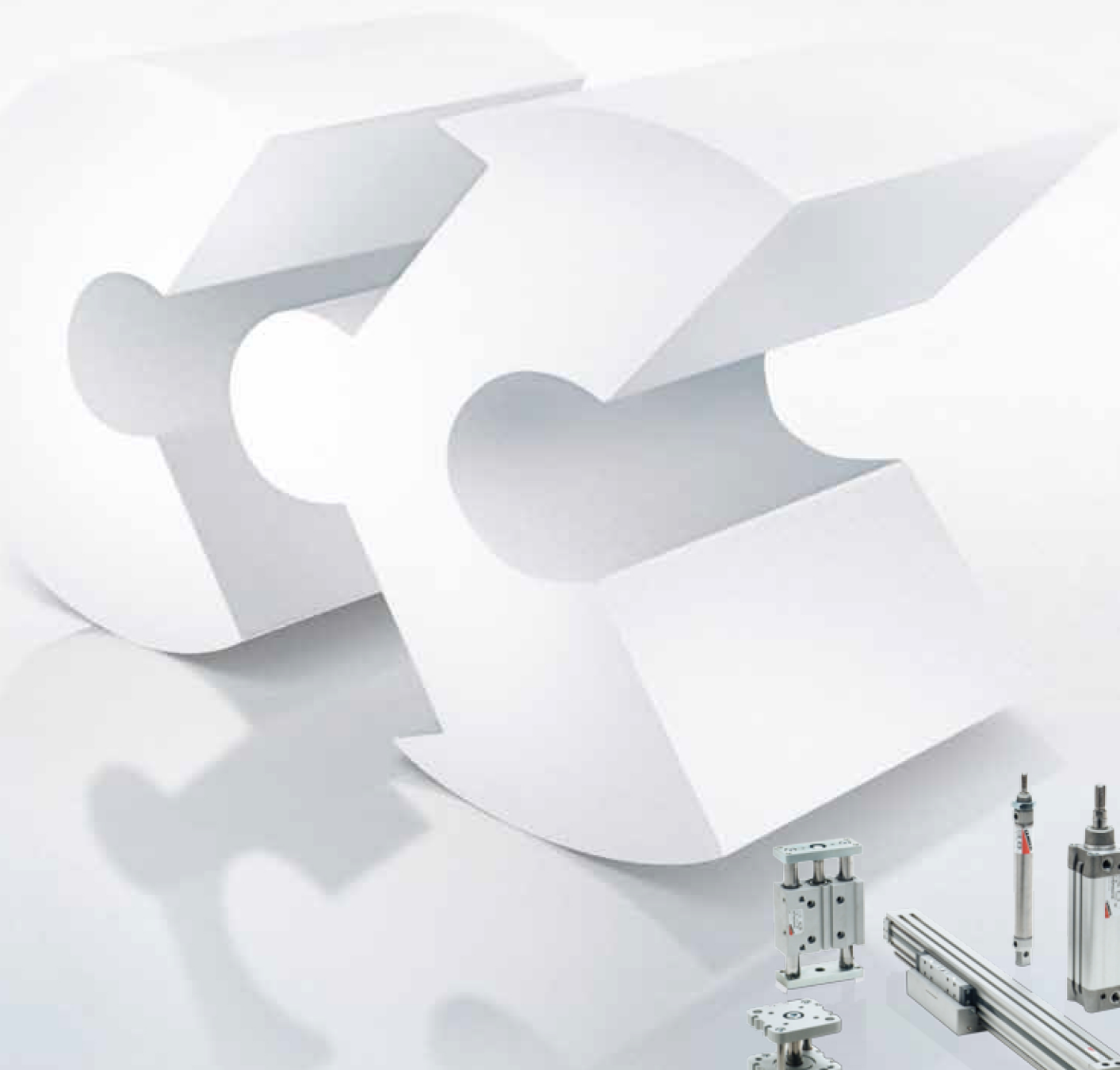




North America

Cylinder and Actuator Catalog

Edition 8.5





CamoZZi Pneumatics, Inc.

2160 Redbud Blvd.

Suite 101

McKinney, Texas 75069

Tel. 972 548 8885

Fax 972 548 2110

Email: info@camozzi-usa.com

www.camozzi-usa.com

WELCOME TO THE WORLD OF CAMOZZI.

Welcome to the world of Camozzi and our new **North American Cylinder and Actuator Catalog**. As a part of our ongoing effort in continued product development, Camozzi is launching this new, improved and updated catalog designed with an easy-to-use and practical format, which offers a comprehensive and innovative range of metric and ISO actuator components.

The catalog includes clear and technical images, drawings, dimension tables, technical specifications and new tools that will provide you with a better understanding of our **Cylinder and Actuator** product line.

The new layout and design is organized by product family from smaller to larger sized units. The chapters reflect the more common actuator divisions found in North America. The back of the catalog contains all spare parts and seal kits.

We hope you find the new catalog and its overall design changes to be helpful to you and your customers.



UNI EN ISO 9001

Day by day we try to improve ourselves, to extend our competence and our professionalism in a constant way.



UNI EN ISO 14001

Minimize the consumption of energy, water, raw material and the production of waste, and focus on recycling wherever possible.

www.camozziusa.com





Everybody talks about quality. We prefer to talk about the many components that work together to create a quality system that ensures excellence, not only in the final product but throughout the entire business process. Research, technological innovation, training, respect for personnel, employee and environmental safety, and total customer care are all factors that Camozzi considers strategic in the achievement of quality reflecting an unyielding commitment to the pursuit of excellence.

In 2009 Camozzi renewed from Det NorskeVeritas the certifications for the Quality Management Systems regarding UNI EN ISO 9001:2008 and for the Environmental Management Systems as UNI EN ISO 14001:2004.

One of Camozzi's main goals, equal to quality and safety, is the protection of the environment and compatibility of our activities with the territorial context in which they are performed.



Without creative ideas, there would be no technology

IDEAS LEAD TO THE CREATION

OF NEW PRODUCTS,

BRILLIANT DESIGNS AND INNOVATIVE

MANUFACTURING SOLUTIONS.

Camozzi thrives on innovation
and provides a stimulating
environment where staff can
express their creativity to the full,
whilst manual and repetitive
operations are undertaken

by highly automated machinery
that conforms to stringent safety
and environmental standards.

Each component and accessory
is designed, manufactured and tested
to the highest possible specification
to ensure consistent levels of
product excellence are achieved.





Our commitment: the secret of our success

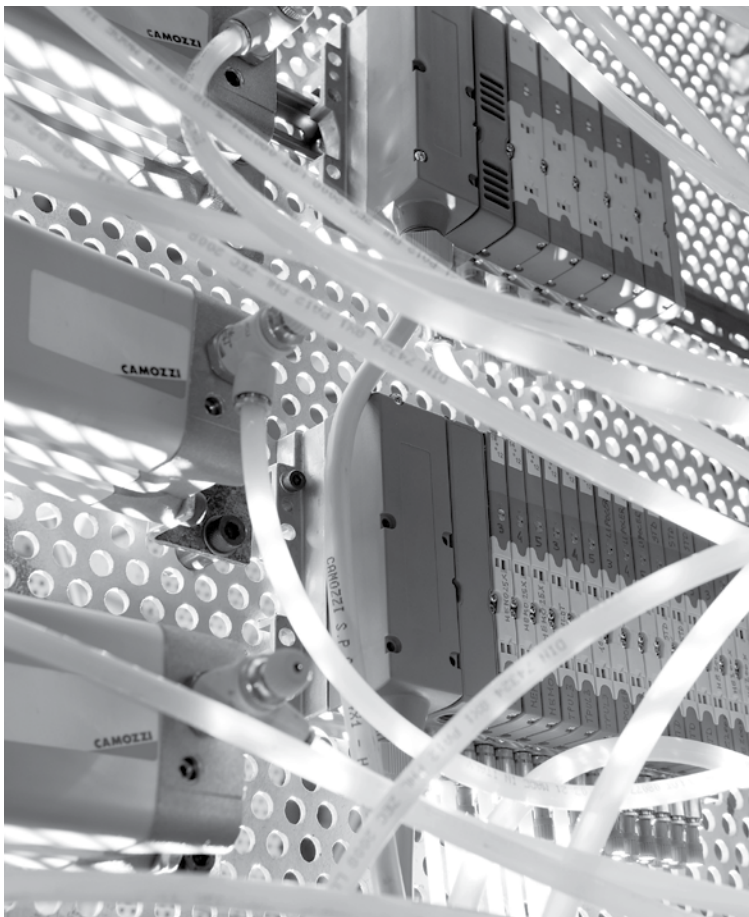
THE STRUCTURE AND ORGANIZATION OF OUR MANAGEMENT TEAM IS CENTRAL TO CAMOZZI'S CONTINUED GROWTH AND DEVELOPMENT, and is supported by sophisticated software systems for all operations, standardised to ensure vertical integration. The complex and widely varying needs of our customers set the agenda not only for innovative product development but also for quality, commitment and service,

and with Camozzi's worldwide sales organization we can reach you quickly anywhere in the world. In our quest for perfection and greater efficiency, Camozzi will meet the demands and expectations of an everchanging market, and the challenges laid down by our competitors, with optimism, fairness and enthusiasm.





Quality... an absolute and total commitment



EVERYBODY TALKS ABOUT QUALITY.

WE PREFER TO TALK ABOUT THE MANY COMPONENTS THAT WORK TOGETHER TO CREATE A QUALITY SYSTEM that ensures excellence, not only in the final product but throughout the entire business process.

Research, technological innovation, training, respect for personnel, employee and environmental safety, and total customer care are all factors that Camozzi considers strategic in the achievement of quality reflecting an unyielding commitment to the pursuit of excellence.

ISO 9001

Day by day we try to improve ourselves, to extend our competence and our professionalism in a constant way.

Mandatory directives

- Directive 85/374/CE concerning liability for defective products modified by D.Lgs. 02/02/01 n° 25.
- Directive 2006/95/CE "Equipment designed for use within certain voltages".
- Directive 2004/108/CE "Electromagnetic Compatibility EMC" and repealing Directive 89/336/EEC.
- Directive 94/9/CE "Atex".
- Directive 2006/42/CE "Machinery".
- Directive 97/23/CE "Pressure equipment - PED".
- Directive 2001/95/CE "General products' safety".
- Regulation 1907/2006 concerning the registration, evaluation, authorisation and restriction of chemicals (REACH).

COMPANY WITH INTEGRATED MANAGEMENT SYSTEM
CERTIFIED BY DNV

ISO 9001 - ISO 14001

In 2003 Camozzi obtained from Det NorskeVeritas the certifications for the Quality Management Systems regarding ISO 9001:2000 and for the Environmental Management Systems as ISO 14001:1996. In 2006, "Det Norske Veritas" issues the new certification ISO 14001:2004, whereas in 2009, it issues the new certification ISO 9001:2008 confirming also certification ISO 14001:2004. One of Camozzi's main goals, equal to quality and safety, is the protection of the environment and compatibility of our activities with the territorial context in which they are performed.

From the 1° July 2003, all products commercialised in the European Union and destined to be used in potentially explosive areas, should be approved according directive 94/9/CE better known as ATEX.

This new directive involves also the non electrical parts, as for instance pneumatic commands which should be approved.



ISO 14001

Minimise the consumption of energy, water, raw material and the production of waste, and focus on recycling wherever possible.

Technical standards

- ISO 4414 - Pneumatic fluid power - General rules relating to systems.
- EN 983 - Safety of machinery - Safety requirements for Fluid power systems and their components. Pneumatics

Environmental notes

- To protect the environment and health, our products are designed and manufactured to operate without lubrication. At the end of the product's life, we recommend the separation of the components to allow recycling.
- Packaging: we respect the environment, using materials which can be recycled. The packaging consists of plastic bags which are recyclable PVC and paper.
- Green Design Project: in the study of new products, the environmental impact is always taken into consideration (real project, elaboration, etc.).

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▶ **EXPRESS DELIVERY AVAILABLE**

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Product Guide

Round Body Minicylinders, DIN/ISO 6432 Series 16, 24 and 25

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EXPRESS DELIVERY AVAILABLE



Series 16: $\varnothing$ 8 - 10 - 12
 Series 24: $\varnothing$ 16 - 20 - 25 magnetic
 Series 25: $\varnothing$ 16 - 20 - 25 magnetic cushioned

Tie-rod Cylinders, ISO 6431, ISO 15552 compliant Series 60

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EXPRESS DELIVERY AVAILABLE

Single or double-acting, magnetic, cushioned
 Standard, low temperature and low friction versions
 $\varnothing$ 32, 40, 50, 63, 80, 100, 125 mm

Extruded Body Cylinders, ISO 6431, ISO 15552 compliant Series 61

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EXPRESS DELIVERY AVAILABLE

Single or double-acting, magnetic, cushioned
 Standard, low temperature and low friction versions
 $\varnothing$ 32, 40, 50, 63, 80, 100, 125 mm

Extruded Body Cylinders, ISO 6431, ISO 15552 compliant Series 62

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Double-acting, magnetic, cushioned
 $\varnothing$ 32, 40, 50, 63, 80, 100, (ISO 15552)

Rod Lock Series RL

page 54



For cylinders ISO 6431/VDMA and ISO 6432
 $\varnothing$ 20 - 25 - 32 - 40 - 50 - 63 - 80 - 100 - 125

Guides Series 45

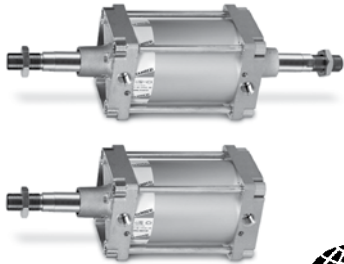
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For cylinders DIN/ISO 6432 - $\varnothing$ 12, 16, 20, 25
 For cylinders DIN/ISO 6431 - $\varnothing$ 32, 40, 50, 63, 80, 100

Large Bore Tie-rod Cylinders, ISO 6431 Series 40

page 64



EXPRESS DELIVERY AVAILABLE

Double acting, cushioned, magnetic
ø160 - 200 - 250 - 320 (DIN/ISO 6431)



Large Bore Extruded Cylinders, ISO 6431 Series 41

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EXPRESS DELIVERY AVAILABLE

Double-acting cushioned, magnetic
ø160 - 200 (DIN/ISO 6431)



Magnetic proximity switches Series CST - CSV and CSH

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Reed, Electronic

Proximity Switches Series CSN

page 93



Reed switch

Threaded Body Minicylinders Series 14

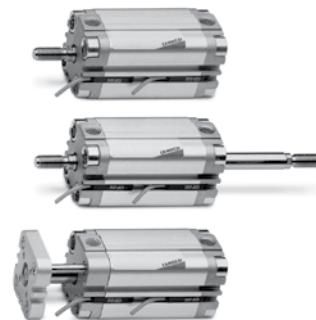
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Single-acting
ø 6, 10, 16 - Strokes 5, 10, 15 mm
with super-rapid fitting ø 4 and M5 port

Compact Cylinders Series 31

page 105



Double and single-acting, double-acting non-rotating, magnetic
ø12, 16, 20, 25
ø 32, 40, 50, 63, 80, 100 UNITOP

**Compact Cylinders
Tandem and Multi-Position Versions
Series 31**

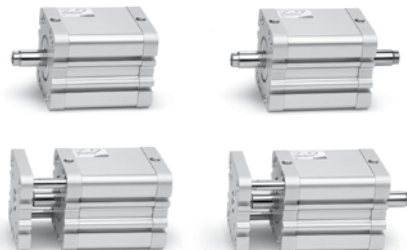
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Double-acting (31M-31F)
ø 12, 16, 20, 25, 32, 40, 50, 63, 80, 100

**Compact Cylinders, ISO 21287 compliant
Series 32**

page 124



Single or double-acting, non-rotating
ø 20, 25, 32, 40, 50, 63, 80, 100.

**Compact Cylinders ISO 21287 compliant
Tandem and Multi-Position Versions
Series 32**

page 141



Double-acting, magnetic, ø 25, 40, 63, 100.

**Short-Stroke Cylinders
Series QN**

page 145



Single-acting, non magnetic
ø 8, 12, 20, 32, 50, 63

**Short-Stroke Cylinders
Series QP and QPR**

page 148



Double-acting, magnetic, cushioned
ø 32, 40, 50, 63, 80, 100, (ISO 15552)

**Round Body Cylinders
Series 27**

page 158



Double-acting, magnetic
ø 20, 25, 32, 40, 50, 63

**Round Body Cylinders
Series 42**

page 166



Single or double-acting, magnetic, cushioned
Ø 32, 40, 50, 63

**Stainless Steel Minicylinders, ISO 6432
Series 94 and 95**

page 180



Single-acting and double-acting
Standard CETOP RP52-P DIN/ISO 6432
Series 94 (Ø 16, 20, 25): magnetic
Series 95 (Ø 25): magnetic, cushioned

**Stainless Steel Tie-rod Cylinders, ISO 6431
Series 90**

page 186



Single or double-acting, cushioned, magnetic (DIN/ISO 6431)
Ø32, 40, 50, 63, 80, 100 and 125

**Stainless Steel Round Body Cylinders
Series 92**

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Single or double-acting, cushioned, magnetic
Ø32 - 40 - 50 - 63

**Stainless Steel Cylinders
Series 97**

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Single or double-acting, cushioned, magnetic.
Ø 32, 40, 50, 63 mm

Rodless Cylinders Series 50

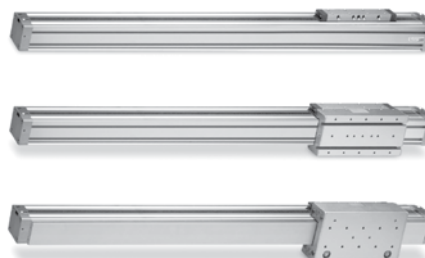
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Double-acting, magnetic, cushioned
ø16, 25, 32, 40, 50, 63, 80

Rodless Cylinders Series 52

page 220



Double-acting, magnetic, cushioned
ø25, 32, 40, 50, 63

Cylinders with Integrated Guide Series QCT and QCB

page 232



Double-acting, magnetic piston, guided
ø 20, 25, 32, 40, 50, 63

Cylinders with Integrated Guide Series QCTF and QCBF

page 237



Double-acting, magnetic piston, with double bearings and flanges
ø 20, 25, 32, 40

Twin Cylinders Series QX

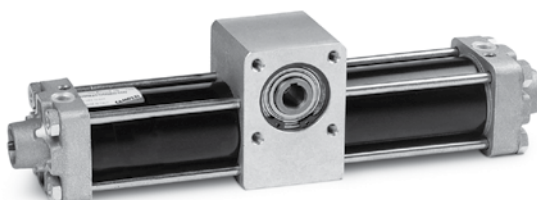
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Single or double-acting, magnetic, cushioned
Standard and low friction versions
ø 32, 40, 50, 63, 80, 100, 125 mm

Rotary Cylinders Series 18

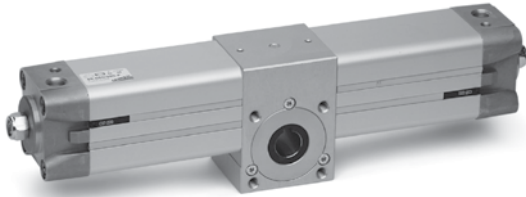
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Non magnetic, cushioned
ø32, 40, 50, 63, 80, 100, 125
Rotational angles 90° and 180°

Rotary Cylinders Series 69

page 261



Magnetic, cushioned
 $\varnothing$ 32, 40, 50, 63, 80, 100, 125
 Rotational angles: 90°, 180°, 270° and 360°

Rotary Cylinders Series 30

page 266



Cushioned and not cushioned
 $\varnothing$ 50 - 63 - 80 - 100
 Rotational angles 90° and 180°

Rotary Actuators, NAMUR interface VDI/VDE 3845 & ISO 5211 (ATEX certified) Series ARP

page 269



Model: "Rack & Pinion" - Rotational angles: 90°
 Sizes: 001, 003, 005, 010, 012, 020, 035, 055, 070, 100, 150, 250, 400

Angular Grippers Series CGA

page 277



Magnetic
 Sizes 10, 16, 20, 25, 32

180° Angular Grippers Series CGSN

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Magnetic
 Sizes 16 - 20 - 25 - 32

Parallel Grippers Series CGP

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Magnetic
 Sizes 10 - 16 - 20 - 25 - 32

Guided Parallel Grippers Series CGB

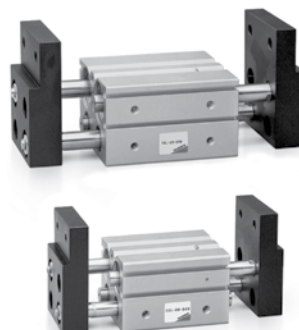
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Magnetic
Sizes 16 - 20 - 25 - 32

Wide Opening Parallel Grippers Series CGL

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Magnetic
Sizes 10 - 16 - 20 - 25 - 32

3-Finger Centric Grippers Series CGC

page 304



Magnetic
Sizes 50 - 64 - 80 - 100 - 125

Magnetic Proximity Switches Series CSB and CSC

page 308



Reed switches

Hydrochecks Series 43

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Bore $\varnothing$ 40
Regulated thrust or return stroke
Skip-Stop function

Shock Absorbers Series SA

page 326



M8x1 - M10x1 - M12x1 - M14x1,5 - M20x1,5 - M25x1,5 -
M27x1,5
Self compensating

**Magnetic Proximity Switches
Series CST - CSV and CSH**

page 332



Reed, Electronic

**Magnetic Proximity Switches
Series CSB and CSC**

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Reed switches

**Proximity Switches
Series CSN**

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Reed switch

1 ISO / VDMA Cylinders

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▶ EXPRESS DELIVERY AVAILABLE

Round Body Minicylinders, DIN/ISO 6432 Series 16, 24 and 25

 EXPRESS DELIVERY AVAILABLE

Series 16: $\varnothing$ 8 - 10 - 12 bumpers

Series 24: $\varnothing$ 16 - 20 - 25 bumpers and magnetic piston

Series 25: $\varnothing$ 16 - 20 - 25 adjustable cushion and magnetic piston



- » Single or double-acting
- » Standard CETOP
RP52P DIN/ISO 6432
- » Stainless steel rod and tube
- » Anodized AL heads and caps

Minicylinders Series 16, 24 and 25 are manufactured according to the European Standard Specifications CETOP RP52-P and DIN/ISO 6432. The choice of materials and other design features have provided the basis for a complete range of versatile and reliable cylinders.

The precise method of crimping the tube at the head and cap ensures that all the parts are perfectly aligned. Since the Series 16 and 24 may operate at very high speeds, bumpers are attached to the piston as standard in order to reduce noise and wear resulting from high impact loads.

Series 24 and 25 are suitable for mounting magnetic proximity switches. Series 25 has an adjustable pneumatic cushion and a magnetic piston. Various mounting accessories are available to enable the cylinders to function in a variety of applications.

GENERAL DATA

Type of construction	crimped
Operation	single-acting or double-acting
Materials	end-caps = anodized AL, tube and rod = stainless steel, piston = AL, seals = NBR - PU, other parts = see coding
Brackets	rod end, flange, feet, trunnion (mounting brackets are supplied separately from the cylinders)
Stroke min - max	Series 16 $\varnothing$ 8 – $\varnothing$ 10: 10 - 250 mm / Series 16: $\varnothing$ 12: 10 - 300 mm / Series 24 & 25 $\varnothing$ 16: 10 - 600 mm; $\varnothing$ 20 - $\varnothing$ 25: 10 - 1000 mm
Bores	Series 16: $\varnothing$ 8, 10, 12 / Series 24 & 25: $\varnothing$ 16, 20, 25
Operating temperature	0°C – 80°C (with dry air -20°C) (32 - 176°F, with dry air -4°F)
Operating pressure	1 – 10 bar (double-acting); 2 – 10 bar (single-acting) (14.5 - 145 psi DA, 29 - 145 psi SA)
Fluid	filtered air, without lubrication. If lubricated air is used, it is recommended to use oil ISO VG32. Once applied the lubrication should never be interrupted.
Speed	10 – 1000 mm/sec (without load)

STANDARD STROKES FOR MINICYLINDERS SERIES 16 - 24 and 25

- = Double-acting
 ✕ = Single-acting

MAXIMUM STROKE LENGTHS (mm)

Series (and Ø)	Min-Max Stroke (Produced in USA)	Min-Max Stroke (Produced in Italy)
16 (Ø 8-10)	10-250 mm	10-250 mm
16 (Ø 12)	10-300 mm	10-300 mm
24, 25 (Ø 16)	10-600 mm	10-600 mm
24, 25 (Ø 20-25)	10-600 mm	10-1000 mm

STANDARD STROKES

Series	Ø	10	25	40	50	80	100	125	160	200	250	300	320	400	500
16	8	✕	✕	✕	✕	■	■	■	■	■					
16	10	✕	✕	✕	✕	■	■	■	■	■					
16	12	✕	✕	✕	✕	■	■	■	■	■	■	■			
24	16	✕	✕	✕	✕	■	■	■	■	■	■	■	■	■	■
24	20	✕	✕	✕	✕	■	■	■	■	■	■	■	■	■	■
24	25	✕	✕	✕	✕	■	■	■	■	■	■	■	■	■	■
25	16	■	■	■	■	■	■	■	■	■	■	■	■	■	■
25	20	■	■	■	■	■	■	■	■	■	■	■	■	■	■
25	25	■	■	■	■	■	■	■	■	■	■	■	■	■	■

CODING EXAMPLE

24	N	2	A	16	A	100	
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24	SERIES: 16 = non-magnetic piston (bore sizes 8, 10 or 12 only) 24 = magnetic piston (bore sizes 16, 20 or 25 only) 25 = magnetic piston and adjustable cushions (bore sizes 16, 20 or 25 only)
N	VERSION N = standard
2	OPERATION 1 = single-acting (front spring) 2 = double-acting 3 = double-acting (through-rod) 7 = single-acting (through-rod)
A	MATERIALS rod = rolled stainless steel AISI 303 tube = stainless steel AISI 304 end-caps = anodized AL
16	BORE: 08 = 8 mm 10 = 10 mm 12 = 12 mm 16 = 16 mm 20 = 20 mm 25 = 25 mm
A	CONSTRUCTION A = threaded nose mount with lock nut + lock nut for rod RL = cylinder with rod lock ø20 - ø25 (rod extension required. See table.)
100	STROKE (see table)
	= standard V = rod seals FKM (VITON)

ACCESSORIES FOR MINICYLINDERS SERIES 16 - 24 - 25



Rear trunnion bracket
Mod. I



Coupling piece
Mod. GKF



Self aligning rod
Mod. GK



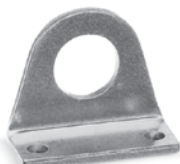
Rod fork end Mod. G



Swivel ball joint Mod. GA



Front/rear flange mount
Mod. E



Foot mount Mod. B



Front Cap nut Mod. V



Piston rod nut Mod. U



Piston rod socket joint
Mod. GY

All accessories are supplied separately, except for Piston rod nut Mod. U and Nose nut Mod. V

Rod Gland

Rod Bearing is oil impregnated, sintered bronze containing graphite for high speed and heavy load applications.

Heads and Caps

Heads and Caps are lightweight aluminum that have been precision machined and anodized.

Piston Bumpers

Shock absorbing bumpers reduce noise and piston wear. Standard (Series 16 and 24).

Piston

Aluminum, two-piece design allows for a solid magnet ensuring consistent switch sensing. Nylon wear ring increases piston support while reducing wear and friction. (Series 24 and 25).

Adjustable Cushion Seal Design

Precision-machined piston spears combined with floating cushion collar allow for a smooth deceleration at end of stroke. Cushion collar is specifically designed for rapid low-pressure breakaway when stroke reverses (Series 25).

Piston Rod

All stainless steel ground and polished rods, burnished for improved seal life and reduced wear. Standard.

Cylinder Tube

Stainless Steel tube that provides superior seal life and wear resistance.

Rod Threads

Threads are rolled Stainless Steel for greater strength..

Rod Nut

Threads are rolled Stainless Steel for greater strength.

Key Flat

Hydraulically pressed key flat.

Rod and Wiper Seal

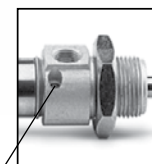
Piston rod lip seal and wiper combination. A compact design, allowing for greater bushing support without sacrificing sealing ability. Standard polyurethane.

Piston Seals

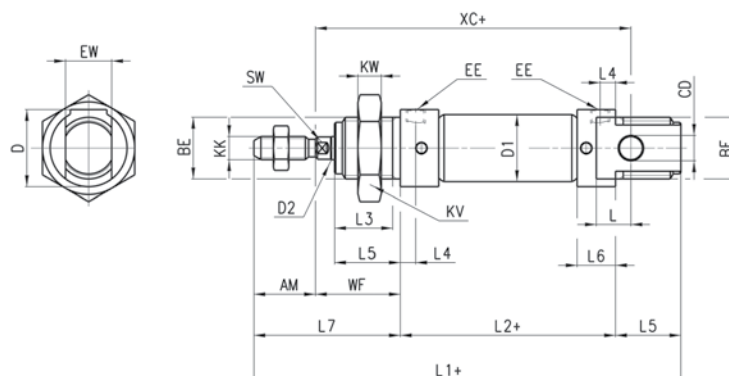
Rounded lip u-cup seal reduces friction; specifically designed for lube or non-lube service. Maintains factory prelube against the cylinder wall. Standard polyurethane.

Cushion Adjustment

Recessed and captive cushion adjustment screws. Fine thread adjustment for greater repeatability and accuracy. Standard Viton (Series 25).



Minicylinders Series 16, 24 and 25

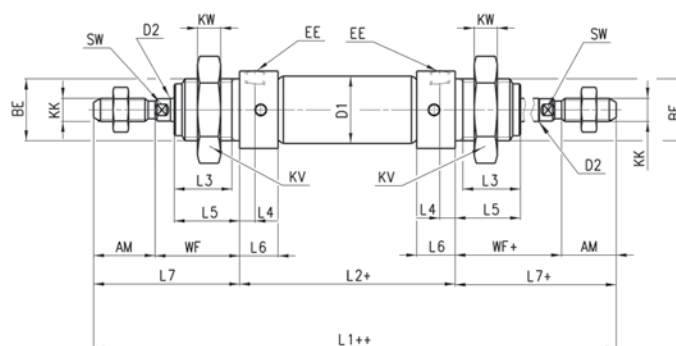


+ = add the stroke

DIMENSIONS (mm)

Mod.	Ø	EW	KW	BE	KK	CD	D1	EE	ØD2	L1+	XC+	L2+	AM	L3	L4	L5	L	WF	L6	L7	KV	SW	D	cushion strokes front/rear
16	8	8	7	M12x1,25	M4x0,7	4	9,3	M5	4	86	64	46	12	10	4,5	12	6	16	9	28	19	-	15	- / -
16	10	8	7	M12x1,25	M4x0,7	4	11,3	M5	4	86	64	46	12	10	4,5	12	6	16	9	28	19	-	15	- / -
16	12	12	8	M16x1,5	M6x1	6	13,3	M5	6	105	75	50	16	15	4,5	17	9	22	9	38	24	5	20	- / -
24-25	16	12	8	M16x1,5	M6x1	6	17,3	M5	6	111	82	56	16	15	5,5	17	9	22	10	38	24	5	20	10 / 10
24-25	20	16	10	M22x1,5	M8x1,25	8	21,3	G1/8	8	132	95	68	20	18	8	20	12	24	16	44	32	7	27	13 / 15
24-25	25	16	10	M22x1,5	M10x1,25	8	26,5	G1/8	10	141,5	104	69,5	22	20	8	22	12	28	16	50	32	9	27	16 / 14

Minicylinders Series 16, 24 and 25 - through-rod

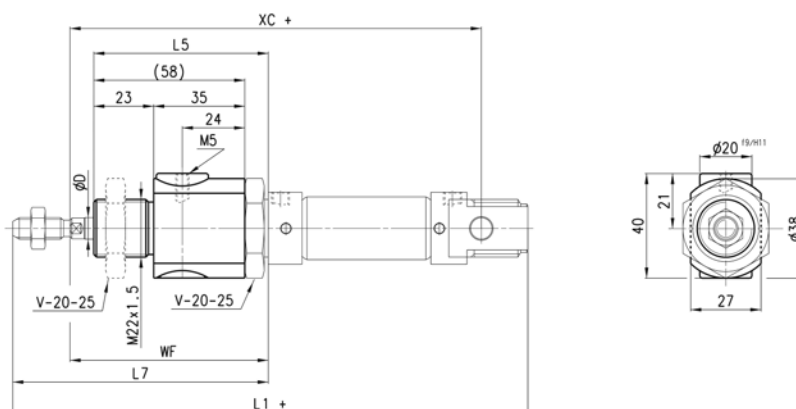


- + = add the stroke
- ++ = add the stroke two times

DIMENSIONS (mm)

Mod.	Ø	KW	BE	KK	ØD1	EE	ØD2	L1++	L2+	AM	L3	L4	L5	WF+	L6	L7+	KV	SW	cushion strokes front/rear
16	8	7	M12x1,25	M4x0,7	9,3	M5	4	102	46	12	10	4,5	12	16	9	28	19	-	- / -
16	10	7	M12x1,25	M4x0,7	11,3	M5	4	102	46	12	10	4,5	12	16	9	28	19	-	- / -
16	12	8	M16x1,5	M6x1	13,3	M5	6	126	50	16	15	4,5	17	22	9	38	24	5	- / -
24-25	16	8	M16x1,5	M6x1	17,3	M5	6	132	56	16	15	5,5	17	22	10	38	24	5	10 / 10
24-25	20	10	M22x1,5	M8x1,25	21,3	G1/8	8	156	68	20	18	8	20	24	16	44	32	7	13 / 15
24-25	25	10	M22x1,5	M10x1,25	26,5	G1/8	10	169,5	69,5	22	20	8	22	28	16	50	32	9	16 / 14

Minicylinders Series 16, 24 and 25 with rod lock (Mod. RLC)



Ø	Rod extension [X] (mm)	Holding force [static load] (N)
20	+50	300
25	+48	400

+ = add the stroke

DIMENSIONS (mm)

							Clamping Force (Static Load)
Ø	^{G7} D	WF	L5	L7	XC+	L1+	F (N)
20	8	74	70	94	145	182	300
25	10	76	70	98	152	189,5	400

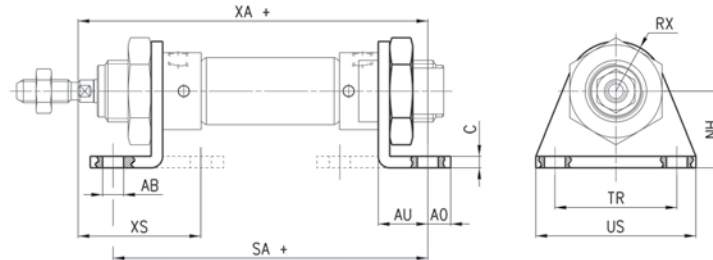
Foot mount Mod. B

Material: zinc-plated steel.



Supplied with:
2x feet
1x front end cap nut
mod. V

+ = add the stroke



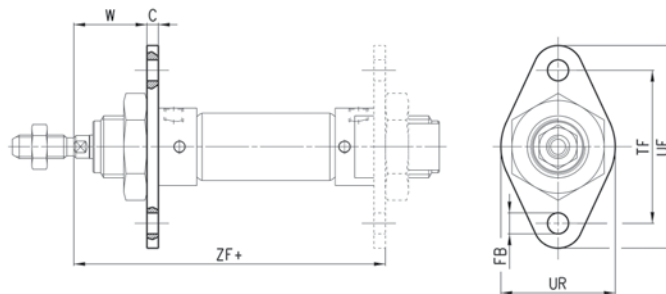
DIMENSIONS (mm)													
Mod.	Ø	TR	US	ØAB	C	NH	AO	AU	RX	XA+	SA+	XS	Weight (g)
B-8-10	8-10	25	35	4,5	2,5	16	4,5	10,5	10	72,5	67	54	46
B-12-16	12	32	42	5,5	3	20	6	13	13	82,5	71	64	78
B-12-16	16	32	42	5,5	3	20	6	13	13	91	82	68	78
B-20-25	20	40	54	6,6	4	25	8	16	20	108	100	80	174
B-20-25	25	40	54	6,6	4	25	8	16	20	113,5	101,5	85,5	174

Front/rear flange mount Mod. E

Material: zinc-plated steel.



+ = add the stroke



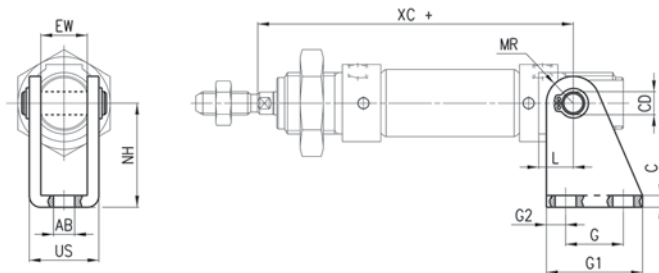
DIMENSIONS (mm)									
Mod.	Ø	C	ØFB	TF	UF	UR	W	ZF	Weight (g)
E-8-10	8-10	2,5	4,5	30	25	40	13,5	64,5	10
E-12-16	12	3	5,5	40	30	53	19	75	21
E-12-16	16	3	5,5	40	30	53	19	81	21
E-20-25	20	4	6,6	50	40	66	20	96	39
E-20-25	25	4	6,6	50	40	66	24	101,5	39

Rear trunnion bracket Mod. I

Material: zinc-plated steel.



+ = add the stroke



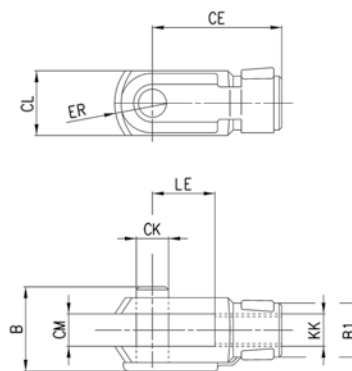
DIMENSIONS (mm)

Mod.	Ø	G1	G	G2	ØCD	ØAB	C	NH	EW	US	MR	XC+	L	Weight (g)
I-8-10	8-10	20	12,5	3,5	4	4,5	2,5	24	8	13,1	5	64	6	20
I-12-16	12	25	15	5	6	5,5	3	27	12	18,1	7	75	9	38
I-12-16	16	25	15	5	6	5,5	3	27	12	18,1	7	82	9	38
I-20-25	20	32	20	6	8	6,6	4	30	16	24,1	10	95	12	78
I-20-25	25	32	20	6	8	6,6	4	30	16	24,1	10	104	12	78

Rod fork end Mod. G

ISO 8140

Material: zinc-plated steel.



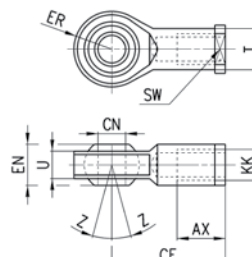
DIMENSIONS (mm)

Mod.	Ø	ØCK	LE	CM	CL	ER	CE	KK	B	ØB1	Weight (g)
G-8-10	8-10	4	8	4	8	5	16	M4x0,7	11	8	6
G-12-16	12-16	6	12	6	12	7	24	M6x1	16	10	18
G-20	20	8	16	8	16	10	32	M8x1,25	22	14	46
G-25-32	25	10	20	10	20	12	40	M10x1,25	26	18	88

Swivel ball joint Mod. GA

ISO 8139

Material: zinc-plated steel.



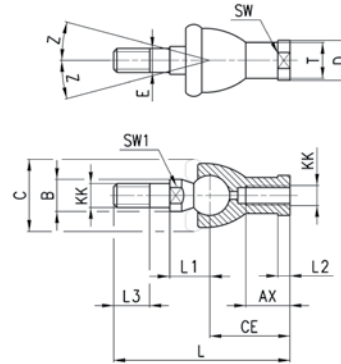
DIMENSIONS (mm)

Mod.	Ø	ØCN ^(H7)	U	EN	ER	AX	CE	KK	ØT	Z	SW	Weight (g)
GA-8-10	8-10	5	6	8	9	10	27	M4x0,75	9	6,5°	9	20
GA-12-16	12-16	6	7	9	10	12	30	M6X1	10	6,5°	11	25
GA-20	20	8	9	12	12	16	36	M8X1,25	12,5	6,5°	14	44
GA-32	25	10	10,5	14	14	20	43	M10X1,25	15	6,5°	17	76

Piston rod socket joint Mod. GY

ISO 8139

Material: Zinc-Aluminum alloy and zinc-plated steel.



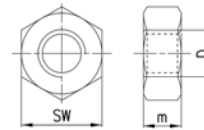
DIMENSIONS (mm)

Mod.	Ø	KK	L	CE	L2	AX	E	ØB	ØC	ØT	ØD	L1	L3	SW1	SW	Z	Weight (g)
GY-12-16	12-16	M6X1	40	28	5	15	6	10	20	10	13	12,2	11	8	11	15	42
GY-20	20	M8X1,25	65	32	5	16	8	12	24	12,5	16	16	12	10	14	15	74
GY-32	25	M10X1,25	74	35	6,5	18	10	14	28	15	19	19,5	15	11	17	15	122

Piston rod nut Mod. U

UNI EN ISO 4035

Material: zinc-plated steel.



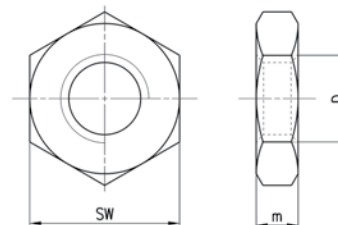
DIMENSIONS (mm)

Mod.	Ø	D	m	SW	Weight (g)
U-8-10	8-10	M4X0,7	3	7	0,5
U-12-16	12-16	M6X1	4	10	1,6
U-20	20	M8X1,25	5	13	3,6
U-25-32	25	M10X1,25	6	17	7,6

Front End-Cap nut Mod.V

UNI EN ISO 4035

Material: zinc-plated steel.



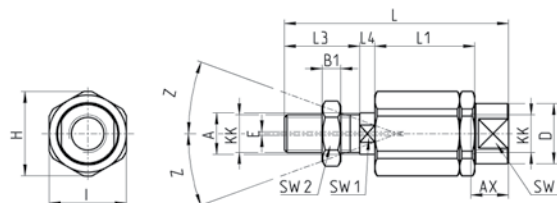
DIMENSIONS (mm)

Mod.	Ø	D	m	SW	Weight (g)
V-8-10	8-10	M12X1,25	5	19	10,2
V-12-16	12-16	M16X1,5	6	24	15
V-20-25	20-25	M22X1,5	10	32	32

EXPRESS DELIVERY AVAILABLE

Self aligning rod Mod. GK

Material: zinc-plated steel.

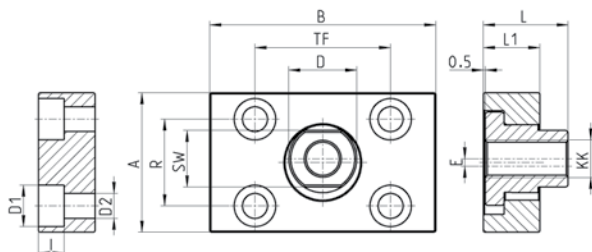
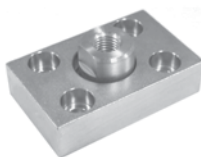


DIMENSIONS (mm)

Mod.	Ø	KK	L	L1	L3	L4	ØA	ØD	H	I	SW	SW1	SW2	B1	AX	Z	E	Weight (g)
GK-20	20	M8x1,25	57	26	21	5	8	12,5	19	17	11	7	13	4	16	4	2	51,5
GK-25-32	25-32	M10x1,25	71,5	35	20	7,5	14	22	32	30	19	12	17	5	22	4	2	215

Coupling piece Mod. GKF

Material: zinc-plated steel.



DIMENSIONS (mm)

Mod.	Ø	KK	A	B	R	TF	L	L1	I	Ø D	Ø D1	Ø D2	SW	E	Weight (g)
GKF-20	20	M8x1,25	30	35	20	25	22,5	10	-	14	5,5	-	13	1,5	76
GKF-25-32	25	M10x1,25	37	60	23	36	22,5	15	6,8	18	11	6,6	15	2	240

Tie-rod Cylinders, ISO 6431, ISO 15552 compliant Series 60

EXPRESS DELIVERY AVAILABLE

Single or double-acting, magnetic, cushioned
Standard and low friction versions
ø 32, 40, 50, 63, 80, 100, 125 mm



The Series 60 cylinders comply with the dimensions laid down in the ISO 15552 standards. A permanent magnet, mounted on the piston, enables information to be received regarding the piston position by means of proximity switches positioned along the cylinder tube.

This cylinder series is normally equipped with adjustable end-stroke cushioning. Moreover these cylinders are equipped with bumpers in order to reduce noise and the impact of the piston as it reaches the end of the stroke.

» In compliance with ISO 15552 standards and with the previous DIN/ISO 6431 - VDMA 24562 standards

- » Rolled stainless steel rod
- » Adjustable pneumatic cushioning
- » Special designs available

LOW FRICTION:

- » Friction force reduced by over 40%
- » Reduced stick-slip effect
- » Minimum operating pressure down to 0,1 bar (1.5 psi)
- » Double-acting with low friction in both directions

LOW TEMPERATURE:

Versions for -40°C and for -50°C

METAL ROD SCRAPER OPTION FOR DIRT/ICE APPLICATIONS

- » For dirt / ice applications
- » Resistant to dust, cement, resin, mud and wood residue

GENERAL DATA

Type of construction	with tie-rods
Operation	double-acting, single-acting, tandem. Low friction version: double-acting only.
Materials	standard = AL end-caps, rolled stainless steel rod AISI 420B, anodized AL tube, zinc-plated steel nuts and tie-rods, PU seals; low friction = standard materials with NBR piston seal and NBR rod seal (FKM rod seal on request); low temperature: standard materials with chrome plated stainless steel AISI 420B rod, brass rod scraper ring, stainless steel AISI 303 nuts, stainless steel AISI 420B tie-rods, PU piston seals and NBR rod seal
Type of mounting	with tie-rods, with front / rear flange, foot mounting, with centre / front / rear / swivel trunnion
Strokes min - max	10 – 2500 mm
Operating temperature	0°C – 80°C (with dry air - 20°C) (32 – 176°F, with dry air -4°F) low temperature (-40°C version): -40°C – 60°C (with dry air -40°C) low temperature (-50°C version): -50°C – 60°C (with dry air -50°C)
Operating pressure	1 – 10 bar (standard and low temperature versions) (14.5 - 145 psi) 0,1 – 10 bar (low friction version) (1.5 - 145 psi)
Speed	10 – 1000 mm/sec, no load (standard and low temperature versions) 5 – 1000 mm/sec, no load (low friction version)
Fluid	filtered air, without lubrication. For standard versions only: if lubricated air is used, it is recommended to use oil ISOVG32. Once applied the lubrication should never be interrupted.

STANDARD STROKES FOR CYLINDERS SERIES 60

■ = Single-acting (standard versions) ✕ = Double-acting (standard low friction and low temperature versions)
Other strokes up to 2500 mm are available on request.

Ø	MAXIMUM STROKE LENGTHS (mm)												
	Series (and Ø)		Min-Max Stroke (Produced in USA)					Min-Max Stroke (Produced in Italy)					
	60-61 (Ø 32-125)		10-1500 mm					10-2500 mm					
Ø	25	50	75	100	125	150	160	200	250	300	320	400	500
32	■ ✕	■ ✕	■ ✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕
40	■ ✕	■ ✕	■ ✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕
50	■ ✕	■ ✕	■ ✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕
63	■ ✕	■ ✕	■ ✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕
80	■ ✕	■ ✕	■ ✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕
100		■ ✕	■ ✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕
125		✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕

CODING EXAMPLE

60	M	2	L	050	A	0200	
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60

SERIES

M

VERSIONS:

M = magnetic

N = non magnetic

L = low friction, magnetic

2

OPERATION

1 = single-acting, front spring

2 = double-acting *, front and rear cushioned

3 = double-acting *, no cushion

4 = double-acting *, rear cushioned

5 = double-acting *, front cushioned

6 = double-acting *, through-rod, front and rear cushioned

7 = single-acting, through-rod

* all double-acting cylinders are also available in the low friction version.

L

MATERIALS

L = see the general data on page 1/1.20.01

T = stainless steel AISI 420B tie-rods - stainless steel AISI 303 tie-rod nuts

C = rolled stainless steel AISI 303 piston rod, stainless steel AISI 304 piston rod nut

U = rolled stainless steel AISI 303 piston rod, AISI 304 piston-rod nut, AISI 420B tie-rods, AISI 303 tie-rod nuts

W = rolled stainless steel AISI 304 piston rod, AISI 304 piston-rod nut, AISI 420B tie-rods, AISI 303 tie-rod nuts

Z = chrome plated stainless steel AISI 420B rod, stainless steel AISI 304 rod nut, stainless steel AISI 420B tie-rods,

stainless steel AISI 303 tie-rods nuts, seals for low temperature (-40°C), brass rod scraper (Ø 125 excepted)

Y = chrome plated stainless steel AISI 420B rod, stainless steel AISI 304 rod nut, stainless steel AISI 420B tie-rods,

stainless steel AISI 303 tie-rods nuts, seals for low temperature (-50°C), brass rod scraper (Ø 125 excepted)

050

BORE:

032 = 32 mm

040 = 40 mm

050 = 50 mm

063 = 63 mm

080 = 80 mm

100 = 100 mm

125 = 125 mm

A

CONSTRUCTION:

A = standard with lock nut for rod

RL = cylinder with rod lock (rod extension required. See table.)

F = cylinder with centre trunnion

020

STROKE:

see table

= standard

V = FKM rod seal

N = tandem

R = NBR rod seal

W = all FKM seals, up to 140°C

C = PU coated cylinder. Colour: Grey *

L = low friction version without rod seal (rear supply only) **

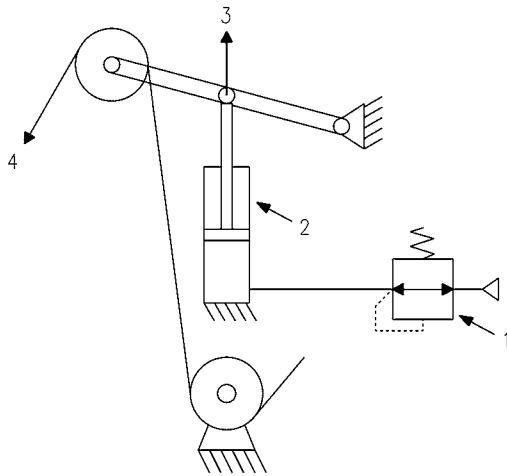
(_ _ _) = extended piston rod _ _ _ mm

G = with brass rod scraper (chrome plated stainless steel AISI 420B rod, NBR rod seal) (Ø 125 excepted)

* Version C: available on request. For further information, please contact our technical dept.

** The possibility to order the cylinder without piston rod seal, further reduces the friction force.

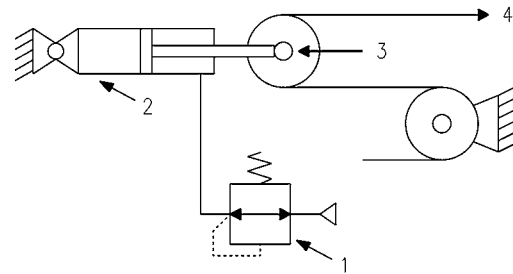
LOW FRICTION cylinders Series 60 - APPLICATION EXAMPLES



CYLINDER IN THRUST

DRAWING NOTES:

1. Precision pressure regulator or electro-pneumatic regulator
2. Low friction cylinder
3. Force direction
4. Band

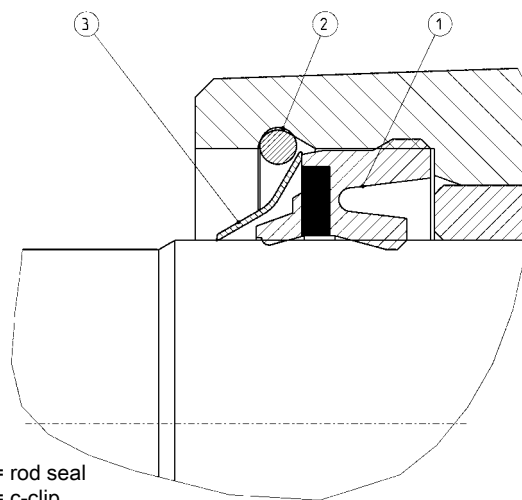


CYLINDER IN TRACTION

Note: in order to reach the highest performance, it is recommended to connect precision pressure regulator or an electro-pneumatic regulator with the low friction cylinder as shown in the drawing.

LOW TEMPERATURE cylinders Series 60 - DETAIL

Rod scraper included in all low-temperature cylinders



- 1 = rod seal
2 = c-clip
3 = metal scraper

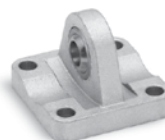
ACCESSORIES FOR CYLINDERS SERIES 60

Piston rod socket joint
Mod. GY

Piston rod nut Mod. U



Clevis pin Mod. S

Rear trunnion ball-joint
Mod. R

Rod fork end Mod. G



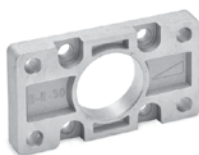
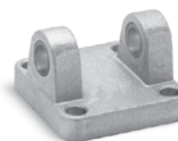
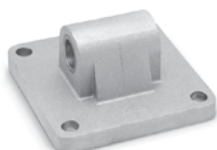
Swivel ball joint Mod. GA

90° male trunnion
Mod. ZCSwivel combination
Mod. I

Centre trunnion Mod. F

Self aligning rod
Mod. GKCounter bracket for
centre trunnion Mod. BF

Foot mount Mod. B

Front and rear flange
Mod. D-ERear female trunnion
Mod. C and C-HFront female trunnion
Mod. H and C-HRear male trunnion
Mod. L

All accessories are supplied separately, except for Piston rod nut Mod. U

Rod Gland

Hard Anodized Aluminum body and integrated design includes rod bearing and rod lip/wiper seal. Rod Bearing is oil impregnated, sintered bronze containing graphite for high speed and heavy load applications.

Tie Rod Nuts

Tie rod nuts are ID hexed and ID threaded providing a flush face and ability to assemble and disassemble mounting brackets without loosening Head.

Heads and Caps

Heads and Caps are lightweight aluminum that have been precision machined and anodized.

Piston Bumpers

Shock absorbing bumpers reduce noise and piston wear. Standard.

Piston

Aluminum, one-piece design with built-in solid magnet ensuring consistent switch sensing.

Cushion Adjustment

Recessed and captive cushion adjustment screws. Fine thread adjustment for greater repeatability and accuracy. Standard Viton.

Piston Rod

All stainless steel ground and polished rods, burnished for improved seal life and reduced wear. Standard.

Rod Threads

Threads are rolled Stainless Steel for greater strength.

Rod Nut

Threads are rolled Stainless Steel for greater strength.

Key Flat

Hydraulically pressed key flat.

Rod and Wiper Seal

Piston rod lip seal and wiper combination. A compact design, allowing for greater bushing support without sacrificing sealing ability. Standard polyurethane.

Tube End Seals

Captured seal made from BUNA-N offering a wide range of temperature applications and positive sealing. Standard.

Adjustable Cushion Seal Design

Precision-machined piston spears combined with floating cushion collar allow for a smooth deceleration at end of stroke. Cushion collar is specifically designed for rapid low-pressure breakaway when stroke reverses.

Cylinder Tube

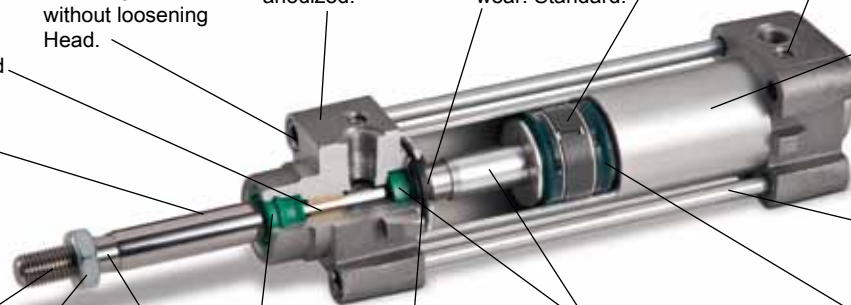
Hard Anodized Aluminum tube that provides superior seal life and wear resistance.

Tie Rods

Zinc plated steel, rolled threads for added strength.

Piston Seals

Rounded lip u-cup seal reduces friction; specifically designed for lube or non-lube service. Maintains factory prelube against the cylinder wall. Standard polyurethane.

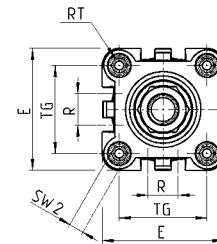
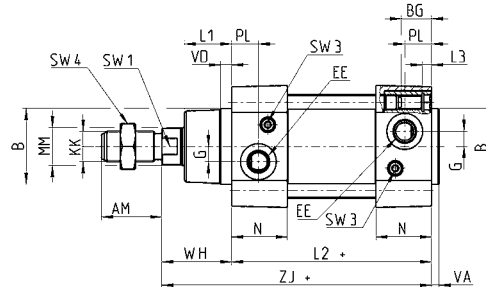


Cylinders Series 60

Note: the single-acting cylinders' sizes ZJ and L2 are increased by 25 mm.



+ = add the stroke



DIMENSIONS (mm)

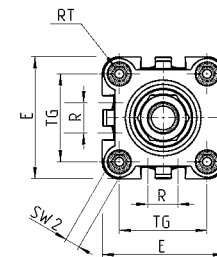
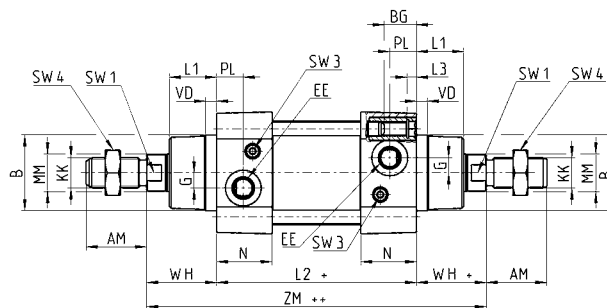
Ø	AM	B	BG	E	EE	G	KK	L1	L2+	L3	MM	N	PL	R	RT	SW1	SW2	SW3	SW4	TG	VA	VD	WH	ZJ+	Front/rear cushion stroke
32	22	30	16	46	G1/8	5	M10x1,25	18	94	5	12	26	14	13	M6	10	6	2	17	32,5	4	5	26	120	17 / 12
40	24	35	16	55	G1/4	5	M12x1,25	21	105	5	16	29	15	13,5	M6	13	6	2	19	38	4	5	30	135	20 / 17
50	32	40	16	64,5	G1/4	8	M16x1,5	25	106	5	20	29,5	15	16	M8	17	8	3	24	46,5	4	6	37	143	15 / 14
63	32	45	16	75	G3/8	8	M16x1,5	26	121	5	20	36,5	21	28	M8	17	8	3	24	56,5	4	6	37	158	17 / 16
80	40	45	19	93	G3/8	8	M20x1,5	30	128	0	25	36	21	30	M10	22	10	5	30	72	4	7	46	174	20 / 20
100	40	55	19,5	110	G1/2	8	M20x1,5	35	138	0	25	38,5	23	40	M10	22	10	5	30	89	4	7	51	189	21 / 19
125	54	60	23	135	G1/2	10,5	M27x2	42	160	0	32	43	23,5	50	M12	27	12	4	41	110	6	8	65	225	26 / 25

Cylinders Series 60 - through-rod

Note: the single-acting cylinders' sizes ZJ and L2 are increased by 25 mm.



+ = add the stroke
++ = add the stroke two times



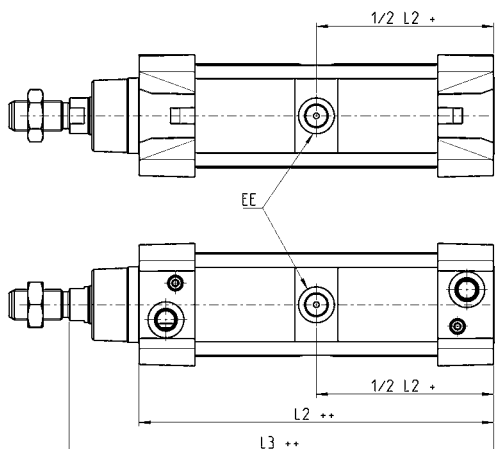
DIMENSIONS (mm)

Ø	AM	B	BG	E	EE	G	KK	L1	L2+	L3	MM	N	PL	R	RT	SW1	SW2	SW3	SW4	TG	VD	WH	ZM++	Front/rear cushion stroke
32	22	30	16	46	G1/8	5	M10x1,25	18	94	5	12	26	14	13	M6	10	6	2	17	32,5	5	26	146	17 / 12
40	24	35	16	55	G1/4	5	M12x1,25	21	105	5	16	29	15	13,5	M6	13	6	2	19	38	5	30	165	20 / 17
50	32	40	16	64,5	G1/4	8	M16x1,5	25	106	5	20	29,5	15	16	M8	17	8	3	24	46,5	6	37	180	15 / 14
63	32	45	16	75	G3/8	8	M16x1,5	26	121	5	20	36,5	21	28	M8	17	8	3	24	56,5	6	37	195	17 / 16
80	40	45	19	93	G3/8	8	M20x1,5	30	128	0	25	36	21	30	M10	22	10	5	30	72	7	46	220	20 / 20
100	40	55	19,5	110	G1/2	8	M20x1,5	35	138	0	25	38,5	23	40	M10	22	10	5	30	89	7	51	240	21 / 19
125	54	60	23	135	G1/2	10,5	M27x2	42	160	0	32	43	23,5	50	M12	27	12	4	41	110	8	65	290	26 / 25

Cylinders Series 60 - tandem version

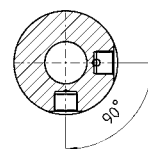


+ = add the stroke
++ = add the stroke two times

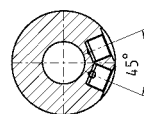


Intermediate porting orientation

Ø32-40-50-63



Ø80-100-125



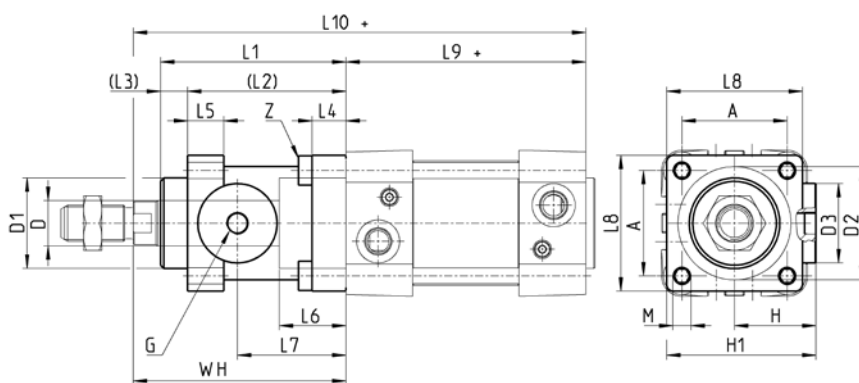
DIMENSIONS (mm)

Ø	EE	L2	L3
32	G1/8	171,5	197,5
40	G1/4	191,5	221,5
50	G1/4	188	225
63	G3/8	204	241
80	G3/8	225,5	271,5
100	G1/2	231	282
125	G1/2	264	329

Cylinders Series 60 with rod lock



Ø	Rod extension [X] (mm)	Holding force [static load] (N)
20	+50	300
25	+48	400
32	+40	650
40	+43	1100
50	+57	1600
63	+57	2500
80	+80	4000
100	+80	6300
125	+125	8800



+ = add the stroke

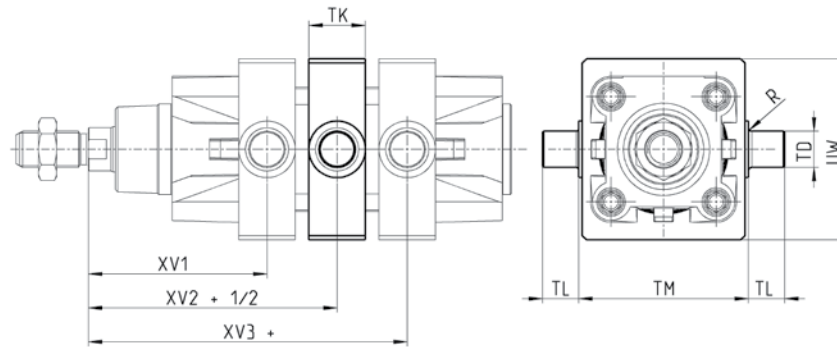
DIMENSIONS (mm)

Ø	ØD	ØD1	ØD2	ØD3	A	G	H	H1	L1	L2	L3	L4	L5	L6	L7	L8	L9+	L10+	M	WH	Z
32	12	30,5	35	25	32,5	M5	25,5	46,5	58	48	10	8	13	20,5	34	45	94	160	M6	66	M6X20
40	16	35	40	28	38	G1/8	30	53	65	55	10	8	13	22,5	38	50	105	178	M6	73	M6X20
50	20	40	50	35	46,5	G1/8	36	64	82	70	12	15	16	29,5	48	60	106	200	M8	94	M8X30
63	20	45	60	38	56,5	G1/8	40	75	82	70	12	15	16	29,5	49,5	70	121	215	M8	94	M8X30
80	25	45	80	48	72	G1/8	50	95	110	90	20	18	20	35	61	90	128	254	M10	126	M10X35
100	25	55	100	58	89	G1/8	58	110,5	115	100	15	18	20	39	69	105	138	269	M10	131	M10X35
125	32	60	130	65	110	G1/8	80	150	167	122	45	22	30	51	86,5	140	160	350	M12	190	M12X40

Cylinders Series 60 with centre trunnion Mod F.



+ = add the stroke
++ = add the stroke twice



DIMENSIONS (mm)

Ø	XV1	XV2	XV3	TM	TK	TD	TL	UW	R
32	62	73	84	50	20	12	12	65	0,1
40	71,5	82,5	93,5	63	25	16	16	74	0,15
50	79	90	101	75	25	16	16	85	0,15
63	88,5	97,5	106,5	90	30	20	20	100	0,15
80	97	110	123	110	30	20	20	120	0,15
100	104,5	120	135,5	132	30	25	25	135	0,2
125	123	145	167	162	30	25	25	160	0,2

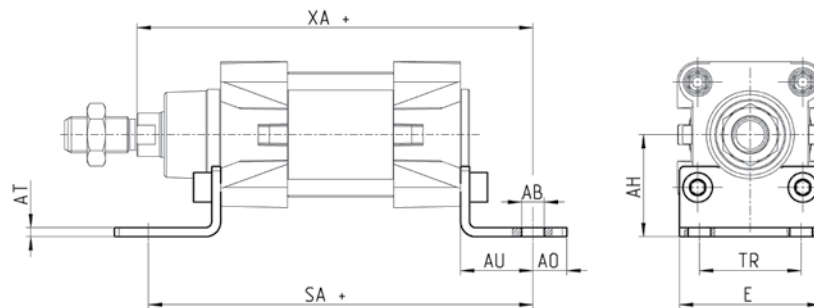
Foot mount Mod. B

Material: zinc-plated steel



Supplied with:
2x feet
4x screws

+ = add the stroke

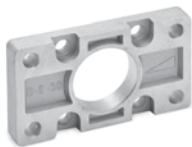


DIMENSIONS (mm)

Mod.	Ø	AT	SA+	XA+	TR	E	AB	AH	AO	AU	torque force
B-41-32	32	4	142	144	32	45	7	32	11	24	6 Nm
B-41-40	40	4	161	163	36	53,5	10	36	15	28	6 Nm
B-41-50	50	4	170	175	45	62,5	10	45	15	32	13 Nm
B-41-63	63	5	185	190	50	73	10	50	15	32	13 Nm
B-41-80	80	6	210	216	63	92	12	63	20	41	19 Nm
B-41-100	100	6	220	230	75	108,5	14,5	71	25	41	22 Nm
B-41-125	125	7	250	270	90	132	16,5	90	25	45	26 Nm

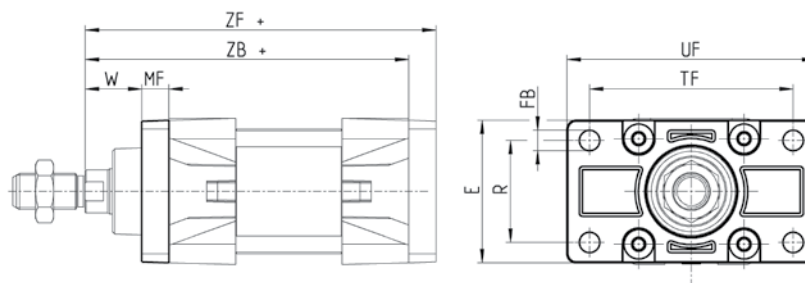
Front and rear flange Mod. D-E

Material: Aluminium



Supplied with:
1x flange
4x screws

+ = add the stroke

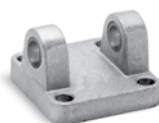


DIMENSIONS (mm)

Mod.	Ø	W	MF	ZB	TF	R	UF	E	FB	ZF	torque force
D-E-41-32	32	16	10	120	64	32	86	45	7	130	6 Nm
D-E-41-40	40	20	10	135	72	36	88	52	9	145	6 Nm
D-E-41-50	50	25	12	143	90	45	110	63	9	155	13 Nm
D-E-41-63	63	25	12	158	100	50	116	73	9	170	13 Nm
D-E-41-80	80	30	16	174	126	63	148	95	12	190	19 Nm
D-E-41-100	100	35	16	189	150	75	176	115	14	205	22 Nm
D-E-41-125	125	45	20	225	180	90	224	135	16	245	26 Nm

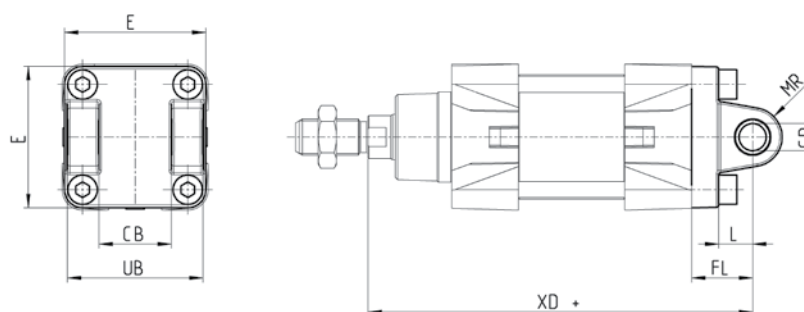
Rear female trunnion Mod. C and C-H

Material: Aluminium



Supplied with:
1x female trunnion
4x screws

+ = add the stroke



DIMENSIONS (mm)

Mod.	Ø	CD	L	FL	XD+	MR	E	CB	UB	torque force
C-41-32	32	10	12	22	142	10	45	26	45	6 Nm
C-41-40	40	12	15	25	160	13	52	28	52	6 Nm
C-41-50	50	12	15	27	170	13	63	32	60	13 Nm
C-H-41-63	63	16	20	32	190	15	73	40	70	13 Nm
C-H-41-80	80	16	24	36	210	15	95	50	90	19 Nm
C-H-41-100	100	20	29	41	230	18	115	60	110	22 Nm
C-H-41-125	125	25	30	50	275	25	135	70	130	26 Nm

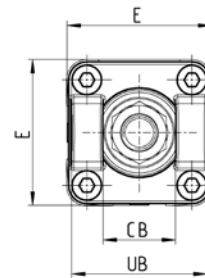
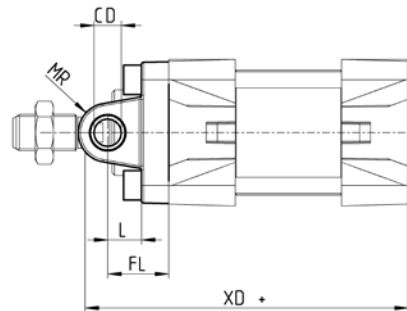
Front female trunnion Mod. H and C-H

Material: Aluminium



Supplied with:
1x trunnion
4x screws

+ = add the stroke



DIMENSIONS (mm)

Mod.	CB	UB	E	XD+	FL	L	CD	MR	torque force
H-41-32	26	45	45	120	22	12	10	10	6 Nm
H-41-40	28	52	52	135	25	15	12	13	6 Nm
H-41-50	32	60	63	143	27	15	12	13	13 Nm
H-60-63	40	70	73	158	32	20	16	15	13 Nm
C-H-41-80	50	90	95	174	36	24	16	15	19 Nm
C-H-41-100	60	110	115	189	41	29	20	18	22 Nm
C-H-41-125	70	130	135	225	50	30	25	25	22 Nm

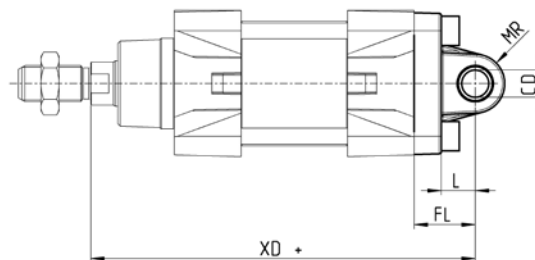
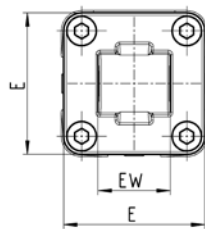
Rear male trunnion Mod. L

Material: Aluminium



Supplied with:
1x male trunnion
4x screws

+ = add the stroke



DIMENSIONS (mm)

Mod.	Ø	CD	L	FL	XD+	MR	E	EW	torque force
L-41-32	32	10	12	22	142	9	45	26	6 Nm
L-41-40	40	12	15	25	160	13	52	28	6 Nm
L-41-50	50	12	15	27	170	13	63	32	13 Nm
L-41-63	63	16	20	32	190	15	73	40	13 Nm
L-41-80	80	16	24	36	210	15	95	50	19 Nm
L-41-100	100	20	29	41	230	18	115	60	22 Nm
L-41-125	125	25	30	50	275	25	135	70	26 Nm

EXPRESS DELIVERY AVAILABLE

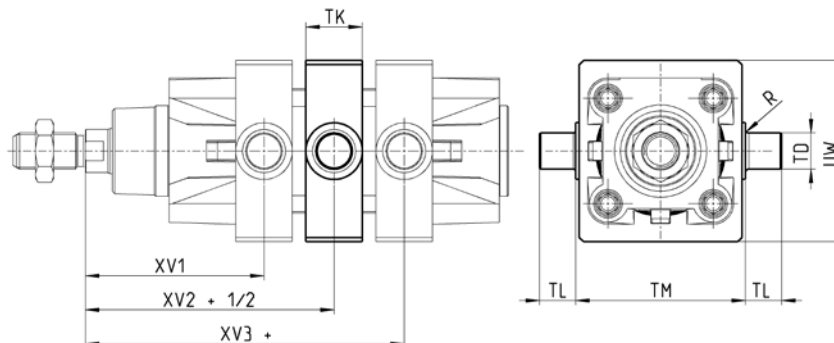
Centre trunnion Mod. F

Material: zinc-plated steel



Supplied with:
1x intermediate trunnion
8x clamping pins
8x set screws

+ = add the stroke

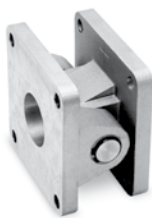


DIMENSIONS (mm)

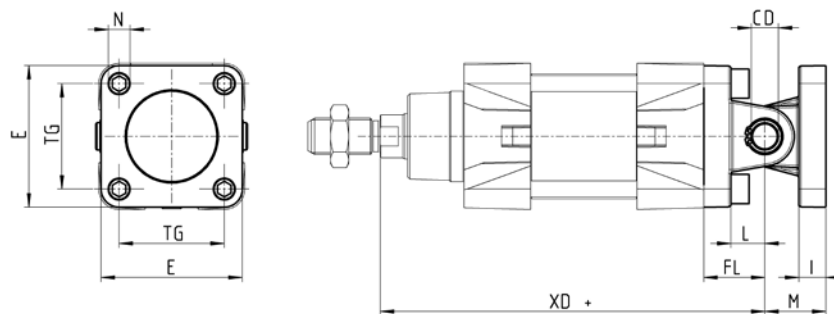
Mod.	Ø	XV1	XV2	XV3	TM	TK	TD	TL	UW	R
F-32	32	62	73	84	50	20	12	12	60	0,1
F-40	40	71,5	82,5	93,5	63	25	16	16	68	0,15
F-50	50	79	90	101	75	25	16	16	80	0,15
F-63	63	88,5	97,5	106,5	90	30	20	20	95	0,15
F-80	80	97	110	123	110	30	20	20	120	0,15
F-100	100	104,5	120	135,5	132	30	25	25	135	0,2
F-125	125	123	145	167	160	30	25	25	160	0,2

Accessory combination Mod. I (combination of models C + L + S)

Material: Aluminium



+ = add the stroke



DIMENSIONS (mm)

Mod.	Ø	ØCD	L	FL	XD+	TG	E	I	M	ØN	torque force
I-41-32	32	10	12	22	142	32,5	45	10	22	6,5	6 Nm
I-41-40	40	12	15	25	160	38	52	10	25	6,5	6 Nm
I-41-50	50	12	15	27	170	46,5	63	12	27	9	13 Nm
I-41-63	63	16	20	32	190	56,5	73	12	32	9	13 Nm
I-41-80	80	16	24	36	210	72	95	12	36	11	19 Nm
I-41-100	100	20	29	41	230	89	115	12	41	11	22 Nm
I-41-125	125	25	30	50	275	110	135	20	50	13	26 Nm

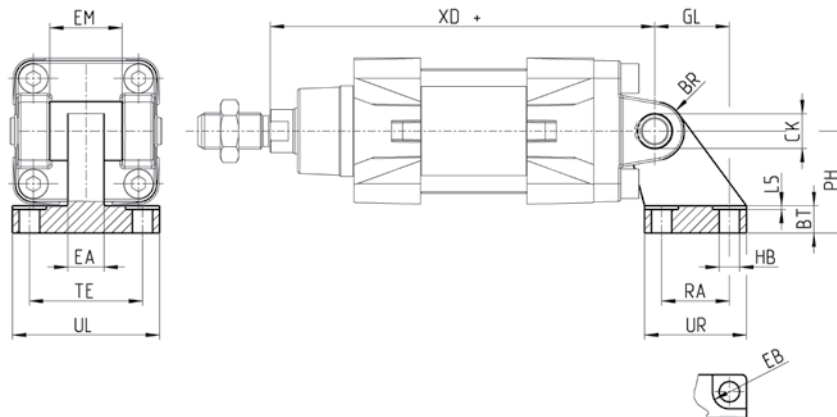
90° male trunnion Mod. ZC

CETOP RP 107P
Material: aluminium



Supplied with:
1x male trunnion

+ = add the stroke

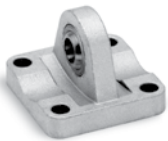


DIMENSIONS (mm)

Mod.	Ø	EB	ØCK	HB	XD+	TE	UL	EA	GL	L5	RA	EM	UR	PH	BT	BR
ZC-32	32	11	10	6,6	142	38	51	10	21	1,6	18	26	31	32	8	10
ZC-40	40	11	12	6,6	160	41	54	15	24	1,6	22	28	35	36	10	11
ZC-50	50	15	12	9	170	50	65	16	33	1,6	30	32	45	45	12	13
ZC-63	63	15	16	9	190	52	67	16	37	1,6	35	40	50	50	14	15
ZC-80	80	18	16	11	210	66	86	20	47	2,5	40	50	60	63	14	15
ZC-100	100	18	20	11	230	76	96	20	55	2,5	50	60	70	71	17	19
ZC-125	125	20	25	14	275	94	124	30	70	3,2	60	70	90	90	20	22,5

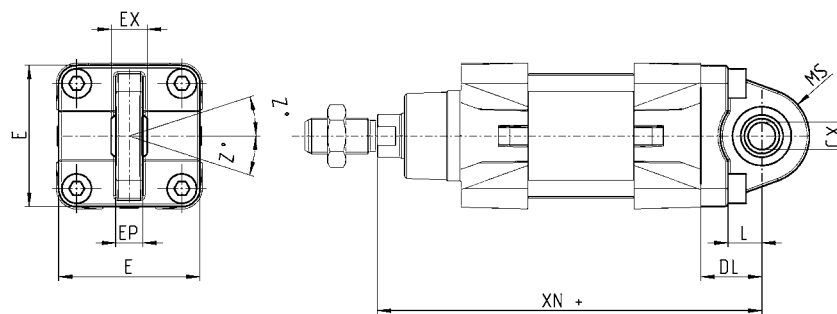
Rear trunnion ball-joint Mod. R*

Material: aluminium
* not according to standard



Supplied with:
1x trunnion ball joint
4x screws

+ = add the stroke

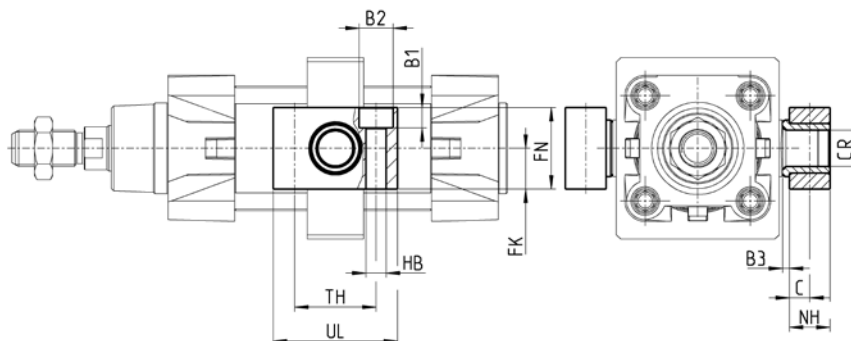


DIMENSIONS (mm)

Mod.	Ø	ØCX	L	DL	XN+	MS	E	EX	EP	Z	torque force
R-41-32	32	10	12	22	142	16	45	14	10,5	4	6 Nm
R-41-40	40	12	15	25	160	20	52	16	12	4	6 Nm
R-41-50	50	12	15	27	170	20	63	16	12	4	13 Nm
R-41-63	63	16	20	32	190	24	73	21	15	4	13 Nm
R-41-80	80	16	24	36	210	24	95	21	15	4	19 Nm
R-41-100	100	20	29	41	230	30	115	25	18	4	22 Nm
R-41-125	125	30	30	50	275	40	140	37	25	4	26 Nm

Counter bracket for centre trunnion Mod. BF

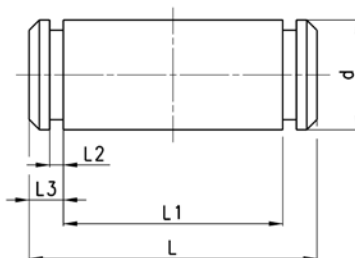
Material: aluminium

Supplied with:
2x supports

DIMENSIONS (mm)

Mod.	CR	NH	C	b3	TH	UL	FK	FN	B1	B2	HB
BF-32	12	15	7,5	3	32	46	15	30	6,8	11	6,6
BF-40-50	16	18	9	3	36	55	18	36	9	15	9
BF-63-80	20	20	10	3	42	65	20	40	11	18	11
BF-100-125	25	25	12,5	3,5	50	75	25	50	13	20	14

Clevis pin Mod. S

Supplied with:
1x clevis pin (stainless steel 303)
2x C-clips (steel) plain carbon steel

DIMENSIONS (mm)

Mod.	Ø	d	L	L1	L2	L3
S-32	32	10	52	46	1,1	3
S-40	40	12	59	53	1,1	3
S-50	50	12	67	61	1,1	3
S-63	63	16	77	71	1,1	3
S-80	80	16	97	91	1,1	3
S-100	100	20	121	111	1,3	5
S-125	125	25	140,5	132	1,3	4,25

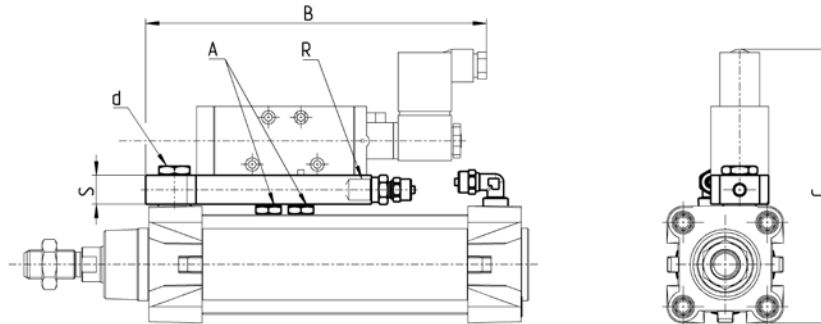
Accessory for mounting valves on the cylinder

The mounting sub-base Mod. PCV enables the valve to be mounted directly on the cylinder using Stud Manifold bolts Mod. 1635 or flow controllers, Mod. SCU. The stud bolts used to attach the valve outlet ports to the PCV mounting plate are model number 1631-01-**(thread size of valve). The other end of the plate has a threaded port to connect fittings to the rear end-cap port.



d* = mounting on the cylinder using Mod. 1635 or Mod. SCU.

Note: the minimum possible stroke is 100mm.



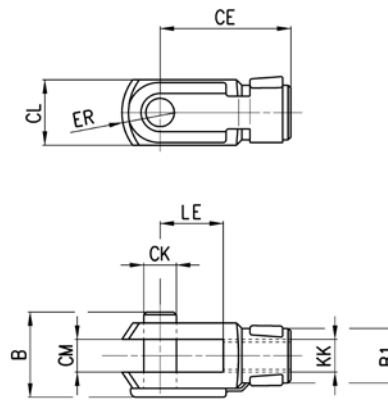
DIMENSIONS (mm)

Mod.	Ø	A	B	C	R	S	d*	Valve Model To Use (Standard valves with end cap turned 180°)
PCV-32	32	G1/8	185	131,5	G1/8	16	G1/8	458-015-22-S19
PCV-40-50	40	G1/8	188,5	140,5	G1/4	16	G1/4	458-015-22-S19
PCV-40-50	50	G1/8	188,5	150	G1/4	16	G1/4	458-015-22-S19
PCV-63-80	63	G1/4	215	167	G1/4	16	G3/8	454-015-22-S07
PCV-63-80	80	G1/4	215	185	G1/4	16	G3/8	454-015-22-S07

Rod fork end Mod. G

ISO 8140

Material: zinc-plated steel



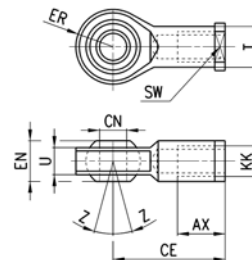
DIMENSIONS (mm)

Mod.	Ø	ØCK	LE	CM	CL	ER	CE	KK	B	B1
G-25-32	32	10	20	10	20	12	40	M10X1,25	26	18
G-40	40	12	24	12	24	14	48	M12X1,25	32	20
G-50-63	50-63	16	32	16	32	19	64	M16X1,5	40	26
G-80-100	80-100	20	40	20	40	25	80	M20X1,5	48	34
G-41-125	125	30	55	30	55	38	110	M27X2	74	48

Swivel ball joint Mod. GA

ISO 8139.

Material: zinc-plated steel.

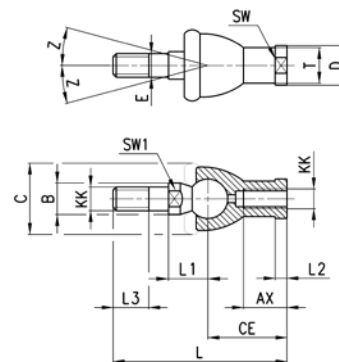


DIMENSIONS (mm)

Mod.	Ø	ØCN ⁽¹⁷⁾	U	EN	ER	AX	CE	KK	T	Z	SW
GA-32	32	10	10,5	14	14	20	43	M10X1,25	15	6,5	17
GA-40	40	12	12	16	16	22	50	M12X1,25	17,5	6,5	19
GA-50-63	50-63	16	15	21	21	28	64	M16X1,5	22	7,5	22
GA-80-100	80-100	20	18	25	25	33	77	M20x1,5	27,5	7	30
GA-41-125	125	30	25	37	35	51	110	M27x2	40	7,5	41

Piston rod socket joint Mod. GY

Material: Zinc-Aluminum alloy and zinc-plated steel.



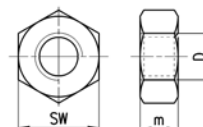
DIMENSIONS (mm)

Mod.	Ø	KK	L	CE	L2	AX	SW	SW1	L1	L3	ØT	ØD	E	ØB	ØC	Z
GY-32	32	M10X1,25	74	35	6,5	18	17	11	19,5	15	15	19	10	14	28	15
GY-40	40	M12X1,25	84	40	6,5	20	19	17	21	17	17,5	22	12	19	32	15
GY-50-63	50-63	M16X1,5	112	50	8	27	22	23	27,5	23	22	27	16	22	40	11
GY-80-100	80-100	M20x1,5	133	63	10	38	30	25	31,5	25	27,5	34	20	27	45	7,5

Piston rod nut Mod. U

UNI EN ISO 4035

Material: zinc-plated steel

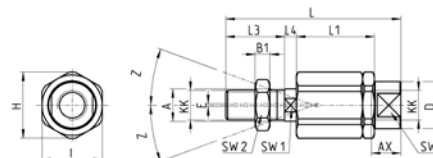


DIMENSIONS (mm)

Mod.	Ø	KK	m	SW
U-25-32	32	M10X1,25	6	17
U-40	40	M12X1,25	7	19
U-50-63	50-63	M16X1,5	8	24
U-80-100	80-100	M20X1,5	9	30
U-41-125	125	M27X2	12	41

Self aligning rod Mod. GK

Material: Zinc-Aluminum alloy and zinc-plated steel.

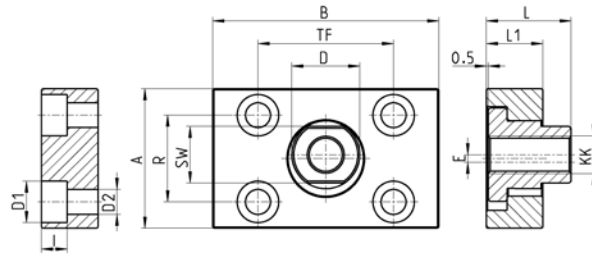
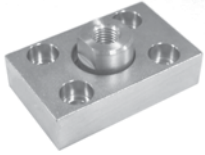


DIMENSIONS (mm)

Mod.	Ø	KK	L	L1	L3	L4	ØA	ØD	H	I	SW	SW1	SW2	B1	AX	Z	E
GK-25-32	32	M10X1,25	71,5	35	20	7,5	14	22	32	30	19	12	17	5	22	4	2
GK-40	40	M12X1,25	75,5	35	24	7,5	14	22	32	30	19	12	19	6	22	4	2
GK-50-63	50-63	M16X1,5	104	53	32	10	22	32	45	41	27	20	24	8	30	3	2
GK-80-100	80-100	M20x1,5	119	53	40	10	22	32	45	41	27	20	30	10	37	3	2

Coupling piece Mod. GKF

Material: Zinc-Aluminum alloy and zinc-plated steel.



DIMENSIONS (mm)

Mod.	Ø	KK	A	B	R	TF	L	L1	I	Ø D	Ø D1	Ø D2	SW	E
GKF-25-32	32	M10x1,25	37	60	23	36	22,5	15	6,8	18	11	6,6	15	2
GKF-40	40	M12x1,25	56	60	38	42	22,5	15	9	20	15	9	15	2,5
GKF-50-63	50-63	M16x1,5	80	80	58	58	26,5	15	10,5	25	18	11	22	2,5
GKF-80-100	80-100	M20x1,5	90	90	65	65	32,5	20	13	30,5	20	14	27	2,5
GKF-125	125	M27x2	90	90	65	65	35,5	20	13	40	20	14	36	4

Extruded Body Cylinders, ISO 6431, ISO 15552 compliant Series 61

EXPRESS DELIVERY AVAILABLE

Single or double-acting, magnetic, cushioned
Standard and low friction versions
ø 32, 40, 50, 63, 80, 100, 125 mm



The Series 61 cylinders comply with the dimensions laid down in the ISO 15552 standards. A permanent magnet, mounted on the piston, enables information to be received regarding the piston position by means of proximity switches positioned along the cylinder profile. These grooves can be covered with a slot cover profile.

This cylinder series is normally equipped with adjustable end-stroke cushioning. Moreover these cylinders are equipped with bumpers in order to reduce noise and the impact of the piston as it reaches the end of the stroke.

» In compliance with ISO 15552 standards and with the previous DIN/ISO 6431 - VDMA 24562 standards

- » Rolled stainless steel rod
- » Adjustable pneumatic cushioning
- » Special designs available

LOW FRICTION:

- » Friction force reduced by over 40%
- » Reduced stick-slip effect
- » Minimum operating pressure down to 0,1 bar (1.5 psi)
- » Double-acting with low friction in both directions

LOW TEMPERATURE:

Versions for -40°C and for -50°C

METAL ROD SCRAPER OPTION FOR DIRT/ICE APPLICATIONS

- » For dirt / ice applications
- » Resistant to dust, cement, resin, mud and wood residue

GENERAL DATA

Type of construction	with tie-rods (inside the profile)
Operation	double-acting, single-acting, tandem. Low friction version: double-acting only.
Materials	standard = AL end-caps, rolled stainless steel rod AISI 420B, anodized AL tube, zinc-plated steel nuts and tie-rods, PU seals; low friction = standard materials with NBR piston seal and NBR rod seal (FKM rod seal on request); low temperature: standard materials with chrome plated stainless steel AISI 420B rod, brass rod scraper ring, stainless steel AISI 303 nuts, stainless steel AISI 420B tie-rods, PU piston seals and NBR rod seal
Type of mounting	with tie-rods, with front / rear flange, foot mounting, with centre / front / rear / swivel trunnion
Strokes min - max	10 – 2500 mm
Operating temperature	0°C – 80°C (with dry air - 20°C) (32 - 176°F, with dry air -4°F) low temperature (-40°C version): -40°C - 60°C (with dry air -40°C) low temperature (-50°C version): -50°C - 60°C (with dry air -50°C)
Operating pressure	1 – 10 bar (standard and low temperature versions) (14.5 - 145 psi) 0,1 – 10 bar (low friction version) (1.5 - 145 psi)
Speed	10 – 1000 mm/sec, no load (standard and low temperature versions) 5 – 1000 mm/sec, no load (low friction version)
Fluid	filtered air, without lubrication. For standard versions only: if lubricated air is used, it is recommended to use oil ISOVG32. Once applied the lubrication should never be interrupted.

STANDARD STROKES FOR CYLINDERS SERIES 61

■ = Single-acting (standard versions) ✕ = Double-acting (standard low friction and low temperature versions)
Other strokes up to 2500 mm are available on request.

MAXIMUM STROKE LENGTHS (mm)

Series (and Ø)	Min-Max Stroke (Produced in USA)	Min-Max Stroke (Produced in Italy)
60-61 (Ø 32-125)	10-1500 mm	10-2500 mm

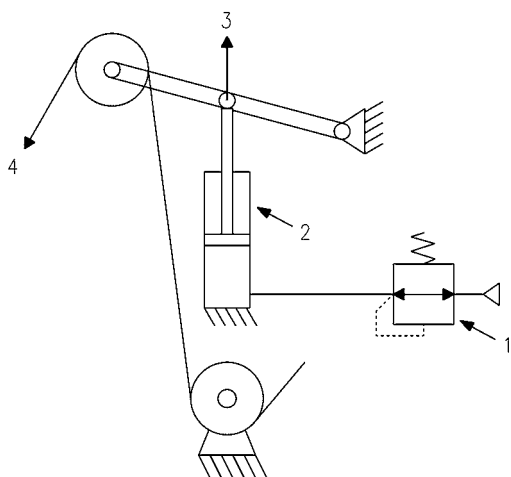
Ø	25	50	75	80	100	125	150	160	200	250	300	320	400	500
32	■ ✕	■ ✕	■ ✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕
40	■ ✕	■ ✕	■ ✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕
50	■ ✕	■ ✕	■ ✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕
63	■ ✕	■ ✕	■ ✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕
80	■ ✕	■ ✕	■ ✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕
100		■ ✕	■ ✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕
125		✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕

CODING EXAMPLE

61	M	2	P	050	A	0200	
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61	SERIES
M	VERSION: M = standard, magnetic L = low friction, magnetic
2	OPERATION: 1 = single-acting, front spring (ø 32 ± ø 100) 2 = double-acting *, front and rear cushioned 3 = double-acting *, no cushion 4 = double-acting *, rear cushioned 5 = double-acting *, front cushioned 6 = double-acting *, through-rod, front and rear cushioned 7 = single-acting, through-rod * all double-acting cylinders are also available in the low friction version.
P	MATERIALS P = see the general data on page 1/1.25.01 R = stainless steel AISI 420B tie-rods - stainless steel AISI 303 tie-rod nuts C = rolled stainless steel AISI 303 piston rod, stainless steel AISI 304 piston rod nut U = rolled stainless steel AISI 303 piston rod, AISI 304 piston-rod nut, AISI 420B tie-rods, AISI 303 tie-rod nuts W = rolled stainless steel AISI 304 piston rod, AISI304 piston-rod nut, AISI 420B tie-rods, AISI 303 tie-rod nuts Z = chrome plated stainless steel AISI 420B rod, stainless steel AISI 304 rod nut, stainless steel AISI 420B tie-rods, stainless steel AISI 303 tie-rods nuts, seals for low temperature (-40°C), brass rod scraper (Ø 125 excepted) Y = chrome plated stainless steel AISI 420B rod, stainless steel AISI 304 rod nut, stainless steel AISI 420B tie-rods, stainless steel AISI 303 tie-rods nuts, seals for low temperature (-50°C), brass rod scraper (Ø 125 excepted)
050	BORE: 032 = 32 mm 040 = 40 mm 050 = 50 mm 063 = 63 mm 080 = 80 mm 100 = 100 mm 125 = 125 mm
A	CONSTRUCTION: A = standard with rod nut RL = cylinder with rod lock (rod extension required. See table.)
0200	STROKE: see the table
	= standard V = FKM rod seal N = tandem R = NBR rod seal W = all FKM seals, up to 140 C° C = PU coated cylinder. Colour: Grey * L = low friction version without rod seal (rear supply only) ** (_ _ _) = extended piston rod _ _ _ mm G = with brass rod scraper (chrome plated stainless steel AISI 420B rod, NBR rod seal) (Ø 125 excepted) * Version C: available on request. For further information, please contact our technical dept. ** The possibility to order the cylinder without piston rod seal, further reduces the friction force.

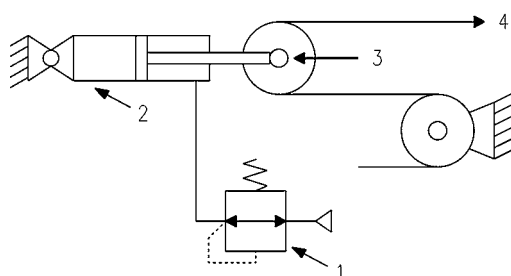
LOW FRICTION cylinders Series 61 - APPLICATION EXAMPLES



CYLINDER IN THRUST

DRAWING NOTES:

1. Precision pressure regulator or electro-pneumatic regulator
2. Low friction cylinder
3. Force direction
4. Band

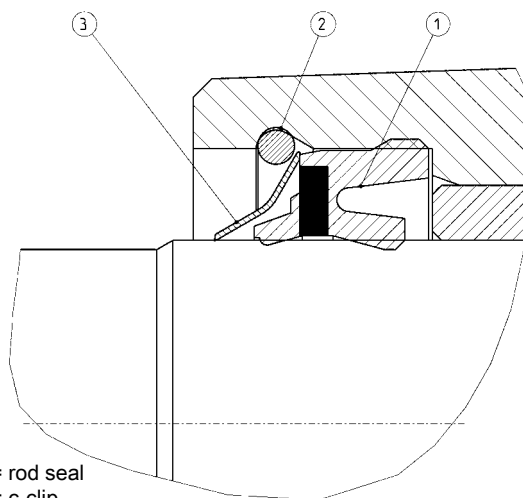


CYLINDER IN TRACTION

Note: in order to reach the highest performance, it is recommended to connect precision pressure regulator or an electro-pneumatic regulator with the low friction cylinder as shown in the drawing.

LOW TEMPERATURE cylinders Series 60 - DETAIL

Rod scraper included in all low-temperature cylinders



- 1 = rod seal
2 = c-clip
3 = metal scraper

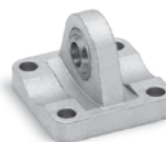
CYLINDERS ACCESSORIES SERIES 61

Piston rod socket joint
Mod. GY

Piston rod nut Mod. U



Clevis pin Mod. S

Rear trunnion ball-joint
Mod. RCoupling piece
Mod. GKF

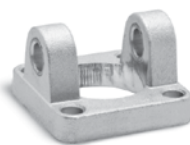
Swivel ball joint Mod. GA

90° male trunnion
Mod. ZCSwivel Combination
Mod. IFront and rear flange
Mod. D-ESelf aligning rod
Mod. GK

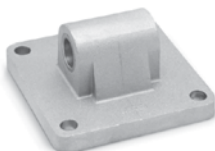
Centre trunnion Mod. F



Foot mount Mod. B

Front female trunnion
Mod. H and C-HRear female trunnion
Mod. C and C-H

Rod fork end Mod. G

Rear trunnion male
Mod. L

All accessories are supplied separately, except for piston rod nut Mod. U

Rod Gland

Hard Anodized Aluminum body and integrated design includes rod bearing and rod lip/wiper seal. Rod Bearing is oil impregnated, sintered bronze containing graphite for high speed and heavy load applications.

Piston Rod

All stainless steel ground and polished rods, burnished for improved seal life and reduced wear. Standard.

Rod Threads

Threads are rolled Stainless Steel for greater strength.

Rod Nut

Threads are rolled Stainless Steel for greater strength.

Tie Rod Nuts

Tie rod nuts are ID hexed and ID threaded providing a flush face and ability to assemble and disassemble mounting brackets without loosening Head.

Heads and Caps

Heads and Caps are lightweight aluminum that have been precision machined and anodized.

Piston Bumpers

Shock absorbing bumpers reduce noise and piston wear. Standard.

Piston

Aluminum, one-piece design with built-in solid magnet ensuring consistent switch sensing.

Cushion Adjustment

Recessed and captive cushion adjustment screws. Fine thread adjustment for greater repeatability and accuracy. Standard Viton.

Cylinder Tube

Hard Anodized Aluminum tube that provides superior seal life and wear resistance.

Aluminum Extrusion

Multiple slotted grooves for sensor mounting.

Piston Seals

Rounded lip u-cup seal reduces friction; specifically designed for lube or non-lube service. Maintains factory prelube against the cylinder wall. Standard polyurethane.

Adjustable Cushion Seal Design

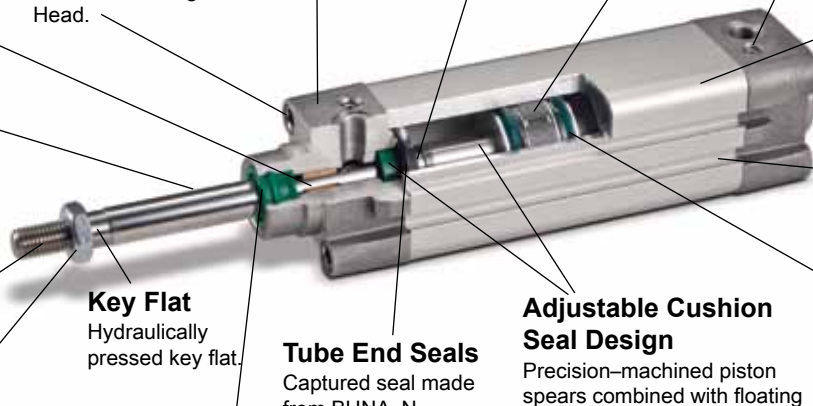
Precision-machined piston spears combined with floating cushion collar allow for a smooth deceleration at end of stroke. Cushion collar is specifically designed for rapid low-pressure breakaway when stroke reverses.

Tube End Seals

Captured seal made from BUNA-N offering a wide range of temperature applications and positive sealing. Standard.

Rod and Wiper Seal

Piston rod lip seal and wiper combination. A compact design, allowing for greater bushing support without sacrificing sealing ability. Standard polyurethane.

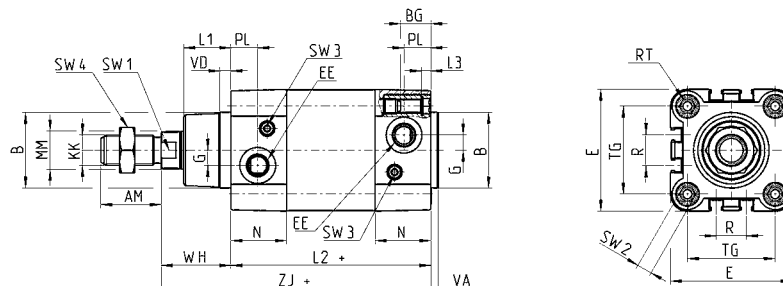


Cylinders Series 61

N.B. : the single-acting cylinders' sizes L1 and L2 are increased by 25 mm.



+ = add the stroke



DIMENSIONS (mm)

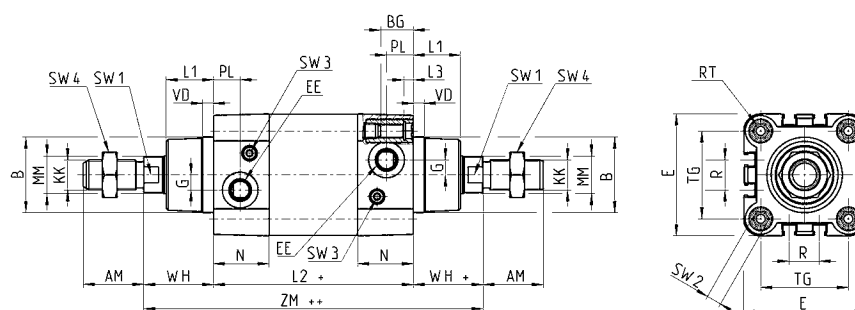
Ø	AM	B	BG	E	EE	G	KK	L1	L2+	L3	MM	N	PL	R	RT	SW1	SW2	SW3	SW4	TG	VA	VD	WH	ZJ+	front and rear cushion stroke
32	22	30	16	46	G1/8	5	M10x1,25	18	94	5	12	26	14	13	M6	10	6	2	17	32,5	4	5	26	120	17 / 12
40	24	35	16	55	G1/4	5	M12x1,25	21	105	5	16	29	15	13,5	M6	13	6	2	19	38	4	5	30	135	20 / 17
50	32	40	16	64,5	G1/4	8	M16x1,5	25	106	5	20	29,5	15	16	M8	17	8	3	24	46,5	4	6	37	143	15 / 14
63	32	45	16	75	G3/8	8	M16x1,5	26	121	5	20	36,5	21	28	M8	17	8	3	24	56,5	4	6	37	158	17 / 16
80	40	45	19	93	G3/8	8	M20x1,5	30	128	0	25	36	21	30	M10	22	10	5	30	72	4	7	46	174	20 / 20
100	40	55	19,5	110	G1/2	8	M20x1,5	35	138	0	25	38,5	23	40	M10	22	10	5	30	89	4	7	51	189	21 / 19
125	54	60	23	135	G1/2	10,5	M27x2	42	160	0	32	43	23,5	50	M12	27	12	4	41	110	6	8	65	225	26 / 25

Cylinders Series 61 - through-rod

Note: the single-acting cylinders sizes L1 and L2 are increased by 25 mm.



+ = add the stroke
++ = add the stroke two times



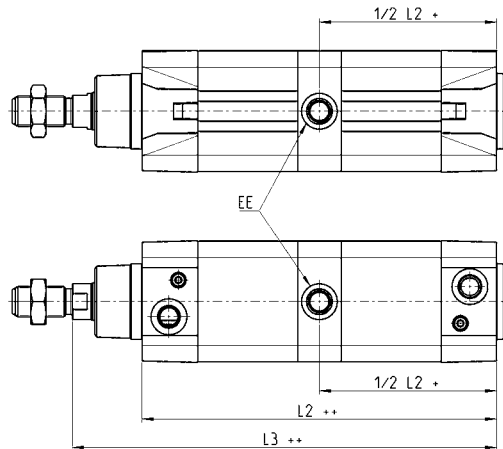
DIMENSIONS (mm)

Ø	AM	B	BG	E	EE	G	KK	L1	L2+	L3	MM	N	PL	R	RT	SW1	SW2	SW3	SW4	TG	VD	WH	ZM++	front and rear cushion stroke
32	22	30	16	46	G1/8	5	M10x1,25	18	94	5	12	26	14	13	M6	10	6	2	17	32,5	5	26	146	17 / 12
40	24	35	16	55	G1/4	5	M12x1,25	21	105	5	16	29	15	13,5	M6	13	6	2	19	38	5	30	165	20 / 17
50	32	40	16	64,5	G1/4	8	M16x1,5	25	106	5	20	29,5	15	16	M8	17	8	3	24	46,5	6	37	180	15 / 14
63	32	45	16	75	G3/8	8	M16x1,5	26	121	5	20	36,5	21	28	M8	17	8	3	24	56,5	6	37	195	17 / 16
80	40	45	19	93	G3/8	8	M20x1,5	30	128	0	25	36	21	30	M10	22	10	5	30	72	7	46	220	20 / 20
100	40	55	19,5	110	G1/2	8	M20x1,5	35	138	0	25	38,5	23	40	M10	22	10	5	30	89	7	51	240	21 / 19
125	54	60	23	135	G1/2	10,5	M27x2	42	160	0	32	43	23,5	50	M12	27	12	4	41	110	8	65	290	26 / 25

Cylinders Series 61 - tandem version



+ = add the stroke
++ = add the stroke two times



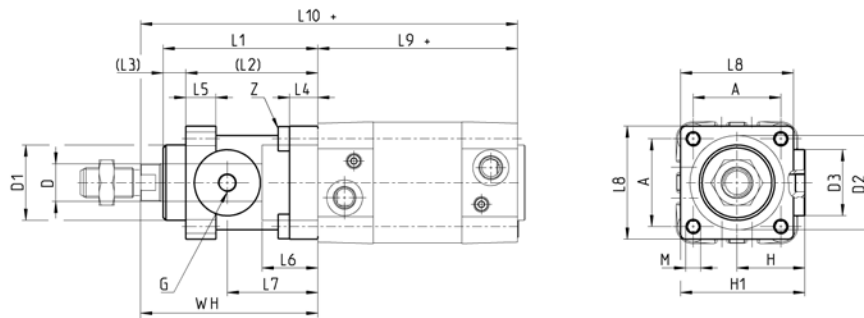
DIMENSIONS (mm)

Ø	EE	L2+	L3+
32	G1/8	172,5	197,5
40	G1/4	191,5	221,5
50	G1/4	188	225
63	G3/8	204	241
80	G3/8	225,5	271,5
100	G1/2	231	282
125	G1/2	264	329

Cylinders Series 61 with rod lock



Ø	Rod extension [X] (mm)	Holding force [static load] (N)
20	+50	300
25	+48	400
32	+40	650
40	+43	1100
50	+57	1600
63	+57	2500
80	+80	4000
100	+80	6300
125	+125	8800



+ = add the stroke

DIMENSIONS (mm)

Ø	ØD	ØD1	ØD2	ØD3	A	G	H	H1	L1	L2	L3	L4	L5	L6	L7	L8	L9+	L10+	M	WH	Z
32	12	30,5	35	25	32,5	M5	25,5	46,5	58	48	10	8	13	20,5	34	45	94	160	M6	66	M6x20
40	16	35	40	28	38	G1/8	30	53	65	55	10	8	13	22,5	38	50	105	178	M6	73	M6x20
50	20	40	50	35	46,5	G1/8	36	64	82	70	12	15	16	29,5	48	60	106	200	M8	94	M6x20
63	20	45	60	38	56,5	G1/8	40	75	82	70	12	15	16	29,5	49,5	70	121	215	M8	94	M8x30
80	25	45	80	48	72	G1/8	50	95	110	90	20	18	20	35	61	90	128	254	M10	126	M10x35
100	25	55	100	58	89	G1/8	58	110,5	115	100	15	18	20	39	69	105	138	269	M10	131	M10x35
125	32	60	130	65	110	G1/8	80	150	167	122	45	22	30	51	86,5	140	160	350	M12	190	M12x40

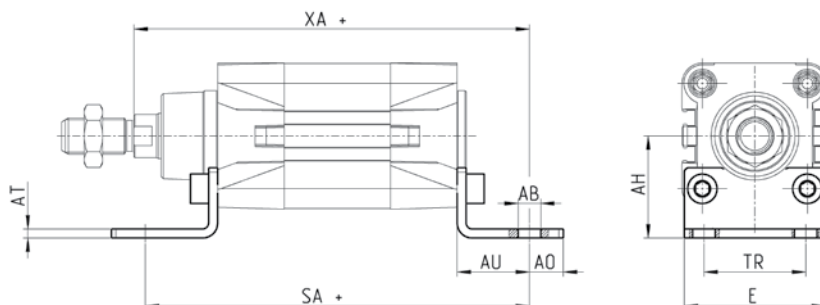
Foot mount Mod. B

Material: zinc-plated steel



Supplied with:
2x feet
4x screws

+ = add the stroke

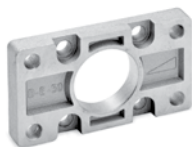


DIMENSIONS (mm)

Mod.	Ø	AT	SA+	XA+	TR	E	AB	AH	AO	AU
B-41-32	32	4	142	144	32	45	7	32	11	24
B-41-40	40	4	161	163	36	53,5	10	36	15	28
B-41-50	50	4	170	175	45	62,5	10	45	15	32
B-41-63	63	5	185	190	50	73	10	50	15	32
B-41-80	80	6	210	216	63	92	12	63	20	41
B-41-100	100	6	220	230	75	108,5	14,5	71	25	41
B-41-125	125	7	250	270	90	132	16,5	90	25	45

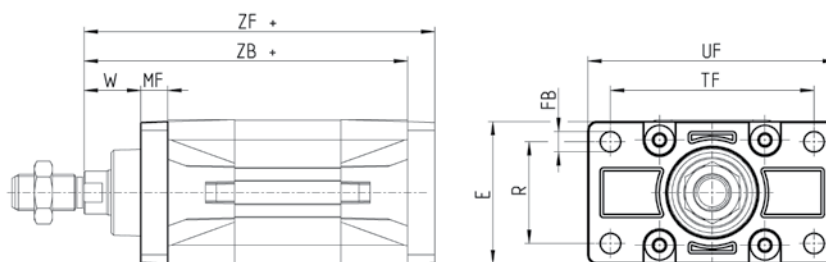
Front and rear flange Mod. D-E

Material: Aluminium



Supplied with:
1x flange
4x screws

+ = add the stroke



DIMENSIONS (mm)

Mod.	Ø	W	MF	ZB+	TF	R	UF	E	FB	ZF+	torque force
D-E-41-32	32	16	10	120	64	32	86	45	7	130	6 Nm
D-E-41-40	40	20	10	135	72	36	88	52	9	145	6 Nm
D-E-41-50	50	25	12	143	90	45	110	63	9	155	13 Nm
D-E-41-63	63	25	12	158	100	50	116	73	9	170	13 Nm
D-E-41-80	80	30	16	174	126	63	148	95	12	190	19 Nm
D-E-41-100	100	35	16	189	150	75	176	115	14	205	22 Nm
D-E-41-125	125	45	20	225	180	90	224	135	16	245	26 Nm

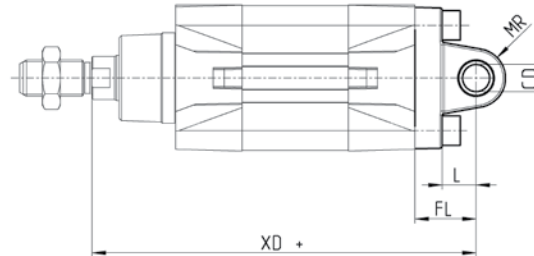
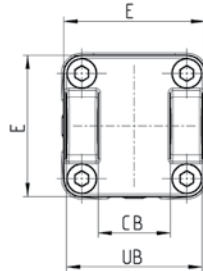
Rear female trunnion Mod. C and C-H

Material: Aluminium



Supplied with:
1x female trunnion
4x screws

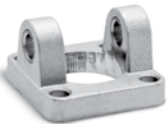
+ = add the stroke



DIMENSIONS (mm)										
Mod.	Ø	CD	L	FL	XD+	MR	E	CB	UB	torque force
C-41-32	32	10	12	22	142	10	45	26	45	6 Nm
C-41-40	40	12	15	25	160	13	52	28	52	6 Nm
C-41-50	50	12	15	27	170	13	63	32	60	13 Nm
C-H-41-63	63	16	20	32	190	15	73	40	70	13 Nm
C-H-41-80	80	16	24	36	210	15	95	50	90	19 Nm
C-H-41-100	100	20	29	41	230	18	115	60	110	26 Nm
C-H-41-125	125	25	30	50	275	25	135	70	130	26 Nm

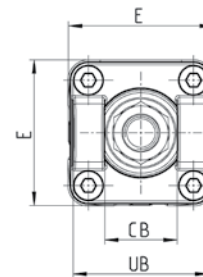
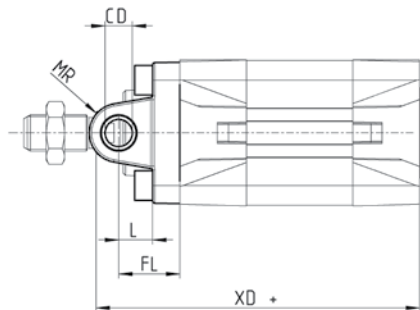
Front female trunnion Mod. H and C-H

Material: Aluminium



Supplied with:
1x female trunnion
4x screws

+ = add the stroke



DIMENSIONS (mm)									
Mod.	Ø	CB	UB	E	XD	FL	L	CD	MR
H-41-32	32	26	45	45	120	22	12	10	10
H-41-40	40	28	52	52	135	25	15	12	13
H-41-50	50	32	60	63	143	27	15	12	13
H-60-63	63	40	70	73	158	32	20	16	15
C-H-41-80	80	50	90	95	174	36	24	16	15
C-H-41-100	100	60	110	115	189	41	29	20	18
C-H-41-125	125	70	130	135	225	50	30	25	25

EXPRESS DELIVERY AVAILABLE

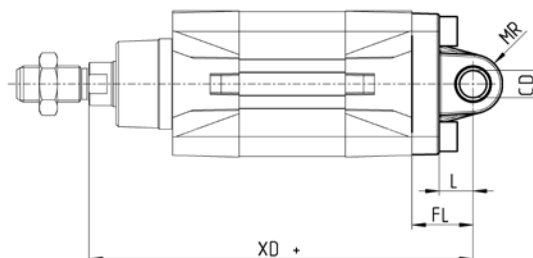
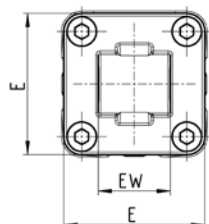
Rear male trunnion Mod. L

Material: Aluminium



Supplied with:
1x male trunnion
4x screws

+ = add the stroke



DIMENSIONS (mm)

Mod.	Ø	CD	L	FL	XD+	MR	E	EW	torque force
L-41-32	32	10	12	22	142	9	45	26	6 Nm
L-41-40	40	12	15	25	160	13	52	28	6 Nm
L-41-50	50	12	15	27	170	13	63	32	13 Nm
L-41-63	63	16	20	32	190	15	73	40	13 Nm
L-41-80	80	16	24	36	210	15	95	50	19 Nm
L-41-100	100	20	29	41	230	18	115	60	22 Nm
L-41-125	125	25	30	50	275	25	135	70	26 Nm

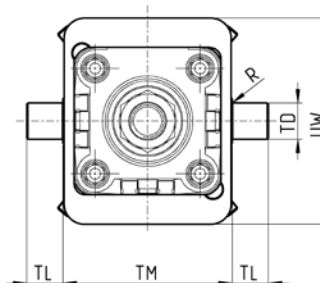
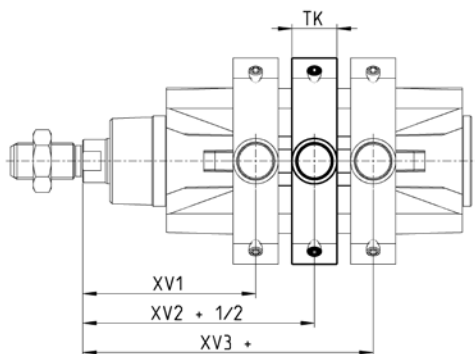
Centre trunnion Mod. F

Material: zinc-plated steel



Supplied with:
1x centre trunnion
8x set screws
8x clamping pins

+ = add the stroke



DIMENSIONS (mm)

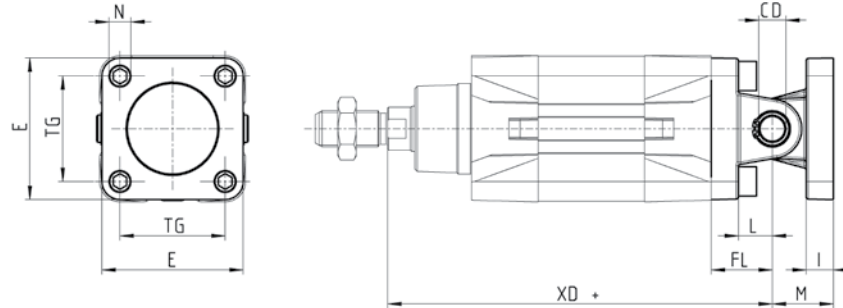
Mod.	Ø	XV1	XV2	XV3	TM	TK	TD	TL	UW	R
F-61-32	32	61	73	85	50	18	12	12	65	0,1
F-61-40	40	69	82,5	96	63	20	16	16	75	0,15
F-61-50	50	76,5	90	103,5	75	20	16	16	91	0,15
F-61-63	63	86	97,5	109	90	25	20	20	94	0,15
F-61-80	80	94,5	110	125,5	110	25	20	20	130	0,15
F-61-100	100	104,5	120	135,5	132	30	25	25	145	0,2
F-61-125	125	123	145	167	160	30	25	25	155	0,2

Accessory combination Mod. I (combination of models C + L + S)

Material: aluminium



+ = add the stroke



DIMENSIONS (mm)

Mod.	Ø	ØCD	L	FL	XD+	TG	E	I	M	ØN	torque force
I-41-32	32	10	12	22	142	32,5	45	10	22	6,5	6 Nm
I-41-40	40	12	15	25	160	38	52	10	25	6,5	6 Nm
I-41-50	50	12	15	27	170	46,5	63	13	27	9	13 Nm
I-41-63	63	16	20	32	190	56,5	73	15	32	9	13 Nm
I-41-80	80	16	24	36	210	72	95	15	36	11	19 Nm
I-41-100	100	20	29	41	230	89	115	18	41	11	26 Nm
I-41-125	125	25	30	50	275	110	135	25	50	13	26 Nm

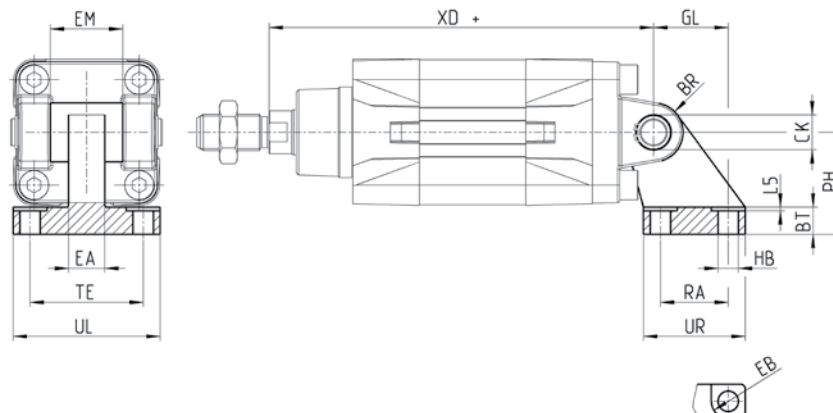
90° male trunnion Mod. ZC

CETOP RP 107P

Material: Aluminium

Supplied with:
1x male support

+ = add the stroke



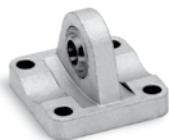
DIMENSIONS (mm)

Mod.	Ø	EB	CK	HB	XD+	TE	UL	EA	GL	L5	RA	EM	UR	PH	BT	BR
ZC-32	32	11	10	6,6	142	38	51	10	21	1,6	18	26	31	32	8	10
ZC-40	40	11	12	6,6	160	41	54	15	24	1,6	22	28	35	36	10	11
ZC-50	50	15	12	9	170	50	65	16	33	1,6	30	32	45	45	12	13
ZC-63	63	15	16	9	190	52	67	16	37	1,6	35	40	50	50	14	15
ZC-80	80	18	16	11	210	66	86	20	47	2,5	40	50	60	63	14	15
ZC-100	100	18	20	11	230	76	96	20	55	2,5	50	60	70	71	17	19
ZC-125	125	20	25	14	275	94	124	30	70	3,2	60	70	90	90	20	22,5

Trunnion ball-joint Mod. R*

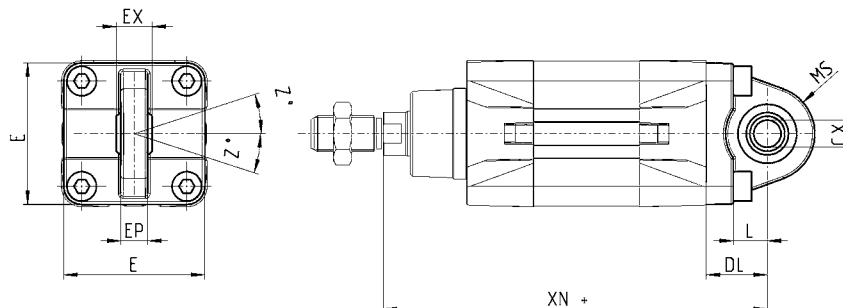
Material: Aluminium

* not according to standard



Supplied with:
1x trunnion ball joint
4x screws

+ = add the stroke



DIMENSIONS (mm)

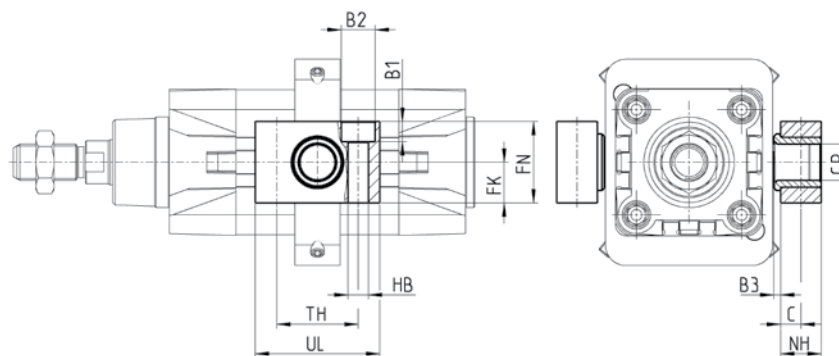
Mod.	Ø	CX	L	DL	XN+	MS	E	EX	EP	Z	torque force
R-41-32	32	10	12	22	142	16	45	14	10,5	4	6 Nm
R-41-40	40	12	15	25	160	20	52	16	12	4	6 Nm
R-41-50	50	12	15	27	170	20	63	16	12	4	13 Nm
R-41-63	63	16	20	32	190	24	73	21	15	4	13 Nm
R-41-80	80	16	24	36	210	24	95	21	15	4	19 Nm
R-41-100	100	20	29	41	230	30	115	25	18	4	22 Nm
R-41-125	125	30	30	50	275	40	140	37	25	4	26 Nm

Counter bracket for centre trunnion Mod. BF

Material: Aluminium



Supplied with:
2x supports

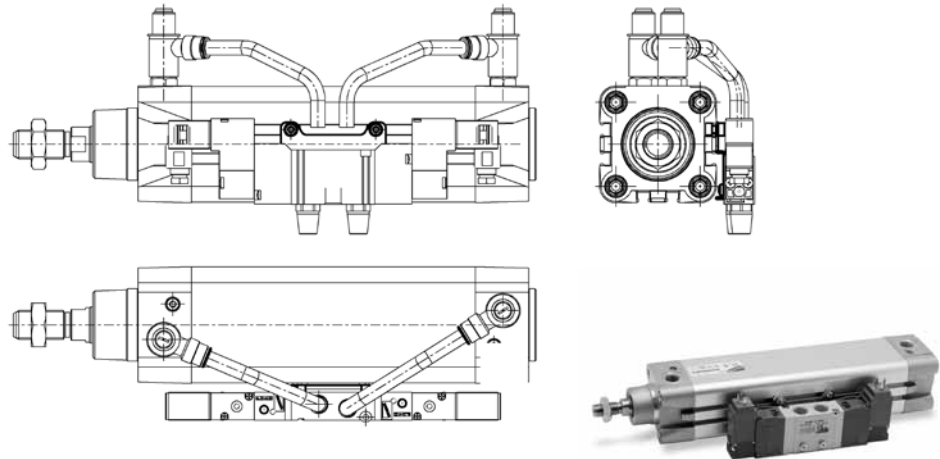


DIMENSIONS (mm)

Mod.	Ø	CR	NH	C	B3	TH	UL	FK	FN	B1	B2	HB
BF-32	32	12	15	7,5	3	32	46	15	30	6,8	11	6,6
BF-40-50	40 - 50	16	18	9	3	36	55	18	36	9	15	9
BF-63-80	63 - 80	20	20	10	3	42	65	20	40	11	18	11
BF-100-125	100 - 125	25	25	12,5	3,5	50	75	25	50	13	20	14

Accessory to mount valves on the cylinder

The mounting sub-base Mod. PCV enables the valve or solenoid valve to be mounted directly on the cylinder by means of set screws that assemble through the PCV plate and into the slots of the profile extrusion.



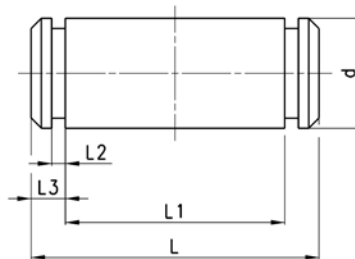
DIMENSIONS (mm)

Mod.	
PCV-61-K3	to connect valves - solenoid valves Series 3
PCV-61-K4	to connect valves - solenoid valves Series 4 port G1/4
PCV-62-KEN	to connect valves - solenoid valves Series EN
PCV-61-K8	to connect valves - solenoid valves Series 4 port G1/8 and Series 3 port G1/4

Clevis pin Mod. S



Supplied with:
1x clevis pin (stainless steel 303)
2x C-clips (plain carbon steel)



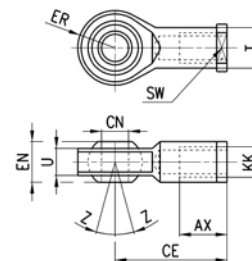
DIMENSIONS (mm)

Mod.	Ø	d	L	L1	L2	L3
S-32	32	10	52	46	1,1	3
S-40	40	12	59	53	1,1	3
S-50	50	12	67	61	1,1	3
S-63	63	16	77	71	1,1	3
S-80	80	16	97	91	1,1	3
S-100	100	20	121	111	1,3	5
S-125	125	25	140,5	132	1,3	4,25

Swivel ball joint Mod. GA

ISO 8139.

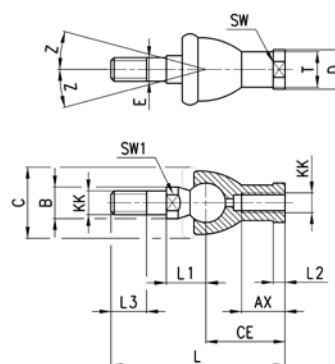
Material: zinc-plated steel.



DIMENSIONS (mm)										
Mod.	ØCN	U	EN	ER	AX	CE	KK	T	Z	SW
GA-32	10	10,5	14	14	20	43	M10X1,25	15	6,5	17
GA-40	12	12	16	16	22	50	M12X1,25	17,5	6,5	19
GA-50-63	16	15	21	21	28	64	M16X1,5	22	7,5	22
GA-80-100	20	18	25	25	33	77	M20x1,5	27,5	7	30
GA-41-125	30	25	37	37	51	110	M27x2	40	7,5	41

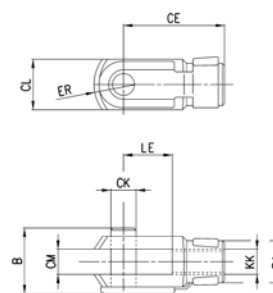
Piston rod socket joint Mod. GY

Material: Zinc-Aluminum alloy and zinc-plated steel.



DIMENSIONS (mm)																		
Mod.	Ø	KK	L	CE	L2	AX	SW	SW1	L1	L3	ØT	ØD	E	ØB	ØC	Z		
GY-32	32	M10X1,25	74	35	6,5	18	17	11	19,5	15	15	19	10	14	28	15		
GY-40	40	M12X1,25	84	40	6,5	20	19	17	21	17	17,5	22	12	19	32	15		
GY-50-63	50-63	M16X1,5	112	50	8	27	22	23	27,5	23	22	27	16	22	40	11		
GY-80-100	80-100	M20x1,5	133	63	10	38	30	25	31,5	25	27,5	34	20	27	45	7,5		

Rod fork end Mod. G

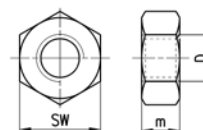
Material: zinc-plated steel
ISO 8140

DIMENSIONS (mm)										
Mod.	Ø	ØCK	LE	CM	CL	ER	CE	KK	B	B1
G-25-32	32	10	20	10	20	12	40	M10 X 1,25	26	18
G-40	40	12	24	12	24	14	48	M12 X 1,25	32	20
G-50-63	50-63	16	32	16	32	19	64	M16 X 1,5	40	26
G-80-100	80-100	20	40	20	40	25	80	M20 X 1,5	48	34
G-41-125	125	30	55	30	55	38	110	M27 X 2	74	48

Piston rod nut Mod. U

UNI EN ISO 4035.

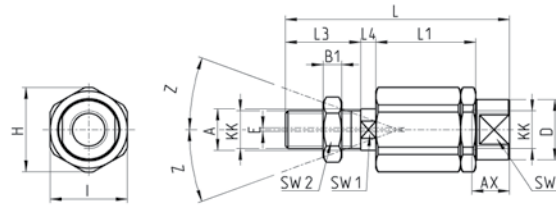
Material: zinc-plated steel.



DIMENSIONS (mm)			
Mod.	D	m	SW
U-25-32	M10X1,25	6	17
U-40	M12X1,25	7	19
U-50-63	M16X1,5	8	24
U-80-100	M20x1,5	9	30
U-41-125	M27x2	12	41

Self aligning rod Mod. GK

Material: zinc-plated steel.

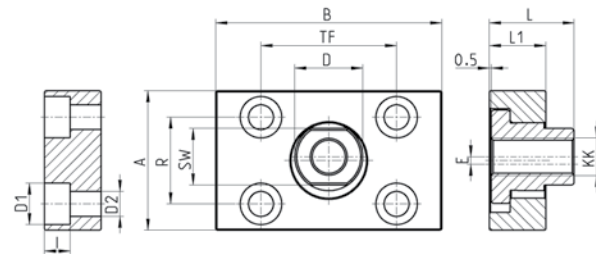
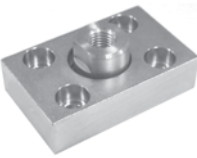


DIMENSIONS (mm)

Mod.	Ø	KK	L	L1	L3	L4	ØA	ØD	H	I	SW	SW1	SW2	B1	AX	Z	E
GK-25-32	25-32	M10x1,25	71,5	35	20	7,5	14	22	32	30	19	12	17	5	22	4	2
GK-40	40	M12x1,25	75,5	35	24	7,5	14	22	32	30	19	12	19	6	22	4	2
GK-50-63	50-63	M16x1,5	104	53	32	10	22	32	45	41	27	20	24	8	30	3	2
GK-80-100	80-100	M20x1,5	119	53	40	10	22	32	45	41	27	20	30	10	37	3	2

Coupling piece Mod. GKF

Material: zinc-plated steel.



DIMENSIONS (mm)

Mod.	Ø	KK	A	B	R	TF	L	L1	I	Ø D	Ø D1	Ø D2	SW	E
GKF-25-32	32	M10x1,25	37	60	23	36	22,5	15	6,8	18	11	6,6	15	2
GKF-40	40	M12x1,25	56	60	38	42	22,5	15	9	20	15	9	15	2,5
GKF-50-63	50-63	M16x1,5	80	80	58	58	26,5	15	10,5	25	18	11	22	2,5
GKF-80-100	80-100	M20x1,5	90	90	65	65	32,5	20	13	30,5	20	14	27	2,5
GKF-125	125	M27x2	90	90	65	65	35,5	20	13	40	20	14	36	4

Extruded Body Cylinders, ISO 6431, ISO 15552 compliant Series 62

Double-acting, magnetic, cushioned
ø 32, 40, 50, 63, 80, 100, (ISO 15552)



- » In compliance with ISO 15552 standards and with the previous DIN/ISO 6431/VDMA 24562 standards
- » Rolled stainless steel rod
- » Clean and light design
- » Adjustable pneumatic cushioning
- » Aluminum Profile
- » Composite piston

Cylinders Series 62 have been designed to comply with the dimensions laid down in the ISO 15552 standards. A permanent magnet is integrated in the piston which enables the detection of the piston position by means of proximity switches (Series CSH) mounted in grooves along one side of the cylinder profile. These grooves can be covered with a slot cover profile Mod. S-CST-500.

These cylinders are equipped with adjustable end-stroke cushioning. They are also equipped with a mechanical cushioning in order to reduce the impact of the piston as it reaches the end of the stroke.

GENERAL DATA

Type of construction	with tie-rods (inside the profile)
Operation	double-acting
Materials	end-caps = AL, seals = NBR, piston = composite, other parts: see coding
Type of mounting	with tie-rods, front flange, rear flange, feet front and rear trunnion, swivel combination
Stroke min - max	10 – 2500 mm
Operating temperature	0°C – 80°C (with dry air -10°C) (32 - 176°F, with dry air -4°F)
Special designs	see coding example
Operating pressure	1 – 10 bar (14.5 - 145 psi)
Speed	10 – 1000 mm/sec (NO LOAD)
Fluid	filtered air, without lubrication. If lubricated air is used, it is recommended to use oil ISOVG32. Once applied the lubrication should never be interrupted.
Proximity switch to use	CSH

STANDARD STROKES FOR CYLINDERS SERIES 62

Special strokes until 2500 mm available on request

✕ = Double-acting

Ø	25	50	75	80	100	125	150	160	200	250	300	320	400	500
32	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕
40	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕
50	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕
63	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕
80	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕
100		✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕

CODING EXAMPLE

62	M	2	P	050	A	0200	
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62	SERIES
M	VERSION M= standard, magnetic
2	OPERATION 2 = double-acting, front + rear cushion 3 = double-acting, no cushion 4 = double-acting, rear cushion 5 = double-acting, front cushion 6 = double-acting, through-rod, front + rear cushion
P	MATERIALS P = see general data section on previous page R = stainless steel AISI 420B tie-rods, stainless steel AISI 303 tie-rod nuts C = rolled stainless steel AISI 303 piston rod, stainless steel AISI 304 piston rod nut U = rolled stainless steel AISI 303 piston rod, stainless steel AISI 304 piston rod nut, stainless steel AISI 420B tie-rod, stainless steel AISI 303 tie-rod nuts W = rolled stainless steel AISI 304 piston rod, stainless steel AISI 304 piston rod nut, stainless steel AISI 420B tie-rods, stainless steel AISI 303 tie-rod nuts
050	BORE: 032 = 32 mm 040 = 40 mm 050 = 50 mm 063 = 63 mm 080 = 80 mm 100 = 100 mm
A	CONSTRUCTION A = standard lock nut for rod RL = cylinder with rod lock (rod extension required. See table.)
0200	STROKE: 10 – 2500 mm
	= standard V = FKM (VITON) piston rod seal (_ _ _) = extended piston rod _ _ _ mm

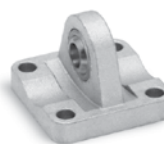
ACCESSORIES FOR CYLINDERS SERIES 62

Piston rod socket joint
Mod. GY

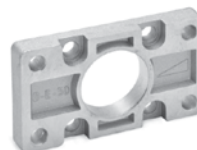
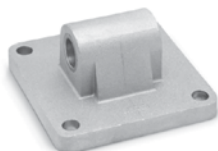
Piston rod nut Mod. U



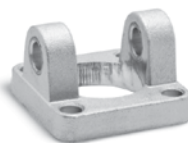
Clevis pin Mod. S

Rear trunnion ball-joint
Mod. RCoupling piece
Mod. GKF

Swivel ball joint Mod. GA

90° male trunnion
Mod. ZCSwivel Combination
Mod. IFront and rear flange
Mod. D-ESelf aligning rod
Mod. GKRear trunnion male
Mod. L

Foot mount Mod. B

Front female trunnion
Mod. H and C-HRear female trunnion
Mod. C and C-H

Rod fork end Mod. G

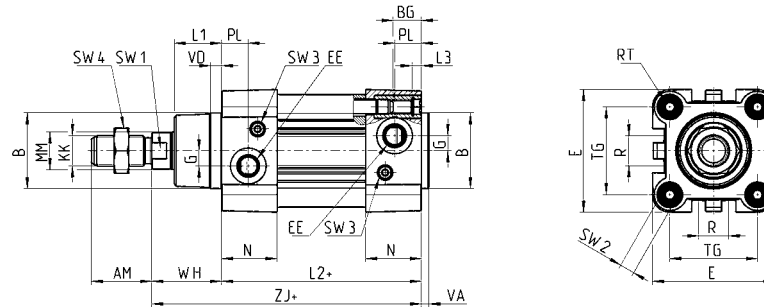


All accessories are supplied separately, except for piston rod nut Mod. U

Cylinders Series 62



+ = add the stroke



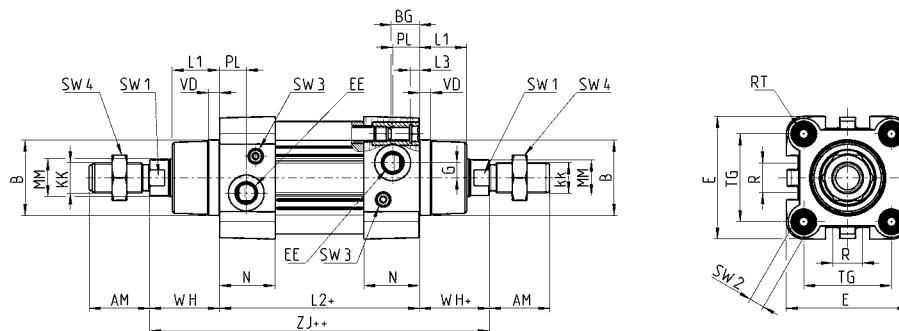
DIMENSIONS (mm)

Ø	AM	B	BG	E	EE	G	KK	L1	L2+	L3	MM	N	PL	R	RT	SW1	SW2	SW3	SW4	TG	VA	VD	WH	ZJ+	front and rear cushion stroke
32	22	30	16	46	G1/8	5	M10x1,25	18	94	5	12	26	14	13	M6	10	6	2	17	32,5	4	5	26	120	17
40	24	35	16	55	G1/4	5	M12x1,25	21	105	5	16	29	15	13,5	M6	13	6	2	19	38	4	5	30	135	20
50	32	40	16	64,5	G1/4	8	M16x1,5	25	106	5	20	29,5	15	16	M8	17	8	3	24	46,5	4	6	37	143	15
63	32	45	16	75	G3/8	8	M16x1,5	26	121	5	20	36,5	21	28	M8	17	8	3	24	56,5	4	6	37	158	17
80	40	45	19	93	G3/8	8	M20x1,5	30	128	0	25	36	21	30	M10	22	10	5	30	72	4	7	46	174	20
100	40	55	19,5	110	G1/2	8	M20x1,5	35	138	0	25	38,5	23	40	M10	22	10	5	30	89	4	7	51	189	21

Cylinders Series 62 - through-rod



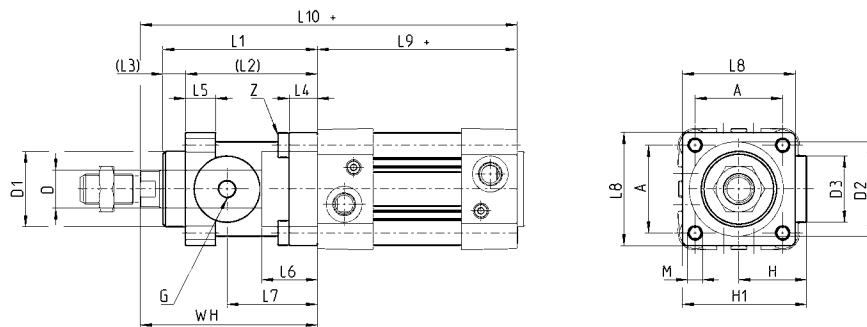
+ = add the stroke
 ++ = add the stroke two times



DIMENSIONS (mm)

Ø	AM	B	BG	E	EE	G	KK	L1	L2+	L3	MM	N	PL	R	RT	SW1	SW2	SW3	SW4	TG	VD	WH	ZM+	front and rear cushion stroke
32	22	30	16	46	G1/8	5	M10x1,25	18	94	5	12	26	14	13	M6	10	6	2	17	32,5	5	26	146	17
40	24	35	16	55	G1/4	5	M12x1,25	21	105	5	16	29	15	13,5	M6	13	6	2	19	38	5	30	165	20
50	32	40	16	64,5	G1/4	8	M16x1,5	25	106	5	20	29,5	15	16	M8	17	8	3	24	46,5	6	37	180	15
63	32	45	16	75	G3/8	8	M16x1,5	26	121	5	20	36,5	21	28	M8	17	8	3	24	56,5	6	37	195	17
80	40	45	19	93	G3/8	8	M20x1,5	30	128	0	25	36	21	30	M10	22	10	5	30	72	7	46	220	20
100	40	55	19,5	110	G1/2	8	M20x1,5	35	138	0	25	38,5	23	40	M10	22	10	5	30	89	7	51	240	21

Cylinders Series 62 with rod lock



Ø	Rod extension [X] (mm)	Holding force [static load] (N)
20	+50	300
25	+48	400
32	+40	650
40	+43	1100
50	+57	1600
63	+57	2500
80	+80	4000
100	+80	6300
125	+125	8800

+ = add the stroke

DIMENSIONS (mm)																					
Ø	ØD	ØD1	ØD2	ØD3	A	G	H	H1	L1	L2	L3	L4	L5	L6	L7	L8	L9+	L10+	M	WH	Z
32	12	30,5	35	25	32,5	M5	25,5	46,5	58	48	10	8	13	20,5	34	45	94	160	M6	66	M6x20
40	16	35	40	28	38	G1/8	30	53	65	55	10	8	13	22,5	38	50	105	178	M6	73	M6x20
50	20	40	50	35	46,5	G1/8	36	64	82	70	12	15	16	29,5	48	60	106	200	M8	94	M6x20
63	20	45	60	38	56,5	G1/8	40	75	82	70	12	15	16	29,5	49,5	70	121	215	M8	94	M8x30
80	25	45	80	48	72	G1/8	50	95	110	90	20	18	20	35	61	90	128	254	M10	126	M10x35
100	25	55	100	58	89	G1/8	58	110,5	115	100	15	18	20	39	69	105	138	269	M10	131	M10x35

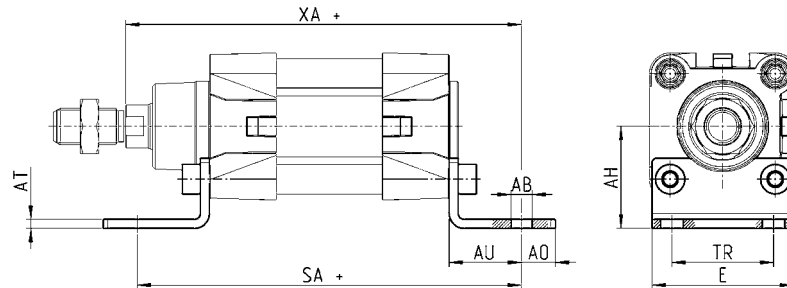
Foot mount Mod. B

Material: zinc-plated steel



Supplied with:
2x feet
4x screws

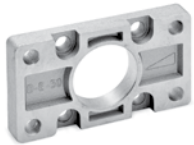
+ = add the stroke



Mod.	Ø	AT	SA+	XA+	TR	E	AB	AH	AO	AU
B-41-32	32	4	142	144	32	45	7	32	11	24
B-41-40	40	4	161	163	36	53,5	10	36	15	28
B-41-50	50	4	170	175	45	62,5	10	45	15	32
B-41-63	63	5	185	190	50	73	10	50	15	32
B-41-80	80	6	210	216	63	92	12	63	20	41
B-41-100	100	6	220	230	75	108,5	14,5	71	25	41

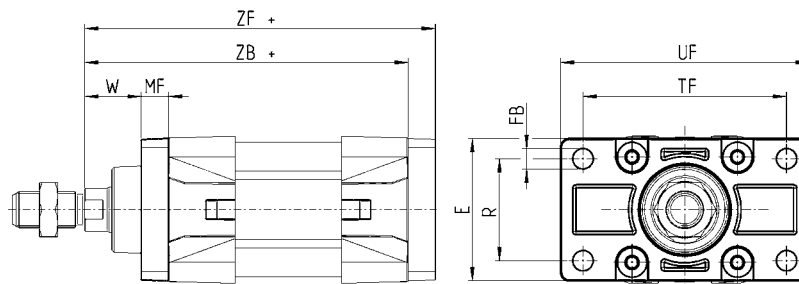
Front and rear flange Mod. D-E

Material: aluminium



Supplied with:
1x flange
4x screws

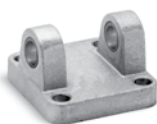
+ = add the stroke



Mod.	Ø	W	MF	ZB+	TF	R	UF	E	FB	ZF+	torque force
D-E-41-32	32	16	10	120	64	32	86	45	7	130	6 Nm
D-E-41-40	40	20	10	135	72	36	88	52	9	145	6 Nm
D-E-41-50	50	25	12	143	90	45	110	63	9	155	13 Nm
D-E-41-63	63	25	12	158	100	50	116	73	9	170	13 Nm
D-E-41-80	80	30	16	174	126	63	148	95	12	190	19 Nm
D-E-41-100	100	35	16	189	150	75	176	115	14	205	22 Nm

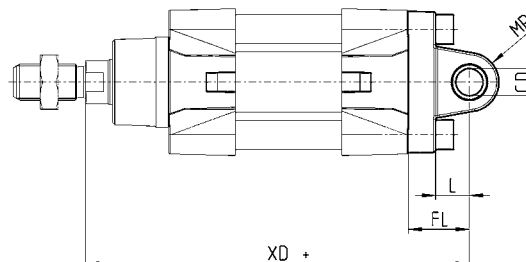
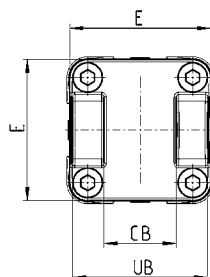
Rear female trunnion Mod. C and C-H

Material: Aluminium



Supplied with:
1x female trunnion
4x screws

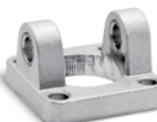
+ = add the stroke



Mod.	Ø	CD	L	FL	XD+	MR	E	CB	UB	torque force
C-41-32	32	10	12	22	142	10	45	26	45	6 Nm
C-41-40	40	12	15	25	160	13	52	28	52	6 Nm
C-41-50	50	12	15	27	170	13	63	32	60	13 Nm
C-H-41-63	63	16	20	32	190	15	73	40	70	13 Nm
C-H-41-80	80	16	24	36	210	15	95	50	90	19 Nm
C-H-41-100	100	20	29	41	230	18	115	60	110	26 Nm

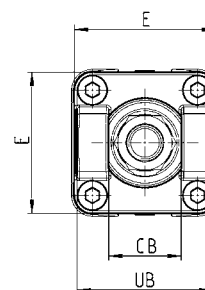
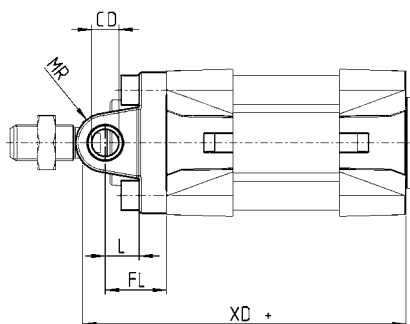
Front female trunnion Mod. H and C-H

Material: Aluminium



Supplied with:
1x female trunnion
4x screws

+ = add the stroke



Mod.	Ø	CB	UB	E	XD	FL	L	CD	MR
H-41-32	32	26	45	45	120	22	12	10	10
H-41-40	40	28	52	52	135	25	15	12	13
H-41-50	50	32	60	63	143	27	15	12	13
H-60-63	63	40	70	73	158	32	20	16	15
C-H-41-80	80	50	90	95	174	36	24	16	15
C-H-41-100	100	60	110	115	189	41	29	20	18

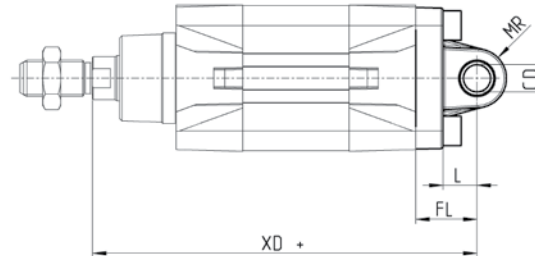
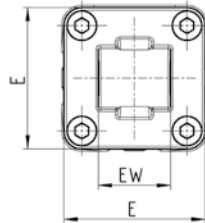
Rear trunnion, male Mod. L

Material: aluminium



Supplied with:
1x male trunnion
4x screws

+ = add the stroke

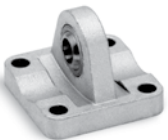


Mod.	Ø	CD	L	FL	XD+	MR	E	EW	torque force
L-41-32	32	10	12	22	142	9	45	26	6 Nm
L-41-40	40	12	15	25	160	13	52	28	6 Nm
L-41-50	50	12	15	27	170	13	63	32	13 Nm
L-41-63	63	16	20	32	190	15	73	40	13 Nm
L-41-80	80	16	24	36	210	15	95	50	19 Nm
L-41-100	100	20	29	41	230	18	115	60	22 Nm

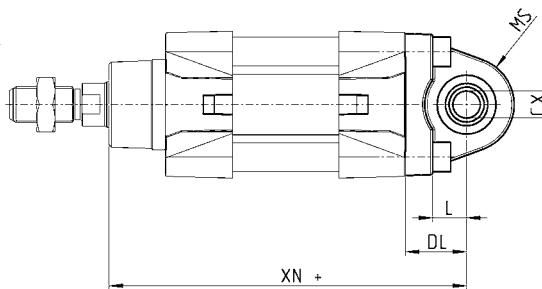
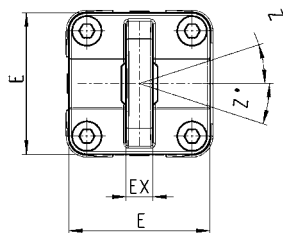
Trunnion ball-joint Mod. R*

Material: Aluminium

* not according to standard



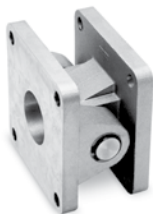
Supplied with:
1x trunnion ball-joint
4x screws



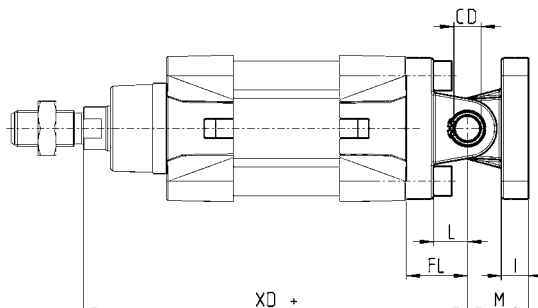
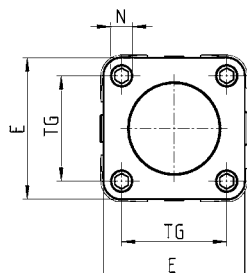
Mod.	Ø	CX	L	DL	XN+	MS	E	EX	EP	Z	Torque force
R-41-32	32	10	12	22	142	16	45	14	10,5	4	6 Nm
R-41-40	40	12	15	25	160	20	52	16	12	4	6 Nm
R-41-50	50	12	15	27	170	20	63	16	12	4	13 Nm
R-41-63	63	16	20	32	190	24	73	21	15	4	13 Nm
R-41-80	80	16	24	36	210	24	95	21	15	4	19 Nm
R-41-100	100	20	29	41	230	30	115	25	18	4	22 Nm

Accessory combination Mod. I (combination of models C + L + S)

Material: Aluminium



+ = add the stroke



Mod.	Ø	ØCD	L	FL	XD+	MR	E	CB	UB	torque force
I-41-32	32	10	12	22	142	10	45	26	45	6 Nm
I-41-40	40	12	15	25	160	10	52	28	52	6 Nm
I-41-50	50	12	15	27	170	13	63	32	60	13 Nm
I-41-63	63	16	20	32	190	15	73	40	70	13 Nm
I-41-80	80	16	24	36	210	15	95	50	90	19 Nm
I-41-100	100	20	29	41	230	18	115	60	110	26 Nm

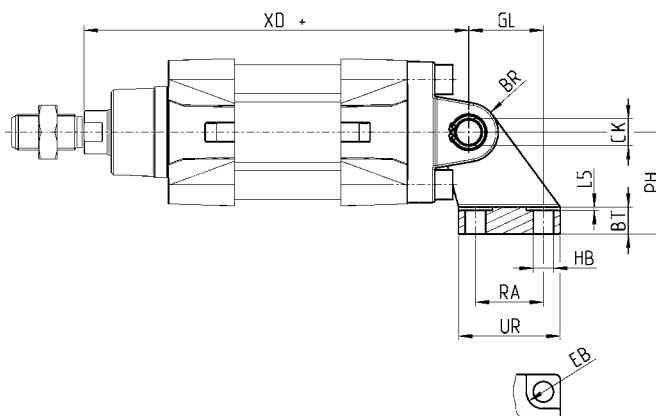
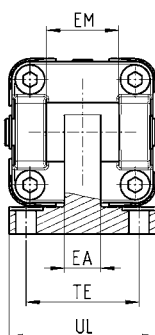
90° male trunnion Mod. ZC

CETOP RP 107P

Material: Aluminium

Supplied with:
1x male support

+ = add the stroke



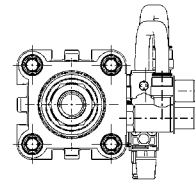
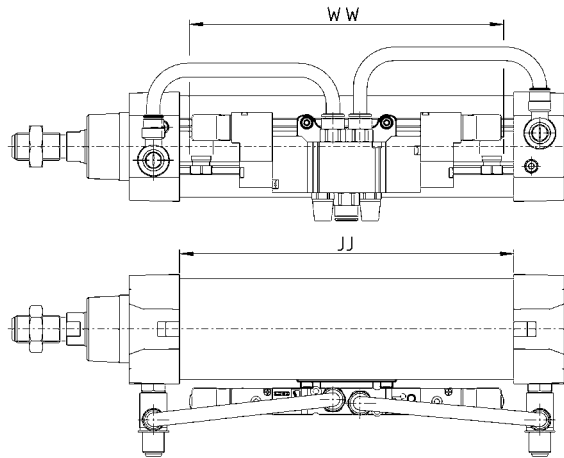
Mod.	Ø	EB	CK	HB	XD+	TE	UL	EA	GL	L5	RA	EM	UR	PH	BT	BR
ZC-32	32	11	10	6,6	142	38	51	10	21	1,6	18	26	31	32	8	10
ZC-40	40	11	12	6,6	160	41	54	15	24	1,6	22	28	35	36	10	11
ZC-50	50	15	12	9	170	50	65	16	33	1,6	30	32	45	45	12	13
ZC-63	63	15	16	9	190	52	67	16	37	1,6	35	40	50	50	14	15
ZC-80	80	18	16	11	210	66	86	20	47	2,5	40	50	60	63	14	15
ZC-100	100	18	20	11	230	76	96	20	55	3,2	50	60	70	71	17	19

Accessory to mount valves on the cylinder

The mounting sub-base Mod. PCV enables the valve or solenoid valve to be mounted directly on the cylinder by means of set screws that assemble through the PCV plate and into the slots of the profile extrusion.



Make sure that the total length of the selected valve (WW) is smaller than the dimension JJ of the selected cylinder.
For more information see www.camozzi.com/products/area/downloads.



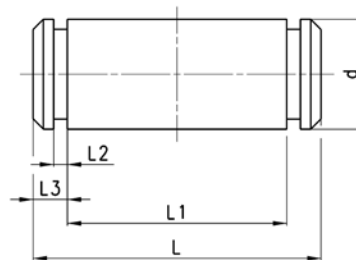
Mod.

PCV-62-K3	to connect valves - solenoid valves Series 3
PCV-62-K4	to connect valves - solenoid valves Series 4 port G1/4
PCV-62-KEN	to connect valves - solenoid valves Series EN
PCV-62-K8	to connect valves - solenoid valves Series 4 port G1/8 and Series 3 port G1/4

Clevis pin Mod. S



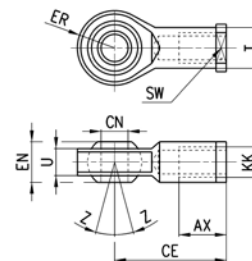
Supplied with:
1x clevis pin (stainless steel 303)
2x C-clips (plain carbon steel)



Mod.	Ø	d	L	L1	L2	L3
S-32	32	10	52	46	1,1	3
S-40	40	12	59	53	1,1	3
S-50	50	12	67	61	1,1	3
S-63	63	16	77	71	1,1	3
S-80	80	16	97	91	1,1	3
S-100	100	20	121	111	1,3	5

Swivel ball joint Mod. GA

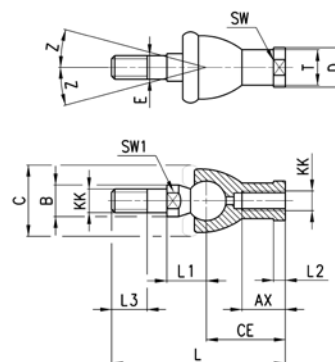
Material: zinc-plated steel
ISO 8139



Mod.	ØCN	U	EN	ER	AX	CE	KK	T	Z	SW
GA-32	10	10,5	14	14	20	43	M10X1,25	15	6,5	17
GA-40	12	12	16	16	22	50	M12X1,25	17,5	6,5	19
GA-50-63	16	15	21	21	28	64	M16X1,5	22	7,5	22
GA-80-100	20	18	25	25	33	77	M20x1,5	27,5	7	30

Piston rod socket joint Mod. GY

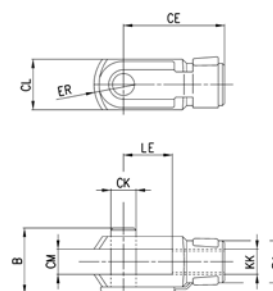
Material: Zinc-Aluminum alloy and zinc-plated steel



Mod.	Ø	KK	L	CE	L2	AX	SW	SW1	L1	L3	ØT	ØD	E	ØB	ØC	Z
GY-32	32	M10X1,25	74	35	6,5	18	17	11	19,5	15	15	19	10	14	28	15
GY-40	40	M12X1,25	84	40	6,5	20	19	17	21	17	17,5	22	12	19	32	15
GY-50-63	50-63	M16X1,5	112	50	8	27	22	23	27,5	23	22	27	16	22	40	11
GY-80-100	80-100	M20x1,5	133	63	10	38	30	25	31,5	25	27,5	34	20	27	45	7,5

Rod fork end Mod. G

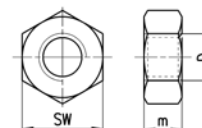
Material: zinc-plated steel
ISO 8140



Mod.	Ø	ØCK	LE	CM	CL	ER	CE	KK	B	B1
G-25-32	32	10	20	10	20	12	40	M10 X 1,25	26	18
G-40	40	12	24	12	24	14	48	M12 X 1,25	32	20
G-50-63	50-63	16	32	16	32	19	64	M16 X 1,5	40	26
G-80-100	80-100	20	40	20	40	25	80	M20 X 1,5	48	34

Piston rod nut Mod. U

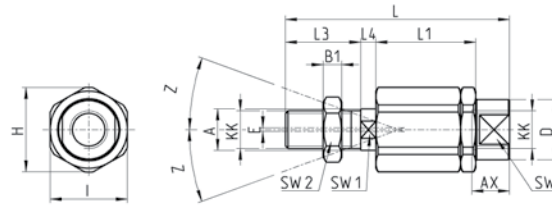
Material: zinc-plated steel
UNI EN ISO 4035



Mod.	D	m	SW
U-25-32	M10X1,25	6	17
U-40	M12X1,25	7	19
U-50-63	M16X1,5	8	24
U-80-100	M20x1,5	9	30

Self aligning rod Mod. GK

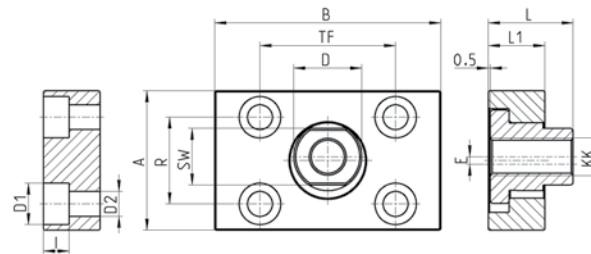
Material: zinc-plated steel



Mod.	Ø	KK	L	L1	L3	L4	ØA	ØD	H	I	SW	SW1	SW2	B1	AX	Z	E
GK-25-32	25-32	M10x1,25	71,5	35	20	7,5	14	22	32	30	19	12	17	5	22	4	2
GK-40	40	M12x1,25	75,5	35	24	7,5	14	22	32	30	19	12	19	6	22	4	2
GK-50-63	50-63	M16x1,5	104	53	32	10	22	32	45	41	27	20	24	8	30	3	2
GK-80-100	80-100	M20x1,5	119	53	40	10	22	32	45	41	27	20	30	10	37	3	2

Coupling piece Mod. GKF

Material: zinc-plated steel



Mod.	Ø	KK	A	B	R	TF	L	L1	I	Ø D	Ø D1	Ø D2	SW	E
GKF-25-32	32	M10x1,25	37	60	23	36	22,5	15	6,8	18	11	6,6	15	2
GKF-40	40	M12x1,25	56	60	38	42	22,5	15	9	20	15	9	15	2,5
GKF-50-63	50-63	M16x1,5	80	80	58	58	26,5	15	10,5	25	18	11	22	2,5
GKF-80-100	80-100	M20x1,5	90	90	65	65	32,5	20	13	30,5	20	14	27	2,5

Rod Lock Series RL

For cylinders ISO 6431/VDMA and ISO 6432
 ø 20 - 25 - 32 - 40 - 50 - 63 - 80 - 100 - 125



- » Compact design
- » Functioning in both directions
- » Blocks without pressure releases with pressure

The Series RL rod locks are available in 9 different sizes (diameters: 20, 25, 32, 40, 50, 63, 80, 100 to 125 mm). The compact dimensions allow units to be fitted on cylinders where space is limited.

Rod lock units are often used to hold the load in position during Emergency Stop conditions or when the air supply may be accidentally disconnected from the system. The holding forces are measured at 8 bar and apply in both directions.

Caution!

The rod lock should not be used to "brake" the piston rod in dynamic conditions and must only be applied when movement has ceased.

Note:

the cylinder piston rod length must be increased when using a rod lock unit. See the table for the minimum extension lengths for each diameter.

GENERAL DATA

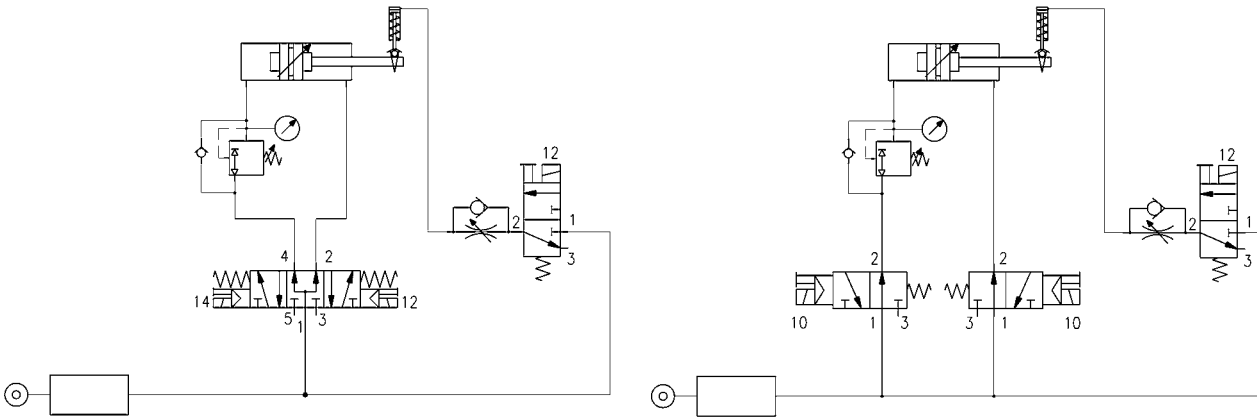
Type of construction	compact
Operation	piston operated clamp
Materials	housing: anodized AL clamp: brass seals: NBR (Buna-N)
Cylinder diameter	ø 20 - 25 - 32 - 40 - 50 - 63 - 80 - 100 - 125
Operating temperature	0°C – 80°C (with dry air -20°C) (32 - 176°F, with dry air -4°F)
Configuration	pressure release
Operating pressure	3 – 8 bar (45 - 115 psi)
Ports	M5 = ø20, 25, 32 - G1/8 = ø40, 50, 63, 80, 100, 125
Fluid	Filtered air without lubrication. If lubricated air is used, it is recommended to use ISOVG32 oil. Once applied the lubrication should never be interrupted.

CODING EXAMPLE

RLC - 41 - 32

RLC	SERIES RLC = standard, complete with cartridge and housing RLB = cartridge only (spare part for existing housings already assembled)
41	CYLINDER SERIES 24 = for Series 24 and 25 41 = for Series 60, 61 and 62
32	CYLINDER DIAMETER (mm) 20 = 20 mm 25 = 25 mm 32 = 32 mm 40 = 40 mm 50 = 50 mm 63 = 63 mm 80 = 80 mm 100 = 100 mm 125 = 125 mm

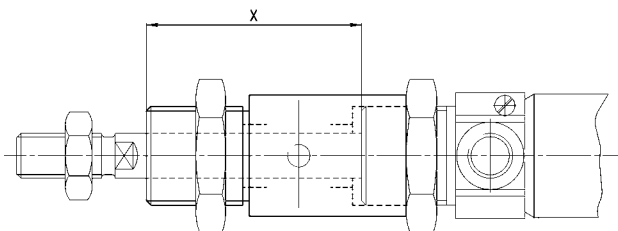
CONNECTION EXAMPLES



For a correct use of the rod lock Mod. RLC a pneumatic circuit is recommended (as shown in the examples).

ROD EXTENSION and HOLDING FORCE

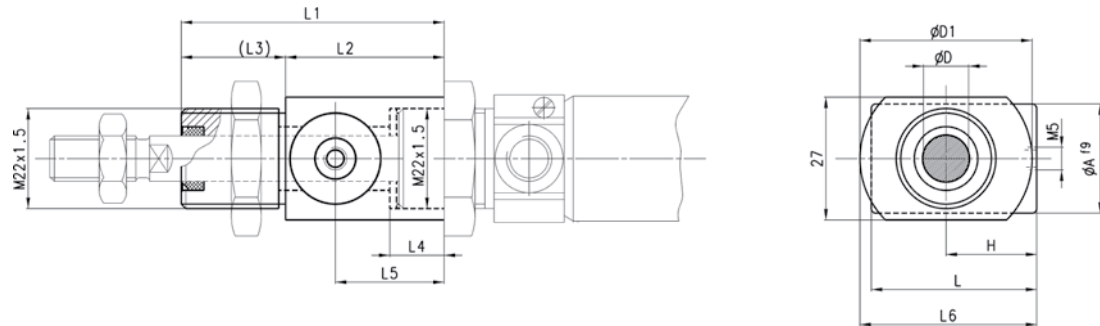
Table showing the rod extensions which are necessary for the rod lock mounting.



ø	Rod extension [X] (mm)	Holding force [static load] (N)
20	+50	300
25	+48	400
32	+40	650
40	+43	1100
50	+57	1600
63	+57	2500
80	+80	4000
100	+80	6300
125	+125	8800

Rod Lock Series RL

ø 20 - 25.

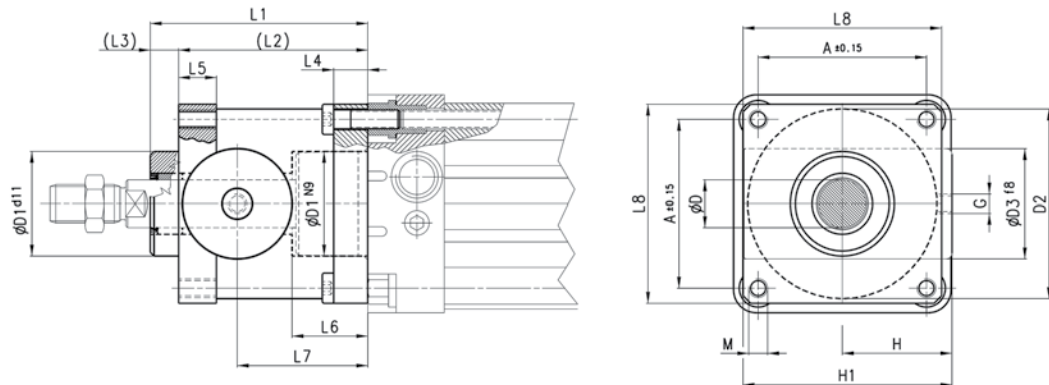


DIMENSIONS (mm)

Mod.	Ø	D	A	D1	H	L	L1	L2	L3	L4	L5	L6
RLC-24-20	20	8	20	38	21	40	58	35	23	12	24	40
RLC-24-25	25	10	20	38	21	40	58	35	23	12	24	40

Rod Lock Series RL

ø 32 - 125.



DIMENSIONS (mm)

Mod.	Ø	D	D1	D2	D3	G	L1	L2	L3	L4	L5	L6	L7	L8	A	M	H	H1	Z
RLC-41-32	32	12	30,5	35	25	M5	58	48	10	8	13	20,5	34	45	32,5	M6	25,5	46,5	M6X20
RLC-41-40	40	16	35	40	28	G1/8	65	55	10	8	13	22,5	38	50	38	M6	30	53	M6X20
RLC-41-50	50	20	40	50	35	G1/8	82	70	12	15	16	29,5	48	60	46,5	M8	36	64	M8X30
RLC-41-63	63	20	45	60	38	G1/8	82	70	12	15	16	29,5	49,5	70	56,5	M8	40	75	M8X30
RLC-41-80	80	25	45	80	48	G1/8	110	90	20	18	20	35	61	90	72	M10	50	95	M10X35
RLC-41-100	100	25	55	100	58	G1/8	115	100	15	18	20	39	69	105	89	M10	58	110,5	M10X35
RLC-41-125	125	32	60	130	65	G1/8	167	122	45	22	30	51	86,5	140	110	M12	80	150	M12X40

Guides Series 45

For cylinders DIN/ISO 6432 - $\varnothing 12, 16, 20, 25$

For cylinders DIN/ISO 6431 - $\varnothing 32, 40, 50, 63, 80, 100$



- » To be used with VDMA/ ISO cylinders
- » Available as ball bearing guide and self lubricating bronze bushing guide

Series 45 guides can be used with all cylinders DIN/ISO 6432 of $\varnothing 12 - \varnothing 25$ and DIN/ISO 6431 of $\varnothing 32 - \varnothing 100$.

The Series 45 Guides have been developed in order to prevent piston rod rotation and can support possible radial loads.

Series 45 Guides are available in three different models depending on the applicable loads. The UT and HT guides with bronze bushings are self lubricating, while HB guides have a ball-bearing assembly for radial support.

To ensure the right choice of the loads in relation to the stroke, please refer to the graphs. The shorter the stroke the higher will be the applicable loads.

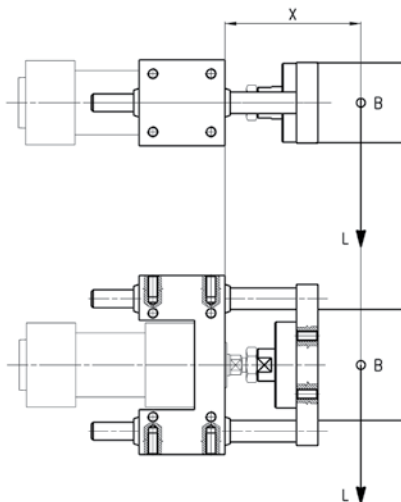
GENERAL DATA

Type of construction	U and H
Operation	45NUT and 45NHT without lubrication, 45NHB requires lubrication
Material	anodized aluminium body, rolled stainless steel AISI 420B columns for 45UT and 45HT, hardened carbon steel C50 columns for 45HB, stainless steel flexible coupling AISI 303, anodized aluminium plate
Assembly	by means of threaded holes
Strokes min - max	see diagrams
Installation	in any position

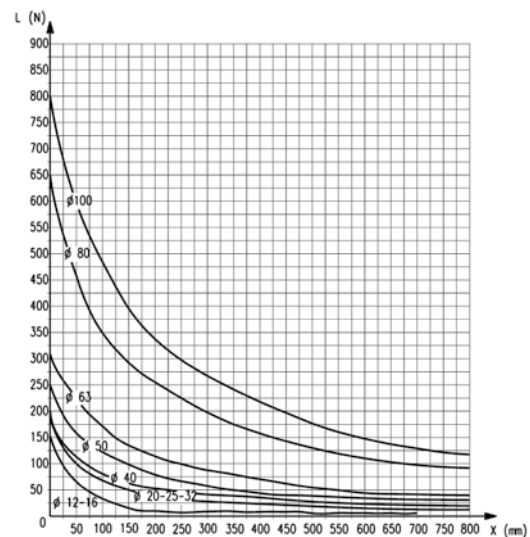
CODING EXAMPLE

45	N	UT	050	A	0100
45	SERIES				
N	VERSION N = standard				
UT	OPERATION UT = "U" oil impregnated bronze bushing HT = "H" oil impregnated bronze bushing HB = "H" ball-bearing support guides				
050	BORE 012 = 12 mm 016 = 16 mm 020 = 20 mm 025 = 25 mm 032 = 32 mm 040 = 40 mm 050 = 50 mm 063 = 63 mm 080 = 80 mm 100 = 100 mm				
A	MATERIALS A = anodized aluminium body, stainless steel columns AISI 420B for 45UT and 45HT, hardened carbon-steel columns C50 for 45HB				
0100	STROKE in mm				

APPLICABLE LOADS DEPENDING ON PROJECTION - GRAPH 1

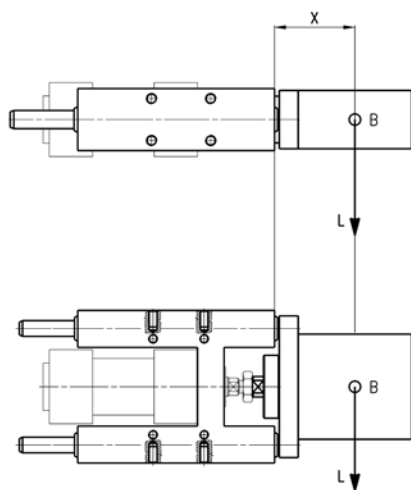


B = centre of gravity for applied load
 L = load
 X = fixed projection + stroke
 fixed projection = distance to the centre of gravity

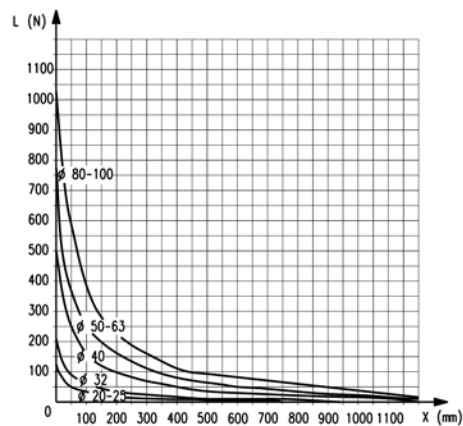


Guide "U" bushing support (45NUT)

APPLICABLE LOADS DEPENDING ON PROJECTION - GRAPH 2

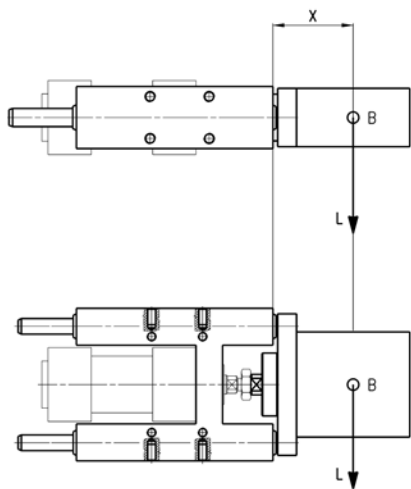


B = centre of gravity for applied load
 L = load
 X = fixed projection + stroke
 fixed projection = distance to the centre of gravity

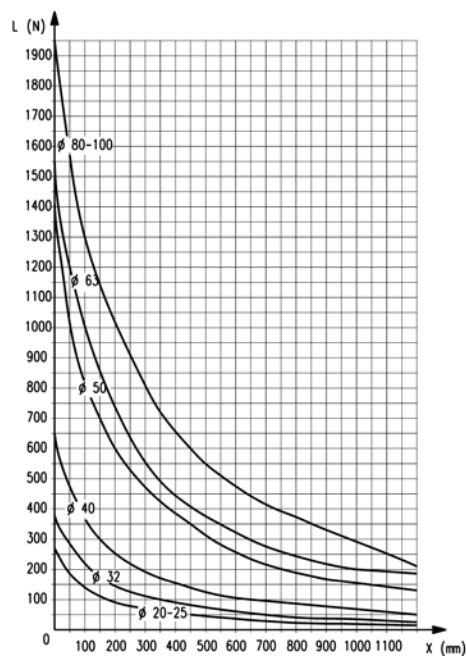


Guide "HB" with linear ball bearing (45NHB)

APPLICABLE LOADS DEPENDING ON PROJECTION - GRAPH 3



B = centre of gravity for applied load
 L = load
 X = fixed projection + stroke
 fixed projection = distance to the centre of gravity



Guide "HT" bushing support (45NHT)

Guides Mod. 45NUT

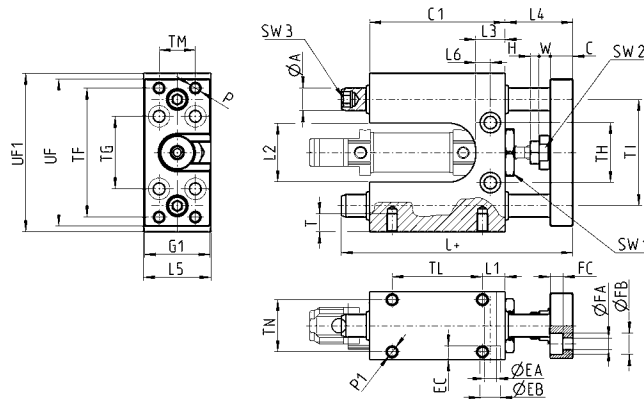


Suitable for cylinders Series 16, 24 and 25 DIN/ISO 6432, $\varnothing$ 12 and 16. These guides do not need lubrication. For applicable loads, see graph N°1.

Cylinders $\varnothing$ 12 and $\varnothing$ 16 use the same guides.

Supplied with:
1x fixing nut.

Draw note:
+ = add the stroke



DIMENSIONS (mm)

$\varnothing$	TF	TG	TH	TI	TM	TL	TN	UF1	UF	G1	$\varnothing A$	C1	H	W	C	L	L1	L2	L3	L4	L5	L6	P	P1	T	$\varnothing EA$	$\varnothing EB$	EC	$\varnothing FA$	$\varnothing FB$	FC	SW1	SW2	SW3
12	57	32	26,5	47	16	40	23	70	65	29	10	60	4	5	10	102,5	10	26	13	30	30	6,5	M5	M5	8	5,5	9	5,7	5,5	9,5	5,7	21	13	6
16	57	32	26,5	47	16	40	23	70	65	29	10	60	4	5	10	102,5	10	26	13	30	30	6,5	M5	M5	8	5,5	9	5,7	5,5	9,5	5,7	21	13	6

Guides Mod. 45NUT

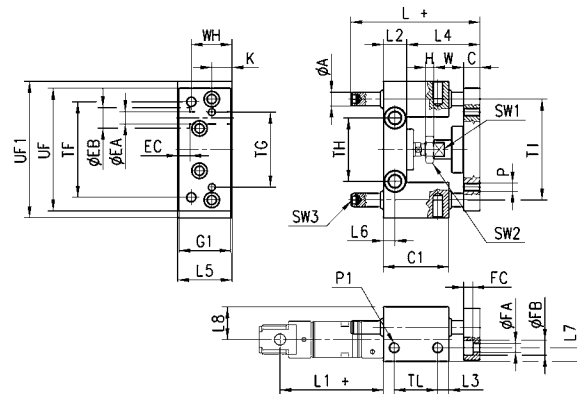
Suitable for cylinders Series 24 and 25 DIN/ISO 6432, $\varnothing$ 20 and 25. These guides do not need lubrication.

For applicable loads, see graph N°1.



Supplied with:
1x fixing nut.

Draw note:
+ = add the stroke



DIMENSIONS (mm)

$\varnothing$	TF	TG	TH	TI	TL	UF1	UF	G1	$\varnothing A$	WH	C1	H	W	C	K	L	L1	L2	L3	L4	L5	L6	L7	L8	P	P1	$\varnothing EA$	$\varnothing EB$	EC	$\varnothing FA$	$\varnothing FB$	FC	SW1	SW2
20	70	55	46,5	74	32	100	90	38	10	30	48	4	22	12	15	77	71	17	8	48+2	40	8,5	10	24	M6	M8	9	15	9	6,5	11	6,8	13	13
25	70	55	46,5	74	32	100	90	38	10	30	48	6	22	12	15	77	76	17	8	48+2	40	8,5	10	24	M6	M8	9	15	9	6,5	11	6,8	13	17

Guides Mod. 45NHT

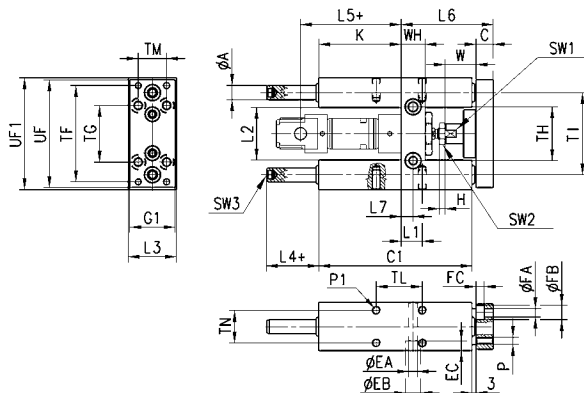
Suitable for cylinders Series 24 and 25 DIN/ISO 6432, $\varnothing$ 20 and 25. These guides do not need lubrication.

For applicable loads, see graph N°1.



Supplied with:
1x fixing nut.

Draw note:
+ = add the stroke



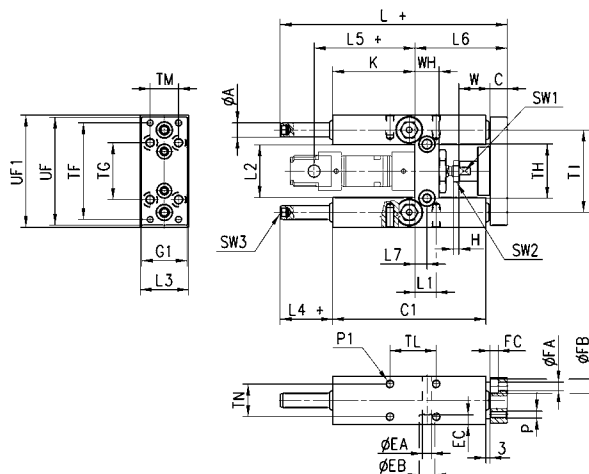
DIMENSIONS (mm)

$\varnothing$	TF	TG	TH	TI	TL	TM	TN	UF	G1	UF1	$\varnothing A$	WH	C1	H	W	C	K	L	L1	L2	L3	L4	L5	L6	L7	P	P1	T	$\varnothing EA$	$\varnothing EB$	EC	$\varnothing FA$	$\varnothing FB$	FC	SW1	SW2	SW3
20	68	40	38	58	32,5	20	23	76	32	79	10	17	108	4	22	12	58	160	15	37	34	37	71	65	8,5	M5	M6	14	6,5	11	6,8	5,5	10	5,7	13	13	6
25	68	40	38	58	32,5	20	23	76	32	79	10	17	108	6	17	12	58	160	15	37	34	37	76	65	8,5	M5	M6	14	6,5	11	6,8	5,5	10	5,7	13	17	6

Guides Mod. 45NHB

Suitable for cylinders Series 24 and 25 DIN/ISO 6432, $\varnothing$ 20 and 25.

To lubricate these guides, use the special lubricator. For applicable loads, see graph No. 2.

Supplied with:
1x fixing nut.Draw note:
+ = add the stroke

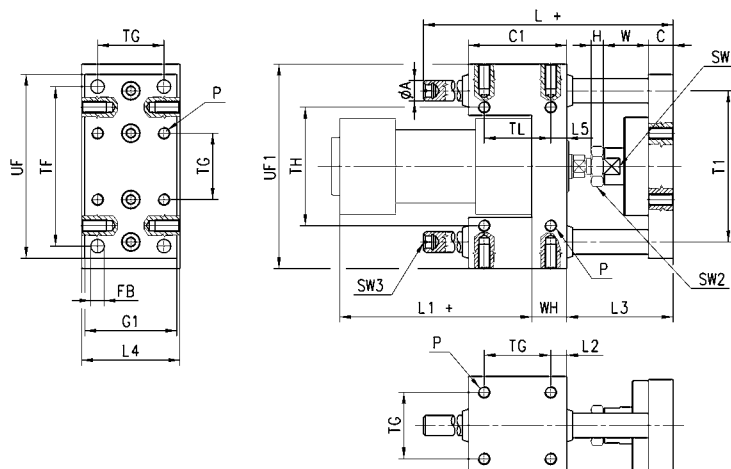
DIMENSIONS (mm)

Ø	TF	TG	TH	TI	TL	TM	TN	UF	G1	UF1	A	WH	C1	H	W	C	K	L	L1	L2	L3	L4	L5	L6	L7	P	P1	T	ØEA	ØEB	EC	ØFA	ØFB	FC	SW1	SW2	SW3
20	68	40	38	58	32,5	20	23	76	32	79	10	17	108	4	22	12	58	160	15	37	34	37	71	65	8,5	M5	M6	14	6,5	11	6,8	5,5	10	5,7	13	13	6
25	68	40	38	58	32,5	20	23	76	32	79	10	17	108	6	17	12	58	160	15	37	34	37	76	65	8,5	M5	M6	14	6,5	11	6,8	5,5	10	5,7	13	17	6

Guides Mod. 45NUT

Suitable for cylinders Series 60 and 61 DIN/ISO 6431, $\varnothing$ 32, 40, 50, 63, 80 and 100.

These guides do not need lubrication. For applicable loads, see graph No. 1.

Supplied with:
4x fixing screws.Draw note:
+ = add the stroke

DIMENSIONS (mm)

Ø	TF	TG	TH	ØA	T1	P	FB	UF	G1	UF1	L	C1	H	W	C	L1	WH	L2	L3	L4	L5	TL	SW1	SW2	SW3
32	78	32,5	58	12	74	M6	6,6	90	45	100	106	48	6	22	12	94	17	7,8	52	48	7,8	32,5	15	17	3
40	84	38	64	12	80	M6	6,6	100	50	106	117	58	7	22	12	105	21	10	53	56	10	38	15	19	6
50	100	46,5	80	16	96	M8	9	120	60	125	129	59	8	26	15	106	25	6,2	64	66	6,3	46,5	22	24	6
63	105	56,5	95	16	104	M8	9	125	70	132	146	76	8	26	15	121	25	9,8	64	76	9,8	56,5	22	24	6
80	130	72	130	20	130	M10	11	155	90	165	170	90	9	32	16	128	34	9	72	98	20	50	27	30	6
100	150	89	150	20	150	M10	11	175	110	185	190	110	9	32	16	138	39	10,5	72	118	20	70	27	30	6

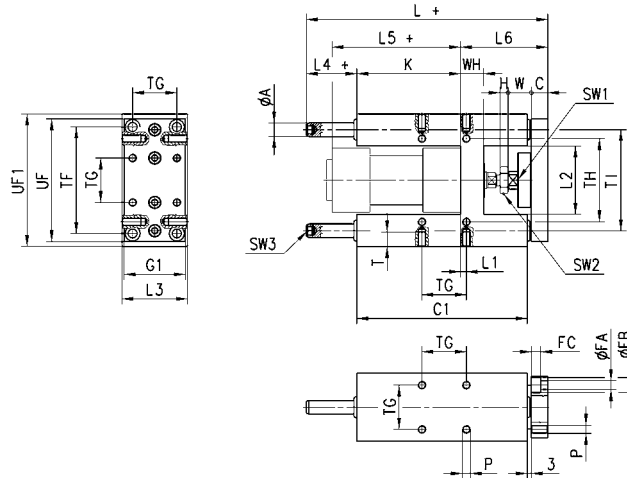
Guides Mod. 45NHT

Suitable for cylinders Series 60 and 61 DIN/ISO 6431, $\varnothing$ 32, 40, 50, 63, 80 and 100.
These guides do not need lubrication. For applicable loads, see graph No. 3.



Supplied with:
4x fixing screws.

Draw note:
+ = add the stroke



DIMENSIONS (mm)

$\varnothing$	TF	TG	TH	TI	UF	G1	UF1	$\varnothing$ A	WH	C1	H	W	C	K	L	L1	L2	L3	L4	L5	L6	P	T	$\varnothing$ FA	$\varnothing$ FB	FC	SW1	SW2	SW3
32	78	32,5	61	74	90	45	97	12	17	125	6	17	12	76	177	4,3	50,2	50	37	94	64	M6	14	6,5	11	6,8	13	17	6
40	84	38	69	87	110	54	115	16	21	140	7	22	12	81	192	11	58,2	58	37	105	74	M6	14	6,5	11	6,8	15	19	6
50	100	46,5	85	104	130	63	137	20	26	149	8	26	15	78,5	205	19,8	70,2	70	37,5	106	89	M8	16	9	15	9	22	24	6
63	105	56,5	100	119	145	80	152	20	26	182	8	26	15	111	237	15,3	85,2	85	37	121	89	M8	16	9	15	9	22	24	6
80	130	72	130	148	180	100	189	25	32	215	9	32	20	128	280	21	105,4	105	42	128	110	M10	20	11	18	11	27	30	6
100	150	89	150	172	200	120	213	25	32	220	9	32	20	128	280	24,5	130,4	130	37	138	115	M10	20	11	18	11	27	30	6

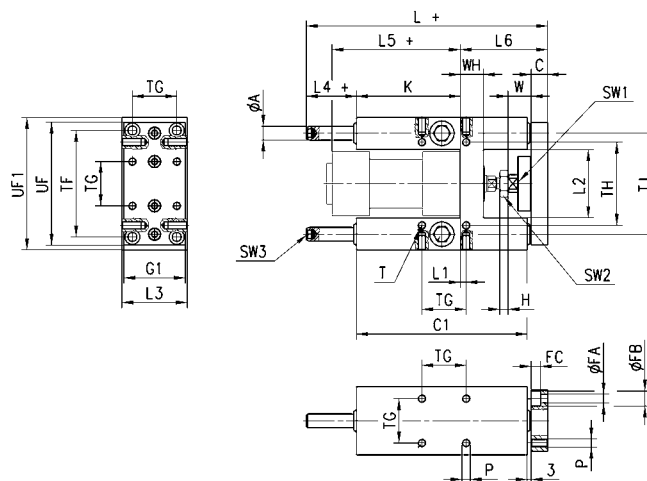
Guides Mod. 45NHB

Suitable for cylinders Series 60 and 61 DIN/ISO 6431, $\varnothing$ 32, 40, 50, 63, 80 and 100.
To lubricate these guides, use the special lubricator. For applicable loads, see graph No. 2.



Supplied with:
4x fixing screws.

Draw note:
+ = add the stroke



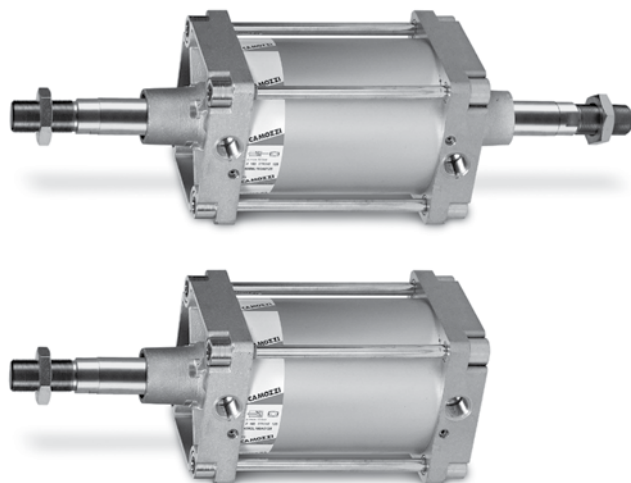
DIMENSIONS (mm)

$\varnothing$	TF	TG	TH	TI	UF	G1	UF1	$\varnothing$ A	WH	C1	H	W	C	K	L	L1	L2	L3	L4	L5	L6	P	T	$\varnothing$ FA	$\varnothing$ FB	FC	SW1	SW2	SW3
32	78	32,5	61	74	90	45	97	12	17	125	6	17	12	76	177	4,3	50,2	50	37	94	64	M6	14	6,5	11	6,8	13	17	6
40	84	38	69	87	110	54	115	16	21	140	7	22	12	81	192	11	58,2	58	37	105	74	M6	14	6,5	11	6,8	15	19	6
50	100	46,5	85	104	130	63	137	20	26	149	8	26	15	78,5	237	19,8	70,2	70	69,5	106	89	M8	16	9	15	9	22	24	6
63	105	56,5	100	119	145	80	152	20	26	182	8	26	15	111	237	15,3	85,2	85	37	121	89	M8	16	9	15	9	22	24	6
80	130	72	130	148	180	100	189	25	34	215	9	32	20	128	280	21	105,4	105	42	128	110	M10	20	11	18	11	27	30	6
100	150	89	150	172	200	120	213	25	39	220	9	32	20	128	280	24,5	130,4	130	37	138	115	M10	20	11	18	11	27	30	6

Large Bore Tie-rod Cylinders, ISO 6431 Series 40

EXPRESS DELIVERY AVAILABLE

Double acting, cushioned, magnetic
 ø 160 - 200 - 250 - 320 mm (DIN/ISO 6431)



- » In compliance with ISO 15552 standards and with the previous DIN/ISO 6431-VDMA 24562 standards
- » Adjustable pneumatic cushioning
- » Rolled stainless steel rod (Ø 160 - 200 mm)
- » Chrome plated steel rod (Ø 250 - 320 mm)

The cylinders Series 40 with diameters 160, 200, 250 have been designed so as to comply with the dimensions laid down in the DIN/ISO 6431 standards. A permanent magnet is mounted on the piston in these cylinders. The position of the cylinder is obtained by the magnetic proximity switches mounted on the cylinders.

This cylinder series is normally equipped with adjustable end-stroke cushioning. Moreover, to reduce the noise of the impact of the piston and end-caps, these cylinders are equipped with a mechanical cushioning.

GENERAL DATA

Type of construction	with tie-rods
Operation	double-acting
Materials	end-caps = aluminium - other parts: see coding
Mounting	with tie-rods, front flange, rear flange, feet, centre trunnion, front and rear trunnion, swivel combination
Strokes min - max	10 - 2500 mm
Operating temperature	0°C - 80°C (with dry air - 20°C) (32 - 176°F, with dry air -4°F)
Operating pressure	1 - 10 bar
Speed	10 - 500 mm/sec (without load)
Fluid	filtered air, without lubrication. If lubricated air is used, it is recommended to use oil ISOVG32. Once applied the lubrication should never be interrupted.

STANDARD STROKES FOR DOUBLE-ACTING CYLINDERS SERIES 40

■ = Double-acting cylinders

MAXIMUM STROKE LENGTHS (mm)

Series (and Ø)	Min-Max Stroke (Produced in USA)	Min-Max Stroke (Produced in Italy)
40, 41 (Ø 160-320)	10-1500 mm	10-2500 mm

Ø	25	50	75	80	100	125	150	160	200	250	300	320	400	500
160		■		■	■		■		■		■		■	■
200		■			■				■		■			
250		■			■				■		■			
320		■			■				■		■			

CODING EXAMPLE

40	M	2	L	160	A	0200	
----	---	---	---	-----	---	------	--

40	SERIES
M	VERSION: M = standard, magnetic
2	OPERATION: 2 = double-acting (front and rear cushions) 3 = double-acting (no cushion) 4 = double-acting (rear cushions) 5 = double-acting (front cushion) 6 = double-acting (through-rod with front and rear cushions)
L	MATERIALS: L = see the general data on page 1/1.10.01 T = stainless steel AISI 420B tie-rods - stainless steel AISI 303 tie-rod nuts C = rolled stainless steel AISI 303 piston rod, stainless steel AISI 304 piston rod nut U = rolled stainless steel AISI 303 piston rod, stainless steel AISI 304 piston-rod nut, stainless steel AISI 420B tie-rods, stainless steel AISI 303 tie-rod nuts W = rolled stainless steel AISI 304 piston rod, stainless steel AISI 304 piston-rod nut, stainless steel AISI 420B tie-rods, stainless steel AISI 303 tie-rod nuts Note: rod of cylinders with bore of 250 mm = C40 chrome plated steel.
160	BORE: 160 = 160 mm 200 = 200 mm 250 = 250 mm 320 = 320 mm
A	TYPE OF BRACKET: A = standard F = cylinder with centre trunnion
0200	STROKE see table
	= standard V = FKM rod seals W = all FKM seals, up to 140°C C = PU coated cylinder. Colour: Grey * (_ _ _) = extended piston rod _ _ _ mm Notes: the C version is available on request. For further details, contact our technical dept. The W and C versions are available for diameters 160 and 200 only. The V version is available for diameters 160, 200 and 250 only.

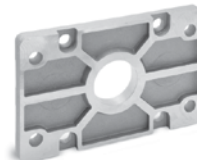
ACCESSORIES FOR CYLINDERS SERIES 40



Clevis pin Mod. S

90° Swivel combination
Mod. ZSCounter bracket for
centre trunnion Mod. BF

Rod fork end Mod. G

Front and rear flange
Mod. D-E

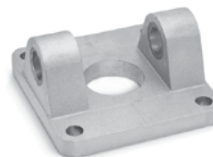
Centre trunnion Mod. F



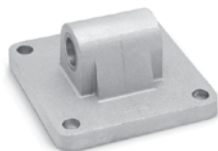
Foot mount Mod. B



Swivel ball joint Mod. GA

Female trunnion
Mod. C-H

Piston rod nut Mod. U

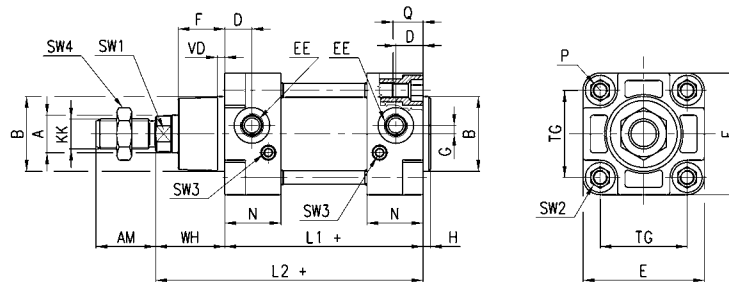
Rear trunnion, male
Mod. LSwivel Combination
Mod. I

All accessories are supplied separately except for Piston rod nut Mod. U

Cylinders Series 40



+ = add the stroke



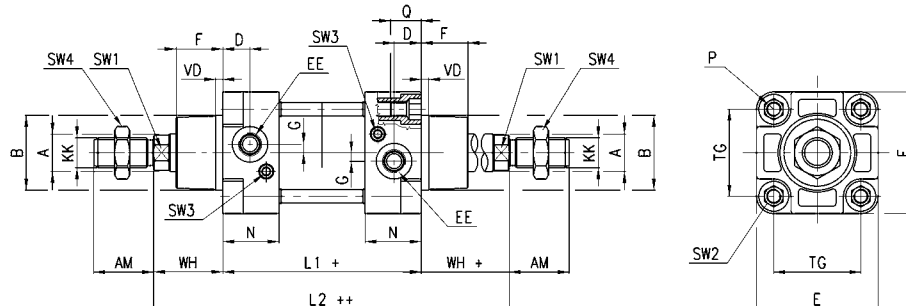
DIMENSIONS (mm)

Ø	ØA	KK	ØB	D	G	F	AM	H	EE	WH	L1+	L2+	VD	N	P	Q	TG	E	SW1	SW2	SW3	SW4	cushion strokes front/rear
160	40	M36x2	65	25	12	53.5	72	6	G3/4	80	180	260	6	45	M16	26	140	176	36	17	4	55	29 / 36
200	40	M36x2	75	25	12	63.5	72	6	G3/4	95	180	275	6	45	M16	26	175	216	36	17	4	55	44 / 42
250	50	M42x2	90	31	12	67	84	10	G1	105	200	305	6	60	M20	26	220	270	46	19	6		50 / 50
320	63	M48x2	110	31	12	83	96	10	G1	120	220	340	12	55.5	M24	28	270	340	55	-	-	75	56 / 56

Cylinders Series 40 - through-rod



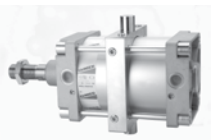
+ = add the stroke
++ = add the stroke twice



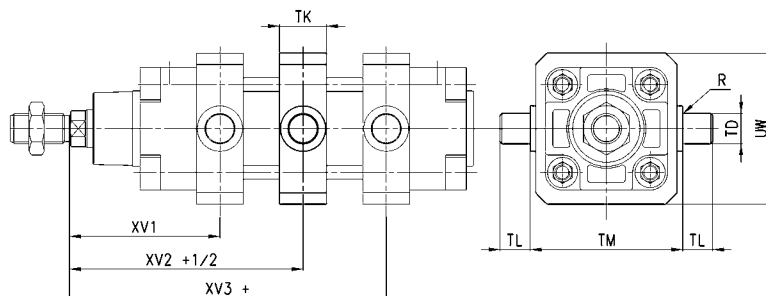
DIMENSIONS (mm)

Ø	ØA	KK	ØB	D	G	F	AM	H	EE	WH	L1+	L2++	VD	N	P	Q	TG	E	SW1	SW2	SW3	SW4	cushion strokes front/rear
160	40	M36x2	65	25	12	53.5	72	6	G3/4	80	180	340	6	45	M16	26	140	176	36	17	4	55	29 / 36
200	40	M36x2	75	25	12	63.5	72	6	G3/4	95	180	370	6	45	M16	26	175	216	36	17	4	55	44 / 42
250	50	M42x2	90	31	12	67	84	10	G1	105	200	410	6	60	M20	26	220	270	46	19			50 / 50
320	63	M48x2	110	31	12	83	96	10	G1	120	220	460	12	55.5	M24	28	270	340	55	-	-	75	56 / 56

Cylinders Series 40 with centre trunnion Mod. F



+ = add the stroke



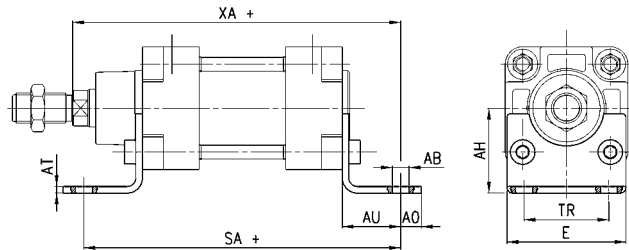
DIMENSIONS (mm)									
Ø	XV1	XV2+ 1/2	XV3+	TM	TK	TD	TL	UW	R
160	145	170	195	200	40	32	32	200	0,2
200	160	185	210	250	40	32	32	250	0,2
250	185	205	225	320	50	40	40	300	-
320	210,5	230	249,5	400	70	50	50	400	-

Foot mount Mod. B

Material: black-painted steel
(cataphoresis)
Supplied with:
2x feet
4x screws



+ = add the stroke

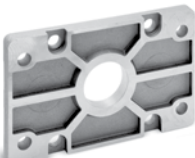


DIMENSIONS (mm)

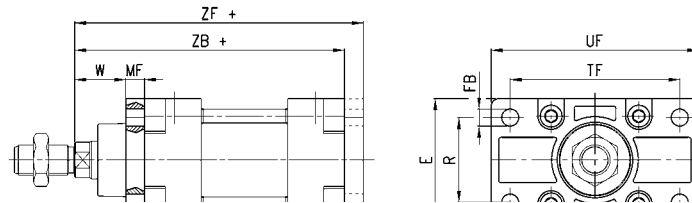
Mod.	Ø	AT	SA +	XA+	TR	E	ØAB	AH	AO	AU
B-41-160	160	10	300	320	115	175	18	115	20	60
B-41-200	200	11	320	345	135	215	22	135	30	70
B-41-250	250	20	350	380	165	270	28	165	35	75
B-41-320	320	20	390	425	200	353	35	200	45	85

Front and rear flange Mod. D-E

Material: Aluminium.
Supplied with:
1x flange
4x screws



+ = add the stroke



DIMENSIONS (mm)

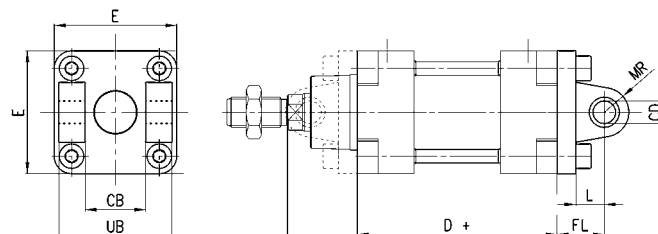
Mod.	Ø	W	MF	ZB+	TF	R	UF	G1	ØFB	ZF +
D-E-41-160	160	60	20	260	230	115	276	175	18	280
D-E-41-200	200	70	25	275	270	135	312	215	22	300
D-E-41-250	250	80	25	305	330	165	390	240	26	330
D-E-41-320	320	90	30	340	400	200	470	334	33	370

Front and rear female trunnion Mod. C-H

Material: Aluminium.
Supplied with:
1x female trunnion
4x screws



+ = add the stroke



DIMENSIONS (mm)

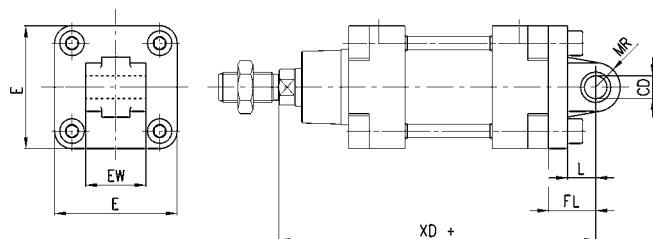
Mod.	Ø	ØCD	L	FL	D+	XD+	MR	E	CB	UB
C-H-41-160	160	30	35	55	180	315	30	175	90	170
C-H-41-200	200	30	35	60	180	335	30	215	90	170
C-H-41-250	250	40	45	70	-	375	40	270	110	200
C-H-41-320	320	45	50	80	220	420	45	350	120	220

EXPRESS DELIVERY AVAILABLE

Rear male trunnion Mod. L



Material: Aluminium.
Supplied with:
1x male trunnion
4x screws



+ = add the stroke

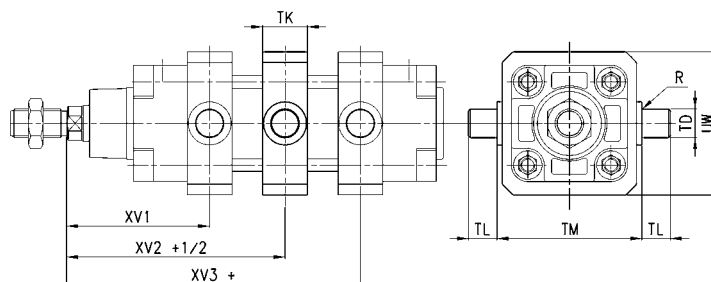
DIMENSIONS (mm)

Mod.	Ø	ØCD	L	FL	XD+	MR	E	EW
L-41-160	160	30	35	55	315	30	175	90
L-41-200	200	30	35	60	335	30	215	90
L-41-250	250	40	45	70	375	40	270	110
L-41-320	320	40	50	80	375	45	270	110

Centre trunnion Mod. F



Material: white zinc-plated steel.
Supplied with:
1x centre trunnion
4x clamping elements
8x locking screws



+ = add the stroke

DIMENSIONS (mm)

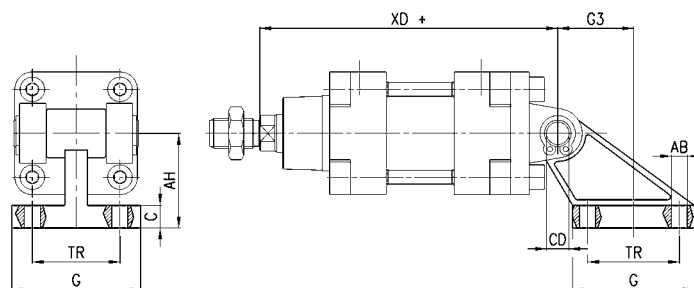
Mod.	Ø	XV 1	XV + 1/2	XV3 +	TM	TK	ØTD	TL	UW	R
F-160	160	145	170	195	200	40	32	32	200	0,2
F-200	200	160	185	210	250	40	32	32	250	0,2
F-250	250	185	205	225	320	50	40	40	300	-
F-320	320	210,5	230	249,5	400	70	50	50	400	-

90° Swivel combination Mod. ZS*



Material: Aluminium.
*not according to standard

Supplied with:
1x 45° swivel combination

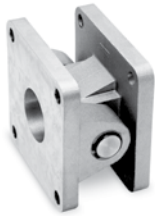


+ = add the stroke

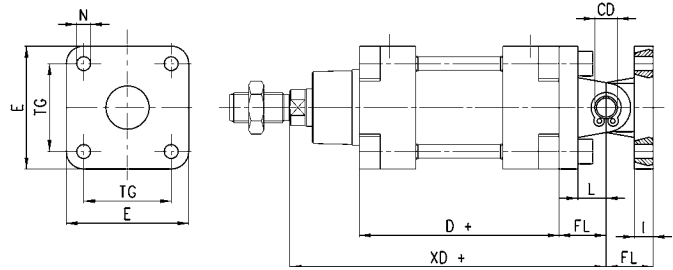
DIMENSIONS (mm)

Mod.	Ø	TR	ØAB	AH	C	G	ØCD	XD +	G3
ZS-160	160	140	18	140	20	180	30	315	105
ZS-200	200	175	18	140	25	220	30	335	125

Swivel combination Mod. I (combination of C + L + S)



+ = add the stroke

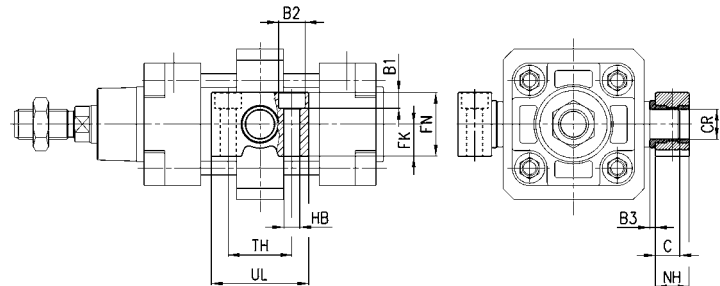


DIMENSIONS (mm)

Mod.	Ø	ØCD	L	FL	D	XD	TG	E	ØN	I
I-41-160	160	30	35	55	180	315	140	175	17	20
I-41-200	200	30	35	60	180	335	175	215	17	25

Counter bracket for centre trunnion Mod. BF

Material: Aluminium.
Supplied with:
2x supports

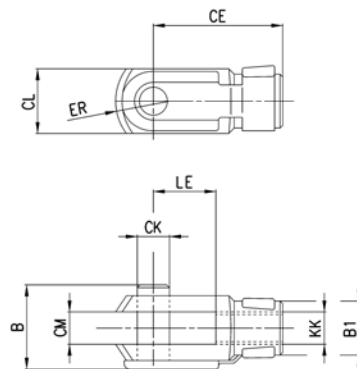


DIMENSIONS (mm)

Mod.	Ø	ØCR	NH	C	B3	TH	UL	FK	FN	B1	ØB2	ØHB
BF-160-200	160-200	32	35	17,5	4	60	92	30	60	16	26	18

Rod fork end Mod. G

ISO 8140.
Material: zinc-plated steel.



DIMENSIONS (mm)

Mod.	Ø	ØCK	LE	CM	CL	ER	CE	KK	B	ØB1
G-160-200	160-200	35	72	35	70	44	144	M36x2	92	60
G-250	250	40	84	40	85	-	168	M42x2	96	70
G-320	320	50	90	50	90	73	192	M48x2	120	80

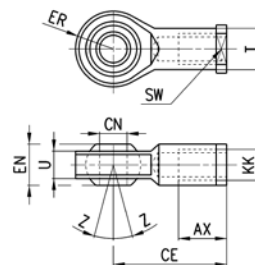
EXPRESS DELIVERY AVAILABLE



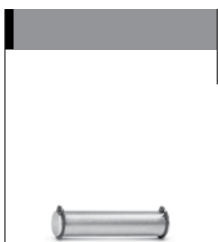
Swivel ball joint Mod. GA

ISO 8139.

Material: zinc-plated steel.



DIMENSIONS (mm)											
Mod.	Ø	ØCN	U	EN	ER	AX	CE	KK	ØT	Z	SW
GA-160-200	160-200	35	28	43	40	56	125	M36x2	46	6	50
GA-250	250	40	33	49	-	60	142	M42x2	55	-	-
GA-320	320	50	45	60	58,5	65	160	M48x2	65	12	65

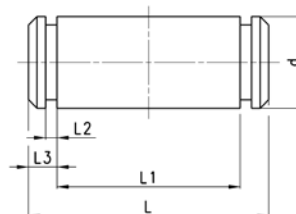


Clevis pin Mod. S

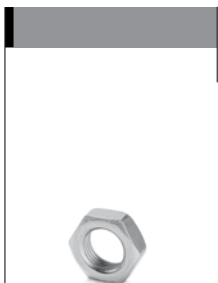
Supplied with:

1x clevis pin (stainless steel 303)

2x C-clips (plain carbon steel)



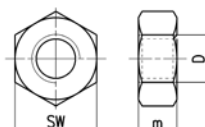
DIMENSIONS (mm)						
Mod.	Ø	d	L	L1	L2	L3
S-160-200	160-200	30	179	170,5	1,6	4,25
S-250	250	40	210	202	-	4
S-320	320	45	236	222	1,85	7



Piston rod nut Mod. U

ISO 4035.

Material: zinc-plated steel.

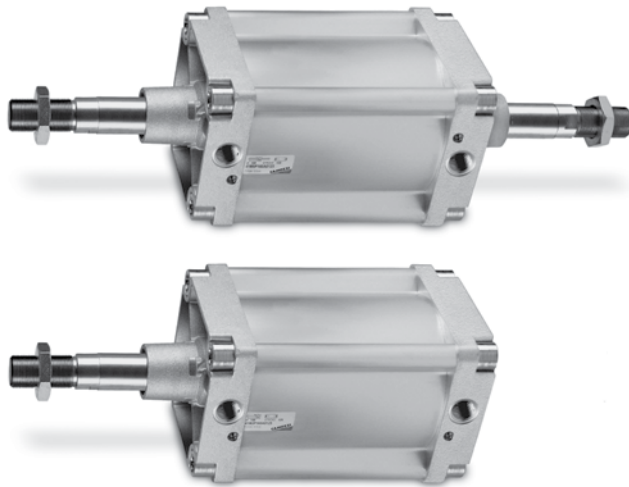


DIMENSIONS (mm)				
Mod.	Ø	D	m	SW
U-160-200	160-200	M36x2	14	55
U-250	250	M42x2	16	65
U-320	320	M48x2	24	75

Large Bore Extruded Cylinders, ISO 6431 Series 41

 EXPRESS DELIVERY AVAILABLE

Double-acting cushioned, magnetic
 ø160 - 200 (DIN/ISO 6431)



- » DIN/ISO 6431 VDMA 24562
- » Rolled stainless steel rod
- » Adjustable cushioning
- » Aluminum Profile

Cylinders Series 41 with diameters 160 and 200 have been designed so as to comply with the dimensions laid down in the DIN/ISO 6431 standards. The extruded aluminium tube in this series is regarded as very aesthetically pleasing.

The mounting brackets used on the end-caps tube are designed in an extremely secure way, making use of the cylinder tie-rods positioned internally and not visible on the assembled cylinders. This cylinder series is normally equipped with adjustable cushioning. Moreover, to reduce the noise of the impact of the piston and end-caps, these cylinders are equipped with a mechanical cushioning.

GENERAL DATA

Type of construction	with tie-rods
Operation	double-acting
Materials	end-caps = AL; other parts: see coding
Mounting	with tie-rods, front flange, rear flange, feet, centre trunnion, front and rear trunnion, swivel combination
Strokes min - max	10 – 2500 mm
Operating temperature	0°C – 80°C (with dry air - 20°C) (32 - 176°F, with dry air -4°F)
Operating pressure	1 – 10 bar
Speed	10 – 500 mm/sec (without load)
Fluid	filtered air, without lubrication. If lubricated air is used, it is recommended to use oil ISOVG32. Once applied the lubrication should never be interrupted.

STANDARD STROKES FOR DOUBLE-ACTING CYLINDERS SERIES 41

* = Double-acting

MAXIMUM STROKE LENGTHS (mm)

Series (and Ø)	Min-Max Stroke (Produced in USA)	Min-Max Stroke (Produced in Italy)
40, 41 (Ø 160-320)	10-1500 mm	10-2500 mm

STANDARD STROKES

Ø	25	50	75	80	100	125	150	160	200	250	300	320	400	500
160		*			*		*		*				*	*
200		*			*				*					

CODING EXAMPLE

41	M	2	P	160	A	0200	
----	---	---	---	-----	---	------	--

41	SERIES
M	VERSION M = standard magnetic
2	OPERATION 2 = double-acting (front and rear cushions) 3 = double-acting (no cushion) 4 = double-acting (rear cushions) 5 = double-acting (front cushion) 6 = double-acting (through-rod with front and rear cushions)
P	MATERIALS P = see the general data on page 1/1.15.01 R = stainless steel AISI 420B tie-rods, stainless steel AISI 303 tie-rod nuts C = rolled stainless steel AISI 303 piston rod, stainless steel AISI 304 piston rod nut U = rolled stainless steel AISI 303 piston rod, stainless steel AISI 304 piston rod nut, stainless steel AISI 420B tie-rods, stainless steel AISI 303 tie-rod nuts W = rolled stainless steel AISI 304 piston rod, stainless steel AISI 304 piston rod nut, stainless steel AISI 420B tie-rods, stainless steel AISI 303 tie-rod nuts
160	BORE 160 = 160 mm 200 = 200 mm
A	TYPE OF DESIGN A = tie-rods F = cylinder with centre trunnion
0200	STROKE see table
	= standard V = FKM rod seals W = all FKM seals, up to 140°C C = PU coated cylinder. Color: Grey * (_ _ _) = extended piston rod _ _ _ mm * The C version is available on request. For further information, please contact our technical department.

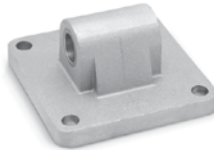
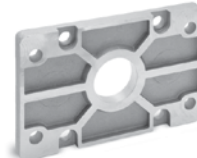
ACCESSORIES FOR CYLINDERS SERIES 41

MAXIMUM STROKE LENGTHS (mm)

Series (and Ø)	Min-Max Stroke (Produced in USA)	Min-Max Stroke (Produced in Italy)
40, 41 (Ø 160-320)	10-1500 mm	10-2500 mm



Clevis pin Mod. S

90° swivel combination
Mod. ZSRear trunnion, male
Mod. LFront and rear flange
Mod. D-ECounter bracket for
centre trunnion Mod. BF

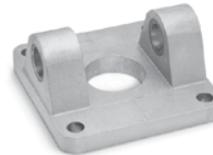
Centre trunnion Mod. F



Foot mount Mod. B



Rod fork end Mod. G

Front and rear female
trunnion Mod. C-H

Swivel ball joint Mod. GA

Swivel combination
Mod. I

Piston rod nut Mod. U

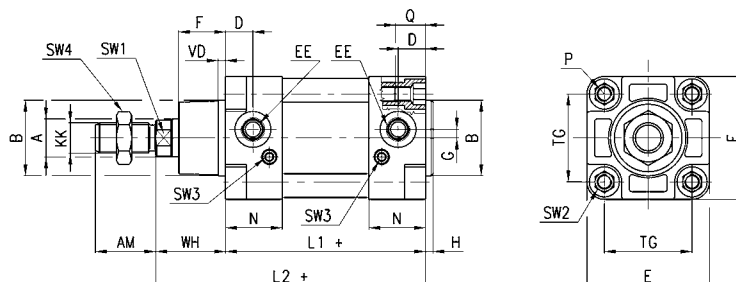


All accessories are supplied separately, except for the piston rod nut Mod. U

Cylinders Series 41



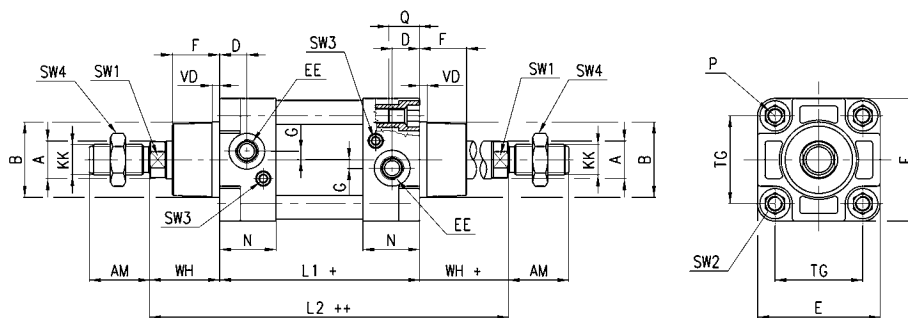
+ = add the stroke



DIMENSIONS (mm)

Ø	ØA	KK	ØB	D	G	F	AM	H	EE	WH	L1+	L2+	VD	N	P	Q	TG	E	SW1	SW2	SW3	SW4	cushioning front/rear
160	40	M36x2	65	25	12	53.5	72	6	G3/4	80	180	260	6	45	M16	26	140	176	36	17	4	55	29 / 36
200	40	M36x2	75	25	12	63.5	72	6	G3/4	95	180	275	6	45	M16	26	175	216	36	17	4	55	44 / 42

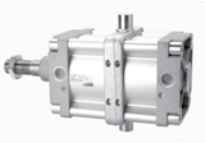
Cylinders Series 41 - through-rod

+ = add the stroke
++ = add the stroke 2 times

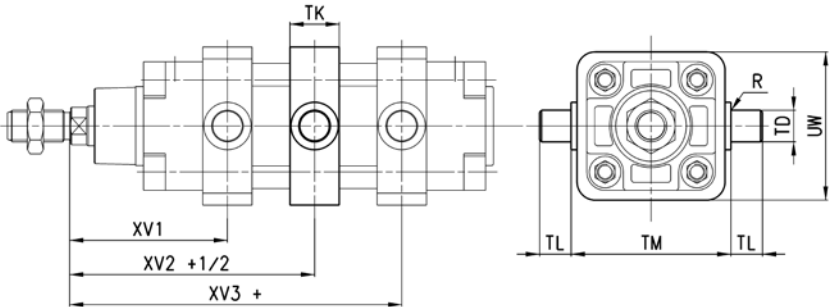
DIMENSIONS (mm)

Ø	A	KK	B	D	G	F	AM	EE	WH	L1+	L2++	VD	N	P	Q	TG	E	SW1	SW2	SW3	SW4	cushioning front/rear
160	40	M36x2	65	25	12	53.5	72	G3/4	80	180	340	6	45	M16	26	140	176	36	17	4	55	29 / 36
200	40	M36x2	75	25	12	63.5	72	G3/4	95	180	370	6	45	M16	26	175	216	36	17	4	55	44 / 42

Cylinders Series 41 with centre trunnion Mod. F



+ = add the stroke



DIMENSIONS (mm)									
Ø	XV1	XV2	XV3	TM	TK	TD	TL	UW	R
160	145	170	195	200	40	32	32	200	0,2
200	160	185	210	250	40	32	32	250	0,2

ISO / VDMA CYLINDERS

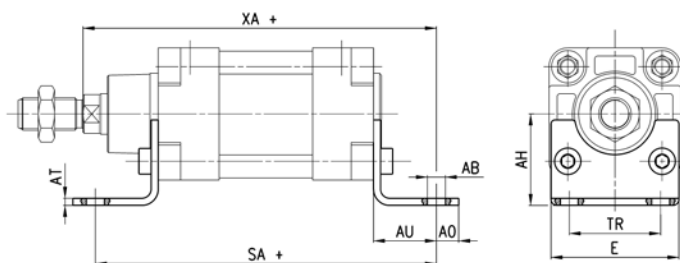
EXPRESS DELIVERY AVAILABLE

Foot mount Mod. B

Material: black-painted steel
(cataphoresis)
Supplied with:
2x feet
4x screws



+ = add the stroke

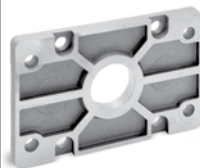


DIMENSIONS (mm)

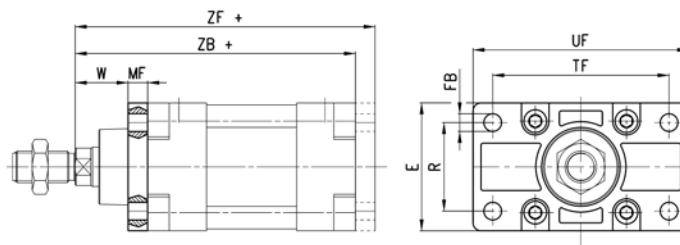
Mod.	Ø	AT	SA+	XA+	TR	E	ØAB	AH	AO	AU
B-41-160	160	10	300	320	115	175	18	115	20	60
B-41-200	200	11	320	345	135	215	22	135	30	70

Front and rear flange Mod. D-E

Material: Aluminium.
Supplied with:
1x flange
4x screws



+ = add the stroke

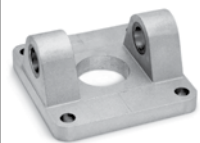


DIMENSIONS (mm)

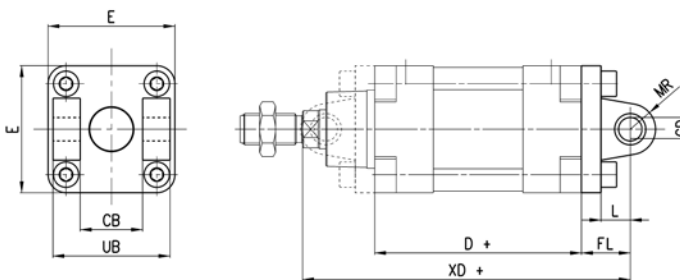
Mod.	Ø	W	MF	ZB+	TF	R	UF	E	ØFB	ZF+
D-E-41-160	160	60	20	260	230	115	276	175	18	280
D-E-41-200	200	70	25	275	270	135	312	215	22	300

Front and rear female trunnion Mod. C-H

Material: Aluminium.
Supplied with:
1x female trunnion
4x screws



+ = add the stroke

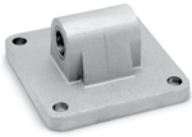


DIMENSIONS (mm)

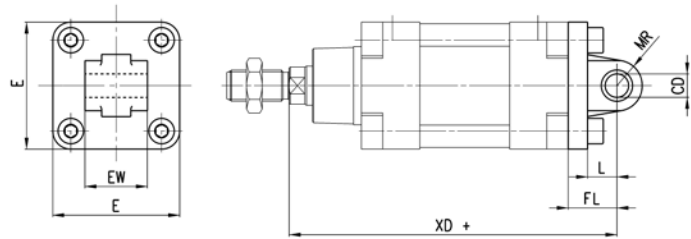
Mod.	Ø	ØCD	L	FL	D+	XD+	MR	E	CB	UB
C-H-41-160	160	30	35	55	180	315	30	175	90	170
C-H-41-200	200	30	35	60	180	335	30	215	90	170

Rear male trunnion Mod. L

Material: Aluminium
 Supplied with:
 1x male trunnion
 4x screws



+ = add the stroke



DIMENSIONS (mm)

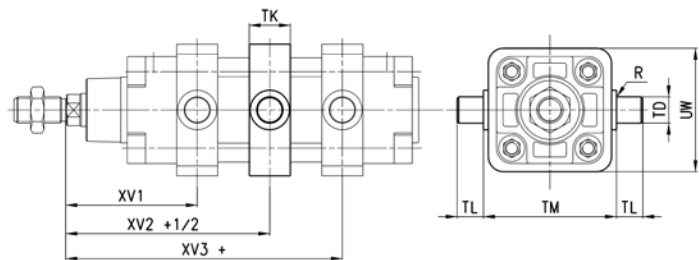
Mod.	Ø	ØCD	L	FL	XD+	MR	E	EW -0.5-1.2
L-41-160	160	30	35	55	315	30	175	90
L-41-200	200	30	35	60	335	30	215	90

Centre trunnion Mod. F

Material: white zinc-plated steel.
 Supplied with:
 1x centre trunnion
 4x clamping elements
 4x locking screws



+ = add the stroke



DIMENSIONS (mm)

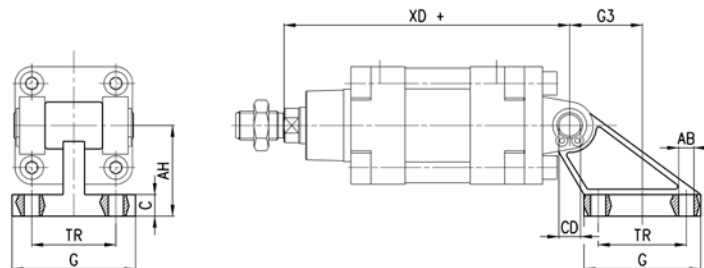
Mod.	Ø	XV1	XV+1/2	XV3+	TM	h	ØTD	TL	UW	R
F-41-160	160	145	170	195	200	40	32	32	200	0.2
F-41-200	200	160	185	210	250	40	32	32	250	0.2

90° Swivel combination Mod. ZS*

Material: Aluminium
 * not according to standard



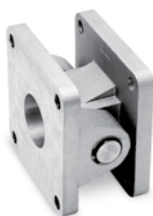
+ = add the stroke



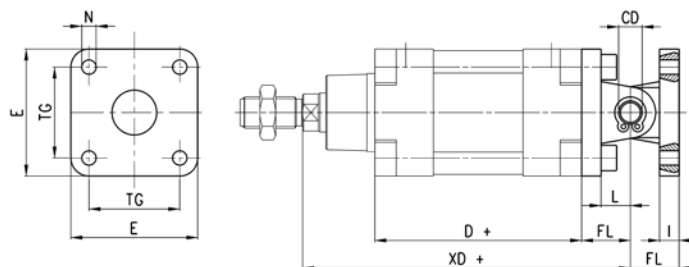
DIMENSIONS (mm)

Mod.	Ø	TR	ØAB	AH	C	G	ØCD	XD+	G3
ZS-160	160	140	18	140	20	180	30	315	105
ZS-200	200	175	18	140	25	220	30	335	125

Swivel combination Mod. I (combination of C + L + S)



+ = add the stroke

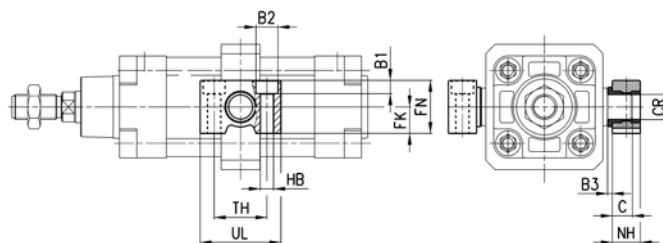


DIMENSIONS (mm)

Mod.	Ø	ØCD	L	FL	D+	XD+	TG	E	ØN	I
I-41-160	160	30	35	55	180	315	140	175	17	20
I-41-200	200	30	35	60	180	335	175	215	17	25

Counter bracket for centre trunnion Mod. BF

Material: Aluminium.
Supplied with:
2x supports

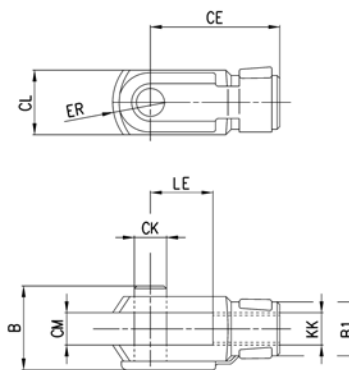


DIMENSIONS (mm)

Mod.	Ø	ØCR	NH	C	B3	TH	UL	FK	FN	B1	ØB2	ØHB
BF-160-200	160-200	32	35	17,5	4	60	92	30	60	16	26	18

Rod fork end Mod. G

ISO 8140.
Material: zinc-plated steel.



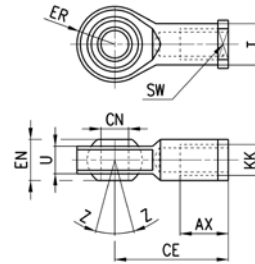
DIMENSIONS (mm)

Mod.	Ø	ØCK	LE	CM	CL	ER	CE	KK	B	ØB1
G-160-200	160-200	35	72	35	70	44	144	M36X2	92	60

Swivel ball joint Mod. GA

ISO 8139.

Material: zinc-plated steel.



DIMENSIONS (mm)

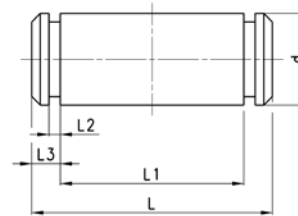
Mod.	Ø	ØCN	U	EN	ER	AX	CE	KK	ØT	Z	SW
GA-160-200	160-200	35	28	43	40	56	125	M36x2	46	6	50

Clevis pin Mod. S

Supplied with:

1x clevis pin (stainless steel 303)

2x C-clips (plain carbon steel)



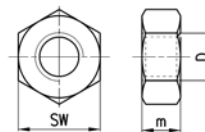
DIMENSIONS (mm)

Mod.	Ø	d	L	L1	L2	L3
S-160-200	160-200	30	179	170	1,6	4,25

Piston rod nut Mod. U

UNI EN ISO 4035.

Material: zinc-plated steel.



DIMENSIONS (mm)

Mod.	Ø	D	m	SW
U-160-200	160-200	M36x2	14	55

Magnetic proximity switches

Series CST - CSV and CSH

Reed, Electronic



- » Designed to fit into the cylinder profile barrel
- » 3 models (CST - CSV - CSH) are suitable for all Camozzi's cylinder range
- » With or without M8 connector

Switches are available in two different versions: Reed with mechanical switching and electronic with electronic switching. The electronic versions are suggested for heavy duty with frequent operations and strong vibrations.

The magnetic proximity switches CST-CSV-CSH detect the position of the cylinder piston. When the internal contact is actuated by a magnetic field, the sensors complete an electrical circuit and provide an output signal to directly actuate a solenoid valve or a PLC. A yellow LED diode shows when the internal magnetic contact is closed.

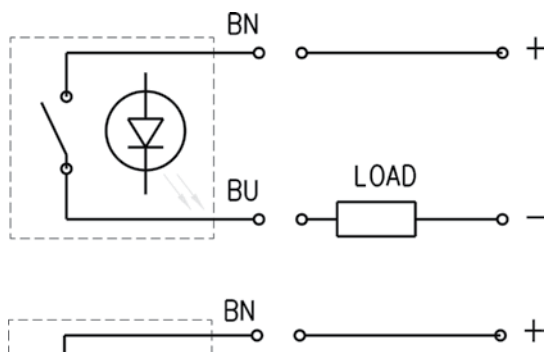
GENERAL DATA

Models	CST-... CSV-... CSH-...
Operation	Reed contact Electronic
Output	Static or electronic PNP
Type of contact	All switches have Normally Open contact
Voltage	See model characteristics
Max current	See model characteristics
Max load	Reed switches 8 W DC and 10 VA AC Electronic switches 6 W DC
Protection level	IP 67
Materials	Plastic body encapsulating epoxy resin cable PVC, connector PVC connector body PUR
Mounting	Directly into the groove, or by means of adapters.
Signalling	By means of yellow diode Led
Protections	See model characteristics
Switching time	Reed switches <1,8 ms Electronic switches <1 ms
Operating temperature	-10°C – 80°C (14°F - 176°F)
Electrical duration	Reed switches 10.000.000 cycles Electronic switches 10.000.000.000 cycles
Electrical connection	cable 2x0,14 (2m) high flexibility cable 3x0,14 (2m) high flexibility connector M8 and cable 0,3 m

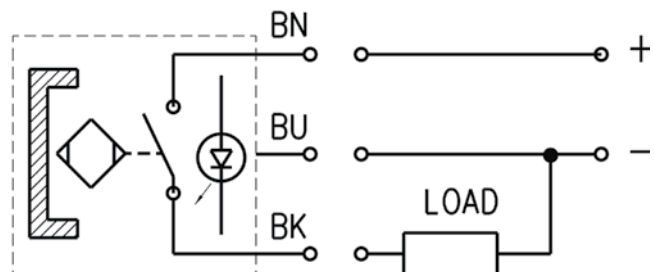
CODING EXAMPLE

CS	T	-	2	2	0	N	-	5
CS	SERIES							
T	SLOT TYPE T = T-slot V = V-slot H = frontal inserting slot							
2	OPERATION 2 = reed 3 = electronic							
2	CONNECTIONS 2 = 2 wires (Reed only) 3 = 3 wires 5 = 2 wires with M8 connector (Reed only) 6 = 3 wires with M8 connector							
0	POWER SUPPLY VOLTAGE 0 = 10-110V DC; 10-230V AC (PNP) 1 = 30-110V DC; 30-230V AC (PNP) 2 = 3 wires cst (PNP) 3 = 10-30V AC/DC (PNP) 4 = 10-27V DC (PNP)							
N	NOTE N = ACCORDING TO NORM (CST/CSV-250N only)							
5	LENGTH OF THE CABLE (for CSH only): 2 = 2 mt 5 = 5 mt							

SWITCHES ELECTRICAL CONNECTIONS



Reed switches
 BN = brown
 BU = blue
 BK = black



Electronic switches
 BN = brown
 BU = blue
 BK = black

Connecting schemes in series

The Reed version with 3 wires allows the connection of several sensors in series, as there is no voltage drop between the supply and the load (see connecting scheme).

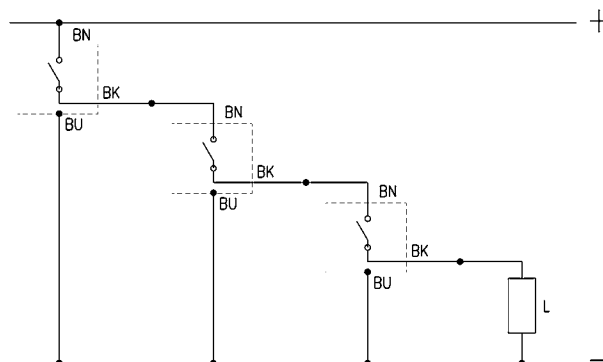
The voltage drop is 2,8V for the Reed sensors with 2 wires and 1V for Hall effect sensors with 3 wires.

BN = brown

BU = blue

BK = black

L = load



Useful information for correct use of the magnetic sensors

The magnetic sensors consist of a reed switch which is enclosed in a glass bulb containing a rarified gas. The contacts, which are made of magnetic material (nickel-iron), are flexible and are coated, at the contact points with a high quality non-arcing material.

Switching is effected by means of a suitable magnetic field and actuation is achieved by means of the permanent magnet inside the piston. The two sensors are of the normally open type and, therefore, when they are subject to the effect of the magnetic field, they close the circuit.

The operating field of the sensors with respect to the magnetic piston is shown in this picture. The dimension b indicates the amplitude of the magnetic field or switching field during which the circuit is closed. The value H represents the operational hysteresis of the sensor with respect to the form and amplitude of the magnetic field. The operating field, as a result of hysteresis, is displaced by the dimension H in the opposite direction to movement of the piston.

The values b and H are shown in the table and are classified according to bore.

The maximum speed permitted for each cylinder is a function of the value b and the response time of the various components connected after the sensor.

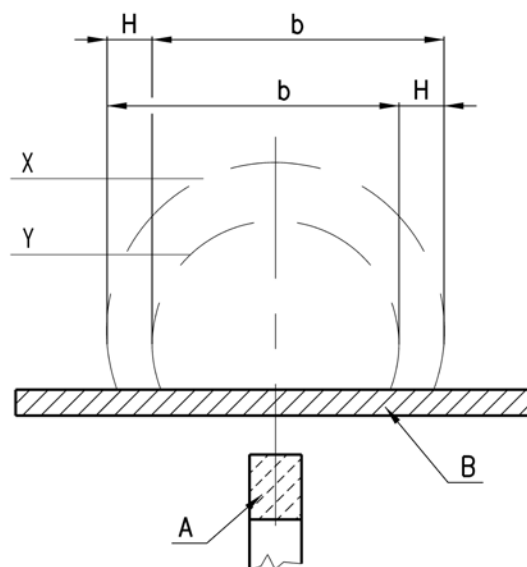
The maximum speed for a cylinder guided by magnetic sensors

is calculated as follows: $b / t = \text{Speed}$

where: b = contact stroke in mm (see table)

t = total reaction time in milli seconds of electric control components connected after the sensor

Speed = maximum speed in m/second

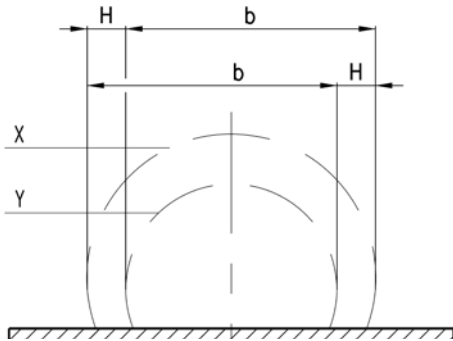


CONTACT STROKE AND HYSTERESIS

Useful information for correct use of the magnetic sensors:

H = operational hysteresis of the sensor with respect to the form and amplitude of the magnetic field

b = contact stroke in mm

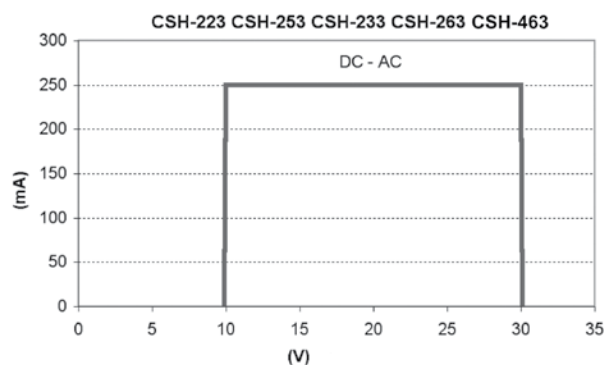


Series	Ø	b (mm)	H (mm)	Series	Ø	b (mm)	H (mm)
24-25	16	9,2	1,2	60	32	9,9	1
24-25	20	12	1	60	40	8,9	1,2
24-25	25	11,7	1,1	60	50	10,7	1
27	20	10,5	1,6	60	63	12,9	1,2
27	25	10,9	1,6	60	80	11,5	1,4
27	32	10,7	1,1	60	100	14,9	1,4
27	40	12,1	1,7	60	125	22	1
27	50	12,1	1,2	61	32	9	1
27	63	14,1	1,3	61	40	9,3	1,3
QP	12	10	1,3	61	50	11	1,6
QP	16	11,8	1,5	61	63	13,4	1,3
QP	20	11,1	1,6	61	80	13,2	1,6
QP	25	10,6	1,6	61	100	15,2	1,7
QP	32	12,7	1,2	61	125	22,1	1,3
QP	40	12,5	1,1	42	32	10,8	1,5
QP	50	15,4	1,6	42	40	11,2	1,6
QP	63	16,7	1,5	42	50	12,6	1,7
QP	80	13,2	1,7	42	63	14,1	1,7
QP	100	16,8	1,8	QCT	20	10	1,7
31	12	9,2	1,4	QCT	25	11,4	1,8
31	16	7,9	1,3	QCT	32	12,1	1,8
31	20	9,1	1,5	QCT	40	12,4	1,8
31	25	10,6	1,5	QCT	50	13,7	1,9
31	32	11,9	1,7	QCT	63	13,5	1,8
31	40	12,9	2,2	69	32	34,5	3,8
31	50	14,7	1,2	69	40	29,6	4,1
31	63	15,2	1,4	69	50	31,5	4,6
31	80	16,6	1,8	69	63	32,3	3,1
31	100	16,8	1,7	69	80	24	2,9
40	160	24	2	69	100	25,6	2,9
40	200	26	2	69	125	30,1	1,7

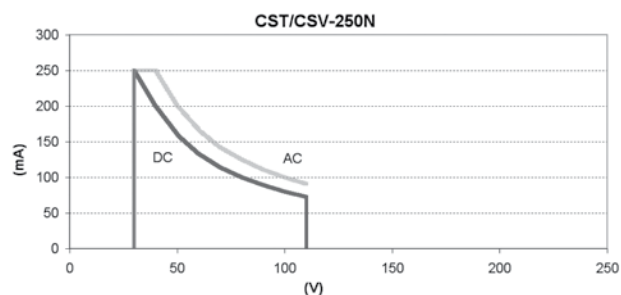
Series	Ø	b (mm)	H (mm)
62	32	10	1
62	40	11	1
62	50	12	1,2
62	63	13	1
62	80	13	1
62	100	16	1

Load curves

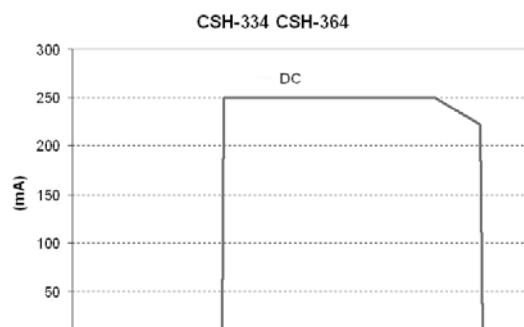
Load curve - CSH



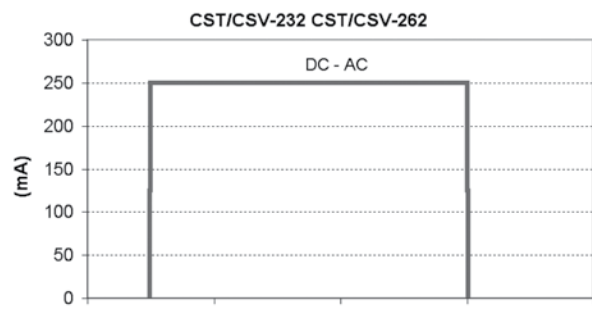
Load curve - CST/CSV



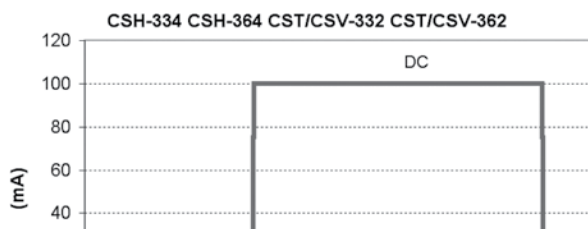
Load curve - CSH



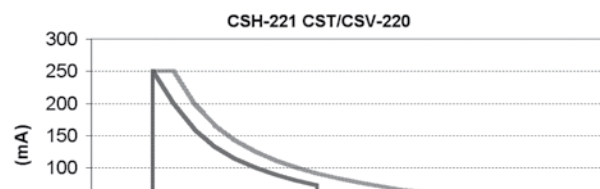
Load curve - CST/CSV



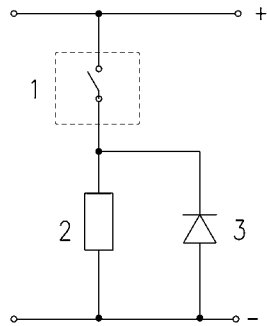
Load curve - CSH, CST/CSV



Load curve - CSH, CST/CSV



Electric circuit with protection against voltage spikes



DC applications: there is no protection on the Reed sensors on the inductive load, therefore it is advisable to use an electric circuit with protection against the voltage spikes. See picture above for a typical example.

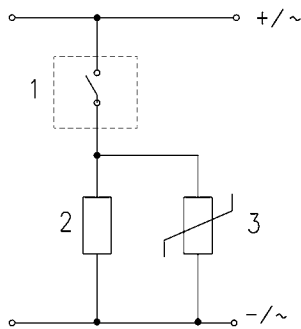
Legend:

1 = Sensor

2 = Load

3 = Protection diode

Electric circuit with protection against voltage spikes



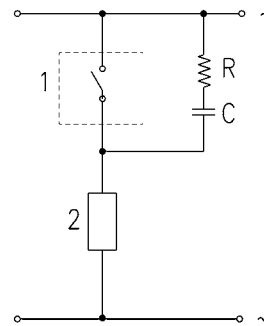
DC and AC applications: there is no protection on the Reed sensors on the inductive load, therefore it is advisable to use an electric circuit with protection against the voltage spikes. See picture above for a typical example.

Legend:

1 = Sensor

2 = Load

3 = Protection varistor



AC applications: there is no protection on the Reed sensors on the inductive load, therefore it is advisable to use an electric circuit with protection against the voltage spikes. See picture above for a typical example.

Legend:

1 = Sensor

2 = Load

C + R = Series of resistor and protection capacitor

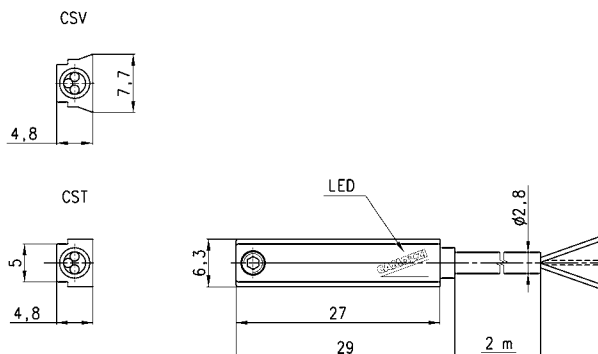
Magnetic proximity switch Series CST

Length cable 2 mt. or 5 mt.

* = Mod. CST-220 and CSV-220 suitable up to 230 V AC.



In case of polarity reversing the sensor will still be operating, but the LED diode won't turn on.



DIMENSIONS (mm)

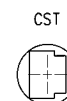
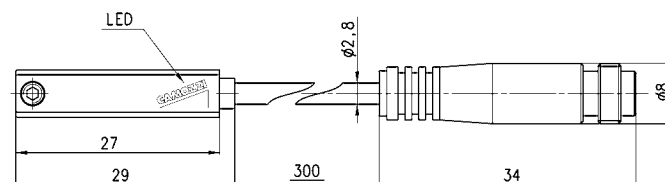
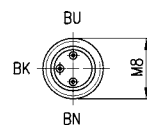
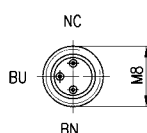
Mod.	Operation	Voltage (V)	Output	Max. current	Max. Load	Protection
CST-220	Reed	10-110*AC/DC	-	250 mA		None
CSV-220	Reed	10-110*AC/DC	-	250 mA		None
CST-220-5	Reed	10-110*AC/DC	-	250 mA		None
CST-232	Reed	5-30 AC/DC	PNP	250 mA		Against polarity reversing
CSV-232	Reed	5-30 AC/DC	PNP	250 mA		Against polarity reversing
CST-332	Electronic	10-27 DC	PNP	100 mA		Against polarity reversing and overvoltage
CSV-332	Electronic	10-27 DC	PNP	100 mA		Against polarity reversing and overvoltage

Magnetic proximity switch Series CST with male connector M8

Length cable 0,3 mt.



In case of polarity reversing the sensor will still be operating, but the LED diode won't turn on.



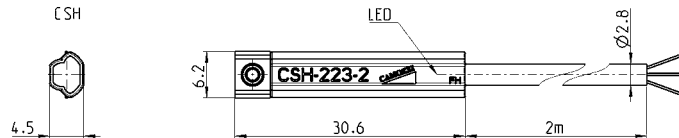
Mod.	Operation	Voltage (V)	Output	Max. current	Max. Load	Protection
CST-250N	Reed	10-110* AC/DC	-	250 mA		None
CSV-250N	Reed	10-110* AC/DC	-	250 mA		None
CST-262	Reed	5-30 AC/DC	PNP	250 mA		Against polarity reversing
CSV-262	Reed	5-30 AC/DC	PNP	250 mA		Against polarity reversing
CST-362	Electronic	10-27 DC	PNP	100 mA		Against polarity reversing and overvoltage
CSV-362	Electronic	10-27 DC	PNP	100 mA		Against polarity reversing and overvoltage

Magnetic proximity switches with 2-wire or 3-wire cable Series CSH

For max. operating current see load curves diagrams.



In case of polarity reversing the sensor will still be operating, but the LED diode won't turn on.



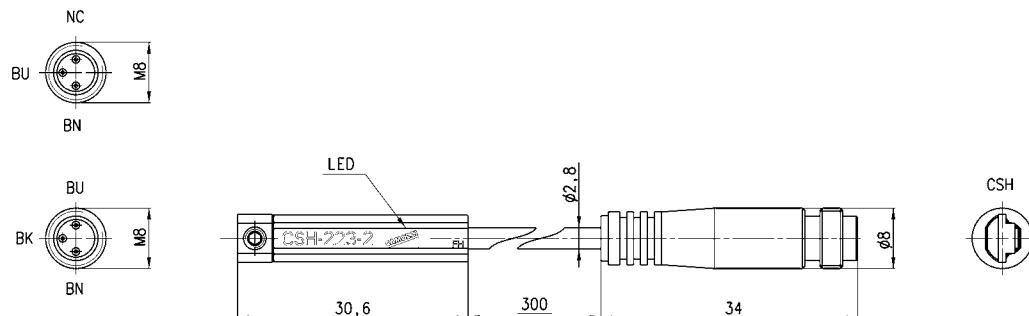
Mod.	Operation	Voltage (V)	Output	Max current	Protection
CSH-223-2	Reed	10-30 AC/DC	-	250 mA	Against polarity reversing
CSH-223-5	Reed	10-30 AC/DC	-	250 mA	Against polarity reversing
CSH-221-2	Reed	30-230 AC 30-110 DC	-	250 mA	Against polarity reversing
CSH-221-5	Reed	30-230 AC 30-110 DC	-	250 mA	Against polarity reversing
CSH-233-2	Reed	10-30 AC/DC	PNP	250 mA	Against polarity reversing
CSH-233-5	Reed	10-30 AC/DC	PNP	250 mA	Against polarity reversing
CSH-334-2	Electronic	10-27 AC/DC	PNP	250 mA	Against polarity reversing and overvoltage
CSH-334-5	Electronic	10-27 AC/DC	PNP	250 mA	Against polarity reversing and overvoltage

Magnetic proximity switches with male connector M8 Series CSH

For max. operating current see load curves diagrams.



In case of polarity reversing the sensor will still be operating, but LED diode won't turn on.



Mod.	Operation	Voltage (V)	Output	Max current	Max Load	Protection
CSH-253	Reed	10-30 AC/DC	-	250 mA		Against polarity reversing
CSH-263	Reed	10-30 AC/DC	PNP	250 mA		Against polarity reversing
CSH-364	Electronic	10-27 AC/DC	PNP	250 mA		Against polarity reversing and overvoltage

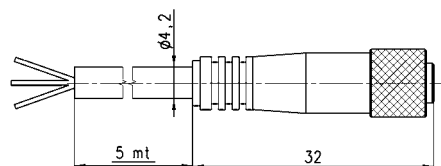
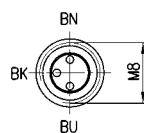
Extension with female connector M8 Mod. CS-5

Extension length 5 mt.

BN = Brown

BK = Black

BU = Blue

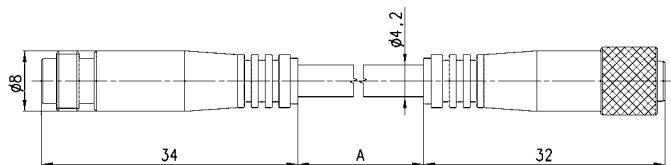


In case of the use of sensors with two wires with connector M8 models CST-250N, CSV-250N, CSH-253 connect the brown wire to the input (+) and the black wire to the load.

Mod.

CS-5

Extension with female/male connector M8



Mod.

A

CS-DW03HB-C250

250 mm

CS-DW03HB-C500

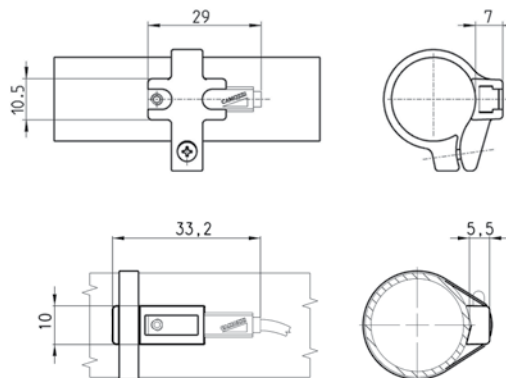
500 mm

Mounting brackets for sensors Series CST - CSH

Materials:

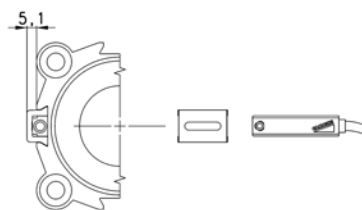
- from S-CST-05-12 stainless steel

- from S-CST-02-04 and S-CST-18-21 technopolymer.



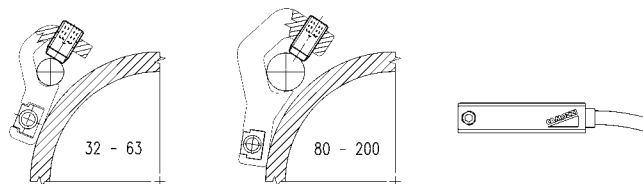
Mod.	Cylinder series	Ø	Mod.	Cylinder series	Ø	Mod.	Cylinder series	Ø
S-CST-02	24-25-27	16	S-CST-07	90-92	40	S-CST-12	90	125
S-CST-03	24-25-27	20	S-CST-08	90-92	50	S-CST-18	27-42	32
S-CST-04	24-25-27	25	S-CST-09	90-92	63	S-CST-19	27-42	40
S-CST-05	94-95	16-20-25	S-CST-10	90	80	S-CST-20	27-42	50
S-CST-06	90-92	32	S-CST-11	90	100	S-CST-21	27-42	63

Mounting brackets for sensors Series CST



Mod.	Cylinders series	Ø
S-CST-01	QP - QPR	20-100
S-CST-01	50	32-80

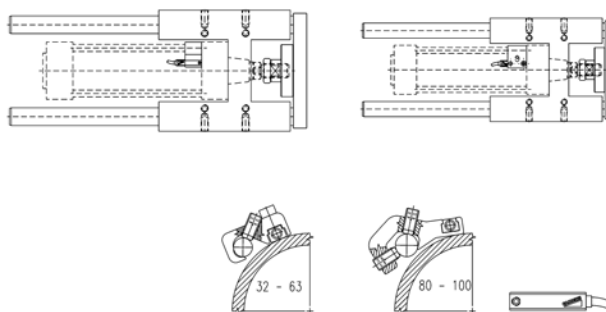
Mounting brackets for sensors Series CST and CSH



Mod.	Cylinders series	Ø
S-CST-25	60	32-63
S-CST-26	60	80 - 100
S-CST-27	60	125
S-CST-28	40	160 - 200

Mounting brackets for sensors Series CST and CSH

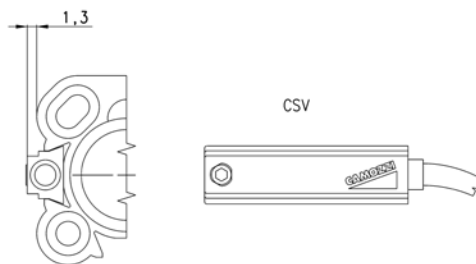
For cylinders series 60 mounted with guides series 45NHT or 45NHB.



Mod.	Cylinders series	Ø
S-CST-45N1	60	32-63
S-CST-45N2	60	80 - 100

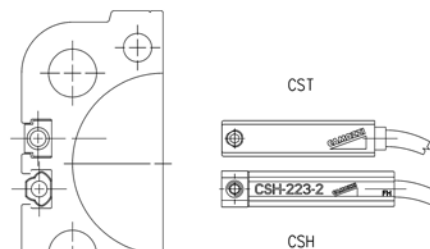
Sensors Series CSV

CST sensors must be assembled directly into the groove:
for cylinders ø16-25 Series 50
for cylinders ø12-16 Series QP-QPR.



Sensors Series CST - CSH

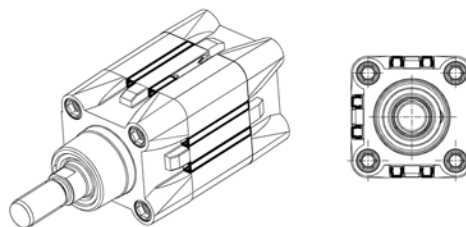
CST/CSH sensors can be directly mounted on the following cylinders:
Series 31 - 31R
Series 32 - 32R
Series 52
Series 61
Series 62 (CSH only)
Series 69
Series QC - QCBF - QCTF



Slot cover profile Mod. S-CST-500

Supplied in unit lengths of 500mm ea.

Slot cover profile for cylinders Series:
31 - 31 tandem and multi-position -
QCT - QCB - QCBT-QCBF - 61 - 69
- 32 - 32 tandem and multi-position.



Mod.
S-CST-500

Proximity Switches Series CSN

Reed switch



- » Integrated clamp for direct mounting onto tie-rods, Series 60 ISO w/ 32mm - 100mm bore
- » Integrated DIN 43650-B connection w/ LED

It is designed so that it can be fixed directly on the tie-rod by means of two screws which assure the position longitudinal to the cylinder axle; and with a third screw for the anti-rotation positioning. The three terminals are indicated by the numbers 1, 2 and 3 and enable the following connections to be made (see the scheme).

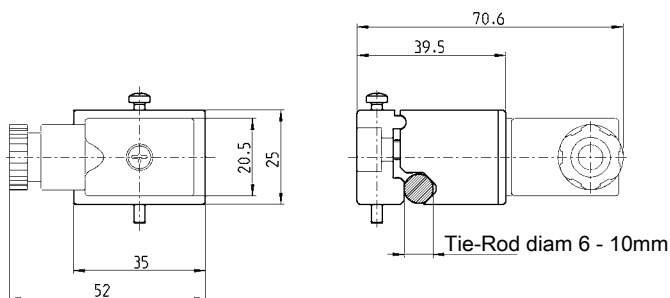
The electrical proximity switch mod. CSN 2032-0 consists of a Reed switch complete with an electronic protection circuit and a red LED indicator all encapsulated in an insulated sealed casing.

GENERAL DATA

Mod.	CSN 2032- 0
Voltage	from 12 to 220V AC and DC
Protection	IP54 / IP65 with connector DIN 43650
Material	glass-reinforced PA
Mounting	bracket for tie rod $\varnothing 6 - \varnothing 10$
Signalling	integrated red LED
Electrical connection	DIN 43650 connector, Mod. 122-800
Max. current	1.5 A
Max. load	20 W DC - 30 VA AC
Actuating time	≤ 2 ms
Actuating tolerance	± 1 mm
Operating temperature	- 25°C – + 75°C, (-13°F - 167° F)
Type of contact	NO (normally open)

Switches Series CSN

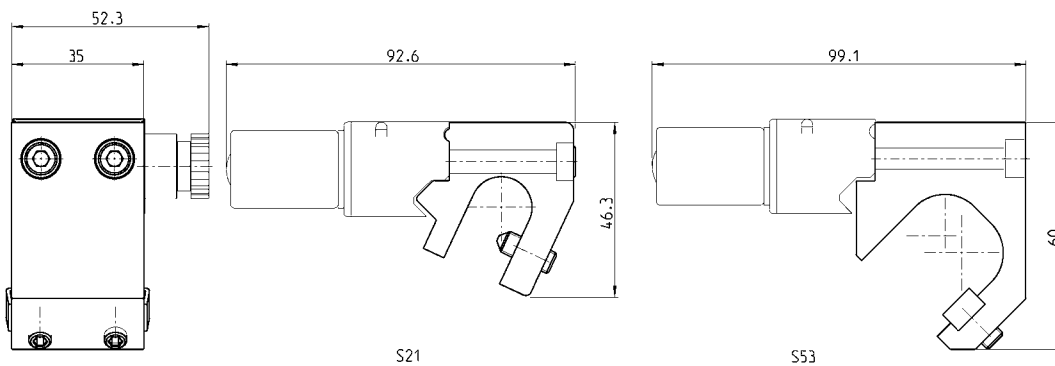
For cylinders Series 40 from $\varnothing$ 160 – 250 (mounting band Mod. S21 to be ordered separately).
 For cylinders Series 41 from $\varnothing$ 160 - 200 (mounting band Mod. S53 to be ordered separately).
 For cylinders Series 60 from diam 32mm - 100mm bore, direct mounting on tie-rods.



Mod.

CSN 2032-0

Mounting bracket for sensor



S21

S53

Mod.

S21

for cylinders Series 40 $\varnothing$ 160 - 200 and 250

S53

for cylinders Series 41 $\varnothing$ 160 and 200

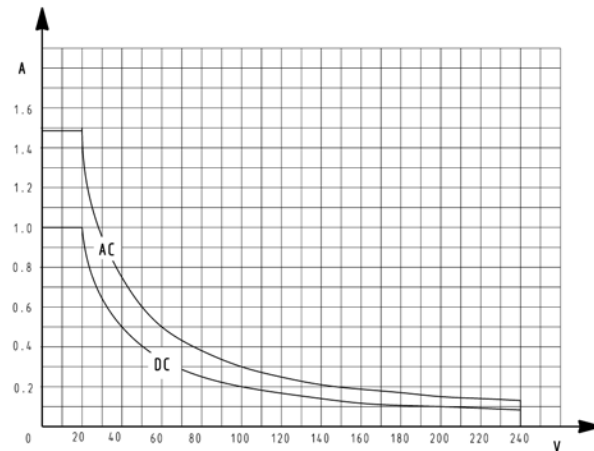
Maximum contact load

The maximum load (W) which the contacts are able to tolerate is that indicated in the section "General data", i.e.

- 20 W for direct current (DC)
- 30 VA for alternating current (AC)

The effective load allowed depends on the operating voltage (minimum 12 V, maximum 220 V) as shown in the following graph.

Note: this graph was obtained from practical tests performed using a load consisting of our Series A and 6 solenoid valves, at an operating speed of one stroke per second. For higher operating speeds, you are advised to contact our technical department.



TECHNICAL DATA

CONNECTION

- For inductive loads = solenoid valves, electrical magnets, relay.

To connectors = terminals 1 - 2

- For capacitive loads = circuit with remaining tension (see PLC controls)

To connectors = 1 - 3

Note: For connections with wires of approximately 10m, the connection shall be made as for a capacitive load.

MAXIMUM LOADS

For maximum loads see relative diagram, those loads are valid only for inductive loads. For capacitive loads, using clamp 3 (or black wire) load must not exceed 80 mA and load must be given by PLC or, for electrical circuits, by microrelay or micro solenoid valves with 2W maximum consumption.

Note: When operating with direct current, clamp 1 must always be connected to the positive outlet (+). In cases where commands are given from the PLC and logic NPN, clamp 1 must be connected to the inlet. In cases where commands are given from the PLC and logic PNP, clamps 2 or 3 must be connected to the inlet.

LEGEND:

C1 = capacitive load

C2 = inductive load

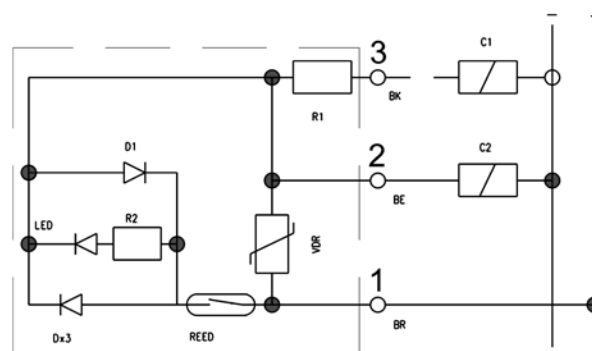


TABLE SHOWING THE COMPATIBILITY OF MAGNETIC PROXIMITY SWITCHES BY CYLINDER SERIES

Series	Ø	CST - CSH	CSV	CSB-D-220 / CSB-H-220	CSC-D-220 / CSB-H-220	CSN
24 - 25	16	S-CST-02				
	20	S-CST-03				
	25	S-CST-04				
27	20	S-CST-03				
	25	S-CST-04				
	32	S-CST-18				
	40	S-CST-19				
	50	S-CST-20				
	63	S-CST-21				
31	12	Direct mounting				
	16	Direct mounting				
	20	Direct mounting				
	25	Direct mounting				
	32	Direct mounting				
	40	Direct mounting				
	50	Direct mounting				
	63	Direct mounting				
	80	Direct mounting				
	100	Direct mounting				
32	20	Direct mounting				
	25	Direct mounting				
	32	Direct mounting				
	40	Direct mounting				
	50	Direct mounting				
	63	Direct mounting				
	80	Direct mounting				
	100	Direct mounting				
40	160	S-CST-28				S21
	200	S-CST-28				S21
	250					S21
41	160					S53
	200					S53
42	32	S-CST-18				
	40	S-CST-19				
	50	S-CST-20				
	63	S-CST-21				
50	16		Direct mounting			
	25		Direct mounting			
	32	S-CST-01				
	40	S-CST-01				
	50	S-CST-01				
	63	S-CST-01				
	80	S-CST-01				
52	25	Direct mounting				
	32	Direct mounting				
	40	Direct mounting				
	50	Direct mounting				
	63	Direct mounting				
60	32	S-CST-25				Direct mounting
	40	S-CST-25				Direct mounting
	50	S-CST-25				Direct mounting
	63	S-CST-25				Direct mounting
	80	S-CST-26				Direct mounting
	100	S-CST-26				Direct mounting
	125	S-CST-27				S21
60 + 45N	32	S-CST-45N1				
	40	S-CST-45N1				
	50	S-CST-45N1				
	63	S-CST-45N1				
	80	S-CST-45N2				
	100	S-CST-45N2				

TABLE SHOWING THE USE OF CAMOZZI MAGNETIC PROXIMITY SWITCHES

Series	Ø	CST - CSH	CSV	CSB-D-220 / CSB-H-220	CSC-D-220 / CSC-H-220
61	32	Direct mounting			
	40	Direct mounting			
	50	Direct mounting			
	63	Direct mounting			
	80	Direct mounting			
	100	Direct mounting			
	125	Direct mounting			
62	32	Direct mounting (CSH only)			
	40	Direct mounting (CSH only)			
	50	Direct mounting (CSH only)			
	63	Direct mounting (CSH only)			
	80	Direct mounting (CSH only)			
	100	Direct mounting (CSH only)			
69	32	Direct mounting			
	40	Direct mounting			
	50	Direct mounting			
	63	Direct mounting			
	80	Direct mounting			
	100	Direct mounting			
	125	Direct mounting			
90	32	S-CST-25			
	40	S-CST-25			
	50	S-CST-25			
	63	S-CST-25			
	80	S-CST-26			
	100	S-CST-26			
	125	S-CST-27			
92	32	S-CST-06			
	40	S-CST-07			
	50	S-CST-08			
	63	S-CST-09			
94	16	S-CST-05			
	20	S-CST-05			
94/95	25	S-CST-05			
CGA	10			Direct mounting	
	16			Direct mounting	
	20			Direct mounting	
	25			Direct mounting	
	32			Direct mounting	
CGB	16			Direct mounting	
	20			Direct mounting	
	25			Direct mounting	
	32			Direct mounting	
CGC	50			Direct mounting	
	64			Direct mounting	
	80			Direct mounting	
	100			Direct mounting	
	125			Direct mounting	
CGL	10				Direct mounting
	16				Direct mounting
	20				Direct mounting
	25				Direct mounting
	32				Direct mounting
CGP	10			Direct mounting	
	16			Direct mounting	
	20			Direct mounting	
	25			Direct mounting	
	32			Direct mounting	
CGS	16			Direct mounting	
	20			Direct mounting	
	25			Direct mounting	
	32			Direct mounting	

TABLE SHOWING THE USE OF CAMOZZI MAGNETIC PROXIMITY SWITCHES

Series	Ø	CST - CSH	CSV	CSB-D-220 CSB-H-220	CSC-D-220 CSC-H-220
QC	20	Direct mounting			
	25	Direct mounting			
	32	Direct mounting			
	40	Direct mounting			
	50	Direct mounting			
	63	Direct mounting			
	80	Direct mounting			
QP-QPR	12		Direct mounting		
	16		Direct mounting		
	20	S-CST-01			
	25	S-CST-01			
	32	S-CST-01			
	40	S-CST-01			
	50	S-CST-01			
	63	S-CST-01			
	80	S-CST-01			
	100	S-CST-01			
QCBF	20	Direct mounting			
	25	Direct mounting			
	32	Direct mounting			
	40	Direct mounting			
QCTF	20	Direct mounting			
	25	Direct mounting			
	32	Direct mounting			
	40	Direct mounting			
QX	10				Direct mounting
	16				Direct mounting
	20				Direct mounting
	25				Direct mounting
	32				Direct mounting

2 Compact & Short-Stroke Cylinders

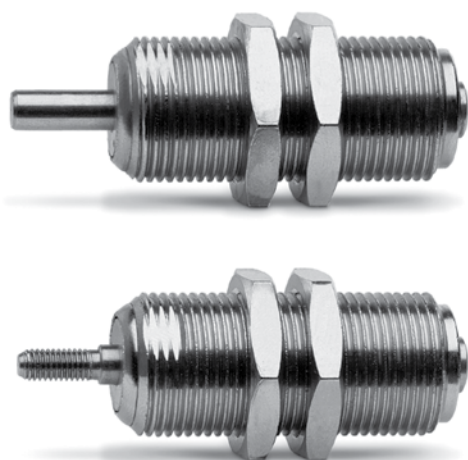
Page

Series 14		Threaded Body Minicylinders	102
Series 31		Compact Cylinders	105
Series 31		Compact Cylinders Tandem and Multi-Position Versions	120
Series 32		Compact Cylinders, ISO 21287 compliant	124
Series 32		Compact Cylinders ISO 21287 compliant Tandem and Multi-Position Versions	141
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Series QP and QPR		Short-Stroke Cylinders	148
Series 27		Round Body Cylinders	158
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		Table showing the compatibility of magnetic proximity switches by cylinder series	174

Threaded Body Minicylinders Series 14

Single-acting
 ø 6, 10, 16 - Strokes 5, 10, 15 mm
 with super-rapid fitting ø 4 and M5 port

- » Compact design
- » With threaded or non threaded piston rod
- » Threaded body



The single-acting compact minicylinder Series 14 has been designed for installation in small spaces. The design allows the cylinders to be inserted into threaded blocks incorporated in the machine.

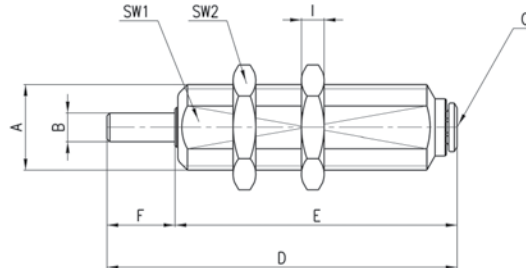
All the minicylinders are supplied with a super-rapid fitting incorporated in a tube ø 4 or with a M5 thread. They are available in two versions with either a threaded or a non threaded piston rod.

GENERAL DATA

Type of construction	compact, non magnetic
Operation	single-acting
Materials	body = brass seals = NBR other = stainless steel
Operating pressure	P. min 2,5 bar - P. max 8 bar
Operating temperature	0°C – 80°C (with dry air - 20°C) (32 - 176°F, with dry air -4°F)
Fluid	clean air, without lubrication. If lubricated air is used, it is recommended to use oil ISOVG32. Once applied the lubrication should never be interrupted.
Bore	ø 6, 10, 16
Stroke	see table
Mounting method	by means of threaded body

Compact minicylinders with non threaded piston rod Mod. 14N1A

Super-rapid fitting incorporated

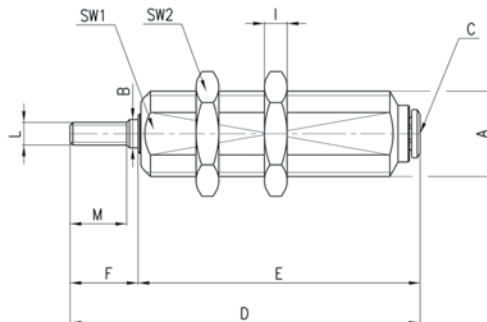


DIMENSIONS (mm)

Mod.	Ø	STROKE	A	B	C	D	E	F	SW1	SW2	I
14N1A06A05	6	5	M10x1	3	4/2	34	29	5	9	12	3
14N1A06A10	6	10	M10x1	3	4/2	42	37	5	9	12	3
14N1A06A15	6	15	M10x1	3	4/2	47	42	5	9	12	3
14N1A10A05	10	5	M15x1,5	5	4/2	50	38	12	13	19	4
14N1A10A10	10	10	M15x1,5	5	4/2	57	45	12	13	19	4
14N1A10A15	10	15	M15x1,5	5	4/2	62	50	12	13	19	4
14N1A16A05	16	5	M22x1,5	6	4/2	53,5	39,5	14	20	27	5
14N1A16A10	16	10	M22x1,5	6	4/2	62	48	14	20	27	5
14N1A16A15	16	15	M22x1,5	6	4/2	67	53	14	20	27	5

Compact minicylinders with threaded piston rod Mod. 14N1A

Super-rapid fitting incorporated

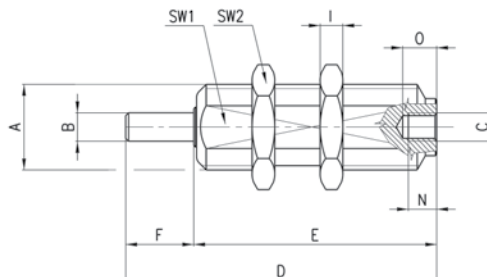


DIMENSIONS (mm)

Mod.	Ø	STROKE	A	B	C	D	E	F	SW1	SW2	I	L	M
14N1A06B05	6	5	M10x1	3	4/2	38	29	9	9	12	3	M3x0,5	7
14N1A06B10	6	10	M10x1	3	4/2	46	37	9	9	12	3	M3x0,5	7
14N1A06B15	6	15	M10x1	3	4/2	51	42	9	9	12	3	M3x0,5	7
14N1A10B05	10	5	M15x1,5	5	4/2	50	38	12	13	19	4	M4x0,7	10
14N1A10B10	10	10	M15x1,5	5	4/2	57	45	12	13	19	4	M4x0,7	10
14N1A10B15	10	15	M15x1,5	5	4/2	62	50	12	13	19	4	M4x0,7	10
14N1A16B05	16	5	M22x1,5	6	4/2	53,5	39,5	14	20	27	5	M5x0,8	12
14N1A16B10	16	10	M22x1,5	6	4/2	62	48	14	20	27	5	M5x0,8	12
14N1A16B15	16	15	M22x1,5	6	4/2	67	53	14	20	27	5	M5x0,8	12

Compact minicylinders with non threaded piston rod Mod. 14N1M

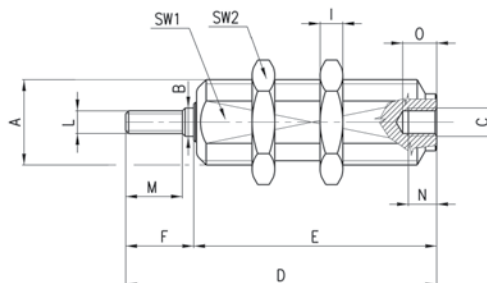
Threaded port



DIMENSIONS (mm)													
Mod.	Ø	STROKE	A	B	C	D	E	F	SW1	SW2	I	N	O
14N1M06A05	6	5	M10x1	3	M5	28	23	5	9	12	3	5	6
14N1M06A10	6	10	M10x1	3	M5	36	31	5	9	12	3	5	6
14N1M06A15	6	15	M10x1	3	M5	41	36	5	9	12	3	5	6
14N1M10A05	10	5	M15x1,5	5	M5	43	31	12	13	19	4	5	6
14N1M10A10	10	10	M15x1,5	5	M5	50	38	12	13	19	4	5	6
14N1M10A15	10	15	M15x1,5	5	M5	55	43	12	13	19	4	5	6
14N1M16A05	16	5	M22x1,5	6	M5	46,5	32,5	14	20	27	5	5	6
14N1M16A10	16	10	M22x1,5	6	M5	55,5	41,5	14	20	27	5	5	6
14N1M16A15	16	15	M22x1,5	6	M5	60,5	46,5	14	20	27	5	5	6

Compact minicylinders with threaded piston rod Mod. 14N1M

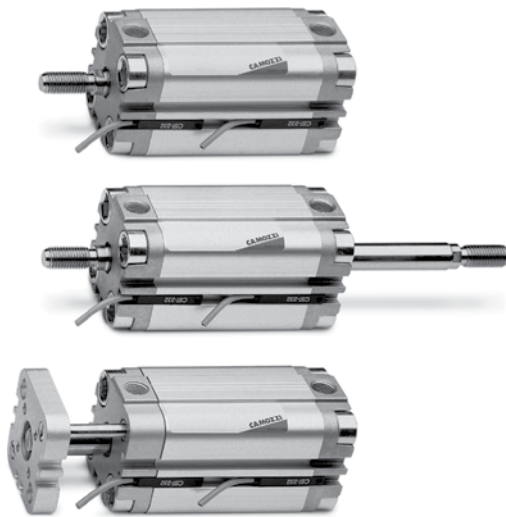
Threaded port



DIMENSIONS (mm)															
Mod.	Ø	STROKE	A	B	C	D	E	F	SW1	SW2	I	L	M	N	O
14N1M06B05	6	5	M10x1	3	M5	32	23	9	9	12	3	M3x0,5	7	5	6
14N1M06B10	6	10	M10x1	3	M5	40	31	9	9	12	3	M3x0,5	7	5	6
14N1M06B15	6	15	M10x1	3	M5	45	36	9	9	12	3	M3x0,5	7	5	6
14N1M10B05	10	5	M15x1,5	5	M5	43	31	12	13	19	4	M4x0,7	10	5	6
14N1M10B10	10	10	M15x1,5	5	M5	50	38	12	13	19	4	M4x0,7	10	5	6
14N1M10B15	10	15	M15x1,5	5	M5	55	43	12	13	19	4	M4x0,7	10	5	6
14N1M16B05	16	5	M22x1,5	6	M5	46,5	32,5	14	20	27	5	M5x0,8	12	5	6
14N1M16B10	16	10	M22x1,5	6	M5	55,5	41,5	14	20	27	5	M5x0,8	12	5	6
14N1M16B15	16	15	M22x1,5	6	M5	60,5	46,5	14	20	27	5	M5x0,8	12	5	6

Compact Cylinders Series 31

Double and single-acting, double-acting non-rotating, magnetic
 ø12, 16, 20, 25
 ø 32, 40, 50, 63, 80, 100 UNITOP



- » Compact design
- » Wide variety of models available
- » Standard magnetic
- » High temperature (double-acting and non magnetic)

The compact dimensions allow the cylinders to be installed within confined spaces. These cylinders are suitable for use with feet, flange and trunnion.

The compact Single or double-acting cylinders Series 31 are available in 10 different bore sizes from ø 12 to ø 100. The guides are inserted in the external profile parallel to the sliding axis on three sides. These guides are used to locate the switches that sense the piston position. The construction design of these cylinders provides excellent axis stability. They are available either with a male or female thread. These cylinders can be supplied in W version for high temperatures (140°C). This version is not magnetic.

GENERAL DATA

Type of construction	compact profile
Operation	Single or double-acting
Materials	body and end-caps = AL - rod = rolled stainless steel AISI 303 - piston rod = AL - seals = PU or FKM for high temperatures (140°C)
Brackets	flange, feet, trunnion
Stroke min - max	Series 31R, 31M and 31F: ø12-25 = 1-200mm, ø32 - 63 = 1-300 mm, ø80-100 = 1-400mm The min. stroke for the use of sensors is 10 mm.
Operating temperature	0°C - 80°C (with dry air - 20°C) (32 - 176°F, with dry air -4°F)
Operating pressure	1 - 10 bar (double-acting); 2 - 10 bar (single-acting), (14 - 145 psi - DA : 29 - 145 psi - SA)
Fluid	filtered air, without lubrication. If lubricated air is used, it is recommended to use oil ISOVG32. Once applied the lubrication should never be interrupted.
Speed	10 - 1000 mm/sec (without load)

STANDARD STROKE FOR COMPACT MAGNETIC CYLINDERS SERIES 31

• = Single-acting female, male

■ = Double-acting female, male

✕ = Non-rotating

STANDARD STROKES										
Ø	5	10	15	20	25	30	40	50	60	80
12	■ ✕ •	■ ✕ •	■ ✕	■ ✕	■ ✕	■ ✕	■ ✕			
16	■ ✕ •	■ ✕ •	■ ✕ •	■ ✕ •	■ ✕ •	■ ✕	■ ✕			
20	■ ✕ •	■ ✕ •	■ ✕ •	■ ✕ •	■ ✕ •	■ ✕	■ ✕	■ ✕		
25	■ ✕ •	■ ✕ •	■ ✕ •	■ ✕ •	■ ✕ •	■ ✕	■ ✕	■ ✕		
32	■ ✕ •	■ ✕ •	■ ✕ •	■ ✕ •	■ ✕ •	■ ✕	■ ✕	■ ✕		
40	■ ✕ •	■ ✕ •	■ ✕ •	■ ✕ •	■ ✕ •	■ ✕	■ ✕	■ ✕	■ ✕	■ ✕
50		■ ✕ •	■ ✕ •	■ ✕ •	■ ✕ •	■ ✕	■ ✕	■ ✕	■ ✕	■ ✕
63		■ ✕ •	■ ✕ •	■ ✕ •	■ ✕ •	■ ✕	■ ✕	■ ✕	■ ✕	■ ✕
80		■ ✕ •	■ ✕ •	■ ✕ •	■ ✕ •	■ ✕	■ ✕	■ ✕	■ ✕	■ ✕
100		■ ✕ •	■ ✕ •	■ ✕ •	■ ✕ •	■ ✕	■ ✕	■ ✕	■ ✕	■ ✕

CODING EXAMPLE

31	M	2	A	032	A	050	
----	---	---	---	-----	---	-----	--

31

SERIES

31 = compact magnetic

M

VERSION

M = male rod thread

F = female rod thread

R = non-rotating with flange only double-acting

2

OPERATION

1 = single-acting front spring

2 = double-acting

3 = double-acting through-rod

4 = single-acting rear spring

A

MATERIALS

A = rolled stainless steel AISI 303 rod tube profile aluminum

032

BORE

012 = 12 mm

016 = 16 mm

020 = 20 mm

025 = 25 mm

032 = 32 mm

040 = 40 mm

050 = 50 mm

063 = 63 mm

080 = 80 mm

100 = 100 mm

A

DESIGN TYPE

A = standard

050

STROKE

(see table)

= standard

S = special

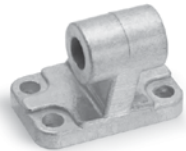
V = rod seal FKM

W = seals in FKM for high temperatures (140°C)

COMPACT MAGNETIC CYLINDERS SERIES 31

Swivel ball joint Mod. GA
for cyl. 31M90° swivel combination
for trunnion Mod. I

Rear trunnion Mod. C

Rod fork end Mod. G
for cyl. 31MPiston rod nut Mod. U
for cyl. 31M90° swivel combin. for
fem. trunnion Mod. ZC

Rear trunnion Mod. L

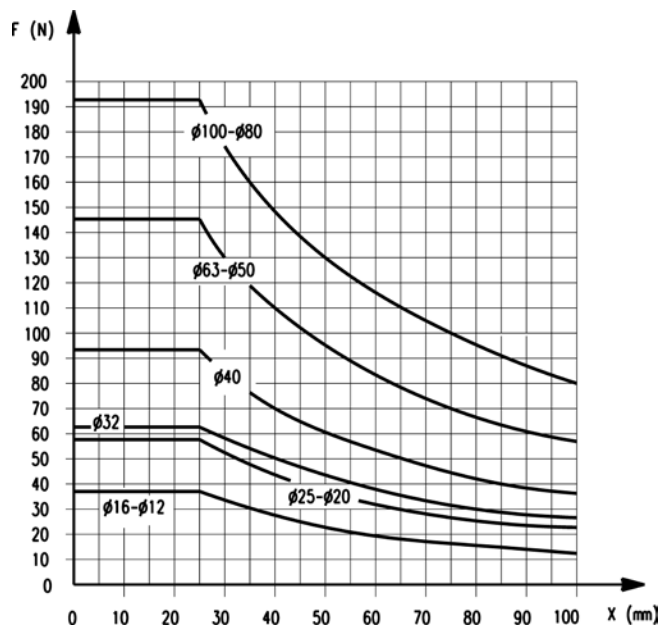
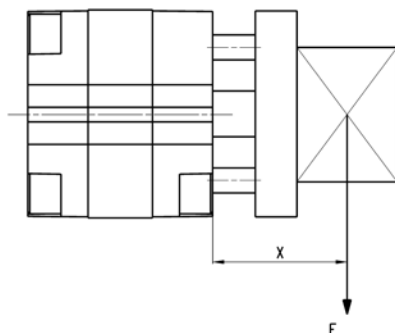
Rear and front flange
Mod. D

Foot mount Mod. B

Coupling piece
Mod. GKFSelf aligning rod
Mod. GKPiston rod socket joint
Mod. GY for cyl. 31M

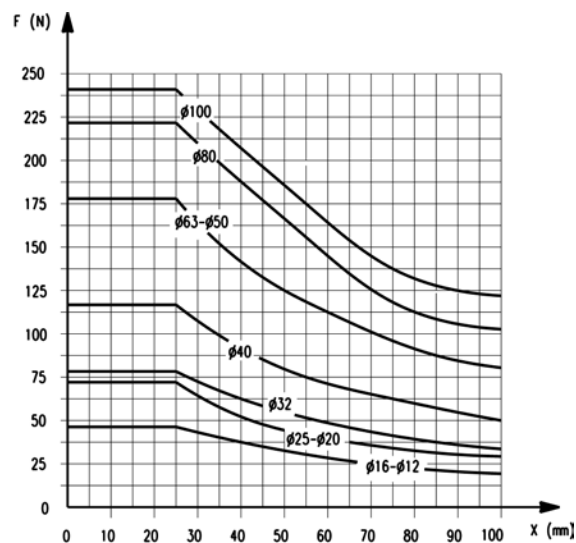
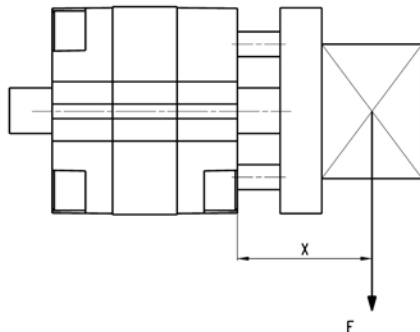
All accessories are supplied separately.

ANTI-ROTATION - Transversal load dependant on stroke



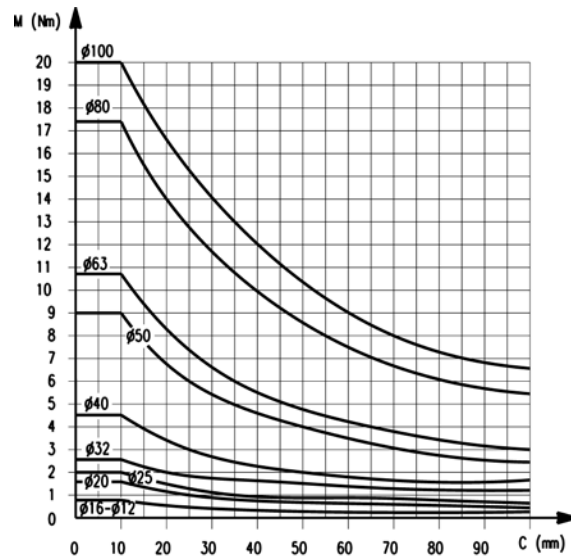
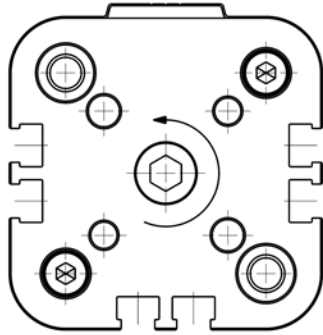
It is possible to determine the amount of strokes required in the general data (excluding radial loads and torque moments). When imposing radial loads on the cylinder it is important to respect the maximum stroke of the baricenter. In the presence of torque moments, respect the maximum stroke as shown in the diagrams.

ANTI-ROTATION THROUGH-ROD - Transversal load dependant on stroke



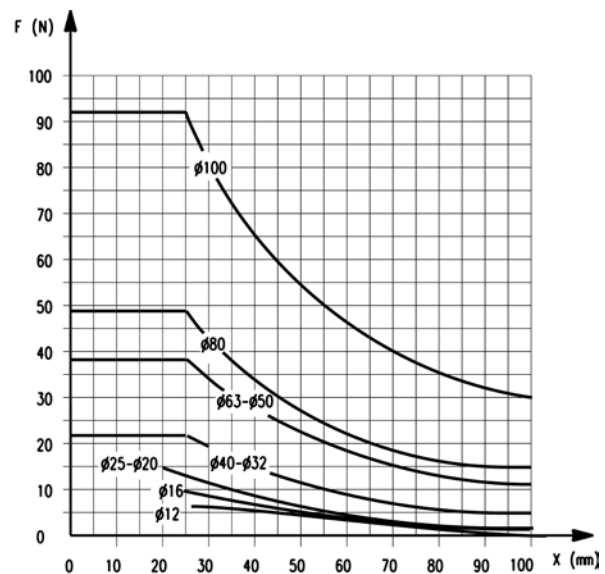
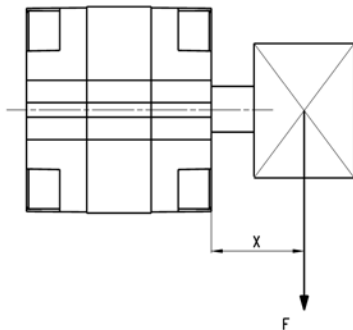
It is possible to determine the amount of strokes required in the general data (excluding radial loads and torque moments). When imposing radial loads on the cylinder it is important to respect the maximum stroke of the baricenter. In the presence of torque moments, respect the maximum stroke as shown in the diagrams.

TORQUE MOMENT - dependant on stroke C



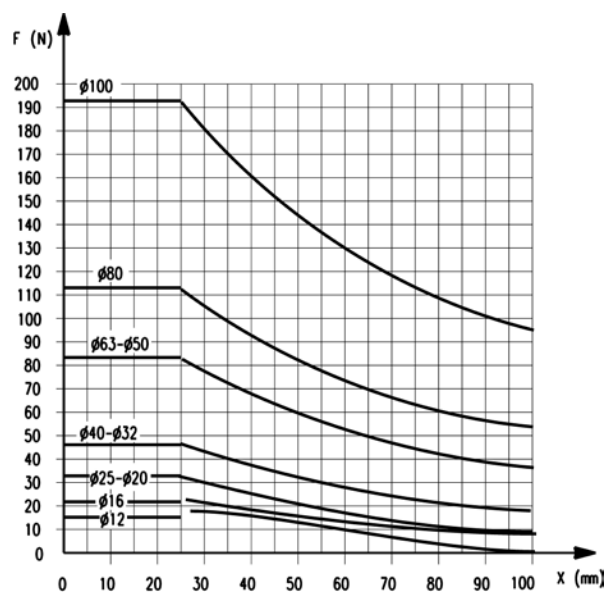
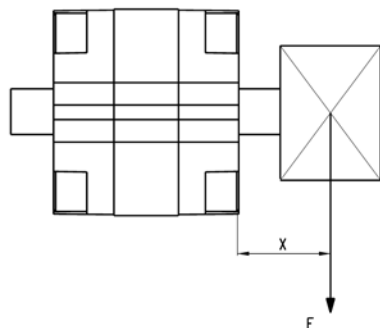
It is possible to determine the amount of strokes required in the general data (excluding radial loads and torque moments). When imposing radial loads on the cylinder it is important to respect the maximum stroke of the baricenter. In the presence of torque moments, respect the maximum stroke as shown in the diagrams.

TRANSVERSAL LOAD - dependant on stroke



It is possible to determine the amount of strokes required in the general data (excluding radial loads and torque moments). When imposing radial loads on the cylinder it is important to respect the maximum stroke of the baricenter. In the presence of torque moments, respect the maximum stroke as shown in the diagrams.

TRANSVERSAL LOAD THROUGH-ROD - dependant on stroke

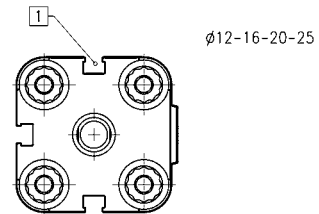
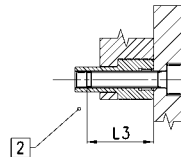
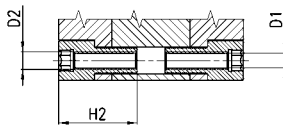
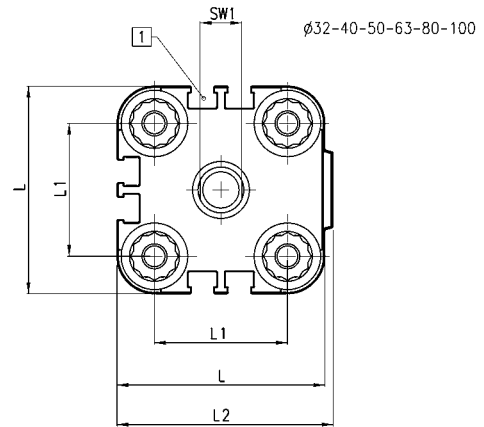
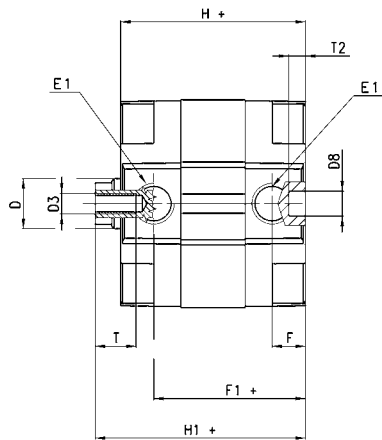


It is possible to determine the amount of strokes required in the general data (excluding radial loads and torque moments). When imposing radial loads on the cylinder it is important to respect the maximum stroke of the baricenter. In the presence of torque moments, respect the maximum stroke as shown in the diagrams.

Compact magnetic cylinders Mod. 31F and 31M



- 1 = Groove for sensor CST
 2 = Keep to the minimum screwing depth.
 + = add the stroke



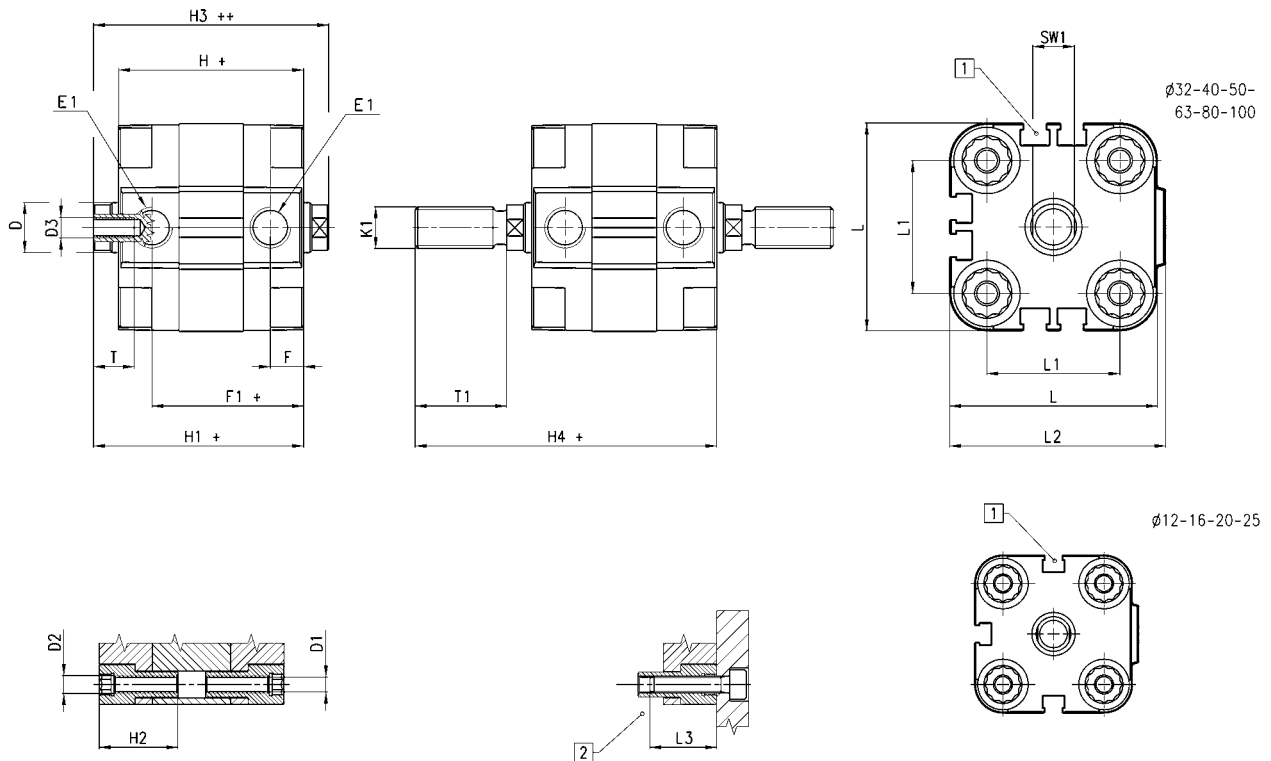
DIMENSIONS (mm)

Ø	ØD	ØD1	D2	D3	ØD8 ^(H9)	E1	F	F1+	H+	H1+	H2	H3+	K1	L	L1	L2	L3	T	T1	T2	SW1
12	6	3,5	M4	M3	6	M5	8	30	38	42,5	18,5	58,5	M6	29	18	30	16	6	16	4	5
16	8	3,5	M4	M4	6	M5	8	30	38	42,5	18,5	62,5	M8	29	18	30	16	8	20	4	7
20	10	4,5	M5	M5	6	M5	8	30	38	42,5	18,5	64,5	M10x1,25	36	22	37,5	18	10	22	4	8
25	10	4,5	M5	M5	6	M5	8	31,5	39,5	45	18,5	67	M10x1,25	40	26	41,5	18	10	22	4	8
32	12	5,5	M6	M6	6	G1/8	8	36,5	44,5	50,5	21,5	72,5	M10x1,25	50	32	52	20	12	22	4	10
40	12	5,5	M6	M6	6	G1/8	8	37,5	45,5	52	21,5	74	M10x1,25	60	42	62,5	20	12	22	4	10
50	16	6,5	M8	M8	6	G1/8	8	37,5	45,5	53	22,5	77	M12x1,25	68	50	71	20	12	24	4	13
63	16	8,5	M10	M8	8	G1/8	8	42	50	57,5	24,5	81,5	M12x1,25	87	62	91	25	12	24	4	13
80	20	8,5	M10	M10	8	G1/8	8,5	47,5	56	64	24,5	96	M16x1,5	107	82	111	25	16	32	4	17
100	25	8,5	M10	M12	8	G1/4	10,5	56	66,5	76,5	31,5	116,5	M20x1,5	128	103	133	25	20	40	4	22

Compact magnetic cylinders Mod. 31F and 31M - through-rod



1 = Groove for sensor CST
 2 = Keep to the minimum screwing depth.
 + = add the stroke
 ++ = add the stroke 2 times

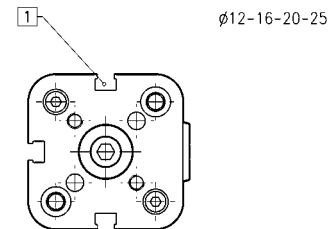
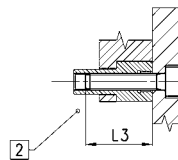
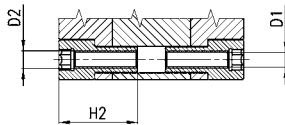
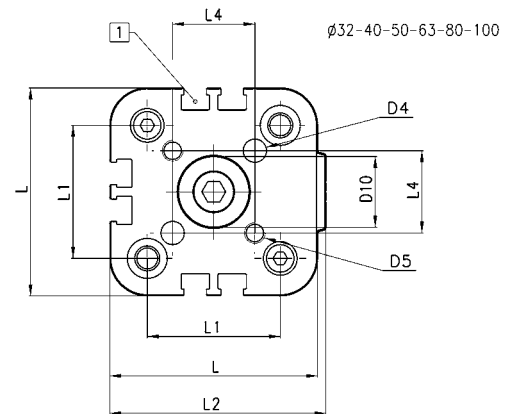
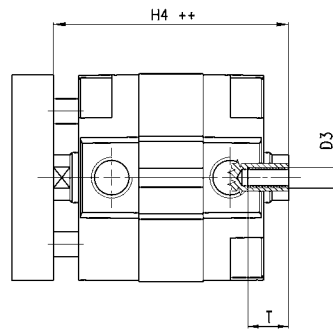
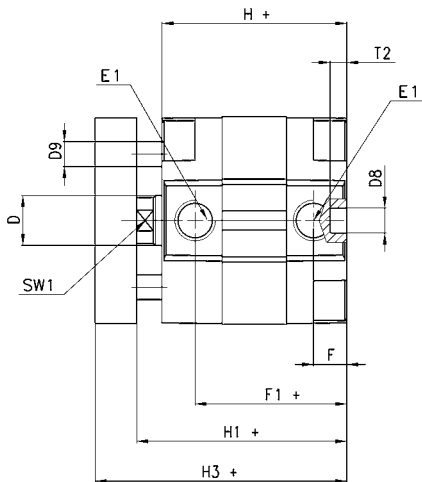


DIMENSIONS (mm)																				
Ø	ØD	ØD1	D2	D3	E1	F	F1+	H+	H1+	H2	H3++	H4+	K1	L	L1	L2	L3	T	T1	SW1
12	6	3,5	M4	M3	M5	8	30	38	42,5	18,5	47	58,5	M6	29	18	30	16	6	16	5
16	8	3,5	M4	M4	M5	8	30	38	42,5	18,5	47	62,5	M8	29	18	30	16	8	20	7
20	10	4,5	M5	M5	M5	8	30	38	42,5	18,5	47	64,5	M10x1,25	36	22	37,5	18	10	22	8
25	10	4,5	M5	M5	M5	8	31,5	39,5	45	18,5	50,5	67	M10x1,25	40	26	41,5	18	10	22	8
32	12	5,5	M6	M6	G1/8	8	36,5	44,5	50,5	21,5	56,5	72,5	M10x1,25	50	32	52	20	12	22	10
40	12	5,5	M6	M6	G1/8	8	37,5	45,5	52	21,5	58,5	74	M10x1,25	60	42	62,5	20	12	22	10
50	16	6,5	M8	M8	G1/8	8	37,5	45,5	53	22,5	60,5	77	M12x1,25	68	50	71	20	12	24	13
63	16	8,5	M10	M8	G1/8	8	42	50	57,5	24,5	65	81,5	M12x1,25	87	62	91	25	12	24	13
80	20	8,5	M10	M10	G1/8	8,5	47,5	56	64	24,5	72	96	M16x1,5	107	82	111	25	16	32	17
100	25	8,5	M10	M12	G1/4	10,5	56	66,5	76,5	31,5	86,5	116,5	M20x1,5	128	103	133	25	20	40	22

Compact magnetic cylinders Mod. 31R



- 1 = Groove for sensor CST
 2 = Keep to the minimum screwing depth.
 + = add the stroke
 ++ = add the stroke 2 times



DIMENSIONS (mm)																									
Ø	ØD	ØD1	D2	D3	ØD4 ^(H9)	D5	D8 ^(H9)	ØD9	D10	E1	F	F1+	H+	H1+	H2	H3+	H4++	L	L1	L2	L3	L4	T	T2	SW1
12	6	3,5	M4	M3	3	M3	6	5	6	M5	8	30	38	42,5	18,5	48,5	47	29	18	30	16	9,9	6	4	5
16	8	3,5	M4	M4	3	M3	6	5	8	M5	8	30	38	42,5	18,5	48,5	47	29	18	30	16	9,9	8	4	7
20	10	4,5	M5	M5	4	M4	6	6	10	M5	8	30	38	42,5	18,5	50,5	47	36	22	37,5	18	12	10	4	8
25	10	4,5	M5	M5	5	M5	6	6	14	M5	8	31,5	39,5	45	18,5	53	50,5	40	26	41,5	18	15,6	10	4	8
32	12	5,5	M6	M6	5	M5	6	6	17	G1/8	8	36,5	44,5	50,5	21,5	60,5	56,5	50	32	52	20	19,8	12	4	10
40	12	5,5	M6	M6	5	M5	6	6	17	G1/8	8	37,5	45,5	52	21,5	62	58,5	60	42	62,5	20	23,3	12	4	10
50	16	6,5	M8	M8	6	M6	6	10	22	G1/8	8	37,5	45,5	53	22,5	65	60,5	68	50	71	20	29,7	12	4	13
63	16	8,5	M10	M8	6	M6	8	10	22	G1/8	8	42	50	57,5	24,5	69,5	65	87	62	91	25	35,4	12	4	13
80	20	8,5	M10	M10	8	M8	8	12	28	G1/8	8,5	47,5	56	64	24,5	78	72	107	82	111	25	46	16	4	17
100	25	8,5	M10	M12	10	M10	8	12	30	G1/4	10,5	56	66,5	76,5	31,5	90,5	86,5	128	103	133	25	56,6	20	4	22

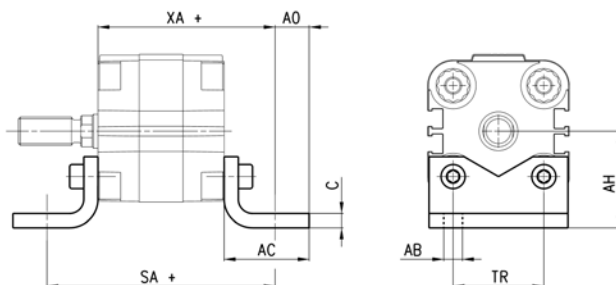
Foot mount Mod. B

Material: zinc-plated steel



Supplied with:
2x feet
4x screws

+ = add the stroke



DIMENSIONS (mm)

Mod.	Ø	C	SA+	XA+	TR	ØAB	AH	AO	AC
B-31-12-16	12 - 16	3	64	51	18	5,5	22	7	20
B-32-20	20	4	70	54	22	6,6	27	9	25
B-31-25	25	4	71,5	55,5	26	6,6	29	9	25
B-31-32	32	5	80,5	62,5	32	6,6	34	12	30
B-31-40	40	5	85,5	65,5	42	9	40,5	10	30
B-31-50	50	5,5	93,5	69,5	50	9	47	11	35
B-31-63	63	5,5	104	77	62	11	56,5	13	40
B-31-80	80	7,5	116	86	82	11	68,5	15	45
B-31-100	100	7,5	132,5	99,5	103	13,5	81	12	45

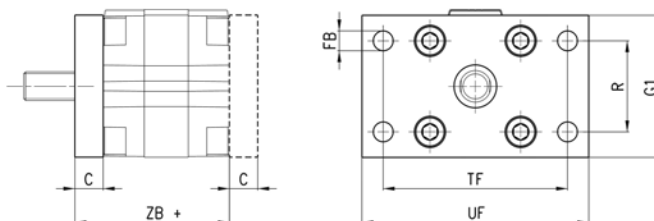
Rear and front flange Mod. D-E

Material: zinc-plated steel



Supplied with:
1x flange
4x screws

+ = add the stroke



DIMENSIONS (mm)

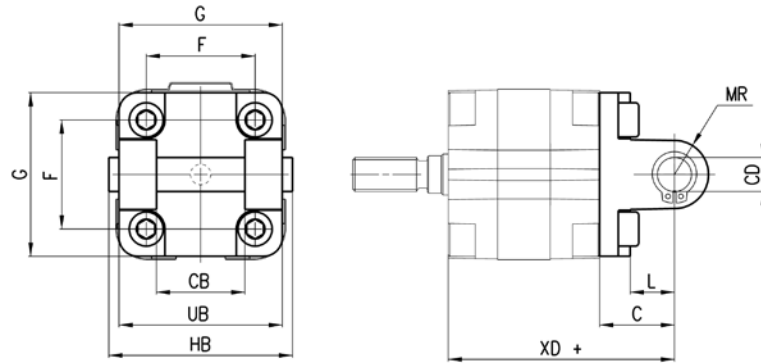
Mod.	Ø	C	ZB+	TF	R	UF	G1	ØFB
D-E-31-12-16	12 - 16	10	48	43	-	55	29	5,5
D-E-32-20	20	10	48	55	-	70	36	6,6
D-E-32-25	25	10	49,5	60	-	76	40	6,6
D-E-31-32	32	10	54,5	65	32	80	50	7
D-E-31-40	40	10	55,5	82	36	102	60	9
D-E-31-50	50	12	57,5	90	45	110	68	9
D-E-31-63	63	15	65	110	50	130	87	9
D-E-31-80	80	15	71	135	63	160	107	12
D-E-31-100	100	15	81,5	163	75	190	128	14

Female rear trunnion Mod. C

Material: Aluminium



Supplied with:
 4x screws
 1x clevis pin
 1x centering pin
 1x trunnion
 + = add the stroke



DIMENSIONS (mm)

Mod.	Ø	ØCD	L	C	XD+	MR	F	G	CB	UB	HB
C-31-32	32	10	13	21	66,5	11	32	50	26	45	54
C-31-40	40	12	16	25	70,5	13	42	60	28	52	62
C-31-50	50	12	16	27	72,5	13	50	68	32	60	70
C-31-63	63	16	21	32	82	17	62	87	40	70	82
C-31-80	80	16	23	36	92	17	82	102	50	90	102
C-31-100	100	20	26	41	107,5	21	103	128	60	110	126

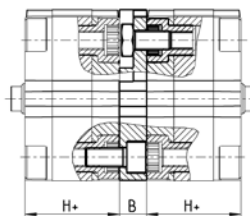
Intermediate bracket Mod. DC

Flange in aluminium



Supplied with:
 1x flange
 1x centering pin
 4x screws

+ = add the stroke



DIMENSIONS (mm)

Mod.	Ø	B	H+
DC-31-12-16	12-16	12,5	38
DC-31-20	20	12,5	38
DC-31-25	25	13	39,5
DC-31-32	32	14,5	44,5
DC-31-40	40	14,5	45,5
DC-31-50	50	14,5	45,5
DC-31-63	63	14,5	50
DC-31-80	80	16,5	56
DC-31-100	100	19,5	66,5

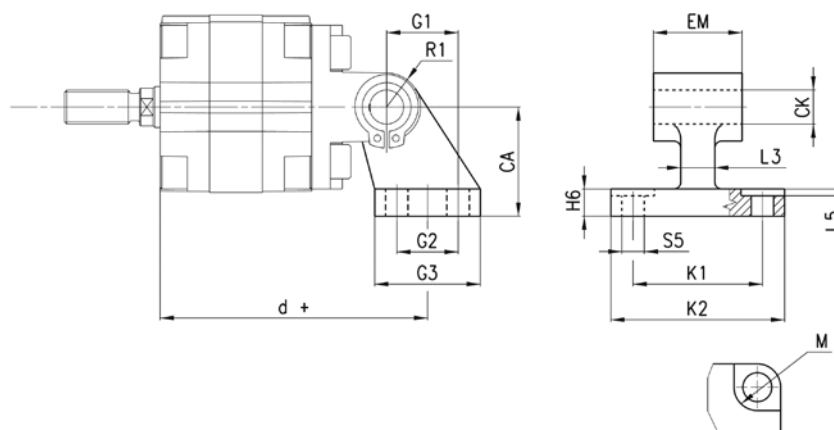
90° Swivel combination for female trunnion Mod. ZC

Male rear
Material: aluminium



Supplied with:
1x male support

+ = add the stroke



DIMENSIONS (mm)

Mod.	Ø	M	ØCK	ØS5	d+	K1	K2	L3	G1	L5	G2	EM	G3	CA	H6	R1
ZC-32	32	11	10	6,6	78,5	38	51	10	21	1,6	18	26	31	32	8	10
ZC-40	40	11	12	6,6	83,5	41	54	15	24	1,6	22	28	35	36	10	11
ZC-50	50	15	12	9	90,5	50	65	16	33	1,6	30	32	45	45	12	13
ZC-63	63	15	16	9	101,5	52	67	16	37	1,6	35	40	50	50	14	15
ZC-80	80	18	16	11	119	66	86	20	47	2,5	40	50	60	63	14	15
ZC-100	100	18	20	11	137,5	76	96	20	55	3,2	50	60	70	71	17	19

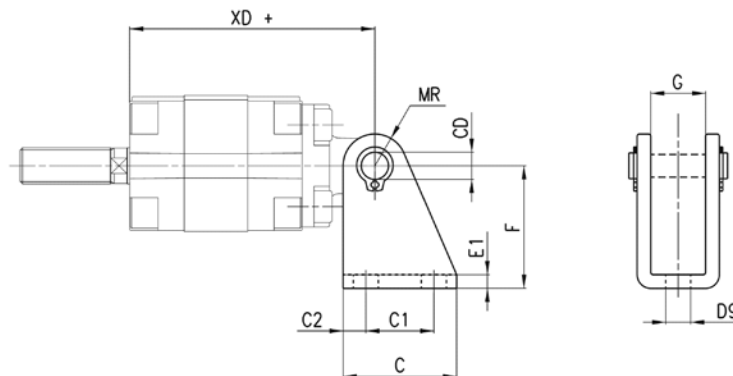
90° swivel combination for trunnion Mod. I

Material: zinc-plated steel



Supplied with:
2x C-clips
1x female support
1x clevis pin

+ = add the stroke



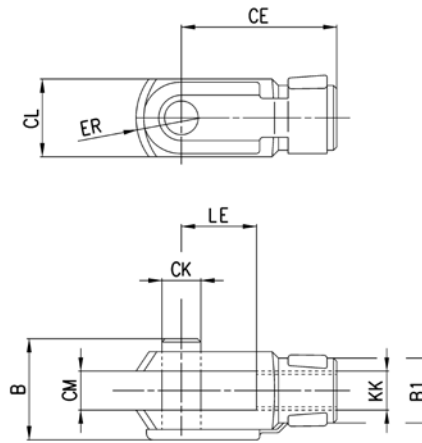
DIMENSIONS (mm)

Mod.	Ø	ØCD	C	C1	ØC2	XD+	MR	ØD9	E1	F	G
I-12-16	12	6	25	15	5	54	7	5,5	3	27	12,1
I-12-16	16	6	25	15	5	54	7	5,5	3	27	12,1
I-20-25	20	8	32	20	6	58	10	6	4	30	16,1
I-20-25	25	8	32	20	6	59,5	10	6	4	30	16,1

Rod fork end Mod. G

ISO 8140

Material: zinc-plated steel

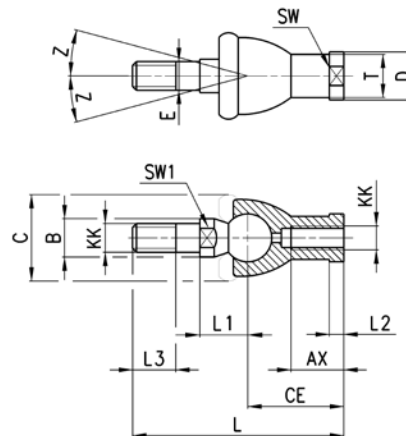


DIMENSIONS (mm)

Mod.	Ø	B	ØB1	ØCK	LE	CM	CL	ER	CE	KK
G-12-16	12	16	10	6	12	6	12	7	24	M6X1
G-20	16	22	14	8	16	8	8	42	32	M8X1,25
G-25-32	20 – 40	26	18	10	20	10	20	12	40	M10X1,25
G-40	50 – 63	32	20	12	24	12	24	14	48	M12X1,25
G-50-63	80	40	26	16	32	16	32	19	64	M16X1,25
G-80-100	100	48	34	20	40	20	40	25	80	M20X1,5

Piston rod socket joint Mod. GY

Material: Zinc-Aluminum alloy and zinc-plated steel



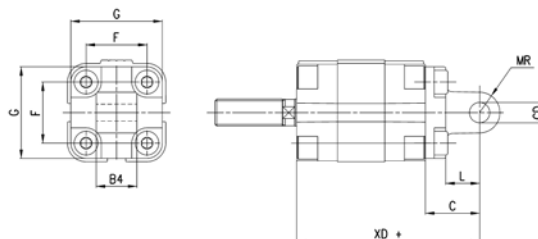
DIMENSIONS (mm)

Mod.	Ø	S	L	CE	L2	AX	E	ØB	ØC	ØT	ØD	L1	L3	SW1	SW	Z
GY-12-16	12	M6X1	55	28	5	15	6	10	20	10	13	12,2	11	8	11	15
GY-20	16	M8X1,25	65	32	5	16	8	12	24	12,5	16	16	12	10	14	15
GY-32	20-40	M10X1,25	74	35	6,5	18	10	14	28	15	19	19,5	15	11	17	15
GY-40	50-63	M12X1,25	84	40	6,5	20	12	19	32	17,5	22	21	17	17	19	15
GY-50-63	80	M16X1,5	112	50	8	27	16	22	40	22	27	27,5	23	19	22	11
GY-80-100	100	M20X1,5	133	63	10	38	20	27	45	27,5	34	31,5	25	24	30	7,5

Rear trunnion Mod. L



Male rear.
Material: aluminium
Supplied with:
4x screws
1x male trunnion
1x centering pin



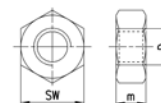
DIMENSIONS (mm)									
	Ø	ØCD	L	C	XD+	MR	F	G	B4
L-31-12-16	12	6	10	16	54	6	18	30	12
L-31-12-16	16	6	10	16	54	6	18	30	12
L-31-20	20	8	14	20	58	8	22	37,5	16
L-31-25	25	8	14	20	59,5	8	26	41,5	16

+ = add the stroke

Piston rod nut Mod. U



Material: zinc-plated steel
UNI EN ISO 4035

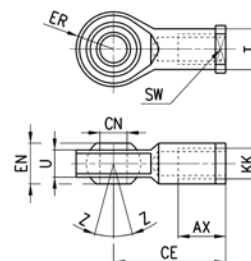


DIMENSIONS (mm)				
Mod.	Ø cylinder	D	m	SW
U-12-16	12	M6X1	4	10
U-20	16	M8X1,25	5	13
U-25-32	20-40	M10X1,25	6	17
U-40	50-63	M12X1,25	7	19
U-50-63	80	M16X1,5	8	24
U-80-100	100	M20X1,5	9	30

Swivel ball joint Mod. GA



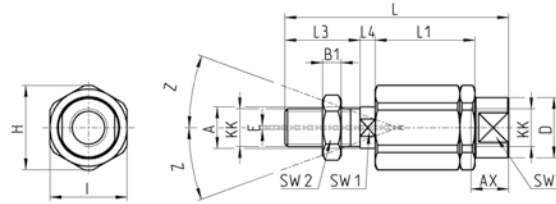
Material: zinc-plated steel
ISO 8139



DIMENSIONS (mm)											
Mod.	Ø	ØCN	U	EN	ER	AX	CE	KK	T	Z	SW
GA-12-16	12	6	7	9	10	12	30	M6X1	10	6,5	11
GA-20	16	8	9	12	20	48	16	M8X1,25	12,5	6,5	14
GA-32	20-40	10	10,5	14	14	20	43	M10X1,25	15	6,5	17
GA-40	50-63	12	12	16	16	22	50	M12X1,25	17,5	6,5	19
GA-50-63	80	16	15	21	21	28	64	M16X1,5	22	7,5	22
GA-80-100	100	20	18	25	25	33	77	M20X1,5	27,5	7	30

Self aligning rod Mod. GK

Material: zinc-plated steel

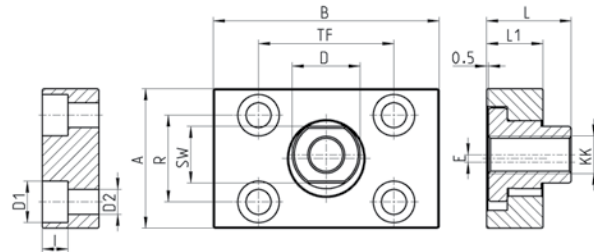
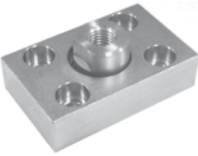


DIMENSIONS (mm)

Mod.	Ø	KK	L	L1	L3	L4	Ø A	Ø D	H	I	SW	SW1	SW2	B1	AX	Z	E
GK-20	16	M8x1,25	57	26	21	5	8	12,5	19	17	11	7	13	4	16	4	2
GK-25-32	20-25-32-40	M10x1,25	71,5	35	20	7,5	14	22	32	30	19	12	17	5	22	4	2
GK-40	50-63	M12x1,25	75,5	35	24	7,5	14	22	32	30	19	12	19	6	22	4	2
GK-50-63	80	M16x1,5	104	53	32	10	22	32	45	41	27	20	24	8	30	3	2
GK-80-100	100	M20x1,5	119	53	40	10	22	32	45	41	27	20	30	10	37	3	2

Coupling piece Mod. GKF

Material: zinc-plated steel



DIMENSIONS (mm)

Mod.	Ø	KK	A	B	R	TF	L	L1	I	Ø D	Ø D1	Ø D2	SW	E
GKF-20	16	M8x1,25	30	35	20	25	22,5	10	-	14	5,5	-	13	1,5
GKF-25-32	20-25-32-40	M10x1,25	37	60	23	36	22,5	15	6,8	18	11	6,6	15	2
GKF-40	50-63	M12x1,25	56	60	38	42	22,5	15	9	20	15	9	15	2,5
GKF-50-63	80	M16x1,5	80	80	58	58	26,5	15	10,5	25	18	11	22	2,5
GKF-80-100	100	M20x1,5	90	90	65	65	32,5	20	13	30,5	20	14	27	2,5

Compact Cylinders Tandem and Multi-Position Versions Series 31

Double-acting (31M-31F)

ø 12, 16, 20, 25, 32, 40, 50, 63, 80, 100

- » Compact design
- » Available in different diameters and strokes
- » Standard magnetic



The compact dimensions allow the cylinders to be installed within confined spaces. These cylinders are suitable for use with feet, flange and trunnion mountings.

In order to complete the compact cylinder series, two new versions have been introduced - tandem and multi-position models.

The new tandem version with 2, 3 or 4 stages generates a thrust force which is 2, 3 or 4 times that of the normal cylinder.

The multi-position version allows a maximum of 3 different positions which are determined by the stroke of the individual actuators.

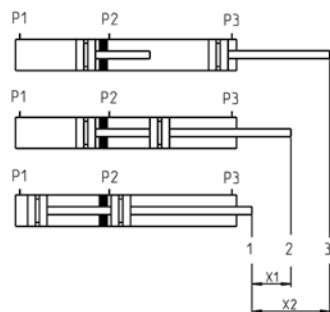
GENERAL DATA

Type of construction	compact profile
Operation	double-acting
Materials	body and end-caps = AL rod = rolled stainless steel AISI 303 piston = AL rod and piston seals = PU
Mounting	flange - feet - trunnion
Strokes	min. and max. for tandem 31M and 31F: ø12-25 = 1-80 mm, ø32-100 = 1-100 mm min. and max. for multi-position 31M and 31F: ø12-25 = dimension for x2 max 200 mm ø32-63 = dimension for x2 max 300 mm, ø80-100 = dimension for x2 max 400 mm.
Operating temperature	0°C – 80°C (with dry air -20°C), (32 - 176°F, with dry air -4°F)

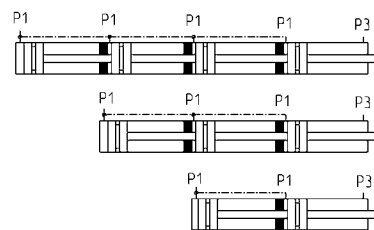
CODING EXAMPLE

31	M	2	A	032	A	050	N	2
31	SERIES							
M	VERSION M = male rod thread F = female rod thread							
2	OPERATION 2 = double-acting							
A	MATERIALS A = rolled stainless steel rod AISI 303 profile aluminium							
032	BORE 012 = 12 mm 016 = 16 mm 020 = 20 mm 025 = 25 mm 032 = 32 mm 040 = 40 mm 050 = 50 mm 063 = 63 mm 080 = 80 mm 100 = 100 mm							
A	CONSTRUCTION TYPE A = standard							
050	STROKE in mm - tandem stroke in mm - multi-position X1mm/X2mm (see application scheme)* insert stroke without the initial 0							
N	TANDEM AND MULTI-POSITION							
2	STAGES (only for tandem) 2 = 2 stages 3 = 3 stages 4 = 4 stages							

Application schemes



Multi-position
Example for ordering:
X1 = 25 mm and X2 = 100 mm
31M2A032A25/100N



Tandem
Example for ordering:
stroke 25 mm
31M2A032A025N2 (2 stages)

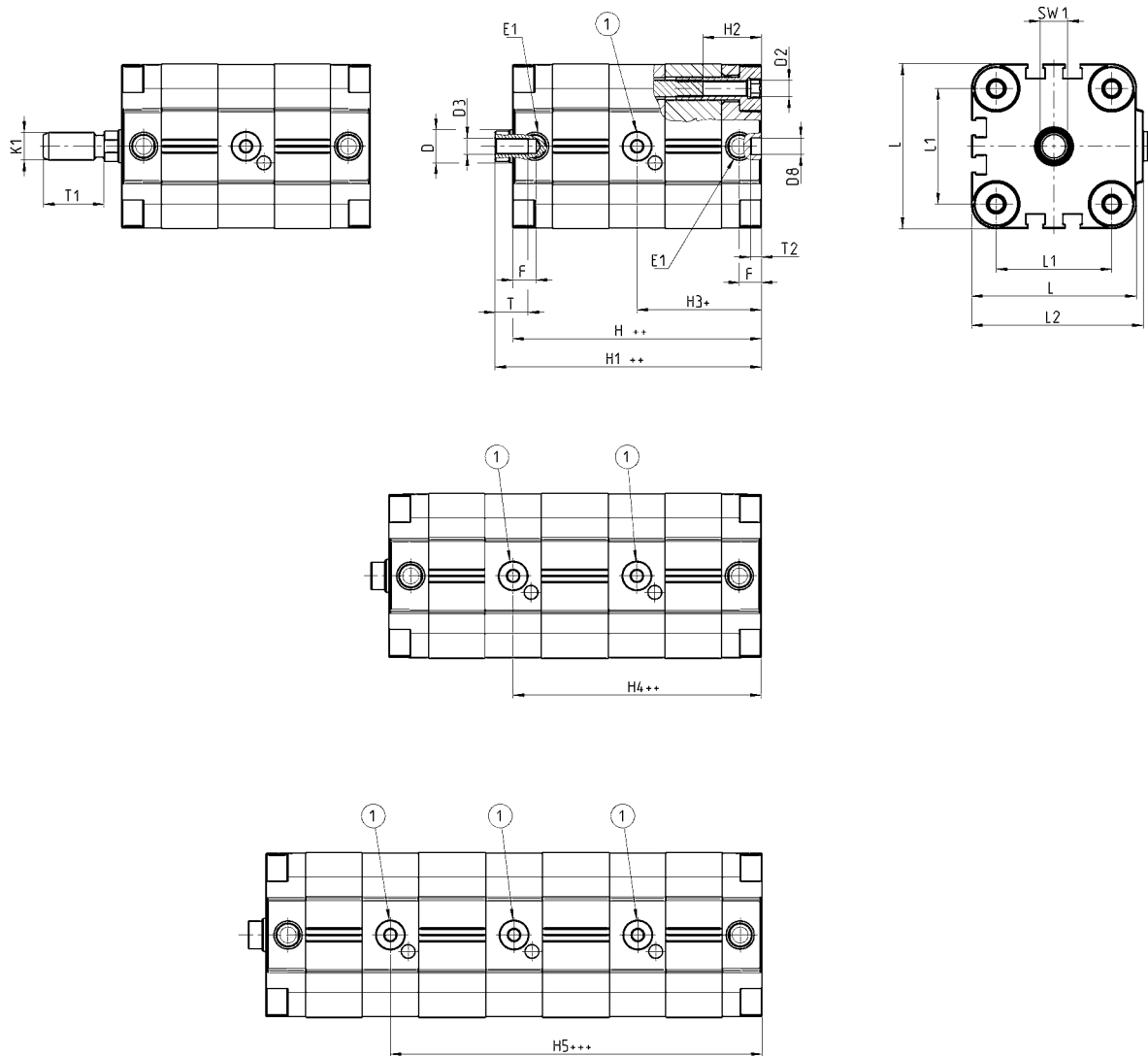
Cylinders Series 31 - Tandem version

Mod. 31F2A...N...

Mod. 31M2A...N...



+ = add the stroke
 ++ = add the stroke two times
 +++ = add the stroke three times
 ++++ = add the stroke four times
 ① = air inlet cylinders ø12, 16, 20, 25



DIMENSIONS (mm)

Ø	ØD	D2	D3	ØD8	E1	F	H++	H1++	H2	H3+	H4++	H5+++	K1	L	L1	L2	T	T1	T2	SW1	3ST _{H1+++}	3ST _{H1+++}	4ST _{H1+++}	4ST _{H1+++}
12	6	M4	M3	6	M5	8	63,5	68	12,5	34,5	60	85,5	M6	29	18	30	6	16	4	5	89	93,5	114,5	119
16	8	M4	M4	6	M5	8	63,5	68	12,5	34,5	60,5	86,5	M8	29	18	30	8	20	4	7	89,5	94	115,5	120
20	10	M5	M5	6	M5	8	78	82,5	17	43,5	83,5	123,5	M10x1,25	36	22	37,5	10	22	4	8	118	122,5	158	162,5
25	10	M5	M5	6	M5	8	78	83,5	17	39,1	78,1	117,1	M10x1,25	40	26	41,5	10	22	4	8	117	122,5	156	161,5
32	12	M6	M6	6	G1/8	8	90,5	96,5	21,5	46,5	92,6	138,7	M10x1,25	50	32	52	12	22	4	10	136,5	142,5	182,5	188,5
40	12	M6	M6	6	G1/8	8	90,5	97	21,5	46,5	90,2	135,2	M10x1,25	60	42	62,5	12	22	4	10	135,5	142	180,5	187
50	16	M8	M8	6	G1/8	8	90,5	98	18	47,5	92,5	137,5	M12x1,25	68	50	71	12	24	4	13	135,5	143	180	188
63	16	M10	M8	8	G1/8	8	100,5	108	26	50,2	100,7	151,2	M12x1,25	87	62	91	12	24	4	13	151	158,5	201,5	209
80	20	M10	M10	8	G1/8	8,5	112	120	26,5	59	115	171	M16x1,5	107	82	111	16	32	4	17	168	176	224	232
100	25	M10	M12	8	G1/4	10,5	135,5	145,5	26,5	71,3	140,4	209,5	M20x1,5	128	103	133	20	40	4	22	204,5	214,5	237,5	283,5

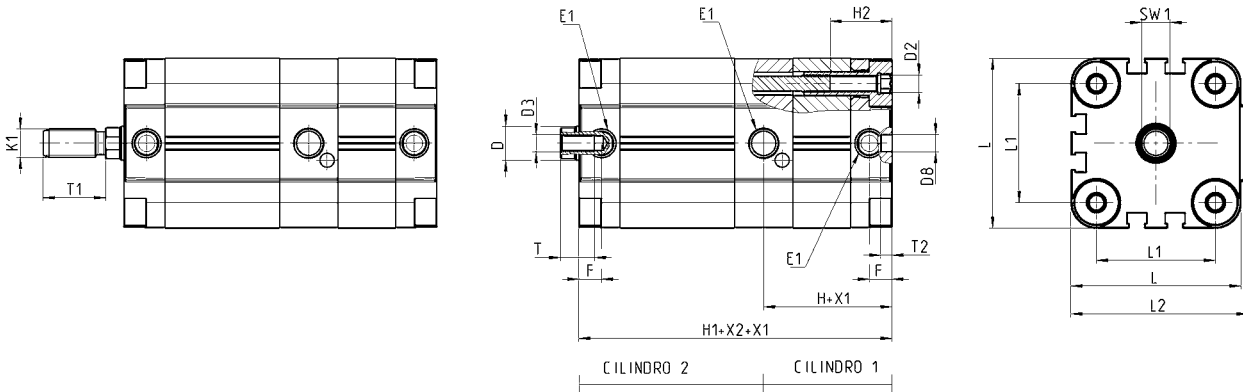
Cylinders Series 31 - multi-position version

Mod. 31F2A...X1/X2/X3/X4N

Mod. 31M2A...X1/X2/X3/X4N



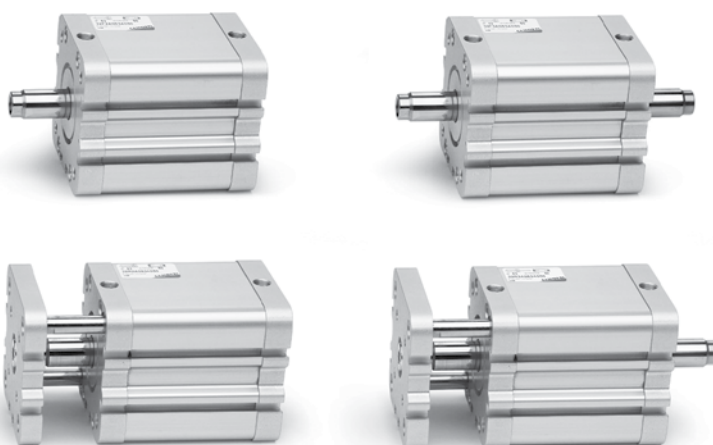
X1= stroke of stage 1
 X2= total stroke of application scheme
 + = add the stroke



DIMENSIONS (mm)																	
Ø	ØD	D2	D3	ØD8	E1	F	H+x1	H1+x2+x1	H2	K1	L	L1	L2	T	T1	T2	SW1
12	6	M4	M3	6	M5	8	34,5	63,5	12,5	M6	29	18	30	6	16	4	5
16	8	M4	M4	6	M5	8	34,5	63,5	12,5	M8	29	18	30	8	20	4	7
20	10	M5	M5	6	M5	8	43,5	78	17	M10x1,25	36	22	37,5	10	22	4	8
25	10	M5	M5	6	M5	8	39,1	78	17	M10x1,25	40	26	41,5	10	22	4	8
32	12	M6	M6	6	G1/8	8	46,5	90,5	21,5	M10x1,25	50	32	52	12	22	4	10
40	12	M6	M6	6	G1/8	8	45	90,5	21,5	M10x1,25	60	42	62,5	12	22	4	10
50	16	M8	M8	6	G1/8	8	47	90,5	18	M12x1,25	68	50	71	12	24	4	13
63	16	M8	M8	8	G1/8	8	50	100,5	26	M12x1,25	87	62	91	12	24	4	13
80	20	M10	M10	8	G1/8	8,5	59	112	26,5	M16x1,5	107	82	111	16	32	4	17
100	25	M12	M12	8	G1/4	10,5	71	135,5	26,5	M20x1,5	128	103	133	20	40	4	22

Compact Cylinders, ISO 21287 compliant Series 32

Single or double-acting, non-rotating
 Ø 20, 25, 32, 40, 50, 63, 80, 100.



- » Compact design
- » Wide variety of models available in different diameters
- » In compliance with ISO 21287

Series 32 cylinders, thanks to their compactness, are suitable for installation in confined spaces. Being in compliance with the ISO 21287 Standard, the cylinders Series 32 have the advantage that they can be used in conjunction with mountings/accessories suitable for other standard cylinders DIN/ISO 6431 / VDMA 24562 (Series 60/61).

GENERAL DATA

Construction	compact profile
Operation	Single or double acting, magnetic
Materials	body and end-caps = anodized AL rod = rolled stainless steel AISI 303 piston = AL rod seal, OR end-block and piston seal = PU high temperatures: rod seal, OR end-block and piston in FKM (140°C)
Mounting	with threaded holes on the end blocks flange - feet - trunnion
Stroke min and max (1)	Series 32F, 32M, 32R Ø20-25 = 5-300 mm Series 32F, 32M, 32R Ø32-40-50-63 = 5-400 mm Series 32F, 32M, 32R Ø80-100 = 5-500 mm
Operating temperature	0°C – 80°C (with dry air -20°C), (32 - 176°F, with dry air -4°F)
Operating pressure	1 – 10 bar (double-acting) / 2-10 bar (single-acting), (14 - 145 psi, DA : 29 - 145 psi, SA)
Fluid	clean air without lubrication. If lubricated air is used it is recommended to use oil ISOVG32. Once applied the lubrication should never be interrupted.
Operation speed	10 – 1000mm/sec. (without load)

(1) the minimum stroke for the use of the sensors is 10 mm.

STANDARD STROKES FOR CYLINDERS SERIES 32

✕= Non-rotating ●= Double-acting, male/female rod thread;
 ■= Single-acting, front/rear spring, male/female rod thread.

Ø	5	10	15	20	25	30	40	50	60	80
20	✕●■	✕●■	✕●■	✕●■	✕●■	✕●	✕●	✕●		
25	✕●■	✕●■	✕●■	✕●■	✕●■	✕●	✕●	✕●		
32	✕●■	✕●■	✕●■	✕●■	✕●■	✕●	✕●	✕●	✕●	✕●
40	✕●■	✕●■	✕●■	✕●■	✕●■	✕●	✕●	✕●	✕●	✕●
50		✕●■	✕●■	✕●■	✕●■	✕●	✕●	✕●	✕●	✕●
63		✕●■	✕●■	✕●■	✕●■	✕●	✕●	✕●	✕●	✕●
80		✕●■	✕●■	✕●■	✕●■	✕●	✕●	✕●	✕●	✕●
100		✕●■	✕●■	✕●■	✕●■	✕●	✕●	✕●	✕●	✕●

CODING EXAMPLE

32	M	2	A	032	A	050	
----	---	---	---	-----	---	-----	--

32	SERIES
M	VERSION M = male thread F = female thread R = antirotation with flange (not single-acting)
2	OPERATION 1 = single-acting 2 = double-acting 3 = double-acting through rod 4 = single-acting rear spring
A	MATERIALS anodized aluminium body, end blocks and piston – rod seal, OR end block and piston seal in PU
032	BORES 020 = 20 mm 025 = 25 mm 032 = 32 mm 040 = 40 mm 050 = 50 mm 063 = 63 mm 080 = 80 mm 100 = 100 mm
A	CONSTRUCTION A = standard
050	STROKE in mm - see table = standard S = special V = FKM rod seal W = high temperatures (with FKM seals for high temperatures 140°C)

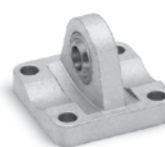
ACCESSORIES FOR CYLINDERS SERIES 32

Piston rod socket joint
Mod. GY

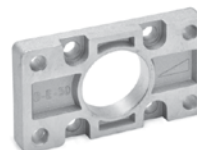
Piston rod nut Mod. U



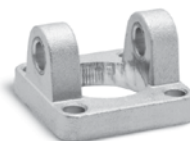
Clevis pin Mod. S

Rear trunnion ball-joint
Mod. RCoupling piece
Mod. GKF

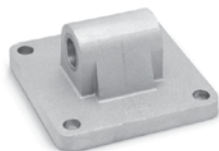
Swivel ball joint Mod. GA

90° male trunnion
Mod. ZCSwivel combination
Mod. IFront and rear flange
Mod. D-ESelf aligning rod
Mod. GK90° swivel combination
for trunnion Mod. I

Foot mount Mod. B

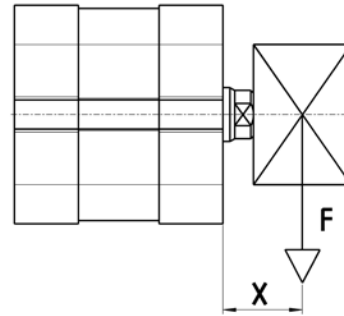
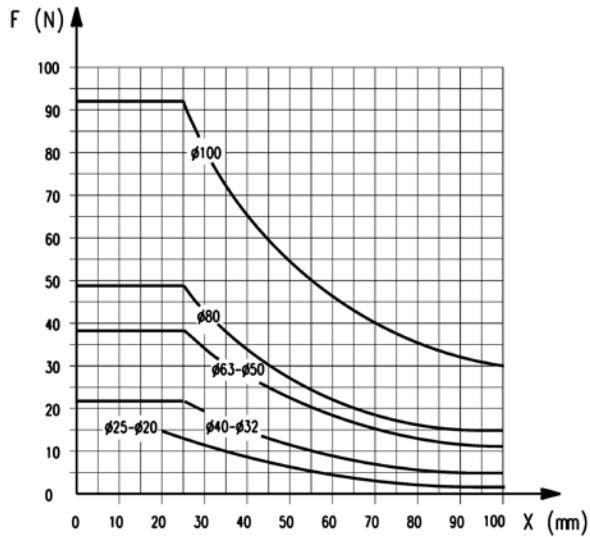
Front female trunnion
Mod. H and C-HRear female trunnion
Mod. C and C-H

Rod fork end Mod. G

Rear trunnion male
Mod. L

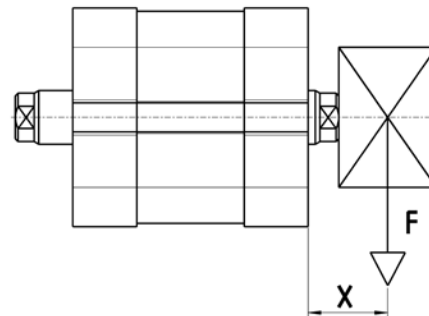
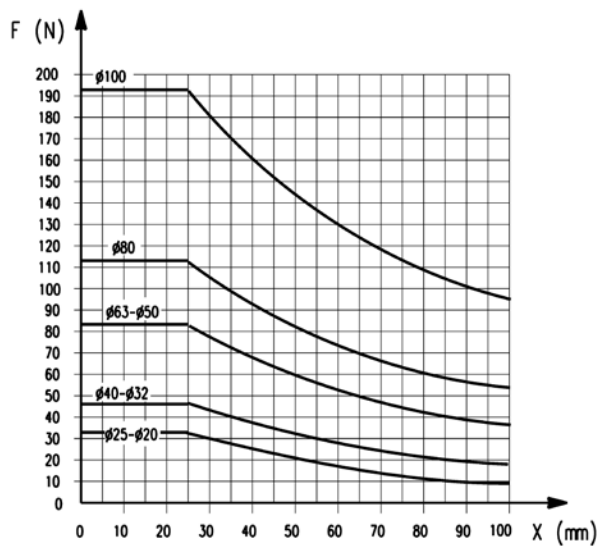
All accessories are supplied separately.

APPLICABLE LOADS



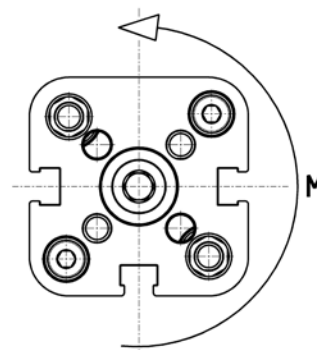
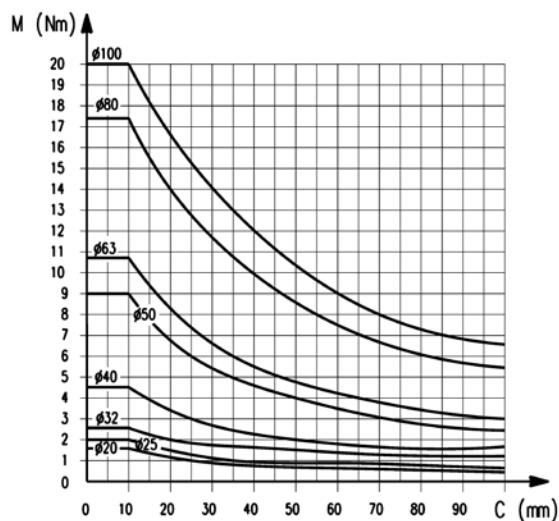
Standard.
Transversal load (F) dependant on stroke (X)

APPLICABLE LOADS



Through-rod.
Transversal load (F) dependant on stroke (X)

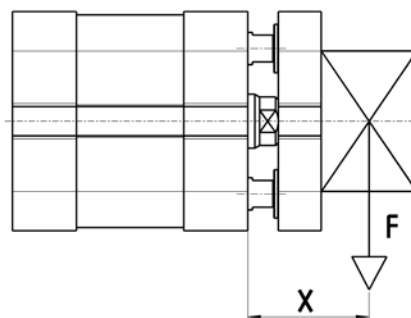
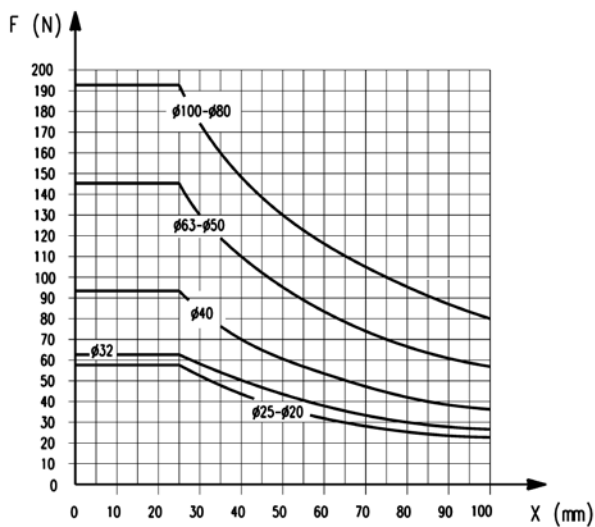
APPLICABLE LOADS



It is possible to use longer strokes as indicated in the general data (excluding radial loads and torque moments). When imposing radial loads on the cylinder it is important to respect the maximum stroke of the centre of gravity. In the presence of torque moments, respect the maximum stroke as shown in the diagrams.

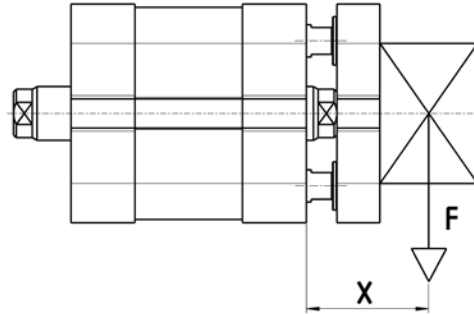
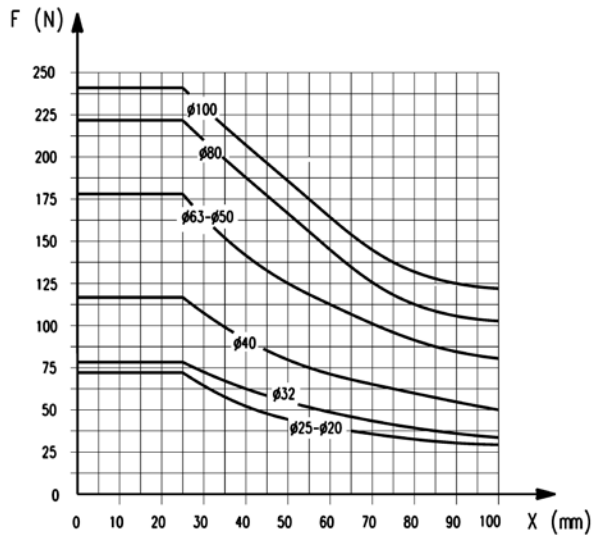
Torque moment (M) dependant on stroke (C).

APPLICABLE LOADS



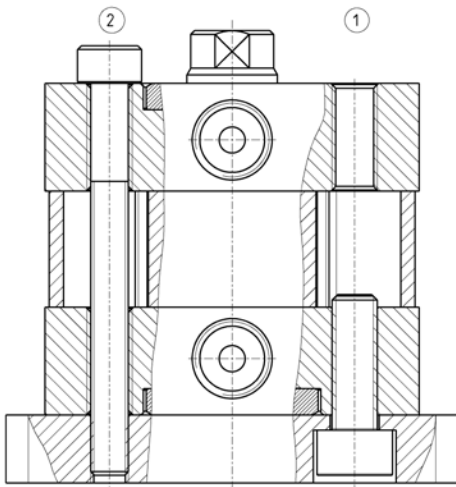
Anti-rotation.
Transversal load (F) dependant on stroke (X).

APPLICABLE LOADS



Anti-rotation through-rod.
Transversal load (F) dependant on stroke (X).

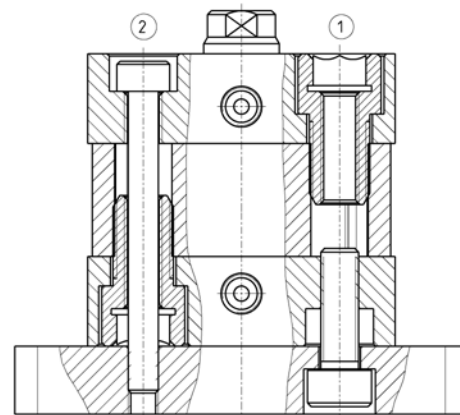
MOUNTING EXAMPLE



Mounting example for mounting cylinders Ø 32; 40; 50; 63; 80; 100.

1 = Rear mounting
2 = Through mounting

N.B. For through mounting with screws through the cylinder it is recommended to use non-magnetic screws.



Mounting example for mounting cylinders Ø 20 – 25.

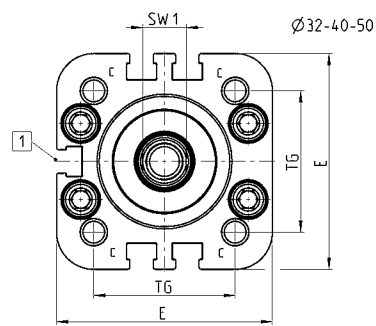
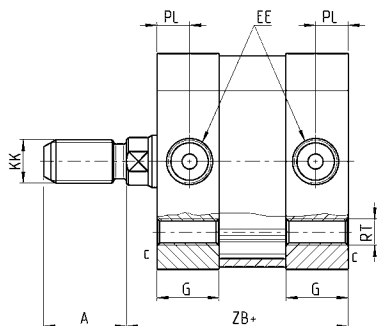
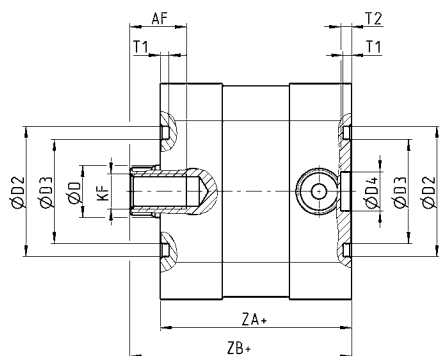
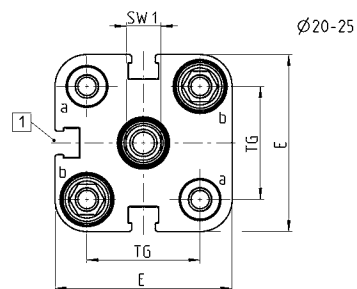
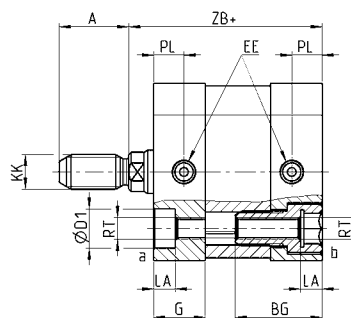
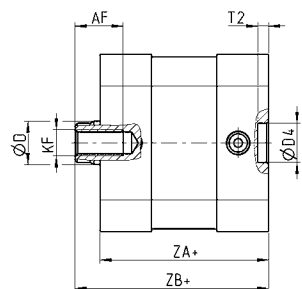
1 = Rear mounting
2 = Through mounting

N.B. For through mounting with screws through the cylinder it is recommended to use non-magnetic screws.

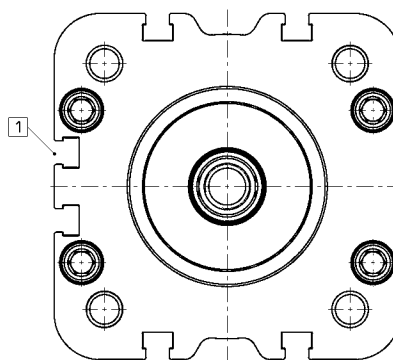
Compact magnetic cylinders Mod. 32F and 32M



+ = add the stroke
1 = groove for sensor



Ø63-80-100



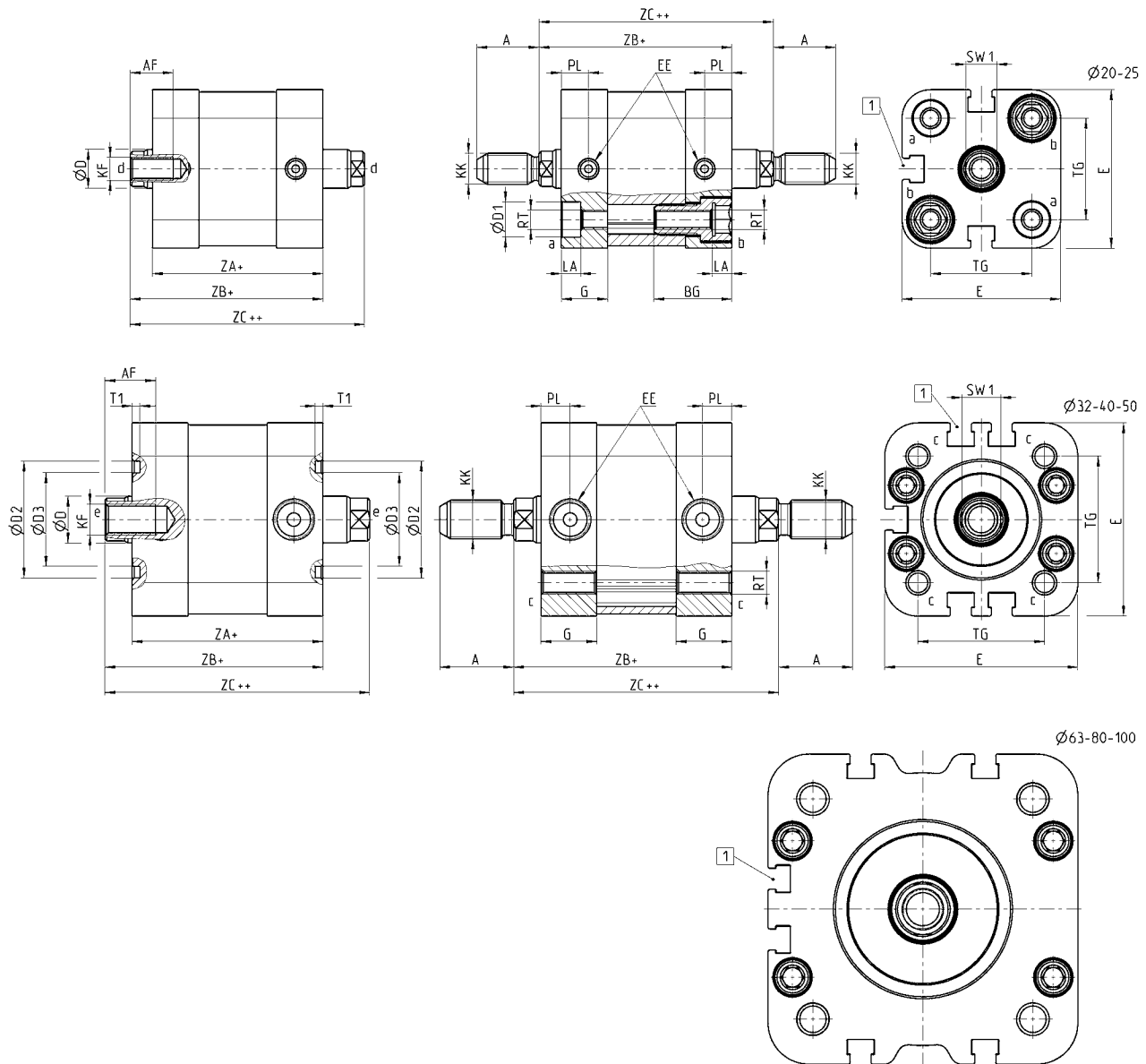
DIMENSIONS (mm)

Ø	A	AF	BG	G	ØD	D1	ØD2	ØD3	ØD4	E	EE	KF	KK	LA	PL	RT	SW1	T1	T2	TG	ZA	ZB
20	16	11	20	10,9	10	9	-	-	9	35,8	M5	M6	M8X1,25	5	6,5	M5	8	-	2,5	22	36,8	42,5
25	16	11	20	11,9	10	9	-	-	9	40,7	M5	M6	M8X1,25	5	7	M5	8	-	2,5	26	38,8	44,5
32	19	13	-	14,3	12	-	30	24	9	49,6	G1/8	M8	M10X1,25	-	7,6	M6	10	2	2,5	32,5	44	51
40	19	13	-	14,3	12	-	35	29	9	57	G1/8	M8	M10X1,25	-	7,6	M6	10	2	2,5	38	45	52
50	22	16	-	14,3	16	-	40	34	12	69,6	G1/8	M10	M12X1,25	-	7,6	M8	13	2	3	46,5	45	53
63	22	16	-	14	16	-	45	39	12	79,6	G1/8	M10	M12X1,25	-	7,6	M8	13	2	3	56,5	49	57
80	28	20	-	14,8	20	-	45	39	12	95,6	G1/8	M12	M16X1,5	-	7,7	M10	17	2	3	72	54	63,5
100	28	20	-	17,8	25	-	55	49	12	115,6	G1/8	M12	M16X1,5	-	8	M10	22	2	3	89	66,8	76,5

Compact magnetic cylinders Mod. 32F3 and 32M3

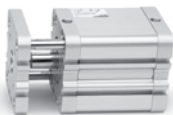


+ = add the stroke
 ++ = add the stroke two times
 1 = groove for sensor

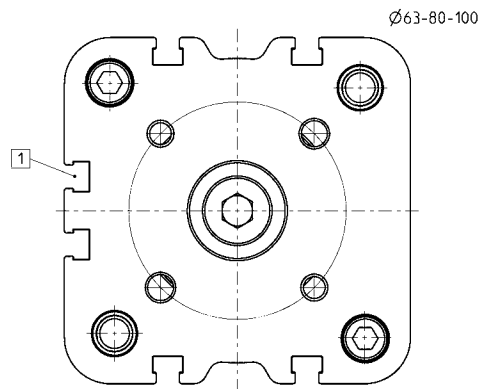
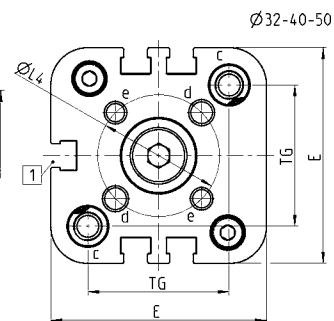
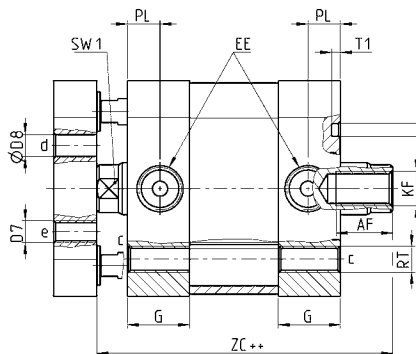
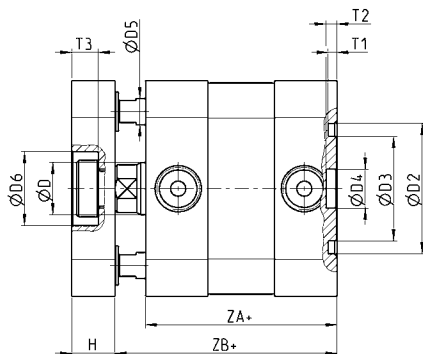
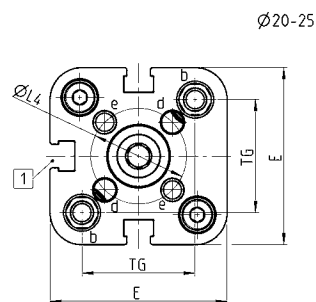
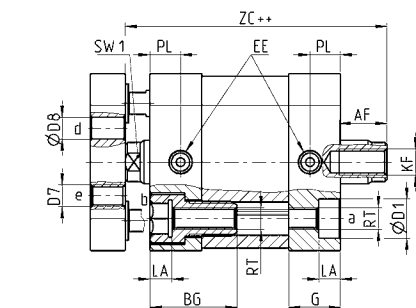
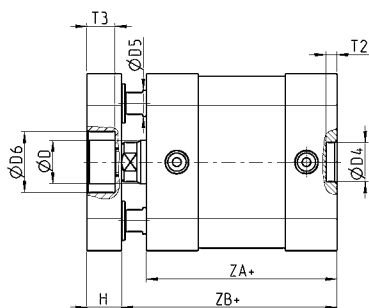


DIMENSIONS (mm)																					
Ø	A	AF	BG	G	ØD	ØD1	ØD2	ØD3	E	EE	KF	KK	LA	PL	RT	SW1	T1	TG	ZA	ZB	ZC
20	16	11	20	10,9	10	9	-	-	35,8	M5	M6	M8X1,25	5	6,5	M5	8	-	22	36,8	42,5	48,2
25	16	11	20	11,9	10	9	-	-	40,7	M5	M6	M8X1,25	5	7	M5	8	-	26	38,8	44,5	50,2
32	19	13	-	14,3	12	-	30	24	49,6	G1/8	M8	M10X1,25	-	7,6	M6	10	2	32,5	44	51	58
40	19	13	-	14,3	12	-	35	29	57	G1/8	M8	M10X1,25	-	7,6	M6	10	2	38	45	52	59
50	22	16	-	14,3	16	-	40	34	69,6	G1/8	M10	M12X1,25	-	7,6	M8	13	2	46,5	45	53	61
63	22	16	-	14	16	-	45	39	79,6	G1/8	M10	M12X1,25	-	7,6	M8	13	2	56,5	49	57	65
80	28	20	-	14,8	20	-	45	39	95,6	G1/8	M12	M16X1,5	-	7,7	M10	17	2	72	54	63,5	73
100	28	20	-	17,8	25	-	55	49	115,6	G1/8	M12	M16X1,5	-	8	M10	22	2	89	66,8	76,5	86,2

Compact magnetic cylinders Mod. 32R



+ = add the stroke
 ++ = add the stroke two times
 1 = groove for sensor



DIMENSIONS (mm)

Ø	AF	BG	G	ØD	ØD1	ØD2	ØD3	ØD4	ØD5	ØD6	D7	ØD8	E	EE	H	KF	LA	ØL4	PL	RT	SW1	T1	T2	T3	TG	ZA	ZB	ZC
20	11	20	10,9	10	9	-	-	9	6	-	M4	4	35,8	M5	8	M6	5	17	6,5	M5	8	-	2,5	-	22	36,8	42,5	48,2
25	11	20	11,9	10	9	-	-	9	6	14	M5	5	40,7	M5	8	M6	5	22	7	M5	8	-	2,5	6,5	26	38,8	44,5	50,2
32	13	-	14,3	12	-	30	24	9	6	17	M5	5	49,6	G1/8	10	M8	-	28	7,6	M6	10	2	2,5	6	32,5	44	51	58
40	13	-	14,3	12	-	35	29	9	6	17	M5	5	57	G1/8	10	M8	-	33	7,6	M6	10	2	2,5	6	38	45	52	59
50	16	-	14,3	16	-	40	34	12	10	22	M6	6	69,6	G1/8	12	M10	-	42	7,6	M8	13	2	3	7	46,5	45	53	61
63	16	-	14	16	-	45	39	12	10	22	M6	6	79,6	G1/8	12	M10	-	50	7,6	M8	13	2	3	7	56,5	49	57	65
80	20	-	14,8	20	-	45	39	12	12	24	M8	8	95,6	G1/8	14	M12	-	65	7,7	M10	17	2	3	10,5	72	54	63,5	73
100	20	-	18	25	-	55	49	12	12	24	M10	10	115,6	G1/8	14	M12	-	80	8	M10	22	2	3	10,5	89	66,8	77,5	86,2

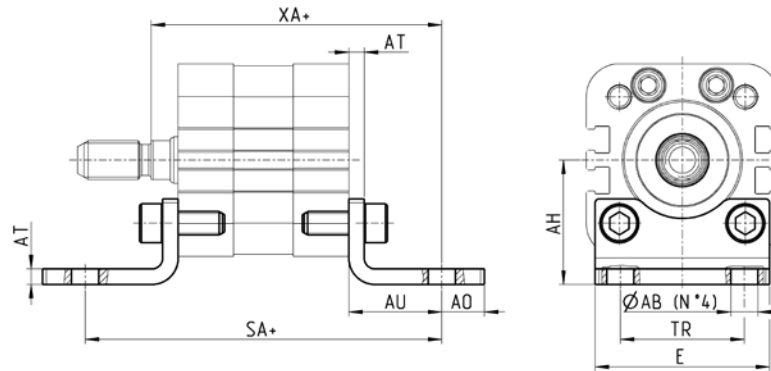
Foot mount Mod. B

Material: zinc-plated steel.



Supplied with:
2x feet
4x screws

+ = add the stroke



DIMENSIONS (mm)

Mod.	Ø	ØAB	AH	AO	AU	AT	E	TR	SA	XA
B-32-20	20	6,5	27	9	16	4	35	22	68,8	58,5
B-31-25	25	6,5	29	9	16	4	39	26	70,8	60,5
B-41-32	32	7	32	11	24	4	45	32	92	75
B-41-40	40	10	36	15	28	4	53,5	36	101	80
B-41-50	50	10	45	15	32	4	62,5	45	109	85
B-41-63	63	10	50	15	32	5	73	50	113	89
B-41-80	80	12	63	20	41	6	92	63	136	104,5
B-41-100	100	14,5	71	25	41	6	108,5	71	148,8	117,5

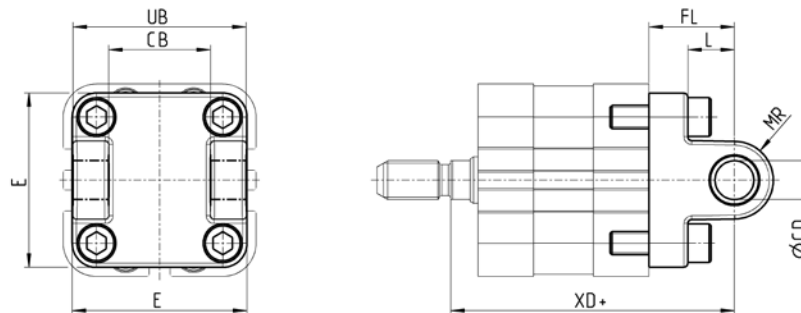
Rear female trunnion Mod. C and C-H

Material: Aluminium.



Supplied with:
1x female trunnion
4x screws

+ = add the stroke

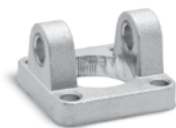


DIMENSIONS (mm)

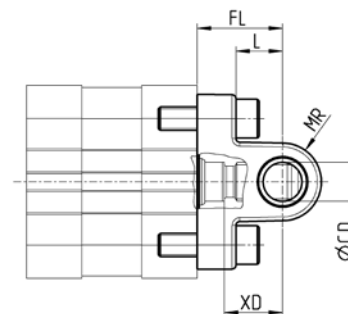
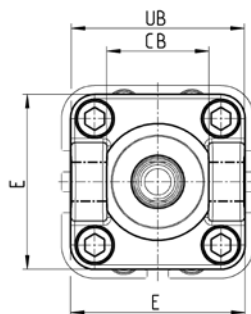
Mod.	Ø	ØCD	E	CB	UB	L	FL	MR	XD
C-41-32	32	10	45	26	45	12	22	10	73
C-41-40	40	12	53,5	28	52	15	25	12	77
C-41-50	50	12	62,5	32	60	15	27	13	80
C-H-41-63	63	16	73	40	70	20	32	17	89
C-H-41-80	80	16	92	50	90	24	36	17	99,5
C-H-41-100	100	20	108,5	60	110	29	41	21	117,5

Front female trunnion Mod. H and C-H

Material: Aluminium.



Supplied with:
1x female trunnion
4x screws



DIMENSIONS (mm)

Mod.	Ø	ØCD	E	CB	UB	L	FL	MR	XD
H-41-32	32	10	45	26	45	12	22	10	15
H-41-40	40	12	53,5	28	52	15	25	12	18
H-41-50	50	12	62,5	32	60	15	27	13	19
H-60-63	63	16	73	40	70	20	32	17	24
C-H-41-80	80	16	92	50	90	24	36	17	26,5
C-H-41-100	100	20	108,5	60	110	29	41	21	31,3

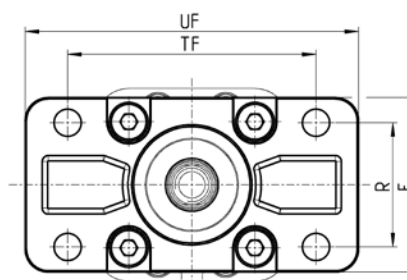
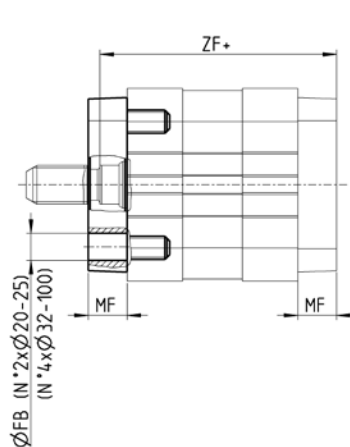
Front and rear flange Mod. D-E

Material: zinc-plated steel for Ø 20 - Ø 25; Aluminium for Ø 32 - Ø 100.



Supplied with:
1x flange
4x screws

+ = add the stroke

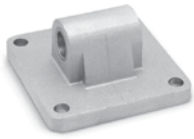


DIMENSIONS (mm)

Mod.	Ø	ØFB	E	MF	R	TF	UF	ZF
D-E-32-20	20	6,6	36	10	-	55	70	52,5
D-E-32-25	25	6,6	40	10	-	60	76	54,5
D-E-41-32	32	7	45	10	32	64	86	61
D-E-41-40	40	9	52	10	36	72	88	62
D-E-41-50	50	9	63	12	45	90	110	65
D-E-41-63	63	9	73	12	50	100	116	69
D-E-41-80	80	12	95	16	63	126	148	79,5
D-E-41-100	100	14	115	16	75	150	176	92,5

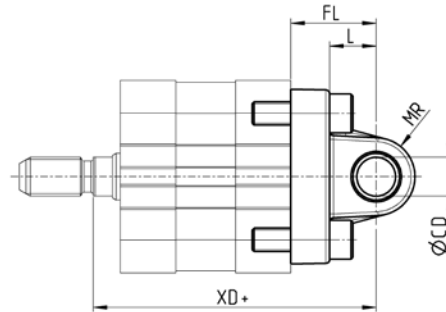
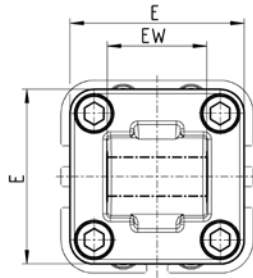
Rear trunnion male Mod. L

Material: Aluminium.



Supplied with:
1x male trunnion
4x screws

+ = add the stroke

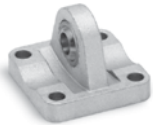


DIMENSIONS (mm)

Mod.	Ø	Ø CD	E	EW	L	FL	MR	XD
L-32-20	20	8	34	16	14	20	8	62,5
L-32-25	25	8	38	16	14	20	8	64,5
L-41-32	32	10	45	26	12	22	10	73
L-41-40	40	12	53,5	28	15	25	13	77
L-41-50	50	12	62,5	32	15	27	13	80
L-41-63	63	16	73	40	20	32	17	89
L-41-80	80	16	92	50	24	36	17	99,5
L-41-100	100	20	108,5	60	29	41	21	117,5

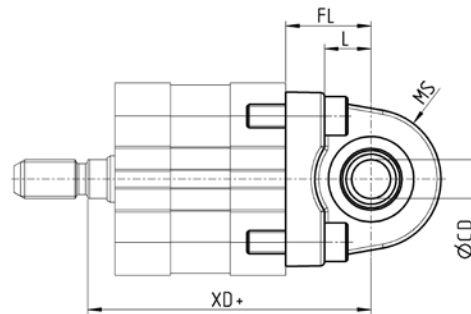
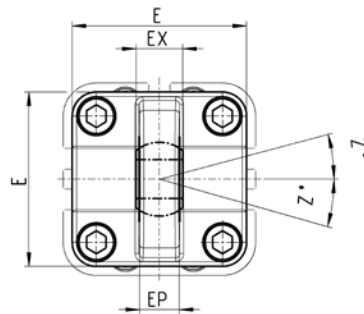
Rear trunnion ball-joint Mod. R

Material: Aluminium.



Supplied with:
1x ball joint
4x screws

+ = add the stroke



DIMENSIONS (mm)

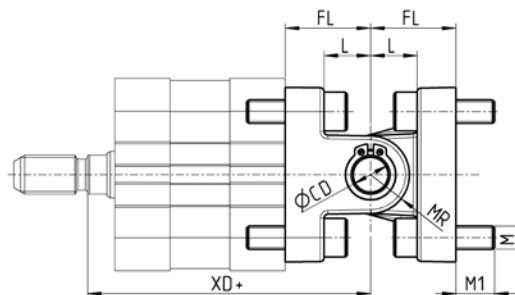
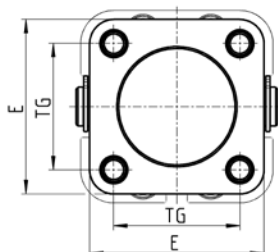
Mod.	Ø	ØCD	E	EX	EP	L	FL	MS	XD	Z°
R-41-32	32	10	45	14	10,5	12	22	18	73	4
R-41-40	40	12	53,5	16	12	15	25	18	77	4
R-41-50	50	12	62,5	16	12	15	27	21	80	4
R-41-63	63	16	73	21	15	20	32	23	89	5
R-41-80	80	16	92	21	15	24	36	36	99,5	5
R-41-100	100	20	108,5	25	18	29	41	41	117,5	5

Accessory combination Mod. I (combination of C + L + S)

Material: Aluminium.



+ = add the stroke



DIMENSIONS (mm)

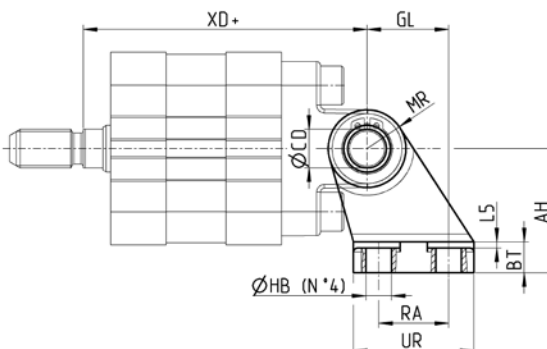
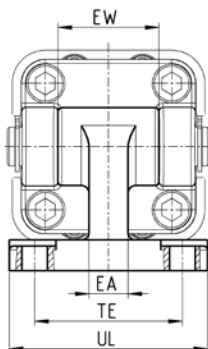
Mod.	Ø	ØCD	E	L	FL	M	M1	MR	TG	XD
I-41-32	32	10	45	12	22	M6	10	10	32,5	73
I-41-40	40	12	53,5	15	25	M6	10	12	38	77
I-41-50	50	12	62,5	15	27	M8	13	13	46,5	80
I-41-63	63	16	73	20	32	M8	13	17	56,5	89
I-41-80	80	16	92	24	36	M10	16	17	72	99,5
I-41-100	100	20	108,5	29	41	M10	16	21	89	117,5

90° male trunnion Mod. ZC

Material: Aluminium.

Supplied with:
1x male support

+ = add the stroke



DIMENSIONS (mm)

Mod.	Ø	AH	BT	ØCD	EA	EW	GL	ØHB	L5	MR	RA	UL	UR	TE	XD
ZC-32	32	32	8	10	10	26	21	6,6	1,6	10	18	51	31	38	73
ZC-40	40	36	10	12	15	28	24	6,6	1,6	11	22	54	35	41	77
ZC-50	50	45	12	12	16	32	33	9	1,6	13	30	65	45	50	80
ZC-63	63	50	14	16	16	40	37	9	1,6	15	35	67	50	52	89
ZC-80	80	63	14	16	20	50	47	11	2,5	15	40	86	60	66	99,5
ZC-100	100	71	17	20	20	60	55	11	2,5	19	50	96	70	76	117,5

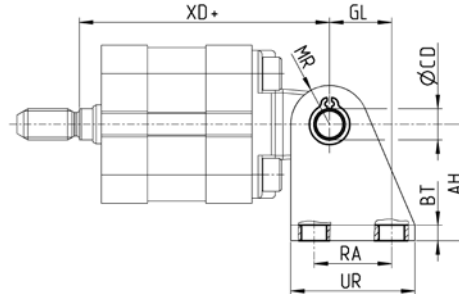
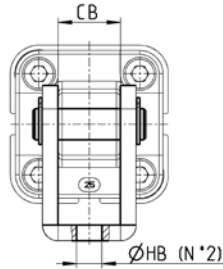
90° swivel combination for trunnion Mod. I

Material: zinc-plated steel.



Supplied with:
1x female support
2x C-clips
1x clevis pin

+ = add the stroke



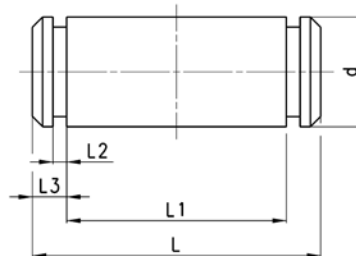
DIMENSIONS (mm)

Mod.	Ø	AT	BT	ØCD	CB	GL	ØHB	MR	RA	UR	XD
I-20-25	20	30	4	8	16,1	16	6,5	10	20	32	62,5
I-20-25	25	30	4	8	16,1	16	6,5	10	20	32	64,5

Clevis pin Mod. S



Supplied with:
1x clevis pin (stainless steel)
2x C-clips (plain carbon steel)

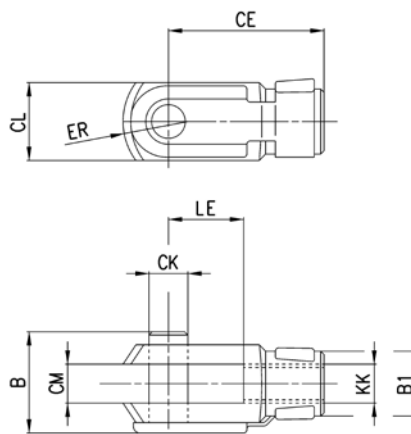


DIMENSIONS (mm)

Mod.	Ø	D	L	L1	L2	L3
S-32	32	10	52	46	1,1	3
S-40	40	12	59	53	1,1	3
S-50	50	12	67	61	1,1	3
S-63	63	16	77	71	1,1	3
S-80	80	16	97	91	1,1	3
S-100	100	20	121	111	1,3	5

Rod fork end Mod. G

Material: zinc-plated steel ISO 8140.

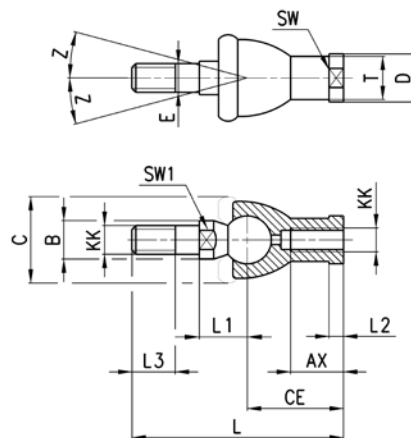


DIMENSIONS (mm)

Mod.	Ø	ØCK	LE	CM	CL	ER	CE	KK	B	ØB1
G-20	20-25	8	16	8	16	10	32	M8X1,25	22	14
G-25-32	32-40	10	20	10	20	12	40	M10x1,25	26	18
G-40	50-63	12	24	12	24	14	48	M12x1,25	32	20
G-50-63	80-100	16	32	16	32	19	64	M16x1,5	40	26

Piston rod socket joint Mod. GY

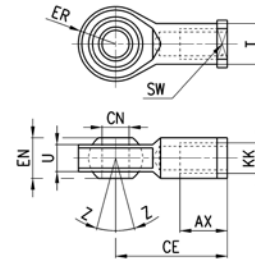
Material: zinc-plated steel and Zinc-Aluminum alloy.



DIMENSIONS (mm)

Mod.	Ø	KK	L	CE	L2	AX	SW	SW1	L1	L3	ØT	ØD	E	ØB	ØC	Z
GY-20	20-25	M8X1,25	65	32	5	16	14	10	16	12	12,5	13	6	10	20	15
GY-32	32-40	M10X1,25	74	35	6,5	18	17	11	19,5	15	15	19	10	14	28	15
GY-40	50-63	M12X1,25	84	40	6,5	20	19	17	21	17	17,5	22	12	19	32	15
GY-50-63	80-100	M16X1,5	112	50	8	27	22	19	27,5	23	22	27	16	22	40	11

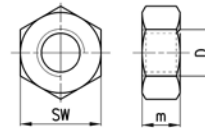
Swivel ball joint Mod. GA



DIMENSIONS (mm)

Mod.	Ø	ØCN	U	EN	ER	AX	CE	KK	ØT	Z	SW
GA-20	20-25	8	9	12	12	16	36	M8X1,25	12,5	6,5	14
GA-32	32-40	10	10,5	14	14	20	43	M10x1,25	15	6,5	17
GA-40	50-63	12	12	16	16	22	50	M12X1,25	17,5	6,5	19
GA-50-63	80-100	16	15	21	21	28	64	M16x1,5	22	7,5	22

Piston rod nut Mod. U



DIMENSIONS (mm)

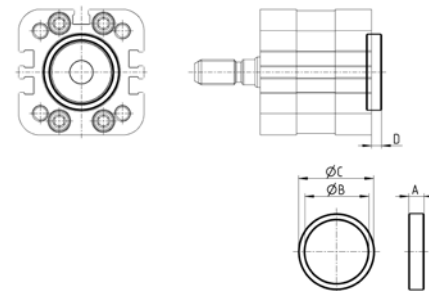
Mod.	Ø	D	M	SW
U-20	20-25	M8X1,25	5	13
U-25-32	32-40	M10X1,25	6	17
U-40	50-63	M12X1,25	7	19
U-50-63	80-100	M16X1,5	8	24

Centering sleeve Mod. TR

Designed for the centering of both the rear and front end caps with brackets Mod. B/D-E/C/C-H/H/L/R, as for the centering of the cylinder while mounting.



Material: anodized AL



DIMENSIONS (mm)

Mod.	Ø	A	ØB	ØC	D
TR-32-32	32	6	25	30	4
TR-32-40	40	6	30	35	4
TR-32-50	50	6	35	40	4
TR-32-63	63-80	7	40	45	5
TR-32-100	100	7	50	55	5

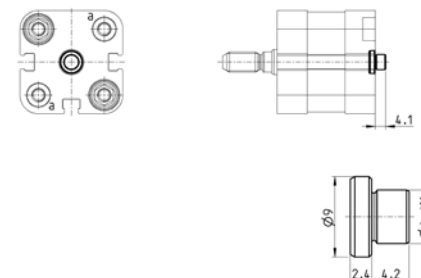
Supplied with:
1x centering ring

Centering pin Mod. TS-32-20

Designed both for the centering of the rear end caps with brackets L-32-20 / L-32-25 as for the centring of the cylinder while mounting.

Note: also suitable to use in holes "a" of the rear and front end caps of cylinders Ø20-Ø25 or in the central hole of the rear end caps of cylinders Ø32-Ø40.

Material: anodized AL



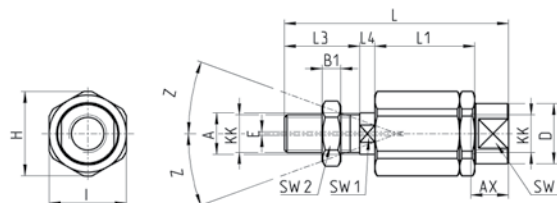
Supplied with:
1x centering pin

Mod.
TS-32-20

Self aligning rod Mod. GK

Only for cylinders with male rod.

Material: zinc-plated steel.

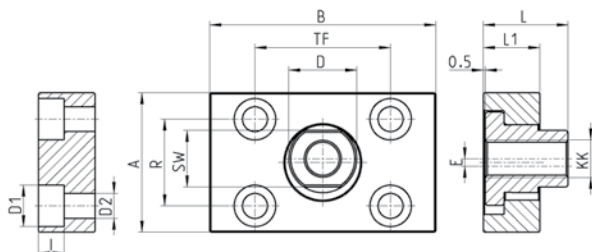
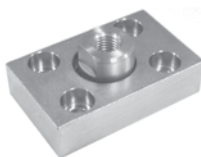


DIMENSIONS (mm)

Mod.	Ø	KK	L	L1	L3	L4	ØA	ØD	H	I	SW	SW1	SW2	B1	AX	Z	E
GK-20	20-25	M8x1,25	57	26	21	5	8	12,5	19	17	11	7	13	4	16	4	2
GK-25-32	32-40	M10x1,25	71,5	35	20	7,5	14	22	32	30	19	12	17	5	22	4	2
GK-40	50-63	M12x1,25	75,5	35	24	7,5	14	22	32	30	19	12	19	6	22	4	2
GK-50-63	80-100	M16x1,5	104	53	32	10	22	32	45	41	27	20	24	8	30	3	2

Coupling piece Mod. GKF

Material: zinc-plated steel.



DIMENSIONS (mm)

Mod.	Ø	KK	A	B	R	TF	L	L1	I	ØD	ØD1	ØD2	SW	E
GKF-20	20-25	M8x1,25	30	35	20	25	22,5	10	-	14	5,5	-	13	1,5
GKF-25-32	32-40	M10x1,25	37	60	23	36	22,5	15	6,8	18	11	6,6	15	2
GKF-40	50-63	M12x1,25	56	60	38	42	22,5	15	9	20	15	9	15	2,5
GKF-50-63	80-100	M16x1,5	80	80	58	58	26,5	15	10,5	25	18	11	22	2,5

Compact Cylinders ISO 21287 compliant Tandem and Multi-Position Versions Series 32

Double-acting, magnetic, $\varnothing$ 25, 40, 63, 100.



- » Compact design
- » Wide variety of models available in different diameters
- » In compliance with ISO 21287

The extreme compact Tandem version allows to obtain up to 2 times the force of a normal cylinder, while the multi-position version allows to obtain up to three positions with only one cylinder.

The cylinder Series 32 Tandem and multi-position versions are, thanks to their compactness, suitable to be installed within confined spaces. They can be used in conjunction with the same mounting elements of other standard cylinders DIN/ISO 6431/VDMA 24562 (Series 60/61).

GENERAL DATA

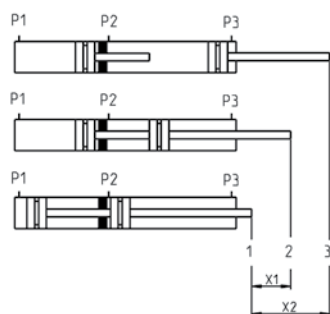
Construction	compact profile
Operation	double-acting, magnetic
Material	body and end-caps = anodized AL rod = rolled stainless steel AISI 303 piston = anodized AL rod seal, OR end-block and piston seal = PU
Mounting	with threaded holes on the end blocks flange – feet – trunnion
Strokes min. and max. (1)	Series 32F, 32M $\varnothing$ 25 = 5-300 mm (dimension x2)
Multiposition	Series 32F, 32M $\varnothing$ 40 - 63 = 5-400 mm (dimension x2) Series 32F, 32M $\varnothing$ 100 = 5-500 mm (dimension x2)
Strokes min. and max. (1)	Series 32F, 32M $\varnothing$ 25 = 5-80 mm
Tandem	Series 32F, 32M $\varnothing$ 40 - 63 - 100 = 5-100 mm
Operating temperature	0°C – 80°C (with dry air -20°C), (32 – 176°F, with dry air -4°F)
Operating pressure	1 – 10 bar, (14 – 145 psi)
Fluid	clean air, without lubrication. If lubricated air is used, it is recommended to use oil ISOVG32. Once applied the lubrication should never be interrupted.
Operating speed	10 – 1000 mm/sec (without load)

(1) the minimum stroke for the use of the sensors is 10 mm.

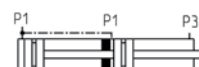
CODING EXAMPLE

32	M	2	A	040	A	050	N	2
32	SERIES: compact magnetic							
M	VERSION: M = male rod thread F = female rod thread							
2	OPERATION: 2 = double-acting							
A	MATERIALS: A = anodized aluminium body, end blocks and piston – rod seal, OR end block and piston seal in PU							
040	BORE: 025 = 25 mm 040 = 40 mm 063 = 63 mm 100 = 100 mm							
A	CONSTRUCTION A = standard							
050	STROKE in mm - tandem stroke in mm - multi-position X1mm/X2mm - insert the strokes without the initial 0 (see application schemes).							
N	Tandem and multi-position							
2	STAGES (only for tandem) 2 = 2 stages							

Operation scheme



Multi-position
Example: 32M2A040A25/75N
X1 = 25 mm
X2 = 75 mm

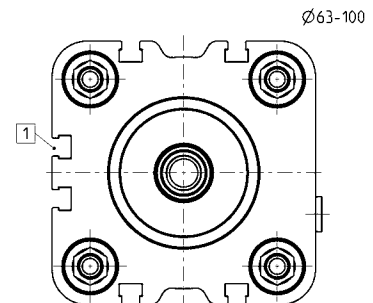
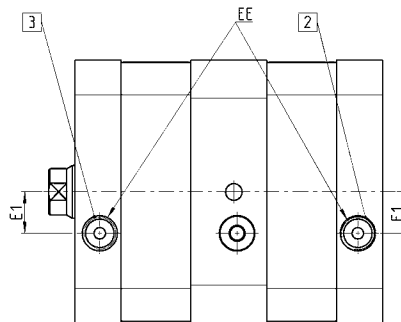
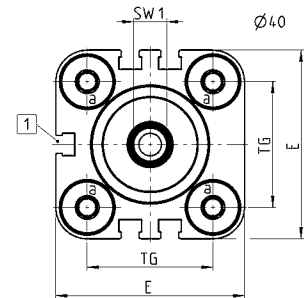
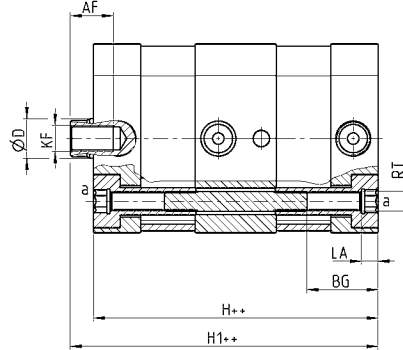
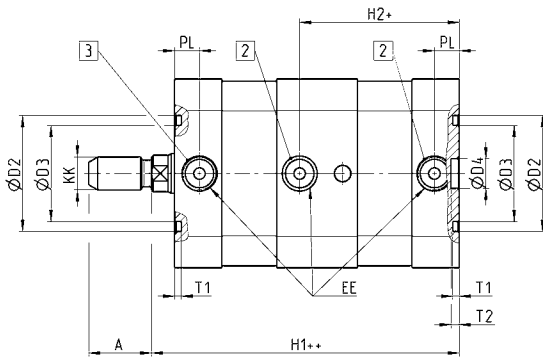
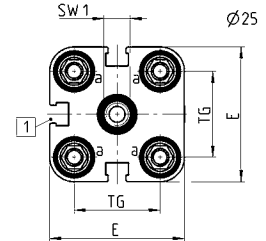
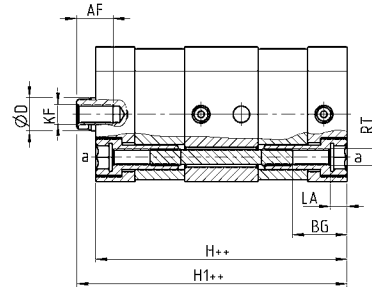
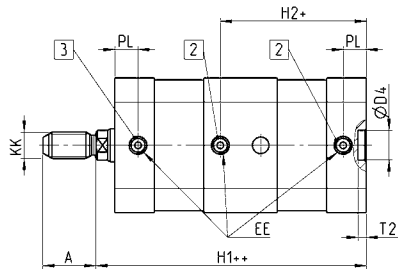


Tandem
Example: 32M2A040A050N2
Stroke = 50 mm

Tandem cylinders Mod. 32F2A/32M2A...N2



+ = add the stroke
 ++ = add the stroke two times
 1 = Groove for sensor
 2 = Positive stroke
 3 = Negative stroke



DIMENSIONS (mm)

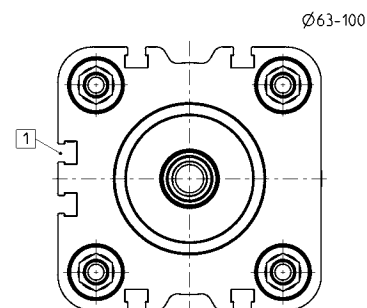
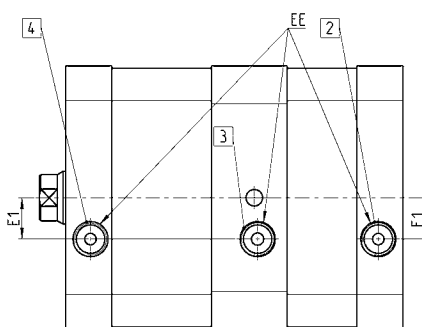
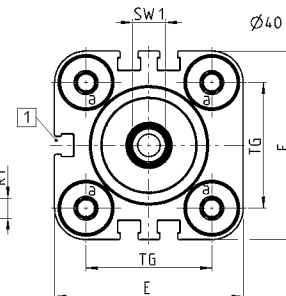
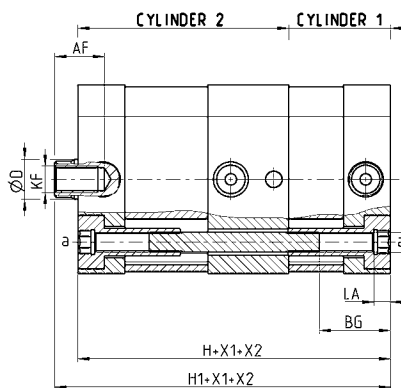
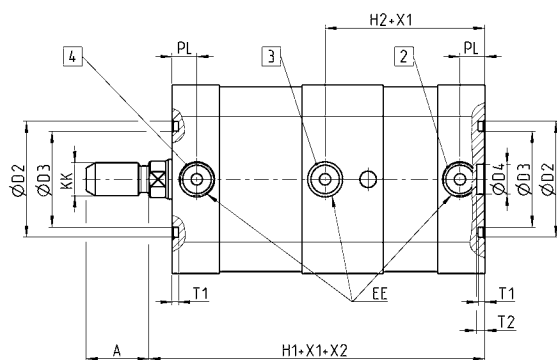
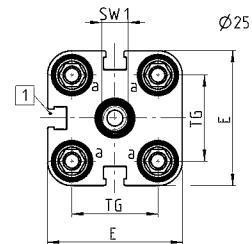
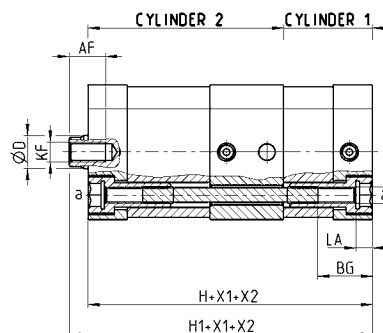
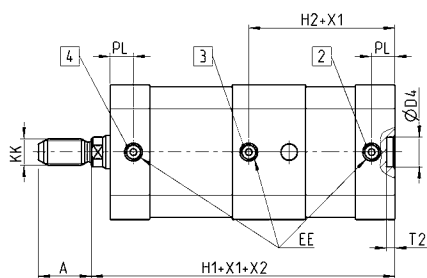
Ø	A	AF	BG	ØD	ØD2	ØD3	ØD4	E	EE	E1	H	H1	H2	KF	KK	LA	PL	RT	SW1	T1	T2	TG
25	16	11	16,5	10	-	-	9	40,7	M5	-	76	81,7	44	M6	M8X1,25	5	7	M5	8	-	2,5	26
40	19	13	21,5	12	35	29	9	57	G1/8	-	86	93	48,2	M8	M10X1,25	5	7,6	M6	10	2	2,5	38
63	22	16	18,5	16	45	39	12	79,6	G1/8	12,5	93	101	-	M10	M12X1,25	6	7,6	M8	13	2	3	56,5
100	28	20	20	25	55	49	12	115,6	G1/8	25	121	130,7	-	M12	M16X1,5	6	8	M10	22	2	3	89

Multi-position cylinders Mod. 32F2A/32M2A...X1/X2N

- 1 = Groove for sensor
 2 = Positive stroke cylinder 1
 3 = Positive stroke cylinder 2
 4 = Negative stroke for both cylinders



X1 = Partial stroke
 X2 = Total stroke as operation scheme pag. 1.1.31.2



DIMENSIONS (mm)

Ø	A	AF	BG	ØD	ØD2	ØD3	ØD4	E	EE	E1	H	H1	H2	KF	KK	LA	PL	RT	SW1	T1	T2	TG
25	16	11	16,5	10	-	-	9	40,7	M5	-	76	81,7	44	M6	M8X1,25	5	7	M5	8	-	2,5	26
40	19	13	21,5	12	35	29	9	57	G1/8	-	86	93	48,2	M8	M10X1,25	5	7,6	M6	10	2	2,5	38
63	22	16	18,5	16	45	39	12	79,6	G1/8	12,5	93	101	44	M10	M12X1,25	6	7,6	M8	13	2	3	56,5
100	28	20	20	25	55	49	12	115,6	G1/8	25	121	130,7	60,5	M12	M16X1,5	6	8	M10	22	2	3	89

Short-Stroke Cylinders Series QN

Single-acting, non magnetic
ø 8, 12, 20, 32, 50, 63



The Series QN short-stroke cylinders (single-acting) have been designed so that they can be installed in confined spaces. The standard strokes are indicated in the tables below. Due to the compactness and sturdiness of these cylinders, they are mainly suitable for positioning and locking.

GENERAL DATA

Type of construction	compact
Operation	single-acting
Materials	body = AL - seals = NBR - other = stainless steel and brass
Operating pressure	P. min 2 bar P. max 10 bar, (29 - 145 psi)
Operating temperature	0°C – 80°C (with dry air - 20°C), (32 - 176°F, with dry air -4°F)
Fluid	clean air, without lubrication. If lubricated air is used, it is recommended to use oil ISO VG32. Once applied the lubrication should never be interrupted.
Bore	ø 8, 12, 20, 32, 50, 63
Stroke	see table
Type of mounting	by means of holes in body

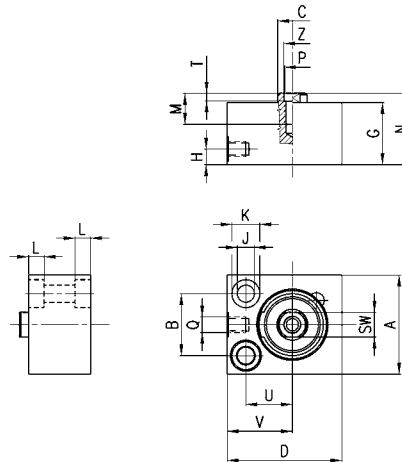
STANDARD STROKES FOR CYLINDERS SERIES QN

STANDARD STROKES				
Ø	4	5	10	25
8	×			
12	×		×	
20	×		×	
32		×	×	×
50			×	×
63			×	×

CODING EXAMPLE

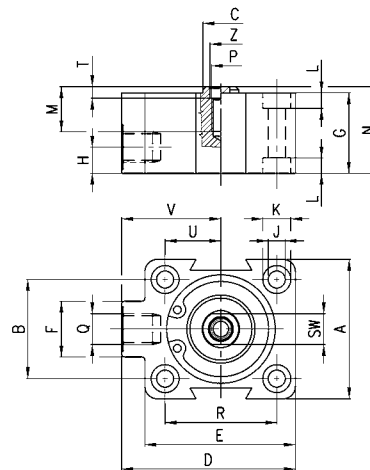
QN	1	A	50	A	25
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QN	SERIES
1	OPERATING 1 = single-acting
A	MATERIALS A = rolled stainless steel rod aluminium body
50	BORE 08 = 8 mm 12 = 12 mm 20 = 20 mm 32 = 32 mm 50 = 50 mm 63 = 63 mm
A	TYPE OF DESIGN A = standard
25	STROKE (see table)

Short-stroke cylinders Series QN - bores $\varnothing$ 8, 12 and 20

DIMENSIONS (mm)

Mod.	$\varnothing$	A ^{h8}	B	$\varnothing$ C	D	G	H	$\varnothing$ J	$\varnothing$ K	L	M	N	P	Q ^{H13}	SW	T ^{+0,1}	U	V	Z ^{+0,10}
QN1A08A04	8	18	11	4	20	16	5	3,2	5,8	3	-	17	-	M5	-	-	8	13,5	-
QN1A12A04	12	20	13	5	25	16	5	3,2	5,8	3	-	17	-	M5	-	-	9	16	-
QN1A12A10	12	20	13	5	25	26	5	3,2	5,8	3	-	30	-	M5	-	-	9	16	-
QN1A20A04	20	32	20	10	37	20	5	5,5	9	5	8	21	M5	M5	8	2,5	15	21	5,5
QN1A20A10	20	32	20	10	37	32	5	5,5	9	5	8	33	M5	M5	8	2,5	15	21	5,5

Short-stroke cylinders Series QN - bores $\varnothing$ 32, 50 and 63

DIMENSIONS (mm)

Mod.	$\varnothing$	A ^{h8}	B	$\varnothing$ C	D	E	F	G	H	$\varnothing$ J	$\varnothing$ K	L	M	N	P	Q ^{H13}	R	SW	T ^{+0,1}	U	V	Z ^{+0,10}
QN1A32A05	32	45	32	12	56	48,5	18	26	8,5	5,5	9	5	14,5	27	M6	G1/8	36	10	2,5	18	32	7
QN1A32A10	32	45	32	12	56	48,5	18	32	8,5	5,5	9	5	14,5	33	M6	G1/8	36	10	2,5	18	32	7
QN1A32A25	32	45	32	12	56	48,5	18	57,5	8,5	5,5	9	5	14,5	58,5	M6	G1/8	36	10	2,5	18	32	7
QN1A50A10	50	64	50	16	72	64	20	30	8,5	6,5	10,5	6,3	15,5	31	M8	G1/8	50	13	3,5	25	40	8,5
QN1A50A25	50	64	50	16	72	64	20	57,5	8,5	6,5	10,5	6,3	15,5	58,5	M8	G1/8	50	13	3,5	25	40	8,5
QN1A63A10	63	80	62	16	88	80	20	35	8,5	8,5	14	8,5	14,5	36	M8	G1/8	62	13	3,5	31	48	8,5
QN1A63A25	63	80	62	16	88	80	20	60,5	8,5	8,5	14	8,5	14,5	62,5	M8	G1/8	62	13	3,5	31	48	8,5

Short-Stroke Cylinders Series QP and QPR

Series QP: Single or double-acting, magnetic
Series QPR: double-acting magnetic, non-rotating
ø 12, 16, 20, 25, 32, 40, 50, 63, 80, 100



The guides are manufactured in the external profile parallel to the sliding axis on three sides. These are used to locate the switches that sense the piston position. The non rotating guides make the QPR suitable for supply operations and for handling equipment.

The Series QP and QPR cylinders are available in 10 bore sizes, from ø12 to ø100. Their compact dimension allows the installation in small spaces. Because of their particular construction, they can be mounted by means of feet or trunnion.

GENERAL DATA

Type of construction	compact profile (QP), compact with non rotating guides (QPR)
Operation	QP Single or double acting, QPR double - acting
Materials	body = AL (anodized) - steel rod = rolled stainless - seals = NBR (FKM on request)
Operating temperature	0°C – 80°C (with dry air - 20°C), (32 - 176°F, with dry air -4°F)
Assembly	by means of screws
Operating pressure	1 – 10 bar (double - acting); 2 – 10 bar (single- acting), (14 - 145 psi , DA : 29 - 145 psi , SA)
Fluid	filtered air, without lubrication. If lubricated air is used, it is recommended to use oil ISOVG32. Once applied the lubrication should never be interrupted.
Strokes (min-max)	Series QP: ø12 – ø 25= 1- 150 mm / ø 32 – ø 100= 1-200 mm Series QPR: ø 12= 1-50 mm / ø 16= 1-75 mm / ø 20 – ø 100=1- 100 mm
Strokes	The minimum stroke for use of the sensors is 10 mm
Bores	ø 12, 16, 20, 25, 32, 40, 50, 63, 80, 100

STANDARD STROKES FOR SHORT-STROKE CYLINDERS SERIES QP AND QPR

■ = Double-acting

✕ = Single-acting

● = Non-rotating

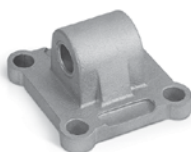
STANDARD STROKES														
Ø	5	10	15	20	25	30	35	40	45	50	60	75	80	100
12	■ ✕ ●	■ ✕ ●	■ ✕ ●	■ ✕	■ ✕ ●	■ ●	■	■	■					
16	■ ✕ ●	■ ✕ ●	■ ✕ ●	■ ✕ ●	■ ✕ ●	■ ●	■ ●	■ ●	■ ●	■ ●	■ ●	■ ●	■	■
20	■ ✕ ●	■ ✕ ●	■ ✕ ●	■ ✕ ●	■ ✕ ●	■ ●	■ ●	■ ●	■ ●	■ ●	■ ●	■ ●	■ ●	■ ●
25	■ ✕ ●	■ ✕ ●	■ ✕ ●	■ ✕ ●	■ ✕ ●	■ ●	■ ●	■ ●	■ ●	■ ●	■ ●	■ ●	■ ●	■ ●
32	■ ✕ ●	■ ✕ ●	■ ✕ ●	■ ✕ ●	■ ✕ ●	■ ●	■ ●	■ ●	■ ●	■ ●	■ ●	■ ●	■ ●	■ ●
40	■ ✕ ●	■ ✕ ●	■ ✕ ●	■ ✕ ●	■ ✕ ●	■ ●	■ ●	■ ●	■ ●	■ ●	■ ●	■ ●	■ ●	■ ●
50	■ ✕ ●	■ ✕ ●	■ ✕ ●	■ ✕ ●	■ ✕ ●	■ ●	■ ●	■ ●	■ ●	■ ●	■ ●	■ ●	■ ●	■ ●
63	■ ✕ ●	■ ✕ ●	■ ✕ ●	■ ✕ ●	■ ✕ ●	■ ●	■ ●	■ ●	■ ●	■ ●	■ ●	■ ●	■ ●	■ ●
80	■ ✕ ●	■ ✕ ●	■ ✕ ●	■ ✕ ●	■ ✕ ●	■ ●	■ ●	■ ●	■ ●	■ ●	■ ●	■ ●	■ ●	■ ●
100	■ ✕ ●	■ ✕ ●	■ ✕ ●	■ ✕ ●	■ ✕ ●	■ ●	■ ●	■ ●	■ ●	■ ●	■ ●	■ ●	■ ●	■ ●

CODING EXAMPLE

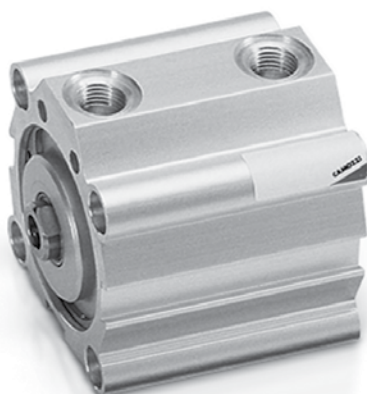
QP	2	A	050	A	050	
QP	SERIES QP = standard QPR = standard non-rotating					
2	OPERATION 1 = single-acting (front spring) only QP 2 = double-acting 3 = double-acting through rod					
A	MATERIALS A = rolled stainless steel rod - AL tube profile					
050	BORE 012 = 12 mm 016 = 16 mm 020 = 20 mm 025 = 25 mm 032 = 32 mm 040 = 40 mm 050 = 50 mm 063 = 63 mm 080 = 80 mm 100 = 100 mm					
A	TYPE OF MOUNTING A = compact					
050	STROKE (see table)					
	= standard V = FKM rod seal					

ACCESSORIES FOR SHORT-STROKE CYLINDERS SERIES QP

Foot mount Mod. B

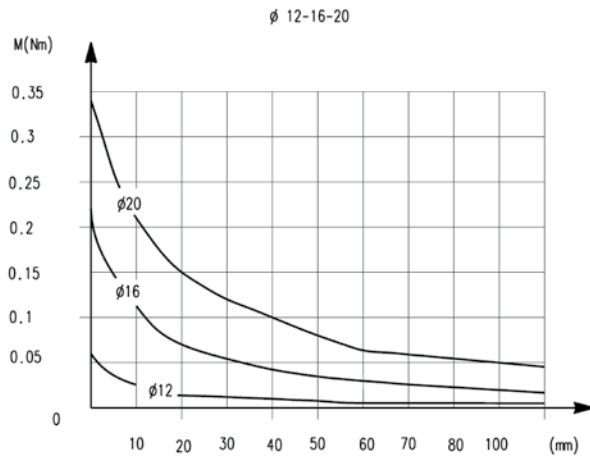
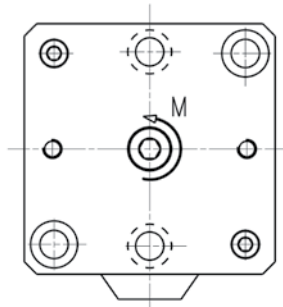


Male trunnion Mod. L

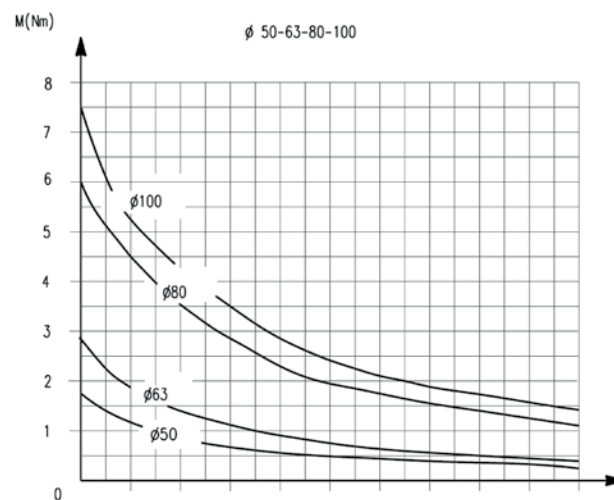
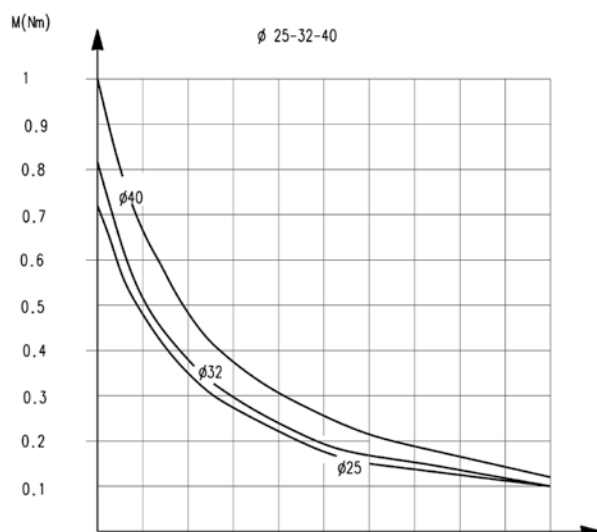


All accessories are supplied separately.

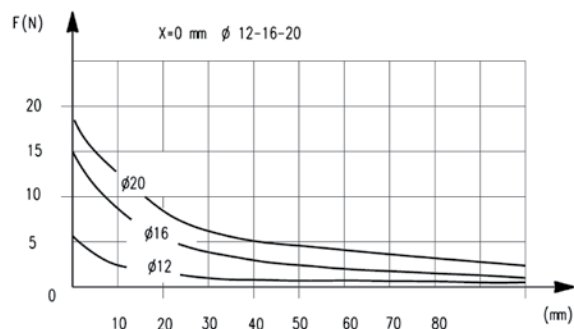
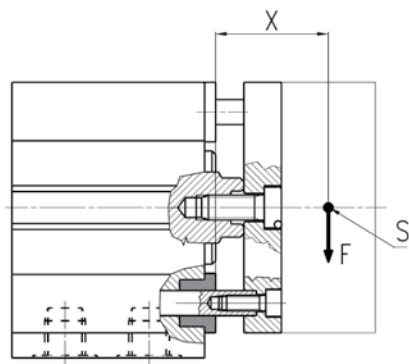
TORQUE MOMENT ACCORDING TO STROKE C



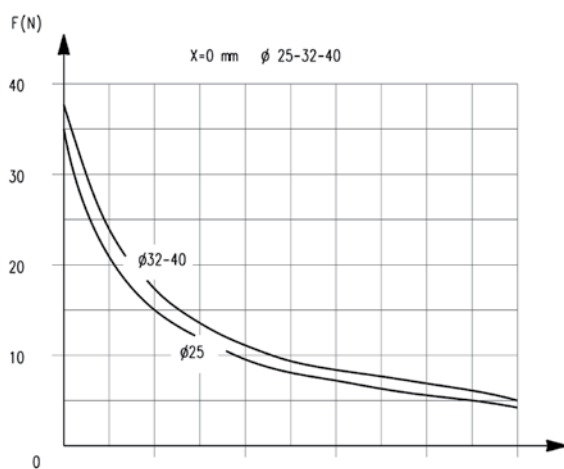
TORQUE MOMENT ACCORDING TO STROKE C



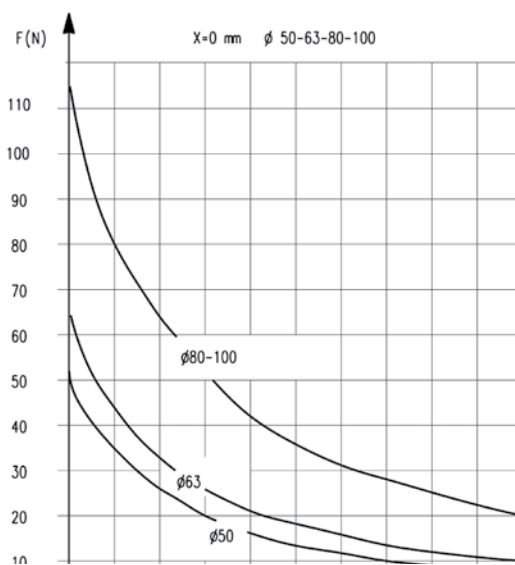
TRANSVERSAL LOAD ACCORDING TO PROJECTION "x"



TRANSVERSAL LOAD ACCORDING TO PROJECTION "x"



F = transversal force

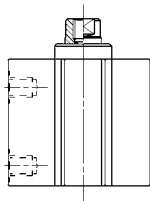
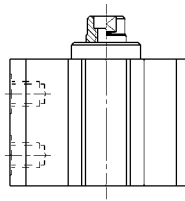
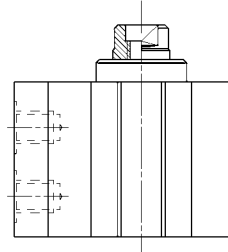
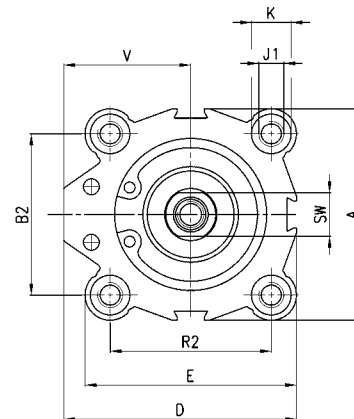
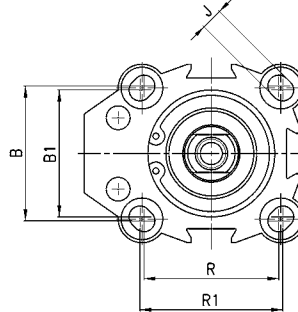
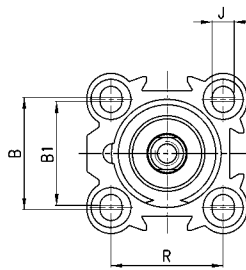
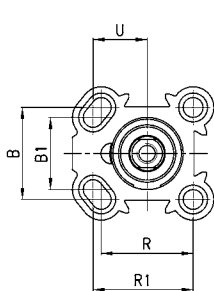
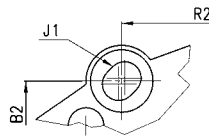
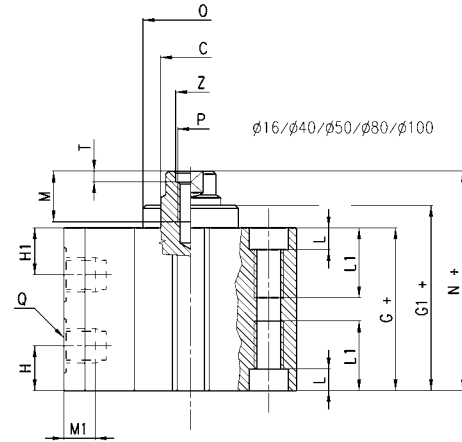


Short-stroke cylinders Series QP

Note:

The cylinder's end stop must be provided externally.
For single-acting cylinders $\varnothing$ 12, 16, 20 and 25 add
5 mm to size G+, G1+ and N+

+ = add the stroke

 $\varnothing$ 12/ $\varnothing$ 20 $\varnothing$ 25 $\varnothing$ 32/ $\varnothing$ 63 $\varnothing$ 16/ $\varnothing$ 40/ $\varnothing$ 50/ $\varnothing$ 80/ $\varnothing$ 100

DIMENSIONS (mm)

$\varnothing$	A	B	B1	B2	$\varnothing$ C	D	E	G +	G1 +	H1	H	J	J1	K	L	L1	M	M1	N +	$\varnothing$ O	P	Q	R	R1	R2	SW	T	U	V	Z
12	23.8	15.5	13	-	6	25	25	29.6	-	12.3	7.8	3.5	-	5.8	3	-	5.5	4.5	32.9	-	M3	M5	15.5	16.75	-	5	-	9	13.15	-
16	29	20	-	-	8	29	29	32	32.4	10.9	8.7	3.5	-	5.8	3	-	8	4.5	36.4	16.6	M4	M5	20	-	-	6	-	-	14.5	-
20	37	25.5	20	-	10	39.25	39.25	31.2	31.7	9.8	9.8	5.5	-	9	6	-	8	4.5	36	19.5	M6	M5	25.5	27.75	-	8	-	15	20.75	-
25	40	28	26	-	10	40	40	32.1	33.5	8	6.9	5.5	-	10	5.5	-	8	4.5	37.5	22	M6	M5	28	-	-	8	-	-	20	-
32	45	34	32	33	12	55.5	47	39.5	-	9.5	9.5	5.5	M8	10.5	6	21	10	7.5	44	-	M6	G1/8	34	36	35	10	2.5	-	32	7
40	52	-	-	40	16	57	52	42.4	43.4	10.7	10.7	5.5	M8	9	6	21	13.5	7.5	47.9	29.6	M8	G1/8	-	-	40	13	3.5	-	31	8.5
50	64	-	-	50	16	72	64	42.2	44	11.2	11.2	6.5	M8	10.5	6	21	13.5	9	48.4	37.5	M8	G1/4	-	-	50	13	3.5	-	40	8.5
63	80	62	60	61	20	88	80	49.5	-	13	13	8.5	M12	15	8.5	31.5	13.5	9	54	-	M8	G1/4	60	62	61	17	4	-	48	8.5
80	98	-	-	77	25	104	98	57.5	-	16.2	16.2	10.5	M12	17	10.5	31.5	15	10.5	63.5	-	M16	G3/8	-	-	77	22	4	-	55	16.5
100	117	-	-	94	25	123.5	117	68.5	-	20.3	20.3	10.5	M12	17	10.5	31.5	15	10.5	74.5	-	M16	G3/8	-	-	94	22	4	-	65	16.5

Short-stroke cylinders Series QP

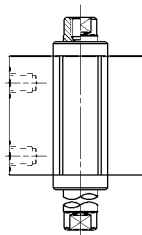
Note:

The cylinder's end stop must be provided externally.

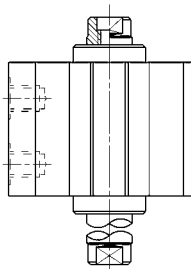


+ = add the stroke
+ = add the stroke 2 times

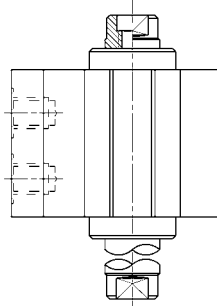
Ø12/Ø20



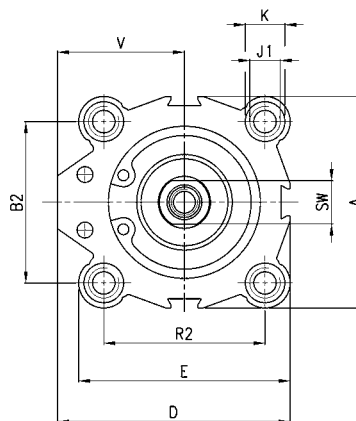
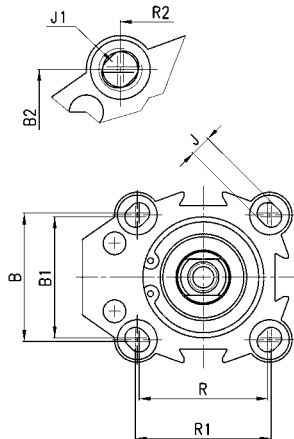
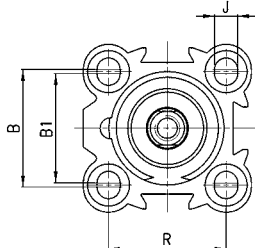
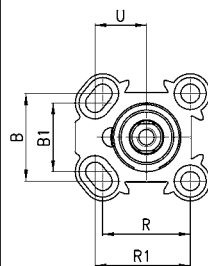
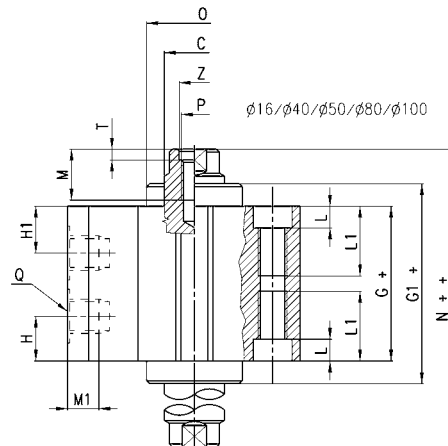
Ø25



Ø32/Ø63



Ø16/Ø40/Ø50/Ø80/Ø100



DIMENSIONS (mm)

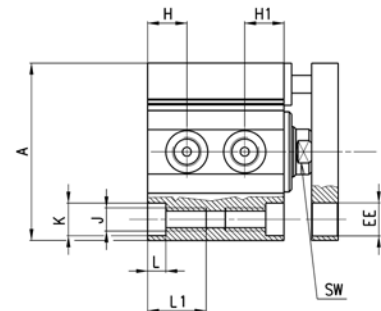
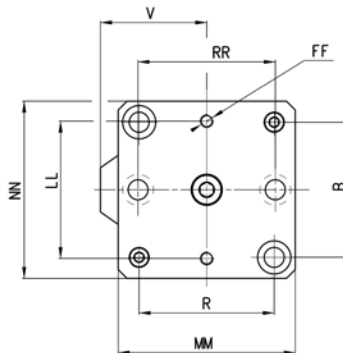
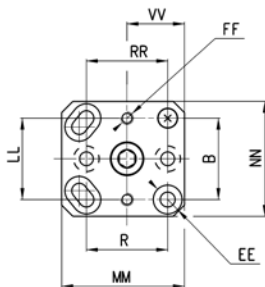
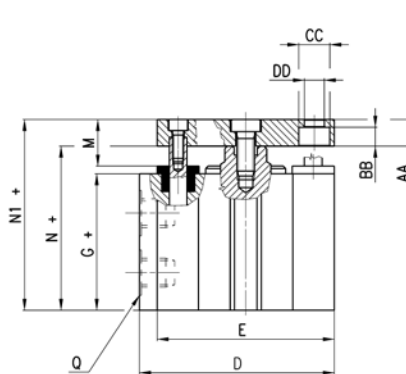
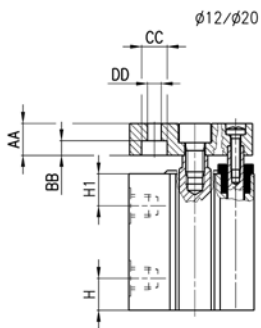
Ø	A	B	B1	B2	ØC	D	E	G+	G1+	H1	H	J	J1	K	L	L1	M	M1	N++	ØO	P	Q	R	R1	R2	SW	T	U	V	Z
12	23.8	15.5	13	-	6	25	25	37.3	-	12.3	12.3	3.5	-	5.8	3	-	5.5	4.5	41	-	M3	M5	15.5	16.75	-	5	-	9	13.15	-
16	29	20	-	-	8	29	29	38	38.8	10.9	10.9	3.5	-	5.8	3	-	8	4.5	52	16.6	M4	M5	20	-	-	6	-	-	14.5	-
20	37	25.5	20	-	10	39.25	39.25	38.1	39.1	9.8	9.8	5.5	-	9	6	-	8	4.5	47.7	19.5	M6	M5	25.5	27.75	-	8	-	15	20.75	-
25	40	28	26	-	10	40	40	36.3	39.1	8	8	5.5	-	10	5.5	-	8	4.5	47.1	22	M6	M5	28	-	-	8	-	-	20	-
32	45	34	32	33	12	55.5	47	39.5	-	9.5	9.5	5.5	M8	10.5	6	21	10	7.5	48.5	-	M6	G1/8	34	36	35	10	2.5	-	32	7
40	52	-	-	40	16	57	52	42.4	44.4	10.7	10.7	5.5	M8	9	6	21	13.5	7.5	53.4	29.6	M8	G1/8	-	-	40	13	3.5	-	31	8.5
50	64	-	-	50	16	72	64	42.2	45.8	11.2	11.2	6.5	M8	10.5	6	21	13.5	9	54.8	37.5	M8	G1/4	-	-	50	13	3.5	-	40	8.5
63	80	62	60	61	20	88	80	49.5	-	13	13	8.5	M12	15	8.5	31.5	13.5	9	58.5	-	M8	G1/4	60	62	61	17	4	-	48	8.5
80	98	-	-	77	25	104	98	57.5	-	16.2	16.2	10.5	M12	17	10.5	31.5	15	10.5	69.5	-	M16	G3/8	-	-	77	22	4	-	55	16.5
100	117	-	-	94	25	123.5	117	68.5	-	20.3	20.3	10.5	M12	17	10.5	31.5	15	10.5	80.5	-	M16	G3/8	-	-	94	22	4	-	65	16.5

Short-stroke cylinder Series QPR

Note: The cylinder's end stop must be provided externally.



+ = add the stroke



DIMENSIONS (mm)

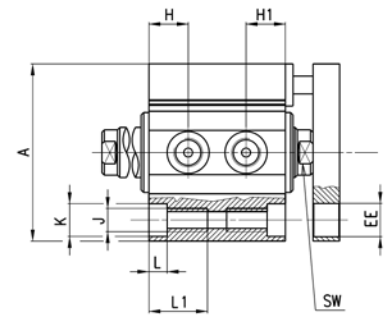
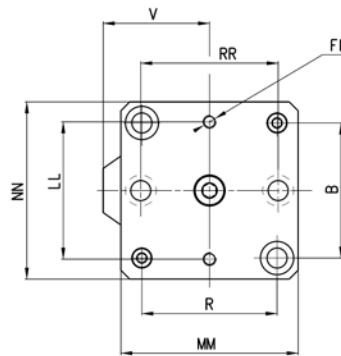
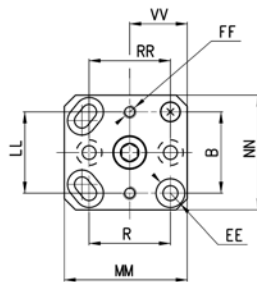
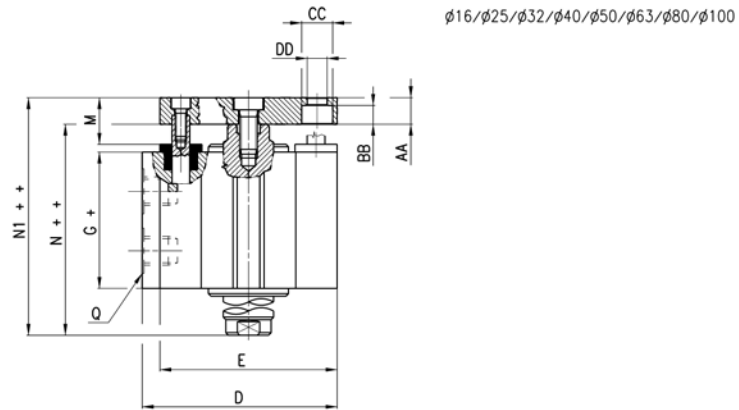
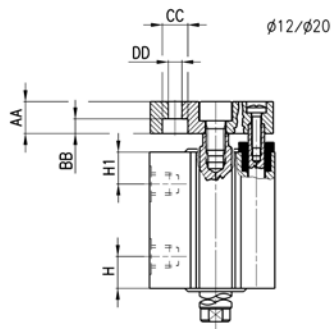
Ø	A	B	D	E	G +	H1	H	J	K	L	L1	N +	N1 +	Q	R	SW	V	AA	BB	ØCC	ØDD	EE	FF	LL	MM	NN	RR	VV
12	23.8	15.5	25	25	29.6	12.3	7.8	3.5	5.8	3	-	32.9	37.9	M5	15.5	5	13.15	5	3.5	6.2	3.2	5.8	M3	15.5	25	24	15.5	12
16	29	20	29	29	32	10.9	8.7	3.5	5.8	3	-	36.4	41.4	M5	20	6	14.5	5	3.5	6.2	3.2	6.5	M3	20	28	28	20	-
20	37	25.5	39.25	39.25	31.2	9.8	9.8	5.5	9	6	-	36	46	M5	25.5	8	20.75	10	4.6	8	4.2	9	M4	25.5	38.5	36	25.5	18
25	40	28	40	40	32.1	8	6.9	5.5	10	5.5	-	37.5	47.5	M5	28	8	20	10	4.6	8	4.2	10	M4	27	40	40	28	-
32	45	33	55.5	47	39.5	9.5	9.5	M8	10.5	6	21	44	54	G1/8	35	10	32	10	6	9	5.5	9	M5	32	47	45	36	-
40	52	40	57	52	42.4	10.7	10.7	M8	9	6	21	47.9	57.9	G1/8	40	13	31	10	6	9	5.5	9	M5	40	52	50	40	-
50	64	50	72	64	42.2	11.2	11.2	M8	10.5	6	21	48.4	60.4	G1/4	50	13	40	12	6.8	10.5	6.5	10	M6	50	65	65	50	-
63	80	61	88	80	49.5	13	13	M12	15	8.5	31.5	54	66	G1/4	61	17	48	12	8.5	14	9	15	M6	62	80	80	62	-
80	98	77	104	98	57.5	16.2	16.2	M12	17	10.5	31.5	63.5	78.5	G3/8	77	22	55	15	10	16.5	11	17	M8	77	100	100	77	-
100	117	94	123.5	117	68.5	20.3	20.3	M12	17	10.5	31.5	74.5	89.5	G3/8	94	22	65	15	10	16.5	11	17	M8	94	115	115	94	-

Short-stroke cylinder Series QPR - through-rod

Note: The cylinder's end stop must be provided externally.



+ = add the stroke
++ = add the stroke 2 times



DIMENSIONS (mm)

Ø	A	B	D	E	G +	H1	H	J	K	L	L1	N ++	N1 ++	Q	R	SW	V	AA	BB	ØCC	ØDD	EE	FF	LL	MM	NN	RR	VV
12	23.8	15.5	25	25	37.3	12.3	12.3	3.5	5.8	3	-	41	46	M5	15.5	5	13.15	5	3.5	6.2	3.2	5.8	M3	15.5	25	24	15.5	12
16	29	20	29	29	38	10.9	10.9	3.5	5.8	3	-	52	57	M5	20	6	14.5	5	3.5	6.2	3.2	6.5	M3	20	28	28	20	-
20	37	25.5	39.25	39.25	38.1	9.8	9.8	5.5	9	6	-	47.7	57.5	M5	25.5	8	20.75	10	4.6	8	4.2	9	M4	25.5	38.5	36	25.5	18
25	40	28	40	40	36.3	8	8	5.5	10	5.5	-	47.1	57.1	M5	28	8	20	10	4.6	8	4.2	10	M4	27	40	40	28	-
32	45	33	55.5	47	39.5	9.5	9.5	M8	10.5	6	21	48.5	58.5	G1/8	35	10	32	10	6	9	5.5	9	M5	32	47	45	36	-
40	52	40	57	52	42.4	10.7	10.7	M8	9	6	21	53.4	63.4	G1/8	40	13	31	10	6	9	5.5	9	M5	40	52	50	40	-
50	64	50	72	64	42.2	11.2	11.2	M8	10.5	6	21	54.8	66.8	G1/4	50	13	40	12	6.8	10.5	6.5	10	M6	50	65	65	50	-
63	80	61	88	80	49.5	13	13	M12	15	8.5	31.5	58.5	70.5	G1/4	61	17	48	12	8.5	14	9	15	M6	62	80	80	62	-
80	98	77	104	98	57.5	16.2	16.2	M12	17	10.5	31.5	69.5	84.5	G3/8	77	22	55	15	10	16.5	11	17	M8	77	100	100	77	-
100	117	94	123.5	117	68.5	20.3	20.3	M12	17	10.5	31.5	80.5	95.5	G3/8	94	22	65	15	10	16.5	11	17	M8	94	115	115	94	-

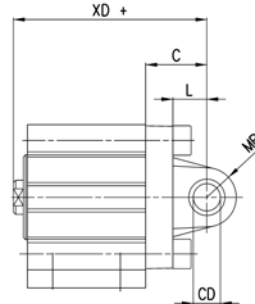
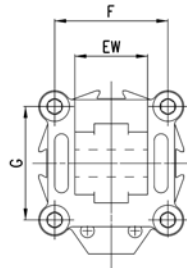
Male trunnion bracket Mod. L

Material: Aluminium



Supplied with:
1x trunnion
4x screws

+ = add the stroke



DIMENSIONS (mm)

Mod.	Ø	CD ¹⁹	MR	L	C	XD+	F	G	EW
L-QP-32	32	10	9	12	22	66	33	35	26
L-QP-40	40	12	13	15	25	73	40	40	28
L-QP-50	50	12	13	15	27	75,5	50	50	32
L-QP-63	63	16	15	20	32	86	61	61	40
L-QP-80	80	16	15	24	36	99,5	77	77	50
L-QP-100	100	20	18	29	41	115,5	94	94	60

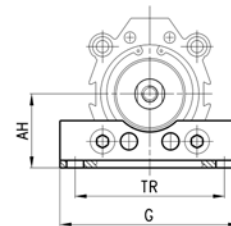
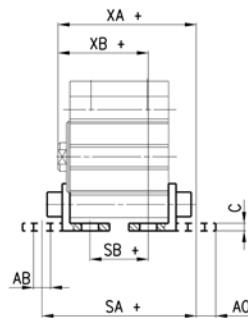
Feet bracket Mod. B

Material: zinc-plated steel.



Supplied with:
2x feet
4x screws

+ = add the stroke

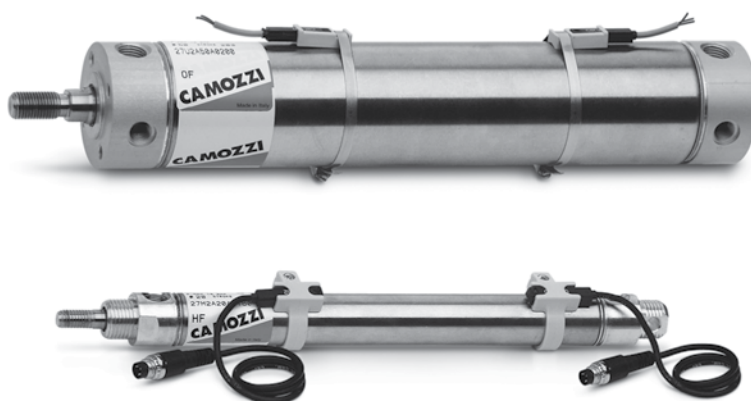


DIMENSIONS (mm)

Mod.	Ø	C	SA+	XA+	SB+	XB+	TR	G	AB	AH	AO
B-QP-32	32	3	61,9	55,2	23,1	35,8	57	71	6,6	30	8,8
B-QP-40	40	3	64,8	59,1	26	39,7	64	78	6,6	33	8,8
B-QP-50	50	4	71,6	63,1	20,8	37,7	79	95	9	39	10,3
B-QP-63	63	4	81,9	70,2	25,1	41,8	95	113	11	46	13,8
B-QP-80	80	6	96,5	83	28,5	49	118	140	13	59	10,5
B-QP-100	100	6	114,5	97,5	22,5	51,5	137	162	13	71	17

Round Body Cylinders Series 27

Double-acting, magnetic
ø 20, 25, 32, 40, 50, 63



- » Reduced dimensions
- » Different mounting options
- » Perfect alignment, perfect linearity

The Series 27 has been designed to reduce the cylinders sizes as much as possible. These cylinders have been constructed with clean lines using stainless steel for both the tube and the rod and Aluminium for the end-caps.

The choice of material and other design features have allowed to create a range of versatile and reliable cylinders. The precise method of securing the tube to the end block ensures that all the parts are perfectly aligned. Mechanical cushioning has been fitted on these cylinders in order to reduce noise produced by the piston impact on the end-caps. Cylinders Series 27 are suitable for assembling with magnetic sensors. Various mounting bracket accessories enable the cylinders to be fitted to suit the requirements of a particular application.

GENERAL DATA

Type of construction	crimped
Operation	double acting
Materials	end-caps = AL piston = stainless steel piston seals = thermoplastic resin - rod seals = PU
Mounting	feet - trunnion - steel bar - pins
Strokes min-max	all diameters 10 - 1000 mm
Bores	ø 20, 25, 32, 40, 50, 63
Operating temperature	0°C – 80°C (with dry air - 20°C) (32 - 176°F, with dry air -4°F)
Operating pressure	1 – 10 bar, (14 - 145 psi)
Speed	10 – 1000 mm/sec (no load)
Fluid	filtered air, without lubrication. If lubricated air is used, it is recommended to use oil ISOVG32. Once applied the lubrication should never be interrupted.

STANDARD STROKES FOR DOUBLE-ACTING CYLINDERS SERIES 27

Mod. 27M and 27T (ø 20 – 40) and Mod. 27U (ø 20 – 63)

Ø	10	25	40	50	80	100	125	160	200	250	300	320	400	500
20	■	■	■	■	■	■	■	■	■	■	■	■	■	■
25	■	■	■	■	■	■	■	■	■	■	■	■	■	■
32	■	■	■	■	■	■	■	■	■	■	■	■	■	■
40	■	■	■	■	■	■	■	■	■	■	■	■	■	■
50	■	■	■	■	■	■	■	■	■	■	■	■	■	■
63	■	■	■	■	■	■	■	■	■	■	■	■	■	■

CODING EXAMPLE

27	M	2	A	20	A	0050
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27	SERIES
M	VERSION M = rear end block upper round port for ø 20-25-32-40 T = rear end block rear round port for ø 20-25-32-40 U = rear end block upper round port for ø 20-25-32-40-50-63
2	OPERATION 2 = double-acting
A	MATERIALS A = rolled stainless steel rod stainless steel tube
20	BORE 20 = 20 mm 25 = 25 mm 32 = 32 mm 40 = 40 mm 50 = 50 mm 63 = 63 mm
A	TYPE OF DESIGN A = standard
0050	STROKE (see table)

ACCESSORIES FOR MAGNETIC CYLINDERS SERIES 27

Coupling piece |
Mod. GKFSelf aligning rod
Mod. GKThreaded trunnion pin
Mod. TPiston rod socket joint
Mod. GY

Swivel ball joint Mod. GA



Foot mount Mod. B



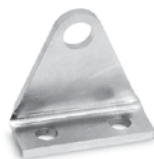
Foot mount Mod. B



Nose nut Mod. V

Rear trunnion bracket
Mod. I

Piston rod nut Mod. U

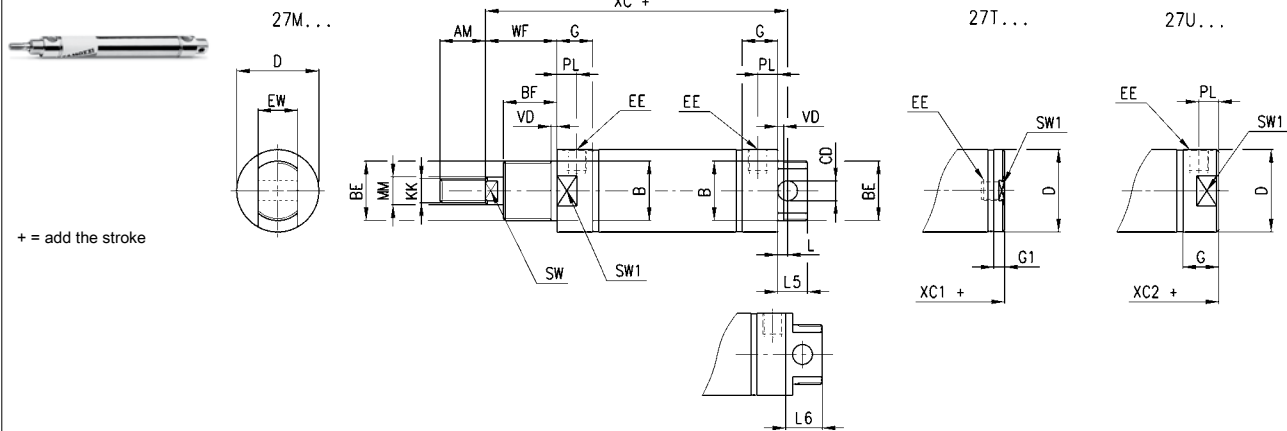
Rear trunnion bracket
Mod. I

Rod fork end Mod. G



All accessories are supplied separately except for piston rod nut Mod. U

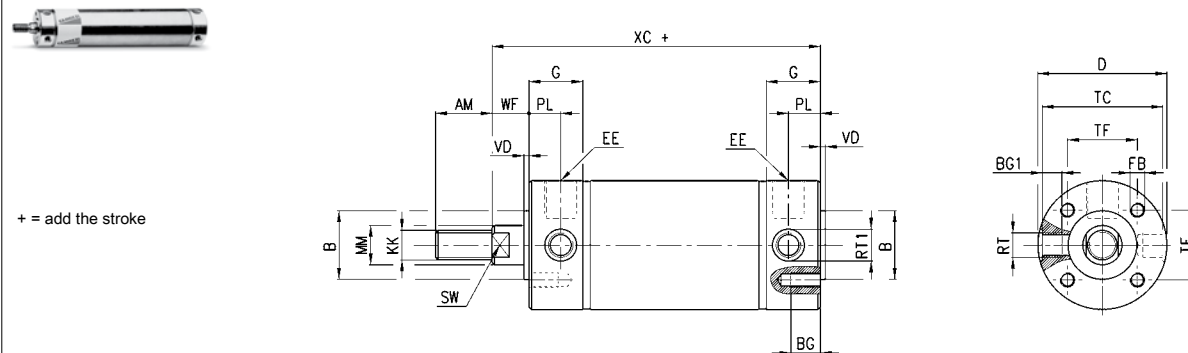
Cylinders Series 27 (Ø 20, 25, 32, 40)



DIMENSIONS (mm)

Ø	AM	B	BF	BE	ØCD ^{h0}	ØD	EE	EW	G	G1	KK	L	L6	ØMM	L5	PL ^{h0}	SW	VD	WF	XC+	XC1+	XC2+	SW1
20	14	16	12	M16x1,5	6	21,5	G1/8	12	15,5	8	M8x1,25	7	-	8	13	9	7	3	17	77	62,5	70,8	19
25	16	18	12	M18x1,5	8	26,5	G1/8	14	15,5	8	M10x1,25	9	-	10	17	9	9	3	16,5	78,5	62	69,5	24
32	22	22	15	M22x1,5	8	33,5	G1/8	16	17,5	5,5	M10x1,25	7	20	12	15	9	10	3	23	93	74	86	30
40	23	30	15	M30x1,5	10	41,5	G1/8	20	18	5,5	M12x1,25	5	24	16	15	10	13	3	24	96	78,5	91	38

Cylinders Series 27 (Ø 50, 63)



DIMENSIONS (mm)

Ø	AM	ØB	BG	BG1	ØD	EE	FB	G	KK	ØMM ^{h0}	PL	RT	RT1	SW	TC	TF	VD	WF	XC+
50	23	28	12	8	52,5	G1/4	M6	22	M12x1,25	16	13	M10x1	13	13	49	28,5	2	13	97
63	30	35	12	9,5	65,5	G1/4	M8	22	M16x1,5	20	13	M12x1,5	15	17	62	35,5	2	13	99

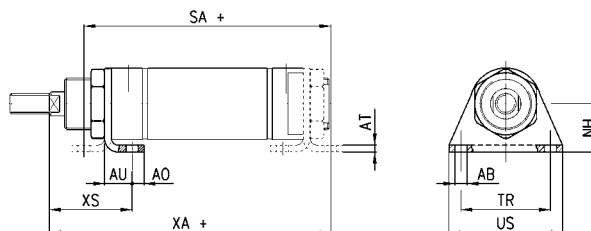
Foot mount Mod. B

Material: zinc-plated steel

Supplied with:
1x foot
1x front end cap nut mod. V



+ = add the stroke



DIMENSIONS (mm)

Mod.	Ø	ØAB	AO	AT	AU	NH	SA+	TR	US	XA+	XS
B-27-20	20	5,5	6	3	13	20	79	32	42	83	27
B-27-25	25	6,6	8	3	12,5	22	78	38	49	82	26
B-27-32	32	6,6	8	4	16	25	95	40	54	102	35
B-27-40	40	7	7	4	16	28	99	52	66	107	36

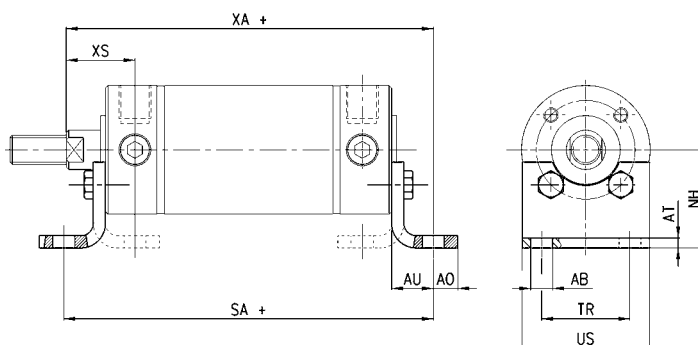
Foot mount Mod. B

Material: zinc-plated steel

Supplied with:
2x feet
4x screws



+ = add the stroke



DIMENSIONS (mm)

Mod.	Ø	ØAB	AO	AT	AU	NH	SA+	TR	US	XA+	XS
B-27-50	50	9	10	4	17	40	118	36	52	114	26
B-27-63	63	9	10	5	19	47	124	45	61	118	27

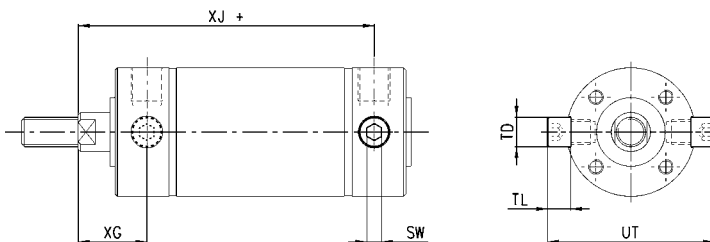
Threaded trunnion pin Mod. T

Material: stainless steel

Supplied with:
2x pins



+ = add the stroke



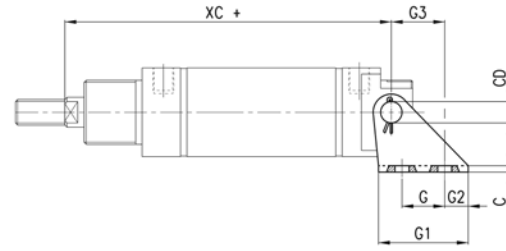
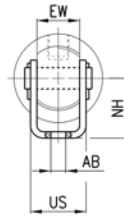
DIMENSIONS (mm)

Mod.	Ø	SWSW	ØTD ¹⁹	TL	UT	XG	XJ+
T-27-50	50	6	12	9,5	68	26	84
T-27-63	63	6	14	11	84	26	86

Rear trunnion bracket Mod. I (Ø 20, 25, 32, 40)

Material: zinc-plated steel

Supplied with:
1x female hinge
1x pin
2x C-clips



+ = add the stroke

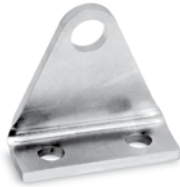
DIMENSIONS (mm)

Mod.	Ø	G	G1	G2	G3	C	XC+	ØAB	US	NH	ØCD	EW
I-27-20	20	15	30	8	18,5	1,5	77	5,5	15	20	6	12
I-27-25	25	15	33	9	20	2	78,5	6,6	18	22	8	14
I-27-32	32	15	35	10	20	2	93	6,6	20,5	25	8	16
I-27-40	40	20	42	11	25	3	96	7	26	28	10	20

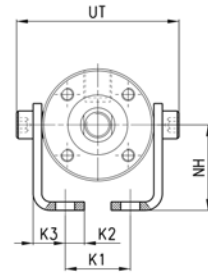
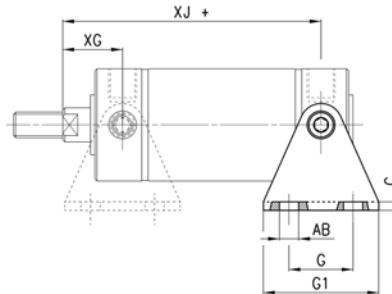
Rear trunnion bracket Mod. I

Material: zinc-plated steel

Supplied with:
2x pins
2x feet



+ = add the stroke

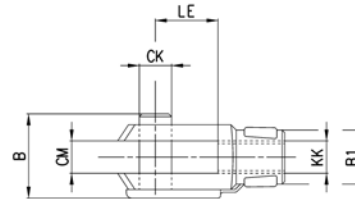
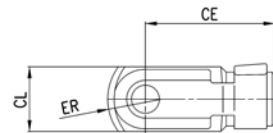


DIMENSIONS (mm)

Mod.	Ø	G	G1	C	XJ+	XG	ØAB	K1	K1	K2	K3	NH	UT
I-27-50	50	30	54	4	84	26	9	9	30,5	9	15	40	68
I-27-63	63	40	64	5	86	26	9	9	40,5	9	17,5	47	84

Rod fork end Mod. G

Material: zinc-plated steel
ISO 8140

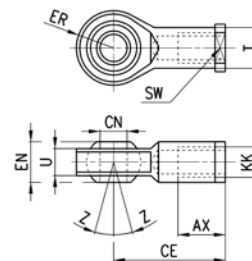


DIMENSIONS (mm)

Mod.	Ø	ØCK	LE	CM	CL	ER	CE	KK	B	ØB1
G-20	20	8	16	8	16	10	32	M8x1,25	22	14
G-25-32	25-32	10	20	10	20	12	40	M10X1,25	26	18
G-40	40-50	12	24	12	24	14	48	M12X1,25	32	20
G-50-63	63	16	32	16	32	19	64	M16X1,5	40	26

Swivel ball joint Mod. GA

Material: zinc-plated steel
ISO 8139

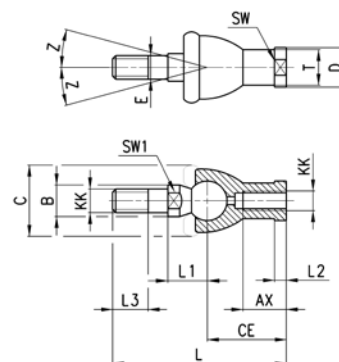


DIMENSIONS (mm)

Mod.	Ø	ØCN ^(H7)	U	EN	ER	AX	CE	KK	ØT	Z	SW
GA-20	20	8	9	12	12	16	36	M8x1,25	12,5	6,5	14
GA-32	25-32	10	10,5	14	14	20	43	M10x1,25	15	6,5	17
GA-40	40-50	12	12	16	16	22	50	M12x1,25	17,5	6,5	19
GA-50-63	63	16	15	21	21	28	64	M16x1,5	22	7,5	22

Piston rod socket joint Mod.GY

Material: Zinc-Aluminum alloy and zinc-plated steel

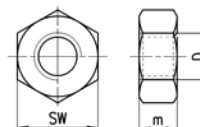


DIMENSIONS (mm)

Mod.	Ø	KK	L	CE	L2	AX	E	ØB	ØC	T	D	L1	L3	SW1	SW	Z
GY-20	20	M8X1,25	65	32	5	16	8	12	24	12,5	16	16	12	10	14	15
GY-32	25-32	M10X1,25	74	35	6,5	18	10	14	28	15	19	19,5	15	11	17	15
GY-40	40-50	M12X1,25	84	40	6,5	20	12	19	32	17,5	22	21	17	17	19	15
GY-50-63	63	M16X1,5	112	50	8	27	16	22	40	22	27	27,5	23	19	22	11

Piston rod nut Mod. U

Material: zinc-plated steel
UNI EN ISO 4035

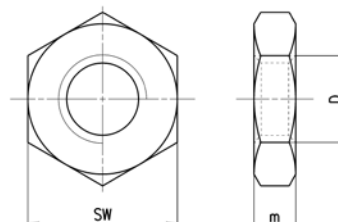


DIMENSIONS (mm)

Mod.	Ø	D	m	SW
U-20	20	M8X1,25	5	13
U-25-32	20-32	M10X1,25	6	17
U-40	40-50	M12X1,25	7	19
U-50-63	63	M16X1,5	8	24

Nose nut Mod. V

Material: zinc-plated steel
UNI EN ISO 4035
V-27-25 / V-42-32 not according standard.

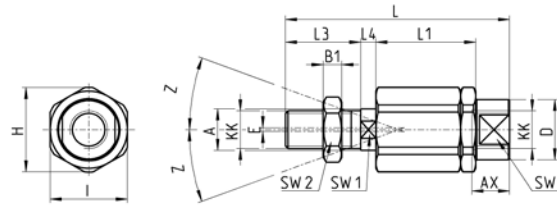


DIMENSIONS (mm)

Mod.	Ø	D	m	SW
V-12-16	20	M16X1,5	6	24
V-27-25	25	M18X1,5	5	24
V-20-25	32	M22X1,5	10	32
V-42-32	40	M30x1,5	8	-

Self aligning rod Mod. GK

Material: zinc-plated steel

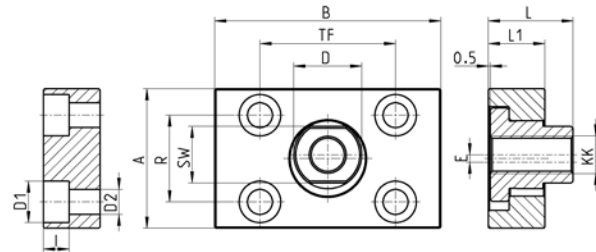


DIMENSIONS (mm)

Mod.	Ø	KK	L	L1	L3	L4	Ø A	Ø D	H	I	SW	SW1	SW2	B1	AX	Z	E
GK-20	20	M8x1,25	57	26	21	5	8	12,5	19	17	11	7	13	4	16	4	2
GK-25-32	25-32	M10x1,25	71,5	35	20	7,5	14	22	32	30	19	12	17	5	22	4	2
GK-40	40	M12x1,25	75,5	35	24	7,5	14	22	32	30	19	12	19	6	22	4	2
GK-50-63	50-63	M16x1,5	104	53	32	10	22	32	45	41	27	20	24	8	30	3	2

Female Alignment Coupling Mod. GKF

Material: zinc-plated steel



DIMENSIONS (mm)

Mod.	Ø	KK	A	B	R	TF	L	L1	I	Ø D	Ø D1	Ø D2	SW	E
GKF-20	20	M8x1,25	30	35	20	25	22,5	10	-	14	5,5	-	13	1,5
GKF-25-32	25-32	M10x1,25	37	60	23	36	22,5	15	6,8	18	11	6,6	15	2
GKF-40	40	M12x1,25	56	60	38	42	22,5	15	9	20	15	9	15	2,5
GKF-50-63	50-63	M16x1,5	80	80	58	58	26,5	15	10,5	25	18	11	22	2,5

Round Body Cylinders Series 42

Single or double-acting, magnetic, cushioned
Ø 32, 40, 50, 63

- » Perfect alignment
- » Different mounting options



Cylinders Series 42 have been designed without tie rods to assure an extremely clean design.

Stainless steel has been used for the tube and the rod, while the end cover is made in anodized Aluminium. These cylinders are normally equipped with adjustable end-stroke cushioning and with a mechanical cushioning in order to make the impact of the piston less noisy as it reaches the end of the stroke.

GENERAL DATA

Type of construction	compact - crimped
Operation	single-acting or double-acting
Materials	end-caps = AL tube = stainless steel AISI 304 rod = stainless steel AISI 420B other parts (see coding)
Type of mounting	front flange, rear flange, feet, front and rear trunnion, threaded pins
Strokes min - max	10 - 1000 mm
Operating temperature	0 – 80°C (with dry air 20°C)
Operating pressure	1 – 10 bar (double-acting); 2 – 10 bar (single-acting)
Speed	10 – 1000 mm/sec (NO LOAD)
Fluid	clean air, without lubrication. If lubricated air is used, it is recommended to use oil ISOVG32. Once applied the lubrication should never be interrupted.

STANDARD STROKES FOR DOUBLE-ACTING CYLINDERS SERIES 42

- ✕ = Double acting
 ■ = Single acting

Ø	25	50	75	80	100	125	150	160	200	250	300	320	400	500
32	✕ ■	✕ ■	✕ ■	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕
40	✕ ■	✕ ■	✕ ■	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕
50	✕ ■	✕ ■	✕ ■	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕
63	✕ ■	✕ ■	✕ ■	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕

CODING EXAMPLE

42	M	2	N	050	A	0200
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42	SERIES
M	VERSION M= standard magnetic
2	OPERATION 1 = single-acting (front spring) 2 = double-acting (front and rear cushions) 3 = double-acting (no cushion) 4 = double-acting (rear cushions) 5 = double-acting (front cushion) 6 = double-acting (through-rod with front and rear cushions) 7 = single-acting (through-rod)
N	MATERIALS N = rod stainless steel AISI 420B - tube stainless steel AISI 304 - NBR seals
050	BORE 032 = 32 mm 040 = 40 mm 050 = 50 mm 063 = 63 mm
A	TYPE OF DESIGN A = standard (threaded nose mount with lock nut V+ lock for nut for rod U)
0200	STROKE (see table)

ACCESSORIES FOR CYLINDERS SERIES 42



Nose nut Mod. V

Coupling piece
Mod. GKFSelf aligning rod
Mod. GKPiston rod socket joint
Mod. GY

Rod fork end Mod. G



Foot mount Mod. P



Trunnion Mod. I



Swivel ball joint Mod. GA

Brack threaded pins
Mod. T

Piston rod nut Mod. U



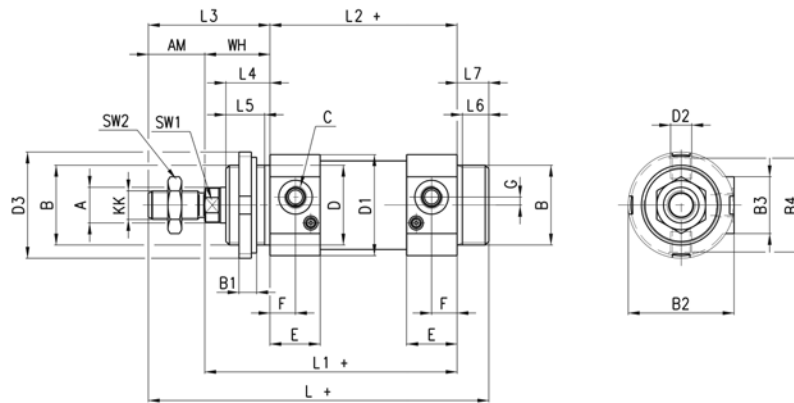
All accessories are supplied separately, except for piston rod lock Mod. U and nose nut Mod. V.

Cylinders Series 42

N.B. : the single-acting cylinders, sizes L, L1 and L2 are increased by 25 mm.



+ = add the stroke



DIMENSIONS (mm)

Ø	A	KK	B	B1	B2	B3	B4	C	D ¹¹	D1	D2	D3	E	F	G	SW1	SW2	AM	WH	L +	L1 +	L2 +	L3	L4	L5	L6	L7	Cushion stroke
32	12	M10x1.25	M30x1.5	8	41.5	28	36	G1½	30	38	M8x1	42	23.5	10.5	5	10	17	22	26	156	120	94	48	18	15	11	14	17
40	16	M12x1.25	M38x1.5	10	50	30	43	G1¼	38	46	M10x1	50	29	15	5	13	19	24	30	175	135	105	54	22	19	13	16	24
50	20	M16x1.5	M45x1.5	10	58.5	32	54	G1¼	40	57	M12x1.5	60	28.5	14.5	4.5	17	24	32	37	193	143	106	69	25	22	15	18	22
63	20	M16x1.5	M45x1.5	10	70.5	46.5	66	G3/8	45	70	M14x1.5	60	35	15	7	17	24	32	37	208	158	121	69	25	22	15	18	27

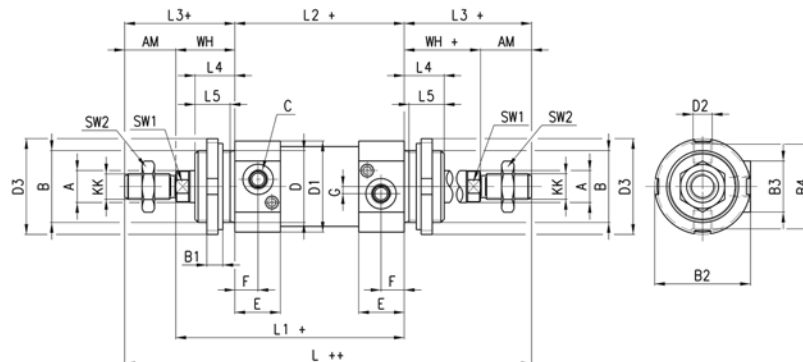
Cylinders Series 42

Through rod.

N.B. : the single-acting cylinders, sizes L, L1 and L2 are increased by 25 mm.



+ = add the stroke
++ = add the stroke 2 times



DIMENSIONS (mm)

Ø	A	KK	B	B1	B2	B3	B4	C	D	D1	D2	D3	E	F	G	SW1	AM	SW2	WH +	L ++	L1 +	L2 +	L3 +	L4	L5	Cushion stroke
32	12	M10x1.25	M30x1.5	8	41.5	28	36	G1/8	30	38	M8x1	42	23.5	10.5	5	10	22		26	190	145	119	48	18	15	17
40	16	M12x1.25	M38x1.5	10	50	30	43	G1/4	38	46	M10x1	50	29	15	5	13	24		30	213	160	130	54	22	19	24
50	20	M16x1.5	M45x1.5	10	58.5	32	54	G1/4	45	57	M12x1.5	60	28.5	14.5	4.5	17	32		37	244	168	131	69	25	22	22
63	20	M16x1.5	M45x1.5	10	70.5	46.5	66	G3/8	45	70	M14x1.5	60	35	15	7	17	32		37	259	158	121	69	25	22	22

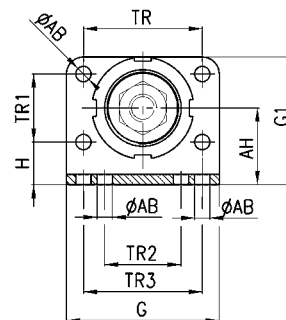
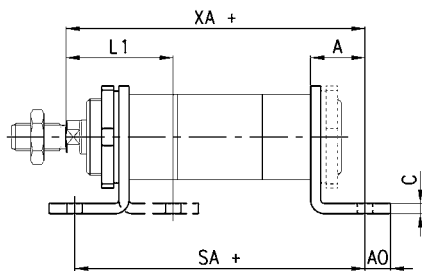
Foot mount Mod. P

Material: zinc-plated steel.



Supplied with:
1x nut
2x single feet

+ = add the stroke



DIMENSIONS (mm)

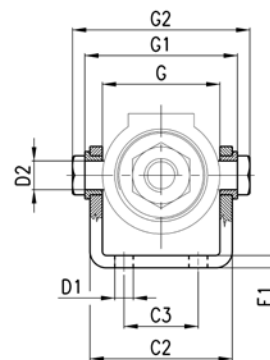
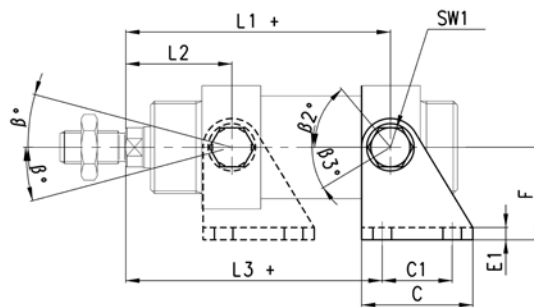
Mod.	Ø	L1	SA +	XA +	A	AB	AO	AH	C	G	G1	TR	TR1	TR2	TR3	H
P-42-32	32	46	142	144	24	7	11	32	4	66	53	52	28	32	52	18
P-42-40	40	53	161	163	28	9	15	36	5	80	61	60	30	36	60	21
P-42-50	50	63	170	175	32	9	15	45	6	90	75	70	40	45	70	25
P-42-63	63	63	185	190	32	9	10	50	6	96	85	76	50	50	76	25

Trunnion Mod. I

Material: zinc-plated steel.



+ = add the stroke



DIMENSIONS (mm)

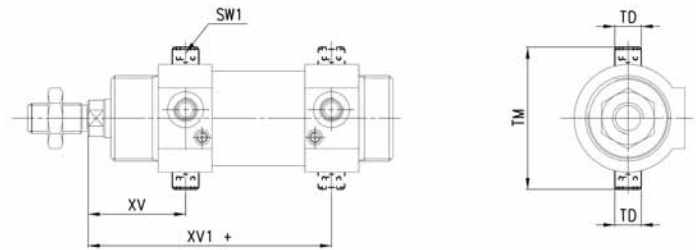
Mod.	Ø	L1 +	L2	L3 +	C	C1	C2	C3	D1	D2	E1	F	SW1	G	G1	G2
I-42-32	32	109,5	36,5	105,5	40	24	46,1	20	7	10	4	35	13	38,1	50,1	58,1
I-42-40	40	120	45	117	50	30	56,1	28	9	12	5	40	17	46,1	60,1	70,1
I-42-50	50	128,5	51,5	124,5	54	34	69,1	36	9	14	6	45	19	57,1	74,1	86,1
I-42-63	63	143	52	142	65	35	82,1	42	9	16	6	50	19	70,1	88,1	100,1

Bracket with threaded pins Mod. T

Material: stainless steel

Supplied with:
2x pins

+ = add the stroke

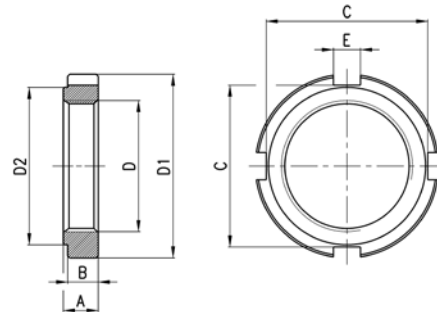


DIMENSIONS (mm)

Mod.	Ø	XV	XV1+	TD	TM	SW1
T-42-32	32	36,5	109,5	10	51	5
T-42-40	40	45	120	12	61	6
T-42-50	50	51,5	128,5	14	75	6
T-42-63	63	52	143	16	90	8

Nose nut Mod.V-42

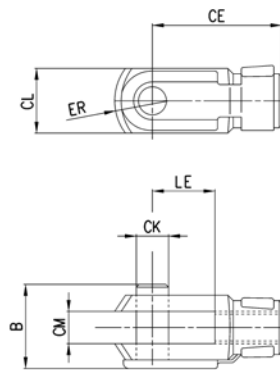
Material: zinc-plated steel



DIMENSIONS (mm)

Mod.	Ø	D	D1	D2	A	B	C	E
V-42-32	32	M30X1,5	42	36	8	7	37	6,2
V-42-40	40	M38x1,5	50	48	10	9	44	7,2
V-42-50-63	50-63	M45x1,5	60	56	10	9	53	7,2

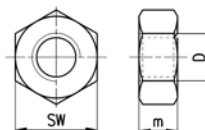
Rod fork end Mod. G

Material: stainless steel
ISO 8140

DIMENSIONS (mm)

Mod.	Ø	ØCK	LE	CM	CL	ER	CE	KK	B	B1
G-25-32	32	10	20	10	20	12	40	M10X1,25	26	18
G-40	40	12	24	12	24	14	48	M12X1,25	32	20
G-50-63	50-63	16	32	16	32	19	64	M16X1,5	40	26

Piston rod lock Mod. U

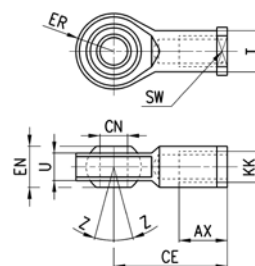


DIMENSIONS (mm)

Mod.	Ø	D	m	SW
U-25-32	32	M10X1,25	6	17
U-40	40	M12X1,25	7	19
U-50-63	50-63	M16X1,5	8	24

Swivel ball joint Mod. GA

Material: zinc-plated steel
ISO 8139

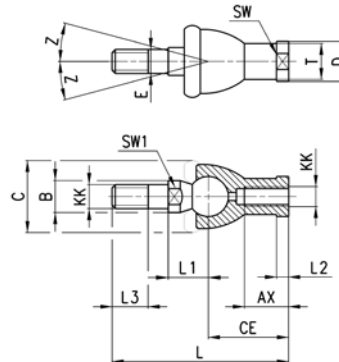


DIMENSIONS (mm)

Mod.	Ø	ØCN	U	EN	ER	AX	CE	KK	T	Z	SW
GA-32	32	10	10,5	14	14	20	43	M10X1,25	15	6,5	17
GA-40	40	12	12	16	16	22	50	M12X1,25	17,5	6,5	19
GA-50-63	50-63	16	15	21	21	28	64	M16X1,5	22	7,5	22

Piston rod socket joint Mod. GY

Material: Zinc-Aluminum alloy and
zinc-plated steel

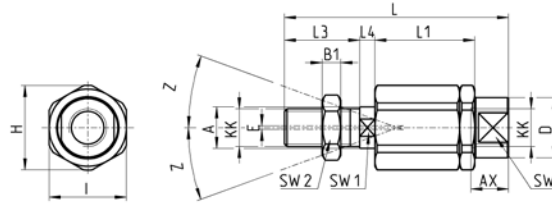


DIMENSIONS (mm)

Mod.	Ø	KK	L	CE	L2	AX	SW	SW1	L1	L3	ØT	ØD	E	ØB	ØC	Z
GY-32	32	M10x1,25	74	35	6,5	18	17	11	19,5	15	15	19	10	14	28	15
GY-40	40	M12x1,25	84	40	6,5	20	19	17	22	17	17,5	22	12	19	32	15
GY-50-63	50-63	M16x1,5	112	50	8	27	22	19	27,5	23	22	27	16	22	40	11

Self aligning rod Mod. GK

Material: zinc plated steel

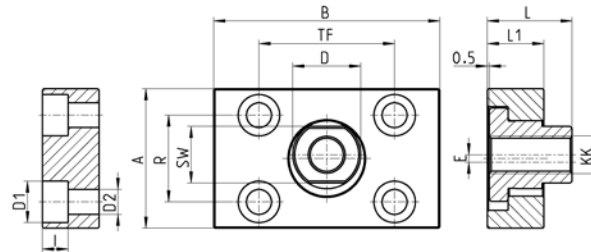
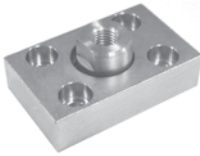


DIMENSIONS (mm)

Mod.	Ø	KK	L	L1	L3	L4	Ø A	Ø D	H	I	SW	SW1	SW2	B1	AX	Z	E
GK-25-32	32	M10x1,25	71,5	35	20	7,5	14	22	32	30	19	12	17	5	22	4	2
GK-40	40	M12x1,25	75,5	35	24	7,5	14	22	32	30	19	12	19	6	22	4	2
GK-50-63	50-63	M16x1,5	104	53	32	10	22	32	45	41	27	20	24	8	30	3	2

Female Alignment Coupling Mod. GKF

Material: zinc plated steel



DIMENSIONS (mm)

Mod.	Ø	KK	A	B	R	TF	L	L1	I	ØD	ØD1	ØD2	SW	E
GKF-25-32	32	M10x1,25	37	60	23	36	22,5	15	6,8	18	11	6,6	15	2
GKF-40	40	M12x1,25	56	60	38	42	22,5	15	9	20	15	9	15	2,5
GKF-50-63	50-63	M16x1,5	80	80	58	58	26,5	15	10,5	25	18	11	22	2,5

TABLE SHOWING THE COMPATIBILITY OF MAGNETIC PROXIMITY SWITCHES BY CYLINDER SERIES

Series	Ø	CST - CSH	CSV	CSB-D-220 / CSB-H-220	CSC-D-220 / CSB-H-220	CSN
24 - 25	16	S-CST-02				
	20	S-CST-03				
	25	S-CST-04				
27	20	S-CST-03				
	25	S-CST-04				
	32	S-CST-18				
	40	S-CST-19				
	50	S-CST-20				
	63	S-CST-21				
31	12	Direct mounting				
	16	Direct mounting				
	20	Direct mounting				
	25	Direct mounting				
	32	Direct mounting				
	40	Direct mounting				
	50	Direct mounting				
	63	Direct mounting				
	80	Direct mounting				
	100	Direct mounting				
32	20	Direct mounting				
	25	Direct mounting				
	32	Direct mounting				
	40	Direct mounting				
	50	Direct mounting				
	63	Direct mounting				
	80	Direct mounting				
40	160	S-CST-28				S21
	200	S-CST-28				S21
	250					S21
	160					S53
	200					S53
42	32	S-CST-18				
	40	S-CST-19				
	50	S-CST-20				
	63	S-CST-21				
50	16		Direct mounting			
	25		Direct mounting			
	32	S-CST-01				
	40	S-CST-01				
	50	S-CST-01				
	63	S-CST-01				
	80	S-CST-01				
52	25	Direct mounting				
	32	Direct mounting				
	40	Direct mounting				
	50	Direct mounting				
	63	Direct mounting				
60	32	S-CST-25				Direct mounting
	40	S-CST-25				Direct mounting
	50	S-CST-25				Direct mounting
	63	S-CST-25				Direct mounting
	80	S-CST-26				Direct mounting
	100	S-CST-26				Direct mounting
	125	S-CST-27				S21
60 + 45N	32	S-CST-45N1				
	40	S-CST-45N1				
	50	S-CST-45N1				
	63	S-CST-45N1				
	80	S-CST-45N2				
	100	S-CST-45N2				

TABLE SHOWING THE USE OF CAMOZZI MAGNETIC PROXIMITY SWITCHES

Series	Ø	CST - CSH	CSV	CSB-D-220 / CSB-H-220	CSC-D-220 / CSC-H-220
61	32	Direct mounting			
	40	Direct mounting			
	50	Direct mounting			
	63	Direct mounting			
	80	Direct mounting			
	100	Direct mounting			
	125	Direct mounting			
62	32	Direct mounting (CSH only)			
	40	Direct mounting (CSH only)			
	50	Direct mounting (CSH only)			
	63	Direct mounting (CSH only)			
	80	Direct mounting (CSH only)			
	100	Direct mounting (CSH only)			
69	32	Direct mounting			
	40	Direct mounting			
	50	Direct mounting			
	63	Direct mounting			
	80	Direct mounting			
	100	Direct mounting			
	125	Direct mounting			
90	32	S-CST-25			
	40	S-CST-25			
	50	S-CST-25			
	63	S-CST-25			
	80	S-CST-26			
	100	S-CST-26			
	125	S-CST-27			
92	32	S-CST-06			
	40	S-CST-07			
	50	S-CST-08			
	63	S-CST-09			
94	16	S-CST-05			
	20	S-CST-05			
94/95	25	S-CST-05			
CGA	10			Direct mounting	
	16			Direct mounting	
	20			Direct mounting	
	25			Direct mounting	
	32			Direct mounting	
CGB	16			Direct mounting	
	20			Direct mounting	
	25			Direct mounting	
	32			Direct mounting	
CGC	50			Direct mounting	
	64			Direct mounting	
	80			Direct mounting	
	100			Direct mounting	
	125			Direct mounting	
CGL	10				Direct mounting
	16				Direct mounting
	20				Direct mounting
	25				Direct mounting
	32				Direct mounting
CGP	10			Direct mounting	
	16			Direct mounting	
	20			Direct mounting	
	25			Direct mounting	
	32			Direct mounting	
CGS	16			Direct mounting	
	20			Direct mounting	
	25			Direct mounting	
	32			Direct mounting	

TABLE SHOWING THE USE OF CAMOZZI MAGNETIC PROXIMITY SWITCHES

Series	Ø	CST - CSH	CSV	CSB-D-220 CSB-H-220	CSC-D-220 CSC-H-220
QC	20	Direct mounting			
	25	Direct mounting			
	32	Direct mounting			
	40	Direct mounting			
	50	Direct mounting			
	63	Direct mounting			
	80	Direct mounting			
QP-QPR	12		Direct mounting		
	16		Direct mounting		
	20	S-CST-01			
	25	S-CST-01			
	32	S-CST-01			
	40	S-CST-01			
	50	S-CST-01			
	63	S-CST-01			
	80	S-CST-01			
	100	S-CST-01			
QCBF	20	Direct mounting			
	25	Direct mounting			
	32	Direct mounting			
	40	Direct mounting			
QCTF	20	Direct mounting			
	25	Direct mounting			
	32	Direct mounting			
	40	Direct mounting			
QX	10				Direct mounting
	16				Direct mounting
	20				Direct mounting
	25				Direct mounting
	32				Direct mounting

3 Stainless Steel Cylinders

Page

Series 94 and 95		Stainless Steel Minicylinders, ISO 6432	180
Series 90		Stainless Steel Tie-rod Cylinders, ISO 6431	186
Series 92		Stainless Steel Round Body Cylinders	195
Series 97		Stainless Steel Cylinders	201

Stainless Steel Minicylinders, ISO 6432 Series 94 and 95

Single-acting and double-acting
Standard CETOP RP52-P DIN/ISO 6432
Series 94 (ø 16, 20, 25): magnetic
Series 95 (ø 25): magnetic, cushioned

» ISO/DIN 6432

» Stainless steel



The cylinders Series 94 and 95 are suitable for use in harsh environmental conditions as in the off-shore, naval, pharmaceutical, nuclear and food industries. Their construction enables the replacement of all seals.

GENERAL DATA

Type of construction	end blocks secured to the tube
Operation	single-acting and double-acting
Materials	end blocks and rod = stainless steel AISI 316, seals = NBR Series 94: tube in stainless steel AISI 304 Series 95: tube in stainless steel AISI 316
Type of mounting	screw - flange - feet - swivel combination
Strokes min - max	10 – 500 mm
Operating temperature	0° - 80°C (with dry air -20°C), (32 - 176°F, with dry air -4°F)
Special designs	for applications in damp, dusty or aggressive environments
Operating pressure	1 – 10 bar, (14 - 145 psi)
Speed	10 – 1000 mm/sec (without load)
Fluid	clean air, without lubrication
* If lubricated air is used, it is recommended to use oil ISOVG32. Once applied the lubrication should never be interrupted.	

STANDARD STROKES FOR MINICYLINDERS SERIES 94 AND 95

- = double-acting
 ✕ = single-acting

Ø	10	25	40	50	80	100	125	160	200	250	300	320	400	500
94 16	■ ✕	■ ✕	■ ✕	■ ✕	■	■	■	■	■					
94 20	■ ✕	■ ✕	■ ✕	■ ✕	■	■	■	■	■	■	■			
94 25	■ ✕	■ ✕	■ ✕	■ ✕	■	■	■	■	■	■	■	■	■	■
95 25	■	■	■	■	■	■	■	■	■	■	■	■	■	■

CODING EXAMPLE

94	N	2	A	16	A	100	
----	---	---	---	----	---	-----	--

94	SERIES 94 = magnetic 95 = magnetic, cushioned
N	VERSION N = standard
2	OPERATION 1 = single-acting (front spring) 2 = double-acting 3 = double-acting (through-rod)
A	MATERIALS A = stainless steel, seals in NBR (Buna-N) V = stainless steel, all seals in FKM , (VITON)
16	BORE (ø): 16 = 16 mm 20 = 20 mm 25 = 25 mm
A	TYPE OF DESIGN A = standard (locking ring for end cap V + lock nut for rod U)
100	STROKE (see table) = standard V = rod seals in FKM , (VITON)

ACCESSORIES FOR STAINLESS STEEL MINICYLINDERS SERIES 94 AND 95



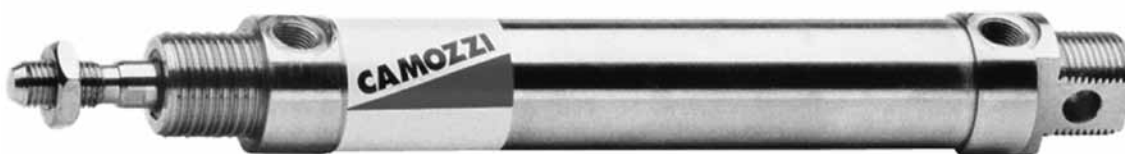
Foot mount Mod. B

Rod fork end
Mod. G-94/90Swivel ball joint
Mod. GA-94/90Nose nut Mod. V-94 and
Mod. U-90

Flange bracket Mod. E



Trunnion bracket Mod. I

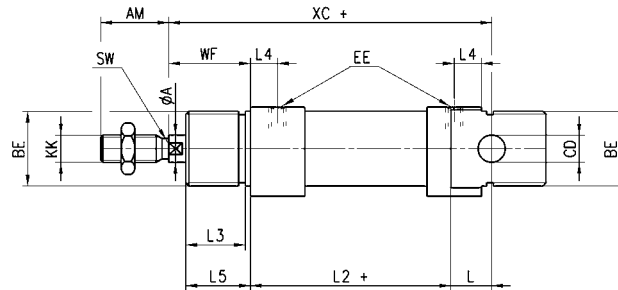
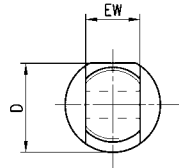
Piston rod nut
Mod. U-94/90

All accessories are supplied separately, except for piston rod nut Mod. U

Cylinders Series 94 and 95



+ = add the stroke



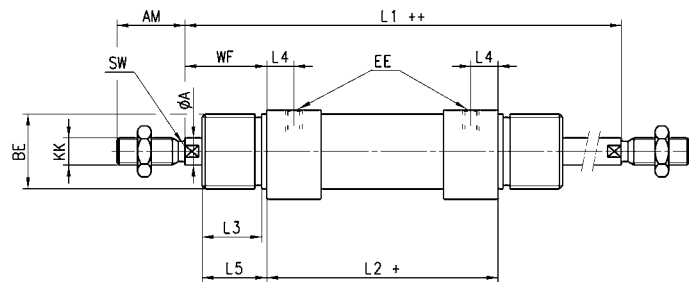
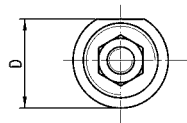
DIMENSIONS (mm)

Mod.	Ø	A	AM	BE	CD	D	EE	EW	KK	L	L2	L3	L4	L5	SW	WF	XC
94	16	6	16	M16x1,5	6	21,2	M5	12	M6	9	56	14	5,5	15	5	22	82
94	20	8	20	M22x1,5	8	26,2	G1/8	16	M8	12	68	17,5	8	19	7	24	95
94-95	25	10	22	M22x1,5	8	32,5	G1/8	16	M10x1,25	12	69	18,5	7,5	20	8	28	104

Cylinders Series 94 and 95 - through-rod



+ = add the stroke
 ++ = add the stroke two times



DIMENSIONS (mm)

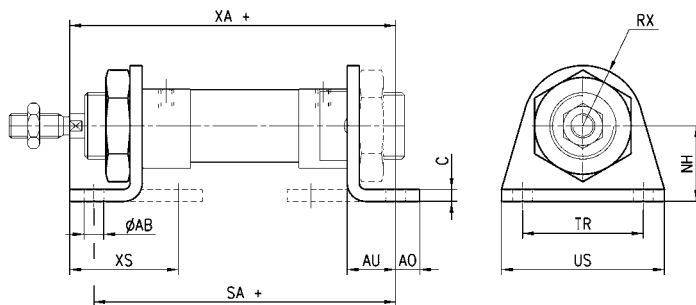
Mod.	Ø	A	AM	BE	D	EE	KK	L1	L2	L3	L4	L5	SW	WF
94	16	6	16	M16x1,5	21,2	M5	M6	100	56	14	5,5	15	5	22
94	20	8	20	M22x1,5	26,2	G1/8	M8	116	68	17,5	8	19	7	24
94-95	25	10	22	M22x1,5	32,5	G1/8	M10x1,25	125	69	18,5	7,5	20	8	28

Foot mount Mod. B

Material: stainless steel 304

Supplied with:
2x feet
1x nut

+ = add the stroke



DIMENSIONS (mm)

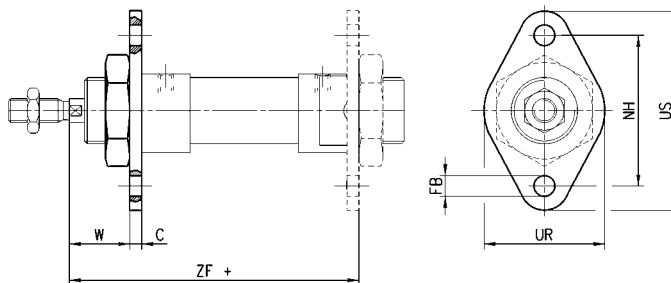
Mod.	Ø	AB	AO	AU	C	NH	RX	SA	TR	US	XA	XS
B-94-12-16	16	5,5	6	13	3	20	13	82	32	42	91	32
B-94-20-25	20	6,6	8	16	4	25	20	100	40	54	108	36
B-94-20-25	25	6,6	8	16	4	25	20	101	40	54	113	40

Flange bracket Mod. E

Material: stainless steel 304

Supplied with:
1x flange

+ = add the stroke

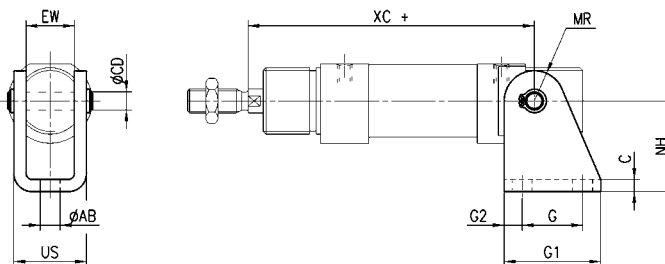


DIMENSIONS (mm)

Mod.	Ø	C	FB	TF	UF	UR	W	ZF
E-94-12-16	16	3	5,5	40	53	30	19	81
E-94-20-25	20	4	6,6	50	66	40	20	96
E-94-20-25	25	4	6,6	50	66	40	24	101

Trunnion Bracket Mod. I

Material: stainless steel 304

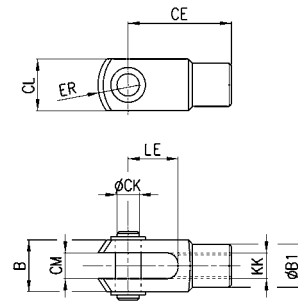


DIMENSIONS (mm)

Mod.	Ø	AB	C	CD	EW	G	G1	G2	MR	NH	US	XC+
I-94-12-16	16	5,5	3	6	12	15	25	5	7	27	18,1	82
I-94-20-25	20	6,6	4	8	16	20	32	6	10	30	24,1	95
I-94-20-25	25	6,6	4	8	16	20	32	6	10	30	24,1	104

Rod Fork End Mod. G-94/90

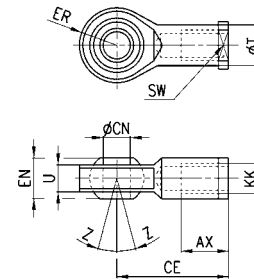
Material: stainless steel 303
ISO 8140



DIMENSIONS (mm)									
Mod.	CK	LE	KK	CM	ER	CE	CL	B	B1
G-94-12-16	6	12	M6x1	6	7	24	12	16	10
G-94-20	8	16	M8x1,25	8	10	32	16	22	14
G-90-25-32	10	20	M10x1,25	10	12	40	20	26	18

Swivel Ball Joint Mod. GA-94/90

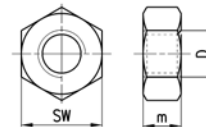
Material: stainless steel 304
ISO 8139



DIMENSIONS (mm)									
Mod.	CN	U	EN	ER	AX	CE	KK	T	Z
GA-94-12-16	6	7	9	10	12	30	M6x1	10	6,5
GA-94-20	8	9	12	12	16	36	M8x1,25	12,5	6,5
GA-90-32	10	10,5	14	14	20	43	M10x1,25	15	6,5

Piston rod nut Mod. U-94/90

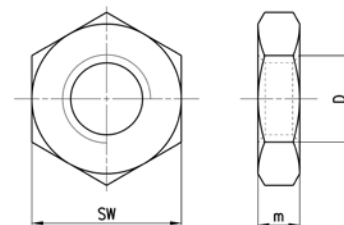
Material: stainless steel 304
UNI 5589



DIMENSIONS (mm)			
Mod.	D	m	SW
U-94-12-16	M6x1	4	10
U-94-20	M8x1,25	5	13
U-90-25-32	M10x1,25	6	17

Nose Nut Mod. V-94 and Mod. U-90

Material: stainless steel 304



DIMENSIONS (mm)			
Mod.	Ø	D	m
U-90-50-63	12-16	M16x1,5	8
V-94-20-25	20-25	M22x1,5	10

Stainless Steel Tie-rod Cylinders, ISO 6431 Series 90

Single or double-acting, cushioned, magnetic (DIN/ISO 6431)
 ø32, 40, 50, 63, 80, 100 and 125



- » DIN/ISO 6431
- » Clean design
- » Stainless steel AISI 316



Stainless steel cylinders Series 90 ø 32, 40, 50, 63, 80, 100 and 125 have been designed to comply with the sizes of standard DIN/ISO 6431. These cylinders are suitable for use in harsh environmental conditions as in the off-shore, naval, pharmaceutical, nuclear and food industries.

A permanent magnet is mounted on the piston in these cylinders. The position of the cylinder is obtained by the magnetic proximity switches mounted on the cylinder. This series of cylinders is normally equipped with adjustable end-stroke cushioning. In addition these cylinders are equipped with a mechanical cushioning in order to make the impact of the piston less noisy as it reaches the end of the stroke.

GENERAL DATA

Type of construction	with tie-rods
Operation	single-acting or double-acting
Materials	end block, tube, tie-rods and rod = stainless steel AISI 316 (SS 2343); seals = NBR
Type of mounting	front and rear flange - feet front and rear bracket - swivel combination
Stroke	standard (see table) / min-max: all bores 25-800 mm
Operating temperature	0°C – 80°C (with dry air - 20°C) (32 - 176°F, with dry air -4°F)
Operating pressure	1 – 10 bar, (14 - 145 psi)
Speed	10 – 1000 mm/sec (no load)
Fluid	clean air, without lubrication. If lubricated air is used, it is recommended to use oil ISOVG32. Once applied, lubrication should never be interrupted.

STANDARD STROKES FOR CYLINDER SERIES 90

- ✕ = Double-acting
• = Single-acting

Ø	25	50	75	80	100	125	150	160	200	250	300	320	400	500
32	✕•	✕•	✕•	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕
40	✕•	✕•	✕•	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕
50	✕•	✕•	✕•	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕
63	✕•	✕•	✕•	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕
80	✕•	✕•	✕•	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕
100	✕•	✕•	✕•	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕
125		✕•	✕•	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕

CODING EXAMPLE

90	M	2	A	050	A	0200	
----	---	---	---	-----	---	------	--

90	SERIES
M	VERSION M = standard, magnetic
2	OPERATION 1 = single-acting (front spring) 2 = double-acting (front and rear cush.) 6 = double-acting (through-rod with front and rear cushions)
A	MATERIALS A = stainless steel AISI 316 (SS 2343), seals in NBR, (Buna-N) V = stainless steel AISI 316 (SS 2343), all seals in FKM, (VITON)
050	BORE (ø): 032 = 32 mm 040 = 40 mm 050 = 50 mm 063 = 63 mm 080 = 80 mm 100 = 100 mm 125 = 125 mm
A	TYPE OF DESIGN A = standard
0200	STROKE see table
	= standard V = rod seals in FKM, (VITON)

ACCESSORIES FOR STAINLESS STEEL CYLINDERS SERIES 90

Rear trunnion, female
Mod. C

Piston rod nut Mod. U-90

Combination
Mod. I

Rod fork end Mod. G-90

Front and rear flange
Mod. D

Foot mount Mod. B

90° male trunnion
Mod. ZCSwivel ball joint
Mod. GA-90Rear trunnion, male
Mod. L

Clevis pin Mod. S-90



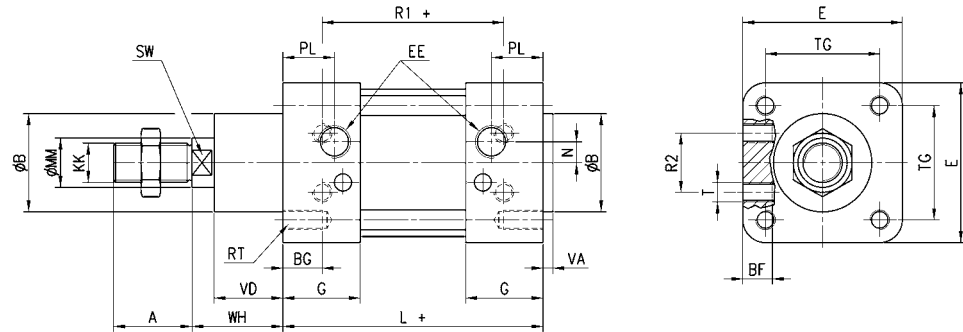
All accessories are supplied separately, except for the piston rod nut Mod. U

Cylinders Series 90

Note: the single-acting cylinders, dimensions L and R1 are increased by 25 mm.



+ = add the stroke



DIMENSIONS (mm)

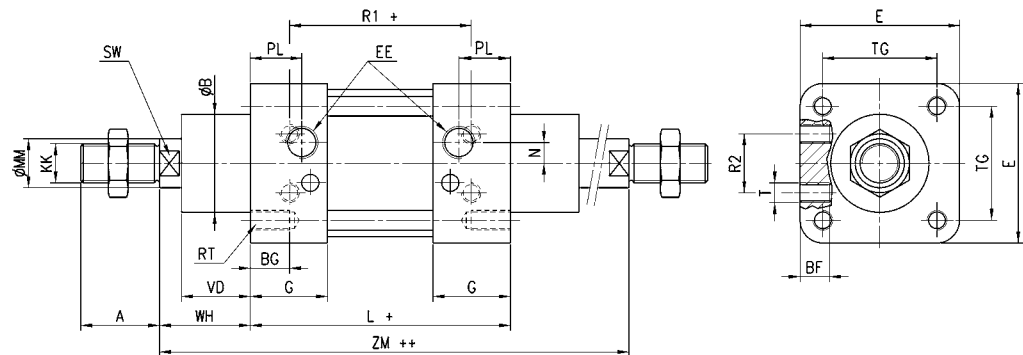
ϕ	A	B	BF	BG	E	EE	G	KK	L	MM	N	PL	RT	R1	R2	SW	T	TG	VA	VD	WH
32	22	30	10	16	45	G1/8	28	M10x1,25	94	12	4,5	14	M6	64	16	10	M5	33	4	20	26
40	24	35	10	16	55	G1/4	32	M12x1,25	105	16	5,5	16	M6	70	21	13	M6	38	4	22	30
50	32	40	12	16	65	G1/4	32	M16x1,5	106	20	8,5	21	M8	74	24	17	M8	46,5	4	28	37
63	32	45	12	16	80	G3/8	35	M16x1,5	121	20	8,5	22	M8	85	33	17	M8	56,5	4	28	37
80	40	45	15	16	95	G3/8	36	M20x1,5	128	25	8,5	23	M10	92	34	21	M10	72	4	34	46
100	40	55	15	16	115	G1/2	41	M20x1,5	138	25	10	26	M10	100	58	21	M10	89	4	38	51
125	54	60	24	20	140	G1/2	45	M27x2	160	32	12,5	30	M12	110	65	27	M12	110	5	50	65

Cylinders Series 90 - through-rod

Note: the single-acting cylinders, dimensions L, R1 and ZM are increased by 25 mm.



+ = add the stroke
++ = add the stroke two times



DIMENSIONS (mm)

ϕ	A	B	BF	BG	E	EE	G	KK	L	MM	N	PL	RT	R1	R2	SW	T	TG	VD	WH	ZM
32	22	30	10	16	45	G1/8	28	M10x1,25	94	12	4,5	14	M6	64	16	10	M5	33	20	26	146
40	24	35	10	16	55	G1/4	32	M12x1,25	105	16	5,5	16	M6	70	21	13	M6	38	22	30	165
50	32	40	12	16	65	G1/4	32	M16x1,5	106	20	8,5	21	M8	74	24	17	M8	46,5	28	37	180
63	32	45	12	16	80	G3/8	35	M16x1,5	121	20	8,5	22	M8	85	33	17	M8	56,5	28	37	195
80	40	45	15	16	95	G3/8	36	M20x1,5	128	25	8,5	23	M10	92	34	21	M10	72	34	46	220
100	40	55	15	16	115	G1/2	41	M20x1,5	138	25	10	26	M10	100	58	21	M10	89	38	51	240
125	54	60	24	20	140	G1/2	45	M27x2	160	32	12,5	30	M12	110	65	27	M12	110	50	65	290

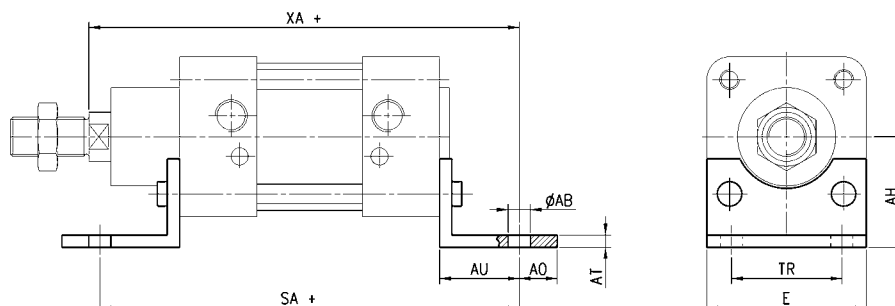
Foot mount Mod. B

Material: stainless steel 304



Supplied with:
2x feet
4x screws

+ = add the stroke



DIMENSIONS (mm)

Mod.	Ø	AB	AH	AO	AT	AU	E	TR	SA	XA
B-90-32	32	7	32	11	4	24	45	32	142	144
B-90-40	40	9	36	8	4	28	52	36	161	163
B-90-50	50	9	45	15	5	32	65	45	170	175
B-90-63	63	9	50	13	5	32	75	50	185	190
B-90-80	80	12	63	14	6	41	95	63	210	215
B-90-100	100	14	75	16	6	41	115	75	220	230
B-90-125	125	16	90	25	8	45	140	90	250	270

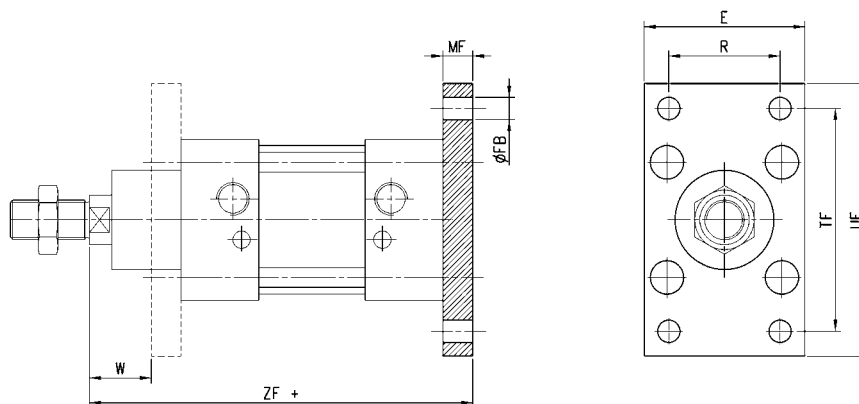
Front and rear flange Mod. D

Material: stainless steel 304.



Supplied with:
1x flange
4x screws

+ = add the stroke



DIMENSIONS (mm)

Mod.	Ø	E	FB	MF	TF	UF	W	ZF	R
D-E-90-32	32	45	7	10	64	80	16	130	32
D-E-90-40	40	52	9	10	72	90	20	145	36
D-E-90-50	50	65	9	12	90	110	25	155	45
D-E-90-63	63	75	9	12	100	120	25	170	50
D-E-90-80	80	95	12	16	126	150	30	190	63
D-E-90-100	100	115	14	16	150	170	35	205	75
D-E-90-125	125	140	16	20	180	205	45	245	90

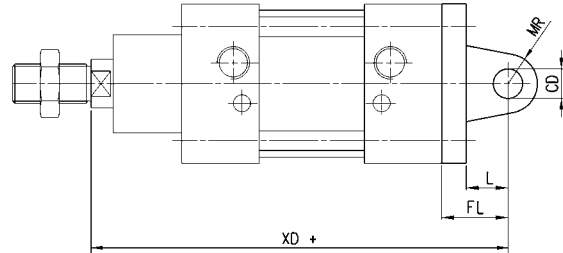
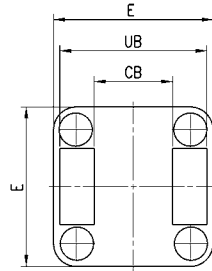
Rear trunnion, female Mod. C

Material: stainless steel 304.



Supplied:
1x female trunnion
4x screws

+ = add the stroke



DIMENSIONS (mm)									
Mod.	Ø	CB	CD	E	FL	L	MR	UB	XD
C-H-90-32	32	26	10	45	22	12	10	45	142
C-H-90-40	40	28	12	52	25	15	12	52	161
C-H-90-50	50	32	12	65	27	17	12	60	170
C-H-90-63	63	40	16	75	32	20	16	70	185
C-H-90-80	80	50	16	95	36	22	16	90	210
C-H-90-100	100	60	20	115	41	25	20	110	230
C-H-90-125	125	70	25	140	50	30	25	130	275

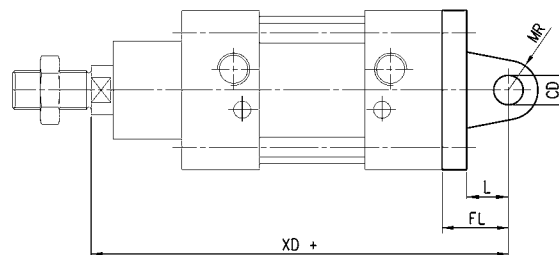
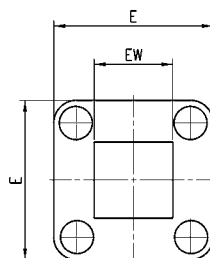
Rear trunnion, male Mod. L

Material: stainless steel 304.



Supplied:
1x male trunnion
4x screws

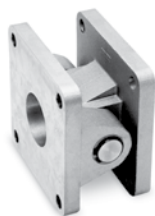
+ = add the stroke



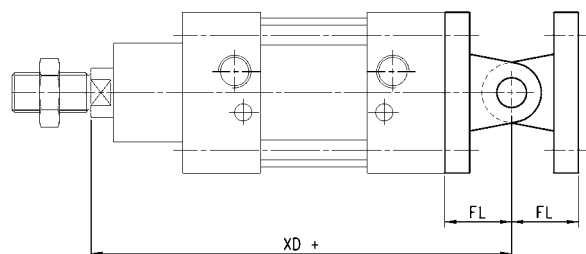
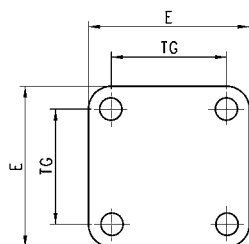
DIMENSIONS (mm)								
Mod.	Ø	EW	CD	E	FL	L	MR	XD
L-90-32	32	26	10	45	22	12	10	142
L-90-40	40	28	12	52	25	15	12	161
L-90-50	50	32	12	65	27	17	12	170
L-90-63	63	40	16	75	32	20	16	185
L-90-80	80	50	16	95	36	22	16	210
L-90-100	100	60	20	115	41	25	20	230
L-90-125	125	70	25	140	50	30	25	275

Combination Mod. I (combination of C + L + S)

Material: stainless steel 304



+ = add the stroke



DIMENSIONS (mm)

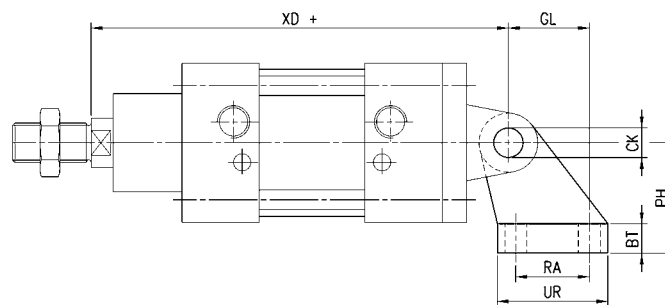
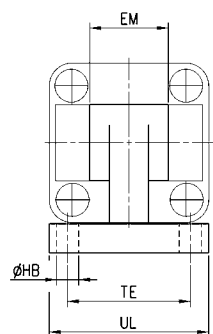
Mod.	Ø	E	FL	L	TG	XD
I-41-32	32	45	22	12	33	142
I-41-40	40	52	25	15	38	161
I-41-50	50	65	27	17	47	170
I-41-63	63	75	32	20	57	185
I-41-80	80	95	36	22	72	210
I-41-100	100	115	41	25	89	230
I-41-125	125	140	50	30	110	275

90° male trunnion Mod. ZC

Material: stainless steel 304

Supplied with:
1x male support

+ = add the stroke

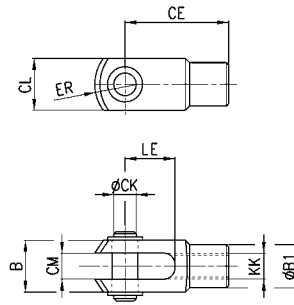


DIMENSIONS (mm)

Mod.	Ø	BT	CK	EM	GL	HB	PH	RA	TE	UL	UR	XD
ZC-90-32	32	8	10	26	21	6,6	32	18	38	51	31	142
ZC-90-40	40	10	12	28	24	6,6	36	22	41	54	35	161
ZC-90-50	50	12	12	32	33	9	45	30	50	65	45	170
ZC-90-63	63	14	16	40	37	9	50	35	52	67	50	185
ZC-90-80	80	14	16	50	47	11	63	40	66	86	60	210
ZC-90-100	100	17	20	60	55	11	71	50	76	96	70	230
ZC-90-125	125	20	25	70	70	14	90	60	94	124	90	275

Rod fork end Mod. G-90

Material: stainless steel 303
ISO 8140

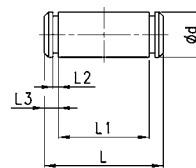


DIMENSIONS (mm)

Mod.	Ø	CK	LE	CM	CL	ER	CE	KK	B	B1
G-90-25-32	32	10	20	10	20	12	40	M10x1,25	26	18
G-90-40	40	12	24	12	24	14	48	M12x1,25	31	20
G-90-50-63	50-63	16	32	16	32	19	64	M16x1,5	39	26
G-90-80-100	80-100	20	40	20	40	25	80	M20x1,5	50	34
G-90-125	125	30	54	30	55	38	110	M27x2	67	48

Clevis pin Mod. S-90

Material: stainless steel 303

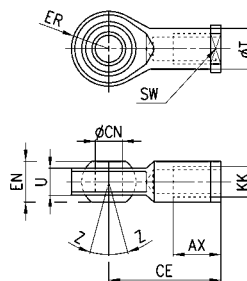


DIMENSIONS (mm)

Mod.	Ø	d	L	L1	L2	L3
S-90-32	32	10	53	46	1,1	3
S-90-40	40	12	60	53	1,1	3
S-90-50	50	12	68	61	1,1	3
S-90-63	63	16	78	71	1,1	3
S-90-80	80	16	98	91	1,1	3
S-90-100	100	20	118	111	1,3	5
S-90-125	125	25	139	132	1,3	4,2

Swivel ball joint Mod. GA-90

Material: stainless steel 304
ISO 8139

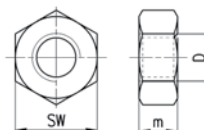


DIMENSIONS (mm)

Mod.	$\emptyset$	CN	U	EN	ER	AX	CE	KK	T	Z	SW
GA-90-32	32	10	10,5	14	14	20	43	M10x1,25	15	6,5	17
GA-90-40	40	12	12	16	16	22	50	M12x1,25	17,5	6,5	19
GA-90-50-63	50-63	16	15	21	21	28	64	M16x1,5	22	7,5	22
GA-90-80-100	80-100	20	18	25	21	33	77	M20x1,5	27,5	7	30
GA-90-125	125	30	25	35	35	51	110	M27x2	40	7,5	41

Piston rod nut Mod. U-90

Material: stainless steel 304
UNI 5589



DIMENSIONS (mm)

Mod.	$\emptyset$	D	m	SW
U-90-25-32	32	M10x1,25	6	17
U-90-40	40	M12x1,25	7	19
U-90-50-63	50-63	M16x1,5	8	24
U-90-80-100	80-100	M20x1,5	9	30
U-90-125	125	M27x2	12	41

Stainless Steel Round Body Cylinders Series 92

Single or double-acting, cushioned, magnetic
ø32 - 40 - 50 - 63



- » Clean design
- » Stainless steel AISI 316
- » Adjustable end-stroke cushioning

Stainless steel cylinders Series 92 are suitable for use in the off-shore, naval, pharmaceutical, nuclear and food industries.

This series of cylinders is normally equipped with adjustable end-stroke cushioning. In addition, these cylinders are equipped with a mechanical cushioning in order to make the impact of the piston less noisy as it reaches the end of the stroke. Their construction enables the replacement of all seals.

GENERAL DATA

Type of construction	end blocks secured to the tube
Operation	single-acting and double-acting
Materials	end blocks, tube, rod = stainless steel AISI 316 - seals = NBR
Type of mounting	feet - front and rear bracket threaded pin - locking ring for end cap
Stroke min.-max.	for all bores 25 - 800 mm
Operating temperature	0°C - 80°C (with dry air - 20°C) (32 - 176°F, with dry air -4°F)
Operating pressure	1 - 10 bar, (14 - 145 psi)
Speed	10 - 1000 mm/sec (no load)
Fluid	filtered air, without lubrication. If lubricated air is used, it is recommended to use oil ISOVG32. Once applied the lubrication should never be interrupted.

STANDARD STROKES FOR DOUBLE-ACTING CYLINDERS SERIES 92

Ø	25	50	75	80	100	125	150	160	200	250	300	320	400	500
32	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖
40	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖
50	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖
63	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖

CODING EXAMPLE

92	M	2	A	050	A	0200	
----	---	---	---	-----	---	------	--

92	SERIES
M	VERSION M = standard magnetic
2	OPERATION 1 = single-acting (front spring) 2 = double-acting (front and rear cush.) 6 = double-acting (through-rod front and rear cushions)
A	MATERIALS A = stainless steel AISI 316, seals in NBR, (Buna-N) V = stainless steel AISI 316, all FKM seals, (VITON)
050	BORE (ø): 032 = 32 mm 040 = 40 mm 050 = 50 mm 063 = 63 mm
A	TYPE OF DESIGN A = standard (locking ring for end cap V + lock nut for rod U)
0200	STROKE (see table)
	= standard V = rod seals in FKM, (VITON)

ACCESSORIES FOR STAINLESS STEEL CYLINDERS SERIES 92



Nose nut V-92

Swivel ball joint Mod.
GA-90

Piston rod nut Mod. U-90



Trunnion bracket Mod. I

Bracket with threaded
pins Mod. T

Foot mount Mod. P



Rod fork end Mod. G-90

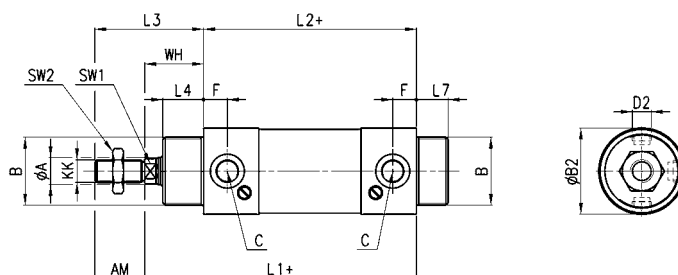


All accessories are supplied separately, except for piston rod nut Mod. U.

Cylinders Series 92



+ = add the stroke



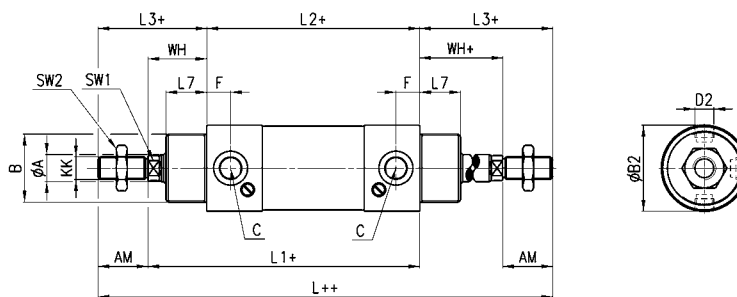
DIMENSIONS (mm)

Ø	A	KK	B	B2	C	D2	F	SW1	SW2	AM	WH	L1+	L2+	L3	L4	L7
32	12	M10x1,25	M30x1,5	35	G1/8	M8x1	10.5	10	17	22	26	120	94	48	18	14
40	16	M12x1,25	M38x1,5	44	G1/4	M10x1	15	13	19	24	30	135	105	54	22	16
50	20	M16x1,5	M45x1,5	54	G1/4	M12x1.5	14.5	17	24	32	37	145	106	69	25	18
63	20	M16x1,5	M45x1,5	67	G3/8	M14x1.5	15	17	24	32	37	158	121	69	25	18

Cylinders Series 92 - through-rod



+ = add the stroke
 ++ = add the stroke 2 times



DIMENSIONS (mm)

Ø	A	AM	B	F	C	KK	SW1	SW2	WH	L++	L1+	L2+	L3	L4	B2	D2
32	12	22	M30x1,5	10,5	G1/8	M10x1,25	10	17	26	190	120	94	48	18	35	M8x1
40	16	24	M38x1,5	15	G1/4	M12x1,25	13	19	30	213	135	105	54	22	44	M10x1
50	20	32	M45x1,5	14,5	G1/4	M16x1,5	17	24	37	244	143	106	69	25	54	M12x1,5
63	20	32	M45x1,5	15	G3/8	M16x1,5	17	24	37	259	158	121	69	25	67	M14x1,5

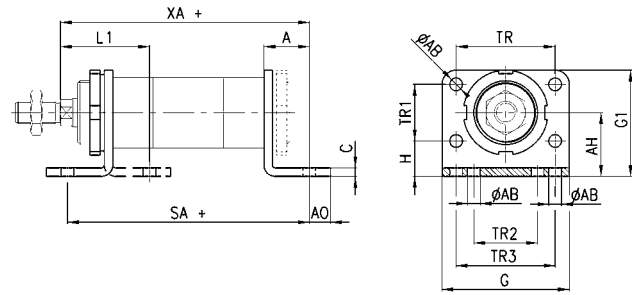
Foot mount Mod. P

Material: stainless steel 304

Supplied with:
1x nut
2x single feet



+ = add the stroke



DIMENSIONS (mm)

Mod.	Ø	A	AB	AO	AH	C	G	G1	TR	TR1	TR2	TR3	H	L1	SA +	XA +
P-92-32	32	24	7	11	32	4	66	53	52	28	32	52	18	46	142	144
P-92-40	40	28	9	15	36	5	80	61	60	30	36	60	21	53	161	163
P-92-50	50	32	9	15	45	6	90	75	70	40	45	70	25	63	170	175
P-92-63	63	32	9	10	50	6	96	85	76	50	50	76	25	63	185	190

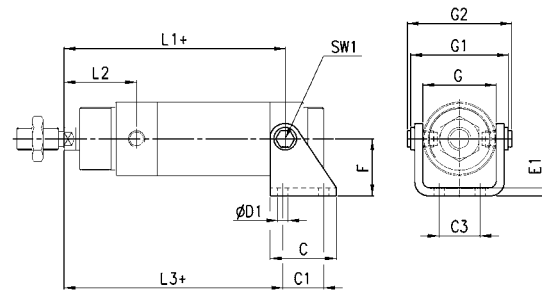
Trunnion bracket Mod. I

Material: stainless steel 304

Supplied with:
1x female trunnion
2x pins
2x cartridges



+ = add the stroke



DIMENSIONS (mm)

Mod.	Ø	C	C1	C3	D1	D2	E1	F	G	G1	G2	L1+	L2	L3+	SW1
I-92-32	32	40	24	20	7	10	4	35	38,1	50,1	58,1	109,5	36,5	105,5	13
I-92-40	40	50	30	28	9	12	5	40	46,1	60,1	70,1	120	45	117	17
I-92-50	50	54	34	36	9	14	6	45	57,1	74,1	86,1	128,5	51,5	124,5	19
I-92-63	63	65	35	42	9	16	6	50	70,1	88,1	100,1	143	52	142	19

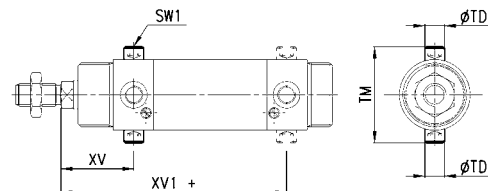
Bracket with threaded pins Mod. T

Material: stainless steel 303

Supplied with:
2x pins



+ = add the stroke



DIMENSIONS (mm)

Mod.	Ø	XV	XV1 +	TD	TM	SW1
T-42-32	32	36,5	109,5	10	51	5
T-42-40	40	45	120	12	62	6
T-42-50	50	51,5	128,5	14	75	6
T-42-63	63	52	143	16	91	8

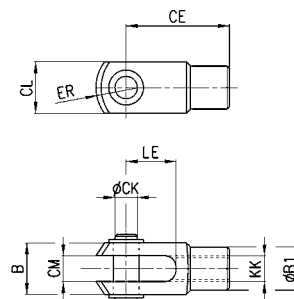
Rod fork end Mod. G-90

Material: stainless steel 303
ISO 8140



DIMENSIONS (mm)

Mod.	Ø	CK	LE	CM	CL	ER	CE	KK	B	ØB1
G-90-25-32	32	10	20	10	20	12	40	M10x1,25	26	18
G-90-40	40	12	24	12	24	14	48	M12x1,25	31	20
G-90-50-63	50-63	16	32	16	32	19	64	M16x1,5	39	26



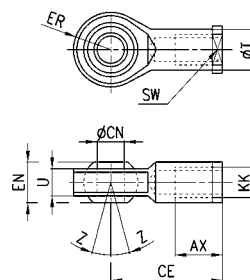
Swivel ball joint Mod. GA-90

Material: stainless steel 304
ISO 8139



DIMENSIONS (mm)

Mod.	Ø	CN	U	EN	ER	AX	CE	KK	ØT	Z	SW
GA-90-32	32	10	10,5	14	14	20	43	M10x1,25	15	6,5	17
GA-90-40	40	12	12	16	16	22	50	M12x1,25	17,5	6,5	19
GA-90-50-63	50-63	16	15	21	21	28	64	M16x1,5	22	7,5	22



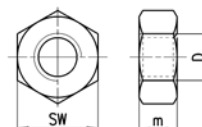
Piston rod nut Mod. U-90

Material: stainless steel 304
UNI 5589



DIMENSIONS (mm)

Mod.	Ø	d	m	SW
U-90-25-32	32	M10x1,25	6	17
U-90-40	40	M12x1,25	7	19
U-90-50-63	50-63	M16x1,5	8	24



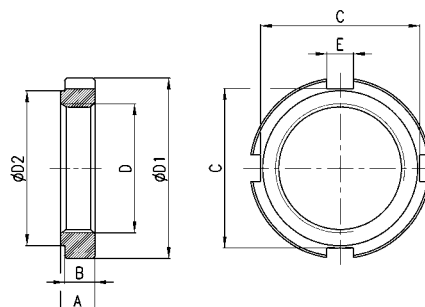
Nose nut Mod.V-92

Material: stainless steel 304



DIMENSIONS (mm)

Mod.	Ø	D	D1	D2	A	B	C	E
V-92-32	32	M30x1,5	42	36	8	7	37	6,2
V-92-40	40	M38x1,5	50	48	10	9	44	7,2
V-92-50-63	50-63	M45x1,5	60	56	10	9	53	7,2



Stainless Steel Cylinders Series 97

Single or double-acting, cushioned, magnetic.
ø 32, 40, 50, 63 mm



- » Clean design
- » Stainless steel AISI 304
- » Adjustable endstroke cushioning

Stainless steel cylinders Series 97 are suitable for use in the off-shore, naval, pharmaceutical, nuclear and food industries.

These cylinders are normally equipped with end-stroke cushioning which can be adjusted through a screw on the end block. In order to reduce the impact of the piston on the end block, these cylinders are also equipped with mechanical cushioning.

GENERAL DATA

Type of construction	the end blocks are screwed to the tube with an intermediate Teflon ring
Operation	single-acting and double-acting
Materials	end blocks, tube, rod in stainless steel AISI 304 rod seals in PU, piston seals in NBR plastic guiding element, NSF H1-certified lubricant
Type of mounting	threaded front and rear locking ring pins on front cap ends rear male hinge articulated rear male hinge rear female hinge
Stroke min-max	25 - 800 mm
Operating temperature	0°C - 80°C (with dry air - 20°C) (32 - 176°F, with dry air -4°F)
Operating pressure	1 - 10 bar, (14 - 145 psi)
Speed	10 - 1000 mm/sec (without load)
Fluid	Filtered air, without lubrication. If lubricated air is used, it is recommended to use oil ISOVG32. Once applied the lubrication should never be interrupted.

STANDARD STROKES FOR CYLINDERS SERIES 97

- = Single-acting
- ✕ = Double-acting

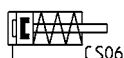
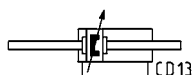
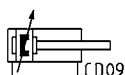
STANDARD STROKES														
Ø	25	50	75	80	100	125	150	160	200	250	300	320	400	500
32	✕•	✕•	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕
40	✕•	✕•	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕
50	✕•	✕•	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕
63	✕•	✕•	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕	✕

CODING EXAMPLE

97	M	2	A	050	A	0200	
97	SERIES						
M	VERSIONS: M = rear male hinge S = articulated rear male hinge F = rear female hinge T = front and rear threaded end blocks A = front end block with pin						
2	OPERATION: 1 = single-acting, front spring 2 = double-acting, front and rear cushions 6 = double-acting, through-rod, front and rear cushions (T and A versions only)					PNEUMATIC SYMBOLS: CS06 CD09 CD13	
A	MATERIALS: A = stainless steel AISI 304 - PU seals V = stainless steel AISI 304 - FKM seals						
050	BORE: 032 = 32 mm - 040 = 40 mm - 050 = 50 mm - 063 = 63 mm						
A	TYPE OF DESIGN: A = standard (locking ring for end cap V + lock nut for rod U)						
0200	STROKE (see the table)						
	= standard V = rod seal in FKM						

PNEUMATIC SYMBOLS

The pneumatic symbols which have been indicated in the CODING EXAMPLE are shown below.



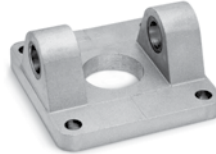
ACCESSORIES FOR STAINLESS STEEL CYLINDERS SERIES 97



Foot mount Mod. B



Trunnion bracket Mod. I

Rear female trunnion
bracket Mod. C-HTight rear female tr.
bracket Mod. CRMale tr. bracket with
swivel ball joint Mod. R90° male tr. bracket + sw.
ball joint Mod. ZCR

Rod fork end Mod. G-90

Swivel ball joint
Mod. GA-90Piston rod nut
Mod. U-90

Nose nut Mod. V-97



Clevis pin Mod. S-90

Anti-rotation clevis pin
Mod. SR-90

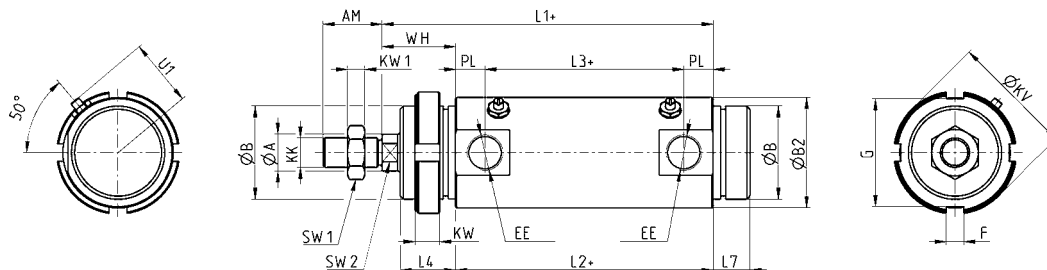
All accessories are supplied separately, except for piston rod nut Mod. U and nose nut Mod. V.

Cylinders Series 97, Mod. T

With threaded front and rear end blocks



+ = add the stroke

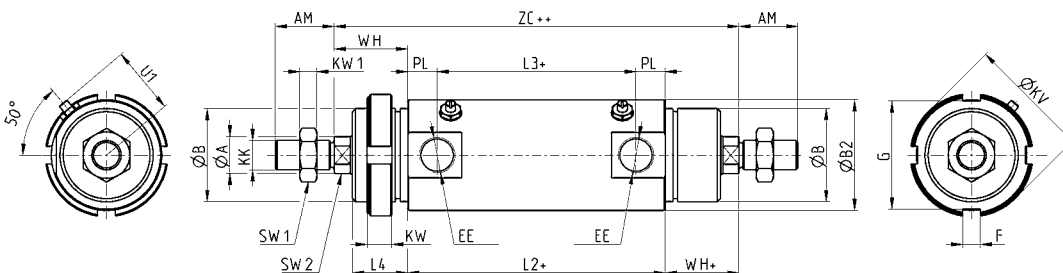


DIMENSIONS

Ø	ØA	AM	ØB	ØB2	EE	F	G	KK	PL	SW1	KW1	SW2	U1	WH	L1+	L2+	L3+	L4	L7	KW	ØKV
32	12	22	M30x1,5	36	G1/8	5	38	M10x1,25	9	17	6	10	23	26	120	94	76	19,5	15	7	42
40	16	24	M38x1,5	45	G1/4	6	50	M12x1,25	12	19	7	13	27	30	135	105	81	22,5	15	8	55
50	20	32	M45x1,5	55	G1/4	6	53	M16x1,5	12	24	8	17	33	37	143	106	82	28	18	10	60
63	20	32	M45x1,5	68	G3/8	6	53	M16x1,5	13	24	8	17	40	37	158	121	95	28	18	10	60

Cylinders Series 97, Mod. T - through-rod

With threaded end blocks

+ = add the stroke once
++ = add the stroke twice

DIMENSIONS

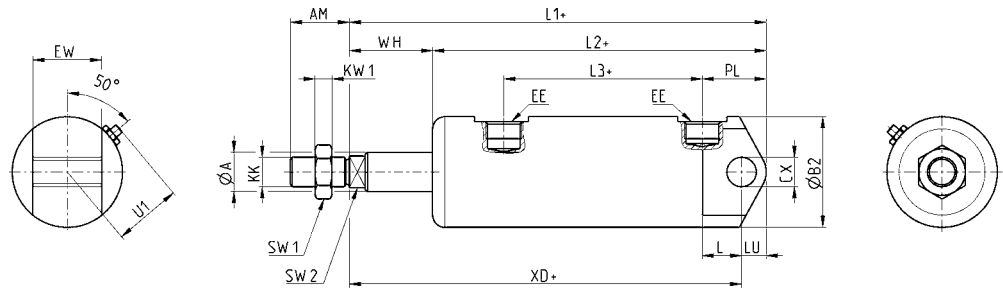
Ø	ØA	AM	ØB	ØB2	EE	F	G	KK	PL	SW1	KW1	SW2	U1	WH+	L2+	L3+	L4	KW	ØKV	ZC++
32	12	22	M30x1,5	36	G1/8	5	38	M10x1,25	9	17	6	10	23	26	94	76	19,5	7	42	146
40	16	24	M38x1,5	45	G1/4	6	50	M12x1,25	12	19	7	13	27	30	105	81	22,5	8	55	165
50	20	32	M45x1,5	55	G1/4	6	53	M16x1,5	12	24	8	17	33	37	106	82	28	10	60	180
63	20	32	M45x1,5	68	G3/8	6	53	M16x1,5	13	24	8	17	40	37	121	95	28	10	60	195

Cylinders Series 97, Mod. M

With rear male trunnion bracket



+ = add the stroke



DIMENSIONS

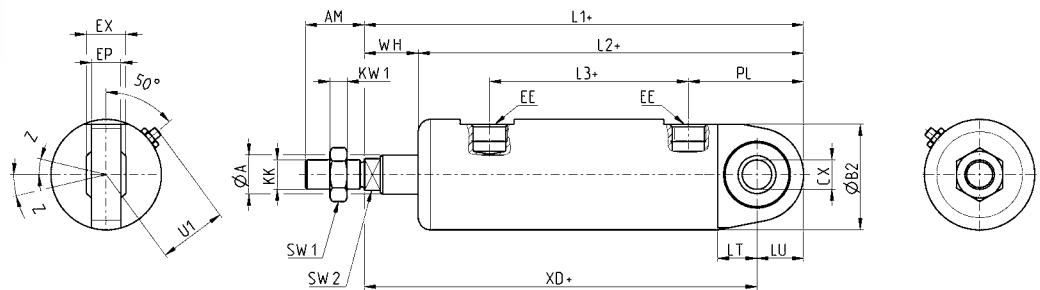
Ø	ØA	AM	ØB2	CX	EE	EW	KK	PL	SW1	KW1	SW2	U1	WH	L1+	L2+	L3+	L	LU	XD+
32	12	22	36	10	G1/8	26	M10x1,25	23	17	6	10	23	26	151	125	76	13	9	142
40	16	24	45	12	G1/4	28	M12x1,25	26	19	7	13	27	34	170	136	81	16	10	160
50	20	32	55	12	G1/4	32	M16x1,5	32	24	8	17	33	37	182	145	82	16,5	12	170
63	20	32	68	16	G3/8	40	M16x1,5	29,5	24	8	17	40	50	202	152	95	21	12	190

Cylinders Series 97, Mod. S

With articulated rear male trunnion bracket



+ = add the stroke



DIMENSIONS

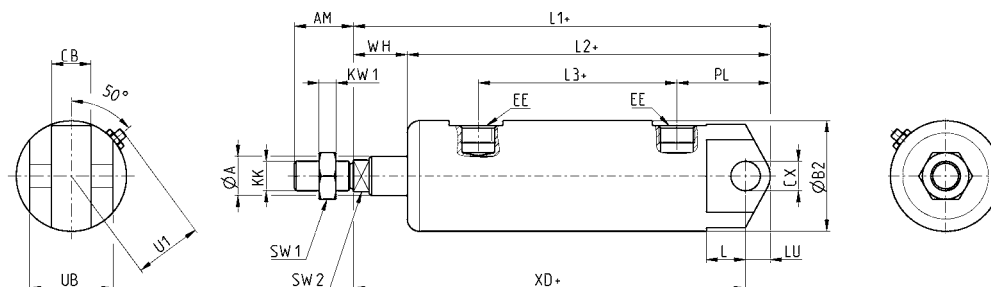
Ø	ØA	AM	ØB2	CX	EE	EP	EX	KK	PL	SW1	KW1	SW2	U1	WH	L1+	L2+	L3+	LT	LU	XD+	Z
32	12	22	36	10	G1/8	10,5	14	M10x1,25	37	17	6	10	23	18	157	139	76	13	15	142	13
40	16	24	45	12	G1/4	12	16	M12x1,25	47	19	7	13	27	22	179	157	81	16	19	160	13
50	20	32	55	16	G1/4	15	21	M16x1,5	49	24	8	17	33	28,5	190,5	162	82	16,5	20,5	170	15
63	20	32	68	16	G3/8	15	21	M16x1,5	60	24	8	17	40	31,5	214	182,5	95	21	24	190	15

Cylinders Series 97, Mod. F

With rear female trunnion bracket



+ = add the stroke



DIMENSIONS

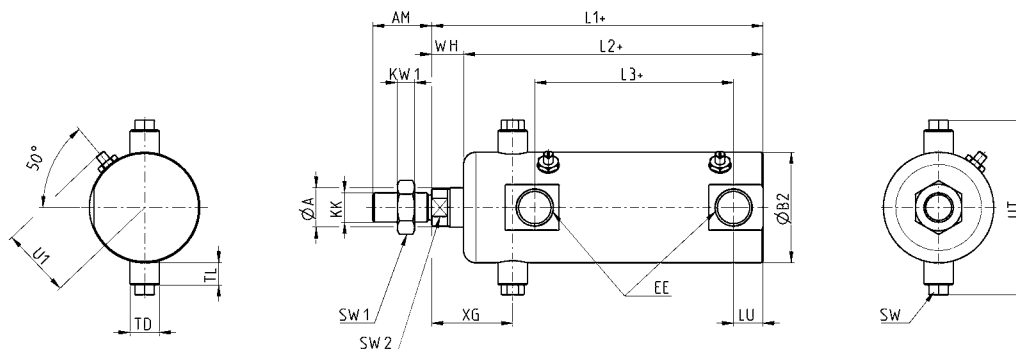
Ø	ØA	AM	ØB2	CB	CX	EE	KK	PL	SW1	KW1	SW2	U1	WH	L1+	L2+	L3+	L	LU	XD+	UB
32	12	22	36	14	10	G1/8	M10x1,25	31	17	6	10	23	18	151	133	76	13	9	142	34
40	16	24	45	16	12	G1/4	M12x1,25	38	19	7	13	27	22	170	148	81	16	10	160	40
50	20	32	55	21	16	G1/4	M16x1,5	40,5	24	8	17	33	28,5	182	153,5	82	16,5	12	170	45
63	20	32	68	21	16	G3/8	M16x1,5	48	24	8	17	40	31,5	202	170,5	95	21	12	190	51

Cylinders Series 97, Mod. A

With front end block with pins



+ = add the stroke



DIMENSIONS

Ø	ØA	AM	ØB2	EE	KK	SW	SW1	KW1	SW2	U1	WH	L1+	L2+	L3+	LU	XG	TD	TL	UT
32	12	22	36	G1/8	M10x1,25	8	17	6	10	23	9	120	111	76	9	27	10	7	58
40	16	24	45	G1/4	M12x1,25	8	19	7	13	27	13	135	122	81	12	33	12	9	71
50	20	32	55	G1/4	M16x1,5	8	24	8	17	33	18	143	125	82	12	40	14	9	81
63	20	32	68	G3/8	M16x1,5	12	24	8	17	40	22,5	158	135,5	95	13	45	16	12	104

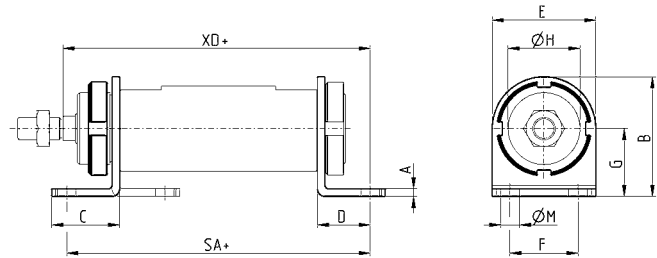
Foot mount Mod. B

Material: stainless steel 304

Supplied with:
1x nut
2x single feet



+ = add the stroke



DIMENSIONS

Mod.	Ø	A	B	C	D	E	SA+	F	G	ØH	ØM	XD+
B-97-32	32	4	53	35	24	42	142	32	32	30,1	7	142
B-97-40	40	4	63,5	36	28	55	161	36	36	38,1	10	160
B-97-50	50	5	77,5	47	32	65	170	45	45	45,1	10	170
B-97-63	63	5	82,5	45	32	65	185	50	50	45,1	10	190

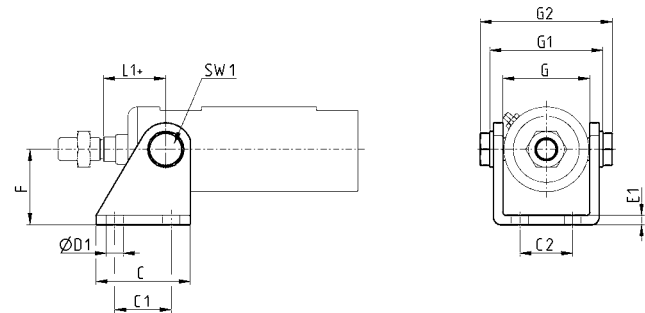
Trunnion bracket Mod. I

Material: stainless steel 304

Supplied with:
1x female trunnion
2x cartridges



+ = add the stroke



DIMENSIONS

Mod.	Ø	C	C1	C2	ØD1	E1	F	G	G1	G2	L1+	SW1
I-97-32	32	40	24	20	7	4	35	38,1	50,1	58,1	27	13
I-97-40	40	50	30	28	9	5	40	46,1	60,1	70,1	33	17
I-97-50	50	54	34	36	9	6	45	57,1	74,1	86,1	40	19
I-97-63	63	65	35	42	9	6	50	70,1	88,1	100,1	45	19

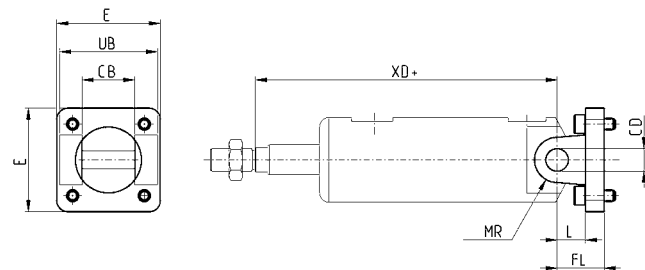
Rear female trunnion bracket Mod. C-H

Material: stainless steel 316

Supplied with:
1x female trunnion bracket
4x screws



+ = add the stroke



DIMENSIONS

Mod.	Ø	CB	CD	E	FL	L	MR	UB	XD+
C-H-90-32	32	26	10	45	22	12	10	45	142
C-H-90-40	40	28	12	55	25	15	12	52	160
C-H-90-50	50	32	12	65	27	17	12	60	170
C-H-90-63	63	40	16	75	32	20	16	70	190

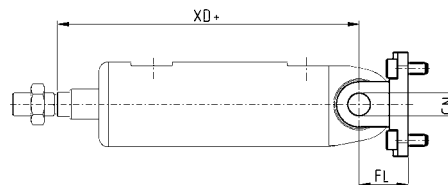
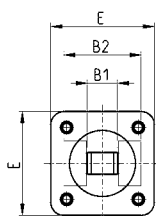
Tight rear female trunnion bracket Mod. CR

Material: stainless steel 316

Supplied with:
1x female trunnion bracket
4x screws



+ = add the stroke



DIMENSIONS

Mod.	Ø	B1	B2	E	CN	FL	XD+
CR-90-32	32	14	34	45	10	22	142
CR-90-40	40	16	40	55	12	25	160
CR-90-50	50	21	45	65	16	27	170
CR-90-63	63	21	51	75	16	32	190

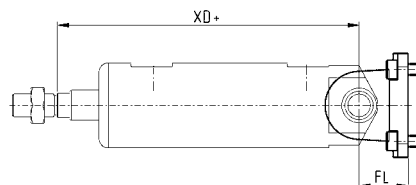
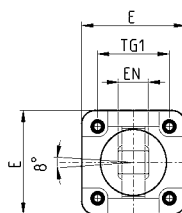
Male trunnion bracket with swivel ball joint Mod. R

Material: stainless steel 316

Supplied with:
1x male trunnion bracket
4x screws



+ = add the stroke



DIMENSIONS

Mod.	Ø	E	EN	FL	TG1	XD+
R-90-32	32	45	14	22	32,5	142
R-90-40	40	55	16	25	38	160
R-90-50	50	65	21	27	46,5	170
R-90-63	63	75	21	32	56,5	190

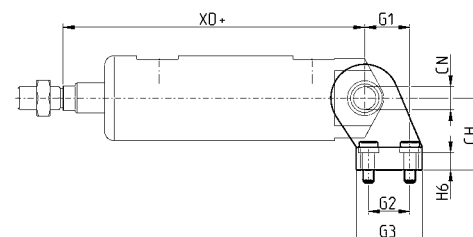
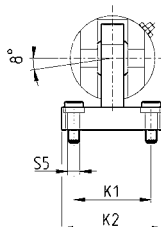
90° male trunnion bracket with swivel ball joint Mod. ZCR

Material: stainless steel 316

Supplied with:
1x male trunnion bracket
4x screws



+ = add the stroke



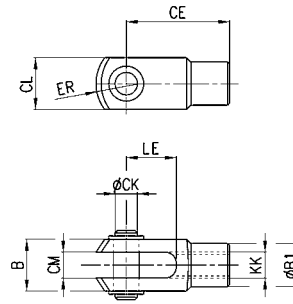
DIMENSIONS

Mod.	Ø	CH	CN	G1	G2	G3	H6	K1	K2	S5	XD+
ZCR-90-32	32	32	10	21	18	31	10	38	51	6,6	142
ZCR-90-40	40	36	12	24	22	35	10	41	54	6,6	160
ZCR-90-50	50	45	16	33	30	45	12	50	65	9	170
ZCR-90-63	63	50	16	37	35	50	12	52	67	14	190

Rod fork end Mod. G-90

ISO 8140

Material: stainless steel 303



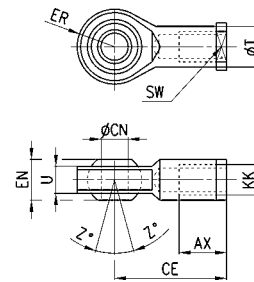
DIMENSIONS

Mod.	Ø	ØCK	LE	CM	CL	ER	CE	KK	B	ØB1
G-90-25-32	32	10	20	10	20	12	40	M10x1,25	26	18
G-90-40	40	12	24	12	24	14	48	M12x1,25	31	20
G-90-50-63	50-63	16	32	16	32	19	64	M16x1,5	39	26

Swivel ball joint Mod. GA-90

ISO 8139

Material: stainless steel 304



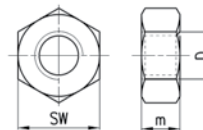
DIMENSIONS

Mod.	Ø	ØCN	U	EN	ER	AX	CE	KK	ØT	Z	SW
GA-90-32	32	10	10,5	14	14	20	43	M10x1,25	15	6,5	17
GA-90-40	40	12	12	16	16	22	50	M12x1,25	17,5	6,5	19
GA-90-50-63	50-63	16	15	21	21	28	64	M16x1,5	22	7,5	22

Piston rod nut Mod. U-90

ISO 4035

Material: stainless steel 304

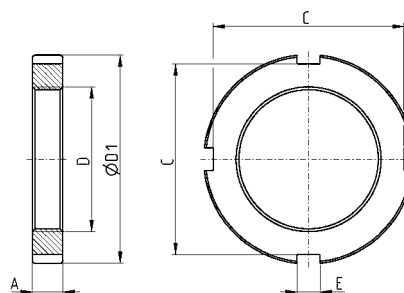


DIMENSIONS

Mod.	Ø	D	m	SW
U-90-25-32	32	M10x1,25	6	17
U-90-40	40	M12x1,25	7	19
U-90-63	50-63	M16x1,5	8	24

Nose nut Mod. V-97

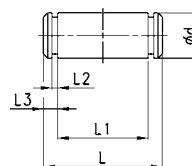
Material: stainless steel 304



DIMENSIONS						
Mod.	Ø	A	D	ØD1	E	C
V-97-32	32	7	M30X1,5	42	5	38
V-97-40	40	8	M38X1,5	55	6	50
V-97-50-63	50-63	10	M45X1,5	60	6	53

Clevis pin Mod. S-90

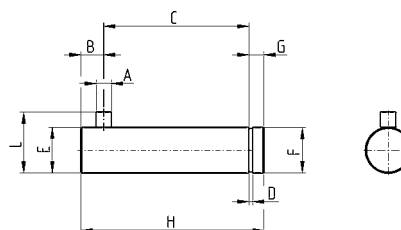
Supplied with:
 1x clevis pin in stainless steel 303
 2x c-clips in plain carbon steel



DIMENSIONS						
Mod.	Ø	Ød	L	L1	L2	L3
S-90-32	32	10	53	46	1,1	3
S-90-40	40	12	60	53	1,1	3
S-90-50	50	12	68	61	1,1	3
S-90-63	63	16	78	71	1,1	3

Antirotating clevis pin Mod. SR-90

Supplied with:
 1x antirotating clevis pin
 in stainless steel 316
 1x c-clip in plain carbon steel



DIMENSIONS										
Mod.	Ø	A	B	C	D	E	F	G	H	L
SR-90-32	32	3	4,5	32,5	1,1	10	9,6	4	41	14
SR-90-40	40	4	6	38	1,1	12	11,5	4	48	16
SR-90-50	50	4	6	43	1,1	16	15,2	5	54	20
SR-90-63	63	4	6	49	1,1	16	15,2	5	60	20

4 Rodless and Guided/ Twin-Bore Cylinders

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Rodless Cylinders Series 50

Double-acting, magnetic, cushioned
ø16, 25, 32, 40, 50, 63, 80



- » Four ports on each chamber
- » Possibility to supply both chambers from one side (on request)

The Series 50 rodless cylinders are available in 7 different diameters to cover as many applications as possible. A permanent magnet is assembled on the cylinder piston allowing the position to be detected by means of proximity switches positioned on the sliding axis. This series of cylinder is normally supplied with end-stroke cushioning, that can be regulated by means of a screw located on the end-cover.

The Series 50 cylinders are recommended to be used according to the load values and torque forces detailed in the relative tables.

GENERAL DATA

Type of construction	rodless with integral carriage
Operation	double-acting
Materials	end-covers, piston and barrel = AL seals = PU and NBR
Type of mounting	foot mounted
Strokes min - max	for all bores 100 – 4000 mm
Operating temperature	0°C – 50°C (with dry air - 10°C), (32 F - 122 F , with dry air down to 14 F)
Operating pressure	1 – 8 bar, (14 - 116 psi)
Speed	10 – 1000 mm/sec (without load)
Fluid	clean air, without lubrication If lubricated air is used, it is recommended to use oil ISOVG32. Once applied the lubrication should never be interrupted.

CODING EXAMPLE

50	M	2	P	50	A	0500
----	---	---	---	----	---	------

50	SERIES
M	VERSION M= standard magnetic
2	OPERATION 2 = double-acting cushioned
P	MATERIALS P = anodized AL profile tube - PU and NBR seals - standard carriage U = anodized AL profile tube - PU and NBR seals - flanged carriage
50	BORE 16 = 16 mm 25 = 25 mm 32 = 32 mm 40 = 40 mm 50 = 50 mm 63 = 63 mm 80 = 80 mm
A	TYPE OF MOUNTING A = standard
0500	STROKE (see table)

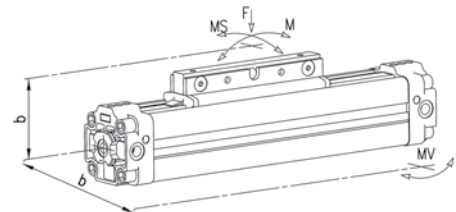
MAXIMUM PERMITTED LOADS AND TORQUE FORCES

$$M = F \times b$$

$$MS = F \times b$$

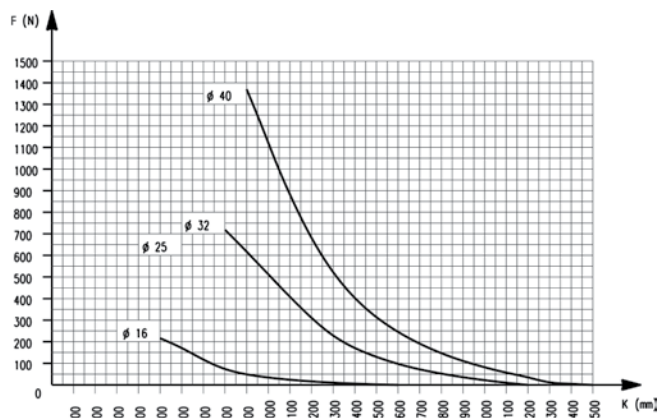
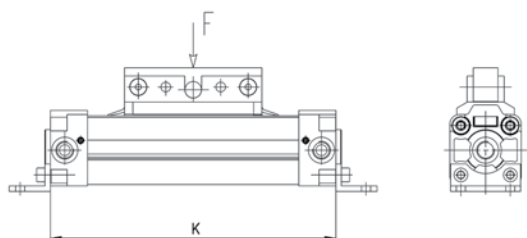
$$MV = F \times b$$

Note: Loads and bending torque are valid if applied separately.



Ø	Max. load permitted (N) F	Max. bending torque force permitted (Nm) M	Max. bending torque force permitted (Nm) Ms	Torsional torque force permitted (Nm) Mv
16	218	3,1	0,5	1
25	660	12,4	1,9	5
32	720	30	4	8
40	1370	39	4	9
50	1600	122	11	16
63	2210	190	19	26
80	3770	305	30	47

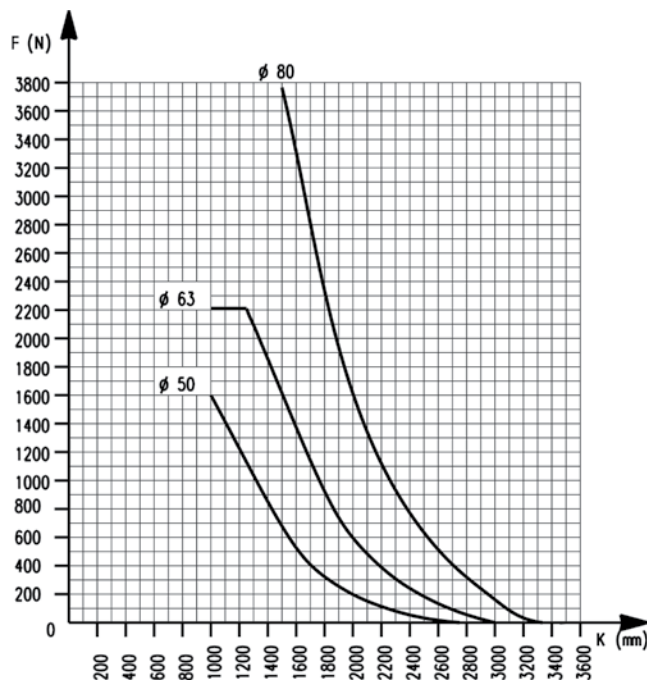
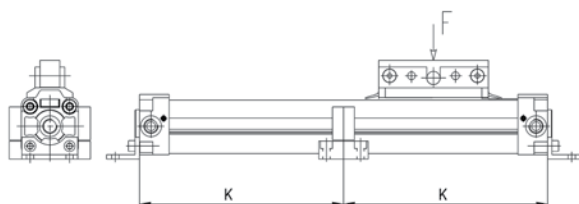
LOADS ACCORDING TO SUPPORTS DISTANCE



Note: This chart has been made according to a max. distance of 0.5 mm Load (N).

Once the load and the cylinder diameter have been fixed, the chart gives the K values beyond which it is necessary to put an intermediate feet Mod. BH-50.

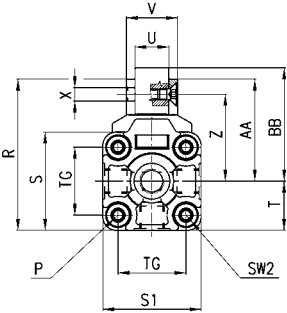
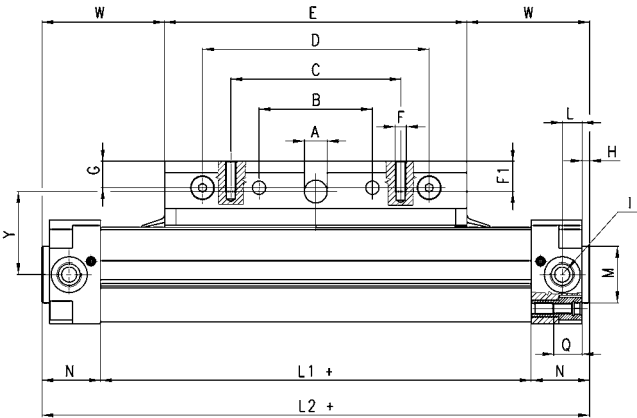
LOADS ACCORDING TO SUPPORTS DISTANCE



Note: This chart has been made according to a max. distance of 0.5 mm Load (N).

Once the load and the cylinder diameter have been fixed, the chart gives the K values beyond which it is necessary to put an intermediate feet Mod. BH-50.

Cylinders with standard carriage Mod. 50M2P

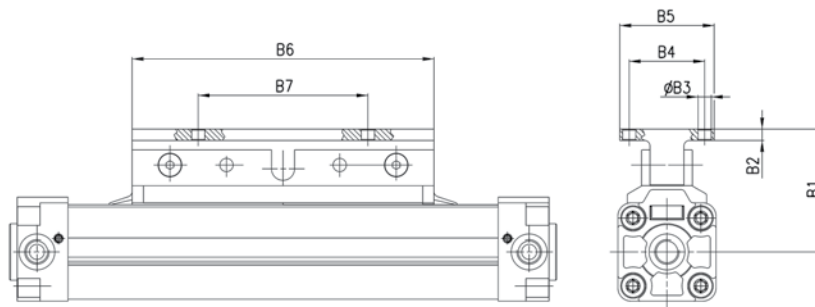


DIMENSIONS (mm)																															
Ø	A	B	C	D	E	F	F1	G	H	I	L	L1+	L2+	M	N	P	Q	R	S	S1	T	U	V	Z	X	Y	W	AA	BB	TG	SW2
16	5	32	48	64	76	M4	8	6	2	M5	5,3	100	130	16	15	M3	8	42,5	28	27	13,5	10	18	24	4,5	24,5	27	29	30	18	4
25	8	50	80	100	120	M5	10	13	2,5	G1/8	9,5	150	200	22	25	M5	13,5	63	40	40	20	15	23	33	5,5	38	40	43	46	27	6
32	12	60	90	120	160	M6	15	14	4	G1/4	10,5	188	250	30	31	M6	15	80	52	52	26	18	27	46	7	48,5	45	54	60	36	6
40	12	55	90	110	150	M6	12	12	4	G1/4	17,5	226	300	35	37	M6	15	88,5	63	63	31,5	18	28	49	7	51	75	57	61	43	6
50	12	70	110	140	180	M6	12	12	4	G1/4	13,5	272	350	40	39	M8	16	103	74,5	76	38	18	28	57	7	59	85	65	69	53	10
63	16	90	140	180	220	M8	15	15	4	G3/8	17,5	342	430	45	44	M8	16	125	92	94	47	19	30	68	9	70	105	78	83	67	10
80	20	120	180	240	280	M10	20	18	4	G1/2	32	408	520	45	56	M10	18,5	153,5	115,5	117	58,5	20	32	83	11	86	120	95	101	83	12

The company reserves the right to vary models and dimensions without notice.
These products are designed for industrial applications and are not suitable for sale to the general public.



Cylinders with flanged carriage Mod. 50M2U

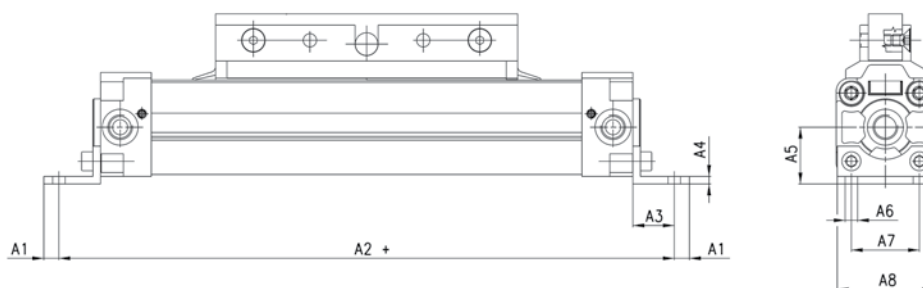


DIMENSIONS (mm)							
Ø	B1	B2	B3	B4	B5	B6	B7
16	36	4	4,5	25	40	76	50
25	51	5	5,5	35	50	120	70
32	66	6	7	40	50	160	90
40	66	6	7	45	60	150	80
50	74	6	7	45	60	180	100
63	89	7	9	60	80	220	130
80	108	8	11	75	100	280	180

Foot mount Mod. B-50

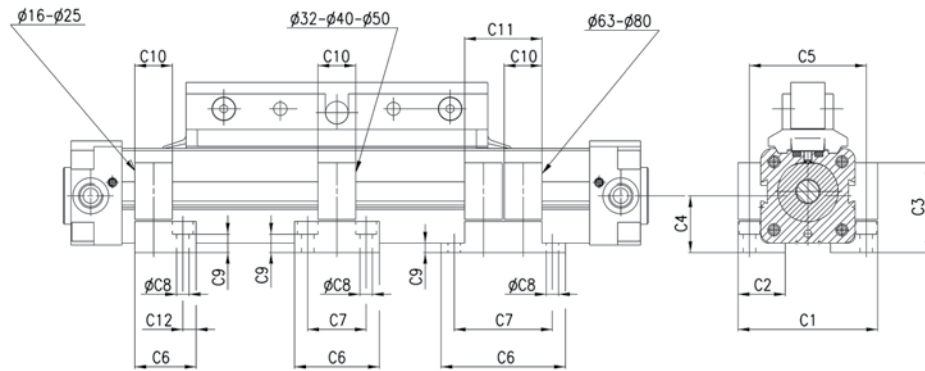


+ = add the stroke



DIMENSIONS (mm)								
Mod.	A1	A2+	A3	A4	A5	A6	A7	A8
B-50-16	3	150	12	3	15	3,6	18	26
B-50-25	6,5	232	18,5	3	22	5,5	27	39
B-50-32	8	286	22	4	30	6,6	36	51
B-50-40	13,5	325	16,5	4	38	9	30	62
B-50-50	13,5	375	16,5	6	48	9	40	75
B-50-63	11	460	19	6	57	11	48	93
B-50-80	18,5	555	21,5	6	72	14	60	116

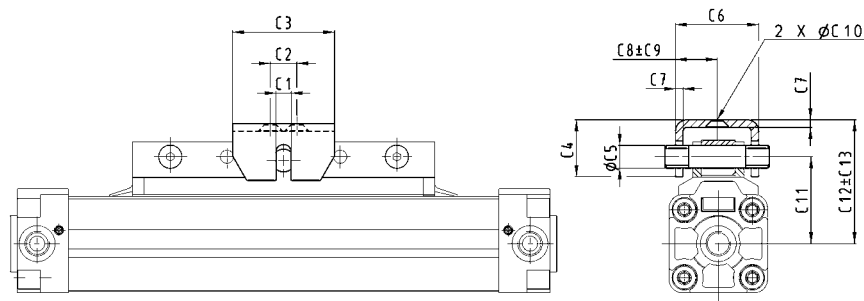
Brackets Mod. BH-50



DIMENSIONS (mm)

Mod.	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
BH-50-16	42	12	25	15	34	20	-	3,4	4,5	12	-	4
BH-50-25	56	21	32,6	22	47	22	-	5,5	10,1	12	-	5
BH-50-32	74	25	47,5	30	62	45	31	6,6	9,7	20	-	-
BH-50-40	85	35	56	38	73	60	45	6,6	18,2	20	-	-
BH-50-50	98	32	67,5	48	86	60	45	6,6	29,7	20	-	-
BH-50-63	126	50	78,5	57	109	74	56	9	11	20	41	-
BH-50-80	155	65	96	72	135	80	60	11	14,5	20	41	-

Self-compensating adaptor Mod. CF-50

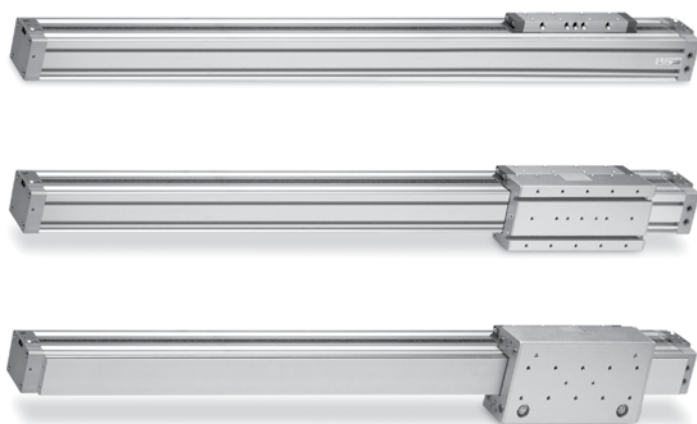


DIMENSIONS (mm)

Mod.	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13
CF-50-25	6	16	40,8	22,9	7,9	31,5	3	15,8	1,2	5,6	38	55,4	4,5
CF-50-32	9,3	50	76,4	27,4	11,9	38,5	4	19	1,7	7,1	48,5	69,4	5,5
CF-50-40	9,3	50	76,4	24,4	11,9	38,5	4	19	1,2	7,1	51	70,9	3,5
CF-50-50	9,3	80	114,6	37,1	11,9	43,9	6	22	1,8	8,6	59	89,2	5,9
CF-50-63	12,7	100	134,6	42,2	15,9	43,9	6	22	0,8	8,6	70	104,7	6,5
CF-50-80	12,7	125	159,5	42,2	19,9	50,3	6	25,1	3	11	86	122,2	5

Rodless Cylinders Series 52

Double-acting, magnetic, cushioned
ø25, 32, 40, 50, 63



- » Three main versions, Basic, Slide bearing and Roller bearing
- » Extra short carriage as option for all versions
- » Possibility of feeding both chambers from one side only

A permanent magnet is assembled on the piston allowing the position to be detected by means of proximity switches positioned in grooves located on 3 sides on the cylinder profile. The cylinder is equipped with an end stroke cushioning which can be regulated by means of a screw located on each end cover of the cylinder. These cylinders are also available in versions with air supply from one side (end cover) if needed.

The rodless cylinders Series 52 are available in 5 diameters (25, 32, 40, 50 and 63 mm) and comes in three main versions: Basic (M), with Slide bearing (G) and with Roller bearings (R). Furthermore these three main versions are each available with either standard- or short carriage to cover a wider range of applications.

GENERAL DATA

Models	Standard, with slide bearings, with roller bearings, air supply from one or both sides, with standard or short carriage For sizes 50 - 63 roller bearings version is not available, ("R")
Materials	AL (anodized), plastic, hardened steel, seals: NBR, PU, (Buna-N and Polyurethane)
Operating temperature	- 10°C – + 70 °C, (14 F - 160 F)
Speed	10 – 1000 mm/sec (without load)
Fluid	filtered air, without lubrication. If lubricated air is used, it is recommended to use ISO VG32 oil. Once applied the lubrication should never be interrupted. If speeds exceed 1 m/s lubricated air is recommended.
Bore size	Ø 25 Ø 32 Ø 40 Ø 50 Ø 63
Operating pressure	1 – 8 bar, (14 - 116 psi) 1,5 – 8 bar (Ø 25 for "R" version), (22 - 116 psi)
Connection	G1/8 (Ø 25; 32) G1/4 (Ø 40) G3/8 (Ø 50; 63)
Cushioning length (mm)	14 mm - Ø 25 20 mm - Ø 32 25 mm - Ø 40 22 mm - Ø 50 32 mm - Ø 63
Strokes	up to 6000 mm

CODING EXAMPLE						
52	M	2	P	40	A	0500
52	SERIES					
M	VERSION M = standard G = with slide bearing R = with roller bearing (only Ø25 - 32 - 40)					
2	OPERATION 2 = double-acting, cushioned, with air supply from both sides 8 = double-acting, cushioned, with air supply from one side only					
P	MATERIALS P = anodized AL profile tube, NBR and PU seals, standard carriage C = anodized AL profile, NBR and PU seals, short carriage					
40	BORE 25 = 25 mm 32 = 32 mm 40 = 40 mm 50 = 50 mm 63 = 63 mm					
A	TYPE OF MOUNTING A = standard					
0500	STROKE (see table)					

LOADS AND TORQUE FORCES Ø 25 - 32

COMPLEX LOADS

If more than one force and torque is applied simultaneously, they have to be calculated according to the following formula: $L/L(\max) + L_s/L_s(\max) + M/M(\max) + M_s/M_s(\max) + M_v/M_v(\max) \leq 1$.

For models 52M, the load and torque values refer to the center of the tube. For models 52G/52R the load and torque values refer to the center point of the external guide. It is also necessary for these models to guarantee on the fixing surface a max 0.1 flatness's value.

The load and torque values refer to a velocity of: Models 52M/52G/52M/52G $\leq 0,2$ m/s, models 52R ≤ 2 m/s.

For the adjustment coefficients of loads see page 1.8.10.04

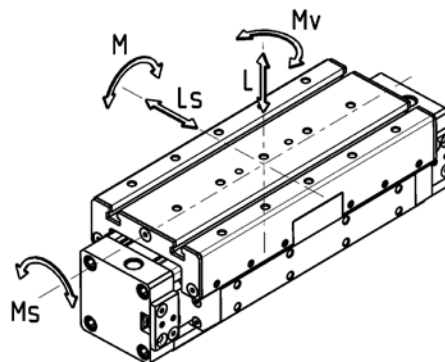
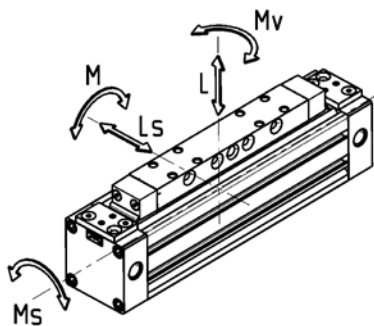


Table showing the maximum permitted loads and torque forces

Mod.	L Max (N)	Ls Max (N)	M Max (Nm)	Ms Max (Nm)	Mv Max (Nm)	Mass at 0 mm stroke (kg)	Additional mass per 100 mm (kg)
52M2P25A - 52M8P25A	270	-	13	2,5	11	0,88	0,30
52M2C25A - 52M8C25A	270	-	8	2	7	0,62	0,30
52G2P25A - 52G8P25A	580	580	23	10	23	1,31	0,30
52G2C25A - 52G8C25A	340	340	9	5	9	0,88	0,30
52R2P25A - 52R8P25A	850	1300	65	35	105	1,97	0,42
52R2C25A - 52R8C25A	850	1300	29	35	64	1,33	0,42
52M2P32A - 52M8P32A	300	-	30	3	24	1,40	0,39
52M2C32A - 52M8C32A	300	-	15	3	12	0,96	0,39
52G2P32A - 52G8P32A	850	850	33	15	33	2,09	0,39
52G2C32A - 52G8C32A	460	460	14	6,5	14	1,35	0,39
52R2P32A - 52R8P32A	900	1500	79	40	125	2,96	0,48
52R2C32A - 52R8C32A	900	1500	36	40	76	1,91	0,48

LOADS AND TORQUE FORCES Ø 40 - 50 - 63

COMPLEX LOADS

If more than one force and torque is applied simultaneously, they have to be calculated according to the following formula: $L/L(\max) + L_s/L_s(\max) + M/M(\max) + M_s/M_s(\max) + M_v/M_v(\max) \leq 1$.

For models 52M, the load and torque values refer to the center of the tube. For models 52G/52R the load and torque values refer to the center point of the guide.

The load and torque values refer to a velocity of: Models 52M/52G $\leq 0,2$ m/s Models 52R ≤ 2 m/s

If the velocity exceeds 0.2m/s for the models 52M/52G, the load and torque values have to be multiplied by the coefficients according to the table. For the adjustment coefficients of loads see page 1.8.10.04

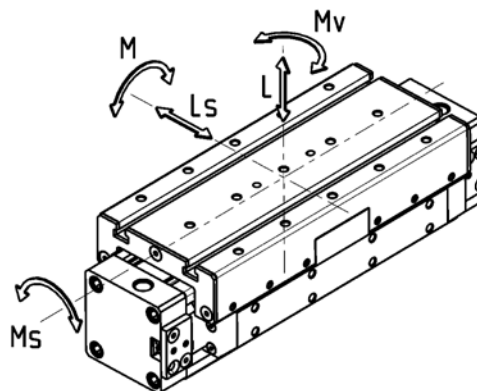
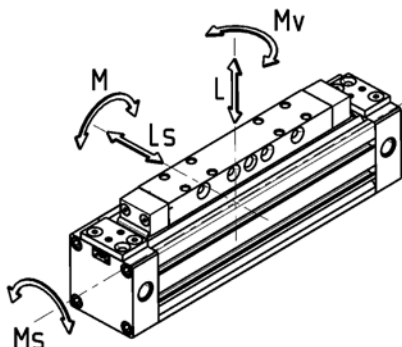
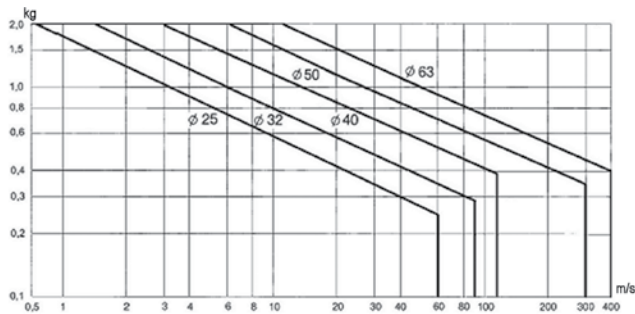


Table showing the maximum permitted loads and torque forces

Mod.	L Max (N)	Ls Max (N)	M Max (Nm)	Ms Max (Nm)	Mv Max (Nm)	Mass at 0 mm stroke (kg)	Additional mass per 100 mm (kg)
52M2P40A - 52M8P40A	650	-	60	4	54	2,41	0,52
52M2C40A - 52M8C40A	650	-	30	4	27	1,65	0,52
52G2P40A - 52G8P40A	1120	1120	60	25	60	3,58	0,52
52G2C40A - 52G8C40A	600	600	25	11	25	2,30	0,52
52R2P40A - 52R8P40A	1200	2000	190	67	118	5,89	0,74
52R2C40A - 52R8C40A	1200	2000	85	67	72	3,84	0,74
52M2P50A - 52M8P50A	800	-	80	17	74	5,30	0,96
52M2C50A - 52M8C50A	800	-	38	17	32	3,50	0,96
52G2P50A - 52G8P50A	1550	1550	200	70	200	7,28	0,96
52G2C50A - 52G8C50A	820	800	60	40	60	4,63	0,96
52M2P63A - 52M8P63A	1400	-	110	17	100	8,10	1,32
52M2C63A - 52M8C63A	1400	-	50	17	48	5,40	1,32
52G2P63A - 52G8P63A	2200	2000	300	102	300	11,02	1,32
52G2C63A - 52G8C63A	1100	1100	105	56	105	7,10	1,32

END CUSHION DIAGRAM



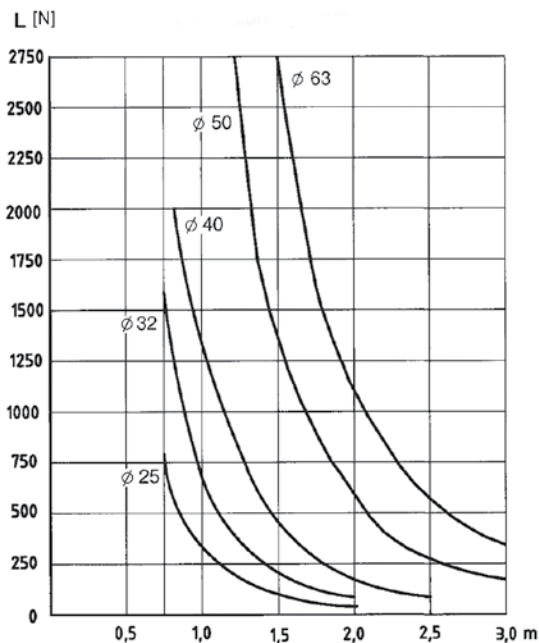
The end cushion regulating screw has to be regulated to obtain a smooth movement at the end of stroke.
In those applications which have different values than the ones stated in the diagram, external shock-absorbers have to be used.
The shock-absorber should be centrally located with respect to the center of the mass.
The diagram applies for horizontal operations.

Correction coefficient, loads see page 1.8.10.03.

speed - coefficient:

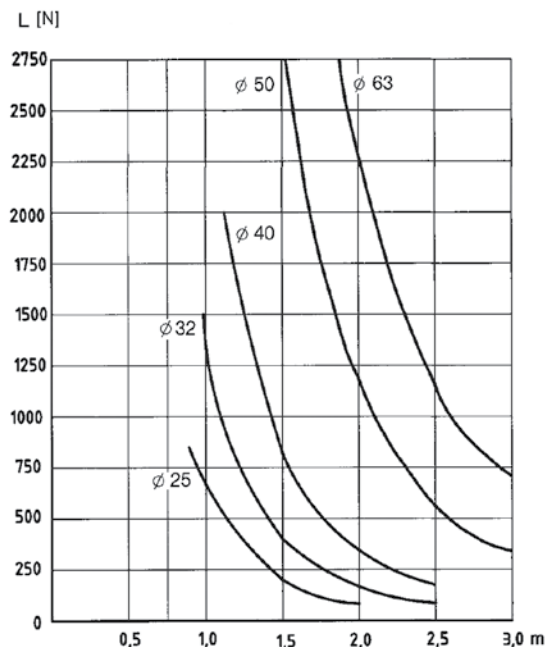
0,2 m/s	- 1
0,3 m/s	- 0,75
0,4 m/s	- 0,5
0,5 m/s	- 0,4
0,75 m/s	- 0,27
1 m/s	- 0,2

LOADS ACCORDING TO SUPPORTS DISTANCE



DEFLECTION 0.5 mm

The charts have been made according to a max. deflection of 0.5 mm and 1 mm when a load (N) is applied.
The charts give the max distance between two supports in order to stay within the deflection range given.



DEFLECTION 1 mm

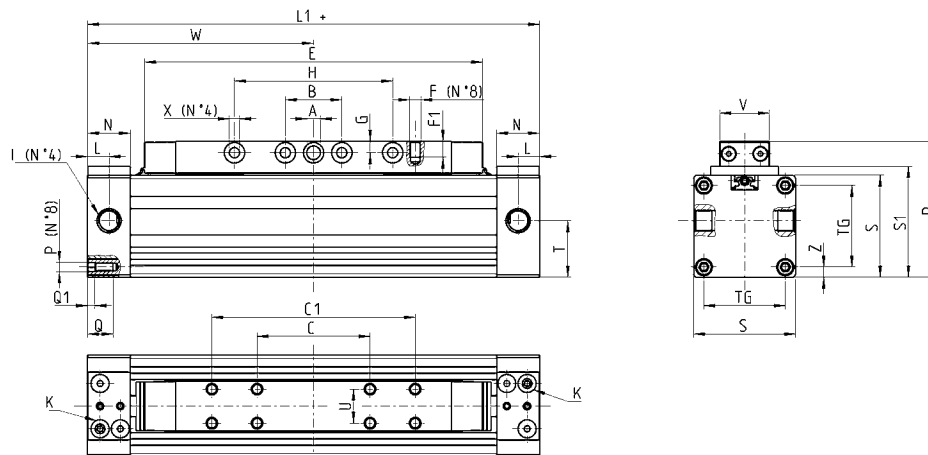
The charts have been made according to a max. deflection of 0.5 mm and 1 mm when a load (N) is applied.
The charts give the max distance between two supports in order to stay within the deflection range given.

Cylinders with standard carriage Mod. 52M2P

The cylinder has two supply ports "I" for both endcovers. The operator needs to choose which one of the two ports to use on each endcover. The remaining port has to be closed with the supplied tap.



+ = add the stroke
K = cushion regulation screw



DIMENSIONS (mm)

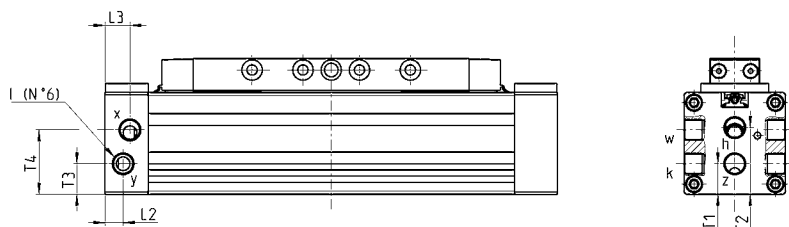
Mod.	Ø	W	E	L1	I	B	G	N	L	ØA	ØX	S1	T	Z	C1	C	U	F	F1	H	V	S	R	P	TG	Q	Q1
52M2P25A	25	100	149,5	200	G1/8	25	5	19	9,5	6	4,5	49	25	4,5	90	50	15	M5	7	70	22	45	60	M4	36	11	3
52M2P32A	32	120	184,5	240	G1/8	25	5,5	19	9,5	6	5,5	58	32	7,5	130	45	15	M5	7	100	22	54	69	M5	41	11	4
52M2P40A	40	150	222,5	300	G1/4	25	7	23	11,5	7	6,5	68	38	7,5	160	90	15	M5	9	130	22	64	82	M6	49	12	4
52M2P50A	50	175	262	350	G3/8	35	9	30	17	10	8,5	94	59	12,5	150	60	34	M8	16	180	46	90	115	M8	65	17	5
52M2P63A	63	200	300	400	G3/8	50	9,5	30	17	10	8,5	110	68,5	14,0	240	80	34	M8	16	180	46	106	131	M8	78	17	5

Cylinders with standard carriage Mod. 52M8P

The cylinder has six supply ports (I), three for one direction (x-h-w), and the other three (y-z-k) for the opposite direction. With supporting feet (Mod. B-52 / BA-52), ports "h" and "z" have to be closed.



Where no dimensions are presented, refer to dimensions of cylinder model 52M2P.



DIMENSIONS (mm)

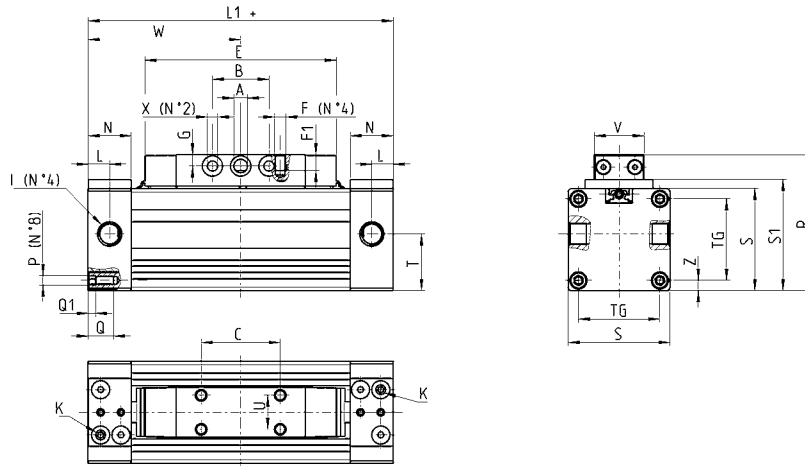
Mod.	Ø	T1	T2	T3	T4	L2	L3	I
52M8P25A	25	13,5	29,5	13,5	28,5	8	11	G1/8
52M8P32A	32	17,5	34,5	17,5	34,5	9,5	9,5	G1/8
52M8P40A	40	15,5	38	20,5	42,5	11,5	11,5	G1/4
52M8P50A	50	29,5	59	29	59	17	17	G3/8
52M8P63A	63	34	68,5	34	68,5	17	17	G3/8

Cylinders with short carriage Mod. 52M2C

The cylinder has two supply ports "I" for both endcovers. The operator needs to choose which one of the two ports to use on each end cover. The remaining port has to be closed with the supplied tap.



+ = add the stroke
K = cushion regulation screw



DIMENSIONS (mm)

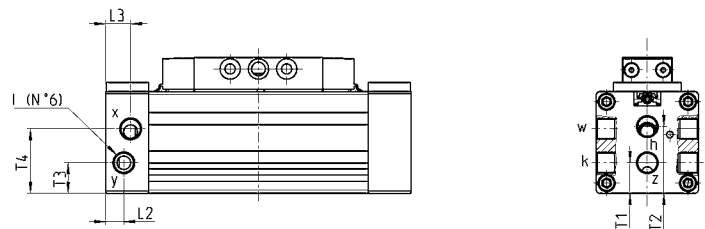
Mod.	Ø	W	L	L1	I	B	G	N	E	ØA	ØX	R	C	F	F1	U	T	V	S	S1	TG	P	Z	Q	Q1
52M2C25A	25	67,5	9,5	135	G1/8	25	5	19	84,5	6	4,5	60	35	M5	7	15	25	22	45	49	36	M4	4,5	11	3
52M2C32A	32	77,5	9,5	155	G1/8	25	5,5	19	99,5	6	5,5	69	45	M5	7	15	32,5	22	54	58	41	M5	7,5	11	4
52M2C40A	40	95	11,5	190	G1/4	25	7	23	112,5	7	6,5	82	50	M5	9	15	38,5	22	64	68	49	M6	7,5	12	4
52M2C50A	50	105	17	210	G3/8	35	9	30	122	10	8,5	115	64	M8	16	34	59	46	90	94	65	M8	12,5	17	5
52M2C63A	63	125	17	250	G3/8	50	9,5	30	150	10	8,5	131	80	M8	16	34	68,5	46	106	110	78	M8	14	17	5

Cylinders with short carriage Mod. 52M8C

The cylinder has six supply ports (I), three for one direction (x-h-w), and the other three (y-z-k) for the opposite direction. With supporting feet (Mod. B-52 / BA-52), ports "h" and "z" have to be closed.



Where no dimensions are presented, refer to dimensions of cylinder model 52M2C.



DIMENSIONS (mm)

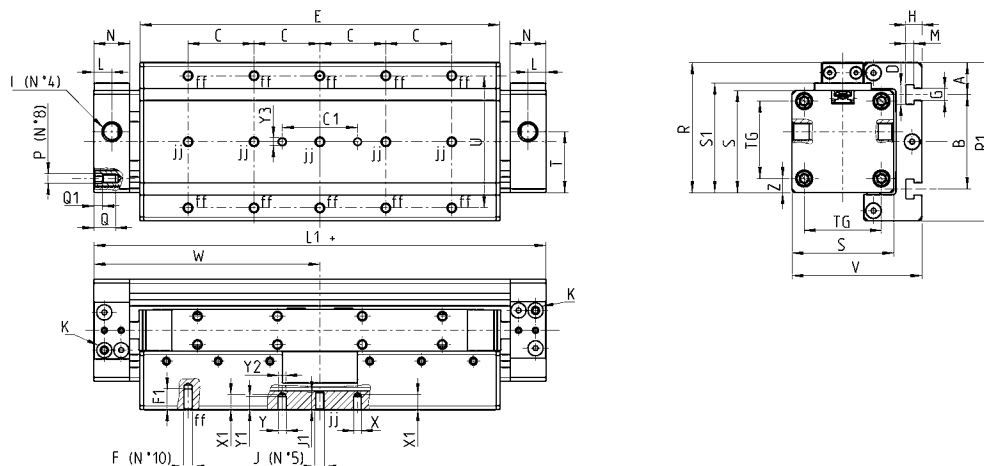
Mod.	Ø	T1	T2	T3	T4	L2	L3	I
52M8C25A	25	13,5	29,5	13,5	28,5	8	11	G1/8
52M8C32A	32	17,5	34,5	17,5	34,5	9,5	9,5	G1/8
52M8C40A	40	15,5	38	20,5	42,5	11,5	11,5	G1/4
52M8C50A	50	29,5	59	29	59	17	17	G3/8
52M8C63A	63	34	68,5	34	68,5	17	17	G3/8

Cylinders with slide bearing Mod. 52G2P

The cylinder has two supply ports "I" for both endcovers. The operator needs to choose which one of the two ports to use on each end cover. The remaining port has to be closed with the supplied tap.



jj = these holes are present in cylinder Ø32 only
+ add the stroke
K = cushion regulation screw



DIMENSIONS (mm)

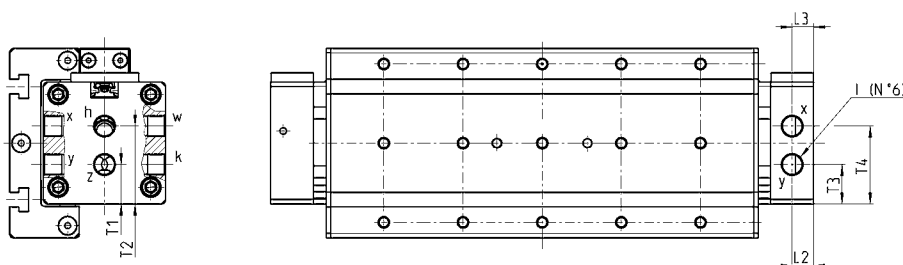
Mod.	Ø	W	E	L1	I	L	T	U	N	C	F	F1	D	B	A	H	G	M	J	J1	TG	Z	S	R1	P	V	Q	Q1	ØY2	Y	ØX	Y1	X1	Y3	C1	S1	R
52G2P25A	25	100	159	200	G1/8	9,5	25	30	19	30	M5	8	10,5	50	12,5	8,5	6,5	4,5	-	-	36	4,5	45	75	M4	59	11	3	4	4,5	4	4,5	5,5	4	40	49	60
52G2P32A	32	120	191	240	G1/8	9,5	32,5	70	19	35	M5	11	10,5	50	17	8,5	6,5	4,5	M5	9	41	7,5	54	84	M5	69	11	4	4	4,5	4	7	8	4	40	58	69
52G2P40A	40	150	246	300	G1/4	11,5	38	55	23	55	M6	12	10,5	80	10	8,5	6,5	4,5	-	-	49	7,5	64	100	M6	79	12	4	6	6,5	6	7	8	6	40	68	82
52G2P50A	50	175	270	350	G3/8	17	59	42	30	50	M8	16	10,5	94	23	8,5	6,5	4,5	-	-	65	12,5	90	133	M8	112,5	17	5	-	6,5	6	3	3	6	40	94	115
52G2P63A	63	200	320	400	G3/8	17	68,5	60	30	60	M8	16	10,5	110	24	8,5	6,5	4,5	-	-	78	14	106	150	M8	134,5	17	5	-	6,5	6	6,5	6,5	6	40	110	132

Cylinders with slide bearing Mod. 52G8P

The cylinder has six supply ports (I), three for one direction (x-h-w), and the other three (y-z-k) for the opposite direction. With supporting feet (Mod. B-52 / BA-52), ports "h" and "z" have to be closed.



Where no dimensions are presented, refer to dimensions of cyl. mod. 52G2P. The guide can be applied on the right side, if requested.



DIMENSIONS (mm)

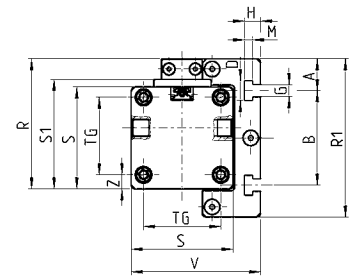
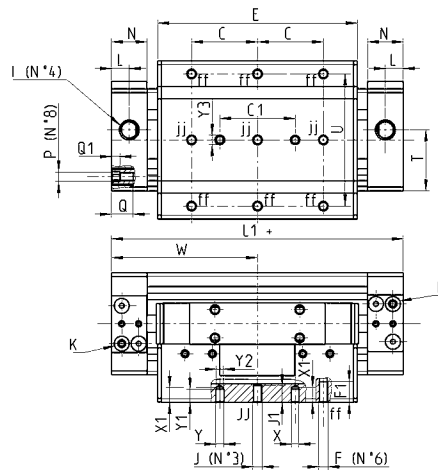
Mod.	Ø	T1	T2	T3	T4	L2	L3	I
52G8P25A	25	13,5	29,5	13,5	28,5	8	11	G1/8
52G8P32A	32	17,5	34,5	17,5	34,5	9,5	9,5	G1/8
52G8P40A	40	15,5	38	20,5	42,5	11,5	11,5	G1/4
52G8P50A	50	29,5	59	29	59	17	17	G3/8
52G8P63A	63	34	68,5	34	68,5	17	17	G3/8

Cylinders with slide bearing Mod. 52G2C

The cylinder has two supply ports "I" for both endcovers. The operator needs to choose which one of the two ports to use on each end cover. The remaining port has to be closed with the supplied tap.



jj = these holes are present
in cylinder Ø32 only
+ add the stroke
K = cushion regulation
screw



DIMENSIONS (mm)

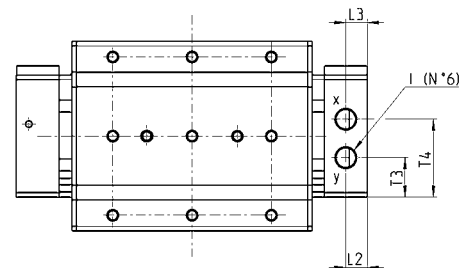
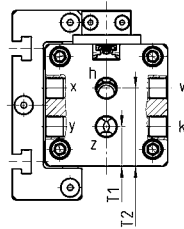
Mod.	Ø	W	E	L1	I	L	T	U	N	C	F	F1	D	B	A	H	G	M	J	J1	TG	Z	S	R1	P	V	Q	Q1	ØY2	Y	ØX	Y1	X1	Y3	C1	S1	R
52G2C25A	25	67,5	94	135	G1/8	9,5	25	30	19	30	M5	8	10,5	50	12,5	8,5	6,5	4,5	-	-	36	4,5	45	75	M4	59	11	3	4	4,5	4	4,5	5,5	4	40	49	60
52G2C32A	32	77,5	106	155	G1/8	9,5	32,5	70	19	35	M5	11	10,5	50	17	8,5	6,5	4,5	M5	9	41	7,5	54	84	M5	69	11	4	4	4,5	4	7	8	4	40	58	69
52G2C40A	40	95	136	190	G1/4	11,5	38,5	55	23	55	M6	12	10,5	80	10	8,5	6,5	4,5	-	-	49	7,5	64	100	M6	79	12	4	6	6,5	6	7	8	6	40	68	82
52G2C50A	50	105	148	210	G3/8	17	59	42	30	50	M8	16	10,5	94	23	8,5	6,5	4,5	-	-	65	12,5	90	133	M8	113	17	5	-	6,5	6	3	3	6	40	94	115
52G2C63A	63	125	180	250	G3/8	17	68,5	60	30	60	M8	16	10,5	110	24	8,5	6,5	4,5	-	-	78	14	106	150	M8	134,5	17	5	-	6,5	6	6,5	6,5	6	40	110	132

Mod. 52G8C

The cylinder has six supply ports (I), three for one direction (x-h-w), and the other three for the opposite direction (y-z-k). With supporting feet (mod. B-52 / BA-52), ports "h" and "z" have to be closed.



Where no dimensions
are presented, refer to
dimensions of cylinder
model 52G2C. The guide
can be applied on the right
side, if requested.



DIMENSIONS (mm)

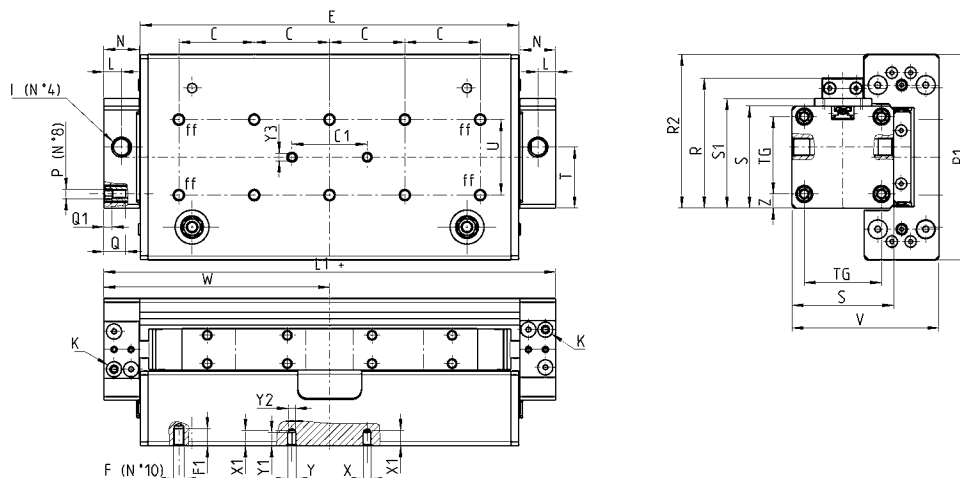
Mod.	Ø	T1	T2	T3	T4	L2	L3	I
52G8C25A	25	13,5	29,5	13,5	28,5	8	11	G1/8
52G8C32A	32	17,5	34,5	17,5	34,5	9,5	9,5	G1/8
52G8C40A	40	15,5	38	20,5	42,5	11,5	11,5	G1/4
52G8C50A	50	29,5	59	29	59	17	17	G3/8
52G8C63A	63	34	68,5	34	68,5	17	17	G3/8

Cylinders with Roller bearings Mod. 52R2P

The cylinder has two supply ports "I" for both endcovers. The operator needs to choose which one of the two ports to use on each end cover. The remaining port has to be closed with the supplied tap.



ff = these holes are not present in cylinder 25
+ add the stroke
K = cushion regulation screw



DIMENSIONS (mm)

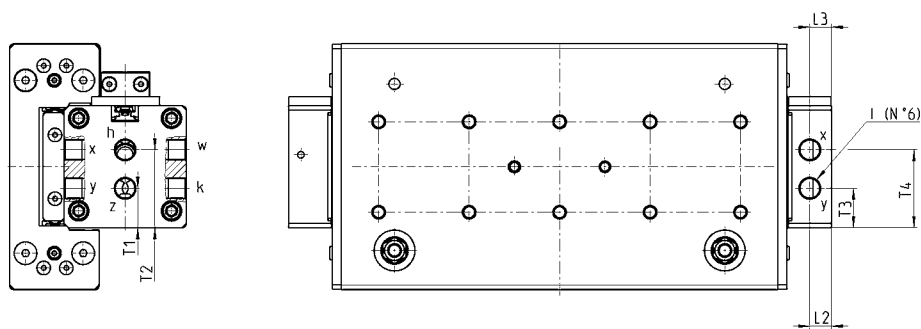
Mod.	Ø	W	E	L1	I	L	T	U	N	C	F	F1	TG	Z	S	R1	P	V	Q	Q1	ØY2	Y	ØX	Y1	X1	Y3	C1	S1	R2	R
52R2P25A	25	100	160	200	G1/8	9,5	25	40	19	40	M5	7,5	36	4,5	45	97	M4	68	11	3	4	4,5	4	7	8	4	40	49	71	60
52R2P32A	32	120	201	240	G1/8	9,5	32,5	40	19	40	M6	9	41	5,5	54	109	M5	78	11	4	4	4,5	4	7	8	4	40	58	81,5	69
52R2P40A	40	150	252	300	G1/4	11,5	38	55	23	55	M6	12	49	7,5	64	145	M6	90,5	12	4	6	6,5	6	7	8	6	40	68	104,5	82

Cylinders with Roller bearings Mod. 52R8P

The cylinder has six ports, three for one direction (x-h-w), and the other three (y-z-k) for the opposite direction. With supporting feet (Mod. B-52 / BA-52), ports "h" and "z" have to be closed.



Where no dimensions are presented, refer to dimensions of cylinder model 52R2P. The guide can be applied on the right side, if requested.



DIMENSIONS (mm)

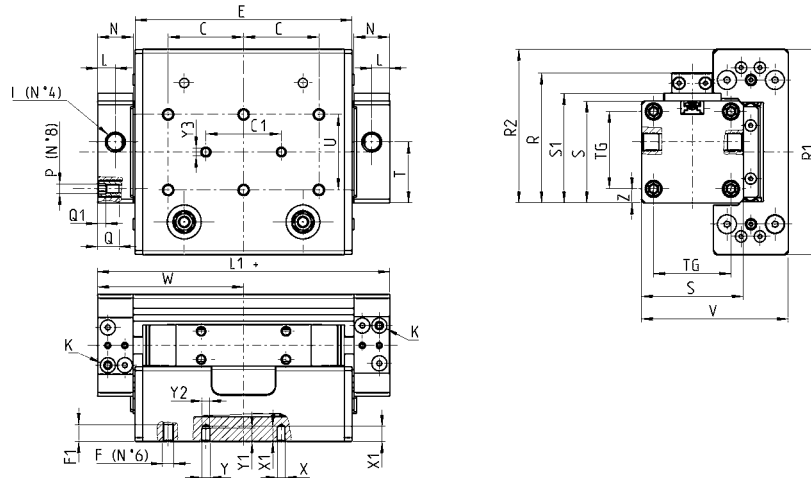
Mod.	Ø	T1	T2	T3	T4	L2	L3	I
52R8P25A	25	13,5	29,5	13,5	28,5	8	11	G1/8
52R8P32A	32	17,5	34,5	17,5	34,5	9,5	9,5	G1/8
52R8P40A	40	15,5	38	20,5	42,5	11,5	11,5	G1/4

Cylinders with Roller bearings Mod. 52R2C

The cylinder has two supply ports "I" for both endcovers. The operator needs to choose which one of the two ports to use on each end cover. The remaining port has to be closed with the supporting tap.



+ = add the stroke
K = cushion regulation screw



DIMENSIONS (mm)

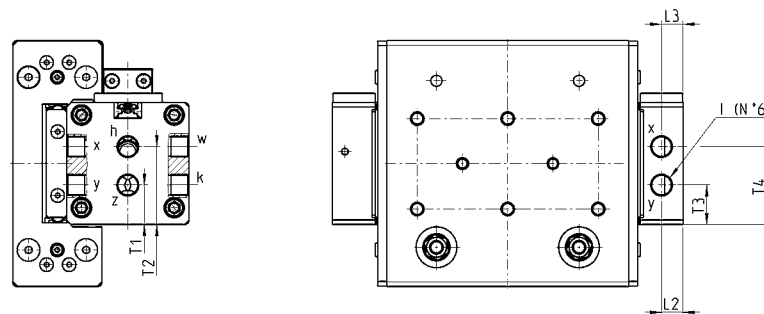
Mod.	Ø	W	E	L1	I	L	T	U	N	C	F	F1	TG	Z	S	R1	P	V	Q	Q1	ØY2	Y	ØX	Y1	X1	Y3	C1	S1	R2	R
52R2C25A	25	67,5	95	135	G1/8	9,5	25	40	19	20	M5	7,5	36	4,5	45	97	M4	68	11	3	4	4,5	4	7	8	4	40	49	71	60
52R2C32A	32	77,5	115	155	G1/8	9,5	32,5	40	19	40	M6	9	41	5,5	54	109	M5	78	11	4	4	4,5	4	7	8	4	40	58	81,5	69
52R2C40A	40	95	143,5	190	G1/4	11,5	38	55	23	55	M6	12	49	7,5	64	145	M6	90,5	12	4	6	6,5	6	7	8	6	40	68	104,5	82

Cylinders with Roller bearings Mod. 52R8C

The cylinder has six supply ports (I), three for one direction (x-h-w), and the other three (y-z-k) for the opposite direction. With supporting feet (Mod. B-52 / BA-52), ports "h" and "z" have to be closed.



Where no dimensions are presented, refer to dimensions of cylinder model 52R2C. The guide can be applied on the right side, if requested.



DIMENSIONS (mm)

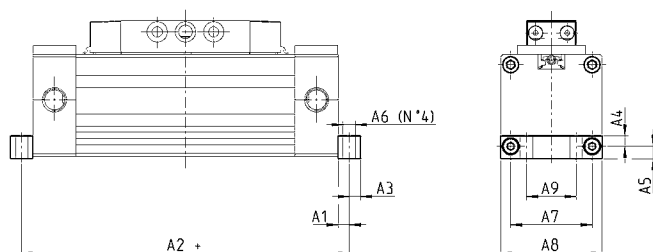
Mod.	Ø	T1	T2	T3	T4	L2	L3	I
52R8C25A	25	13,5	29,5	13,5	28,5	8	11	G1/8
52R8C32A	32	17,5	34,5	17,5	34,5	9,5	9,5	G1/8
52R8C40A	40	15,5	38	20,5	42,5	11,5	11,5	G1/4

Foot mount Mod. B-52



The following is supplied:
2x feet
4x screws

+ = add the stroke



DIMENSIONS (mm)

Mod.	Ø	A1	A2 Series 52...P...	A2 Series 52...C...	A3	A4	A5	Ø A6	A7	A8	A9
B-52-25	25	5	210	145	5	4,5	5,5	5,5	36	45	22
B-52-32	32	7,5	255	170	7,5	7,5	8,5	7	41	51	25
B-52-40	40	7,5	315	205	7,5	7,5	8,5	9	49	64	25
B-52-50	50	7,5	365	225	7,5	12,5	13,5	8,5	65	89	40
B-52-63	63	7,5	415	265	7,5	14	15	8,5	78	105	50

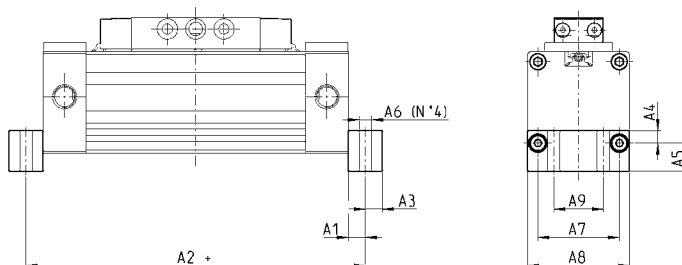
Foot mount Mod. BA-52

These are to be used with intermediate bracket (Mod. BH-52... and BL-52...)



The following is supplied:
2x feet
4x screws

+ = add the stroke



DIMENSIONS (mm)

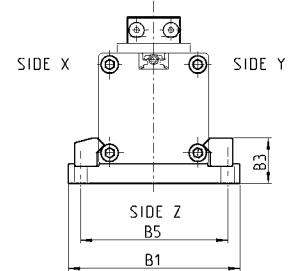
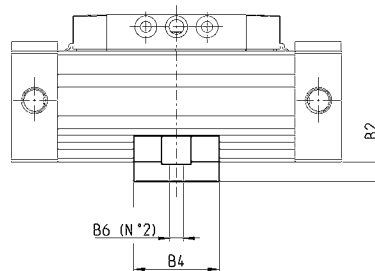
Mod.	Ø	A1	A2 Series 52...P...	A2 Series 52...C...	A3	A4	A5	Ø A6	A7	A8	A9
BA-52-25	25	7,5	215	150	7,5	5,5	12,5	5,5	36	45	22
BA-52-32	32	7,5	255	170	7,5	16,5	17,5	7	41	51	25
BA-52-40	40	7,5	315	205	7,5	8,5	17,5	9	49	64	25
BA-52-50	50	7,5	365	225	7,5	12,5	27,5	8,5	65	89	40
BA-52-63	63	7,5	415	265	7,5	11	29	8,5	78	105	50

Intermediate brackets Mod.BH and BL 52-32

Assembling by using two intermediate brackets without using the feet bracket. If the application requires the assembling of an intermediate bracket on sides X-Y, it is necessary to use model BL-52-32 (only Ø32).



The following is supplied:
1x intermediate bracket
4x screws



DIMENSIONS (mm)

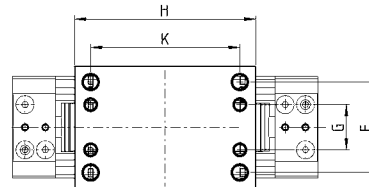
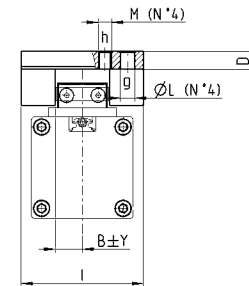
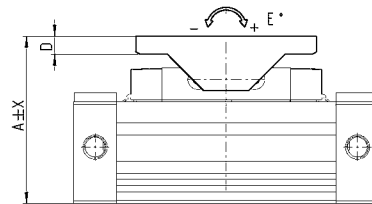
Mod.	Ø	B1	B2	B3	B4	B5	Ø B6
BH-52-25	25	70	8	18,5	35	60	5,5
BH-52-32	32	85	10	18,5	40	73	6,5
BL-52-32	32	85	10	18,5	40	73	6,5
BH-52-40	40	105	10	18,5	40	90,5	9
BH-52-50	50	138	15	30	70	120	11
BH-52-63	63	154	15	36	70	136	11

Self-compensating adaptor Mod.CF-52

The self-compensating adaptor is used to compensate the difference between the rodless cylinder and the external guide system. Suitable for cylinders mod. 52M2P/52M2C/52M8P/52M8C.



The following is supplied:
1x adaptor
1x pin
2x feet
2x c-clips



DIMENSIONS (mm)

Mod.	Ø	A	X	E°	B	Y	D	I	F	G	H	K	Ø L	M
CF-52-25-32	25	74	1	±8	12	0,8	8	54	40	20	80	66	6,5	M6
CF-52-25-32	32	82	0,5	±6	12	0,8	8	54	40	20	80	66	6,5	M6
CF-52-40	40	94,5	0,5	±6	12	0,8	8	54	40	20	80	66	6,5	M6
CF-52-50-63	50	130,5	0,5	±5	24	0,8	11	80	51	23	122	102	9	M8
CF-52-50-63	63	146	0,5	±4,5	24	0,8	11	80	51	23	122	102	9	M8

Cylinders with Integrated Guide Series QCT and QCB

Double-acting, magnetic piston, guided
 ø 20, 25, 32, 40, 50, 63



- » Magnetic sensors can be mounted on both sides
- » QCB: ball bearing guide
- » QCT: bronze bushings
- » Movement and guidance in one unit

Both models are equipped with fixed cushioning to prevent direct impact with the end covers. The design of the cylinder body allows the mounting of the cylinder using either top, bottom or side faces. Several "T" shaped grooves in two faces allow sensors to be fitted in a number of positions. Non-standard strokes are available on demand only.

These compact cylinders, designed to be used in applications where space is limited, are available in two versions: one with sintered bronze bushes (model QCT) and the other with linear ball bearings (model QCB). The QCT version would normally be selected when the side loads applied to the cylinder are high. Model QCB cylinders are suitable for high precision and fast cycling applications.

GENERAL DATA

Type of construction	compact guided QCT = sintered bronze bushings QCB = linear ball bearings
Operation	double-acting
Materials	body = anodized AL flange = zinc-plated steel piston rod = rolled stainless steel AISI 303 QCT columns = rolled stainless steel 420B QCB columns = hardened carbon steel C50 seals = PU
Mounting	threaded and non-threaded holes in the body
Strokes min. max	see table
Operating temperature	0°C – 80°C (with dry air - 20°C) (32 - 176°F, with dry air -4°F)
Speed	50 – 500 mm/s
Operating pressure	1 – 10 bar
Fluid	clean air, non lubricated. If lubricated air is used, it is recommended to use oil ISOVG32. Once applied the lubrication should never be interrupted.

STANDARD STROKES FOR DOUBLE-ACTING CYLINDERS SERIES QC

■ = Double-acting

Out of standard intermediate strokes available on request (strokes multiple of 5 mm)

Ø	20	25	30	40	50	75	100	125	150	175	200
20	■		■	■	■	■	■	■	■	■	■
25	■		■	■	■	■	■	■	■	■	■
32		■			■	■	■	■	■	■	■
40		■			■	■	■	■	■	■	■
50		■			■	■	■	■	■	■	■
63		■			■	■	■	■	■	■	■

CODING EXAMPLE

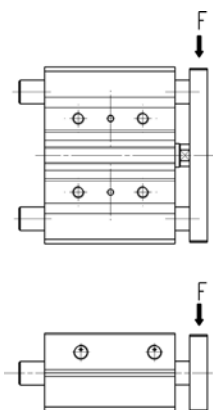
QC	T	2	A	020	A	050
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QC	SERIES
T	VERSION T = sintered bronze bushings B = linear ball bearings
2	OPERATIONS 2 = double-acting
A	MATERIALS A = anodized aluminium body, rolled stainless steel 303 piston rod, rolled stainless steel 420B columns for QCT hardened steel C50 columns for QCB
020	BORE 020 = 20 mm 025 = 25 mm 032 = 32 mm 040 = 40 mm 050 = 50 mm 063 = 63 mm
A	TYPE OF DESIGN A = standard
050	STROKE (see table)

TABLE OF PERMISSABLE LOADS (F), in Newtons (N)

FOR SINTERED BRONZE BUSHES
(QCT) - FOR LINEAR BALL
BEARINGS (QCB)

F (N) 1N = 0.102 kgf
Ex.: QCT2A025A020 = F = 140N

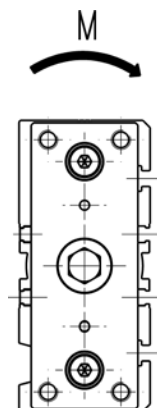


		STROKE											
Ø	Mod	20	25	30	40	50	75	100	125	150	175	200	
20	QCT	100	-	93	81	73	114	93	98	85	75	67	
25	QCT	140	-	120	115	103	165	135	150	131	116	104	
32	QCT	-	253	-	-	214	225	208	225	198	176	159	
40	QCT	-	251	-	-	197	215	206	224	196	175	157	
50	QCT	-	317	-	-	273	267	299	257	225	200	179	
63	QCT	-	316	-	-	273	267	299	257	225	200	179	
20	QCB	110	-	100	125	121	90	86	69	58	49	43	
25	QCB	142	-	85	154	148	106	82	97	81	70	61	
32	QCB	-	222	-	-	91	167	129	145	122	104	90	
40	QCB	-	221	-	-	93	167	128	145	121	104	90	
50	QCB	-	203	-	-	152	161	193	156	130	110	95	
63	QCB	-	201	-	-	151	158	195	157	130	110	94	

TABLE OF PERMISSABLE MOMENTS (M), in Newton-Meters (Nm)

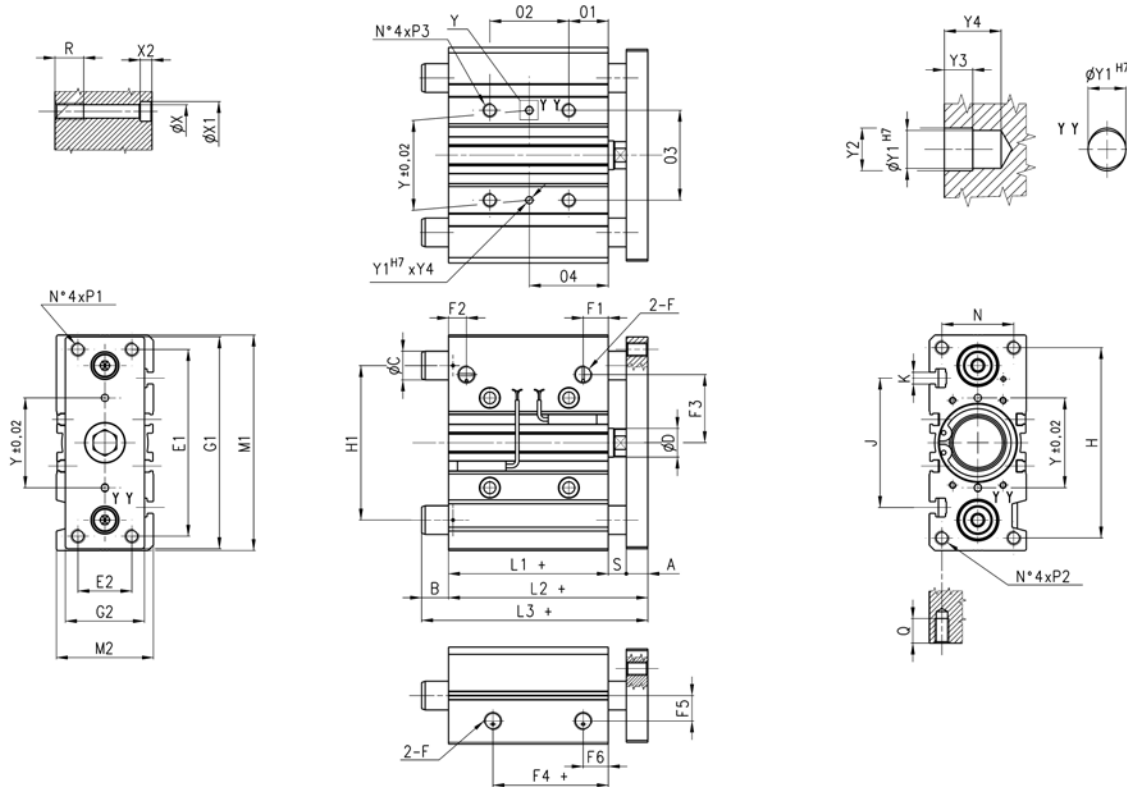
FOR SINTERED BRONZE BUSHES
(QCT) - FOR LINEAR BALL
BEARINGS (QCB)

M (N*m) 1N*m = 0,102 kgf *m
Ex.: QCT2A025A020 = M = 3,4 Nm



		STROKE											
Ø	Mod	20	25	30	40	50	75	100	125	150	175	200	
20	QCT	1,7	-	1,5	1,2	1,0	2,9	2,8	2,6	2,3	2,0	1,8	
25	QCT	3,4	-	2,9	3,6	3,3	4,2	4,3	3,8	3,2	2,7	2,3	
32	QCT	-	6,7	-	-	6,5	7,2	7,0	6,6	5,6	4,8	4,1	
40	QCT	-	8,7	-	-	7,3	9,2	8,8	9,6	8,4	7,5	6,7	
50	QCT	-	15,4	-	-	12,9	12,6	13,4	12,1	11,3	10,7	8,8	
63	QCT	-	15,1	-	-	14,3	16,6	17	14	11,3	9,7	9,1	
20	QCB	3,0	-	2,7	3,4	3,3	2,4	2,3	1,9	1,6	1,3	1,2	
25	QCB	3,5	-	2,7	4,9	4,7	3,4	2,6	3,1	2,6	2,2	2,0	
32	QCB	-	6,3	-	-	3,6	6,5	5,1	5,7	4,8	4,1	3,5	
40	QCB	-	8,5	-	-	4,0	7,2	5,5	6,2	5,2	4,5	3,9	
50	QCB	-	11,1	-	-	8,3	8,8	10,6	8,6	7,1	6,0	5,2	
63	QCB	-	8,3	-	-	7,2	9,8	12,1	9,7	8,1	6,8	5,8	

Cylinders Series QC



+ = add the stroke

Note: for out of standard intermediate strokes (ex. stroke 35), you have to consider the dimensions referring to the immediately higher stroke (ex. stroke 40).

DIMENSIONS

Dimension 02 (mm)	Ø 20	Ø 25	Ø 32	Ø 40	Ø 50	Ø 63	Dimension 04 (mm)	Ø 20	Ø 25	Ø 32	Ø 40	Ø 50	Ø 63
20 – 30 mm stroke	24	24	24	24	24	28	20 – 30	29	29	33	34	36	38
40 – 100 mm stroke	44	44	48	48	48	52	40 – 100	39	39	45	46	48	50
125 – 200 mm stroke	120	120	124	124	124	128	125 – 200	77	77	83	84	86	88

DIMENSIONS (mm)																																					
Ø	A	ØD	E1	E2	F	F1	F2	F3	F4	F5	F6	G1	G2	H	H1	L1	L2	M1	M2	N	O1	O3	P1/P2	P3	Q	R	S	Y	Y1	Y2	Y3	Y4	X	X1	X2	J	K
20	10	10	70	18	G1/8	10,5	10,5	25	12,5	11,5	10,5	81	30	72	54	37	53	83	36	24	17	28	M5X0,8	M6X1	13	12	6	28	3	3,5	3	6	5,5	9,5	5,5	44	M5
25	10	12	78	26	G1/8	11,5	8	28,5	12,5	13,5	11,5	91	40	82	64	37,5	53,5	93	42	30	17	34	M6X1	M6X1	15	12	6	34	4	4,5	3	6	5,5	9,5	5,5	50	M5
32	12	16	96	30	G1/8	12,5	9,5	34	7	15	12,5	110	45	98	78	37,5	59,5	112	48	34	21	42	M8X1,25	M8X1,25	20	16	10	42	4	4,5	3	6	6,5	11	7,5	63	M6
40	12	16	104	30	G1/8	13	12	38	13	18	13	118	45	106	86	44	66	120	54	40	22	50	M8X1,25	M8X1,25	20	16	10	50	4	4,5	3	6	6,5	11	7,5	72	M6
50	15	20	130	40	G1/4	14	11	47	8	215	12	146	60	130	110	44	72	148	64	46	24	66	M10X1,5	M10X1,5	22	20	13	66	5	6	4	8	8,5	14	9	92	M8
63	15	20	130	50	G1/4	14,5	11,4	55	12	28	14,5	158	70	142	124	49	77	162	78	58	24	80	M10X1,5	M10X1,5	22	20	13	80	5	6	4	8	8,5	14	9	110	M10

Fixed dimensions for Mod. QCB

Dimensions L3 and B for different strokes of Mod. QCB



See drawing on prior page

DIMENSIONS (mm)															
Ø	Dim L3 20-30 stroke	Dim L3 25-50 stroke	Dim L3 25-75 stroke	Dim L3 40-100 stroke	Dim L3 75-100 stroke	Dim L3 100-200 stroke	Dim L3 125-200 stroke	Dim B 20-30 stroke	Dim B 25-50 stroke	Dim B 25-75 stroke	Dim B 40-100 stroke	Dim B 75-100 stroke	Dim B 100-200 stroke	Dim B 125-200 stroke	Dim C (Ø)
20	72	-	-	75	-	-	85	19	-	-	22	-	-	32	10
25	74,5	-	-	85,5	-	-	98	21	-	-	32	-	-	44,5	12
32	-	86	-	-	95	-	110	-	26,5	-	-	35,5	-	50,5	16
40	-	86	-	-	95	-	110	-	20	-	-	29	-	44	16
50	-	-	93	-	-	112	-	-	-	21	-	-	40	-	20
63	-	-	93	-	-	112	-	-	-	16	-	-	35	-	20

Fixed dimensions for Mod. QCT

Dimensions L3 and B for different strokes of Mod. QCT

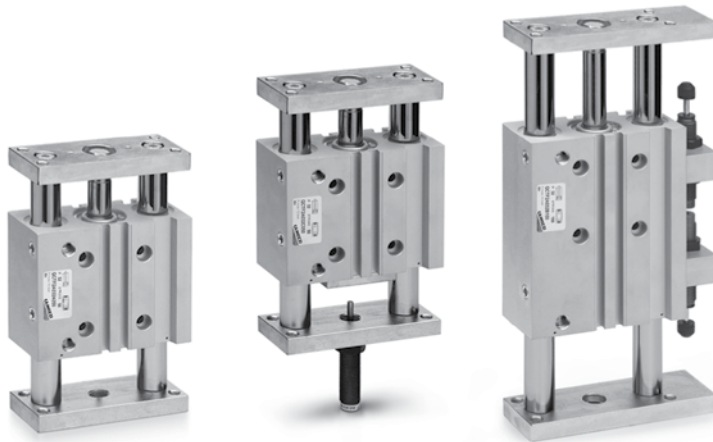


See drawing on prior page

DIMENSIONS (mm)															
Ø	Dim L3 20-30 stroke	Dim L3 25-50 stroke	Dim L3 25-75 stroke	Dim L3 40-100 stroke	Dim L3 75-100 stroke	Dim L3 100-200 stroke	Dim L3 125-200 stroke	Dim B 20-30 stroke	Dim B 25-50 stroke	Dim B 25-75 stroke	Dim B 40-100 stroke	Dim B 75-100 stroke	Dim B 100-200 stroke	Dim B 125-200 stroke	Dim C (Ø)
20	74,5	-	-	-	-	79,5	-	21,5	-	-	-	-	-	26,5	12
25	-	74,5	-	80,5	-	85	-	-	21	-	27	-	31,5	-	16
32	-	-	73,5	-	-	-	91,5	-	-	14	-	-	-	32	20
40	-	-	73,5	-	-	-	91,5	-	-	7,5	-	-	-	25,5	20
50	-	-	-	-	98,5	-	-	-	-	-	-	26,5	-	-	25
63	-	-	-	-	98,5	-	-	-	-	-	-	21,5	-	-	25

Cylinders with Integrated Guide Series QCTF and QCBF

Double-acting, magnetic piston, with double bearings and flanges
ø 20, 25, 32, 40



- » Magnetic sensors can be mounted on both sides
- » QCBF: ball bearing guide
- » QCTF: bronze bushings
- » Movement and guidance in one unit

The end cushioning is available in three different variants:

- A. fixed mechanical cushion (standard)
- B. with two shock absorbers located on the body
- C. with one shock absorber located central on the rear flange.

The versions B and C are suitable for handling of higher mass forces and / or when it is necessary to adjust the stroke.

These cylinders have been designed to be used in applications where space is limited. Regarding the bearings, the Slide Units are available in two versions, one with double sintered bronze bushings (Mod. QCTF) and the other with double linear ball bearings (Mod. QCBF). The QCTF version would normally be selected when the side loads applied to the slide unit are high. Mod. QCBF is suitable for fast cycles (less side load) and higher precision.

GENERAL DATA

Type of construction	compact guided with extended guide rods and double bearings/flanges QCTF = sintered bronze bushings QCBF = linear ball bearings
Operation	double-acting
Materials	body = anodized AL flanges = zinc-plated steel piston rod = rolled stainless steel AISI 303 QCTF columns = rolled stainless steel 420B QCBF columns = hardened carbon steel C50 seals = PU
Mounting	threaded and non threaded holes in the body
Strokes min. max	(see table)
Operating temperature	0°C – 80°C (32 - 176°F, with dry air -4°F) (with dry air -20°C)
Speed	50 – 500 mm/s
Stroke end cushioning Type A	extended stroke - fixed mechanical cushioning retracted stroke - fixed mechanical cushioning we recommend preventing the piston from striking against the end covers
Stroke end cushioning Type B	extended stroke - shock absorber retracted stroke - shock absorber
Stroke end cushioning Type C	extended stroke - shock absorber retracted stroke - fixed mechanical cushioning we recommend preventing the piston from striking against the end covers
Operating pressure	1 – 10 bar (14 - 145 psi)
Fluid	clean air, non lubricated. If lubricated air is used, it is recommended to use oil ISOVG32. Once applied the lubrication should never be interrupted.

STANDARD STROKES FOR DOUBLE-ACTING CYLINDERS SERIES QCTF AND QCBF

■ = Type A and C

Out of standard intermediate strokes available on request (strokes multiple of 5 mm)

✱ = Type B

Ø	20	25	30	40	50	75	100	125	150	175	200
20	■		■	■	■	■ ✱	■ ✱	■ ✱	■ ✱	■ ✱	■ ✱
25	■		■	■	■	■ ✱	■ ✱	■ ✱	■ ✱	■ ✱	■ ✱
32		■			■	■	■ ✱	■ ✱	■ ✱	■ ✱	■ ✱
40		■			■	■	■ ✱	■ ✱	■ ✱	■ ✱	■ ✱

CODING EXAMPLE

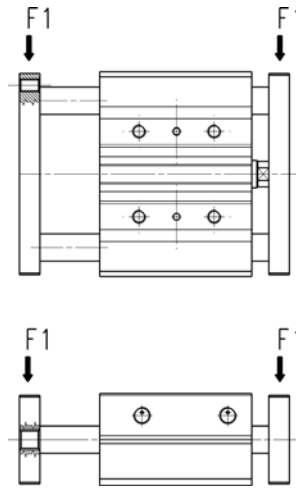
QC	T	F	2	A	020	A	050
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QC	SERIES
T	TYPE OF BEARING T = sintered bronze bushings B = linear ball bearings
F	INSTALLATION TYPE F = body mounted with moving flanges
2	OPERATIONS 2 = double-acting
A	MATERIALS A = anodized aluminium body, rolled stainless steel piston rod 303, rolled stainless steel 420B columns QCT, hardened steel C50 columns QCB
020	BORE 020 = 20 mm 025 = 25 mm 032 = 32 mm 040 = 40 mm
A	CUSHION A = fixed mechanical cushion (standard) B = two shock absorbers located on the body C = one shock absorber located on the rear flange
050	STROKE see table

TABLE OF PERMISSABLE LOADS (F1) FROM ONE FLANGE, in Newtons (N)

FOR SINTERED BRONZE BUSHES
(QCTF) - FOR LINEAR BALL
BEARINGS (QCBF)

F1 (N) 1N = 0.102 kgf

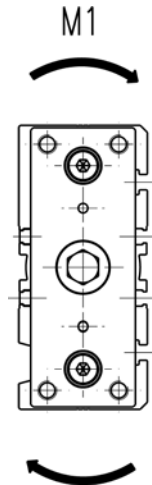


STROKE											
Ø	20	25	30	40	50	75	100	125	150	175	200
20 QCTF	136	-	124	124	123	122	122	121	121	120	120
QCBF	146	-	142	140	139	137	136	134	94	70	53
25 QCTF	181	-	167	165	164	163	162	161	160	159	158
QCBF	171	-	167	165	163	161	160	160	159	142	109
32 QCTF	-	174	-	-	166	162	160	158	156	155	153
QCBF	-	220	-	-	214	211	211	210	210	209	209
40 QCTF	-	189	-	-	175	168	164	161	159	157	155
QCBF	-	228	-	-	219	214	214	212	212	211	210

TABLE OF PERMISSABLE MOMENTS (M1) FROM ONE FLANGE, in Newton-Meters (Nm)

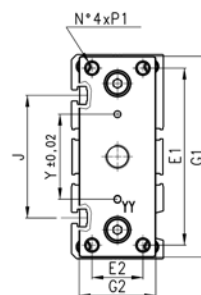
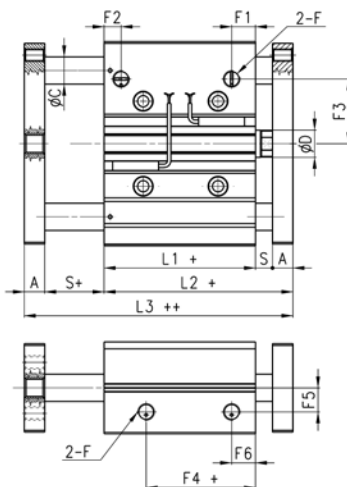
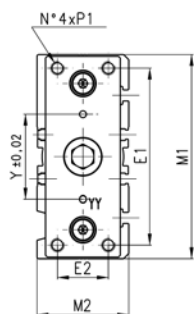
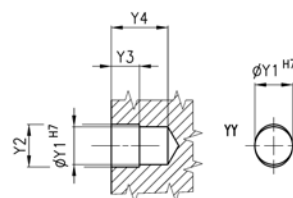
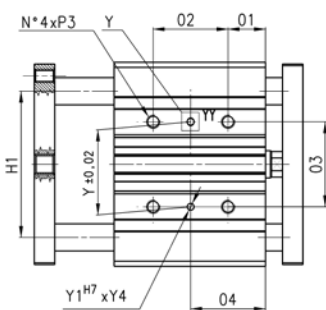
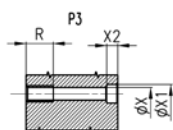
FOR SINTERED BRONZE BUSHES
(QCTF) - FOR LINEAR BALL
BEARINGS (QCBF)

M1 (N*m) 1N*m = 0,102 kgf *m



STROKE												
Ø	Mod.	20	25	30	40	50	75	100	125	150	175	200
20	QCTF	3,6	-	3,3	3'3	3,3	3,2	3,2	3,2	3,2	3,2	3,2
	QCBF	3,9	-	3,7	3,7	3,7	3,6	3,6	3,6	2,5	1,89	1,4
25	QCTF	5,7	-	5,2	5,2	5,2	5,2	5,1	5,1	5,1	5	5
	QCBF	5,4	-	5,2	5,2	5,2	5,1	5,1	5,1	5	4,5	3,4
32	QCTF	-	6,7	-	-	6,4	6,3	6,2	6,1	6	6	5,9
	QCBF	-	8,5	-	-	8,3	8,2	8,2	8,1	8,1	8,1	8,1
40	QCTF	-	8,1	-	-	7,5	7,2	7	6,9	6,8	6,7	6,6
	QCBF	-	9,8	-	-	9,4	9,2	9,2	9,1	9,1	9	9

Mod. QCTF and QCBF type "A"



+ = add the stroke

++ = add the stroke 2 times

Note: for out of standard intermediate strokes (ex. stroke 35), you have to consider the dimensions referring to the immediately higher stroke (ex. stroke 40).

DIMENSIONS

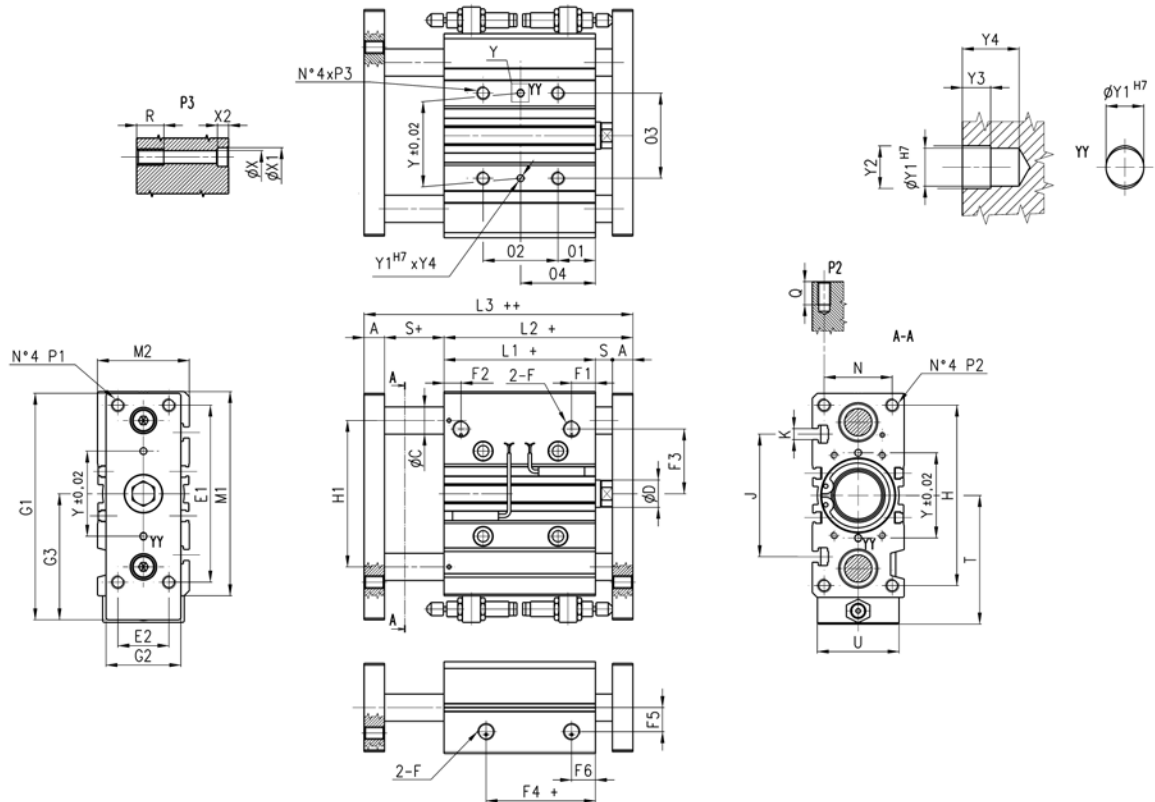
Ø	P1	P3	Y1	Y2	Y3	Y4	X	X1	X2	J	K
20	M5x0,8	M6x1	3	3,5	3	6	5,5	9,5	5,5	44	M5
25	M6x1	M6x1	4	4,5	3	6	5,5	9,5	5,5	50	M5
32	M8x1,25	M8x1,25	4	4,5	3	6	6,5	11	7,5	63	M6
40	M8x1,25	M8x1,25	4	4,5	3	6	6,5	11	7,5	72	M6

	Ø2 stroke 20-30	Ø2 stroke 40-100	Ø2 stroke 125-200	Ø4 stroke 20-30	Ø4 stroke 40-100	Ø4 stroke 125-200	QCBF ØC	QCTF ØC
20	24	44	120	29	39	77	10	12
25	24	44	120	29	39	77	12	16
32	24	48	124	33	45	83	16	20
40	24	48	124	34	46	84	16	20

DIMENSIONS (mm)

Ø	A	ØD	E1	E2	F	F1	F2	F3	F4	F5	F6	G1	G2	H1	L1	L2	L3	M1	M2	Ø1	Ø3	R	S	Y
20	10	10	70	18	1/8	10,5	10,5	25	12,5	11,5	10,5	81	30	54	37	53	69	83	36	17	28	12	6	28
25	10	12	78	26	1/8	11,5	8	28,5	12,5	13,5	11,5	91	40	64	37,5	53,5	69,5	93	42	17	34	12	6	34
32	12	16	96	30	1/8	12,5	9,5	34	7	15	12,5	110	45	78	37,5	59,5	81,5	112	48	21	42	16	10	42
40	12	16	104	30	1/8	13	12	38	13	18	13	118	45	86	44	66	88	120	54	22	50	16	10	50

Mod. QCTF and QCBF type "B"



+ = add the stroke

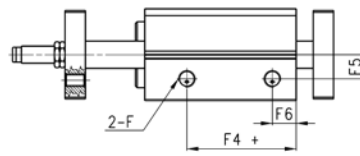
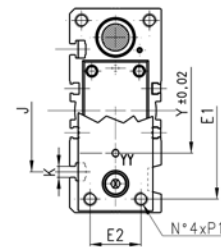
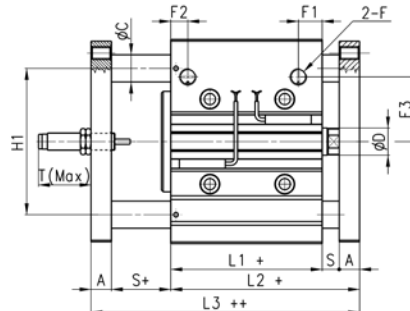
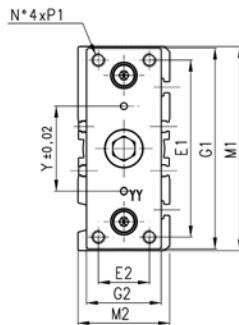
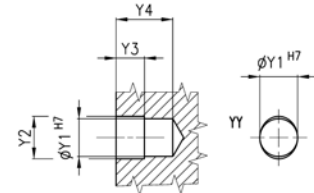
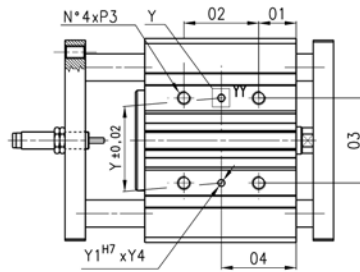
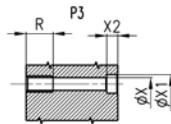
++ = add the stroke 2 times

Note: for out of standard intermediate strokes (ex. stroke 35), you have to consider the dimensions referring to the immediately higher stroke (ex. stroke 40).

DIMENSIONS																		
Ø	P1	P3	T	U	Y	Y1	Y2	Y3	Y4	X	X1	X2	J	K	Shock absorber	Δ stroke (mm)	change in stroke w/ adj. nut Mod. SA-**SC mm	
20	M5x0,8	M6x1	57,5	32	28	3	3,5	3	6	5,5	9,5	5,5	44	M5	SA-1007	0 - 15	0 - +12	
25	M6x1	M6x1	62,5	38	34	4	4,5	3	6	5,5	9,5	5,5	50	M5	SA-1007	0 - 15	0 - +8	
32	M8x1,25	M8x1,25	81	44	42	4	4,5	3	6	6,5	11	7,5	63	M6	SA-1412	0 - 20	0 - +10	
40	M8x1,25	M8x1,25	85	44	50	4	4,5	3	6	6,5	11	7,5	72	M6	SA-1412	0 - 20	0 - +11	

DIMENSIONS (mm)																								
Ø	A	ØD	E1	E2	F	F1	F2	F3	F4+	F5	F6	G1	G2	G3	H1	L1+	L2+	L3++	M1	M2	01	03	R	S
20	10	10	70	18	1/8	10,5	10,5	25	12,5	11,5	10,5	97	30	56,5	54	37	53	69	83	36	17	28	12	6
25	10	12	78	26	1/8	11,5	8	28,5	12,5	13,5	11,5	107	40	61,5	64	37,5	53,5	69	93	42	17	34	12	6
32	12	16	96	30	1/8	12,5	9,5	34	7	15	12,5	134	45	79	78	37,5	59,5	81,5	112	48	21	42	16	10
40	12	16	104	30	1/8	13	12	38	13	18	13	141	45	82	86	44	66	88	120	54	22	50	16	10

Mod. QCTF and QCBF type "C"



+ = add the stroke
++ = add the stroke 2 times

Note: for out of standard intermediate strokes (ex. stroke 35), you have to consider the dimensions referring to the immediately higher stroke (ex. stroke 40).

DIMENSIONS

Ø	P1	P3	T _{Max}	Y	Y1	Y2	Y3	Y4	X	X1	X2	J	K	Shock absorber	Δ stroke (mm)	change in stroke w/ adj. nut Mod. SA- **SC (mm)
20	M5x0,8	M6x1	37	28	3	3,5	3	6	5,5	9,5	5,5	44	M5	SA-1007 W	0 - 25	-15 - -25
25	M6x1	M6x1	37	34	4	4,5	3	6	5,5	9,5	5,5	50	M5	SA-1007 W	0 - 25	-15 - -25
32	M8x1,25	M8x1,25	55	42	4	4,5	3	6	6,5	11	7,5	63	M6	SA-1412 W	0 - 35	-18 - -35
40	M8x1,25	M8x1,25	55	50	4	4,5	3	6	6,5	11	7,5	72	M6	SA-1412 W	0 - 35	-18 - -35
	02 stroke 20-30	02 stroke 40-100	02 stroke 125-200	04 stroke 20-30	04 stroke 40-100	04 stroke 125-200										
20	24	44	120	29	39	77			10	12						
25	24	44	120	29	39	77			12	16						
32	24	48	124	33	45	83			16	20						
40	24	48	124	34	46	84			16	20						

DIMENSIONS (mm)

Ø	A	ØD	E1	E2	F	F1	F2	F3	F4+	F5	F6	G1	G2	H1	L1+	L2+	L3++	M1	M2	01	03	R	S
20	10	10	70	18	1/8	10,5	10,5	25	12,5	11,5	10,5	81	30	54	37	53	69	83	36	17	28	12	6
25	10	12	78	26	1/8	11,5	8	28,5	12,5	13,5	11,5	91	40	64	37,5	53,5	69,5	93	42	17	34	12	6
32	12	16	96	30	1/8	12,5	9,5	34	7	15	12,5	110	45	78	37,5	59,5	81,5	112	48	21	42	16	10
40	12	16	104	30	1/8	13	12	38	13	18	13	118	45	86	44	66	88	120	54	22	50	16	10

Twin Cylinders Series QX

Double-acting, magnetic, guided
ø 10x2, 16x2, 20x2, 25x2, 32x2



The Series QX offers a range of actuators covering a great number of applications which require a guided linear movement. The design of the double piston, besides assuring a solid and effective guide, offers double force in compact dimensions. Where a high force with precise movement is required, along with a non-rotation function and integrated guide, the QX cylinders are the ideal solution.

The QX Series offers two guide versions, with sintered bronze bushings or with linear ball bearings.

- » High force
- » Precise movement
- » Integrated piston-guide
- » QXB: linear ball bearings
- » QXT: sintered bronze bushings
- » Utilizes Mod. CSC sensors for direct mounting on body extrusion slots

GENERAL DATA

Type of construction	compact, magnetic, mechanical bumpers QXT = sintered bronze bushings - QXB = linear ball bearings
Operation	double-acting
Materials	body and flange = anodized AL QXT piston rod = stainless steel AISI 303 - QXB piston rod = hardened carbon steel C50 seals = PU
Mounting method	by means of threaded body
Strokes	from 10 to 100
Operating temperature	0° – 80°C (with dry air - 20°C) , (32 - 176°F, with dry air -4°F)
Operating speed	50 – 500 mm/s
Operating pressure	1 – 10 bar (14 - 145 psi)
Fluid	clean air, without lubrication. If lubricated air is used, it is recommended to use oil ISOVG32. Once applied the lubrication should never be interrupted.

STANDARD STROKES FOR TWIN CYLINDERS SERIES QX

■ = Double-acting

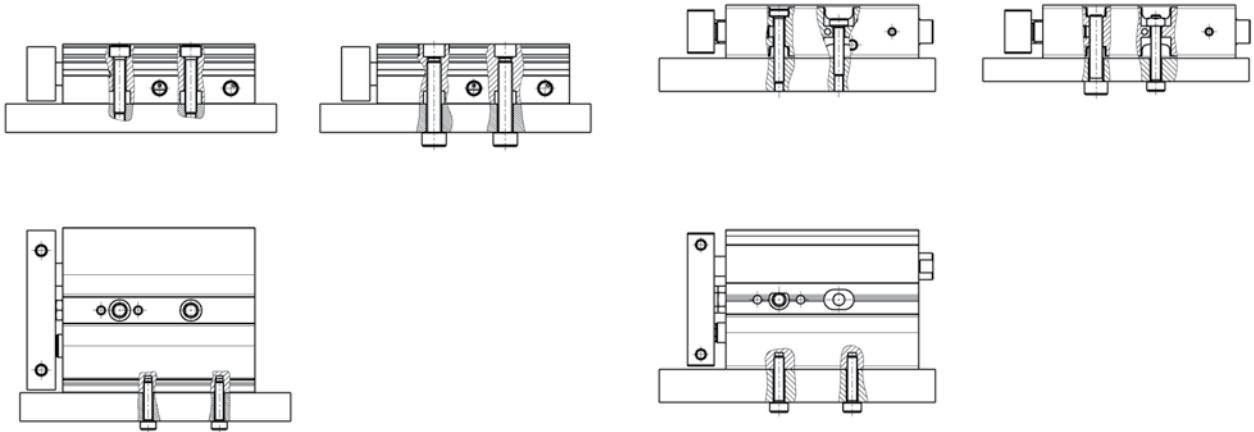
Ø	10	20	30	40	50	75	100
10	■	■	■	■	■	■	
16	■	■	■	■	■	■	■
20	■	■	■	■	■	■	■
25	■	■	■	■	■	■	■
32	■	■	■	■	■	■	■

CODING EXAMPLE

QX	T	2	A	020	A	050
-----------	----------	----------	----------	------------	----------	------------

QX	SERIES
T	VERSION T = sintered bronze bushings B = linear ball bearings
2	OPERATION 2 = double-acting (1 flange) radial / axial pressure supply 3 = double-acting through-rod (double-flange), radial pressure supply
A	MATERIALS A = anodized Aluminium body, rolled stainless steel 303 piston rod
020	BORE 010 = 10 mm 016 = 16 mm 020 = 20 mm 025 = 25 mm 032 = 32 mm
A	TYPE OF DESIGN A = standard
050	STROKE see table

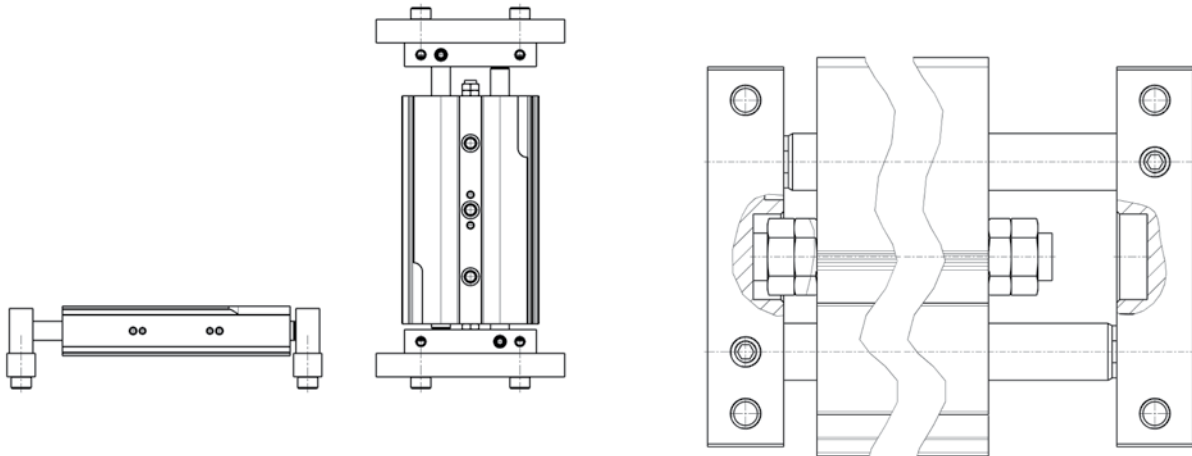
Fixing examples with flange in motion



For Ø 16 – 32

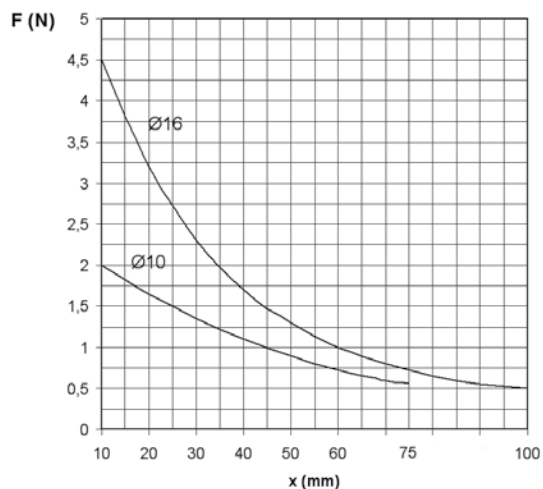
To mount the sensors of QX cylinders ø 10 in the middle grooves, it is advisable to use M3 screws UNI 9327 and nuts M3 UNI 5589.

Fixing examples with cylinder body in motion

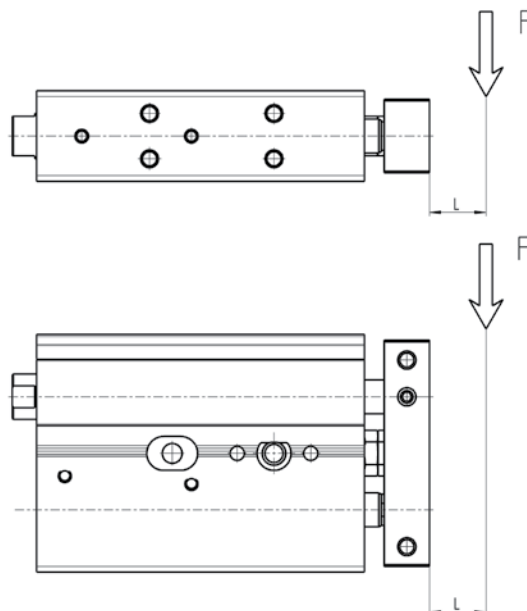


The front and rear regulation screw allows the adjustment of the stroke up to -10mm.

DIAGRAM MAX APPLICABLE LOADS DEPENDING ON THE STROKE (X)

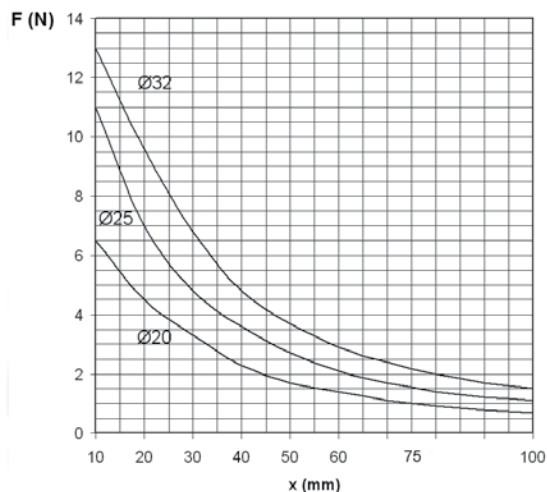


X = cylinder stroke mm.
F = load applied on the flange in N.

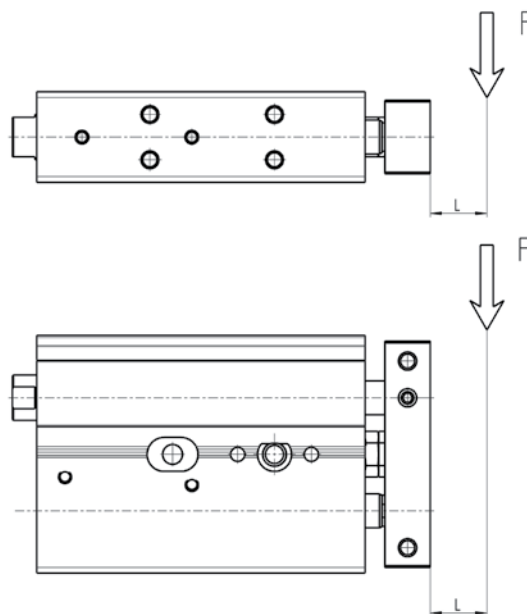


Load " F " should be considered fixed on the flange of the cylinder and with a theoretical projection of L = 0 mm.

DIAGRAM MAX APPLICABLE LOADS DEPENDING ON THE STROKE (X)

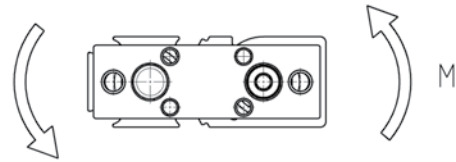
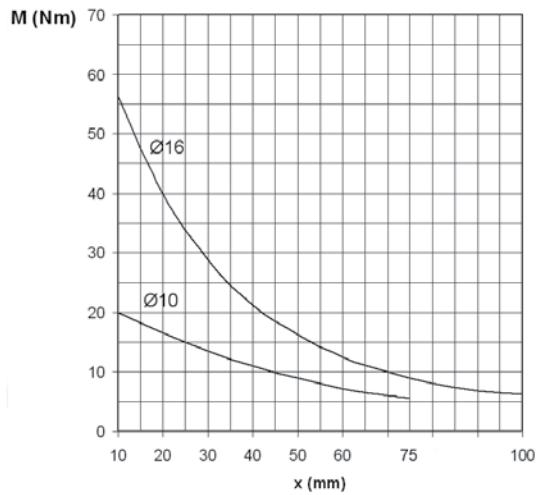


X = cylinder stroke mm.
F = load applied on the flange in N.



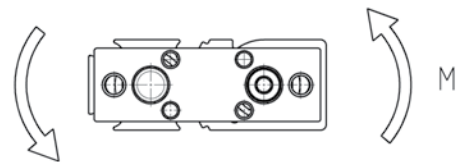
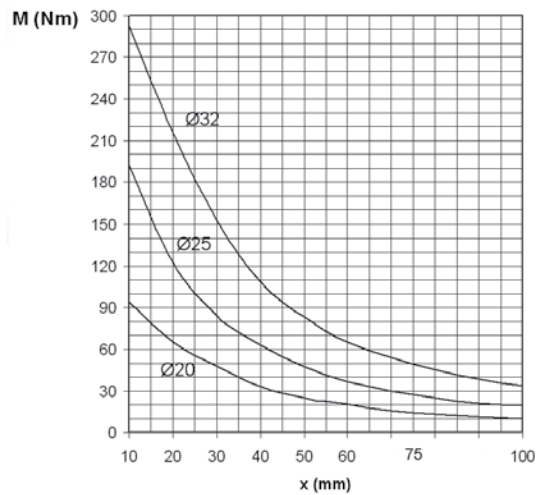
Load " F " should be considered fixed on the flange of the cylinder and with a theoretical projection of L = 0 mm.

DIAGRAM MAX TORQUE MOMENT DEPENDING ON THE STROKE (X)



X = cylinder stroke in mm.
M = torque moment applied on the flange in Nm.

DIAGRAM MAX TORQUE MOMENT DEPENDING ON THE STROKE (X)

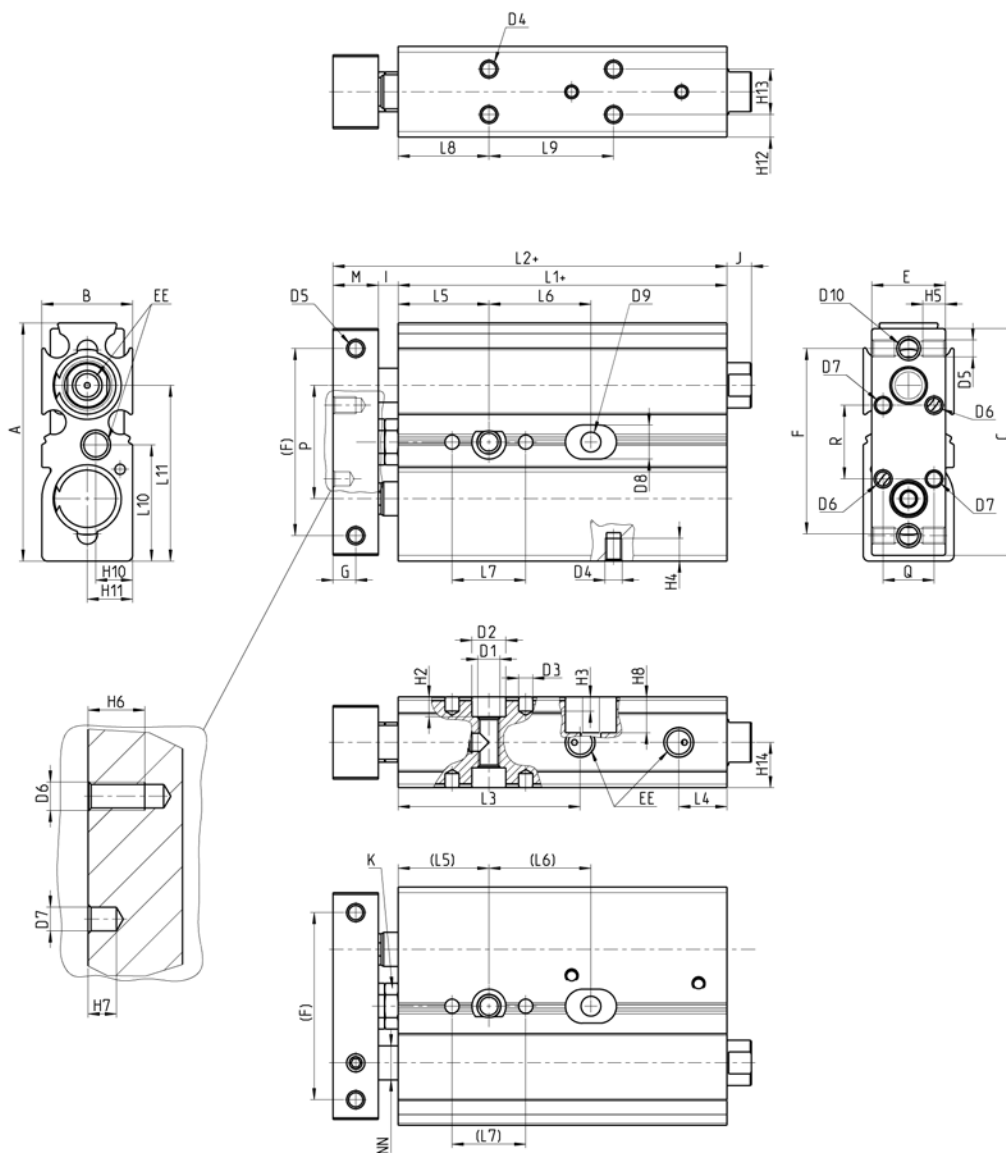


X = cylinder stroke in mm.
M = torque moment applied on the flange in Nm.

Cylinders Series QX (single flange)



+ = add the stroke



Dimensions for Series QX with single flange

+ = add the stroke

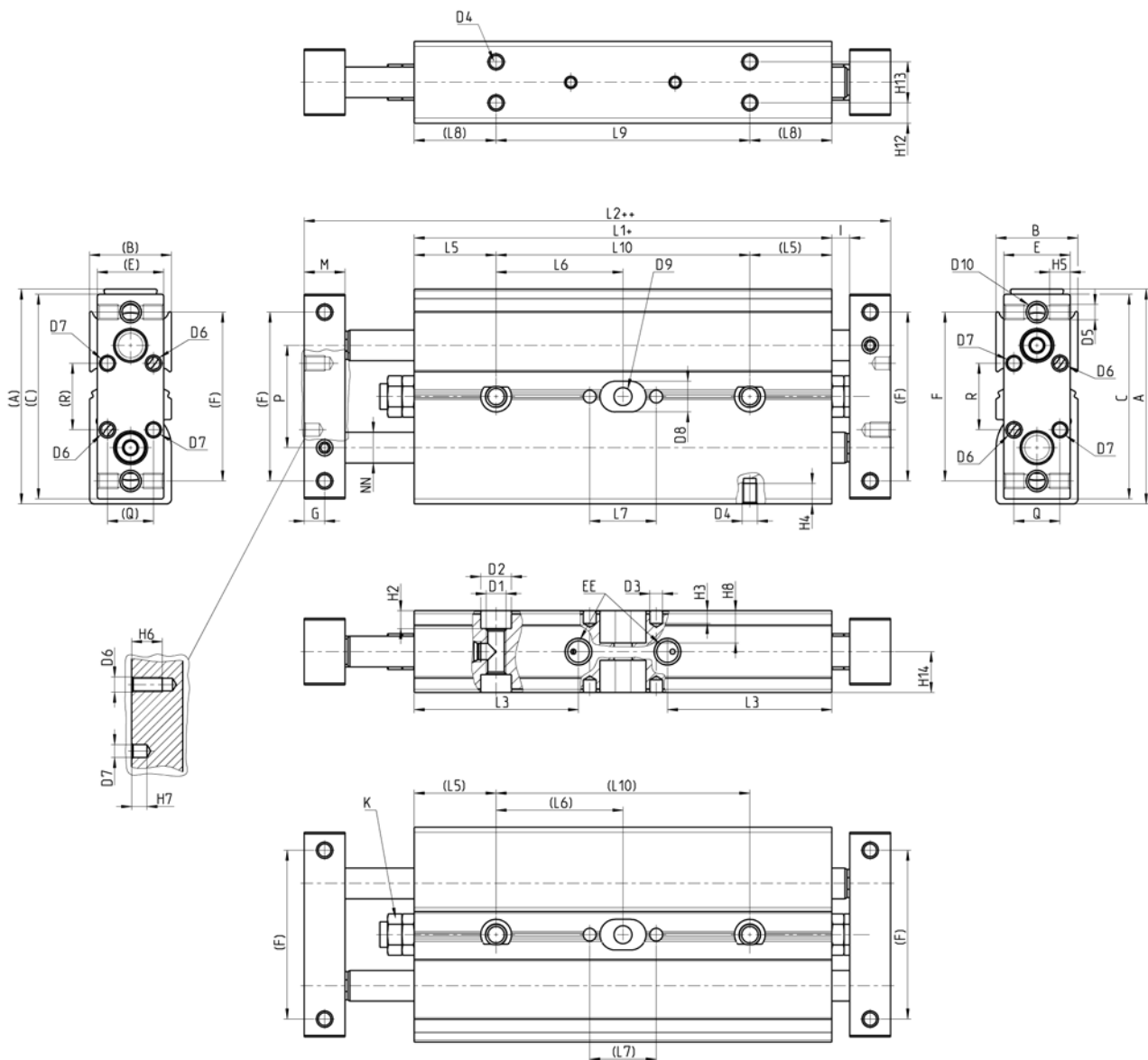
DIMENSIONS (mm)						
Stroke (mm)	Ø 10	Ø 16	Ø 20	Ø 25	Ø 32	
A	42	58	62	76	94	
B	16	21	25	30	37	
C	40	56	60	71	92	
E	13	19	22	27	35	
F	33	42	50	60	75	
G	4	5	6	6	8	
I	3,5	2,5	4,5	4,5	4	
M	8	10	12	12	16	
Q	9	11	16	16	16	
R	13	13	18	18	18	
L1+	48	57,5	67,5	70,5	80,5	
L2+	59,5	70	84	87	100,5	
L3	32,1	34	39,5	44,0	46,5	
L4	8,5	8,5	9	8,5	12	
L5	16	20	25	30	30	
L6 10	18	25	30	30	40	
L6 20	28	25	30	30	40	
L6 30	38	35	40	40	50	
L6 40	48	35	40	40	50	
L6 50	58	35	40	40	50	
L6 75	83	45	60	60	70	
L6 100	-	55	60	60	70	
L7	13	13	20	20	20	
L8	16	30	30	30	30	
L9 10	22	25	30	30	40	
L9 20	32	25	30	30	40	
L9 30	42	35	40	40	50	
L9 40	52	35	40	40	50	
L9 50	62	35	40	40	50	
L9 75	87	45	60	60	70	
L9 100	-	55	60	60	70	
L10	20,5	29	31	38	47	
L11	31	52	57,2	71,5	47	
H2	3,5	4,5	5,5	6,5	6,5	
H3	2,5	4,0	4,0	4,0	4,0	
H4	4,0	5,0	4,5	5,0	7,5	
H5	6,5	6,0	6,0	6,0	7,5	
H6	8,0	6,0	8,0	8,0	8,0	
H7	3,0	3,0	4,0	4,0	4,0	
H8	6,3	-	-	-	-	
H10	6,5	10,5	10,5	15	8,5	
H11	8	16,5	20,2	21,5	28,5	
H12	4	10,5	8,00	8,5	8,5	
H13	8	-	9,0	13,0	20,0	
H14	8	5,5	12,5	15,0	18,5	
D1	M4	M5	M6	M8	M8	
D2	6	7,5	9,5	10,5	10,5	
D3	2,5	2,5	4	4	4	
D4	M3	M3	M4	M5	M5	
D5	M3	M4	M4	M5	M5	
D6	M3	M3	M4	M4	M4	
D7	2,5	2,5	4,0	4,0	4,0	
D8	6,0	-	-	-	-	
D9	3,5	-	-	-	-	
D10	M4	M5	M5	M6	M6	
NN	6	8	10	12	16	
EE	M5	M5	M5	M5	G1/8	
J	4,3	-	-	-	-	
K	7	7	8	8	10	
P	20	25	29	35	45	

Cylinders Series QX (double flange)

4



+ = add the stroke



Dimensions for Series QX with double flange

+ = add the stroke
 ++ = add the stroke 2 times

DIMENSIONS (mm)						
Stroke (mm)	Ø 10	Ø 16	Ø 20	Ø 25	Ø 32	
A	42	58	62	76	94	
B	16	21	25	30	37	
C	40	56	60	71	92	
E	13	19	22	27	35	
F	33	42	50	60	45	
G	4	5	6	6	6	
I	3,5	2,5	4,5	4,5	4	
M	8	10	12	12	16	
Q	9	11	16	16	16	
R	13	13	18	18	18	
L1+	72	86,6	98	104,2	115,6	
L2++	95	111,6	131	137,2	155,6	
L3	32,1	34	39,5	44	46,5	
L5	16	20	25	30	30	
L6	10	25	28,3	29,0	27,1	32,8
L6	20	30	33,3	34,0	32,1	37,8
L6	30	35	38,3	39,0	37,1	42,8
L6	40	40	43,3	44,0	42,1	47,8
L6	50	45	48,3	49,0	47,1	52,8
L6	75	57,3	60,8	61,5	59,6	65,3
L6	100	-	73,3	74,0	72,1	77,8
L7	13	13	20	20	20	
L8	16	30	30	30	30	
L9	10	40	26,6	38	44,2	55,6
L9	20	59,6	33,3	34,0	32,1	37,8
L9	30	69,6	38,3	39,0	37,1	42,8
L9	40	79,6	43,3	44,0	42,1	47,8
L9	50	89,6	48,3	49,0	47,1	52,8
L9	75	114,6	60,8	61,5	59,6	65,3
L9	100	-	73,3	74,0	72,1	77,8
L10	10	49,7	56,6	58,0	54,2	65,6
L10	20	59,6	66,6	68,0	64,2	75,6
L10	30	69,6	76,6	78,0	74,2	85,6
L10	40	79,6	86,6	88,0	84,2	95,6
L10	50	89,6	96,6	98,0	94,2	105,6
L10	75	114,6	121,6	123,0	119,2	130,6
L10	100	-	146,6	148,0	144,2	155,6
H2	6,3	4,5	5,50	6,5	6,5	
H3	2,5	4,0	4,00	4	4	
H4	4	5,0	4,50	5	7,5	
H5	6,5	6,0	6,00	6	7,5	
H6	8	6,0	8,00	8	8	
H7	3	3,0	4,00	4	4	
H8	6,3	-	-	-	-	
D1	M4	M5	M6	M8	M8	
D2	6	7,5	9,5	10,5	10,5	
D3	2,5	2,5	4	4	4	
D4	M3	M3	M4	M5	M5	
D5	M3	M4	M4	M5	M5	
D6	M3	M3	M4	M4	M4	
D7	2,5	2,5	4	4	4	
D8	6	-	-	-	-	
D9	3,5	-	-	-	-	
D10	M4	M5	M5	M6	M6	
NN	6	8	10	12	16	
EE	M5	M5	M5	M5	G1/8	
K	7	7	8	8	10	
P	20	25	29	35	40	

TABLE SHOWING THE COMPATIBILITY OF MAGNETIC PROXIMITY SWITCHES BY CYLINDER SERIES

Series	Ø	CST - CSH	CSV	CSB-D-220 / CSB-H-220	CSC-D-220 / CSB-H-220	CSN
24 - 25	16	S-CST-02				
	20	S-CST-03				
	25	S-CST-04				
27	20	S-CST-03				
	25	S-CST-04				
	32	S-CST-18				
	40	S-CST-19				
	50	S-CST-20				
	63	S-CST-21				
31	12	Direct mounting				
	16	Direct mounting				
	20	Direct mounting				
	25	Direct mounting				
	32	Direct mounting				
	40	Direct mounting				
	50	Direct mounting				
	63	Direct mounting				
	80	Direct mounting				
	100	Direct mounting				
32	20	Direct mounting				
	25	Direct mounting				
	32	Direct mounting				
	40	Direct mounting				
	50	Direct mounting				
	63	Direct mounting				
	80	Direct mounting				
40	160	S-CST-28				S21
	200	S-CST-28				S21
	250					S21
	160					S53
	200					S53
42	32	S-CST-18				
	40	S-CST-19				
	50	S-CST-20				
	63	S-CST-21				
50	16		Direct mounting			
	25		Direct mounting			
	32	S-CST-01				
	40	S-CST-01				
	50	S-CST-01				
	63	S-CST-01				
	80	S-CST-01				
52	25	Direct mounting				
	32	Direct mounting				
	40	Direct mounting				
	50	Direct mounting				
	63	Direct mounting				
60	32	S-CST-25				Direct mounting
	40	S-CST-25				Direct mounting
	50	S-CST-25				Direct mounting
	63	S-CST-25				Direct mounting
	80	S-CST-26				Direct mounting
	100	S-CST-26				Direct mounting
	125	S-CST-27				S21
60 + 45N	32	S-CST-45N1				
	40	S-CST-45N1				
	50	S-CST-45N1				
	63	S-CST-45N1				
	80	S-CST-45N2				
	100	S-CST-45N2				

TABLE SHOWING THE USE OF CAMOZZI MAGNETIC PROXIMITY SWITCHES

Series	Ø	CST - CSH	CSV	CSB-D-220 / CSB-H-220	CSC-D-220 / CSC-H-220
61	32	Direct mounting			
	40	Direct mounting			
	50	Direct mounting			
	63	Direct mounting			
	80	Direct mounting			
	100	Direct mounting			
	125	Direct mounting			
62	32	Direct mounting (CSH only)			
	40	Direct mounting (CSH only)			
	50	Direct mounting (CSH only)			
	63	Direct mounting (CSH only)			
	80	Direct mounting (CSH only)			
	100	Direct mounting (CSH only)			
69	32	Direct mounting			
	40	Direct mounting			
	50	Direct mounting			
	63	Direct mounting			
	80	Direct mounting			
	100	Direct mounting			
	125	Direct mounting			
90	32	S-CST-25			
	40	S-CST-25			
	50	S-CST-25			
	63	S-CST-25			
	80	S-CST-26			
	100	S-CST-26			
	125	S-CST-27			
92	32	S-CST-06			
	40	S-CST-07			
	50	S-CST-08			
	63	S-CST-09			
94	16	S-CST-05			
	20	S-CST-05			
94/95	25	S-CST-05			
CGA	10			Direct mounting	
	16			Direct mounting	
	20			Direct mounting	
	25			Direct mounting	
	32			Direct mounting	
CGB	16			Direct mounting	
	20			Direct mounting	
	25			Direct mounting	
	32			Direct mounting	
CGC	50			Direct mounting	
	64			Direct mounting	
	80			Direct mounting	
	100			Direct mounting	
	125			Direct mounting	
CGL	10				Direct mounting
	16				Direct mounting
	20				Direct mounting
	25				Direct mounting
	32				Direct mounting
CGP	10			Direct mounting	
	16			Direct mounting	
	20			Direct mounting	
	25			Direct mounting	
	32			Direct mounting	
CGS	16			Direct mounting	
	20			Direct mounting	
	25			Direct mounting	
	32			Direct mounting	

TABLE SHOWING THE USE OF CAMOZZI MAGNETIC PROXIMITY SWITCHES

Series	Ø	CST - CSH	CSV	CSB-D-220 CSB-H-220	CSC-D-220 CSC-H-220
QC	20	Direct mounting			
	25	Direct mounting			
	32	Direct mounting			
	40	Direct mounting			
	50	Direct mounting			
	63	Direct mounting			
	80	Direct mounting			
QP-QPR	12		Direct mounting		
	16		Direct mounting		
	20	S-CST-01			
	25	S-CST-01			
	32	S-CST-01			
	40	S-CST-01			
	50	S-CST-01			
	63	S-CST-01			
	80	S-CST-01			
	100	S-CST-01			
QCBF	20	Direct mounting			
	25	Direct mounting			
	32	Direct mounting			
	40	Direct mounting			
QCTF	20	Direct mounting			
	25	Direct mounting			
	32	Direct mounting			
	40	Direct mounting			
QX	10				Direct mounting
	16				Direct mounting
	20				Direct mounting
	25				Direct mounting
	32				Direct mounting

5 Rotary Actuators & Grippers

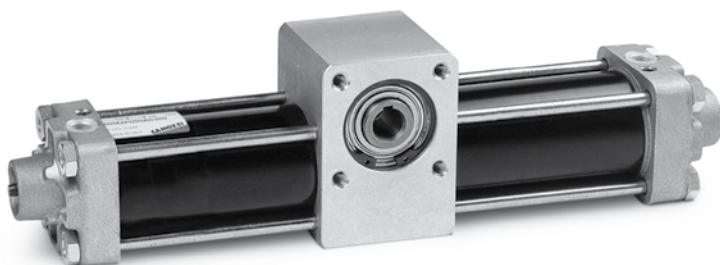
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Rotary Cylinders Series 18

Discontinued
Quantities Limited

Non magnetic, cushioned
ø32, 40, 50, 63, 80, 100, 125
Rotational angles 90° and 180°



The rotary cylinders 18 Series have been designed with seven different bores in order to satisfy a large range of operational requirements. As a result of their design and the materials used, these cylinders can be used in extreme conditions with optimum results.

The rack and pinion are made of hardened ground steel and the pinion is mounted on two bearings. In the cylinder end caps there are screws, which allow rotation to be adjusted by $\pm 7^\circ$.

GENERAL DATA

Type of construction	with tie-rods
Operation	double-acting
Materials	end-caps = AL tube = ST35, coated carbon steel seals = NBR, Buna -N other parts = hardened steel
Type of mounting	hreaded holes in the central body
Standard rotation angles	90° - 180° (other on demand)
Operating pressure	0,5 - 10 bar (8 - 145 psi)
Fluid	clean air, without lubrication. If lubricated air is used, it is recommended to use oil ISOVG32. Once applied the lubrication should never be interrupted.

Discontinued
Quantities Limited

5

TABLE OF TORQUE FORCE IN Nm (THEORETICAL)

Ø	1 bar	2 bar	3 bar	4 bar	5 bar	6 bar	7 bar	8 bar	9 bar	10 bar
32	1,42	2,84	4,26	5,68	7,10	8,50	9,94	11,36	12,77	14,19
40	2,22	4,44	6,65	8,87	11,09	13,31	15,52	17,74	19,96	22,18
50	3,47	6,93	10,40	13,86	17,33	20,79	24,26	27,72	31,19	34,65
63	6,60	13,20	19,81	26,41	33,01	39,61	46,21	52,82	59,42	66,02
80	10,65	21,29	31,94	42,58	53,23	63,87	74,52	85,17	95,81	106,46
100	22,18	44,36	66,54	88,71	110,89	133,07	155,25	177,43	199,61	221,78
125	34,65	69,31	103,96	138,62	173,27	207,92	242,58	277,23	311,90	346,50

CODING EXAMPLE

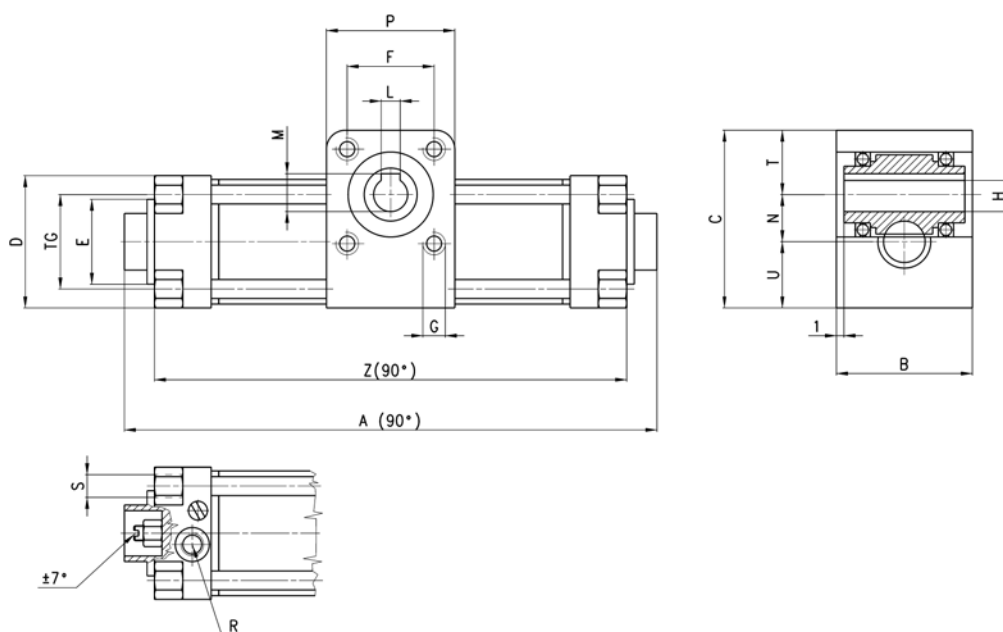
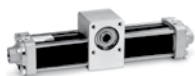
18	-	050	/	090
18	SERIES			
050	BORE 032 = 32 mm 040 = 40 mm 050 = 50 mm 063 = 63 mm 080 = 80 mm 100 = 100 mm 125 = 125 mm			
090	ROTATIONAL ANGLES 090 = 90° 180 = 180°			

ROTARY ACTUATORS AND GRIPPERS

Rotating cylinders Series 18

* increase in "A" and "Z" for each 90° of rotation

Note: Grease the rack using a suitable grease gun.

Discontinued
Quantities Limited

DIMENSIONS (mm)

Ø	A	*	B	C	D	E ^{0h8}	F	G	H ^{0h7}	L	M	N	P	R	S	T	U	TG	Z
32	298	63	52	85	47	25	50	M6	15	5	17.3	26.5	68	G1/8	M6	34	24.5	32.5	254
40	298	63	56	89	54	32	50	M6	15	5	17.3	26.5	68	G1/4	M6	34	28.5	38.2	254
50	298	63	66	94	65	38	50	M8	15	5	17.3	26.5	68	G1/4	M8	34	33.5	46.6	258
63	366	75.5	80	111	78	35	60	M8	20	6	22.8	31	80	G3/8	M8	40	40	58.5	314
80	366	75.5	98	120	97	45	60	M10	20	6	22.8	31	80	G3/8	M10	40	49	72	314
100	426	100.5	118	153	116	45	80	M10	25	8	28.3	41	102	G3/8	M10	53	59	89	374
125	432	100.5	142	165	140	53	80	M12	25	8	28.3	41	102	G1/2	M12	53	71	110	381

Rotary Cylinders Series 69

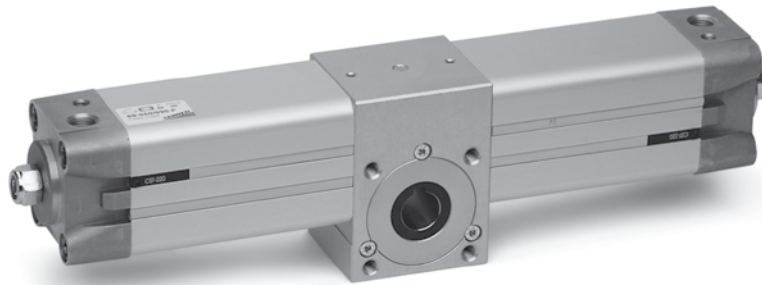
5

Magnetic, cushioned

ø32, 40, 50, 63, 80, 100, 125

Rotational angles: 90°, 180°, 270° and 360°

- » Male or female version
- » Clean design



The rotary cylinders of the 69 Series are available in 7 different bores (from 32 to 125 mm) and can satisfy a large range of operational requirements.

As a result of their design and the materials used, these cylinders can be used in extreme conditions with optimum results.

Through an adjustment screw it is possible to recover part of the play between pinion and rack. On the heads there is a screw which allows rotation to be adjusted by $\pm 5^\circ$.

GENERAL DATA

Type of construction	with internal tie-rods
Operation	double-acting
Materials	end blocks / tube / body = AL rack = steel - rack guide shoe = acetal resin - pinion = hardened steel seals = NBR
Type of mounting	threaded holes in the central body by means of Series 60 brackets
Bore	ø 32, 40, 50, 63, 80, 100, 125
Operating temperature	0°C – 80°C (with dry air - 20°C) (32 - 176°F, with dry air -4°F)
Standard rotation angles	90°, 180°, 270°, 360° (others on request)
Bearings	Ball bearings (ø 32 mm teflon bronze guide)
Operating pressure	1 – 10 bar (14 - 145 psi)
Fluid	clean air, without lubrication. If lubricated air is used, it is recommended to use oil ISOVG32. Once applied the lubrication should never be interrupted

TABLE OF TORQUE FORCE IN Nm (THEORETICAL)

Ø	1 bar	2 bar	3 bar	4 bar	5 bar	6 bar	7 bar	8 bar	9 bar	10 bar
32	1,2	2,4	3,6	4,8	6	7,2	8,4	9,6	10,8	12
40	2,25	4,5	6,75	9	11,25	13,5	15,75	18	20,25	22,5
50	3,9	7,8	11,7	15,6	19,5	23,4	27,3	31,2	35,1	39
63	7,3	14,6	21,9	29,2	36,5	43,8	51,1	58,4	65,7	73
80	15,7	31,4	47,1	62,8	78,5	94,2	109,9	125,6	141,3	157
100	26,35	52,7	79,05	105,4	131,75	158,1	184,45	210,8	237,15	263,5
125	51	102	153	204	255	306	357	408	459	510

CODING EXAMPLE

69	-	050	/	090	-	F
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69 SERIES

050 BORE
 032 = 32 mm
 040 = 40 mm
 050 = 50 mm
 063 = 63 mm
 080 = 80 mm
 100 = 100 mm
 125 = 125 mm

090 ROTATIONAL ANGLES
 090 = 90°
 180 = 180°
 270 = 270°
 360 = 360°

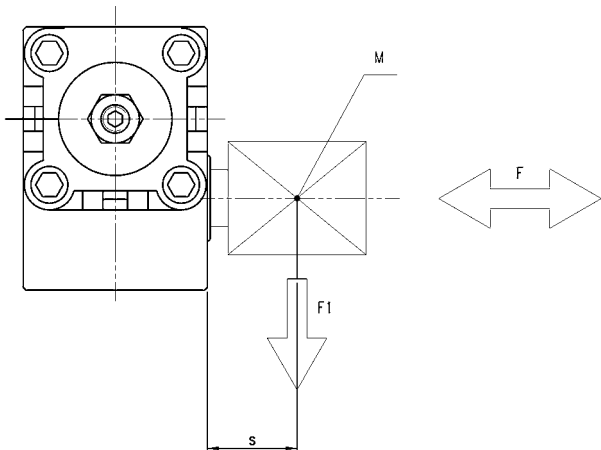
F PINION
 F = Female
 M = Male

AXIAL LOAD

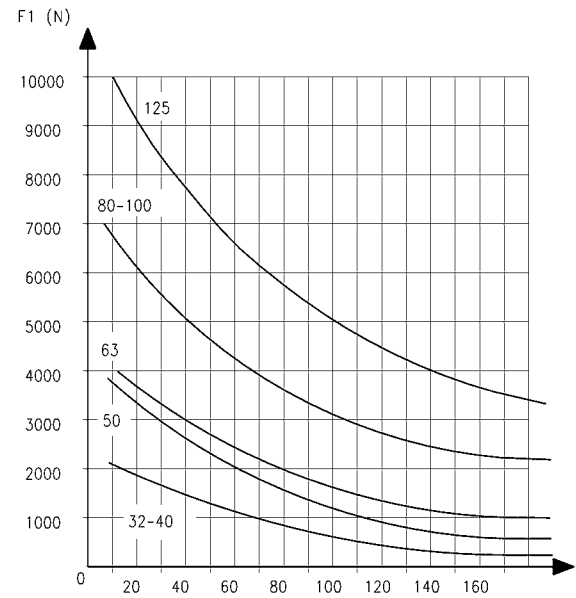
Max. axial load F with $F_1 = 0$

Ø	32	40	50	63	80	100	125
Force F	100 N	100 N	120 N	120 N	200 N	250 N	300 N

RADIAL LOAD



M = Center of Gravity of the applied theoretical load.

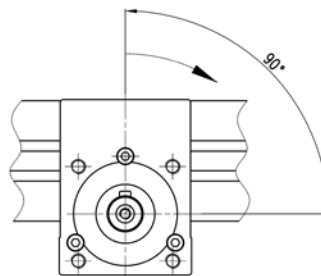
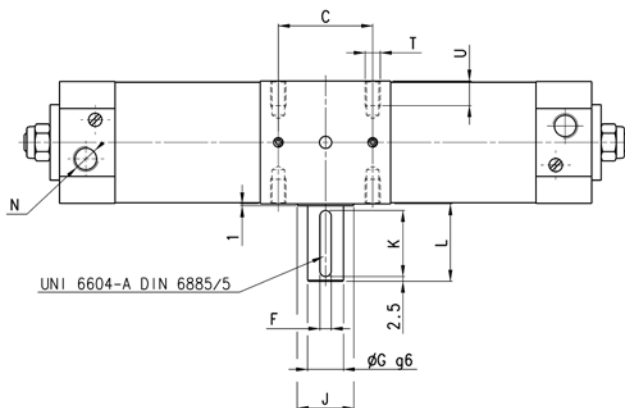
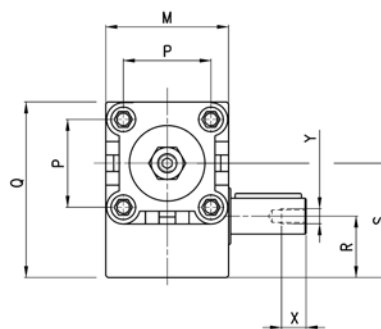
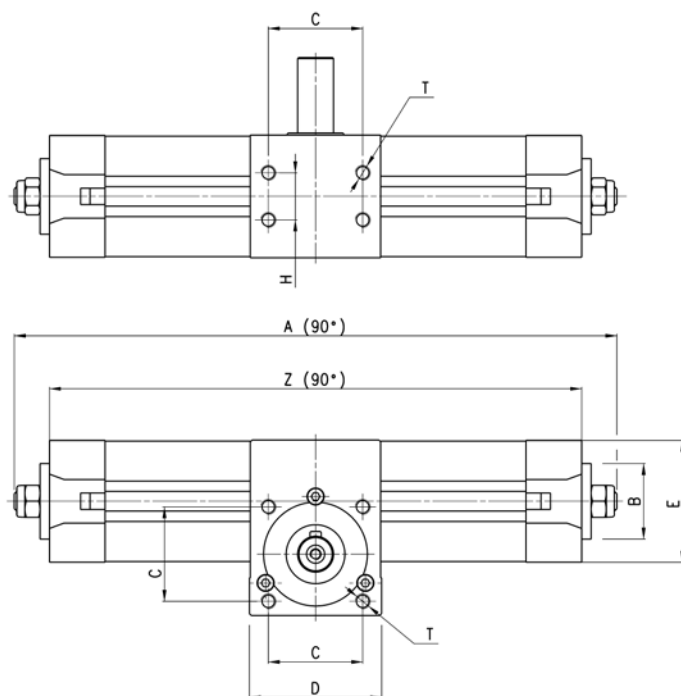


Max. radial load F_1 with $F = 0$

Cylinders Series 69 - male pinion



* increase in "A" and "Z" for each 90° of rotation



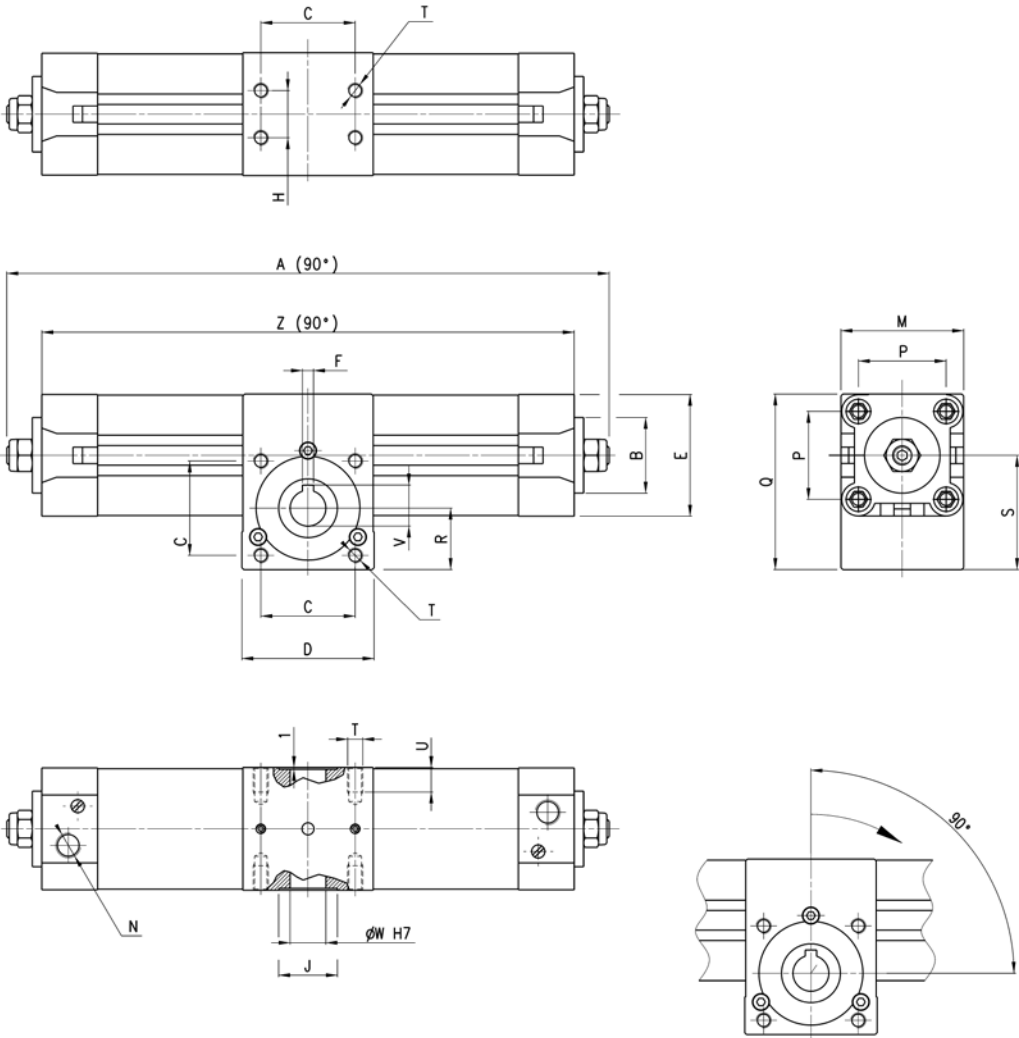
DIMENSIONS (mm)

Ø	A	B	*	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	Y	X	Z
32	249	30	47	33	50	46	5	14	18	25	25	31	50	G1/8	32,5	71,5	25	46,5	M6	10	M5	12,5	219
40	295	35	56,5	40	60	55	5	14	22	25	25	31	60	G1/4	38	82	30	54,5	M6	10	M5	12,5	263
50	316	40	63	50	70	64,5	6	19	25	30	35	41	65	G1/4	46,5	94	32,5	60,5	M8	13	M6	16	282
63	357	45	74,5	60	75	75	8	24	35	30	35	41	75	G3/8	56,5	110	37	70,8	M8	13	M8	19	325
80	443	45	99	80	99	93	8	28	50	45	45	51	99	G3/8	72	142	50	93,5	M10	16	M8	19	404
100	472	55	107	80	115	110	10	38	60	50	45	51	115	G1/2	89	156,5	54	99	M10	16	M10	22	434
125	549	60	132	90	125	135	10	38	70	60	45	51	140	G1/2	110	188	60	118	M12	20	M10	22	505

Cylinders Series 69 - female pinion



* increase in "A" and "Z" for each 90° of rotation



DIMENSIONS (mm)																				
Ø	A	B	*	C	D	E	F	H	J	M	N	P	Q	R	S	T	U	V	W	Z
32	249	30	47	33	50	46	5	18	25	50	G1/8	32,5	71,5	25	46,5	M6	10	16,3	14	219
40	295	35	56,5	40	60	55	5	22	25	60	G1/4	38	82	30	54,5	M6	10	16,3	14	263
50	316	40	63	50	70	64,5	6	25	30	65	G1/4	46,5	94	32,5	60,5	M8	13	21,8	19	282
63	357	45	74,5	60	75	75	6	35	30	75	G3/8	56,5	110	37	70,8	M8	13	21,8	19	325
80	443	45	99	80	99	93	8	50	45	99	G3/8	72	142	50	93,5	M10	16	27,3	24	404
100	472	55	107	80	115	110	8	60	50	115	G1/2	89	156,5	54	99	M10	16	31,3	28	434
125	549	60	132	90	125	135	8	70	60	140	G1/2	110	188	60	118	M12	16	31,3	28	505

The company reserves the right to vary models and dimensions without notice.
These products are designed for industrial applications and are not suitable for sale to the general public.



Rotary Cylinders Series 30

Cushioned and not cushioned

ø 50 - 63 - 80 - 100

Rotational angles 90° and 180°



The rotary cylinders Series 30 are made of a special Aluminium profile. Their compact dimensions and clean lines give a good aesthetic appearance. A unique wear resistant guide block gives increased service life to the unit.

Positioning gears are provided for the rotations.

On the heads there is a screw which allows rotation to be adjusted by $\pm 5^\circ$.

GENERAL DATA

Type of construction	profile
Operation	double acting
Materials	aluminium profile body & end blocks - NBR seals - other parts - hardened steel
Mounting	by means of holes in body
Bore	ø 50 - 63 - 80 - 100
Installation	in any position
Working temperature	0°C – 50°C (- 20°C on dry air) , (32 - 125°F, with dry air -4°F)
Standard rotation	90° - 180°
Operating pressure	0.5 – 10 bar (8 - 145 psi)
Fluid	clean air with or without lubrication

TABLE OF TORQUE FORCE IN Nm (THEORETICAL)

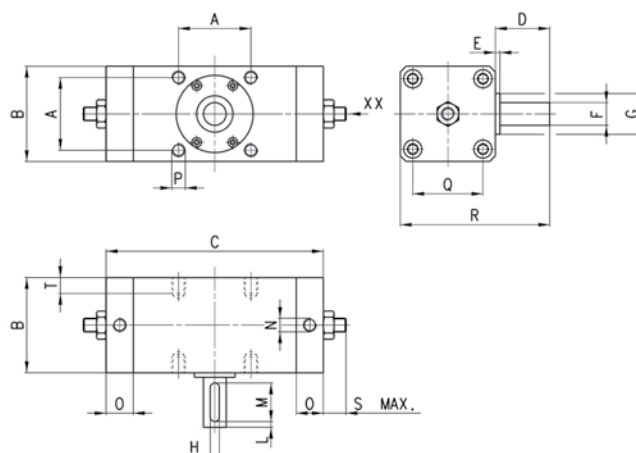
Ø	1 bar	2 bar	3 bar	4 bar	5 bar	6 bar	7 bar	8 bar	9 bar	10 bar
50	2,08	4,16	6,24	8,32	10,40	12,48	14,55	16,63	18,71	20,79
63	4,40	8,80	13,20	17,61	22,01	26,41	30,81	35,21	39,61	44,01
80	7,10	14,19	21,29	28,39	35,49	42,58	49,68	56,78	63,87	70,97
100	16,63	33,27	49,90	66,54	83,17	99,80	116,44	133,07	149,07	166,34

CODING EXAMPLE

30	-	050	/	090	-	3
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30	SERIES
050	BORE 050 = 50 mm 063 = 63 mm 080 = 80 mm 100 = 100 mm
090	ROTATIONAL ANGLES 090 = 90° 180 = 180°
3	Without adjustable cushions

Rotary cylinders Series 30

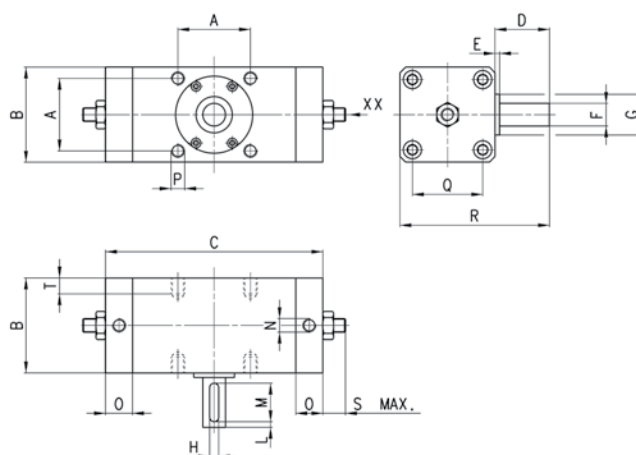


XX = Screw for stroke regulation

DIMENSIONS (mm)

Mod.	A	B	C	D	E	F ^{h7}	G	H	L	M	N	O	P	Q	R	S	T
30-50-090	48	62	162	36	2.5	15	25	5	5	25	G1/8	23	M8 x 1.25	46	98	8	8
30-63-090	60	76	186	41	2.5	17	30	6	5	30	G1/8	24	M10 x 1.5	57	117	8	12
30-80-090	72	92	195	50	3	20	35	6	5	35	G1/4	23,5	M12 x 1.75	70	142	9	13
30-100-090	85	112	247	60	4	25	40	8	5	40	G3/8	26	M12 x 1.75	85	172	9	14
30-50-180	48	62	199	36	2.5	15	25	5	5	25	G1/8	26	M8 x 1.25	46	98	8	8
30-63-180	60	76	237	41	2.5	17	30	6	5	30	G1/8	24	M10 x 1.5	57	117	8	12
30-80-180	72	92	245	50	3	20	35	6	5	35	G1/4	23,5	M12 x 1.75	70	142	9	13
30-100-180	85	112	313	60	4	25	40	8	5	40	G3/8	26	M12 x 1.75	85	172	9	14

Rotary cylinders Series 30



XX = Screw for stroke regulation

DIMENSIONS (mm)

Mod	A	B	C	D	E	F ^{h7}	G	H	L	M	N	O	P	Q	R	S	T
30-050/090-3	48	62	150	36	2.5	15	25	5	5	25	G1/8	17	M8 x 1.25	46	98	8	8
30-063/090-3	60	76	172	41	2.5	17	30	6	5	30	G1/8	17	M10 x 1.5	57	117	8	12
30-080/090-3	72	92	191	50	3	20	35	6	5	35	G1/4	21,5	M12 x 1.75	70	142	9	13
30-100/090-3	85	112	245	60	4	25	40	8	5	40	G3/8	25	M12 x 1.75	85	172	9	14
30-050/180-3	48	62	187	36	2.5	15	25	5	5	25	G1/8	17	M8 x 1.25	46	98	8	8
30-063/180-3	60	76	233	41	2.5	17	30	6	5	30	G1/8	17	M10 x 1.5	57	117	8	12
30-080/180-3	72	92	241	50	3	20	35	6	5	35	G1/4	21,5	M12 x 1.75	70	142	9	13
30-100/180-3	85	112	311	60	4	25	40	8	5	40	G3/8	25	M12 x 1.75	85	172	9	14

Rotary Actuators, NAMUR interface VDI/VDE 3845 & ISO 5211 (ATEX certified) Series ARP

Model: "Rack & Pinion" - Rotational angles: 90°

Sizes: 001, 003, 005, 010, 012, 020, 035, 055, 070, 100, 150, 250, 400



The rotary actuators Series ARP has been designed to meet the high demands by the process industry, where they predominantly are used for controlling the opening and closing process valves of which ball valves and butterfly valves are the most common types.

The actuators exist in thirteen different sizes in order to cover a wide range of applications. Through adjusting screws located on the end caps it is possible to mechanically adjust the opening/closing angle by $\pm 5^\circ$.

All rotary actuators Series ARP are ATEX certified, the air connections are realized in accordance with Namur VDI/VDE 3845 drilling, while the interface drilling of the process valve is in accordance with ISO 5211 standard.

- » ATEX certified product
- » Wide range of available sizes
- » Air connections in accordance with Namur VDI/VDE 3845 drilling
- » Interface drilling of the process valve in accordance with ISO 5211 standard

GENERAL DATA

Type of construction	Rack and pinion type
Operation	spring return (single-acting), double-acting
Materials	extruded AL-profile body (pressure diecasted anodized AL body for mod. ARP400) pressure diecasted AL end caps and pistons / racks (end caps in technopolymer for mod. ARP001) zinc-plated steel pinion POM guide parts NBR seals
Sizes	001, 003, 005, 010, 012, 020, 035, 055, 070, 100, 150, 250, 400
Operating temperature	- 30°C – 100°C (-22°F - 212°F)
Rotation angle	90°
Type of mounting	direct to the flange of the valve through screws and bolts, or through mounting kits consisting of bracket and adaptor pin*
Operating pressure	2 – 10 bar (30 - 145 psi)
Fluid	filtered air without lubrication. If lubricated air is used, it is recommended to use oil ISOVG32. Once applied the lubrication should never be interrupted.
Available spare part kits	- kits which include sliding parts and seals; - kits containing springs for transforming an actuator from double-acting to single-acting with spring return.

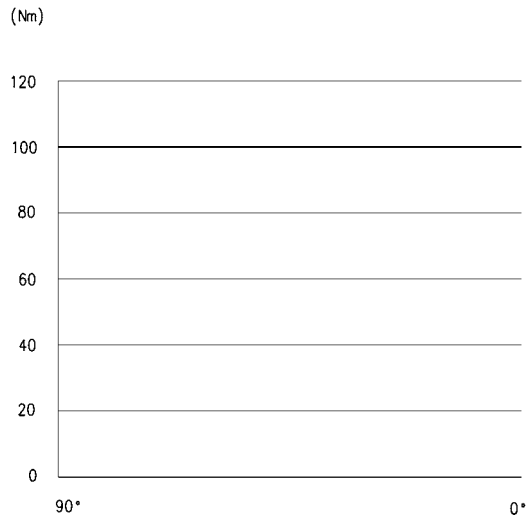
* Bracket and adaptor pin is not supplied by Camozzi

CODING EXAMPLE

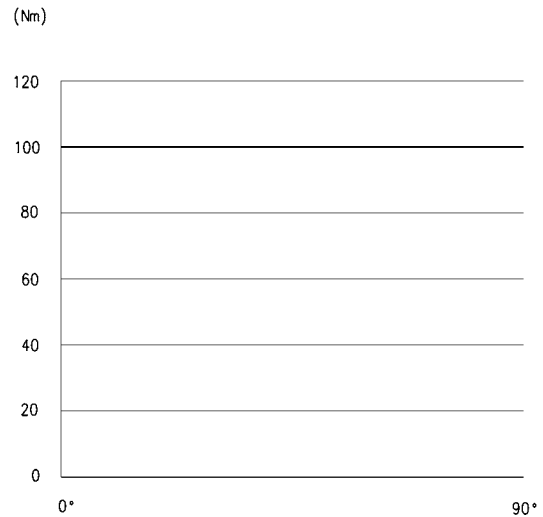
ARP	-	001	-	1A	A	-	F0300	-	A	EX
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ARP	SERIES
001	SIZE: 001 = torque force 9 Nm 003 = torque force 24 Nm 005 = torque force 50 Nm 010 = torque force 100 Nm 012 = torque force 120 Nm 020 = torque force 200 Nm 035 = torque force 370 Nm 055 = torque force 597 Nm 070 = torque force 825 Nm 100 = torque force 1122 Nm 150 = torque force 1655 Nm 250 = torque force 2648 Nm 400 = torque force 4800 Nm
1A	OPERATION: 1A = single-acting, minimum pressure of 4 bar 1B = single-acting, minimum pressure of 5 bar 1C = single-acting, minimum pressure of 5,5 bar 1D = single-acting, minimum pressure of 6 bar 2A = double-acting
A	ROTATION ANGLE: A = 90°
F0300	INTERFACE FOR FLANGE (ISO 5211): F0300 = flange holes F03 F0305 = flange holes F03 + flange holes F05 F0400 = flange holes F04 F0507 = flange holes F05 + flange holes F07 F0700 = flange holes F07 F0710 = flange holes F07 + flange holes F10 F1200 = flange holes F12 F1400 = flange holes F14 F1600 = flange holes F16 F1625 = flange holes F16 + flange holes F25
A	MATERIALS: A = standard anodized E = epoxy (epoxy coating and stainless steel shaft) C = CNI Kanigen type nickel-plating W = high temperatures (200°C) HW = very high temperatures (250°C)
EX	ATEX certified product

TORQUE FORCE DIAGRAM GENERATED BY A DOUBLE-ACTING ACTUATOR

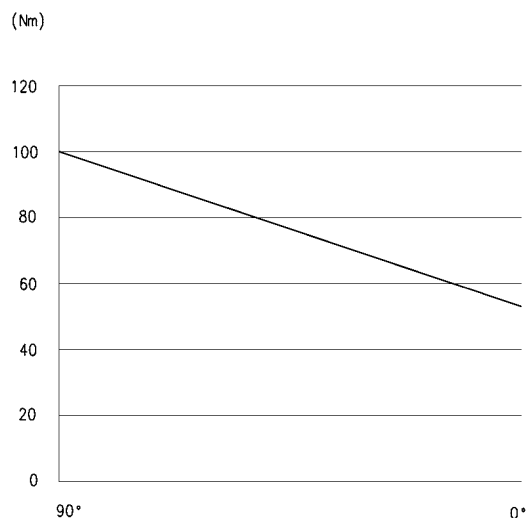


The above graph shows the torque force (in Nm) generated by a double-acting rotary actuator Series ARP during the closing action. The action starts from the 90° position and finishes at 0°. One of the features/advantages with a "rack and pinion" style rotary actuator is that the generated torque force is constant throughout the whole movement. See also the TORQUE FORCE TABLE on page 1/6.20.04.

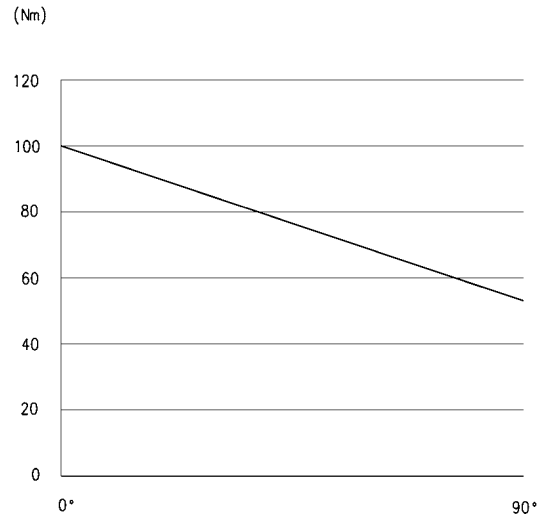


The above graph shows the torque force (in Nm) generated by a double-acting rotary actuator Series ARP during the opening action. The action starts from the 0° position and finishes at 90°. One of the features/advantages with a "rack and pinion" style rotary actuator is that the generated torque force is constant throughout the whole movement. See also the TORQUE FORCE TABLE on page 1/6.20.04.

TORQUE FORCE DIAGRAM GENERATED BY A SINGLE-ACTING ACTUATOR



The above graph shows the torque force (in Nm) generated by a single-acting rotary actuator Series ARP during the closing action. The action starts from the 90° position and finishes at 0°. The generated torque force is at the highest at 90°, while it decreases along the stroke due to the fact that the springs get less compressed. In this case it is the springs which generates the driving force. See also the TORQUE FORCE TABLE on page 1/6.20.04.



The above graph shows the torque force (in Nm) generated by a single acting rotary actuator Series ARP during the opening action. The action starts from the 0° position and finishes at 90°. The generated torque force is at the highest at 0°, while it decreases along the stroke due to the fact that the springs get more compressed, (the counter force increases). In this case it is the compressed air which generates the driving force. See also the TORQUE FORCE TABLE on page 1/6.20.04.

TORQUE FORCE TABLE (Nm)

DOUBLE-ACTING models	3 bar	4 bar	5 bar	5,5 bar	6 bar	7 bar
ARP-001-2A	4,4	5,8	7,33	8,0	8,8	10,2
ARP-003-2A	11,8	15,8	19,7	21,7	23,7	27,6
ARP-005-2A	25,3	33,8	42,2	46,4	50,7	59,1
ARP-010-2A	50,7	67,6	84,5	92,9	101,4	118,3
ARP-012-2A	61,2	81,6	102,1	112,2	122,5	142,9
ARP-020-2A	100,9	134,6	168,2	185,08	201,9	235,5
ARP-035-2A	187,0	249,3	311,6	342,8	374,0	436,3
ARP-055-2A	298,5	398,0	497,5	547,2	597,0	696,5
ARP-070-2A	412,5	550,0	687,5	756,2	825,0	962,5
ARP-100-2A	561,0	748,0	935,0	1028,5	1122,0	1309,0
ARP-150-2A	827,5	1103,3	1379,1	1517,0	1655,0	1930,8
ARP-250-2A	1324,0	1765,3	2206,6	2427,3	2648,0	3089,3
ARP-400-2A	2401,5	3202,0	4002,5	4402,7	4803,0	5603,5
SINGLE-ACTING models (for rotation angles of 90°)	Quantity of springs External - Internal	Spring torque (Nm) 0° - 90°	Supply pressure of 4 bar 0° - 90°	Supply pressure of 5 bar 0° - 90°	Supply pressure of 5,5 bar 0° - 90°	Supply pressure of 6 bar 0° - 90°
ARP-003-1AA	8 - /	5,36 - 10,48	10,40 - 5,30	11,80 - 7,90	16,40 - 11,20	18,30 - 13,20
ARP-003-1BA	10 - /	6,70 - 13,10		13,10 - 6,70	15,00 - 8,60	17,00 - 10,60
ARP-003-1CA	11 - /	7,37 - 14,41			14,40 - 7,30	16,30 - 9,30
ARP-003-1DA	12 - /	8,04 - 15,72			13,70 - 6,00	15,70 - 8,00
ARP-005-1AA	8 - /	12,00 - 21,76	21,80 - 12,00	30,30 - 20,50	34,50 - 34,70	38,70 - 28,90
ARP-005-1BA	10 - /	15,00 - 27,20		27,30 - 15,10	31,50 - 19,30	35,70 - 23,50
ARP-005-1CA	11 - /	16,50 - 29,92			30,00 - 16,60	34,20 - 20,80
ARP-005-1DA	12 - /	18,00 - 32,64			28,50 - 13,80	32,70 - 18,10
ARP-010-1AA	8 - /	26,72 - 40,96	40,90 - 26,60	57,80 - 43,50	66,20 - 52,00	74,70 - 60,40
ARP-010-1BA	10 - /	33,40 - 51,20		51,10 - 33,30	59,60 - 41,80	68,00 - 50,20
ARP-010-1CA	11 - /	36,74 - 56,32			56,20 - 36,60	64,70 - 45,10
ARP-010-1DA	12 - /	40,08 - 61,44			52,90 - 31,50	61,30 - 40,00
ARP-012-1AA	4 - 0	28,80 - 52,40	52,90 - 29,30	73,30 - 49,70	83,50 - 59,90	93,70 - 70,10
ARP-012-1BA	4 - 2	36,00 - 65,50	54,70 - 16,20	66,10 - 36,60	76,30 - 46,80	86,50 - 57,00
ARP-012-1CA	4 - 3	39,60 - 72,10		62,50 - 30,00	72,70 - 40,30	82,90 - 50,50
ARP-012-1DA	4 - 4	43,20 - 78,60		58,90 - 23,50	69,10 - 33,70	79,30 - 43,90
ARP-020-1AA	4 - 0	47,70 - 86,80	86,90 - 47,80	120,60 - 81,50	137,40 - 98,30	154,20 - 115,10
ARP-020-1BA	4 - 2	53,70 - 108,50	75,00 - 26,10	108,60 - 59,80	125,40 - 76,60	142,30 - 93,40
ARP-020-1CA	4 - 3	65,50 - 119,40		102,60 - 48,90	119,50 - 65,80	136,30 - 82,60
ARP-020-1DA	4 - 4	71,60 - 130,20		96,70 - 38,10	113,50 - 54,90	130,30 - 71,70
ARP-035-1AA	4 - 0	88,40 - 160,80	161,00 - 88,70	223,40 - 151,00	254,60 - 182,20	285,70 - 213,40
ARP-035-1BA	4 - 2	110,50 - 201,00	138,90 - 48,50	201,30 - 110,80	232,50 - 142,00	263,60 - 173,20
ARP-035-1CA	4 - 3	121,60 - 221,10		190,20 - 90,70	221,40 - 121,90	252,60 - 153,10
ARP-035-1DA	4 - 4	132,60 - 241,20		179,20 - 70,60	210,40 - 101,80	241,50 - 133,00
ARP-055-1AA	4 - 0	141,00 - 256,40	256,80 - 141,40	356,30 - 240,90	406,00 - 290,60	455,70 - 340,30
ARP-055-1BA	4 - 2	176,30 - 320,50	221,60 - 77,30	321,00 - 176,80	370,70 - 226,50	420,50 - 279,20
ARP-055-1CA	4 - 3	193,90 - 352,60		303,40 - 144,70	353,10 - 194,50	402,80 - 244,20
ARP-055-1DA	4 - 4	211,50 - 384,60		285,80 - 112,70	335,50 - 162,40	385,20 - 212,10
ARP-070-1AA	4 - 0	195,0 - 354,0	355,0 - 196,0	493,0 - 333,0	561,0 - 402,0	630,0 - 471,0
ARP-070-1BA	4 - 2	243,0 - 443,0	306,0 - 107,0	444,0 - 245,0	513,0 - 314,0	581,0 - 382,0
ARP-070-1CA	4 - 3	268,0 - 487,0		420,0 - 201,0	488,0 - 269,0	557,0 - 338,0
ARP-070-1DA	4 - 4	292,0 - 531,0		395,0 - 156,0	464,0 - 225,0	533,0 - 294,0
ARP-100-1AA	4 - 0	265,0 - 482,0	483,0 - 266,0	670,0 - 453,0	764,0 - 547,0	857,0 - 640,0
ARP-100-1BA	4 - 2	331,0 - 603,0	417,0 - 146,0	604,0 - 333,0	697,0 - 426,0	791,0 - 520,0
ARP-100-1CA	4 - 3	365,0 - 663,0		571,0 - 272,0	664,0 - 366,0	758,0 - 459,0
ARP-100-1DA	4 - 4	398,0 - 723,0		538,0 - 212,0	631,0 - 306,0	725,0 - 399,0
ARP-150-1AA	4 - 0	391,0 - 711,0	712,0 - 392,0	988,0 - 668,0	1126,0 - 806,0	1264,0 - 944,0
ARP-150-1BA	4 - 2	489,0 - 889,0	615,0 - 215,0	890,0 - 491,0	1028,0 - 629,0	1166,0 - 766,0
ARP-150-1CA	4 - 3	538,0 - 977,0		842,0 - 402,0	979,0 - 540,0	1117,0 - 678,0
ARP-150-1DA	4 - 4	586,0 - 1066,0		793,0 - 313,0	931,0 - 451,0	1069,0 - 589,0
ARP-250-1AA	6 - /	606,0 - 936,0	1159,0 - 829,0	1600,0 - 1270,0	1821,0 - 1491,0	2042,0 - 1712,0
ARP-250-1BA	8 - /	808,0 - 1248,0	957,0 - 517,0	1398,0 - 958,0	1619,0 - 1179,0	1840,0 - 1400,0
ARP-250-1CA	9 - /	909,0 - 1404,0		1297,0 - 802,0	1518,0 - 1023,0	1739,0 - 1244,0
ARP-250-1DA	10 - /	1010,0 - 1560,0		1196,0 - 646,0	1417,0 - 867,0	1638,0 - 1088,0
ARP-400-1AA	10 - /	1180,0 - 1820,0	2022,0 - 1382,0	2823,0 - 2183,0	3223,0 - 2583,0	3623,0 - 2983,0
ARP-400-1BA	12 - /	1416,0 - 2184,0	1786,0 - 1018,0	2587,0 - 1819,0	2987,0 - 2219,0	3387,0 - 2619,0
ARP-400-1CA	15 - /	1770,0 - 2730,0		2233,0 - 1273,0	2633,0 - 1673,0	3033,0 - 2073,0
ARP-400-1DA	16 - /	1888,0 - 2912,0			2515,0 - 1491,0	2915,0 - 1891,0

The company reserves the right to vary models and dimensions without notice.
These products are designed for industrial applications and are not suitable for sale to the general public.

Rotary actuators Series ARP - Sizes from 001 to 150

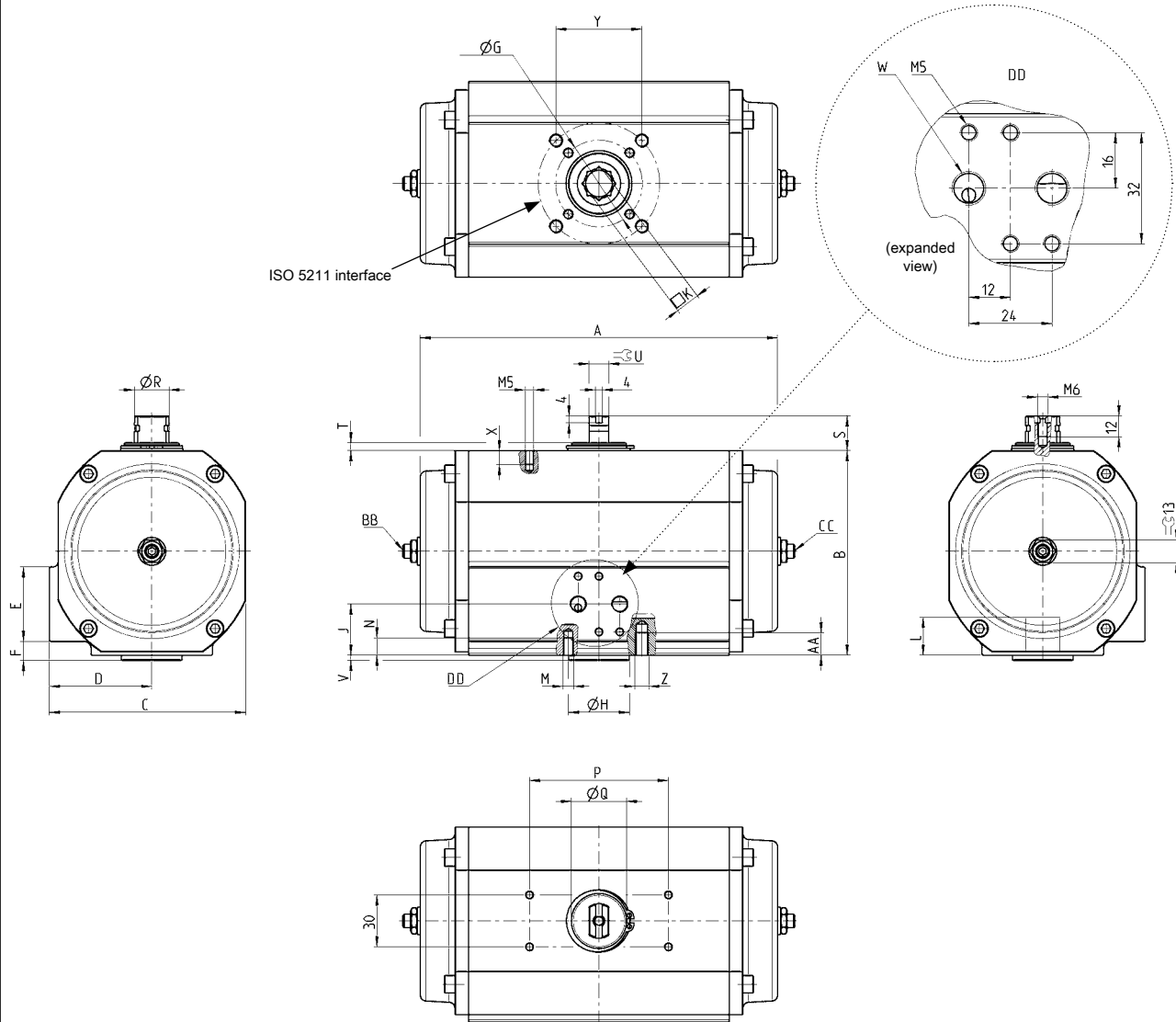
NOTE TO THE TABLE:

* ARP-003-... also available with double drilling ISO

F03/F05 and square key K of 9 mm

** DA = double-acting - SA = single-acting

BB = end-stroke regulation on the end cap
 CC = end-stroke regulation on the end cap
 DD = solenoid mounting/Namur Interface, according to Namur
 VDI/VDE 3845



Mod.	ISO	A	B	C	D	E	F	ØG	ØH	ØJ	K	L	M	N	P	ØQ	ØR	S	T	U	V	W	X	Y	Z	AA	BB	CC	Weight (Kg) DA / SA **
ARP-001-...	F03	103	45	51	28,5	-	-	36	25	22,5	9	12	M5	8	80	22,4	16	20	4,5	11,5	2	G1/8	5	-	-	-	-	-	0,6 / -
ARP-003-...	F04*	149,5	70	69,5	38	49	10,5	36	-	23	11	12	M5	8	80	32	20	20	4,5	11,5	-	G1/8	8	35,3	-	-	-	4	1 / 1,1
ARP-005-...	F05-F07	186,5	87	90,5	49	49	22	50	35	34,5	14	15	M6	10	80	32	20	20	4,5	11,5	2,6	G1/8	8	49,5	M8	13	-	4	1,8 / 1,9
ARP-010-...	F05-F07	206	118	113	59	43	8	50	35	29,5	14	15	M6	10	80	32	20	20	4,5	11,5	2,9	G1/8	8	49,5	M8	13	-	-	2,8 / 2,9
ARP-012-...	F05-F07	206	118,5	120,2	66	43	8	70	55	29,5	17	20	M8	14	80	46	20	20	6	11,5	3	G1/4	6	107	M6	12	-	6	4,1 / 4,7
ARP-020-...	F07	224	140,5	136,5	72	43	8	70	55	29,5	17	20	M8	14	80	50	32	20	6,5	19	3	G1/4	6	107	M6	14	-	8	6,3 / 7
ARP-035-...	F07-F10	270	166,5	156	78	43	8,5	102	70	31	22	25	M10	17	80	61	32	20	6,5	19	2,5	G1/4	6	161	M6	12	-	8	10,5 / 12
ARP-055-...	F12	312	207,5	192,5	95,5	43	20,5	125	85	42	27	30	M12	20	130	61	40	30	7,5	25,4	2,5	G1/4	6	161	M8	16	10	10	18,2 / 20,6
ARP-070-...	F12	358	215,8	198,3	99,3	49	19,3	125	85	45,8	27	30	M12	20	130	72	40	30	6,8	25,4	3	G1/4	6,5	213	M8	12	10	10	20,4 / 24,1
ARP-100-...	F14	366	254	227	113,5	43	39,5	140	100	61	36	40	M16	25	130	78	40	30	6,7	25,4	3	G1/4	6	213	M10	15	12	12	31,2 / 35,8
ARP-150-...	F14	394	304	280	140	48,5	51,5	140	100	76	36	40	M16	25	130	78	40	30	6,7	25,4	3	G1/4	6	244	M8	22	12	12	44,4 / 52,8

Rotary actuators Series ARP - Size 250

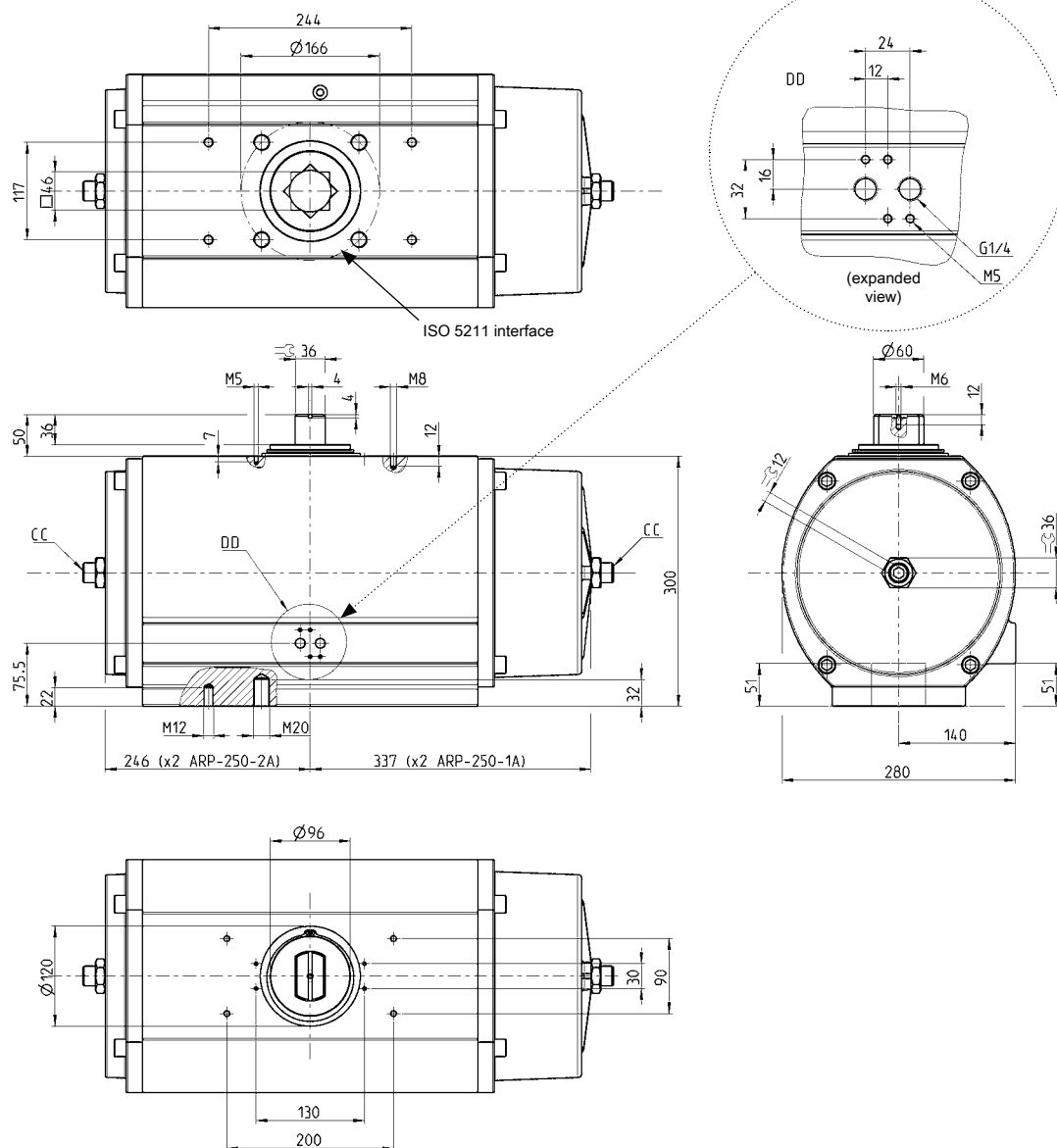
NOTE TO THE TABLE:

** DA = double-acting - SA = single-acting



CC = end-stroke regulation on the end cap
 DD = solenoid mounting/Namur Interface, according to Namur
 VDI/VDE 3845

Owing to the end caps sizes, dimensions change from the double-acting model to the single-acting one.



Mod.	ISO	Weight (Kg) DA / SA **
ARP-250-...	F16	59 / 84

Rotary actuators Series ARP - Size 400

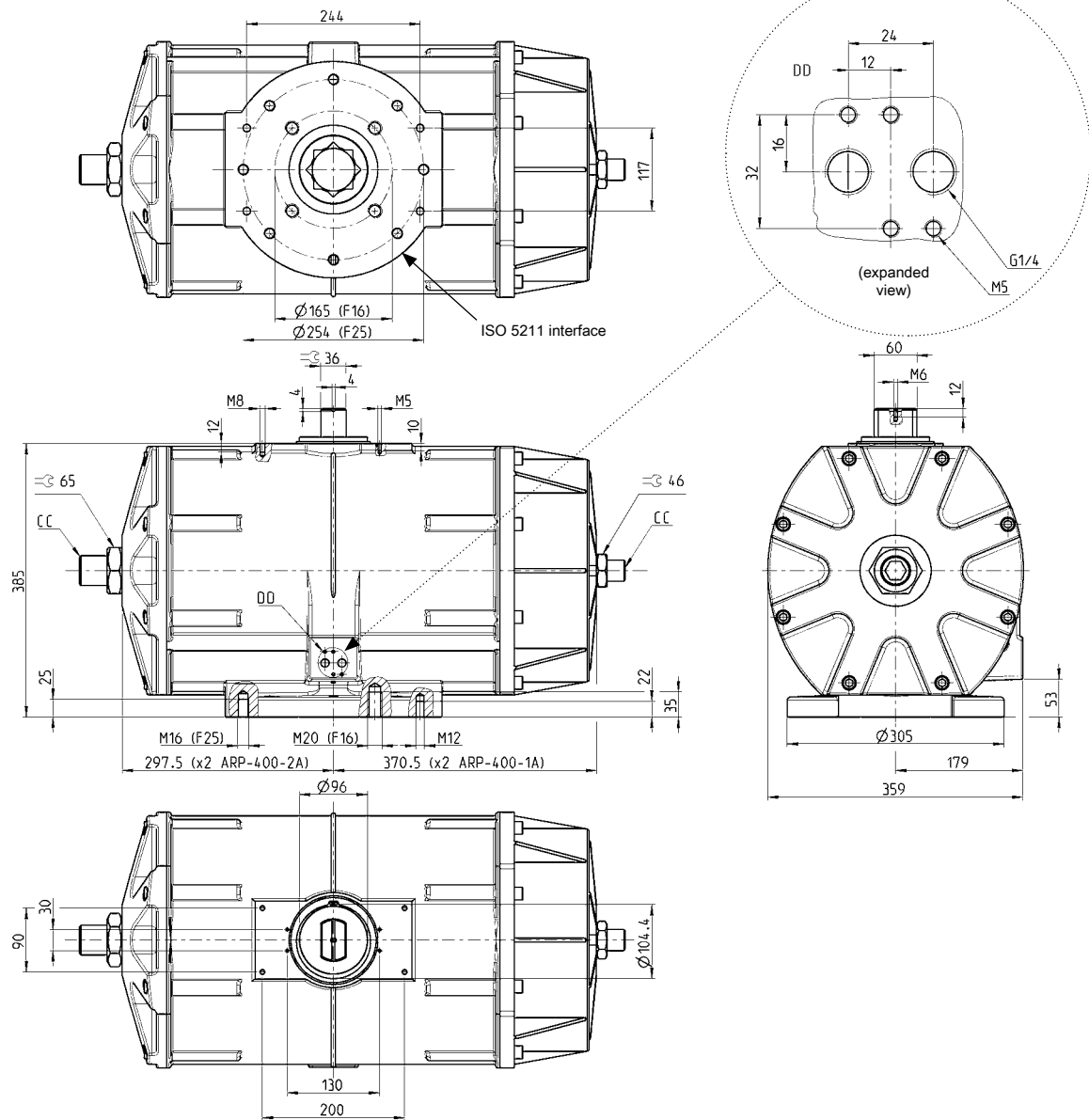
NOTE TO THE TABLE:

** DA = double-acting - SA = single-acting



CC = end-stroke regulation on the end cap
 DD = solenoid mounting/Namur Interface, according to Namur VDI/VDE 3845

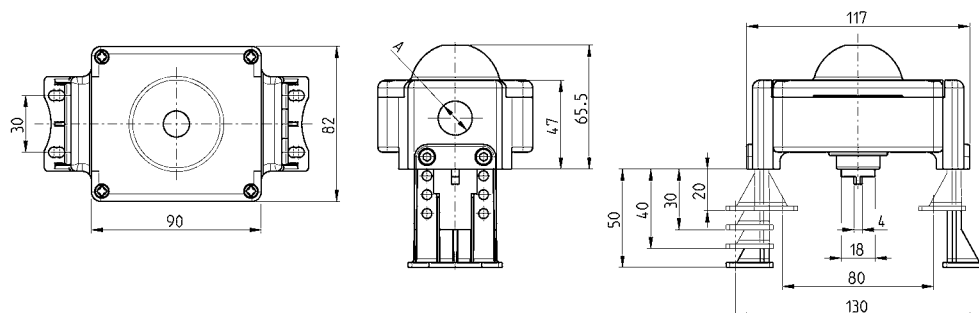
Owing to the end caps sizes, dimensions change from the double-acting model to the single-acting one.



Mod.	ISO	Weight (Kg) DA / SA **
ARP-400-...	F25	107 / 135

Switch box Mod. SBT (standard) e SIP (ATEX version)

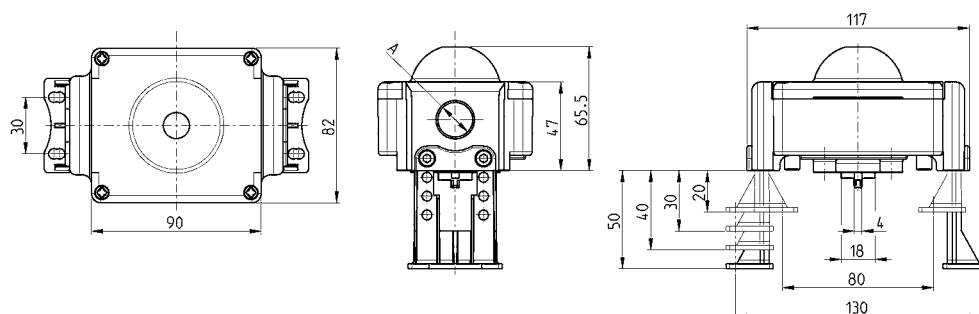
Mod. SIP: intrinsic safety ATEX version with protection modes Ex II 2 G/D
EEx ia IIC T6 for zones classified as 1, 2, 21 e 22.



Mod.	Body material	Cover material	Shaft material	Screws	Operating temperature	Protection class
SBT-012HO-2H	Technopolymer	Polycarbonate	Technopolymer	Stainless steel	-15°C + 80°C	IP65
SIP702L0-2H	Technopolymer	Polycarbonate	Technopolymer	Stainless steel	-15°C + 80°C	IP65

Switch box Mod. SBA (standard) e SIM (ATEX version)

Mod. SIM: intrinsic safety ATEX version with protection modes Ex II 2 G/D
EEx ia IIC T6 for zones classified as 1, 2, 21 e 22.



Mod.	Body material	Cover material	Shaft material	Screws	Operating temperature	Protection class
SBA-012ON-2H	pressure diecasted Aluminium	Polycarbonate	Technopolymer	Stainless steel	-15°C + 80°C	IP65
SIM702LN-2H	pressure diecasted Aluminium	Polycarbonate	Technopolymer	Stainless steel	-15°C + 80°C	IP65

Angular Grippers Series CGA

5

Magnetic
Sizes 10, 16, 20, 25, 32



- » Compact design
- » Flexible mounting
- » Optional mounting adaptors

For an easier installation the gripper can also be equipped with an optional installation adaptor mod. C-CGP (female) or L-CGP (male).

The angular grippers Series CGA, available in 5 different sizes, open and close at angles between -10° and $+30^\circ$. The proximity switches can be inserted in the U-shaped grooves on the body.

Grippers Series CGA have mounting holes on three sides which provide flexibility in installation.

GENERAL DATA

Model	CGA-10; CGA-16; CGA-20; CGA-25; CGA-32					
Bore sizes	$\varnothing$ 10; $\varnothing$ 16; $\varnothing$ 20; $\varnothing$ 25; $\varnothing$ 32					
Type of operation	double-acting					
Operating pressure	1.5 – 7 bar (22 - 102 psi)					
Operating temperature	0 – 80°C (with dry air - 20°C) (32 - 176°F, with dry air -4°F)					
Max. operating frequency	180 cycles/min					
Lubrication	lever section - lubrication required on sliding section					
Grip moment - closed M (Ncm)	1,6xP	8xP	17xP	34xP	61xP	P = operating pressure (bar)
Grip moment - open M (Ncm)	2,6xP	11xP	23xP	43xP	81xP	
Effective gripping force F (N)	F = M/L x 0,85			L = distance of gripping point (cm)		
Length of la. gripping point L (cm)	3,0	4,0	6,0	7,0	8,5	
Weight (g)	$\varnothing$ 10 = 40	$\varnothing$ 16 = 100	$\varnothing$ 20 = 200	$\varnothing$ 25 = 330	$\varnothing$ 32 = 540	
Lever open / closed angles	-10° - $+30^\circ$					
Port sizes	M5 (CGA-10 M3)					
Magnet	magnet for proximity sensors in piston					
Fluid	filtered air, without lubrication. If lubricated air is used, it is recommended to use oil ISOVG32. Once applied the lubrication should never be interrupted.					

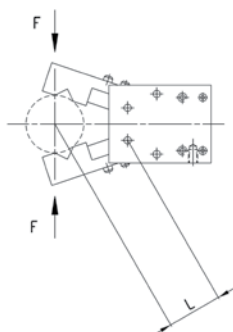
CODING EXAMPLE

CGA	-	20
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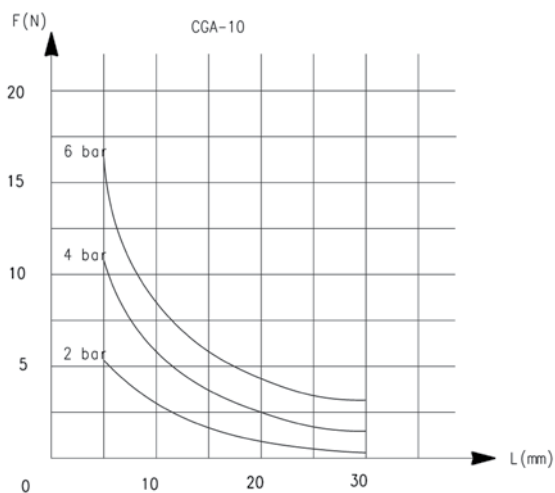
CGA	SERIES
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20	SIZES 10 = ø 10 mm 16 = ø 16 mm 20 = ø 20 mm 25 = ø 25 mm 32 = ø 32 mm
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CLOSING GRIPPING FORCE - CHARACTERISTICS

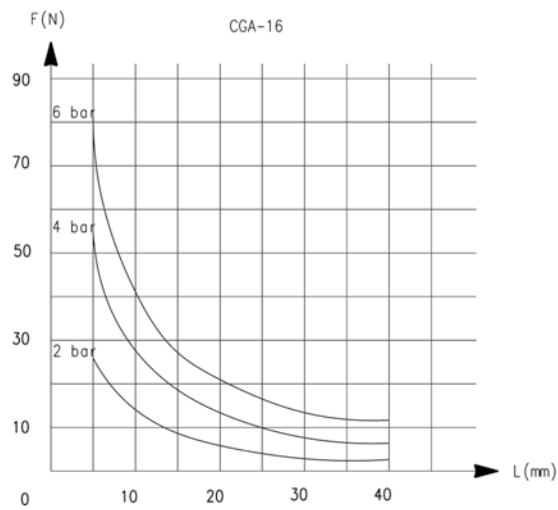


L = Length of gripping point
 F = Gripping force

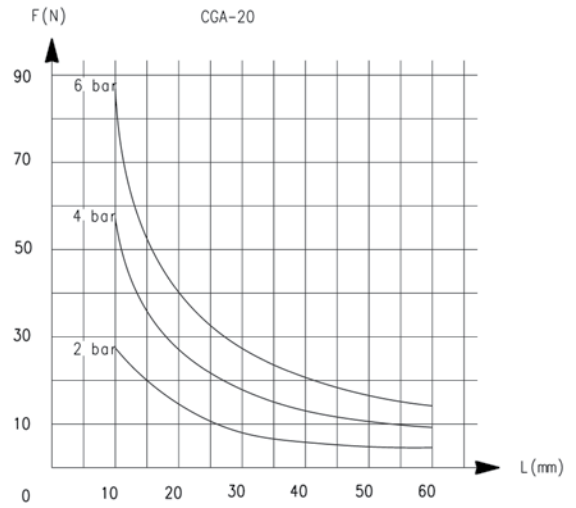


L = Length of gripping point
 F = Gripping force

CLOSING GRIPPING FORCE - CHARACTERISTICS

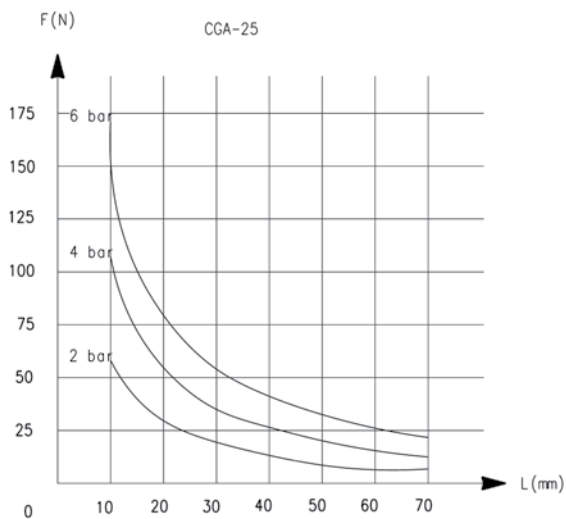


L = Length of gripping point
F = Gripping force

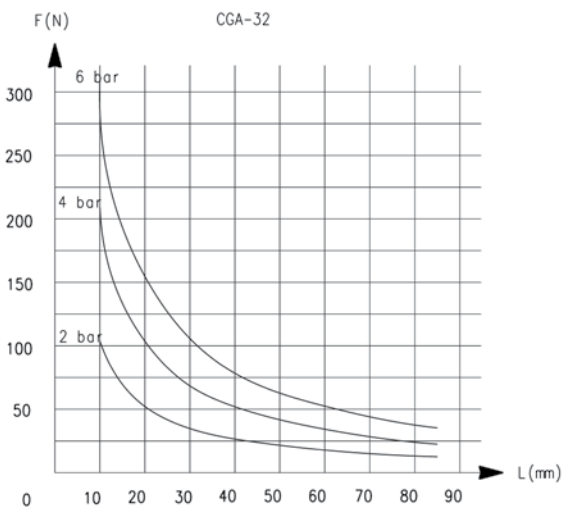


L = Length of gripping point
F = Gripping force

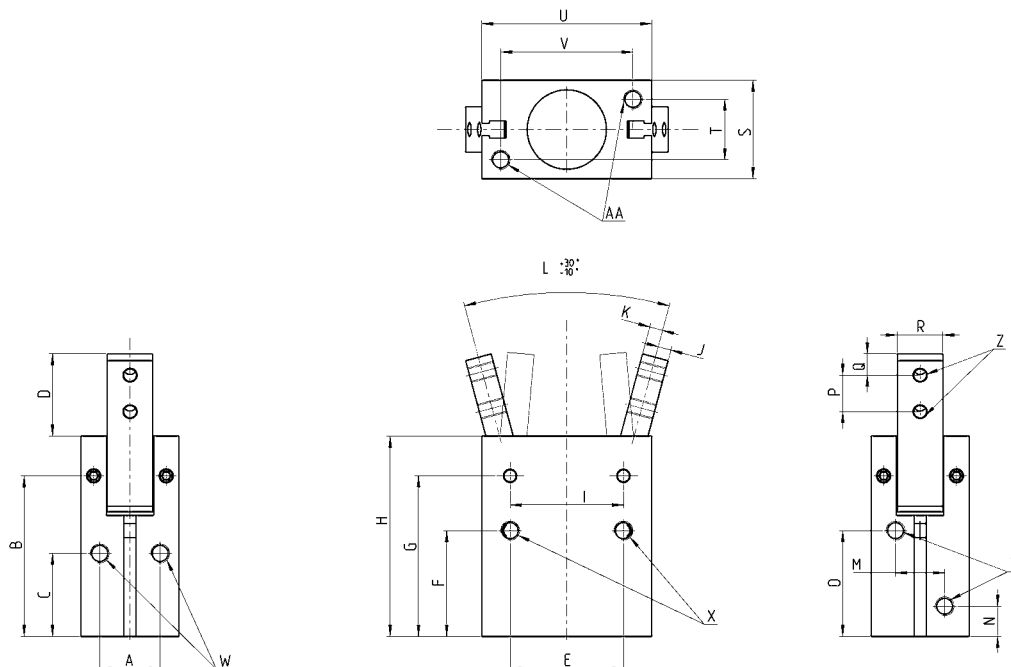
CLOSING GRIPPING FORCE - CHARACTERISTICS



L = Length of gripping point
F = Gripping force



L = Length of gripping point
F = Gripping force



Y = port connection
Z = claw mounting-hole
X.W.AA = Mounting hole

DIMENSIONS

Mod.	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
CGA-10	10	30,5	15,5	15,7	18	20	30,5	36,5	14	2,5	1,5	0°	10	7,5	19	6	3	7	16	10	23	17
CGA-16	14	38	21	17,5	24	25,5	38	45,5	24	3	3	0°	12	7,5	25,5	8	3	9	22	14	34	26
CGA-20	16	42,5	22	22	30	28	42,5	53	30	3,5	3,5	0°	13	8	28	10	4	12	26	16	45	35
CGA-25	20	48,5	24,5	26	36	31,5	48,5	61	36	4,5	4,5	0°	18	9	31	12	5	14	32	20	52	40
CGA-32	26	54	30	30	44	37,5	45	68	42	5	5	0°	24	10	33,5	14	6	18	40	26	60	46

DIMENSIONS (mm)

Mod.	W thread	W depth	Z thread	Z depth	AA thread	AA depth
CGA-10	M3	7	M3	-	M3	5
CGA-16	M4	11	M5	-	M4	7
CGA-20	M5	13	M5	-	M5	8
CGA-25	M6	15	M5	-	M6	10
CGA-32	M6	20	M5	-	M6	10

180° Angular Grippers Series CGSN

Magnetic

Sizes: ø 16, 20, 25, 32 mm



- » Mounting repeatability is improved
- » Gripping fingers in polished nickel plated steel exhibit high resistance against corrosion
- » Large moving area

The gripper Series CGSN is equipped with mounting holes on the sides which guarantee a greater flexibility in installation. Some calibrated installation holes on the base make the installation easier. The gripper can be supplied with an optional installation adapter mod. C-CGP (female) or C-CGP (male).

The grippers Series CGSN are available in 4 different sizes and their fingers open 180° in order to enable the gripper to free the working area. In this way it is possible to reduce the number of movements in a working sequence. A link mechanism provides high gripping force. Proximity switches can be inserted in the grooves on the body.

GENERAL DATA

Functioning	double effect			
Working pressure	1 bar - 7 bar			
Working temperature	-10°C - 60°C (14°F - 140°F)			
Max operating frequency	100 cycles/min			
Lubrication	lubrication is required on sliding section only			
Lever open/close angles	-1° / + 180° (tolerance ±3°)			
Repeatability	± 0.2 mm			
Air ports	M5x0.8			
Fluid	Filtered air without lubrication. If lubricated air is used, it is recommended to use oil ISO VG32. Once applied, lubrication should never be interrupted.			
Bore sizes (mm)	16	20	25	32
Weight(g)	140	255	430	740
Theoretical grip moment [M] (N·cm)	123xP	235xP	454xP	968xP [P = pressure (MPa)]
Max length of gripping point [L] (mm)	80	100	120	140
Effective gripping force [F] (N)	F = M/L x 0.9 (value with the fingers in parallel position) , L = distance of gripping point (cm)			
Example with P = 0.5MPa and L max	F = 7N	F = 10N	F = 17N	F = 30N

CODING EXAMPLE

CGSN	-	20
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CGSN

SERIES

PNEUMATIC SYMBOL

PNZ1

See the following pages

20

SIZES

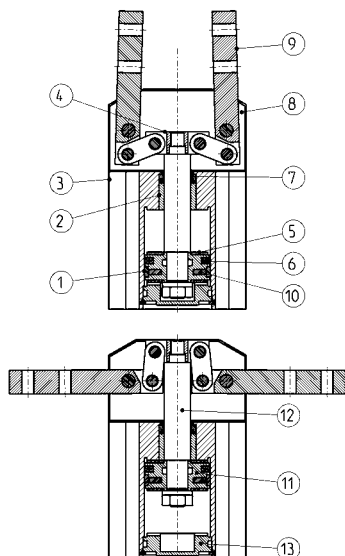
16 = ø 16 mm

20 = ø 20 mm

25 = ø 25 mm

32 = ø 32 mm

Gripper Series CGSN - construction



PARTS

MATERIALS

1 = Piston guide ring	Polyacetalic
2 = Bushing	Bronze
3 = Body	Aluminium
4 = T-shackle	Stainless steel
5 = Buffer seal	PU
6 = Piston seal	NBR
7 = Piston rod seal	PU
8 = Anti-friction guided lamina	Bronze
9 = Finger lever	Nickel-plated stainless steel
10 = Magnet	Plastoferrite
11 = Piston	Aluminium
12 = Rod	Stainless steel
13 = Header	Aluminium

Criteria to choose the most suitable model: 1) GRIP FORCE ANALYSIS

To choose the most suitable gripper according to the weight of the load that has to be moved, it is suggested to select a model that develops a grip strength 20 times higher than the load weight at least. In case of great acceleration or impact during the load moving it is necessary to supply a wider margin.

EXAMPLE OF CALCULATION (see the diagram on the right)

Weight of the load to be moved (Kg) = 0.06

Coefficient of safety = 20

Gripping moment L (mm) = 30

Working pressure (MPa) = 0.5

F = grip force

Fmin [min. required grip force] = $0,06\text{kg} \times 20 \times 9.8\text{m/s}^2 = 12\text{N}$ (minimum).

From the diagram we deduce that with the model CGSN16 the gripping strength is 16N according to the distance from the grip moment (L = 30mm) and at the pressure (0.5MPa) as shown in the example. The grip force is 26 times higher than the load weight. The condition requiring that grip force is 20 times higher than the set grip force at least is thus satisfied.

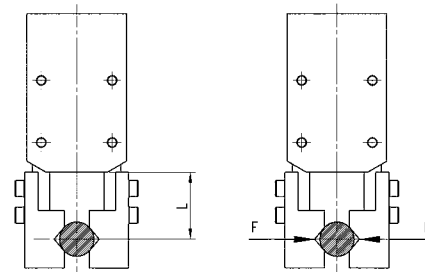
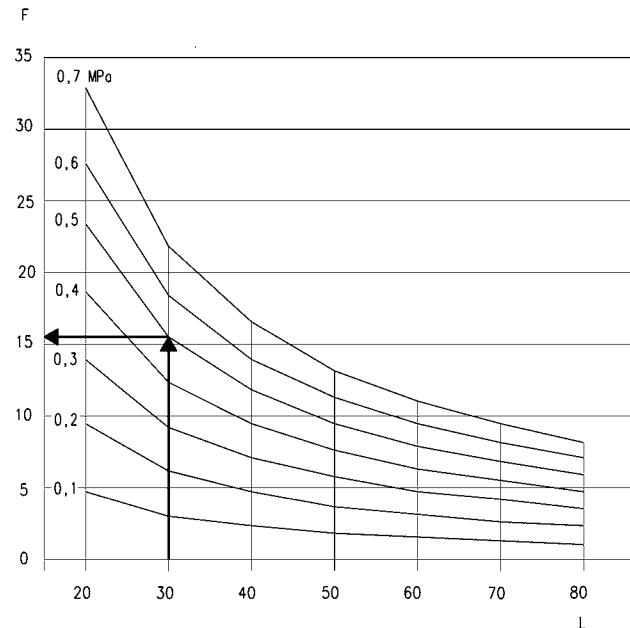
EFFECTIVE GRIP FORCE

DRAWING LEGEND:

L = Gripping moment (mm)

F = Finger grip force (N)

The shown grip force corresponds to the grip force of a finger when all fingers (or accessories) are in touch with the load.



Criteria to choose the most suitable model: 1) GRIPPING MOMENT ANALYSIS

New

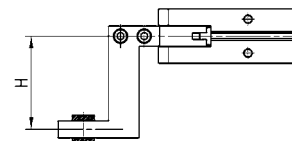
LEGEND:

H = Grip arm (mm)

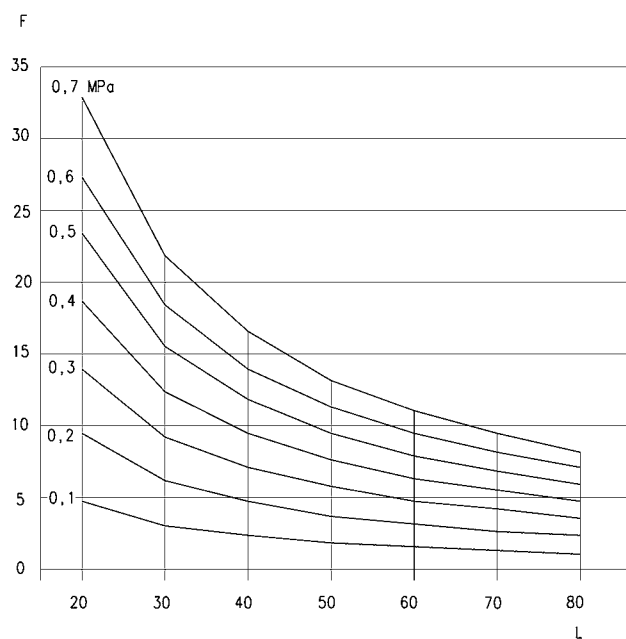
P = Pressure (MPa)

The load has to be maintained within the distance field from the gripper barycentre (H) for a certain set pressure.

If the load is outside the recommended field for a certain pressure, the product durability can be compromised.

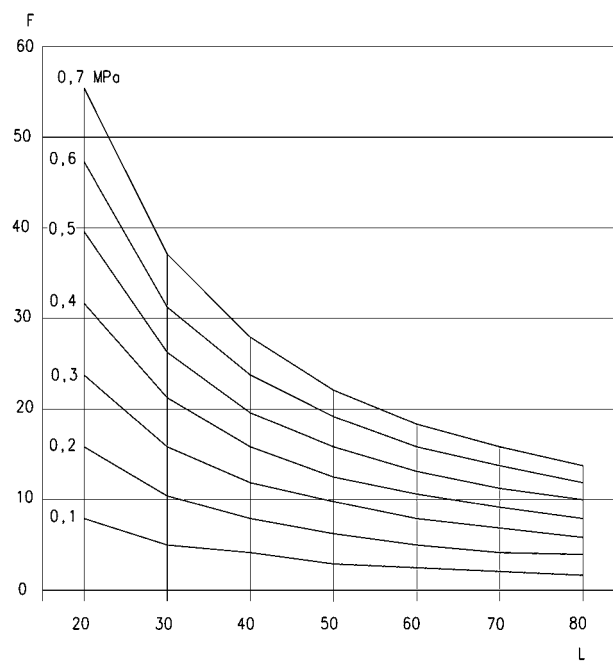


Diagrams to choose the most suitable gripper model



CGSN-16

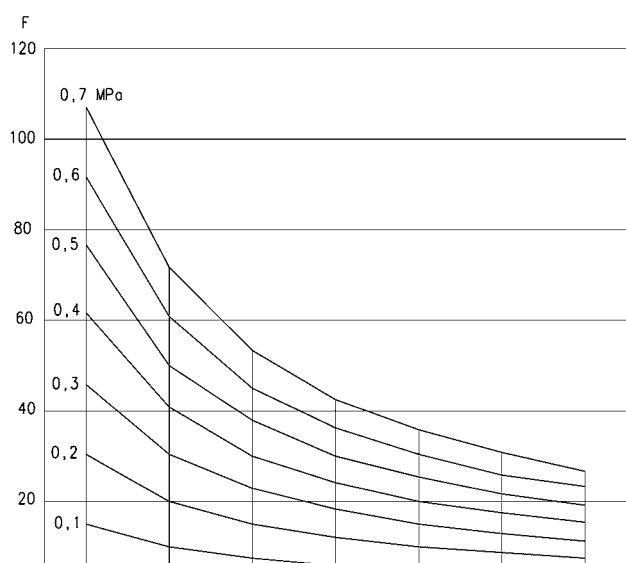
F = Grip force (N)
L = Gripping moment (mm)



CGSN-20

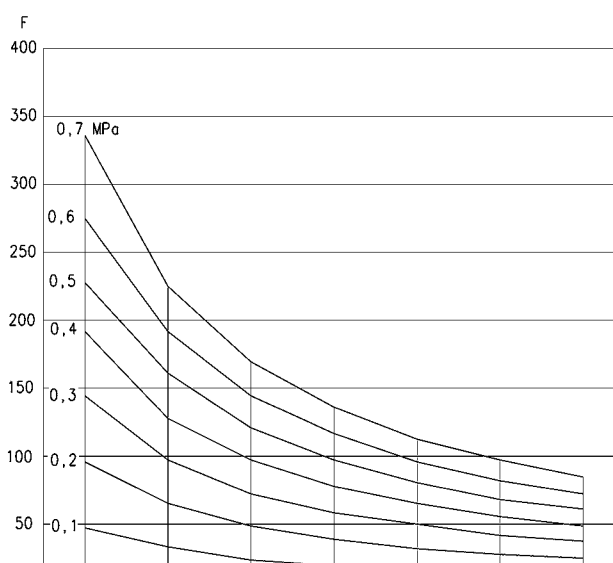
F = Grip force (N)
L = Gripping moment (mm)

Diagrams to choose the most suitable gripper model



CGSN-25

F = Grip force (N)
L = Gripping moment (mm)



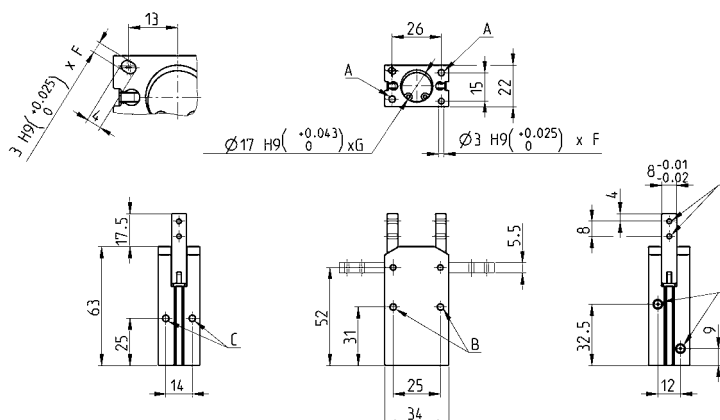
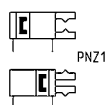
CGSN-32

F = Grip force (N)
L = Gripping moment (mm)

CGSN gripper, bore 16 mm - dimensions



A,B,C = mounting thread
D = adaptor mounting thread
E = opening/closing connection ports

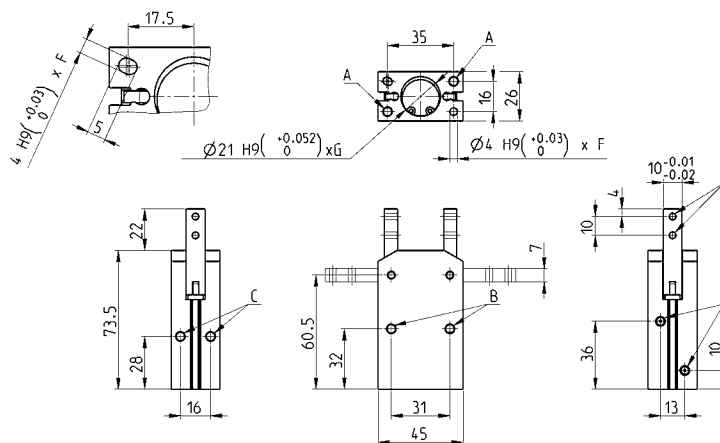


Mod.	A [Thread - Depth]	B [Thread - Depth]	C [Thread - Depth]	D [Thread]	E [Thread]	F [Depth]	G [Depth]
CGSN-16	M4 - 7	M4 - 7	M4 - 7	M3	M5	3	1.5

CGSN gripper, bore 20 mm - dimensions

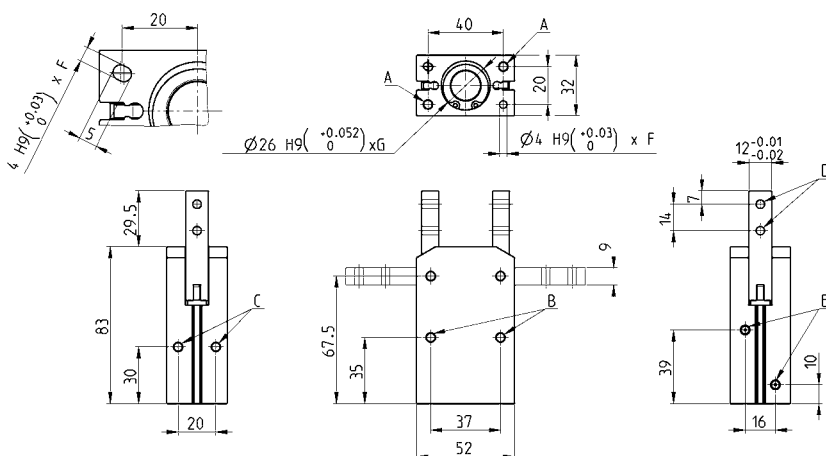


A,B,C = mounting thread
D = adaptor mounting thread
E = opening/closing connection ports

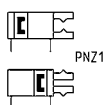


Mod.	A [Thread - Depth]	B [Thread - Depth]	C [Thread - Depth]	D [Thread]	E [Thread]	F [Depth]	G [Depth]
CGSN-20	M5 - 8	M5 - 8	M5 - 8	M4	M5	4	1.5

CGSN gripper, bore 25 mm - dimensions

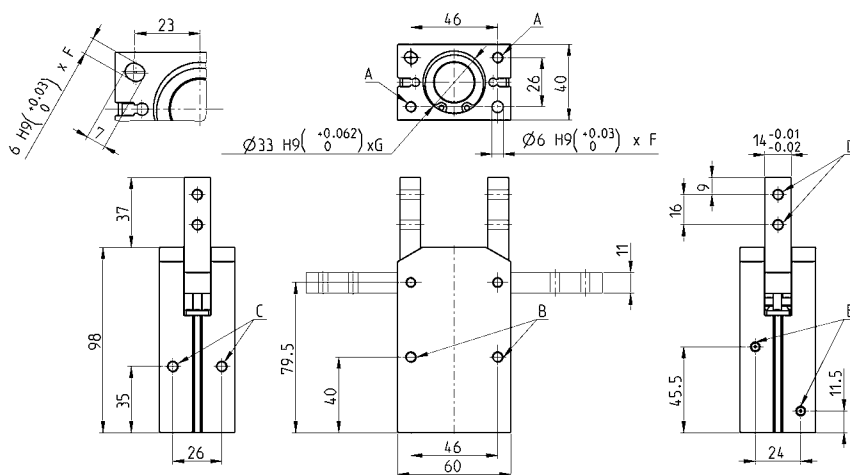


A,B,C = mounting
thread
D = adaptor mounting
thread
E = opening/closing
connection ports



Mod.	A [Thread - Depth]	B [Thread - Depth]	C [Thread - Depth]	D [Thread]	E [Thread]	F [Depth]	G [Depth]
CGSN-25	M5 - 8	M5 - 8	M5 - 8	M5	M5	4	1.5

CGSN gripper, bore 32 mm - dimensions



A,B,C = mounting
thread
D = adaptor mounting
thread
E = opening/closing
connection ports

Mod.	A [Thread - Depth]	B [Thread - Depth]	C [Thread]	D [Thread]	E [Thread - Depth]	F [Depth]	G [Depth]
CGSN-32	M6 - 10	M6 - 10	M5	M6	M6 - 10	6	1.5

Parallel Grippers Series CGP

Magnetic

Sizes 10 - 16 - 20 - 25 - 32



- » High durability
- » Compact design
- » High gripping force

The proximity switches can be inserted in the U-shaped grooves on the body. For an easier installation the gripper can also be equipped with an optional installation adaptor mod. C-CGP (female) or L-CGP (male).

The parallel gripper mod. CGP is available in 5 different sizes.

The closing action of the gripper is generated from the cylinder's thrust side, resulting in a higher gripping force. The gripper is equipped with ring bearings in the sliding section for higher durability. Gripper mod. CGP has mounting holes on three sides which provides flexibility in installation.

GENERAL DATA

Model	CGP-10 CGP-16 CGP-20 CGP-25 CGP-32				
Bore sizes (mm)	Ø 10	Ø 16	Ø 20	Ø 25	Ø 32
Type of operation	double-acting				
Operating pressure	1.5 – 7 bar (22 - 102 psi)				
Operating temperature	0°C – 80°C (with dry air - 20°C) (32 - 176°F, with dry air -4°F)				
Max. operating frequency	180 cycles/min				
Lubrication	lever section - lubrication required on sliding section				
Opening stroke (mm)	Ø 10 = 4	Ø 16 = 8	Ø 20 = 12	Ø 25 = 14	Ø 32 = 16
Theoretical holding force - opening (N)	Ø 10 = 8	Ø 16 = 24	Ø 20 = 47	Ø 25 = 75	Ø 32 = 100
	P = Related to a pressure of 5 bar with gripping point length 3 cm				
Theoretical holding force - closing (N)	Ø 10 = 5	Ø 16 = 8	Ø 25 = 35	Ø 25 = 60	Ø 32 = 85
	P = Related to a pressure of 5 bar with gripping point length 3 cm				
Length of max gripping point L (cm)	3,0	4,0	6,0	7,0	8,5
	L = Related to a pressure of 5 bar				
Weight(g)	Ø 10 = 50	Ø 16 = 140	Ø 20 = 250	Ø 25 = 410	Ø 32 = 680
Port sizes	M5 (CGP-10 M3)				
Fluid	filtered air, without lubrication*				
	*in the event that lubricated air is used, it is recommended to use oil ISO VG32. Once applied, the lubrication should never be interrupted.				

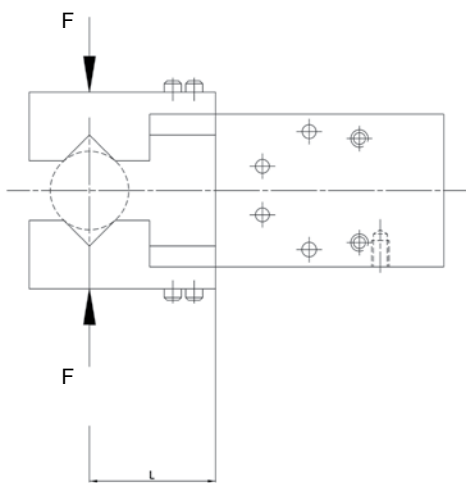
CODING EXAMPLE

CGP	-	20
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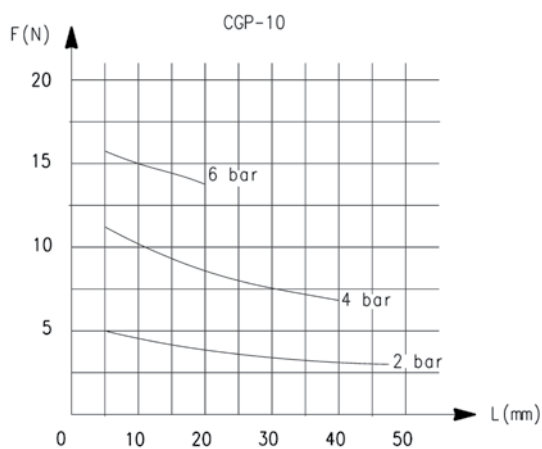
CGP	SERIES
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20	SIZES 10 = $\varnothing$ 10 mm 16 = $\varnothing$ 16 mm 20 = $\varnothing$ 20 mm 25 = $\varnothing$ 25 mm 32 = $\varnothing$ 32 mm
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GRIPPING FORCE CHARACTERISTICS

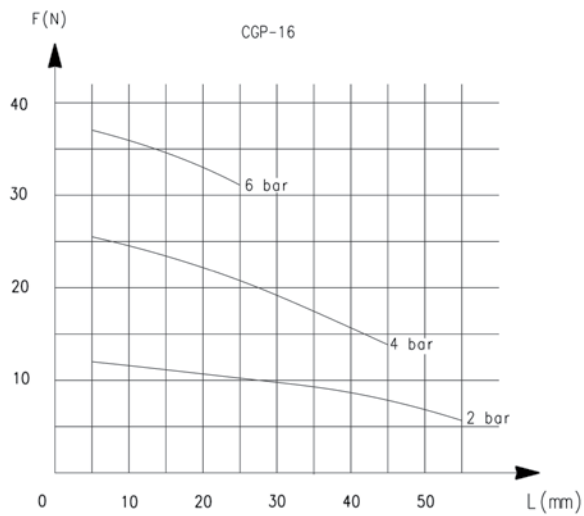


L = Gripping point length
 F = Gripping Force

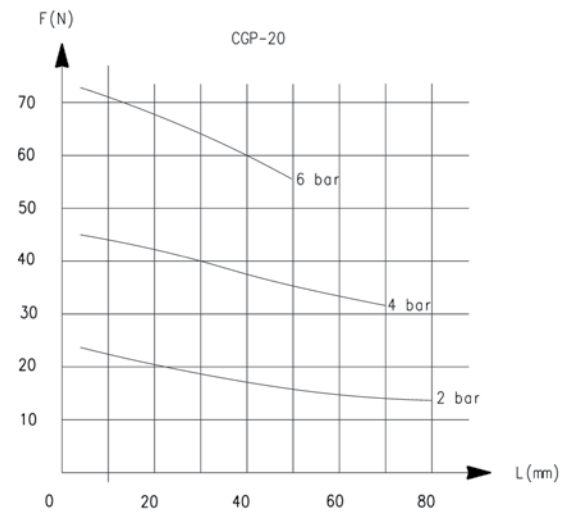


L = Gripping point length
 F = Gripping Force

GRIPPING FORCE CHARACTERISTICS

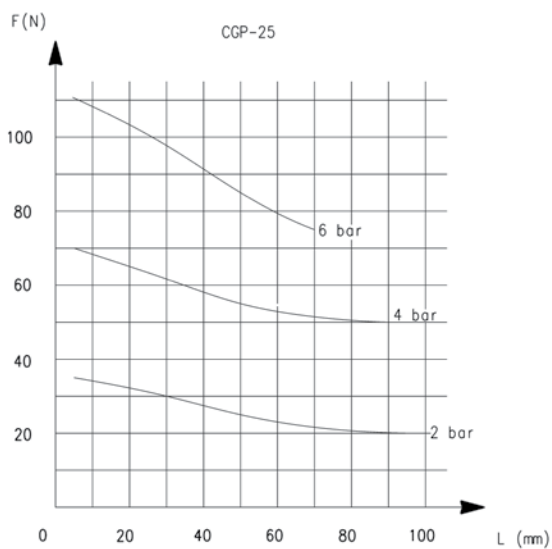


L = Gripping point length
F = Gripping Force

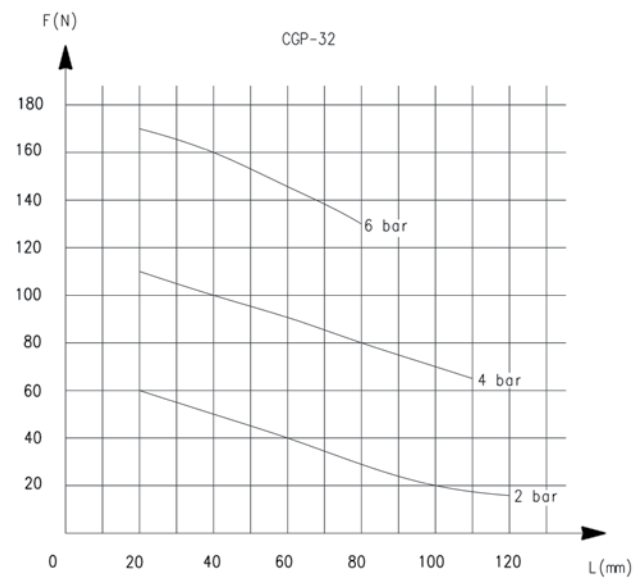


L = Gripping point length
F = Gripping Force

GRIPPING FORCE CHARACTERISTICS

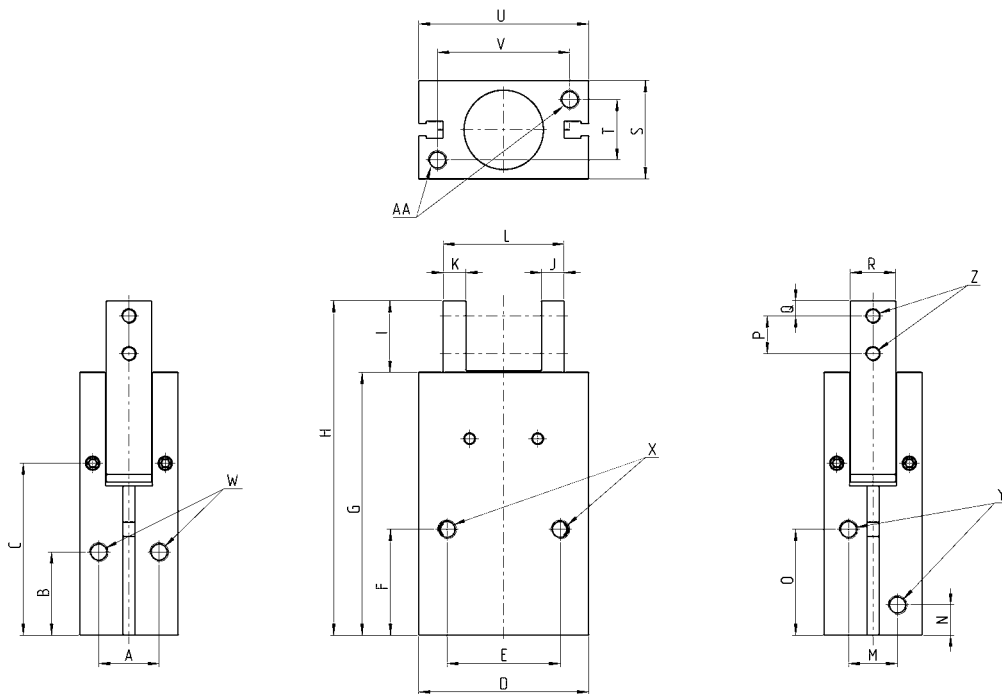


L = Gripping point length
F = Gripping Force



L = Gripping point length
F = Gripping Force

Parallel grippers Series CGP



Y = port connection
 Z = claw mounting-hole
 X.W.AA = Mounting hole

DIMENSIONS

Mod.	A	B	C	D	E	F	G	H	I	J	K	L closed	L open	M	N	O	P	Q	R	S	T	U	V
CGP-10	10	15,5	31,5	23	18	20	45	58	13	4	4	18	22	10	7,5	19	6	3	7	16	10	23	17
CGP-16	14	21	39,5	34	24	25,5	58,8	73,5	15	5	5	25	33	12	7,5	25,5	8	3	11	22	14	34	26
CGP-20	16	22	45,5	45	30	28	69,5	88,5	19	6	6	32	44	13	8	28	10	4	12	26	16	45	35
CGP-25	20	24,5	51	52	36	31,5	79,5	103,5	24	8	8	37	51	18	9	31	12	5	14	32	20	52	40
CGP-32	26	30	56	60	44	37,5	88	119	31	9	9	44	60	24	10	35	15	7	18	40	26	60	46

DIMENSIONS (mm)

Mod.	X thread	X depth	Y thread	Y depth	W thread	W depth	Z thread	Z depth	AA thread	AA depth
CGP-10	M3	7	M3	-	M3	5	M3	-	M3	5
CGP-16	M4	11	M5	-	M4	7	M3	-	M4	7
CGP-20	M5	13	M5	-	M4	8	M4	-	M5	8
CGP-25	M6	14	M5	-	M6	10	M5	-	M6	10
CGP-32	M6	20	M5	-	M6	10	M6	-	M6	10

Guided Parallel Grippers Series CGB

Magnetic

Sizes 16 - 20 - 25 - 32



- » Guided mechanism which allows high repeatability
- » Flexibility in installation
- » High gripping force

The proximity switches can be inserted in the U-shaped grooves on the body. For an easier installation the gripper can also be equipped with an optional installation adaptor mod. C-CGP (female) or L-CGP (male).

The guided parallel gripper Series CGB is available in 4 different sizes and is equipped with a guide mechanism that offers high repeatability. The closing action of the gripper is generated from the cylinder's thrust side, resulting in a higher gripping force. Gripper Series CGB has mounting holes on three sides which provides flexibility in installation.

GENERAL DATA

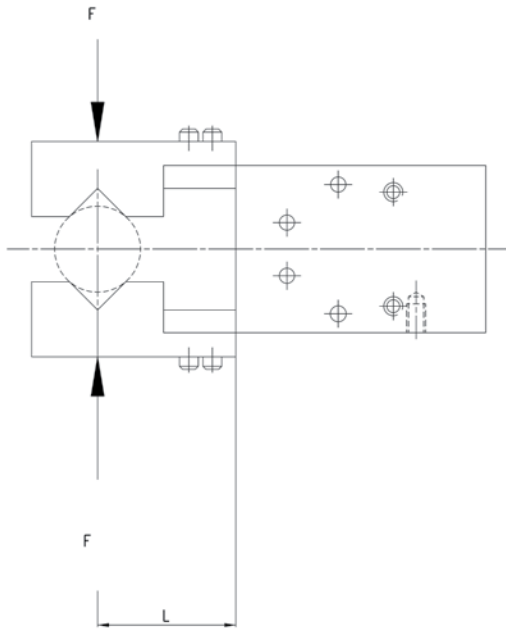
Model		CGB-L-16; CGB-L-20; CGB-L-25; CGB-L-32			
Bore sizes (mm)		Ø 16	Ø 20	Ø 25	Ø 32
Type of operation		double-acting, parallel type			
Operating pressure (bar)		1.5 – 7 bar (22 - 102 psi)			
Operating temperature		0°C – 80°C (with dry air - 20°C) (32 - 176°F, with dry air -4°F)			
Max. operating frequency		180 cycles/min			
Lubrication		lever section - lubrication required on sliding section			
Opening stroke (mm)		Ø 16 = 6	Ø 20 = 8	Ø 25 = 14	Ø 32 = 16
Theoretical holding force* at 5 bar in N	open	Ø 16 = 24	Ø 20 = 47	Ø 25 = 75	Ø 32 = 100
	closed	Ø 16 = 18	Ø 20 = 35	Ø 25 = 60	Ø 32 = 85
Length. of max. gripping point L mm at 5 bar		40	60	80	100
Weight (g)		Ø 16 = 160	Ø 20 = 280	Ø 25 = 495	Ø 32 = 785
Repeatability		± 0,01mm			
Port sizes		M5			
Fluid		filtered air, without lubrication. If lubricated air is used, it is recommended to use oil ISO VG32. Once applied, the lubrication should never be interrupted.			

CODING EXAMPLE

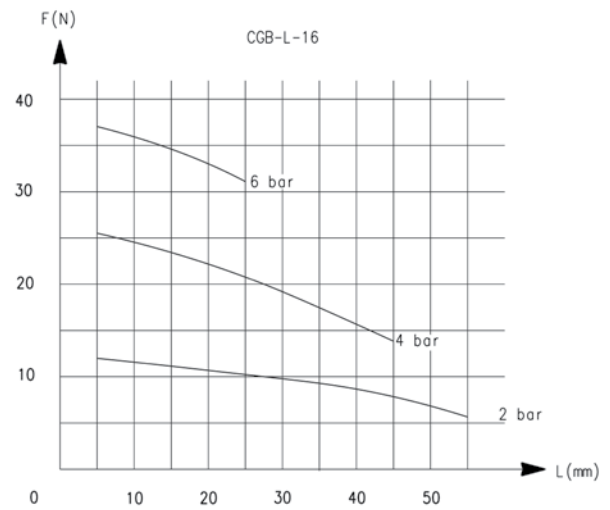
CGB	-	L	-	20
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CGB	SERIES
L	L = Wide finger position style S = Narrow finger position style (only on request)
20	SIZES 16 = ø 16 mm 20 = ø 20 mm 25 = ø 25 mm 32 = ø 32 mm

GRIPPING FORCE CHARACTERISTICS

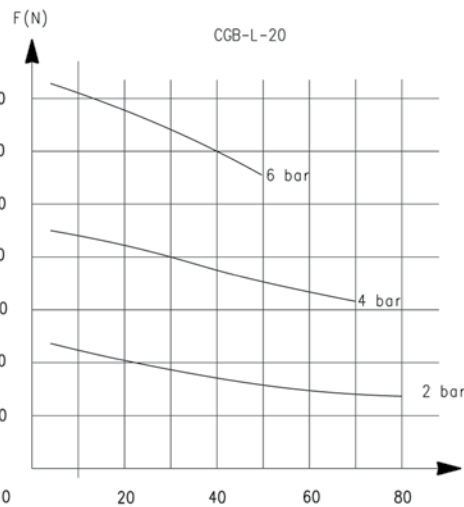


L = Gripping point length
F = Gripping Force

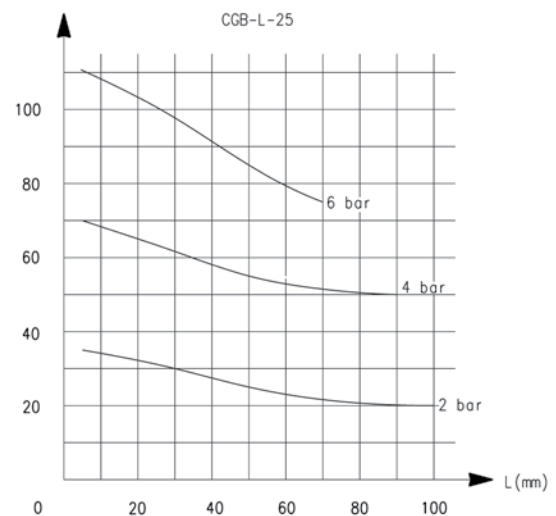


L = Gripping point length
F = Gripping Force

GRIPPING FORCE CHARACTERISTICS

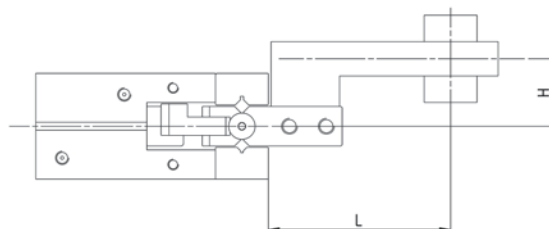
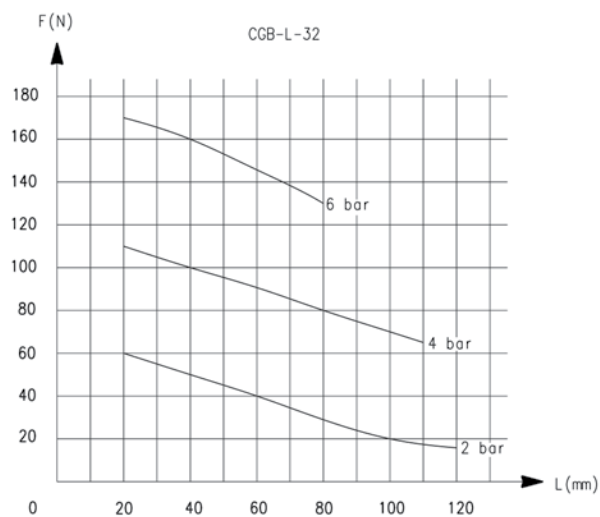


L = Gripping point length
F = Gripping Force



L = Gripping point length
F = Gripping Force

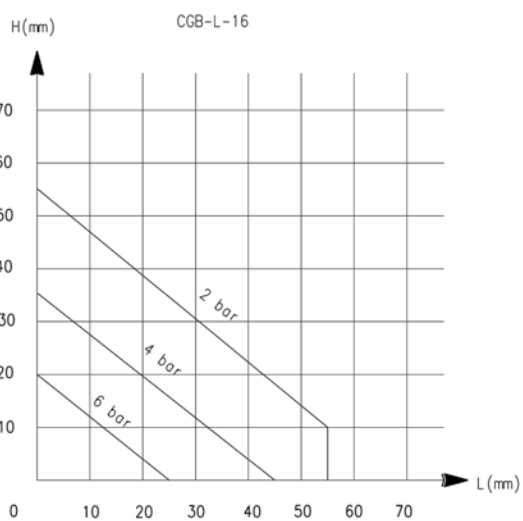
GRIPPING FORCE CHARACTERISTICS



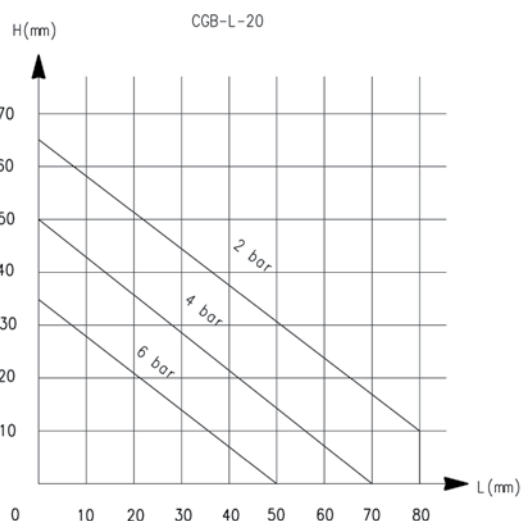
L = Gripping point length
F = Gripping Force

L = Gripping point length
F = Gripping Force

GRIPPING FORCE CHARACTERISTICS

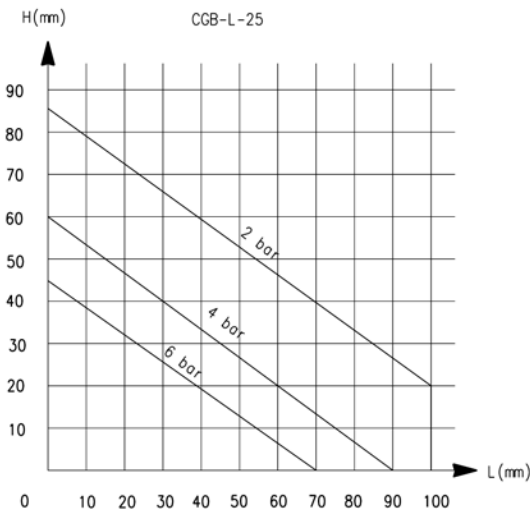


L = Gripping point length
F = Gripping Force

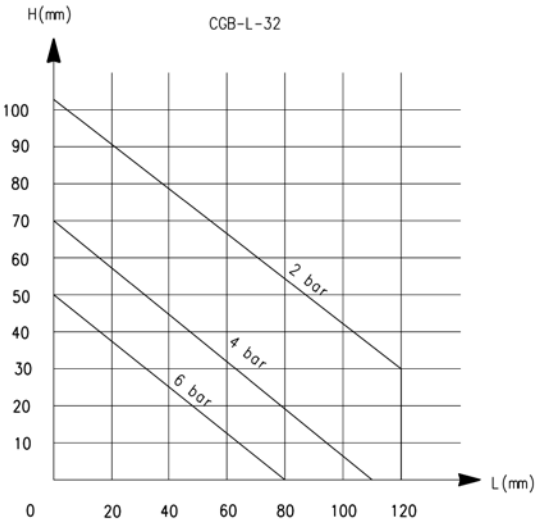


L = Gripping point length
F = Gripping Force

GRIPPING FORCE CHARACTERISTICS

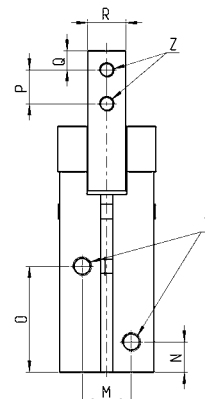
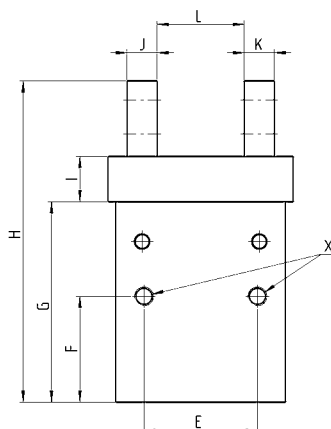
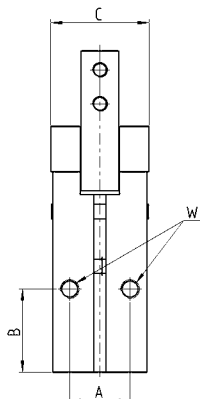
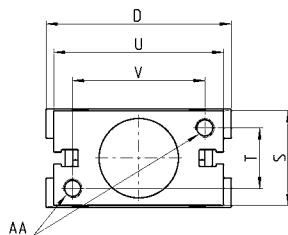


L = Gripping point length
F = Gripping Force



L = Gripping point length
F = Gripping Force

Guided parallel grippers Series CGB-L



Y = port connection
Z = claw mounting-hole
X.W.AA = Mounting hole

DIMENSIONS

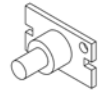
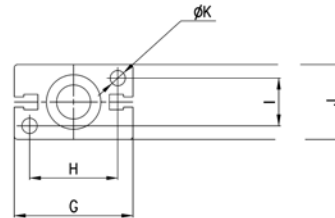
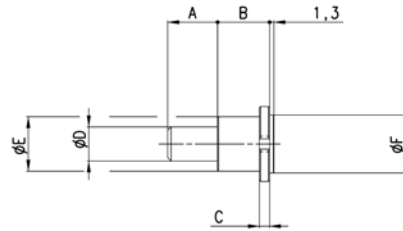
Mod.	A	B	C	D	E	F	G	H	I	J	K	L closed	L open	M	N	O	P	Q	R	S	T	U	V
CGB-L-16	14	21	22	38	24	25,5	45,5	72,5	12	6	6	18	24	12	7,5	25,5	7	4	7	22	14	34	26
CGB-L-20	16	22	26	49	30	28	53	85	12	8	8	23	31	13	8	28	9	5	10	26	16	45	35
CGB-L-25	20	24,5	32	56	36	31,5	63,5	104,5	16	10	10	20	34	18	9	31	12	6	12	32	20	52	40
CGB-L-32	26	30	40	62	44	37,5	68	116	20	10	10	24	40	24	10	33,5	14	6	15	40	26	60	46

DIMENSIONS (mm)

Mod.	X thread	X depth	Y thread	Y depth	W thread	W depth	Z thread	Z depth	AA thread	AA depth
CGB-L-16	M4	11	M5	5	M4	7	M3	-	M4	7
CGB-L-20	M5	13	M5	5	M5	8	M4	-	M5	8
CGB-L-25	M6	16	M5	5	M6	10	M5	-	M6	10
CGB-L-32	M6	20	M5	8	M6	10	M6	-	M6	10

Mounting brackets Mod. L-CGP

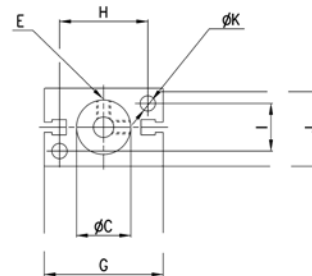
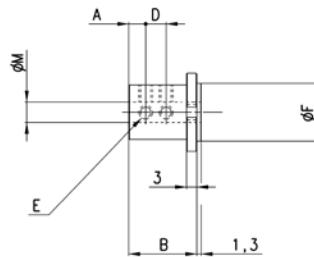
for gripper Series CGA, CGP, CGS and CGB



Mod.	A	B	C	D	E	F	G	H	I	J	K
L-CGP-16	15	15	3	10	16	17	35	26	14	22	4,5
L-CGP-20	15	15	3	10	18	21	46	35	16	26	5,5
L-CGP-25	25	17	5	14	26	26	53	40	20	32	6,6
L-CGP-32	25	20	6	16	30	34	61	46	26	40	6,6

Mounting brackets Mod. C-CGP

for gripper Series CGA, CGP, CGS and CGB

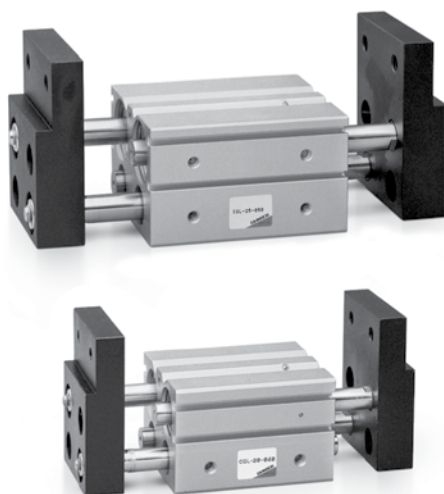


Mod.	A	B	C	D	E	F	G	H	I	J	K	M
C-CGP-16	5	20,5	16	7	M4	17	35	26	14	23	4,5	6
C-CGP-20	7	25,5	20	9	M4	21	46	35	16	27	5,5	8
C-CGP-25	8	30,5	25	10	M4	26	53	40	20	33	6,6	10
C-CGP-32	10	40,5	32	15	M4	34	61	46	26	41	6,6	12

Wide Opening Parallel Grippers Series CGL

Magnetic

Sizes 10 - 16 - 20 - 25 - 32



- » High gripping force
- » Suitable to handle pieces with different sizes
- » Wipers for protection
- » Sensor groove slot suitable for sensor model CSC

Due to the relatively long stroke of the fingers, the gripper mod. CGL is suitable to handle workpieces with different sizes. This gripper mod. CGL is equipped with rod wipers to protect against dust. The proximity switches (Mod. CSC) can be inserted in the C-shaped grooves on the body in order to detect whether the gripper is in an open or closed position.

The wide opening parallel gripper mod. CGL is available in 5 different sizes and has a compact design with a high gripping force and exists in five diameters with three different strokes. The high gripping force is obtained by means of a double piston mechanism and the fingers are synchronized by a rack and pinion mechanism.

GENERAL DATA

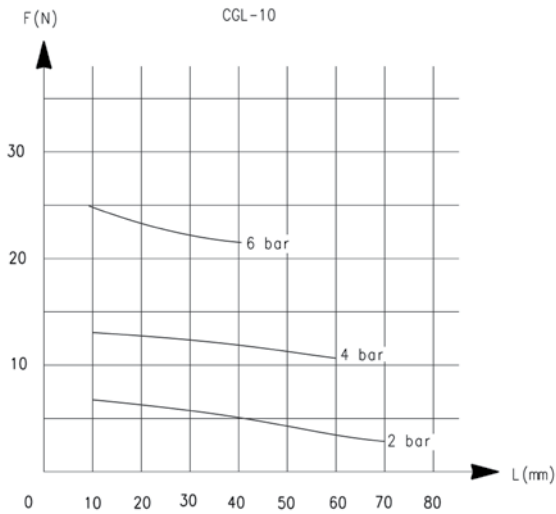
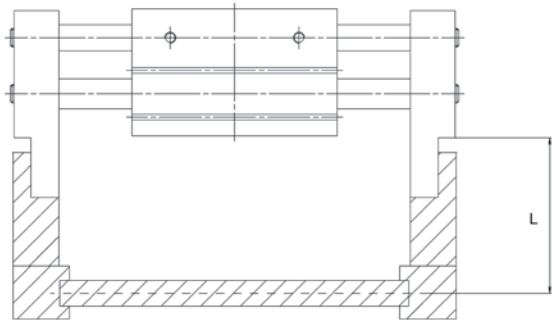
Model	CGL-10; CGL-16M; CGL-20; CGL-25; CGL-32
Bore sizes (mm)	Ø 10 - 16 - 20 - 25 - 32
Stroke	see models' tables
Type of operation	double-acting, parallel type
Operating pressure (bar)	1,5 - 7 bar (22 - 102 psi)
Operating pressure	0°C - 60°C (32°F - 140°F)
Max. operating frequency	40 cycles/min
Lubrication	with or without lubrication
Theoretical holding force (N) with a pressure of 5 bar with gripping point length 5 cm	Ø 10 = 35 N Ø 16 = 70 N Ø 20 = 105 N Ø 25 = 170 N Ø 32 = 270 N
Length of max. gripping point L with pressure of 5 bar	Ø 10 = 40 mm Ø 16 = 60 mm Ø 20 = 80 mm Ø 25 = 90 mm Ø 32 = 100 mm
Weight	see tables
Repeatability	+/- 0,1mm
Port sizes	Ø 10 - 16 - 20 - 25 = M5 Ø 32 = G1/8
Fluid	filtered air, without lubrication. If lubricated air is used, it is recommended to use oil ISO VG32. Once applied, the lubrication should never be interrupted.

CODING EXAMPLE

CGL	-	20	40
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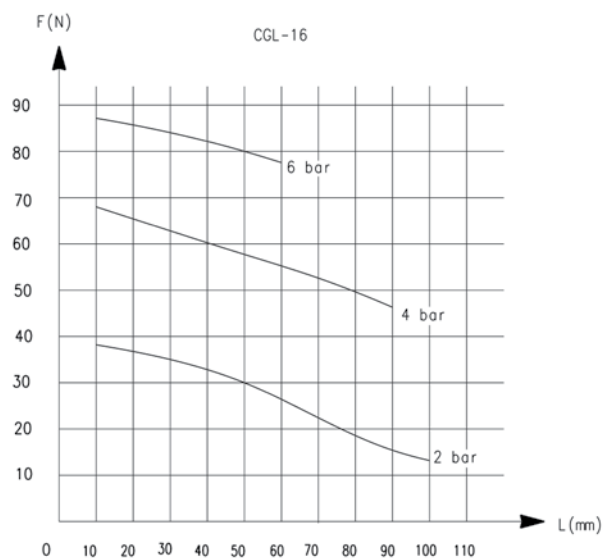
CGL	SERIES
20	SIZES 10 = ø 10 mm 16 = ø 16 mm 20 = ø 20 mm 25 = ø 25 mm 32 = ø 32 mm
40	STROKE (see dimension tables for optional strokes available)

GRIPPING FORCE CHARACTERISTICS

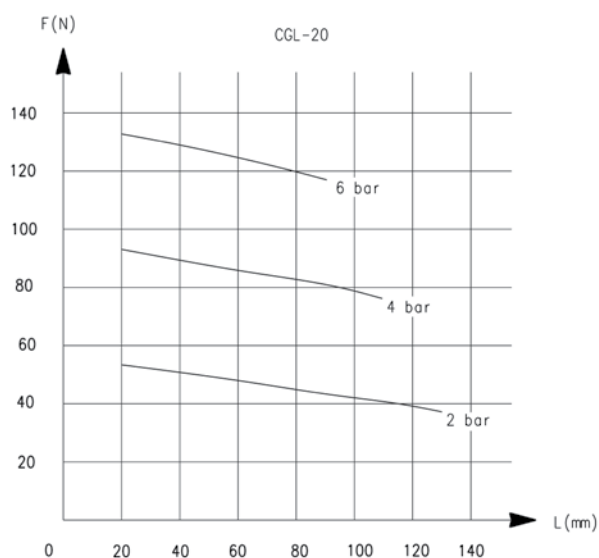


F = Gripping Force
L = Gripping point length

GRIPPING FORCE CHARACTERISTICS

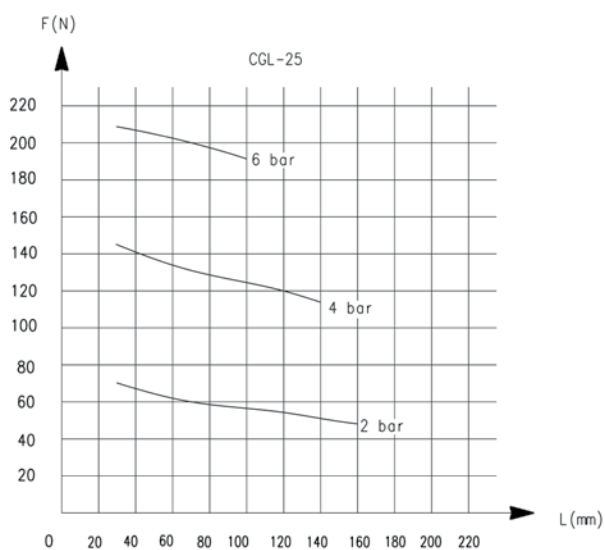


F = Gripping Force
L = Gripping point length

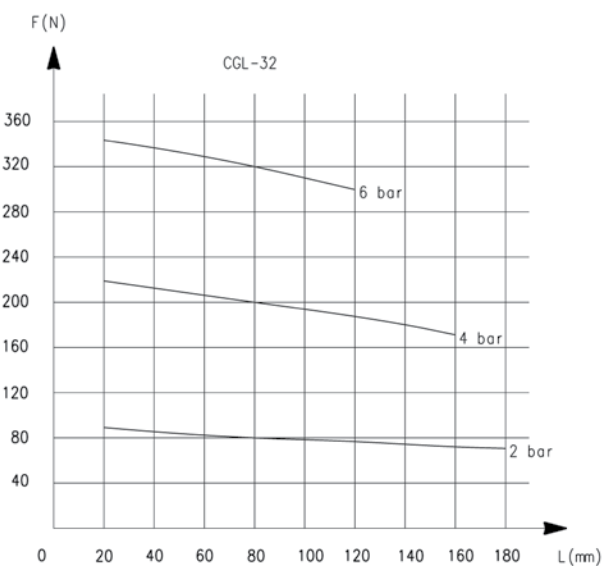


F = Gripping Force
L = Gripping point length

GRIPPING FORCE CHARACTERISTICS

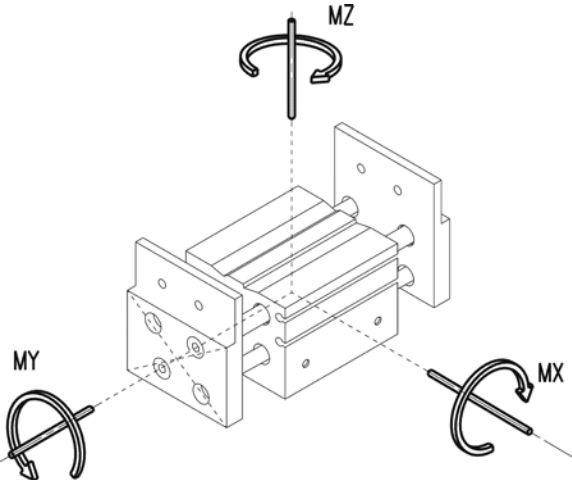


F = Gripping Force
L = Gripping point length



F = Gripping Force
L = Gripping point length

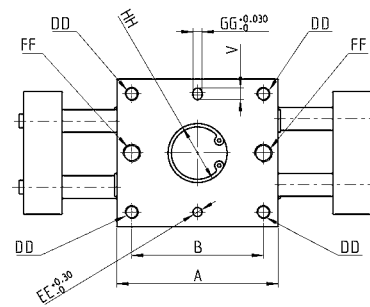
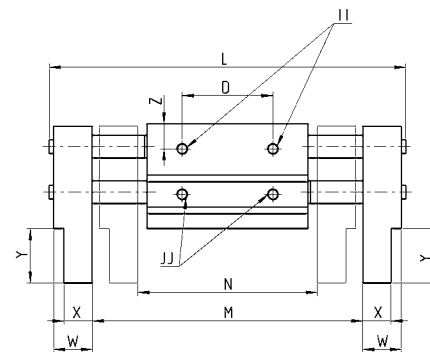
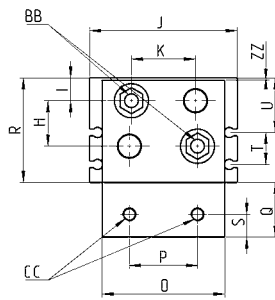
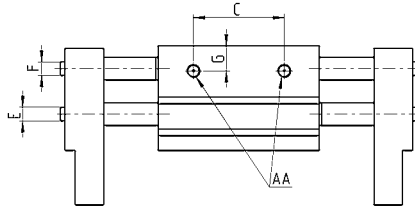
TABLE SHOWING THE LOAD PARAMETERS OF THE FINGERS



	Max. torque force permitted				
CGL-... (Nm)	10	16	20	25	32
Mx	0,86	4,68	9,6	18,6	36
My	0,51	2,80	5,76	11,16	21,6
Mz	0,56	3,04	6,24	12,1	23,4

Wide opening parallel grippers Series CGL

See the dimensions table on next page



CGL - Dimensions

DIMENSIONS (mm)																				
Mod.	A	B	C	D	L	M	N	Weight (g)	Stroke (mm)											
CGL-1020	52	36	30	30	100(80)	76	56	300	20											
CGL-1040	68	52	46	46	136(96)	112	72	360	40											
CGL-1060	86	70	64	64	174(114)	150	90	440	60											
CGL-1630	60	45	26	26	128(98)	98	68	560	30											
CGL-1660	90	75	56	56	188(128)	158	98	780	60											
CGL-1680	110	95	76	76	228(148)	198	118	1100	80											
CGL-2040	71	58	40	40	157(117)	119	79	1000	40											
CGL-2080	113	100	82	82	239(159)	201	121	1400	80											
CGL-20100	133	120	102	102	279(179)	241	141	1660	100											
CGL-2550	88	70	50	50	192(142)	146	96	1720	50											
CGL-25100	142	124	104	104	296(196)	250	150	2480	100											
CGL-25120	160	142	122	122	334(214)	288	168	3480	120											
CGL-3270	110	86	69	69	240(170)	188	118	2940	70											
CGL-32120	158	134	117	117	338(218)	286	166	4120	120											
CGL-32160	202	178	161	161	422(262)	370	210	5770	160											
Mod.	ØE	ØF	G	H	I	J	K	O	P	Q	R	S	T	U	V	W	X	Y	Z	ZZ
CGL-10	6	6	8,5	12,5	8	44	18,2	34	20	15	31	7	12	15	4	10	7	15	8,5	0,5
CGL-16	8	8	9,5	16,5	9	55	22,6	43	25	19	39	8	14	19	4	13	9	19	9,5	0,5
CGL-20	10	10	11	20	10	65	28	54	30	24	46	10	14	24	5	17	12,5	24	11	0,6
CGL-25	12	12	12	24	11	76	33,2	64	40	29	52	12	20	26	6	21	14	29	12	1
CGL-32	16	14	15,5	30	14,5	82	32,2	70	42	32	68	15	25	33	7	24	15	32	15,5	1
	AA	AA	BB	BB	CC	CC	DD	DD	ØEE	ØEE	ØFF	ØFF	ØGG	ØGG	HH	HH	II	II	JJ	JJ
Mod.	Thread	Depth	Thread	Depth	Thread	Depth	Thread	Depth	Thread	Depth	Thread	Depth	Thread	Depth	Thread	Depth	Thread	Depth	Thread	Depth
CGL-10	M5	6	M5	-	M4	-	M4	5	3	3	M5	7	3	3	19	-	M5	6	M5	-
CGL-16	M5	7	M6	-	M5	-	M5	8	3	3	M6	10	3	3	24	-	M5	7	M5	-
CGL-20	M5	6	M6	-	M6	-	M6	9	4	4	M8	10	4	4	26	-	M5	8	M5	-
CGL-25	M5	6	M8	-	M8	-	M8	10	5	4	M10	15	5	4	28	-	M5	6	M5	-
CGL-32	M6	8	M10	-	M10	-	M8	10	6	6	M10	13	6	6	26	-	-	-	G1/8	-

3-Finger Centric Grippers Series CGC

Magnetic

Sizes 50 - 64 - 80 - 100 - 125



- » Compact design
- » High gripping force
- » Long stroke

The proximity switches can be inserted in the U-shaped grooves on the body in order to detect whether the gripper is in an open or closed position.

The 3-finger centric gripper Mod. CGC is available in 5 different sizes.

Significant for Mod. CGC is the compact design that allows the combination of a high gripping force and long stroke.

The piston is equipped with permanent magnet for the use of magnetic proximity switches mod. CSB.

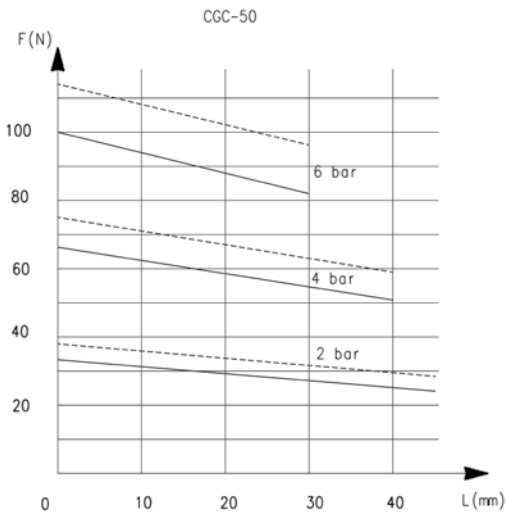
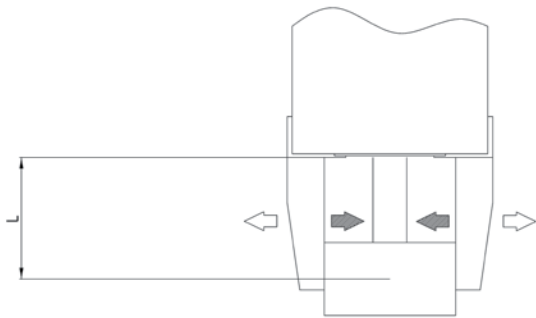
GENERAL DATA

Model	CGC-50; CGC-64; CGC-80; CGC-100; CGC-125	
Bore sizes	Ø 32 Ø 45 Ø 58 Ø 77 Ø 98	
Type of operation	double-acting	
Materials	housing: high tensile special hard-coated aluminium alloy, Functional parts: hardened steel	
Operating pressure (bar)	2 – 7 bar (29 - 102 psi)	
Operating temperature	5°C – 60°C (41°F - 140°F)	
Repeatability	± 0,05 mm	
Max. operating frequency	60 cycles/min	
Lubrication	lever section	lubrication required on sliding section
Theoretical holding force (N) with gripping point at 30 mm with 5 bar opening	Ø 32 = 78, Ø 45 = 185 Ø 58 = 340, Ø 77 = 580 Ø 98 = 940	
Theoretical holding force (N) with gripping point at 30 mm with 5 bar closing	Ø 32 = 68, Ø 45 = 160 Ø 58 = 290, Ø 77 = 510 Ø 98 = 860	
Weight (g)	Ø 32 = 230, Ø 45 = 410 Ø 58 = 800, Ø 77 = 1400 Ø 98 = 2400	
Stroke per finger (mm)	Ø 32 = 4, Ø 45 = 6 Ø 58 = 8, Ø 77 = 10 Ø 98 = 13	
Port sizes	Ø 32- 45 -58 - M5 Ø 77 - Ø 98 -G1/8	
Fluid	filtered air without lubrication. If lubricated air is used, it is recommended to use oil ISO VG32. Once applied, the lubrication should never be interrupted.	

CODING EXAMPLE

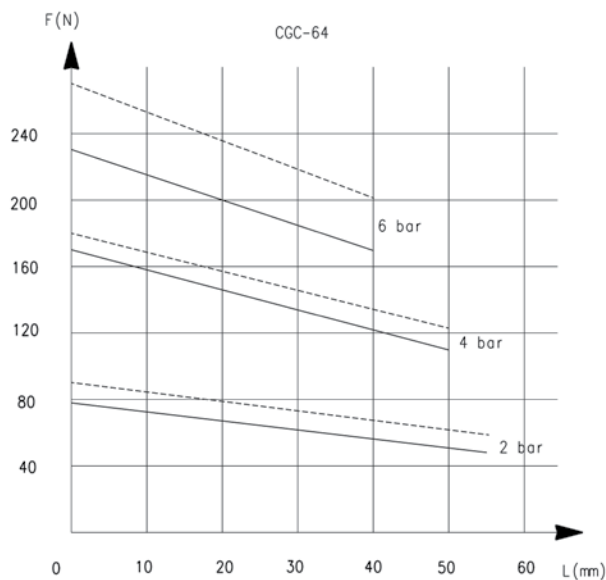
CGC	-	050
CGC	SERIES	
050	SIZE 050 = 32 mm 064 = 45 mm 080 = 58 mm 100 = 77 mm 125 = 98 mm	

GRIPPING FORCE CHARACTERISTICS

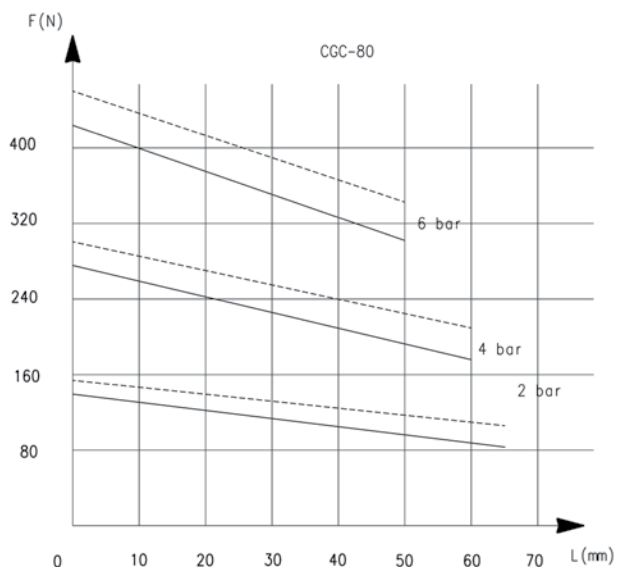


F = Gripping Force
L = Gripping point length

GRIPPING FORCE CHARACTERISTICS

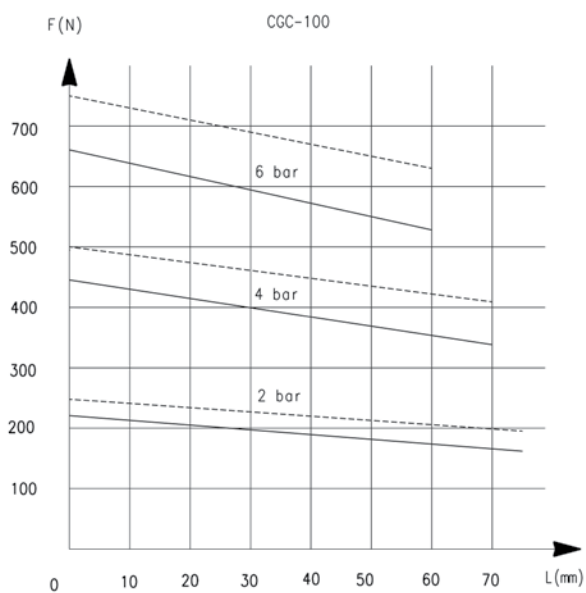


F = Gripping Force
L = Gripping point length

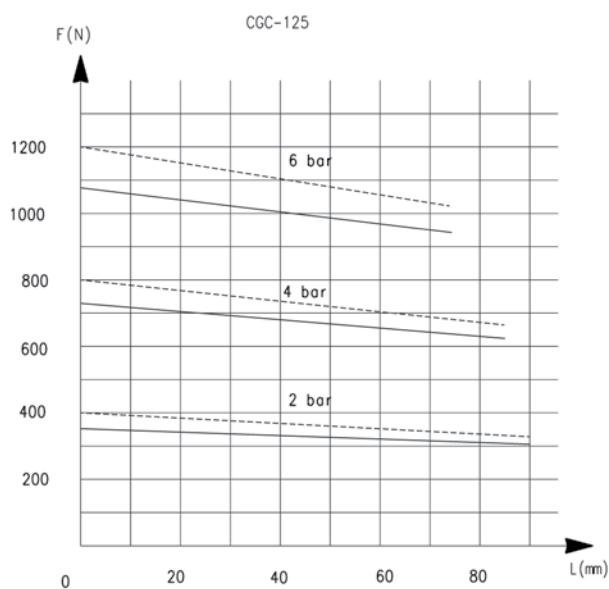


F = Gripping Force
L = Gripping point length

GRIPPING FORCE CHARACTERISTICS

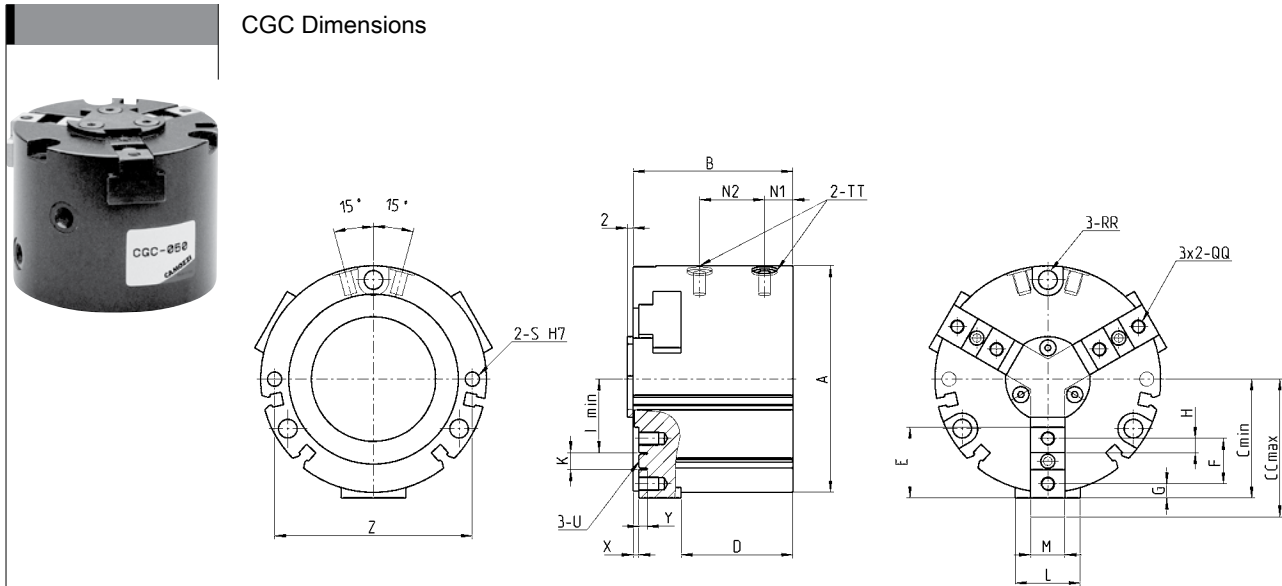


F = Gripping Force
L = Gripping point length



F = Gripping Force
L = Gripping point length

CGC Dimensions

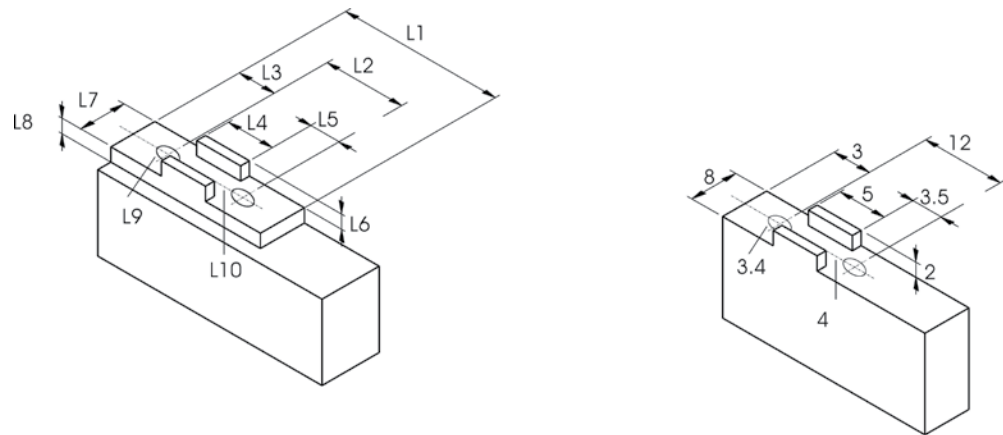


DIMENSIONS (mm)

Mod.	A	B	C	CC	D	E	F	G	H	I	K	L	M	N1	N2	RR	QQ	S	TT	U	X	Y	Z	Weight (g)
CGC-050	50	39	26,5	30,5	27	18	12	3	3,5	15	5	14	8	9	13,5	Ø 3,4	M3x0,5	Ø 3	M5	Ø 4	1	2	44	230
CGC-064	64	47,5	32	38	32	20	13	4	4	19	5	18	10,2	10	16	Ø 5,5	M4x0,7	Ø 4	M5	Ø 4	2	2,5	56	410
CGC-080	80	56,5	42	50	39,5	25	16	5	5	26	6	23	12,2	10	23	Ø 6,6	M5x0,8	Ø 5	M5	Ø 5	2	3	70	800
CGC-100	100	65	52	62	45,5	32	20	6	6	32	8	27	14,2	12	25	Ø 6,6	M6x1	Ø 5	G 1/8	Ø 6	3	3	90	1400
CGC-125	125	76	65,5	78,5	52	40	24	8,5	8	41	8	30	16,2	13,5	27,5	Ø 9	M6x1	Ø 6	G 1/8	Ø 6	3	3,5	112	2400

CGC Dimensions

Dimensions for external mounting support



DIMENSIONS (mm)

Mod.	L1	L2	L3	L4	L5	L6	L7	L8	ØL9	L10	L11	L12	L13
CGC-050	18,5	12	4	5	3,5	2	8	3	3,4	4	26	50	18
CGC-064	20	13	4	5	4	2,5	10,2	4,5	4,5	4	32	64	18
CGC-080	25	16	5	6	5	3	12,2	5,5	5,5	5	41	80	23
CGC-100	32	20	6	8	6	3	14,2	5,5	6,6	6	51	100	27
CGC-125	40	24	8,5	8	8	3,5	16,2	5,5	6,6	6	60	125	30

Magnetic Proximity Switches Series CSB and CSC

Reed switches



- » Mod. CSB for direct mounting on all gripper series, except gripper CGL
- » Mod CSG for direct mounting on series CGL grippers

The reed switch that has a mechanical switching element, is suitable for voltages, AC and DC up to 110 V. Proximity switches mod. CSC are suitable for gripper mod. CGL. The proximity switches are impregnated in a sealed isolating cover. These sensors are designed to fit into the grooves provided in the profile barrel of the grippers. For electrical connections see schemes.

The magnetic proximity switches CSB/CSC define the position of the magnetic piston. When the internal contact is actuated by a magnetic field, the sensors complete an electrical circuit and provide an output signal to actuate directly a solenoid valve or a PLC. A red Led shows when the internal magnetic contact is closed.

GENERAL DATA

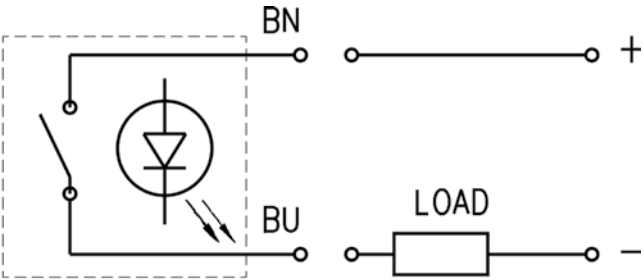
Model	CSB-220 CSC-220
Operation	Reed contact
Voltage	3 – 110 V AC/DC
Protection	IP66
Material	Plastic body encapsulating epoxy resin
Mounting	directly into the groove
Signalling	by means of LED (red)
Electrical connections	2 x 0,14 cable (2 m)
Switching current	3 – 50 mA
Max. load	8 W, 10 VA
Switching time	<1 ms (1/1000 sec)
Operating temperature	-10°C – 60°C (14°F - 140°F)
Type of contact	Normally Open
Weight	18 g
Protection circuit	None
Output	-

CODING EXAMPLE

CS	B	-	D	-	2	20
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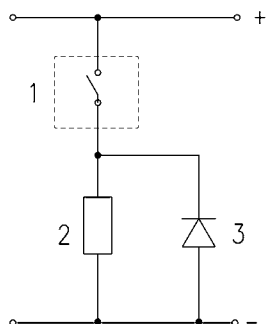
CS	SERIES
B	B = Square shape C = Round shape
D	D = straight lead H = lead 90°
2	2 = reed
20	20 = 2 wires (only reed)

ELECTRICAL CONNECTORS



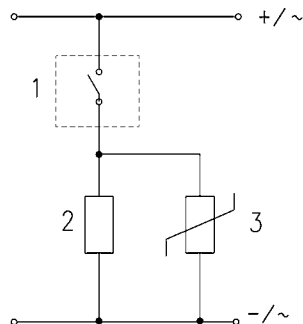
BN = brown
BU = blue

Electric circuits with protection against voltage spikes



There is no protection on the Reed sensors on the inductive load, therefore it is advisable to use electric circuits with protection against the voltage spikes: the first for direct current (DC), the second for alternating current (AC).

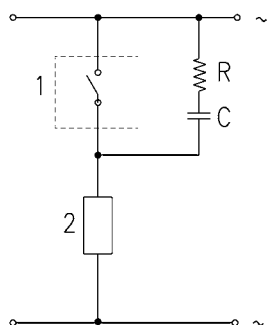
1 = Reed sensor
2 = Load
3 = Diode / Varistor



When the wire length of sensor connection load is more than 10m, inductors shall be installed in series near the sensor to avoid ripple.

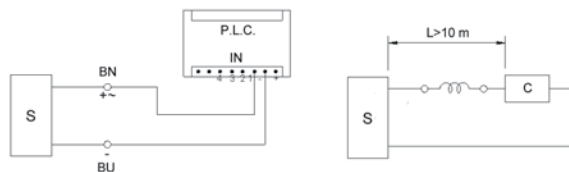
1 = Reed sensor
2 = Load
R = Resistor
C = Capacitor

Electric circuits with protection against voltage spikes



There is no protection on the Reed sensors on the inductive load, therefore it is advisable to use electric circuits with protection against the voltage spikes.

BN = Brown
BU = Blue
C = Load



When the wire length of sensor connection load is more than 10m, inductors shall be installed in series near the sensor to avoid ripple.

BN = Brown
BU = Blue
C = Load

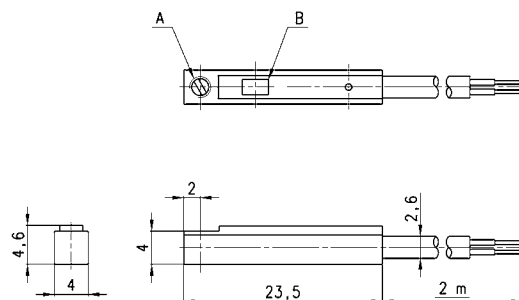
When L is more than 10mt. the cable has to be considered as an inductive load.

CSB - D - 220



Mod.

CSB-D-220

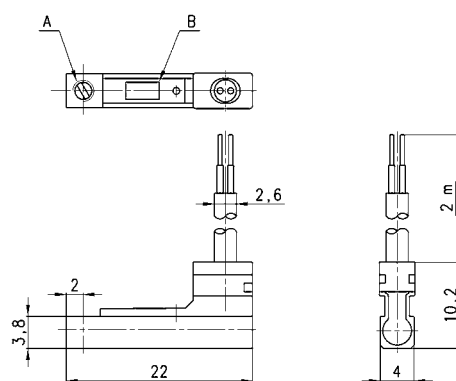


CSB - H - 220



Mod.

CSB-H-220

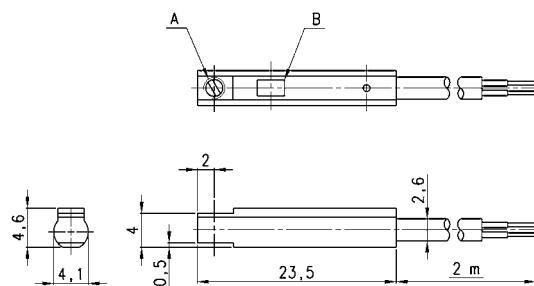


CSC - D - 220



Mod.

CSC-D-220



CSC - H - 220



Mod.

CSC-H-220

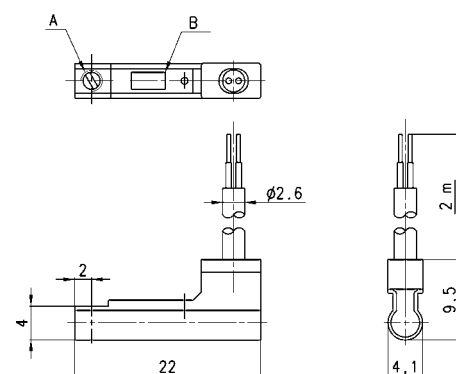


TABLE SHOWING THE COMPATIBILITY OF MAGNETIC PROXIMITY SWITCHES BY CYLINDER SERIES

Series	Ø	CST - CSH	CSV	CSB-D-220 / CSB-H-220	CSC-D-220 / CSB-H-220	CSN
24 - 25	16	S-CST-02				
	20	S-CST-03				
	25	S-CST-04				
27	20	S-CST-03				
	25	S-CST-04				
	32	S-CST-18				
	40	S-CST-19				
	50	S-CST-20				
	63	S-CST-21				
31	12	Direct mounting				
	16	Direct mounting				
	20	Direct mounting				
	25	Direct mounting				
	32	Direct mounting				
	40	Direct mounting				
	50	Direct mounting				
	63	Direct mounting				
	80	Direct mounting				
	100	Direct mounting				
32	20	Direct mounting				
	25	Direct mounting				
	32	Direct mounting				
	40	Direct mounting				
	50	Direct mounting				
	63	Direct mounting				
	80	Direct mounting				
40	160	S-CST-28				S21
	200	S-CST-28				S21
	250					S21
	160					S53
	200					S53
42	32	S-CST-18				
	40	S-CST-19				
	50	S-CST-20				
	63	S-CST-21				
50	16		Direct mounting			
	25		Direct mounting			
	32	S-CST-01				
	40	S-CST-01				
	50	S-CST-01				
	63	S-CST-01				
	80	S-CST-01				
52	25	Direct mounting				
	32	Direct mounting				
	40	Direct mounting				
	50	Direct mounting				
	63	Direct mounting				
60	32	S-CST-25				Direct mounting
	40	S-CST-25				Direct mounting
	50	S-CST-25				Direct mounting
	63	S-CST-25				Direct mounting
	80	S-CST-26				Direct mounting
	100	S-CST-26				Direct mounting
	125	S-CST-27				S21
60 + 45N	32	S-CST-45N1				
	40	S-CST-45N1				
	50	S-CST-45N1				
	63	S-CST-45N1				
	80	S-CST-45N2				
	100	S-CST-45N2				

TABLE SHOWING THE USE OF CAMOZZI MAGNETIC PROXIMITY SWITCHES

Series	Ø	CST - CSH	CSV	CSB-D-220 / CSB-H-220	CSC-D-220 / CSC-H-220
61	32	Direct mounting			
	40	Direct mounting			
	50	Direct mounting			
	63	Direct mounting			
	80	Direct mounting			
	100	Direct mounting			
	125	Direct mounting			
62	32	Direct mounting (CSH only)			
	40	Direct mounting (CSH only)			
	50	Direct mounting (CSH only)			
	63	Direct mounting (CSH only)			
	80	Direct mounting (CSH only)			
	100	Direct mounting (CSH only)			
69	32	Direct mounting			
	40	Direct mounting			
	50	Direct mounting			
	63	Direct mounting			
	80	Direct mounting			
	100	Direct mounting			
	125	Direct mounting			
90	32	S-CST-25			
	40	S-CST-25			
	50	S-CST-25			
	63	S-CST-25			
	80	S-CST-26			
	100	S-CST-26			
	125	S-CST-27			
92	32	S-CST-06			
	40	S-CST-07			
	50	S-CST-08			
	63	S-CST-09			
94	16	S-CST-05			
	20	S-CST-05			
94/95	25	S-CST-05			
CGA	10			Direct mounting	
	16			Direct mounting	
	20			Direct mounting	
	25			Direct mounting	
	32			Direct mounting	
CGB	16			Direct mounting	
	20			Direct mounting	
	25			Direct mounting	
	32			Direct mounting	
CGC	50			Direct mounting	
	64			Direct mounting	
	80			Direct mounting	
	100			Direct mounting	
	125			Direct mounting	
CGL	10				Direct mounting
	16				Direct mounting
	20				Direct mounting
	25				Direct mounting
	32				Direct mounting
CGP	10			Direct mounting	
	16			Direct mounting	
	20			Direct mounting	
	25			Direct mounting	
	32			Direct mounting	
CGS	16			Direct mounting	
	20			Direct mounting	
	25			Direct mounting	
	32			Direct mounting	

TABLE SHOWING THE USE OF CAMOZZI MAGNETIC PROXIMITY SWITCHES

Series	Ø	CST - CSH	CSV	CSB-D-220 CSB-H-220	CSC-D-220 CSC-H-220
QC	20	Direct mounting			
	25	Direct mounting			
	32	Direct mounting			
	40	Direct mounting			
	50	Direct mounting			
	63	Direct mounting			
	80	Direct mounting			
QP-QPR	12		Direct mounting		
	16		Direct mounting		
	20	S-CST-01			
	25	S-CST-01			
	32	S-CST-01			
	40	S-CST-01			
	50	S-CST-01			
	63	S-CST-01			
	80	S-CST-01			
	100	S-CST-01			
QCBF	20	Direct mounting			
	25	Direct mounting			
	32	Direct mounting			
	40	Direct mounting			
QCTF	20	Direct mounting			
	25	Direct mounting			
	32	Direct mounting			
	40	Direct mounting			
QX	10				Direct mounting
	16				Direct mounting
	20				Direct mounting
	25				Direct mounting
	32				Direct mounting

6 Hydro-Checks and Shock-Absorbers

Page

Series 43		Hydrochecks	318
Series SA		Shock Absorbers	326

Hydrochecks Series 43

6

Bore $\varnothing$ 40

Regulated thrust or return stroke

Skip-Stop function



The Series 43 hydrocheck units are available with two different types of control: regulated outward movement and fast return; or fast outward movement and regulated return. These hydrochecks come complete with an oil surge tank which ensures automatic equalization. Speed variation is obtained by means of an incorporated flow regulator designed to allow comprehensive and constant use.

Upon request, they can be supplied with an incorporated stop valve or an acceleration valve or both. To restore oil when the minimum level in the surge tank is reached, use oil OLIR-40 and pump Mod. 43N-PMP.

GENERAL DATA

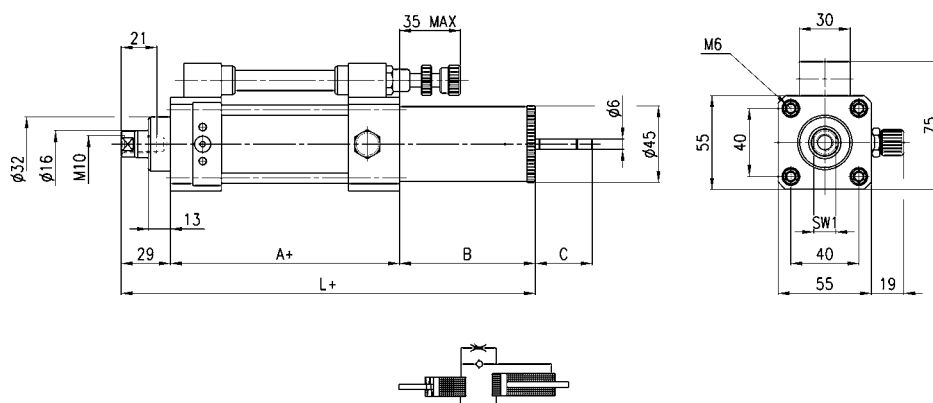
Type of construction	with tie-rods
Operation	regulated thrust or return stroke
Controllable load	max. 500 kg (including inertia or moving masses)
Operating temperature	-10°C +70°C (14°F - 158°F)
Fluid	special hydraulic oil (contact our engineers)
Speed	minimum: 14mm/min maximum: 15 m/min (in non regulated direction)
Standard stroke	50, 100, 150, 200 (special stroke available on request)
Type of mounting	feet Mod. B-40 (see B-41-40 for dimensions)
Special designs	with STOP or SKIP and SKIP/STOP valve

CODING EXAMPLE

43	N	-	P	S	0	-	40	-	200
----	---	---	---	---	---	---	----	---	-----

43	SERIES
N	N = standard S = special
P	L = in-line tank P = parallel tank
S	S = thrust (hydrocheck's rod return regulated) T = traction (hydrocheck's rod thrust regulated)
0	A = SKIP valve B = SKIP + STOP valve V = STOP valve 0 = standard
40	BORE: 40 mm
200	STROKE in mm.

Hydrochecks Mod. 43N-LTO-40



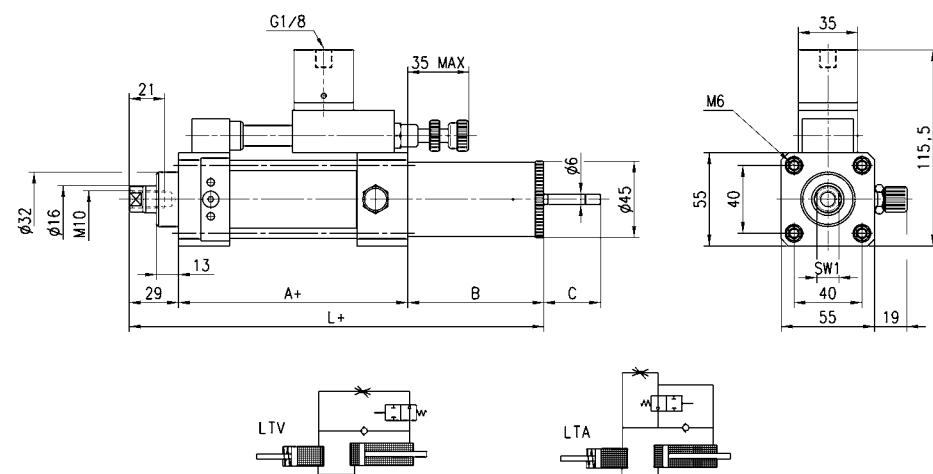
+ = add the stroke

DIMENSIONS (mm)

Mod.	Strokes (mm)	A+	B	C	L+	SW1
43N-LTO-40	50-100	85	80	32	194	13
43N-LTO-40	150-200	85	100	47	214	13

Hydrochecks Mod. 43N-LTA-40 and 43N-LTV-40

On request



+ = add the stroke

DIMENSIONS (mm)

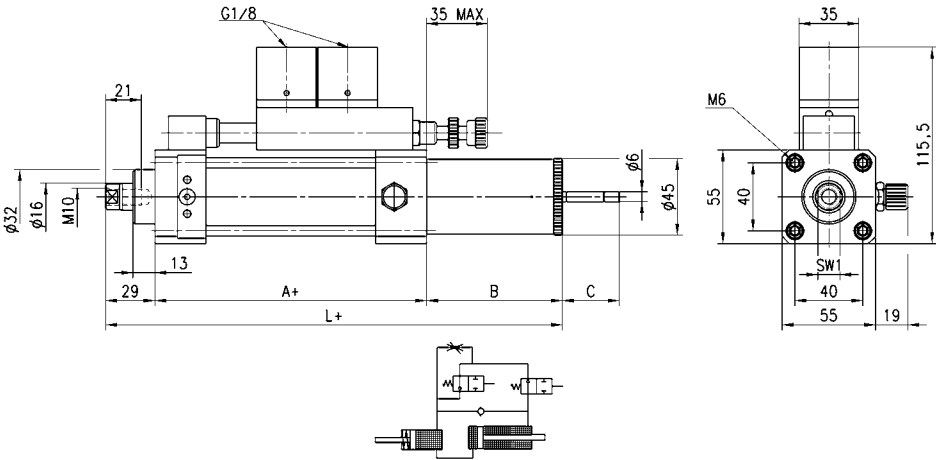
Mod.	Strokes (mm)	A+	B	C	L+	SW1
43N-LTA-40	50-100	85	80	32	194	13
43N-LTA-40	150-200	85	100	47	214	13
43N-LTV-40	50-100	85	80	32	194	13
43N-LTV-40	150-200	85	100	47	214	13



Hydrochecks Mod. 43N-LTB-40

On request

+ = add the stroke



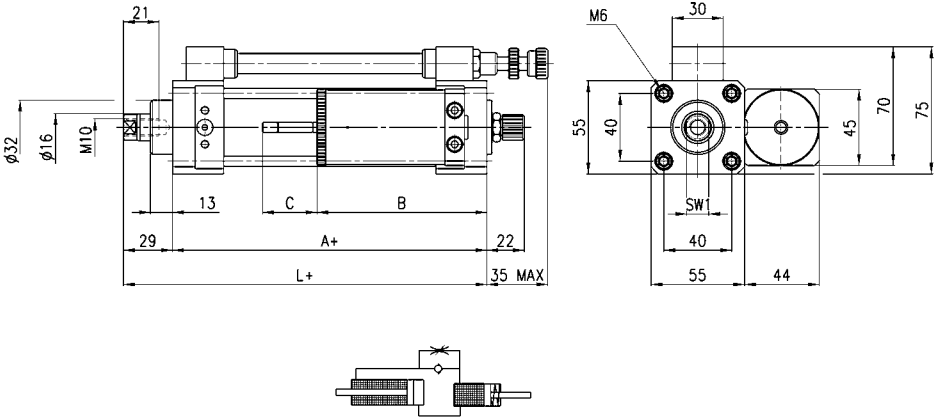
DIMENSIONS (mm)						
Mod.	Strokes (mm)	A+	B	C	L+	SW1
43N-LTB-40	50-100	85	80	32	194	13
43N-LTB-40	150-200	85	100	47	214	13



Hydrochecks Mod. 43N-PTO-40

On request

+ = add the stroke



DIMENSIONS (mm)						
Mod.	Strokes (mm)	A+	B	C	L+	SW1
43N-PTO-40	50	85	100	32	114	13
43N-PTO-40	100	85	105	32	114	13
43N-PTO-40	150-200	85	125	47	114	13

The company reserves the right to vary models and dimensions without notice.
These products are designed for industrial applications and are not suitable for sale to the general public.

[illegible]

DIMENSIONS (mm)						
Mod.	Strokes (mm)	A+	B	C	L+	SW1
43N-PTA-40	50	85	100	32	114	13
43N-PTA-40	100	85	105	32	114	13
43N-PTA-40	150-200	85	125	47	114	13
43N-PTV-40	50	85	100	32	114	13
43N-PTV-40	100	85	105	32	114	13
43N-PTV-40	150-200	85	125	47	114	13

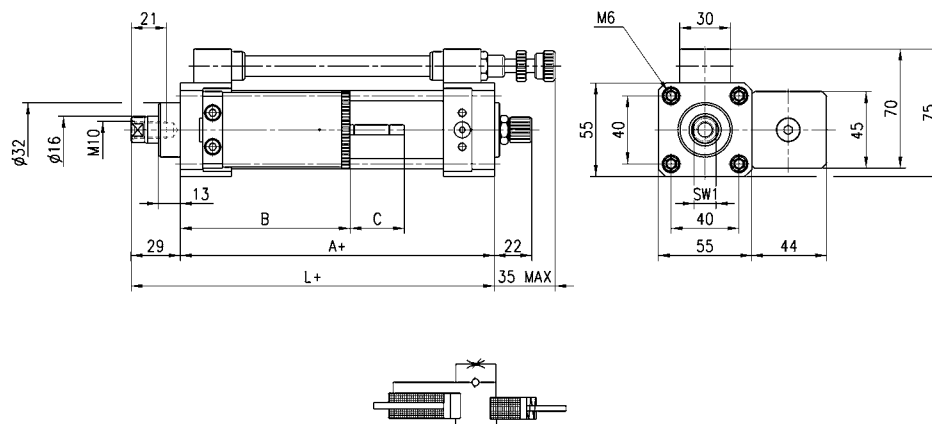
[illegible]

DIMENSIONS (mm)						
Mod.	Strokes (mm)	A+	B	C	L+	SW1
43N-PTB-40	50	85	100	32	114	13
43N-PTB-40	100	85	105	32	114	13
43N-PTB-40	150-200	85	125	47	114	13

Hydrochecks Mod. 43N-PSO-40



+ = add the stroke



DIMENSIONS (mm)

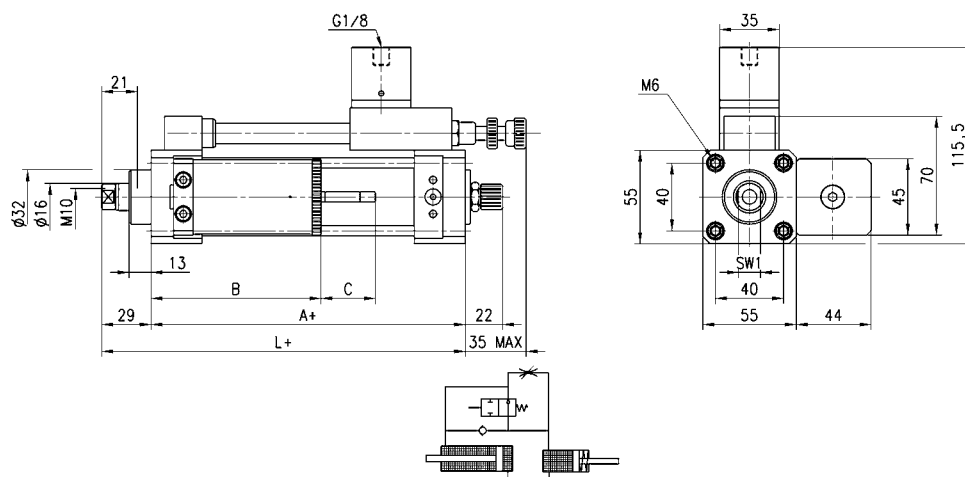
Mod.	Strokes (mm)	A+	B	C	L+	SW1
43N-PSO-40	50	85	100	32	114	13
43N-PSO-40	100	85	105	32	114	13
43N-PSO-40	150-200	85	125	47	114	13

Hydrochecks Mod. 43N-PSA-40 and 43N-PSV-40

On request



+ = add the stroke



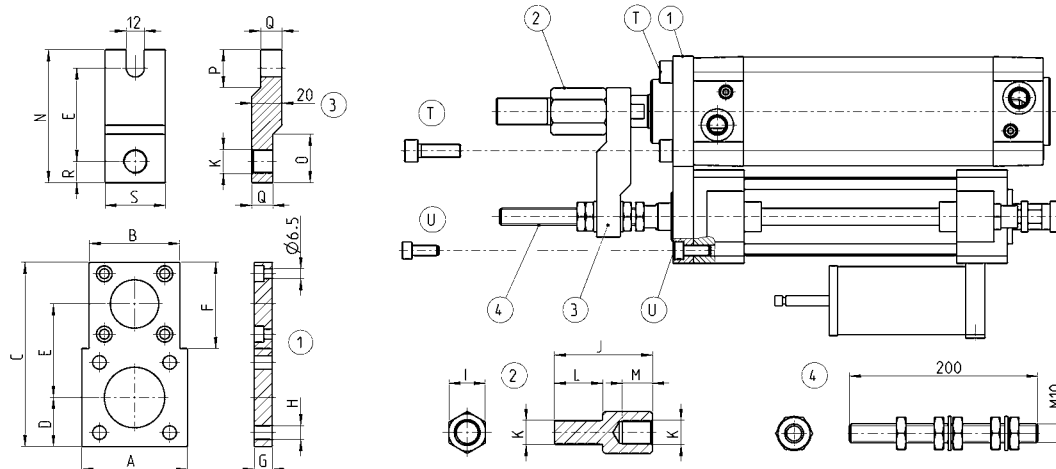
DIMENSIONS (mm)

Mod.	Strokes (mm)	A+	B	C	L+	SW1
43N-PSA-40	50	85	100	32	114	13
43N-PSV-40	50	85	100	32	114	13
43N-PSA-40	100	85	105	32	114	13
43N-PSV-40	100	85	105	32	114	13
43N-PSA-40	150-200	85	125	47	114	13
43N-PSV-40	150-200	85	125	47	114	13

[illegible]

DIMENSIONS (mm)						
Mod.	Strokes (mm)	A+	B	C	L+	SW1
43N-PSB-40	50	85	100	32	114	13
43N-PSB-40	100	85	105	32	114	13
43N-PSB-40	150-200	85	125	47	114	13

Hydrocheck mounting kit for cylinders Ø 40 - 50 - 63 - 80.



DIMENSIONS (mm)																			
Mod.	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
43N-40-40	60	-	110	26,5	56	-	12	7	19	47	M12X1,25	24	14	80	25	25	14	12	40
43N-40-50	70	60	122	32,5	62	57	12	9	24	65	M16X1,5	32	20	88	32	25	14	14	40
43N-40-63	80	60	132	37,5	67	57	20	9	24	65	M16X1,5	32	20	93	32	25	14	14	40
43N-40-80	100	60	152	47,5	77	57	20	11	30	78	M20X1,5	40	25	107	-	-	-	18	50



Hydrocheck restore pump Mod. 43N-PMP
Pump for refilling hydraulic speed regulator

Mod.
43N-PMP

Shock Absorbers

Series SA

6

M8x1 - M10x1 - M12x1 - M14x1,5 - M20x1,5 - M25x1,5 - M27x1,5
Self compensating



- » Suitable for different applications
- » Usable with or without a stop collar
- » Self compensating

By using shock absorber Series SA, following advantages would be provided.

- Increased production rate
- Reduced maintenance costs
- Reduce noise and vibration
- Extended life time of the machine.

Shock absorbers Series SA exist in 7 different sizes and are used to provide impact and noise absorption when stopping objects in motion. Series SA is of a self compensating type which makes it suitable for different applications such as low load/high speed or high load/low speed applications without requiring any additional adjustments on the shock absorber.

Series SA is designed so it can be used with or without a stop collar.

GENERAL DATA

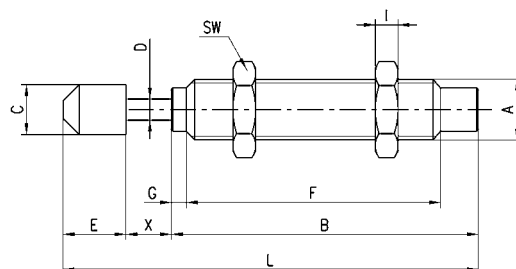
Model	SA - 0806 SA - 1007 SA - 1210 SA - 1412 SA - 2015 SA - 2525 SA - 2725
Type of construction	Hydraulic shock absorber, self compensating
Materials	Body: steel, black coated Piston rod: carbon steel chrome plated Piston: carbon steel Sealings: NBR
Threaded body	M8x 1 M10x 1 M12 x 1 M14x 1,5 M20x 1,5 M25x 1,5 M27x 1,5
Absorption stroke (mm)	6 7 10 12 15 25 25
Max. Energy absorption per cycle, Et (Nm)	3 6 12 20 59 80 147
Max. Energy absorption per hour, ETc, (Nm)	7000 12400 22500 33000 38000 60000 72000
Max. effective mass Me (kg)	6 12 22 40 120 180 270
Max N° cycles per minute	80 70 40 70 45 20 10
Impact speed, v (m/s)	0,3 - 2,5 0,3 - 3,5 0,3 - 4,0 0,3 - 5,0
min. - max.	0,3 - 5,0 0,3 - 5,0 0,3 - 5,0
Weight (g)	15 25 32 65 150 295 360
Working temperature (°C)	-10°C – +80°C (14°F - 176°F)

CODING EXAMPLE

SA	-	2015	
----	---	------	--

SA	SERIES
0806	SIZE/STROKE 0806 = Size M8 x 1 / Stroke 6 mm 1007 = Size M10 x 1 / Stroke 7 mm 1210 = Size M12 x 1 / Stroke 10 mm 1412 = Size M14 x 1,5 / Stroke 12 mm 2015 = Size M20 x 1,5 / Stroke 15 mm 2525 = Size M25x 1,5 / Stroke 25 mm 2725 = Size M27 x 1,5 / Stroke 25 mm
	VERSION = standard, with cap W = Without cap (on request)

Shock Absorbers Series SA



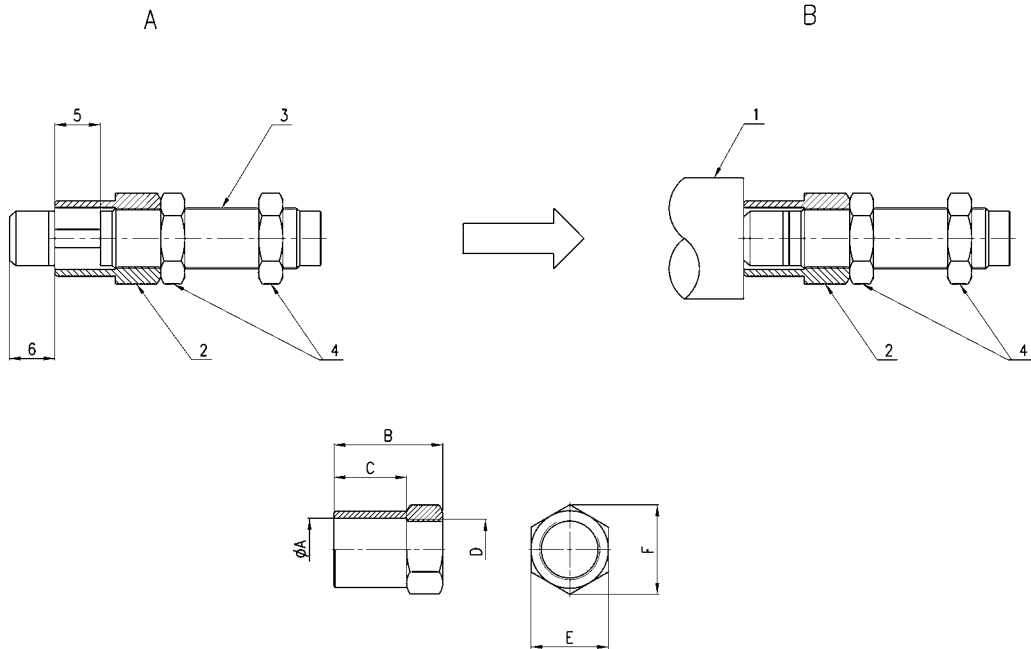
DIMENSIONS (mm)

Mod.	A	B	C	D	E	F	G	I	L	SW	X
SA-0806W	M8X1	40,6	-	2,8	-	33,6	2	3	-	11	6
SA-0806	M8X1	40,6	6,6	2,8	8,5	33,6	2	3	55,2	11	6
SA-1007W	M10X1	47	-	3	-	39	3	3	-	12,7	7
SA-1007	M10X1	47	8,6	3	8,6	39	3	3	62,6	12,7	7
SA-1210W	M12X1	50	-	3	-	45,5	-	4	-	14	10
SA-1210	M12X1	50	10,3	3	8,5	45,5	-	4	68,5	14	10
SA-1412W	M14X1,5	67	-	4	-	58	4	6	-	19	12
SA-1412	M14X1,5	67	12	4	11	58	4	6	90	19	12
SA-2015W	M20X1,5	73	-	6	-	62	4	8	-	26	15
SA-2015	M20X1,5	73	18	6	15	62	4	8	103	26	15
SA-2525W	M25X1,5	92	-	8	-	82	-	10	-	32	25
SA-2525	M25X1,5	92	22	8	19	82	-	10	136	32	25
SA-2725W	M27X1,5	99	-	8	-	86	5	6,5	-	32	25
SA-2725	M27X1,5	99	22	8	19	86	5	6,5	143	32	25

Adjusted stroke nut

A = Initial position
B = Final position

- 1 = Impact object
- 2 = Adjusted stroke nut
- 3 = Shock absorber
- 4 = Fixing screw
- 5 = Stroke
- 6 = Stroke length



DIMENSIONS (mm)						
Mod.		Ø A	B	C	D	F
SA-08SC	(for SA-0806)	10,5	14	9	M8X1	12,7
SA-10SC	(for SA-1007)	12	16	10	M10X1	14,7
SA-12SC	(for SA-1210)	14,5	20	13	M12X1	18,5
SA-14SC	(for SA-1412)	25,8	20	15	M14X1	21,9
SA-20SC	(for SA-2015)	27,8	35	20	M20X1,5	30
SA-25SC	(for SA-2525)	5,8	45	30	M25X1,5	37
SA-27SC	(for SA-2725)	20,7	65	50	M27X1,5	37

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7 Proximity Switches

Page

Series CST - CSV and CSH		Magnetic Proximity Switches	332
Series CSB and CSC		Magnetic Proximity Switches	343
Series CSN		Proximity Switches	347
Table showing the compatibility of magnetic proximity switches by cylinder series			350

Magnetic Proximity Switches Series CST - CSV and CSH

7

Reed, Electronic



- » Designed to fit into the cylinder profile barrel
- » 3 models (CST - CSV - CSH) are suitable for all Camozzi's cylinder range
- » With or without M8 connector

Switches are available in two different versions: Reed with mechanical switching and electronic with electronic switching. The electronic versions are suggested for heavy duty with frequent operations and strong vibrations.

The magnetic proximity switches CST-CSV-CSH detect the position of the cylinder piston. When the internal contact is actuated by a magnetic field, the sensors complete an electrical circuit and provide an output signal to directly actuate a solenoid valve or a PLC. A yellow LED diode shows when the internal magnetic contact is closed.

GENERAL DATA

Models	CST-... CSV-... CSH-...
Operation	Reed contact Electronic
Output	Static or electronic PNP
Type of contact	All switches have Normally Open contact
Voltage	See model characteristics
Max current	See model characteristics
Max load	Reed switches 8 W DC and 10 VA AC Electronic switches 6 W DC
Protection level	IP 67
Materials	Plastic body encapsulating epoxy resin cable PVC, connector PVC connector body PUR
Mounting	Directly into the groove, or by means of adapters.
Signalling	By means of yellow diode Led
Protections	See model characteristics
Switching time	Reed switches <1,8 ms Electronic switches <1 ms
Operating temperature	-10°C – 80°C (14°F - 176°F)
Electrical duration	Reed switches 10.000.000 cycles Electronic switches 10.000.000.000 cycles
Electrical connection	cable 2x0,14 (2m) high flexibility cable 3x0,14 (2m) high flexibility connector M8 and cable 0,3 m

CODING EXAMPLE								
CS	T	-	2	2	0	N	-	5
CS	SERIES							
T	SLOT TYPE T = T-slot V = V-slot H = frontal inserting slot							
2	OPERATION 2 = reed 3 = electronic							
2	CONNECTIONS 2 = 2 wires (Reed only) 3 = 3 wires 5 = 2 wires with M8 connector (Reed only) 6 = 3 wires with M8 connector							
0	POWER SUPPLY VOLTAGE 0 = 10-110V DC; 10-230V AC (PNP) 1 = 30-110V DC; 30-230V AC (PNP) 2 = 3 wires cst (PNP) 3 = 10-30V AC/DC (PNP) 4 = 10-27V DC (PNP)							
N	NOTE N = ACCORDING TO NORM (CST/CSV-250N only)							
5	LENGTH OF THE CABLE (for CSH only): 2 = 2 mt 5 = 5 mt							

SWITCHES ELECTRICAL CONNECTIONS

Reed switches
BN = brown
BU = blue
BK = black

Electronic switches
BN = brown
BU = blue
BK = black

Connecting schemes in series

The Reed version with 3 wires allows the connection of several sensors in series, as there is no voltage drop between the supply and the load (see connecting scheme).

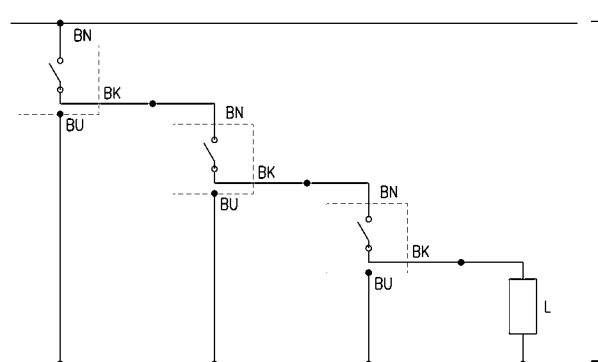
The voltage drop is 2,8V for the Reed sensors with 2 wires and 1V for Hall effect sensors with 3 wires.

BN = brown

BU = blue

BK = black

L = load



Useful information for correct use of the magnetic sensors

The magnetic sensors consist of a reed switch which is enclosed in a glass bulb containing a rarified gas. The contacts, which are made of magnetic material (nickel-iron), are flexible and are coated, at the contact points with a high quality non-arcing material.

Switching is effected by means of a suitable magnetic field and actuation is achieved by means of the permanent magnet inside the piston. The two sensors are of the normally open type and, therefore, when they are subject to the effect of the magnetic field, they close the circuit.

The operating field of the sensors with respect to the magnetic piston is shown in this picture. The dimension b indicates the amplitude of the magnetic field or switching field during which the circuit is closed. The value H represents the operational hysteresis of the sensor with respect to the form and amplitude of the magnetic field. The operating field, as a result of hysteresis, is displaced by the dimension H in the opposite direction to movement of the piston.

The values b and H are shown in the table and are classified according to bore.

The maximum speed permitted for each cylinder is a function of the value b and the response time of the various components connected after the sensor.

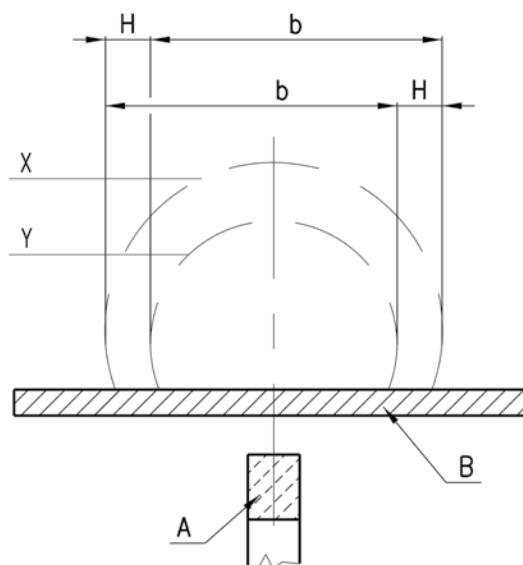
The maximum speed for a cylinder guided by magnetic sensors

is calculated as follows: $b / t = \text{Speed}$

where: b = contact stroke in mm (see table)

t = total reaction time in milli seconds of electric control components connected after the sensor

Speed = maximum speed in m/second

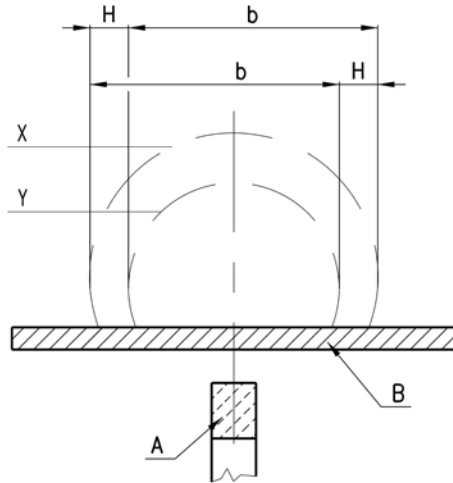


CONTACT STROKE AND HYSTERESIS

Useful information for correct use of the magnetic sensors:

H = operational hysteresis of the sensor with respect to the form and amplitude of the magnetic field

b = contact stroke in mm

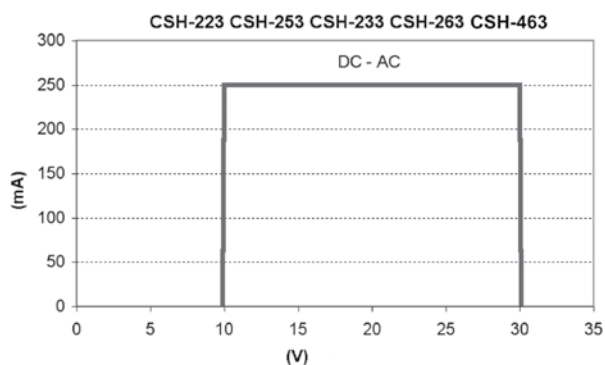


Series	Ø	b (mm)	H (mm)	Series	Ø	b (mm)	H (mm)
24-25	16	9,2	1,2	60	32	9,9	1
24-25	20	12	1	60	40	8,9	1,2
24-25	25	11,7	1,1	60	50	10,7	1
27	20	10,5	1,6	60	63	12,9	1,2
27	25	10,9	1,6	60	80	11,5	1,4
27	32	10,7	1,1	60	100	14,9	1,4
27	40	12,1	1,7	60	125	22	1
27	50	12,1	1,2	61	32	9	1
27	63	14,1	1,3	61	40	9,3	1,3
QP	12	10	1,3	61	50	11	1,6
QP	16	11,8	1,5	61	63	13,4	1,3
QP	20	11,1	1,6	61	80	13,2	1,6
QP	25	10,6	1,6	61	100	15,2	1,7
QP	32	12,7	1,2	61	125	22,1	1,3
QP	40	12,5	1,1	42	32	10,8	1,5
QP	50	15,4	1,6	42	40	11,2	1,6
QP	63	16,7	1,5	42	50	12,6	1,7
QP	80	13,2	1,7	42	63	14,1	1,7
QP	100	16,8	1,8	QCT	20	10	1,7
31	12	9,2	1,4	QCT	25	11,4	1,8
31	16	7,9	1,3	QCT	32	12,1	1,8
31	20	9,1	1,5	QCT	40	12,4	1,8
31	25	10,6	1,5	QCT	50	13,7	1,9
31	32	11,9	1,7	QCT	63	13,5	1,8
31	40	12,9	2,2	69	32	34,5	3,8
31	50	14,7	1,2	69	40	29,6	4,1
31	63	15,2	1,4	69	50	31,5	4,6
31	80	16,6	1,8	69	63	32,3	3,1
31	100	16,8	1,7	69	80	24	2,9
40	160	24	2	69	100	25,6	2,9
40	200	26	2	69	125	30,1	1,7

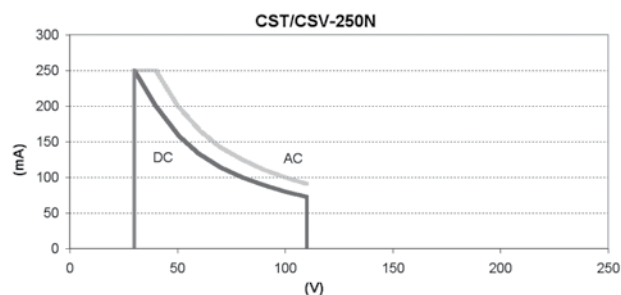
Series	Ø	b (mm)	H (mm)
62	32	10	1
62	40	11	1
62	50	12	1,2
62	63	13	1
62	80	13	1
62	100	16	1

Load curves

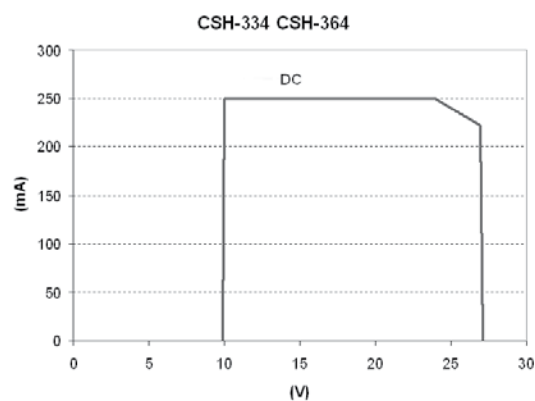
Load curve - CSH



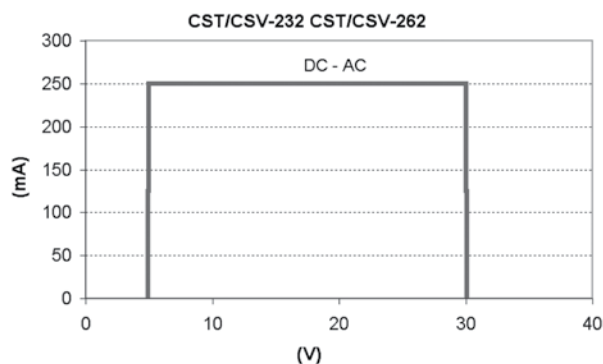
Load curve - CST/CSV



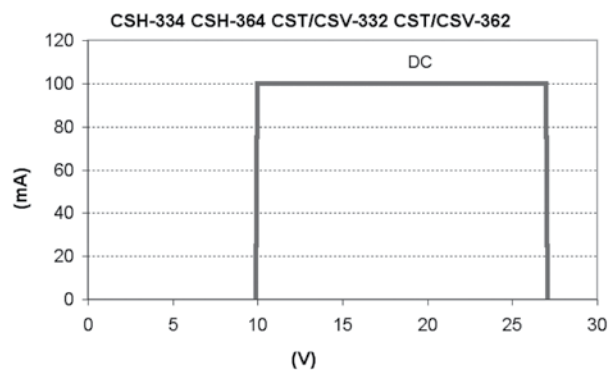
Load curve - CSH



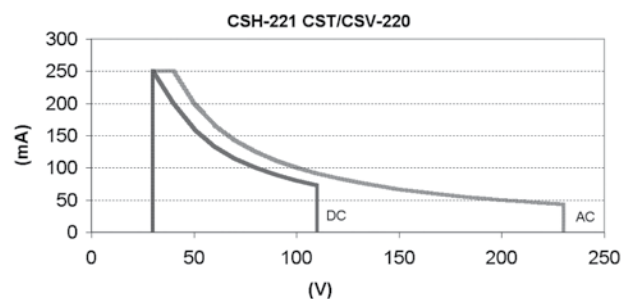
Load curve - CST/CSV



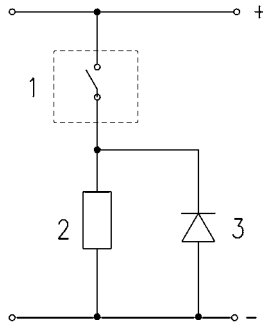
Load curve - CSH, CST/CSV



Load curve - CSH, CST/CSV



Electric circuit with protection against voltage spikes



DC applications: there is no protection on the Reed sensors on the inductive load, therefore it is advisable to use an electric circuit with protection against the voltage spikes.

See picture above for a typical example.

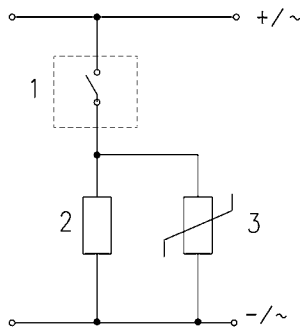
Legend:

1 = Sensor

2 = Load

3 = Protection diode

Electric circuit with protection against voltage spikes



DC and AC applications: there is no protection on the Reed sensors on the inductive load, therefore it is advisable to use an electric circuit with protection against the voltage spikes.

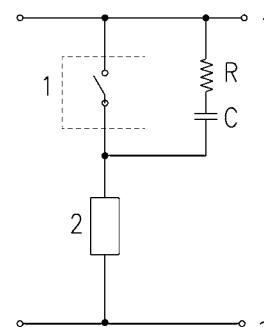
See picture above for a typical example.

Legend:

1 = Sensor

2 = Load

3 = Protection varistor



AC applications: there is no protection on the Reed sensors on the inductive load, therefore it is advisable to use an electric circuit with protection against the voltage spikes.

See picture above for a typical example.

Legend:

1 = Sensor

2 = Load

C + R = Series of resistor and protection capacitor

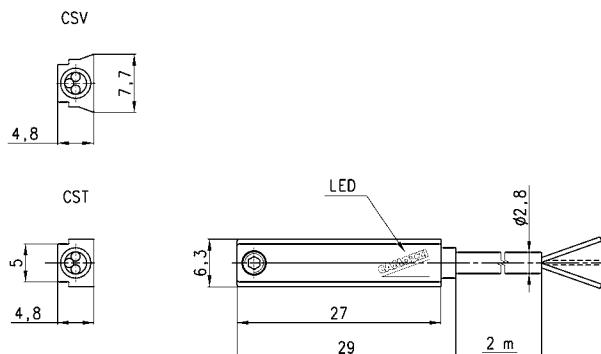
Magnetic proximity switch Series CST

Length cable 2 mt. or 5 mt.

* = Mod. CST-220 and CSV-220 suitable up to 230 V AC.



In case of polarity reversing the sensor will still be operating, but the LED diode won't turn on.



DIMENSIONS (mm)

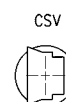
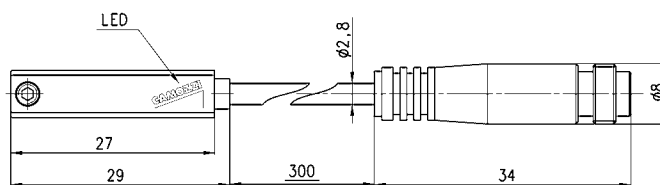
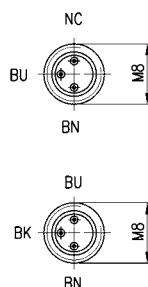
Mod.	Operation	Voltage (V)	Output	Max. current	Max. Load	Protection
CST-220	Reed	10-110*AC/DC	-	250 mA		None
CSV-220	Reed	10-110*AC/DC	-	250 mA		None
CST-220-5	Reed	10-110*AC/DC	-	250 mA		None
CST-232	Reed	5-30 AC/DC	PNP	250 mA		Against polarity reversing
CSV-232	Reed	5-30 AC/DC	PNP	250 mA		Against polarity reversing
CST-332	Electronic	10-27 DC	PNP	100 mA		Against polarity reversing and overvoltage
CSV-332	Electronic	10-27 DC	PNP	100 mA		Against polarity reversing and overvoltage

Magnetic proximity switch Series CST with male connector M8

Length cable 0,3 mt.



In case of polarity reversing the sensor will still be operating, but the LED diode won't turn on.



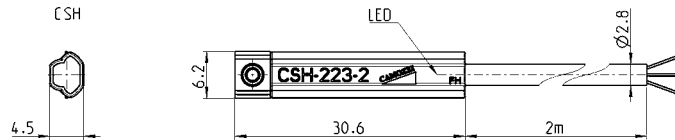
Mod.	Operation	Voltage (V)	Output	Max. current	Max. Load	Protection
CST-250N	Reed	10-110* AC/DC	-	250 mA		None
CSV-250N	Reed	10-110* AC/DC	-	250 mA		None
CST-262	Reed	5-30 AC/DC	PNP	250 mA		Against polarity reversing
CSV-262	Reed	5-30 AC/DC	PNP	250 mA		Against polarity reversing
CST-362	Electronic	10-27 DC	PNP	100 mA		Against polarity reversing and overvoltage
CSV-362	Electronic	10-27 DC	PNP	100 mA		Against polarity reversing and overvoltage

Magnetic proximity switches with 2-wire or 3-wire cable Series CSH

For max. operating current see load curves diagrams.



In case of polarity reversing the sensor will still be operating, but the LED diode won't turn on.



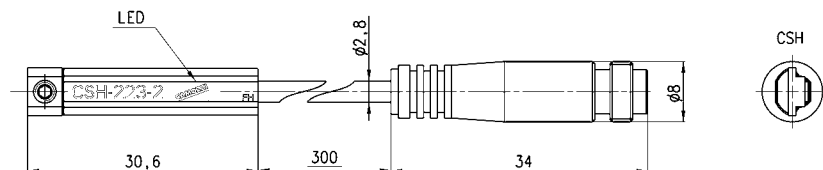
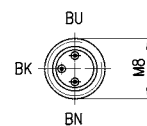
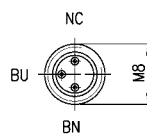
Mod.	Operation	Voltage (V)	Output	Max current	Protection
CSH-223-2	Reed	10-30 AC/DC	-	250 mA	Against polarity reversing
CSH-223-5	Reed	10-30 AC/DC	-	250 mA	Against polarity reversing
CSH-221-2	Reed	30-230 AC 30-110 DC	-	250 mA	Against polarity reversing
CSH-221-5	Reed	30-230 AC 30-110 DC	-	250 mA	Against polarity reversing
CSH-233-2	Reed	10-30 AC/DC	PNP	250 mA	Against polarity reversing
CSH-233-5	Reed	10-30 AC/DC	PNP	250 mA	Against polarity reversing
CSH-334-2	Electronic	10-27 AC/DC	PNP	250 mA	Against polarity reversing and overvoltage
CSH-334-5	Electronic	10-27 AC/DC	PNP	250 mA	Against polarity reversing and overvoltage

Magnetic proximity switches with male connector M8 Series CSH

For max. operating current see load curves diagrams.



In case of polarity reversing the sensor will still be operating, but LED diode won't turn on.



Mod.	Operation	Voltage (V)	Output	Max current	Max Load	Protection
CSH-253	Reed	10-30 AC/DC	-	250 mA		Against polarity reversing
CSH-263	Reed	10-30 AC/DC	PNP	250 mA		Against polarity reversing
CSH-364	Electronic	10-27 AC/DC	PNP	250 mA		Against polarity reversing and overvoltage

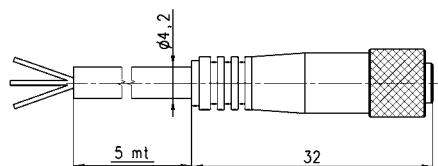
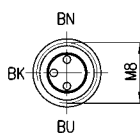
Extension with female connector M8 Mod. CS-5

Extension length 5 mt.

BN = Brown

BK = Black

BU = Blue

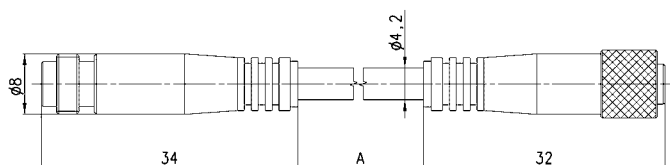


In case of the use of sensors with two wires with connector M8 models CST-250N, CSV-250N, CSH-253 connect the brown wire to the input (+) and the black wire to the load.

Mod.

CS-5

Extension with female/male connector M8



Mod.

A

CS-DW03HB-C250

250 mm

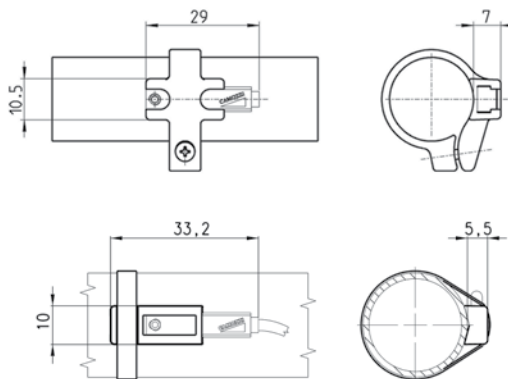
CS-DW03HB-C500

500 mm

Mounting brackets for sensors Series CST - CSH

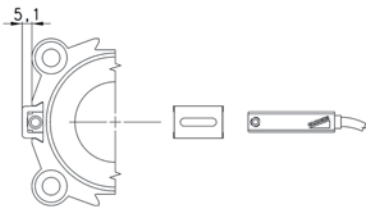
Materials:

- from S-CST-05-12 stainless steel
- from S-CST-02-04 and S-CST-18-21 technopolymer.



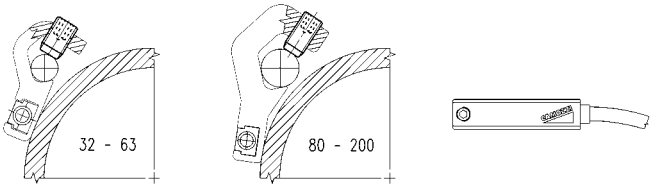
Mod.	Cylinder series	Ø	Mod.	Cylinder series	Ø	Mod.	Cylinder series	Ø
S-CST-02	24-25-27	16	S-CST-07	90-92	40	S-CST-12	90	125
S-CST-03	24-25-27	20	S-CST-08	90-92	50	S-CST-18	27-42	32
S-CST-04	24-25-27	25	S-CST-09	90-92	63	S-CST-19	27-42	40
S-CST-05	94-95	16-20-25	S-CST-10	90	80	S-CST-20	27-42	50
S-CST-06	90-92	32	S-CST-11	90	100	S-CST-21	27-42	63

Mounting brackets for sensors Series CST



Mod.	Cylinders series	Ø
S-CST-01	QP - QPR	20-100
S-CST-01	50	32-80

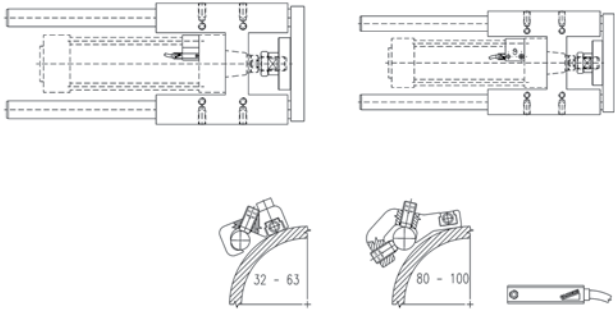
Mounting brackets for sensors Series CST and CSH



Mod.	Cylinders series	Ø
S-CST-25	60	32-63
S-CST-26	60	80 - 100
S-CST-27	60	125
S-CST-28	40	160 - 200

Mounting brackets for sensors Series CST and CSH

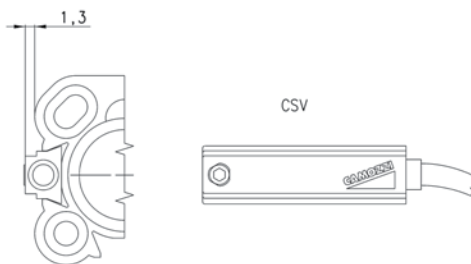
For cylinders series 60 mounted with guides series 45NHT or 45NHB.



Mod.	Cylinders series	Ø
S-CST-45N1	60	32-63
S-CST-45N2	60	80 - 100

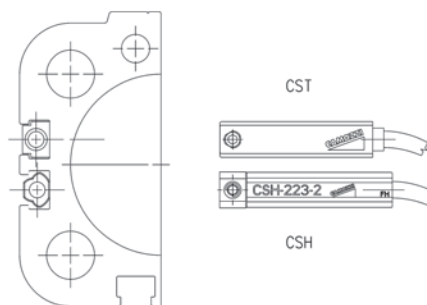
Sensors Series CSV

CST sensors must be assembled directly into the groove:
for cylinders ø16-25 Series 50
for cylinders ø12-16 Series QP-QPR.



Sensors Series CST - CSH

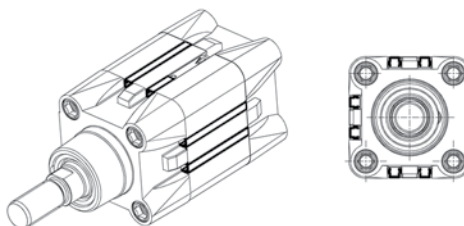
CST/CSH sensors can be directly mounted on the following cylinders:
Series 31 - 31R
Series 32 - 32R
Series 52
Series 61
Series 62 (CSH only)
Series 69
Series QC - QCBF - QCTF



Slot cover profile Mod. S-CST-500

Supplied in unit lengths of 500mm ea.

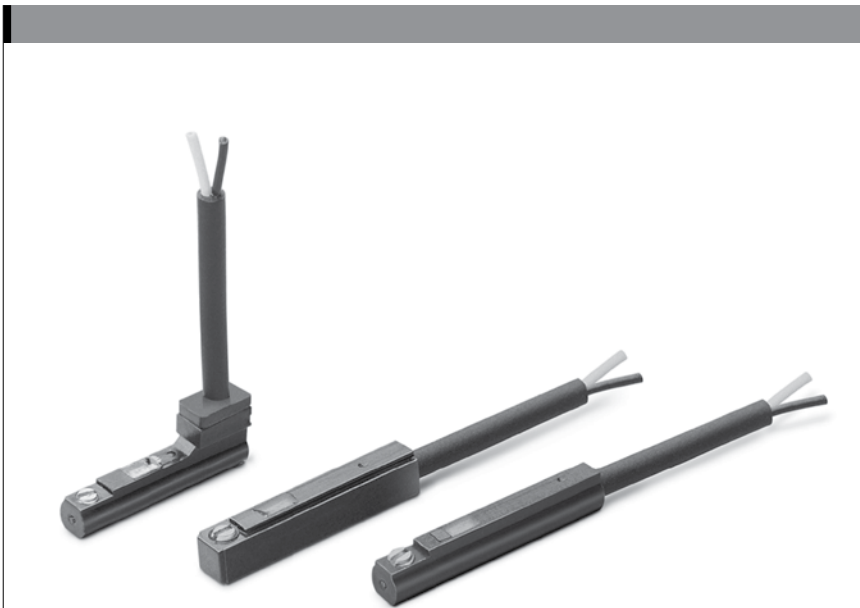
Slot cover profile for cylinders Series:
31 & 31 tandem and multi-position
- QCT - QCB - QCBT-QCBF - 61 - 69 -
32 & 32 tandem and multi-position.



Mod.
S-CST-500

Magnetic Proximity Switches Series CSB and CSC

Reed switches



- » Mod. CSB for direct mounting on all gripper series, except gripper CGL
- » Mod. CSC for direct mounting on series CGL grippers

The reed switch that has a mechanical switching element, is suitable for voltages, AC and DC up to 110 V. Proximity switches mod. CSC are suitable for gripper mod. CGL. The proximity switches are impregnated in a sealed isolating cover. These sensors are designed to fit into the grooves provided in the profile barrel of the grippers. For electrical connections see schemes.

The magnetic proximity switches CSB/CSC define the position of the magnetic piston. When the internal contact is actuated by a magnetic field, the sensors complete an electrical circuit and provide an output signal to actuate directly a solenoid valve or a PLC. A red Led shows when the internal magnetic contact is closed.

GENERAL DATA

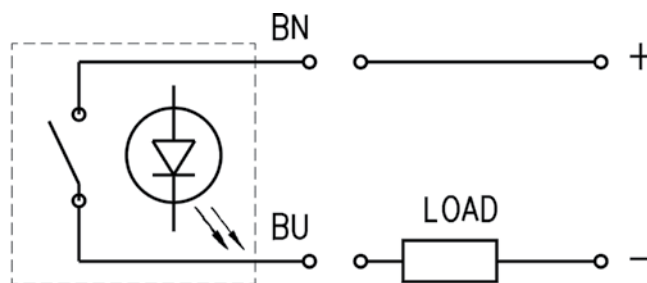
Model	CSB-220 CSC-220
Operation	Reed contact
Voltage	3 – 110 V AC/DC
Protection	IP66
Material	Plastic body encapsulating epoxy resin
Mounting	directly into the groove
Signalling	by means of LED (red)
Electrical connections	2 x 0,14 cable (2 m)
Switching current	3 – 50 mA
Max. load	8 W, 10 VA
Switching time	<1 ms (1/1000 sec)
Operating temperature	-10°C – 60°C, (14°F - 140°F)
Type of contact	Normally Open
Weight	18 g
Protection circuit	None
Output	-

CODING EXAMPLE

CS	B	-	D	-	2	20
----	---	---	---	---	---	----

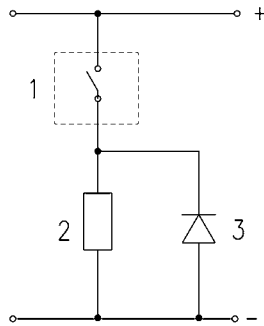
CS	SERIES
B	B = Square shape C = Round shape
D	D = straight lead H = lead 90°
2	2 = reed
20	20 = 2 wires (only reed)

ELECTRICAL CONNECTORS



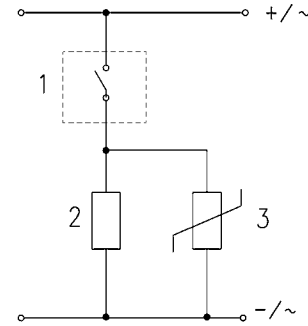
BN = brown
BU = blue

Electric circuits with protection against voltage spikes



There is no protection on the Reed sensors on the inductive load, therefore it is advisable to use electric circuits with protection against the voltage spikes: the first for direct current (DC), the second for alternating current (AC).

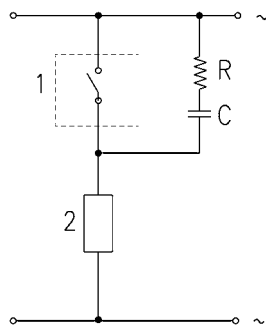
1 = Reed sensor
2 = Load
3 = Diode / Varistor



When the wire length of sensor connection load is more than 10m, inductors shall be installed in series near the sensor to avoid ripple.

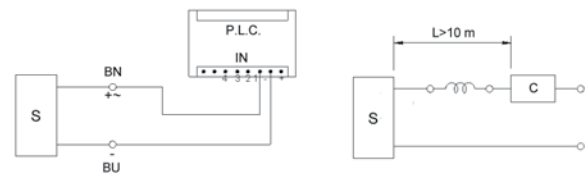
1 = Reed sensor
2 = Load
R = Resistor
C = Capacitor

Electric circuits with protection against voltage spikes



There is no protection on the Reed sensors on the inductive load, therefore it is advisable to use electric circuits with protection against the voltage spikes.

BN = Brown
BU = Blue
C = Load



When the wire length of sensor connection load is more than 10m, inductors shall be installed in series near the sensor to avoid ripple.

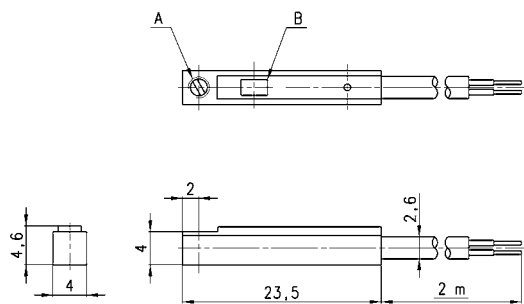
BN = Brown
BU = Blue
C = Load

When L is more than 10mt. the cable has to be considered as an inductive load.

CSB - D - 220



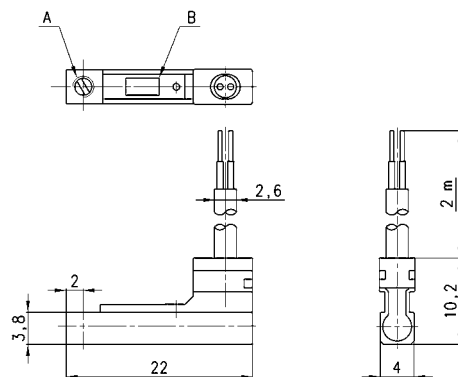
Mod.
CSB-D-220



CSB - H - 220



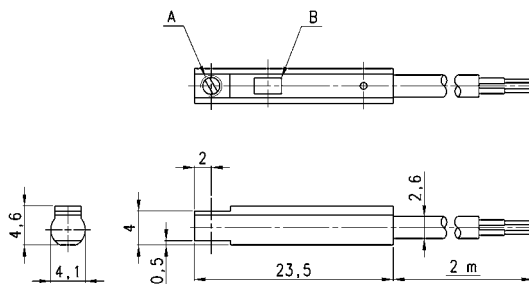
Mod.
CSB-H-220



CSC - D - 220



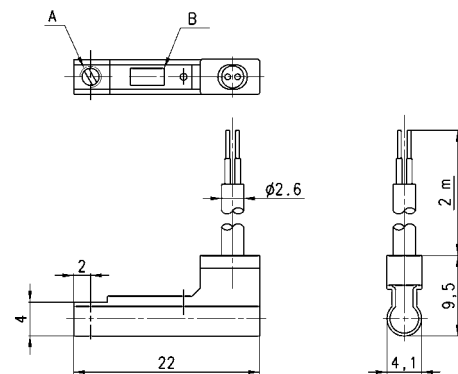
Mod.
CSC-D-220



CSC - H - 220



Mod.
CSC-H-220



Proximity Switches

Series CSN

Reed switch



- » Integrated clamp for direct mounting onto tie-rods, Series 60 ISO w/32mm - 100mm bore
- » Integrated DIN 43650-B connection w/ LED

It is designed so that it can be fixed directly on the tie-rod by means of two screws which assure the position longitudinal to the cylinder axle; and with a third screw for the anti-rotation positioning. The three terminals are indicated by the numbers 1, 2 and 3 and enable the following connections to be made (see the scheme).

The electrical proximity switch mod. CSN 2032-0 consists of a Reed switch complete with an electronic protection circuit and a red LED indicator all encapsulated in an insulated sealed casing.

GENERAL DATA

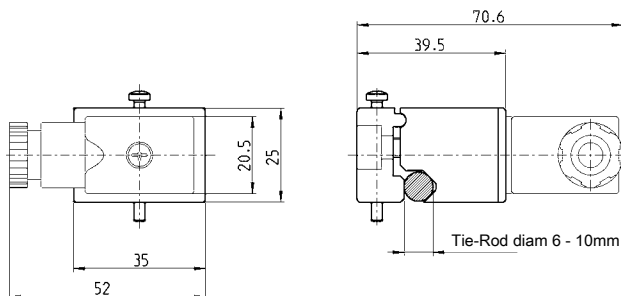
Mod.	CSN 2032- 0
Voltage	from 12 to 220V AC and DC
Protection	IP54 / IP65 with connector DIN 43650
Material	glass-reinforced PA
Mounting	bracket for tie rod $\varnothing 6 - \varnothing 10$
Signalling	integrated red LED
Electrical connection	DIN 43650 connector, Mod. 122-800
Max. current	1.5 A
Max. load	20 W DC - 30 VA AC
Actuating time	≤ 2 ms
Actuating tolerance	± 1 mm
Operating temperature	- 25°C – + 75°C, (-13°F - 167°F)
Type of contact	NO (normally open)

Switches Series CSN

For cylinders Series 40 from $\varnothing$ 160 – 250 (mounting band to be ordered separately).

For cylinders Series 41 from $\varnothing$ 160 - 200 (mounting band to be ordered separately).

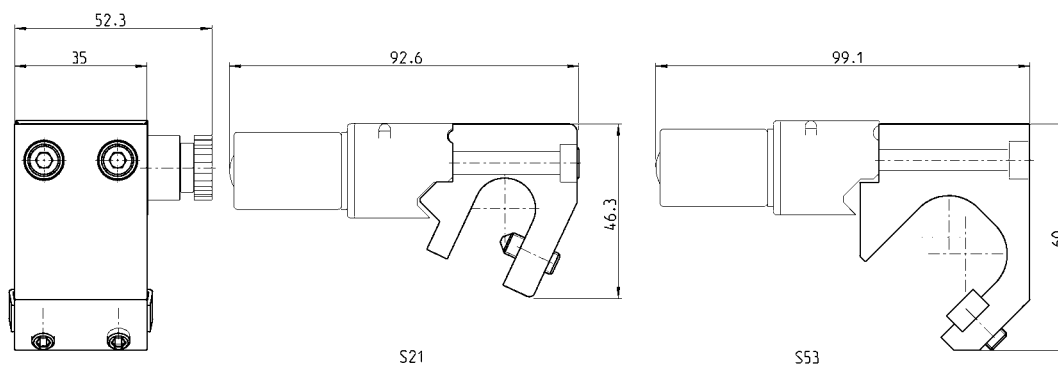
For cylinders Series 60 from diam 32mm - 100mm bore, direct mounting on tie rods



Mod.

CSN 2032-0

Mounting bracket for sensor



Mod.

S21

for cylinders Series 40 $\varnothing$ 160 - 200 and 250

S53

for cylinders Series 41 $\varnothing$ 160 and 200

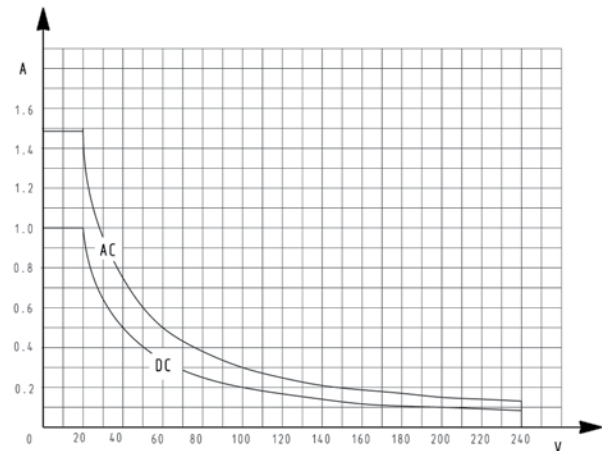
Maximum contact load

The maximum load (W) which the contacts are able to tolerate is that indicated in the section "General data", i.e.

- 20 W for direct current (DC)
- 30 VA for alternating current (AC)

The effective load allowed depends on the operating voltage (minimum 12 V, maximum 220 V) as shown in the following graph.

Note: this graph was obtained from practical tests performed using a load consisting of our Series A and 6 solenoid valves, at an operating speed of one stroke per second. For higher operating speeds, you are advised to contact our technical department.



TECHNICAL DATA

CONNECTION

- For inductive loads = solenoid valves, electrical magnets, relay.

To connectors = terminals 1 - 2

- For capacitive loads = circuit with remaining tension (see PLC controls)

To connectors = 1 - 3

Note: For connections with wires of approximately 10m, the connection shall be made as for a capacitive load.

MAXIMUM LOADS

For maximum loads see relative diagram, those loads are valid only for inductive loads. For capacitive loads, using clamp 3 (or black wire) load must not exceed 80 mA and load must be given by PLC or, for electrical circuits, by microrelay or micro solenoid valves with 2W maximum consumption.

Note: When operating with direct current, clamp 1 must always be connected to the positive outlet (+). In cases where commands are given from the PLC and logic NPN, clamp 1 must be connected to the inlet. In cases where commands are given from the PLC and logic PNP, clamps 2 or 3 must be connected to the inlet.

LEGEND:

C1 = capacitive load

C2 = inductive load

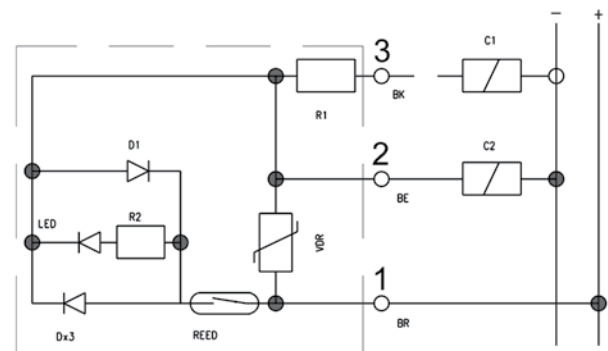


TABLE SHOWING THE COMPATIBILITY OF MAGNETIC PROXIMITY SWITCHES BY CYLINDER SERIES

Series	Ø	CST - CSH	CSV	CSB-D-220 / CSB-H-220	CSC-D-220 / CSB-H-220	CSN
24 - 25	16	S-CST-02				
	20	S-CST-03				
	25	S-CST-04				
27	20	S-CST-03				
	25	S-CST-04				
	32	S-CST-18				
	40	S-CST-19				
	50	S-CST-20				
	63	S-CST-21				
31	12	Direct mounting				
	16	Direct mounting				
	20	Direct mounting				
	25	Direct mounting				
	32	Direct mounting				
	40	Direct mounting				
	50	Direct mounting				
	63	Direct mounting				
	80	Direct mounting				
	100	Direct mounting				
32	20	Direct mounting				
	25	Direct mounting				
	32	Direct mounting				
	40	Direct mounting				
	50	Direct mounting				
	63	Direct mounting				
	80	Direct mounting				
	100	Direct mounting				
40	160	S-CST-28				S21
	200	S-CST-28				S21
	250					S21
41	160					S53
	200					S53
42	32	S-CST-18				
	40	S-CST-19				
	50	S-CST-20				
	63	S-CST-21				
50	16		Direct mounting			
	25		Direct mounting			
	32	S-CST-01				
	40	S-CST-01				
	50	S-CST-01				
	63	S-CST-01				
	80	S-CST-01				
52	25	Direct mounting				
	32	Direct mounting				
	40	Direct mounting				
	50	Direct mounting				
	63	Direct mounting				
60	32	S-CST-25				Direct mounting
	40	S-CST-25				Direct mounting
	50	S-CST-25				Direct mounting
	63	S-CST-25				Direct mounting
	80	S-CST-26				Direct mounting
	100	S-CST-26				Direct mounting
	125	S-CST-27				S21
60 + 45N	32	S-CST-45N1				
	40	S-CST-45N1				
	50	S-CST-45N1				
	63	S-CST-45N1				
	80	S-CST-45N2				
	100	S-CST-45N2				

TABLE SHOWING THE USE OF CAMOZZI MAGNETIC PROXIMITY SWITCHES

Series	Ø	CST - CSH	CSV	CSB-D-220 / CSB-H-220	CSC-D-220 / CSC-H-220
61	32	Direct mounting			
	40	Direct mounting			
	50	Direct mounting			
	63	Direct mounting			
	80	Direct mounting			
	100	Direct mounting			
	125	Direct mounting			
62	32	Direct mounting (CSH only)			
	40	Direct mounting (CSH only)			
	50	Direct mounting (CSH only)			
	63	Direct mounting (CSH only)			
	80	Direct mounting (CSH only)			
	100	Direct mounting (CSH only)			
69	32	Direct mounting			
	40	Direct mounting			
	50	Direct mounting			
	63	Direct mounting			
	80	Direct mounting			
	100	Direct mounting			
	125	Direct mounting			
90	32	S-CST-25			
	40	S-CST-25			
	50	S-CST-25			
	63	S-CST-25			
	80	S-CST-26			
	100	S-CST-26			
	125	S-CST-27			
92	32	S-CST-06			
	40	S-CST-07			
	50	S-CST-08			
	63	S-CST-09			
94	16	S-CST-05			
	20	S-CST-05			
94/95	25	S-CST-05			
CGA	10			Direct mounting	
	16			Direct mounting	
	20			Direct mounting	
	25			Direct mounting	
	32			Direct mounting	
CGB	16			Direct mounting	
	20			Direct mounting	
	25			Direct mounting	
	32			Direct mounting	
CGC	50			Direct mounting	
	64			Direct mounting	
	80			Direct mounting	
	100			Direct mounting	
	125			Direct mounting	
CGL	10				Direct mounting
	16				Direct mounting
	20				Direct mounting
	25				Direct mounting
	32				Direct mounting
CGP	10			Direct mounting	
	16			Direct mounting	
	20			Direct mounting	
	25			Direct mounting	
	32			Direct mounting	
CGS	16			Direct mounting	
	20			Direct mounting	
	25			Direct mounting	
	32			Direct mounting	

TABLE SHOWING THE USE OF CAMOZZI MAGNETIC PROXIMITY SWITCHES

Series	Ø	CST - CSH	CSV	CSB-D-220 CSB-H-220	CSC-D-220 CSC-H-220
QC	20	Direct mounting			
	25	Direct mounting			
	32	Direct mounting			
	40	Direct mounting			
	50	Direct mounting			
	63	Direct mounting			
	80	Direct mounting			
QP-QPR	12		Direct mounting		
	16		Direct mounting		
	20	S-CST-01			
	25	S-CST-01			
	32	S-CST-01			
	40	S-CST-01			
	50	S-CST-01			
	63	S-CST-01			
	80	S-CST-01			
	100	S-CST-01			
QCBF	20	Direct mounting			
	25	Direct mounting			
	32	Direct mounting			
	40	Direct mounting			
QCTF	20	Direct mounting			
	25	Direct mounting			
	32	Direct mounting			
	40	Direct mounting			
QX	10				Direct mounting
	16				Direct mounting
	20				Direct mounting
	25				Direct mounting
	32				Direct mounting

Spare Parts & Seal Kits

Cylinder Repair Kits Legend

KITS: All the parts (pre-assembled) of a complete cylinder without tube, rod and tie-rods, NBR seals.

KITSV: All the parts (pre-assembled) of a complete cylinder without tube, rod and tie-rods, VITON seals.

K02: All cylinders' soft seals in NBR (Rod wiper seal, tube end seals, piston seals, cushion adjustment screw seals, wear band, bumpers).

K02V: All cylinders' soft seals in VITON (Rod wiper seal, tube end seals, piston seals, cushion adjustment screw seals, wear band, bumpers).

K03: All cylinders' soft seals in NBR for single acting cylinders (Rod wiper seal, tube end seals, piston seals, cushion adjustment screw seals, wear band, bumpers).

K03V: All cylinders' soft seals in VITON for single acting cylinders (Rod wiper seal, tube end seals, piston seals, cushion adjustment screw seals, wear band, bumpers).

K04: All cylinders' soft seals in NBR for single acting cylinders (Rod wiper seal, tube end seals, piston seals, cushion adjustment screw seals, wear band, bumpers).

K04V: All cylinders' soft seals in VITON for single acting cylinders (Rod wiper seal, tube end seals, piston seals, cushion adjustment screw seals, wear band, bumpers).

K2, K2V, K3, K3V, K4, K4V: As above but complete with piston.

COMPACT CYLINDERS	Buna Kit (NBR)	Viton Kit
QN1A08	NON REPAIRABLE	
QN1A12	K02-Q12	K02V-Q12
QN1A20	K02-Q20	K02V-Q20
QN1A32	K02-Q32	K02V-Q32
QN1A50	K02-Q50	K02V-Q50
QN1A63	K02-Q63	K02V-Q63
QP & QPR2A12	K02-QP12	K02V-QP12
QP & QPR2A16	K02-QP16	K02V-QP16
QP & QPR2A20	K02-QP20	K02V-QP20
QP & QPR2A25	K02-QP25	K02V-QP25
QP & QPR2A32	K02-QP32	K02V-QP32
QP & QPR2A40	K02-QP40	K02V-QP40
QP & QPR2A50	K02-QP50	K02V-QP50
QP & QPR2A63	K02-QP63	K02V-QP63
QP & QPR2A80	K02-QP80	K02V-QP80
QP & QPR2A100	K02-QP100	K02V-QP100
31M,F,R2A12	K02-31-12	N/A
31M,F,R2A16	K02-31-16	N/A
31M,F,R2A20	K02-31-20	N/A
31M,F,R2A25	K02-31-25	N/A
31M,F,R2A32	K02-31-32	N/A
31M,F,R2A40	K02-31-40	N/A
31M,F,R2A50	K02-31-50	N/A
31M,F,R2A63	K02-31-63	N/A
31M,F,R2A80	K02-31-80	N/A
31M,F,R2A100	K02-31-100	N/A

GRIPPERS	Buna Kit (NBR)
CGA-10-1	K02-CGA-10
CGA-16-1	K02-CGA-16
CGA-20-1	K02-CGA-20
CGA-25-1	K02-CGA-25
CGA-32-1	K02-CGA-32
CGS-16	K02-CGS-16
CGS-20	K02-CGS-20
CGS-25	K02-CGS-25
CGS-32	K02-CGS-32
CGP-10	K02-CGP-10
CGP-16	K02-CGP-16
CGP-20	K02-CGP-20
CGP-25	K02-CGP-25
CGP-32	K02-CGP-32
CGB-L,S-16	K02-CGB-16
CGB-L,S-20	K02-CGB-20
CGB-L,S-25	K02-CGB-25
CGB-L,S-32	K02-CGB-32
CGL-10-00	K02-CGL-10
CGL-16-00	K02-CGL-16
CGL-20-00	K02-CGL-20
CGL-25-00	K02-CGL-25
CGL-32-00	K02-CGL-32
CGC-050-00	K02-CGC-050
CGC-064-00	K02-CGC-064
CGC-080-00	K02-CGC-080
CGC-100-00	K02-CGC-100
CGC-125-00	K02-CGC-125

GUIDES	Kit
	20-45HB/KITS
45, diam. 020	20-45HT/KITS
	20-45UT/KITS
	25-45HB/KITS
45, diam. 025	25-45HT/KITS
	25-45UT/KITS
	32-45HB/KITS
45, diam. 032	32-45HT/KITS
	32-45UT/KITS
	40-45HB/KITS
45, diam. 040	40-45HT/KITS
	40-45UT/KITS
	50-45HB/KITS
45, diam. 050	50-45HT/KITS
	50-45UT/KITS
	63-45HB/KITS
45, diam. 063	63-45HT/KITS
	63-45UT/KITS
	80-45HB/KITS
45, diam. 080	80-45HT/KITS
	80-45UT/KITS
	100-45HB/KITS
45, diam. 100	100-45HT/KITS
	100-45UT/KITS

ROTARY CYLINDERS	Buna Kit
18-032/090,180	K02-29-32
18-040/090,180	K02-29-40
18-050/090,180	K02-29-50
18-063/090,180	K02-29-63
18-080/090,180	K02-29-80
18-100/090,180	K02-29-100
29-032-090,180	K02-29-32
29-040-090,180	K02-29-40
29-050-090,180	K02-29-50
29-063-090,180	K02-29-63
29-080-090,180	K02-29-80
29-100-090,180	K02-29-100
30-050/090,180	K02-30-50
30-063/090,180	K02-30-63
30-080/090,180	K02-30-80
30-100/090,180	K02-30-100
69-032	K02-69-32
69-040	K02-69-40
69-050	K02-69-50
69-063	K02-69-63
69-080	K02-69-80
69-100	K02-69-100
69-125	K02-69-125

MINI CYLINDERS	Buna Kit
14N	NON REPAIRABLE
16N	NON REPAIRABLE
24N	NON REPAIRABLE
25N	NON REPAIRABLE
27M, 27T, 27U	NON REPAIRABLE

SLIDES	Buna Kit
QCT,B2A020A000	K02-QC20
QCT,B2A025A000	K02-QC25
QCT,B2A032A000	K02-QC32
QCT,B2A040A000	K02-QC40
QCT,B2A050A000	K02-QC50
QCT,B2A063A000	K02-QC63

HYDROCHECKS	Buna Kit
43, diam. 40	N/A

SHOCK ABSORBERS	Buna Kit
SA-0806	N/A
SA-1007	N/A
SA-1210	N/A
SA-1412	N/A
SA-2015	N/A
SA-2525	N/A
SA-2725	N/A

STAINLESS STEEL CYLINDERS	Buna Kit
90, diam. 032	K02-90-32
90, diam. 040	K02-90-40
90, diam. 050	K02-90-50
90, diam. 063	K02-90-63
90, diam. 080	K02-90-80
90, diam. 100	K02-90-100
90, diam. 125	K02-90-125
92, diam. 032	N/A
92, diam. 040	N/A
92, diam. 050	N/A
92, diam. 063	N/A
94, diam. 16	K02-94-16
94, diam. 20	K02-94-20
94, diam. 25	K02-95-25
95, diam. 25	K02-95-25

TIE-ROD DIN/ISO CYLINDERS	Buna Kit	Viton Kit	Low Temp (-40°C)
40M,N,R,P2L100	K02-40-100	K02V-40-100	K02B-40-100
40M,N,R,P2L125	K02-40-125	K02V-40-125	K02B-40-125
40M,N,R,P2L160	K02-40-160	K02V-40-160	K02B-40-160
40M,N,R,P2L200	K02-40-200	K02V-40-200	K02B-40-200
40M,N,R,P2L32	K02-40-32	K02V-40-32	K02B-40-32
40M,N,R,P2L40	K02-40-40	K02V-40-40	K02B-40-40
40M,N,R,P2L50	K02-40-50	K02V-40-50	K02B-40-50
40M,N,R,P2L63	K02-40-63	K02V-40-63	K02B-40-63
40M,N,R,P2L80	K02-40-80	K02V-40-80	K02B-40-80
41M,P2P100	K02-40-100	K02V-40-100	K02B-40-100
41M,P2P125	K02-40-125	K02V-40-125	K02B-40-125
41M,P2P160	K02-40-160	K02V-40-160	K02B-40-160
41M,P2P200	K02-40-200	K02V-40-200	K02B-40-200
41M,P2P32	K02-40-32	K02V-40-32	K02B-40-32
41M,P2P40	K02-40-40	K02V-40-40	K02B-40-40
41M,P2P50	K02-40-50	K02V-40-50	K02B-40-50
41M,P2P63	K02-40-63	K02V-40-63	K02B-40-63
41M,P2P80	K02-40-80	K02V-40-80	K02B-40-80
42M,P	NON REPAIRABLE		
60M,N0100	K02-60-100	K02V-60-100	K02Z-60-100
60M,N0125	K02-60-125	K02V-60-125	K02B-60-125
60M,N032	K02-60-32	K02V-60-32	K02Z-60-32
60M,N040	K02-60-40	K02V-60-40	K02Z-60-40
60M,N050	K02-60-50	K02V-60-50	K02Z-60-50
60M,N063	K02-60-63	K02V-60-63	K02Z-60-63
60M,N080	K02-60-80	K02V-60-80	K02Z-60-80
61M2P,R0100	K02-60-100	K02V-60-100	K02Z-60-100
61M2P,R0125	K02-60-125	K02V-60-125	K02B-60-125
61M2P,R032	K02-60-32	K02V-60-32	K02Z-60-32
61M2P,R040	K02-60-40	K02V-60-40	K02Z-60-40
61M2P,R050	K02-60-50	K02V-60-50	K02Z-60-50
61M2P,R063	K02-60-63	K02V-60-63	K02Z-60-63
61M2P,R080	K02-60-80	K02V-60-80	K02Z-60-80

RODLESS CYLINDERS	Buna Kit	End Caps + Red Guide	End Caps + Blue Guide
50M2P16A000	K02-50-16	16-50M/KITS	
50M2P25A000	K02-50-25	25-50M/KITS	25-50M/KITSS01
50M2P32A000	K02-50-32	32-50M/KITS	32-50M/KITSS01
50M2P40A000	K02-50-40	40-50M/KITS	40-50M/KITSS01
50M2P50A000	K02-50-50	50-50M/KITS	50-50M/KITSS01
50M2P63A000	K02-50-63	63-50M/KITS	63-50M/KITSS01
50M2P80A000	K02-50-80	80-50M/KITS	80-50M/KITSS01
50M2P16A000PT	K02-50-16	N/A	
50M2P25A000PT	K02-50-25	25-50M/KITSPT	
50M2P32A000PT	K02-50-32	32-50M/KITSPT	
50M2P40A000PT	K02-50-40	40-50M/KITSPT	
50M2P50A000PT	K02-50-50	50-50M/KITSPT	
50M2P63A000PT	K02-50-63	63-50M/KITSPT	
50M2P80A000PT	K02-50-80	80-50M/KITSPT	
52, diam. 25	K02-52-25		
52, diam. 32	K02-52-32		
52, diam. 40	K02-52-40		

NFPA CYLINDERS	Buna Kit	Viton Kit	Rod Gland		Rod Gland + Seal Kit	
Series 70 Ø	Standard + Oversize	Standard + Oversize	Standard	Oversize	Standard	Oversize
1.50"	K02-701.50	K02V-70-1.50	1.50-70/15C	N/A	1.50-70/15CK	N/A
2.00"	K02-70-2.00	K02V-70-2.00	2.00-70/15C	2.00-70P/15C	2.00-70/15CK	2.00-70P/15CK
2.50"	K02-70-2.50	K02V-70-2.50	2.00-70/15C	2.00-70P/15C	2.50-70/15CK	2.50-70P/15CK
3.25"	K02-70-3.25	K02V-70-3.25	3.25-70/15C	3.25-70P/15C	3.25-70/15CK	3.25-70P/15CK
4.00"	K02-70-4.00	K02V-70-4.00	3.25-70/15C	3.25-70P/15C	4.00-70/15CK	4.00-70P/15CK
5.00"	K02-70-5.00	K02V-70-5.00	3.25-70/15C	3.25-70P/15C	5.00-70/15CK	5.00-70P/15CK

Information for the use of Camozzi products



Just browsing through the pages of our website www.camozzi.com, you will have the possibility to download GSD files for the configuration of Valve Islands, all relative use and installation manuals and the configuration software of the product codes. Moreover, here you can find all 2D and 3D files in the most commonly used formats.

Respecting the limit values for:

- Pressure
- Mass
- Actuating force
- Speed
- Voltage
- Temperature

The pneumatic components have to be used with properly prepared compressed air. The type of preparation depends on the environmental characteristics and the sector of industry in which they will be used. Except for different information shown on the technical data sheet for the single products, in general the air characteristics should be:

Fluid temperature:	-10 – +60°
Environmental temperature:	-20 – +80°
Air filtering according to DIN ISO 8573-1:	not superior to the classes 5/5/4 (see table)
Lubrication:	not necessary, in case use ISOVG32 oil and do not interrupt the lubrication once applied.
Oil contents:	From 1 to 5 drops every 1000 litres of air

Air treatment

Filtering

The temperature affects the capacity of air to maintain water particles (relative humidity).

Warm air contains a larger quantity of water than the same volume filled with cold air.

An excess of humidity causes the formation of condensate.

Cooling of the air modifies the structure of the water it contains, by turning it from a gaseous to a liquid state. Specific apparatus can be used to cool (refrigerator) and heat (drier) the air and are, as a rule, assembled on the outlet of the compressor.

The filtering elements mounted inside the filters for compressed air, are only partly able to separate the condensate from the air, in fact, their main function is to eliminate any solid particles.

During the production of compressed air, compressors can introduce oil into the distribution network. The characteristics of this oil are not compatible with the seals of pneumatic components.

The market trend towards miniaturized products imposes the requirement to use coalescing filters.

It is advisable to provide for automatic drains on the filters.

Lubrication

This is not necessary as the components are already greased with special products. Only use oils with a viscosity of 32 cSt at 40°C. The oil quantity has to be a maximum of 1 drop per minute, this regulation has to be made with the machine in normal operation. The lubrication, once applied, must never be interrupted. If not, the seals of the components could degenerate, compromising their function.

For a correct use of our products, refer to the values shown in the table of the Air Quality classes according to the Standard DIN ISO 8573-1.

Class	Solid bodies Max. dimension of the particles	Air contents dew-point	Oil quantity Max concentration
1	0,1 µ	-70 °C	0,01 mg/m³
2	1 µ	-40 °C	0,1 mg/m³
3	5 µ	-20 °C	1 mg/m³
4	15 µ	+3 °C	5 mg/m³
5	40 µ	+7 °C	25 mg/m³

Pneumatic cylinders

The choice of the correct cylinder mounting to the structure and also that of the rod attachment to any moving parts, are as important as the control of parameters relating to speed, mass and radial loads. The control of these parameters has to be guaranteed by the user. The location of position sensors (reed switches), and their switching response times to magnetic fields, is dependant upon the type and bore size of cylinder and the appropriate precautions need to be taken when fixing these items. (see notes on the pages relative to the sensors).

We do not advise the use of a cylinder application as a shock absorber or as pneumatic cushioning. If used at the maximum speed, we recommend gradual deceleration to avoid a violent impact between piston and the cylinder end cover.

As a general value, we calculate a maximum average speed of 1 m/sec. In this case no lubrication is required as the lubrication introduced during assembly is sufficient to guarantee good operation. If faster speeds are required, we suggest lubrication in the quantities described above.



Products classified for the use in potentially explosive atmospheres (Directive Atex 94/9/CE)

As from the first of July 2003, all products which are commercialised in the European Union and destined to be used in **potentially explosive atmospheres**, have to be approved according to the directive 94/9/CE, also known as ATEX. This new directive also refers to non-electric items, like pneumatic drives, which need to be approved.



ATEX
94/9/CE

» The European certification for products destined to be used in potentially explosive zones.

These are the main changes introduced by the new directive 94/9/CE:

- Also non-electric apparatus and devices, as pneumatic cylinders, are part of the Directive
- The apparatus are assigned to different categories which are assigned to certain potentially explosive zones.
- The products are identified with the CE mark Ex.
- The instructions for use and the declarations of conformity should in order to be supplied with each sold product used in potentially explosive zones.
- Products destined to be used in potentially explosive zones, because of the presence of gas, mist, steam or dust which can be created in manufacturing processes or in all those areas in which there is a constant or random presence of inflammable substances. An explosion can occur when there is an existing presence of inflammable

substances and an ignition source in a potentially explosive atmosphere.

An ignition source could be:

- Electrical (electric arcs, induced current, heat generated by the Joule effect)
 - Mechanical (heat between surfaces caused by friction, sparks generated by the collision of metallic bodies, electrostatic discharges, adiabatic compression)
 - Chemical (exothermic reactions between materials)
 - Naked flames.
- The products which are subject to the approval are those which, during their normal use or because of a malfunction, present one or more ignition sources for the potentially explosive atmospheres.

The producer has to guarantee that the product conforms with the declarations and to the marking of the product. Moreover the product should always be accompanied by the relative instructions. The builder of the equipment and/or user should identify the risk zone in which the products, to which directive 99/92/CE refers,

are used and purchase the product according to the use in the pre-determined zone paying attention to the specifications in the relative instructions.

In case a product is composed by two components with different markings, the component which is classified in the lowest category defines the class to which the complete product belongs.

Example:
solenoid suitable for Category 3
marked ...
Ex - II 3 EEx...

and valve suitable for Category 2 ...
Ex - II 2 EEx...
The valve unit with solenoid can be used only in category 3 or zone 2/22.

Zones, groups and categories

In the places and for the types of equipment subject to Directive 99/92/CE, the employer should execute the classification of the zones regarding the danger of the creation of explosive atmospheres because of the presence of gas or dust.

The apparatus for the use in potentially explosive zones are divided in GROUPS:

GROUP I: apparatus used in mines

GROUP II: apparatus used in installations above the ground.

Group I: Apparatus for mines

CATEGORY M1
Functioning in explosive atmosphere

CATEGORY M2
Non-supplied equipment in explosive atmospheres

Group II: Apparatus for industries above the ground

Product category	GAS	DUST
1	Zone 0	Zone 20
2	Zone 1	Zone 21
3	Zone 2	Zone 22

Classification in zones according to Directive 99/92/CE:

- Category 1** Zone 0 - Area in which (permanently, for long periods or often) an explosive atmosphere is present, consisting of a mixture of air and inflammables in the form of gas, vapour or mist.
- Zone 20 - Area in which (permanently, for long periods or often) an explosive atmosphere is present in the form of a dust/powder cloud which is combustible in the air.
- Category 2** Zone 1 - Area in which, during normal activities, the formation of an explosive atmosphere is probable, consisting of a mixture of air and inflammables in the form of gas, vapours or mist.
- Zone 21 - Area in which occasionally during normal activities the formation of an explosive atmosphere is probable, in the form of a dust/powder cloud which is combustible in the air.
- Category 3** Zone 2 - Area in which, during normal activities, the formation of an explosive atmosphere, consisting of a mixture of air and inflammables in the form of gas, vapour or mist is not probable and, whenever this should occur, it is only of a short duration
- Zone 22 - Area in which, during normal activities, the formation of an explosive atmosphere in the form of a combustible dust/powder cloud is not probable and, whenever this should occur, it is only of a short duration.

Example of Marking: **II 2 GD c T100°C (T5) -20°C≤Ta≤60°C**

- II** Group: Devices which are to be used in spaces exposed to risks of an explosive atmosphere, different from underground spaces, mines, tunnels, etc., individuated according to the criteria in enclosure I of the Directive 94/9/CE (ATEX).
- 2** Category: Devices designed to function in compliance with the operational parameters determined by the manufacturer and guarantee a high protection level.
- GD** Protected against gas (G) and explosive powders (D).
- c** Non-electrical constructions for potentially explosive atmospheres. Protection through constructive security.
- T 100°C** Max. superf. temp. of 100 °C reg. potential hazards resulting from striking within the vicinity of hazardous powders.
- T5** Max. superf. temp. of 100 °C regarding potential hazards which may result from striking within gassy environments.
- Ta** Environmental temperature: **-20°C≤Ta≤60°C**. Environmental temperature range (with dry air).

Group I: Temperature classes

Temperature =150 °C
or = 450 °C according to the level
of dust on the apparatus.

Group II: Temperature classes

Temp. classes for gas (G)	Admissible surface temperatures
T1	450°C
T2	300°C
T3	200°C
T4	135°C
T5	100°C
T6	85°C

ATEX certified Camozzi products**APPARATUS** regarding ATEX - Group II

Cylinders series	Category	Zone	Gas/	Valves series	Category	Zone	Gas/
Dust							
16*	2 DE-3 SE	1/21 DE -2/22 SE	G/D	9#*	2	1/21	G/D
24*	2 DE-3 SE	1/21 DE-2/22SE	G/D	P	3	2/22	G/D
25*	2 DE-3 SE	1/21 DE-2/22SE	G/D	A#	2	1/21	G/D
31	2 DE-3 SE	1/21DE-2/22SE	G/D	4#	2	1/21	G/D
31-32 Cylinders/Tandem/ multi-position	2 DE	1/21 DE	G/D	E (pneumatic)	2	1/21	G/D
40*	2 DE	1/21 DE	G/D	Y	3	2/22	G/D
41*	2 DE	1/21 DE	G/D				
60*	2 DE-3 SE	1/21DE-2/22 SE	G/D				
61*	2 DE-3 SE	1/21DE-2/22 SE	G/D				
62	3 DE	2/22 DE	G/D				
27	2 DE	1/21 DE	G/D				
QP-QPR	2 DE-3 SE	1/21DE-2/22 SE	G/D				
QN	3 SE	2/22 SE	G/D				
42	2 DE-3 SE	1/21DE-2/22 SE	G/D				
CST/CSV/CSH	3	2/22	G/D				
Solenoids series				FRL Groups	Category	Zone	Gas/Dust
Dust				MC#	2	1/21	G/D
U70	3	2/22	G/D	N	2	1/21	G/D
H80	2	1/21	G/D				
Pressure switches series							
PM	1	0/20	G/D				

* According ISO
Without solenoid

DA = Double-Acting cylinders
SA = Single-Acting cylinders

COMPONENTS regarding ATEX - Group II

Products	Category	Zone	Gas/Dusti
Silencers	2	1/21	G/D
Quick release couplings	2	1/21	G/D
Manifolds	2	1/21	G/D
Sub-bases	2	1/21	G/D
Feet	2	1/21	G/D
Caps	2	1/21	G/D
Plates	2	1/21	G/D

» The order code number of the certified products is obtained
by adding "EX"
Es. 358-015 standard solenoid valve
Es. 358-015EX ATEX certified solenoid valve

Pneumatic symbols

Symbol	Type
CYLINDERS	
CD01	Double acting cylinder, fixed cushions
CD02	Double acting cylinder, cushioned
CD03	Double acting cylinder, adjustable rear cushion
CD04	Double acting cylinder, adjustable front cushion
CD05	Double acting cylinder, through-rod, fixed cushions
CD06	Double acting cylinder, through-rod, adjustable front and rear cushion
CD07	Double acting cylinder, magnetic
CD08	Double acting cylinder, magnetic, fixed cushions
CD09	Double acting cylinder, magnetic, adjustable cushions in both directions
CD10	Double acting cylinder, magnetic, adjustable rear cushion
CD11	Double acting cylinder, magnetic, adjustable front cushion
CD12	Double acting cylinder, magnetic, through-rod, fixed cushions
CD13	Double acting cylinder, magnetic, through-rod, adjustable cushions in both directions
CD14	Double acting cylinder, magnetic, through-rod
CD15	Magnetic twin rod cylinders
CD16	Magnetic twin through-rod cylinders
CD17	Double acting rotary cylinder
CD18	Double acting rotary cylinder, magnetic
CD19	Single acting rotary cylinder
CD2T	Magnetic tandem cylinder, two stages, fixed cushions
CD3T	Magnetic tandem cylinder, three stages, fixed cushions
CD4T	Magnetic tandem cylinder, four stages, fixed cushions
CDPP	Magnetic multi-position cylinder, fixed cushions
CDSS	Double acting rodless cylinder, magnetic
CS01	Single acting cylinder, front spring

Symbol	Type
CYLINDERS	
CS02	Single acting cylinder, front spring
CS03	Single acting cylinder, non cushioned
CS04	Single acting cylinder, through-rod
CS05	Single acting cylinder, through-rod, adjustable cushion
CS06	Single acting cylinder, magnetic
CS07	Single acting cylinder, front spring, adjustable rear cushion
CS08	Single acting cylinder, rear spring, magnetic
CS09	Single acting cylinder, magnetic, front spring
CS10	Single acting cylinder, through-rod
CS11	Single acting cylinder, through-rod, adjustable rear cushion
HI01	Hydrocheck, regulated rod thrust
HI02	Hydrocheck, regulated rod return
HI03	Hydrocheck, regulated rod thrust with stop valve
HI04	Hydrocheck, regulated rod return with stop valve
HI05	Hydrocheck, regulated rod thrust with skip valve
HI06	Hydrocheck, regulated rod return with skip valve
HI07	Hydrocheck, regulated rod thrust with skip and stop valve
HI08	Hydrocheck, regulated rod return with skip and stop valve
PNZ1	Double acting magnetic grippers
RDLK	Rod lock device
SOLENOID VALVES	
EV01	Directly operated solenoid valve, 2/2 NC
EV02	Directly operated solenoid valve, 2/2 NO
EV03	Directly operated solenoid valve, 3/2 NCs
EV04	Directly operated solenoid valve, 3/2 NC, monostable, with manual override

Symbol	Type
SOLENOID VALVES	
EV05 	Directly operated solenoid valve, 3/2 NO
EV06 	Directly operated solenoid valve, 3/2 NO, monostable, with manual override
EV07 	Solenoid valve, 3/2 NC with quick exhaust
EV08 	Directly operated solenoid valve, 3/2 NC, bistable, with manual override
EV09 	Directly operated solenoid valve, 3/2 NO, bistable, with manual override
EV10 	Solenoid valve, 3/2 NC, monostable, with bistable manual override
EV11 	Solenoid valve, 3/2, monostable, solenoid pilot with separate air supply and bistable manual override
EV12 	Solenoid valve, 3/2 NO, monostable, with bistable manual override
EV13 	Solenoid valve, 3/2, monostable, solenoid pilot with separate air supply and bistable manual override
EV14 	Solenoid valve, 3/2, bistable, with manual override bistable
EV15 	Solenoid valve, 3/2, bistable, solenoid pilot with separate air supply and bistable manual override
EV16 	Solenoid valve, 3/2 NC, monostable, (pneumatic spring) and bistable manual override
EV17 	Solenoid valve, 3/2 NO, monostable, (pneumatic spring) and bistable manual override
EV18 	Solenoid valve, 5/2, monostable, with bistable manual override
EV19 	Solenoid valve, 5/2, monostable, solenoid pilot with separate air supply and bistable manual override
EV20 	Solenoid valve, 5/2, monostable, (pneumatic spring) and manual override
EV21 	Solenoid valve, 5/2, monostable, (pneumatic spring) and bistable manual override
EV22 	Solenoid valve, 5/2, monostable, solenoid pilot with separate air supply, pneumatic spring and bistable manual override
EV23 	Solenoid valve, 5/2, bistable, with bistable manual override
EV24 	Solenoid valve, 5/2, bistable, with manual override
EV25 	Solenoid valve, 5/2, bistable, solenoid pilot with separate air supply and bistable manual override
EV26 	Solenoid valve, 5/2, bistable, solenoid pilot with separate air supply and bistable manual override
EV27 	Solenoid valve, 5/3 CC, with manual override
EV28 	Solenoid valve, 5/3 CC, with bistable manual override
EV29 	Solenoid valve, 5/3, solenoid pilot with separate air supply and bistable manual override

Symbol	Type
SOLENOID VALVES	
EV30 	Solenoid valve, 5/3, solenoid pilot with separate air supply and bistable manual override
EV31 	Solenoid valve, 5/3 CO, with manual override
EV32 	Solenoid valve, 5/3 CO, with bistable manual override
EV33 	Solenoid valve, 5/3 CO, solenoid pilot with separate air supply and bistable manual override
EV34 	Solenoid valve, 5/3 CO, solenoid pilot with separate air supply and bistable manual override
EV35 	Solenoid valve, 5/3 CP, with manual override
EV36 	Solenoid valve, 5/3 CP, with bistable manual override
EV37 	Solenoid valve, 5/3 CP, solenoid pilot with separate air supply and bistable manual override
EV38 	Solenoid valve, 5/3 CP, solenoid pilot with separate air supply and bistable manual override
EV39 	Double solenoid valve, 3/2 NC, monostable, with bistable manual override
EV40 	Double solenoid valve, 3/2, monostable, solenoid pilot with separate air supply and bistable manual override
EV41 	Double solenoid valve, 3/2 NO, monostable, with bistable manual override
EV42 	Double solenoid valve, 3/2, monostable, solenoid pilot with separate air supply and bistable manual override
EV43 	Double solenoid valve, 3/2 NC, NO, monostable, with bistable manual override
EV44 	Double solenoid valve, 3/2, monostable, solenoid pilot with separate air supply and bistable manual override
EV45 	Directly operated solenoid valve, 3/2, possible universal use, reversed printed ports 1 and 2 on the body
EV46 	Indirectly operated solenoid valve, 2/2 NO
EV47 	Directly operated solenoid valve, 2/2 NC, with linked diaphragm
EV48 	Indirectly operated solenoid valve, 2/2 NC

PNEUMATICALLY OPERATED VALVES

VP01 	Pneumatically operated valve, 3/2, monostable, mechanical spring
VP02 	Pneumatically operated valve, 3/2, bistable
VP03 	Pneumatically operated valve, 3/2, preferential
VP04 	Pneumatically operated valve, 5/2, monostable, mechanical spring
VP05 	Pneumatically operated valve, 5/2, preferential
VP06 	Pneumatically operated valve, 5/2, bistable

Symbol	Type
PNEUMATICALLY OPERATED VALVES	
VP07	Pneumatically operated valve, 5/2, monostable, pneumatic spring
VP08	Pneumatically operated valve, 5/3 CC
VP09	Pneumatically operated valve, 5/3 CO
VP10	Pneumatically operated valve, 5/3 CP
VP11	Pneumatically operated double valve, 3/2, monostable
VP12	Pneumatically operated double valve, 3/2, monostable
VP13	Pneumatically operated double valve, 3/2, monostable

MECHANICALLY OPERATED VALVES	
VM01	Mechanically operated valve, plunger actuation, 3/2 NC, monostable, mechanical spring
VM02	Mechanically operated valve, plunger actuation, 3/2, monostable, mechanical spring
VM03	Mechanically operated valve, plunger actuation, 3/2 NO, monostable, mechanical spring
VM04	Mechanically operated valve, lever/roller actuation, 3/2 NC, monostable, mechanical spring
VM05	Mechanically operated valve, lever/roller actuation, 3/2, monostable, mechanical spring
VM06	Mechanically operated valve, lever/roller actuation, 3/2 NO, monostable, mechanical spring
VM07	Mechanically operated valve, unidirectional lever actuation, 3/2 NC, monostable, mechanical spring
VM08	Mechanically operated valve, unidirectional lever actuation, 3/2 monostable, mechanical spring
VM09	Mechanically operated valve, plunger actuation, 5/2, monostable, mechanical spring
VM10	Mechanically operated valve, plunger actuation, 5/2, monostable, mechanical spring
VM11	Mechanically operated valve, lever/roller actuation, 5/2, monostable, mechanical spring
VM12	Mechanically operated valve, lever/roller actuation, 5/2, monostable, mechanical spring
VM13	Mechanically operated valve, unidirectional lever actuation, 5/2, monostable, mechanical spring
VM14	Mechanically operated sensor valve, 3/2 NO, monostable, mechanical spring
VM15	Mechanically operated sensor valve, 3/2 NC, monostable, mechanical spring
VM16	Mechanically operated sensor valve, plunger actuation, 5/2, monostable, mechanical spring
VM17	Mechanically operated sensor valve, plunger actuation, 5/2, bistable
VM18	Valvola a comando meccanico frontale sensibile 5/2, bistabile
VM19	Mechanically operated sensor valve, lever/roller actuation, 5/2, monostable, mechanical spring
VM20	Mechanically operated sensor valve, lever/roller actuation, 5/2, bistable

MANUALLY OPERATED VALVES	
VN01	Manually operated valve, 3/2, bistable
VN02	Manually operated valve, 3/2, bistable, lockable in two positions
VN03	Manually operated valve, 3/2, bistable
VN04	Manually operated valve, 3/2 NC, monostable, mechanical spring
VN05	Manually operated valve, 3/2 NO, monostable, mechanical spring
VN06	Manually operated valve, 3/2, monostable, mechanical spring
VN07	Manually operated lever valve, 3/2, bistable
VN08	Manually operated lever valve, 3/2, bistable
VN09	Manually operated lever valve, 3/2 NC, monostable, mechanical spring
VN10	Manually operated lever valve, 3/2, bistable
VN11	Manually operated lever valve, 3/2, monostable, mechanical spring
VN12	Pedal operated valve, 3/2 NC, monostable, mechanical spring
VN13	Manually operated valve, 5/2, bistable
VN14	Manually operated valve, 5/2, monostable, mechanical spring
VN15	Manually operated lever valve, 5/2, bistable
VN16	Manually operated lever valve, 5/2, bistable
VN17	Manually operated lever valve, 5/2, monostable, mechanical spring
VN18	Pedal operated valve, 5/2, bistable
VN19	Pedal operated valve, 5/2, monostable bistable
VN20	Manually operated lever valve, 5/3 CC, stable
VN21	Manually operated lever valve, 5/3 CC, monostable
VN22	Manually operated lever valve, 5/3 CO, stable
VN23	Manually operated lever valve, 5/3 CO, stable
VN24	Manually operated lever valve, 5/3 CO, monostable
VN25	Manually operated lever valve, Joystik

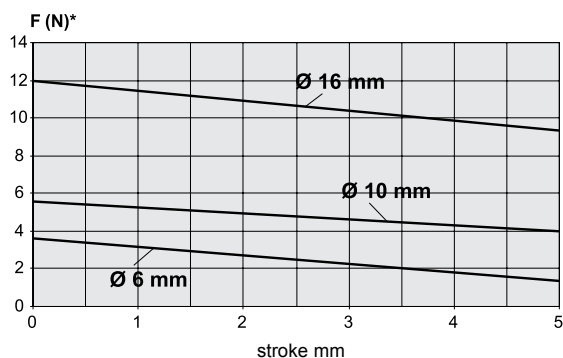
PNEUMATIC LOGIC VALVES	
AND1	"AND" pneumatic symbol
AND2	"AND" logical symbol
ORO1	"OR" pneumatic symbol and circuit selector

Symbol	Type
PNEUMATIC LOGIC VALVES	
ORO2	"OR" logical symbol
YES1	"YES" pneumatic symbol
YES2	"YES" logical symbol
NOT1	"NOT" pneumatic symbol
NOT2	"NOT" logical symbol
MEM1	"MEMORY" pneumatic symbol
MEM2	"MEMORY" logical symbol
AMP1	Signal amplifier, 3/2 NC, mechanical spring return
2LB1	Jet interruption sender sensor
2LB2	Jet interruption receiver sensor
AUTOMATIC VALVES	
ORO1	"OR" pneumatical symbol and circuit selector
VSC1	Quick exhaust valves
VB01	Unidirectional blocking valves
VB01	Bidirectional blocking valves
VNR1	Non return valves
FLOW CONTROL VALVES	
RFU1	Unidirectional flow control valve
RFO1	Bidirectional flow control valve
RP01	Unidirectional flow control valve
RP02	Unidirectional flow control valve
RP03	Bidirectional flow control valve
PRESSURE SWITCHES AND VACUUM SWITCHES	
PMNO	Pressure switch, normally open
PMNC	Pressure switch, normally closed
PMSC	Pressure switch with exchange contacts
TRP1	Electro-pneumatic transducer
SEG1	Pressure indicator
CAP1	Capacity
SILENCIER	
SIL1	Silencier
RSW1	Silenced exhaust controller

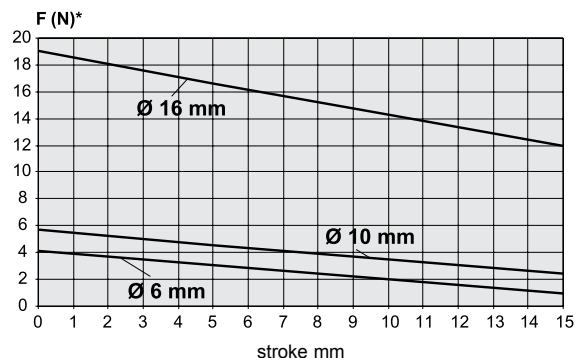
Symbol	Type
FRL	
FT01	Filter without drain
FT02	Filter with manual drain
FT03	Filter with automatic drain
FA01	Coalescing filter without drain
FA02	Coalescing filter with manual drain
FA03	Coalescing filter with automatic drain
FC01	Absorption function without cup hole
PR01	Regulator without relieving
PR02	Regulator with relieving
PR03	Regulator with relieving and by-pass valve
PR04	Regulator without relieving and with by-pass valve
PR05	Regulator without relieving and with pressure gauge
PR06	Regulator with relieving and with pressure gauge
LU0	Lubricator
FR01	Filter-regulator with relieving and manual drain
FR02	Filter-regulator with relieving and without drain
FR03	Filter-regulator with relieving, manual drain and pressure gauge
FR04	Filter-regulator with relieving, without drain and with pressure gauge
FR05	Filter-regulator with relieving, automatic drain and pressure gauge
FR10	Filter-regulator with manual drain, without relieving and with pressure gauge
FR11	Filter-regulator with manual drain and without relieving
FR18	Filter-regulator with relieving and automatic drain
FR19	Manifold pressure regulator
VN02	Lockable isolation valve
AVP1	Soft start valve
BL01	Take-off block
BL02	Take-off block with VNR

Spring loads cylinders

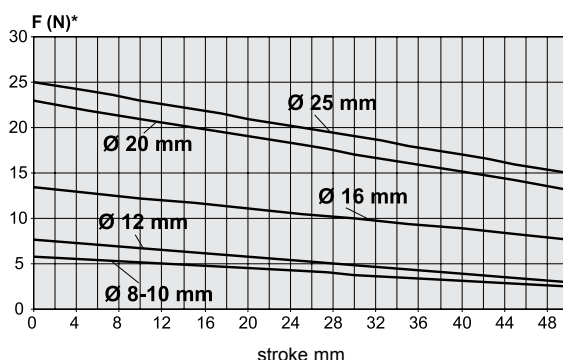
Series 14 - stroke 5 mm



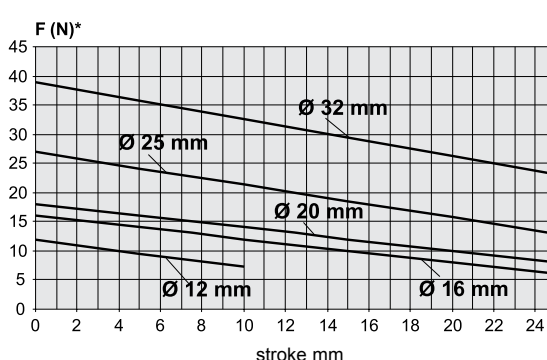
Series 14 - stroke 10 and 15 mm



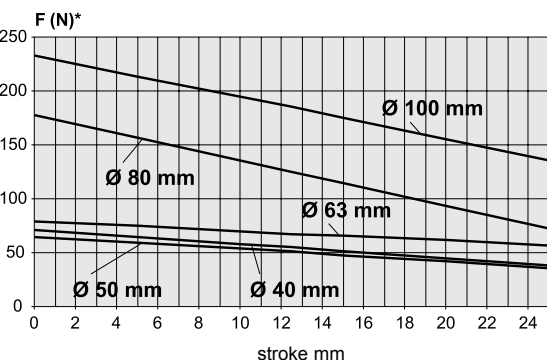
Series 16-24



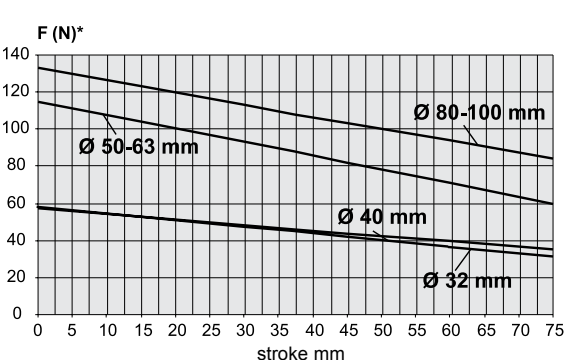
Series 31-32



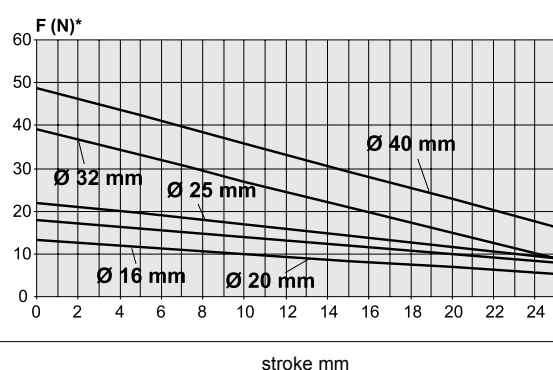
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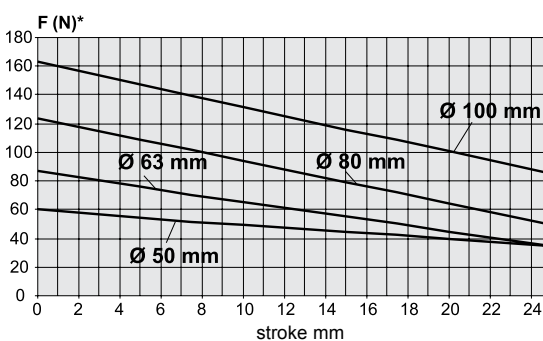
Series 60-61-42-90



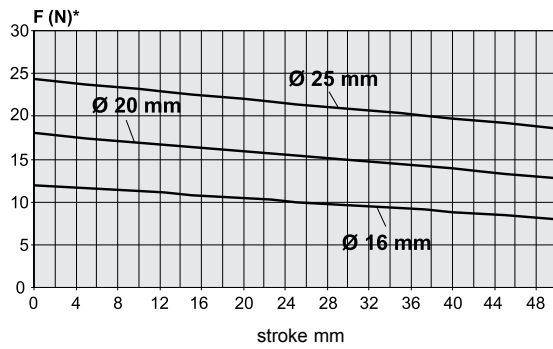
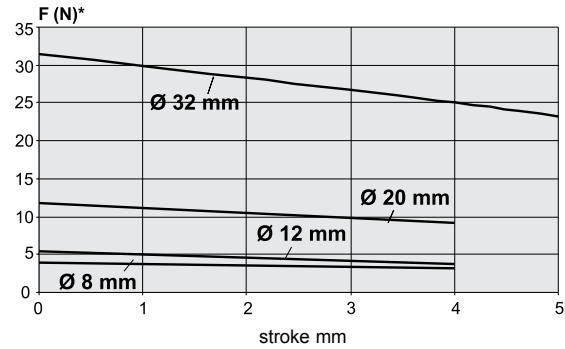
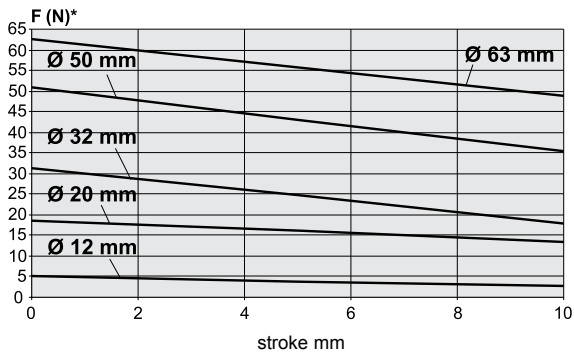
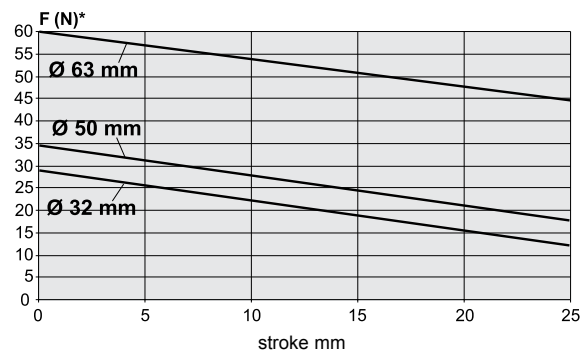
Series QP



Series QP



The company reserves the right to vary models and dimensions without notice. These products are designed for industrial applications and are not suitable for sale to the general public.

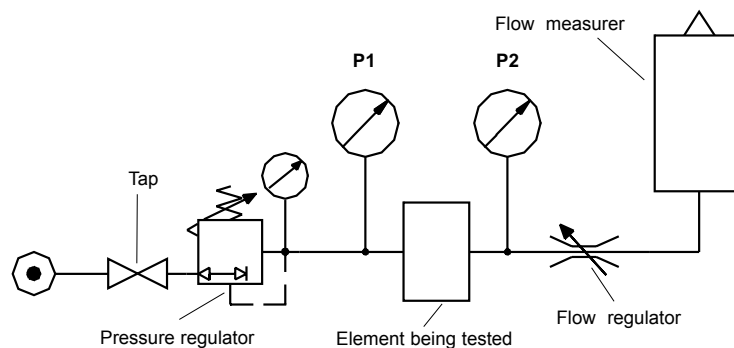
Series 94**Series QN - stroke 4 and 5 mm****Series QN - stroke 10 mm****Series QN - stroke 25 mm*** F = spring force

Flow and speed cylinders

Valves and solenoid valves

Flow survey instruments.

The flow rate indicated in the catalogue is obtained with
P1 = 6 bar e P2 = 5 bar.



Maximum speeds obtainable combining a certain flow regulator (mm/sec) with a cylinder

MOD.	32	40	50	63	80	100	125
GSCU-1/8"; GSVU-1/8"; GMCU-1/8"; GSCU-1/8"	1000	954	611	385	239	153	98
GSCU-1/4"; GSVU-1/4"; GMCU-1/4"; GSCU-1/4"	-	1000	1000	719	446	285	183
RFU 452 M5	246	-	-	-	-	-	-
RFU 482-1/8"	259	166	106	67	41	-	-
RFU 483-1/8"	638	408	261	165	102	65	-
RFU 444-1/4"	-	709	454	286	177	114	73
RFU 446-1/4"	-	-	972	612	380	243	155
SCU M5 - SVU M5	213	-	-	-	-	-	-
SCU-1/4"; SVU-1/4"; MCU-1/4"; MVU-1/4"	-	1000	734	462	287	183	117
SCU-1/8"; SVU-1/8"; MCU-1/8"; MVU-1/8"	557	356	228	144	89	57	-
SCU-3/8"; MCU-3/8"	-	-	-	773	479	307	196
SCU-1/2"; MCU-1/2"	-	-	-	-	1000	1000	-

To obtain the above indicated speeds, the connected tubing should have a certain diameter and not exceed, if indicated, the max. length (mm)

GSCU-1/8"; GSVU-1/8"; GMCU-1/8"; GSCU-1/8"	6/4 max 4000	6/4 max 1000	6/4 max 1000	8/6	8/6	6/4 max 1000	-
GSCU-1/4"; GSVU-1/4"; GMCU-1/4"; GSCU-1/4"	-	6/4 max 1000	8/6 max 4500	8/6 max 3500	8/6 max 3500	8/6 max 3500	8/6 max 3500
RFU 452 M5	4/2 max 3000	-	-	-	-	-	-
RFU 482-1/8"	4/2 max 3000	4/2 max 3000	4/2 max 2500	4/2 max 2500	4/2 max 2500	-	-
RFU 483-1/8"	6/4 max 8000	6/4 max 8000	6/4 max 8000	6/4 max 8000	6/4 max 8000	6/4 max 8000	-
RFU 444-1/4"	-	6/4 max 3000	6/4 max 3000	6/4 max 3000	6/4 max 3000	6/4 max 3000	6/4 max 3500
RFU 446-1/4"	-	-	8/6 max 4500	8/6 max 4000	8/6 max 4000	8/6 max 4000	8/6 max 4000
SCU M5 - SVU M5	4/2 max 4000	-	-	-	-	-	-
SCU-1/4"; SVU-1/4"; MCU-1/4"; MVU-1/4"	-	6/4 max 1000	8/6 max 8000	8/6 max 8000	8/6 max 8000	8/6 max 8000	8/6 max 8000
SCU-1/8"; SVU-1/8"; MCU-1/8"; MVU-1/8"	6/4	6/4	6/4	6/4	4/2 max 2500	4/2 max 2500	-
SCU-3/8"; MCU-3/8"	-	-	-	8/6 max 3000	8/6 max 3000	8/6 max 3000	8/6 max 3000
SCU-1/2"; MCU-1/2"	-	-	-	-	10/8	12/10 max 250	-

Air flow required by the valve to obtain the above indicated speeds (NI/min)

GSCU-1/8"; GSVU-1/8"; GMCU-1/8"; GSCU-1/8"	337	503	503	503	504	504	-
GSCU-1/4"; GSVU-1/4"; GMCU-1/4"; GSCU-1/4"	-	527	824	940	941	939	942
RFU 452 M5	83	-	-	-	-	-	-
RFU 482-1/8"	87	87	87	87	86	-	-
RFU 483-1/8"	215	215	215	215	215	214	-
RFU 444-1/4"	-	374	374	374	373	375	376
RFU 446-1/4"	-	-	801	800	801	801	798
SCU M5 - SVU M5	71	-	-	-	-	-	-
SCU-1/4"; SVU-1/4"; MCU-1/4"; MVU-1/4"	-	527	605	604	605	603	602
SCU-1/8"; SVU-1/8"; MCU-1/8"; MVU-1/8"	188	187	187	188	187	187	-
SCU-3/8"; MCU-3/8"	-	-	-	1011	1010	1012	1009
SCU-1/2"; MCU-1/2"	-	-	-	-	2110	3297	-

Values obtained using cylinders with stroke 1000mm at 6 bar.

Output forces double-acting cylinders

Thrust side

Values in Newtons: Output force in N (efficiency factor 0.9) N x 0.2245 = pounds force lbf

SERIES >		16	24	25	27	31	32	QP	QN	QCT	QCB	QCTB	QCTF	40	41	42	50	52	60	61	62	90	92	94	95
Ø	Thrust side	Pressure																							
		MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)
mm	cm ²	0,10 (1)	0,20 (2)	0,30 (3)	0,40 (4)	0,50 (5)	0,60 (6)	0,70 (7)	0,80 (8)	0,90 (9)	1 (10)														
8	0,50	4,44	8,9	13,3	17,7	22,2	26,6	31,0	35,5	39,9	44,4														
10	0,79	6,93	13,9	20,8	27,7	34,7	41,6	48,5	55,4	62,4	69,3														
12	1,13	9,98	20,0	29,9	39,9	49,9	59,9	69,9	79,8	89,8	99,8														
16	2,01	17,74	35,5	53,2	71,0	88,7	106,5	124,2	141,9	159,7	177,4														
20	3,14	27,72	55,4	83,2	110,9	138,6	166,3	194,1	221,8	249,5	277,2														
25	4,91	43,32	86,6	130,0	173,3	216,6	259,9	303,2	346,5	389,9	433,2														
32	8,04	70,97	141,9	212,9	283,9	354,9	425,8	496,8	567,8	638,7	709,7														
40	12,56	110,89	221,8	332,7	443,6	554,5	665,4	776,2	887,1	998,0	1108,9														
50	19,63	173,27	346,5	519,8	693,1	866,3	1039,6	1212,9	1386,2	1559,4	1732,7														
63	31,16	275,08	550,2	825,2	1100,3	1375,4	1650,5	1925,6	2200,7	2475,7	2750,8														
80	50,24	443,57	887,1	1330,7	1774,3	2217,8	2661,4	3105,0	3548,6	3992,1	4435,7														
100	78,50	693,08	1386,2	2079,2	2772,3	3465,4	4158,5	4851,5	5544,6	6237,7	6930,8														
125	122,66	1082,93	2165,9	3248,8	4331,7	5414,7	6497,6	7580,5	8663,5	9746,4	10829,3														
160	200,96	1774,28	3548,6	5322,8	7097,1	8871,4	10645,7	12419,9	14194,2	15968,5	17742,8														
200	314,00	2772,31	5544,6	8316,9	11089,2	13861,5	16633,8	19406,1	22178,4	24950,8	27723,1														

SERIES > QX

Ø	Thrust side	Pressure									
		MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)
mm	cm²	0,10 (1)	0,20 (2)	0,30 (3)	0,40 (4)	0,50 (5)	0,60 (6)	0,70 (7)	0,80 (8)	0,90 (9)	1 (10)
10	1,58	14,22	28,44	42,66	56,88	71,1	85,32	99,54	113,76	127,98	142,2
16	4,02	35,48	71	106,4	142	177,4	213	248,4	283,8	319,4	354,8
20	6,28	55,44	110,8	166,4	221,8	277,2	332,6	388,2	443,6	499	554,4
25	9,82	86,64	173,2	260	346,6	433,2	519,8	606,4	693	779,8	866,4
32	16,08	141,94	283,8	425,8	567,8	709,8	851,6	993,6	1135,6	1277,4	1419,4

Traction side

Values in Newtons: Output force in N (efficiency factor 0.9) N x 0.2245 = pounds force lbf

SERIES >		16	24	25	40	41	42	60	61	62	90	92	94	95
Ø	Thrust side	Ø rod	Traction side	Pressure										
				MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	
mm	cm²	mm	cm²	0,10 (1)	0,20 (2)	0,30 (3)	0,40 (4)	0,50 (5)	0,60 (6)	0,70 (7)	0,80 (8)	0,90 (9)	1 (10)	
8	0,50	4	0,38	3,33	6,7	10,0	13,3	16,6	20,0	23,3	26,6	29,9	33,3	
10	0,79	4	0,66	5,82	11,6	17,5	23,3	29,1	34,9	40,8	46,6	52,4	58,2	
12	1,13	6	0,85	7,49	15,0	22,5	29,9	37,4	44,9	52,4	59,9	67,4	74,9	
16	2,01	6	1,73	15,25	30,5	45,7	61,0	76,2	91,5	106,7	122,0	137,2	152,5	
20	3,14	8	2,64	23,29	46,6	69,9	93,1	116,4	139,7	163,0	186,3	209,6	232,9	
25	4,91	10	4,12	36,39	72,8	109,2	145,5	181,9	218,3	254,7	291,1	327,5	363,9	
32	8,04	12	6,91	60,99	122,0	183,0	244,0	305,0	365,9	426,9	487,9	548,9	609,9	
40	12,56	16	10,55	93,15	186,3	279,4	372,6	465,7	558,9	652,0	745,2	838,3	931,5	
50	19,63	20	16,49	145,55	291,1	436,6	582,2	727,7	873,3	1018,8	1164,4	1309,9	1455,5	
63	31,16	20	28,02	247,36	494,7	742,1	989,4	1236,8	1484,2	1731,5	1978,9	2226,2	2473,6	
80	50,24	25	45,33	400,25	800,5	1200,8	1601,0	2001,3	2401,5	2801,8	3202,0	3602,3	4002,5	
100	78,50	25	73,59	649,76	1299,5	1949,3	2599,0	3248,8	3898,6	4548,3	5198,1	5847,8	6497,6	
125	122,66	32	114,62	1011,96	2023,9	3035,9	4047,8	5059,8	6071,8	7083,7	8095,7	9107,6	10119,6	
160	200,96	40	188,40	1663,38	3326,8	4990,2	6653,5	8316,9	9980,3	11643,7	13307,1	14970,5	16633,8	
200	314,00	40	301,44	2661,41	5322,8	7984,2	10645,7	13307,1	15968,5	18629,9	21291,3	23952,7	26614,1	

SERIES > QX

Ø		Pressure													
mm	cm ²	Ø rod	Traction side	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)		
		mm	cm ²	0,10 (1)	0,20 (2)	0,30 (3)	0,40 (4)	0,50 (5)	0,60 (6)	0,70 (7)	0,80 (8)	0,90 (9)	1 (10)		
10	1,58	6	1,0148	9,1332	18,2664	27,3996	36,5328	45,666	54,7992	63,9324	73,0656	82,1988	91,332		
16	4,02	16	3,02	26,62	53,2	79,8	106,4	133	159,6	186,2	213	239,6	266,2		
20	6,28	20	4,72	41,58	83,2	124,8	166,4	208	249,6	291	332,6	374,2	415,8		
25	9,82	24	7,56	66,68	133,4	200	266,6	333,4	400	466,8	533,4	600	666,8		
32	16,08	32	12,06	106,46	213	319,4	425,8	532,2	638,8	745,2	851,6	958,2	1064,6		

Traction side

Values in Newtons: Output force in N (efficiency factor 0.9) N x 0.2245 = pounds force lbf

SERIES > 31 32													
Ø	Thrust side	Ø rod	Traction side	Pressure									
				MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)
mm	cm ²	mm	cm ²	0,10 (1)	0,20 (2)	0,30 (3)	0,40 (4)	0,50 (5)	0,60 (6)	0,70 (7)	0,80 (8)	0,90 (9)	1 (10)
12	1,13	6	0,85	7,49	15,0	22,5	29,9	37,4	44,9	52,4	59,9	67,4	74,9
16	2,01	8	1,51	13,31	26,6	39,9	53,2	66,5	79,8	93,1	106,5	119,8	133,1
20	3,14	10	2,36	20,79	41,6	62,4	83,2	104,0	124,8	145,5	166,3	187,1	207,9
25	4,91	10	4,12	36,39	72,8	109,2	145,5	181,9	218,3	254,7	291,1	327,5	363,9
32	8,04	12	6,91	60,99	122,0	183,0	244,0	305,0	365,9	426,9	487,9	548,9	609,9
40	12,56	12	11,43	100,91	201,8	302,7	403,6	504,6	605,5	706,4	807,3	908,2	1009,1
50	19,63	16	17,62	155,53	311,1	466,6	622,1	777,6	933,2	1088,7	1244,2	1399,7	1555,3
63	31,16	16	29,15	257,34	514,7	772,0	1029,4	1286,7	1544,0	1801,4	2058,7	2316,1	2573,4
80	50,24	20	47,10	415,85	831,7	1247,5	1663,4	2079,2	2495,1	2910,9	3326,8	3742,6	4158,5
100	78,50	25	73,59	649,76	1299,5	1949,3	2599,0	3248,8	3898,6	4548,3	5198,1	5847,8	6497,6

SERIES > QP													
Ø	Thrust side	Ø rod	Traction side	Pressure									
				MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)
mm	cm ²	mm	cm ²	0,10 (1)	0,20 (2)	0,30 (3)	0,40 (4)	0,50 (5)	0,60 (6)	0,70 (7)	0,80 (8)	0,90 (9)	1 (10)
12	1,13	6	0,85	7,49	15,0	22,5	29,9	37,4	44,9	52,4	59,9	67,4	74,9
16	2,01	8	1,51	13,31	26,6	39,9	53,2	66,5	79,8	93,1	106,5	119,8	133,1
20	3,14	10	2,36	20,79	41,6	62,4	83,2	104,0	124,8	145,5	166,3	187,1	207,9
25	4,91	10	4,12	36,39	72,8	109,2	145,5	181,9	218,3	254,7	291,1	327,5	363,9
32	8,04	12	6,91	60,99	122,0	183,0	244,0	305,0	365,9	426,9	487,9	548,9	609,9
40	12,56	16	10,55	93,15	186,3	279,4	372,6	465,7	558,9	652,0	745,2	838,3	931,5
50	19,63	16	17,62	155,53	311,1	466,6	622,1	777,6	933,2	1088,7	1244,2	1399,7	1555,3
63	31,16	20	28,02	247,36	494,7	742,1	989,4	1236,8	1484,2	1731,5	1978,9	2226,2	2473,6
80	50,24	25	45,33	400,25	800,5	1200,8	1601,0	2001,3	2401,5	2801,8	3202,0	3602,3	4002,5
100	78,50	25	73,59	649,76	1299,5	1949,3	2599,0	3248,8	3898,6	4548,3	5198,1	5847,8	6497,6

SERIES > 27													
Ø	Thrust side	Ø rod	Traction side	Pressure									
				MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)
mm	cm ²	mm	cm ²	0,10 (1)	0,20 (2)	0,30 (3)	0,40 (4)	0,50 (5)	0,60 (6)	0,70 (7)	0,80 (8)	0,90 (9)	1 (10)
20	3,14	8	2,64	23,29	46,6	69,9	93,1	116,4	139,7	163,0	186,3	209,6	232,9
25	4,91	10	4,12	36,39	72,8	109,2	145,5	181,9	218,3	254,7	291,1	327,5	363,9
32	8,04	12	6,91	60,99	122,0	183,0	244,0	305,0	365,9	426,9	487,9	548,9	609,9
40	12,56	16	10,55	93,15	186,3	279,4	372,6	465,7	558,9	652,0	745,2	838,3	931,5
50	19,63	16	17,62	155,53	311,1	466,6	622,1	777,6	933,2	1088,7	1244,2	1399,7	1555,3
63	31,16	20	28,02	247,36	494,7	742,1	989,4	1236,8	1484,2	1731,5	1978,9	2226,2	2473,6

SERIES > QCT QCB QCTF QCBF													
Ø	Thrust side	Ø rod	Traction side	Pressure									
				MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)
mm	cm ²	mm	cm ²	0,10 (1)	0,20 (2)	0,30 (3)	0,40 (4)	0,50 (5)	0,60 (6)	0,70 (7)	0,80 (8)	0,90 (9)	1 (10)
20	3,14	10	2,36	20,79	41,6	62,4	83,2	104,0	124,8	145,5	166,3	187,1	207,9
25	4,91	12	3,78	33,34	66,7	100,0	133,3	166,7	200,0	233,4	266,7	300,0	333,4
32	8,04	16	6,03	53,23	106,5	159,7	212,9	266,1	319,4	372,6	425,8	479,1	532,3
40	12,56	16	10,55	93,15	186,3	279,4	372,6	465,7	558,9	652,0	745,2	838,3	931,5
50	19,63	20	16,49	145,55	291,1	436,6	582,2	727,7	873,3	1018,8	1164,4	1309,9	1455,5
63	31,16	20	28,02	247,36	494,7	742,1	989,4	1236,8	1484,2	1731,5	1978,9	2226,2	2473,6

Table showing air consumption of double-acting cylinders

Thrust side

Values in NL for each 10 mm of stroke

SERIES > 16														24	25	27	31	32	QP	QCT	QCB	QCTB	QCTF	40	41	42	50	52	60	61	62	90	92	94	95
Ø	Thrust side	Pressure																																	
		MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)																						
mm	cm²	0,10 (1)	0,20 (2)	0,30 (3)	0,40 (4)	0,50 (5)	0,60 (6)	0,70 (7)	0,80 (8)	0,90 (9)	1 (10)																								
8	0,50		0,001	0,002	0,002	0,003	0,003	0,004	0,004	0,005	0,005	0,006																							
10	0,79		0,002	0,002	0,003	0,004	0,005	0,005	0,006	0,007	0,008	0,009																							
12	1,13		0,002	0,003	0,005	0,006	0,007	0,008	0,009	0,010	0,011	0,012																							
16	2,01		0,004	0,006	0,008	0,010	0,012	0,014	0,016	0,018	0,020	0,022																							
20	3,14		0,006	0,009	0,013	0,016	0,019	0,022	0,025	0,028	0,031	0,035																							
25	4,91		0,010	0,015	0,020	0,025	0,029	0,034	0,039	0,044	0,049	0,054																							
32	8,04		0,016	0,024	0,032	0,040	0,048	0,056	0,064	0,072	0,080	0,088																							
40	12,56		0,025	0,038	0,050	0,063	0,075	0,088	0,100	0,113	0,126	0,138																							
50	19,63		0,039	0,059	0,079	0,098	0,118	0,137	0,157	0,177	0,196	0,216																							
63	31,16		0,062	0,093	0,125	0,156	0,187	0,218	0,249	0,280	0,312	0,343																							
80	50,24		0,100	0,151	0,201	0,251	0,301	0,352	0,402	0,452	0,502	0,553																							
100	78,50		0,157	0,236	0,314	0,393	0,471	0,550	0,628	0,707	0,785	0,864																							
125	122,66		0,245	0,368	0,491	0,613	0,736	0,859	0,981	1,104	1,227	1,349																							
160	200,96		0,402	0,603	0,804	1,005	1,206	1,407	1,608	1,809	2,010	2,211																							
200	314,00		0,628	0,942	1,256	1,570	1,884	2,198	2,512	2,826	3,140	3,454																							

SERIES > QX

Ø	Thrust side	Pressure																			
		MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)										
mm	cm²	0,10 (1)	0,20 (2)	0,30 (3)	0,40 (4)	0,50 (5)	0,60 (6)	0,70 (7)	0,80 (8)	0,90 (9)	1 (10)										
10	1,58	0,003	0,005	0,006	0,008	0,009	0,011	0,013	0,014	0,016	0,017										
16	4,02	0,008	0,012	0,016	0,02	0,024	0,028	0,032	0,036	0,04	0,044										
20	6,28	0,012	0,018	0,026	0,032	0,038	0,044	0,05	0,056	0,062	0,07										
25	9,82	0,02	0,03	0,04	0,05	0,058	0,068	0,078	0,088	0,098	0,108										
32	16,08	0,032	0,048	0,064	0,08	0,096	0,112	0,128	0,144	0,16	0,176										

Traction side

Values in NL for each 10 mm of stroke

SERIES > 16 24 25 40 41 42 60 61 62 90 92 94 95																							
Ø	Thrust side	Ø rod	Traction side	Pressure																			
				MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)										
mm	cm²	mm	cm²	0,10 (1)	0,20 (2)	0,30 (3)	0,40 (4)	0,50 (5)	0,60 (6)	0,70 (7)	0,80 (8)	0,90 (9)	1 (10)										
8	0,50	4	0,38	0,001	0,001	0,002	0,002	0,002	0,003	0,003	0,003	0,004	0,004										
10	0,79	4	0,66	0,001	0,002	0,003	0,003	0,004	0,005	0,005	0,006	0,007	0,007										
12	1,13	6	0,85	0,002	0,003	0,003	0,004	0,005	0,006	0,007	0,008	0,008	0,009										
16	2,01	6	1,73	0,003	0,005	0,007	0,009	0,010	0,012	0,014	0,016	0,017	0,019										
20	3,14	8	2,64	0,005	0,008	0,011	0,013	0,016	0,018	0,021	0,024	0,026	0,029										
25	4,91	10	4,12	0,008	0,012	0,016	0,021	0,025	0,029	0,033	0,037	0,041	0,045										
32	8,04	12	6,91	0,014	0,021	0,028	0,035	0,041	0,048	0,055	0,062	0,069	0,076										
40	12,56	16	10,55	0,021	0,032	0,042	0,053	0,063	0,074	0,084	0,095	0,106	0,116										
50	19,63	20	16,49	0,033	0,049	0,066	0,082	0,099	0,115	0,132	0,148	0,165	0,181										
63	31,16	20	28,02	0,056	0,084	0,112	0,140	0,168	0,196	0,224	0,252	0,280	0,308										
80	50,24	25	45,33	0,091	0,136	0,181	0,227	0,272	0,317	0,363	0,408	0,453	0,499										
100	78,50	25	73,59	0,147	0,221	0,294	0,368	0,442	0,515	0,589	0,662	0,736	0,810										
125	122,66	32	114,62	0,229	0,344	0,458	0,573	0,688	0,802	0,917	1,032	1,146	1,261										
160	200,96	40	188,40	0,377	0,565	0,754	0,942	1,130	1,319	1,507	1,696	1,884	2,072										
200	314,00	40	301,44	0,603	0,904	1,206	1,507	1,809	2,110	2,412	2,713	3,014	3,316										

SERIES > QX

Ø	Thrust side	Ø rod	Traction side	Pressure									
				MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)
mm	cm²			0,10 (1)	0,20 (2)	0,30 (3)	0,40 (4)	0,50 (5)	0,60 (6)	0,70 (7)	0,80 (8)	0,90 (9)	1 (10)
10	1,58	6	1,0148	0,002	0,003	0,004	0,005	0,006	0,007	0,008	0,009	0,010	0,011
16	4,02	16	3,02	0,006	0,01	0,012	0,016	0,018	0,022	0,024	0,028	0,03	0,034
20	6,28	20	4,72	0,01	0,014	0,018	0,024	0,028	0,032	0,038	0,042	0,048	0,052
25	9,82	24	7,56	0,016	0,022	0,03	0,038	0,046	0,052	0,06	0,068	0,076	0,084
32	16.08	32	12.06	0,024	0,036	0,048	0,06	0,072	0,084	0,096	0,108	0,12	0,132

Traction side

Values in NL for each 10 mm of stroke

SERIES > 31 32													
Ø	Thrust side	Ø rod	Traction side	Pressure									
				MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)
mm	cm ²	mm	cm ²	0,10 (1)	0,20 (2)	0,30 (3)	0,40 (4)	0,50 (5)	0,60 (6)	0,70 (7)	0,80 (8)	0,90 (9)	1 (10)
12	1,13	6	0,85	0,002	0,003	0,003	0,004	0,005	0,006	0,007	0,008	0,008	0,009
16	2,01	8	1,51	0,003	0,005	0,006	0,008	0,009	0,011	0,012	0,014	0,015	0,017
20	3,14	10	2,36	0,005	0,007	0,009	0,012	0,014	0,016	0,019	0,021	0,024	0,026
25	4,91	10	4,12	0,008	0,012	0,016	0,021	0,025	0,029	0,033	0,037	0,041	0,045
32	8,04	12	6,91	0,014	0,021	0,028	0,035	0,041	0,048	0,055	0,062	0,069	0,076
40	12,56	12	11,43	0,023	0,034	0,046	0,057	0,069	0,080	0,091	0,103	0,114	0,126
50	19,63	16	17,62	0,035	0,053	0,070	0,088	0,106	0,123	0,141	0,159	0,176	0,194
63	31,16	16	29,15	0,058	0,087	0,117	0,146	0,175	0,204	0,233	0,262	0,291	0,321
80	50,24	20	47,10	0,094	0,141	0,188	0,236	0,283	0,330	0,377	0,424	0,471	0,518
100	78,50	25	73,59	0,147	0,221	0,294	0,368	0,442	0,515	0,589	0,662	0,736	0,810

SERIES > QP													
Ø	Thrust side	Ø rod	Traction side	Pressure									
				MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)
mm	cm ²	mm	cm ²	0,10 (1)	0,20 (2)	0,30 (3)	0,40 (4)	0,50 (5)	0,60 (6)	0,70 (7)	0,80 (8)	0,90 (9)	1 (10)
12	1,13	6	0,85	0,002	0,003	0,003	0,004	0,005	0,006	0,007	0,008	0,008	0,009
16	2,01	8	1,51	0,003	0,005	0,006	0,008	0,009	0,011	0,012	0,014	0,015	0,017
20	3,14	10	2,36	0,005	0,007	0,009	0,012	0,014	0,016	0,019	0,021	0,024	0,026
25	4,91	10	4,12	0,008	0,012	0,016	0,021	0,025	0,029	0,033	0,037	0,041	0,045
32	8,04	12	6,91	0,014	0,021	0,028	0,035	0,041	0,048	0,055	0,062	0,069	0,076
40	12,56	16	10,55	0,021	0,032	0,042	0,053	0,063	0,074	0,084	0,095	0,106	0,116
50	19,63	16	17,62	0,035	0,053	0,070	0,088	0,106	0,123	0,141	0,159	0,176	0,194
63	31,16	20	28,02	0,056	0,084	0,112	0,140	0,168	0,196	0,224	0,252	0,280	0,308
80	50,24	25	45,33	0,091	0,136	0,181	0,227	0,272	0,317	0,363	0,408	0,453	0,499
100	78,50	25	73,59	0,147	0,221	0,294	0,368	0,442	0,515	0,589	0,662	0,736	0,810

SERIES > 27													
Ø	Thrust side	Ø rod	Traction side	Pressure									
				MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)
mm	cm ²	mm	cm ²	0,10 (1)	0,20 (2)	0,30 (3)	0,40 (4)	0,50 (5)	0,60 (6)	0,70 (7)	0,80 (8)	0,90 (9)	1 (10)
20	3,14	8	2,64	0,005	0,008	0,011	0,013	0,016	0,018	0,021	0,024	0,026	0,029
25	4,91	10	4,12	0,008	0,012	0,016	0,021	0,025	0,029	0,033	0,037	0,041	0,045
32	8,04	12	6,91	0,014	0,021	0,028	0,035	0,041	0,048	0,055	0,062	0,069	0,076
40	12,56	16	10,55	0,021	0,032	0,042	0,053	0,063	0,074	0,084	0,095	0,106	0,116
50	19,63	16	17,62	0,035	0,053	0,070	0,088	0,106	0,123	0,141	0,159	0,176	0,194
63	31,16	20	28,02	0,056	0,084	0,112	0,140	0,168	0,196	0,224	0,252	0,280	0,308

SERIES > QCT QCB QCTF QCBF													
Ø	Thrust side	Ø rod	Traction side	Pressure									
				MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)
mm	cm ²	mm	cm ²	0,10 (1)	0,20 (2)	0,30 (3)	0,40 (4)	0,50 (5)	0,60 (6)	0,70 (7)	0,80 (8)	0,90 (9)	1 (10)
20	3,14	10	2,36	0,005	0,007	0,009	0,012	0,014	0,016	0,019	0,021	0,024	0,026
25	4,91	12	3,78	0,008	0,011	0,015	0,019	0,023	0,026	0,030	0,034	0,038	0,042
32	8,04	16	6,03	0,012	0,018	0,024	0,030	0,036	0,042	0,048	0,054	0,060	0,066
40	12,56	16	10,55	0,021	0,032	0,042	0,053	0,063	0,074	0,084	0,095	0,106	0,116
50	19,63	20	16,49	0,033	0,049	0,066	0,082	0,099	0,115	0,132	0,148	0,165	0,181
63	31,16	20	28,02	0,056	0,084	0,112	0,140	0,168	0,196	0,224	0,252	0,280	0,308

Sizing guide for Shock Absorbers Series SA

In order to select the correct dimensions of Shock absorbers the following parameters are needed:

- Weight of the impact object m (kg)
- Impact speed v (m/s)
- Propelling or thrust force F (N)
- No. of impact cycles per hour C (/hr)

Some formulas

1. Kinetic energy $E_k = mv^2/2$
2. Drive energy $E_D = F \cdot S$
3. Total energy $E_T = E_k + E_D$
4. Free fall speed $v = \sqrt{(2g \cdot h)}$

Some formulas

5. Cylinder's traction force $F = \frac{D^2 \cdot \pi}{4} \cdot P \cdot g/100$
6. Cylinder's thrust force $F = \frac{(D^2 - d^2) \cdot \pi}{4} \cdot P \cdot g/100$
7. Maximum shock force (approx.) $F_m = 1.2 E_T / S$
8. Total energy consumption per hour $E_{TC} = E_T \cdot C$
9. Mass: $M_e = 2E_T / v^2$

Sizing guide: formulas and examples

Symbols description

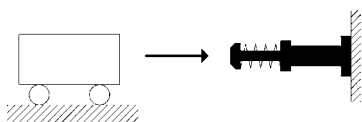
Symbol	Unit	Description
m		friction coefficient
a	(rad)	angle of incline
q	(rad)	side load angle
w	(rad/s)	angular velocity
A	(m)	width
B	(m)	thickness
C	(/hr)	impact cycles per hour
D	(cm)	cylinder diameter
d	(cm)	piston rod diameter
E_D	(Nm)	drive energy per cycle
E_k	(Nm)	kinetic energy per cycle
E_T	(Nm)	total energy per cycle
E_{TC}	(Nm)	total energy per hour
F	(N)	propelling force

Symbol	Unit	Description
F_m	(N)	maximum shock force
g	(m/s ²)	gravity acceleration (9.81 m/s ²)
h	(m)	hight
m	(kg)	mass to be decelerated
M_e	(kg)	effective mass
P	(bar)	operating pressure
R	(m)	radius
R_s	(m)	shock absorber mounting distance from rotation center
S	(m)	stroke (shock absorber)
T	(Nm)	driving torque
t	(s)	deceleration time
v	(m/s)	velocity of impact mass
vs	(m/s)	impact velocity at shock absorber

Example 1: Horizontal impact

Application data:

- $v = 1.0$ m/s
- $m = 50$ kg
- $S = 0.01$ m
- $C = 1500$ cycles/h



Calculation:

$$E_k = \frac{mv^2}{2} = \frac{50 \cdot 1^2}{2} = 25 \text{ Nm}$$

$$E_T = E_k = 25 \text{ Nm}$$

$$E_{TC} = E_T \cdot C = 25 \cdot 1500 = 37500 \text{ Nm/h}$$

$$M_e = \frac{2E_T}{v^2} = \frac{2 \cdot 25}{1^2} = 50 \text{ kg}$$

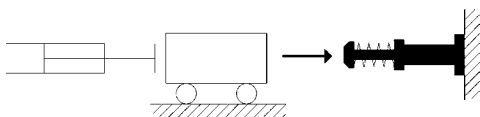
The adequate Shock Absorber to use in this case is Mod. SA 2015 according to the technical data where we find that E_T (max)=59 Nm, E_{TC} (max)=38000 Nm/h and M_e (max)=120 kg.

Example 2: Horizontal impact with propelling force

Application data:

- $m = 40$ kg
- $P = 6$ bar
- $S = 0.01$ m first hypothesis SA 1210
- $v = 1.2$ m/s
- $D = 50$ mm
- $C = 780$ cycles/h

To facilitate the calculation, the pressure in the empty cylinder chamber is not considered (safety condition)



Calculation:

$$E_k = \frac{mv^2}{2} = \frac{40 \cdot 1.2^2}{2} = 28.8 \text{ Nm}$$

Consider the shock absorber with the lowest E_T but superior to 28.8 Nm: mod. SA 2015 $S=0.015$ m

$$E_D = F \cdot S = \frac{D^2 \cdot \pi}{4} \cdot P \cdot g/100 \cdot S = \frac{50^2 \cdot \pi}{4} \cdot 6 \cdot 9.81/100 \cdot 0.015 = 17.3 \text{ Nm}$$

$$E_T = E_k + E_D = 28.8 + 17.3 = 46.1 \text{ Nm}$$

$$E_{TC} = E_T \cdot C = 46.1 \cdot 780 = 35958 \text{ Nm/h}$$

$$M_e = \frac{2E_T}{v^2} = \frac{2 \cdot 46.1}{1.2^2} = 64.0 \text{ Kg}$$

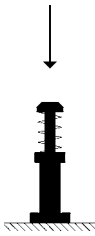
The adequate Shock Absorber to use in this case is Mod.SA 2015 according to the technical data where we find that E_T (max)=59 Nm, E_{TC} (max)= 38000 Nm/h and M_e (max)=120 kg.

Example 3: Free fall impact

Application data:

h = 0,35 m**m** = 5 kg**S** = 0,01 m

first hypothesis SA 1210

C = 1500 cycles/h**Calculation:**

$$v = \sqrt{(2g \cdot h)} = \sqrt{(2 \cdot 9,81 \cdot 0,35)} = 2,6 \text{ m/s}$$

$$E_k = m \cdot g \cdot h = 5 \cdot 9,81 \cdot 0,35 = 17,2 \text{ Nm}$$

Consider the shock absorber with the lowest E_T but superior to 17.2 Nm:
mod. SA 1412 $S=0,012$ m

$$E_D = F \cdot S = m \cdot g \cdot s = 5 \cdot 9,81 \cdot 0,012 = 0,6 \text{ Nm}$$

$$E_t = E_k + E_D = 17,2 + 0,6 = 17,8 \text{ Nm}$$

$$E_{TC} = E_T \cdot C = 17,8 \cdot 1500 = 26700 \text{ Nm/h}$$

$$M_e = \frac{2E_T}{v^2} = \frac{2 \cdot 17,8}{2,6^2} = 5 \text{ Kg}$$

The adequate shock absorber to use in this case is Mod. SA 1412 according to the technical data, where we find that E_T (max)=20 Nm, E_{TC} (max)=33000 Nm/h and M_e (max)=40 kg.**Example 4: Vertical impact downwards with propelling force**

Application data:

m = 50 kg**S** = 0,025 m**P** = 6 bar**D** = 63 mm**C** = 600 cicli/h**v** = 1,0 m/s**Calculation:**

$$E_k = \frac{mv^2}{2} = \frac{50 \cdot 1^2}{2} = 25 \text{ Nm}$$

$$E_D = F \cdot S = (m \cdot g + \frac{D^2 \cdot \pi}{4} P \cdot g/100) \cdot S = (50 \cdot 9,81 + \frac{63^2 \cdot \pi}{4} \cdot 6 \cdot 9,81/100) \cdot 0,025 = 58,1 \text{ Nm}$$

$$E_T = E_k + E_D = 25 + 58,1 = 83,1 \text{ Nm}$$

$$E_{TC} = E_T \cdot C = 83,1 \cdot 600 = 49860 \text{ Nm/h}$$

$$M_e = \frac{2E_t}{v^2} = \frac{2 \cdot 84}{1^2} = 168 \text{ Kg}$$

The adequate shock absorber to use in this case is Mod. SA 2725 according to the technical data, where we find that E_T (max)=147 Nm, E_{TC} (max)=72000 Nm/h and M_e (max)=270 kg.**Example 5: Vertical impact upwards with propelling force**

Application data:

m = 50 kg**h** = 0,3 m**S** = 0,025 m

First hypothesis Mod. SA 2525

P = 6 bar = 0,6 MPa**D** = 63 mm**C** = 600

cycles/h

v = 1,0 m/s**Calculation:**

$$E_k = \frac{mv^2}{2} = \frac{50 \cdot 1^2}{2} = 25 \text{ Nm}$$

Consider the shock absorber with the lowest E_T but superior to 25 Nm:
mod. SA 2015 $S=0,015$ m

$$E_D = F \cdot S = (\frac{D^2 \cdot \pi}{4} P \cdot g/100 - m \cdot g) \cdot S = (\frac{63^2 \cdot \pi}{4} \cdot 6 \cdot 9,81/100 - 50 \cdot 9,81) \cdot 0,015 = 20,1 \text{ Nm}$$

$$E_T = E_k + E_D = 25 + 20,1 = 45,7 \text{ Nm}$$

$$E_{TC} = E_T \cdot C = 45,7 \cdot 600 = 27060 \text{ Nm/h}$$

$$M_e = \frac{2E_t}{v^2} = \frac{2 \cdot 45,7}{1^2} = 91,4 \text{ Kg}$$

The adequate shock absorber to use in this case is Mod. SA 2015 according to the technical data, where we find that E_T (max)=59 Nm, E_{TC} (max)=38000 Nm/h and M_e (max)=120 kg.

Example 6: Inclined impact

Application data:

$m = 10 \text{ kg}$

$h = 0,3 \text{ m}$

$S = 0,015 \text{ m}$

$\alpha = 30^\circ$

$C = 600 \text{ cycles/h}$

Calculation:

$$v = \sqrt{(2g \cdot h)} = \sqrt{(2 \cdot 9,81 \cdot 0,3)} = 2,43 \text{ m/s}$$

$$E_K = m \cdot g \cdot h = 10 \cdot 9,81 \cdot 0,3 = 29,4 \text{ Nm}$$

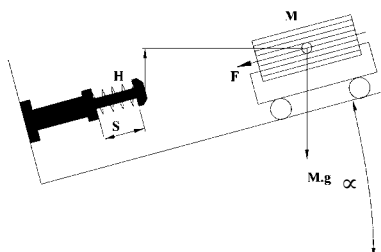
$$E_D = F \cdot S = m \cdot g \cdot \sin \alpha \cdot s = 10 \cdot 9,81 \cdot \sin 30^\circ \cdot 0,015 = 10 \cdot 9,81 \cdot 0,5 \cdot 0,015 = 0,7 \text{ Nm}$$

$$E_T = E_K + E_D = 29,4 + 0,7 = 30,1 \text{ Nm}$$

$$E_{TC} = E_T \cdot C = 30,1 \cdot 600 = 18060 \text{ Nm/h}$$

$$Me = \frac{2E_T}{v^2} = \frac{2 \cdot 30,1}{2,43^2} = 10,2 \text{ Kg}$$

The adequate shock absorber to use in this case is Mod. SA 2015 according to the technical data, where we find that E_T (max)=59 Nm, E_{TC} (max)=38000 Nm/h and Me (max)=120 kg.

**Example 7: Horizontal mass on conveyer**

Application data:

$m = 5 \text{ kg}$

$v = 0,5 \text{ m/s}$

$\mu = 0,25$

$S = 0,006 \text{ m}$

$C = 3000 \text{ cycles/h}$

Calculation:

$$E_K = \frac{mv^2}{2} = \frac{5 \cdot 0,5^2}{2} = 0,63 \text{ Nm}$$

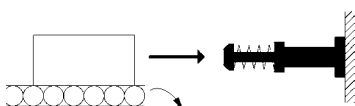
$$E_D = F \cdot S = m \cdot g \cdot \mu \cdot s = 5 \cdot 9,81 \cdot 0,25 \cdot 0,006 = 0,07 \text{ Nm}$$

$$E_T = E_K + E_D = 0,63 + 0,07 = 0,7 \text{ Nm}$$

$$E_{TC} = E_T \cdot C = 0,7 \cdot 3000 = 2100 \text{ Nm/h}$$

$$Me = \frac{2E_T}{v^2} = \frac{2 \cdot 0,7}{0,5^2} = 5,6 \text{ Kg}$$

The adequate shock absorber to use in this case is Mod. SA 0806 according to the technical data, where we find that E_T (max)=3 Nm, E_{TC} (max)=7000 Nm/h and Me (max)=6 kg.

**Example 8: Horizontal rotating door**

Application data:

$m = 20 \text{ kg}$

$\omega = 2,0 \text{ rad/s}$

$T = 20 \text{ Nm}$

$R_s = 0,8 \text{ m}$

$A = 1,0 \text{ m}$

$S = 0,015 \text{ m}$

$C = 600 \text{ cycles/h}$

Calculation:

$$I = \frac{m(4A^2 + B^2)}{12} = \frac{20(4 \cdot 1,0^2 + 0,05^2)}{12} = 6,67 \text{ Kg} \cdot \text{m}^2$$

$$E_K = \frac{I\omega^2}{2} = \frac{6,67 \cdot 2,0^2}{2} = 13,34 \text{ Nm}$$

$$\theta = \frac{S}{R_s} = \frac{0,015}{0,8} = 0,019 \text{ rad}$$

$$E_D = T \cdot \theta = 20 \cdot 0,019 = 0,36 \text{ Nm}$$

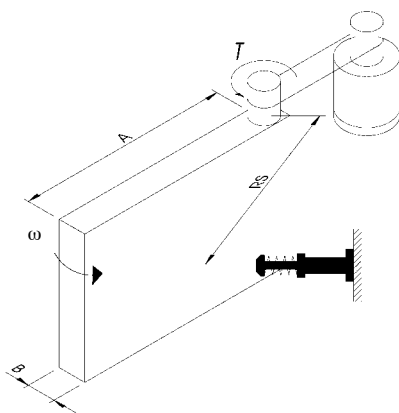
$$E_T = E_K + E_D = 13,34 + 0,36 = 13,7 \text{ Nm}$$

$$E_{TC} = E_T \cdot C = 13,7 \cdot 600 = 8220 \text{ Nm/h}$$

$$v = \omega \cdot R_s = 2,0 \cdot 0,8 = 1,6 \text{ m/s}$$

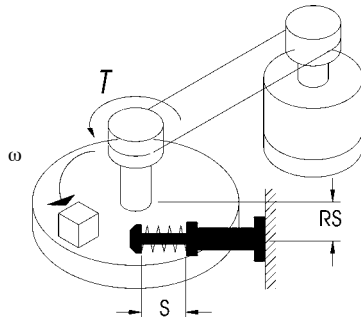
$$Me = \frac{2E_T}{v^2} = \frac{2 \cdot 13,7}{1,6^2} = 10,7 \text{ Kg}$$

The adequate shock absorber to use in this case is Mod. SA 1412 according to the technical data, where we find that E_T (max)=20 Nm, E_{TC} (max)=33000 Nm/h and Me (max)=40 kg.



Example 9: Horizontal rotating door

Application data:

m = 200 kg**ω** = 1,0 rad/s**T** = 100 Nm**R** = 0,5 m**Rs** = 0,4 m**S** = 0,015 m**C** = 100 cycles/h**Calculation:**

$$I = \frac{mR^2}{2} = \frac{200 \cdot 0,5^2}{2} = 25 \text{ Kg} \cdot \text{m}^2$$

$$E_k = \frac{I\omega^2}{2} = \frac{25 \cdot 1,0^2}{2} = 12,5 \text{ Nm}$$

$$\theta = \frac{S}{R_s} = \frac{0,015}{0,4} = 0,0375 \text{ rad}$$

$$E_D = T \cdot \theta = 100 \cdot 0,0375 = 3,75 \text{ Nm}$$

$$E_T = E_k + E_D = 12,5 + 3,75 = 16,25 \text{ Nm}$$

$$E_{Tc} = E_T \cdot C = 16,25 \cdot 100 = 1625 \text{ Nm/h}$$

$$v = \omega \cdot R_s = 1,0 \cdot 0,4 = 0,4 \text{ m/s}$$

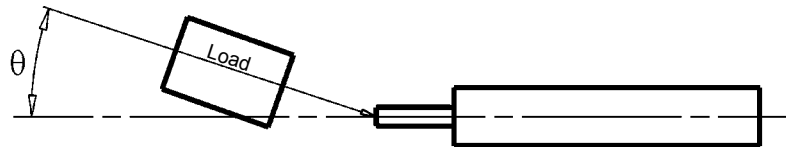
$$M_e = \frac{2 E_T}{v^2} = \frac{2 \cdot 16,25}{0,4^2} = 203 \text{ Kg}$$

The adequate shock absorber to use in this case is Mod. SA 2015 according to the technical data, where we find that E_T (max)= 59 Nm, E_{Tc} (max)= 38000 Nm/h and M_e (max)= 720 kg.

Perpendicularity of the load

To ensure the lifetime of the shock absorber, the movement of the impact body must be perpendicular to the shock absorbers axial centre.

Note: The maximum allowable eccentricity $\theta \leq 2,5^\circ$ (0,044 rad).



Marketing Materials

9

MARKETING MATERIALS



Group Profile Brochure
93-4900-0GB006



Pneumatics
Division Brochure
93-1500-0GB010



North American Cylinder
& Actuator Catalog Ed. 8.4
93-0511-USA001



North American Fittings
& Flow Control Valves
Catalog
93-0507-USA001



North American
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93-0510-USA002



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Metric Master Catalog
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BSP Fittings Poster
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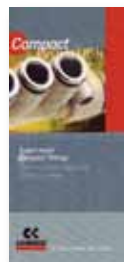
NPTF Fittings Bin Labels
SUS93-5500-0013



Metric Fittings Bin Labels
SUS93-5500-0012



Pro-Fit Fittings Brochure
93-1002-0GB004



Super-Rapid Compact Fittings
Brochure
93-1002-0GB010



Trade Show Panel
94-5010-0002



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94-1160-0006



Assorted Fittings
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25126 Brescia
Italy
Tel. +39 030/37921
Fax +39 030/2400430
info@camozzi.com
www.camozzi.com

Camozzi GmbH Pneumatic
Porschestrasse 1
D-73095 Albershausen
Germany
Tel. +49 7161/91010-0
Fax +49 7161/91010-99
info@camozzi.de
www.camozzi.de

Camozzi GmbH Pneumatic
Löfflerweg 18
A-6060 Hall in Tirol
Austria
Tel. +43 5223/52888-0
Fax +43 5223/52888-500
info@camozzi.at
www.camozzi.at

Camozzi Pneumatics Ltd.
The Fluid Power Centre
Watling Street
Nuneaton - Warwickshire
CV11 6BQ
United Kingdom
Tel. +44 (0)24/7637 4114
Fax +44 (0)24/7634 7520
info@camozzi.co.uk
www.camozzi.co.uk

Camozzi Pneumatique Sarl
5, Rue Louis Gattefossé
Parc de la Bandonnière
69800 Saint Priest
France
Tel. +33 478/213408
Fax +33 472/280136
info@camozzi.fr
www.camozzi.fr

Camozzi Benelux B.V.
De Vijf Boeken 1 A
2911 BL Nieuwerkerk a/d IJssel
The Netherlands
Tel. +31 180/316677
Fax +31 180/316616
info@camozzi.nl
www.camozzi.nl

Camozzi Pneumatik AB
Box 9214
Bronsyxegatan 7
20039 Malmö
Sweden
Tel. +46 40/6005800
Fax +46 40/6005899
info@camozzi.se
www.camozzi.se

Camozzi Aps
Metalvej 7 F
4000 Roskilde
Denmark
Tel. +45 46/750202
Fax +45 46/750203
info@camozzi.dk
www.camozzi.dk

Camozzi Pneumatic Ltd.

Floor 14, Leningradskaya Street, 1-A
Himki, Moscow Region
141400 Moskau
Russian Federation
Tel. +7 495/7354961
Fax +7 495/7354961
info@camozzi.ru
www.camozzi.ru

Camozzi-Pneumatic-Simferopol, LLC
38 Larionova St
95018 Simferopol
Ukraine
Tel. +380 652/515700
Fax +380 652/518198
info@camozzi.ua
www.camozzi.ua

Camozzi Pneumatic
Karbusheva St. 9 Off. 412
246029 Gomel
Byelorussia
Tel. +375 232/478064
232/473920 - 232/478417
Fax +375 232/478417
camozzi@mail.gomel.by

Camozzi Pneumatic Kazakhstan LLP
Shevchenko/Radostovec,
165b/72g, off. 503
050009 Almaty
Kazakhstan
Tel. +7 727/3335334
Fax +7 727/3335334
info@camozzi.kz
www.camozzi.kz

Camozzi Pneumatics Inc.
2160 Redbud Blvd., TX 75069
P.O. Box 2386, TX 75070
McKinney - Texas
USA
Tel. +1 972/5488885
Fax +1 972/5482110
info@camozzi-usa.com
www.camozzi-usa.com

Camozzi Neumatica de Mexico S.A. de C.V.
Lago Tanganica 707
Col. Ocho Cedros 2ª sección
50170 Toluca
México
Tel. +52 722/2707880
Fax +52 722/2707860
camozzi@camozzi.com.mx
www.camozzi.com/mx

Camozzi do Brasil Ltda.
Rua Estácio de Sá, 1042
13080-010 Campinas SP
Brazil
Tel. +55 19/21374500
Fax +55 19/21374530
sac@camozzi.com.br
www.camozzi.com.br

Camozzi Neumatica S.A.
Prof. Dr. Pedro Chutro 3048
1437 Buenos Aires
Argentina
Tel. +54 11/49110816
Fax +54 11/49124191
info@camozzi.com.ar
www.camozzi.com/ar

Camozzi Venezuela S.A.

Calle 146 con Av. 62
N°146-180
P.O. Box 529
Zona Industrial Maracaibo
Edo. Zulia
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Fax +58 261/7360401
info@camozzi.com.ve
www.camozzi.com.ve

Camozzi Iran Co. Ltd.
Motahari Ave. No. 243
Teheran
Iran
Tel. +98 21/88732130
Fax +98 21/88738552
general_secretary@camozziran.com

Shanghai Camozzi Pneumatic Control Components Co, Ltd.
415, Ren De Road
200434 Shanghai
China
Tel. +86 21/65363650
Fax +86 21/65360613
info@camozzi.com.cn
www.camozzi.com.cn

Shanghai Camozzi Automation Control Co, Ltd.
717, Shuang Dan Road,
Malu Town
201801 Jiading Ind. District
Shanghai
China
Tel. +86 21/59100999
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www.camozzi.com.cn

Camozzi India Private Limited
No D-44 Phase II Ext.,
Hosiery Complex
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India
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Camozzi Malaysia SDN. BHD.
30 & 32, Jalan Industri USJ 1/3
Taman Perindustrian USJ 1
47600 Subang Jaya
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www.camozzi.com/my

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www.avs.no

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Switzerland
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info.bag@bibus.ch
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STAF Automation s.r.o.

Kostiviarska 4944/5
974 01 Banská Bystrica
Slovakia
Tel. +421 48/47 227 77
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staf@staf.sk
www.staf.sk/

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geral@teclena.pt
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Technomatic control s.a.

Esopou Street
Kalohori
570 09 Thessaloniki
Greece
Tel. +30 2310/778730
Fax +30 2310/778732
info@technomatic.gr
www.technomatic.gr

L.D. GmbH

Zar Samuil Str. 116
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Bulgary
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camozzi@ld-gmbh.com
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Tech-Con Hungária Kft

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Hungary
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tech-con@tech-con.hu
www.tech-con.hu

Tech-Con Industry Srl

Calea Crângasi N°60
Sector 6, 060346 Bucharest
Romania
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Tech-Con d.o.o. Beograd

Cara Dušana 205a
11080 Zemun - Belgrade
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Tel. +381 11/3072509
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Tech-Con Czech Republic s.r.o.

Ve Zlibku 1800
Praha 9 - Horni Pocernice 19300
Czech Republic
Tel. +420 226/001064
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Kovimex d.o.o.

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SI-1380 Cerknica
Slovenia
Tel. +386 1/7096430
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Bibus Zagreb d.o.o.

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www.bibusmenos.pl

Rayair Automation Ltd.

KW23G Corradino Industrial Estate
Paola, Pla 08
Malta
Tel. +356 21/672497
Fax +356 21/805181
info@rayair-automation.com

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Industrial Area N°64
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Fluidica Cia. Ltda.

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Ohaara Data Engineering
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Syria
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Tubli

Kingdom of Bahrain
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Fax +973 17243225 - 17786906
techline@batelco.com.bh

Compressed Air Technology Co.Saa
83 - El Sabteya Str.
21211 Sabteya ET
Kairo
Egypt
Tel. +20 2/25766266 - 25774400
Fax +20 2/25750113
elhaggar@intouch.com

Asia

Polytechnic Enterprises
A.H. Centre 1st Floor Suite # 101
74000 Shahrah-E-Liquat
Karachi
Pakistan
Tel. +92 21/32426612
Fax + 92 21/32426188
polytech@cyber.net.pk

Seika Corporation
Aqua Dojima East Bldg.
16F, 4-4, 1-Chome, Dojimahama,
Kita-Ku Osaka
Japan
Tel. +81 6/63453176
Fax +81 6/63443584
mashien@jp.seika.com

Exceltec Enviro Pte Ltd
691 Geylang Road # 02-03
389684 **Singapore**
Tel. +65 67436083
Fax +65 67439286
xltenviro@yahoo.com.sg

Savikma Automation & Engineering Services (Pvt) Ltd.
22, Wattegedara Road
Maharagama
Sri Lanka
Tel. +94 115642164
Fax +94 112839652
saes@sltnet.lk

Exceltec Automation Inc.
G/F El-AI Building, 608-I Quezon
Avenue, Barangay Tatalon
Quezon City, Metro Manila
Philippines
Tel. +63 2/416 1143 - 4161141
- 7319015
Fax +63 2/712 1672
exceltec_manila@yahoo.com

Prosperity Machinery Manufacturers Ltd.
3/F., 483E Castle Peak Road
Cheungshawan Kowloon,
Hong Kong
Tel. +852 27437175
Fax +852 27854595

Pneumax Co. Ltd.
104/21, Moo 8,
Chaloem Phrakiat R. 9 Rd.,
Pravet - Bangkok 10250
Thailand
Tel. +66 2/7268000
Fax +66 2/7268260
import@pneumax.co.th
www.pneumax.co.th

PT. Golden Archy Sakti
Kompleks Prima Centre Blok B2 No.2
Jl.Pool PPD - Pesing Poglar No.11,
Kedaung Kali Angke - Cengkareng,
Jakarta Barat 11710
Indonesia
Tel. +62 21/54377888
Fax +62 21/54377089
sales@archy.co.id
www.archy.co.id

Genn Dih Enterprises CO, Ltd.
No. 17, Lane 822, Sec. 2
Chung-Hsing Road, Ta-Li City
Taichung County
Taiwan
Tel. +886 4/24874219 - 24860626
Fax +886 4/24862824
yuchong@ms61.hinet.net

TAE-SEUNG SYSTEM

Bld.19-11
Industrial Material Circul. Center 1629
702-012 San Gyuk-2 Dong, BukGu
Taegu
South Korea
Tel. +82 53/6041699
Fax +82 53/6041694
info@ucikorea.com
www.khic.co.kr

Africa

Hydraulics & Pneumatics (TMS GROUP)
15 Village Crescent Linbro Village
2065 Linbro Business Park
Sandton Johannesburg
South Africa
Tel. +27 11/6081340 - 341
Fax +27 11/6081344
mjones@tmsg.co.za
www.tmsg.co.za

FHP s.a. Flexibles Haute Pression
25 Rue Lt Puissesseau
Casablanca
Morocco
Tel. +212 22/301997
Fax +212 22/301913
fhpelidrisi@iam.net.ma

Sarl.Si.Maaz.Co
36 Bd, Mellah Ali (ex: Marceau)
Oran
Algeria
Tel. +213 41/302791 - 303052
Fax +213 41/301921
mnaima_2@yahoo.fr

DISMATEC
Distribution de Matériels Techniques
N° RCCM-CI-ABJ-2010B1882
16 BP 236 ABIDJAN 16
Ivory Coast
Tel. +225 +21267091
Fax +225 +21262367
dismatec2002@yahoo.fr

A.T.C. Automatismes
25 Av. H. Bourguiba Centre Said B
2033 Megrin Tunis Sud
Tunisia
Tel. +216 71/297328
Fax +216 71/429084
commercial@atc.com.tn

Oceania

Griffiths Components Pty Ltd
605 Burwood Hwy
Knoxfield Victoria
Melbourne 3180
Australia
Tel. +61 3/9800 6500
Fax +61 3/9801 8553
enquiry@camozzi.com.au



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