CUSTOM ACTUATORS SUMMARY

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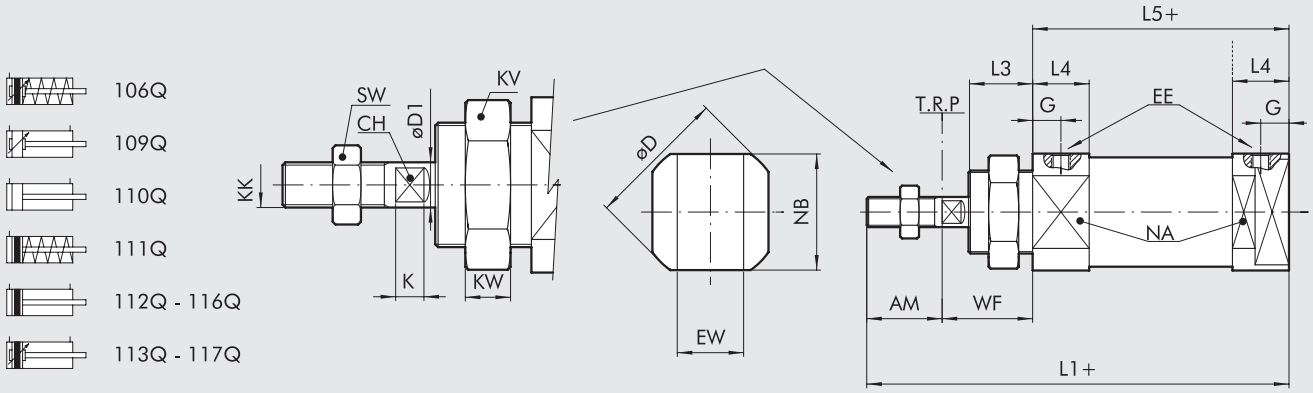
ISO 6432 MINI-CYLINDER WITH LIMITED REAR HEAD

The threaded part of the rear head is removed to save space. But this means there is no way to fix the cylinder using the rear head since there is no threaded part or hole for mounting the accessories.

N.B.: For technical data refer to the standard version.

DIMENSIONS

+ = ADD THE STROKE



Ø	AM $^{+0.0;-2.0}$	øD	øD1	E	G	EE	EW ^{d13}	L1	L3	L4	L5	L6	KK	XC $^{\pm1}$	WF $^{\pm1,2}$	KW	KV	NA	NB	SW	CH	K
8	12	16.7	4	M5	6	M5	8	74	12	10	46	46	M4	64	16	7	19	15	15	7	3	3
10	12	16.7	4	M5	6	M5	8	74	12	10	46	46	M4	64	16	7	19	15	15	7	3	3
12	16	19	6	M5	6	M5	12	87	17	10	49	47	M6	75	22	8	24	17	17	10	5	3.5
16	16	19.7	6	1/8	6	M5	12	94	17	10	56	53	M6	82	22	8	24	18	18	10	5	3.5
20	20	27.9	8	1/8	8	G 1/8	16	112	17	15	68	61	M8	95	24	7	32	24	24	13	7	4.6
25	22	33	10	1/8	9	G 1/8	16	123	20	18	73	66.5	M10x1.25	104	28	7	32	30	30	17	8	5

KEY TO CODES

CYL	1 1 2 TYPE	Q	1 6 BORE	_	0 2 0 STROKE	C MATERIAL	P GASKETS
	■ **106** SE cushioned ■ **109** DEA **110** DE **111** SE **112** DEM ■ **113** DEMA ◆ **116** DEM for mechanical lock ■ **117** DEMA for mechanical lock	**Q** Special head	▼ 08 ▼ 10 ▼ 12 16 20 25	Progressive letter assigned by Metal Work	Ø 8 to 10 stroke 0 to 100 mm Ø 12 to 16 stroke 0 to 200 mm Ø 20 to 25 stroke 0 to 500 mm	**A** C45 chrome rod, aluminium piston rod **C** C45 chrome rod, technopolymer piston rod **Z** Stainless steel piston rod and nut aluminium piston **X** Stainless steel piston rod and nut technopolymer piston	**P** Polyurethane **N** NBR ● **V** FKM/FPM ● **B** Low temperature

DE: Double-acting (non-cushioned, not magnetic)
DEM: Magnetic double-acting (non-cushioned)
DEMA: Magnetic double-acting (cushioned)
DEA: Cushioned double-acting (non-magnetic)
SE: Single-acting (magnetic)

● Only available for non-magnetic versions and with aluminium piston (A or Z)
▼ Stainless steel piston rod
■ Available from Ø 16
◆ Available from Ø 12
N.B.: Specify in the comment area whether **non-magnetic** or **non-stick slip**.

Please contact our sales offices for further information and quotation.

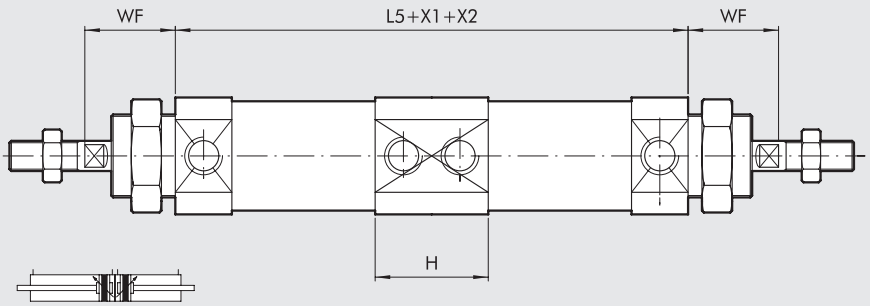
ISO 6432 MINI-CYLINDER OPPOSING

The two cylinders come with a single common rear head.
This type of cylinder is available with diameter 12 DEM, 16 DEM and Ø 25 DEMA.

N.B.: For technical data refer to the standard version.

DIMENSIONS

X1 = CYLINDER 1 STROKE
X2 = CYLINDER 2 STROKE



For other dimensions, refer to the standard version.

Ø	H	L5	WF ±1,2
8	-	-	16
10	-	-	16
12	20	98	22
16	20	112	22
20	-	-	24
25	36	146	28

KEY TO CODES

CYL	107 TYPE	0	16 BORE	0020 STROKE	C MATERIAL	P GASKETS
	107 Opposing	**0** Standard **V** Without head mut **S** Non-magnetic ▲ **G** No stick slip	▼ 08 ▼ 10 ▼ 12 16 20 25	Ø 8 to 10 stroke 0 to 100 mm Ø 12 to 16 stroke 0 to 200 mm Ø 20 to 25 stroke 0 to 500 mm	**A** C45 chrome rod, aluminium piston rod **C** C45 chrome rod, technopolymer piston rod **Z** Stainless steel piston rod and nut aluminium piston **X** Stainless steel piston rod and nut technopolymer piston	**P** Polyurethane **N** NBR ● **V** FKM/FPM ● **B** Low temperature

N.B.: Specify in the comment area whether without **DEM** or **DEMA**.
DEM: Magnetic double-acting (non-cushioned)
DEMA: Magnetic double-acting (cushioned)

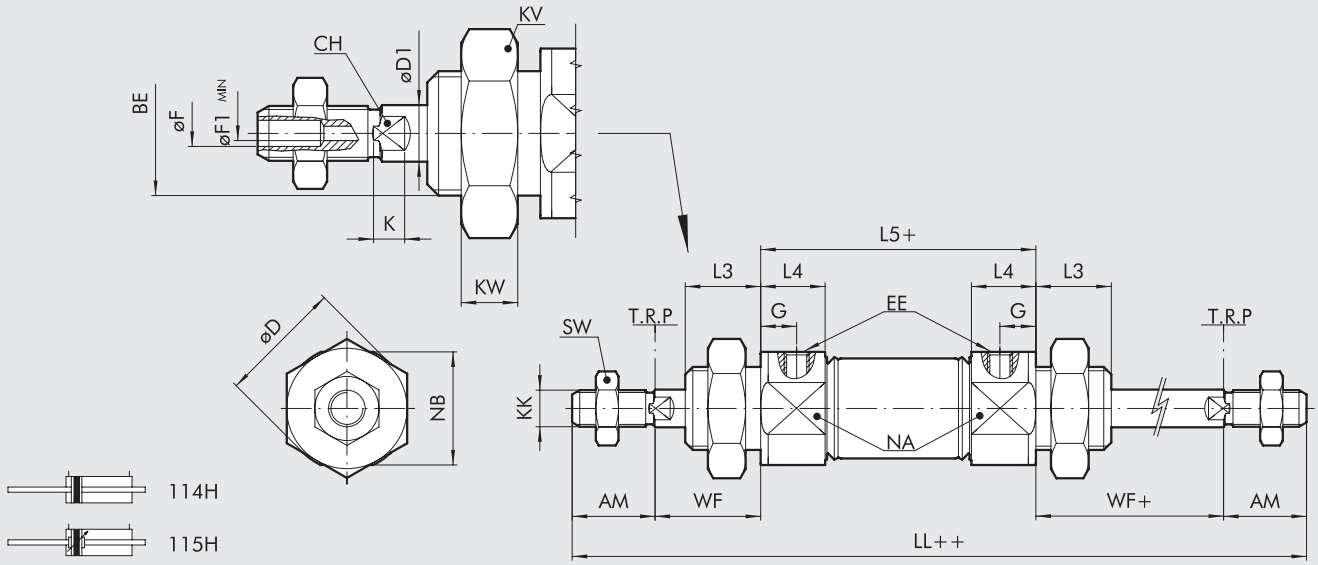
● Only available for non-magnetic versions (S) and with aluminium piston (A or Z)
▲ **For speeds lower than 0.2 m/s, to prevent surging. Use no-lubricated air only**
▼ Stainless steel piston rod

ISO 6432 MINI-CYLINDER PERFORATED THROUGH-ROD

N.B.: For technical data refer to the standard version.

DIMENSIONS

\+ = ADD THE STROKE
++ = ADD TWICE THE STROKE



Ø	AM +0.0;-2.0	BE	øD	øD1	øF	øF1	G	EE	LL	L3	L4	L5	KK	WF ±1,2	KW	KV	NA	NB	SW	CH	K
20	20	M22x1.5	33	8	5	2.5	8	G 1/8	156	17	15	68	M8	24	7	32	28	28	13	7	4.6
25	22	M22x1.5	33	10	5	3	9	G 1/8	173	20	18	73	M10x1.25	28	7	32	30	30	17	8	5

KEY TO CODES

CYL	1 1 5 TYPE	H	2 0 BORE	0 0 2 0 STROKE	Z MATERIAL	P GASKETS
	114 DEM through-rod **115** DEMA through-rod	**H** Perforated rod	20 25	Max 125 mm	**C** C45 chrome piston rod, technopolymer piston **Z** Stainless steel piston rod and nut aluminium piston	**P** Polyurethane **N** NBR ● **V** FKM/FPM ● **B** Low temperature

DEM: Magnetic double-acting (non-cushioned)
DEMA: Magnetic double-acting (cushioned)

● Only available for non-magnetic versions and with aluminium piston

N.B.: Specify in the comment area whether **non-magnetic** or **non-stick slip.**
The non-stick slip version is to be used with speeds lower than 0.2 m/s in order to prevent surging. Use no-lubricated air only.

Please contact our sales offices for further information and quotation.

ISO 6432 MINI-CYLINDERS TWO-FLAT Ø 25

METAL WORK PNEUMATIC

This version is used to maintain objects fixed to the piston rod angularly and apply torques with the limits specified in the technical characteristics. The piston rod of two-flat cylinders features two opposite longitudinal surfaces. It is made of stainless steel. The cylinder front head, which is made of two parts, includes a sintered bronze bush that prevents the piston rod from rotating on its axis. A special polyurethane gasket ensures airtightness and the scraping of any deposit of dirt.
The double-acting magnetic version with end-of-stroke cushioning is available. Pneumatic cushioning on the rear head only is available on specific request, i.e. for piston rod retraction.
The piston rod has a Ø of 12 mm, which is greater than that stated in ISO 6432 (Ø 10), to the advantage of robustness.
The cylinder length is greater than the ISO 6432 standard.

TECHNICAL DATA		Ø25
Max operating pressure	bar	10
	MPa	1
	psi	145
Temperature range	°C	70
Fluid		Unlubricated air. Lubrication, if used, must be continuous
Design		Chamfered stainless steel barrel
Standard strokes ✚	mm	from 1 to 300
Versions		Magnetic double-acting; Single piston rod or through piston rod; No stick-slip
Inrush pressure	bar	0.8
Max torque on piston rod	Nm	0.2
Maximum rotation on the rod	degrees	1° 30 '
Forces generated at 6 bar thrust/retraction	N	280/170
Single piston rod weights		
stroke = 0	g	294
each mm stroke	g	1.32
Through-rod weights		
stroke = 0	g	390
each mm stroke	g	1.94
Notes		**For speeds lower than 0.2 m/s to prevent surging, use the version No stick-slip and non-lubricated air.**
		✚ Maximum recommended strokes. Higher values can create operating problems

KEY TO CODE

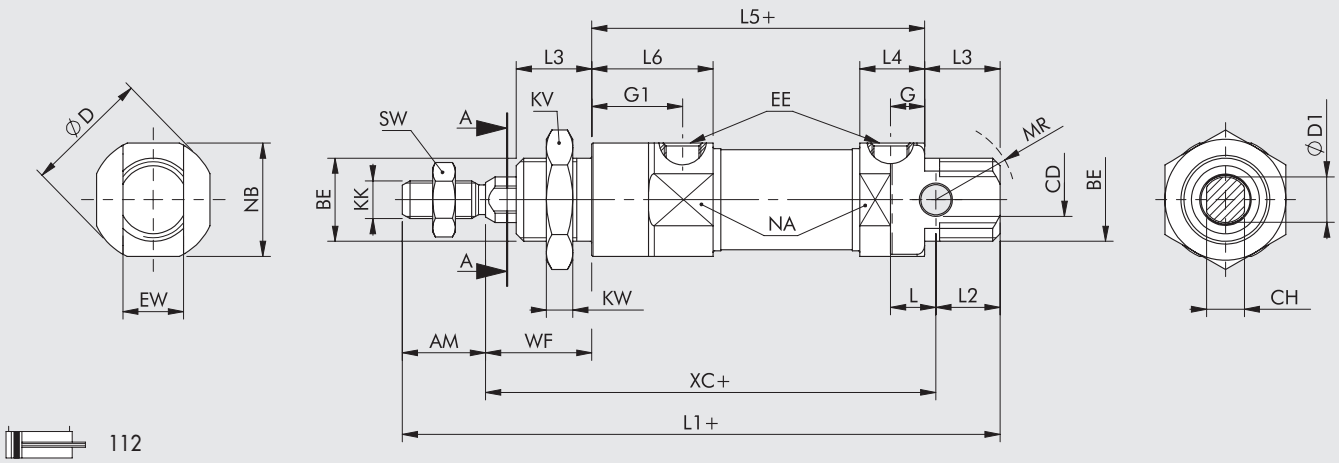
CYL	1 1 2	0	2 5	0 0 5 0	F	P
	TYPE		BORE	STROKE	MATERIAL	GASKETS
	112 DEM **114** DEM through-rod	**0** Standard ▲ **G** No stick-slip	25	Stroke 1 to 300 mm	**F** "Two-Flat" piston rod AISI 303 stainless steel nut	**P** Polyurethane

DEM: Magnetic double-acting (non-cushioned)

▲ **For speeds lower than 0.2 m/s, to prevent surging. Use no-lubricated air only.**

DIMENSIONS

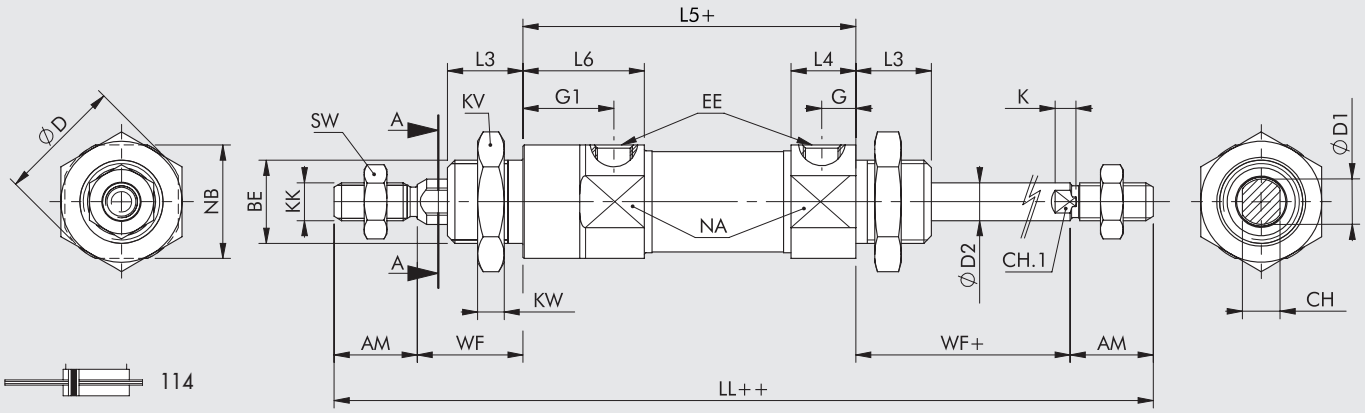
STANDARD VERSION



112

THROUGH-ROD VERSION

+ = ADD THE STROKE
++ = ADD TWICE THE STROKE



114

Ø	AM +0.0;-2.0	BE	øCD H9	øD	øD1	øD2	G	G1	EE	EW d13	L	LL	L1	L2	L3	L4	L5	L6	KK	XC ±1	WF ±1,2	KW	KV	MR	NA	NB	SW	CH	CH1	K
25	22	M22x1.5	8	33	12	10	9	24	G 1/8	16	12	188	158.1	17	20	17.1	88	32.1	M10x1.25	119.1	28	7	32	21	30	30	17	10	8	5

ACCESSORIES

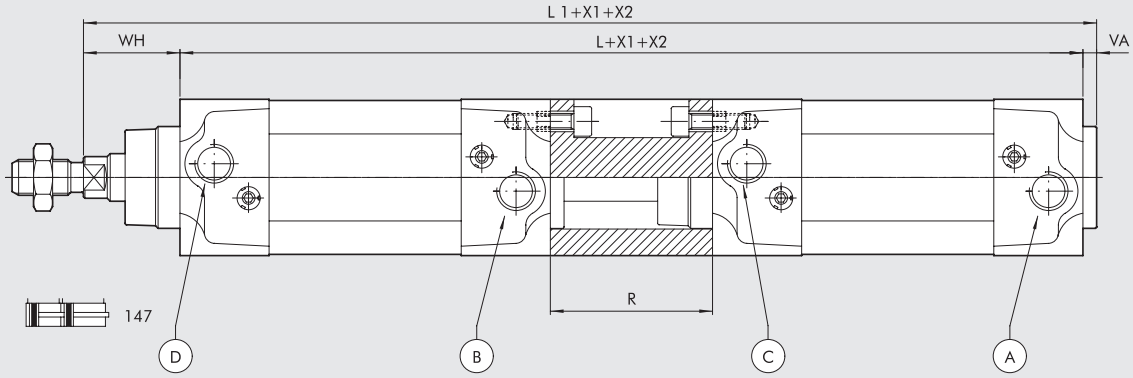
All the accessories of ISO 6432 cylinders can be used, with the exception of the piston rod lock.

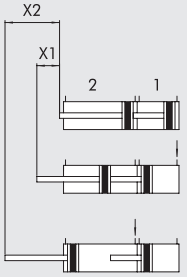
NOTES

ISO 15552 CYLINDER MULTI-POSITION

Two paired cylinders. The first stage defines the shorter stroke and the second one the total stroke.

DIMENSIONS





X1 = CYLINDER 1 STROKE
X2 = CYLINDER 2 STROKE

A = CYLINDER 1 OUT
B = CYLINDER 2 OUT
C = CYLINDER 1 IN
D = CYLINDER 2 IN

For other dimensions, refer to the standard version

1 = STAGE 1
2 = STAGE 2

Ø	WH	VA	R	L	L_1
32	26	4	55	243	273
40	30	4	55	265	299
50	37	4	68	280	321
63	37	4	68	310	351
80	46	4	92	348	398
100	51	4	92	368	423
125	65	6	120	440	511

KEY TO CODES

CYL	147 TYPE	0	32 BORE	_	050 STROKE	C MATERIAL	P GASKETS
	147 Multi-position	**0** Standard **S** Non-magnetic ▲ **G** No stick slip **A** Type A **3** Serie 3	32 40 50 63 80 ■ 100 ■ 125	Progressive letter assigned by Metal Work	from 25 to 2800 mm (stroke X2 to be specified)	**A** C45 chromed rod, aluminium piston rod: standard for all cylinders with ≥ 1000 mm-stroke cylinders and for cylinder with Ø 80 mm and over **C** C45 chromed rod, technopolymer piston: standard for cylinders of Ø 32 to 63 mm with <1000 mm strokes **Z** Stainless steel piston rod and nut aluminium piston **X** Stainless steel piston rod and nut technopolymer piston	**P** Polyurethane gaskets **N** NBR gaskets **V** FKM/FPM gaskets **B** Low temperature

▲ **For speeds lower than 0.2 m/s, to prevent surging. Use no-lubricated air only.**
■ In the code of cylinder with letter in fourth position Ø 100 becomes A1; Ø 125 becomes A2

N.B.: Specify stroke X1 and stroke X2 in the description

ORDERING EXAMPLE: Cylinder 147032_ _ _ CP with stroke X1 = 30 mm, stroke X2 = 50 mm. Metal Work will generate its own special product code according to the key to code.

Please contact our sales offices for further information and quotation.

ISO 15552 CYLINDER
LONG INTERNAL CUSHIONING

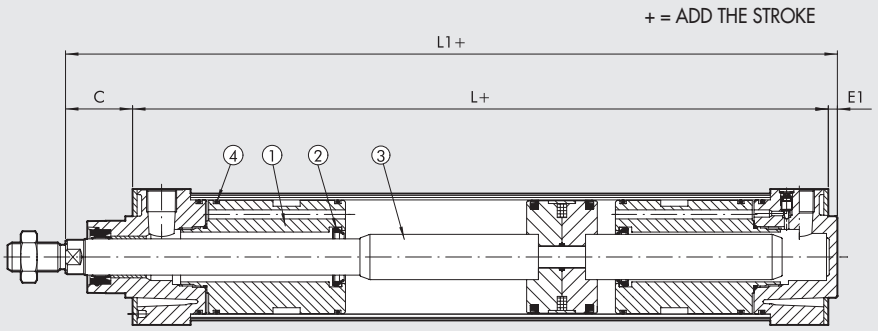
This special version can be provided if, for aesthetic reasons or requirements in assembling the fixing accessories, the long cushioning specified in the catalogue is not required.
The following versions are currently available:
- Ø 50, 63 and 80 cushioning length 100 mm
- Ø 63, cushioning length 150 mm
- Ø 100, cushioning length 80 mm

N.B.: For technical data refer to the standard version.

COMPONENTS

① CUSHIONING EXTENSION: aluminium
② CUSHIONING GASKET: polyurethane, NBR or FKM/FPM
③ CUSHIONING CONE: OT 58
④ STATIC O-rings: NBR

Refer to standard ISO 15552 cylinder for the parts not specified in the drawing.



Ø	Cushioning Length	C	E1	L	L1
50	100	37	5	305	342
63	100	37	5	331	368
	150	37	5	431	468
80	100	46	8	316	362
100	80	51	8	242	293

For other dimensions, refer to the standard version.

KEY TO CODES

CYL	131	Z	32	_	050	A	P
	TYPE		**BORE**		**STROKE**	**MATERIAL**	**GASKETS**
	131 Long Cushioning	**Z** Special	32 40 50 63 80 A1 = 100 A2 = 125	Progressive letter assigned by Metal Work	Max 2500 mm	**A** C45 chromed rod, aluminium piston rod: standard for all cylinders with ≥ 1000 mm-stroke cylinders and for cylinder with Ø 80 mm and over	**P** Polyurethane gaskets **N** NBR gaskets **V** FKM/FPM gaskets **B** Low temperature

N.B.: Specify in the comment area whether **magnetic** or **non-stick slip.**
The non-stick slip version is to be used with speeds lower than 0.2 m/s in order to prevent surging. Use no-lubricated air only.

NOTES

TANK DERIVED FROM CYLINDER ISO 15552 STD

These tanks are derived by fixing two rear heads of an ISO 15552 cylinder to a liner. For management requirements associated with the liner production system, the code shows a fictitious stroke that is obtained by subtracting the basic value L from the total length of the liner (Ltot). **These products are not PED-certified**. This certification is not required when the product of pressure in the tank (expressed in bar) and the volume (expressed in litres) is less than 50.

TECHNICAL DATA

Operating pressure	bar	max 10 (max 1 MPa - 145 psi)
Temperature range	°C	–25 to +80
Bore	mm	32 to 200

CALCULATION OF THE LINER LENGTH

V (Litres) = Requested volume
D (mm) = Cylinder bore
L_{tot} (mm) = Jacket length

$$L_{tot} = \frac{4V \times 10^6}{3.14 \times D^2}$$

Example

V = 3,5 l
D = 100 mm

$$L_{tot} = \frac{(4 \times 3.5) \times 10^6}{3.14 \times 100^2} = 446 \text{ mm}$$

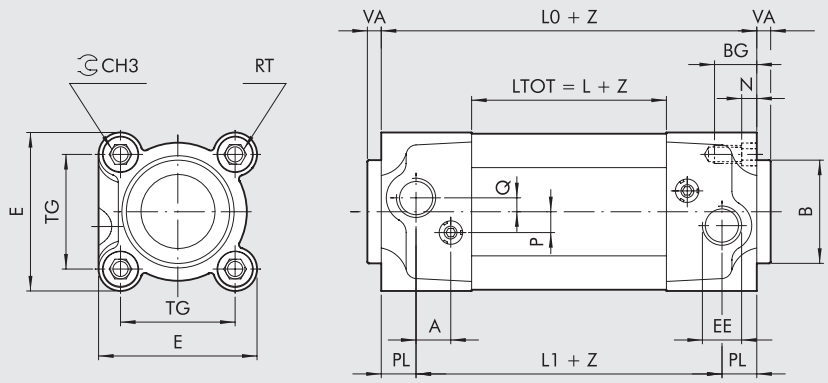
In order to determine the cylinder code, you need to calculate the "fictitious stroke" Z of the relevant pneumatic cylinder.
See dimensions on the following page:
$Z = L_{tot} - L$
For D100 L = 58
Z = 446 - 58 = 388 mm

KEY TO CODES

CYL	1 2 8 TYPE		B	3 2 BORE	0 0 5 0 FICTITIOUS STROKE *	O P MATERIAL
	128	Execution special	**B** Tank	32 40 50 63 80 A1 = 100 A2 = 125	Ø 32 - 63 Max 2800 mm Ø 80 - 125 Max 2600 mm	**OP**
	W128	Execution special	**B** Tank	A3 = 160 A4 = 200	Max 2800 mm	**OP**

* Fictitious stroke Z = L_{tot} (jacket length) - L (basic value)

DIMENSIONS 32 to 125

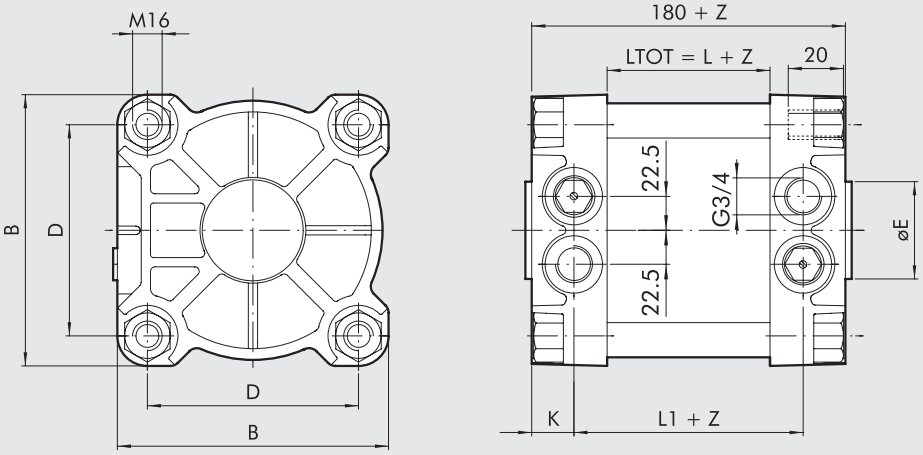


128B

Z = Fictitious stroke

Ø	PL	A	B	CH_3	TG	VA	EE	RT	E	L	L_1	L_0	BG	N	P	Q
32	10	10	30	6	32.5	4	G1/8	M6	46	42	74	94	14.5	4.5	6	4
40	12	10	35	6	38	4	G1/4	M6	54	49	81	105	14.5	4.5	6	4
50	14	10	40	8	46.5	4	G1/4	M8	64.5	46	78	106	17.5	5.5	6	6
63	16	10	45	8	56.5	4	G3/8	M8	75.5	57	89	121	17.5	5.5	6	6
80	18	12	45	10	72	4	G3/8	M10	94	52	92	128	21.5	5.5	10	7
100	20	12	55	10	89	4	G1/2	M10	111	58	98	138	21.5	5.5	10	7
125	25	10	60	12	110	6	G1/2	M12	135	70	110	160	25.5	6.5	12	8

DIMENSIONS 160 to 200



W128B

Z = Fictitious stroke

Ø	B	ØE	D	L	L_1	K
160	180	65	140	80	124	28
200	200	75	175	80	122	29

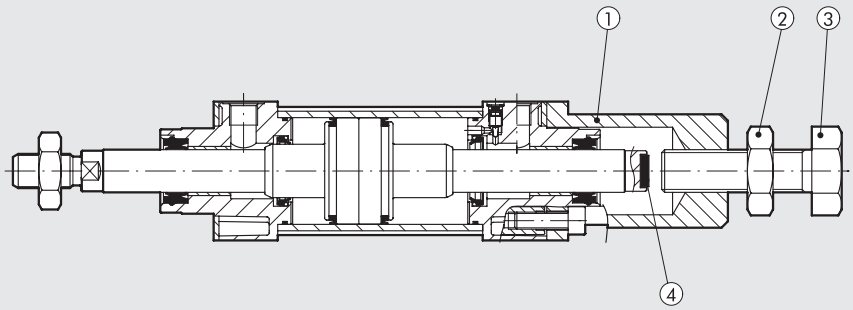
ISO 15552 CYLINDER WITH MECHANICALLY ADJUSTABLE STROKE RETRACTION TYPE

This cylinder originates from the through-rod version with a bolt to adjust the piston rod retraction stroke.
A plastic pad is mounted on the piston rod to reduce noise.
The adjustment may involve part or whole of the stroke.
Note that the rear cushioning loses efficiency as the stroke is reduced.
The flange or rear leg accessories cannot be attached.

N.B.: Existing types: Ø 32; Ø 40; Ø 50; Ø 63; Ø 80; Ø 100 mm
For technical data refer to the standard version.

COMPONENTS

① ALUMINIUM SCREW SUPPORT
② LOCKING NUT
③ STROKE-ADJUSTING SCREW
④ SOUND-DAMPENING PAD



Coding 122Z_ _ _

NOTES

When making an inquiry, please specify the reference cylinder data, including the stroke and the length of adjustment.
For example: cylinder obtained from 1213500200CN with a stroke adjustment of 40 mm.

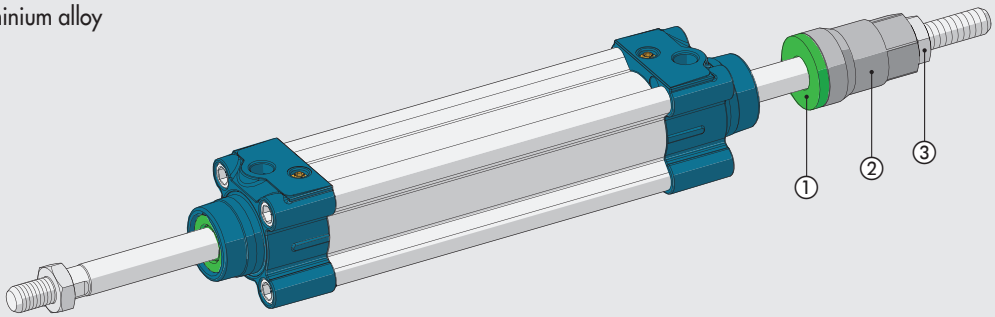
ISO 15552 CYLINDER WITH MECHANICALLY ADJUSTABLE STROKE EXTENSION TYPE

Cylinder derived from the through-rod version, fitted with a threaded bushing to adjust the extension stroke.
A bumper is fitted to the bushing to cushion the impact against the rear cylinder head, thereby minimising noise.
Two setting ranges are provided: 0-25 mm and 0-50 mm.
Unlike the version with adjustable stroke retraction type, the rear air cushioning doesn't lose efficiency.
All fixing accessories (feet, flanges, etc.) compatible with the standard series can also be fitted.

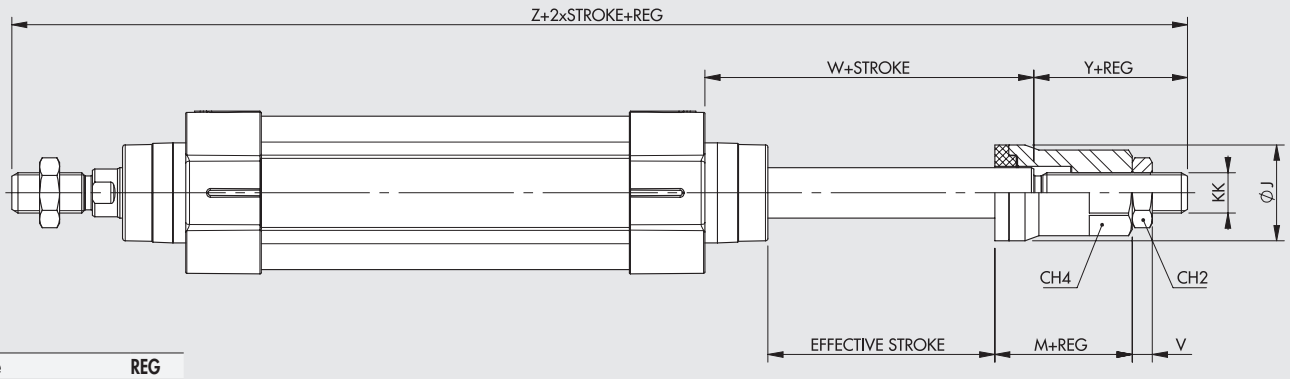
N.B.: Operating temperature range: -25°C to 80 °C.
Refer to the standard version for additional technical data.

COMPONENTS

① BUMPER SEAL: polyurethane
② STOPPER BUSHING: anodized aluminium alloy
③ LOCKING NUT



DIMENSIONS



Code	REG
12E_____A	**25**
12E_____B	**50**

Ø	KK	Ø J	CH2	CH4	M	V	W	Y	Z
32	M10x1.25	28	17	22	19	6	20	24	186
40	M12x1.25	33	19	27	23	7	25	28	212
50	M16x1.5	38	24	30	29.5	8	30.5	36	241.5
63	M16x1.5	40	24	32	30	8	31	36	257
80	M20x1.5	43	30	36	36	9	39	43	296
100	M20x1.5	49	30	41	37	9	44.5	43	316.5
125	M27x2	54	41	46	48	12	53	56	388

For other dimensions, refer to the standard version.

Please contact our sales offices for further information and quotation.

METAL WORK PNEUMATIC

KEY TO CODES

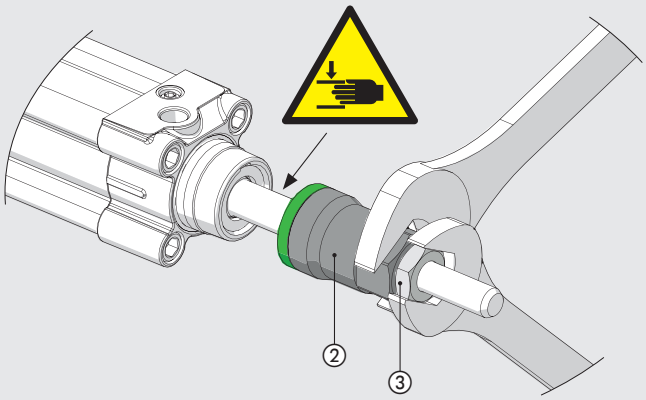
CIL	12E	0	32	0100	A	N	B
	TYPE	VERISION	BORE	STROKE	MATERIAL	GASKETS	STROKE ADJUSTMENT
	12E Through-rod with adjustable output stroke	**0** STD **▲G** STD No stick-slip **S** STD Non-magnetic **A** Type A **▲B** Type A No stick-slip **C** Type A Non-magnetic **3** Series 3 **▲4** Series 3 No stick-slip **5** Series 3 Non-magnetic	**32** Ø32 **40** Ø40 **50** Ø50 **63** Ø63 **80** Ø80 **A1** Ø100 **A2** Ø125	Ø 32 to 80 stroke 1 to 2500 mm Ø 10 to 125 stroke 1 to 2000 mm	**A** C45 chromed piston rod, aluminium piston rod **Z** Stainless steel piston rod, and nut aluminium piston	**N** NBR gaskets **P** Polyurethane gaskets **C** "Combi" piston rod gasket **▶R** "Hard PU" piston rod gasket	**A** Stroke adjustment 0÷25 mm **B** Stroke adjustment 0÷50 mm

▶ Not available for versions B, G and 4 (No stick-slip).
▲ **For speeds lower than 0.2 m/s, to prevent surging. Use no-lubricated air only.**

Other settings shall be assessed upon request.

PRECAUTIONS / WARNINGS

When the cylinder is in operation, the presence of foreign objects between the stopper bushing ② and the cylinder head can create hazardous conditions, with a potential risk of injury to persons and damage to nearby equipment.
An assessment of the risks associated with the application is therefore necessary and, if appropriate, adequate protective measures should be implemented, such as the installation of a protective cover.
When adjusting the stroke, before loosening the locking nut ③, make sure to secure the stopper bushing ② using a suitable wrench. Loosening the locking nut ③ without first securing the bushing ② may cause the load applied to the rod to loosen, with consequent risk of accidents or system malfunctions.

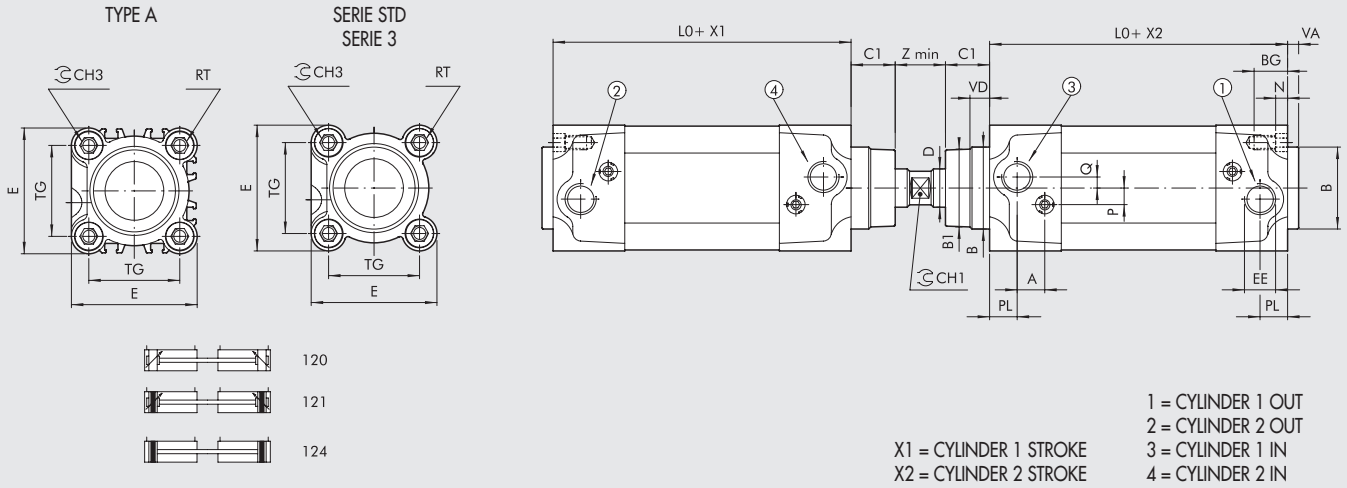


ISO 15552 CYLINDER
COMMON OPPOSING PISTON ROD

Two cylinders with a single common piston rod. The total length varies with the port supplied. This allows 4 different positions to be obtained.

N.B.: For technical data refer to the standard version.

DIMENSIONS



Ø	PL	VD	A	B	B_1	C_1	CH_1	CH_3	D	TG	VA	EE	RT	E	L_0	BG	N	P	Q	Z
32	10	6.5	10	30	28	16	10	6	12	32.5	4	G1/8	M6	46	94	14.5	4.5	6	4	14
40	12	8	10	35	33	20	13	6	16	38	4	G1/4	M6	54	105	14.5	4.5	6	4	14
50	14	13	10	40	38	25	17	8	20	46.5	4	G1/4	M8	64.5	106	17.5	5.5	6	6	16
63	16	14	10	45	40	25	17	8	20	56.5	4	G3/8	M8	75.5	121	17.5	5.5	6	6	16
80	18	12	12	45	43	33	22	10	25	72	4	G3/8	M10	94	128	21.5	5.5	10	7	17
100	20	14	12	55	49	38	22	10	25	89	4	G1/2	M10	111	138	21.5	5.5	10	7	17
125	25	20	10	60	54	45	27	12	32	110	6	G1/2	M12	135	160	25.5	6.5	12	8	26

KEY TO CODES

CYL	1 2 1 TYPE	Z	3 2 BORE	_	0 0 5 0 STROKE	C MATERIAL	P GASKETS
	120 Single-acting cushioned, non-magnetic **121** Double-acting, cushioned **124** Double-acting, non-cushioned	**Z** Special **A** Type A **3** Serie 3	32 40 50 63 80 A1 = 100 A2 = 125	Progressive letter assigned by Metal Work	from 25 to 2800 mm (stroke X2 to be specified)	**A** C45 chromed rod, aluminium piston rod: standard for all cylinders with ≥ 1000 mm-stroke cylinders and for cylinder with Ø 80 mm and over **C** C45 chromed rod, technopolymer piston: standard for cylinders of Ø 32 to 63 mm with <1000 mm strokes **Z** Stainless steel piston rod and nut aluminium piston **X** Stainless steel piston rod and nut technopolymer piston	**P** Polyurethane gaskets **N** NBR gaskets **V** FKM/FPM gaskets ● **B** Low temperature

N.B.: Specify in the comment area whether **non-magnetic** or **non-stick slip.**
The non-stick slip version is to be used with speeds lower than 0.2 m/s in order to prevent surging. Use no-lubricated air only.

● Only available for versions with aluminium piston (A or Z)

In the order description, specify in sequence stroke X1, stroke X2 and value Z, and non-stick slip if necessary (**the sum of strokes X1 + X2 + Z must not exceed 2800 mm**).
ORDERING EXAMPLE: Cylinder with common opposing piston rod 121Z32_ _ _ CP with stroke X1 = 30 mm, stroke X2 = 50 mm, Z = 15 mm. Metal Work will create its own special product code according to the following key to codes.

Please contact our sales offices for further information and quotation.

METAL WORK PNEUMATIC

NOTES

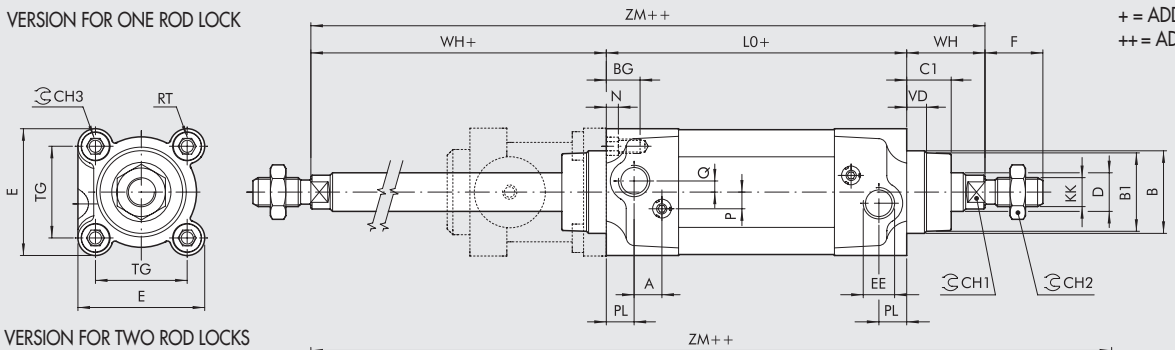
ISO 15552 CYLINDER WITH THROUGH-ROD AND LOCK

One or both piston rods are extended to hold one or two rod locks.

N.B.: For technical data refer to the standard version.

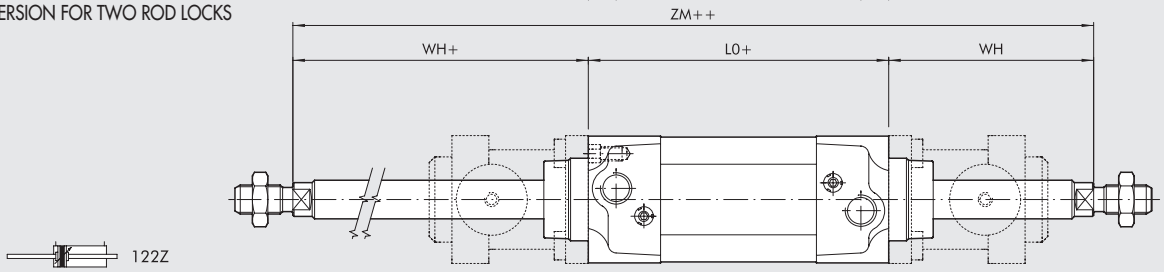
DIMENSIONS

VERSION FOR ONE ROD LOCK



+ = ADD THE STROKE
++ = ADD TWICE THE STROKE

VERSION FOR TWO ROD LOCKS



122Z

Ø	PL	VD	A	B	B_1	WH	C_1	CH_1	CH_2	CH_3	KK	D	TG	VA	F	EE	RT	E	L	L_0	ZM	BG	N	P	Q
32	10	6.5	10	30	28	68	16	10	17	6	M10x1.25	12	32.5	4	22	G1/8	M6	46	120	94	188	14.5	4.5	6	4
40	12	8	10	35	33	75	20	13	19	6	M12x1.25	16	38	4	24	G1/4	M6	54	135	105	200	14.5	4.5	6	4
50	14	13	10	40	38	94	25	17	24	8	M16x1.5	20	46.5	4	32	G1/4	M8	64.5	143	106	237	17.5	5.5	6	6
63	16	14	10	45	40	94	25	17	24	8	M16x1.5	20	56.5	4	32	G3/8	M8	75.5	158	121	252	17.5	5.5	6	6
80	18	12	12	45	43	123	33	22	30	10	M20x1.5	25	72	4	40	G3/8	M10	94	174	128	297	21.5	5.5	10	7
100	20	14	12	55	49	128	38	22	30	10	M20x1.5	25	89	4	40	G1/2	M10	111	189	138	317	21.5	5.5	10	7
125	25	20	10	60	54	187	45	27	41	12	M27x2	32	110	6	54	G1/2	M12	135	225	160	412	25.5	6.5	12	8

KEY TO CODES

CYL	122 TYPE	Z	32 BORE	_	050 STROKE	C MATERIAL	P GASKETS
	122 Through-rod	**Z** Special	32 40 50 63 80 A1 = 100 A2 = 125	Progressive letter assigned by Metal Work	from 25 to 2600 mm	**A** C45 chromed rod, aluminium piston rod **Z** Stainless steel piston rod and nut aluminium piston	**P** Polyurethane gaskets **N** NBR gaskets **V** FKM/FPM gaskets **B** Low temperature

N.B.: Specify in the comment area whether **non-magnetic** or **non-stick slip. The non-stick slip version is to be used with speeds lower than 0.2 m/s in order to prevent surging. Use no-lubricated air only.**

ORDERING EXAMPLE: Cylinder 122040100CP with 1 piston rod lock. Metal Work will create its own special product code according to the following key to codes:

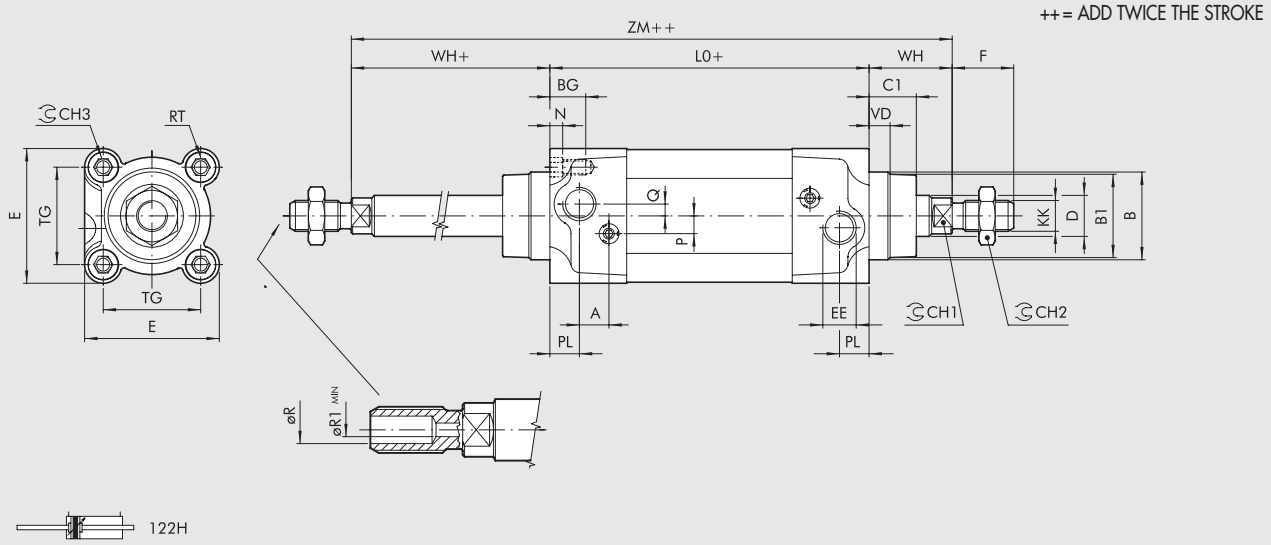
Please contact our sales offices for further information and quotation.

ISO 15552 CYLINDER
PERFORATED THROUGH-ROD

METAL WORK PNEUMATIC

DIMENSIONS

+ = ADD THE STROKE
++ = ADD TWICE THE STROKE



Ø	PL	VD	A	B	B_1	WH	C_1	CH_1	CH_2	CH_3	KK	D	TG	VA	F	EE	RT	E	L	L_0	ZM	BG	N	P	Q	ØR	ØR1
32	10	6.5	10	30	28	26	16	10	17	6	M10x1.25	12	32.5	4	22	G1/8	M6	46	120	94	146	14.5	4.5	6	4	5.5	4
40	12	8	10	35	33	30	20	13	19	6	M12x1.25	16	38	4	24	G1/4	M6	54	135	105	165	14.5	4.5	6	4	7	5
50	14	13	10	40	38	37	25	17	24	8	M16x1.5	20	46.5	4	32	G1/4	M8	64.5	143	106	180	17.5	5.5	6	6	8.5	7
63	16	14	10	45	40	37	25	17	24	8	M16x1.5	20	56.5	4	32	G3/8	M8	75.5	158	121	195	17.5	5.5	6	6	8.5	7
80	18	12	12	45	43	46	33	22	30	10	M20x1.5	25	72	4	40	G3/8	M10	94	174	128	220	21.5	5.5	10	7	10	8
100	20	14	12	55	49	51	38	22	30	10	M20x1.5	25	89	4	40	G1/2	M10	111	189	138	240	21.5	5.5	10	7	10	8
125	25	20	10	60	54	65	45	27	41	12	M27x2	32	110	6	54	G1/2	M12	135	225	160	290	25.5	6.5	12	8	14	10

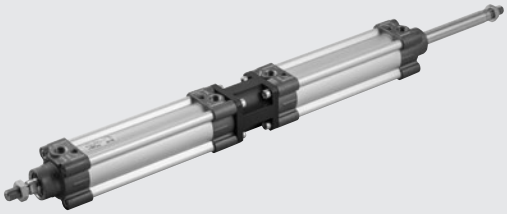
KEY TO CODES

CYL	122 TYPE	H	32 BORE	0050 STROKE	C MATERIAL	P GASKETS
	122 Through-rod	**H** Perforated rod	32 40 50 63 80 A1 = 100 A2 = 125	Ø32 max 100 Ø40 max 150 Ø50 max 190 Ø63 max 200 Ø80 max 220 Ø100 max 225 Ø125 max 250	**A** C45 chromed rod, aluminium piston rod **Z** Stainless steel piston rod and nut aluminium piston	**P** Polyurethane gaskets **N** NBR gaskets **V** FKM/FPM gaskets **B** Low temperature

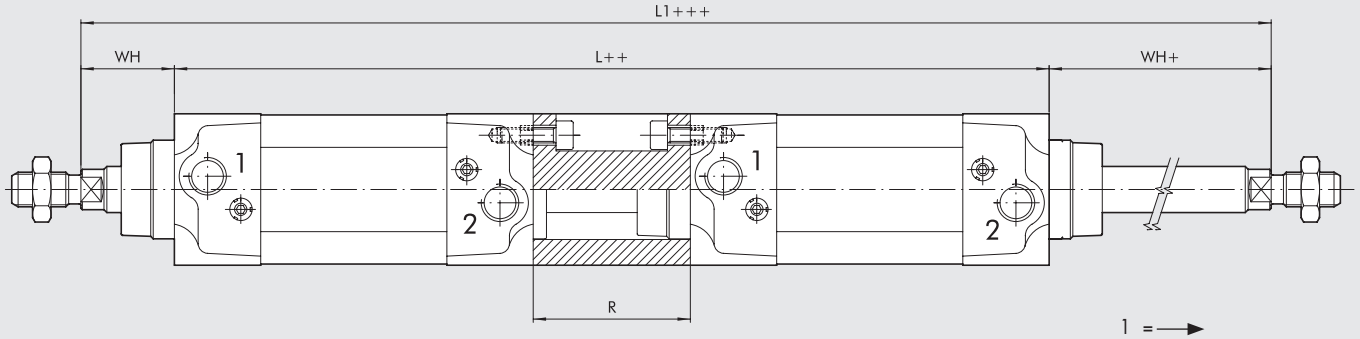
N.B.: Specify in the comment area whether **non-magnetic** or **non-stick slip. The non-stick slip version is to be used with speeds lower than 0.2 m/s in order to prevent surging. Use no-lubricated air only.**

ISO 15552 CYLINDER TANDEM THROUGH-ROD

N.B.: For technical data refer to the standard version.



DIMENSIONS



\+ = ADD THE STROKE
++ = ADD TWICE THE STROKE
+++ = ADD THREE THE STROKE

Ø	WH	R	L	L_1
32	26	55	243	295
40	30	55	265	325
50	37	68	280	354
63	37	68	310	384
80	46	92	348	440
100	51	92	368	470
125	65	120	440	570

For other dimensions, refer to the standard version.

KEY TO CODES

CYL	1 2 7	0	3 2	_	0 5 0	C	P
	TYPE		**BORE**		**STROKE**	**MATERIAL**	**GASKETS**
	127 Through-rod	**0** Diameter **S** Non-magnetic ▲ **G** No stick slip	32 40 50 63 80 A1 = 100 A2 = 125	Progressive letter assigned by Metal Work	from 25 to 2800 mm	**A** C45 chromed rod, aluminium piston rod **Z** Stainless steel piston rod and nut aluminium piston	**P** Polyurethane gaskets **N** NBR gaskets **V** FKM/FPM gaskets **B** Low temperature

▲ **For speeds lower than 0.2 m/s, to prevent surging. Use no-lubricated air only.**

Please contact our sales offices for further information and quotation.

ISO 15552 CYLINDER Ø 160-200 LOW-FRICTION

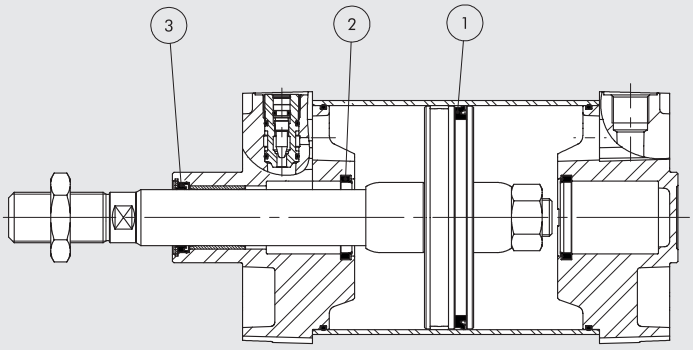
Typically used in pneumatic lifters, this cylinder is characterised by a number of special machining, the use of fewer gaskets and a special grease, all with the aim of mitigating friction and avoiding the stick-slip effect.
Indeed, you can choose either the version operating with piston rod extension or piston rod retraction, which means that only the pressure chamber gaskets are fitted, except for the piston rod gasket, which is always present for the purpose of scraping the piston rod.
In fact, it is a single-acting cylinder without a return spring, where the piston rod is repositioned by forces external to the cylinder.
The grease grade chosen has characteristics that remain constant over time, even in the event of accidental contact with water. It is thus recommended not to use lubricated air as oil could remove the grease and reduce cylinder performance.

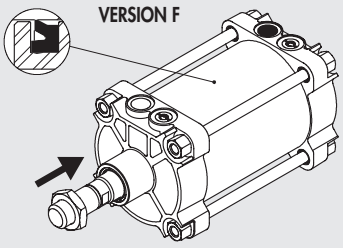
TECHNICAL DATA

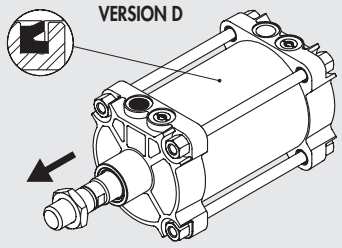
Max operating pressure	bar	10
	MPa	1
	psi	145
Temperature range	°C	–20 to +80
Fluid		Unlubricated air
Bore	mm	160, 200
Design		Round barrel with tie rods
Strokes	mm	from 25 to 1200
Versions		Single-acting when the piston rod extends or retracts, without a return spring; magnetic or non-magnetic; cushioned
Inrush pressure	bar	0.05
Forces generated		See cylinder "**General technical data**" at the beginning of the chapter **A1**
Weight		See cylinder "**General technical data**" at the beginning of the chapter **A1**

COMPONENTS

① Piston gasket, NBR
② Cushioning gasket, polyurethane
③ Piston rod gasket, NBR







KEY TO CODES

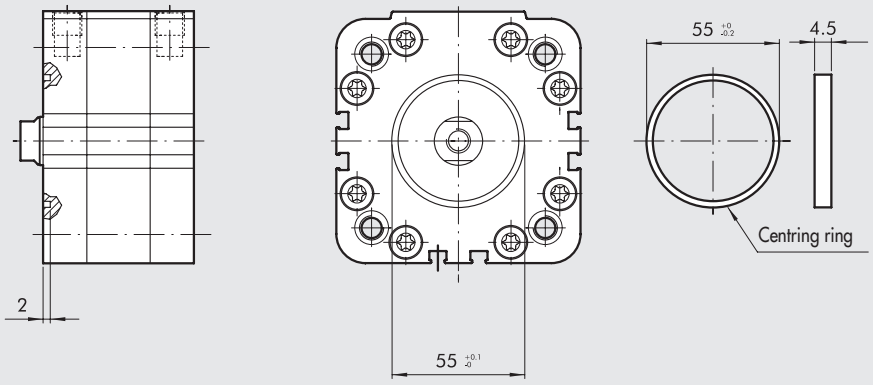
CYL	W 1 2 1	D	A 3	0 0 5 0
	TYPE	**LOW-FRICTION, VERSION**	**BORES**	**STROKE**
	W120 Non magnetic **W121** Magnetic	**D** Rear chamber pressure, cushioning and piston rod gaskets **F** Front chamber pressure and cushioning	**A3** 160 **A4** 200	0025 to 1200 mm

NOTES

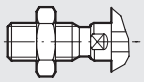
COMPACT CYLINDER SERIES CMPC WITH CENTRING RING

The face of the front head contains a circular groove in which a centring ring can be inserted. The Ø 80 cylinder is currently available.

DIMENSIONS Ø80

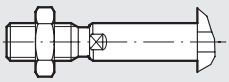


SE-DE MALE PISTON ROD



SE EXTENDED PISTON ROD

SE MALE EXTENDED PISTON ROD



250Z-260Z

253Z-263Z

254Z-264Z

For other dimensions, refer to the standard version

ORDERING CODES

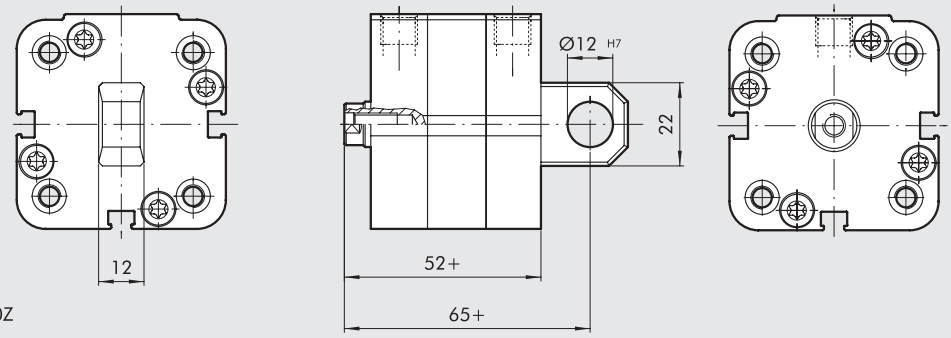
Code	Description
82873M4	Centring ring D55
260Z80A___CP	ISO cylinder series CMPC ø 80 double-acting, centre distance female piston rod with centring slot

COMPACT CYLINDER SERIES CMPC WITH BUILT-IN MALE HINGE

The rear head of the cylinder is integral with a male hinge.
This unit is particularly compact compared to the standard version, in which the male hinge is screwed onto the head.
This version is designed for the Ø 40 mm cylinder with ISO centre distance.

DIMENSIONS Ø 40 CYLINDER

+ = ADD THE STROKE



250Z-260Z

253Z-263Z

254Z-264Z

For other dimensions, refer to the standard version

KEY TO CODES

CYL	25	1	Z	32	_	050	C	P
	TYPE			**BORE**		**STROKE**	**MATERIAL**	**GASKETS**
	25 Compact cylinder centre distances to ISO male piston rod **26** Compact cylinder centre distances to ISO female piston rod	**0** Double-acting ● **3** Single-acting retracting piston rod ● **4** Single-acting extended piston rod	**Z** Special	32 40 50 63 80 A1=100	Progressive letter assigned by Metal Work		▷ **C** C45 piston rod chromium-plated ▷ **X** Stainless steel piston rod ○ **A** C45 chromed rod, aluminium piston ○ **Z** Stainless steel piston rod and nut aluminium piston	**P** Polyurethane ▶ **V** FKM/FPM

● Can also be used as double-acting with spring return
▶ Only for standard double acting and standard through rod double acting version
N.B.: Specify in the comment area whether **magnetic** or **non-stick slip.**
The non-stick slip version is to be used with speeds lower than 0.2 m/s in order to prevent surging. Use no-lubricated air only.

▷ Only for P version (Polyurethane gaskets)
○ Only for Ø 32 to 100 V version (FKM/FPM gaskets) and for Ø 80 and 100 P version (Polyurethane gaskets)

STROKES

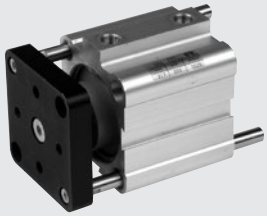
Standard stroke for single-acting cylinders	Standard stroke for double-acting cylinders	Max. recommended strokes for double-acting cylinders
Ø 32 to 100 → 25 mm	Ø 32 to 100 → from 5 to 80 mm	Ø 32; Ø 40 → 300 mm
		Ø 50; Ø 63 → 400 mm
		Ø 80; Ø 100 → 500 mm

Maximum recommended strokes. Higher values can create operating problems

Please contact our sales offices for further information and quotation.

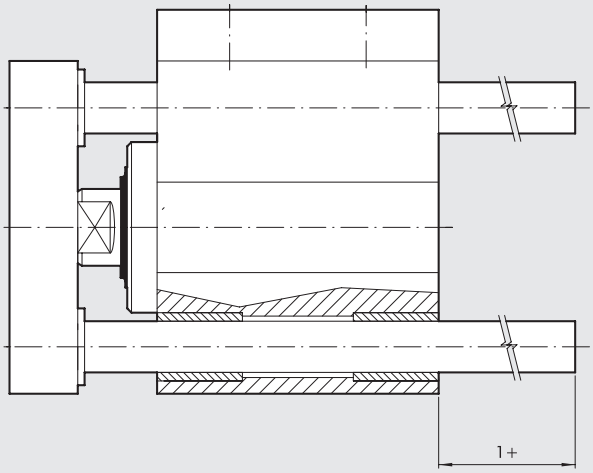
SHORT-STROKE CYLINDER SERIES SSCY ANTI-ROTATION WITH EXTENDED COLUMNS

The jacket contains two guide bushes, one at the front and oneat the rear. The columns have been extended, so they are guided better and have less radial play.



DIMENSIONS

+ = ADD THE STROKE



For other dimensions, refer to the standard version.

KEY TO CODES

CYL	217 TYPE	Z BORE	16 BORE	_	020 STROKE	C MATERIAL	P GASKETS
	217 Double acting, anti-rotation	**Z** Special	12 16 20 25 32 40 50 63 80 ◆ 100	Progressive letter assigned by Metal Work	Ø 12 - 63 stroke from 5 to 120 mm Ø 80 - 100 stroke from 5 to 150 mm	**C** C45 chrome rod, technopolymer piston rod Ø 12 to 63 mm **A** C45 chrome rod, aluminium piston rod (standard Ø 80 to 100 mm) **X** Stainless steel piston rod and nut technopolymer piston Ø 12 to 63 mm **Z** Stainless steel piston rod and nut aluminium piston (standard Ø 80 to 100 mm)	**P** Polyurethane **N** NBR ● **V** FKM/FPM ● **B** Low temperature

◆ In the code of cylinder with letter in fourth position Ø 100 becomes A1
● Only available for non-magnetic versions and with aluminium piston (A or Z)

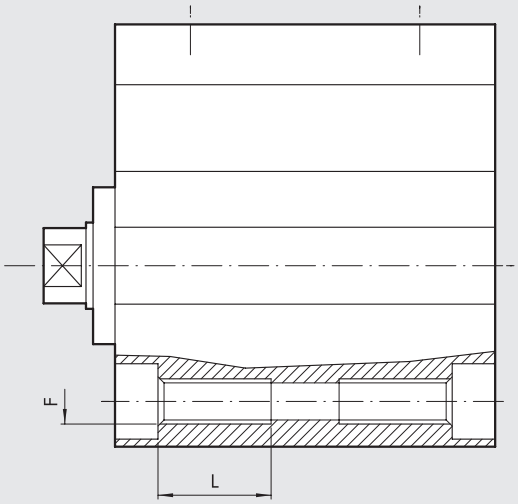
N.B.: Specify in the comment area whether **non-magnetic** or **non-stick slip.** **The non-stick slip version is to be used with speeds lower than 0.2 m/s in order to prevent surging. Use no-lubricated air only.**

NOTES

SHORT-STROKE CYLINDER SERIES SSCY WITH THREADS IN THE LINER

These threads can be made for the longitudinal holes in the liner.
The threads can be made from the piston rod side or the opposite side.

RECOMMENDED THREADS



Ø	F	L
12	M5	10
16	M5	10
20	M6	12
25	M6	12
32	M8	12
40	M8	12
50	M8	16
63	M10	20
80	M10	20
100	M14	28

Note: It is preferable to leave the existing spot-facing in standard cylinder liners.

NOTES

ORDERING EXAMPLE: Cylinder 2120400050CP with threads M6x12 in the cylinder liner, piston rod side.

SHORT-STROKE CYLINDER SERIES SSCY SINGLE ACTING WITH HINGES

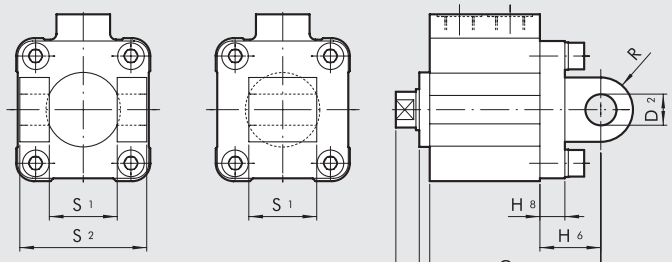
These are SSCY single-acting cylinders with pre-assembled male (model BA) or female (model B) rocking hinge.

DIMENSIONS FOR SER VERSIONS

+ = ADD THE STROKE

Rocking version Female (model B)

Rocking version Male (model BA)



208

210

Ø	Stroke	D_2	G	G_1	H_6	H_8	N	R	S_1	S_2
32	5 - 25	10	59	62.8	22	10	70.3	11	26	45
	> 25 - 50		67	70.8						
40	5 - 25	12	64.5	69.7	25	10	78.2	13	28	52
	> 25 - 50		72.5	77.5						
50	5 - 25	12	66.5	73.2	27	12	80.2	13	32	60
	> 25 - 50		74.5	81.2						
63	5 - 25	16	74	80.7	32	12	89.7	17	40	70
	> 25 - 50		82	88.7						

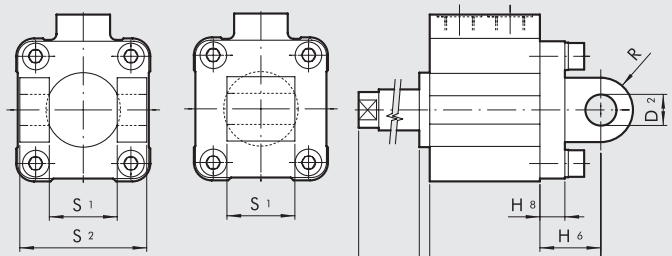
Note: For other dimensions, refer to the standard version.

DIMENSIONS FOR SSE VERSIONS

+ = ADD THE STROKE
++ = ADD TWICE THE STROKE

Rocking version Female (model B)

Rocking version Male (model BA)



209

211

Ø	Stroke	D_2	G	G_1	H_6	H_8	N	R	S_1	S_2
32	5 - 50	10	59	62.8	22	10	70.3	11	26	45
	> 25 - 50		67	70.8						
40	5 - 50	12	64.5	69.7	25	10	78.2	13	28	52
	> 25 - 50		72.5	77.5						
50	5 - 50	12	66.5	73.2	27	12	80.2	13	32	60
	> 25 - 50		74.5	81.2						
63	5 - 50	16	74	80.7	32	12	89.7	17	40	70
	> 25 - 50		82	88.7						

Note: For other dimensions, refer to the standard version.

KEY TO CODES

CYL	208	Z	32	_	015	C	P
	TYPE		BORE		STROKE	MATERIAL	GASKETS
	208 Single-acting retracted rod, non-magnetic **209** Single-acting extended rod, non-magnetic **210** Single-acting, retracted rod **211** Single acting, extended rod	**Z** Special	32 40 50 63	Progressive letter assigned by Metal Work	See above	**C** C45 chrome piston rod, technopolymer piston Ø 12 to 63 mm **A** C45 chrome piston rod, aluminium piston (standard Ø 80 to 100 mm) **X** Stainless steel piston rod and nut technopolymer piston Ø 12 to 63 mm **Z** Stainless steel piston rod and nut aluminium piston (standard Ø 80 to 100 mm)	**P** Polyurethane gaskets **N** NBR gaskets ● **V** FKM/FPM gaskets ● **B** Low temperature

● Only available for versions with aluminium piston (A or Z)

SHORT-STROKE CYLINDER SERIES SSCY
THROUGH-ROD ANTI-ROTATION

KEY TO CODES

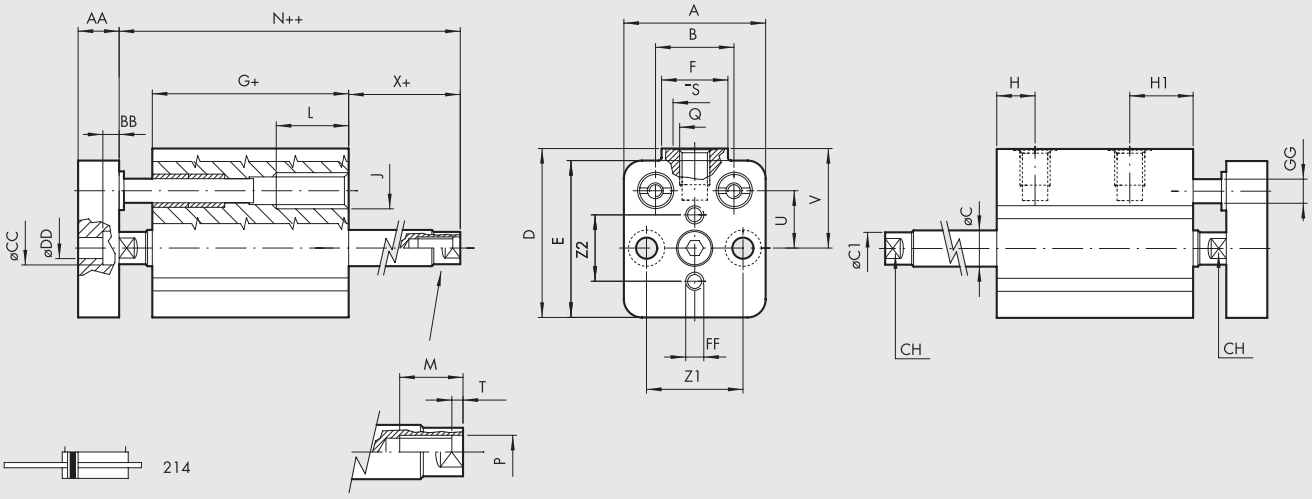
CYL	214 TYPE	Z	16 BORE	_	0020 STROKE	C MATERIAL	P GASKETS
	214 Double acting, through-rod	**Z** Special	12 16 20 25 32 40 50 63 80 ◆ 100	Progressive letter assigned by Metal Work	Ø12 - 63 stroke from 5 to 120 mm Ø80 - 100 stroke from 5 to 150 mm	**C** C45 chrome rod, technopolymer piston rod Ø 12 to 63 mm **A** C45 chrome rod, aluminium piston rod (standard Ø 80 to 100 mm) **X** Stainless steel piston rod and nut technopolymer piston Ø 12 to 63 mm **Z** Stainless steel piston rod and nut aluminium piston (standard Ø 80 to 100 mm)	**P** Polyurethane **N** NBR ● **V** FKM/FPM ● **B** Low temperature

◆ In the code of cylinder with letter in fourth position Ø 100 becomes A1
● Only available for non-magnetic versions and with aluminium piston (A or Z)

N.B.: Specify in the comment area whether **non-magnetic** or **non-stick slip.**
The non-stick slip version is to be used with speeds lower than 0.2 m/s in order to prevent surging. Use no-lubricated air only.

DIMENSIONS Ø 12

\+ = ADD THE STROKE
++ = ADD TWICE THE STROKE

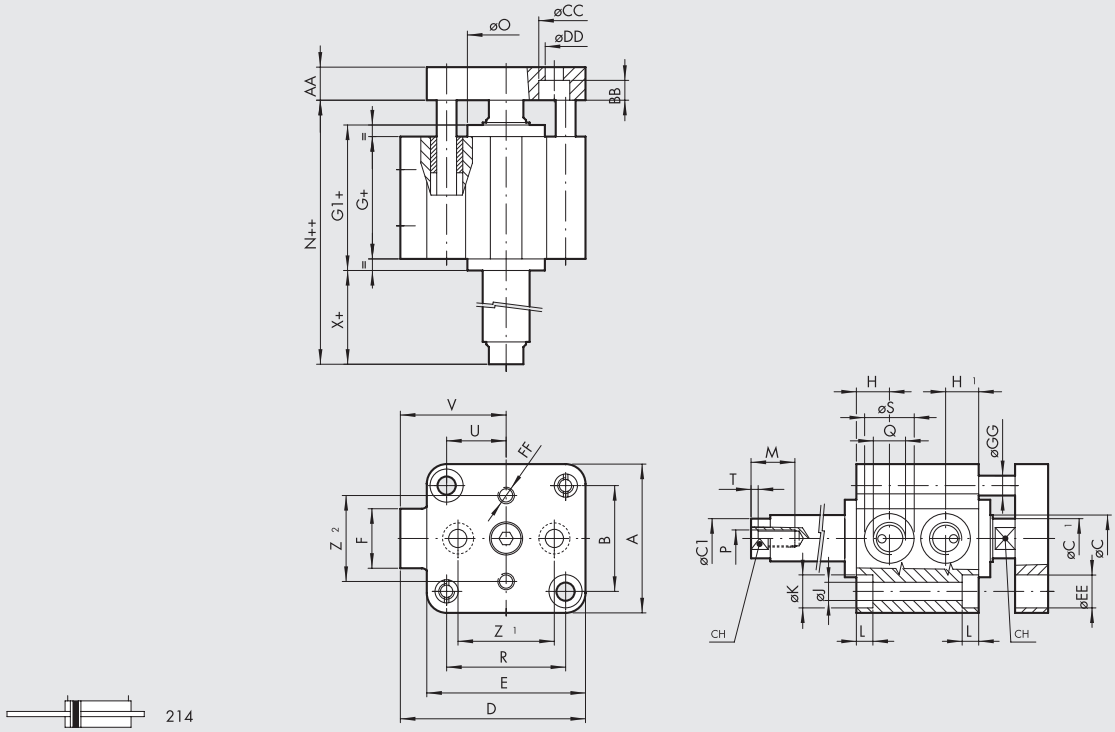


Ø	A	B	øC	ø C_1	CH	D	E	F	G	H	H_1	J	L	M	N	P	T	Z_1	Z_2	Q	øS	U	V	AA	BB	øCC	øDD	FF	øGG	X
12	23.5	13	6	5.5	5	28	26	11	32.5	6.5	10.5	M6	12	7	43.5	M3	2	16	11	M5	8	9.5	16.5	8	3.5	6	3.5	M3	4	5.5

METAL WORK PNEUMATIC

DIMENSIONS Ø16 to Ø100

+ = ADD THE STROKE
++ = ADD TWICE THE STROKE



Ø	A	B	øC	øC1	D	E	F	G	G1	H	H1	J	K	L	N	Z1	Z2	Q	R	øS	CH	U	V	AA	BB	øCC	øDD	øEE	FF	øGG	øO
16	28	20	8	7.5	33	28	11	36.8	-	6.7	10.5	3.7	6	3.7	45.8	20	15	M5	20	8	7	10	19	8	3.5	6	3.5	6	M3	4	-
20	32	22	10	9	37	32	11	36	-	6.5	10.5	4.6	7.5	4.6	45	22	18	M5	22	8	8	11	21	8	5	7.5	4.5	7.5	M4	6	-
25	37	26	10	9	47.5	39	18	35.7	42.7	8.5	8.5	4.6	7.5	4.6	54.7	22	22	G1/8	28	15	8	14	28	8	5	7.5	4.5	8	M4	6	20
32	45	32	12	11	56	48	18	37	44.5	10	10	5.5	10	5.7	59.5	26	26	G1/8	36	15	10	18	32	10	6	10	5.5	10	M5	8	25
40	54.5	40	12	11	62.7	54.5	18	39.5	49.9	10	10	5.5	10	5.7	66.9	34	34	G1/8	40	15	10	20	35.5	10	6	10	5.5	10	M5	8	30
50	66	50	16	15	73	66	18	39.5	52.9	11	11	6.6	11	6.8	66.9	43	43	G1/8	50	15	13	25	40	12	7	11	6.5	11	M6	10	35
63	80	62	16	15	88	80	23	42	55.4	12	12	9	15	9	73.4	55	55	G1/8	62	15	13	31	48	12	9	14	9	15	M6	10	35
80	100	82	20	19	110	100	26	57	77.4	14	14	9	15	9	93.4	70	70	G1/4	82	19	17	41	60	14	9	14	9	15	M8	12	44
100	124	103	25	24	134	124	26	64	85.4	15	15	11	18	11	104.6	94	94	G1/4	103	19	22	51.5	72	17	9	14	9	18	M8	12	56

Ø	X	P	M	T
16	4.5	M5	10	2
20	4.5	M5	10	2
25	6	M5	10	2
32	7.5	M6	15	2.5
40	8.5	M6	15	2.5
50	7	M8	18	3.5
63	9	M8	18	3.5
80	8	M10	18	4
100	9.6	M12	20	5

NOTES

ROUND CYLINDER
SERIES SHORT RNDC

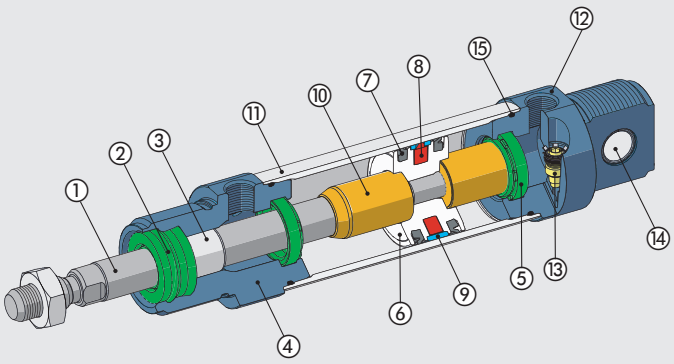
Short clean profile cylinders with hinge built into the rear head.
Available in different versions:

- configuration with or without magnet
- single- and double-acting - single or through-rod
- with pneumatic cushioning or sound-proof version
- range of gaskets available in NBR, POLYURETHANE, FKM/FPM (for high temperatures) and low-temperature gaskets.

TECHNICAL DATA			Ø32	Ø40	Ø50	Ø63
Max operating pressure		bar	10			
		MPa	1			
		psi	145			
Temperature range	POLYURETHANE	°C	–25 to +80			
	NBR	°C	–10 to +80			
	FKM/FPM	°C	–10 to +150 (non-magnetic cylinders)			
	Low temperature	°C	–35 to +80			
Design			Screwed heads			
Fluid			Unlubricated air. Lubrication, if used, must be continuous			
Standard strokes ✚	single-acting	mm	1 to 250			
	double-acting	mm	1 to 500			
Versions			Double-acting, Double-acting through-rod, Double-acting cushioned, Double-acting through-rod cushioned, Single-acting retracted, No stick-slip.			
Magnet for sensors			Available magnetic and non-magnetic versions.			
Inrush pressure		bar	0.4		0.3	
Forces generated at 6 bar thrust/retraction			See cylinder "**General technical data**" at the beginning of the chapter			
Notes			**For speeds lower than 0.2 m/s to prevent surging, use the version No stick-slip and non-lubricated air.**			
			✚ Maximum recommended strokes. Higher values can create operating problems.			

COMPONENTS

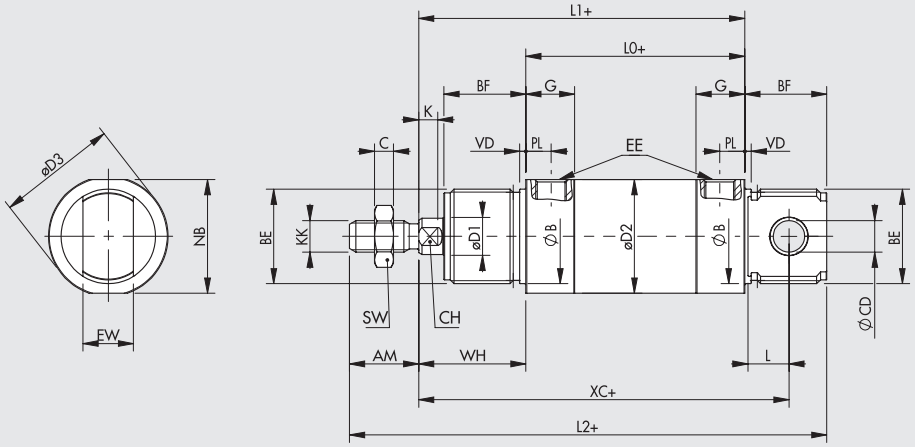
① PISTON ROD: C45 steel or stainless steel, thick chromed
② PISTON ROD GASKET: polyurethane, NBR or FKM/FPM
③ GUIDE BUSHING: steel strip with bronze and PTFE insert
④ FRONT CYLINDER HEAD: anodized aluminium alloy
⑤ CUSHIONING GASKET: polyurethane, NBR or FKM/FPM
⑥ PISTON: aluminium alloy
⑦ PISTON GASKET: polyurethane, NBR or FKM/FPM
⑧ MAGNET: plastoferrite
⑨ GUIDE RING: technopolymer
⑩ CUSHIONING CONE: brass
⑪ BARREL: anodized aluminium alloy
⑫ REAR CYLINDER HEAD: anodized aluminium alloy
⑬ CUSHIONING NEEDLE: brass, with needle out movement safety system even when fully open
⑭ REAR BUSHING: steel strip with bronze and PTFE insert
⑮ Static O-rings: NBR or FKM/FPM



METAL WORK PNEUMATIC

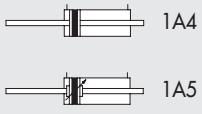
DIMENSIONS

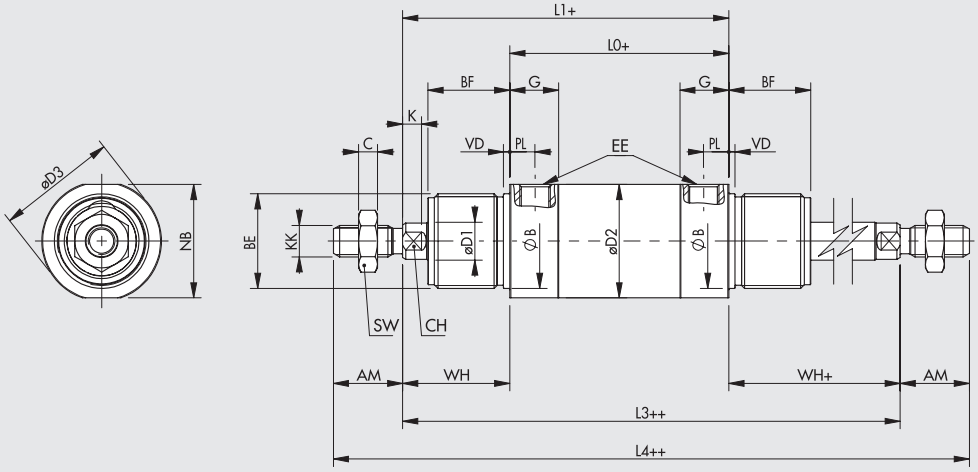
STANDARD VERSION



\+ = ADD THE STROKE
++ = ADD TWICE THE STROKE

THROUGH-ROD VERSION





Ø	AM	WH	BE	BF	KK	Ø CD (H10)	EW	Ø D1	Ø D2	Ø D3	NB	Ø B (h9)	VD	G	PL	EE	L	L0	L1	L2	L3	L4	XC±1	SW	C	CH	K
32	22	34	M30x1.5	26	M10x1.25	10	16	12	36	38	36	30	2	15.5	8	G1/8	13	69.5	103.5	151.5	137.5	181.5	117.5	17	6	10	6
40	24	39	M38x1.5	30	M12x1.25	12	18	16	45	46	43	38	3	21	10	G1/4	15	84.6	123.6	177.6	162.6	210.6	139.6	19	7	13	6
50	32	44	M45x1.5	33	M16x1.5	16	21	20	55	57	54	45	3	19.6	9.8	G1/4	16	86.2	130.2	195.2	174.2	238.2	147.2	24	8	17	8
63	32	45	M45x1.5	33	M16x1.5	16	21	20	68	70	67	45	3	24	11.5	G3/8	16	94.2	139.2	204.2	184.2	248.2	156.2	24	8	17	8

VERSION 1A1... (SINGLE-ACTING)

	L0				L1				L2				XC			
Stroke	**Ø 32**	**Ø 40**	**Ø 50**	**Ø 63**	**Ø 32**	**Ø 40**	**Ø 50**	**Ø 63**	**Ø 32**	**Ø 40**	**Ø 50**	**Ø 63**	**Ø 32**	**Ø 40**	**Ø 50**	**Ø 63**
0 - 50	69.5	84.6	86.2	94.2	103.5	123.6	130.2	139.2	151.5	177.6	195.2	204.2	117.5	139.6	147.2	156.2
51 - 100	98.5	113.6	121.7	130.7	132.5	156.1	165.7	175.7	180.5	210.1	230.7	240.7	146.5	172.1	182.7	192.7
101 - 150	127.5	146.1	157.2	167.2	161.5	188.6	201.2	212.2	209.5	242.6	266.2	277.2	175.5	204.6	218.2	229.2
151 - 200	156.5	178.6	192.7	203.7	190.5	221.1	236.7	248.7	238.5	275.1	301.7	313.7	204.5	237.1	253.7	265.7
201 - 250	185.5	211.1	228.2	240.2	219.5	253.6	272.2	285.2	267.5	307.6	337.2	350.2	233.5	269.6	289.2	302.2

For all the other values, see previous table.

KEY TO CODES

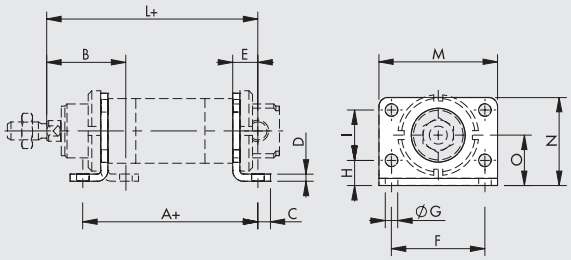
CYL	1 A 0 TYPE	0	3 2 BORE	0 0 5 0 STROKE	A MATERIAL	P GASKETS
	1A9 Cushioned double-acting **1A0** Double-acting **1A1** Magnetic single-acting **1A2** Magnetic double-acting **1A3** Magnetic double-acting cushioned **1A4** Magnetic double-acting through-rod **1A5** Magnetic double-acting cushioned, through-rod	**0** Standard ▲ **G** No stick-slip **S** Non-magnetic	32 40 50 63	For the maximum suppliable strokes, look at the technical data	**A** C45 chrome piston rod, aluminium piston **Z** Stainless steel piston rod and nut aluminium piston	**P** Polyurethane **N** NBR ● **V** FKM/FPM ● **B** Low temperature

▲ **For speeds lower than 0.2m/s, to prevent surging. Use no-lubricated air only**
● Only available for non-magnetic versions (S)

ACCESSORIES FOR ROUND CYLINDER SERIES SHORT RNDC: FIXINGS

FOOT MODEL AC

+ = ADD STROKE

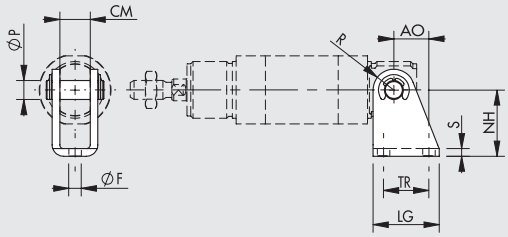


Code	Ø	A	B	C	D	E	F	ØG	H	I	L	M	N	O	Weight [g]
W0950320002	**32**	97.5	44	7	4	14	52	7	14	28	117.5	66	49	28	104
W0950400002	**40**	124.6	49	10	5	20	60	9	18	30	138.6	80	58	33	190
W0950500002	**50**	126.2	58	10	6	20	70	9	20	40	150.2	90	70	40	296
W0950500002	**63***	134.2	59	10	6	20	70	9	20	40	159.2	90	70	40	296

* On Ø 63, it can be used only if mounted outwards
Note: Individually packed

COUNTER-HINGE MODEL BCS

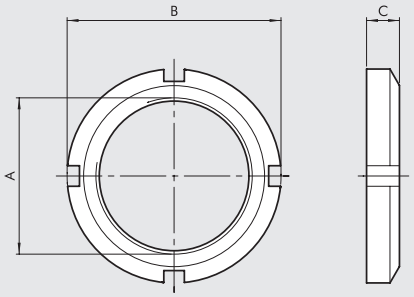
+ = ADD STROKE



Code	Ø	AO	TR js13	ØF H13	ØP f7	CM	R	S	NH	LG	Weight [g]
W0950320022	**32**	18.5	24	6.6	10	16.1	11	4	$35^{+0.40}_{-0.20}$	35	105
W0950400022	**40**	24.5	30	9	12	18.1	13	5	$40^{+0.40}_{-0.20}$	45	185
W0950500022	**50 - 63**	28	34	9	16	21.1	14	6	$45^{+0.50}_{-0.20}$	50	290

Note: Supplied complete with pin and 2 snap rings

HEAD LOCK RING MODEL G

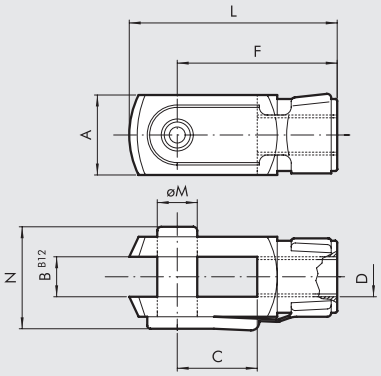


Code	Ø	A	B	C	Weight [g]
W0950320010	**32**	M30x1.5	45	7	46
W0950400010	**40**	M38x1.5	50	8	56
W0950500010	**50 - 63**	M45x1.5	58	9	124

Note: Individually packed

Please contact our sales offices for further information and quotation.

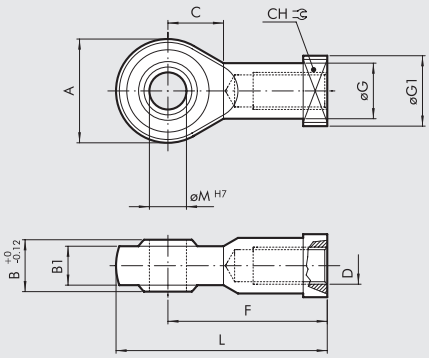
FORK MODEL GK-M



Code	Ø	Ø M	C	B	A	L	F	D	N	Weight [g]
W0950322020	32	10	20	10	20	52	40	M10x1.25	26	92
W0950402020	40	12	24	12	24	62	48	M12x1.25	32	148
W0950502020	50 - 63	16	32	16	32	83	64	M16x1.5	40	340

Note: Individually packed

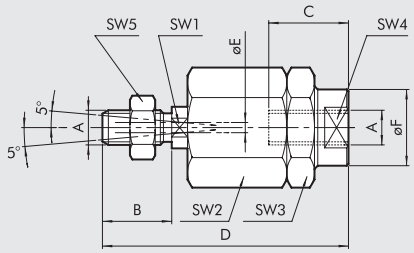
SPHERICAL JOINT MODEL GA-M



Code	Ø	øM	C	B1	B	A	L	F	D	øG	ØG1	CH	Weight [g]
W0950322025	32	10	15	10.5	14	28	57	43	M10x1.25	15	19	17	70
W0950402025	40	12	17	12	16	32	66.5	50	M12x1.25	17.5	22	19	108
W0950502025	50 - 63	16	22	15	21	42	85	64	M16x1.5	22	27	22	216

Note: Individually packed

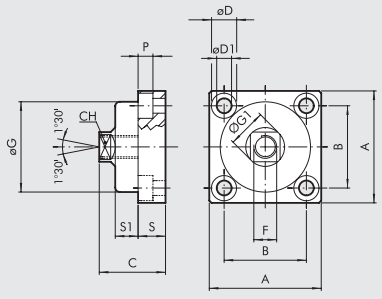
ARTICULATED JOINT MODEL GA-K



Code	Ø	A	B	C	D	øE	øF	SW1	SW2	SW3	SW4	SW5	Weight [g]
W0950322030	32	M10x1.25	20	20	71	4	22	12	30	30	19	17	216
W0950402030	40	M12x1.25	24	20	75	4	22	12	30	30	19	19	220
W0950502030	50 - 63	M16x1.5	32	32	103	4	32	20	41	41	30	24	620

Note: Individually packed

FLEXIBLE COLLAR - MODEL GA

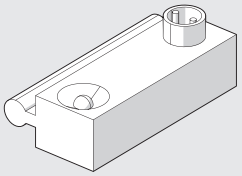


Code	Ø	A	B	C	CH	øD	øD1	F	øG	ØG1	P	S	S1	Weight [g]
W0950326021	32	49	36	30	13	11	6.5	M10x1.25	39.5	17	6.5	12	10	172
W0950406021	40	59	42	36	15	14	8.5	M12x.125	44	19	8.5	15	13.5	286
W0950506021	50 - 63	79	58	44	22	17	10.5	M16x1.5	59	26	10.5	20	15	628

Note: Individually packed

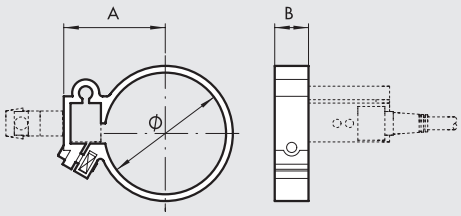
ACCESSORIES FOR ROUND CYLINDER SERIES SHORT RNDC: MAGNETIC SENSORS

SENSOR SERIES DSM - Ø 32-50



For codes and technical data, see **chapter A6**.

SENSOR BRACKET - Ø 32-50



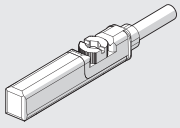
Code	Bore	Model	Ø	A	B
W0950000132	32	Bracket DXF 36-32	36	29.5	10
W0950000140	40	Bracket DXF 45-40	45	34.5	10
W0950000150	50	Bracket DXF 52-50	55	38.5	10

FOR MOUNTING ON THE CYLINDER Ø 50 INSERT
THE ALUMINIUM SPACER ① YOU FIND IN THE PACKAGE

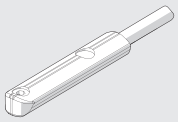
RETRACTABLE SENSOR - Ø 63

For codes and technical data, see **chapter A6**.

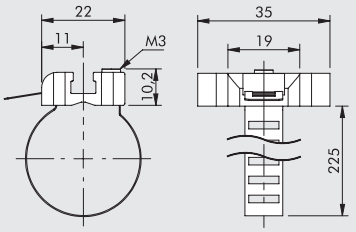
SENSOR, SQUARE TYPE
Latest generation,
secure fixing



SENSOR, OVAL TYPE
Traditional



UNIVERSAL SENSOR BRACKET - Ø 63



Code	Bore	Model
W0950001103	63	Sensor bracket 8 to 63

Note: Individually packed

MATERIAL

Bracket: stainless steel

Sensor holder: zamak

NOTES

METAL WORK PNEUMATIC

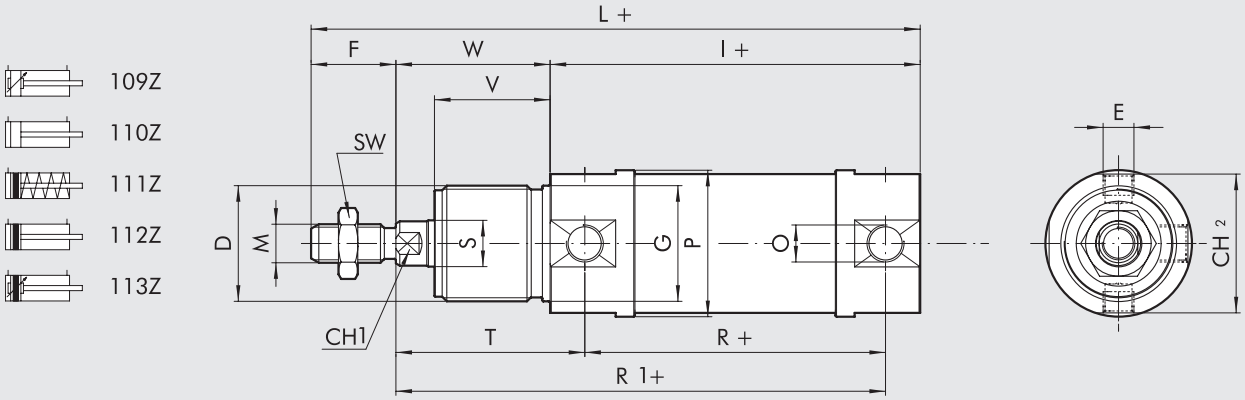
NOTES

ROUND CYLINDER SERIES RNDC WITH REDUCED HEAD

The rear head does not have a threaded nose, which gives a shorter overall length compared to a standard cylinder.

DIMENSIONS

\+ = ADD THE STROKE



DIMENSIONS OF DOUBLE-ACTING

Ø	D	E	F	Ø G	CH1	I	L	M	N	O	Ø P	R	Ø S	SW	T	CH2	V	W	L1
32	M30x1.5	M8x1	22	30	10	96	158	M10x1.25	14	G1/8	38	78	12	17	49	36	30	40	220
40	M38x1.5	M10x1	24	38	13	113	182	M12x1.25	16	G1/4	46	89	16	19	57	43	35	45	251
50	M45x1.5	M12x1.5	32	45	17	120	202	M16x1.5	18	G1/4	57	96	20	24	62	54	38	50	284

DIMENSIONS OF SINGLE-ACTING

			I			L			R1		
Lower limit	**Stroke**	**Upper limit**	**Ø 32**	**Ø 40**	**Ø 50**	**Ø 32**	**Ø 40**	**Ø 50**	**Ø 32**	**Ø 40**	**Ø 50**
0	< C ≤	50	96	113	120	172	198	220	127	146	158
50	< C ≤	100	125	145.5	155.5	201	230.5	255.5	156	178.5	193.5
100	< C ≤	150	154	178	191	230	263	291	185	211	229
150	< C ≤	200	183	210.5	226.5	259	295.5	326.5	214	243.5	264.5
200	< C ≤	250	212	243	262	288	328	362	243	276	300

For all the other values, see previous table, except for "T" and "R" which are both replaced by "R1"

KEY TO CODES

CYL	1 1 2	Z	3 2	_	0 2 5	C	P
	TYPE		**BORE**		**STROKE**	**MATERIAL**	**GASKETS**
	109 DEA **110** DE ■ **111** SE **112** DEM **113** DEMA	**Z** Special	32 40 50	Progressive letter assigned by Metal Work	25 to 500 mm	**A** C45 chrome rod, aluminium piston rod **C** C45 chrome rod, technopolymer piston rod **Z** Stainless steel piston rod and nut aluminium piston **X** Stainless steel piston rod and nut technopolymer piston	**P** Polyurethane **N** NBR ● **V** FKM/FPM ● **B** Low temperature

DE: Double-acting (non-cushioned, not magnetic)
DEM: Magnetic double-acting (non-cushioned)
DEMA: Magnetic double-acting (cushioned)
DEA: Cushioned double-acting (non-magnetic)
SE: Single-acting (magnetic)

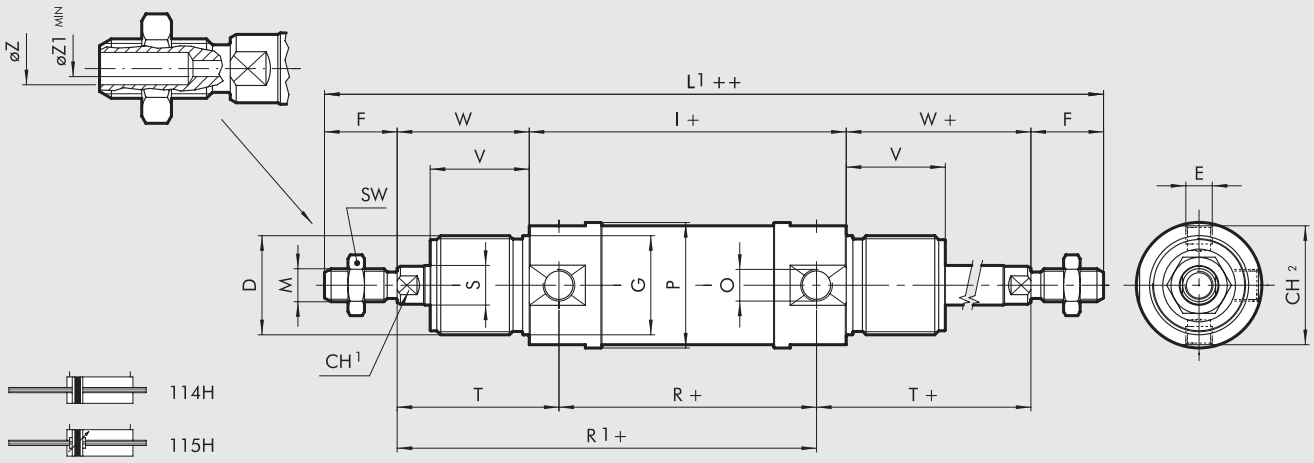
● Only available for non-magnetic versions and with aluminium piston (A or Z)
■ Only available for versions with aluminium piston (A or Z)
N.B.: Specify in the comment area whether **magnetic** or **non-stick slip.**
The non-stick slip version is to be used with speeds lower than 0.2 m/s in order to prevent surging. Use no-lubricated air only.

Please contact our sales offices for further information and quotation.

ROUND CYLINDER SERIES RNDC
PERFORATED THROUGH-ROD

DIMENSIONS

\+ = ADD THE STROKE
++ = ADD TWICE THE STROKE



Ø	D	E	F	øG	CH1	I	L	M	N	O	øP	R	øS	SW	T	CH2	V	W	L1	øZ	øZ1
32	M30x1.5	M8x1	22	30	10	96	172	M10x1.25	14	G1/8	38	78	12	17	47	36	30	40	220	5.5	4
40	M38x1.5	M10x1	24	38	13	113	198	M12x1.25	16	G1/4	46	89	16	19	57	43	35	45	251	7	5
50	M45x1.5	M12x1.5	32	45	17	120	220	M16x1.5	18	G1/4	57	96	20	24	62	54	38	50	284	8.5	7

KEY TO CODES

CYL	1 1 4	H	3 2	_	0 2 5	C	P
	TYPE		**BORE**		**STROKE**	**MATERIAL**	**GASKETS**
	114 DEM through-rod **115** DEMA through-rod	**H** Perforated rod	32 40 50	Progressive letter assigned by Metal Work	Ø 32 max 110 Ø 40 max 120 Ø 50 max 170	**A** C45 chrome rod, aluminium piston rod **C** C45 chrome rod, technopolymer piston rod **Z** Stainless steel piston rod and nut aluminium piston **X** Stainless steel piston rod and nut technopolymer piston	**P** Polyurethane **N** NBR ● **V** FKM/FPM ● **B** Low temperature

DEM: Magnetic double-acting (non-cushioned)
DEMA: Magnetic double-acting (cushioned)

● Only available for non-magnetic versions and with aluminium piston (A or Z)

N.B.: Specify in the comment area whether **non-magnetic** or **non-stick slip.**
The non-stick slip version is to be used with speeds lower than 0.2 m/s in order to prevent surging. Use no-lubricated air only.

ROUND CYLINDER SERIES E

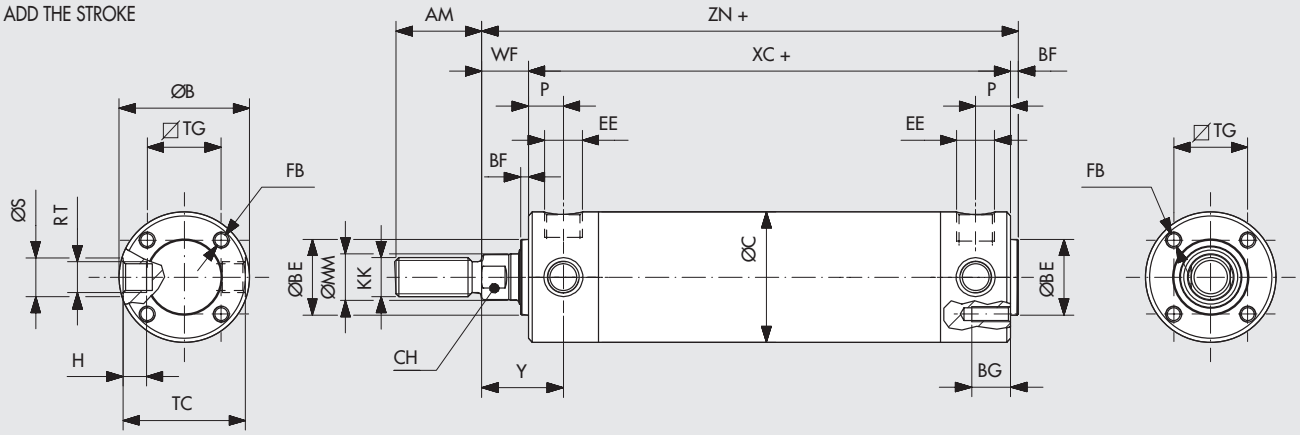
Cylinders with small axes compared to the "RNDC" series.
No threaded noses of the front and rear heads are provided.

TECHNICAL DATA

Operating pressure	bar	10
Temperature range	°C	–20 to +80
Lubrication		The cylinders are prelubricated
Available versions		Double-acting / Double-acting not magnetic
Standard strokes	mm	0 to 500
Supplying conditions		The cylinders are supplied with plastic cups on the threaded ports and protected by a plastic net On request the cylinders can be supplied with nuts muonted on piston rod, with labels printed with customer's logo and code number
Materials	Jacket	AISI 304
	Piston rod	AISI 303
	Head	Aluminium anodyzed
	Gaskets	NBR for piston
	Pistons	Aluminium
	Guide bushing	Technopolymer

DIMENSIONS

\+ = ADD THE STROKE



Ø	AM	ØBE	BG	H	ØB	EE	FB	KK	ØMM	P	RT	ØS	CH	TG	TC	BF	WF	ZN	Y	XC	ØC
32	22	19.5	10	6	33.5	G 1/8	M4	M10x1.25	12	9	M8x1	10	10	19	31.5	2	12	86	21	74	33.6
40	23	22.5	10	7.5	41.5	G 1/8	M5	M12x1.25	16	10	M10x1	12	13	23.5	39	2	12	92	22	80	41.6
50	23	28	12	10	52.3	G 1/4	M6	M12x1.25	16	13	M12x1.5	14	13	28.5	49	2	13	97	26	84	52.4
63	30	35	12	10	65	G 1/4	M8	M16x1.5	20	13	M12x1.5	14	17	35.5	62	2	13	99	26	86	65.4

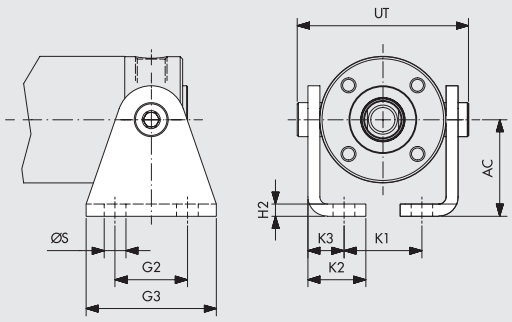
KEY TO CODES

CYL	W 1 1 6	0 3 2	0 0 5 0
	TYPE	**BORE**	**STROKE**
	W116 Non-magnetic double-acting **W117** Magnetic double-acting	032 040 050 063	From 0 to 500 mm

Please contact our sales offices for further information and quotation.

ACCESSORIES FOR ROUND CYLINDER SERIES E

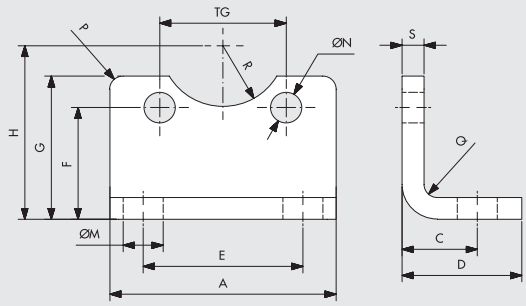
HINGE



Code	Ø	ØS	G2	G3	H2	K1	K2	K3	AC	UT
W0950320052	32	7	20	35	4	15.5	20	13	25	47
W0950400052	40	7	28	42	4	23.5	20	13	28	57
W0950500052	50	9	30	54	5	32.3	24	15	40	71
W0950630052	63	9	40	64	5	40.5	26.5	17.5	47	84

Note: the cod corresponds to 2 piece

FOOT FLANGE



Code	Ø	D	C	ØM	E	A	S	G	H	F	R	TG	ØN	P	Q
W0950320051	32	16	7.5	7	18	32	4	22	25	16	10	19	5	2	2
W0950400051	40	16	7	7	27	40	4	23	28	16	11.5	23.5	6	2	2
W0950500051	50	17	10	9	36	51	5	33	40	17	14	28.5	7	3	3
W0950630051	63	19	10	9	45	61	5	38	47	19	17.5	35.5	9	4	3

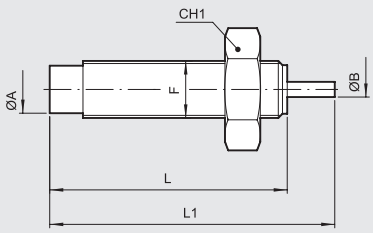
Note: Individually packed

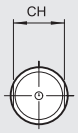
NOTES

SHOCK ABSORBERS

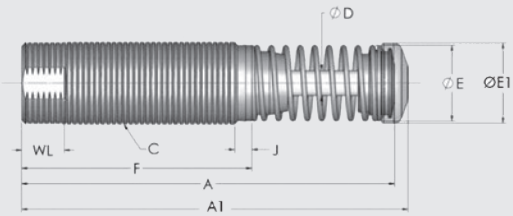
These shock absorbers are supplied on rodless cylinders, and on slides and on rotaring actuators. This description is a guide to the identification of the features for ordering spare parts.
Slides S9, S11 and S12 without a shock absorbers are designed to hold one at a later stage.

DIMENSIONS AND ORDERING CODES





ECO125



Code	Description	ØA	ØB	F	L	L1	CH	CH1	Stroke	Ek/ cycle	Ek/ hour	Me	S*	Use on standard products	Notes
0950004020	Shock abs. MC30EU M1-NB+nut M8X1	-	2.5	M8x1	40.9	52	-	10	8	3.5	5600	0.4-1.9	1		
W0950005300	Shock abs. MC30EU M2-NB+nut M8X1	-	2.5	M8x1	40.9	52	-	10	8	3.5	5600	1.8-5.4	2	S14 ø8	
0950004001	Shock abs. ECO8 MC2+nut M8X1	6.6	2.5	M8x1	40.9	47	-	12	6.4	3	5650	-	2	S11-S12 ø12	
0950004021	Shock abs. MC30EU M3-NB+nut M8X1	-	2.5	M8x1	40.9	52	-	10	8	3.5	5600	5-15	3		
0950004022	Shock abs. ECO10 MF1+nut M10X1	8.6	3	M10x1	46.5	54	-	13	7	6	12400	-	1		
0950004002	Shock abs. ECO10 MF2+nut M10X1	8.6	3	M10x1	46.5	54	-	13	7	6	12400	-	2	S11-S12 ø16-ø20	
W0950005301	Shock abs. RT-10+nut M10X1	8.6	3	M10x1	46.5	54	-	13	7	6	18000	5-15	3	S14 ø16 GD_K, ø12-ø16 DAPK1	
0950004009	Shock abs. ECO10-MF3+nut M10X1	8.6	3	M10x1	46.5	54	-	13	7	6	12400	-	3	R3 ø16 external shock absorbers	
0950004003	Shock abs. ECO15 MF1+nut M12X1	9.9	3	M12x1	62.2	72.4	11	15	10.4	10	28200	-	1	Rodless ø16, S11-S12 ø25	
0950004023	Shock abs. ECO15 MF2+nut M12X1	9.9	3	M12x1	62.2	72.4	11	15	10.4	10	28200	-	2		
0950004010	Shock abs. ECO15 MF4+nut M12X1	9.9	3	M12x1	62.2	72.4	11	15	10.4	10	28200	-	4	R3 ø20-ø22 external shock absorbers	
0950004012	Shock abs. MC150EUMH+nut M14X1.5	-	4.8	M14x1.5	69.1	86.6	-	17	12.5	20	34000	8.6-86	1	DAPK2	
0950004013	Shock abs. MC150EUMH2+nut M14X1.5	-	4.8	M14x1.5	69.1	86.6	-	17	12.5	20	34000	70-200	2	DAPK2	
0950004004	Shock abs. ECO25 MC2+nut M14X1.5	10.9	4	M14x1.5	81.3	97.5	12	17	16	26	34000	-	2	Rodless ø25, S11-S12 ø30, GD_K ø20-ø25	
W0950005303	Shock abs. SC190EU M3-NB+ nut M14X1.5	-	4	M14x1.5	87.7	110.1	12	17	16	25	34000	9-45	3	S14 ø25	Use on standard products
0950004008	Shock abs. ECO25-MC4+nut M14X1.5	10.9	4	M14x1.5	81.3	97.5	12	17	16	26	34000	-	4	R3 ø30	
0950004014	Shock abs. SC190EUM7+nut M14X1.5	-	4	M14x1.5	87.7	110.1	12	17	16	25	34000	136-1550	7	DAPK2	Do not use in pressurised vessels
0950004015	Shock abs. ECO S 25 MC2+nut M14X1.5	10.9	4	M14x1.5	69.5	82.7	12	17	12.7	20	34000	-	2	R3 ø25 and R3 ø25-ø30 external shock absorbers	
0950004025	Shock abs. ECO50 MC1+nut M20X1.5	16.3	4.8	M20x1.5	95.5	118.4	18	24	22	54	53700	-	1		
0950004005	Shock abs. ECO50 MC2+nut M20X1.5	16.3	4.8	M20x1.5	95.5	118.4	18	24	22	54	53700	-	2	Rodless ø32, R3 ø40 and R3 external shock absorbers, GD_K ø32	
0950004026	Shock abs. ECO50 MC3+nut M20X1.5	16.3	4.8	M20x1.5	95.5	118.4	18	24	22	54	53700	-	3		
0950004027	Shock abs. ECO100 MF1+nut M25X1.5	22	6.4	M25x1.5	128.8	102.6	23	32	25	90	70000	-	1		
0950004006	Shock abs. ECO100 MF2+nut M25X1.5	22	6.4	M25x1.5	128.8	102.6	23	32	25	90	70000	-	2	Rodless ø40-ø50, GD_K ø40	
0950004028	Shock abs. ECO100 MF3+nut M25X1.5	22	6.4	M25x1.5	128.8	102.6	23	32	25	90	70000	-	3		

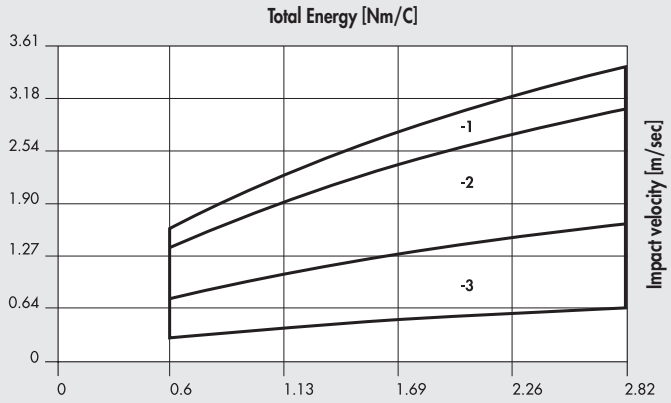
Code	Description	A	A1	C	D	E	E1	F	J	WF	WL	Me	S*	Use on standard products	Notes
0950004029	Shock abs. ECO125 MF1+nut M36X1.5	140.2	145.3	M36x1.5	9.5	29	30.5	87	25	160	91000	-	1		
0950004030	Shock abs. ECO125 MF2+nut M36X1.5	140.2	145.3	M36x1.5	9.5	29	30.5	87	25	160	91000	-	2		
0950004007	Shock abs. ECO125 MF3+nut M36X1.5	140.2	145.3	M36x1.5	9.5	29	30.5	87	25	160	91000	-	3	Rodless ø63	

S* = CUSHIONING (low = high speeds, low masses, SOFT shock absorber / high = low speeds, high masses, HARD shock absorber)

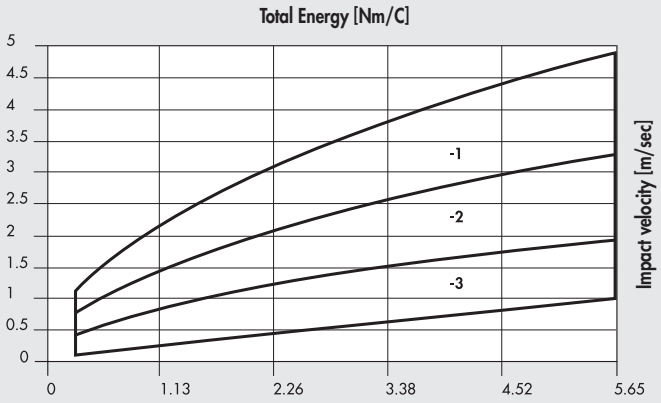
Please contact our sales offices for further information and quotation.

SHOCK ABSORBERS CHOICE DIAGRAMS

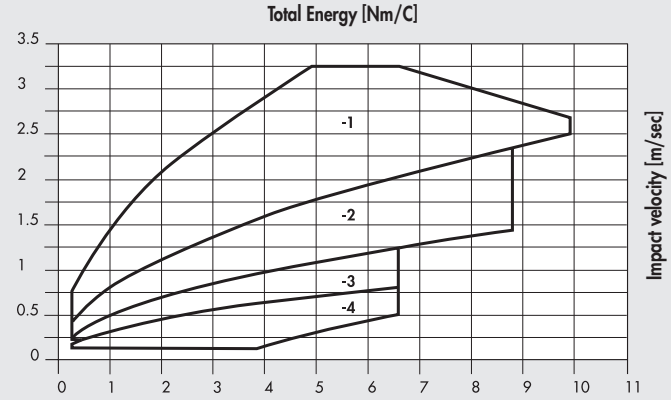
M8x1



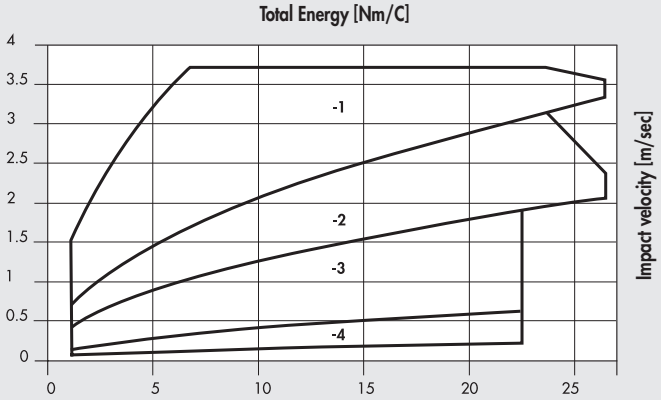
M10x1



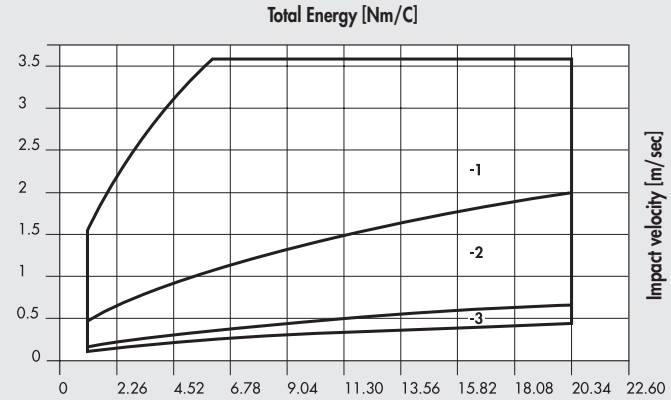
M12x1



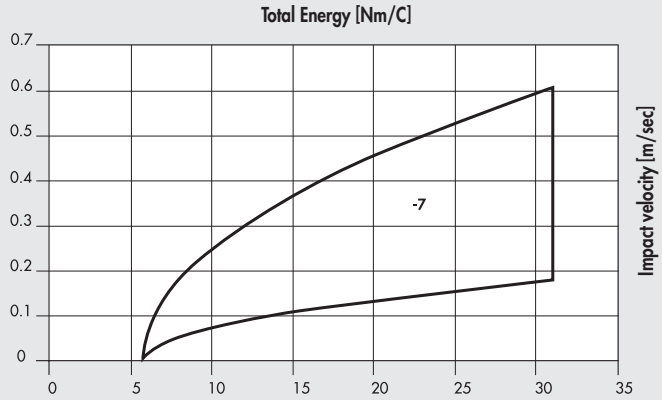
M14x1.5



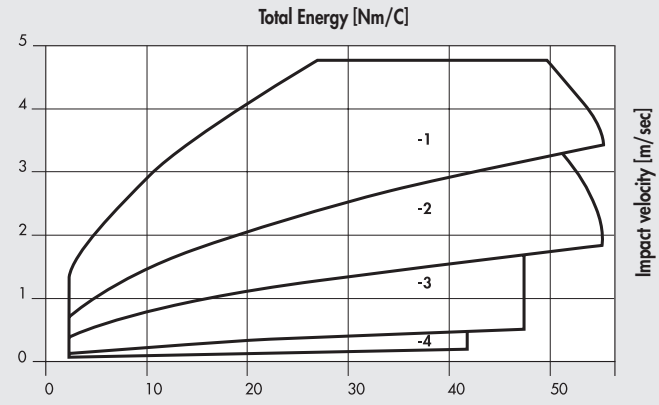
M14x1.5 L = 69.5



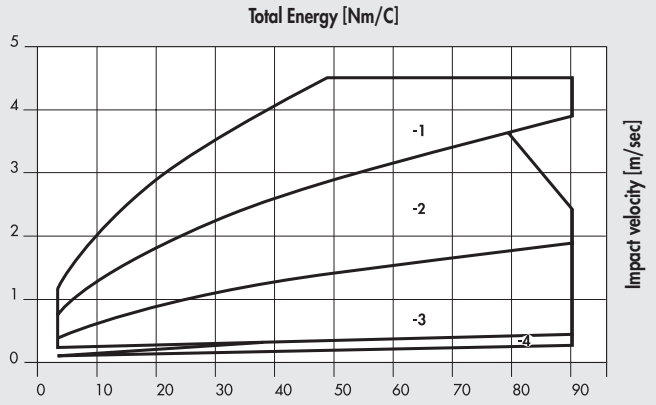
M14x1.5 S = 7



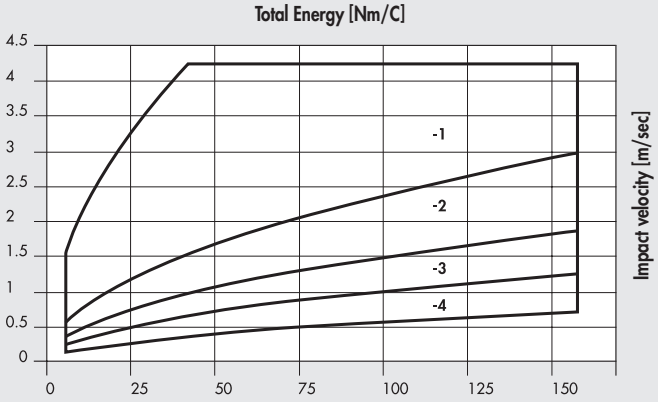
M20x1.5



M25x1.5



M36x1.5



NOTES

SPECIAL PISTON RODS

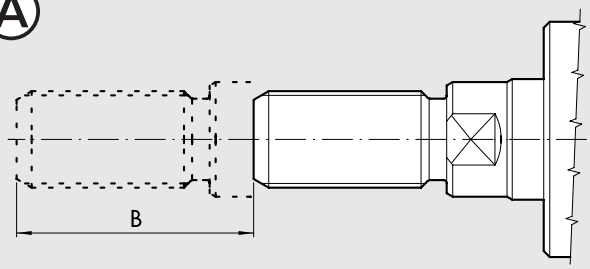
The main types of special piston rod have been classified in order to highlight the difference compared to standard piston rods. In general, all types of Metal Work cylinders can be supplied with special piston rods unless problems of dimensions or production process are encountered.
Below is a list of cylinders available with a special piston rod:

- ISO 6432 mini-cylinder, series STD and series TP
- ISO 15552 cylinder series STD, type A, series 3, with "Combi" piston rod gasket and TWO-FLAT
- ISO 15552 cylinder Ø160-200
- ISO 21287 cylinder series LINER
- Compact cylinder series CMPC, series CMPC TWO-FLAT
- Round cylinder series RNDC
- Short-stroke cylinder series SSCY

N.B.: Taking the order codes specified by the customer, Metal Work will generate its own special product code each time.

PISTON ROD WITH ENHANCED PROJECTION

TYPE Ⓐ

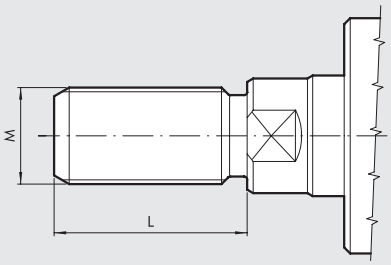


Sample configuration:
Cil 1210400100CP extended piston rod type A: B = 50

Price: please contact our sales offices
Delivery: 3 working days
Minminum quantity: 1 piece

PISTON ROD WITH SPECIAL THREAD

TYPE Ⓑ



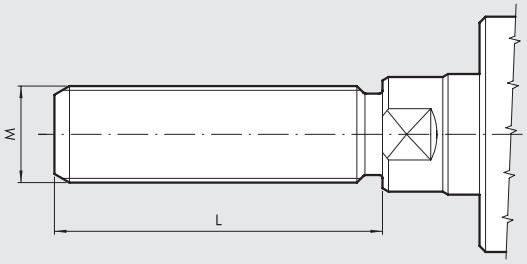
- The nut for the piston rod in not included
- Applies to L ≤ 3 x M
- Applies to metric threads
- The thread diameter must be less than the piston rod diameter

Sample configuration:
Cil 1210400100CP special thread type B: M = M10 x 1.25 L = 30

Price: please contact our sales offices
Delivery: 3 working days
Minimum quantity: 1 piece

PISTON ROD WITH EXTRA-LONG THREAD

TYPE Ⓒ



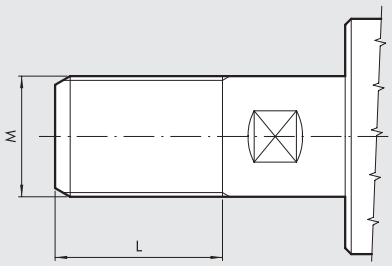
- Not included in the nut of the piston rod
- Applies to L > 3 x M
- Applies to metric threads
- The thread diameter must be less than the piston rod diameter

Sample configuration:
Cil 1210400100CP special thread type C: M = 12 x 1.25 L = 50

Price: please contact our sales offices
Delivery: 5 working days
Minimum quantity: 1 piece

PISTON ROD WITH THREAD WITHOUT UNDERCUT

TYPE D



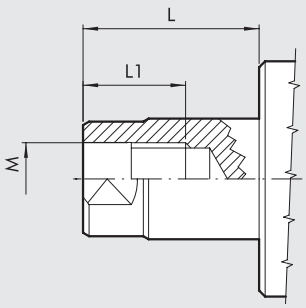
- The nut of the piston rod is only included if the thread is standard for that cylinder.
- Applies to L ≤ 3 x M
- Applies to metric threads

Sample configuration:
Cil 1210400100CP thread without undercut type D: M = M12 x 1.25 L = 24

Price: please contact our sales offices
Delivery: 3 working days
Minimum quantity: 1 piece

PISTON ROD WITH FEMALE THREAD

TYPE E



- L1 ≤ 4 times M
- Applies to metric threads

The standard L1 value for Metal Work is:

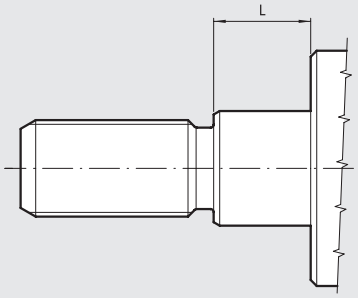
M	M3	M4	M5	M6	M8	M10	M12
L1	8	10	12	14	16	20	24

Sample configuration:
Cil 1210400100CP female thread type E: M = M8, L1 = 16, L = 10

Price: please contact our sales offices
Delivery: 3 working days
Minimum quantity: 1 piece

PISTON ROD WITHOUT KEY PLANE

TYPE F

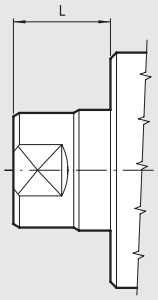


Sample configuration:
Cil 1210400100CP without key plain type F: L = 5

Price: please contact our sales offices
Delivery: 3 working days
Minimum quantity: 1 piece

UNTHREADED PISTON ROD

TYPE G



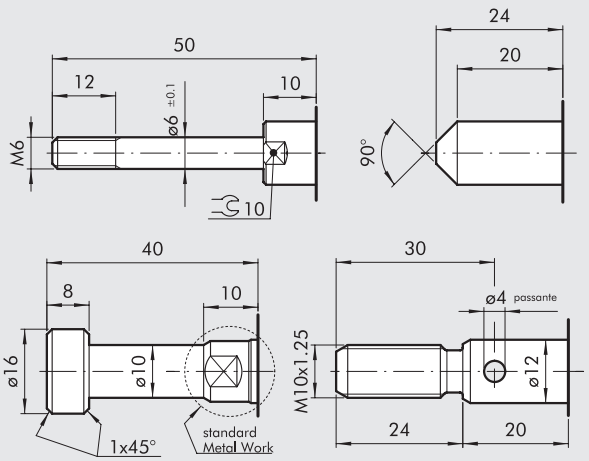
Sample configuration:
Cil 1210400100CP without thread type G: L = 10

Price: please contact our sales offices
Delivery: 3 working days
Minimum quantity: 1 piece

Please contact our sales offices for further information and quotation.

SPECIAL PISTON RODS TO DRAWING

TYPE
(S)
EXAMPLES



- A drawing with values, and work tolerances if necessary, must be provided.

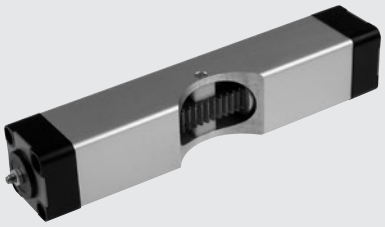
A few examples are shown here.

Price / Delivery / Minimum quantity: please contact our sales offices

NOTES

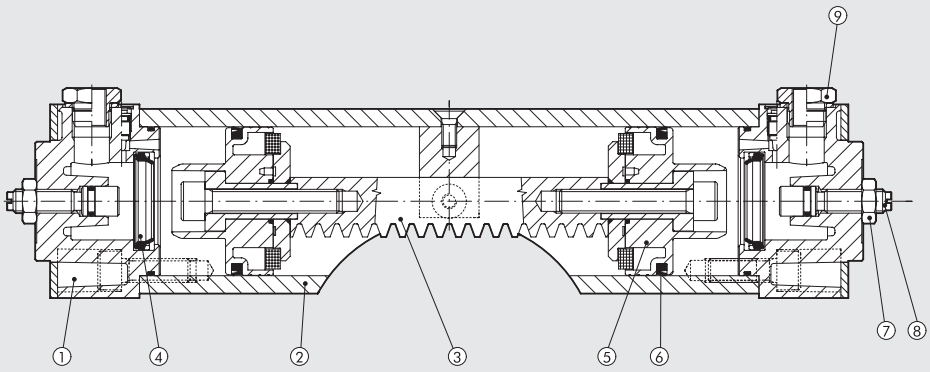
ISO 15552 CYLINDER ROTARY

Fitted with a visible rack for coupling to a pinion provided by the customer.
The cylinder diameter is 50 mm.
The total stroke is 70 mm with possible end-of-stroke adjustment.
The rack has module m = 2 . Retracting sensors can be fixed to the cylinder liner.



COMPONENTS

① HEAD: made of die-cast aluminium
② JACKET: made of anodized and calibrated aluminium sections
③ RACK: UNI 6588 made of steel
④ CUSHIONING GASKET: polyurethane
⑤ HALF-PISTON: self-lubricating technopolymer with built-in cushioning ogives
⑥ PISTON ROD GASKET: made of NBR
⑦ LOCKING NUT: made of steel
⑧ STROKE ADJUSTING SCREW: made of AISI 303 steel
⑨ A4/Z 1/8" ADAPTOR: made of nickel-plated brass



ORDERING CODES

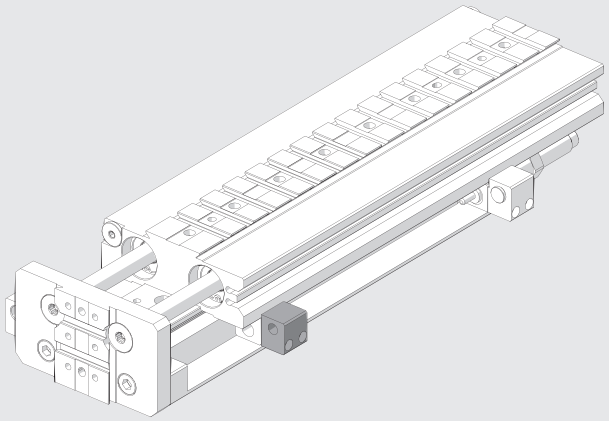
128Z50A070CN Cylinder Ø 50 stroke 70 rotary

NOTES

Please contact our sales offices for further information and quotation.

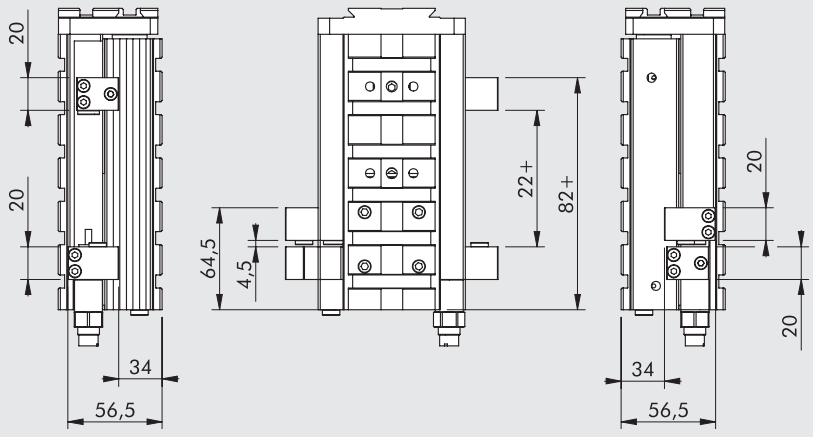
COMPACT PRECISION SLIDE SERIES S14K, WITH INDUCTIVE SENSOR

Flat, compact precision slides with two cylinders.
The fixed and moving parts are moved by a sturdy ball recirculation carriage running on hardened guides. Elastic mechanical stop or shock absorbers are used to achieve adjustable stop at the end of the stroke.
A three-position version is available allowing an intermediate stop.
Slots are provided in the body for end-of-stroke sensors.
Provision for housing two M8 inductive sensors detecting the slide (out-in) limit switches is available for size 25 only. The sensors are screwed onto the fixed body by means of two sensor-holding blocks, while two more blocks with a metal stop are fixed to the mobile part; the dimensions at the sides are slightly larger.

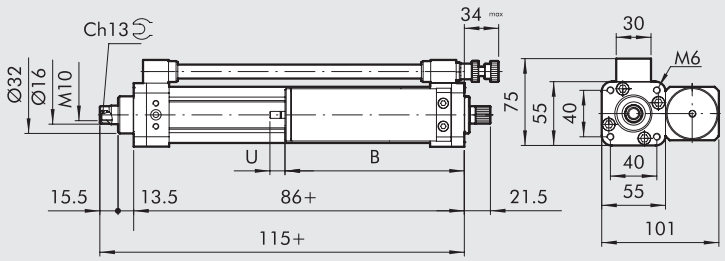


TECHNICAL DATA		S14K-25
Operating pressure	bar	2 to 8
	psi	29 to 116
Temperature range	°C	–10 to +80
Fluid		Dry or lubricated 10 µm filtered compressed air. Lubrication, if used, must be continuous
Maximum speed	m/s	0.8
Versions		With shock absorbers – With elastic mechanical stop
Bore		2 x Ø 25
Piston rod diameter	mm	12
Strokes	mm	10, 20, 30, 40, 50, 80, 100, 125, 150, 200
Stroke reduction by adjusting the decelerators retraction	mm	30 extension / 30 retraction
Stroke reduction by adjusting the buffers retraction	mm	15 extension / 15 retraction
Maximum impact energy with hydraulic decelerators	J	20
Maximum impact energy with buffers	J	0.5
Sensors		Sensors Magnetic Hall or Reed or M8 inductive proximity
Theoretical thrust force at 6 bar	N	589
Theoretical pull force at 6 bar	N	453
Repeatability in stop positions	mm	0.02 (with shock absorbers); 0.02 (with buffers and 5 bar minimum pressure)
Monitoring position		Any
Notes		Lubrication recommended: every 2 million cycles for strokes below 100 mm and 1 million for longer strokes (grease code 9910506)

DIMENSIONS



HYDRAULIC BRAKE SERIES BRK Ø 40 mm WITH FIXING HOLES TO DISTANCE 40 mm



\+ = ADD THE STROKE

The drawing is illustrative of a type of brakes.
The differences compared to the standard are:
- Length 86 + (instead of 84 +)
- Length 115 + (instead of 114 +)
- Length 13.5 (instead of 14.5)
- Length 21.5 (instead of 22.5)
- Length 34 max (instead of 35 max)

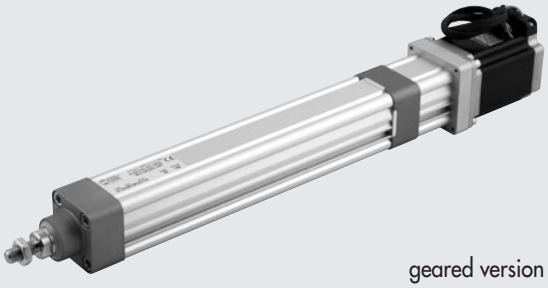
NOTES

Please contact our sales offices for further information and quotation.

ELECTRIC CYLINDER SERIES ELEKTRO ISO 15552 WITH ACME SCREW (ACME)

An electric cylinder with a connection interface in accordance with ISO 15552.
The piston rod is moved forwards by a lead screw and nut with a trapezoidal outline (Acme): this is an irreversible system that can be used to move the loads vertically. If the motor power supply fails, the load is supported by the screw. The piston has a gauged driving band that minimises the clearance with the jacket (the screw is made of steel while the nut is in brass).
The cylinder can be equipped with a built-in non-rotating system featuring two opposing slides that run in separate longitudinal slots in the barrel. The piston comes with magnets and the barrel has longitudinal slots for housing sensors. The piston rod has increased outside diameter and thickness to make it extra rigid and more resistant to radial and peak loads.
A system for greasing the screws is included. Numerous standard accessories for pneumatic cylinders, including intermediate hinge, can be used for mounting the cylinder.
The motor can be selected from an optimised range.
There is a version for in-line assembly, where the drive shaft is jointed directly onto the screw. There is also a geared motor version, where transmission is provided by pulleys and a cog belt standard 1:1.
Suitable motor drives are provided.
Special adaptor flanges and joints can be provided if the customer wishes to use a particular make of motor.
It is advisable to lubricate the cylinder every 50 km or at least once a year (preferably with MOBILITH SHC 460 grease).

in-line version



geared version

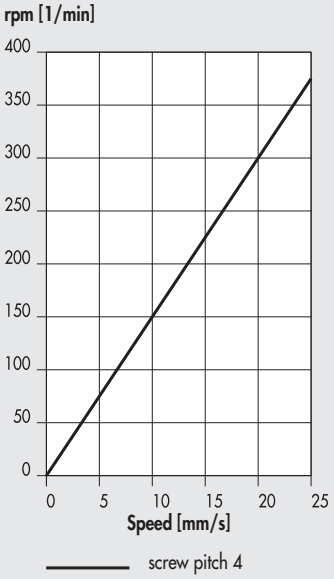
TECHNICAL DATA			Ø 32	Ø 50	Ø 63	Ø 80
Piston rod thread			M10x1.25	M16x1.5	M16x1.5	M20x1.5
Temperature range	WITH MOTOR	°C	see single motor data sheet			
	ONLY MECHANICS	°C	from -10 to +50			
Electrical protection rating with	STEPPING motors		IP40 or IP55 (see key to codes)			
Maximum stroke		mm	500	1500		
Positioning repeatability		mm	± 0.1			
Positioning accuracy		mm	± 0.5 **			
Overall radial oscillation of the piston rod (without load) for 100 mm of stroke		mm	0.4			
Versions			With or without piston rod non-rotating			
Uncontrolled impact at the end of stroke			NOT ALLOWED (it provides an extra-stroke minimum 5 mm)			
Sensor magnet			YES			
Maximum angle of twist of the piston rod for non-rotating version			0°45'			
Work position			Any			
Duty cycle			20%			

** indicative average data that gets influenced by various factors such as the stroke, the type of motor, the cylinder version, etc ...

MECHANICAL FEATURES		Ø 32	Ø 50	Ø 63	Ø 80
Screw pitch (p)	mm	4			
Screw diameter	mm	14	16	20	30
Maximum liftable load	kg	100	200	400	800
	N	1000	2000	4000	8000
Maximum speed (V_{max})	mm/s	25			

PISTON ROD SPEED AS A FUNCTION OF rpm

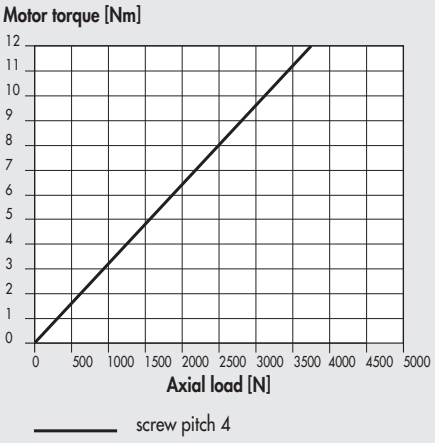
The graph shows the direct correspondence between the number of turns (1/min) and the translation speed of the stem (mm/s).
In any case all the other conditions and limitations of each specific cylinder will have to be complied.



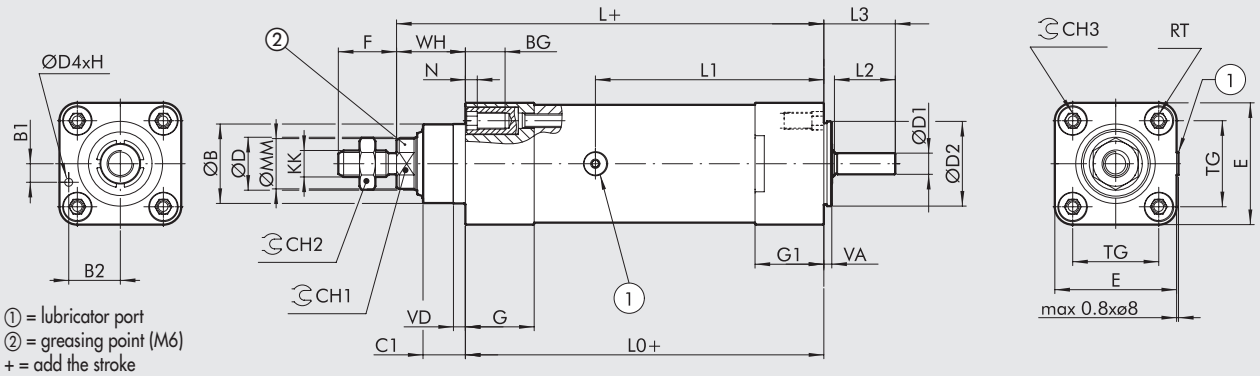
DRIVE TORQUE AS A FUNCTION OF THE AXIAL LOAD APPLIED TO THE PISTON ROD

The friction generated in the mechanical system is taken into account.

Ø 32, Ø 50, Ø 63, Ø 80



CYLINDER DIMENSIONS (WITHOUT MOTOR)



① = lubricator port
② = greasing point (M6)
+ = add the stroke

Ø	ØB (d11)	B1	B2	BG	C1	CH1	CH2	CH3	ØD (f7)	ØD1 (h7)	ØD2	ØD4 (h7)	E	F	G	G1	H	KK	L	L0
32	30	7	19.5	14.5	16	17	17	6	20	8	32	3	46	22	26	26	9	M10x1.25	168.4	134
50	40	7	28	17.5	25	21	24	8	25	9	50	3	64.5	32	30	30	9	M16x1.5	201.4	157
63	45	9	34.5	17.5	25	26	24	8	30	14	63	3	75.5	32	32	46	9	M16x1.5	227.4	183
80	60	15	42.5	21	31	40	30	10	45	19	80	3	93	40	38	67	9	M20x1.5	331.4	248

Ø	L1	L2	L3	ØMM	N	RT	TG	VA	VD	WH
32	86.3	23	27	19	4.5	M6	32.5	3	4.5	34.4
50	100.8	24	28.4	24	5.5	M8	46.5	5.5	5.5	44.4
63	122.3	34	39.5	29.5	5.5	M8	56.5	5.5	6.5	44.4
80	181.1	41.7	47.2	44	5	M10	72	5.5	17.5	53.4

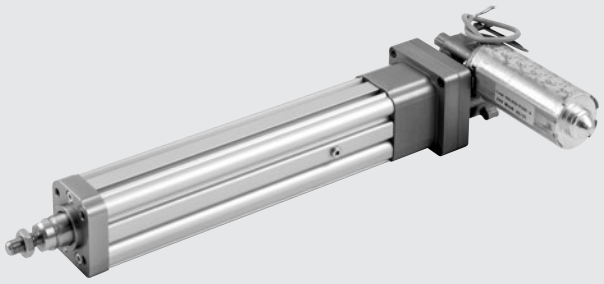
KEY TO CODES CYLINDER (WITHOUT MOTOR)

CYL	37	1	V	32	0100	1	5
	TYPE			BORE	STROKE	SCREW PITCH	VERSION
	37 Electric actuators	**1** ISO 15552 electric cylinder	**V** Acme screw	32 50 63 80		**1** Screw pitch 4	**5** Without antirotation IP40 **6** With antirotation IP40 **7** Without antirotation IP55/IP65 **8** With antirotation IP55/IP65

Please contact our sales offices for further information and quotation.

ELECTRIC CYLINDER SERIES ELEKTRO ISO 15552 EK WITH DIRECT CURRENT MOTOR

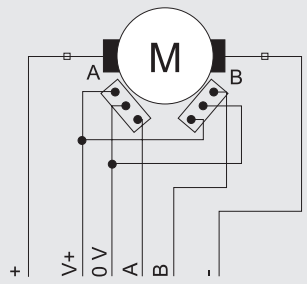
Electric cylinders in the ELEKTRO ISO 15552 EK series (with ISO 15552 interface) can also be supplied with a DC motor for simplified control of the movement and reduced costs in terms of product and management system at the same time.
For the new line with DC motors, the forward movement of the piston rod can be obtained either with a trapezoidal screw and nut or a screw.
The cylinder incorporates an anti-rotation system obtained from two engineering polymer pads that run in the special slots inside the cylinder liner. On request, a version without anti-rotation is also available.
The piston comes complete with a magnet and the liner has slots for mounting magnetic sensors.
A system for greasing the screw/nut is included.
The motor supplied is ready equipped with an incorporated gearbox, it is axially connected to the cylinder and includes a pair of "Hall" sensors for possible position control.
Can be coupled with 37D3112000 drive.



TECHNICAL DATA		Lead screw	Trapezoidal screw
Screw pitch	mm	5	4
Screw diameter	mm	12	14
Piston rod thread		Male, M10x1.25	
Ambient temperature	°C	0 ÷ 40	
Degree of protection with motor mounted		IP40	
Minimum stroke	mm	At least 2 times the screw pitch	
Maximum stroke	mm	500	
Versions		In line, with or without anti-rotation of the piston rod	
Uncontrolled impact at the end of stroke		NOT ALLOWED (it provides an extra-stroke minimum 5 mm)	
Sensor magnet		YES	
Work position		Any	
Duty Cycle		20% **	
Motor		Direct current DC	
Supply voltage	VDC	24	
Input power with MAX torque	W	48	
Input current with MAX torque	A	2	
Max axial load	N	See graphic on next page	
Maximum speed	mm/s	See graphic on next page	
Maximum load in vertical position and motor powered off (reversibility)	N	100	Irreversible (max recommended 1000)
Interference suppression		LC circuit	
Direction of rotation		According to polarity	
Encoder		Two-channel, three motor pulses/revolution per channel, NPN.	
Resolution	mm/imp.	0.085	0.068

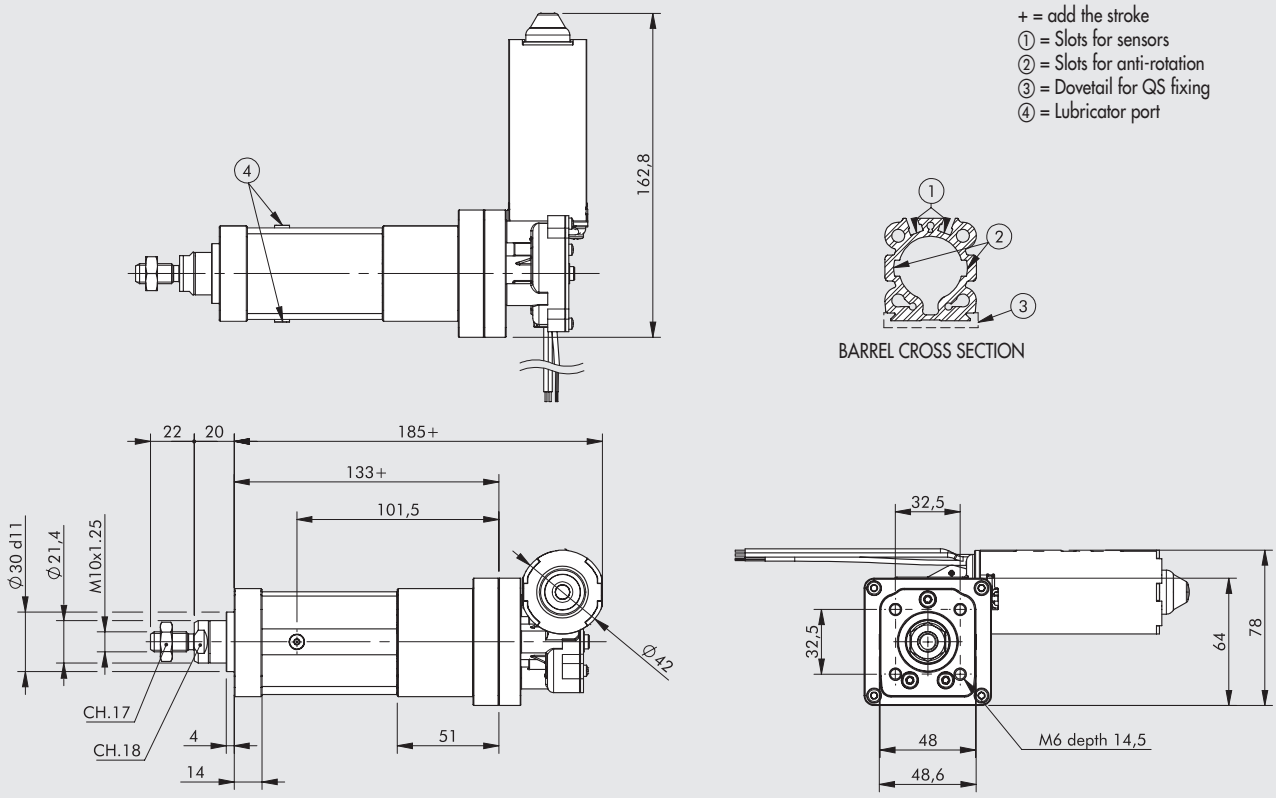
** maximum motor temperature, measured on the outer surface, must NOT exceed 70°C

CYLINDER CONNECTION AND WIRING DIAGRAM



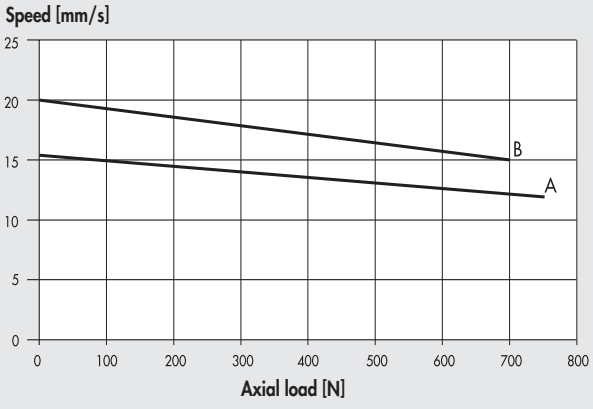
Function	Corresponding wire colour
Motor power supply +	Red
Motor power supply -	Blue
ENCODER Power supply r V+ 5 ÷ 20 VDC	Brown
Encoder 0 V supply	White
Encoder channel A (NPN)	Green
Encoder channel B (NPN)	Yellow

DIMENSIONS



AXIAL LOAD CURVES AS A FUNCTION OF SPEED

Ø32 with gearmotor CC 1/19.67 24VDC / max 2A



A = with trapezoidal screw 14x4
B = with lead screw 12x5

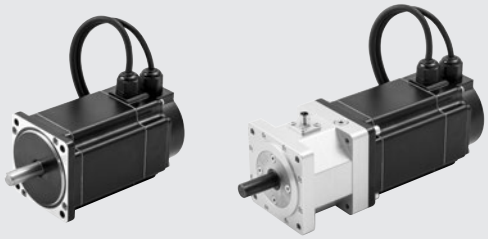
ACCESSORIES

The accessories of the ELEKTRO ISO 15552 EK series electric cylinders can be used, with the exception of the rear clamps.

STEPPING MOTORS WITH IP65 ENCODER (WITH OR WITHOUT BRAKE)

METAL WORK PNEUMATIC

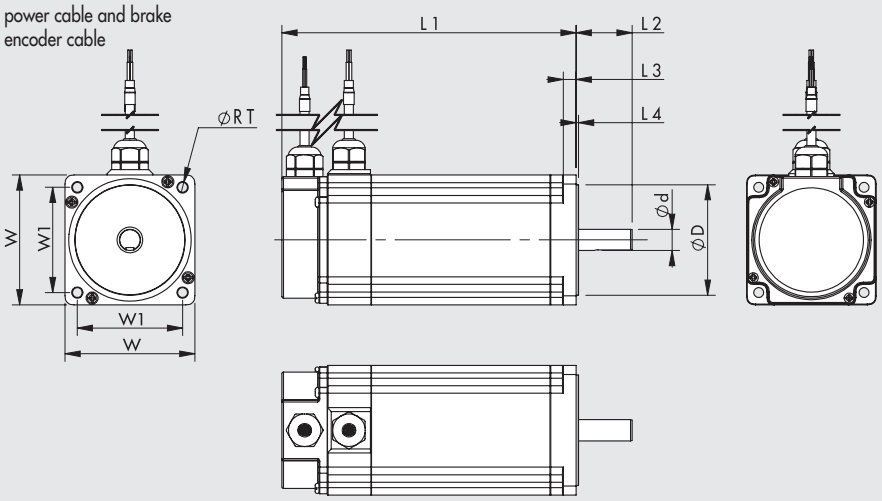
For the ELEKTRO series actuators, Metal Work offers a range of stepping motors other than the standard one.
In case of interest, you can send a new specific request of actuator sizing that will be examined by our engineers given that such parameters as performance, features and dimensions may vary.



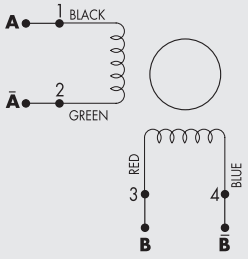
TECHNICAL DATA		MOTOR 37M8230002	MOTOR 37M8470002	MOTOR 37M8470003	MOTOR 37M3230002	MOTOR 37M3470002	MOTOR 37M3470003
Motor type		STEPPING + ENCODER			STEPPING with BRAKE + ENCODER		
Nominal torque	Nm	**2.3**	**7.4**	**9.2**	**2.3**	**7.4**	**9.2**
Coupling flange		**NEMA 24**	**NEMA 34**	**NEMA 34**	**NEMA 24**	**NEMA 34**	**NEMA 34**
Base step angle		1.8°±0.09°			1.8°±0.09°		
Bipolar current	A	5	6	6	5	6	6
Resistance	Ω	0.45	0.54	0.72	0.45	0.54	0.72
Inductance	mH	1.8	5	7.3	1.8	5	7.3
Bipolar holding torque	Nm	3	8.5	12	3	8.5	12
Rotor inertia	kgmm²	69	360	540	69	360	540
Mass	kg	1.4	3.6	5	1.4	3.6	5
Temperature range	°C	from -10 to +50					
Degree of protection		IP65					
Motor encoder		Incremental					
Type of output circuit		Differential					
Output signal channels		2 channels (NO zero mark)					
Resolution	positions per rev	1000					
Encoder supply voltage	VDC	5					
BRAKE							
Braking torque	Nm		-		2	9	9
Supply voltage	VDC		-		24	24	24
Power consumption	W		-		11	18	18
Connecting time	ms		-		6	7	7
Delay time	ms		-		2	2	2
Connecting time	ms		-		25	40	40

DIMENSIONS OF VERSION WITHOUT BRAKE

Motors are supplied with 1-metre long ready-wired cables, with free wires to the drive.
1 = access for power cable and brake
2 = access for encoder cable



WIRING DIAGRAM



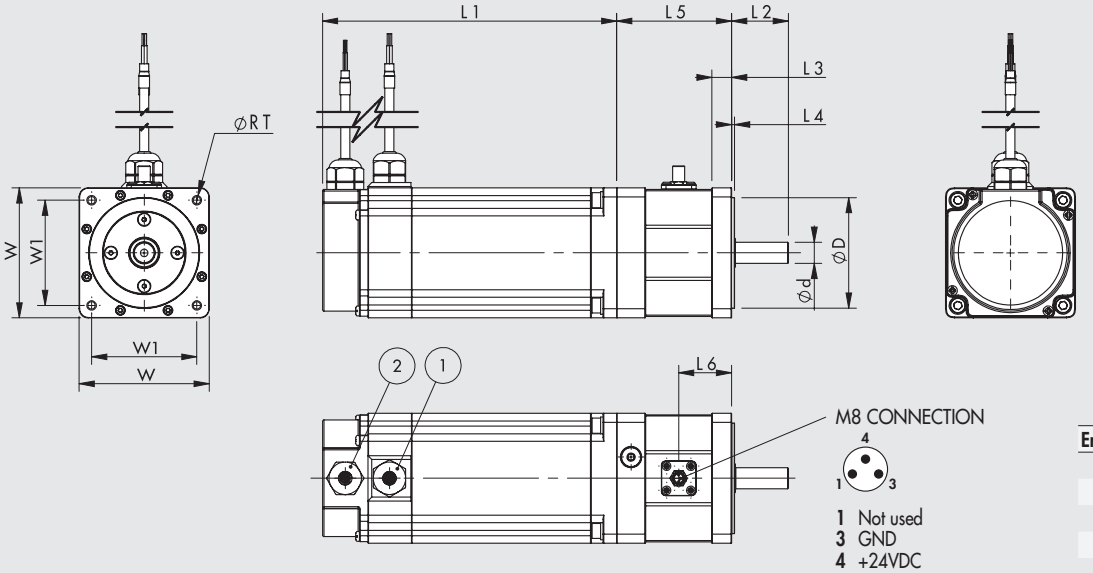
Encoder	Color	Function
1	Black	GND
2	Red	VCC
3	Blue/White	EA–
4	Blue	EA+
5	Orange/White	EB–
6	Orange	EB+

Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.013	øD ±0.05	L1 ±1	L2 ±1	L3	L4 ±0.2	RT	W	W1
STEPPING + ENCODER	**37M8230002**	2.3	NEMA 24	10	36	107.2	21	5	1.6	5	60	50
	37M8470002	7.4	NEMA 34	14	73	156.5	37	9	1.6	6.5	85.85	69.58
	37M8470003	9.2	NEMA 34	14	73	194.5	37	9	1.6	6.5	85.85	69.58

Please contact our sales offices for further information and quotation.

DIMENSION OF VERSION WITH BRAKE

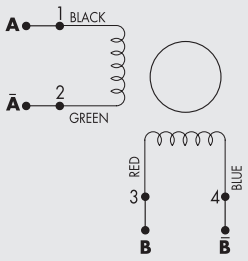
Motors are supplied with 1-metre long ready-wired cables, with free wires to the drive.
1 = access for power cable and brake
2 = access for encoder cable



M8 CONNECTION

1 Not used
3 GND
4 +24VDC

WIRING DIAGRAM



Encoder	Color	Function
1	Black	GND
2	Red	VCC
3	Blue/White	EA–
4	Blue	EA+
5	Orange/White	EB–
6	Orange	EB+

Motor type	Motor code	Motor torque [Nm]	Braking torque [Nm]	ød 0/-0.013	øD ±0.25	L1 ±1	L2 ±1	L3	L4 ±0.2	L5	L6	RT	W	W1
STEPPING	**37M3230002**	2.3	2	8	38.1	107.2	21	15	1.6	65.8	32.9	4.25	60	47.16
+ ENCODER	**37M3470002**	7.4	9	14	73	156.5	37.5	13	1.6	76	35	6.25	86	69.58
+ BRAKE	**37M3470003**	9.2	9	14	73	194.5	37.5	13	1.6	76	35	6.25	86	69.58

STANDARD AND ALTERNATIVE SYNOPTIC

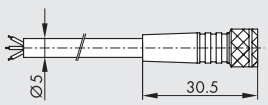
Motor type	Standard code	Alternative (with encoder)
STEPPING	**37M1470000**	**37M8470003**
	37M1220000	**37M8230002**

Motor type	Standard code	Alternative
STEPPING	**37M8220000**	**37M8230002**
+ ENCODER	**37M8230000**	**37M8230002**
	37M8470000	**37M8470003**

Motor type	Standard code	Alternative
STEPPING	**37M3220000**	**37M3230002**
+ ENCODER	**37M3230000**	**37M3230002**
+ BRAKE	**37M3430000**	**37M3470002**
	37M3460000	**37M3470002**
	37M3450000	**37M3470002**
	37M3470000	**37M3470003**

ACCESSORIES FOR BRAKE

CABLE WITH STRAIGHT CONNECTOR

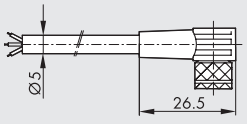


Pin	Cable color
1	Brown
3	Blue
4	Black

Code	Description
02400A0100	M8 female 3 PIN HIGH FLEX CL6 connector with cable L = 1 m
02400A0250	M8 female 3 PIN HIGH FLEX CL6 connector with cable L = 2.5 m
02400A0500	M8 female 3 PIN HIGH FLEX CL6 connector with cable L = 5 m
02400A1000	M8 female 3 PIN HIGH FLEX CL6 connector with cable L = 10 m

Note: Very flexible cables, class 6 according to IEC 60228

CABLE WITH 90° CONNECTOR



Pin	Cable color
1	Brown
3	Blue
4	Black

Code	Description
02400B0100	M8 female 3 PIN 90° HIGH FLEX CL6 connector with cable L = 1 m
02400B0250	M8 female 3 PIN 90° HIGH FLEX CL6 connector with cable L = 2.5 m
02400B0500	M8 female 3 PIN 90° HIGH FLEX CL6 connector with cable L = 5 m
02400B1000	M8 female 3 PIN 90° HIGH FLEX CL6 connector with cable L = 10 m

Note: Very flexible cables, class 6 according to IEC 60228

FIELDBUS DRIVES FOR STEPPING MOTORS

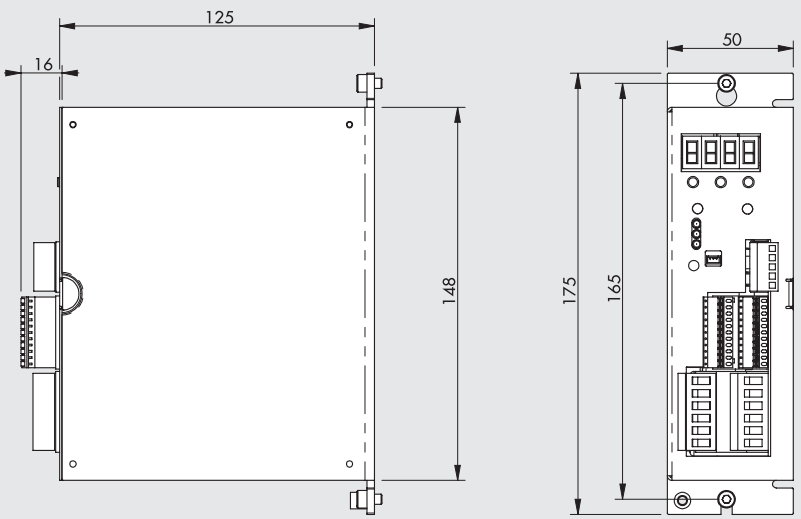
This range comprises mini-step bipolar chopper drives of up to 1/128 steps, with a fieldbus interface for driving STEPPING motors of all sizes, with a rated current of up to 12A.
The fieldbuses available are Profinet IO, EtherCAT, Ethernet/IP.
These drives consist of a board housed in a metal box, and they are fitted with removable screw connectors with separate logic and power.
Each drive:

- features digital and analogue I/O;
- can control differential and single-ended encoders;
- can control the parking brake and perform reset procedures by means of limit switches;
- can handle power supply voltages of up to 125VDC and up to 90VAC;
- is space saving;
- offers high versatility in use;
- provides automatic and configurable power reductions.

DRIVE TECHNICAL DATA

Drive code		**37D1442001**	**37D1442002**	**37D1442003**	**37D1642000**	**37D1642004**	**37D1642005**
Model		HT721			HT 741		
STEPPING motor drive		Metal box					
Dimensions	mm	170 x 139 x 49					
Connectors		Screw type					
Onboard power supply		NO					
Control (fieldbus)		Profinet IO	EtherCAT	Ethernet/IP	Profinet IO	EtherCAT	Ethernet/IP
Operating voltage range (power)	VDC	24 - 90			24 - 140		
	VAC	18 - 60			18 - 100		
Operating voltage range (logic)	VDC	24					
Current range	A	1 - 7			1 - 12		
Pulses per rev values selected by dip-switch	pulse/rev	200, 400, 800, 1000, 1600, 3200, 6400, 12800, 25600					
Encoder control		Differential 5V, Single Ended 12 - 24V					
Automatic current reduction with motor off	%	YES (0, 25, 50, 100%)					
Type of inputs/analogue outputs	VDC	0 - 10					
Type of inputs/digital outputs		PNP - NPN configurable opto-insulated					
Protections		Overtemperature, overvoltage, undervoltage, short-circuit protection at digital outputs					
Weight	g	720					

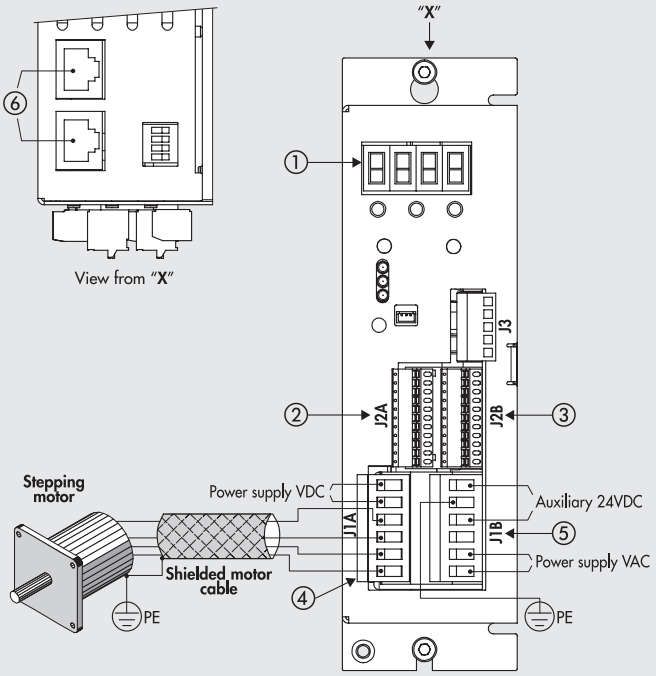
OVERALL DIMENSIONS



WIRING DIAGRAM FOR STEPPING MOTOR DRIVES

① 4-DIGIT DISPLAY and PROGRAMMING KEYS: to set some system operating parameters.
② ENCODER- DIGITAL INPUT CONNECTORS: push-pull, line-driver and open-collector encoders can be connected.
There are 3 PNP and NPN user configurable digital inputs.
③ DIGITAL OUTPUT TO ANALOG INPUT CONNECTOR: there are 3 user configurable digital outputs and three 0-10V analogue inputs.
④ DC MOTOR PHASE AND POWER SUPPLY STAGE CONNECTOR.
⑤ AC POWER SUPPLY STAGE AND LOGIC STAGE CONNECTOR.
⑥ Profinet IO, EtherCAT, EtherNet/IP FIELDBUS CONNECTION

Log on to www.metalwork.it to view the instruction manual.



NOTES

Please contact our sales offices for further information and quotation.

METAL WORK PNEUMATIC

NOTES