

## Cylinders Series 40



**Bore  $\varnothing$ : 32, 40, 50, 63, 80, 100, 125 DISCONTINUED FROM PRODUCTION**

See Series 60 for Interchange

Double-acting (magnetic) (DIN/ISO 6431)

Bore  $\varnothing$ : 160, 200 mm double acting cushioned, adjustable

[6 1/4", 7 7/8" inch approximations]

Incorporated flow control valve option [BSPP ports only]

The Series 40 cylinders with diameter 160 and 200 mm have been designed so as to comply with the dimensions laid down in the DIN/ISO 6431 standards.

A permanent magnet is mounted on the piston in these cylinders.

The position of the cylinder is obtained by the magnetic proximity switches mounted on the cylinders. This cylinder series is normally equipped with adjustable end-stroke cushioning. Moreover, these cylinders are equipped with a mechanical cushioning in order to make the impact of the piston less noisy as it reaches the end of the stroke. In both the front and rear end caps it is possible to obtain a flow control valve which allows the velocity of the cylinder to be adjusted throughout the stroke (up to  $\varnothing$  100). Whenever the maximum velocities

used are greater than the capacity of the incorporated regulator, the unidirectional valve located at the entrance port can be removed by means of a screwdriver.

The cylinder series can also accommodate stroke lengths up to 1000 mm for bore sizes shown in the table, thanks to the antifriction guide on the piston and the bronze bush that guides the rod. When choosing the magnetic switches you should refer to the section 1.84 - 1.96 in the catalog.

**Note:** The mounting brackets are supplied separately. For rod accessories, see page 1.22 - 1.23. The brackets and sensors have to be ordered separately from cylinders.



- ▶ DIN/ISO 6431
- ▶ VDMA 24562
- ▶ Rolled stainless steel rod
- ▶ Adjustable cushioning



**GENERAL DATA**

Type of construction	With tie-rods
Operation	double-acting
Materials	Aluminum end-blocks other parts see coding
Type of mounting	With tie-rods, front flange, rear flange, feet, center trunnion, front and rear trunnion, swivel combination
Bore	ø 160, 200 mm
Stroke	Standard (see table) mm and inch approximations
Ports	160 = 1/2"; 200 = 3/4" (NPTF ports see code below)
Assembly position	any position
Operating temperature	0°C – 80°C (with dry air –20°C), 32°F – 175°F (Dry Air –4°F)
Special designs	For applications in damp, dusty or aggressive environments. For NPTF cylinder bores see code key below.

\*For special design requests, contact factory for exact code

**PNEUMATIC DATA**

Operating pressure	Min. pressure: 1 bar (14.5 psi) Max. pressure: 10 bar (145 psi)
Speed	Minimum = 10 mm/sec (no load) Maximum ≤ 1000 mm/sec (no load)
Fluid	Clean air, with or without lubrication

**CYLINDER CODING**

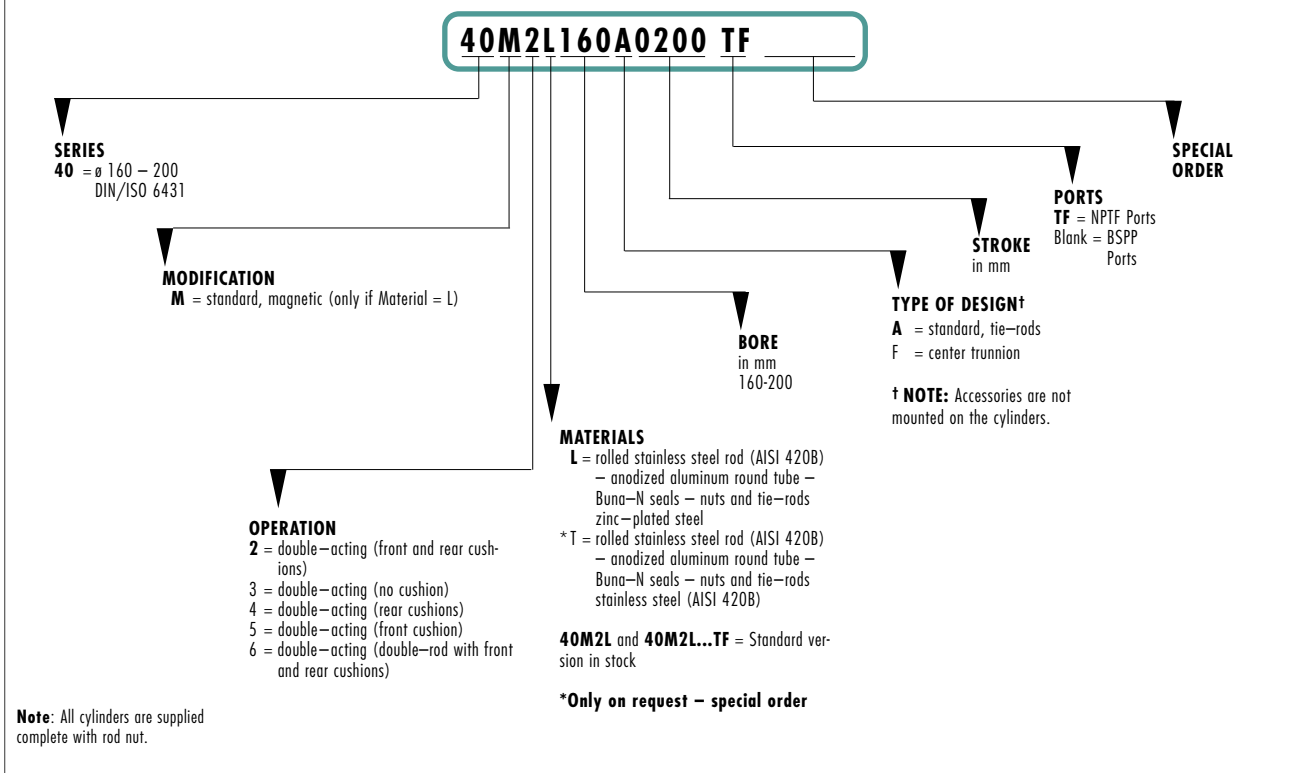


TABLE SHOWING AIR CONSUMPTION OF SERIES 40

Bore ø mm (inch)	Rod ø mm	working area in cm <sup>2</sup>	Operating pressure in bar 1 bar = 14.5 psi										
			1	2	3	4	5	6	7	8	9	10	
			Air consumption in NL/min. for each 10 mm of stroke										
160 (6 1/4")	40	Extend side	201	0.402	0.603	0.804	1.005	1.206	1.407	1.608	1.810	2.011	2.212
		Retract side	138.5	0.377	0.565	0.754	0.942	1.131	1.319	1.508	1.696	1.885	2.073
200 (7 7/8")	40	Extend side	314	0.628	0.942	1.257	1.571	1.885	2.199	2.513	2.827	3.142	3.456
		Retract side	301.5	0.603	0.905	1.206	1.508	1.810	2.111	2.413	2.714	3.016	3.317

THE VALUES SHOWN IN THE TABLE WERE OBTAINED USING THE FOLLOWING FORMULA:

$$Q_s = \frac{D^2 \cdot \pi \cdot (P + 1)}{4 \cdot 1000} \cdot H \quad Q_n = (Q_s + Q_t) \cdot n \quad Q_t = \frac{(D^2 - d^2) \cdot \pi \cdot (P + 1)}{4 \cdot 1000} \cdot H$$

Q<sub>s</sub> = consumption on extend side  
D = diameter on extend side in cm

Q<sub>t</sub> = consumption on retract side  
d = rod diameter in cm

Q<sub>n</sub> = consumption of cylinder  
H = cylinder stroke in cm

n = number of cycles per minute  
P = operating pressure in bar

TABLE SHOWING THE OUTPUT FORCE OF SERIES 40

Bore ø mm (inch)	Rod ø mm	working area in cm <sup>2</sup>	Operating pressure in bar 1 bar = 14.5 psi										
			1	2	3	4	5	6	7	8	9	10	
			Output force in N (efficiency factor = 0,9)					Force in N x 0.2245 = lbf					
160 (6 1/4")	40	Extend side	201	1786	3572	5358	7144	8930	10716	12502	14288	16074	17860
		Retract side	188.5	1674	3349	5023	6697	8372	10046	11721	13395	15069	16744
200 (7 7/8")	40	Extend side	314	2791	5581	8372	11162	13953	16744	19534	22325	25115	27906
		Retract side	301.5	2679	5358	8037	10716	13395	16074	18753	21432	24111	26790

THE VALUES SHOWN IN THE TABLE WERE OBTAINED USING THE FOLLOWING FORMULA:

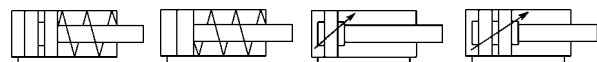
$$S_s = \frac{D^2 \cdot \pi}{4} \cdot P \cdot \eta \quad S_t = \frac{(D^2 - d^2) \cdot \pi}{4} \cdot P \cdot \eta$$

S<sub>s</sub> = output force on extend side  
S<sub>t</sub> = output force on retract side

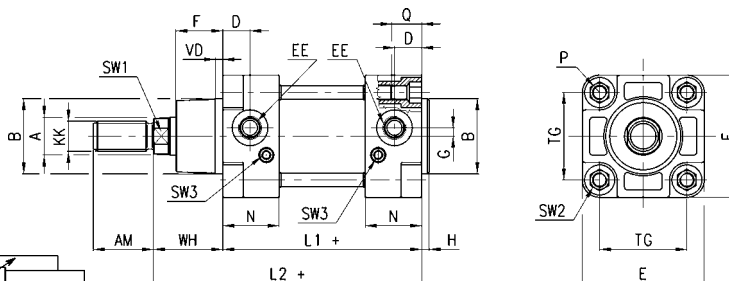
P = operating pressure in bar  
D = diameter on extend side in cm

d = rod diameter in cm  
η = efficiency factor

**Cylinders Series 40**



+ add the stroke



**DIMENSIONS**

**NPTF**

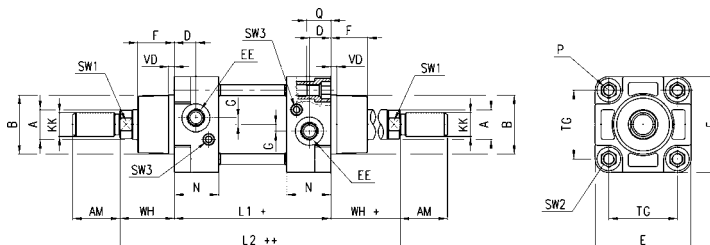
ø	øA	KK	øB <sup>911</sup>	D	G	F	AM <sup>0</sup> / <sub>2</sub>	H	EE	WH	L1	L2	VD	N	P	Q	TG	E	SW1	SW2	SW3	cushion stroke
160	40	M36x2	65	25	12	53,5	72	6	3/4"	80	180	260	6	45	M16	26	140	176	36	17	4	45
200	40	M36x2	75	25	12	63,5	72	6	3/4"	95	180	275	6	45	M16	26	175	216	36	17	4	49

**Cylinders Series 40**

Double rod



+ add the stroke  
++ add the stroke twice



**DIMENSIONS**

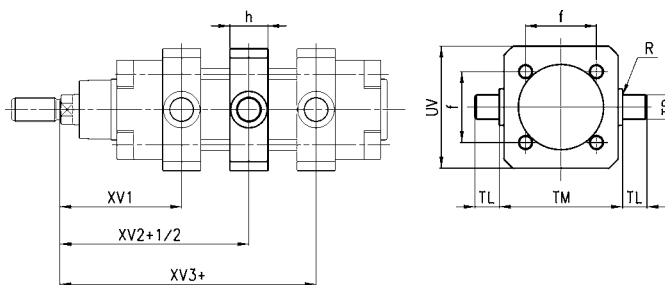
**NPTF**

ø	øA	KK	øB <sup>911</sup>	D	G	F	AM <sup>0</sup> / <sub>2</sub>	EE	WH	L1	L2	VD	N	P	Q	TG	E	SW1	SW2	SW3	cushion stroke
160	40	M36x2	65	25	12	53,5	72	3/4"	80	180	340	6	45	M16	26	140	176	36	17	4	45
200	40	M36x2	75	25	12	63,5	72	3/4"	95	180	340	6	45	M16	26	175	216	36	17	4	49

**Cylinder with centre trunnion Mod. F...**



+ add the stroke

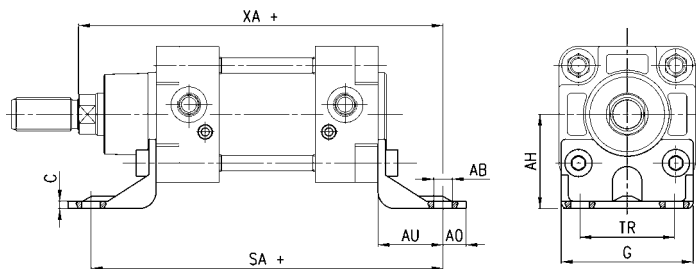


**DIMENSIONS**

ø	XV1 ± 2	XV2 ± 2	XV3 ± 2	f	TM	h14	h	TD e9	TL h14	UV	R
160	145	170	195	140	200	40	32	32	200	0,2	
200	160	185	210	175	250	40	32	32	250	0,2	

**Foot mount Mod. B...**

Material: zinc-plated steel.  
The following is supplied:  
N° 2 feet  
N° 4 screws



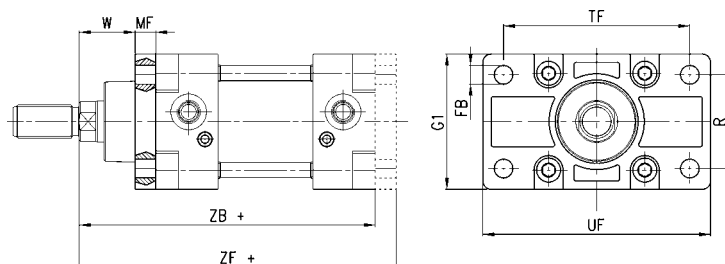
+ add the stroke

**DIMENSIONS**

Mod.	∅	C	SA <sup>±2</sup>	XA <sup>±2</sup>	TR <sup>J514</sup>	G	∅AB <sup>H13</sup>	AH <sup>J515</sup>	A0	AU
<b>B-41-160</b>	160	10	300	320	115	175	18	115	20	60
<b>B-41-200</b>	200	11	320	345	135	215	22	135	30	70

**Front and rear flange Mod. D-E...**

Material: aluminium.  
The following is supplied:  
N° 1 flange  
N° 4 screws



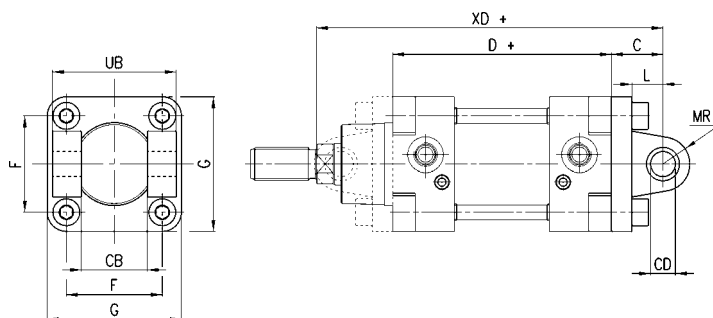
+ add the stroke

**DIMENSIONS**

Mod.	∅	W <sup>±2.5</sup>	MF <sup>J514</sup>	ZB <sup>J514</sup>	TF <sup>J514</sup>	R <sup>J514</sup>	UF	G1	∅FB <sup>H13</sup>	ZF <sup>±2</sup>
<b>D-E-41-160</b>	160	60	20	260	230	115	276	175	18	280
<b>D-E-41-200</b>	200	70	25	275	270	135	312	215	22	300

**Front and rear female trunnion Mod. C-H...**

Material: aluminium.  
The following is supplied:  
N° 1 female trunnion  
N° 4 screws



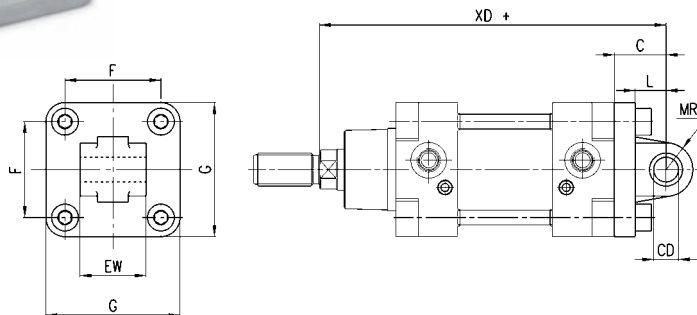
+ add the stroke

**DIMENSIONS**

Mod.	∅	∅CD <sup>H9</sup>	L	C	D	XD <sup>±2</sup>	MR	F	G	CB <sup>H14</sup>	UB <sup>H14</sup>
<b>C-H-41-160</b>	160	30	35	55	180	315	30	140	175	90	170
<b>C-H-41-200</b>	200	30	35	60	180	335	30	175	215	90	170

**Rear trunnion, male Mod. L...**

Material: aluminium.  
The following is supplied:  
N° 1 male trunnion  
N° 4 screws



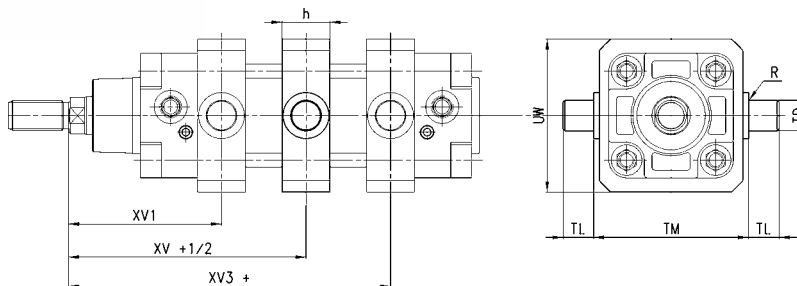
+ ad the stroke

**DIMENSIONS**

Mod.	∅	∅CD <sup>H9</sup>	L	C	XD <sup>+2</sup>	MR	F	G	EW <sup>-0,5 -1,2</sup>
<b>L-41-160</b>	160	30	35	55	315	30	140	175	90
<b>L-41-200</b>	200	30	35	60	335	30	175	215	90

**Centre trunnion Mod. F...**

Material: zinc-plated steel.  
The following is supplied:  
N° 1 centre trunnion  
N° 4 clamping elements  
N° 4 locking screws



+ ad the stroke

**DIMENSIONS**

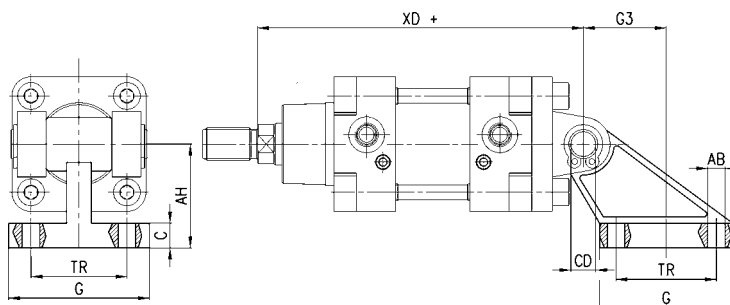
Mod.	∅	XV1 <sup>+2,5</sup>	HV <sup>+2,5</sup>	XV3 <sup>+2,5</sup>	TM <sup>h14</sup>	h	∅TD <sup>e9</sup>	TL <sup>h14</sup>	UW	R
<b>F-160</b>	160	145	170	195	200	40	32	32	200	0,2
<b>F-200</b>	200	160	185	210	250	40	32	32	250	0,2

90° Swivel combination Mod ZS\*...

Material: aluminium.  
\*not according to standard



+ ad the stroke



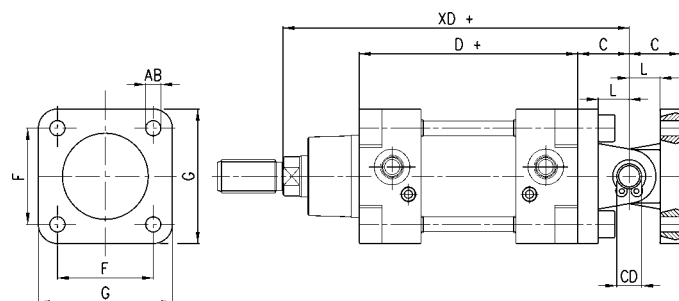
DIMENSIONS

Mod.	ø	TR	øAB <sup>H13</sup>	AH	C	G	øCD <sup>H9</sup>	XD <sup>-2</sup>	G3
ZS-160	160	140	16,5	140	20	180	30	315	105
ZS-200	200	175	16,5	140	25	220	30	335	125

Swivel combination Mod. C+L+S



+ ad the stroke

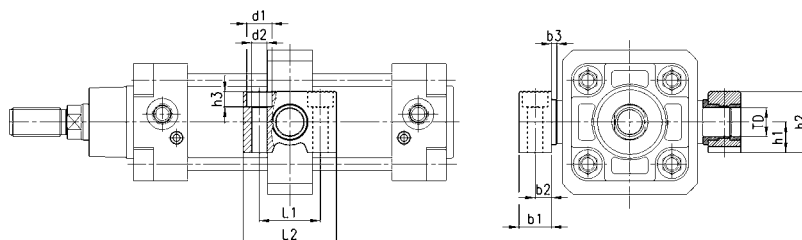
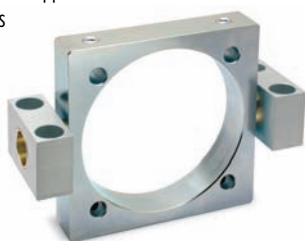


DIMENSIONS

ø	øCD <sup>H9</sup>	L	C	D	XD <sup>-2</sup>	F	G	øAB <sup>H13</sup>
160	30	35	55	180	315	140	175	17
200	30	35	60	180	335	175	215	17

Counter bracket for centre trunnion Mod. BF...

Material: aluminium.  
The following is supplied:  
N° 2 supports

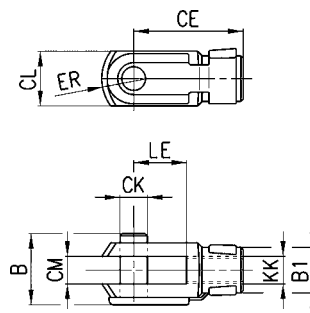


DIMENSIONS

Mod.	ø	øTD	b1	b2	b3	L1	L2	h1	h2	h3	ød1	ød2
BF-160-200	160-200	32	35	17,5	4	60	92	30	60	16	26	18

**Rod Fork End G...**

ISO 8140.  
Material: zinc-plated steel.

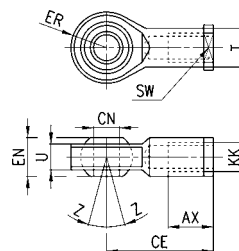


**DIMENSIONS**

Mod.	ø	øCK	LE	CM	CL	ER	CE	KK	B	øB1
<b>G-160-200</b>	160-200	35	72	35	70	44	144	M36x2	92	60

**Swivel Ball Joint Mod. GA...**

ISO 8139.  
Material: zinc-plated steel.

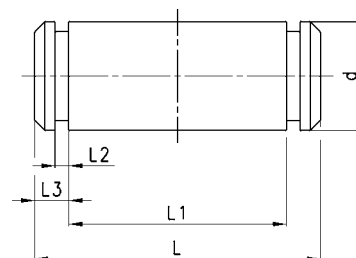


**DIMENSIONS**

Mod	ø	øCN <sup>H7</sup>	U	EN	ER	AX	CE	KK	øT	Z	SW
<b>GA-160-200</b>	160-200	35	28	43	40	56	125	M36x2	46	6	50

**Clevis Pin Mod. S...**

The following is supplied:  
N° 1 centering pin (stainless steel 303)  
N° 2 Seeger (steel)



**DIMENSIONS**

Mod.	ø	d	L	L1	L2 <sup>H13</sup>	L3
<b>S-160-200</b>	160-200	30	179	170,5	1,6	4,25

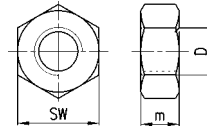


**Piston Rod Lock Nut Mod. U...**

UNI EN ISO 4035.

Material: zinc-plated steel.

Included on Series 40 cylinders.

**DIMENSIONS**

Mod.	$\varnothing$	D	m	SW
<b>U-160-200</b>	160-200	M36x2	14	55