



## Series 1319-1320-1321

### General

This series of pneumatic cylinders is manufactured according to ISO 6431 standards adapted to VDMA 24562 and CNOMO/AFNOR 49003 that guarantee the interchangeability of the cylinders even without mounted anchoring.

### Construction characteristics

End caps	from Ø32 to Ø125: UNI 5079 aluminium alloy casting painted black by cataphoresis from Ø160 to Ø200: UNI 3051 aluminium chilled painted black by cataphoresis
Rod	stainless steel or C43 chromed steel
Barrel	oxidised aluminium
Cushion bushings	hardened aluminium
Rod-guide bushing	self-lubricating sintered bronze
Piston	vulcanized rubber block on steel core with incorporated plastoferrite permanent magnet, or without magnet for non magnetic version (plus rear spacer).
Seals	standard: NBR Oil resistant rubber, PUR Piston rod and cushion seals (FPM seals available upon request)
Cushion adjustment screws	brass

### Operational characteristics

Fluid	Filtered air. No lubrication needed, if applied it shall be continuous.
Pressure	max. 10 bar
Operating temperature	-5 °C - +70 °C with standard seals (magnetic or non magnetic piston) -5 °C - +80 °C with FPM seals for 1319 and 1320 series (magnetic piston) -5 °C - +150 °C with FPM seals for 1321 series (non magnetic piston)
Cushioning length	Ø 32 - 40 - 50 - 63 - 80 - 100 - 125 - 160 - 200 mm 28 - 32 - 32 - 40 - 44 - 50 - 55 - 55 - 55

Please follow the suggestions below to ensure a long life for these cylinders:

- use clean and lubricated air
- correct alignment during assembly with regard to the applied load so as to avoid radial components or bending the rod.
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device)
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.)

**Please note: air must be dried for applications with lower temperature.**

Use hydraulic oils H class (ISO VG32) for correct continued lubrication.

Our Technical Department will be glad to help.

#### Standard strokes (for all diameters)

##### Double acting version

from 0 to 150, every 25 mm
over 150 up to 500, every 50 mm
over 500 up to 1000, every 100 mm

On request are available strokes up to 2800 mm

##### Single acting version

From Ø32 to Ø125, up to stroke 50 mm

On request are available strokes up to 200 mm

#### Stroke tolerance (ISO 15552)

Bore	Stroke	Tolerance
32 - 40 - 50	up to 500	+2 0
	over 500 up to 1250	+3,2 0
63 - 80 - 100	up to 500	+2,5 0
	over 500 up to 1250	+4 0
125 - 160 - 200	up to 500	+4 0
	over 500 up to 1250	+5 0

### Minimum and maximum springs load for single acting version

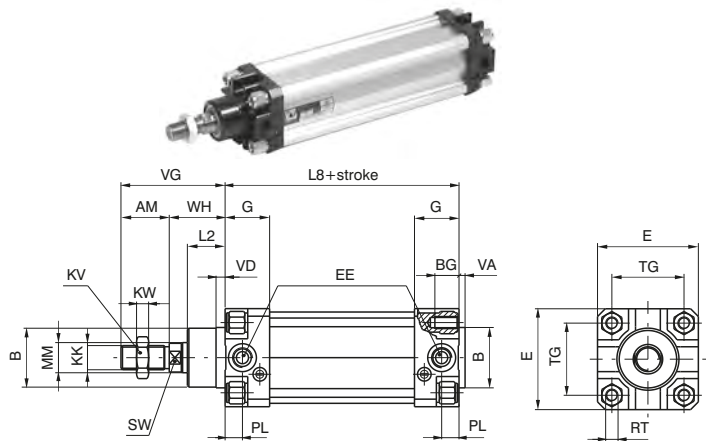
Bore	Ø32	Ø40	Ø50 - Ø63	Ø80 - Ø100	Ø125
Min. load (N)	15	25	50	100	150
Max. load (N)	40	80	115	200	250

► **Basic version "01"**

Ordering code
1319.Ø.stroke.01 magnetic chromed rod
1320.Ø.stroke.01 magnetic stainless steel rod
1321.Ø.stroke.01 non magnetic chromed rod
13--Ø.stroke.01V FPM seals
13--Ø.stroke.01MA Front springs (Ø32-Ø125)*
13--Ø.stroke.01MP Rear springs (Ø32-Ø125)*

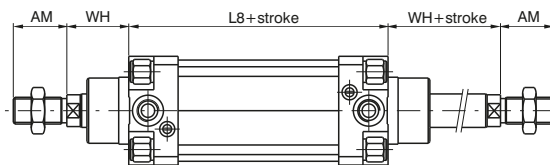
\* Max. stroke 50

This is the configuration that represents the basic cylinder according to ISO-VDMA standards. It can be directly anchored on machine parts using the four thread on the end cap. For other applications see the following pages where different types of attachments are shown.



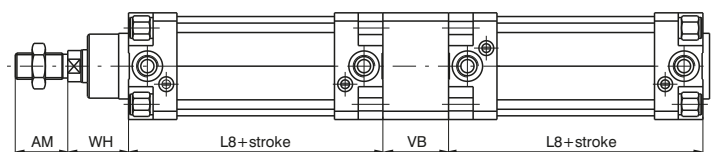
► **Through rod cylinder version "02"**

Ordering code
1319.Ø.stroke.02 magnetic chromed rod
1320.Ø.stroke.02 magnetic stainless steel rod
1321.Ø.stroke.02 non magnetic chromed rod
13--Ø.stroke.02V FPM seals



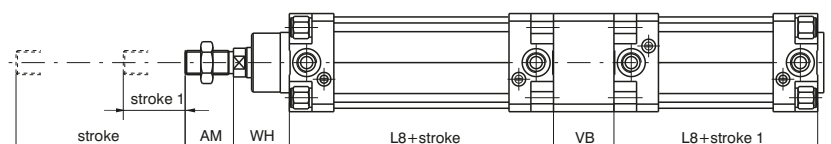
► **Tandem push with a common rods "G"**

Ordering code
1319.Ø.stroke.G magnetic chromed rod
1320.Ø.stroke.G magnetic stainless steel rod
1321.Ø.stroke.G non magnetic chromed rod



► **Tandem push with independent rods "F"**

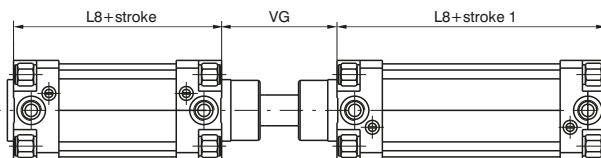
Ordering code
1319.Ø.stroke.stroke1.F magnetic chromed rod
1320.Ø.stroke.stroke1.F magnetic stainless steel rod
1321.Ø.stroke.stroke1.F non magnetic chromed rod



### Opposed tandem with common rod "D"

Ordering code

1319.Ø.stroke.stroke1.D magnetic chromed rod  
1320.Ø.stroke.stroke1.D magnetic stainless steel rod  
1321.Ø.stroke.stroke1.D non magnetic chromed rod



### Tandem with opposed rods "E"

Ordering code

1319.Ø.stroke.stroke1.E magnetic chromed rod  
1320.Ø.stroke.stroke1.E magnetic stainless steel rod  
1321.Ø.stroke.stroke1.E non magnetic chromed rod

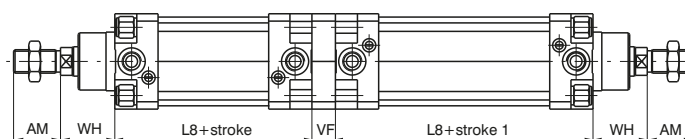


Table of dimensions

Bore	32	40	50	63	80	100	125	160	200	
AM	22	24	32	32	40	40	54	72	72	
B (d 11)	30	35	40	45	45	55	60	65	75	
BG	14	14	16	16	21	21	23	24	24	
E	46	52	65	75	95	115	140	180	220	
EE	G 1/8"	G 1/4"	G 1/4"	G 3/8"	G 3/8"	G 1/2"	G 1/2"	G 3/4"	G 3/4"	
G	25	29	29,5	36	36	40	45	49	49	
KK	M10X1,25	M12X1,25	M16x1,5	M16x1,5	M20x1,5	M20x1,5	M27x2	M36x2	M36x2	
KV	17	19	24	24	30	30	41	55	55	
KW	6	7	8	8	9	9	12	18	18	
L2	16	20	25	25	32	35	45	50	60	
L8 *	94	105	106	121	128	138	160	180	180	
MM	12	16	20	20	25	25	32	40	40	
PL	9	11,5	13	14	16	18	19	24	25	
RT	M6	M6	M8	M8	M10	M10	M12	M16	M16	
SW	10	13	17	17	22	22	27	32	32	
TG	32,5	38	46,5	56,5	72	89	110	140	175	
VA	4	4	4	4	4	4	6	5	5	
VB	25	30	40	40	50	50	75	70	75	
VD	5	6	6	6	10	10	12	10	10	
VF	12	12	16	16	20	20	25	30	30	
VG	48	54	69	69	86	91	119	152	167	
WH	26	30	37	37	46	51	65	80	95	
Weight g	Stroke 0	480	730	1150	1600	2800	3600	7800	15000	21500
	every 10 mm	25	32	56	60	90	100	140	265	325

\* For strokes over 50mm, the length does not increase proportionally to the stroke, and allowance must be made for adequate spring allocation (see table of L8 dimensions).

#### "L8" dimensions for "rear spring" and "front spring"

Bore	32	40	50	63	80	100	125
L8 (Stroke 51 ÷ 100)	134	150	151	166	183	193	230
L8 (Stroke 101 ÷ 150)	174	195	196	211	238	248	300
L8 (Stroke 151 ÷ 200)	214	240	241	256	293	303	370



## Series 1348-1349-1350, Non rotating cylinders

### Construction characteristics

End caps	UNI 5079 aluminium alloy casting painted black by cataphoresis
Rod	C43 chromed steel Ra = 0.2
Barrel	UNI 9006/1 aluminium alloy square section, hardened 30 micron oxidate
Cushion bushings	2011 UNI 9002/5 hardened alloy aluminium
Piston	polyacetal resin, self-lubricated and anti-wear, with plastoferrite rings in magnetic version
Piston seals	NBR oil-resistant rubber, PUR Piston rod and cushion seals
Cushioning adjustment screw	brass

### Technical characteristics

Fluid	Filtered air. No lubrication needed, if applied it shall be continuous.
Pressure	10 bar
Operating temperature	-5°C - +70°C

Please follow the suggestions below to ensure a long life for these cylinders:

- use clean and lubricated air
- correct alignment during assembly with regard to the applied load so as to avoid radial components or bending the rod.
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device)
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.)

**Please note: air must be dried for applications with lower temperature.**

Use hydraulic oils H class (ISO VG32) for correct continued lubrication.

Our Technical Department will be glad to help.

Bore	Usable surface (square profile) cm <sup>2</sup>	Max couple on the rod (max torque) Nm	Grade precision (rest rod, without load) anti-rotation	Cushion length mm.
32	8.31	0.5	12'	22
40	12.41	0.8	12'	27
50	18.41	1.1	12'	27
63	29.67	1.5	12'	32

### Standard strokes (for all diameters)

from 0 to 150, every 25 mm

#### Other stroke for these following bores:

- Ø 32 80 mm
- Ø 40 80 - 160 mm
- Ø 50 80 - 160 - 200 - 250 mm
- Ø 63 80 - 160 - 200 - 300 - 320 mm

On request are available strokes up to 1000 mm

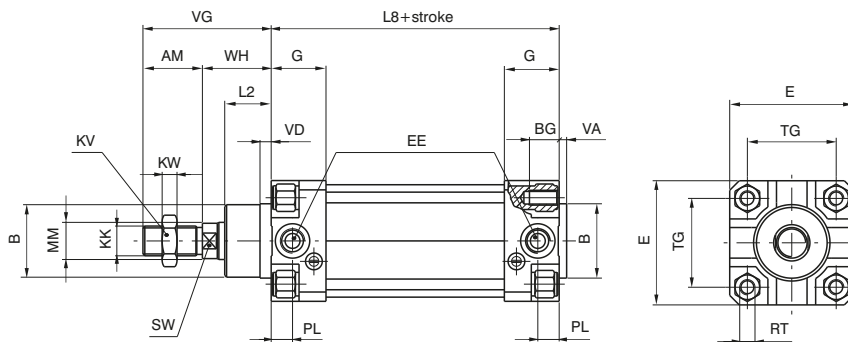
### Stroke Tolerance (ISO 15552)

Bore	Stroke	Tolerance
32 - 40 - 50 - 63	up to 500	+2 0

**Basic version**

Ordering code

- 1348.Ø.stroke.01**  
magnetic chromed rod
- 1349.Ø.stroke.01**  
magnetic stainless steel rod
- 1350.Ø.stroke.01**  
non-magnetic chromed rod



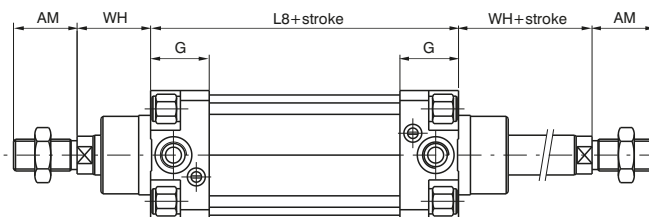
Bore	32	40	50	63	
AM	22	24	32	32	
B (d 11)	30	35	40	45	
BG	12	12	16	16	
E	46	52	65	75	
EE	G 1/8"	G 1/4"	G 1/4"	G 3/8"	
G	25	29	29,5	36	
KK	M10x1,25	M12x1,25	M16x1,5	M16x1,5	
KV	17	19	24	24	
KW	6	7	8	8	
L 2	16	20	25	25	
L 8	94	105	106	121	
MM	12	16	20	20	
PL	9	11,5	13	14	
RT	M6	M6	M8	M8	
SW	10	13	17	17	
TG	32,5	38	46,5	56,5	
VA	4	4	4	4	
VD	5	6	6	6	
VG	48	54	69	69	
WH	26	30	37	37	
Weight	stroke 0	505	705	1320	1710
g	every 10 mm	24	33	53	58

This is the configuration that represents the basic cylinder according to ISO standards. It can be directly anchored on machine parts using the four threads on the end cap. For other applications see the following pages where different types of attachments shown.

**Through rod cylinder version**

Ordering code

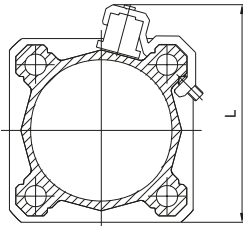
- 1348.Ø.stroke.02**  
magnetic chromed rod
- 1349.Ø.stroke.02**  
magnetic stainless steel rod
- 1350.Ø.stroke.02**  
non-magnetic chromed rod



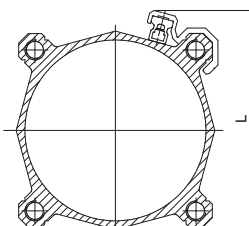
► **Sensor brackets**

Sensor brackets codes 1500._, RS._, HS._	Sensor brackets codes 1595.HAP	Bore	L
Code	Code		
1320.A	1320.ASC	Ø32	60
		Ø40	65
1320.B	1320.BSC	Ø50	77
		Ø63	87
1320.C	1320.CSC	Ø80	105
		Ø100	125
1320.D	1320.DSC	Ø125	145
1320.E	1320.ESC	Ø160	184
1320.F	1320.FSC	Ø200	222

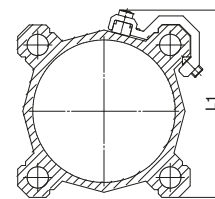
Sensor brackets codes 1580._, MRS._, MHS._		
Code	Bore	L1
1320.AS	Ø32	48
	Ø40	54
1320.BS	Ø50	66
	Ø63	76
1320.CS	Ø80	96
	Ø100	112
1320.DSC	Ø125	145
1320.ESC	Ø160	184
1320.FSC	Ø200	222



Sensors 1500.\_,RS.\_,HS.\_



Sensors 1595.HAP

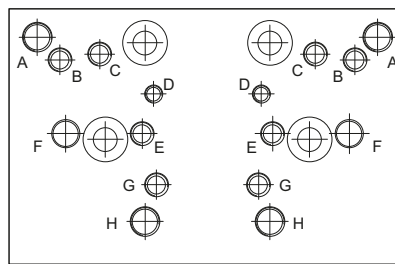


Sensors 1580.\_, MRS.\_, MHS.\_

**Sensors for microbore cylinders:** for technical characteristics and ordering codes see "Magnetic sensors" section

► **Solenoid valves supports**

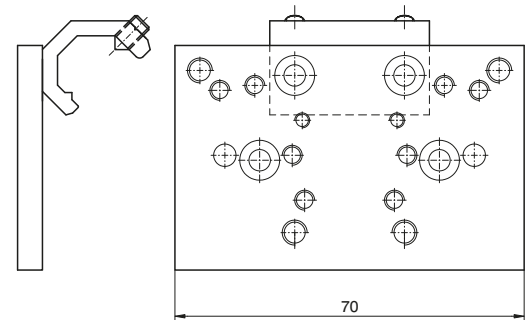
This accessory permits to mount a valve or an electrovalve on a side of the cylinder. The plate can be fitted on the cylinder profiled barrel, and, on it, can be mounted either a threaded distributor or a base on which can be mounted an ISO distributor. Once installed the connections must be done with fittings and pipes. All of the threaded holes on the support plate are dedicated to different valves series as per attached drawing.



Fixing holes for valves series:

- A = 414/2
- B = 824
- C = 828, T488, 488, 484
- D = 2400
- E = 2600
- F = Bases for ISO distributors
- G = 858/2
- H = T424

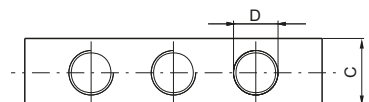
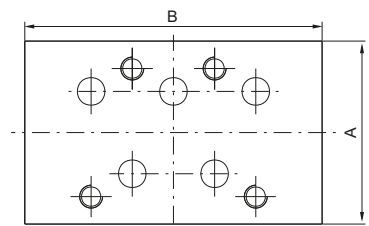
Ordering code
1320.15 (Ø32 - Ø40)
1320.16 (Ø50 - Ø63)
1320.17 (Ø80 - Ø100)
1320.18 (Ø125)
1320.19 (Ø160)
1320.20 (Ø200)



► **Bases for ISO solenoid valves**

Ordering code

1320.21	bases for ISO 1 solenoid valves
1320.22	bases for ISO 2 solenoid valves



		Dimensions			
		A	B	C	D
1320.21	bases for ISO 1 solenoid valves	40	75	15	G 1/8"
1320.22	bases for ISO 2 solenoid valves	50	95	20	G 1/4"



## Series 1386-1387-1388/ 1396/1397/1398, ECOPLUS

### General

Profiled tube has two "T" slots on the three sides hosting sensors 1580. \_, MRS. \_, MHS. \_ without adaptors.

### Construction characteristics

End caps	Series 1386 - 1388: high resistant thermoplastic material	Series 1396 - 1398: Die-casting aluminium
Rod	C43 chromed steel or stainless steel	
Barrel	anodised aluminium alloy	
Rod-guide bushing	self-lubricating sintered bronze	
Piston	acetal resin, aluminium on request	
Seal	standard: NBR Oil resistant rubber, PUR Piston rod seals (PUR seals available upon request)	
Cushion adjusting screws	brass	

### Operational characteristics

Fluid	Filtered air. No lubrication needed, if applied it shall be continuous.
Max. pressure	10 bar
Operating temperature	-5°C - +70°C with standard seals -30°C - +80°C with PUR seals
Bore	Ø 32 - 40 - 50 - 63 - 80 - 100
Cushioning length	mm 27 - 31 - 31 - 37 - 40 - 44
Cushioning length "K" and "PK" version	mm 20 - 20 - 22 - 22 - 32 - 32

Please follow the suggestions below to ensure a long life for these cylinders:

- use clean and lubricated air
- correct alignment during assembly with regard to the applied load so as to avoid radial components or bending the rod;
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device and aluminium piston);
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.)

**Please note: air must be dried for applications with lower temperature.**

Use hydraulic oils H class (ISO VG32) for correct continued lubrication.

Our Technical Department will be glad to help.

#### Standard strokes (for all diameters)

from 0 to 150, every 25 mm
from 150 to 500, every 50 mm
from 500 to 1000, every 100

On request are available strokes up to 2800 mm

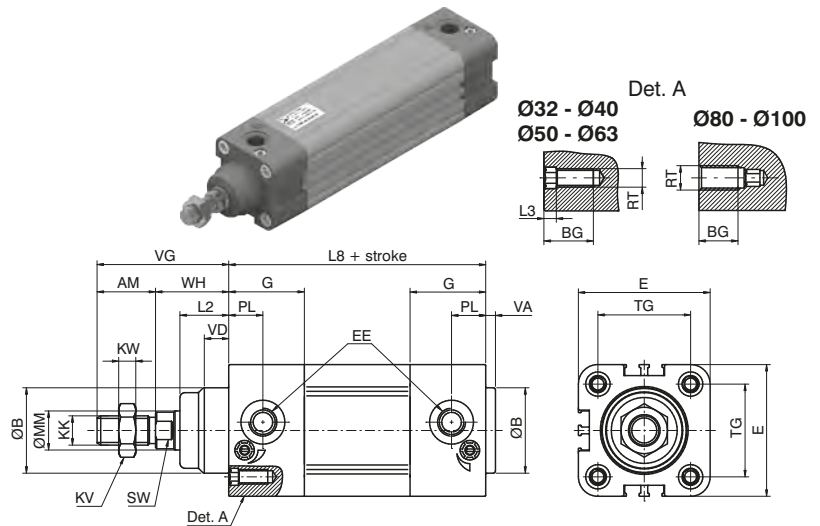
#### Stroke tolerance (ISO 15552)

Bore	Stroke	Tolerance
32 - 40 - 50	up to 500	+2 0
	over 500 up to 1000	+3.2 0
63 - 80 - 100	up to 500	+2.5 0
	over 500 up to 1000	+4 0



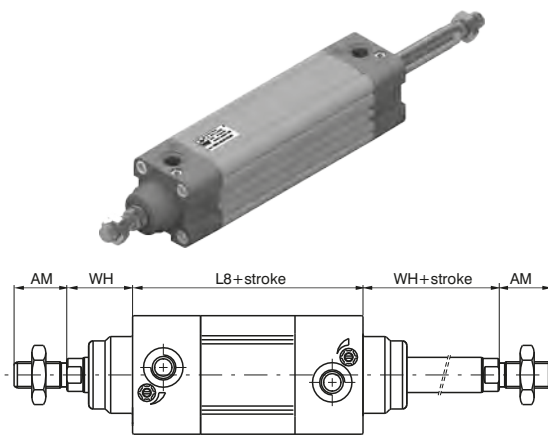
► **Basic version "01"**

Ordering code
<b>TECHNOPOLYMER COVERS</b>
1386.Ø.stroke.01 Magnetic chromed rod
1387.Ø.stroke.01 Magnetic stainless steel rod
1388.Ø.stroke.01 Non magnetic chromed rod
<b>ALUMINIUM COVERS</b>
1396.Ø.stroke.01 Magnetic chromed rod
1397.Ø.stroke.01 Magnetic stainless steel rod
1398.Ø.stroke.01 Non magnetic chromed rod



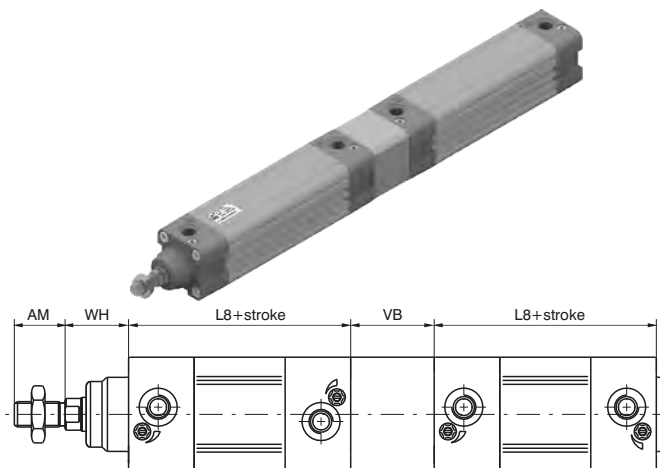
► **Through rod cylinder version "02"**

Ordering code
<b>TECHNOPOLYMER COVERS</b>
1386.Ø.stroke.02 Magnetic chromed rod
1387.Ø.stroke.02 Magnetic stainless steel rod
1388.Ø.stroke.02 Non magnetic chromed rod
<b>ALUMINIUM COVERS</b>
1396.Ø.stroke.02 Magnetic chromed rod
1397.Ø.stroke.02 Magnetic stainless steel rod
1398.Ø.stroke.02 Non magnetic chromed rod



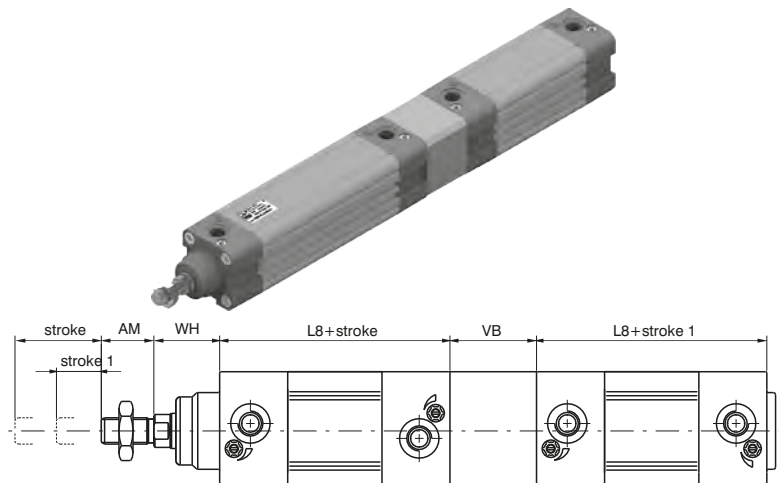
► **Tandem push with common rods "G"**

Ordering code
<b>TECHNOPOLYMER COVERS</b>
1386.Ø.stroke.G Magnetic chromed rod
1387.Ø.stroke.G Magnetic stainless steel rod
1388.Ø.stroke.G Non magnetic chromed rod
<b>ALUMINIUM COVERS</b>
1396.Ø.stroke.G Magnetic chromed rod
1397.Ø.stroke.G Magnetic stainless steel rod
1398.Ø.stroke.G Non magnetic chromed rod



► **Tandem push with independent rods "F"**

Ordering code
<b>TECHNOPOLYMER COVERS</b>
1386.Ø.stroke.stroke1.F Magnetic chromed rod
1387.Ø.stroke.stroke1.F Magnetic stainless steel rod
1388.Ø.stroke.stroke1.F Non magnetic chromed rod
<b>ALUMINIUM COVERS</b>
1396.Ø.stroke.stroke1.F Magnetic chromed rod
1397.Ø.stroke.stroke1.F Magnetic stainless steel rod
1398.Ø.stroke.stroke1.F Non magnetic chromed rod





► **Opposed tandem with common rod "D"**

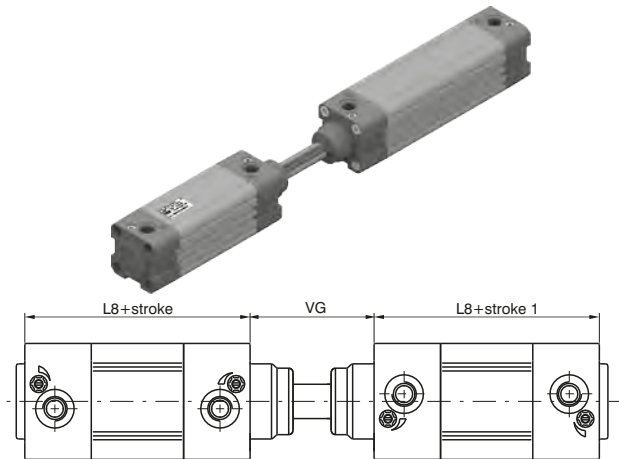
Ordering code

**TECHNOPOLYMER COVERS**

- 1386.Ø.stroke.stroke1.D Magnetic chromed rod
- 1387.Ø.stroke.stroke1.D Magnetic stainless steel rod
- 1388.Ø.stroke.stroke1.D Non magnetic chromed rod

**ALUMINIUM COVERS**

- 1396.Ø.stroke.stroke1.D Magnetic chromed rod
- 1397.Ø.stroke.stroke1.D Magnetic stainless steel rod
- 1398.Ø.stroke.stroke1.D Non magnetic chromed rod



► **Tandem with opposed rods "E"**

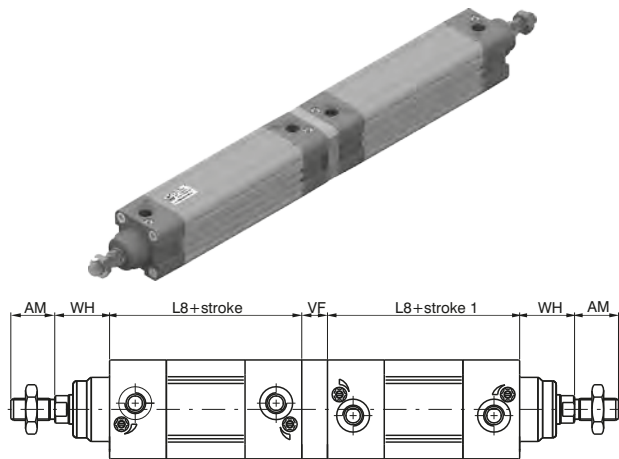
Ordering code

**TECHNOPOLYMER COVERS**

- 1386.Ø.stroke.stroke1.E Magnetic chromed rod
- 1387.Ø.stroke.stroke1.E Magnetic stainless steel rod
- 1388.Ø.stroke.stroke1.E Non magnetic chromed rod

**ALUMINIUM COVERS**

- 1396.Ø.stroke.stroke1.E Magnetic chromed rod
- 1397.Ø.stroke.stroke1.E Magnetic stainless steel rod
- 1398.Ø.stroke.stroke1.E Non magnetic chromed rod



► **Variants**

Ordering code

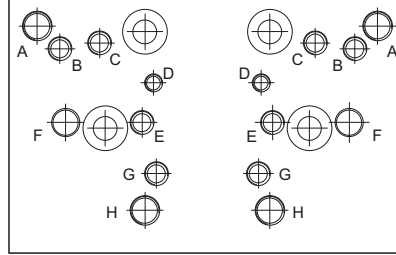
- 13\_ \_Ø.stroke\_ \_P = Version with PUR seals
- 13\_ \_Ø.stroke\_ \_K = Version with aluminium piston
- 13\_ \_Ø.stroke\_ \_PK = Version with PUR seals and aluminium piston

**Table of dimensions**

Bore		32	40	50	63	80	100	
AM		22	24	32	32	40	40	
B (d 11)		30	35	40	45	45	55	
BG		16	16	18	18	16	16	
E		46	54	65	77,5	95,5	115,5	
EE		G 1/8"	G 1/4"	G 1/4"	G 3/8"	G 3/8"	G 1/2"	
G		29	31	33	36	40	44	
KK		M10X1,25	M12X1,25	M16x1,5	M16x1,5	M20x1,5	M20x1,5	
KV		17	19	24	24	30	30	
KW		6	7	8	8	9	9	
L2		16	20	25	25	32	35	
L3		4	4	5	5	/	/	
L8		94	105	106	121	128	138	
MM		12	16	20	20	25	25	
PL		13	14	14	16	16	18	
RT		M6	M6	M8	M8	M10	M10	
SW		10	13	17	17	22	22	
TG		32,5	38	46,5	56,5	72	89	
VA		4	4	4	4	4	4	
VB		33	41	51	51	65	71	
VD		8	10	12	12	15	16	
VF		12	12	16	16	20	20	
VG		48	54	69	69	86	91	
WH		26	30	37	37	46	51	
Weight	Aluminium covers	stroke 0	550	690	1200	1590	2500	3670
g		every 10 mm	29	40	57	66	96	112
Weight	Technopolymer covers	stroke 0	470	590	1020	1320	2090	3010
g		every 10 mm	29	40	57	66	96	112

### Solenoid valves supports

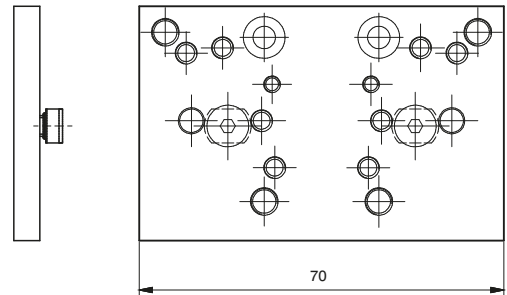
This accessory permits to mount a valve or an electrovalve on a side of the cylinder. The plate can be fitted on the cylinder profiled barrel, and, on it, can be mounted either a threaded distributor or a base on which can be mounted an ISO distributor. Once installed the connections must be done with fittings and pipes. All of the threaded holes on the support plate are dedicated to different valves series as per attached drawing.



Fixing holes for valves series:

- A = 414/2
- B = 824
- C = 828, T488, 488, 484
- D = 2400
- E = 2600
- G = 858/2
- H = T424

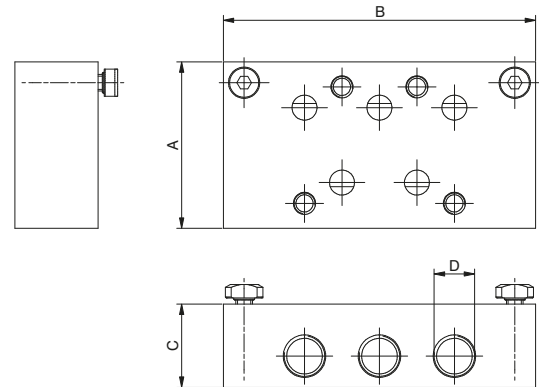
Ordering code
<b>1386.15</b>



**Attention:** do not use ISO distributor for base mounting

### Bases for ISO solenoid valves

Ordering code
<b>1320.23</b> bases for ISO 1 solenoid valves
<b>1320.24</b> bases for ISO 2 solenoid valves



	Dimensions			
	A	B	C	D
bases for ISO 1 solenoid valves	40	75	15	G 1/8"
bases for ISO 2 solenoid valves	50	95	20	G 1/4"



## Series 1390-1391-1392, ECOLIGHT

### Construction characteristics

End caps	die-casting aluminium
Rod	C43 chromed steel or stainless steel
Barrel	aluminium alloy anodised
Rod-guide bushing	spheroid bronze on steel band with P.T.F.E. coat
Piston	Ø32 - Ø100 acetal resin, aluminium on request Ø125 - Ø200 aluminium <b>V, Q, R, L</b> versions (Ø32 - Ø100): aluminium
Seals	standard: NBR oil resistant rubber, PUR piston rod seals <b>V</b> version: FPM <b>P</b> version: PUR <b>Q</b> version: NBR and PUR with plastic rod scraper with a high wear resistance <b>R</b> version: PUR with metallic rod scraper <b>L</b> version: special PUR
Cushion adjusting screws	brass

### Operational characteristics

Fluid	Filtered air. No lubrication needed, if applied it shall be continuous. <b>L version</b> (for low temperature): dried air, guarantee a dew point lower than the minimum operating temperature
Max. pressure	10 bar
Operating temperature	-5°C - +70°C with standard seals -30°C - +80°C with PUR seals ( <b>P</b> version) -5°C - +80°C with FPM seals for 1390 and 1391 series (magnetic piston) ( <b>V</b> version) -5°C - +150°C with FPM seals for 1392 series (no magnetic piston) ( <b>V</b> version) -20°C - +80°C ( <b>Q</b> version) -10°C - +80°C ( <b>R</b> version) -50°C - +80°C ( <b>L</b> version)
Bore	Ø 32 - 40 - 50 - 63 - 80 - 100 - 125 - 160 - 200
Cushioning length	mm 27 - 31 - 31 - 37 - 40 - 44 - 44 - 50 - 55
Cushion length version with aluminum piston	mm 20 - 20 - 22 - 22 - 32 - 32 - / - / - /



Please follow the suggestions below to ensure a long life for these cylinders:

- use clean and lubricated air
- correct alignment during assembly with regard to the applied load so as to avoid radial components or bending the rod;
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device and the aluminium piston);
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.)

**VERSIONS WITH ADDITIONAL ROD SCRAPER**

**Version with plastic rod scraper (Q)**

The pneumatic seal is manufactured using a special NBR seal material, with the rod scraper that comes in contact with the external environment made of a plastic material with a high wear resistance. The geometric shape with its excellent scraping capacity guarantees additional protection of the piston rod and nose seal against the impurities, liquids, water, and debris.

**Version with metallic rod scraper (R)**

The pneumatic seal is manufactured using a special FPM seal material with its own scraping lip with the additional rod scraper that comes into contact with the external environment made of metal. This combination of scraping lip and metal rod scraper enable these actuators to be used in particularly extreme environments.

Here are some examples:

**Aluminum foundries:** To remove the residues of alumina or fluorine compounds that are deposited on the piston rod during the preparation phase of aluminum casting.

**Automotive:** To prevent debris which has collected on the piston rod damaging the nose seal during operation especially waste produced during the welding process.

**Industrial ovens:** To eliminate cement powders or those produced during the manufacture of bricks/tiles

Thanks to the high-performance nose seal and scraper protection of the piston rod, the cylinder will be protected against premature wear that you would normally experience using standard cylinders in these harsh environments.

**Low temperature version (L):** The special seals compound allows the use of the cylinders up to a temperature of -50°C. The rod scraper seal is equipped with a metallic scraper which removes ice crystals which might form at minus temperature

**Please note: air must be dry for applications with lower temperature.**

Use hydraulic oils H class (ISO VG32) for correct continued lubrication.

Our Technical Department will be glad to help.

**Standard strokes** (for all diameters)

from 0 to 150, every 25 mm
from 150 to 500, every 50 mm
from 500 to 1000, every 100 mm

On request are available strokes up to 2800 mm

**Stroke tolerance** (ISO 15552)

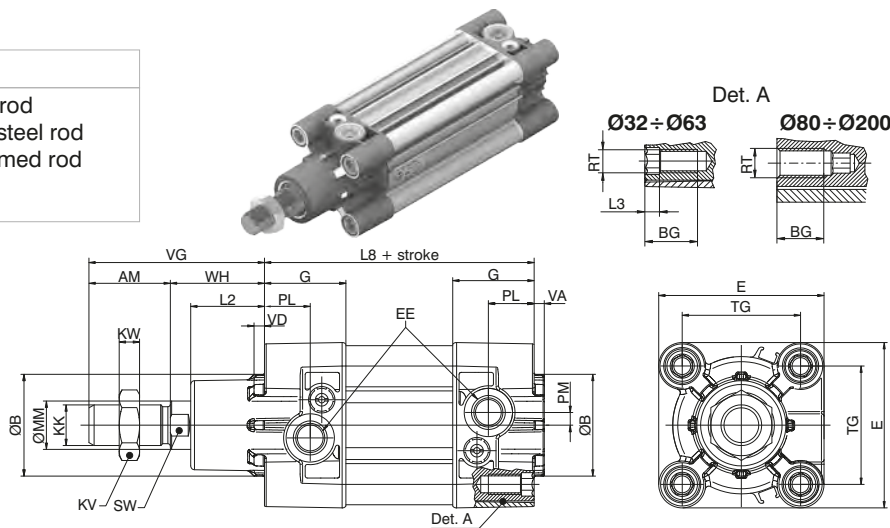
Bore	Stroke	Tolerance
<b>32 - 40 - 50</b>	up to 500	+2 0
	over 500 up to 1250	+3.2 0
<b>63 - 80 - 100</b>	up to 500	+2.5 0
	over 500 up to 1250	+4 0
<b>125 - 160 - 200</b>	up to 500	+4 0
	over 500 up to 1250	+5 0

**Basic version "01"**

Ordering code

- 1390.Ø.stroke.01** Magnetic chromed rod
- 1391.Ø.stroke.01** Magnetic stainless steel rod
- 1392.Ø.stroke.01** Non magnetic chromed rod

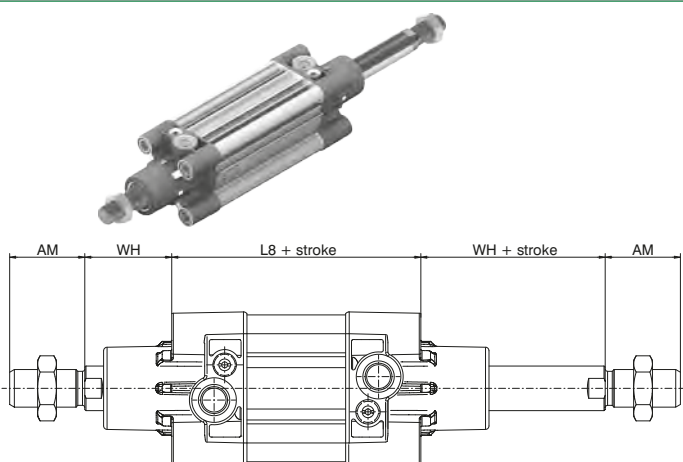
This is the configuration representing the basic cylinder according to ISO-VDMA standards. It can be directly anchored on machine parts using the four threads on the end cap screws. For other applications see "Cylinder section" on the General Catalogue, where different types of attachments are shown.



**Through rod cylinder version "02"**

Ordering code

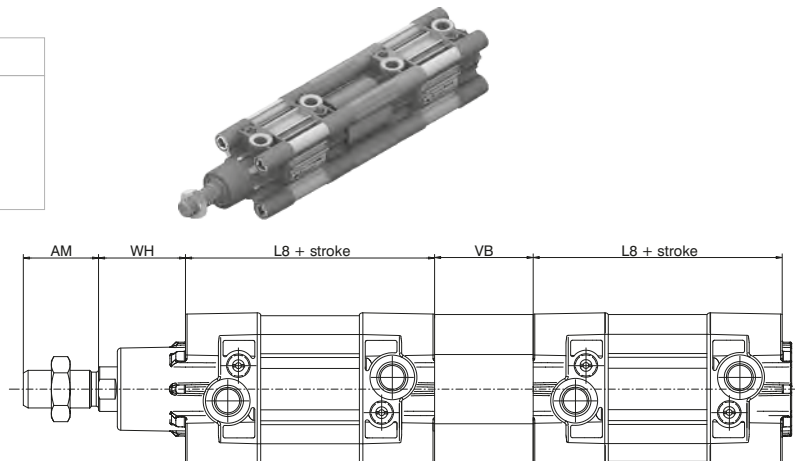
- 1390.Ø.stroke.02** Magnetic chromed rod
- 1391.Ø.stroke.02** Magnetic stainless steel rod
- 1392.Ø.stroke.02** Non magnetic chromed rod



**Tandem push with common rods "G"**

Ordering code

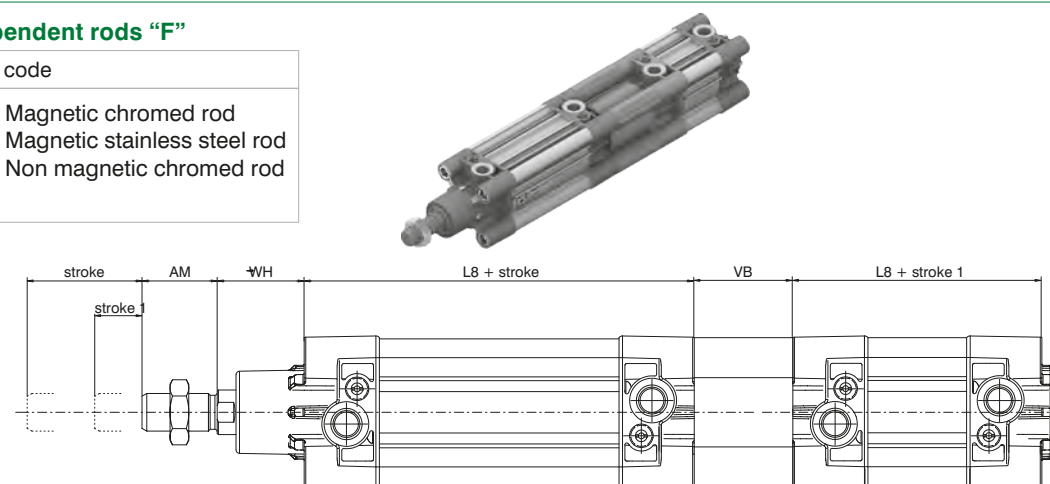
- 1390.Ø.stroke.G** Magnetic chromed rod
- 1391.Ø.stroke.G** Magnetic stainless steel rod
- 1392.Ø.stroke.G** Non magnetic chromed rod



**Tandem push with independent rods "F"**

Ordering code

- 1390.Ø.stroke.stroke1.F** Magnetic chromed rod
- 1391.Ø.stroke.stroke1.F** Magnetic stainless steel rod
- 1392.Ø.stroke.stroke1.F** Non magnetic chromed rod

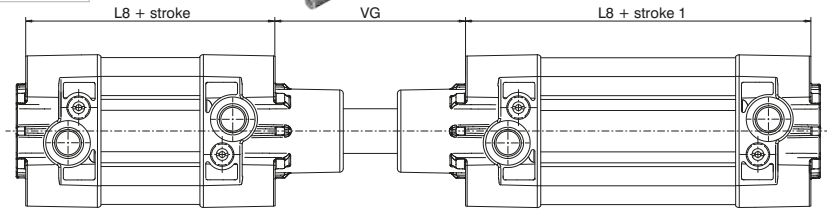
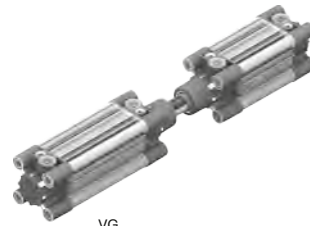


3 PNEUMATIC ACTUATION

► **Opposed tandem with common rod "D"**

Ordering code

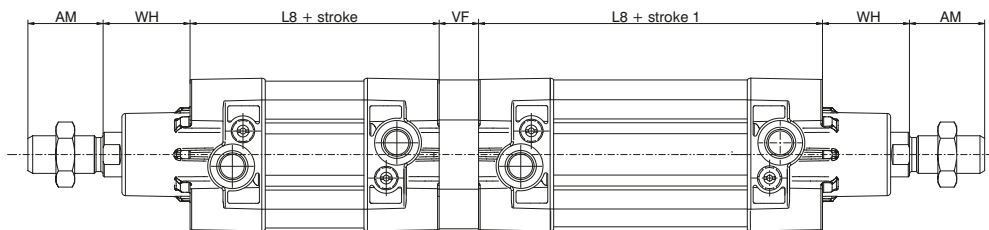
**1390.Ø.stroke.stroke1.D** Magnetic chromed rod  
**1391.Ø.stroke.stroke1.D** Magnetic stainless steel rod  
**1392.Ø.stroke.stroke1.D** Non magnetic chromed rod



► **Tandem with opposed rods - "E"**

Ordering code

**1390.Ø.stroke.stroke1.E** Magnetic chromed rod  
**1391.Ø.stroke.stroke1.E** Magnetic stainless steel rod  
**1392.Ø.stroke.stroke1.E** Non magnetic chromed rod



**Variants**

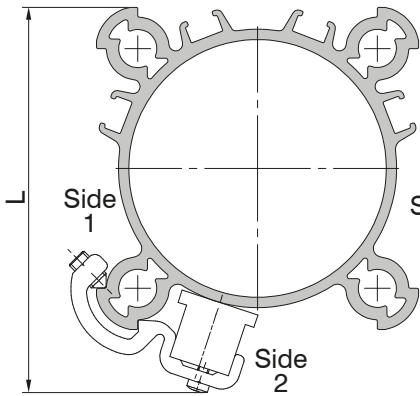
Ordering code

**139\_Ø.stroke.\_.P** = Version with PUR seals  
**139\_Ø.stroke.\_.K** = Version with aluminium piston (from Ø32 to Ø100)  
**139\_Ø.stroke.\_.PK** = Version with PUR seals and aluminium piston (from Ø32 to Ø100)  
**139\_Ø.stroke.\_.V** = Version with FPM seals and aluminium piston  
**139\_Ø.corsa.\_.R** = Version with metallic rod scraper and aluminium piston (Ø32-Ø100)  
**139\_Ø.corsa.\_.Q** = Version with plastic rod scraper and aluminium piston (Ø32-Ø100)  
**139\_Ø.stroke.\_.PQ** = Version with PUR seals and plastic rod scraper and aluminium piston (Ø32-Ø100)  
**139\_Ø.corsa.\_.L** = Version for low temperature and aluminium piston (-50°C) (Ø32-Ø100)

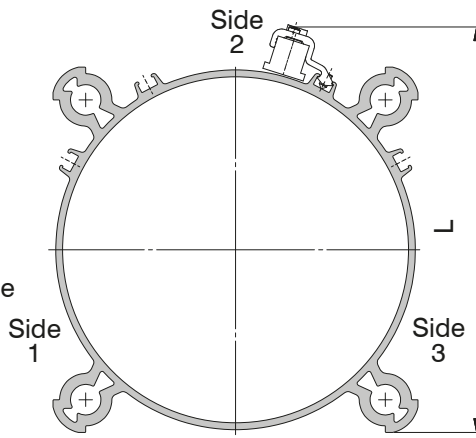
**Table of dimensions**

Bore	32	40	50	63	80	100	125	160	200	
AM	22	24	32	32	40	40	54	72	72	
B (d 11)	30	35	40	45	45	55	60	65	75	
BG	16	16	18	18	16	16	21	25	25	
E	47	54	65	76	95	113	138	180	216	
EE	G 1/8"	G 1/4"	G 1/4"	G 3/8"	G 3/8"	G 1/2"	G 1/2"	G 3/4"	G 3/4"	
G	29.5	33	32	36	38.5	41.5	48	49	49	
KK	M10X1.25	M12X1.25	M16x1.5	M16x1.5	M20x1.5	M20x1.5	M27x2	M36x2	M36x2	
KV	17	19	24	24	30	30	41	55	55	
KW	6	7	8	8	9	9	12	18	18	
L2	19	22	29	29	35	36	45	50	60	
L3	4	4	5	5	/	/	/	/	/	
L8	94	105	106	121	128	138	160	180	180	
MM	12	16	20	20	25	25	32	40	40	
PL	13	16	18	18	16	18	25	26	25	
PM	3	4	5	4.5	2.5	6	8	11	11	
RT	M6	M6	M8	M8	M10	M10	M12	M16	M16	
SW	10	13	17	17	22	22	27	36	36	
TG	32.5	38	46.5	56.5	72	89	110	140	175	
VA	4	4	4	4	4	4	6	6	6	
VB	33	41	51	51	65	71	75	70	75	
VD	4	4	4	4	4	4	6	6	6	
VF	12	12	16	16	20	20	25	30	30	
VG	48	54	69	69	86	91	119	152	167	
WH	26	30	37	37	46	51	65	80	95	
Weight	stroke 0	460	650	1030	1360	2180	2890	5700	11200	14900
	every 10 mm	23	32	45	49	75	81	130	195	245

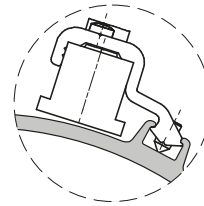
On the ECOLIGHT series it is possible to use three sensor types, according to bore, as indicated below:



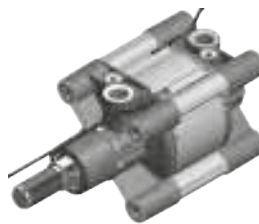
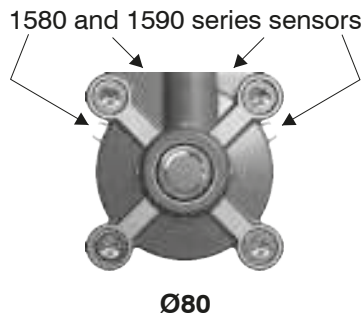
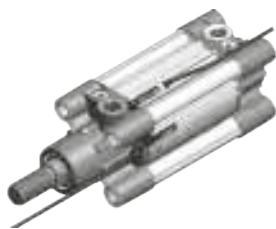
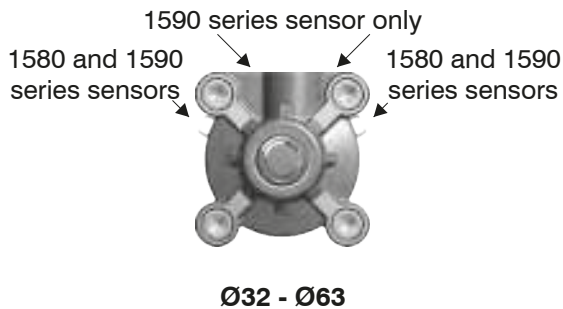
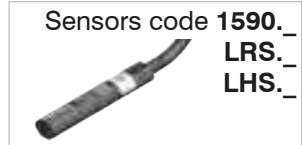
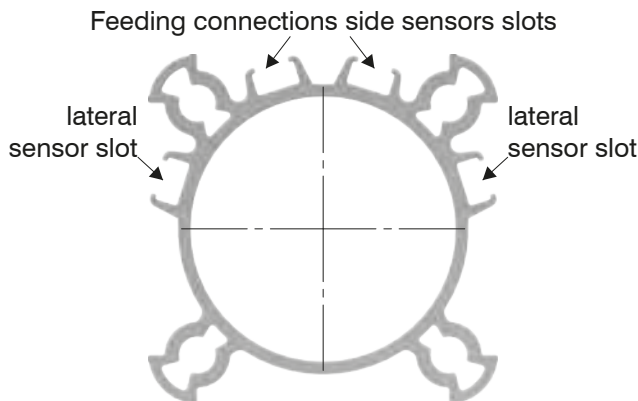
Ø32 - Ø100: the sensors can be fixed on the three sides as indicated in the drawing, by using suitable brackets (except for Ø32 on side 2)



Ø125 - Ø200: the sensors can be fixed on the three sides as indicated in the drawing, by using suitable bracket

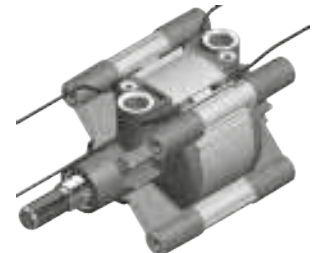
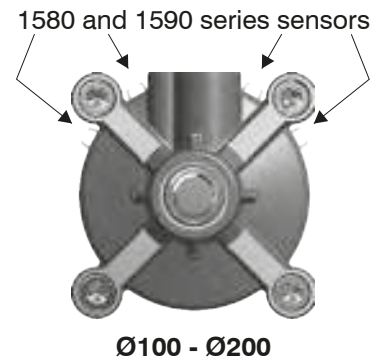


Code	Bore	L
1390.A	Ø32	58
	Ø40	65
1390.B	Ø50	75
	Ø63	86
1390.C	Ø80	105
	Ø100	122
1390.D	Ø125	150
	Ø160	190
	Ø200	225



**CYLINDERS - BORE SIZE Ø80:**

The two top housing can be accessed from the front of the unit, one housing can be accessed from the front end cap and the opposite housing from the rear end cap. It is therefore possible to use both type of sensors: 1580 - 1590.



**CYLINDERS - BORE SIZE Ø100-Ø200:**  
 All four housings can be accessed from the front of the unit. It is therefore possible to use both type of sensors: 1580 - 1590.

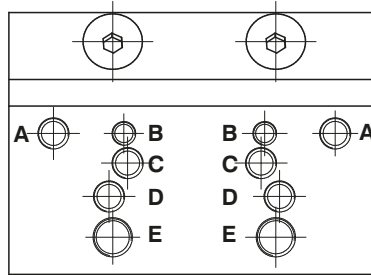
**CYLINDERS - BORE SIZES Ø32 to Ø63:**

The two slots on connection side are plugged, therefore only sensor 1590 can be used. Suitable for top housing and once placed by means of its screw, it can be fixed in desired position.



### Solenoid valves supports

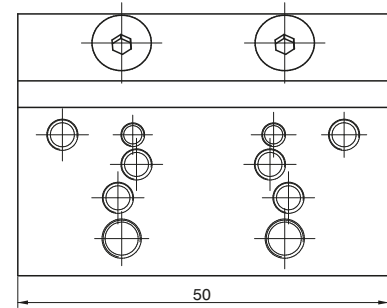
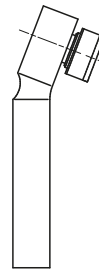
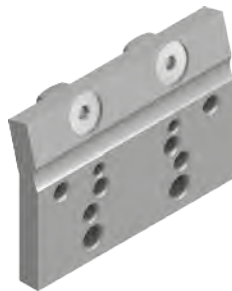
This accessory permits to mount a valve or an electrovalve on a side of the cylinder. The plate can be fitted on the cylinder profiled barrel. Once installed the connections must be done with fittings and pipes. All of the threaded holes on the support plate are dedicated to different valves series as per attached drawing.



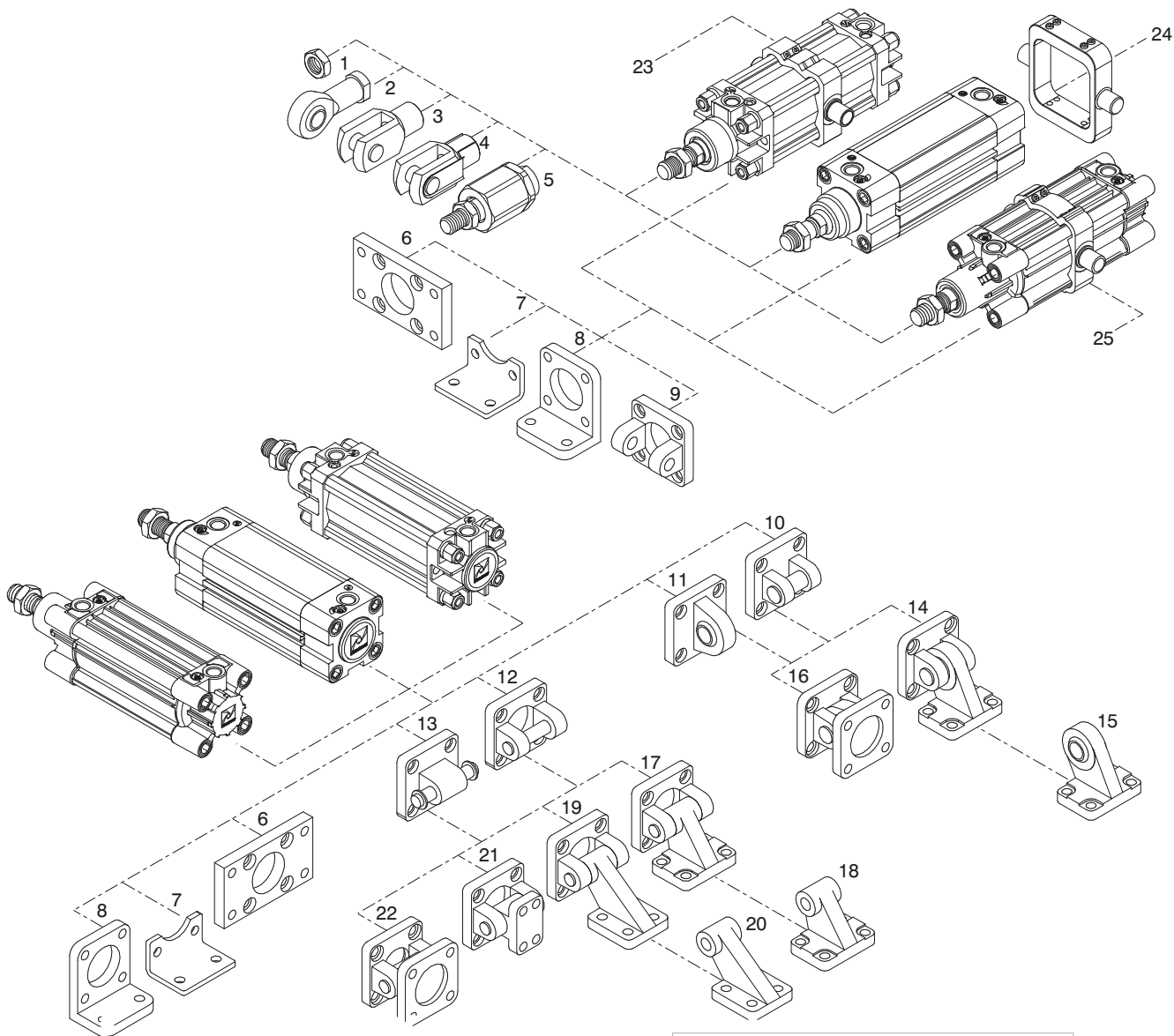
Fixing holes for valves series:

- A = 488 / 484
- B = 2400
- C = T488
- D = 2600
- E = T424

Ordering code
<b>1390.25</b> (for Ø32)
<b>1390.26</b> (for Ø40)
<b>1390.27</b> (for Ø50)
<b>1390.28</b> (for Ø63)
<b>1390.29</b> (for Ø80)
<b>1390.30</b> (for Ø100)



**Attention:** do not use ISO distributor for base mounting

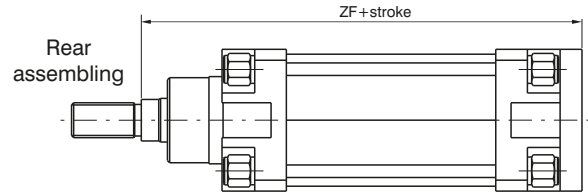
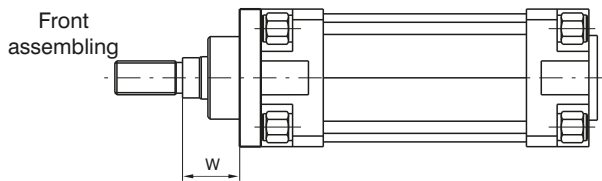
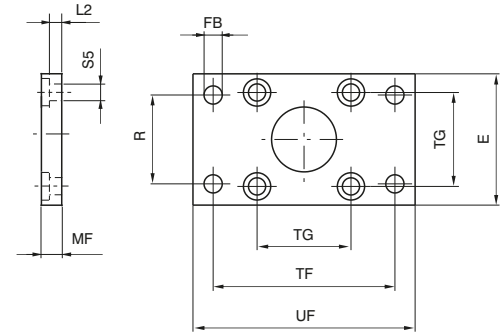


Pos.	Description	Ordering code	
		Aluminium	Steel
1	Rod nut	/	1320.Ø.18F
2	Ball joint	/	1320.Ø.32F
3	Forks	/	1320.Ø.13F
4	Fork with clips	/	1320.Ø.13/1F
5	Self-aligning joint	/	1320.Ø.33F
6	Flange (MF1-MF2)	1390.Ø.03F 1390.Ø.03FP	1380.Ø.03F
7	Short mounting foot brackets (in sheet metal MS1)	/	1320.Ø.05/1F
8	Standard mounting foot brackets	1320.Ø.05F	/
9	Front clevis	1380.Ø.08F	1320.Ø.19F
10	Rear narrow clevis (AB6)	1380.Ø.30F	1320.Ø.29F
11	Rear male clevis (with jointed head according to DIN 648K standard)	1380.Ø.15F	1320.Ø.25F
12	Rear female clevis (MP2)	1380.Ø.09F	1320.Ø.20F
13	Rear male clevis (MP4)	1380.Ø.09/1F	1320.Ø.21F
14	Complete square angle trunnion (pos.10 + pos.15)	/	1320.Ø.27F
15	Simple square counter clevis (pos.14)	/	1320.Ø.28F
16	Square angle trunnion with jointed head (pos.10 + pos.11)	1380.Ø.36F	1320.Ø.26F
17	Square angle trunnion (AB7) (pos.18 + pos.12)	1380.Ø.35F	1320.Ø.23F
18	Simple square counter clevis (pos.17)	1320.Ø.11/2F	1320.Ø.24F
19	Simple rear trunnion with support brackets (pos.20 + pos.12)	1380.Ø.11F	/
20	Simple square counter clevis (pos.19)	1320.Ø.11/1F	/
21	Standard trunnion	1380.Ø.10F	/
22	Standard complete trunnion (pos.12 + pos.13)	1380.Ø.22F	1320.Ø.22F
23	1319 - 1321 cylinders series Intermediate trunnion	1320.Ø.12BF	1320.Ø.12F
24	1386 - 1388 / 1396 - 1398 EcoPlus series Intermediate trunnion	/	1386.Ø.12F
25	1390 - 1392 Ecolight series Intermediate trunnion	1390.Ø.12F	/

► **Front and rear flanges (MF1 - Mf2)**

Ordering code		
Steel	:	<b>1380.Ø.03F</b> (Ø32 ... Ø200)
Aluminium	:	<b>1390.Ø.03F</b> (Ø32 ... Ø100)
Die-casting aluminium	:	<b>1390.Ø.03FP</b> (Ø32 ... Ø100)

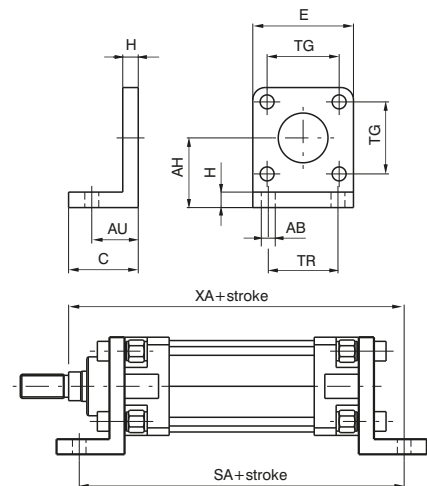
Plate which allows anchorage of the cylinder at a right angle to the plane. It is made of zinc-plated extruded steel.



Bore	E	FB (H 13)	MF (JS 14)	R (JS 14)	TF (JS 14)	TG	UF	ZF	W	L2	S5	Weight(g) steel	Weight(g) aluminium	Weight(g) Die-casting aluminium
32	45	7	10	32	64	32,5	80	130	16	5	6,6	190	65	60
40	52	9	10	36	72	38	90	145	20	5	6,6	250	90	69
50	65	9	12	45	90	46,5	110	155	25	6,5	9	480	170	130
63	75	9	12	50	100	56,5	120	170	25	6,5	9	620	220	170
80	95	12	16	63	126	72	150	190	30	8	11	1430	500	345
100	115	14	16	75	150	89	170	205	35	8	11	1990	690	485
125	140	16	20	90	180	110	205	245	45	10,5	14	3750	/	/
160	180	18	20	115	230	140	260	280	60	9,5	18	6350	/	/
200	220	22	25	135	270	175	300	300	70	12,5	18	11350	/	/

► **Standard mounting foot brackets**

Ordering code	
Aluminium:	<b>1320.Ø.05F</b> (1 piece)

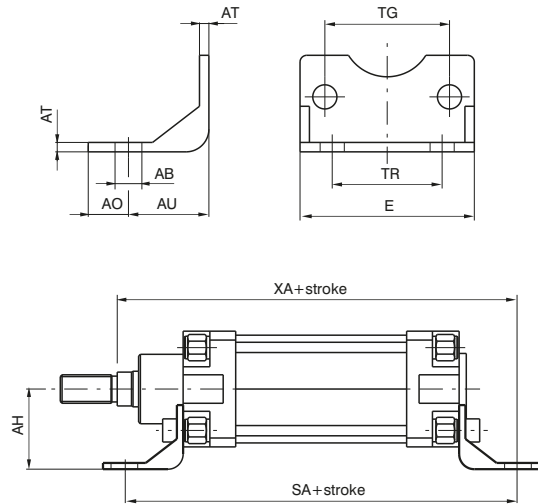


Elements used to anchor the cylinder parallel to the mounting plane. They are made of cast aluminium, painted black.

Bore	32	40	50	63	80	100	125	160	200
AB (H 14)	7	9	9	9	12	14	16	18	22
AH (JS 15)	32	36	45	50	63	71	91	115	135
AU (±0,2)	24	28	32	32	41	41	45	60	70
C	35	35	45	45	55	56	68	82	90
E	45	52	65	75	95	115	140	180	220
H	8	8	10	10	12	12	16	20	20
SA	142	161	170	185	210	220	250	300	320
TG	32,5	38	46,5	56,5	72	89	110	140	175
TR (JS 14)	32	36	45	50	63	75	90	115	135
XA	144	163	175	190	215	230	270	320	345
Weight gr.	45	65	140	175	380	470	920	2300	3200

Short mounting foot brackets (in sheet metal MS1)

Ordering code
Steel: <b>1320.Ø.05/1F</b> (1 piece)

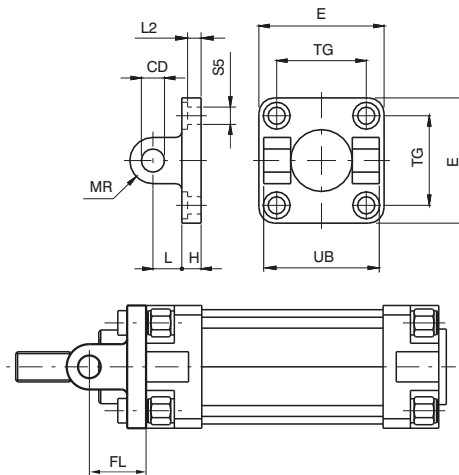


Elements used to anchor the cylinder parallel to the mounting plane. They are made of steel, and painted black.

Bore	32	40	50	63	80	100	125	160	200
AB (H 14)	7	9	9	9	12	14	16	18	22
AH (JS 15)	32	36	45	50	63	71	90	115	135
AU (± 0.2)	24	28	32	32	41	41	45	60	70
AO (± 0.2)	11	8	15	13	14	16	25	15	30
E	45	52	65	75	95	115	140	180	220
AT	4	4	5	5	6	6	8	9	12
SA	142	161	170	185	210	220	250	300	320
TG	32,5	38	46,5	56,5	72	89	110	140	175
TR (JS 14)	32	36	45	50	63	75	90	115	135
XA	144	163	175	190	215	230	270	320	345
Weight g	65	80	170	190	380	452	1090	1190	3450

Front clevis (not specified by ISO-VDMA standards)

Ordering code
Aluminium: <b>1380.Ø.08F</b>
Steel: <b>1320.Ø.19F</b>



Used to mount the cylinder either parallel or at a right angle to the mounting plane; allows the cylinder to self-align under load. Made of aluminium alloy or steel (see ordering code) and painted black.

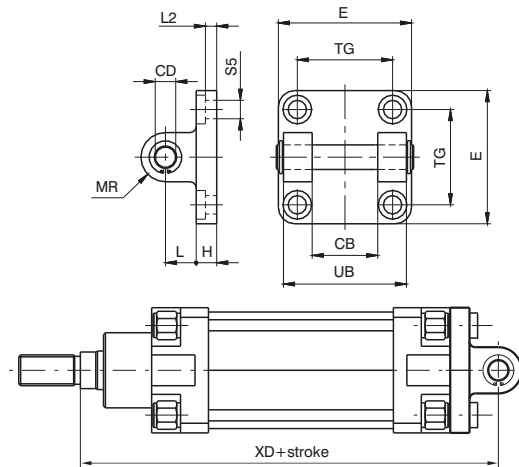
Bore	32	40	50	63	80	100	125	160	200	
CD (H9)	10	12	12	16	16	20	25	30	30	
E	Aluminium	45	52	65	75	95	115	140	180	220
	Steel	45	55	65	75	95	115	140	180	220
FL (±0,2)	22	25	27	32	36	41	50	55	60	
H	Aluminium	9	9	11	11	14	14	20	20	25
	Steel	10	10	10	12	14	16	20	20	20
L	Aluminium	13	16	16	21	22	27	30	35	35
	Steel	12	15	17	20	22	25	30	35	40
MR	10	12	12	16	16	20	25	25	25	
TG	32,5	38	46,5	56,5	72	89	110	140	175	
UB (h14)	45	52	60	70	90	110	130	170	170	
L2(±0,5)	5,5	5,5	6,5	6,5	10	10	10	10	11	
S5 (H13)	6,6	6,6	9	9	11	11	14	18	18	
Weight g	Aluminium	50	75	125	190	380	620	1180	1780	2900
	Steel	150	235	340	550	1010	1710	3360	5750	8960

**Rear clevis (MP2)**

Ordering code  
Aluminium: **1380.Ø.09F**  
Steel: **1320.Ø.20F**



Similar to type 08 but includes a hinge pin. This type of mounting allows anchorage of the cylinder either parallel or right angle to plane; the cylinder rod can oscillate and self-align as necessary when under load. Made of aluminium alloy or steel (see ordering code) and painted black.



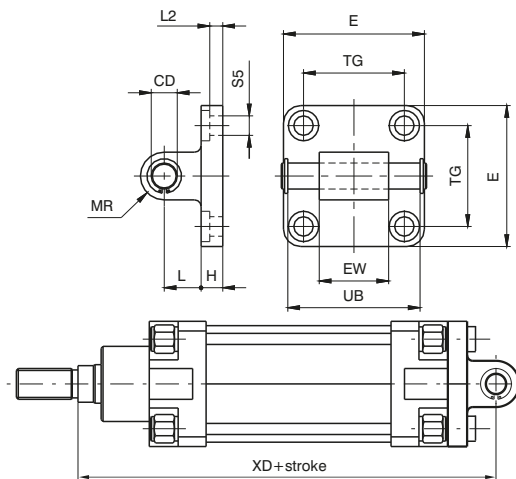
Bore		32	40	50	63	80	100	125	160	200
CB (H 14)		26	28	32	40	50	60	70	90	90
CD		10	12	12	16	16	20	25	30	30
E	Aluminium	45	52	65	75	95	115	140	180	220
	Steel	45	55	65	75	95	115	140	180	220
H	Aluminium	9	9	11	11	14	14	20	20	25
	Steel	10	10	10	12	14	16	20	20	20
L	Aluminium	13	16	16	21	22	27	30	35	35
	Steel	12	15	17	20	22	25	30	35	40
MR		10	12	12	16	16	20	25	25	25
TG		32,5	38	46,5	56,5	72	89	110	140	175
UB (h14)		45	52	60	70	90	110	130	170	170
XD		142	160	170	190	210	230	275	315	335
L2(±0,5)		5,5	5,5	6,5	6,5	10	10	10	10	11
S5		6,6	6,6	9	9	11	11	14	18	18
Weight	Aluminium	80	130	185	310	530	910	1710	2760	3820
	Steel	180	290	400	670	1160	2000	3890	6730	9880

**Rear male clevis (MP4)**

Ordering code  
Aluminium: **1380.Ø.09/1F**  
Steel: **1320.Ø.21F**



Similar to 09 clevis except for the connection, which is male rather than female. Used to mount the cylinder either parallel or at a right angle to the plane; the cylinder rod can oscillate and self-align as necessary when under load. Made of aluminium alloy or steel (see ordering code) and painted black.

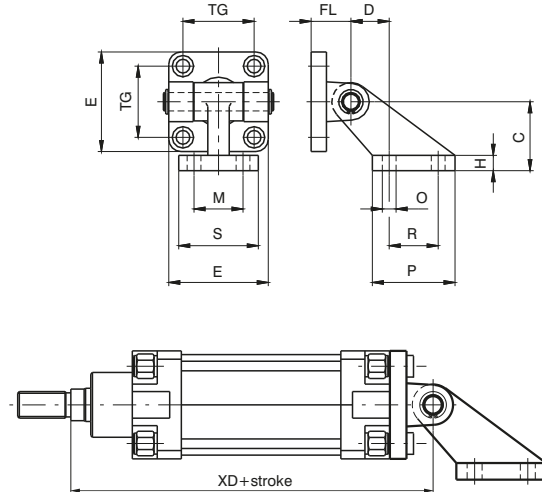


Bore		32	40	50	63	80	100	125	160	200
CD		10	12	12	16	16	20	25	30	30
E	Aluminium	45	52	65	75	95	115	140	180	220
	Steel	45	55	65	75	95	115	140	180	220
EW		26 <sup>(-0,2/-0,6)</sup>	28 <sup>(-0,2/-0,6)</sup>	32 <sup>(-0,2/-0,6)</sup>	40 <sup>(-0,2/-0,6)</sup>	50 <sup>(-0,2/-0,6)</sup>	60 <sup>(-0,2/-0,6)</sup>	70 <sup>(-0,5/-1,2)</sup>	90 <sup>(-0,5/-1,2)</sup>	90 <sup>(-0,5/-1,2)</sup>
	Aluminium	9	9	11	11	14	14	20	20	25
H	Steel	10	10	10	12	14	16	20	20	20
	Aluminium	13	16	16	21	22	27	30	35	35
L	Steel	12	15	17	20	22	25	30	35	40
	Aluminium	10	12	12	16	16	20	25	25	25
MR		10	12	12	16	16	20	25	25	25
TG		32,5	38	46,5	56,5	72	89	110	140	175
UB (h14)		46	53	61	71	91	111	132	171,5	171,5
XD		142	160	170	190	210	230	275	315	335
L2 (±0.5)		5,5	5,5	6,5	6,5	10	10	10	10	11
S5		6,6	6,6	9	9	11	11	14	18	18
Weight	Aluminium	90	130	190	340	580	960	1890	2830	3940
	Steel	210	330	430	810	1350	2400	4300	6880	8560

**Simple rear trunnion with support brackets (not specified by ISO-VDMA standards)**

Ordering code

Aluminium: **1380.Ø.11F**  
 Counter clevis can be ordered separately with code 1320.Ø.11/1F



Bore	32	40	50	63	80	100	125	160	200
C (±0,2)	32	45	45	63	63	90	90	140	140
D (±0,5)	18	25	25	32	32	40	40	50	50
E	45	52	65	75	95	115	140	180	220
H	8	10	10	12	12	17	17	20	20
FL	22	25	27	32	36	41	50	55	60
M (JS 14)	25	32	32	40	40	50	50	63	63
TG	32,5	38	46,5	56,5	72	89	110	140	175
O (H 13)	7	9	9	11	11	14	14	18	18
P	37	54	54	75	75	103	103	154	154
R (JS 14)	20	32	32	50	50	70	70	110	110
S	41	52	52	63	63	80	80	110	110
XD	142	160	170	190	210	230	275	315	335
Weight g	130	260	330	600	820	1560	2530	4735	5795

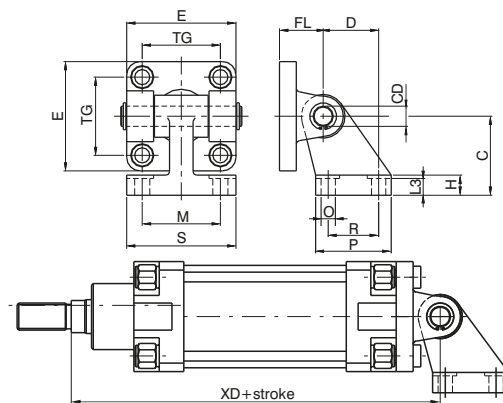
Used to mount cylinders parallel to the plane to which the counter clevis is attached. Allows self-alignment of the cylinder rod under load with an oscillation up to 90 degrees from the mounting plane.

**Square angle trunnion**

Ordering code

Aluminium: **1380.Ø.35F**  
 Counter clevis can be ordered separately with code 1320.Ø.11/2F

Steel: **1320.Ø.23F (Ø32-Ø100)**  
 Counter clevis can be ordered separately with code 1320.Ø.24F



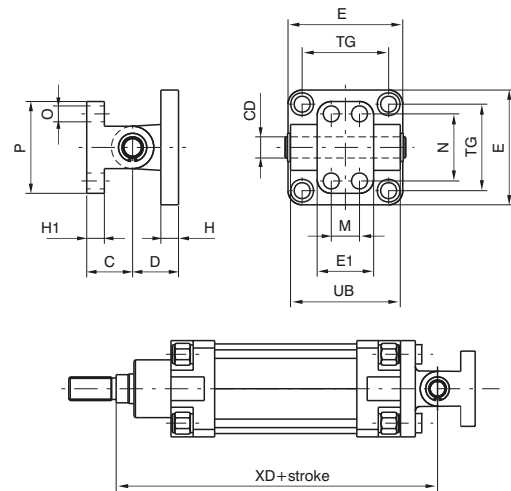
Bore		32	40	50	63	80	100	125	160	200
E	Aluminium	45	52	65	75	95	115	140	180	220
	Steel	45	55	65	75	95	115	140	180	220
TG		32,5	38	46,5	56,5	72	89	110	140	175
FL		22	25	27	32	36	41	50	55	60
D (JS14)		21	24	33	37	47	55	70	97	105
CD		10	12	12	16	16	20	25	30	30
C (JS15)		32	36	45	50	63	71	90	115	135
H	Aluminium	8	10	12	14	14	17	20	25	30
	Steel	8	10	12	12	14	15	/	/	/
L3	Aluminium	6,4	8,4	10,4	12,4	11,5	14,5	16,8	21	26
	Steel	6,5	8,5	10,5	10,5	11,5	12,5	/	/	/
R (JS14)		18	22	30	35	40	50	60	88	90
P		31	35	45	50	60	70	90	126	130
O (H13)		6,6	6,6	9	9	11	11	14	14	18
S		51	54	65	67	86	96	124	156	162
M (JS14)		38	41	50	52	66	76	94	118	122
XD		142	160	170	190	210	230	275	315	335
Weight g	Aluminium	120	180	225	435	730	1220	2325	3780	4950
	Steel	340	500	640	1250	2100	3500	/	/	/

► **Standard trunnion (not specified by ISO-VDMA standards)**

Ordering code
Aluminium: <b>1380.Ø.10F</b>



Mounting consists of clevis 09 and counter clevis. Used to mount cylinders at a right angle to the plane to which the counter clevis is attached. Allows self-alignment of the cylinder rod under load with an oscillation of  $\pm 60$  degrees.



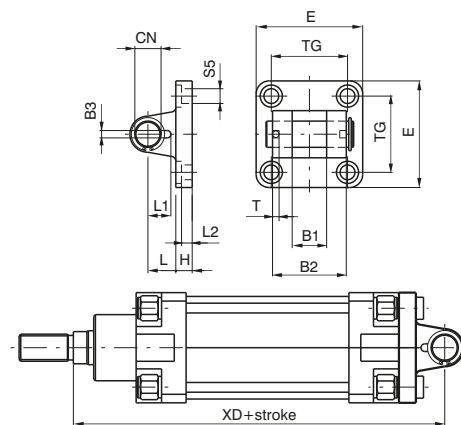
Bore	32	40	50	63	80	100	125	160	200
C ( $\pm 0.2$ )	18	26	26	34	34	41	41	55	55
CD	10	12	12	16	16	20	25	30	30
D	22	25	27	32	36	41	50	55	60
E	45	52	65	75	95	115	140	180	220
E1	25	32	32	46	46	56	56	71	71
H	10	10	12	12	16	16	20	20	25
H1	8	10	10	12	12	16	16	20	20
M ( $\pm 0.2$ )	-	16	16	25	25	32	32	43	43
N ( $\pm 0.2$ )	28	38	38	54	54	90	90	150	150
O	7	9	9	11	11	14	14	18	18
P	40	52	52	75	75	115	115	180	180
TG	32.5	38	46.5	56.5	72	89	110	140	175
UB	45	52	60	70	90	110	130	170	170
XD	142	160	170	190	210	230	275	315	335
Weight g	110	190	240	490	710	1290	2090	3690	4810

► **Rear narrow clevis**

Ordering code
Aluminium: <b>1380.Ø.30F</b>
Steel: <b>1320.Ø.29F</b> ( $\varnothing 32 \dots \varnothing 125$ )



Utilised with clevis 15F allows the cylinder to oscillate in all directions. Made of aluminium alloy or steel (see ordering code) and painted black.



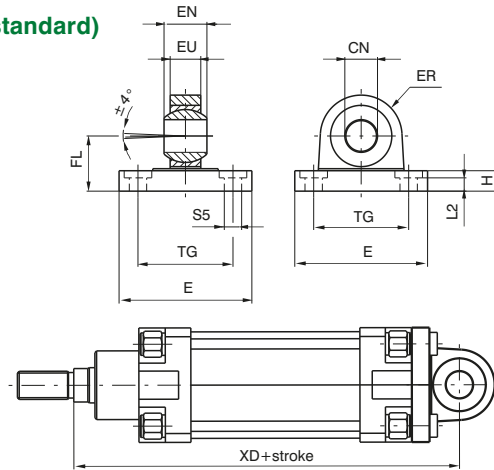
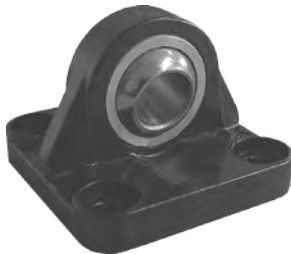
Bore	32	40	50	63	80	100	125	160	200
B1 (H 14)	14	16	21	21	25	25	37	43	43
B2 (d 12)	34	40	45	51	65	75	97	122	122
B3 ( $\pm 0.2$ )	3,3	4,3	4,3	4,3	4,3	6,3	6,3	6,3	6,3
CN	10	12	16	16	20	20	30	35	35
E	Aluminium	45	52	65	75	95	115	140	220
	Steel	45	55	65	75	95	115	140	220
H	Aluminium	9	9	11	11	14	14	20	25
	Steel	10	10	10	12	14	16	/	/
L	Aluminium	13	16	16	21	22	27	30	35
	Steel	12	15	17	20	22	25	/	/
L1	11,5	12	14	14	16	16	24	26,5	26,5
L2 ( $\pm 0,5$ )	5,5	5,5	6,5	6,5	10	10	10	10	11
S5	6,6	6,6	9	9	11	11	14	18	18
T	3	4	4	4	4	4	6	6	6
TG	32,5	38	46,5	56,5	72	89	110	140	175
XD	142	160	170	190	210	230	275	315	335
Weight g	Aluminium	70	115	200	290	570	820	1710	4380
	Steel	160	270	370	670	1110	2100	4150	/



**Rear male clevis (with jointed head according to DIN 648K standard)**

Ordering code

Aluminium: **1380.Ø.15F**  
 Steel: **1320.Ø.25F** (Ø32 ... Ø125)



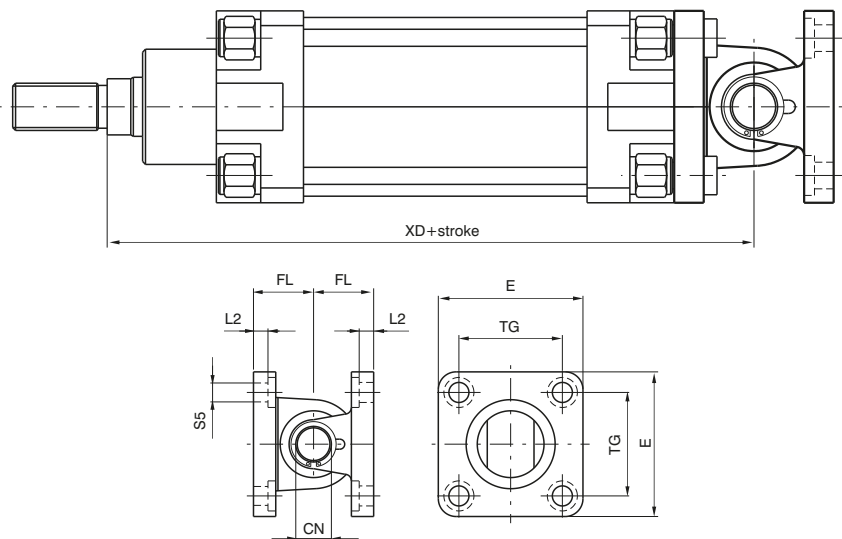
Bore		32	40	50	63	80	100	125	160	200
CN (H 7)		10	12	16	16	20	20	30	35	35
E	Aluminium	45	52	65	75	95	115	140	180	220
	Steel	45	55	65	75	95	115	140	180	220
EN (-0.1)		14	16	21	21	25	25	37	43	43
ER	Aluminium	16	19	21	24	28.5	30	40	45	48
	Steel	15	18	20	23	27	30	40	/	/
EU		10.5	12	15	15	18	18	25	28	28
FL (JS 15)		22	25	27	32	36	41	50	55	60
H	Aluminium	9	9	11	11	14	14	20	20	25
	Steel	10	10	10	12	14	16	20	/	/
L2 (±0.5)		5.5	5.5	6.5	6.5	10	10	10	10	11
S5		6.6	6.6	9	9	11	11	14	18	18
TG		32.5	38	46.5	56.5	72	89	110	140	175
XD		142	160	170	190	210	230	275	315	335
Weight g	Aluminium	60	100	180	245	480	650	1410	2420	3840
	Steel	210	310	400	710	1350	2400	4000	/	/

Utilised with clevis 30F allows the cylinder to oscillate in all directions. Made of aluminium alloy or steel (see ordering code) and painted black.

**Complete standard trunnion (with jointed head according to DIN 648K standards)**

Ordering code

Aluminium: **1380.Ø.36F**  
 Counter clevis can be ordered separately with code 1380.Ø.15F  
 Steel: **1320.Ø.26F** (Ø32-Ø125)  
 Counter clevis can be ordered separately with code 1320.Ø.25F



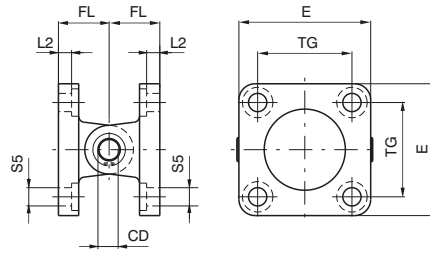
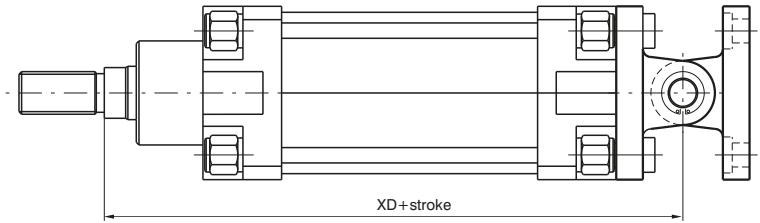
Bore		32	40	50	63	80	100	125	160	200
CN		10	12	16	16	20	20	30	35	35
E	Aluminium	45	52	65	75	95	115	140	180	220
	Steel	45	55	65	75	95	115	140	180	220
FL (JS 15)		22	25	27	32	36	41	50	55	60
L 2 (±0.5)		5.5	5.5	6.5	6.5	10	10	10	10	11
S5		6.6	6.6	9	9	11	11	14	18	18
TG		32.5	38	46.5	56.5	72	89	110	140	175
XD		142	160	170	190	210	230	275	315	335
Weight g	Aluminium	130	215	380	535	1050	1470	3120	5430	8220
	Steel	380	580	770	1380	2460	4500	8150	/	/

► **Standard complete trunnion**

Ordering code

Aluminium: **1380.Ø.22F**  
Mounting consists of rear clevis code 1380.Ø.09F  
+ rear male clevis code 1380.Ø.09/1F  
(ordering separately)

Steel: **1320.Ø.22F**  
Mounting consists of rear clevis code 1320.Ø.20F  
+ rear male clevis code 1320.Ø.21F  
(ordering separately)

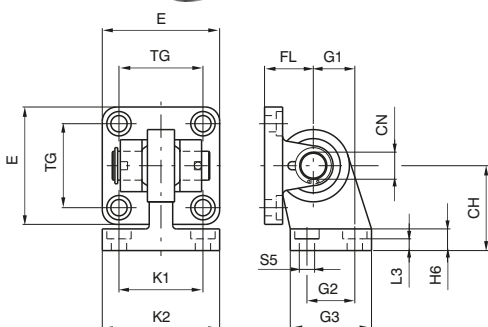
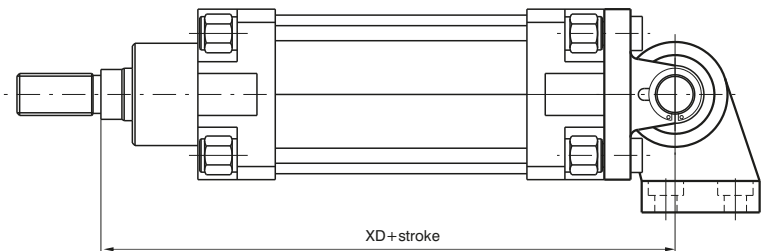


Bore	32	40	50	63	80	100	125	160	200
CD	10	12	12	16	16	20	25	30	30
E	45	55	65	75	95	115	140	180	220
FL	22	25	27	32	36	41	50	55	60
L 2 (±0.5)	5,5	5,5	6,5	6,5	10	10	10	10	11
S 5	6,6	6,6	9	9	11	11	14	18	18
TG	32,5	38	46,5	56,5	72	89	110	140	175
XD	142	160	170	190	210	230	275	315	335
Weight g	360	580	780	1370	2370	4110	7670	12650	17480

► **Complete square angle trunnion (with joined head according to DIN 648K standards)**

Ordering code

Steel: **1320.Ø.27F**  
Mounting consists of  
rear clevis narrow code 1320.Ø.29F  
+ simple counter clevis code 1320.Ø.28F  
(ordering separately)

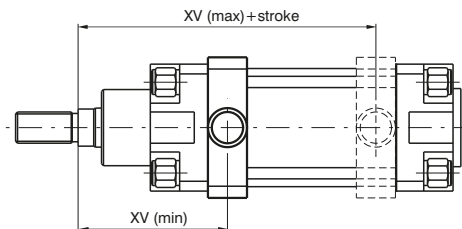
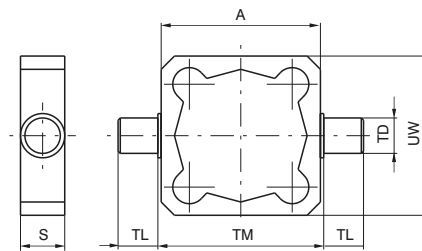
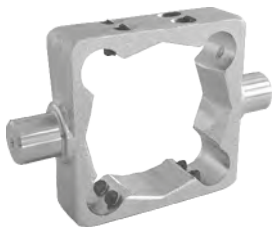


Bore	32	40	50	63	80	100	125
CH (JS 15)	32	36	45	50	63	71	90
CN	10	12	16	16	20	20	30
E	45	55	65	75	95	115	140
FL (JS 15)	22	25	27	32	36	41	50
G1 (JS 15)	21	24	33	37	47	55	70
G2 (JS 14)	18	22	30	35	40	50	60
G3	31	35	45	50	60	70	90
H6	10	10	12	12	14	15	20
K1 (JS 14)	38	41	50	52	66	76	94
K2	51	54	65	67	86	96	124
L3 (*0.5)	8,5	8,5	10,5	10,5	11,5	12,5	17
S5	6,6	6,6	9	9	11	11	14
TG	32,5	38	46,5	56,5	72	89	110
XD	142	160	170	190	210	230	275
Weight g	330	480	830	1220	2100	3580	7000

Intermediate trunnion Series 1319 - 1321

Ordering code

Steel: 1320.Ø.12F



Clevis to be mounted on the barrel to have the centre of rotation of the hinge pin at a point between the end caps of the cylinder. It is attached to the barrel by means of eight pointed grains that block in the "V" groove of the four protruding shapes. In the case of anchorage subject to heavy use, it is recommended to connect the clevis once the right position has been found.

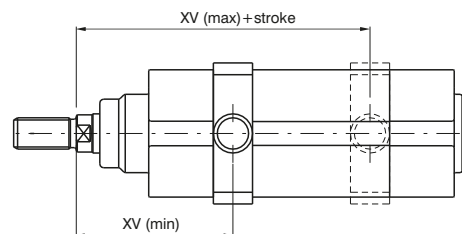
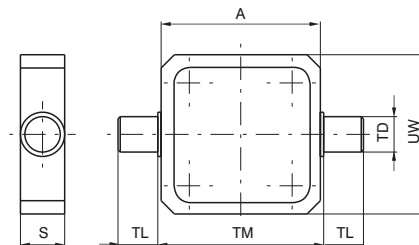
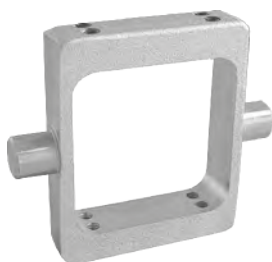
**Attention:** mounting of the clevis with contact to the end plates does not allow the use of the magnetic sensors as the switch limits.

Bore	32	40	50	63	80	100	125	160	200
A	49	62	73	87	109	130	155	190	240
S	18	21	21	27	27	32	32	40	40
TD (e9)	12	16	16	20	20	25	25	32	32
TL (h14)	12	16	16	20	20	25	25	32	32
TM (h14)	50	63	75	90	110	132	160	200	250
UW	59	62	73	87	109	130	155	190	240
XV (max.)	85	96	102	109	123.5	131.5	162	193	204
XV (min.)	61	69	78	86	96.5	108.5	128	150	168
Weight g	180	270	330	650	890	1550	1950	3580	5850

Intermediate trunnion Series 1386 - 1388 - 1396 - 1398

Ordering code

Steel: 1386.Ø.12F



Clevis to be mounted on the barrel to have the centre of rotation of the hinge pin at a point between the end caps of the cylinder. It is attached to the barrel by means of eight pointed grains. In the case of anchorage subject to heavy use, it is recommended to connect the clevis once the right position has been found.

**Attention:** mounting of the clevis with contact to the end plates does not allow the use of the magnetic sensors as the switch limits.

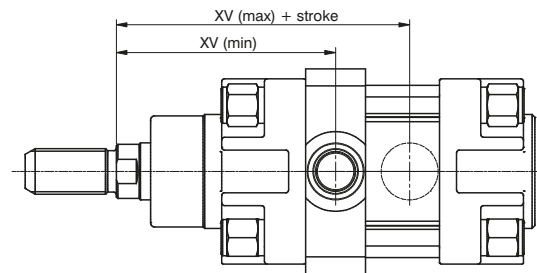
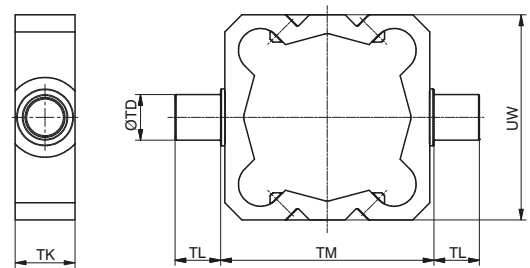
Bore	32	40	50	63	80	100
A	49.8	62.6	74.1	89.1	109.1	130.1
S	18	21	21	27	27	30
TD (e 9)	12	16	16	20	20	25
TL (h 14)	12	16	16	20	20	25
TM (h 14)	50	63	75	90	110	132
UW	70	78	91	94	130	145
XV (max.)	80	91.5	97.5	106.5	118.5	127
XV (min.)	66	73.5	82.5	88.5	101.5	113
Weight g	195	350	430	565	1035	1450

► Intermediate trunnion Series 1319 - 1321

Ordering code
<b>1320.Ø.12BF</b> (Aluminium with steel bushes)



**Aluminium Intermediate Trunnion with steel bushes** to be mounted on the barrel. This solution allows the cylinder to rotate around the hinge which can be mounted in any position between the end caps. It is attached to the barrel by means of 8 grub screws which secure the Trunnion to the extruded barrel. In the case of heavy duty applications it is recommended that the Trunnion is secured using expansion pins.  
In case off applications with high speed, high load and high pressure please contact our technical office.  
**Please note:** If the Trunnion is mounted in direct contact with the cylinder end cap, it will not be possible to fit magnetic sensors at the end of stroke.



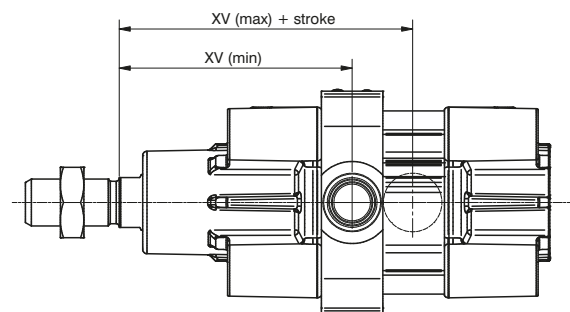
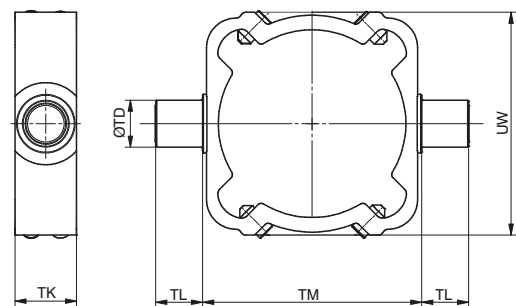
Bore	32	40	50	63	80	100
TD	Ø12	Ø16	Ø16	Ø20	Ø20	Ø25
TL	12	16	16	20	20	25
TM	50	63	75	90	110	132
TK	18	21	21	27	27	32
UW	54	60	72	87	109	130
XV min.	61	69	78	86	96.5	108.5
XV max.	85	96	102	109	123.5	131.5
Weight g	70	110	140	280	370	630

► Intermediate trunnion Series 1390 - 1392

Ordering code
<b>1390.Ø.12F</b> (Aluminium with steel bushes)



**Aluminium Intermediate Trunnion with steel bushes** to be mounted on the barrel. This solution allows the cylinder to rotate around the hinge which can be mounted in any position between the end caps. It is attached to the barrel by means of 8 grub screws which secure the Trunnion to the extruded barrel. In the case of heavy duty applications it is recommended that the Trunnion is secured using expansion pins.  
In case off applications with high speed, high load and high pressure please contact our technical office.  
**Please note:** If the Trunnion is mounted in direct contact with the cylinder end cap, it will not be possible to fit magnetic sensors at the end of stroke 1500\_., RS\_., HS\_ series.



Bore	32	40	50	63	80	100
TD	Ø12	Ø16	Ø16	Ø20	Ø20	Ø25
TL	12	16	16	20	20	25
TM	53*	63	75	90	110	132
TK	18	21	21	27	27	32
UW	56	64	76	92	112	134
XV min.	65	74	80	87	99	109
XV max.	81	91	100	108	121	130.5
Weight g	60	100	125	240	320	540

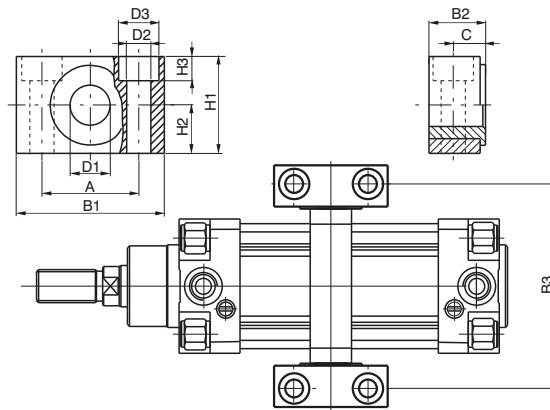
\* (Ø32, TM: not according to standard ISO 15552)

3 PNEUMATIC ACTUATION

Support for intermediate trunnion

Ordering code

**1320.Ø.12/1F**  
(1 piece)



Combining two supports to the intermediate trunnion it is possible to fix the cylinder on plane surface.

Bore	32	40	50	63	80	100	125	160	200
A (±0.2)	32	36	36	42	42	50	50	60	60
B1	46	55	55	65	65	75	75	92	92
B2	18	21	21	23	23	28.5	28.5	40	40
B3	71	87	99	116	136	164	192	245	295
C	10.5	12	12	13	13	16	16	22.5	22.5
D1 (F7)	12	16	16	20	20	25	25	32	32
D2	6.6	9	9	11	11	14	14	18	18
D3	11	15	15	18	18	20	20	26	26
H1	30	36	36	40	40	50	50	60	60
H2 (±0.1)	15	18	18	20	20	25	25	30	30
H3	7	9	9	11	11	13	13	17	17
Weight g (1 piece)	100	150	150	235	235	435	435	850	850

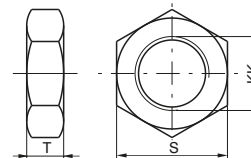
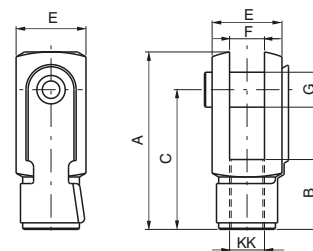
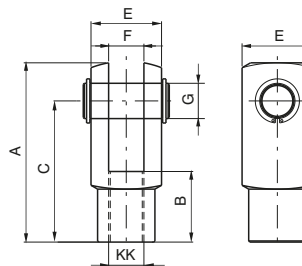
Rod forks and nuts

Ordering code

**1320.Ø.13F**

**1320.Ø.13/1F**  
(from ø32 to ø100)

**1320.Ø.18F**



Bore	32	40	50	63	80	100	125	160	200	
A	52	62	83	83	105	105	148	188	188	
B	20	24	32	32	40	40	56	72	72	
C	40	48	64	64	80	80	110	144	144	
E	20	24	32	32	40	40	55	70	70	
F(B12)	10	12	16	16	20	20	30	35	35	
G	10	12	16	16	20	20	30	35	35	
S	17	19	24	24	30	30	41	55	55	
T	6	7	8	8	9	9	12	18	18	
KK	M10X1.25		M12X1.25	M16X1.5	M16X1.5	M20X1.5	M20X1.5	M27X2	M36X2	M36X2
Weight	forks	100	140	340	340	680	680	2500	4000	4000
g	nut	15	20	20	20	40	40	100	210	210

Fork:

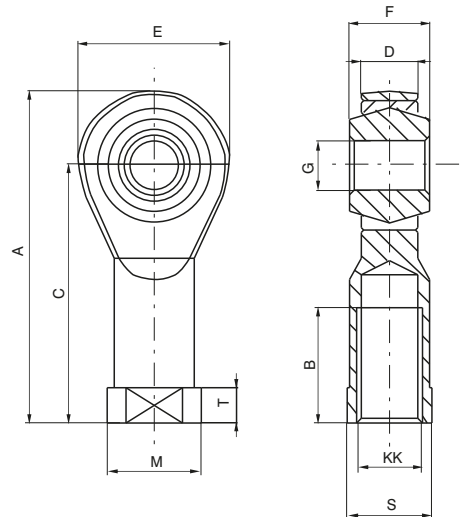
Element that when screwed to the rod consents a regular functioning even when there are significant lateral forces as the connection point. Made of zinc-plated steel.

Nut:

Used to block the position of the fork.

► **Ball joint**

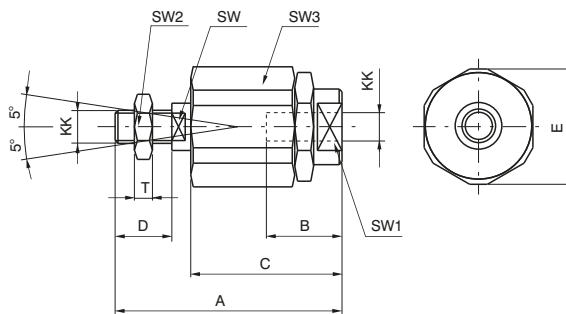
Ordering code
<b>1320.Ø.32F</b>



Bore	32	40	50	63	80	100	125	160	200
A	57	66	85	85	102	102	145	165	165
B	20	22	28	28	33	33	51	56	56
C	43	50	64	64	77	77	110	125	125
D (-0.1)	10.5	12	15	15	18	18	25	28	28
E	28	32	42	42	50	50	70	80	80
F	14	16	21	21	25	25	37	43	43
G (H 7)	10	12	16	16	20	20	30	35	35
KK	M10x1.25	M12x1.25	M16x1.5	M16x1.5	M20x1.5	M20x1.5	M27x2	M36x2	M36x2
M	19	22	27	27	34	34	50	58	58
S	17	19	22	22	30	30	41	50	50
T	6.5	6.5	8	8	10	10	15	17	17
Weight g	76	110	220	220	410	410	1200	1600	1600

► **Self-aligning joint**

Ordering code
<b>1320.Ø.33F</b>



Bore	32	40	50	63	80	100
A	71	75	103	103	119	119
B	20	20	32	32	40	40
C	46	46	63	63	71	71
D	20	24	32	32	40	40
E	32	32	45	45	45	45
KK	M10x1.25	M12x1.25	M16x1.5	M16x1.5	M20x1.5	M20x1.5
SW	12	12	20	20	20	20
SW1	19	19	27	27	27	27
SW2	17	19	24	24	30	30
SW3	30	30	41	41	41	41
T	6	7	8	8	9	9
Weight g	220	230	660	660	700	700



## Series 1315, Round tube with tie rod cylinders - Ø250 / Ø320

### General

Tie rod cylinders, according to standard ISO15552.

### Construction characteristics

End caps	aluminium alloy casting
Rod	C43 chromed steel
Barrel	oxidised aluminium
Tie rod	steel with rolled threads
Cushion bushings	aluminium
Rod-guide bushing	sintered bronze
Piston	aluminium
Seals	Standard: NBR oil resistant rubber, PUR piston rod seals

### Operational characteristics

Fluid	filtered and lubricated air - hydraulic oil (with special bushing)
Pressure	max. 12 bar
Operating temperature	-5 °C - +70 °C
Cushioning length	50 mm

Please follow the suggestions below to ensure a long life for these cylinders:

- use clean and lubricated air
- correct alignment during assembly with regard to the applied load so as to avoid radial components or bending the rod.
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device);
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.)

**Please note: air must be dried for applications with lower temperature.**

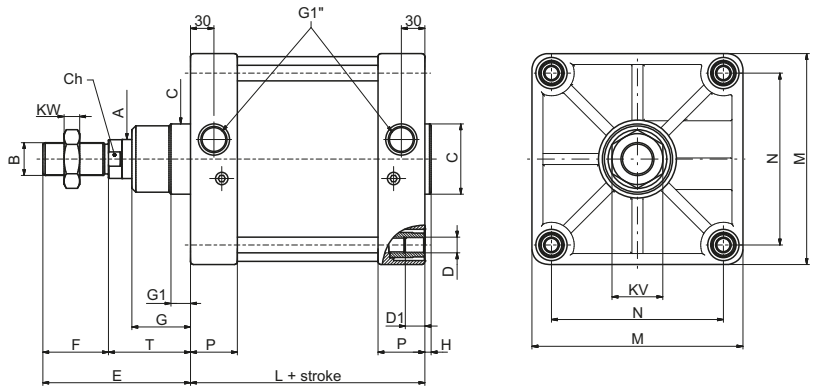
Use hydraulic oils H class (ISO VG32) for correct continued lubrication.

Our Technical Department will be glad to help.



Basic version

Ordering code	
<b>1315.Ø.stroke.01A</b>	
magnetic, aluminium barrel	
<b>BORE</b>	
Ø	250 = 250 mm
	320 = 320 mm

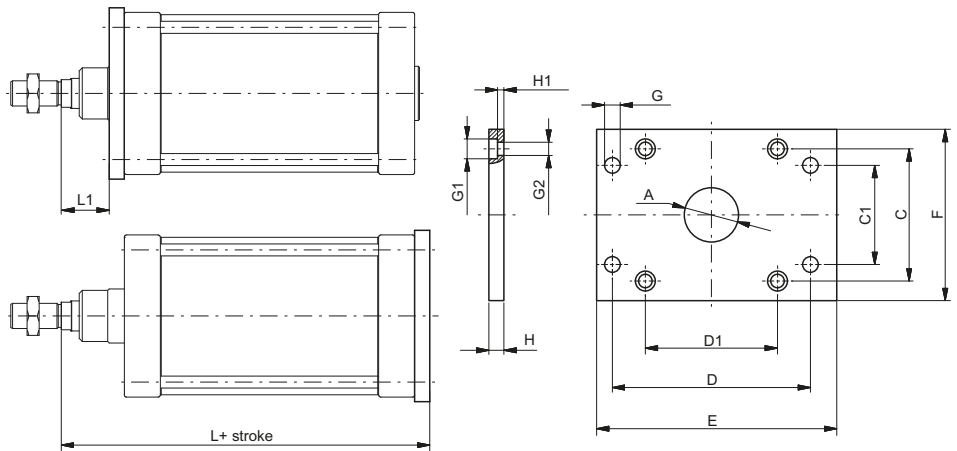


BORE	A	B	Ch	C	D	D1	E	F	G	G1	H	KW	KV	L	M	N	P	T	Weight (g)
250	Ø50	M42x2	46	Ø90	M20	25	189	84	75	25	8	21	Es64	200	270	220	60	105	28.170 (increase of 380 g each 10 mm stroke)
320	Ø63	M48x2	55	Ø110	M24	28	216	96	90	25	10	24	Es72	220	350	270	65	120	49.810 (increase of 616 g each 10 mm stroke)

Table of dimensions

Front and rear flanges

Ordering code	
<b>1315.Ø.03F</b>	
(Steel)	
<b>BORE</b>	
Ø	250 = 250 mm
	320 = 320 mm

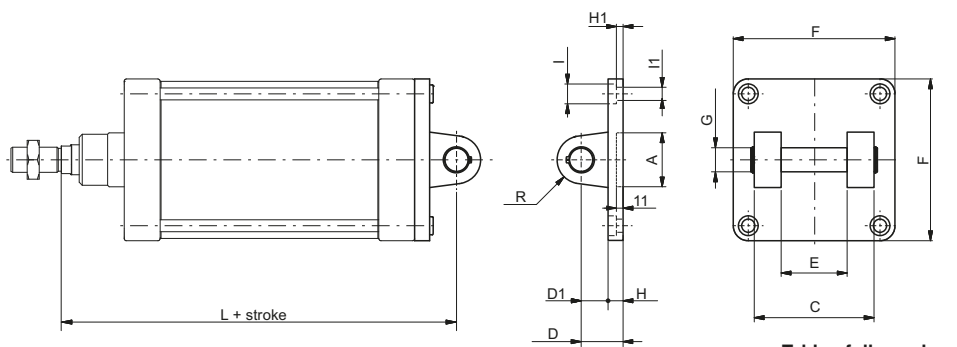


BORE	A(H11)	C	C1 (JS14)	D (JS14)	D1	E	F	G (H13)	G1 (H13)	G2 (H13)	H (±0.2)	H1 (±0.5)	L	L1	Weight (g)
250	90	220	165	330	220	400	285	26	33	22	25	10,5	330	80	20.150
320	110	270	200	400	270	470	350	33	39	26	30	15	370	90	34.000

Table of dimensions

Rear clevis

Ordering code	
<b>1315.Ø.09F</b>	
<b>BORE</b>	
Ø	250 = 250 mm
	320 = 320 mm

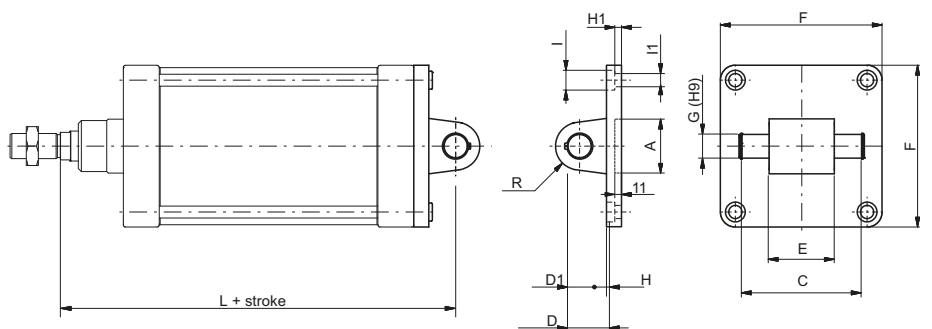


BORE	A	C (h14)	D (±0.2)	D1	E (H14)	F	G (H9)	H	H1	I	I1	L	R	Weight (g)
250	Ø90	200	70	45	110	270	40	25	11	33	22	375	40	7.800
320	Ø110	220	80	50	120	350	42,5	30	15	39	26	420	45	13.000

Table of dimensions

Rear male clevis

Ordering code	
<b>1315.Ø.09/1F</b>	
<b>BORE</b>	
Ø	250 = 250 mm
	320 = 320 mm

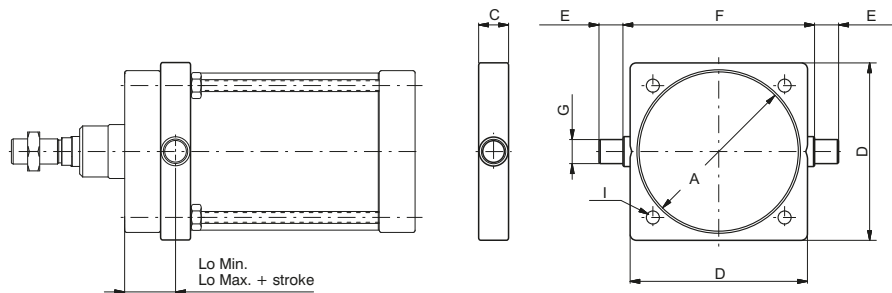


BORE	A	C (+0.3/-0)	D (±0.2)	D1	E (±0.5/-1.2)	F	G (H9)	H	H1	I	I1	L	R	Weight (g)
250	Ø90	202	70	45	110	270	40	25	11	33	22	375	40	8.300
320	Ø110	222	80	50	120	350	42,5	30	15	39	26	420	45	13.060

Table of dimensions

**Intermediate trunnion**

Ordering code	
<b>1315.Ø.12F</b>	
(Steel)	
Ø	<b>Bore</b>
	250 = 250 mm
	320 = 320 mm

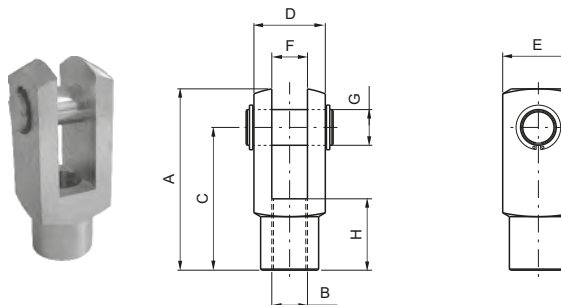


**Table of dimensions**

BORE	A	C	D	E (h14)	F (h14)	G (e9)	I	Lo Min.	Lo Max.	Weight (g)
250	Ø268	50	295	40	320	Ø40	Ø20,25	85	115 + stroke	10.500
320	Ø343	70	370	50	400	Ø50	Ø24,25	95	125 + stroke	25.300

**Fork with pin**

Ordering code	
<b>1302.Ø.13F</b>	
(Steel)	
Ø	<b>Bore</b>
	250 = 250 mm
	320 = 320 mm

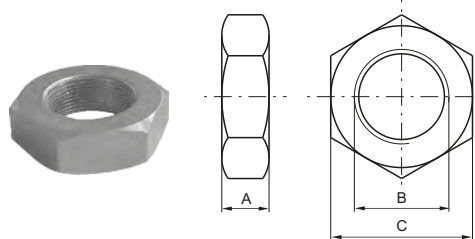


**Table of dimensions**

BORE	A	B	C	D	E	F	G	H	Weight (g)
250	188	M42x2 (H8)	144	70	70	35 (B12)	Ø35 (H9)	72	3.700
320	265	M48x2	192	96	96	50	Ø50	96	9.700

**Rod lock nut**

Ordering code	
<b>1302.Ø.18F</b>	
(Steel)	
Ø	<b>Bore</b>
	250 = 250 mm
	320 = 320 mm

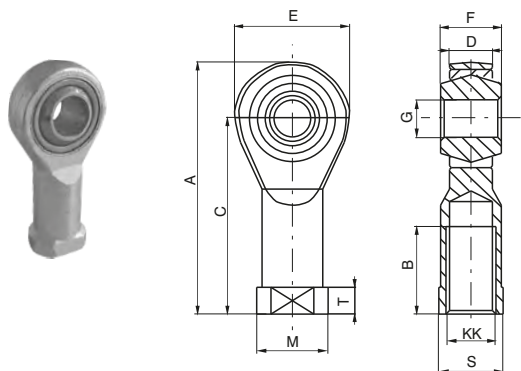


**Table of dimensions**

BORE	A	B	C	Weight (g)
250	21	M42x2	65	260
320	24	M48x2	72	580

**Ball joint**

Ordering code	
<b>1302.Ø.32F</b>	
(Steel)	
Ø	<b>Bore</b>
	250 = 250 mm
	320 = 320 mm

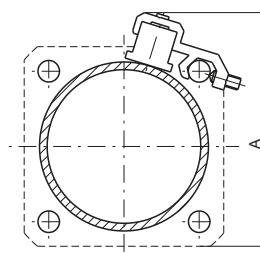


**Table of dimensions**

BORE	250	320
A	187	218
B	60	65
C	142	162
D (-0.1)	33	45
E	91	117
F	49	60
G (H 7)	40	50
KK	M42x2	M48x2
M	65	75
S	55	65
T	19	23
Weight g.	2.400	5.000

**Sensor bracket - codes 1500.\_,RS.\_,HS.\_**

Ordering code	
<b>1306.D (Ø250)</b>	
<b>1306.E (Ø320)</b>	



**Table of dimensions**

BORE	A
250	250
320	365

For technical characteristics and Sensors ordering code see "Magnetic sensors" section

3 PNEUMATIC ACTUATION



## Series AISI 316 stainless steel - Steel line

### General

The 1393-1394 stainless steel ISO 15552 cylinders series are designed for corrosion resistance application such as marine, pharmaceutical and food ambiances.

The pre lubrication grease used is NSF H1 certified for food application.

Specific care has been taken during the design stages and the result is a clean profile cylinder easy to clean and free from possible residue build-up areas.

All parts in contact with the external environment are in Stainless steel 316L and the seals are available in two different compounds for different temperature applications: PUR -30°C - +80°C and FPM -5°C - +150°C.

The range starts from 32 bore up to 100 bore, round barrel and tie rods design. Double acting version standard or with through rod, magnetic or not magnetic piston available.

The piston is aluminium and the sensor bracket, when required is in stainless steel 316.

The cylinder can be fixed via the threaded holes in the tie rod nuts or with the wide range of stainless steel accessories.

### Construction characteristics

End caps, piston rod, barrel, cushion screws	Stainless steel AISI 316
Rod-guide bushings	Stainless steel AISI 316 with P.T.F.E. coat
Half-pistons	Aluminium
Seals	PUR or FPM on request
Lubricating grease	NSF-H1 certified grease for incidental contact with food

### Operational characteristics

Fluid	Filtered air. No lubrication needed, if applied it shall be continuous.
Max. pressure	10 bar
Operating temperature	-30° C - +80°C with PUR seals -5° C - +150°C with FPM seals and non magnetic piston -5° C - +80°C with FPM seals and magnetic piston
Bore	Ø 32 - 40 - 50 - 63 - 80 - 100
Cushioning length	mm 20 - 20 - 22 - 22 - 32 - 32

Please follow the suggestions below to ensure a long life for these cylinders:

- use clean and lubricated air
- correct alignment during assembly with regard to the applied load so as to avoid radial components or bending the rod.
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device)
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.)

**Please note: air must be dried for applications with lower temperature.**

Our Technical Department will be glad to help.

### Standard strokes (for all diameters)

from 0 to 150, every 25 mm
over 150 up to 500, every 50 mm
over 500 up to 1000, every 100

### Stroke tolerance (ISO 15552)

Bore	Stroke	Tolerance
32 - 40 - 50	up to 500	+2 0
	over 500 up to 1250	+3.2 0
63 - 80 - 100	up to 500	+2.5 0
	over 500 up to 1250	+4 0

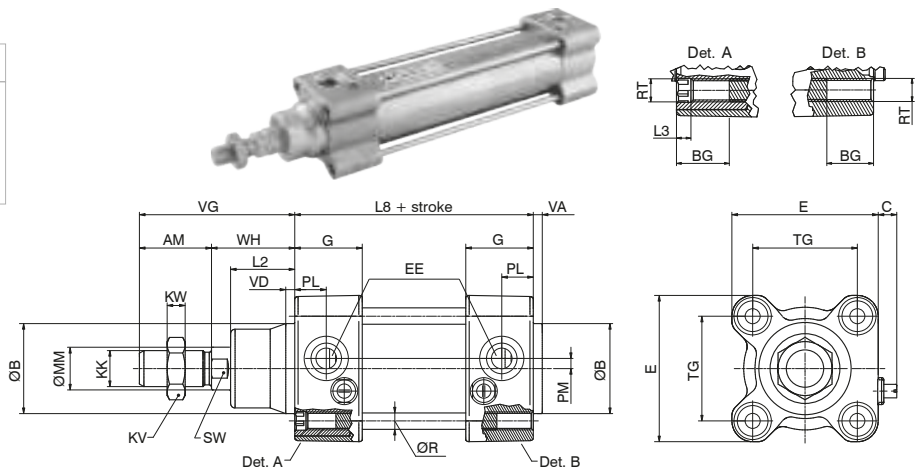
On request are available strokes up to 2800 mm

**Basic version "01"**

Ordering code

**1393.Ø.stroke.01** Magnetic  
**1394.Ø.stroke.01** Non magnetic

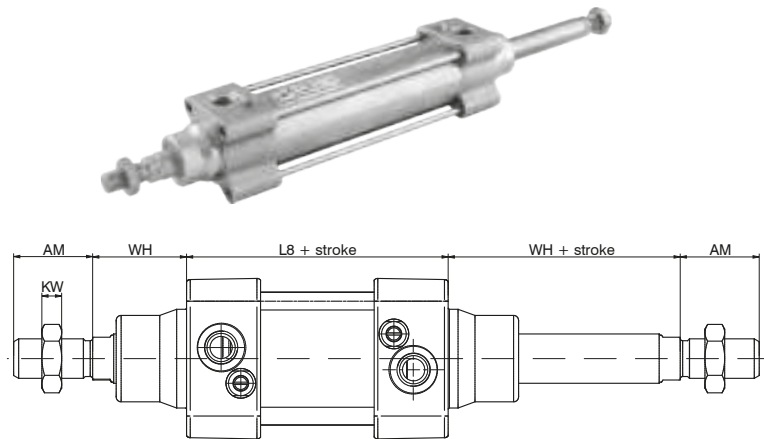
This is the configuration representing the basic cylinder according to ISO standards. It can be directly anchored on machine parts using the four threads on the end cap screws. For other applications see the pages about different types of stainless steel fixings.



**Through rod cylinder version - "02"**

Ordering code

**1393.Ø.stroke.02** Magnetic  
**1394.Ø.stroke.02** Non magnetic



**Variants**

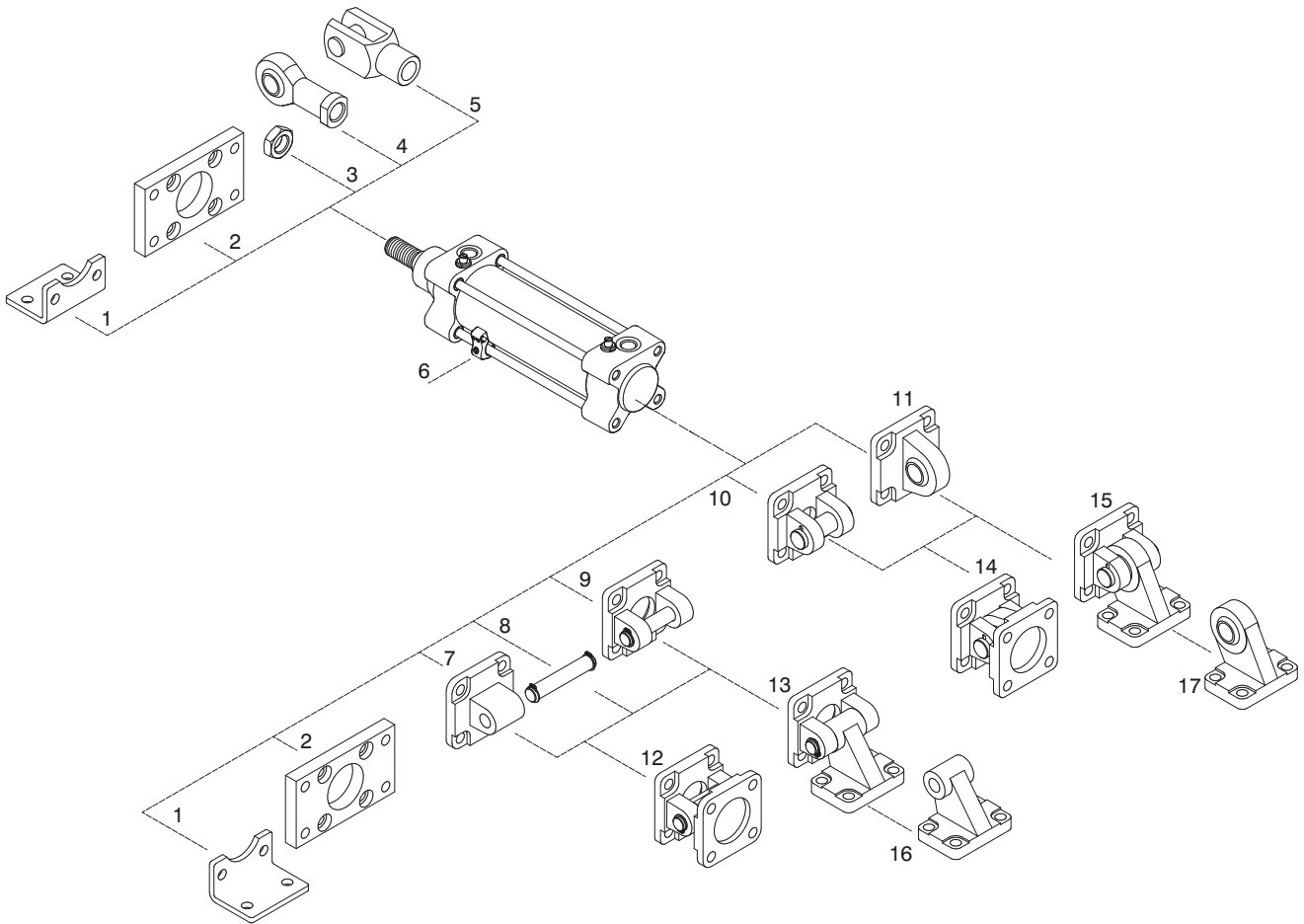
Version with FPM seals

Ordering code

**139\_(93.94) Ø.stroke.\_ \_ V**

**Table of dimensions**

Bore		32	40	50	63	80	100
AM		22	24	32	32	40	40
ØB (d 11)		30	35	40	45	45	55
BG min.		16	16	16	16	18	17
C	min.	4	4	4	4	3,5	3,5
	max.	7,5	7,5	8,5	8,5	9	9
E		47	52	65	76	95	113
EE		G1/8"	G1/4"	G1/4"	G3/8"	G3/8"	G1/2"
G		29	31	30	34	36	40,5
KK		M10X1,25	M12X1,25	M16X1,5	M16X1,5	M20x1,5	M20X1,5
KV		17	19	24	24	30	30
KW		16	7	8	8	9	9
L2		20	22	28,5	29	35	36
L3		4,5	4,5	5	5	6	6
L8		94	105	106	121	128	138
ØMM		12	16	20	20	25	25
PL		13	14	14	16	16	18
PM		3	3,5	4,5	7	8	8
ØR		Ø5,2	Ø5,2	Ø7,1	Ø7,1	Ø8,9	Ø8,9
RT		M6	M6	M8	M8	M10	M10
SW		10	13	17	17	22	22
TG		32,5	38	46,5	56,5	72	89
VA		4	4	4	4	4	4
VD		4	4	4	4	4	4
VG		48	54	69	69	86	91
WH		26	30	37	37	46	51
Weight	stroke 0	1000	1430	2150	3000	4400	6400
	every 10 mm	35	45	63	80	120	135



Position	Description	Ordering code	Materials
1	Short mounting foot brackets (MS1)	1393.Ø.05/1F	Stainless steel AISI 316
2	Flange (MF1-MF2)	1393.Ø.03F	Stainless steel AISI 316
3	Rod nut	1393.Ø.18F	Stainless steel AISI 316
4	Ball joint	1393.Ø.32F	Stainless steel
5	Fork	1393.Ø.13F	Stainless steel
6	Sensor bracket	1393._	Stainless steel AISI 316
7	Rear male clevis (MP4)	1393.Ø.09/1F	Stainless steel AISI 316
8	Pin (AA4) with circlips for rear clevis (MP2) (pos. 9)	1393.Ø.37F	Stainless steel AISI 316
9	Rear female clevis (MP2)	1393.Ø.09F	Stainless steel AISI 316
10	Rear narrow clevis (AB6)	1393.Ø.30F	Stainless steel AISI 316
11	Rear male clevis (with jointed head - MP6)	1393.Ø.15F	Stainless steel AISI 316
12	Standard complete trunnion (pos. 7 + pos. 9)	1393.Ø.22F	Stainless steel AISI 316
13	Square angle trunnion (pos. 9 + pos. 16)	1393.Ø.35F	Stainless steel AISI 316
14	Standard complete trunnion with jointed head (pos. 10 + pos.11)	1393.Ø.36F	Stainless steel AISI 316
15	Complete square angle trunnion (pos. 10 + pos.17)	1393.Ø.27F	Stainless steel AISI 316
16	Simple square counter clevis (AB7) (pos. 13)	1393.Ø.11/2F	Stainless steel AISI 316
17	Simple square counter clevis (pos. 15)	1393.Ø.28F	Stainless steel AISI 316

**Sensor bracket**

Ordering code

- 1393.A** (Ø32 ... Ø40)
- 1393.B** (Ø50 ... Ø63)
- 1393.C** (Ø80 ... Ø100)

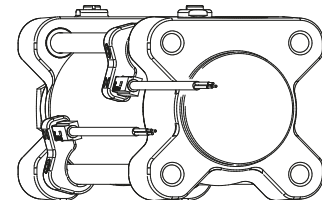
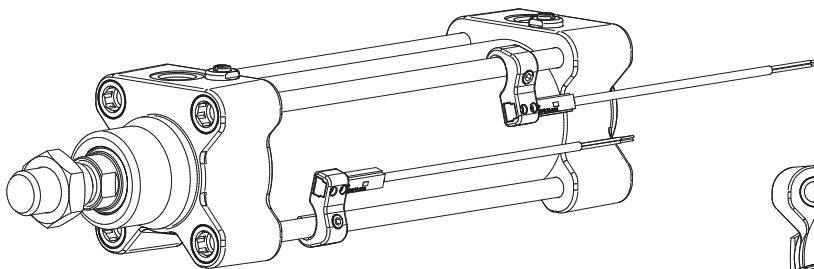
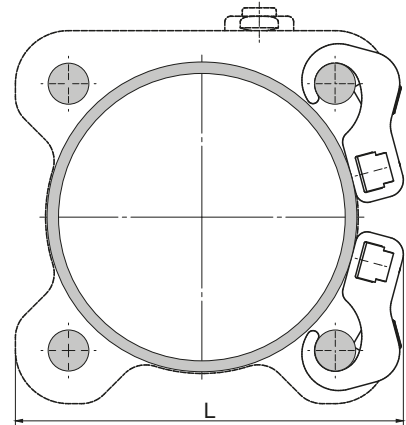


Fixing bracket made of stainless steel AISI 316 for sensor mounting on cylinders.

Sensors cod. **1580.**\_  
**MRS.**\_  
**MHS.**\_



Bore	L
Ø32	51
Ø40	57
Ø50	67
Ø63	79
Ø80	98
Ø100	115



To mount the brackets on the tie rods use the dedicated stainless steel grub screw.

3 PNEUMATIC ACTUATION

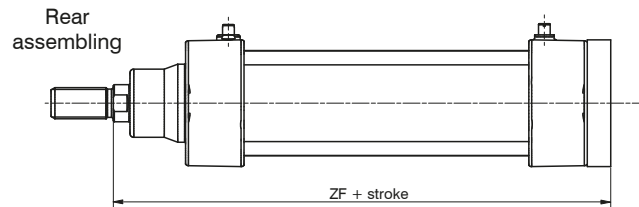
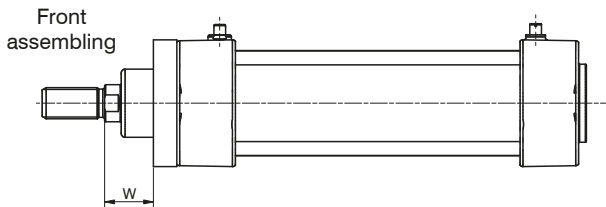
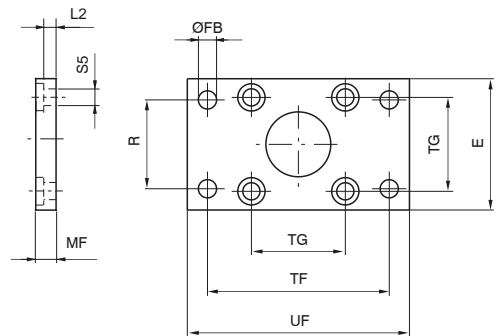
**Front and rear flanges (MF1 - MF2)**

Ordering code

**1393.Ø.03F**



Plate in stainless steel AISI 316 which allows anchorage of the cylinder at a right angle to the plane.



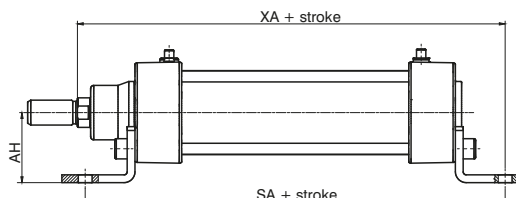
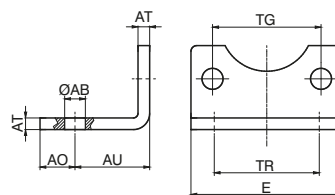
Bore	E	ØFB (H 13)	MF (JS 14)	R (JS 14)	TF (JS 14)	TG	UF	ZF	W	L2	ØS5	Weight (g)
32	45	7	10	32	64	32,5	80	130	16	5	6,6	190
40	52	9	10	36	72	38	90	145	20	5	6,6	250
50	65	9	12	45	90	46,5	110	155	25	6,5	9	480
63	75	9	12	50	100	56,5	120	170	25	6,5	9	620
80	95	12	15	63	126	72	150	189	31	7	11	1430
100	115	14	15	75	150	89	170	204	36	7	11	1990

► **Short mounting foot brackets (MS1)**

Ordering code
<b>1393.Ø.05/1F</b>



Elements used to anchor the cylinder parallel to the mounting plane. They are made of stainless steel AISI 316.



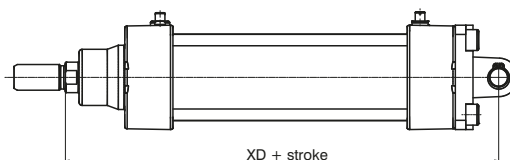
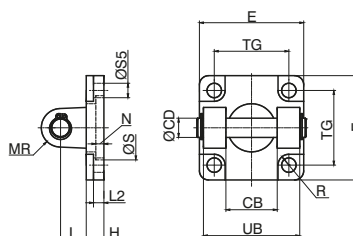
Bore	32	40	50	63	80	100
ØAB (H 14)	7	9	9	9	12	14
AH	32	36	45	50	63	71
AU (± 0.2)	24	28	32	32	41	41
AO	11	8	15	13	14	16
E	45	52	65	75	95	115
AT	4	4	5	5	6	6
SA	142	161	170	185	210	220
TG	32,5	38	46,5	56,5	72	89
TR (JS 14)	32	36	45	50	63	75
XA	144	163	175	190	215	230
Weight g	60	70	160	180	370	430

► **Rear clevis (MP2)**

Ordering code
<b>1393.Ø.09F</b>



This type of mounting allows anchorage of the cylinder either parallel or right angle to plane; the cylinder rod can oscillate and self-align as necessary when under load. Made of stainless steel AISI 316.



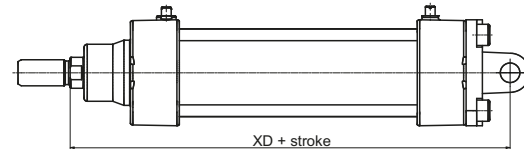
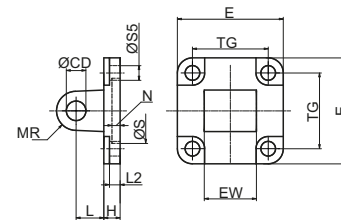
Bore	32	40	50	63	80	100
CB (H 14)	26	28	32	40	50	60
ØCD	10	12	12	16	16	20
E	45	55	65	75	95	115
ØS (H11)	30	35	40	45	45	55
N	5	5	5	5	/	/
R (H13)	5,5	5,5	7,5	7,5	9	9
H	10	10	10	12	14	16
L	12	15	17	20	22	25
MR	10	12	12	16	16	20
TG	32,5	38	46,5	56,5	72	89
UB (h14)	45	52	60	70	90	110
XD	142	160	170	190	210	230
L2 (±0,5)	5,5	5,5	6,5	6,5	10	10
S5 (H13)	6,6	6,6	9	9	11	11
Weight g	140	230	370	540	1000	1700



**Rear male clevis (MP4)**

Ordering code

**1393.Ø.09/1F**



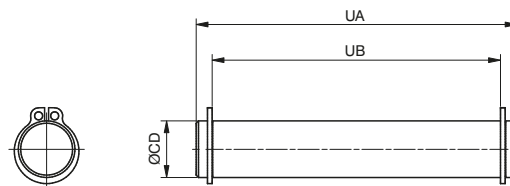
Similar to 09 clevis except for the connection, which is male rather than female. Used to mount the cylinder either parallel or at a right angle to the plane; the cylinder rod can oscillate and self-align as necessary when under load. Made of stainless steel AISI 316.

Bore	32	40	50	63	80	100
CD (H 9)	10	12	12	16	16	20
E	45	55	65	75	95	115
EW ( <sup>-0.2</sup> / <sub>-0.6</sub> )	26	28	32	40	50	60
H	10	10	10	12	14	16
L	12	15	17	20	22	25
ØS (H11)	30	35	40	45	45	55
N	5	5	5	5	/	/
R (H13)	5,5	5,5	7,5	7,5	9	9
MR	10	12	12	16	16	20
TG	32,5	38	46,5	56,5	72	89
XD	142	160	170	190	210	230
L2 (±0,5)	5,5	5,5	6,5	6,5	10	10
S5 (H13)	6,6	6,6	9	9	11	11
Weight g	180	280	370	680	1200	2100

**Pin with circlips for rear clevis (MP4 and MP2)**

Ordering code

**1393.Ø.37F**

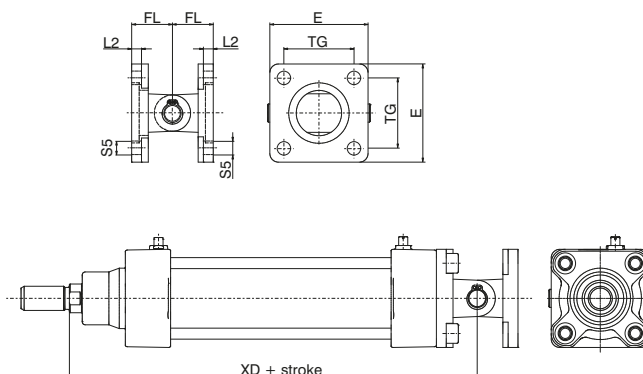


Stainless steel AISI 316 pin, complete with stainless steel circlips, which can be used with clevis code 1393.Ø.09/1F and 1393.Ø.09F

Bore	32	40	50	63	80	100
CD (e8)	10	12	12	16	16	20
UA	53	60	68	78	98	118
UB ( <sup>-0.5</sup> / <sub>-0</sub> )	46	53	61	71	91	111
Weight g	35	50	60	120	150	290

► **Standard complete trunnion**

Ordering code  
**1393.Ø.22F**  
Mounting consists of rear clevis code 1380.Ø09F  
+rear male clevis code 1380.Ø.09/1F  
(ordering separately)

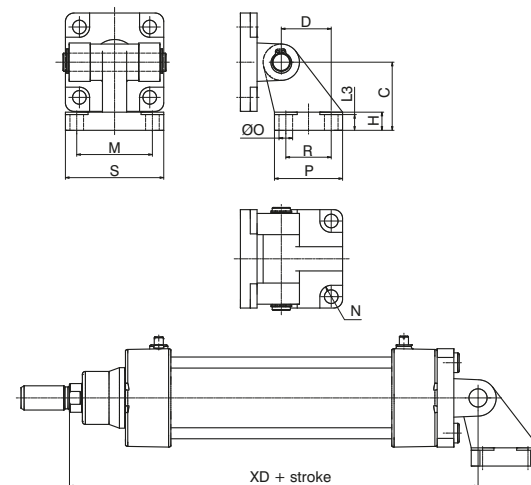


Made of stainless steel AISI 316.

Bore	32	40	50	63	80	100
E	45	55	65	75	95	115
FL	22	25	27	32	36	41
L 2 (±0,5)	5,5	5,5	6,5	6,5	10	10
S 5	6,6	6,6	9	9	11	11
TG	32,5	38	46,5	56,5	72	89
XD	142	160	170	190	210	230
Weight g	360	580	780	1370	2370	4110

► **Square angle trunnion (AB7)**

Ordering code  
**1393.Ø.35F**  
Counter clevis can be ordered  
separately with code 1393.Ø.11/2F



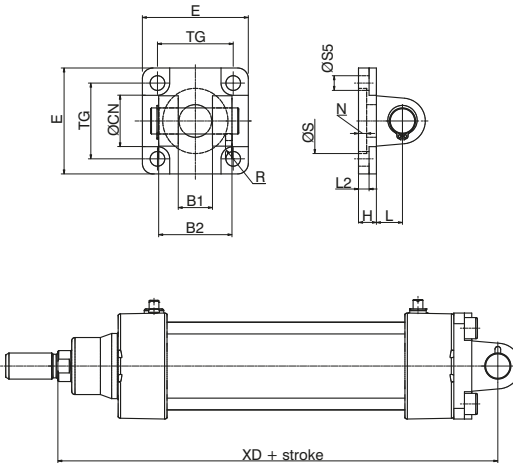
Made of stainless steel AISI 316.

Bore	32	40	50	63	80	100
D (JS 15)	21	24	33	37	47	55
C (JS 15)	32	36	45	50	63	71
H	8	10	12	12	14	15
N (H 13)	5,5	5,5	7,5	7,5	9	9
L3	6,5	8,5	10,5	10,5	11,5	12,5
R (JS 14)	18	22	30	35	40	50
P	31	35	45	50	60	70
O (H 13)	6,6	6,6	9	9	11	11
S	51	54	65	67	86	96
M (JS 14)	38	41	50	52	66	76
XD	142	160	170	190	210	230
Weight g	330	520	810	1200	2200	4710

**Rear narrow clevis (AB6)**

Ordering code

**1393.Ø.30F**



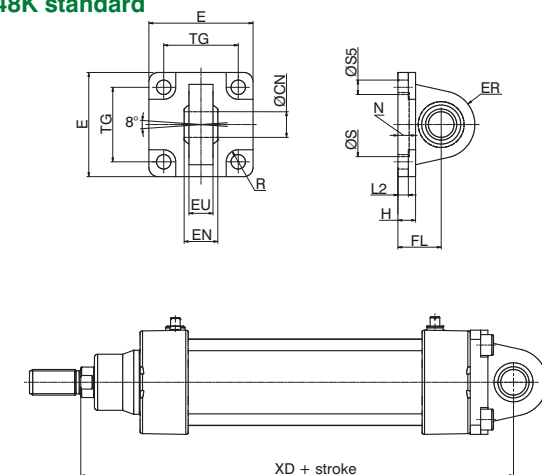
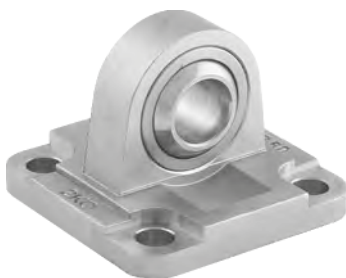
Bore	32	40	50	63	80	100
B1 (H 14)	14	16	21	21	25	25
B2 (h 14)	34	40	45	51	65	75
ØCN	10	12	16	16	20	20
E	45	55	65	75	95	115
H	10	10	10	12	14	16
L	12	15	17	20	22	25
L2 (±0,5)	5,5	5,5	6,5	6,5	10	10
S5 (H 13)	6,6	6,6	9	9	11	11
TG	32,5	38	46,5	56,5	72	89
XD	142	160	170	190	210	230
ØS (H 12)	30	35	40	45	45	55
R (H 13)	5,5	5,5	7,5	7,5	9	9
N	5	5	5	5	5	5
Weight g	170	270	420	650	1380	2050

Utilised with clevis 1393.Ø.15F allows the cylinder to oscillate in all directions (see standard complete trunnion 1393.Ø.36F)  
 Made of stainless steel AISI 316.

**Rear male clevis (MP6) with jointed head according to DIN 648K standard**

Ordering code

**1393.Ø.15F**

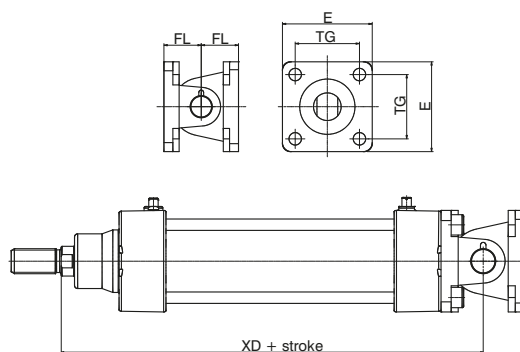


Bore	32	40	50	63	80	100
ØCN (H 7)	10	12	16	16	20	20
E	45	55	65	75	95	115
EN (-0.1)	14	16	21	21	25	25
ER	15	18	20	23	27	30
EU	10,5	12	15	15	18	18
FL (JS 15)	22	25	27	32	36	41
H	10	10	10	12	14	16
L2	5,5	5,5	6,5	6,5	10	10
S5 (H 13)	6,6	6,6	9	9	11	11
TG	32,5	38	46,5	56,5	72	89
XD	142	160	170	190	210	230
ØS (H 11)	30	35	40	45	45	55
R (H 13)	5,5	5,5	7,5	7,5	9	9
N	5	5	5	5	5	5
Weight g	150	260	370	600	1130	1800

Utilised with clevis 1393.Ø.30F allows the cylinder to oscillate in all directions.  
 Made of stainless steel AISI 316.

► **Standard complete trunnion with jointed head according to DIN 648K standard**

Ordering code  
**1393.Ø.36F**  
Mounting consists of rear narrow clevis  
code 1393.Ø.30F  
with rear male clevis code 1393.Ø.15F

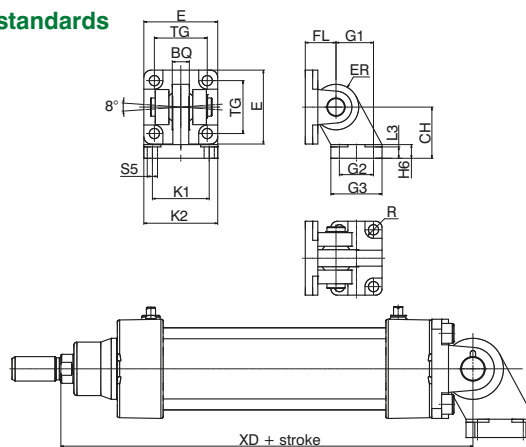


Made of stainless steel AISI 316.

Bore	32	40	50	63	80	100
E	45	55	65	75	95	115
FL (JS 15)	22	25	27	32	36	41
TG	32,5	38	46,5	56,5	72	89
XD	142	160	170	190	210	230
Weight g	320	530	790	1250	2510	3850

► **Complete square angle trunnion with jointed head acc. to DIN 648K standards**

Ordering code  
**1393.Ø.27F**  
Mounting consist of rear narrow clevis  
cod. 1393.Ø.30F  
with Simple square counter clevis cod. 1393.Ø.28F  
(ordering separately)



Made of stainless steel AISI 316.

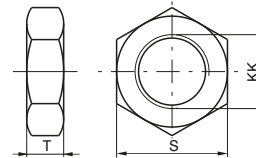
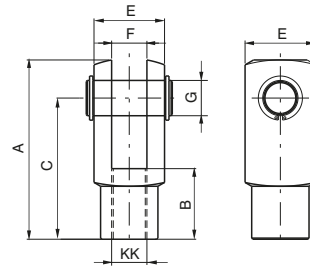
Bore	32	40	50	63	80	100
CH (JS 15)	32	36	45	50	63	71
E	45	55	65	75	95	115
FL	22	25	27	32	36	41
G1 (JS 15)	21	24	33	37	47	55
G2 (JS 14)	18	22	30	35	40	50
G3	31	35	45	50	60	70
H6	10	10	12	12	14	15
K1 (JS 14)	38	41	50	52	66	76
K2	51	54	65	67	86	96
L3 (+0,5)	8,5	8,5	10,5	10,5	11,5	12,5
S5 (H13)	6,6	6,6	9	9	11	11
TG	32,5	38	46,5	56,5	72	89
XD	142	160	170	190	210	230
BQ	10,5	12	15	15	18	18
ER	15	18	20	23	27	30
R (H 13)	5,5	5,5	7,5	7,5	9	9
Weight g	350	540	880	1200	2350	3380

### Rod fork and nuts

Ordering code

1393.Ø.13F

1393.Ø.18F



**Fork:**  
Element that when screwed to the rod consents a regular functioning even when there are significant lateral forces as the connection point.  
Made of stainless steel AISI 303.

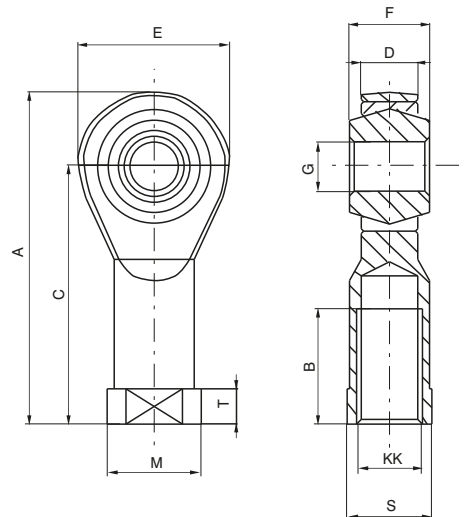
**Nut:**  
Used to block the position of the fork.  
Made of stainless steel AISI 316.

Bore	32	40	50	63	80	100	
A	52	62	83	83	105	105	
B	20	24	32	32	40	40	
C	40	48	64	64	80	80	
E	20	24	32	32	40	40	
F(B13)	10	12	16	16	20	20	
G	10	12	16	16	20	20	
S	17	19	24	24	30	30	
T	6	7	8	8	9	9	
KK	M10X1,25		M12X1,25	M16X1,5	M16X1,5	M20X1,5	M20X1,5
Weight	fork	100	140	340	340	680	680
g	Nut	15	20	20	20	40	40

### Ball joint

Ordering code

1393.Ø.32F



**Balljoint:**  
Mounted on the rod thread, assures a regular operation even in the presence of significant forces to the linked element.  
Made of stainless steel AISI 304 and 420.

Bore	32	40	50	63	80	100
A	57	66	85	85	102	102
B	20	22	28	28	33	33
C	43	50	64	64	77	77
D	10,5	12	15	15	18	18
E	28	32	42	42	50	50
F	14	16	21	21	25	25
G (H 7)	10	12	16	16	20	20
KK	M10x1,25	M12x1,25	M16x1,5	M16x1,5	M20x1,5	M20x1,5
M	19	22	27	27	34	34
S	17	19	22	22	30	30
T	6,5	6,5	8	8	10	10
Weight g	75	110	220	220	410	410

## Series 1450 - 1463 - Hydro-pneumatic speed control cylinders (Ø50 - Ø63)

### General

Pneumatic cylinder ISO 15552 handling and controlling movement by means of internal hydraulic circuit.  
All ISO fixing devices can be used except for:

- Cylinder Ø63 front clevis code 1463.63.08F
- Cylinder Ø63 front flange code 1463.63.03F
- Cylinder Ø63 foot code 1463.63.05/1F

### Ordering key

14 .stroke. . . .

Ø50  
Ø63

#### Regulation

- A = Regulation on extraction
- B = Regulation on compression
- D = Double regulation

#### STOP function

- 0 = None
- A = Stop N.C. extraction
- B = Stop N.C. compression
- C = Double Stop N.C.
- D = Stop N.O. extraction
- E = Stop N.O. compression
- F = Double Stop N.O.

#### SKIP function

- 0 = None
- A = Skip N.C. extraction
- B = Skip N.C. compression
- C = Double Skip N.C.
- D = Skip N.O. extraction
- E = Skip N.O. compression
- F = Double Skip N.O.

### Construction characteristics

End cap	aluminium black anodised
Piston Rod	steel tube externally chrome plated
Barrel	aluminium alloy anodised
Magnetic piston	aluminium
Cushion screw	nickel plated steel
Oil tank	aluminium
Pneumatic piston seal (pneumatic side)	oil resitant NBR rubber
Rod and cushion seal	PUR
Hydraulic piston seal (hydraulic side)	PUR

### Technical characteristics

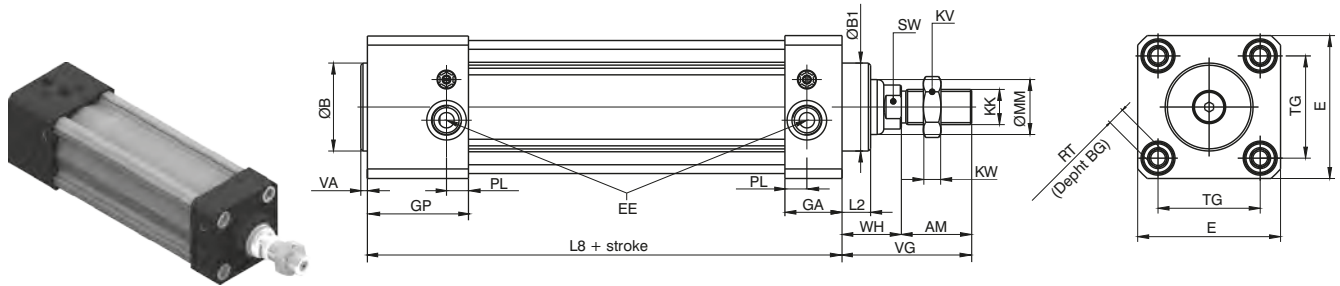
Pneumatic media	filtered and lubricated air
Hydraulic media	filtered 1µ hydraulic oil
Maximum pressure	8 bar
Skip & Stop valve minimum operating pressure	3 bar
Environment temperature	-5°C +70°C
Minimum regulated speed	40 mm/min.
Maximum regulated speed	6000 mm/min. *
Speed with SKIP	150 mm/sec. *
Free speed (without regulation)	300 mm/sec. *
Cushion speed	20 mm *
Standard stroke	from 50 to 450 steps 50 mm
Possibility of rear regulation (on request)	

\* **Attention:** speed recorded with cylinder on horizontal position fed at 8 bar without load on piston rod.

### Force (N)

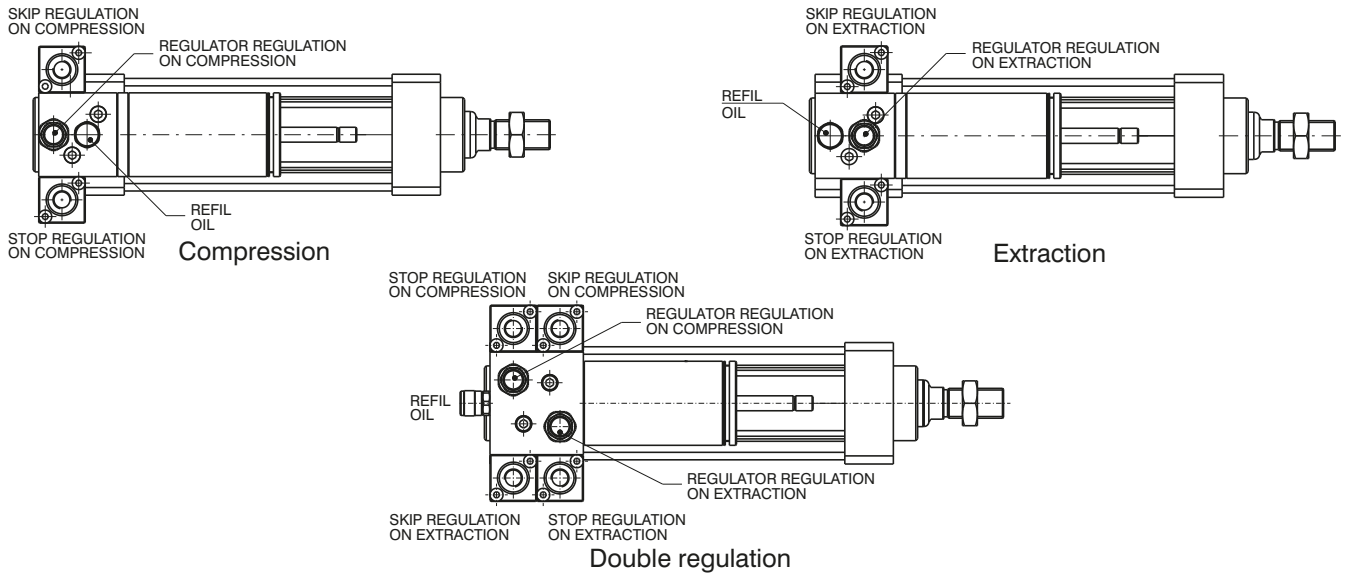
BORE	FORCE	PRESSURE (bar)									
		1	2	3	4	5	6	7	8	9	10
50	Extraction	181.4	362.9	544.3	725.7	907.2	1088.6	1270	1451.5	1632.9	1814.3
	Compression	144.4	288.8	433.2	577.6	722	866.3	1010.7	1155.1	1299.5	1443.9
63	Extraction	294.6	589.1	883.7	1178.2	1472.8	1767.3	2061.9	2356.5	2651	2945.6
	Compression	211.3	422.6	633.9	845.2	1056.6	1267.9	1479.2	1690.5	1901.8	2113.1

► Base cylinder dimensions



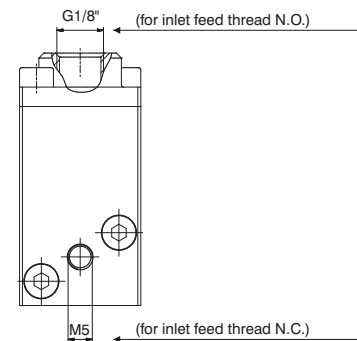
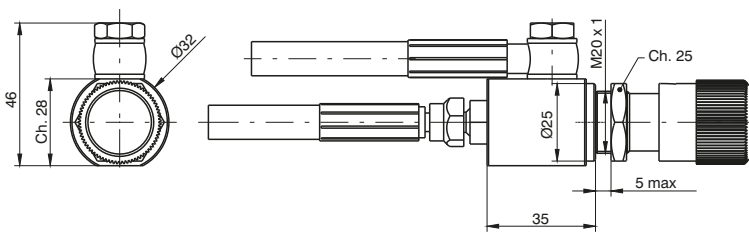
Bore	AM	B (d11)	B1 (d11)	BG	E	EE	GA	GP	KK	KV	KW	L2	L8	MM	PL	RT	SW	TG	VA	VG	WH
50	32	40	40	16	65	G1/4"	26	46	M16x1,5	24	8	13	116	25	10	M8	17	46,5	3	59	27
63		45	50		75	G3/8"			M16x1,5			20	121	35	12			56,5	4	69	37

Function valves and regulators position for the different versions



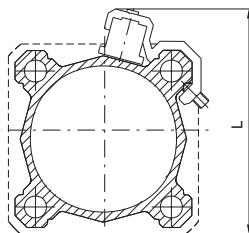
Rear regulator dimensions

SKIP and STOP valves inlet feed position



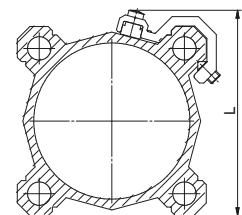
► Sensor brackets codes 1500., RS., HS.

Dimensions	
Bore	L
Ø50	77
Ø63	87



► Sensor brackets codes 1580., MRS., MHS.

Dimensions	
Bore	L
Ø50	66
Ø63	76



Ordering code  
**1320.B** Brackets for cylinder sensors Ø50 - Ø63

Ordering code  
**1320.BS** Brackets for cylinder sensors Ø50 - Ø63

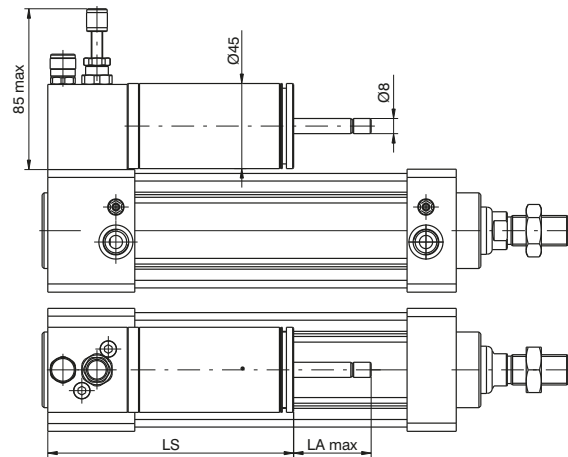
Sensor for cylinder

For technical characteristics and code see "Magnetic sensor" section



► Regulation on the outward stroke

Ordering code
<b>14Ø.stroke.A.0.0</b>

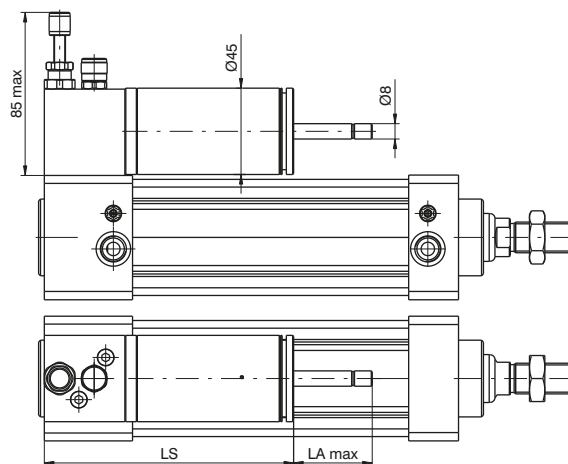


Ø50 Weight g 1970 + g 200 every 50 mm. stroke  
Ø63 Weight g 2591 + g 280 every 50 mm. stroke

Strokes	LS	LA max
0 ... 150	130	41
151 ... 350	185	66
351 ... 450	255	106

► Regulation on the inward stroke

Ordering code
<b>14Ø.stroke.B.0.0</b>

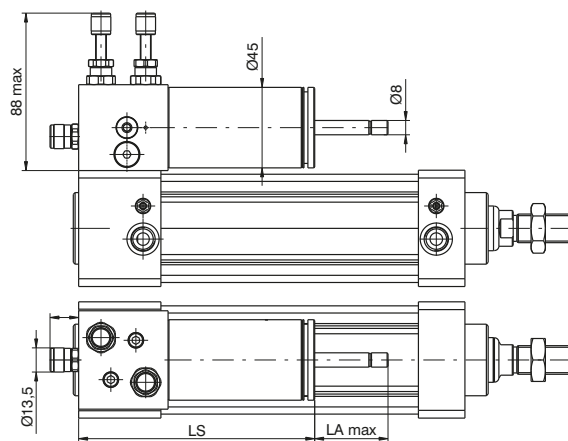


Ø50 Weight g 1970 + g 200 every 50 mm. stroke  
Ø63 Weight g 2591 + g 280 every 50 mm. stroke

Strokes	LS	LA max
0 ... 150	130	41
151 ... 350	185	66
351 ... 450	255	106

► Regulation in both directions

Ordering code
<b>14Ø.stroke.D.0.0</b>

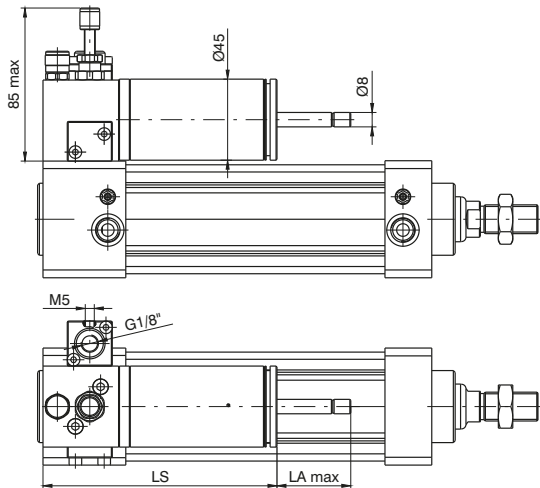


Ø50 Weight g 2128 + g 200 every 50 mm. stroke  
Ø63 Weight g 2749 + g 280 every 50 mm. stroke

Strokes	LS	LA max
0 ... 150	132	41
151 ... 350	187	66
351 ... 450	257	106

Regulation on the outward stroke with Skip N.O.

Ordering code  
**14Ø.stroke.A.0.D**

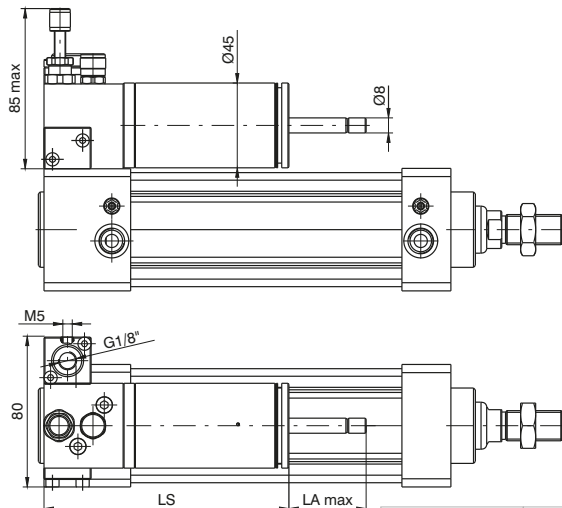


Ø50 Weight g 2059 + g 200 every 50 mm. stroke  
Ø63 Weight g 2928 + g 280 every 50 mm. stroke

Strokes	LS	LA max
0 ... 150	130	41
151 ... 350	185	66
351 ... 450	255	106

Regulation on the inward stroke with Skip N.O.

Ordering code  
**14Ø.stroke.B.0.E**

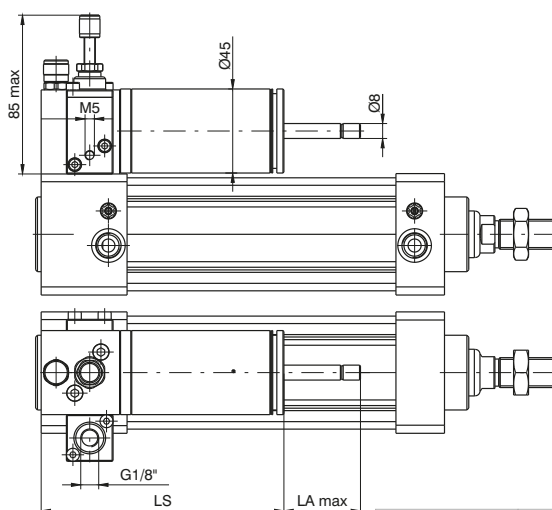


Ø50 Weight g 2059 + g 200 every 50 mm. stroke  
Ø63 Weight g 2928 + g 280 every 50 mm. stroke

Strokes	LS	LA max
0 ... 150	130	41
151 ... 350	185	66
351 ... 450	255	106

Regulation on the outward stroke with Stop N.O.

Ordering code  
**14Ø.stroke.A.D.0**



Ø50 Weight g 2059 + g 200 every 50 mm. stroke  
Ø63 Weight g 2928 + g 280 every 50 mm. stroke

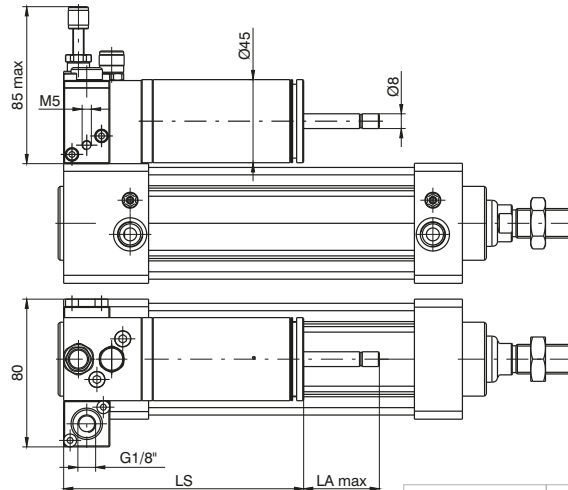
Strokes	LS	LA max
0 ... 150	130	41
151 ... 350	185	66
351 ... 450	255	106

► Regulation on the inward stroke with Stop N.O.

Ordering code
<b>14Ø.stroke.B.E.0</b>



Ø50 Weight g 2059 + g 200 every 50 mm. stroke  
Ø63 Weight g 2928 + g 280 every 50 mm. stroke



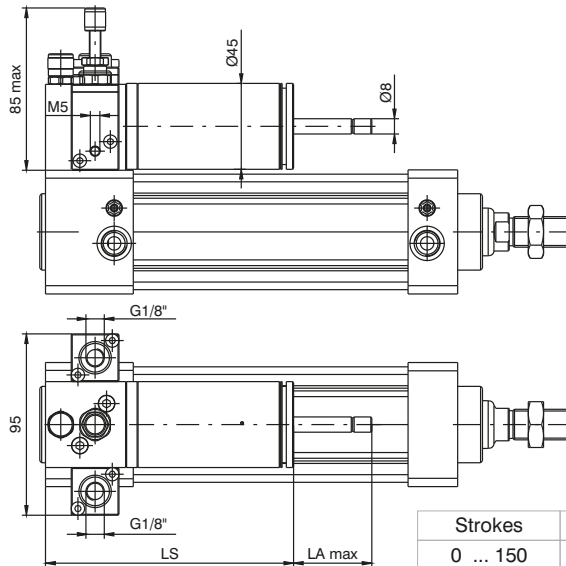
Strokes	LS	LA max
0 ... 150	130	41
151 ... 350	185	66
351 ... 450	255	106

► Regulation on the outward stroke with Skip N.O. - Stop N.O.

Ordering code
<b>14Ø.stroke.A.D.D</b>



Ø50 Weight g 2140 + g 200 every 50 mm. stroke  
Ø63 Weight g 2761 + g 280 every 50 mm. stroke



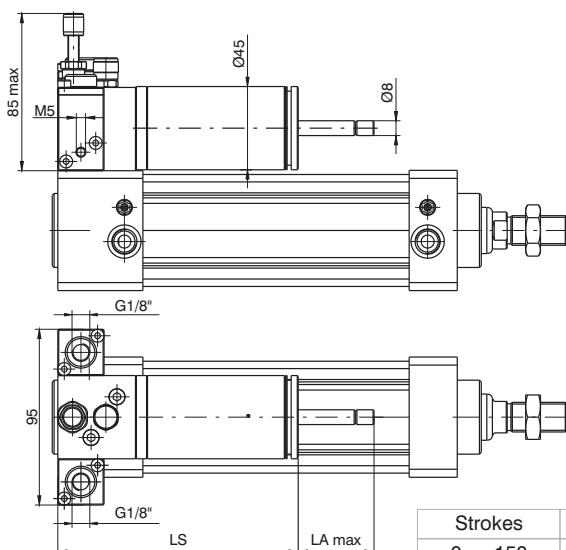
Strokes	LS	LA max
0 ... 150	130	41
151 ... 350	185	66
351 ... 450	255	106

► Regulation on the inward stroke with Skip N.O. - Stop N.O.

Ordering code
<b>14Ø.stroke.B.E.E</b>



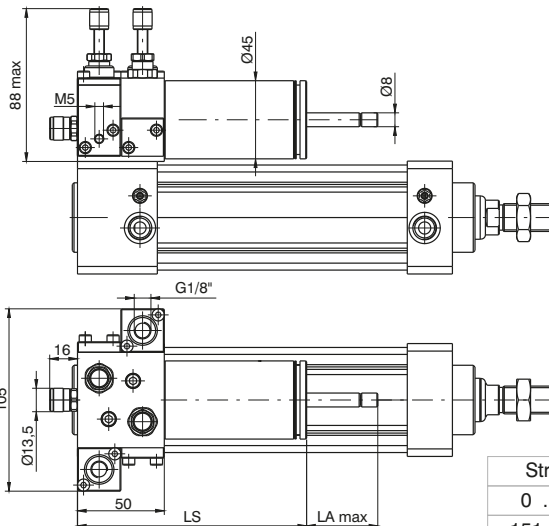
Ø50 Weight g 2140 + g 200 every 50 mm. stroke  
Ø63 Weight g 2761 + g 280 every 50 mm. stroke



Strokes	LS	LA max
0 ... 150	130	41
151 ... 350	185	66
351 ... 450	255	106

**Regulation and Skip in both directions (N.O. Skip valves in both directions)**

Ordering code  
**14Ø.stroke.D.0.F**

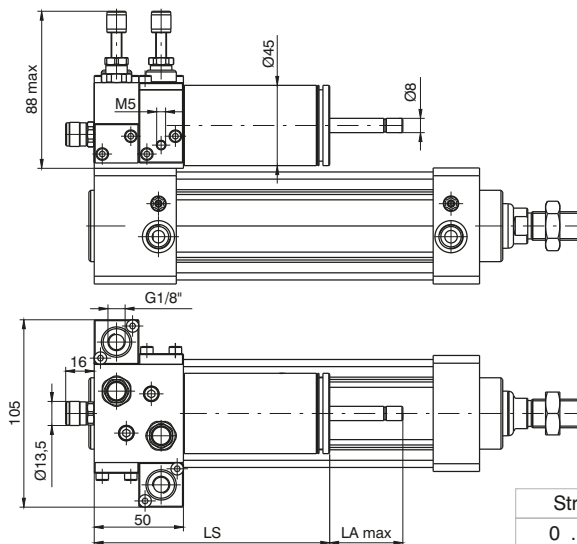


Strokes	LS	LA max
0 ... 150	132	41
151 ... 350	187	66
351 ... 450	257	106

Ø50 Weight g 2311 + g 200 every 50 mm. stroke  
Ø63 Weight g 2932 + g 280 every 50 mm. stroke

**Regulation and Stop in both directions (N.O. Stop valves in both directions)**

Ordering code  
**14Ø.stroke.D.F.0**

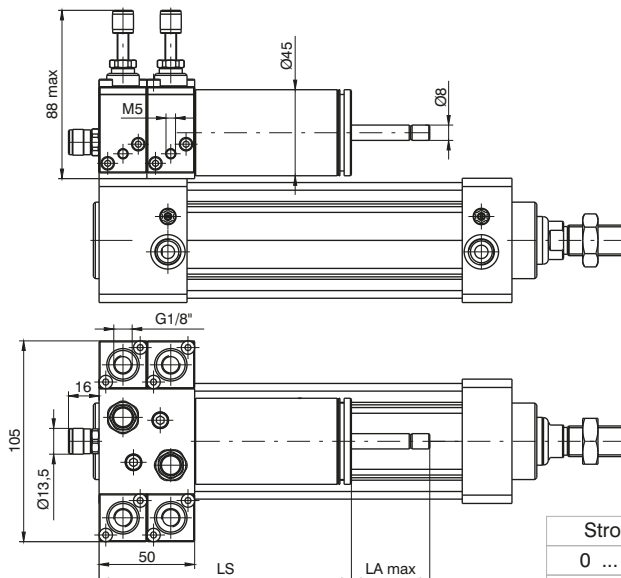


Strokes	LS	LA max
0 ... 150	132	41
151 ... 350	187	66
351 ... 450	257	106

Ø50 Weight g 2311 + g 200 every 50 mm. stroke  
Ø63 Weight g 2932 + g 280 every 50 mm. stroke

**Regulation with Skip and Stop in both directions (N.O. Skip and Stop valves in both directions)**

Ordering code  
**14Ø.stroke.D.F.F**



Strokes	LS	LA max
0 ... 150	132	41
151 ... 350	187	66
351 ... 450	257	106

Ø50 Weight g 2473 + g 200 every 50 mm. stroke  
Ø63 Weight g 3094 + g 280 every 50 mm. stroke