



General

This series of cylinders is available in two versions with different threaded fixing holes. The first one includes cylinders from Ø 32 to Ø 100 called "ISO" with fixing holes same as cylinders ISO 6431 - VDMA 24562. Cylinders from Ø 20 to Ø 100 called "UNITOP", parts of second series, are mainly according to standard UNITOP RU - P/6 - P/7. Cylinders Ø 12 and Ø 16 non standard, are interchangeable with similar products available on the market. The ISO version uses all fixing devices of series 1320 with exception of intermediate trunnion, while for cylinders Ø 12, Ø 16 and for "UNITOP" version are available fixing devices as flanges, foot, male and female clevis made with aluminium or steel. For use of magnetic sensors see directions on next page.

Construction characteristics

Body	anodised aluminium
Heads	from Ø12 to Ø25 aluminium alloy UNI 9006/1 anodised from Ø32 to Ø100 UNI 5076 aluminium die-casting and painted (cataphoresis)
Piston rod bushing	sintered bronze
Piston rod	from Ø12 to Ø25 stainless steel from Ø32 to Ø100 C43 chromed (on request stainless steel for all bores)
Piston	from Ø12 to Ø25 plated zinc steel dal Ø32 al Ø100 aluminium alloy 2011 UNI 9002/5
Seals	PUR (on request HNBR)
Spring	zinc plated steel for springs
Fixing screws	zinc plated steel

Technical characteristics

Fluid	filtered air, with or without lubrication
Maximum working pressure	10 bar
Working temperature	-30°C - +80°C with standard seals (magnetic or non magnetic piston) -5°C - +80°C with HNBR seals (magnetic piston) -5°C - +120°C with HNBR seals (non magnetic piston)

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 single acting cylinders

Ø12 10 mm max.
from Ø16 to Ø100 25 mm max.

Standard strokes for double acting cylinders

Ø12 and Ø16 from 5 to 40mm every 5mm
Ø20 and Ø25 from 5 to 50mm every 5mm
Ø32 - Ø100 from 5 to 80mm every 5mm

Maximum suggested strokes

Ø12 and Ø16 100 mm
Ø20 and Ø25 200 mm
Ø32 and Ø40 300 mm
Ø50 and Ø63 400 mm
Ø80 and Ø100 500 mm

Maximum suggested strokes with non-rotating device

from Ø12 to Ø25 40 mm
from Ø32 to Ø100 80 mm

Minimum and maximum springs load

Bore	12	16	20	25	32	40	50	63	80	100
Min. load (N)	3,9	4,4	4,9	9,8	12,3	16,7	27,5	37,3	59,4	101,3
Max. load (N)	9,3	17,7	18,1	25,5	34,3	44,1	51,0	63,8	99,4	141,9

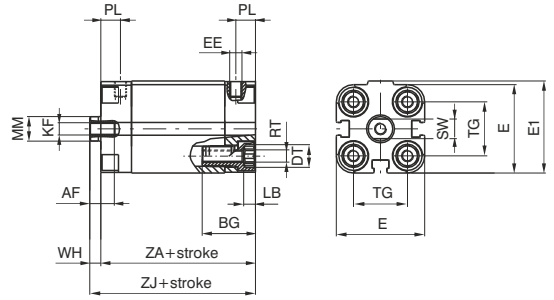
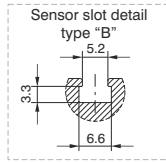
Longer strokes may be utilised if there is no radial loads on piston rod considering there isn't adjustable cushioning system.



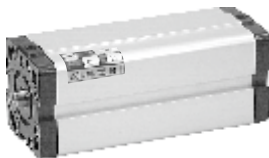
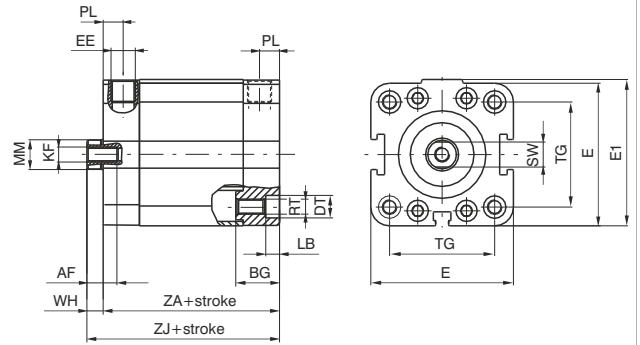
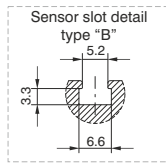
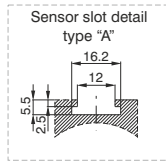
**BASIC version
double and single acting**



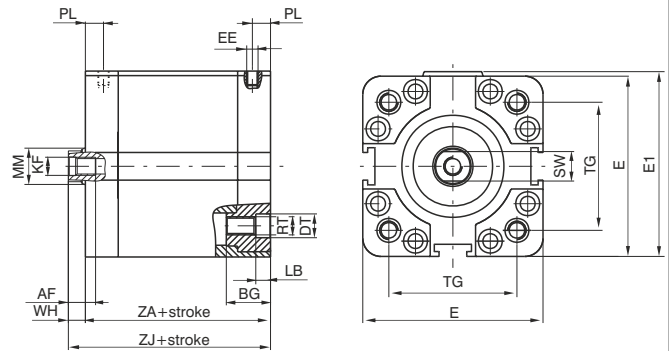
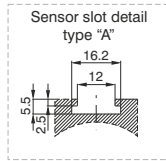
for bores from $\varnothing 12$ to $\varnothing 25$
use sensors codes
1580._, MHS._, MRS._ only



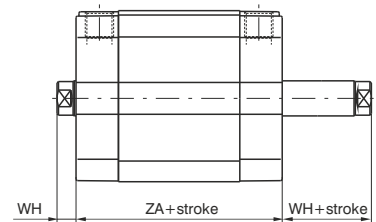
for bores from $\varnothing 32$ to $\varnothing 50$
use sensors codes
1500._, RS._, HS._ (slot A)
1580._, MHS._, MRS._
(slot B and slot A with adapter code 1380.01F)



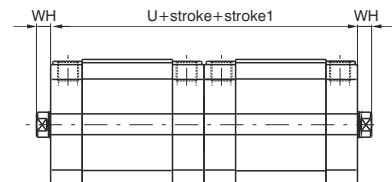
for bores from $\varnothing 63$ to $\varnothing 100$
use sensors codes
1500._, RS._, HS._ and
1580._, MHS._, MRS._
(with adapter code 1380.01F)



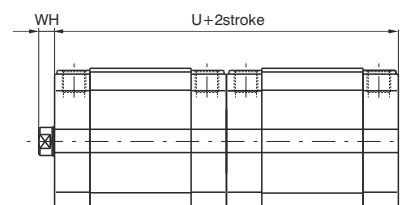
**PUSH/PULL rod version
double and single acting**



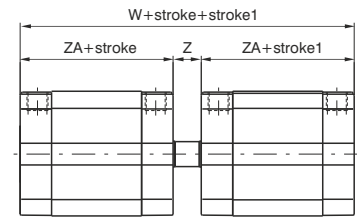
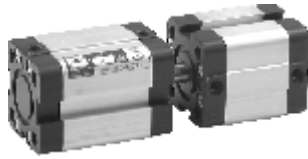
Tandem with opposite rods



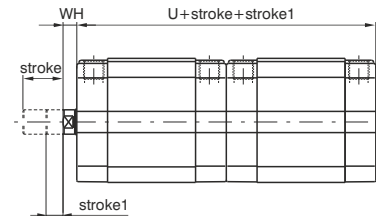
Tandem push with common rods



Opposed tandem with common rod



Tandem push with independent rods



Ordering code

Basic version push/pull

15 . Ø . stroke

- 1 = Double acting (magnetic)
 - 2 = Front spring (magnetic)
 - 3 = Rear spring (magnetic)
 - 4 = Double acting (non magnetic)
 - 5 = Front spring (non magnetic)
 - 6 = Rear spring (non magnetic)
 - 01 = Basic version - female piston rod
 - 02 = Basic version - male piston rod
 - 03 = Push / pull version - female piston rod
 - 04 = Push / pull version - male piston rod
 - 05 = Push / pull version - bored male piston rod
 - 06 = Push / pull version - bored female piston rod
 - 07 = Non - rotating version
 - 08 = Push / pull version with non rotating device on one side - female piston rod *
 - 09 = Push / pull version with non rotating device on one side - male piston rod *
 - 1 = Chromed rod C43 (from Ø12 to Ø25 stainless steel)
 - 2 = Stainless steel rod (from Ø32 to Ø100)
 - 6 = ISO (Ø32 - Ø100)
 - 7 = ISO HNBR (Ø32 - Ø100)
 - 8 = UNITOP (Ø12 - Ø100)
 - 9 = UNITOP HNBR (Ø12 - Ø100)
- * for single acting version, the spring is on the anti-rotation side

Tandem version

15 . Ø . stroke .(stroke1) . .

- A = Tandem with opposite rods female thread
- E = Tandem with opposite rods male thread
- L = Tandem opposite rods with non rotating device on both sides
- C = Tandem push with common rods female thread
- G = Tandem push with common rods male thread
- H = Tandem push with common rods, push-pull version rod female threads
- N = Tandem push with common rods with non rotating device
- D = Opposed tandem with common rod
- B = Tandem push with independent rods female thread
- F = Tandem push with independent rods male thread
- M = Tandem push with independent rods with non rotating device
- P = Tandem push/pull with independent rods - female thread
- Q = Tandem push/pull with independent rods - male thread
- 1 = Chromed rod C43 (from Ø12 to Ø25 stainless steel)
- 2 = Stainless steel rod (from Ø32 to Ø100)
- 6 = ISO (Ø32 - Ø100)
- 7 = ISO HNBR (Ø32 - Ø100)
- 8 = UNITOP (Ø12 - Ø100)
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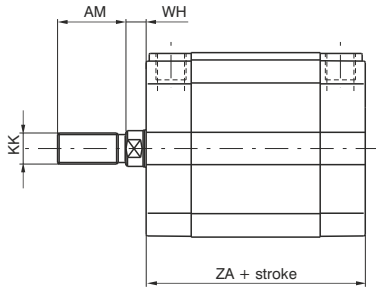
Table of dimensions

Bore	12	16	20	25	32	40	50	63	80	100	
AF	6	8	10	10	12	12	12	12	16	20	
BG	19	19	20	20	17.5	17.5	19.5	19.5	23.5	24.5	
DT	6	6	8	8	10	9	10.5	10.5	14	14	
E	29	29	36	40	48	57	67	80	102	122	
E1	30	30	37.5	41.5	49.5	58.5	69	82	105	125	
EE	M 5	M 5	M 5	M 5	G 1/8"	G 1/8"	G 1/8"	G 1/8"	G 1/8"	G 1/4"	
KF	M 3	M 4	M 5	M 5	M 6	M 6	M 8	M 8	M 10	M12	
LB	3.5	3.5	4,8	4,8	5,5	5,5	6,5	6,5	8,5	8,5	
MM	6	8	10	10	12	12	16	16	20	25	
PL	8	8	8	8	8	8	8	8	8,5	10,5	
RT	M 4	M 4	M 5	M 5	M 6	M 6	M 8	M 8	M 10	M 10	
SW	5	7	8	8	10	10	13	13	17	22	
TG ISO	/	/	/	/	32.5	38	46.5	56.5	72	89	
TG UNITOP	18	18	22	26	32	42	50	62	82	103	
U	76	76	76	79	89	91	91	100	112	133	
W	85	85	85	90	101	104	106	115	128	153	
WH	4.5	4.5	4.5	5.5	6	6.5	7.5	7.5	8	10	
Z	9	9	9	11	12	13	15	15	16	20	
ZA *	38	38	38	39.5	44.5	45.5	45.5	50	56	66.5	
ZJ *	42.5	42.5	42.5	45	50.5	52	53	57.5	64	76.5	
Weight gr.	stroke 0	88	90	140	170	210	320	460	690	1390	2290
	every 5 mm	8	8	12	13	15	19	25	31	50	66

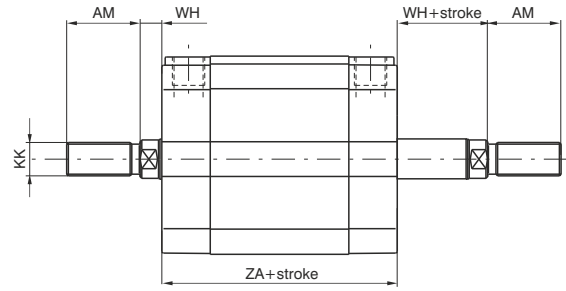
* These dimensions increase of 10 mm for cylinders ø 12 front spring version.

Tabular weights above refer to Basic Versions. The weights of Tandem versions are approximately double those shown.

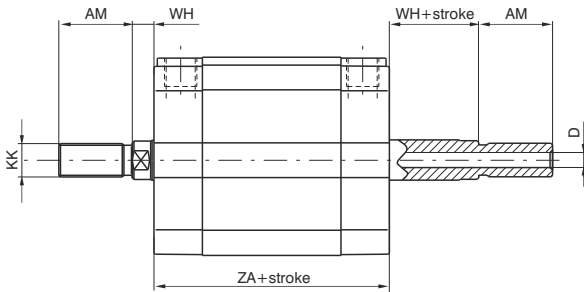
Basic version male piston rod



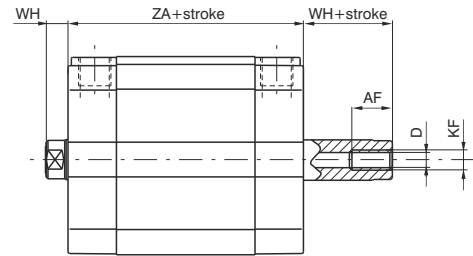
Push - pull version male rod



Push - pull version bored male piston rod

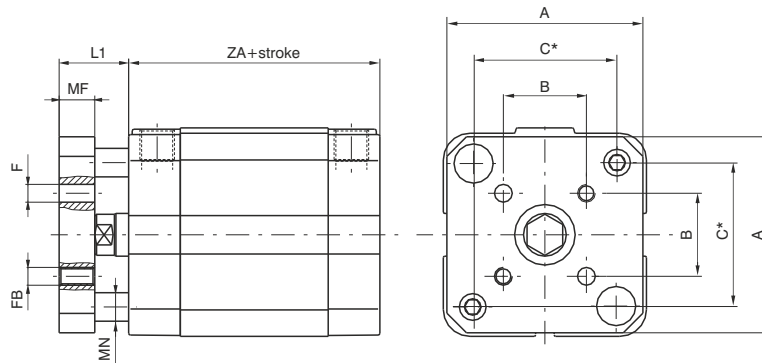


Push - pull version bored female piston rod



Maximum allowed stroke = ZB (see table)

Non-rotating version



* = Distance between rods centres

Bore	12	16	20	25	32	40	50	63	80	100
A	28.5	28.5	35.5	39.5	45	55	65	80	100	120
AF	6	8	10	10	12	12	12	12	16	20
AM	16	20	22	22	22	22	24	24	32	40
B	9.9	9.9	12	15.6	19.8	23.3	29.7	35.4	46	56.6
C	18	18	22	26	34	40.5	49	59.5	77	94
D	2.3	3.2	3.8	3.8	4.5	4.5	6	6	8	10
F	3	3	4	5	5	5	6	6	8	10
FB	M 3	M 3	M 4	M 5	M 5	M 5	M 6	M 6	M 8	M 10
KF	M 3	M 4	M 5	M 5	M 6	M 6	M 8	M 8	M 10	M 12
KK	M6X1	M8X1.25	M10X1.25	M10X1.25	M10X1.25	M10X1.25	M12X1.25	M12X1.25	M16X1.5	M20X1.5
L1	10.5	10.5	12.5	13.5	16	16.5	19.5	19.5	22	24
MF	6	6	8	8	10	10	12	12	14	14
MN	5	5	6	6	8	8	10	10	12	12
WH	4.5	4.5	4.5	5.5	6	6.5	7.5	7.5	8	10
ZA	38	38	38	39.5	44.5	45.5	45.5	50	56	66.5
ZB	20	25	50	50	50	50	75	75	80	80

Front and rear flanges

Ordering code

ISO
1500.Ø.03F
steel

UNITOP
1580.Ø.03F
steel

1580.Ø.03/1F
aluminium

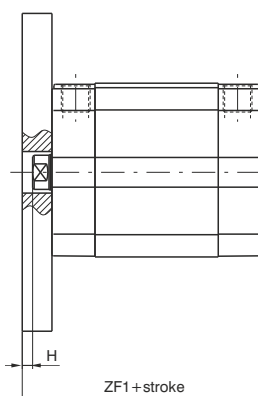
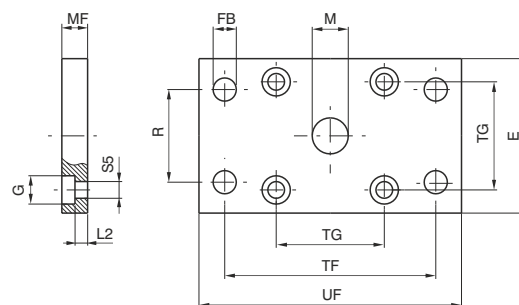
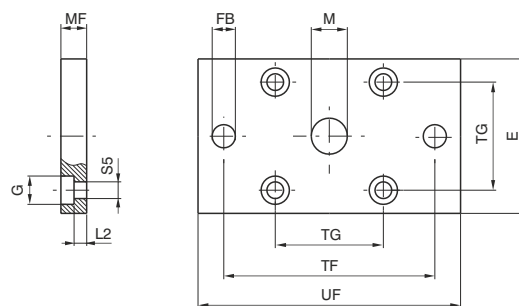


For bores from 12 to 25

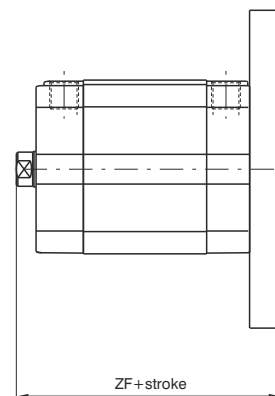


For bores from 32 to 100

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



Front

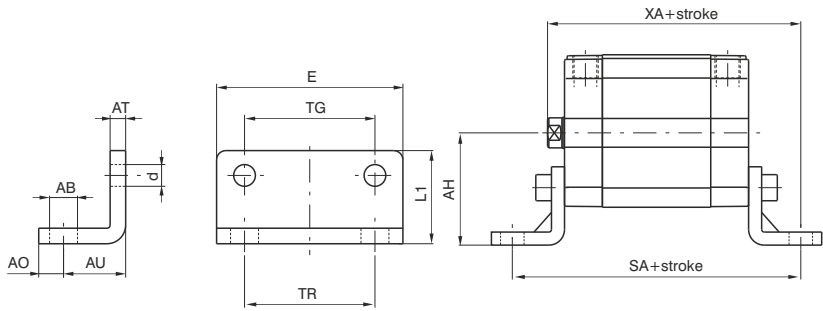
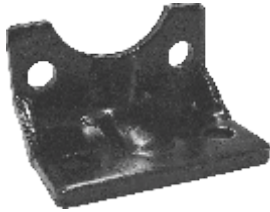


Rear

	ISO Dimensions						UNITOP Dimensions									
	32	40	50	63	80	100	12-16	20	25	32	40	50	63	80	100	
Bore	32	40	50	63	80	100	12-16	20	25	32	40	50	63	80	100	
E	45	52	65	75	95	115	29	36	40	50	60	68	87	107	128	
S5 (H13)	6,6	6,6	9	9	11	11	4,5	5,5	5,5	6,6	6,6	9	9	11	11	
FB(H13)	7	9	9	9	12	14	5,5	6,6	6,6	7	9	9	9	12	14	
G	10,5	11	15	15	18	18	9	10	10	11	11	15	15	18	18	
H	4	3,5	4,5	4,5	8	6	5,5	5,5	4,5	4	3,5	4,5	7,5	7	5	
L2	5	5	6,5	6,5	8	8	4,6	4,6	4,6	3,6	3,6	3,4	6,4	4,4	4,4	
M(H11)	30	35	40	45	45	55	10	12	12	14	14	18	18	23	28	
MF(JS14)	10	10	12	12	16	16	10	10	10	10	10	12	15	15	15	
R(JS14)	32	36	45	50	63	75	/	/	/	32	36	45	50	63	75	
TF(JS14)	64	72	90	100	126	150	43	55	60	65	82	90	110	135	163	
TG	32,5	38	46,5	56,5	72	89	18	22	26	32	42	50	62	82	103	
UF	80	90	110	120	150	170	55	70	76	80	102	110	130	160	190	
ZF	60,5	62	65	69,5	80	92,5	52,5	52,5	55	60,5	62	65	72,5	79	91,5	
ZF1	54,5	55,5	57,5	62	72	82,5	48	48	49,5	54,5	55,5	57,5	65	71	81,5	
Weight gr.	Steel	160	250	480	620	1430	1970	100	170	210	270	430	600	1210	1810	2610
	Aluminium	/	/	/	/	/	/	35	60	70	90	150	210	420	630	900

Foot

Ordering code
ISO
1500.Ø.05/1F
(1 piece)
UNITOP
1580.Ø.05/1F
(1 piece)

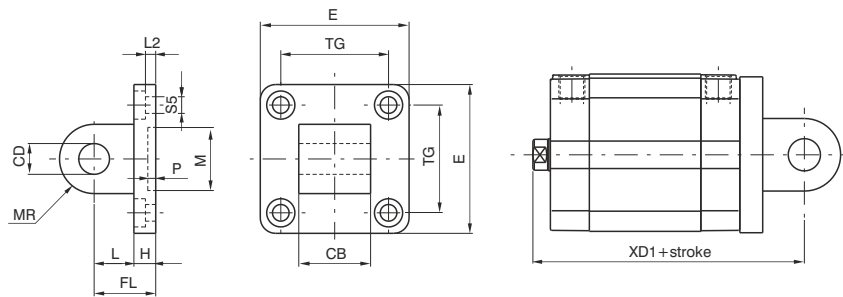
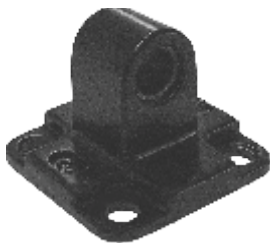


Element used to anchor the cylinder parallel to the mounting plane. They are made with stamped and pierced sheet metal black painted.

	ISO Dimensions						UNITOP Dimensions								
Bore	32	40	50	63	80	100	12-16	20	25	32	40	50	63	80	100
AB (H14)	7	9	9	9	12	14	5.5	6.6	6.6	6.6	9	9	11	11	13.5
AH (JS15)	32	36	45	50	63	71	22	27	30	32	42.5	47	59.5	65.5	78
AO (±0.2)	11	8	15	13	14	16	4.5	6	6	8	8	8	12	12	12
AT	4	4	5	5	6	6	3	4	4	5	5	6	6	8	8
AU (±0.2)	24	28	32	32	41	41	13	16	16	18	20	24	27	30	33
d	7	7	9	9	11	11	4.4	5.4	5.4	6.6	6.6	9	9	11	11
E	45	52	65	75	95	115	30	36	40	50	60	68	84	102	123
L1	30	30	36	35	47	53	17.5	22	23	24	29.5	30	39	36.5	38.5
SA	92.5	101.5	109.5	114	138	148.5	64	70	71.5	80.5	85.5	93.5	104	116	132.5
TG	32.5	38	46.5	56.5	72	89	18	22	26	32	42	50	62	82	103
TR	32	36	45	50	63	75	18	22	26	32	42	50	62	82	103
XA	74.5	80	85	89.5	105	117.5	55.5	58.5	61	68.5	72	77	84.5	94	109.5
Weight gr.	50	70	120	180	320	400	20	35	45	75	100	150	250	390	500

UNITOP rear male clevis for bores from 12 to 25

Ordering code
1580.Ø.09/1F (Aluminium)
1580.Ø.09/2F (Steel)



This type of mounting allows anchorage of the cylinder both parallel and at the right angle to the plane. The cylinder rod can oscillate and self-align to the connected load. It's made with aluminium alloy black painted or with zinc plated steel (from Ø 20).

Bore	12-16	20	25
CB(h14)	12	16	16
CD (H9)	6	8	8
E (±0.5)	27	34	38
FL	16	20	20
H	6	6	6
L	10	14	14
L2 (±0.5)	2.6	2.6	2.6
M (H11)	10	12	12
MR	6	8	8
P (+0.3)	3	3	3
S5 (H13)	4.5	5.5	5.5
TG (±0.2)	18	22	26
XD1	58.5	62.5	65
Weight gr.	Steel	/	70
	Aluminium	13	25

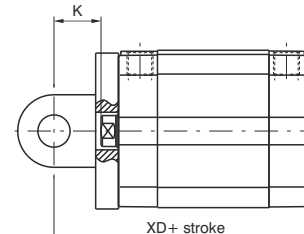
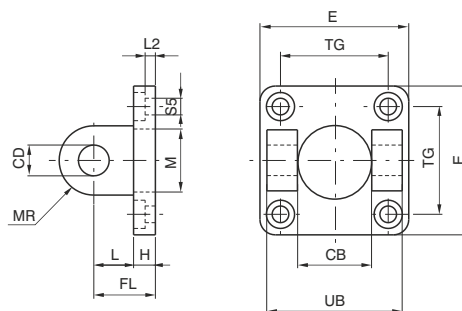
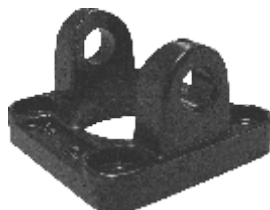
Front female clevis for bores from 32 to 100

Ordering code

ISO
Aluminium
1500.Ø.08F

UNITOP (Aluminium)
1580.Ø.11F

UNITOP (Steel)
1580.Ø.13F



This type of mounting allows anchorage of the cylinder both parallel and at the right angle to the plane. The cylinder rod can oscillate and self-align to the connected load. It's made with aluminium alloy black painted or with zinc plated steel.

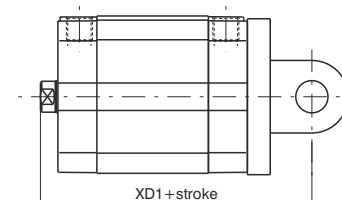
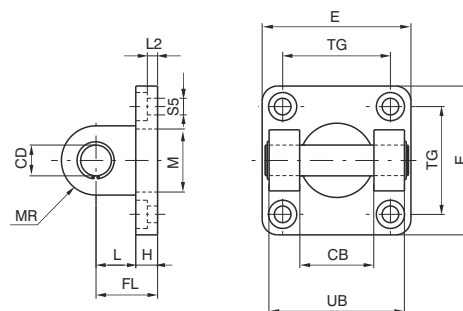
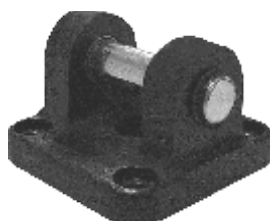
Rear female clevis for bores from 32 to 100

Ordering code

ISO
Aluminium
1500.Ø.09F

UNITOP (Aluminium)
1580.Ø.10F

UNITOP (Steel)
1580.Ø.12F



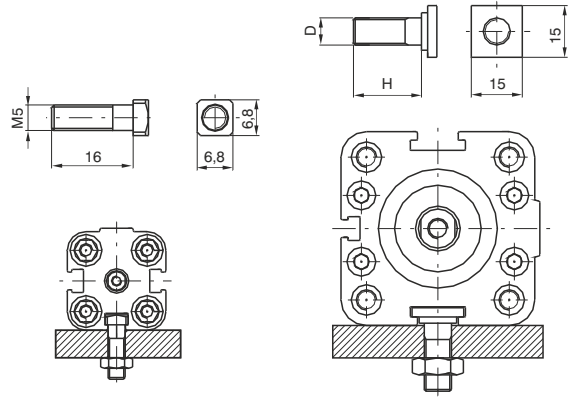
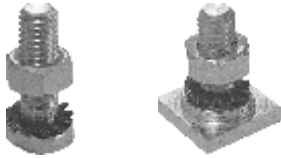
This type of mounting allows anchorage of the cylinder both parallel and at the right angle to the plane. The cylinder rod can oscillate and self-align to the connected load. It's made with aluminium alloy black painted or with zinc plated steel.

	ISO Dimensions						UNITOP Dimensions						
	32	40	50	63	80	100	32	40	50	63	80	100	
Bore	32	40	50	63	80	100	32	40	50	63	80	100	
CB (H14)	26	28	32	40	50	60	26	28	32	40	50	60	
CD (H9)	10	12	12	16	16	20	10	12	12	16	16	20	
E	45	52	65	75	95	115	48	58	66	83	102	123	
FL	22	25	27	32	36	41	22	25	27	32	36	41	
H	9	9	11	11	14	14	9	9	11	11	13	15	
K	16	18.5	19.5	24.5	28	31	16	18.5	19.5	24.5	28	31	
L	13	16	16	21	22	27	13	16	16	21	23	26	
L2	5.5	5.5	6.5	6.5	10	10	5.5	5.5	6.5	6.5	10	10	
M	30	35	40	45	45	55	14	14	18	18	23	28	
MR	10	12	12	16	16	20	10	12.5	12.5	15	15	20	
S5	6.6	6.6	9	9	11	11	6.6	6.6	9	9	11	11	
TG	32.5	38	46.5	56.5	72	89	32	42	50	62	82	103	
UB	45	52	60	70	90	110	45	52	60	70	90	110	
XD	66.5	70.5	72.5	82	92	107.5	66.5	70.5	72.5	82	92	107.5	
XD1	72.5	77	80	89.5	100	117.5	72.5	77	80	89.5	100	117.5	
Weight gr.	Steel	Front	/	/	/	/	/	180	310	420	700	1240	2210
		Rear	/	/	/	/	/	220	360	480	830	1390	2500
	Alum.	Front	40	70	120	170	360	65	110	145	240	430	770
		Rear	80	120	180	300	500	80	125	170	290	480	865

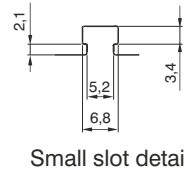
Slot fixing screws

Ordering code

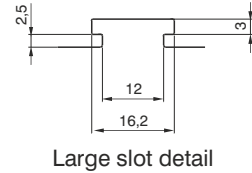
- 1500.17F** small slot (from Ø12 to Ø50)
- 1500.15F** large slot (Ø32)
- 1500.16F** large slot (from Ø40 to Ø63)
- 1500.18F** large slot (from Ø80 to Ø100)



Example of mounting with square head screws



Small slot detail



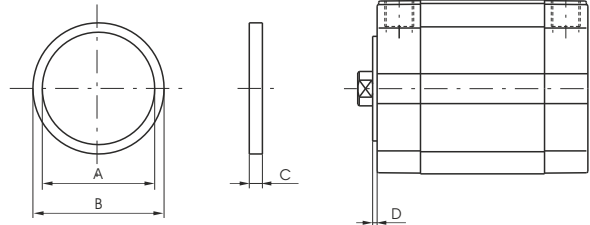
Large slot detail

Bore	12 - 50	32	40 - 63	80 - 100
D	/	M6	M8	M10
H	/	15	20	25
Weight gr.	8	10	18	25

Centering rings

Ordering code

1580.Ø.02F



This aluminium ring allows the center assembling of the cylinder.

Bore	32	40	50	63	80	100
A	25	30	35	40	40	50
B (e11)	30	35	40	45	45	55
C	3,5	3,5	3,5	4,5	5,5	5,5
D	1,5	1,5	1,5	2	2,5	2,5
Weight gr.	2	2	3	4	5	6

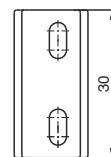
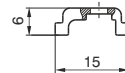
Sensor adapter

Ordering code

1380.01F



Weight gr. 2



Nylon accessory for sensor mounting 1580._, MRS._, MHS._ inside "A" shape.

Sensor with 2.5 m. cable

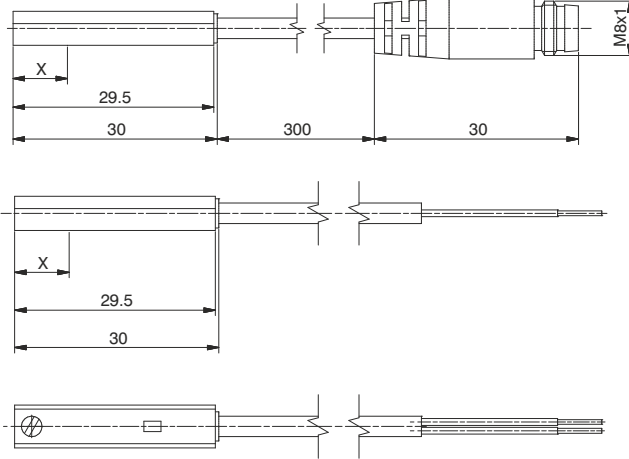


Weight gr. 27

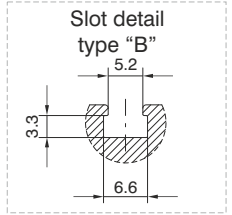
Sensor with cable and M8 connector



Weight gr. 15



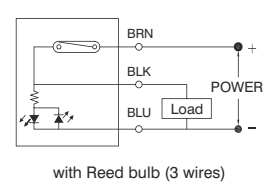
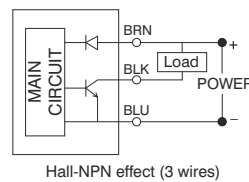
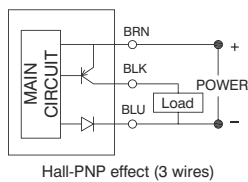
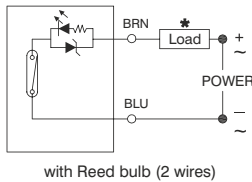
X= point of commutation



Sensor ordering codes

Ampulla Reed sensors, with led, Universal, N.O. (Normally open)		X=point of commutation
1580.U	(2 wires) cable 2.5 mt.	15 mm
MRS.U	(2 wires) cable 300 mm, M8 connector (use MC1 or MC2 connectors)	15 mm
1580.UAP	PNP (3 wires) cable 2.5 mt.	15 mm
MRS.UAP	PNP (3 wires) cable 300 mm, M8 connector (use MCH1 or MCH2 connectors)	15 mm
Hall effect sensors, with led, DC, N.O. (Normally open)		X=point of commutation
1580.HAP	PNP (3 wires) cable 2.5 mt.	8 mm
1580.HAN	NPN (3 wires) cable 2.5 mt.	8 mm
MHS.P	PNP (3 wires) cable 300 mm, M8 connector (use MCH1 or MCH2 connectors)	8 mm

Diagrams and connections



* The load (LOAD) can be connected either to negative or positive pole

Technical characteristics	1580.U	MRS.U	1580.UAP	MRS.UAP	1580.HAP	1580.HAN	MHS.P
Type of contact	N.O.						
Output type	PNP				NPN		PNP
Maximum current	14 VA - 10 W		4 VA - 3 W		3 W		
Maximum permanent power	5 - 230V DC/AC		5 - 30V DC/AC		10 - 30 V DC		
Voltage range	3.5 V		0V **		2 V		
Working temperature	-10°C - +70°C						
Maximum voltage drop	2 x 0.14 Ø3.3mm PUR		2 x 0.14 Ø3.3mm PUR		3 x 0.14 Ø3.3 mm PUR		
Cable section (mm ²)	IP 67						
Degree of protection							

** Even if one sensor generates a voltage drop very close to 0 Volts, we suggest to connect no more than 30 sensors in series.

Cable ordering code

Connection 2 wires

- MC1** cable 2 wires l=2.5m with M8 connector
- MC2** cable 2 wires l=5m with M8 connector
- MC3** cable 2 wires l=10m with M8 connector

Connector



Sensor



- 1 Brown (+)
- 4 Blue (-)
- 3 Not use

Connection 3 wires

- MCH1** cable 3 wires l=2.5m with M8 connector
- MCH2** cable 3 wires l=5m with M8 connector
- MCH3** cable 3 wires l=10m with M8 connector

Connector



Sensor



- 1 Brown (+)
- 4 Black (signal)
- 3 Blue (-)