Piston Rod Cylinders
Bellows Cylinders

Consistent design of accessories for all cylinder series, e.g. swivel mountings, pivots, piston rod eyes, magnetic switches, etc.

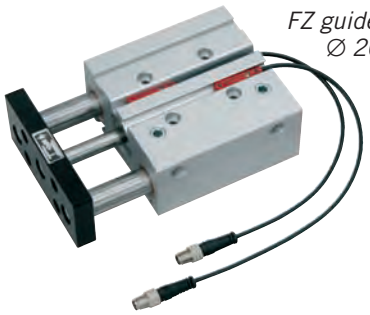
Advanced cylinder concepts with outstanding performance define the ORIGA piston rod cylinder programme.

The resulting advantages are the basis for trouble-free operation – whether as individual components or in a combined system, meeting the demands of modern automation for high reliability and high economic efficiency. Special solutions can be developed for optimum efficiency in specific applications.

DZ tie rod cylinder
to ISO 15552 (ISO 6431)
∅ 125 - 320 mm

DZB blocking cylinder
mountings to ISO 15552
(ISO 6431)
∅ 32 - 125 mm

ST stop cylinder



FZ guided cylinder
∅ 20 - 50 mm

NZ cylinder
to ISO 21287
∅ 12 - 100 mm

SZ short stroke cylinder
∅ 12 - 100 mm

AZV non-rotating cylinder
mountings to
ISO 15552 (ISO 6431)
∅ 32 - 100 mm

AZ cylinder
to ISO 15552 (ISO 6431)
VDMA 24562
∅ 32 - 100 mm

R round cylinder
to ISO 6432 ∅ 10 - 25 mm
R round cylinder ∅ 32 - 63 mm

SP bellows cylinder
single, double, triple convolution

HOERBIGER-ORIGA-Products for ⟨Ex⟩-Atmospheres
Equipment Group II Category 2GD
Piston Rod Cylinders: ⟨Ex⟩ II 2GD c T4 T135°C

Note on ordering:
When ordering the ATEX version of a cylinder, please add "ATEX" to the type designation and order no.
Example:
DZ 5125-0100 ATEX
PA 53540-0100 ATEX

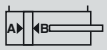
Cylinders *for EX-Areas* ATEX versions

Formula	F = p · A-R
Symbol	Description
A p R	Piston area Pressure in bar Friction ca. 10%

[1]) Air consumption when charging in dm3/100 mm stroke. The tube volume must also be taken into consideration.
The given figures relate to piston area A.

The figures for piston area B change proportionally with the piston areas A to B.

A = Piston area - piston side
B = Piston area - piston rod side



Piston Force and Air Consumption

for Standard Cylinders

		Piston diameter (mm)																
		8	10	12	16	20	25	32	40	50	63	80	100	125	160	200	250	320
Piston area * (cm^2)	A	0.5	0.8	1.1	2.0	3.1	4.9	8.0	12.6	19.6	31.2	50.0	78.0	122.7	201.0	314.1	490.8	804
	B	0.38	0.65	0.85	1.7	2.6	4.1	6.9	10.6	16.5	28.0	45.4	73.6	114.7	188.5	301.5	471.2	773
Approx. piston force (kN) at ... bar	1	0.0045	0.007	0.010	0.018	0.028	0.044	0.072	0.113	0.176	0.281	0.452	0.706	1.104	1.809	2.827	4.417	7.236
	2	0.0090	0.014	0.020	0.036	0.056	0.088	0.144	0.226	0.353	0.561	0.905	1.413	2.209	3.619	5.654	8.835	14.476
	3	0.0135	0.021	0.030	0.054	0.084	0.132	0.217	0.339	0.530	0.842	1.357	2.120	3.313	5.428	8.482	13.253	21.715
	4	0.0180	0.028	0.040	0.072	0.113	0.176	0.289	0.452	0.707	1.122	1.809	2.827	4.417	7.238	11.309	17.671	28.953
	5	0.0225	0.035	0.050	0.090	0.141	0.220	0.362	0.565	0.884	1.402	2.262	3.534	5.522	9.407	14.137	22.089	36.191
	6	**0.0270**	**0.042**	**0.060**	**0.108**	**0.169**	**0.265**	**0.434**	**0.678**	**1.060**	**1.683**	**2.714**	**4.241**	**6.626**	**10.857**	**16.964**	**26.507**	**43.429**
	7	0.0315	0.049	0.070	0.126	0.197	0.309	0.506	0.792	1.237	1.963	3.167	4.948	7.731	12.666	19.792	30.952	50.652
	8	0.0360	0.056	0.080	0.144	0.226	0.353	0.579	0.905	1.414	2.244	3.619	5.654	8.835	14.476	22.619	35.342	57.788
	9	0.0405	0.063	0.090	0.162	0.254	0.397	0.651	1.018	1.590	2.524	4.071	6.361	9.940	16.286	25.447	39.760	65.124
	10	0.0450	0.070	0.100	0.180	0.282	0.441	0.723	1.131	1.767	2.805	4.523	7.068	11.044	18.095	28.274	44.178	72.360
Approx. air consumption (dm3/100 mm stroke at ... bar1) Figures are valid for piston area A (see symbol)	1	0.010	0.016	0.02	0.04	0.06	0.09	0.18	0.30	0.46	0.71	1.20	1.90	2.65	4.60	6.90	10.80	16.50
	2	0.015	0.024	0.03	0.06	0.09	0.14	0.27	0.43	0.69	1.00	1.85	2.85	4.10	6.90	10.40	16.30	24.50
	3	0.020	0.032	0.04	0.08	0.12	0.19	0.36	0.58	0.92	1.40	2.45	3.80	5.50	9.20	13.90	21.80	32.50
	4	0.025	0.040	0.05	0.10	0.15	0.24	0.45	0.72	1.15	1.75	3.00	4.75	6.95	11.50	17.40	27.20	40.50
	5	0.030	0.048	0.06	0.12	0.18	0.29	0.55	0.86	1.40	2.10	3.65	5.70	8.40	13.80	20.90	32.70	48.00
	6	**0.035**	**0.056**	**0.07**	**0.14**	**0.21**	**0.34**	**0.65**	**1.00**	**1.60**	**2.50**	**4.25**	**6.60**	**9.70**	**16.00**	**24.40**	**38.20**	**56.50**
	7	0.040	0.064	0.08	0.16	0.25	0.39	0.73	1.15	1.80	2.85	4.85	7.60	11.15	18.30	27.90	43.70	64.50
	8	0.045	0.072	0.09	0.18	0.28	0.41	0.82	1.30	2.00	3.20	5.45	8.50	12.55	20.60	31.50	49.20	72.50
	9	0.050	0.080	0.10	0.20	0.31	0.49	0.90	1.45	2.30	3.55	6.10	9.50	14.00	22.90	35.00	54.60	80.50
	10	0.055	0.088	0.11	0.22	0.34	0.53	1.00	1.60	2.50	3.90	6.40	10.40	15.40	25.20	38.50	60.10	89.00



AZL - Standard Cylinders

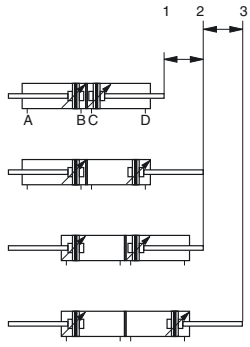
Ø 32-100 mm

to ISO 15552 (ISO 6431), VDMA 24562 and CETOP RP43P

Multiple Position Cylinder

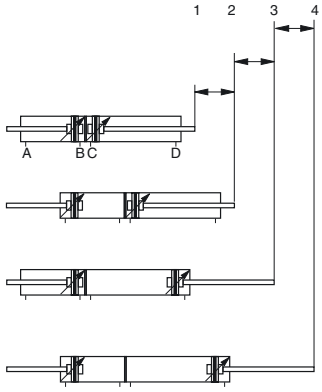
A three- or four-position cylinder consists of two separate cylinders whose piston rods extend in opposite directions. Depending on the control system and the division of the stroke length, this type of cylinder can provide up to four positions, with each position defined exactly by a stop. Note that when a piston rod end is fixed, the cylinder tube itself carries out the movement and therefore requires flexible air connections.

Arrangement for 3 positions



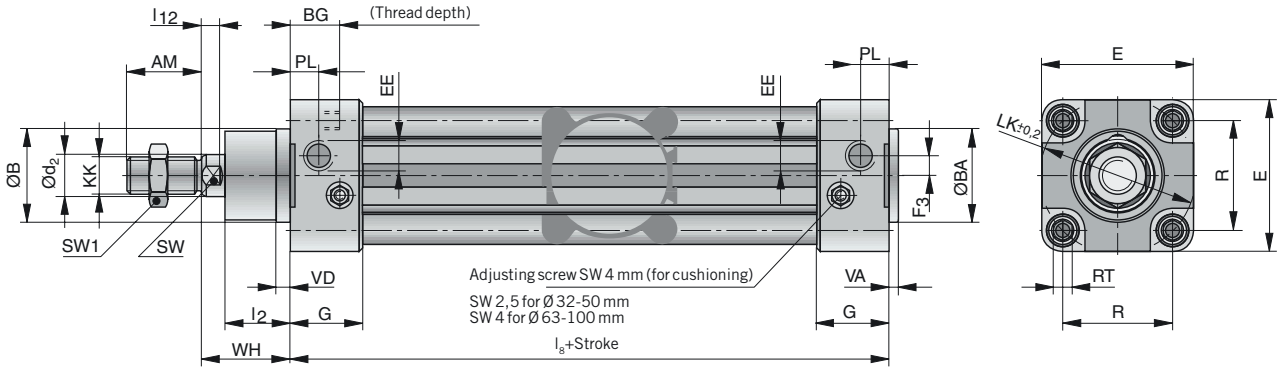
Two AZL cylinders of the same stroke length are connected together.

Arrangement for 4 positions



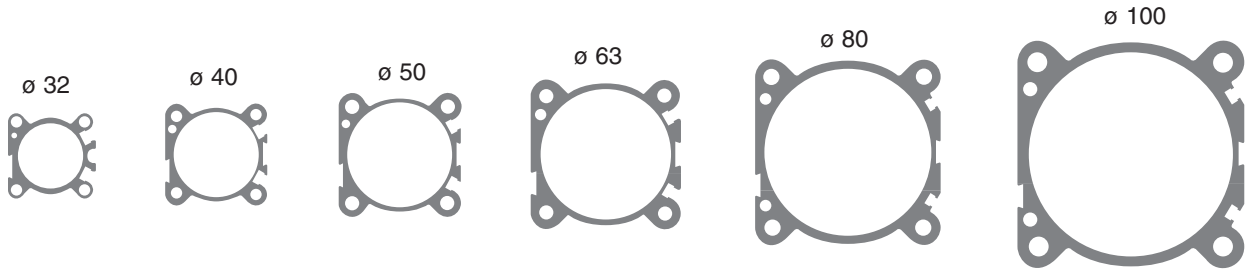
Two AZL cylinders of different stroke lengths are connected together.

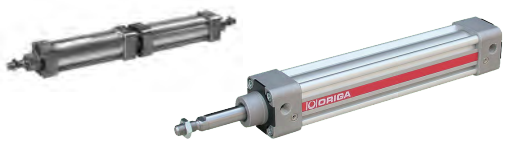
Dimensions for Basic Cylinder, Series AZL...., Ø 32 – 100 mm



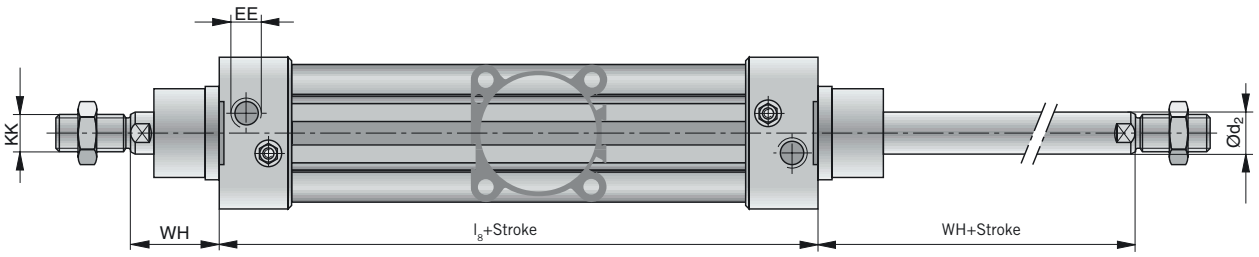
Dimension Table (mm) – Series AZL..., AZD...., AZZ....

Cyl. Ø	$ØB_{d11}$	$Ød_2$	E	F_3	G	l_2	l_8 +Stroke	l_{12}	R	AM	$ØBA_{d11}$	BG
32	30	12	47	4.5	30.5	20	94	6	32.5	22	30	16
40	35	16	55	5.3	34	20.5	105	6.5	38	24	35	16
50	40	20	65	8.5	31	28	106	8	46.5	32	40	16
63	45	20	78	8	33	26	121	8	56.5	32	45	16
80	45	25	95	9	35.5	32.5	128	10	72	40	45	17
100	55	25	115	13	37	37.5	138	10	89	40	55	17

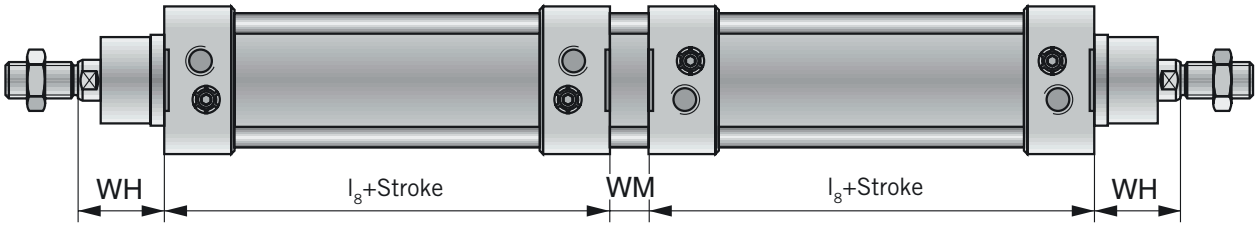




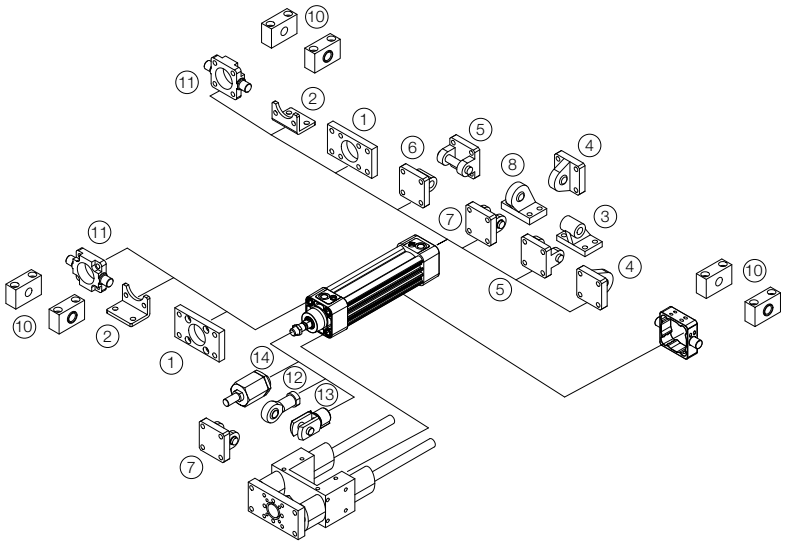
Dimensions – Basic Cylinder with Through Piston Rod, Series AZD…., Ø 32 – 100 mm



Dimensions – Multiple Position Cylinder, Series AZZ…., Ø 32 – 100 mm



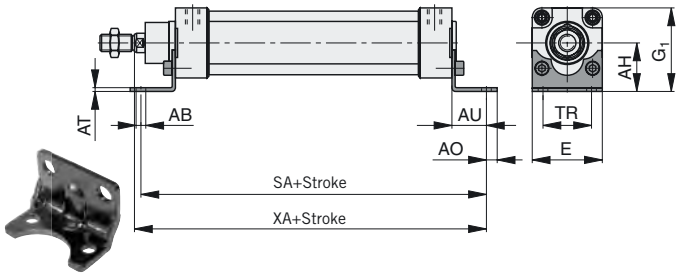
Cyl. Ø	EE	ØLK	KK	PL	RT	SW	SW_1	VA	VD	WH	WM
32	G1/8	46	M10x1.25	20	M6	10	17	4	5	26	12
40	G1/4	54	M12x1.25	14.5	M6	13	19	4	4.5	30	12
50	G1/4	66	M16x1.5	16	M8	17	24	4	6	37	15
63	G3/8	80	M16x1.5	16	M8	17	24	4	6	37	14
80	G3/8	102	M20x1.5	20.5	M10	22	30	4	6	46	18
100	G1/2	126	M20x1.5	19	M10	22	30	4	6	51	18



Mountings
Ø 32-100 mm
to ISO 15552 (ISO 6431), VDMA 24562 and CETOP RP43P

Mountings – Basic Cylinder, Series AZ...., AZD....., AZZ...., Ø 32 – 100 mm

Dimensions for Mounting A



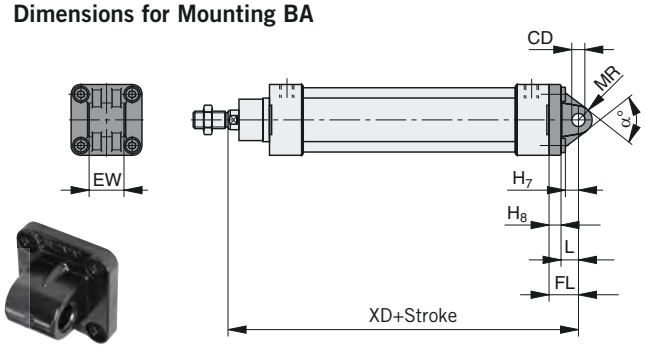
Material: steel passivated

Dimension Table (mm) – for Mounting A

Cyl. Ø	E	G_1	AB	AH	AO	AT	AU	SA +Stroke	TR	XA +Stroke
32	47	55.5	7	32	8	4	24	142	32	144
40	53	62.5	9	36	10	4	28	161	36	163
50	65	77.5	9	45	10	5	32	170	45	175
63	75	87.5	9	50	10	5	32	185	50	190
80	95	110.5	12	63	14	6	41	210	63	215
100	115	128.5	14	71	15	6	41	220	75	230

Included in delivery: 2 foot brackets, 4 screws

Dimensions for Mounting BA



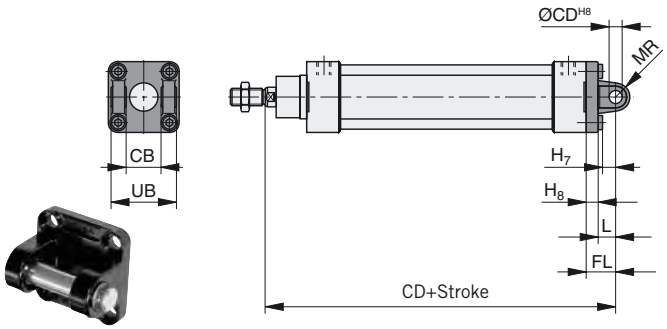
Material: cast aluminium

Dimension Table (mm) – for Mounting BA

Cyl. Ø	H_7	H_8	L	ØCD^{H8}	EW	FL	MR +Stroke	XD	α°
32	10	10	12	10	26	22	10.5	142	60
40	13	10	15	12	28	25	13	160	60
50	12	11	16	12	32	27	13	170	70
63	17	11	21	16	40	32	17	190	60
80	16	15	21	16	50	36	17	210	70
100	20.5	16	25	20	60	41	21	230	70

Included in delivery: 1 rear trunnion mounting, 4 screws

Dimensions for Mounting B



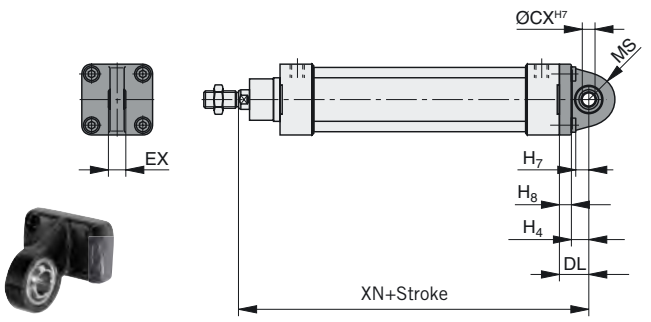
Material: cast aluminium

Dimension Table (mm) – for Mounting B

Cyl. Ø	H_7	H_8	L	ØCD^{H8}	CB	FL	MR	UB	XD +Stroke
32	10	10	12	10	26	22	9	45	142
40	13	10	15	12	28	25	11	52	160
50	12	11	16	12	32	27	12	60	170
63	17	11	21	16	40	32	15	70	190
80	16	15	22	16	50	36	16	90	210
100	20.5	16	25	20	60	41	20	110	230

Included in delivery: 1 rear trunnion mounting, 4 screws

Dimensions for Mounting BAS
(rear trunnion mounting with spherical bearing)

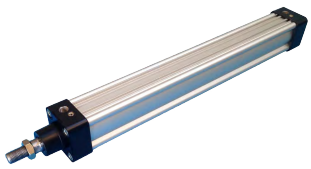


Material: cast aluminium

Dimension Table (mm) – for Mounting BAS

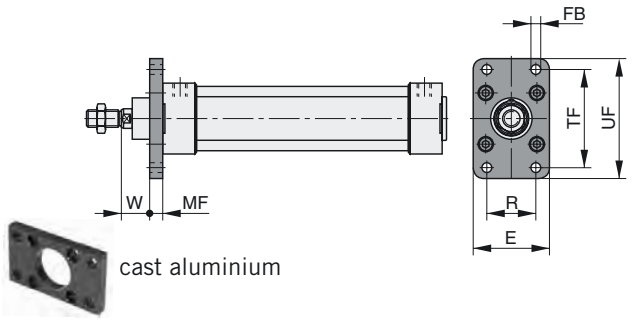
Cyl. Ø	H_4	H_6	H_7	ØCX^{H7}	DL	EX	MS	XN +Stroke
32	12	22	10	10	10	14	18	142
40	15	25	13	12	10	16	21	160
50	16	27	12	12	11	16	23	170
63	21	32	17	16	11	21	27	190
80	21	36	16	26	15	21	29	210
100	25	41	20.5	20	16	25	34	230

Included in delivery: 1 rear trunnion mounting with spherical bearing, 4 screws

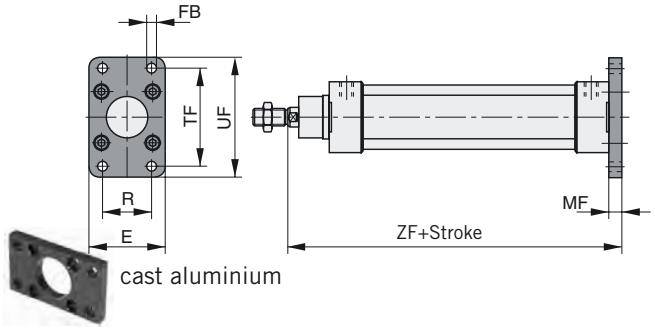


Mounting – Basic Cylinder, Series AZ...., AZD....., AZZ...., Ø 32 – 100 mm

Dimensions for Mounting C



Dimensions for Mounting D



Dimension Table (mm) – for Mounting C

Cyl. Ø	E	R	ØFB	MF	TF	UF	W
32	50	32	7	10	64	79	16
40	56	36	9	10	72	90	20
50	70	45	9	12	90	110	25
63	77	50	9	12	100	120	25
80	100	63	12	16	126	153	30
100	120	75	14	16	150	178	35

Included in delivery: 1 flange, 4 screws

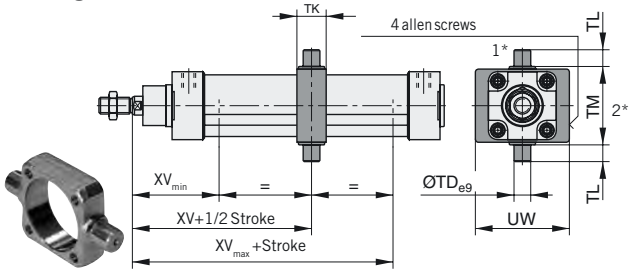
Dimension Table (mm) – for Mounting D

Cyl. Ø	E	R	ØFB	MF	TF	UF	ZF +Stroke
32	50	32	7	10	64	79	130
40	56	36	9	10	72	90	145
50	70	45	9	12	90	110	155
63	77	50	9	12	100	120	170
80	100	63	12	16	126	153	190
100	120	75	14	16	150	178	205

Included in delivery: 1 flange, 4 screws

Dimensions for Mounting EN, ISO 15552 (ISO 6431) only for series AZ (profile cylinder barrel version)

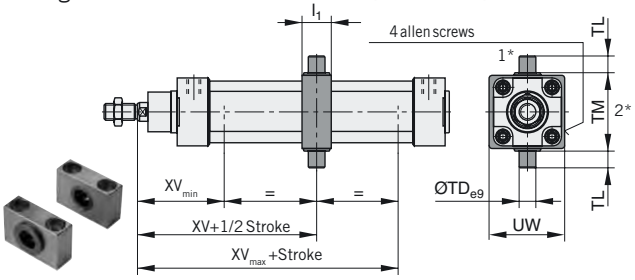
Flange dimensions to ISO 15552 (ISO 6431)



Material: aluminium, anodized
1* Mounting lugs in same direction as air connection (industrial standard version)
2* Mounting lugs offset 90° from air connection

Dimensions for Mounting EN, ISO 15552 (ISO 6431) only for series AZZ (tie rod version)

Flange dimensions to ISO 15552 (ISO 6431)



Material: SG cast iron, chromated
1* Mounting lugs in same direction as air connection (industrial standard version)
2* Mounting lugs offset 90° from air connection

Dimension Table (mm) – for Mounting EN

Cyl. Ø	ØTD$_{e9}$	TK	TL	TM	UW	XV$_{min}$	XV+ 1/2 Stroke	XV$_{max}$ +Stroke
32	12	25	12	50	65	67	73	79
40	16	28	16	63	75	72	83	94
50	16	28	16	75	85	81	90	99
63	20	36	20	90	100	85	98	111
80	20	36	20	110	120	99	110	121
100	25	48	25	132	135	107	120	133

The trunnion mounting can be moved to any position between XV$_{min}$ and XV$_{max}$ after loosening the clamping screws..

Included in delivery: 1 rear trunnion mounting

With the EN mounting, the mounting slot for the magnetic switches is offset 90° from the air connection

Dimension Table (mm) – for Mounting EN

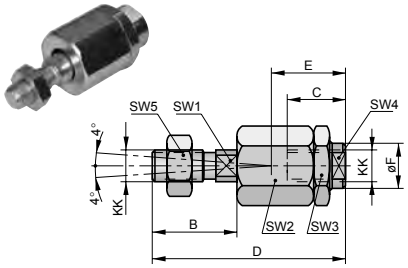
Cyl. Ø	l$_1$	ØTD$_{e9}$	TL	TM	UW	XV$_{min}$	XV+ 1/2 Stroke	XV$_{max}$ + Stroke
32	15	12	12	50	46	64	73	82
40	20	16	16	63	59	74	82.5	91
50	20	16	16	75	69	78	90	102
63	25	20	20	90	84	82.5	97.5	112.5
80	30	20	20	110	102	96.5	110	123.5
100	32	25	25	132	125	104	120	136

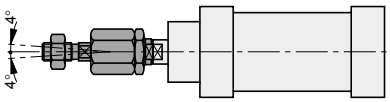
The trunnion mounting can be moved to any position between XV$_{min}$ and XV$_{max}$ after loosening the clamping screws.

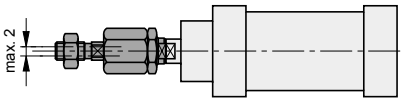
Note on EN mounting: To avoid faulty switching, the magnetic switches should be fitted at least 10 to 20 mm away from the EN mounting, depending on cylinder diameter.

Included in delivery: 1 rear trunnion mounting

Compensating Coupling for Piston Rod







Material: steel

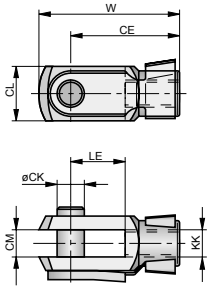
Angle compensation

Radial compensation of centre axis

Order Instructions, Dimension Table (mm), Weight

Order Instructions Type	Order No.	to Cyl.Ø	B	C	D	E	ØF	KK	SW1	SW2	SW3	SW4	SW5	Weight (kg)
AK-M 10x1,25	KY 1129	32	20	23	70	31	21,5	M10x1,25	12	30	30	19	17	0,218
AK -M12x1,25	KY 1131	40	23	23	67	31	21,5	M12x1,25	12	30	30	19	19	0,207
AK -M16x1,5	KY 1133	50,63	40	32	112	45	33,5	M16x1,5	19	41	41	30	30	0,637
AK -M20x1,5	KY 1134	80,100	40	42	122	56	33,5	M20x1,5	19	41	41	30	30	0,711

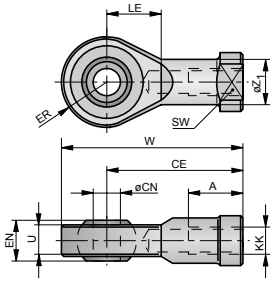
Piston Rod Clevis to ISO 8140 (CETOP RP102P)



Order Instructions, Dimension Table (mm), Weight

Order Instructions Type	Order No.	to Cyl.-Ø	ØCK	CE	CL	CM	KK	LE	W	Weight (kg)
GK-M10 x 1,25	KY 6135	32	10	40	20	10	M10x1,25	20	52	0,08
GK-M12 x 1,25	KY 6136	40	12	48	24	12	M12x1,25	24	62	0,125
GK-M16 x 1,5	KY 6139	50,63	16	64	32	16	M16x1,5	32	83	0,30
GK-M20 x 1,5	KY 6141	80,100	20	80	40	20	M20x1,5	40	105	0,52

Piston Rod Eye to ISO 8139 (CETOP RP103 P)



Order Instructions, Dimension Table (mm), Weight

Order Instructions Type	Order No.	to Cyl.-Ø	A	CE	øCN	EN	ER	KK	LE	SW	U	W	$øZ_1$	Weight (kg)
GA-M10 x 1,25	KY 6147	32	20	43	10	14	14	M10x1,25	15	17	10,5	57	15	0,072
GA-M12 x 1,25	KY 6148	40	22	50	12	16	16	M12x1,25	17	19	12	66	17,5	0,107
GA-M16 x 1,5	KY 6150	50,63	28	64	16	21	21	M16x1,5	22	22	15	85	22	0,21
GA-M20 x 1,5	KY 6151	80,100	33	77	20	25	25	M20x1,5	26	32	18	102	27,5	0,38

FSE Locking Unit Ø 32-125 mm

Series FSE..

Version:
with locking unit – locks if pressure drops

Cylinders see page 44, 45 **and** 49.

Characteristics

Characteristics	Symbol	Unit	Description						
General									
Description			Piston rod cylinder with locking unit						
Series			AZF						
Locking unit			locks if pressure drops						
Material – Locking unit									
Cartridge			Aluminium, anodised						
Housing			Aluminium, anodised						
Clamping Jaw			Ms						
Cyl. piston rod			Steel, high-alloy						
FSE unlocking pressure		bar	≥4 bis 10						
Cylinder diameter		mm	32	40	50	63	80	100	125
Pilot air connection			M5	M5	G1/8	G1/8	G1/8	G1/8	G1/8
Locking force, static **)		N	600	1000	1500	2200	3000	5000	7000

for further information see standard cylinder on pages 44, 45 and 49

Weight (mass) kg

Description	Cylinder diameter						
	32	40	50	63	80	100	125
Locking unit	0.60	0.80	1.00	1.20	1.40	1.60	1.80
Basic cylinder *)	0.70	1.20	1.75	2.32	3.75	4.90	7.87

*) with 100 mm stroke and longer piston rod

**) Note:

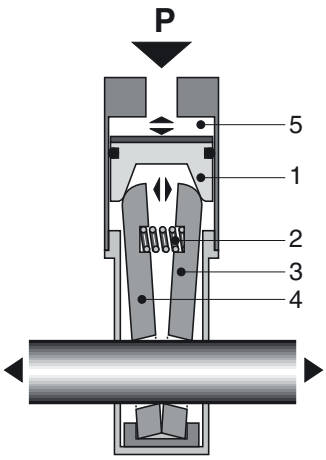
The holding force quoted relates to a static load. If this load is exceeded, slippage can occur. Any dynamic forces occurring in operation must not exceed the static holding force.
In clamped operating mode, if the load is fiuctuatung, the clamping unit is not free from play. The cylinder is not suitable for positioning tasks.

Actuation:

The clamping unit must only be released when both cylinder chambers are pressurised, otherwise there is danger of an accident from the jerky movement of the piston rod. Shutting off the compressed air supply at both ends with a 5/3 way valve provides adequate safety only for a short time.

Function

If the pressure drops the piston rod is locked by two tilting plates.
When the piston (1) is put under pressure it is pushed downwards, pressing the two tilting plates (3) and (4) together. The piston rod is then free to move.
If the pressure drops in piston chamber (5), a spring pushes the two plates (3) and (4) apart, so that the wedge effect pushes the piston (1) upwards and the tilting plates lock the piston rod.



Important

- The locking unit can only be mounted on the cylinder if it is held in its unlocked position either by air pressure or by a suitable screw.
- When the cylinder piston rod is locked it must not be rotated or subjected to external force.

Order Instructions – Locking unit (without cylinder), Series FSE-..., Ø 32 – 125 mm

Description	Symbol	for Cyl. Ø	Order Instructions	
			Type	Order-No.
		32	FSE 032	KC 8227
		40	FSE 040	KC 8228
		50	FSE 050	KC 8229
		63	FSE 063	KC 8230
		80	FSE 080	KC 8231
		100	FSE 100	KC 8232
		125	FSE 125	KC 8233