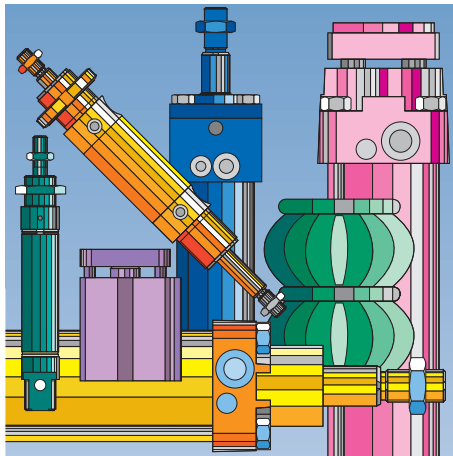


AUTOMATION  
TECHNOLOGY

## SPECIALTY CYLINDERS

BORES: 8 mm to 125 mm  
R: ISO 6432 • ROV: OVAL BORE • SZ/SZV/NZK: COMPACT  
AZ: ISO 6431 • AZV/RDV: TWIN ROD  
DZB/DZBA/FSE: BLOCKING CYLINDERS  
FEUG/FEHG/FEHK: LINEAR GUIDES



**HOERBIGER**  
 **ORIGA**

## AZ Cylinder

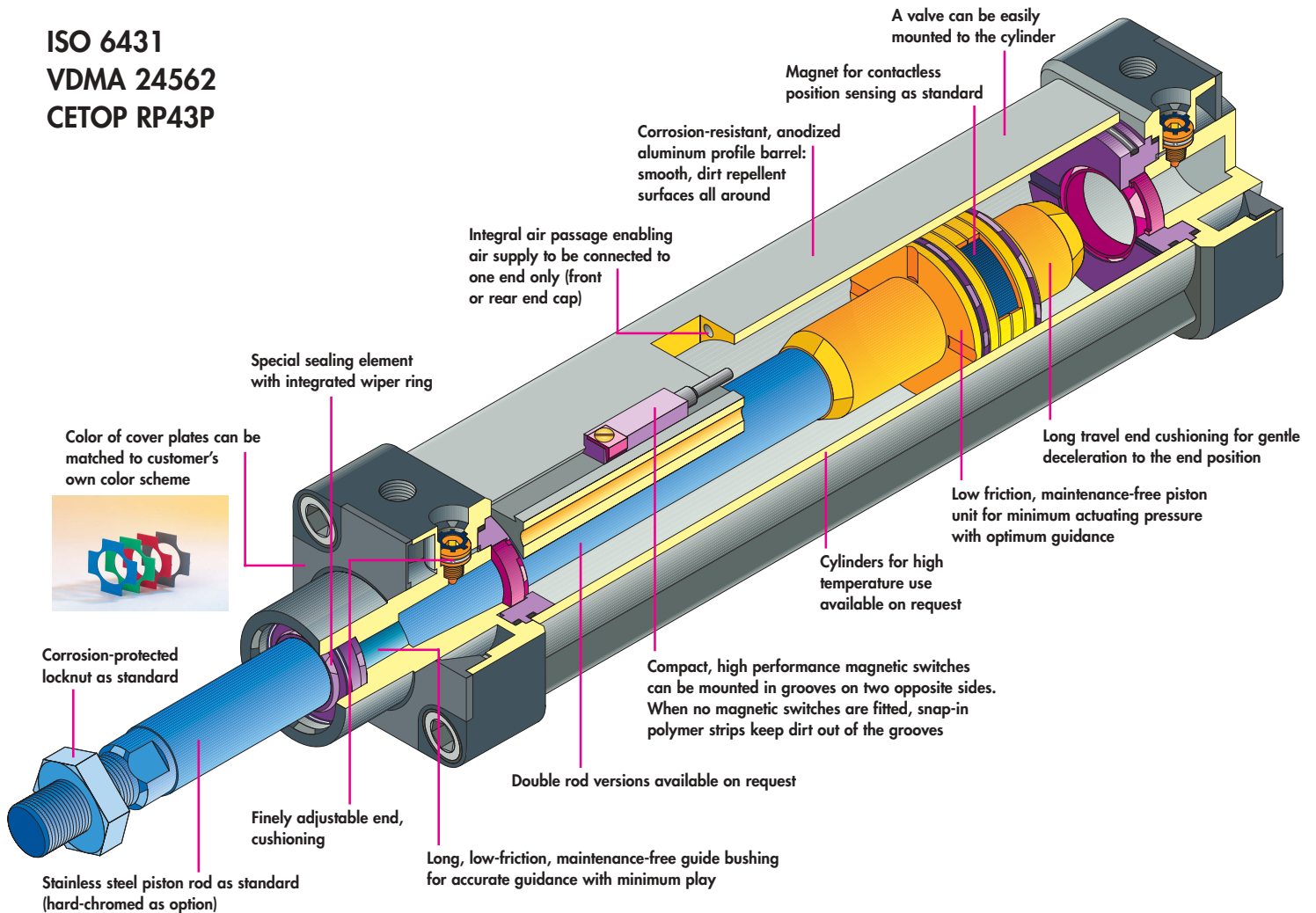
### Internal Construction

*Parts reduction and design simplification have led to significant advantages in production and assembly operations - for a performance/price ratio which benefits the customer.*

ISO 6431

VDMA 24562

CETOP RP43P



### THE DESIGN

The first thing you'll notice about the AZ Series cylinder is its smooth profile and clean design. Structured to integrate into your system, it offers dirt repellent snap-in strips and end cap plates that can be matched to system colors.

### A GROWING LINE TO HANDLE ALL YOUR NEEDS

Available in all popular diameters and strokes with double-acting and double-rod versions, as well as, compact and non-rotating models.

### INTEGRAL AIR PASSAGE

The integral air passage enables the air supply to be connected to either conventional air connections or dual ports in the rear or front caps.

### OPTIONS FOR SPECIAL APPLICATIONS

- Protective finish for added durability in hostile environments
- High temperature seals

### DOVE-TAIL GROOVES

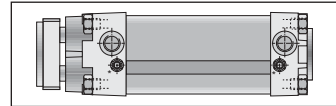
Two dove-tail grooves, on opposite sides of the cylinder barrel, allow easy fitting of small, high-performance magnetic switches (both reed and hall effect types), which are contained almost completely within the overall cylinder profile. In addition, the cylinder can be modified to accept a control valve mounted directly to it, forming one compact unit.

### ESSENTIAL ACCESSORIES

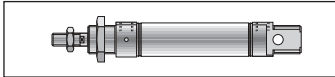
Six different mounting options provide a wide range of installation options, even where space is tight.

$$I = \sum r^2 \Delta m$$

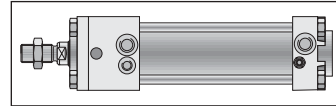
**Technical Section**  
Force and Load Charts  
Pages 1-6



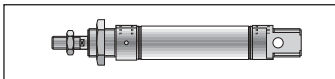
**Series AZV**  
Twin Rod Cylinder  
Bores 25mm-100mm  
Pages 41-49



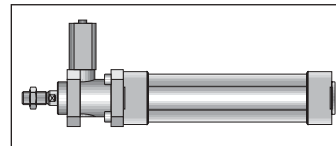
**Series R**  
ISO 6432  
Bores 10mm-25mm  
Pages 7-11



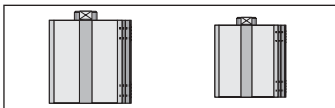
**Series DZB**  
Blocking Cylinder  
Bores 32mm-125mm  
Pages 50-57



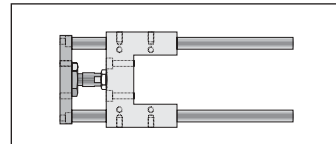
**Series ROV**  
Oval Bore Cylinder  
Bores 8mm-25mm  
Pages 12-16



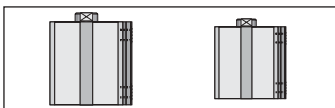
**Series FSE**  
Blocking Cylinder  
Bores 32mm-125mm  
Pages 58-61



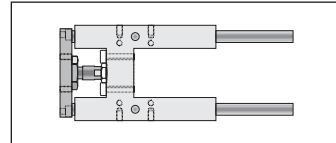
**Series SZ**  
Compact Cylinder  
Bores 12mm-100mm  
Pages 17-21



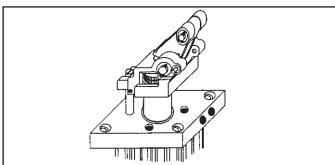
**Series FEUG**  
Linear Guides  
"U" Form  
Bushing Type  
ISO 6431 & 6432  
Pages 62-66



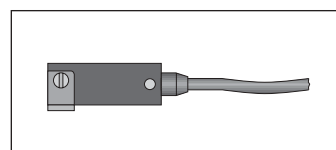
**Series NZK**  
Compact Cylinder  
Bores 32mm-100mm  
Pages 22-24



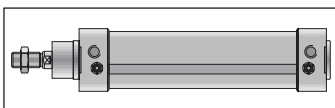
**Series FEHG, FEHK'**  
Linear Guides  
"H" Form  
Bushing and Bearing Type  
ISO 6431  
Page 67-71



**Series WST**  
Stopper Cylinder  
Bores 50-80mm  
Pages 25-28



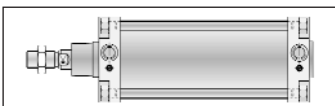
**Sensors**  
Reed  
Hall Effect (NPN, PNP)  
Air  
Welding Proof  
Page 72-75



**Series AZ**  
ISO 6431  
Bores 32mm-100mm  
Pages 29-36

**Spares**

**Spare Parts**  
Seal Kits  
Page 76-78



**Series DZ**  
ISO 6431  
Bores 125-250mm  
Pages 37-40

# General Information



## Metric Conversions

(Multiply \_\_\_\_\_ By \_\_\_\_\_ to Convert to \_\_\_\_\_ )

### METRIC TO US

#### LENGTH

mm	0.0394	in
cm	0.3937	in
m	3.2808	ft

#### AREA

mm <sup>2</sup>	0.0016	in <sup>2</sup>
cm <sup>2</sup>	0.1550	in <sup>2</sup>

#### VOLUME

mm <sup>3</sup>	6.10 x 10 <sup>-5</sup>	in <sup>3</sup>
cm <sup>3</sup> (cc)	0.0610	in <sup>3</sup>
m <sup>3</sup>	35.315	ft <sup>3</sup>

#### WEIGHT

g	0.0353	oz
kg	2.2046	lb

#### FORCE

gF	2.205 x 10 <sup>-3</sup>	lbf
N	0.2248	lbf

#### TORQUE

Nm	0.7376	ft•lb
----	--------	-------

#### PRESSURE

kPa	0.145	psi
Bar	14.50	psi
kg/cm <sup>2</sup>	14.223	psi

#### TEMPERATURE

$$^{\circ}\text{F} = (1.8 \times \text{C}^{\circ}) + 32$$

#### FLOW RATE

$$\text{l/min} \times 0.035 = \text{SCFM}$$

$$\text{l/min} \div 1000 = \text{Cv}$$

### US TO METRIC

#### LENGTH

in	25.4	mm
in	2.54	cm
ft	0.3048	m

#### AREA

in <sup>2</sup>	645.16	mm <sup>2</sup>
in <sup>2</sup>	6.4516	cm <sup>2</sup>

#### VOLUME

in <sup>3</sup>	16387	mm <sup>3</sup>
in <sup>3</sup>	16.387	cm <sup>3</sup> (cc)
ft <sup>3</sup>	0.0283	m <sup>3</sup>

#### WEIGHT

oz	28.35	g
lb	0.4536	kg

#### FORCE

lbf	453.6	gf
lbf	4.4482	N

#### TORQUE

ft•lb	1.3559	Nm
-------	--------	----

#### PRESSURE

psi	6.895	kPa
psi	0.06895	Bar
psi	0.0703	kg/cm <sup>2</sup>

#### TEMPERATURE

$$^{\circ}\text{C} = 5/9(^{\circ}\text{F} - 32)$$

#### FLOW RATE

$$\text{SCFM} \times 28.57 = \text{l/min}$$

$$\text{Cv} 1.0 = \text{Kv} 0.856$$

# Technical Information



## Force and Load Charts - All Cylinders (except ROV)

Piston Area	Bore													
	8	10	12	16	20	25	32	40	50	63	80	100	125	
A IN <sup>2</sup>	0.078	0.122	0.175	0.311	0.487	0.761	1.246	1.947	3.043	4.831	7.791	12.174	19.021	
B IN <sup>2</sup>	0.059	0.101	0.132	0.264	0.403	0.636	1.07	1.643	2.558	4.34	7.037	11.408	17.779	
<b>Theoretical Forces lbf at ___PSI</b>														
PSI	15	1.17	1.83	2.63	4.67	7.31	11.42	18.69	29.21	45.65	72.47	116.87	182.61	285.32
	30	2.34	3.66	5.25	9.33	14.61	22.83	37.38	58.41	91.29	144.93	233.73	365.22	570.63
	45	3.51	5.49	7.88	14.00	21.92	34.25	56.07	87.62	136.94	217.40	350.60	547.83	855.95
	60	4.68	7.32	10.50	18.66	29.22	45.66	74.76	116.82	182.58	289.86	467.46	730.44	1141.26
	75	5.85	9.15	13.13	23.33	36.53	57.08	93.45	146.03	228.23	362.33	584.33	913.05	1426.58
	90	7.02	10.98	15.75	27.99	43.83	68.49	112.14	175.23	273.87	434.79	701.19	1095.66	1711.89
	105	8.19	12.81	18.38	32.66	51.14	79.91	130.83	204.44	319.52	507.26	818.06	1278.27	1997.21
	120	9.36	14.64	21.00	37.32	58.44	91.32	149.52	233.64	365.16	579.72	934.92	1460.88	2282.52
	135	10.53	16.47	23.63	41.99	65.75	102.74	168.21	262.85	410.81	652.19	1051.79	1643.49	2567.84
	150	11.70	18.30	26.25	46.65	73.05	114.15	186.90	292.05	456.45	724.65	1168.65	1826.10	2853.15

Piston Area	Bore													
	8	10	12	16	20	25	32	40	50	63	80	100	125	
A CM <sup>2</sup>	0.502	0.785	1.131	2.01	3.141	4.91	8.04	12.56	19.63	31.17	50.26	78.54	122.7	
A CM <sup>2</sup>	0.38	0.65	0.85	1.70	2.60	4.10	6.90	10.60	16.50	28.00	45.40	73.60	114.7	
<b>Theoretical Forces kN at ___bar</b>														
BAR	1	0.005	0.007	0.01	0.018	0.028	0.044	0.072	0.112	0.175	0.279	0.450	0.703	1.099
	2	0.009	0.014	0.02	0.036	0.056	0.088	0.144	0.225	0.351	0.558	0.900	1.407	2.199
	3	0.014	0.021	0.03	0.054	0.084	0.131	0.216	0.337	0.527	0.837	1.351	2.111	3.298
	4	0.018	0.028	0.04	0.072	0.112	0.175	0.288	0.450	0.703	1.117	1.801	2.814	4.398
	5	0.023	0.035	0.05	0.090	0.140	0.219	0.360	0.563	0.879	1.396	2.251	3.518	5.497
	6	0.027	0.042	0.06	0.108	0.168	0.263	0.432	0.675	1.055	1.675	2.702	4.222	6.597
	7	0.032	0.049	0.07	0.126	0.197	0.307	0.504	0.788	1.231	1.955	3.152	4.926	7.696
	8	0.036	0.056	0.08	0.144	0.225	0.351	0.576	0.900	1.407	2.234	3.603	5.629	8.796
	9	0.041	0.063	0.09	0.162	0.253	0.395	0.648	1.013	1.583	2.513	4.053	6.333	9.896
	10	0.045	0.070	0.10	0.180	0.281	0.439	0.720	1.125	1.759	2.793	4.503	7.037	10.995



- A\* = PUSH- Piston area
- B\* = PULL- Piston area minus rod

The figures shown above relate to the piston area, PUSH. The forces for the piston area minus the rod are not shown in the chart shown above.

# Technical Information



## Force and Load Charts - ROV Oval Bore

Bore Ø	Piston Rod	Actuation		Theoretical Forces													
				Area in <sup>2</sup>	lbf at __ PSI						Area cm <sup>2</sup>	da N at __ Bar					
					30	45	60	75	90	105		2	3	4	5	6	7
8	4	Double Acting	A*	0.10	3.00	4.50	6.00	7.50	9.00	10.50	0.63	1.26	1.89	2.52	3.15	3.78	4.41
			B*	0.08	2.40	3.60	4.80	6.00	7.20	8.40	0.51	1.02	1.53	2.04	2.55	3.06	3.57
		Single Acting	A**	0.10	3.00	4.50	6.00	7.50	9.00	10.50	0.63	0.63	1.13	1.77	2.52	3.15	3.78
			B**	0.08	2.40	3.60	4.80	6.00	7.20	8.40	0.51	0.42	0.93	1.44	1.95	2.46	2.97
10	4	Double Acting	A*	0.16	4.80	7.20	9.60	12.00	14.40	16.80	1.00	2.00	3.00	4.00	5.00	6.00	7.00
			B*	0.14	4.20	6.30	8.40	10.50	12.60	14.70	0.88	1.76	2.64	3.52	4.40	5.28	6.16
		Single Acting	A**	0.16	4.80	7.20	9.60	12.00	14.40	16.80	1.00	1.25	2.37	3.63	4.12	5.00	6.12
			B**	0.14	4.20	6.30	8.40	10.50	12.60	14.70	0.88	0.91	1.79	2.67	3.55	4.43	5.31
12	6	Double Acting	A*	0.23	6.90	10.35	13.80	17.25	20.70	24.15	1.50	3.00	4.50	6.00	7.50	9.00	10.50
			B*	0.19	5.70	8.55	11.40	14.25	17.10	19.95	1.23	2.46	3.69	4.92	6.15	7.38	8.61
		Single Acting	A**	0.23	6.90	10.35	13.80	17.25	20.70	24.15	1.50	2.44	4.08	5.40	6.88	8.37	10.12
			B**	0.19	5.70	8.55	11.40	14.25	17.10	19.95	1.23	1.61	2.84	4.07	5.30	6.53	7.76
16	6	Double Acting	A*	0.31	9.30	13.95	18.60	23.25	27.90	32.55	2.00	4.00	6.00	8.00	10.00	12.00	14.00
			B*	0.28	8.40	12.60	16.80	21.00	25.20	29.40	1.83	3.46	5.20	6.90	8.70	10.40	12.10
		Single Acting	A**	0.31	9.30	13.95	18.60	23.25	27.90	32.55	2.00	3.50	5.00	7.40	8.20	9.10	12.00
			B**	0.27	8.10	12.15	16.20	20.25	24.30	28.35	1.73	1.51	3.25	4.95	6.75	8.45	10.15
20	8	Double Acting	A*	0.59	17.70	26.55	35.40	44.25	53.10	61.95	3.80	7.60	11.40	15.20	19.00	22.80	26.60
			B*	0.51	15.30	22.95	30.60	38.25	45.90	53.55	3.30	6.60	9.90	13.20	16.50	19.80	23.10
		Single Acting	A**	0.59	17.70	26.55	35.40	44.25	53.10	61.95	3.80	4.63	8.78	4.63	15.98	19.52	24.15
			B**	0.51	15.30	22.95	30.60	38.25	45.90	53.55	3.30	3.70	5.88	10.30	13.60	16.90	20.20
25	10	Double Acting	A*	0.67	20.10	30.15	40.20	50.25	60.30	70.35	4.30	8.60	12.90	17.20	21.50	25.80	30.10
			B*	0.55	16.50	24.75	33.00	41.25	49.50	57.75	3.52	7.04	10.56	14.08	17.60	21.12	24.64
		Single Acting	A**	0.67	20.10	30.15	40.20	50.25	60.30	70.35	4.30	6.40	11.70	16.20	21.50	26.30	31.20
			B**	0.55	16.50	24.75	33.00	41.25	49.50	57.75	3.52	4.14	7.66	11.18	14.70	18.22	21.74



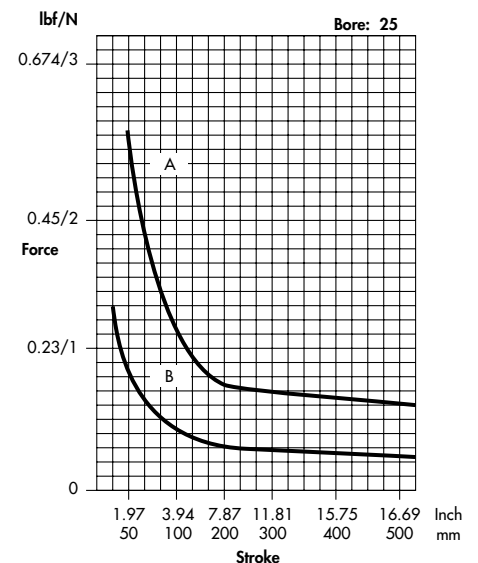
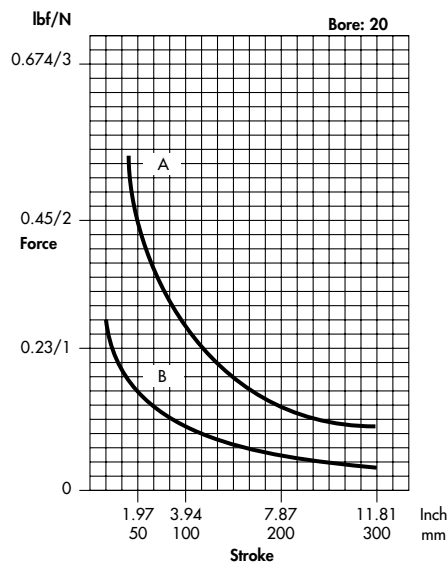
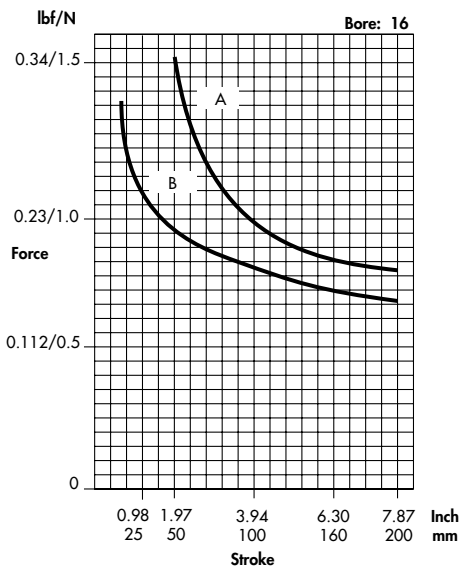
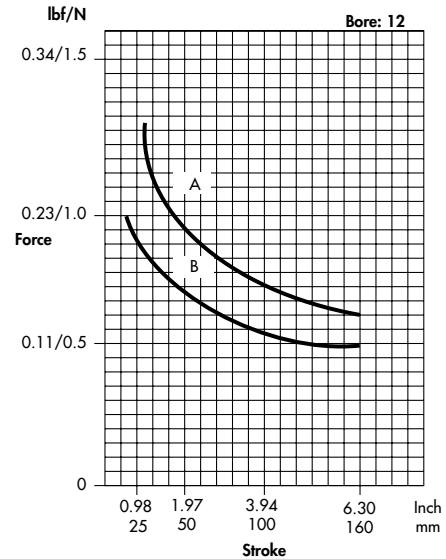
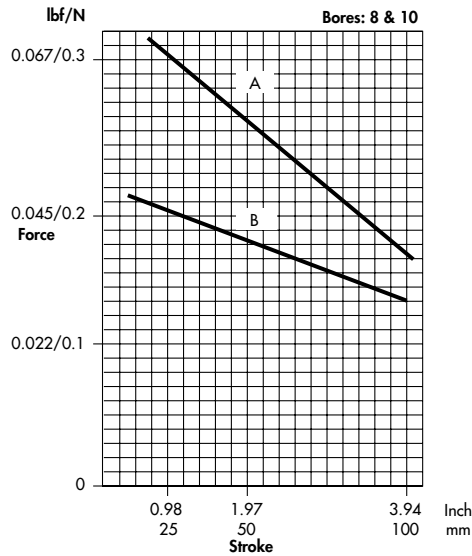
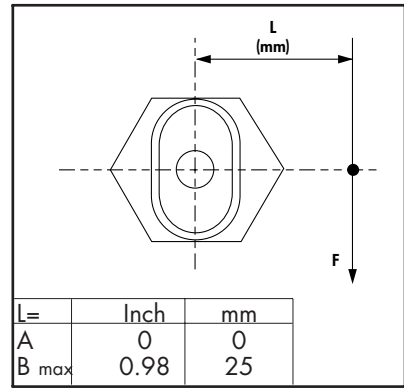
- A\* = PUSH- Piston Area
- B\* = PULL- Piston Area minus Rod
- A\*\* = PUSH- Piston Area
- B\*\* = PULL- Piston Area minus Rod & Spring

## Technical Information

### Force and Load Charts - ROV Oval Bore

For correct cylinder selection at full rod extension, Force "F" should be below the load curve on the appropriate cylinder chart.

#### LATERAL LOAD OFFSET

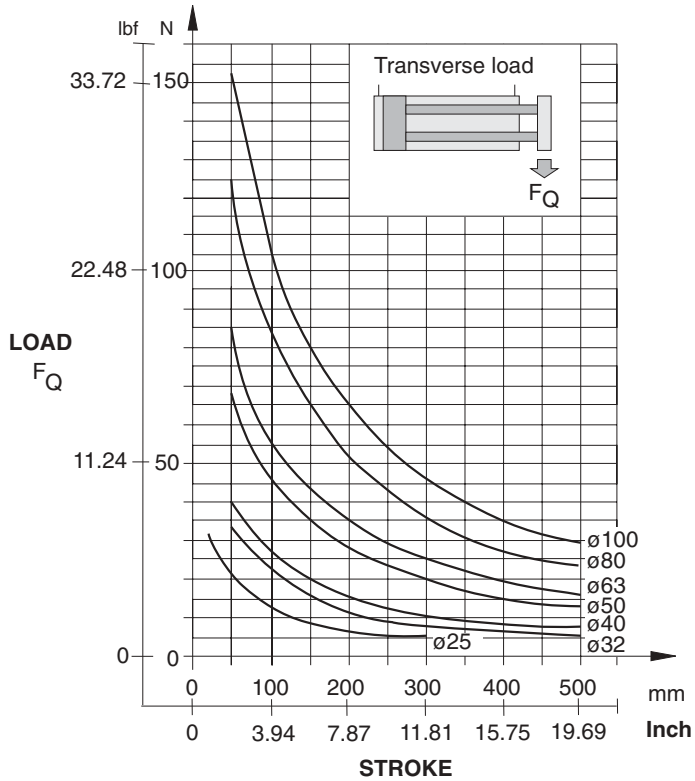


# Technical Information

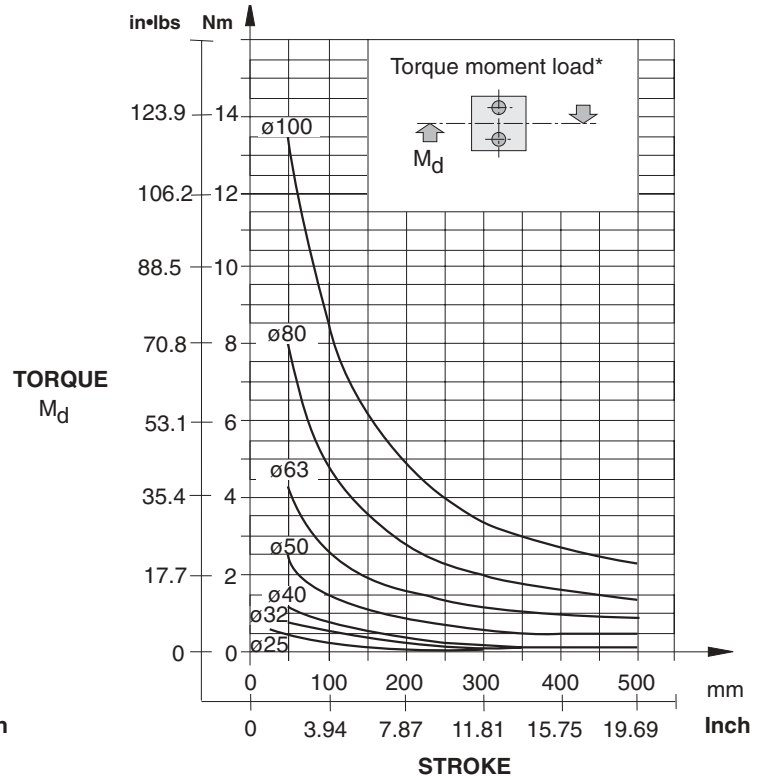


## Force and Load Charts - AZV Twin Rod

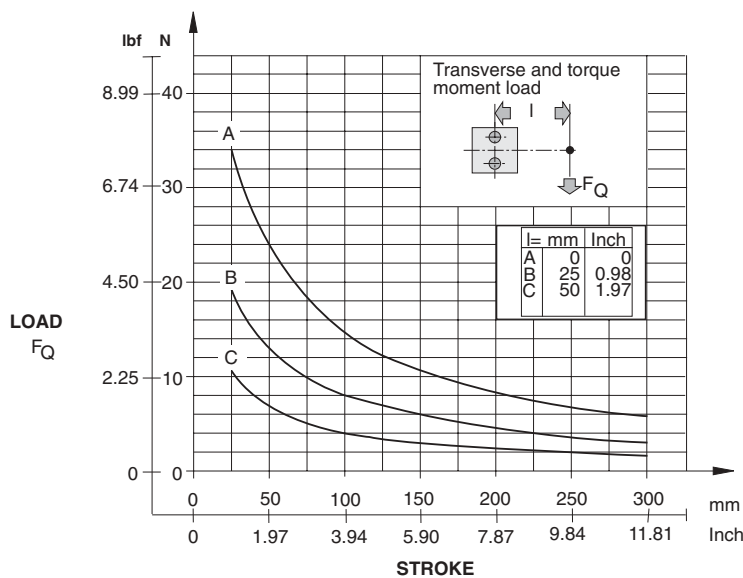
Traverse Load Ø25-100mm



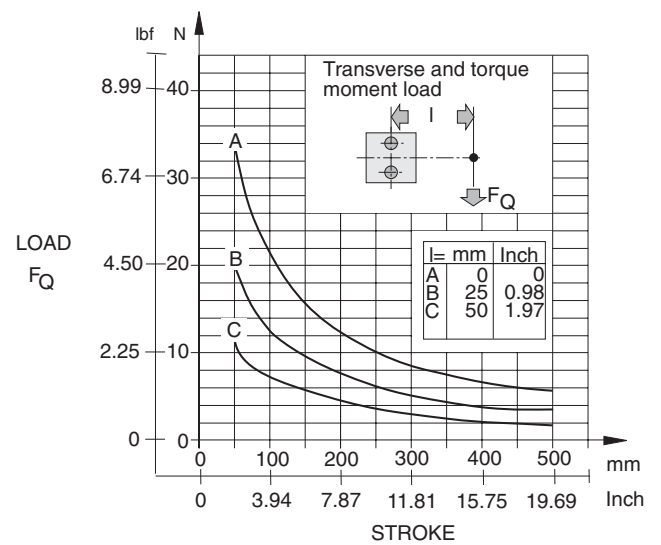
Torque Load Ø25-100mm



Side Load Ø25mm



Side Load Ø32mm

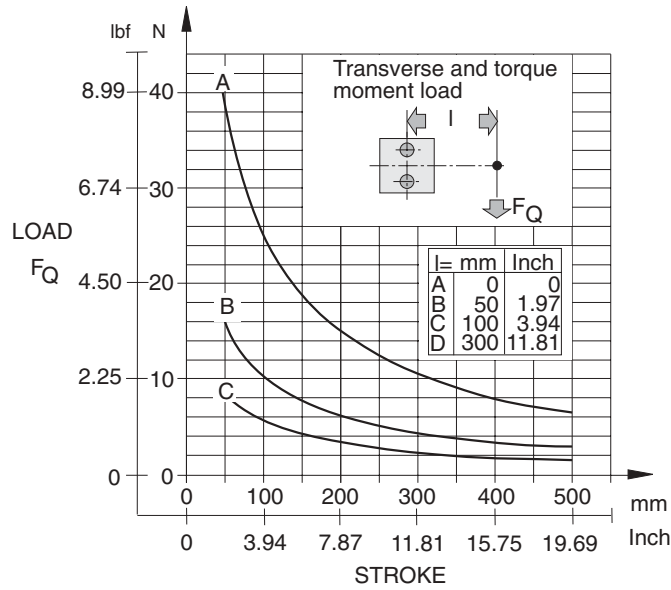




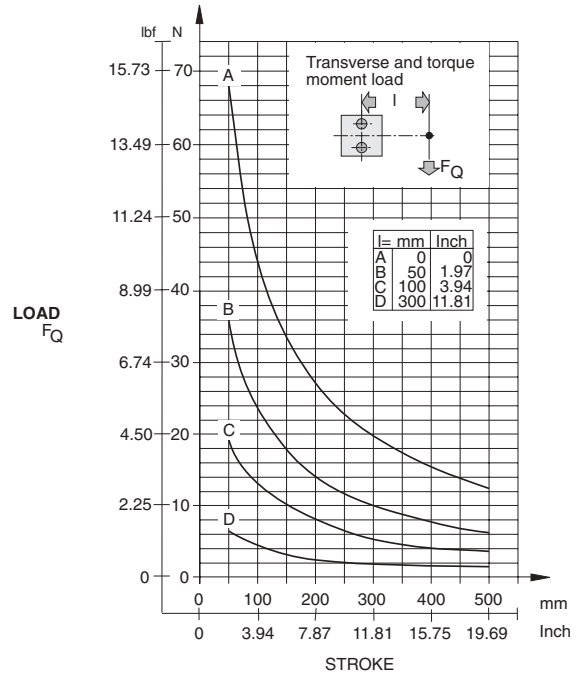
## Technical Information

### Force and Load Charts - AZV Twin Rod

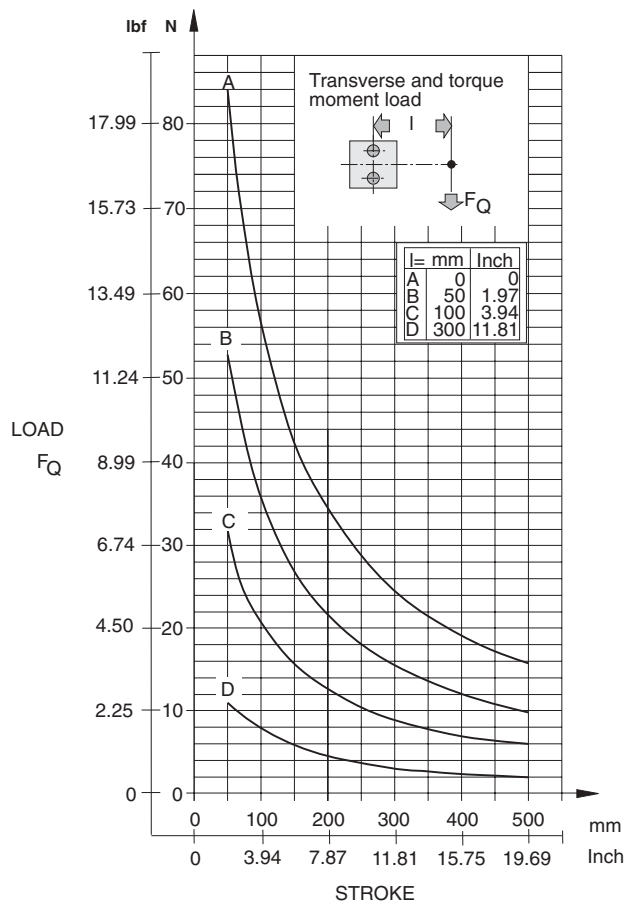
Side Load Ø40mm



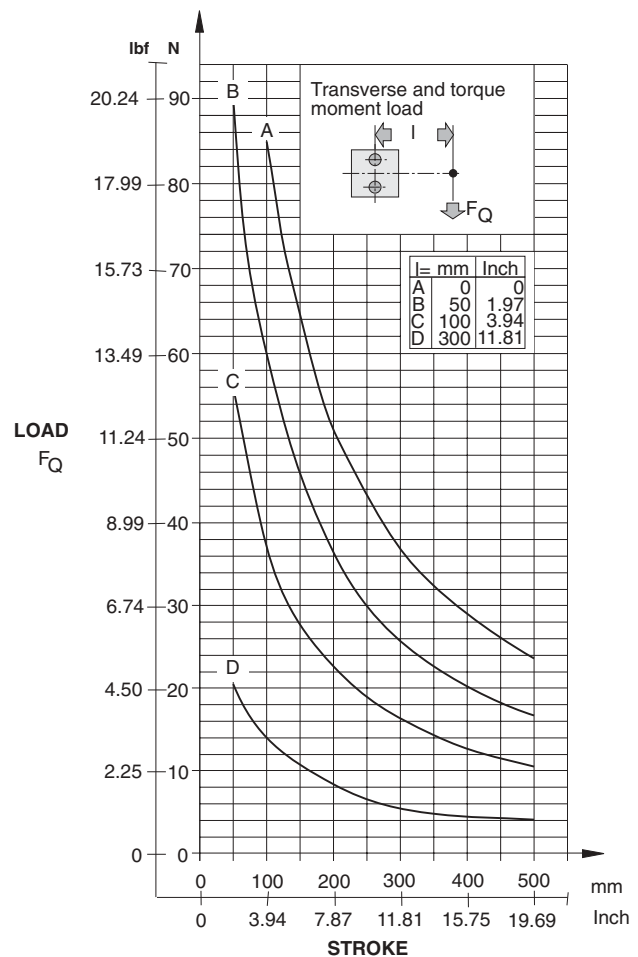
Side Load Ø50mm



Side Load Ø63mm



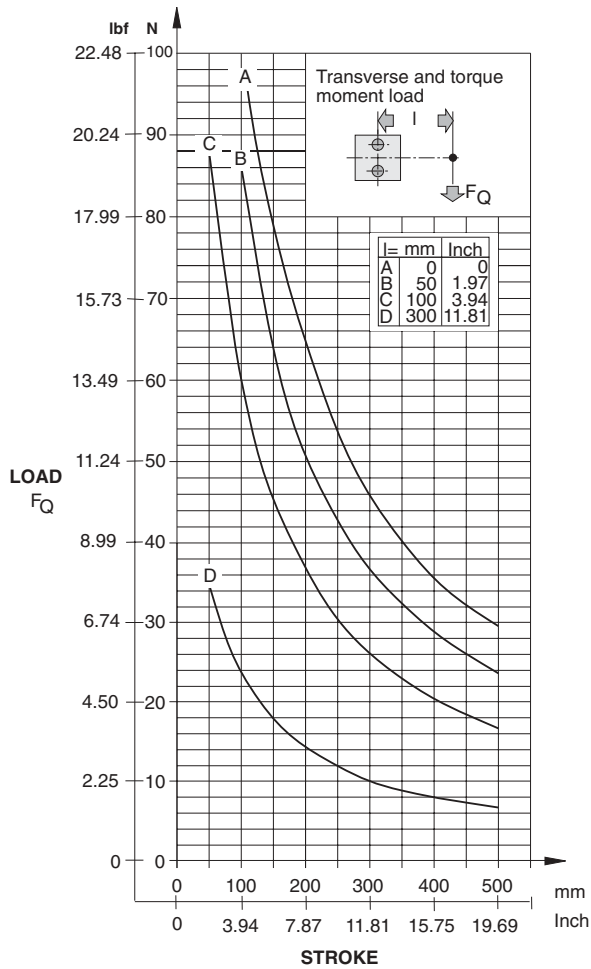
Side Load Ø80mm



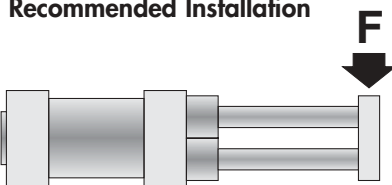
## Technical Information

### Force and Load Charts - AZV Twin Rod

Side Load  $\varnothing 100\text{mm}$



#### Recommended Installation



Cylinders should be mounted with the rods in the vertical orientation for optimum performance..

# R Cylinder

## Specifications

Features						
Type	ISO 6432 CETOP RP52P					
Series	R					
Configurations	R2 Double Acting, Single Rod R3 Single Acting, Single Rod, Spring Return R5 Double Acting, Single Rod, Magnetic Piston, Cushions R6 Double Acting, Single Rod, Magnetic Piston RDU 6 Double Acting, Double Rod, Magnetic Piston					
Construction Materials						
Barrel	Stainless Steel					
End Caps	Aluminum, Anodized (10µ)					
Piston Rod	Stainless Steel					
Characteristics						
Operating Temperature	Min. -5° F (-20°C) Max. +176°F (+80°C)					
Operating Pressure	Ø10		Ø12-25			
	Min: 22 PSI (1.5 bar)		15 PSI (1 bar)			
	Max: 145 PSI (10 bar)		145 PSI (10 bar)			
Normal Operating Pressure	90 PSI (6 bar)					
Lubrication	Pre-lubricated at factory. If additional lubrication is required use oil compatible for NBR seal and designed for use in pneumatic systems.					
Media	Filtered and regulated compressed air					
Installation	In any position					
Weight	See chart with mounts					
Stroke Length	Up to 320mm - Longer contact factory					
Theoretical Forces	See Technical Information Sheet					
Load Capacity	See Technical Information Sheet					
Specifications						
Piston Diameter		10	12	16	20	25
Port Sizes	Metric (G)	M5	M5	M5	G1/8	G1/8
Rod Diameter	mm	4	6	6	8	10
Cushion Lengths	mm				17	17

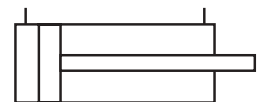
## Series R

Ø10mm - 25mm

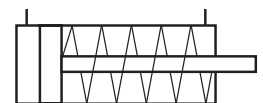
ISO 6432

CETOP RP52P

**R 2: Double Acting, Single Rod**



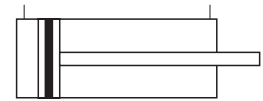
**R 3: Single Acting, Single Rod**



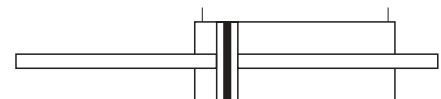
**R 5: Double Acting, Single Rod, Magnets, Cushions**



**R 6: Double Acting, Single Rod, Magnets**



**RDU 6: Double Acting, Double Rod, Magnets**



### Features:

- Stainless Steel Rod
- Pre-Lubricated Design
- Magnetic Piston
- Adjustable Cushions

## R Cylinder

### Ordering Information

**Example:** R 5025/25  
 ISO 6432  
 Single Rod  
 Double Acting, Magnets, Cushions  
 25mm Bore  
 25mm Stroke

**Versions:** \_\_\_\_\_   R        5        0  2  5   /   2  5  

- R        -    Single Rod  
 RDU     -    Double Rod

**Actuation:** \_\_\_\_\_

- 5 - Double Acting, Magnets, Cushions (Ø20 & 25)  
 6 - Double Acting, Magnets  
 2 - Double Acting  
 3 - Single Acting, Magnets

**Stroke:**

- Ø10: any mm increment up to 100mm standard
- Ø12 & 16: any mm increment up to 160mm standard
- Ø20 & 25: any mm increment up to 320mm standard
- Contact factory for special stroke lengths
- Single acting stroke lengths of 10, 25 & 50mm

**Bore:**

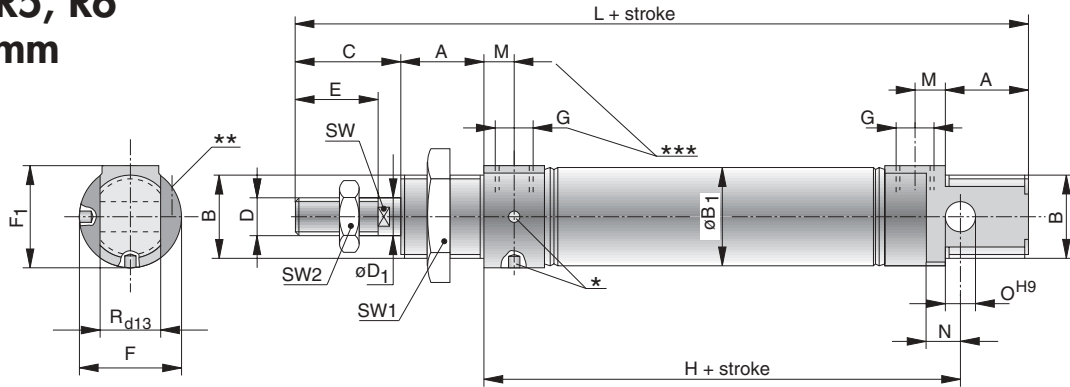
- 010 - 10mm (nom. 7/16")  
 012 - 12mm (nom. 1/2")  
 016 - 16mm (nom. 3/4")  
 020 - 20mm (nom. 7/8")  
 025 - 25mm (nom. 1")

**Proximity Sensors/Brackets: See Page 73**

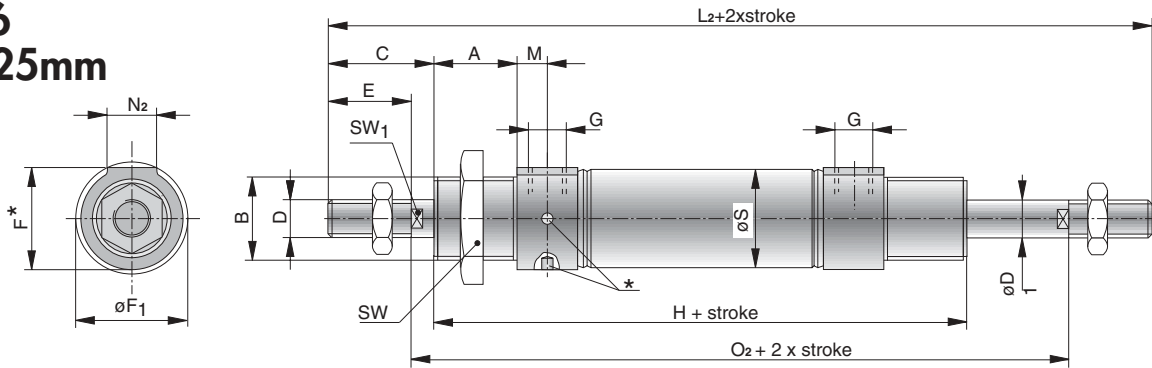
## R Cylinder

### Dimensional Data

### R2, R3, R5, R6 Ø10-25mm



### RDU 6 Ø12-25mm



- \* Holes for "C" Spanner Wrench
- \*\* Location of Adjustable Cushion, R5020 & R5025 Only
- \*\*\* Omit Dimensions "G" and "M" for Series R3 Cylinders

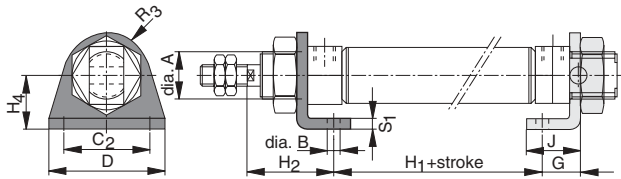
Bore Ø	A	B	B <sub>1</sub>	C	D	Ø D <sub>1</sub>	E	F	F <sub>1</sub>	G	H	H <sub>2</sub>
									hex		+ stroke	+ stroke
10	0.47 12	7/16 • 20 M12 x 1.25	0.44 11.3	0.63 16	6 • 32 M4	0.16 4	0.47 12	0.59 15	0.59 15	10 • 32 M5	1.89 48	- -
12	0.67 17	M16 x 1.5	0.52 13.3	0.83 21	M6	0.24 6	0.63 16	0.79 20	0.79 20	M5	2.09 53	3.23 82
16	0.67 17	5/8 • 18 M16 x 1.5	0.68 17.3	0.83 21	10 • 32 M6	0.24 6	0.63 16	0.79 20	0.79 20	10 • 32 M5	2.36 60	3.54 90
20	0.79 20	M22 x 1.5	0.83 21.3	0.94 24	M8	0.30 8	0.79 20	1.06 27	1.06 27	G1/8	2.80 71	4.25 108
25	0.87 22	7/8 • 14 M22 x 1.5	1.04 26.5	1.10 28	3/8 • 24 M10 x 1.25	0.39 10	0.87 22	1.06 27	1.06 27	1/8 NPTF G1/8	2.99 76	4.45 113
Bore Ø	L + stroke	L <sub>2</sub> +2X stroke	M	N	N <sub>2</sub>	Ø O <sub>H9</sub>	O <sub>2</sub> +2X stroke	R <sub>d13</sub>	ØS	SW	SW <sub>1</sub>	SW <sub>2</sub>
10	3.39 86		0.22 5.5	0.24 6	- -	0.16 4	- -	0.31 8	- -	0.12 3	0.67 17	- -
12	4.09 104	4.88 124	0.22 5.5	0.35 9	0.37 9.5	0.24 6	3.62 92	0.47 12	0.52 13.3	0.20 5	0.87 22	10
16	4.37 111	5.20 132	0.22 5.5	0.35 9	0.37 9.5	0.24 6	3.94 100	0.47 12	0.68 17.3	0.20 5	0.87 22	10
20	5.20 132	6.14 156	0.33 8.5	0.47 12	0.57 14.5	0.31 8	4.57 116	0.63 16	0.84 21.3	0.28 7	1.06 27	13
25	5.55 141	6.65 169	0.33 8.5	0.47 12	0.57 14.5	0.31 8	4.92 125	0.63 16	1.04 26.5	0.35 9	1.06 27	17

## R Cylinder

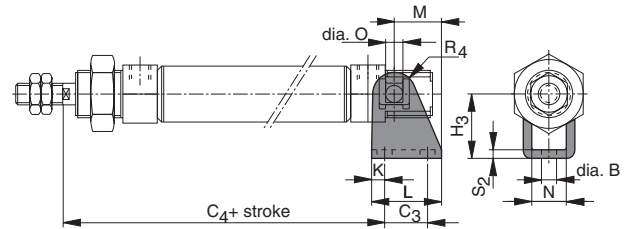
### Cylinder Mounts

#### Foot Mount- Type RA

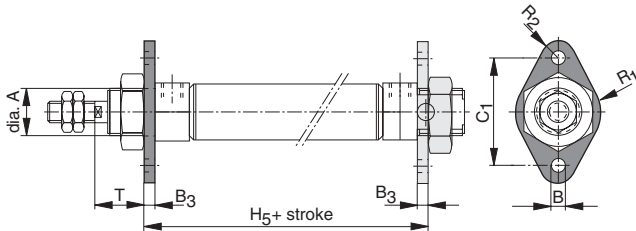
- RA1- 1 Bracket with Mounting Nut
- RA2- 2 Brackets with Mounting Nuts



#### Rear Clevis- Type RB



#### Front or Rear Flange- Type RC



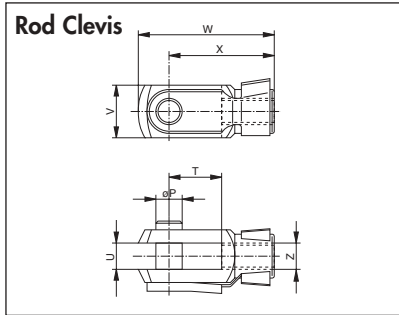
**Ordering Information:**  
See ROV Series Cylinder on Page 14

Bore Ø	A	B	B <sub>3</sub>	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	C <sub>4+</sub>	D	G	H <sub>1+stroke</sub>	H <sub>2</sub>	H <sub>3</sub>	H <sub>4</sub>	H <sub>5 stroke</sub>
10	0.47 12	0.18 4.5	0.12 3	1.18 30	0.98 25	0.49 12.5	2.56 65	1.38 35	0.43 11	1.14 29	0.94 24	0.94 24	0.63 16	2.52 64
12	0.63 16	0.22 5.5	0.16 4	1.57 40	1.26 32	0.59 15	2.87 73	1.65 42	0.55 14	1.02 26	1.26 32	1.06 27	0.79 20	2.83 72
16	0.63 16	0.22 5.5	0.16 4	1.57 40	1.26 32	0.59 15	3.15 80	1.65 42	0.55 14	1.30 33	1.26 32	1.06 27	0.79 20	3.11 79
20	0.87 22	0.26 6.6	0.20 5	1.97 50	1.57 40	0.79 20	3.58 91	2.13 54	0.67 17	1.69 43	1.42 36	1.18 30	0.98 25	2.83 97
25	0.87 22	0.26 6.6	0.20 5	1.97 50	1.57 40	0.79 20	3.94 100	2.13 54	0.67 17	1.89 48	1.57 40	1.18 30	0.98 25	4.13 105
Bore Ø	J	K	L	M	N	O	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	R <sub>4</sub>	S <sub>1</sub>	S <sub>2</sub>	T	
10	0.63 16	0.26 6.5	0.91 23	0.71 18	0.32 8.1	0.16 4	0.49 12.5	0.20 5	0.39 10	0.20 5	0.12 3	0.10 2.5	0.51 13	
12	0.79 20	0.20 5	0.98 25	0.71 18	0.48 12.1	0.24 6	0.59 15	0.26 6.5	0.47 12	0.28 7	0.16 4	0.12 3	0.71 18	
16	0.79 20	0.20 5	0.98 25	0.71 18	0.48 12.1	0.24 6	0.59 15	0.26 6.5	0.47 12	0.28 7	0.16 4	0.12 3	0.71 18	
20	0.98 25	0.24 6	1.26 32	0.87 22	0.63 16.1	0.31 8	0.79 20	0.31 8	0.79 20	0.39 10	0.20 5	0.16 4	0.91 19	
25	0.98 25	0.24 6	1.26 32	0.87 22	0.63 16.1	0.31 8	0.79 20	0.31 8	0.79 20	0.39 10	0.20 5	0.16 4	0.91 23	

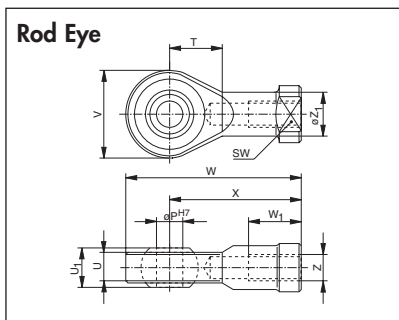
**Proximity Sensors/Brackets: See Page 73**

## R Cylinder

### Cylinder Accessories

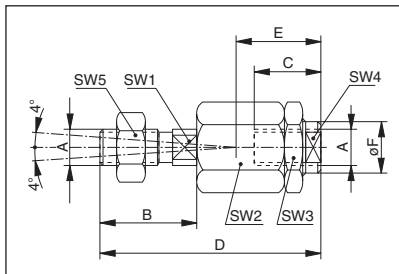


Order Instructions									
Order #	Bore Ø	ØP	T	U	V	W	X	Z	Weight (lbs.)(kg)
KZ 1413	8,10	0.16	0.31	0.16	0.31	0.87	0.63		0.02
		4	8	4	8	22	16	M4	0.008
KY 6132	12,16	0.24	0.47	0.24	0.47	1.22	0.94		0.04
		6	12	6	12	31	24	M6	0.016
KY 6133	20	0.31	0.63	0.31	0.63	1.65	1.26		0.08
		8	16	8	16	42	32	M8	0.038
KY 6135	25	0.39	0.79	0.39	0.79	2.05	1.57		0.18
		10	20	10	20	52	40	M10 x1.25	0.08

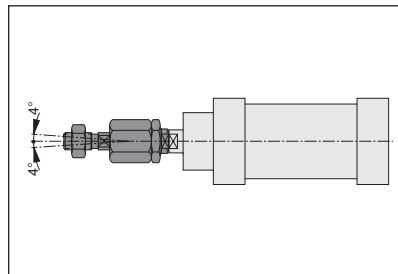


Order Instructions													
Order #	Bore Ø	Øp <sup>H7</sup>	T	U	U1	V	W	W <sub>1</sub>	X	Z	ØZ <sub>1</sub>	SW	Weight (lbs.)(kg)
KX 6023	8,10	0.20	0.35	0.24	0.31	0.63	1.38	0.47	1.06		0.35	0.31	0.05
		5	9	6	8	16	35	12	27	M4	9	8	0.021
KY 6144	12,16	0.24	0.43	0.27	0.35	0.79	1.57	0.47	1.18		0.39	0.43	0.06
		6	11	6.75	9	20	40	12	30	M6	10	11	0.025
KY 6145	20	0.31	0.51	0.35	0.47	0.94	1.89	0.63	1.42		0.49	0.55	0.09
		8	13	9	12	24	48	16	36	M8	12.5	14	0.043
KY 6147	25	0.39	0.59	0.41	0.55	1.10	2.24	0.79	1.69		0.59	0.67	0.16
		10	15	10.5	14	28	57	20	43	M10 x1.25	15	17	0.072

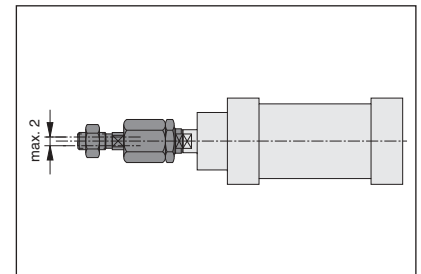
### Rod Alignment Coupling



### Angular Compensation



### Radial Compensation for the Center Axis



Order Instructions													
Order #	Bore Ø	A	B	C	D	E	ØF	SW <sub>1</sub>	SW <sub>2</sub>	SW <sub>3</sub>	SW <sub>4</sub>	SW <sub>5</sub>	Weight (lbs.)(kg)
KY 1152	8,10		0.31	0.55	1.34	0.79	0.47	0.12	0.47	0.47	0.47	0.28	0.04
		M4	8	14	34	20	12	3	12	12	12	7	0.018
KY 1126	12,16		0.47	0.43	1.42	0.55	0.33	0.20	0.51	0.51	0.28	0.39	0.05
		M6	12	11	36	14	8.5	5	13	13	7	10	0.021
KY 1127	20		0.51	0.55	1.81	0.79	0.49	0.28	0.67	0.67	0.39	0.51	0.11
		M8	13	14	46	20	12.5	7	17	17	10	13	0.049
KY 1129	25		0.79	0.91	2.76	1.22	0.85	0.47	1.18	1.18	0.75	0.67	0.48
		M10x1.25	20	23	70	31	21.5	12	30	30	19	17	0.218

Proximity Sensors/Brackets: See Page 73

# ROV Oval Bore Cylinder



## Specifications

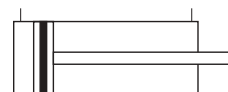
Features							
Type	Oval Bore (ISO 6432)						
Series	ROV						
Configurations	ROV 6 Double Acting, Single Rod, Magnetic Piston ROV 7 Single Acting, Single Rod, Magnetic Piston, Spring Return ROVD 6 Double Acting, Double Rod, Magnetic Piston ROVDG Double Acting, Double Rod, Magnetic Piston, Hollow Rod						
Construction Materials							
Barrel	Stainless Steel						
End Caps	Aluminum, Anodized (10µ)						
Piston Rod	Stainless Steel						
Rod Bearing	Teflon Impregnated Bronze						
Piston	Urethane						
Seals	Urethane						
Cushion Needle	Brass						
Characteristics							
Operating Temperature	Min. 14° F (-10°C) Max. +176°F (+70°C)						
Operating Pressure	Min. Double Acting - 15 PSI (1 bar), Single Acting - 30 PSI (2 bar) Max. 145 PSI (10 bar)						
Normal Operating Pressure	90 PSI (6 bar)						
Lubrication	Pre-lubricated at factory. If additional lubrication is required use oil compatible with NBR seals and designed for use in pneumatic systems.						
Media	Filtered and Regulated Compressed Air						
Installation	In any Position						
Weight	See Chart - Page 15						
Stroke Length	Varies by Bore Size						
Theoretical Forces	See Technical Information Sheet						
Load Capacity	See Technical Information Sheet						
Specifications							
Piston Diameter		8	10	12	16	20	25
Port Sizes	Metric (G)	M5	M5	M5	M5	G 1/8	G 1/8
Rod Diameter	mm	4	4	6	6	8	10
Cushion Lengths	mm	--	--	--	--	14	16

## Series ROV

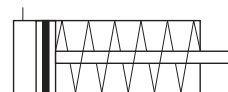
Ø8mm - 25mm

Oval Bore (ISO 6432)

**ROV 6: Double Acting, Single Rod, Magnets**



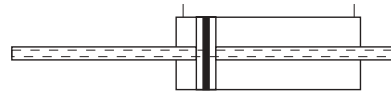
**ROV 7: Single Acting, Single Rod, Magnets**



**ROVD 6: Double Acting, Double Rod, Magnets**



**ROVDG: Double Acting, Double Rod, Magnets, Hollow Rod**



### Features:

**Stainless Steel Rod**  
**Pre-Lubricated Design**  
**Magnetic Piston**  
**Adjustable Cushions**  
**(Ø20 & 25 only)**  
**Double Hollow Rod**



## ROV Oval Bore Cylinder

### Ordering Information

**Example:** ROV 6020/50  
 Oval Piston  
 Single Rod  
 Double Acting, Magnets  
 20mm Bore  
 50mm Stroke

ROV                    6 0 2 0 / 5 0

**Versions:**

- ROV    -    Single Rod
- ROVD -    Double Rod
- ROVDG - Double Hollow Rod

**Actuation:**

- 5 - Double Acting, Magnets, Cushions
- 6 - Double Acting, Magnets
- 7 - Single Acting, Magnets

**Proximity Sensors/Brackets: See Page 73**

**Stroke:**

- MM: (standard)
- Ø8 & 10: any mm increment up to 100mm standard
  - Ø12 & 16: any mm increment up to 300mm standard
  - Ø20 & 25: any mm increment up to 500mm standard
  - Contact factory for special stroke lengths
  - Single acting stroke lengths of 10, 25 & 50mm

**Bore:**

- 008 - 8mm (nom. 5/16")
- 010 - 10mm (nom. 7/16")
- 012 - 12mm (nom. 1/2")
- 016 - 16mm (nom. 3/4")
- 020 - 20mm (nom. 7/8")
- 025 - 25mm (nom. 1")

# ROV Oval Bore Cylinder



## Cylinder Mounts

Weights		8mm		10mm		Bore Ø 12mm		16mm		20mm		25mm	
		*1	*2	1	2	1	2	1	2	1	2	1	2
Basic Cylinder	lbs.	.178		.198	.088	0.33	.132	.374	.176	.847	.286	.847	.286
	kg	0.081		0.090	0.040	0.150	0.060	0.170	0.080	0.385	0.130	0.385	0.130
Type RA (1 bracket)	lbs.	.048		.048		.095		.095		0.22		0.22	
	kg	0.022		0.022		0.043		0.043		0.100		0.100	
Type RC	lbs.	.029		.029		.062		.062		0.11		0.11	
	kg	0.013		0.013		0.028		0.028		0.050		0.050	
Type RB	lbs.	.051		.051		.079		.079		.176		.176	
	kg	0.023		0.023		0.036		0.036		0.080		0.080	

\*1 = Weight for cylinder with (100 mm) stroke

\*2 = Weight for every additional (100 mm) stroke length

Body Mounts		8mm	10mm	Bore Ø 12mm	16mm	20mm	25mm
<b>Foot Mount (single pc.)</b>							
Type: RA1-	Metric	KX 9271	KX 9271	KK 26.302	KK 26.302	KK 28.302	KK 28.302
<b>Foot Mount (Set)</b>							
Type: RA2-	Metric	PD 31522	PD 31522	PD 25771	PD 25771	PD 25772	PD 25772
<b>Rear Clevis</b>							
Type: RB-	Metric	KZ 1412	KZ 1412	KZ 1419	KZ 1419	KZ 1420	KZ 1420
<b>Front or Rear Flange</b>							
Type: RC	Metric	KX 9272	KX 9272	KK 26.305	KK 26.305	KK 28.305	KK 28.305

**Dimensional Information: See R Series Cylinder on Page 10.**

Rod Accessories		8mm	10mm	Bore Ø 12mm	16mm	20mm	25mm
Rod Nut	Metric	ZP 3838	ZP 3838	ZP 1730	ZP 1730	ZP 2128	ZP 1810
Nose Nut	Metric	ZP 4077	ZP 4077	ZP 4078	ZP 4078	PD 35855	PD 35855
Rod Clevis	Metric	KZ 1413	KZ 1413	KY 6132	KY 6132	KY 6133	KY 6135
Rod Eye	Metric	KX 6023	KX 6023	KY 6144	KY 6144	KY 6145	KY 6147
Rod Alignment Coupling	Metric	KY 1152	KY 1152	KY 1126	KY 1126	KY 1127	KY 1129

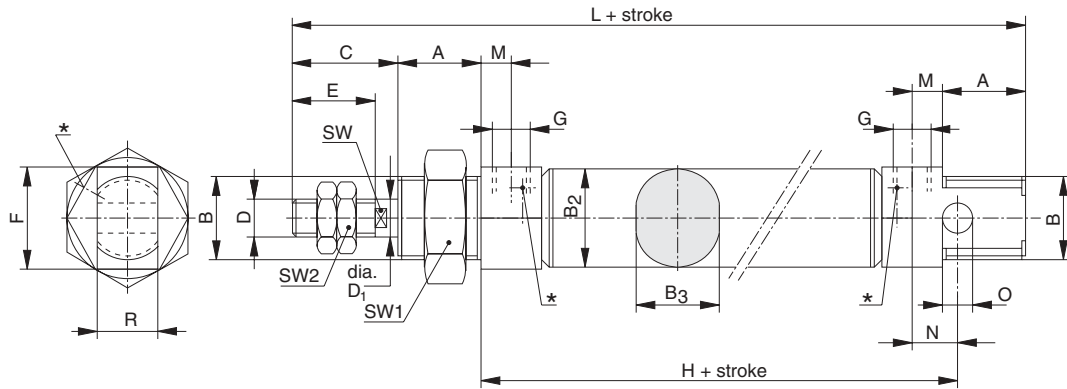
**Dimensional Information: See R Series Cylinder on Page 11**

**Proximity Sensors/Brackets: See Page 73**

## ROV Oval Bore Cylinder

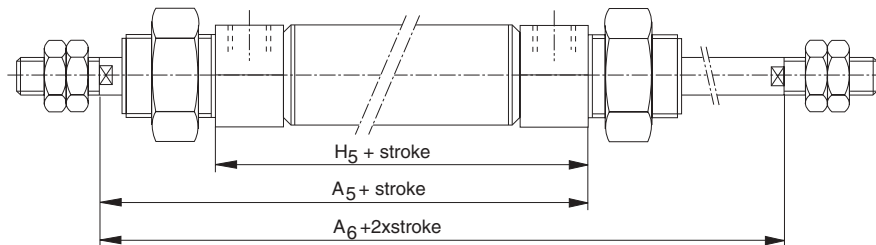
### Dimensional Data

#### ROV Ø8-25mm



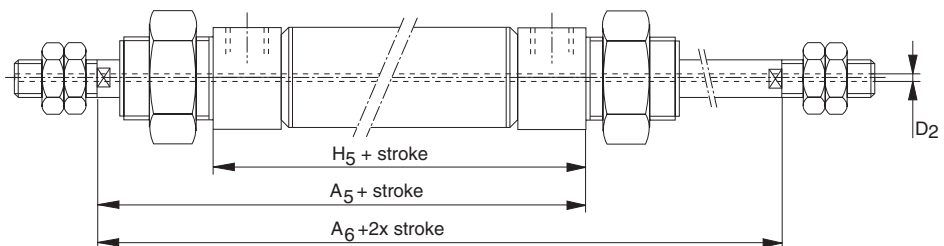
- \* Port is omitted on the Spring Return version
- \*\* Adjustable Cushion Location. Bore 20 and 25 ONLY

#### ROVD Ø8-25mm



See ROV drawing for balance of dimensions

#### ROVDG Ø8-25mm



See ROV and ROVD drawings for balance of dimensions

# ROV Oval Bore Cylinder



## Dimensional Data

Bore Ø	A	A <sub>5</sub> + stroke	A <sub>6</sub> +2 x stroke	B	B <sub>2</sub>	B <sub>3</sub>	C	D	Ø D <sub>1</sub>	D <sub>2</sub>	E	F hex
8	<b>0.51</b> 13	<b>2.40</b> 61	<b>3.03</b> 77	M12 x 1.25	<b>0.56</b> 11.8	<b>0.33</b> 8.3	<b>0.59</b> 15	M4	<b>0.16</b> 4	<b>0.04</b> 1	<b>0.47</b> 12	14
10	<b>0.51</b> 13	<b>2.40</b> 61	<b>3.03</b> 77	<b>7/16 • 20</b> M12 x 1.25	<b>0.56</b> 14.3	<b>0.41</b> 10.3	<b>0.59</b> 15	<b>6 • 32</b> M4	<b>0.16</b> 4	<b>0.04</b> 1	<b>0.47</b> 12	<b>0.55</b> 14
12	<b>0.67</b> 17	<b>2.68</b> 68	<b>3.54</b> 90	M16 x 1.5	<b>0.68</b> 17.3	<b>0.48</b> 12.3	<b>0.83</b> 21	M6	<b>0.24</b> 6	<b>0.05</b> 1.2	<b>0.63</b> 16	<b>0.79</b> 20
16	<b>0.67</b> 17	<b>2.95</b> 75	<b>3.82</b> 97	<b>5/8 • 18</b> M16 x 1.5	<b>0.78</b> 19.8	<b>0.56</b> 14.3	<b>0.83</b> 21	<b>10 • 32</b> M6	<b>0.24</b> 6	<b>0.05</b> 1.2	<b>0.63</b> 16	<b>0.79</b> 20
20	<b>0.79</b> 20	<b>3.58</b> 91	<b>4.53</b> 115	M22 x 1.5	<b>1.00</b> 25.5	<b>0.81</b> 20.5	<b>0.94</b> 24	M8	<b>0.30</b> 8	<b>0.13</b> 3.2	<b>0.79</b> 20	<b>1.06</b> 27
25	<b>0.87</b> 22	<b>3.94</b> 100	<b>5.04</b> 128	<b>7/8 • 14</b> M22 x 1.5	<b>1.04</b> 26.5	<b>0.89</b> 22.5	<b>1.10</b> 28	<b>3/8 • 24</b> M10 x 1.25	<b>0.39</b> 10	<b>0.13</b> 3.2	<b>0.87</b> 22	<b>1.06</b> 27
Bore Ø	G	H + stroke	H <sub>5</sub> + stroke	L + stroke	M	N	O <sub>H9</sub>	R <sub>d13</sub>	SW	SW1	SW2	
8	M5	<b>1.89</b> 48	<b>1.77</b> 45	<b>3.39</b> 86	<b>0.24</b> 6	<b>0.24</b> 6	<b>0.16</b> 4	<b>0.30</b> 8	--	19	7	
10	<b>10 • 32</b> M5	<b>1.89</b> 48	<b>1.77</b> 45	<b>3.39</b> 86	<b>0.24</b> 6	<b>0.24</b> 6	<b>0.16</b> 4	<b>0.3</b> 8	--	19	7	
12	M5	<b>2.09</b> 53	<b>1.81</b> 46	<b>4.21</b> 102	<b>0.24</b> 6	<b>0.35</b> 9	<b>0.24</b> 6	<b>0.47</b> 12	5	23	10	
16	<b>10 • 32</b> M5	<b>2.36</b> 60	<b>2.09</b> 53	<b>4.21</b> 107	<b>0.24</b> 6	<b>0.35</b> 9	<b>0.24</b> 6	<b>0.47</b> 12	5	23	10	
20	G1/8	<b>2.80</b> 71	<b>2.64</b> 67	<b>5.20</b> 132	<b>0.30</b> 8	<b>0.47</b> 12	<b>0.31</b> 8	<b>0.63</b> 16	7	32	13	
25	<b>1/8 NPTF</b> G1/8	<b>2.99</b> 76	<b>2.83</b> 72	<b>5.63</b> 143	<b>0.31</b> 8	<b>0.47</b> 12	<b>0.31</b> 8	<b>0.63</b> 16	9	32	17	

## SZ Compact Cylinder

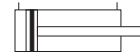
### Specifications

Features	
Type	Compact Cylinder
Series	SZ
Configurations	SZ6 Double Acting, Single Rod, Magnetic Piston SZD6 Double Acting, Double Rod, Magnetic Piston SZV6 Double Acting, Non-Rotating, Magnetic Piston SZ7 Single Acting, Single Rod, Magnetic Piston, Spring Return
Construction Materials	
Barrel	Extruded Aluminum, Anodized (10µ)
Front Cover	Brass: Ø 12 to 40 Aluminum: Ø 50 to 100
Rear Cover	Aluminum, Anodized (10µ)
Piston Rod	Stainless Steel
Rod Bearing	Teflon Impregnated Brass
Piston	Delron: Ø 12 to 40 Aluminum: Ø 50 to 100
Seals	NBR (Optional: Viton)
Guide Rods	Stainless Steel
Guide Rod Bearings	Teflon Impregnated Steel
Tooling Plate	Aluminum, Anodized (10µ)
Bumpers	Polyurethane
Characteristics	
Operating Temperature	14° F (-10°C) to 158 °F (+70°C)
Operating Pressure	Min. SZ 6/SZV6 15 PSI (1 bar) SZD 12 38 PSI (2.5 bar) ø16, 20 30 PSI (2 bar) ø25-40 22 PSI (1.5 bar) ø50-100 15 PSI (1 bar) Max. 145 PSI (10 bar)
Normal Operating Pressure	90 PSI (6 bar)
Lubrication	Pre-lubricated at factory. If additional lubrication is required, use oil compatible with NBR seals and designed for use in pneumatic systems.
Media	Filtered and Regulated Compressed Air
Installation	In any Position
Weight	See Chart - Page 19
Stroke Length	Varies by Bore Size
Theoretical Forces	See Technical Information Sheet
Load Capacity	See Technical Information Sheet
Specifications	
Piston Diameter	12 16 20 25 32 40 50 63 80 100
Port Sizes	NPT 10•32 M5 10•32 M5 10•32 M5 1/8 1/8 1/8 1/8 1/8 1/8 1/4 1/4 Metric (G) M5 M5 M5 1/8 1/8 1/8 1/8 1/8 1/8 1/4 1/4
Rod Diameter	Inch 0.24 0.31 0.39 0.47 0.47 0.63 0.78 0.78 0.78 0.98 1.26 mm 6 8 10 12 12 20 20 20 20 25 32

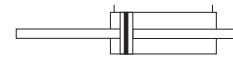
### Series SZ

Ø12mm - 100mm

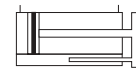
#### SZ 6: Double Acting, Single Rod, Magnets



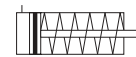
#### SZD 6: Double Acting, Double Rod, Magnets



#### SZV 6: Double Acting, Non-Rotating, Magnets



#### SZ 7: Single Acting, Single Rod, Magnets



#### Features:

**Stainless Steel Rod**  
**Magnetic Piston**  
**Bumpers**  
**Pre-Lubricated Design**  
**Inch or Metric Construction**

## SZ Compact Cylinder

### Ordering Information

**Example:** SZV-U 6050/50-D  
 Compact Cylinder  
 Non-Rotating  
 U.S. Option  
 Double Acting, Magnets  
 50mm Bore  
 50mm Stroke  
 Threaded Body Option

S Z V - U 6 0 5 0 / 5 0 - D

**Versions:**

- SZ - Single Rod
- SZD - Double Rod
- SZV - Non-Rotating

**Design:**

- - Metric Construction
- U - US Construction: NPT Ports & UNC Threads

**Actuation:**

- 6 - Double Acting, Magnets
- 7 - Single Acting, Magnets

**Options:**

- - Standard
- D - Threaded Body, top & bottom

**Stroke:**

- MM: (standard)
- any mm increment
  - see stroke length chart on next page for maximum stroke lengths
  - contact factory for special stroke lengths

**Bore:**

- 012 - 12mm (nom. 1/2")
- 016 - 16mm (nom. 3/4")
- 020 - 20mm (nom. 7/8")
- 025 - 25mm (nom. 1")
- 032 - 32mm (nom. 1-1/4")
- 040 - 40mm (nom. 1-1/2")
- 050 - 50mm (nom. 2")
- 063 - 63mm (nom. 2-1/2")
- 080 - 80mm (nom. 3-1/8")
- 100 - 100mm (nom. 4")

**Proximity Sensors/Brackets: See Page 73**

## SZ Compact Cylinder

### Cylinder Details

Standard Strokes (MM)	Bore Ø									
	12mm	16mm	20mm	25mm	32mm	40mm	50mm	63mm	80mm	100mm
<b>SZ-U 6</b>	<b>Double Acting, Single Rod</b>									
<b>SZD-U 6</b>	<b>Double Acting, Double Rod</b>									
5	•		•	•	•	•	•	•	•	•
10	•	•	•	•	•	•	•	•	•	•
15	•	•	•	•	•	•	•	•	•	•
20	•	•	•	•	•	•	•	•	•	•
25	•	•	•	•	•	•	•	•	•	•
30			•	•	•	•	•	•	•	•
40			•	•	•	•	•	•	•	•
50			•	•	•	•	•	•	•	•
60				•	•	•	•	•	•	•
80					•	•	•	•	•	•
<b>SZV-U 6</b>	<b>Double Acting, Non-Rotating</b>									
5			•	•	•	•	•	•		
10			•	•	•	•	•	•		
15			•	•	•	•	•	•		
20			•	•	•	•	•	•		
25			•	•	•	•	•	•		
30			•	•	•	•	•	•		
40			•	•	•	•	•	•		
50			•	•	•	•	•	•		
60				•	•	•	•	•		
80					•	•	•	•		
<b>SZ-U 7</b>	<b>Single Acting, Single Rod</b>									
5	•	•	•	•	•	•				
10	•	•	•	•	•	•	•	•	•	•
25		•	•	•	•	•	•	•	•	•

(Contact the factory for non-standard stroke lengths)

### Spring Forces

Mode		Bore Ø									
		12mm	16mm	20mm	25mm	32mm	40mm	50mm	63mm	80mm	100mm
Cylinder Extended	<b>lbf</b>	<b>2.25</b>	<b>4.05</b>	<b>6.07</b>	<b>6.97</b>	<b>10.57</b>	<b>13.04</b>	<b>19.33</b>	<b>23.60</b>	<b>29.23</b>	<b>33.72</b>
	N	10	18	27	31	47	58	86	105	130	150
Retracted Stroke (5mm)	<b>lbf</b>	<b>1.80</b>	<b>3.37</b>	<b>5.17</b>	<b>5.85</b>	<b>8.54</b>	<b>10.79</b>	--	--	--	--
	N	8	15	23	26	38	48	--	--	--	--
Retracted Stroke (10mm)	<b>lbf</b>	<b>1.35</b>	<b>2.70</b>	<b>4.27</b>	<b>4.72</b>	<b>6.29</b>	<b>8.54</b>	<b>15.74</b>	<b>20.23</b>	<b>25.63</b>	<b>31.02</b>
	N	6	12	19	21	28	38	70	90	114	138
Spring Constant	<b>lbf/in</b>	<b>2.23</b>	<b>3.08</b>	<b>4.05</b>	<b>5.14</b>	<b>10.34</b>	<b>11.71</b>	--	--	--	--
	N/mm	0.39	0.54	0.71	0.9	1.81	2.05	--	--	--	--
Retracted Stroke (25mm)	<b>lbf</b>	--	<b>2.47</b>	<b>4.27</b>	<b>4.50</b>	<b>6.29</b>	<b>8.54</b>	<b>10.79</b>	<b>15.06</b>	<b>20.23</b>	<b>26.98</b>
	N	--	11	19	20	28	38	48	67	90	120
Spring Constant	<b>lbf/in</b>	--	<b>1.54</b>	<b>2.00</b>	<b>2.57</b>	<b>4.28</b>	<b>4.57</b>	<b>8.62</b>	<b>8.79</b>	<b>9.25</b>	<b>12.33</b>
	N/mm	--	0.27	0.35	0.45	0.75	0.8	1.51	1.54	1.62	2.16

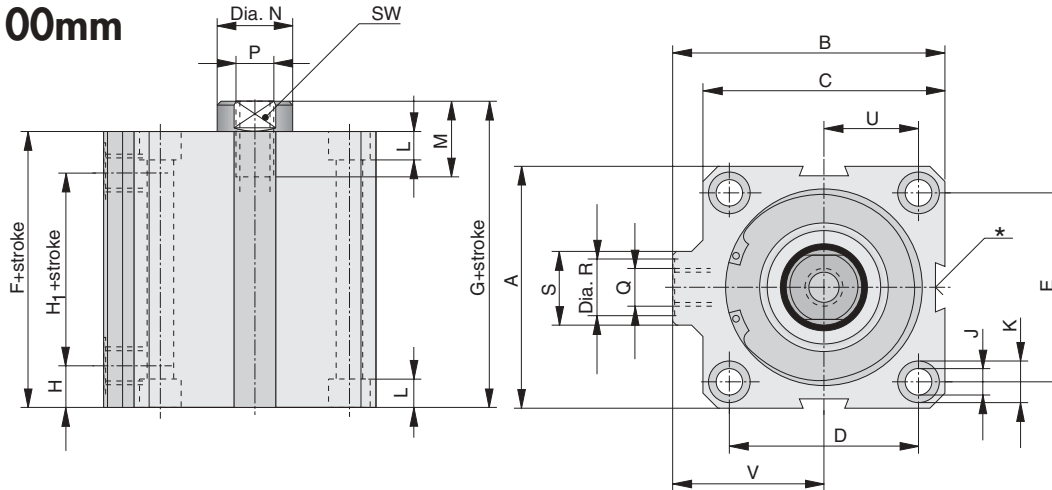
### Weights

Cylinder Type		Bore Ø									
		12mm	16mm	20mm	25mm	32mm	40mm	50mm	63mm	80mm	100mm
SZ 6/7 per 0.38"(10mm)	<b>lbs</b>	<b>0.11</b>	<b>0.18</b>	<b>0.24</b>	<b>0.35</b>	<b>0.51</b>	<b>0.77</b>	<b>1.10</b>	<b>1.98</b>	<b>2.87</b>	<b>4.63</b>
	kg	0.05	0.08	0.11	0.16	0.23	0.35	0.50	0.90	1.30	2.10
	<b>lbs</b>	<b>0.03</b>	<b>0.04</b>	<b>0.05</b>	<b>0.07</b>	<b>0.09</b>	<b>0.13</b>	<b>0.18</b>	<b>0.24</b>	<b>0.30</b>	<b>0.47</b>
SZD 6 per 0.38"(10mm)	kg	0.013	0.018	0.022	0.033	0.042	0.059	0.080	0.108	0.138	0.213
	<b>lbs</b>	<b>0.13</b>	<b>0.22</b>	<b>0.31</b>	<b>0.44</b>	<b>0.62</b>	<b>0.95</b>	<b>1.43</b>	<b>2.34</b>	<b>3.44</b>	<b>5.60</b>
	kg	0.06	0.10	0.14	0.20	0.28	0.43	0.64	1.06	1.56	2.54
SZV 6 per 0.38"(10mm)	<b>lbs</b>			<b>0.06</b>	<b>0.09</b>	<b>0.11</b>	<b>0.17</b>	<b>0.23</b>	<b>0.29</b>	<b>0.39</b>	<b>0.61</b>
	kg			0.015	0.022	0.028	0.042	0.051	0.075	0.104	0.133
	<b>lbs</b>			<b>0.49</b>	<b>0.62</b>	<b>0.77</b>	<b>1.06</b>	<b>1.41</b>	<b>2.65</b>		
	kg			0.22	0.28	0.35	0.48	0.65	1.20		
	<b>lbs</b>			<b>0.05</b>	<b>0.08</b>	<b>0.10</b>	<b>0.14</b>	<b>0.20</b>	<b>0.25</b>		
	kg			0.024	0.036	0.046	0.065	0.090	0.115		

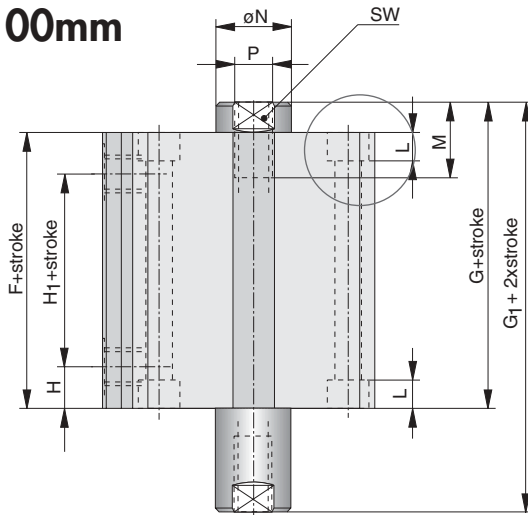
## SZ Compact Cylinder

### Dimensional Data

#### SZ6 and SZ7 Ø12-100mm



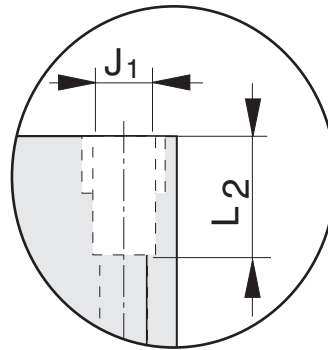
#### SZD 6 Ø12-100mm



#### Threaded Mounting Holes: OPTION- D

In addition to the counter bored thru-holes, threaded mounting holes are available. The diagram below details this feature.

# of threaded hole: SZV: (2) Bottom Only  
SZ6/7 & SZD 6: (8) Bottom & Top



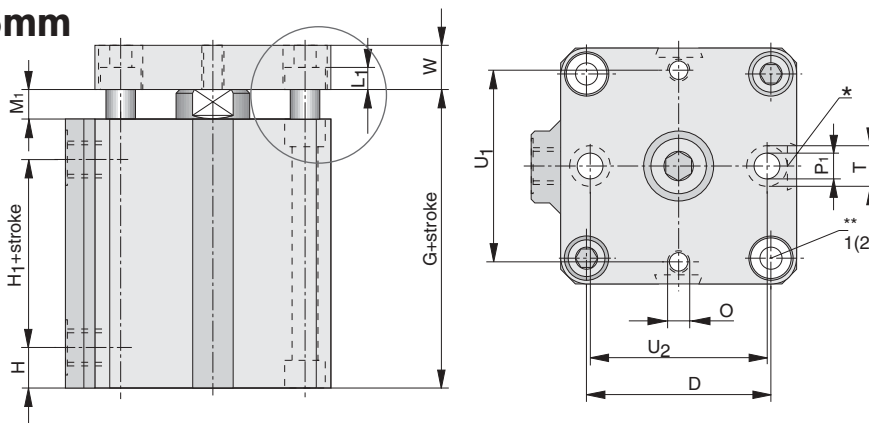
#### Dimension Explanations:

- J- Hole diameter thru Extrusion
- K- Counter Bore Diameter
- L- Body Counter Bore Depth
- L<sub>1</sub>- Depth of Counterbore in Tooling Plate
- M- Piston Rod Thread Depth
- N<sub>1</sub>- Diameter of Guide Rods

#### Notes:

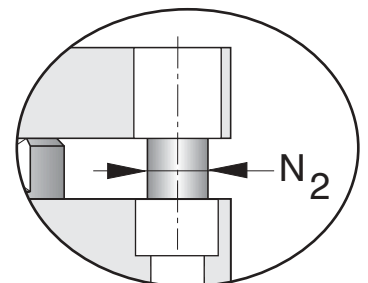
- \* The center sensor dovetail is omitted on the Bore 20 Cylinder.
- 1- Through holes in Tooling Plate for SZV version
- \*\* Thru-hole in Tooling Plate

#### SZV 6 Ø20-63mm



#### Counter Bored Holes:

The standard cylinders have thru mounting holes that are counter bored. The diagram below shows details of this feature.





# SZ Compact Cylinder



## Dimensional Data

Bore Ø	A	B	C	D	E	F + stroke	G + stroke	G <sub>1</sub> + 2 x stroke	H	H <sub>1</sub> + stroke	J
12	0.91 23	1.06 27	0.98 25	0.68 17.2	0.51 13	1.34 34	1.52 38.5	1.69 43	0.39 10	0.55 14	0.13 3.4
16	1.10 28	1.18 30	1.10 28	0.79 20	0.79 20	1.36 34.5	1.57 40	1.79 45.5	0.39 10	0.55 14	0.13 3.4
20	1.26 32	1.34 34	1.26 32	0.87 22	0.87 22	1.42 36	1.65 42	1.89 48	0.43 11	0.55 14	0.18 4.5
25	1.46 37	1.73 44	1.54 39	1.10 28	1.02 26	1.52 38.5	1.77 45	2.03 51.5	0.45 11.5	0.61 15.5	0.18 4.5
32	1.77 45	2.05 52	1.89 48	1.42 36	1.26 32	1.54 39	1.79 45.5	2.05 52	0.35 9	0.81 20.5	0.22 5.5
40	2.17 55	2.32 59	2.17 55	1.61 41	1.61 41	1.65 42	1.89 48	2.17 55	0.35 9	0.94 24	0.26 6.7
50	2.52 64	2.83 72	2.52 64	1.97 50	1.97 50	1.77 45	2.09 53	2.40 61	0.43 11	0.91 23	0.26 6.7
63	3.15 80	3.46 88	3.15 80	2.44 62	2.44 62	2.07 52.5	2.38 60.5	2.70 68.5	0.47 12	1.12 28.5	0.33 8.5
80	3.70 94	4.09 104	3.70 94	2.87 73	2.87 73	2.24 57	2.60 66	2.95 75	0.51 13	1.22 31	0.33 8.5
100	4.61 117	4.94 125.5	4.61 117	3.56 90.5	3.56 90.5	2.30 58.5	2.70 68.5	3.09 78.5	0.55 14	1.22 31	0.41 10.5

Bore Ø	J <sub>1</sub>	K	L	L <sub>1</sub>	L <sub>2</sub>	M	M <sub>1</sub>	N	N <sub>2</sub>	O	P
12	8•32 M4	0.24 6	0.13 3.4		0.48 12	0.24 6		0.24 6			4•40 M3
16	8•32 M4	0.24 6	0.13 3.4		0.48 12	0.31 8		0.31 8			8•32 M4
20	1/4•20 M5	0.30 7.5	0.19 4.8	0.20 5	0.74 15	0.31 8	0.24 6	0.39 10	0.20 5	10•32 M4	10•32 M5
25	1/4•20 M5	0.30 7.5	0.19 4.8	0.20 5	0.74 15	0.47 12	0.26 6.5	0.47 12	0.20 5	10•32 M4	1/4•20 M6
32	5/16•18 M7	0.39 10	0.23 5.8	0.24 6	0.93 24	0.47 12	0.26 6.5	0.47 12	0.24 6	10•32 M5	1/4•20 M8
40	5/16•18 M8	0.43 11	0.27 6.8	0.24 6	0.93 24	0.47 12	0.24 6	0.63 16	0.24 6	10•32 M5	5/16•18 M8
50	5/16•18 M8	0.43 11	0.27 6.8	0.28 7	0.93 24	0.69 17.5	0.31 8	0.79 20	0.31 8	10•32 M6	3/8•16 M10
63	1/2•13 M10	0.55 14	0.33 8.3	0.35 9	1.49 30	0.69 17.5	0.31 8	0.79 20	0.39 10	10•32 M6	3/8•16 M12
80	1/2•13 M10	0.55 14	0.33 8.3		1.49 30	0.98 25		0.98 25			1/2•13 M16
100	1/2•13 M12	0.71 18	0.43 11		1.49 36	1.10 28		1.26 32			3/4•10 M20

Bore Ø	P <sub>1</sub>	Q	R	S	SW	T	U	U <sub>1</sub>	U <sub>2</sub>	V	W
12		10•32 M5	0.31 8	0.43 11	5		0.34 8.6			0.57 14.5	
16		10•32 M5	0.31 8	0.43 11	6		0.39 10			0.63 16	
20	0.18 4.5	10•32 M5	0.31 8	0.43 11	8	0.30 7.5	0.43 11	0.87 22	0.87 22	0.71 18	0.31 8
25	0.18 4.5	1/8 NPT G1/8	0.59 15	0.75 19	10	0.31 8	0.55 14	1.02 26	1.10 28	0.96 24.5	0.31 8
32	0.22 5.5	1/8 NPT G1/8	0.59 15	0.75 19	10	0.39 10	0.71 18	1.26 32	1.42 36	1.10 28	0.39 10
40	0.22 5.5	1/8 NPT G1/8	0.59 15	0.75 19	13	0.39 10	0.81 20.5	1.57 40	1.57 40	1.24 31.5	0.39 10
50	0.27 6.8	1/8 NPT G1/8	0.59 15	0.75 19	17	0.45 11.5	0.98 25	1.97 50	1.97 50	1.57 40	0.47 12
63	0.35 9	1/8 NPT G1/8	0.59 15	0.91 23	17	0.57 14.5	1.22 31	2.44 62	2.44 62	1.89 48	0.47 12
80		1/4 NPT G1/4	0.75 19	0.91 23	22		1.44 36.5			2.24 57	
100		1/4 NPT G1/4	0.75 19	0.91 23	27		1.78 45.25			2.64 67	

### NOTE: SZ 7 Spring Return Version: 1" (25mm) Stroke

It is necessary to add the following to the base F & G dimensions

Bores:      16 to 25              Add 0.39" (10mm)  
               32, 40                 Add 0.197" (5mm)

# NZK Compact Cylinder

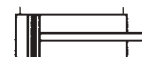
## Specifications

Characteristics	Symbol	Unit	Description
<b>General Features</b>			
Type			Piston Rod Cylinder
Series			NZK
Configurations			NZK6 Double Acting, Single Rod, Magnetic Piston NZK7 Single Acting, Single Rod, Magnetic Piston NZK8 Single Acting, Single Rod, Magnetic Piston
Mounting			See drawing
Tube connection			Thread
Ambient temperature range	$\vartheta_{min}$ $\vartheta_{max}$	°C °C	-20 +80
Mediums - temperature range	$\vartheta_{max}$	°C	+8
Weight (mass)		kg	See table
Installation			In any position
Medium			Filtered and lubricated or filtered and unlubricated compressed air
Lubrication			Oil mist lubrication compatible with polyurethan
Material Cylinder tube Front/Rear covers Piston rod			Aluminum Aluminum Stainless steel
<b>Pneumatic Characteristics</b>			
Nominal pressure	P <sub>n</sub>	bar	6
Operating pressure	P <sub>min</sub> P <sub>max</sub>	bar bar	0.5 (Single acting version: 1.0) 10
Piston diameter		mm	32 40 50 63 80 100
Port size			G1/8 G1/8 G1/8 G1/8 G1/8 G1/4
Piston rod diameter		mm	12 16 20 20 25 25
Piston rod thread			M6 M6 M8 M8 M10 M12 1) M10x1.25 M12x1.25 M16x1.5 M16x1.5 M20x1.5 M20x1.5
Stroke length		mm	Double acting version: See order instructions Single acting version: 5, 10, 15, 20, 25
Cushioning			Elastomer cushioning at both ends
Spring return force	max.	N	See diagram

## Series NZK

Ø32mm - 100mm

**NZK 6: Double Acting, Single Rod, Magnets**



**NZK 7: Single Acting, Single Rod, Magnets**



**NZK 8: Single Acting, Single Rod, Magnets**



### Features:

Stainless Steel Rod  
Magnetic Piston  
Bumpers  
Pre-Lubricated Design  
Spring Extend or Retract  
ISO 6431 Mounting Holes

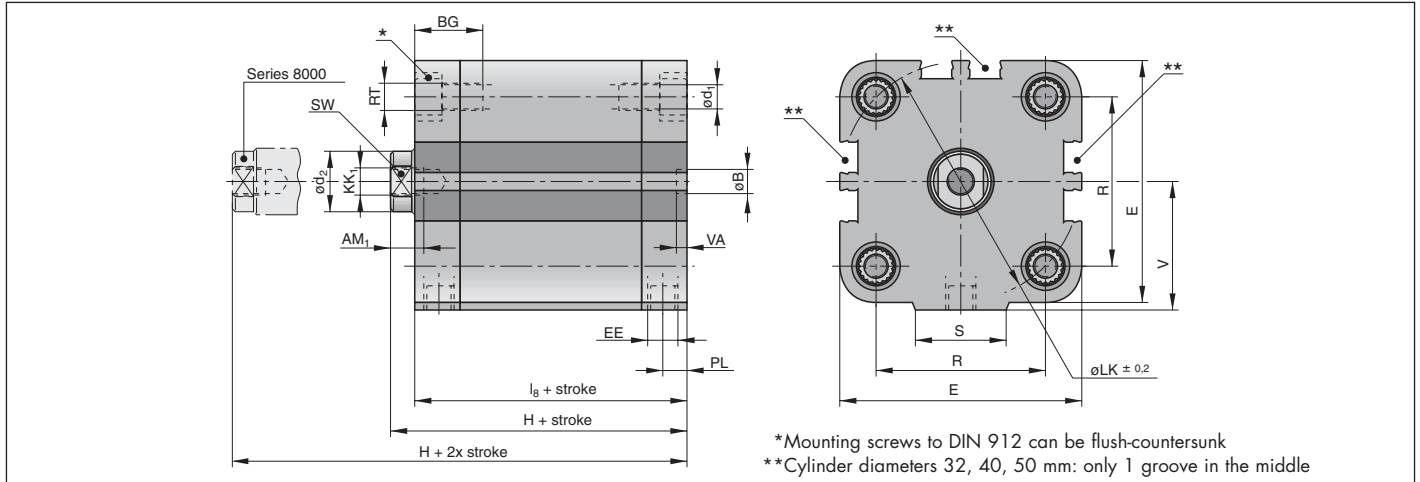
<sup>1)</sup> Piston rod thread on series NZK.../...-AG

# NZK Compact Cylinder

## Cylinder Details

### Dimensions for Basic Cylinder

Version: Piston Rod with Female Thread (Series NZK..../...)



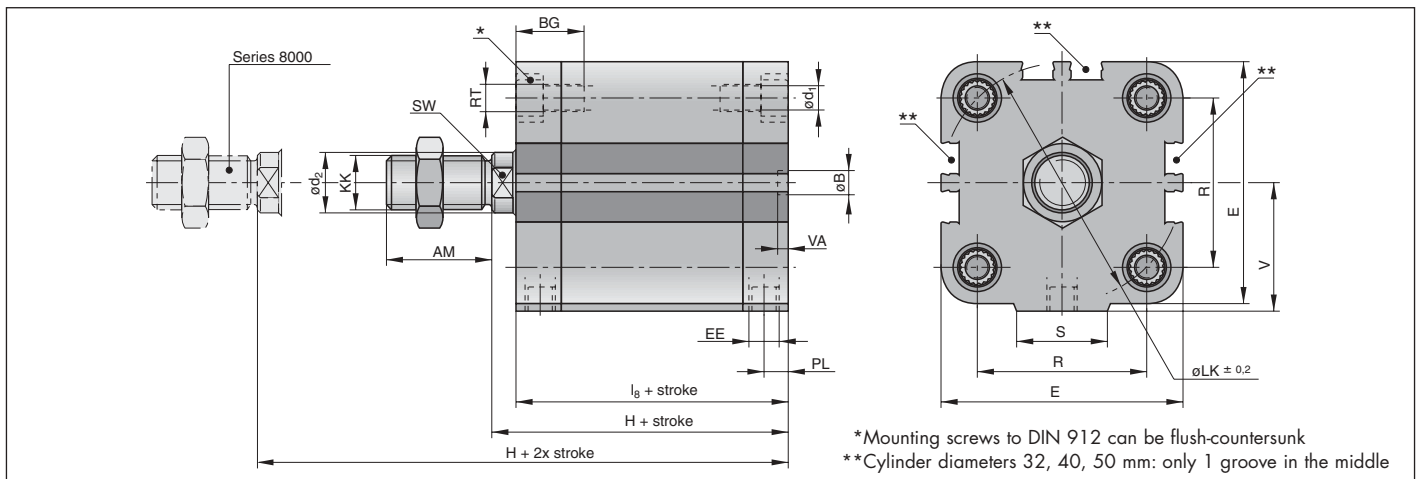
### Dimension Table (mm) for Basic Cylinder

Bore Ø	AM <sub>1</sub>	øB H9	BG	ød <sub>1</sub>	ød <sub>2</sub>	E	EE	H (* +stroke)	KK <sub>1</sub>	l <sub>g</sub> +stroke	øLK	PL	R	RT	S	SW	V	VA
32	12	6	21	5.5	12	50	G1/8	50.5	M6	44.5	46	8	32.5	M6	21	10	26.5	4
40	12	6	21	5.5	16	57	G1/8	52	M6	45.5	54	8	38	M6	22	13	30	4
50	12	6	22.5	6.5	20	67.5	G1/8	53	M8	45.5	66	8	46.5	M8	25	17	35.75	4
63	12	8	22.5	6.5	20	81	G1/8	57.5	M8	50	80	8	56.5	M8	30	17	43.5	4
80	16	8	27.5	8.5	25	98	G1/8	64	M10	56	102	8.5	72	M10	40	19	53	4
100	20	8	32.5	8.5	25	119	G1/4	76.5	M12	66.5	126	10.5	89	M10	50	22	62.5	4

\*Series NZK 8000: H + 2x stroke

### Dimensions for Basic Cylinder

Version: Piston Rod with Male Thread (Series NZK..../...-AG)



### Dimension Table (mm) for Basic Cylinder

Bore Ø	AM	øB H9	BG	ød <sub>1</sub>	ød <sub>2</sub>	E	EE	H (* +stroke)	KK <sub>1</sub>	l <sub>g</sub> +stroke	øLK	PL	R	RT	S	SW	V	VA
32	20	6	21	5.5	12	50	G1/8	50.5	M10x1.25	44.5	46	8	32.5	M6	21	10	26.5	4
40	24	6	21	5.5	16	57	G1/8	52	M12x1.25	45.5	54	8	38	M6	22	13	30	4
50	32	6	22.5	6.5	20	67.5	G1/8	53	M16x1.5	45.5	66	8	46.5	M8	25	17	35.75	4
63	32	8	22.5	6.5	20	81	G1/8	57.5	M16x1.5	50	80	8	56.5	M8	30	17	43.5	4
80	40	8	27.5	8.5	25	98	G1/8	64	M20x1.5	56	102	8.5	72	M10	40	19	53	4
100	40	8	32.5	8.5	25	119	G1/4	76.5	M20x1.5	66.5	126	10.5	89	M10	50	22	62.5	4

\*Series NZK 8000: H + 2x stroke

# NZK Compact Cylinder



## Ordering Information

Description	Symbol	Bore Ø	Type #	Order #
Double acting without adjustable end cushioning, for contactless position sensing		32	NZK 6032/... NZK 6032/...-AG	PA 58390-.... PA 58470-....
		40	NZK 6040/... NZK 6040/...-AG	PA 59310-.... PA 59390-....
		50	NZK 6050/... NZK 6050/...-AG	PA 60390-.... PA 60470-....
		63	NZK 6063/... NZK 6063/...-AG	PA 61330-.... PA 61410-....
		80	NZK 6080/... NZK 6080/...-AG	PA 62230-.... PA 62310-....
		100	NZK 6100/... NZK 6100/...-AG	PA 63130-.... PA 63210-....
Single acting, normally retracted, without adjustable end cushioning for contactless position sensing		32	NZK 7032/... NZK 7032/...-AG	PA 58400-.... PA 58480-....
		40	NZK 7040/... NZK 7040/...-AG	PA 59320-.... PA 59400-....
		50	NZK 7050/... NZK 7050/...-AG	PA 60400-.... PA 60480-....
		63	NZK 7063/... NZK 7063/...-AG	PA 61340-.... PA 61420-....
		80	NZK 7080/... NZK 7080/...-AG	PA 62240-.... PA 62320-....
		100	NZK 7100/... NZK 7100/...-AG	PA 63140-.... PA 63220-....
Single acting, normally extended, without adjustable end cushioning for contactless position sensing		32	NZK 8032/... NZK 8032/...-AG	PA 58460-.... PA 58490-....
		40	NZK 8040/... NZK 8040/...-AG	PA 59360-.... PA 59410-....
		50	NZK 8050/... NZK 8050/...-AG	PA 60460-.... PA 60490-....
		63	NZK 8063/... NZK 8063/...-AG	PA 61400-.... PA 61430-....
		80	NZK 8080/... NZK 8080/...-AG	PA 62300-.... PA 62330-....
		100	NZK 8100/... NZK 8100/...-AG	PA 63200-.... PA 63230-....
<p>Complete type designation and order no. with stroke length in mm (4-digits)</p> <p>Stroke Length: MM (standard)            Double acting Version:—any mm increment up to 500mm standard            Single acting Version:—0005,0010,0015,0020,0025            Contact factory for special stroke lengths</p>				

Description	Bores					
	32mm	40mm	50mm	63mm	80mm	100mm
Foot mounting A-..	PD 27917	PD 27918	PD 28072	PD 28073	PD 28074	PD 28075
Rear trunnion mounting B-..	PD 22704	PD 22705	PD 22706	PD 22707	PD 22708	PD 22709
Rear trunnion mounting BA-..	PD 23412	PD 23413	PD 23414	PD 23415	PD 23416	PD 23417
Rear trunnion mounting BAS-..*	PD 23843	PD 23844	PD 23845	PD 23846	PD 23847	PD 23848
Front flange mounting C-..	PD 23403	PD 23404	PD 23405	PD 23406	PD 23407	PD 23408
Rear flange mounting D-..	PD 23403	PD 23404	PD 23405	PD 23406	PD 23407	PD 23408
Security bolt for mountings B,BA,BAS	KY 6153	KY 6154	KY 6157	KY 6156	KY 6158	KY 6159
Delivery information: on delivery all cylinder mountings, except the trunnion mounting are not assembled						

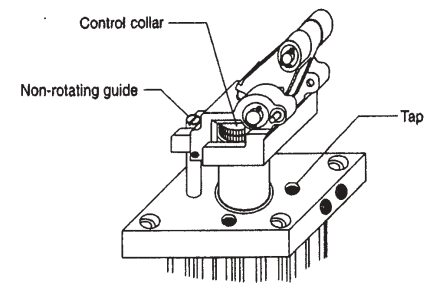
## WST Stopper Cylinder

### Specifications

Features		
Media	Clean dry compressed air	
Operating Pressure Range	22 to 102 psi (1.5 to 7 Bar)	
Max* Pressure	145 psi (10 Bar)	
Operating Temperature Range	32 to 140°F (0 to 60°C)	
Operating Speed Range mm/s	50-500	
Cushion	Urethane Bumper	
Connecting Port	G1/8" (BSP)	
Lubrication	Sealed, lubricated for life	
Shock Absorber	WSAB2012-R	WSAB3625-C
Mounting Type	Flange	Plate
Stroke Tolerance	0-1.5mm	
Bore Size and Stroke Length		
Model	Bore Size	Stroke
WSTV(S)	50, 80	30
WSTSV(S)	50, 80	30
WSTH(S)	50	50

\*The units are not designed to operate at this pressure. Exceeding the operating pressure range may cause damage to reduce the life of the unit.

### Series WST Ø50mm & 80mm



### How to adjust the shock absorber

The shock absorber is set to maximum damping upon delivery. When in operation, adjust the damping of the shock absorber by adjusting the control collar. For the vertical model, it's shown above. For the horizontal model, by the graduated collar.

Gradually reduce the damping level until the load comes to rest in the correct position, without any shock deceleration of the load.

If the load forces the damper to its fully retracted position too rapidly (normally apparent due to a sudden deceleration at the end of stroke), then this may lead to mechanical damage of the unit. In this case, increase the damping to remove the shock deceleration.

Periodically regulate the damping of each unit to maintain the shock absorber energy higher than the apparent load energy.

### Shock absorber replacement

If correctly set, the shock absorber will operate trouble free.

#### Vertical type

Unfasten the head using a spanner while holding the cylinder rod in place.

Replace the shock absorber on the piston rod.

Refasten the head and readjust the shock absorber.

#### Horizontal type

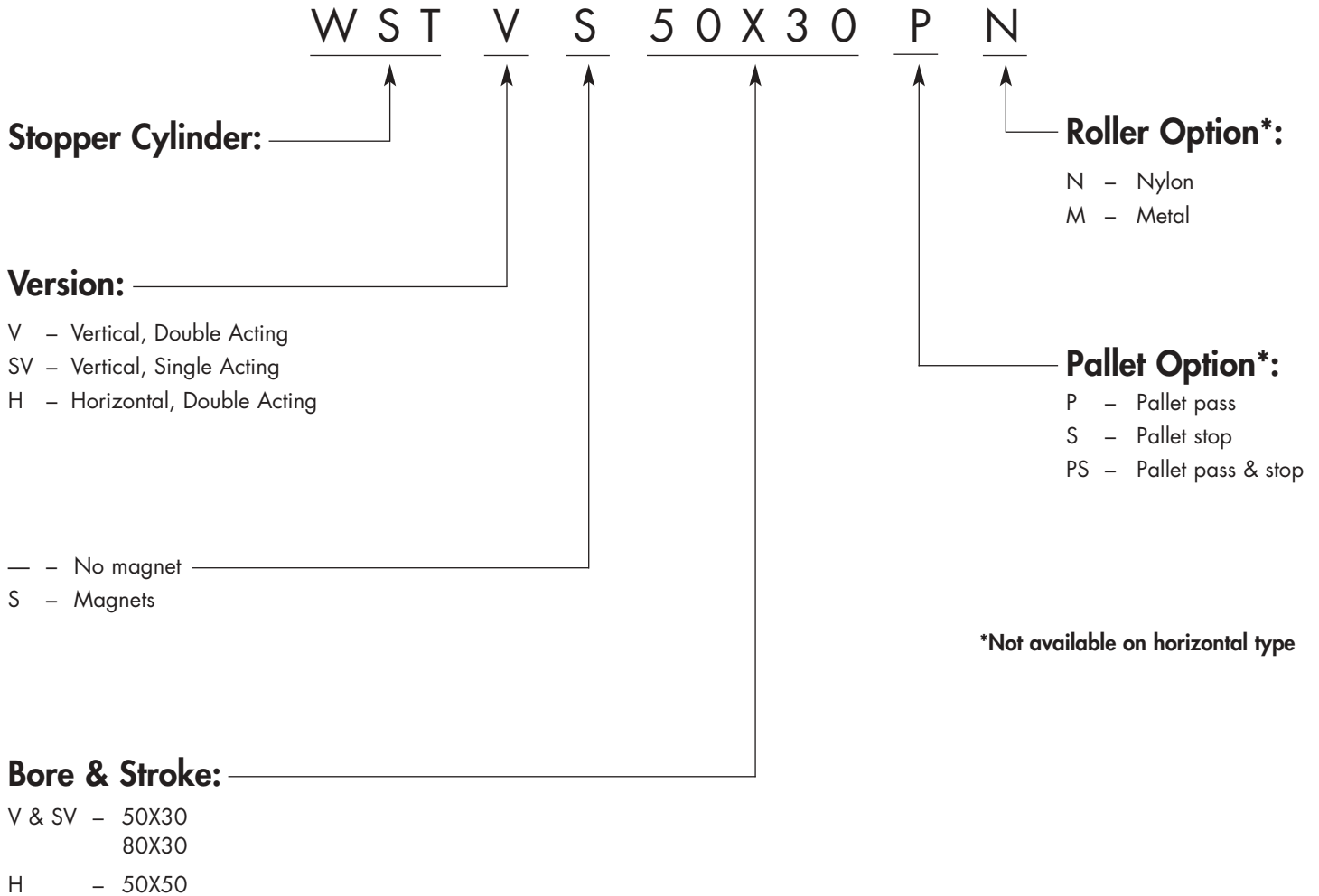
Loosen and remove the locking collar. Remove the shock absorber and replace it.

### Precautions

1. Please note that if the impact energy exceeds the shock absorber energy that is currently set then the cylinder and frame will absorb the excess energy.
2. Keep all moving parts free from scratches or defects, as they may lead to defective operation.
3. The unit must be securely fastened to a fixed surface, to prevent free rotation. Any rotation may lead to incorrect operation or damage.
4. Please keep clear of all moving parts during operation.
5. The sensors are secured by a thread fixing with the mounting slots along the side of the cylinder.  
To reposition a sensor:  
Loosen the threaded fastener.  
Slide the sensor along the groove to its new position.  
Tighten the threaded fastener locking the sensor in place.

## WST Stopper Cylinder

### Ordering Information



### Proximity Sensors

Order #	Description
WE102A/B	Reed Type, 2 wire cable, DC10-28V, AC85-115V
WE155A/B	Reed Type, 3 wire cable, LED, DC4.5V-28V
WS3HA/B	Reed Type, 2 wire cable, LED, DC10-30V (10-50mA), AC85-115V (10-50nA)
WS4HA/B	Reed Type, 2 wire cable, LED, DC10-30V (5-25mA), AC85-115V (5-20nA)
WS9HA/B	Reed Type, 3 wire cable, LED, DC4.5-28V (10-50mA)

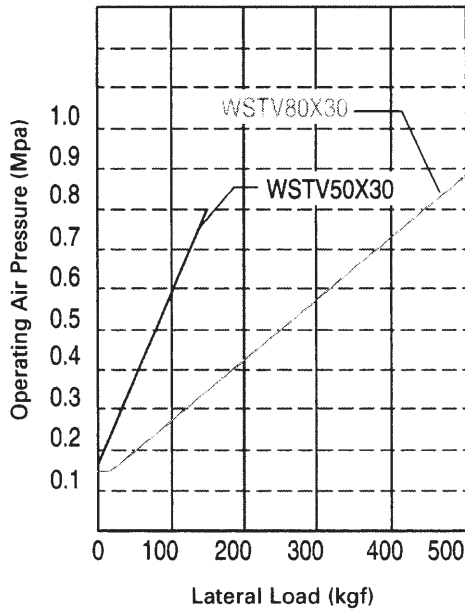
## WST Stopper Cylinder

### Cylinder Sizing

### Type – WSTV(S), WSTSV(S)

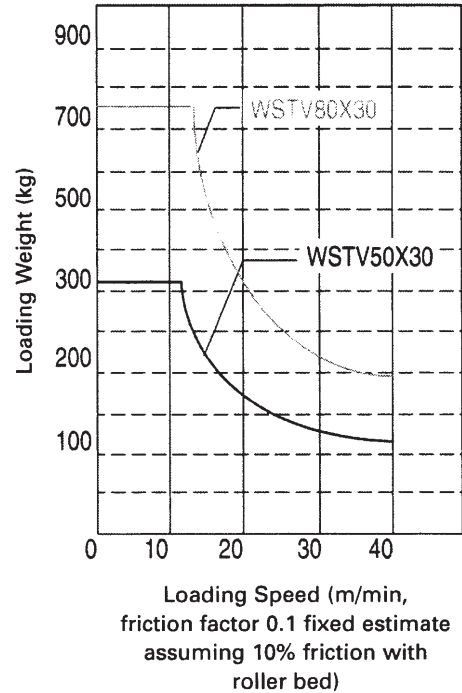
#### Pressure vs Load

Graph 1



#### Load vs Speed

Graph 2



#### Example for selection of stopper cylinder

Check the requirements:

1. Loading speed
2. Loading weight
3. Operating pressure



Bore size selection:

1. Select the cylinder size from Graph 2 using the loading speed and weight
2. Check the estimated operating pressure from Graph 1

For example: A load of 200kg travelling at 15m/min with an estimated friction factor of 0.1.  
 Cross referencing 200kg and 15m/min on Graph 2 gives a WSTV 50x30.  
 Checking on Graph 1 with a lateral load of  $0.1 \times 200\text{kg} = 20\text{kg}$  on a WSTV 50x30.  
 This is below the graph line showing it to be acceptable for the application.

## WST Stopper Cylinder

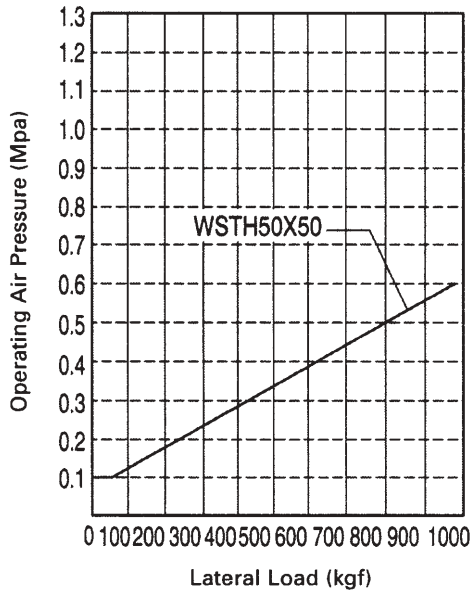
### Cylinder Sizing

### Type – WSTH(S)

#### Pressure vs Load

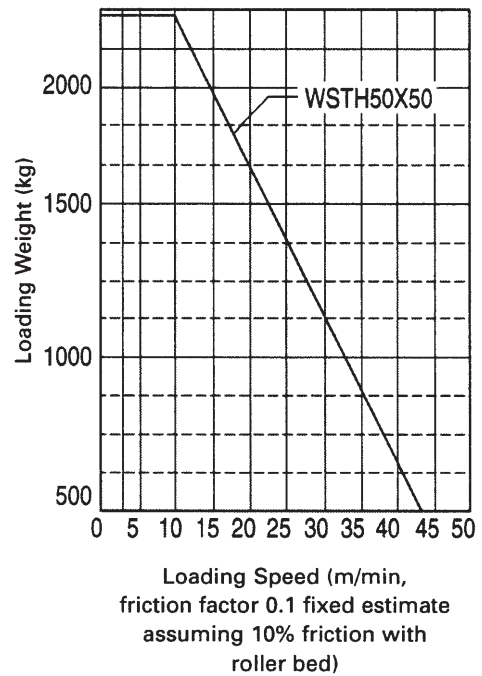
Graph 1

WSTH Series Horizontal type

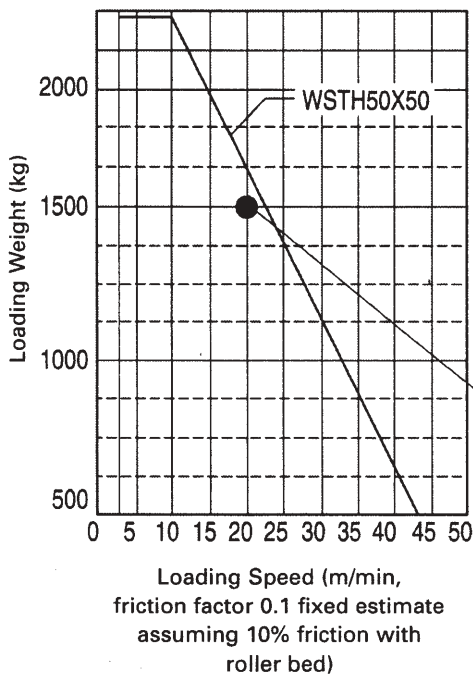


#### Load vs Speed

Graph 2



#### Example



1. Specify load weight
2. Specify load speed
3. Check that it falls within the graph line

For example:  
Mass of 1500kg with a speed of 20m/min is below the line making it acceptable for a WSTH 50x50



## AZ Cylinder

### Specifications

Features	
Type	ISO 6431 VDMA 24562 CETOP RP43P
Series	AZ
Configurations	AZ Double Acting, Single Rod, Magnetic Piston, Cushions AZD Double Acting, Double Rod, Magnetic Piston
Construction Materials	
Barrel	Extruded Aluminum, Anodized (10µ)
End Caps	Die Cast Aluminum
Piston Rod	Stainless Steel
Rod Bearing	Teflon Impregnated Bronze
Piston	Molded NBR, (Optional: Viton)
Cushions Needle	Brass
Seals	Urethane, (Optional: Viton)
End Cap Screws	Steel, zinc plated
Characteristics	
Operating Temperature	Min: -5° F (-20°C) Max: +176 °F (+80°C)
Operating Pressure	Min: 15 PSI (1 bar) Max: 145 PSI (10 bar)
Normal Operating Pressure	90 PSI (6 bar)
Lubrication	Pre-lubricated at factory. If additional lubrication is required use oil compatible for NBR seal and designed for use in pneumatic systems.
Media	Filtered and regulated compressed air
Installation	In any position
Weight	See chart with mounts
Stroke Length	Up to 500mm - Longer contact factory
Theoretical Forces	See Technical Information Sheet
Load Capacity	See Technical Information Sheet
Specifications	
Piston Diameter	32 40 50 63 80 100
Port Sizes	Metric (G) G1/8 G1/4 G1/4 G3/8 G3/8 G1/2
Rod Diameter	mm 12 16 20 20 25 25
Cushion Lengths All Cylinders	mm 21 25 28 30 30 37

### Series AZ

Ø32mm - 100mm

ISO 6431  
VDMA 24562  
CETOP RP43P

**AZ 5: Double Acting, Single Rod,  
Magnets, Cushions**



**AZD 6: Double Acting, Double Rod,  
Magnets**



### Features:

**Stainless Steel Rod  
Magnetic Piston  
Adjustable Cushions  
Pre-Lubricated Design  
Captive Cushion Needles**

## AZ Cylinder

### Ordering Information

**Example:** AZ 5050/25-V  
 ISO 6431  
 Single Rod  
 Double Acting, Magnets, Cushions  
 50mm Bore  
 25mm Stroke  
 Viton Seals

**AZ 5050 / 25 - V**

#### Versions:

AZ – Single Rod  
 AZD – Double Rod

#### Actuation:

#### Standard

5 – Double Acting, Magnets, Cushions  
 1 – Double Acting, Cushions  
 6 – Double Acting, Magnets  
 2 – Double Acting

#### Options:

— – Standard  
 V – Viton  
 D2L – Front, Single End Porting  
 B2L – Rear, Single End Porting

#### Stroke:

MM: (standard)  
 • any mm increment up to 500mm standard  
 • contact factory for special stroke lengths

#### Bore:

032 – 32 mm (nom. 1-1/4")  
 040 – 40 mm (nom. 1-1/2")  
 050 – 50 mm (nom. 2")  
 063 – 63 mm (nom. 2-1/2")  
 080 – 80 mm (nom. 3-1/8")  
 100 – 100 mm (nom. 4")

Contact factory for bore sizes: 125, 160, 200, 250, and 320mm.

**Proximity Sensors/Brackets: See Page 73**

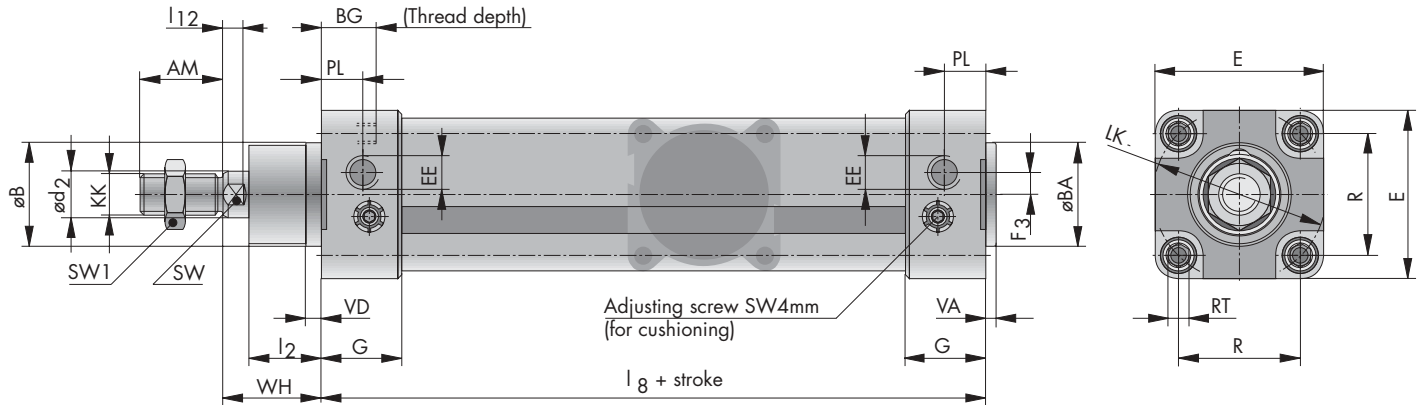
Description	Bore Ø					
	32mm	40mm	50mm	63mm	80mm	100mm
Foot bracket, Type A	PD 27917	PD 27918	PD 28072	PD 28073	PD 28074	PD 28075
Rear double clevis, Type B	PD 22704	PD 22705	PD 22706	PD 22707	PD 22708	PD 22709
Rear single clevis, Type BA	PD 23412	PD 23413	PD 23414	PD 23415	PD 23416	PD 23417
Rear single clevis w/bearing, Type BAS	PD 23843	PD 23844	PD 23845	PD 23846	PD 23847	PD 23848
Front flange, Type C	PD 23403	PD 23404	PD 23405	PD 23406	PD 23407	PD 23408
Rear flange, Type D	PD 23403	PD 23404	PD 23405	PD 23406	PD 23407	PD 23408
Center trunnion, Type EN	PD 39195	PD 39196	PD 39197	PD 39198	PD 39199	PD 39200
Clevis Pin for mounting types B, BA, BAS	KY 6153	KY 6154	KY 6157	KY 6156	KY 6158	KY 6159

Delivery information: all cylinder mountings, except the trunnion mounting, are shipped unassembled

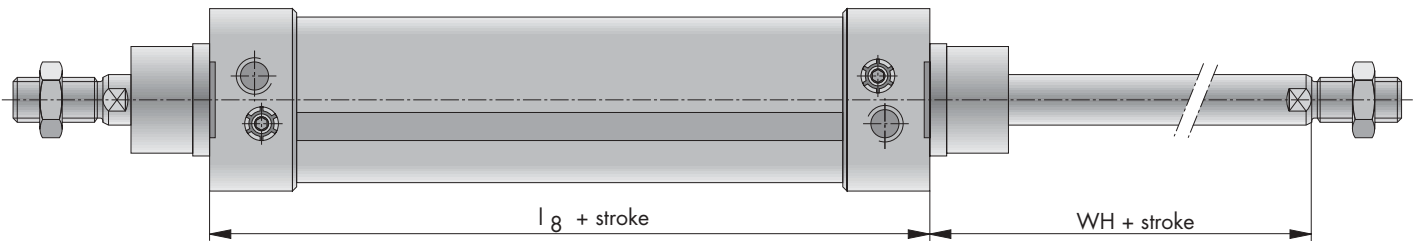
## AZ Cylinder

### Dimensional Data

### AZ Ø32-100mm



### AZD Ø32-100mm



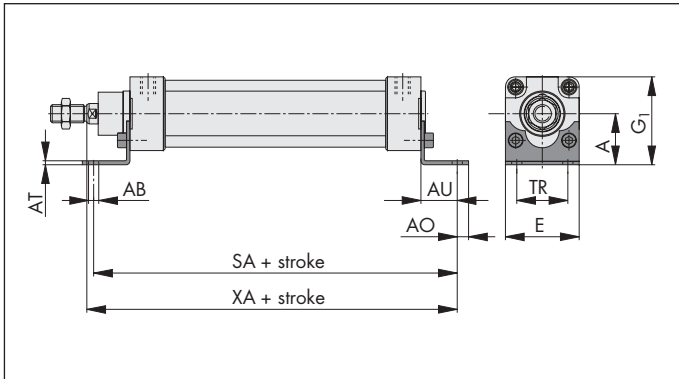
Bore ø	AM	øB	øBA	BG	ød	E	EE	F <sub>3</sub>	G	KK	l <sub>2</sub>	l <sub>g</sub> + stroke	l <sub>12</sub>	øLK	PL	R	RT	SW	SW <sub>1</sub>	VA	VD	WH+ stroke
32	0.79	1.18	1.18	0.63	0.47	1.85	1/8 NPT	0.18	1.20	3/8-24	0.79	3.70	0.24	1.81	0.39	1.28	1/4-20	0.39	0.67	0.16	0.20	1.02
	20	30	30	16	12	47	G1/8	4.5	30.5	M10 X 1.25	20	94	6	46	9.8	32.5	M6	10	17	4	5	26
40	0.94	1.38	1.38	0.63	0.63	2.17	1/4 NPT	0.21	1.34	7/16-20	0.81	4.13	0.26	2.13	0.57	1.50	1/4-20	0.51	0.75	0.16	0.30	1.18
	24	35	35	16	16	55	G1/4	5.3	34	M12 X 1.25	20.5	105	6.5	54	14.5	38	M6	13	19	4	5	30
50	1.26	1.57	1.57	0.63	0.79	2.56	1/4 NPT	0.33	1.22	5/8-18	1.10	4.17	0.31	2.60	0.63	1.83	5/16-18	0.67	0.94	0.16	0.24	1.46
	32	40	40	16	20	65	G1/4	8.5	31	M16 X 1.50	28	106	8	66	16	46.5	M8	17	24	4	6	37
63	1.26	1.77	1.77	0.63	0.79	3.07	3/8 NPT	0.31	1.30	5/8-18	1.02	4.76	0.31	3.15	0.63	2.22	5/16-18	0.67	0.94	0.16	0.24	1.46
	32	45	45	16	20	78	G3/8	8	33	M16 X 1.50	26	121	8	80	16	56.5	M8	17	24	4	6	37
80	1.57	1.77	1.77	0.63	0.98	3.74	3/8 NPT	0.35	1.40	3/4-16	1.28	5.04	0.39	4.02	0.81	2.83	3/8-16	0.87	1.18	0.16	0.24	1.81
	40	45	45	16	25	95	G3/8	9	35.5	M20 X 1.50	32.5	128	10	102	20.5	72	M10	22	30	4	6	46
100	1.57	2.17	2.17	0.63	0.98	4.53	1/2 NPT	0.51	1.46	3/4-16	1.48	5.43	0.39	4.96	0.75	3.50	3/8-16	0.87	1.18	0.16	0.24	2.01
	40	55	55	16	25	115	G1/2	13	37	M20 X 1.50	37.5	138	10	126	19	89	M10	22	30	4	6	51

# AZ Cylinder



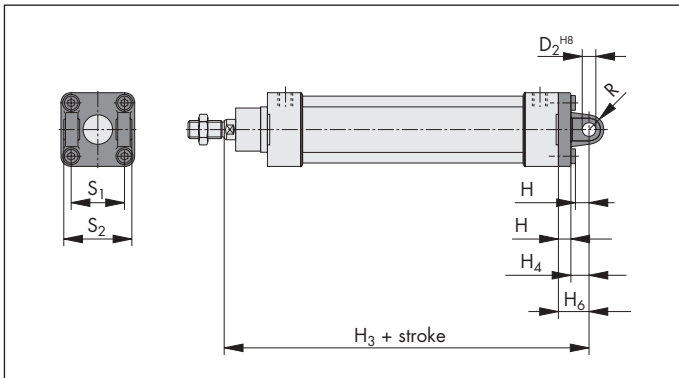
## Cylinder Mounts

### Foot Bracket- Type A



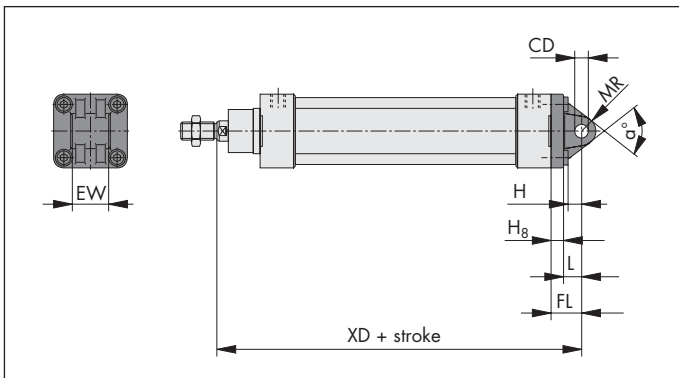
Bore $\varnothing$	AB	AH	AO	AT	AU	E	G <sub>1</sub>	TR	SA+ stroke	XA+ stroke
32	0.28	1.26	0.31	0.12	0.94	1.85	2.19	1.26	5.59	5.67
	7	32	8	3	24	47	55.5	32	142	144
40	0.35	1.42	0.39	0.12	1.10	2.09	2.46	1.42	6.34	6.42
	9	36	10	3	28	53	62.5	36	161	163
50	0.35	1.77	0.39	0.12	1.26	2.56	3.05	1.77	6.69	6.89
	9	45	10	3	32	65	77.5	45	170	175
63	0.35	1.97	0.39	0.12	1.26	2.95	3.44	1.97	7.28	7.48
	9	50	10	3	32	75	87.5	50	185	190
80	0.47	2.48	0.55	0.16	1.61	3.74	4.35	2.48	8.27	8.46
	12	63	14	4	41	95	110.5	63	210	215
100	0.55	2.80	0.59	0.16	1.61	4.53	5.06	2.95	8.66	9.06
	14	71	15	4	41	115	128.5	75	220	23

### Rear Double Clevis- Type B



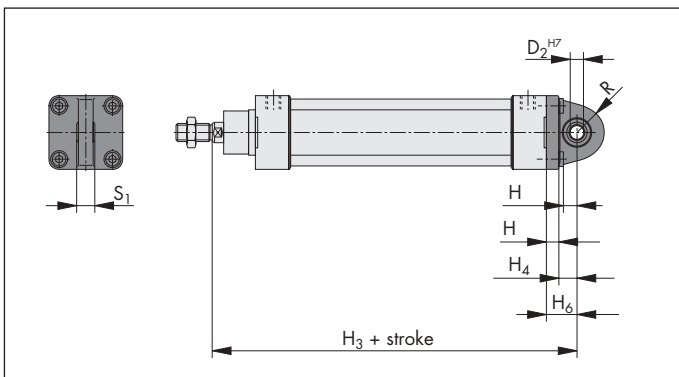
Bore $\varnothing$	$\varnothing D_{H8}$	H <sub>3</sub> + stroke	H <sub>4</sub>	H <sub>6</sub>	H <sub>7</sub>	H <sub>8</sub>	R	S <sub>1</sub>	S <sub>2</sub>
32	0.39	5.59	0.47	0.87	0.43	0.39	0.35	1.02	1.77
	10	142	12	22	11	10	9	26	45
40	0.47	6.30	0.59	0.98	0.55	0.39	0.43	1.10	2.05
	12	160	15	25	14	10	11	28	52
50	0.47	6.69	0.63	1.06	0.59	0.43	0.47	1.26	2.36
	12	170	16	27	15	11	12	32	60
63	0.63	7.48	0.83	1.26	0.79	0.43	0.59	1.57	2.76
	16	190	21	32	20	11	15	40	70
80	0.63	8.27	0.87	1.42	0.83	0.55	0.63	1.97	3.54
	16	210	22	36	21	14	16	50	90
100	0.79	9.06	0.98	1.61	0.94	0.63	0.79	2.36	4.33
	20	230	25	41	24	16	20	60	110

### Rear Single Clevis- Type BA



Bore $\varnothing$	$\varnothing CD_{H8}$	EW	FL	H <sub>7</sub>	H <sub>8</sub>	L	MR	XD+ stroke	$\alpha$
32	0.39	1.02	0.87	0.43	0.39	0.47	0.41	5.59	2.36
	10	26	22	11	10	12	10.5	142	60
40	0.47	1.10	0.98	0.55	0.39	0.59	0.51	6.30	2.36
	12	28	25	14	10	15	13	160	60
50	0.47	1.26	1.06	0.59	0.43	0.63	0.51	6.69	2.76
	12	32	27	15	11	16	13	170	70
63	0.63	1.57	1.26	0.79	0.43	0.83	0.67	7.48	2.36
	16	40	32	20	11	21	17	190	60
80	0.63	1.97	1.42	0.79	0.59	0.83	0.67	8.27	2.76
	16	50	36	20	15	21	17	210	70
100	0.79	2.36	1.61	0.94	0.63	0.98	0.83	9.06	2.76
	20	60	41	24	16	25	21	230	70

### Rear Single Clevis with Spherical Bearing- Type BAS

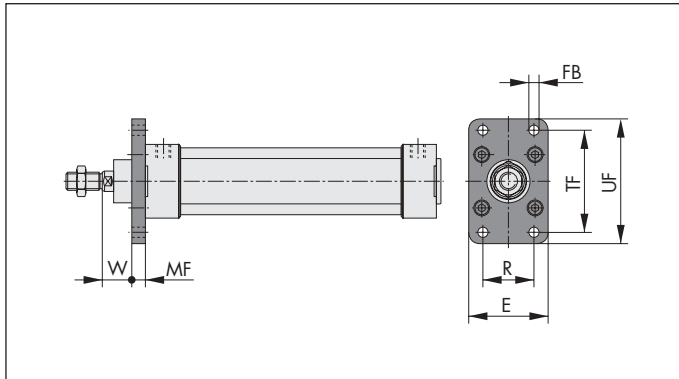


Bore $\varnothing$	$\varnothing D2_{H7}$	H <sub>3</sub> + stroke	H <sub>4</sub>	H <sub>6</sub>	H <sub>7</sub>	H <sub>8</sub>	R	S <sub>1</sub>
32	0.39	5.59	0.47	0.87	0.43	0.39	0.71	0.55
	10	142	12	22	11	10	18	14
40	0.47	6.30	0.59	0.98	0.55	0.39	0.83	0.63
	12	160	15	25	14	10	21	16
50	0.47	6.69	0.63	1.06	0.59	0.43	0.91	0.63
	12	170	16	27	15	11	23	16
63	0.63	7.48	0.83	1.26	0.79	0.43	1.06	0.83
	16	190	21	32	20	11	27	21
80	0.63	8.27	0.83	1.42	0.79	0.59	1.14	0.83
	16	210	21	36	20	15	29	21
100	0.79	9.06	0.98	1.61	0.94	0.63	1.34	0.98
	20	230	25	41	24	16	34	25

## AZ Cylinder

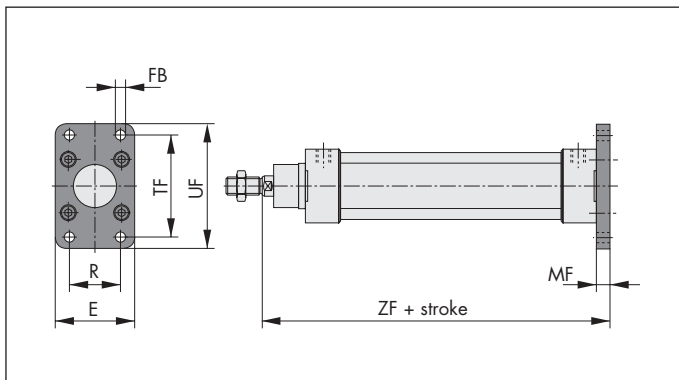
### Cylinder Mounts

#### Front Flange- Type C



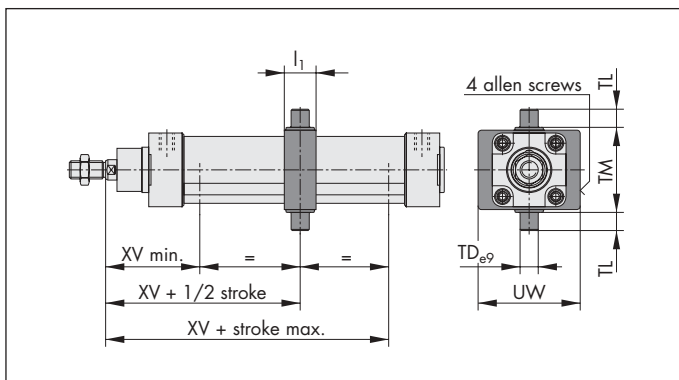
Bore $\varnothing$	$\varnothing$ FB	E	MF	R	TF	UF	W
32	0.28	1.97	0.39	1.26	2.52	3.11	0.63
	7	50	10	32	64	79	16
40	0.35	2.20	0.39	1.42	2.83	3.54	0.79
	9	56	10	36	72	90	20
50	0.35	2.76	0.47	1.77	3.54	4.33	0.98
	9	70	12	45	90	110	25
63	0.35	3.03	0.47	1.97	3.94	4.72	0.98
	9	77	12	50	100	120	25
80	0.47	3.94	0.63	2.48	4.96	6.02	1.18
	12	100	16	63	126	153	30
100	0.55	4.72	0.63	2.95	5.91	7.01	1.38
	14	120	160	75	150	178	35

#### Rear Flange- Type D



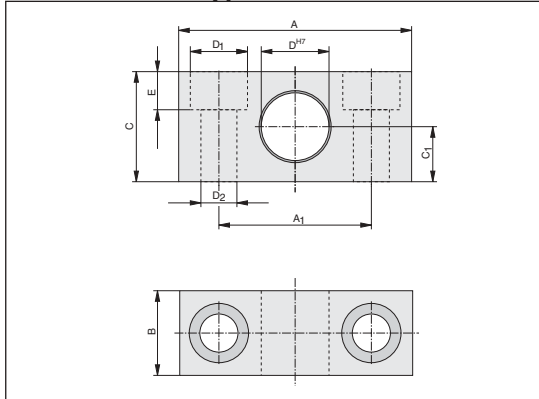
Bore $\varnothing$	$\varnothing$ FB	E	MF	R	TF	UF	ZF+ stroke
32	0.28	1.97	0.39	1.26	2.52	3.11	5.12
	7	50	10	32	64	79	130
40	0.35	2.20	0.39	1.42	2.83	3.54	5.71
	9	56	10	36	72	90	145
50	0.35	2.76	0.47	1.77	3.54	4.33	6.10
	9	70	12	45	90	110	155
63	0.35	3.03	0.47	1.97	3.94	4.72	6.69
	9	77	12	50	100	120	170
80	0.47	3.94	0.63	2.48	4.96	6.02	7.48
	12	100	16	63	126	153	190
100	0.55	4.72	0.63	2.95	5.91	7.01	8.07
	14	120	16	75	150	178	205

#### Adjustable Trunnion- Type EN



Bore $\varnothing$	$l_1$	$\varnothing$ TD e9	TL	TM	UW	XV min.	XV+ 1/2 stroke	XV+ max. stroke
32	0.98	0.47	0.47	1.97	2.56	2.64	2.87	3.11
	25	12	12	50	65	67	73	79
40	1.10	0.63	0.63	2.48	2.95	2.83	3.27	3.70
	28	16	16	63	75	72	83	94
50	1.10	0.63	0.63	2.95	3.35	3.19	3.54	3.90
	28	16	16	75	85	81	90	99
63	1.42	0.79	0.79	3.54	3.94	3.35	3.86	4.37
	36	20	20	90	100	85	98	111
80	1.42	0.79	0.79	4.33	4.72	3.90	4.33	4.76
	36	20	20	110	120	99	110	121
100	1.89	0.98	0.98	5.20	5.31	4.21	4.72	5.24
	48	25	25	132	135	107	120	133

#### Trunnion Blocks- Type EL

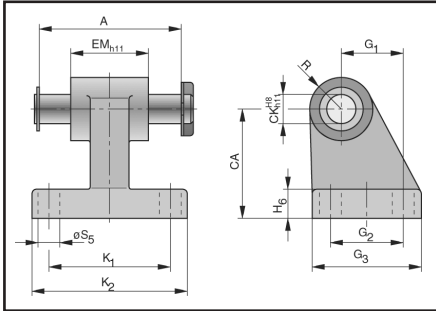


Order #	Bore $\varnothing$	A	A <sub>1</sub>	B	C	C <sub>1</sub>	$\varnothing$ D <sub>H7</sub>	$\varnothing$ D <sub>1</sub>	$\varnothing$ D <sub>2</sub>	E	Weight lbs (kg)
PD 23381	32	2.17	1.42	0.79	1.02	0.51	0.47	0.53	0.33	0.35	0.13
		55	36	20	26	13	12	13.5	8.4	9	0.060
PD 23382	40, 50	2.17	1.42	0.79	1.02	0.51	0.63	0.53	0.33	0.35	0.13
		55	36	20	26	13	16	13.5	8.4	9	0.060
PD 23383	63, 80	2.56	1.65	0.98	1.18	0.59	0.79	0.65	0.41	0.43	0.22
		65	42	25	30	15	20	16.5	10.5	11	0.100
PD 23384	100, 125	2.95	1.97	1.10	1.57	0.79	0.98	0.75	0.51	0.51	0.39
		75	50	28	40	20	25	19	13	13	0.175

# AZ Cylinder



## 90° Pivot Mount - to VDMA 24562

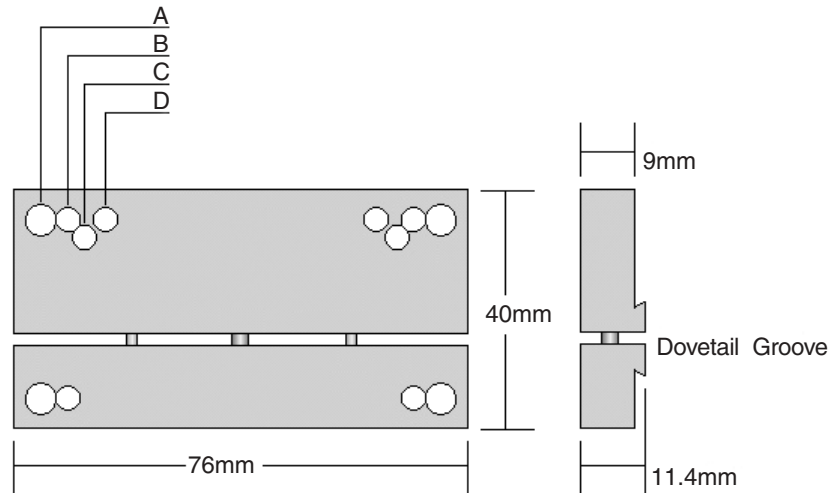


Order #	Bore Ø	A	CA	CK <sup>H8</sup> <sub>h11</sub>	EM <sub>h11</sub>	G <sub>1</sub>	G <sub>2</sub>	G <sub>3</sub>	H <sub>6</sub>	K <sub>1</sub>	K <sub>2</sub>	R <sub>1</sub>	ØS <sub>5</sub>	Wt. lbs (kg)
PD 40844	32	46	32	10	26	21	18	31	8	38	50	10	6.6	0.092
PD 40845	40	53	36	12	28	24	22	35	10	41	53	11	6.6	0.131
PD 40846	50	61	45	12	32	33	30	45	12	50	64	13	9	0.193
PD 40847	63	71	50	16	40	37	35	50	12	52	66	15	9	0.305
PD 40848	80	91	60	16	50	47	40	60	14	66	84	15	11	0.460
PD 40849	100	111	70	20	60	55	50	70	15	76	94	19	11	0.840

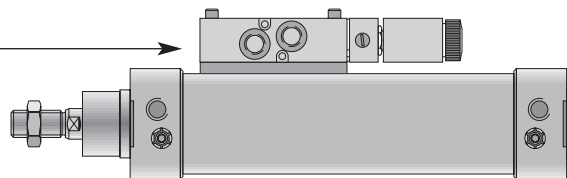
## Valve Mounting Plate Ø32-100mm

### Mounting Holes:

- A = 5/2-way valve; 1/4" NPT
- B = 5/2-way valve; 1/8" NPT
- C = 3/2-way valve; 1/4" NPT
- D = 3/2-way valve; 1/8" NPT



## Typical Valve Installation Using Valve Mounting Plate



Order #: PD 40372

Ordered as a separate item  
 This adapter plate is used primarily to mount our S9 series valves  
 Size: 1/8" or 1/4"  
 Style: 3/2-way or 5/2-way

The plate may also be used for attachment of machine components or other hardware

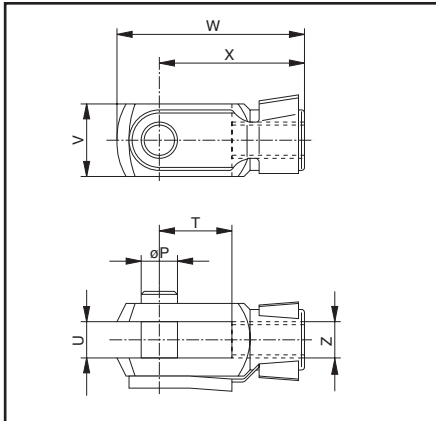
This adapter plate can also be used with the Series SZ, SZV, NZK, NZKV, and AZV cylinders

# AZ Cylinder



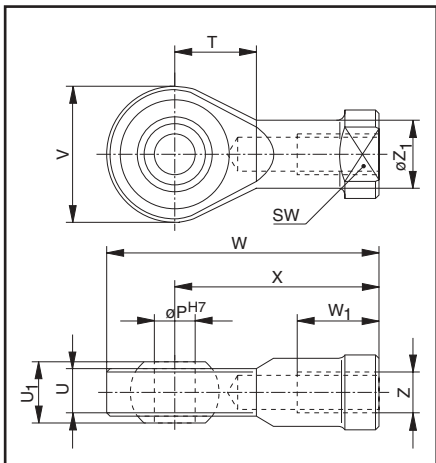
## Rod Mounts

### Rod Clevis with Pin



Order #	Bore Ø	Ø P	T	U	V	W	X	Z	Weight lbs (kg)
KY 6135	32	<b>0.39</b> 10	<b>0.79</b> 20	<b>0.39</b> 10	<b>0.79</b> 20	<b>2.05</b> 52	<b>1.57</b> 40	-- M10x1.25	<b>0.18</b> 0.08
KY 6136	40	<b>0.47</b> 12	<b>0.94</b> 24	<b>0.47</b> 12	<b>0.94</b> 24	<b>2.44</b> 62	<b>1.89</b> 48	-- M12x1.25	<b>0.28</b> 0.125
KY 6139	50, 63	<b>0.63</b> 16	<b>1.26</b> 32	<b>0.63</b> 16	<b>1.26</b> 32	<b>3.27</b> 83	<b>2.52</b> 64	-- M16x1.5	<b>0.66</b> 0.3
KY 6141	80, 100	<b>0.79</b> 20	<b>1.57</b> 40	<b>0.79</b> 20	<b>1.57</b> 40	<b>4.13</b> 105	<b>3.15</b> 80	-- M20x1.5	<b>1.15</b> 0.52
KY 6142	125	<b>0.98</b> 25	<b>1.97</b> 50	<b>0.98</b> 25	<b>1.97</b> 50	<b>5.20</b> 132 max.	<b>3.94</b> 100	-- M24x2	<b>2.38</b> 1.08
KY 6866	125	<b>1.18</b> 30	<b>2.13</b> 54	<b>1.18</b> 30	<b>2.17</b> 55	<b>5.83</b> 148 max.	<b>4.41</b> 112	-- M27x2	<b>3.31</b> 1.5

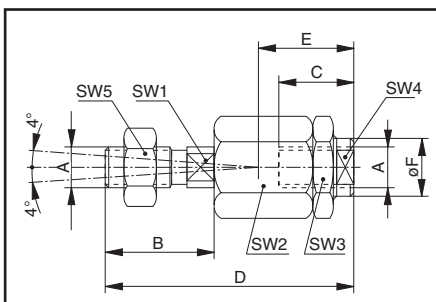
### Rod Eye with Spherical Bearing



Order #	Bore Ø	ØP <sub>1,7</sub>	T	U	U <sub>1</sub>	V	W	W <sub>1</sub>	X	Z	Ø Z <sub>1</sub>	SW	Weight lbs (kg)
KY 6147	32	<b>0.39</b> 10	<b>0.59</b> 15	<b>0.41</b> 10.5	<b>0.55</b> 14	<b>1.10</b> 28	<b>2.24</b> 57	<b>0.79</b> 20	<b>1.69</b> 43	-- M10x1.25	<b>0.59</b> 15	17	0.16 0.072
KY 6148	40	<b>0.47</b> 12	<b>0.67</b> 17	<b>0.47</b> 12	<b>0.63</b> 16	<b>1.26</b> 32	<b>2.60</b> 66	<b>0.87</b> 22	<b>1.97</b> 50	-- M12x1.25	<b>0.69</b> 17.5	19	0.24 0.107
KY 6150	50, 63	<b>0.63</b> 16	<b>0.87</b> 22	<b>0.59</b> 15	<b>0.83</b> 21	<b>1.65</b> 42	<b>3.35</b> 85	<b>1.10</b> 28	<b>2.52</b> 64	-- M16x1.5	<b>0.87</b> 22	22	0.46 0.21
KY 6151	80, 100	<b>0.79</b> 20	<b>1.02</b> 26	<b>0.71</b> 18	<b>0.98</b> 25	<b>1.97</b> 50	<b>4.02</b> 102	<b>1.30</b> 33	<b>3.03</b> 77	-- M20x1.5	<b>1.08</b> 27.5	32	0.84 0.38
KY 6152	125	<b>0.98</b> 25	<b>1.22</b> 31	<b>0.87</b> 22	<b>1.22</b> 31	<b>2.36</b> 60 <sub>1)</sub>	<b>4.88</b> 124 <sub>1)</sub>	<b>1.65</b> 42 <sub>2)</sub>	<b>3.70</b> 94	-- M24x2	<b>1.32</b> 33.5	36	2.56 0.65

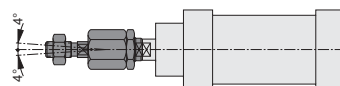
- 1) Maximum- dimension
- 2) Minimum- dimension

### Rod Alignment Coupler

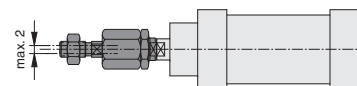


Order #	Bore Ø	A	B	C	D	E	ØF	SW1	SW2	SW3	SW4	SW5	Weight lbs (kg)
KY 1129	32	M10x1.25	<b>0.79</b> 20	<b>0.91</b> 23	<b>2.76</b> 70	<b>1.22</b> 31	<b>0.85</b> 21.5	12	30	30	19	17	<b>0.01</b> 0.218
KY 1131	40	M12x1.25	<b>0.91</b> 23	<b>0.91</b> 23	<b>2.64</b> 67	<b>1.22</b> 31	<b>0.85</b> 21.5	12	30	30	19	19	<b>0.01</b> 0.207
KY 1133	50 63	M16x1.5	<b>1.57</b> 40	<b>1.26</b> 32	<b>4.41</b> 112	<b>1.77</b> 45	<b>1.32</b> 33.5	19	41	41	30	30	<b>0.03</b> 0.637
KY 1134	80 100	M20x1.5	<b>1.54</b> 39	<b>1.65</b> 42	<b>4.80</b> 122	<b>2.20</b> 56	<b>1.32</b> 33.5	19	41	41	30	30	<b>0.03</b> 0.711

### Angular Compensation



### Radial Compensation for the Center Axis

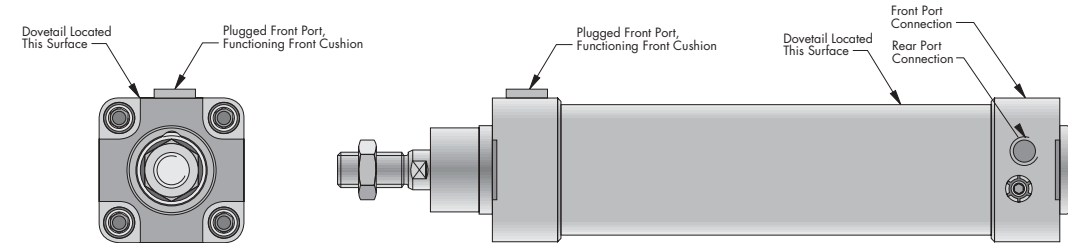


Dimensions: **Bold: INCH**, Std.: mm

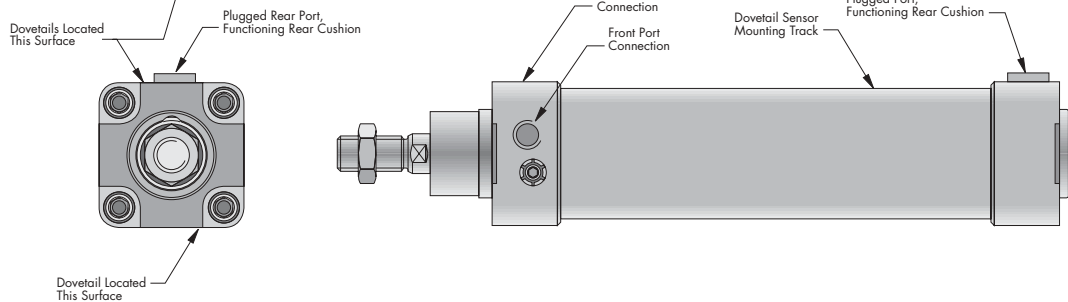
## AZ Cylinder

### Single End Porting

#### -B2L Rear, Single End Porting Ø32-100mm



#### -D2L Front, Single End Porting Ø32-100mm



### Single End Porting

Either the front or the rear end cap can be supplied with Single End Porting. An internal connection is made utilizing the galleries which have been extruded into the cylinder barrel.

The maximum potential speed of the cylinder in the retract (-BZL) or extend (-DZL) modes is limited due to the diameter of the cross-over hole in the barrel. See The following chart.

Deviation in speed (in./sec.) Ref. Cyl. AZ5XXX/6" Stroke (150mm)

Bore Ø	32mm	40mm	50mm	63mm
<b>Extend</b>				
Standard Cylinder	0.09	0.11	0.17	0.20
Single End Port	0.23	0.23	0.26	0.41
<b>Retract</b>				
Standard Cylinder	0.09	0.13	0.19	0.27
Single End Port	0.12	0.24	0.28	0.33



# DZ Cylinder

## Specifications

### Series DZ

Ø125 - 250mm

ISO 6431  
CETOP RP53P\*\*

#### DZ 1: Double Acting, Cushions



#### DZ 5: Double Acting, Magnets, Cushions



#### Features:

**Hard-Chrome Plated Rod**  
**Magnetic Piston**  
**Adjustable Cushions**  
**Pre-Lubricated Design**

Characteristics according to VDI 3294										
Characteristics	Symbol	Unit	Description							
<b>General Features</b>										
Type			Piston rod cylinder							
Series			DZ1, DZ5							
System			Double acting with cushioning							
Mounting			See drawing							
Tube connection			Thread							
Ambient temperature range	$\vartheta_{\min}$ $\vartheta_{\max}$	°C	-20 +80	Note: When using below freezing point (°C) it is necessary to consult us						
Medium temperature range	$\vartheta_{\min}$	°C	+80							
Weight (mass)		kg	See table							
Installation			In any position							
Medium			Filtered and lubricated or filtered and unlubricated compressed air							
Lubrication			Oil mist lubrication compatible with Buna N							
Material	Cylinder tube		Aluminum							
	Front/Rear covers		Aluminum							
	Piston rod		Steel, hard-chrome plated							
<b>Pneumatic Characteristics</b>										
Nominal pressure	$p_n$	bar	6							
Operating pressure range	$p_{\min}$	bar	1							
	$p_{\max}$	bar	10							
Piston diameter		mm	125	160	200	250				
Port size			G 1/2	G 3/4	G 3/4	G 1				
Piston rod diameter		mm	32	40	40	50				
Piston rod thread			M27x2**	M36x2	M36x2	M42x2				
Stroke length		mm	For max. stroke length see load diagram 2.05.002E							
Cushioning			At both ends, infinitely variable							
Cushioning stroke		Cyl.	125	160	200	250				
		mm	42	52	52	52				
<b>Weight (mass) kg</b>										
Mounting	Cylinder-Ø		125		160		200		250	
	*1	*2	1	2	1	2	1	2		
Basic cylinder	7.2	1.3	12.5	2.05	20	2.2	35	4		
A	9.3		16.1		25		on request			
B	8.5		14.9		24					
BA	8.7		15.0		24					
BAS	8.6		14.9		24					
C	8.7		15.0		30					
D	8.7		15.0		30					
EN	10.5		18.3		32					

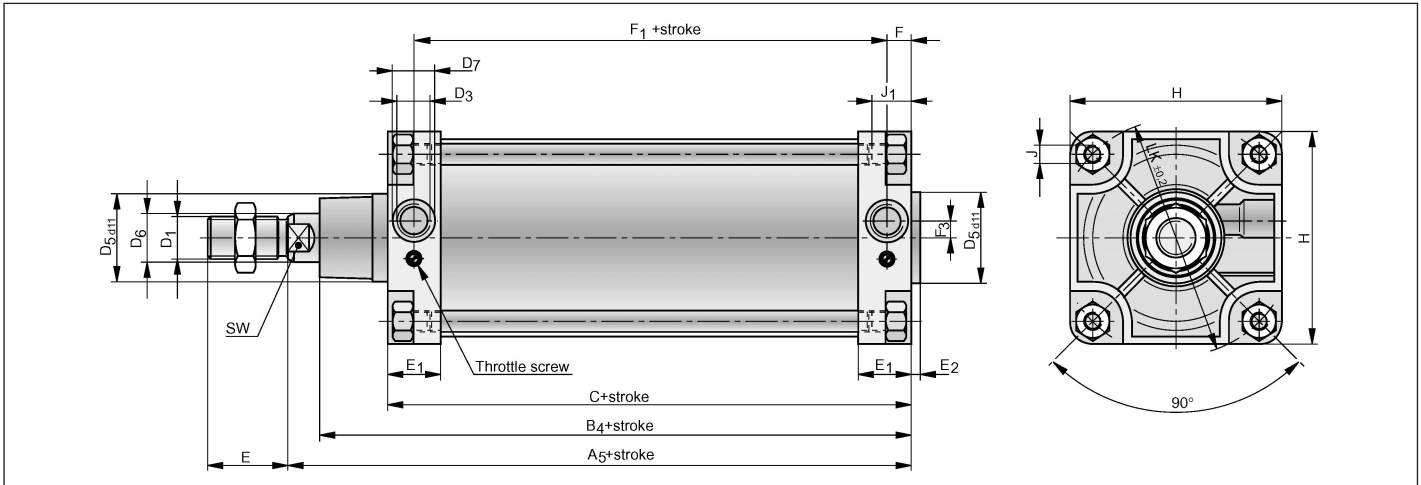
\*1 = Weight for cylinder with 100mm stroke

\*2 = Weight for every additional 10mm stroke length

# DZ Cylinder

## Dimensional Data

### Basic Cylinder

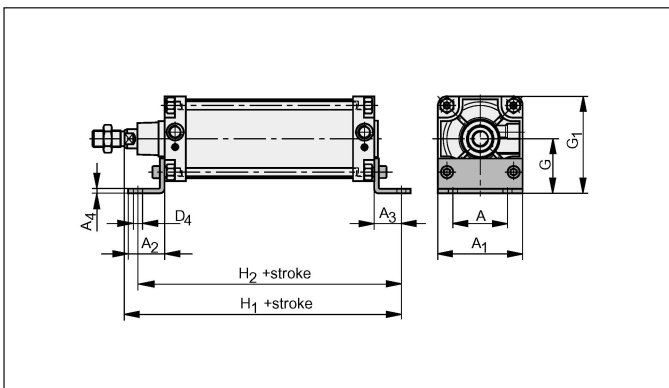


Dimension Table (mm) for Basic Cylinder

Cyl. Ø	A <sub>5+stroke</sub>	B <sub>4+stroke</sub>	C+stroke	D <sub>1</sub>	D <sub>3</sub>	ØD <sub>5</sub>	ØD <sub>6</sub>	ØD <sub>7</sub>	E	E <sub>1</sub>	E <sub>2</sub>	F	F <sub>1+stroke</sub>	F <sub>3</sub>	J	J <sub>1 max.</sub>	H	ØLK	SW
125	225	205	160	M27x2*	G1/2	60	32	28	54	35	6	19	122	11	M12	18	140	156	27
160	260	230	180	M36x2	G3/4	65	40	33	72	45	6	25	130	11	M16	23	180	198	36
200	275	240	180	M36x2	G3/4	75	40	33	72	45	6	25	130	11	M16	23	220	248	36
250	305	270	200	M42x2	G1	90	50	40	84	53	10	32	136	21	M20	27	280	311	48

\*Standard piston rod thread M27x2 - on request M24x2 to CETOP RP53P can also be delivered.

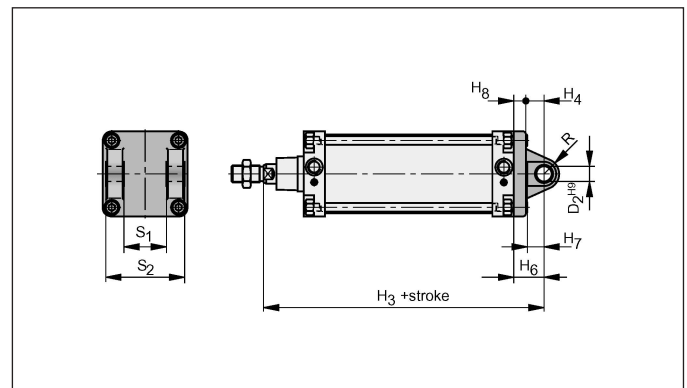
### Foot Bracket - Type A



Dimension Table (mm) for Mounting A

Cyl. Ø	A	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	ØD <sub>4</sub>	G	G <sub>1</sub>	H <sub>1+stroke</sub>	H <sub>2+stroke</sub>
125	90	140	60	45	8	16	90	160	270	250
160	115	180	80	60	8	18	115	205	320	300
200	135	220	100	70	9	22	135	245	345	320
250	165	280	110	75	12	26	165	305	380	360

### Rear Double Clevis - Type B



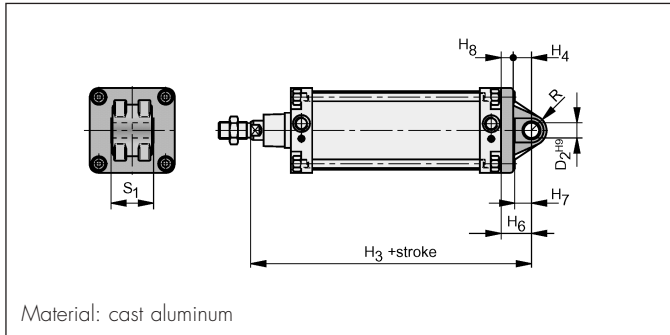
Dimension Table (mm) for Mounting B

Cyl. Ø	D <sub>2H9</sub>	H <sub>3+stroke</sub>	H <sub>4</sub>	H <sub>6</sub>	H <sub>7</sub>	H <sub>8</sub>	R	S <sub>1</sub>	S <sub>2</sub>
125	25	275	30	50	29	20	25	70	130
160	30	315	35	55	34	20	30	90	170
200	30	335	35	60	35	25	31	90	170
250	40	375	45	70	44	25	41	110	200

## DZ Cylinder

### Cylinder Mounts

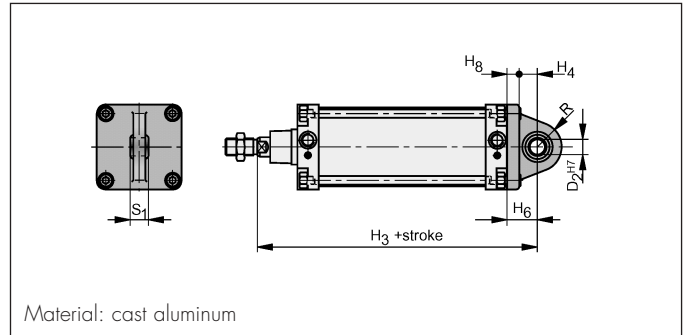
#### Rear Single Clevis - Type BA



Dimension Table (mm) for Mounting BA

Cyl. Ø	ØD <sub>2</sub> H <sup>9</sup>	H <sub>3</sub> +stroke	H <sub>4</sub>	H <sub>6</sub>	H <sub>7</sub>	H <sub>8</sub>	R	S <sub>1</sub>
125	25	275	30	50	29	20	25	70
160	30	315	35	55	34	20	30	90
200	30	335	35	60	35	25	31	90
250	40	375	45	70	44	25	41	110

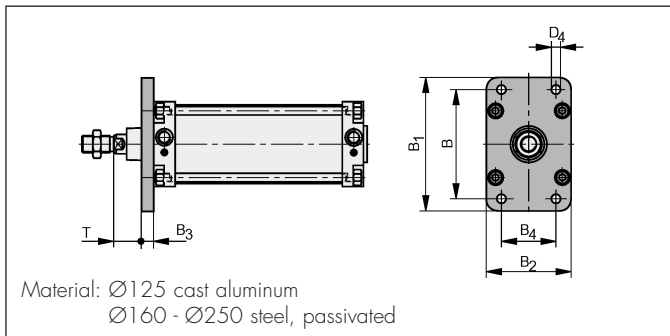
#### Rear Single Clevis - Type BAS



Dimension Table (mm) for Mounting BAS

Cyl. Ø	ØD <sub>2</sub> H <sup>7</sup>	H <sub>3</sub> +stroke	H <sub>4</sub>	H <sub>6</sub>	H <sub>8</sub>	R	S <sub>1</sub>
125	25	275	30	50	20	40	31
160	30	315	35	55	20	48	37
200	on request						
250	on request						

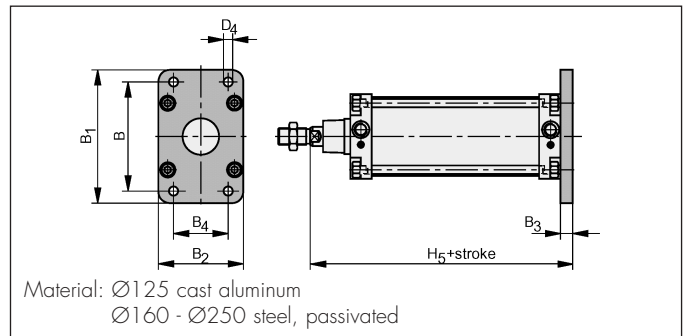
#### Front Flange - Type C



Dimension Table (mm) for Mounting C

Cyl. Ø	B	B <sub>1</sub>	B <sub>2</sub>	B <sub>3</sub>	B <sub>4</sub>	ØD <sub>4</sub>	T
125	180	220	140	20	90	16	45
160	230	280	180	20	115	18	60
200	270	315	220	25	135	22	70
250	330	380	280	25	165	26	80

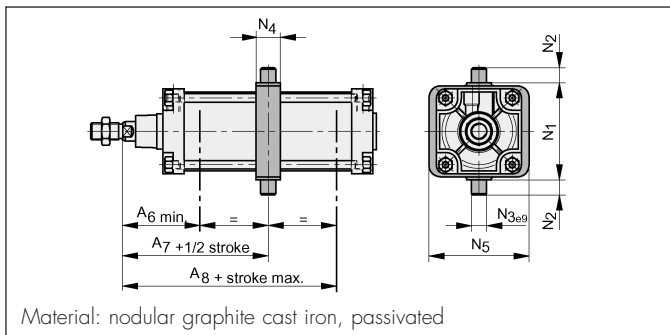
#### Rear Flange - Type D



Dimension Table (mm) for Mounting D

Cyl. Ø	B	B <sub>1</sub>	B <sub>2</sub>	B <sub>3</sub>	B <sub>4</sub>	ØD <sub>4</sub>	H <sub>5</sub> +stroke
125	180	220	140	20	90	16	245
160	230	280	180	20	115	18	280
200	270	315	220	25	135	22	300
250	330	380	280	25	165	26	330

#### Adjustable Trunnion - Type EN



Dimension Table (mm) for Mounting EN

Cyl. Ø	A <sub>6</sub> min	A <sub>7</sub> + 1/2 stroke	A <sub>8</sub> + stroke	N <sub>1</sub>	N <sub>2</sub>	N <sub>3eg</sub>	N <sub>4</sub>	N <sub>5</sub>
125	125	145	165	160	25	25	40	165
160	150	170	190	200	32	32	45	210
200	165	185	205	250	32	32	50	260
250	195	205	210	320	40	40	55	320

Note:  
When ordering please give exact dimension A<sub>7</sub>.  
Mounting is assembled when delivered.

#### Instructions for mounting EN:

In order to avoid faulty operation of the reed switches, a min. distance of 10 to 20mm has to be kept between switch and EN-mounting when fastening them to the cylinder.

# DZ Cylinder

## Ordering Information

Basic Cylinder (Without Mounting)					
Series	Symbol	Standard	Bore Ø	Order Instructions	
				Type #	Order #
Double acting with adjustable end cushioning		ISO	125	DZ1125/...	PA 53530-....
		CETOP	125	DZ1125/...	PA 53500-....
		ISO	160	DZ1160/...	PA 54000-....
		ISO	200	DZ1200/...	PA 54500-....
		ISO	250	DZ1250/...	PA 55000-....
Double acting with adjustable end cushioning, for contactless position sensing		ISO	125	DZ5125/...	PA 53540-....
		CETOP	125	DZ5125/...	PA 53510-....
		ISO	160	DZ5160/...	PA 54010-....
		ISO	200	DZ5200/...	PA 54510-....
		ISO	250	DZ5250/...	PA 55010-....

Complete type designation and order no. with stroke length in mm (4 digits)

Standard stroke length: 0025, 0050, 0080, 0100, 0125, 0160, 0200, 0250, 0320, 0400, 0500

Cylinder with Mounting EN					
Series	Symbol	Standard	Bore Ø	Order Instructions	
				Type #	Order #
Double acting with adjustable end cushioning		ISO	125	DZ1125EN/.../...	PA 53536-....
		CETOP	125	DZ1125EN/.../...	PA 53506-....
		ISO	160	DZ1160EN/.../...	PA 54006-.../...
		ISO	200	DZ1200EN/.../...	PA 54506-.../...
		ISO	250	DZ1250EN/.../...	PA 55006-.../...
Double acting with adjustable end cushioning, for contactless position sensing		ISO	125	DZ5125EN/.../...	PA 53546-.../...
		CETOP	125	DZ5125EN/.../...	PA 53516-.../...
		ISO	160	DZ5160EN/.../...	PA 54016-.../...
		ISO	200	DZ5200EN/.../...	PA 54516-.../...
		ISO	250	DZ5250EN/.../...	PA 55016-.../...

Complete type designation and order no. with stroke length in mm (3 digits)

Give dimension A<sub>7</sub> with type designation and order no.

Description	Order #			
	Ø125	Ø160	Ø200	Ø250
Foot Bracket - Type A	PD 22026	PD 22027	PD 24792	PD 25758
Rear Double Clevis - Type B	PD 22034	PD 22035	PD 24990	PD 25710
Rear Single Clevis - Type BA	PD 23418	PD 22628	PD 24999	PD 25759
Rear Single Clevis - Type BAS	PD 23849	PD 23850	PD 25766	PD 25760
Front Flange - Type C	PD 23409	PD 23410	PD 24924	PD 25761
Rear Flange - Type D	PD 23409	PD 23410	PD 24924	PD 25761
Center Trunnion - Type EN	PD 23591	PD 23592	PD 24923	PD 25762

**Proximity Sensors/Brackets: See Page 73**

## AZV Twin Rod Cylinder

### Specifications

Features	
Type	Twin Rod
Series	AZV
Configurations	AZV: Double Acting, Double Rod, Magnetic Piston, Cushions AZV 3D: Double Acting, 3 Rods, Magnetic Piston, Cushions AZV 4D: Double Acting, 4 Rods, Magnetic Piston, Cushions
Construction Materials	
Barrel	Extruded Aluminum, Anodized (10μ)
End Caps	Die Cast Aluminum
Piston Rod	Steel Hard Chrome Plated (Optional: Stainless Steel)
Rod Bearing	Teflon Impregnated Bronze
Piston	Brass
Piston Bearing	Fiber Reinforced Nylon
Captive Cushion Screw	Brass (Optional: Stainless)
Seals	NBR (Optional: Viton)
End Cap Screws	Steel, Zinc Plated (Optional: Stainless)
Tooling Plate	Bore: 32, 40, 50 Steel, Black Oxide Treated Bore: 63, 80, 100 Aluminum, Black Oxide Treated
Characteristics	
Operating Temperature	Min: -5° F (-20°C) Max: +176 °F (+80°C)
Operating Pressure	Min: 15 PSI (1 bar) Max: 145 PSI (10 bar)
Normal Operating Pressure	90 PSI (6 bar)
Lubrication	Pre-lubricated at factory. If additional lubrication is required, use oil compatible for NBR seal and designed for use in pneumatic systems.
Media	Filtered and Regulated Compressed Air
Installation	In any Position
Weight	See Page 44
Stroke Length	Up to 20 inches—Longer Contact Factory
Theoretical Forces	See Technical Information Section
Load Capacity	See Technical Information Section
Specifications	
<b>Piston Diameter</b>	<b>RDV 25</b> <b>32</b> <b>40</b> <b>50</b> <b>63</b> <b>80</b> <b>100</b>
<b>Port Sizes</b>	<b>NPT</b> -- <b>1/8</b> <b>1/4</b> <b>1/4</b> <b>3/8</b> <b>3/8</b> <b>1/2</b>
	Metric (G) 1/8    1/8    1/4    1/4    3/8    3/8    1/2
Rod Diameter	
AZV (RDV) (2 Pcs)	mm    6    8    10    12    16    20    20
AZV 3D (2 Pcs)	mm    --    8    10    12    16    20    20
(1 Pc.)	mm    --    12    16    20    20    25    25
AZV 4D (4 Pcs)	mm    --    8    10    12    16    20    20
Cushion Lengths	<b>Inch</b> <b>0.67</b> <b>0.78</b> <b>0.98</b> <b>0.98</b> <b>0.98</b> <b>1.10</b> <b>1.18</b>
All Cylinders	mm    17    20    25    25    25    28    30

### Series AZV

Ø32mm - 100mm

### Series RDV

Ø25mm

#### AZV 5: Double Acting, Double Rod, Magnets, Cushions



#### AZV3D 5: Double Acting, 3 Rods, Magnets, Cushions



#### AZV4D 5: Double Acting, 4 Rods, Magnets, Cushions



### Features:

- Magnetic Piston
- Adjustable Cushions
- Pre-Lubricated Design
- Inch or Metric Construction

## AZV Twin Rod Cylinder

### Ordering Information

**Example:** AZV3D - U5050/10-V  
 Twin Rod Cylinder  
 Single Set of Twin Rods w/Single Rod  
 U.S. Option  
 Double Acting, Magnets, Cushions  
 50mm Bore  
 10" Stroke  
 Viton Seals

A Z V 3 D - U 5 0 5 0 / 1 0 - V

#### Versions:

RDV - Ø 25mm Bore Only (Metric Only)

#### AZV Series

- AZV - Single Set Twin Rods
- AZV 3D - Single Set Twin Rods with Single Rod
- AZV 4D - Double Set Twin Rods

#### Design:

- - Metric Construction
- U - US Construction: Inch Stroke, NPT Ports, & UNC Threads

#### Actuation:

- 5 - Double Acting, Magnets, Cushions
- 1 - Double Acting, Cushions
- 6 - Double Acting, Magnets
- 2 - Double Acting

#### Options:

- - Standard
- V - Viton
- EN - Trunnion, Adjustable
- R - Ø32 Piston Rods Tapped 10•32
- 3D Version Only
- T - Rod Thread: Ø32 - 5/16•18  
 Ø40,50,63 - 7/16•20

#### Stroke:

##### INCH:

- any inch increment up to 20" standard
- contact factory for special stroke lengths

##### MM:

- any mm increment up to 500mm standard
- contact factory for special stroke lengths

#### Bore:

- 025 - 25mm (nom. 1")  
(Available Only in Metric Construction)
- 032 - 32 mm (nom. 1 1/4")
- 040 - 40 mm (nom. 1 1/2")
- 050 - 50 mm (nom. 2")
- 063 - 63 mm (nom. 2 1/2")
- 080 - 80 mm (nom. 3 1/8")
- 100 - 100 mm (nom. 4")

Proximity Sensors/Brackets: See Page 73

# AZV Twin Rod Cylinder



## Cylinder Mounts

Body Mounts		25mm	32mm	Bore Ø			80mm	100mm
				40mm	50mm	63mm		
<b>Foot Mounting</b> Type: A-	<b>INCH</b> Metric	-- KK 29.302	<b>4170-0352</b> PD 27917	<b>4170-0452</b> PD 27918	<b>4170-0552</b> PD 28072	<b>4170-0652</b> PD 28073	<b>4170-0852</b> PD 28074	<b>4170-1052</b> PD 28075
<b>Rear Double Clevis</b> Type: B-	<b>INCH</b> Metric	-- --	<b>4172-0351</b> PD 22704	<b>4172-0451</b> PD 22705	<b>4172-0551</b> PD 22706	<b>4172-0651</b> PD 22707	<b>4172-0851</b> PD 22708	<b>4172-1051</b> PD 22709
<b>Rear Single Clevis</b> Type: BA-	<b>INCH</b> Metric	-- KB 28.303	<b>4174-0351</b> PD 23412	<b>4174-0451</b> PD 23413	<b>4174-0551</b> PD 23414	<b>4174-0651</b> PD 23415	<b>4174-0851</b> PD 23416	<b>4174-1051</b> PD 23417
<b>Rear Clevis w/Spherical Bearing</b> Type: BAS-	<b>INCH</b> Metric	-- --	<b>4173-0351</b> PD 23843	<b>4173-0451</b> PD 23844	<b>4173-0551</b> PD 23845	<b>4173-0651</b> PD 23846	<b>4173-0851</b> PD 23847	<b>4173-1051</b> PD 23848
<b>Front Flange</b> Type: CA for AZV 5/3D/4D	<b>INCH</b> Metric	-- --	<b>4175-0351</b> PD 57042	<b>4175-0451</b> PD 57043	<b>4175-0551</b> PD 57044	<b>4175-0651</b> PD 57045	<b>4175-0851</b> PD 57046	<b>4175-1051</b> PD 57047
<b>Rear Flange</b> Type: D	<b>INCH</b> Metric	-- --	<b>4176-0351</b> PD 23403	<b>4176-0451</b> PD 23404	<b>4176-0551</b> PD 23405	<b>4176-0651</b> PD 23406	<b>4176-0851</b> PD 23407	<b>4176-1051</b> PD 23408
<b>Trunnion</b> Type: EN	<b>INCH/mm</b>	--	PD 39195	PD 39196	PD 39197	PD 39198	PD 39199	PD 39200
<b>Trunnion Blocks</b> Type: EL (Pair) (See Page 76)	<b>INCH/mm</b>	--	PD 23381	PD 23382	PD 23382	PD 23383	PD 23383	PD 23384
<b>Pivot Mount</b> (w/o Bolts)	<b>INCH/mm</b>	--	PD 25621	PD 25622	PD 25623	PD 25624	PD 25625	PD 25626

Delivery Information: All mounts are sold separately and are not mounted for shipment, except for the trunnion mount which requires factory installation.

Rod Accessories		25mm	32mm	Bore Ø			80mm	100mm
				40mm	50mm	63mm		
<b>Rod Nut</b>	<b>INCH</b> Metric	-- ZP 3848	<b>ZP-U 1810</b> ZP 1810	<b>ZP-U 2189</b> ZP 2189	<b>ZP-U 0178</b> ZP 0178	<b>ZP-U 0178</b> ZP 0178	<b>ZP-U 0185</b> ZP 0185	<b>ZP-U 0185</b> ZP 0185
<b>Rod Clevis</b>	<b>INCH</b> Metric	-- --	-- KY 6135	-- KY 6136	-- KY 6139	-- KY 6139	-- KY 6141	-- KY 6141
<b>Rod Eye</b>	<b>INCH</b> Metric	-- --	-- KY 6147	-- KY 6148	-- KY 6150	-- KY 6150	-- KY 6151	-- KY 6151
<b>Clevis Pin</b>	<b>INCH/mm</b>	--	KY 6153	KY 6154	KY 6157	KY 6156	KY 6158	KY 6159
<b>Rod Alignment Coupling</b>	<b>INCH</b> Metric	-- --	-- KY 1129	-- KY 1131	-- KY 1133	-- KY 1133	-- KY 1134	-- KY 1134

**NOTES:**

- \* Body Nut for RDV type cylinder
- \*\* Items in **BOLD** type either include Inch mounting hardware or indicate Inch threads.

**Proximity Sensors/Brackets: See Page 73**

# AZV Twin Rod Cylinder



## Weights

### AZV

Weight		25mm		32mm		40mm		Bore Ø 50mm		63mm		80mm		100mm	
		1	2	*1	*2	1	2	1	2	1	2	1	2	1	2
Basic Cylinder	lbs	1.01	0.18	1.76	0.55	2.21	0.77	3.75	1.10	5.73	1.32	9.26	1.98	13.67	2.21
	kg	0.46	0.08	0.8	0.25	1.0	0.35	1.7	0.5	2.6	0.6	4.2	0.9	6.2	1.0
Type A (RA)	lbs	0.22	--	2.21		2.76		4.41		6.62		11.03		15.66	
	kg	0.10	--	1.0		1.25		2.0		3.0		5.0		7.1	
Type B (RA)	lbs	--	--	1.98		2.43		4.08		6.17		10.14		14.99	
	kg	--	--	0.9		1.1		1.85		2.8		4.6		6.8	
Type BA	lbs	--	--	2.21		2.65		4.19		6.62		11.03		16.10	
	kg	--	--	1.0		1.2		1.9		3.0		5.0		7.3	
Type BAS	lbs	--	--	2.09		2.65		4.19		6.39		10.36		15.44	
	kg	--	--	0.95		1.2		1.9		2.9		4.7		7.0	
Type D	lbs	--	--	1.98		2.43		4.08		6.28		10.36		15.44	
	kg	--	--	0.9		1.1		1.85		2.85		4.7		7.0	
Type EN	lbs	--	--	2.65		3.75		5.73		8.60		13.23		19.18	
	kg	--	--	1.2		1.7		2.6		3.90		6.0		8.7	

\*1 = Weight for cylinder with 4" (100 mm) stroke

\*2 = Weight for every additional 4" (100 mm) stroke length

### AZV 3D

Weight		32mm		40mm		Bore Ø 50mm		63mm		80mm		100mm	
		*1	*2	1	2	1	2	1	2	1	2	1	2
Basic Cylinder	lbs	2.21	0.66	3.31	0.99	5.51	1.54	7.06	1.87	11.69	2.87	16.54	3.31
	kg	1.0	0.30	1.5	0.45	2.5	0.7	3.2	0.85	5.3	1.3	7.5	1.5
Type A	lbs	2.65		3.97		6.17		8.38		13.23		18.74	
	kg	1.2		1.8		2.8		3.8		6.0		8.5	
Type C	lbs	2.43		3.53		5.84		7.61		12.79		18.08	
	kg	1.1		1.6		2.65		3.45		5.8		8.2	
Type EN	lbs	3.09		4.85		7.5		9.92		15.88		22.05	
	kg	1.4		2.2		3.4		4.5		7.2		10.0	

\*1 = Weight for cylinder with 4" (100 mm) stroke

\*2 = Weight for every additional 4" (100 mm) stroke length

### AZV 4D

Weight		32mm		40mm		Bore Ø 50mm		63mm		80mm		100mm	
		*1	*2	1	2	1	2	1	2	1	2	1	2
Basic Cylinder	lbs	2.21	0.66	3.09	0.88	5.07	1.32	7.06	1.98	12.35	3.09	16.32	3.31
	kg	1.0	0.30	1.4	0.40	2.3	0.6	3.2	0.9	5.6	1.4	7.4	1.50
Type A	lbs	2.65		3.75		5.73		7.94		13.89		18.30	
	kg	1.2		1.70		2.6		3.6		6.3		8.3	
Type EN	lbs	3.09		4.63		7.06		9.92		16.54		22.05	
	kg	1.4		2.1		3.2		4.5		7.5		10.0	



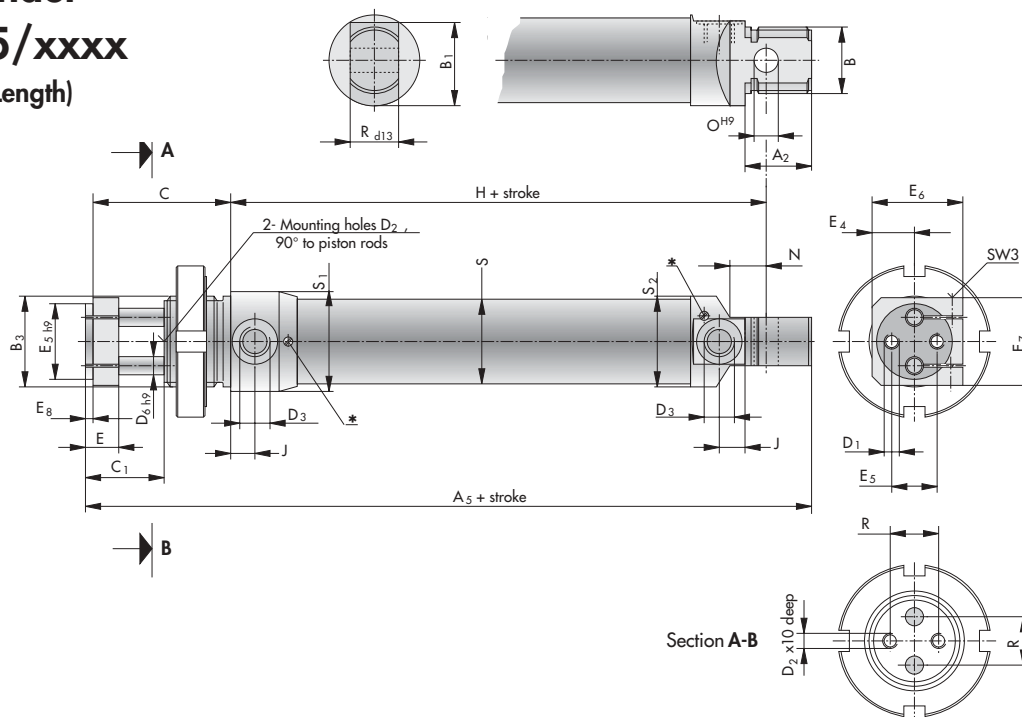
## AZV Twin Rod Cylinder

### Dimensional Data

### Basic Cylinder

### RDV 5025/xxxx

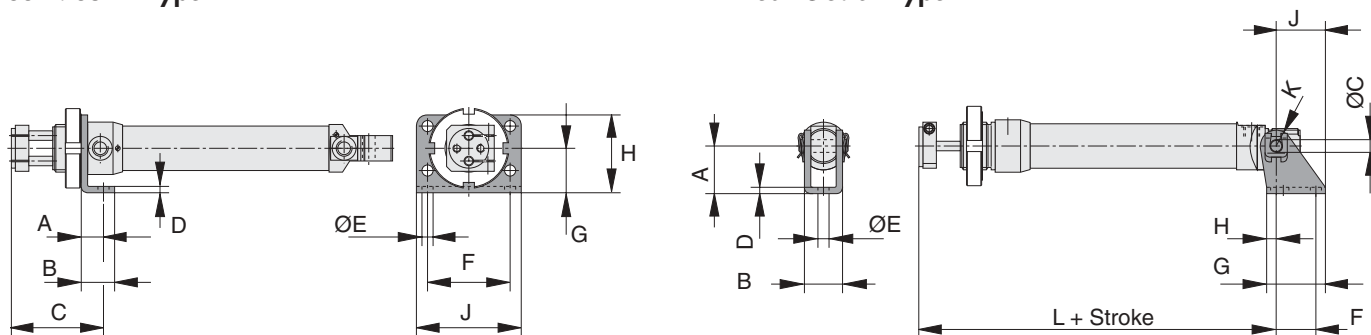
(xxxx= Stroke Length)



A2	A5+ stroke	B	B1	B3	C	D1	D3 h9	øD6	E	E4 h9	øE5	E6
0.87 22	6.16 156.5	-- M22 x 1.5	1.1 28	-- M30x1.5	1.81 46	-- M5	-- G1/8	0.24 6	0.43 11	0.59 15	0.98 25	1.14 29
E7	E8	F3 stroke	H+	N H9	øO	øS	øS1	øS2 d13	R	SW	*	
1.18 30	0.08 2	0.31 8	3.76 95.5	0.47 12	0.31 8	1.1 28	1.3 33	1.18 30	0.63 16	M3	M8x.75	

### Foot Mount - Type RA

### Rear Clevis - Type RB



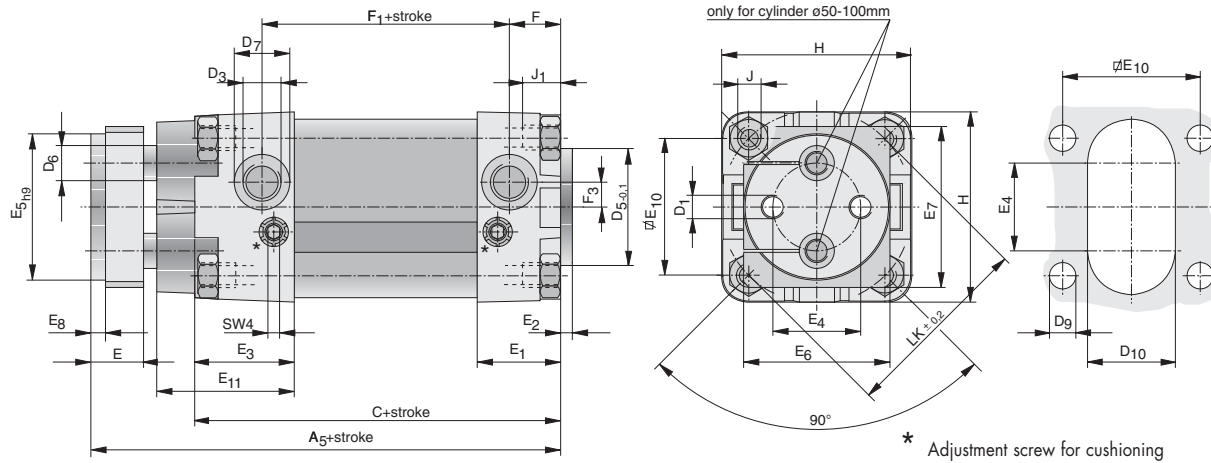
	A	B	C	D	E	F	G	H	J	K	L+
RA	.55 14	.83 21	2.20 56	0.16 4	0.26 6.6	2.05 52	1.10 28	1.93 49	2.60 66		
RB	1.18 30	0.63 16.1	0.31 8	0.16 4	0.26 6.6	0.98 25	1.46 37	0.24 6	1.14 29	0.39 10	5.65 143.5

Dimensions: Bold Type= INCH, Standard= mm

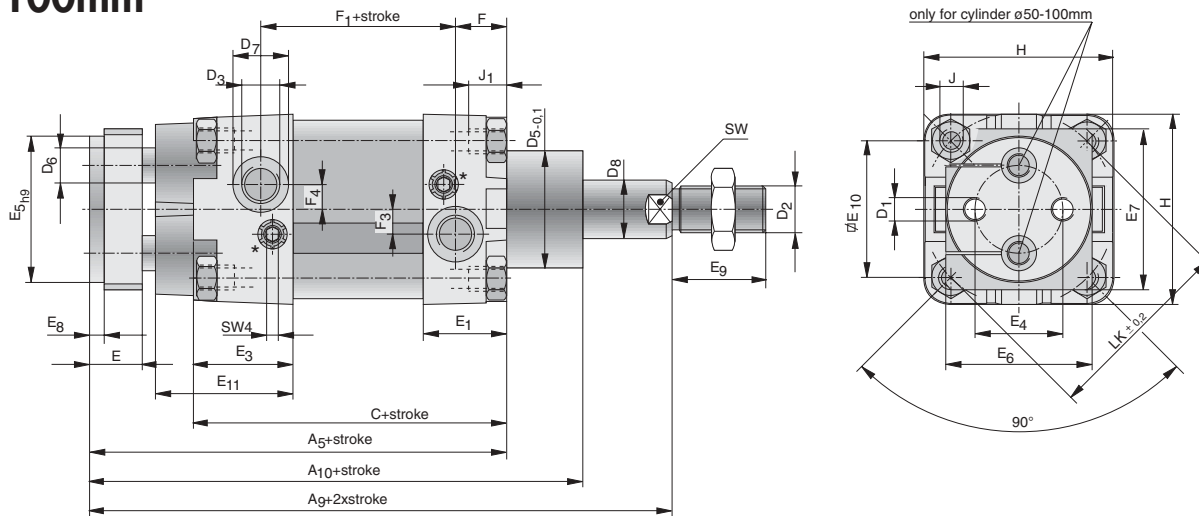
## AZV Twin Rod Cylinder

### Dimensional Data

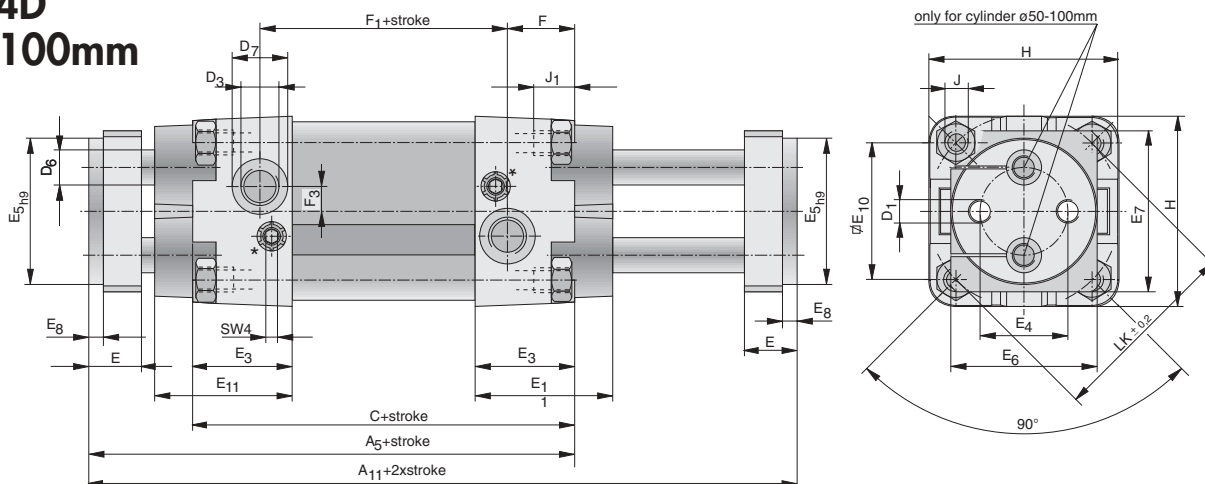
#### AZV Ø32-100mm



#### AZV 3D Ø32-100mm



#### AZV 4D Ø32-100mm



# AZV Twin Rod Cylinder

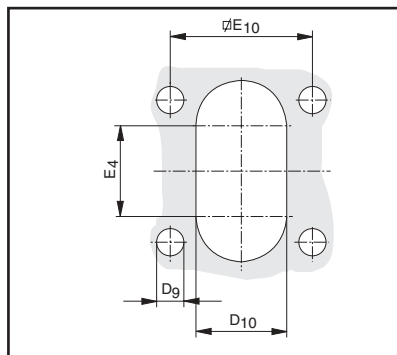


## Dimensional Data

Bore Ø	A <sub>5</sub> + Stroke	A <sub>9</sub> + Stroke	A <sub>10</sub> + Stroke	A <sub>11</sub> + Stroke	C+ Stroke	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	ØD <sub>5</sub>	ØD <sub>6</sub>	ØD <sub>7</sub>
32	5.04 128	6.06 154	5.75 146	6.06 154	4.02 102	1/4•20 M 6	3/8 •24 M10x1.25	1/8 NPT G 1/8	1.18 30	0.31 8	0.59 15
40	5.59 142	6.77 172	6.42 163	6.77 172	4.41 112	5/16•18 M 8	7/16 •20 M12x1.25	1/4 NPT G 1/4	1.38 35	0.39 10	0.75 19
50	5.94 151	7.40 188	6.97 177	7.28 185	4.61 117	5/16•18 M 8	5/8 •18 M16x1.5	1/4 NPT G 1/4	1.57 40	0.47 12	0.75 19
63	6.34 161	7.80 198	7.36 187	7.76 197	4.92 125	3/8•16 M 10	5/8 •18 M16x1.5	3/8 NPT G 3/8	1.77 45	0.63 16	0.91 23
80	6.85 174	8.66 220	8.11 206	8.35 212	5.35 136	1/2•13 M 12	3/4•16 M20x1.5	3/8 NPT G 3/8	1.77 45	0.79 20	0.91 23
100	7.13 181	9.13 232	8.58 218	8.62 219	5.63 143	1/2•13 M 12	3/4•16 M20x1.5	1/2 NPT G 1/2	2.17 55	0.79 20	1.1 28
Bore Ø	D <sub>8</sub>	D <sub>10</sub>	E	E <sub>1</sub>	E <sub>2</sub>	E <sub>3</sub>	ØE <sub>4</sub>	E <sub>5</sub> h <sub>9</sub>	E <sub>6</sub>	E <sub>7</sub>	E <sub>8</sub>
32	0.47 12	0.91 23	0.59 15	1.14 29	0.20 5	1.02 26	0.75 19	1.26 32	1.26 32	1.57 40	0.16 4
40	0.63 16	0.98 25	0.59 15	1.06 27	0.20 5	1.18 30	0.89 22.5	1.57 40	1.57 40	1.77 45	0.16 4
50	0.79 20	1.18 30	0.71 18	1.14 29	0.26 6.5	1.34 34	1.18 30	1.97 50	1.97 50	2.17 55	0.2 5
63	0.79 20	1.34 34	0.87 22	1.18 30	0.24 6	1.34 34	1.5 38	2.48 63	2.48 63	2.76 70	0.2 5
80	0.98 25	1.5 38	0.87 22	1.34 34	0.32 8	1.54 39	1.97 50	3.15 80	3.15 80	3.74 95	0.2 5
100	0.98 25	1.5 38	0.87 22	1.38 35	0.32 8	1.57 40	2.76 70	3.94 100	3.94 100	4.53 115	0.2 5
Bore Ø	E <sub>11</sub>	F	F <sub>1</sub> + Stroke	F <sub>2</sub> + Stroke	F <sub>3</sub>	F <sub>4</sub>	J	J <sub>1</sub> max	H	ØLK	SW
32	1.34 34	0.57 14.5	2.91 74	2.95 75	0.24 6	0.22 5.5	1/4•20 M 6	0.43 11	1.85 47	1.81 46	10
40	1.65 42	0.63 16	3.05 77.5	2.95 75	0.28 7	0.26 6.5	1/4•20 M 6	0.43 11	2.09 53	2.13 54	14
50	1.85 47	0.69 17.5	3.03 77	2.83 72	0.37 9.5	0.33 8.5	5/16•18 M 8	0.47 12	2.56 65	2.6 66	17
63	1.77 45	0.69 17.5	3.43 87	3.27 83	0.39 10	0.31 8	5/16•18 M 8	0.47 12	2.95 75	3.15 80	17
80	2.05 52	0.81 20.5	3.54 90	3.35 85	0.35 9	0.35 9	3/8•16 M 10	0.63 16	3.74 95	4.02 102	22
100	2.09 53	0.75 19	3.94 100	3.74 95	0.51 13	0.51 13	3/8•16 M 10	0.63 16	4.53 115	4.96 126	22

### Tolerance Chart

Bore Ø	h <sub>9</sub>	
	Inch	mm
32	0	0
40	-0.002	-0.062
50	-0.002	-0.062
63	-0.003	-0.074
80	-0.003	-0.074
100	-0.003	-0.087



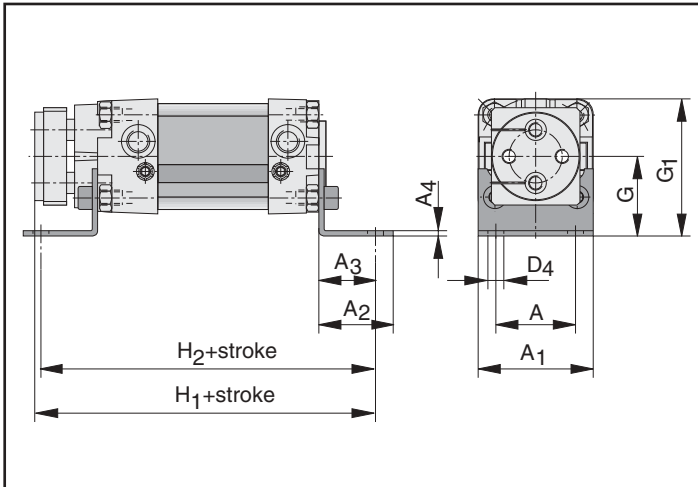
### Dimensions for Front Mounted Installations

Bore Ø	D <sub>9</sub>	D <sub>10</sub>	E <sub>4</sub>	E <sub>10</sub>
32	0.28 7	0.91 23	0.75 19	1.28 32.5
40	0.28 7	0.98 25	0.89 22.5	1.52 38.5
50	0.35 9	1.18 30	1.18 30	1.83 46.6
63	0.35 9	1.34 34	1.50 38	2.23 56.6
80	0.39 10	1.50 38	1.97 50	2.84 72.1
100	0.39 10	1.50 38	2.76 70	3.50 89

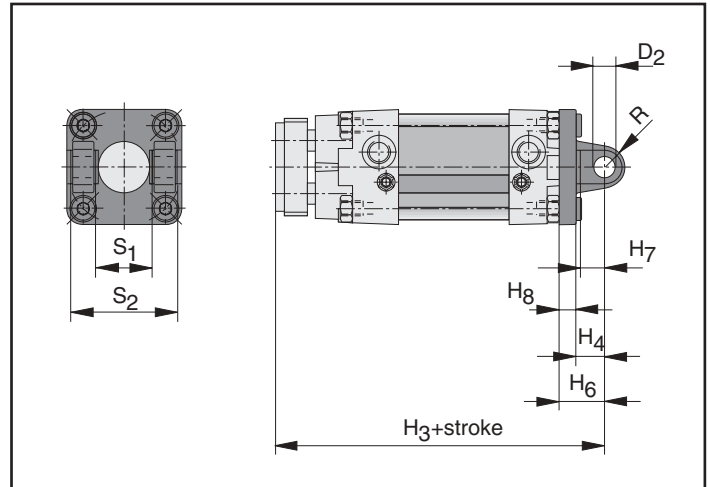
# AZV Twin Rod Cylinder

## Cylinder Mounts

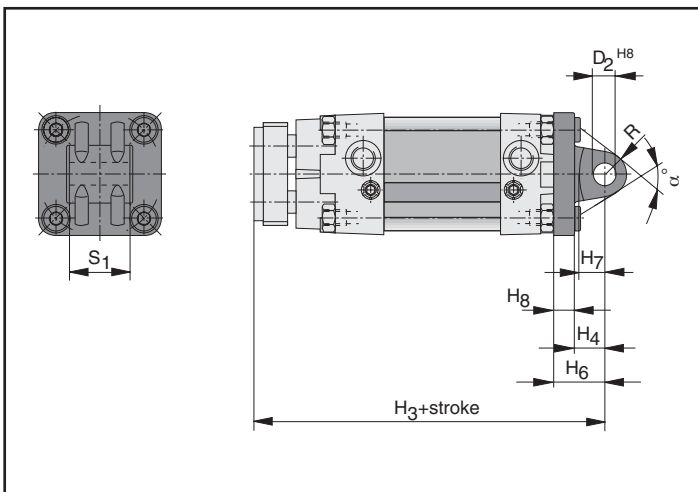
Foot Bracket - Type A



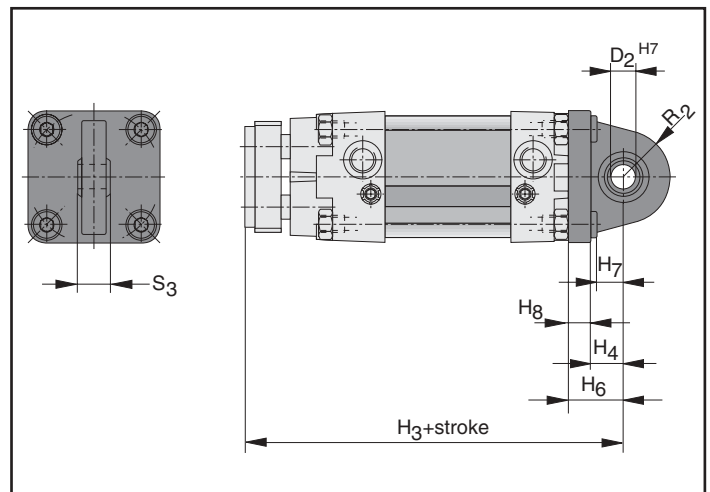
Rear Double Clevis - Type B



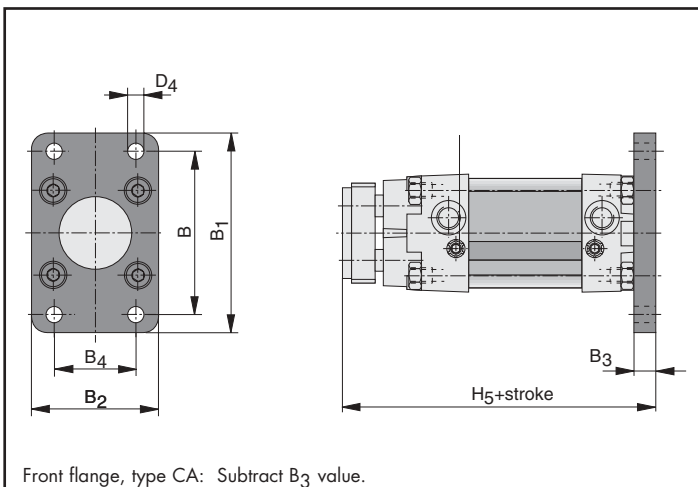
Rear Single Clevis - Type BA



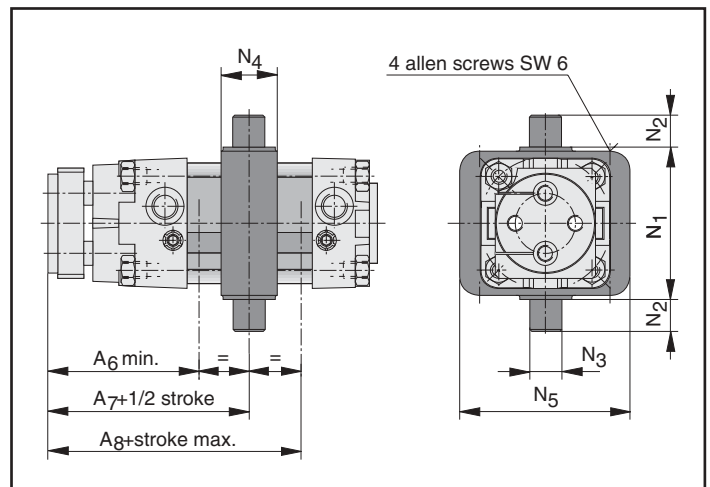
Rear Single Clevis with Spherical Bearing - Type BAS



Rear Flange - Type D



Adjustable Trunnion - Type EN



# AZV Twin Rod Cylinder



## Cylinder Mounts

Bore Ø	A	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>6</sub> min	A <sub>7</sub> + 1/2 Stroke	A <sub>8</sub> max + Stroke	α°	B	B <sub>1</sub>	B <sub>2</sub>
32	1.26	1.85	1.26	0.94	0.12	2.52	2.99	3.43	2.36	2.52	3.11	1.97
	32	47	32	24	3	64	76	87	60	64	79	50
40	1.42	2.09	1.5	1.1	0.12	2.95	3.43	3.9	2.36	2.83	3.54	2.20
	36	53	38	28	3	75	87	99	60	72	90	56
50	1.77	2.56	1.65	1.26	0.12	3.31	3.74	4.17	2.76	3.54	4.33	2.76
	45	65	42	32	3	84	95	106	70	90	110	70
63	1.97	2.95	1.65	1.26	0.12	3.5	3.98	4.41	2.36	3.94	4.72	3.03
	50	75	42	32	3	89	101	112	60	100	120	77
80	2.48	3.74	2.17	1.61	0.16	3.78	4.29	4.76	2.76	4.96	6.02	3.94
	63	95	55	41	4	96	109	121	70	126	153	100
100	2.95	4.53	2.2	1.61	0.16	3.9	4.41	4.92	2.76	5.91	7.01	4.72
	75	115	56	41	4	99	112	125	70	150	178	120

Bore Ø	B <sub>3</sub>	B <sub>4</sub>	ØD <sub>2</sub>	ØD <sub>4</sub>	G	G <sub>1</sub>	H <sub>1</sub> + Stroke	H <sub>2</sub> + Stroke	H <sub>3</sub> + Stroke	H <sub>4</sub>	H <sub>5</sub> + Stroke	H <sub>6</sub>
32	0.39	1.26	0.39	0.28	1.26	2.19	5.98	5.91	5.91	0.47	5.43	0.87
	10	32	10	7	32	55.5	152	150	150	12	138	22
40	0.39	1.42	0.47	0.35	1.42	2.46	6.69	6.61	6.57	0.59	5.98	0.98
	10	36	12	9	36	62.5	170	168	167	15	152	25
50	0.47	1.77	0.47	0.35	1.77	3.05	7.2	7.13	7.01	0.63	6.42	1.06
	12	45	12	9	45	77.5	183	181	178	16	163	27
63	0.47	1.97	0.63	0.35	1.97	3.44	7.6	7.44	7.6	0.83	6.81	1.26
	12	50	16	9	50	87.5	193	189	193	21	173	32
80	0.63	2.48	0.63	0.47	2.48	4.35	8.46	8.58	8.27	0.83	7.48	1.42
	16	63	16	12	63	110.5	215	218	210	21	190	36
100	0.63	2.95	0.79	0.55	2.8	5.06	8.74	8.86	8.74	0.98	7.76	1.61
	16	75	20	14	71	128.5	222	225	222	25	197	41

Bore Ø	H <sub>7</sub>	H <sub>8</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub> e9	N <sub>4</sub>	N <sub>5</sub>	R	R <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	T+ Stroke
32	0.43	0.39	1.97	0.47	0.47	0.99	2.56	0.41	0.71	1.02	1.77	0.55	0.63
	11	10	50	12	12	25	65	10.5	18	26	45	14	16
40	0.55	0.39	2.48	0.63	0.63	1.18	2.76	0.51	0.83	1.1	2.05	0.63	0.79
	14	10	63	16	16	30	70	13	21	28	52	16	20
50	0.59	0.43	2.95	0.63	0.63	1.18	3.54	0.51	0.91	1.26	2.36	0.63	0.98
	15	11	75	16	16	30	90	13	23	32	60	16	25
63	0.79	0.43	3.54	0.79	0.79	1.57	3.94	0.67	1.06	1.57	2.76	0.83	0.98
	20	11	90	20	20	40	100	17	27	40	70	21	25
80	0.83	0.59	4.33	0.79	0.79	1.77	5.51	0.67	1.14	1.97	3.54	0.83	1.18
	21	15	110	20	20	45	140	17	29	50	90	21	30
100	0.94	0.63	5.2	0.98	0.98	1.97	5.94	0.83	1.34	2.36	4.33	0.98	1.38
	24	16	132	25	25	50	151	21	34	60	110	25	35

### Tolerance Chart

Bore Ø	e9		H <sub>7</sub>		H <sub>8</sub>	
	Inch	mm	Inch	mm	Inch	mm
32	-0.001	-0.032	+0.001	+0.018	+0.001	+0.027
	-0.003	-0.075	0	0	0	0
40	-0.001	-0.032	+0.001	+0.018	+0.001	+0.027
	-0.003	-0.075	0	0	0	0
50	-0.001	-0.032	+0.001	+0.018	+0.001	+0.027
	-0.003	-0.075	0	0	0	0
63	-0.002	-0.040	+0.001	+0.018	+0.001	+0.027
	-0.004	-0.092	0	0	0	0
80	-0.002	-0.040	+0.001	+0.018	+0.001	+0.027
	-0.004	-0.092	0	0	0	0
100	-0.002	-0.040	+0.001	+0.021	+0.001	+0.033
	-0.004	-0.092	0	0	0	0

Dimensions: Bold Type: INCH, Standard: mm

# DZB Blocking Cylinder



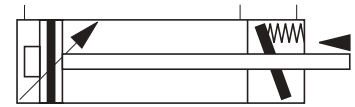
## Specifications

Features	
Type	Blocking Cylinder
Series	DZB
Configurations	DZB Double Acting, Retract Lock, Magnetic Piston, Cushions Rear DZBA Double Acting, Extend Lock, Magnetic Piston, Cushions Rear
Construction Materials	
Barrel	Aluminum, Anodized (10µ)
Front End Cap	Machined Aluminum, Anodized (10µ)
Rear End Cap	Die-Cast Aluminum
Piston Rod	Case Hardened Steel, Hard Chrome Plated
Rod Bearing	Teflon Impregnated Brass
Piston	Molded NBR, (Optional: Viton)
Seals	NBR (Optional: Viton)
Tie Rod Nuts	Steel, Zinc Plated
Tie Rods	Steel, Zinc Plated
Characteristics	
Operating Temperature	NBR: -5°F (-20°C) to +176°F (+80°C)
Operating Pressure	30 PSI (2 bar) to 120 PSI (8 bar)
Normal Operating Pressure	90 PSI (6 bar)
Lock Release Pressure	≥ 60 PSI (4 Bar)
Lubrication	Pre-lubricated at factory. If additional lubrication is required use oil compatible with NBR seals and designed for use in pneumatic systems.
Media	Filtered and Regulated Compressed Air
Installation	In any Position
Weight	See Page 48
Stroke Length	Up to 20 inches—Longer Lengths Contact Factory
Theoretical Forces	See Technical Information Section
Load Holding Capacity	Equal to the Potential Thrust in Direction of Lock
Specifications	
Piston Diameter	32 40 50 63 80 100 125
Port Sizes Metric (G)	1/8 1/4 1/4 3/8 1/2 1/2 1/2
Control Port Metric (G)	M5 1/8 1/8 1/4 1/4 1/4 1/4
Rod Diameter DZB mm	12 16 20 20 25 25 32
Cushion Length (Rear Only) mm	20 25 25 25 28 30 42

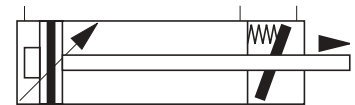
## Series DZB & DZBA

Ø32mm - 125mm

**DZB: Double Acting, Retract Lock, Magnets, Cushions**



**DZBA: Double Acting, Extend Lock, Magnets, Cushions**



### Features:

- Retract Rod Lock Control**
- Extend Rod Lock Control**
- Magnetic Piston**
- Adjustable Rear Cushion**
- Pre-Lubricated Design**
- Inch or Metric Construction**

## DZB Blocking Cylinder

### Ordering Information

**Example:** DZBA 5050/20-V  
 Blocking Cylinder  
 Extended Lock  
 Double Acting, Magnets, Cushions  
 50mm Bore  
 20mm Stroke  
 Viton Seals

D Z B A - 5 0 5 0 / 2 0 - V

#### Versions:

- DZB – Retract Lock Control
- DZBA – Extend Lock Control

#### Actuation:

- 5 – Double Acting, Magnets, Rear Cushions

#### Options:

- – Standard
- V – Viton
- EN – Trunnion

#### Stroke:

- MM: (standard)
- any mm increment up to 500mm standard
- contact factory for special stroke lengths

#### Bore:

- 032 – 32mm (nom. 1-1/4")
- 040 – 40mm (nom. 1-1/2")
- 050 – 50mm (nom. 2")
- 063 – 63mm (nom. 2-1/2")
- 080 – 80mm (nom. 3-1/8")
- 100 – 100mm (nom. 4")
- 125 – 125mm (nom. 5")

Proximity Sensors/Brackets: See Page 73

#### Weights

Bore Ø	32mm		40mm		50mm		63mm		80mm		100mm		125mm	
	*1	*2	*1	*2	*1	*2	*1	*2	*1	*2	*1	*2	*1	*2
Basic Cylinder	lbs. 2.34	0.14	3.20	0.31	5.40	0.37	8.16	0.41	13.23	0.64	20.95	0.77	26.24	0.72
	kg 1.06	0.26	1.45	0.56	2.45	0.67	3.70	0.75	6.00	1.15	9.50	1.40	11.90	1.30
<b>Mount Types:</b>														
Type B	lbs 2.56		3.42		5.51		8.60		14.11		22.27		29.11	
	kg 1.16		1.55		2.50		3.90		6.40		10.10		13.20	
Type BA	lbs 2.78		3.64		5.62		9.04		14.99		23.37		29.55	
	kg 1.26		1.65		2.55		4.10		6.80		10.60		13.30	
Type BAS	lbs 2.67		3.64		5.62		8.82		14.33		22.71		29.33	
	kg 1.21		1.65		2.55		4.00		6.50		10.30		13.40	
Type D	lbs 2.67		3.42		5.51		8.71		14.33		22.71		29.55	
	kg 1.21		1.55		2.50		3.95		6.50		10.30		13.40	
Type EN	lbs 3.22		4.74		7.17		11.03		17.20		26.68		33.52	
	kg 1.46		2.15		3.25		5.00		7.80		12.10		15.20	

\*1 = Weight for cylinder with 4" (100 mm) stroke  
 \*2 = Weight for every additional 4" (100 mm) stroke length.

# DZB Blocking Cylinder



## Cylinder Accessories

Body Mounts	32mm	40mm	50mm	Bore Ø 63mm	80mm	100mm	125mm
Foot Mounting Type: A-	PD 27917	PD 27918	PD 28072	PD 28073	PD 28074	PD 28075	PD 22026
Rear Double Clevis Type: B-	PD 22704	PD 22705	PD 22706	PD 22707	PD 22708	PD 22709	PD 22034
Rear Single Clevis Type: BA-	PD 23412	PD 23413	PD 23414	PD 23415	PD 23416	PD 23417	PD 23418
Rear Clevis w/Spherical Bearing Type: BAS-	PD 23843	PD 23844	PD 23845	PD 23846	PD 23847	PD 23848	PD 23849
Front Flange Type: C	PD 23403	PD 23404	PD 23405	PD 23406	PD 23407	PD 23408	PD 23409
Rear Flange Type: D	PD 23403	PD 23404	PD 23405	PD 23406	PD 23407	PD 23408	PD 23409
Trunnion Type: EN	PD 24039	PD 24040	PD 24041	PD 24042	PD 24043	PD 24044	--
Trunnion Blocks (Pair)	PD 23381	PD 23382	PD 23382	PD 23383	PD 23383	PD 23384	PD 23384
Pivot Mount (w/o Bolts)	PD 40844	PD 40845	PD 40846	PD 40847	PD 40848	PD 40849	

Delivery information: Mounts are sold separately and shipped detached from the cylinder with the exception of the Trunnion Mount which must be attached to the cylinder during the assembly process.

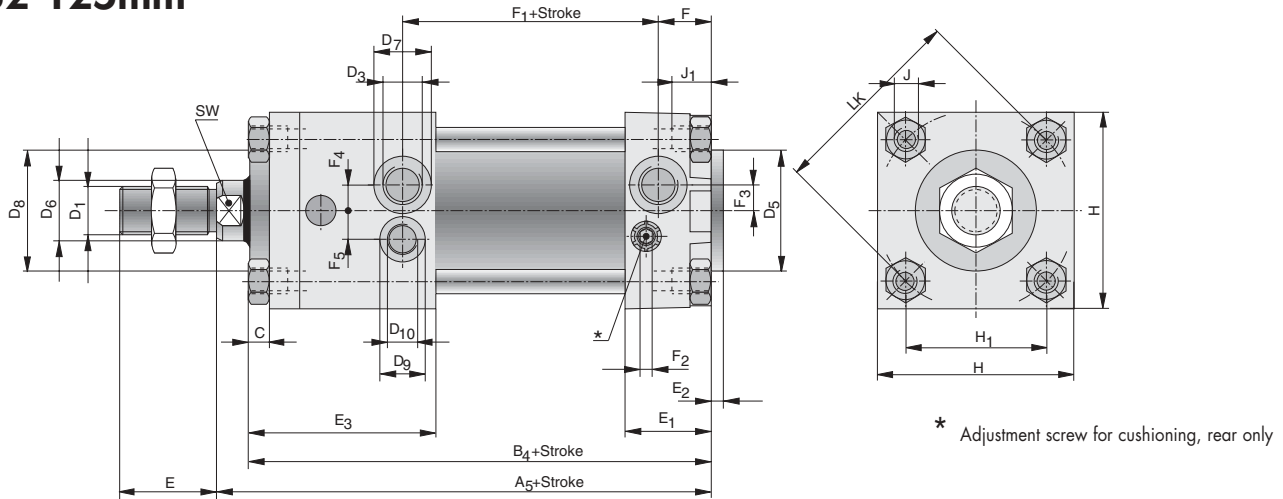
Rod Accessories	32mm	40mm	50mm	Bore Ø 63mm	80mm	100mm	125mm
Rod/Body Nut	ZP 1810	ZP 2189	ZP 0178	ZP 0178	ZP 0185	ZP 0185	ZP 2190 (M24x2) ZP 2039 (M27x2)
Rod Clevis	KY 6135	KY 6136	KY 6139	KY 6139	KY 6141	KY 6141	KY 6142 (M24x2) KY 6866 (M27x2)
Rod Eye w/Bearing	KY 6147	KY 6148	KY 6150	KY 6150	KY 6151	KY 6151	KY 6152 (M24x2) KY 6862 (M27x2)
Clevis Pin	KY 6153	KY 6154	KY 6157	KY 6156	KY 6158	KY 6159	PD 22598
Rod Alignment Coupling	KY 1129	KY 1131	KY 1133	KY 1133	KY 1134	KY 1134	--



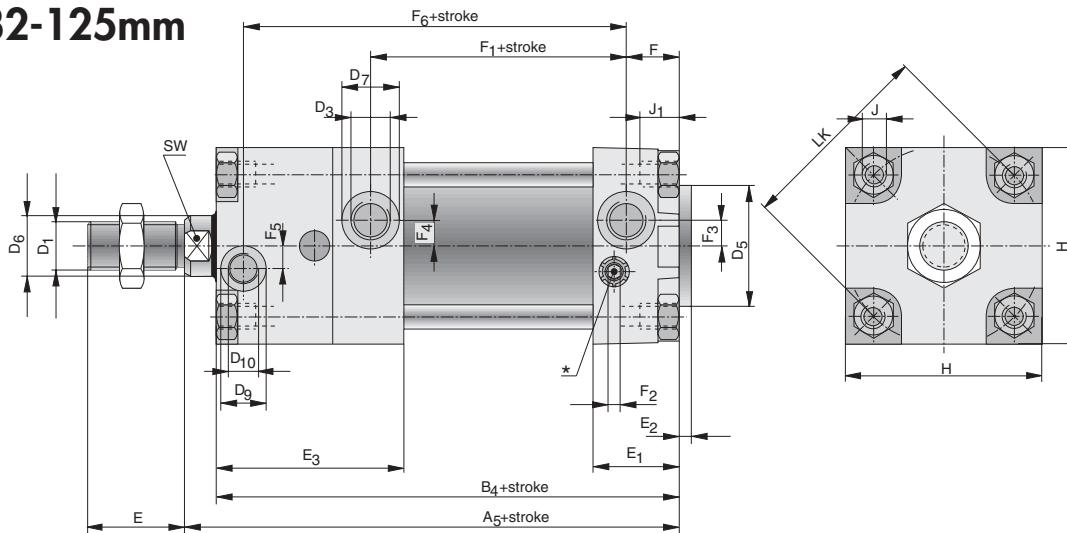
## DZB Blocking Cylinder

### Dimensional Data

#### DZB Ø32-125mm



#### DZBA Ø32-125mm



**NOTE:**

D3      Cylinder Port  
D10     Lock Control Port

## DZB Blocking Cylinder

### Dimensional Data

Bore Ø		A <sub>5</sub> +	B <sub>4</sub> +	C	D <sub>1</sub>	D <sub>3</sub>	Ø D <sub>5</sub>	Ø D <sub>6</sub>	Ø D <sub>7</sub>	Ø D <sub>8</sub>
			Stroke	Stroke						
32	ISO**	<b>4.72</b> 120	<b>4.41</b> 112	<b>0.2</b> 5	<b>3/8•24</b> M 10x1.25	<b>NPT 1/8</b> G1/8	<b>1.18</b> 30	<b>0.47</b> 12	<b>0.59</b> 15	<b>1.18</b> 30
40	ISO**	<b>5.31</b> 135	<b>4.96</b> 126	<b>0.24</b> 6	<b>1/2•20</b> M 12x1.25	<b>NPT 1/4</b> G1/4	<b>1.38</b> 35	<b>0.63</b> 16	<b>0.75</b> 19	<b>1.38</b> 35
50	ISO**	<b>5.63</b> 143	<b>5.2</b> 132	<b>0.26</b> 6.5	<b>5/8•18</b> M 16x1.5	<b>NPT 1/4</b> G1/4	<b>1.57</b> 40	<b>0.79</b> 20	<b>0.75</b> 19	<b>1.57</b> 40
63	*	<b>6.69</b> 170	<b>6.26</b> 159	<b>0.26</b> 6.5	<b>5/8•18</b> M 16x1.5	<b>NPT 3/8</b> G3/8	<b>1.77</b> 45	<b>0.79</b> 20	<b>0.91</b> 23	<b>2.24</b> 57
80	*	<b>7.4</b> 188	<b>6.85</b> 174	<b>0.33</b> 8.5	<b>3/4•16</b> M 20x1.5	<b>NPT 3/8</b> G3/8	<b>1.77</b> 45	<b>0.98</b> 25	<b>0.91</b> 23	<b>3.07</b> 78
100	*	<b>7.99</b> 203	<b>7.44</b> 189	<b>0.33</b> 8.5	<b>3/4•16</b> M 20x1.5	<b>NPT 1/2</b> G1/2	<b>2.17</b> 55	<b>0.98</b> 25	<b>1.1</b> 28	<b>3.94</b> 100
125	ISO**	<b>10.04</b> 255	<b>8.23</b> 209	<b>0.59</b> 15	<b>1•14</b> M 27x2	<b>NPT 1/2</b> G1/2	<b>2.36</b> 60	<b>1.26</b> 32	<b>1.1</b> 28	<b>4.76</b> 121
125	CETOP**	<b>10.04</b> 255	<b>8.23</b> 209	<b>0.59</b> 15	<b>1•14</b> M 24x2	<b>NPT 1/2</b> G1/2	<b>2.36</b> 60	<b>1.26</b> 32	<b>1.1</b> 28	<b>4.76</b> 121

Bore Ø	Ø D <sub>9</sub>	D <sub>10</sub>	E	E <sub>1</sub>	E <sub>2</sub>	E <sub>3</sub>	F	F <sub>1</sub> +	F <sub>2</sub>	F <sub>3</sub>
									Stroke	
32	<b>0.31</b> 8	<b>10 • 32</b> M 5	<b>0.79</b> 20	<b>1.14</b> 29	<b>0.16</b> 4	<b>1.81</b> 46	<b>0.55</b> 14	<b>2.36</b> 60	SW 4	<b>0.22</b> 5.5
40	<b>0.59</b> 15	<b>NPT 1/8</b> G1/8	<b>0.94</b> 24	<b>1.06</b> 27	<b>0.16</b> 4	<b>2.22</b> 56.5	<b>0.63</b> 16	<b>2.5</b> 63.5	SW 4	<b>0.28</b> 7
50	<b>0.59</b> 15	<b>NPT 1/8</b> G1/8	<b>1.26</b> 32	<b>1.14</b> 29	<b>0.16</b> 4	<b>2.4</b> 61	<b>0.69</b> 17.5	<b>2.54</b> 64.5	SW 4	<b>0.33</b> 8.5
63	<b>0.75</b> 19	<b>NPT 1/4</b> G1/4	<b>1.26</b> 32	<b>1.18</b> 30	<b>0.16</b> 4	<b>3.19</b> 81	<b>0.67</b> 17	<b>2.87</b> 73	SW 4	<b>0.31</b> 8
80	<b>0.75</b> 19	<b>NPT 1/4</b> G1/4	<b>1.57</b> 40	<b>1.34</b> 34	<b>0.16</b> 4	<b>3.31</b> 84	<b>0.81</b> 20.5	<b>3.25</b> 82.5	SW 4	<b>0.35</b> 9
100	<b>0.75</b> 19	<b>NPT 1/4</b> G1/4	<b>1.57</b> 40	<b>1.38</b> 35	<b>0.16</b> 4	<b>3.64</b> 92.5	<b>0.75</b> 19	<b>3.66</b> 93	SW 4	<b>0.51</b> 13
125	<b>0.75</b> 19	<b>NPT 1/4</b> G1/4	<b>1.89</b> 48	<b>1.38</b> 40	<b>0.16</b> 4	<b>4.09</b> 104	<b>0.75</b> 19	<b>3.94</b> 100	-	<b>0.43</b> 11
125	<b>0.75</b> 19	G1/4	<b>1.89</b> 48	<b>1.38</b> 40	<b>0.16</b> 4	<b>4.09</b> 104	<b>0.75</b> 19	<b>3.94</b> 100	-	<b>0.43</b> 11

Bore Ø	F <sub>4</sub>	F <sub>5</sub>	F <sub>6</sub>	F <sub>7</sub>	J	J <sub>1</sub>	H max	H <sub>1</sub>	LK Ø	SW
32	<b>0.24</b> 6	<b>0.28</b> 7	<b>3.70</b> 94	<b>0.28</b> 7	<b>1/4•20</b> M 6	<b>0.43</b> 11	<b>1.85</b> 47	<b>1.28</b> 32.5	<b>1.81</b> 46	<b>0.39</b> 10
40	<b>0.31</b> 8	<b>0.37</b> 9.5	<b>4.07</b> 103.5	<b>0.30</b> 7.5	<b>1/4•20</b> M 6	<b>0.43</b> 11	<b>2.09</b> 53	<b>1.52</b> 38.5	<b>2.13</b> 54	<b>0.55</b> 14
50	<b>0.31</b> 8	<b>0.37</b> 9.5	<b>4.21</b> 107	<b>0.30</b> 7.5	<b>5/16•18</b> M 8	<b>0.47</b> 12	<b>2.56</b> 65	<b>1.83</b> 46.6	<b>2.6</b> 66	<b>0.67</b> 17
63	<b>0.47</b> 12	<b>0.43</b> 11	<b>5.12</b> 130	<b>0.33</b> 8.5	<b>5/16•18</b> M 8	<b>0.47</b> 12	<b>2.95</b> 75	<b>2.23</b> 46.6	<b>3.15</b> 80	<b>0.67</b> 17
80	<b>0.49</b> 12.5	<b>0.59</b> 15	<b>5.65</b> 143.5	<b>0.35</b> 9	<b>3/8•16</b> M 10	<b>0.63</b> 16	<b>3.74</b> 95	<b>2.84</b> 72.1	<b>4.02</b> 102	<b>0.87</b> 22
100	<b>0.59</b> 15	<b>0.59</b> 15	<b>6.28</b> 159.5	<b>0.65</b> 16.5	<b>3/8•16</b> M 10	<b>0.63</b> 16	<b>4.53</b> 115	<b>3.50</b> 89	<b>4.96</b> 126	<b>0.87</b> 22
125	<b>0.59</b> 15	<b>0.59</b> 15	<b>7.05</b> 179	<b>1.10</b> 28	<b>1/2•13</b> M 12	<b>0.71</b> 18	<b>5.51</b> 140	<b>4.33</b> 110	<b>6.14</b> 156	<b>1.06</b> 27
125	<b>0.59</b> 15	<b>0.59</b> 15	<b>7.05</b> 179	<b>1.10</b> 28	M 12	<b>0.71</b> 18	<b>5.51</b> 140	<b>4.33</b> 110	<b>6.14</b> 156	<b>1.06</b> 27

\* Dimensions not according to ISO standards

\*\* Dimensions B<sub>4</sub> & A<sub>5</sub> are ISO/CETOP

## DZB Blocking Cylinder

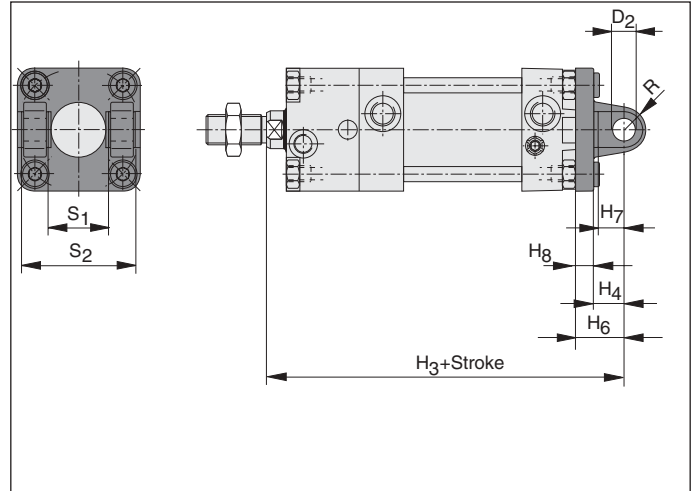
### Cylinder Mounts

#### Foot Bracket- Type A

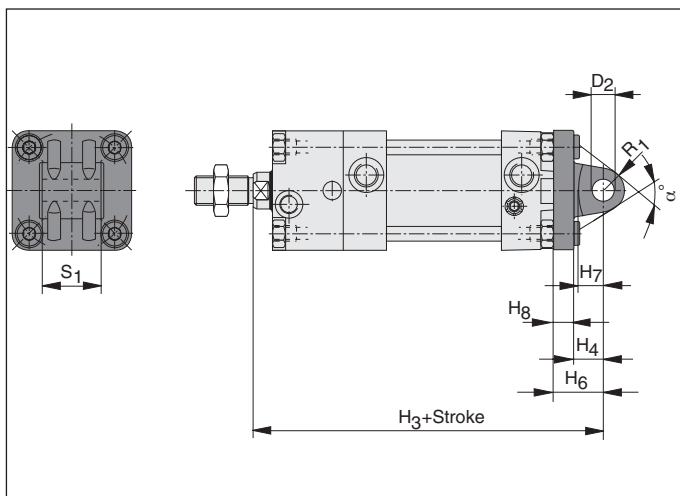
Contact the Factory  
for Further Information

The standard "A" type foot brackets are available. There is the possibility of interference with the Piston Rod. A Rod Extension Option eliminates the problem.

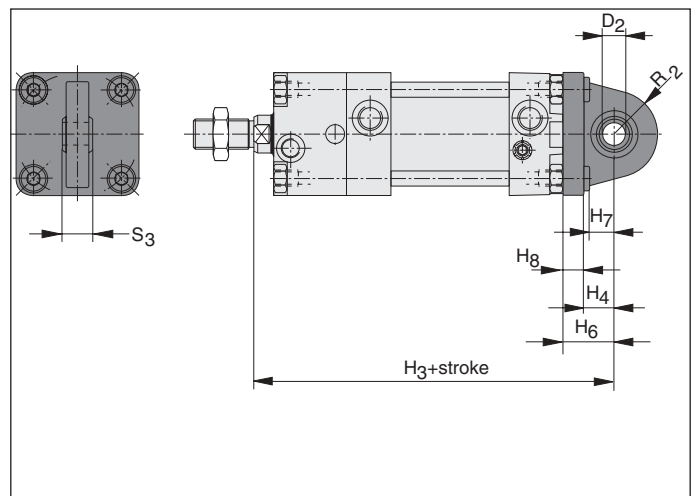
#### Rear Double- Clevis Type B



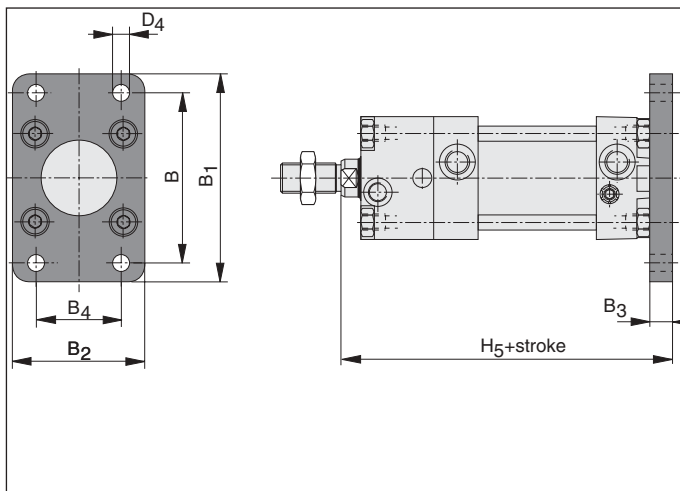
#### Rear Single Clevis- Type BA



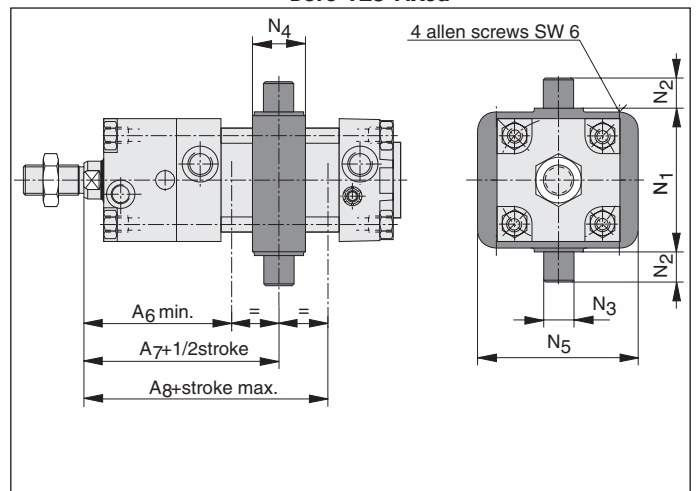
#### Rear Single Clevis with Spherical Bearing- Type BAS



#### Rear Flange- Type D



#### Trunnion\*- Type EN \* Bore 32 to 100 Adjustable Bore 125 Fixed



\* Design: Allows mount to be adjusted between A7 and A8 for all units except the 125mm which requires the factory to set the position. When ordering, please supply the required mounting distance

# DZB Blocking Cylinder



## Cylinder Mounts

Bore Ø	A <sub>6</sub> min	A <sub>7+</sub> 1/2 Stroke	A <sub>8</sub> max Stroke	α°	B	B <sub>1</sub>	B <sub>2</sub>	B <sub>3</sub>	B <sub>4</sub>	D <sub>2</sub> H7**
32	2.64 67	2.87 73	3.11 79	2.36 60	2.52 64	3.11 79	1.97 50	0.39 10	1.26 32	0.39 10*
40	2.83 72	3.27 83	3.66 93	2.36 60	2.83 72	3.54 90	2.20 56	0.39 10	1.42 36	0.47 12*
50	3.19 81	3.54 90	3.90 99	2.76 70	3.54 90	4.33 110	2.76 70	0.47 12	1.77 45	0.47 12*
63	4.51 114.5	4.53 115	4.55 115.5	2.36 60	3.94 100	4.72 120	3.03 77	0.47 12	1.97 50	0.63 16
80	4.80 122	4.96 126	5.12 130	2.76 70	4.96 126	6.02 153	3.94 100	0.63 16	2.48 63	0.63 16
100	5.24 133	5.39 137	5.55 141	2.76 70	5.91 150	7.01 178	4.72 120	0.63 16	2.95 75	0.79 20
125	5.51 140	5.98 152	6.46 164	2.36 60	7.09 180	8.66 220	5.51 140	0.79 20	3.54 90	0.98 25

Bore Ø	D <sub>4</sub>	H <sub>3+</sub> Stroke	H <sub>4</sub>	H <sub>5+</sub> Stroke	H <sub>6</sub>	H <sub>7</sub>	H <sub>8</sub>	N <sub>1</sub>	N <sub>2</sub>
32	0.28 7	5.59 142	0.47 12	5.12 130	0.87 22	0.43 11	0.39 10	1.97 50	0.47 12
40	0.35 9	6.30 160	0.59 15	5.71 145	0.98 25	0.55 14	0.39 10	2.48 63	0.63 16
50	0.35 9	6.69 170	0.63 16	6.10 155	1.06 27	0.59 15	0.43 11	2.95 75	0.63 16
63	0.35 9	7.95 202	0.83 21	7.17 182	1.26 32	0.79 20	0.43 11	3.54 90	0.79 20
80	0.47 12	8.82 224	0.83 21	8.03 204	1.42 36	0.79 20	0.59 15	4.33 110	0.79 20
100	0.55 14	9.61 244	0.98 25	8.62 219	1.61 41	0.94 24	0.63 16	5.20 132	0.98 25
125	0.63 16	10.83 275	1.18 30	9.65 245	1.97 50	1.14 29	0.79 20	6.30 160	0.98 25

Bore Ø	N <sub>3</sub> e9	N <sub>4</sub>	N <sub>5</sub>	R	R <sub>1</sub>	R <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>
32	0.47 12	0.87 22	2.56 65	0.35 9	0.41 10.5	0.71 18	1.02 26	1.77 45	0.55 14
40	0.63 16	1.10 28	2.95 75	0.43 11	0.51 13	0.83 21	1.10 28	2.05 52	0.63 16
50	0.63 16	1.10 28	3.35 85	0.47 12	0.51 13	0.91 23	1.26 32	2.36 60	0.63 16
63	0.79 20	1.38 35	3.94 100	0.59 15	0.67 17	1.06 27	1.57 40	2.76 70	0.83 21
80	0.79 20	1.38 35	4.72 120	0.63 16	0.67 17	1.14 29	1.97 50	3.54 90	0.83 21
100	0.98 25	1.57 40	5.31 135	0.79 20	0.83 21	1.34 34	1.97 50	4.33 110	0.98 25
125	0.98 25	1.57 40	6.50 165	0.98 25	0.98 25	1.57 40	2.76 70	5.12 130	1.22 31

## DZB Blocking Cylinder

### Technical Information

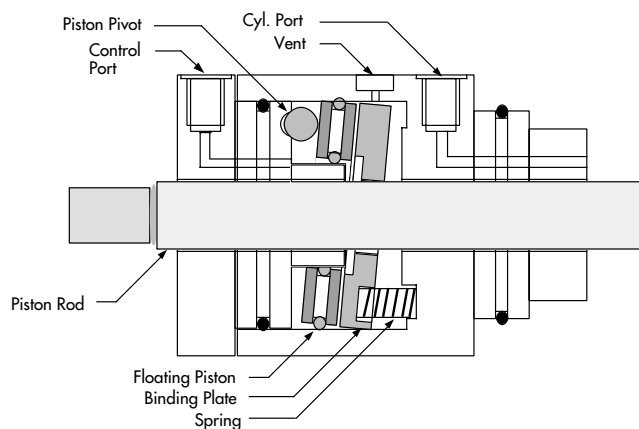
#### HOW A BLOCKING CYLINDER WORKS:

When pressure is supplied to the Control Port, the Floating Piston pivots on the ball positioning the Binding Plate perpendicular to the piston rod. This action releases the piston rod allowing the rod to move freely.

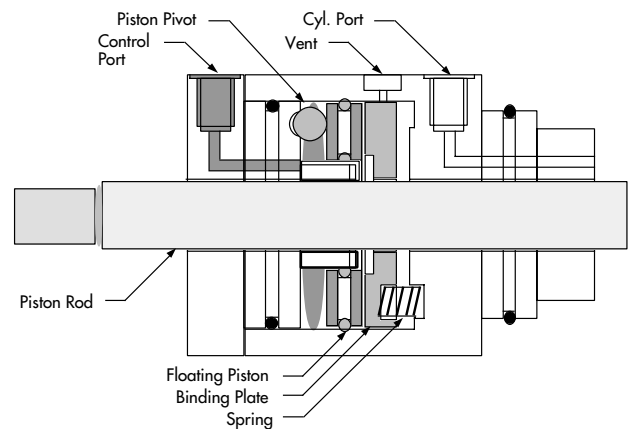
#### Caution:

1. The piston rod should not be allowed to rotate while in the locked position.
2. The Piston Rod should be stopped before operating the locking mechanism.

**DZBA: Extend Lock Control Without Pressure to Control Port**



**DZBA: Extend Lock Control Pressurized Control Port**



#### TYPICAL INSTALLATIONS

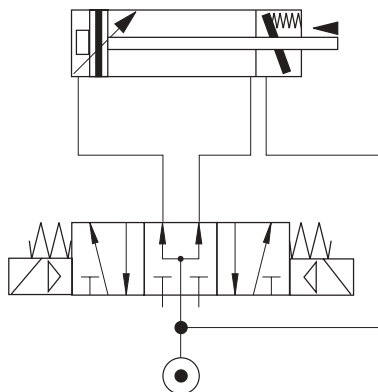
##### Example 1:

Compressed air from the main supply line is connected to both the valve and the control port of the cylinder. If the main supply pressure is lost, the control port releases the binding plate, locking the cylinder rod. The cylinder stays in this position until the main supply pressure returns to both the valve and the control port.

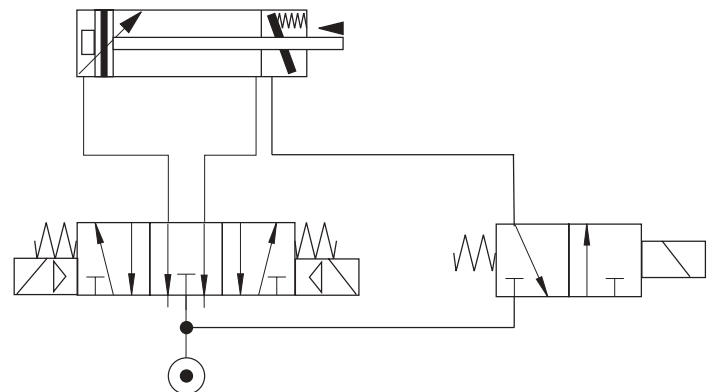
##### Example 2:

A 3-Way, Normally Open Valve independently supplies pressure to the control port. When the valve is energized the piston rod moves freely. De-energizing the valve locks the piston rod in position.

#### EXAMPLE: #1



#### EXAMPLE: #2



## FSE Blocking Cylinder

### Specifications

Characteristics	Symbol	Unit	Comments
<b>General Characteristics</b>			
Description			Blocking Unit (Locks in both directions)
Series			FSE - locks if pressure drops
Mounting			See dimensional drawing
Connection			Threaded
Ambient Temperature	J <sub>max</sub>	°F(C)	176° (+80) Note: When using below freezing point (0°C) it is necessary to consult us
Medium Temperature	J <sub>max</sub>	°F(C)	176° (+80)
Weight (mass)		lb(kg)	See table below
Installation Position			Optional
Medium			Filtered and regulated compressed air
Lubrication			Oil mist lubrication compatible with NBR seals
Material			
Cartridge			Aluminum
Housing			Aluminum
Clamping Jaw			Bronze
Cyl. piston rod			Stainless Steel
<b>Pneumatic Characteristics</b>			
Nominal Pressure	P <sub>n</sub>	PSI(bar)	90 (6)
Cylinder Operating Pressure	P <sub>min</sub>	PSI(bar)	15 (1)
	P <sub>max</sub>	PSI(bar)	145 (10)
Lock Release Pressure		PSI(bar)	≥60 - 145 (≥4 - 10)
Static Locking Force		lbf	135 225 337 495 674 1124 1574
		N	600 1000 1500 2200 3000 5000 7000
Cylinder Diameter		mm	32 40 50 63 80 100 125
Connection Size			G1/8 G1/4 G1/4 G3/8 G3/8 G1/2 G1/2
Piston Rod Diameter		mm	12 16 20 20 25 25 32
Piston Rod Extension		mm	43 46 56 56 78 78 111
Pilot Air Connection			M5 M5 G1/8 G1/8 G1/8 G1/8 G1/8

<b>Weight</b>		Cylinder Diameter (mm)							
Description		32	40	50	63	80	100	125	
Blocking Unit	lbs.	1.32	1.76	2.20	2.65	3.09	3.53	3.97	
	kg	0.60	0.80	1.00	1.20	1.40	1.60	1.80	
Basic cylinder with 100mm stroke and rod extension	lbs.	1.54	2.65	3.86	5.12	8.27	10.80	17.35	
	kg	0.70	1.20	1.75	2.32	3.75	4.90	7.87	

### Series FSE

Ø32mm - 125mm

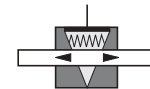
#### Versions:

- Blocking Unit with cylinder
- Blocking Unit without cylinder

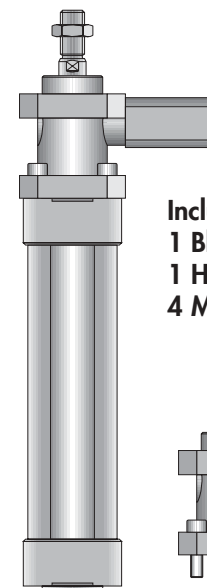
#### AZ 50./...-FSE



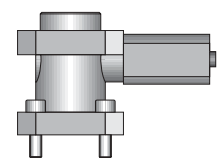
#### FSE..



**Blocking Unit holds the cylinder piston rod, if the signal pressure drops below 60 PSI (4 bar)**



- Includes:**
- 1 Blocking Unit
  - 1 Housing
  - 4 Mounting Screws



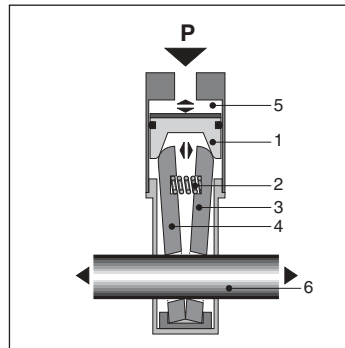
## FSE Blocking Cylinder

### Technical Information

#### Function

If the signal pressure (P) is removed, the piston rod (6) is locked by the two tilting plates (3 and 4).

The signal pressure (P) presses the piston (1) downward, pushing the two tilting plates (3 and 4) together. The piston rod (6) is then free to move. If the signal pressure (P) is removed from the piston chamber (5), the spring (2) pushes the two plates (3 and 4) apart. The wedge effect pushes the piston (1) upward, tilting the plates (3 and 4) apart and locking the piston rod (6).

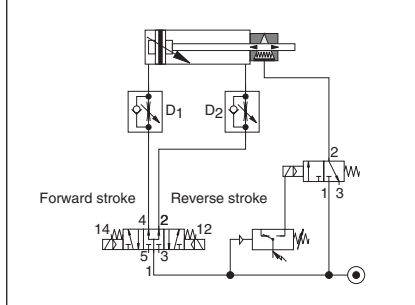


#### Important

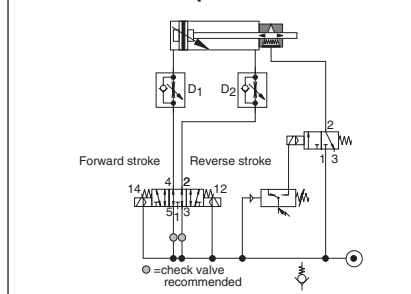
- The Blocking Unit cannot be installed until the unit is unlocked, either by air pressure or by a suitable screw.
- When the cylinder piston rod is locked, it must not be rotated or subjected to external forces.

## Circuit Diagrams for a Cylinder with an FSE Blocking Unit

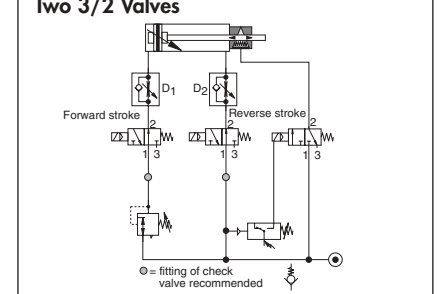
**Example 1: Horizontal Application with 5/3 Valve - RFB (dual center)**



**Example 2: Horizontal Application with 5/3 Valve - RFE (open center)**



**Example 3: Horizontal Application with Two 3/2 Valves**

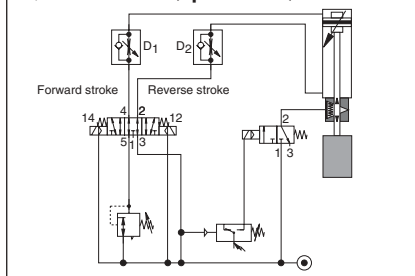


#### Examples 1 and 2:

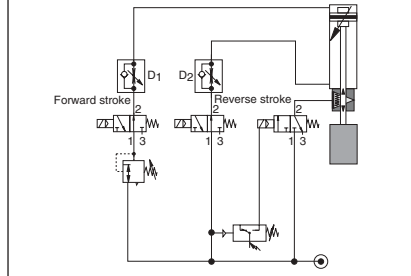
When operating pressure is applied, the P/E converter is closed and the 3/2 valve is opened, i.e. the Blocking Unit is unlocked (working position).

The Blocking Unit is actuated with a 3/2 solenoid valve via a pressure switch. If the pressure drops, the pressure switch reacts and the Blocking Unit exhausts via the 3/2 way valve. The piston rod is locked. The use of the 5/3 valve ensures that both sides of the cylinder piston are pressurized. De-energizing the Blocking Unit allows the piston rod to remain in its present position.

**Example 4: Vertical Application with 5/3 Valve - RFE (open center)**



**Example 5: Vertical Application with Two- 3/2 N/O Valves**



Without the Blocking Unit, the piston rod would continue its forward stroke because of the different piston areas. After the pressure is equalized on both sides of the cylinder piston, the Blocking Unit can be actuated and the piston rod locked. The sequence of operations must therefore be correct. The flow control valves, D1 and D2, only control piston speed and have no influence on the actuation of the Blocking Unit. Installing a check valve increases safety because it prevents any movement of the piston before the Blocking Unit locks.

#### Example 2:

An additional regulator is installed in port #5, to compensate for the effect of the different areas on the two sides of the piston.

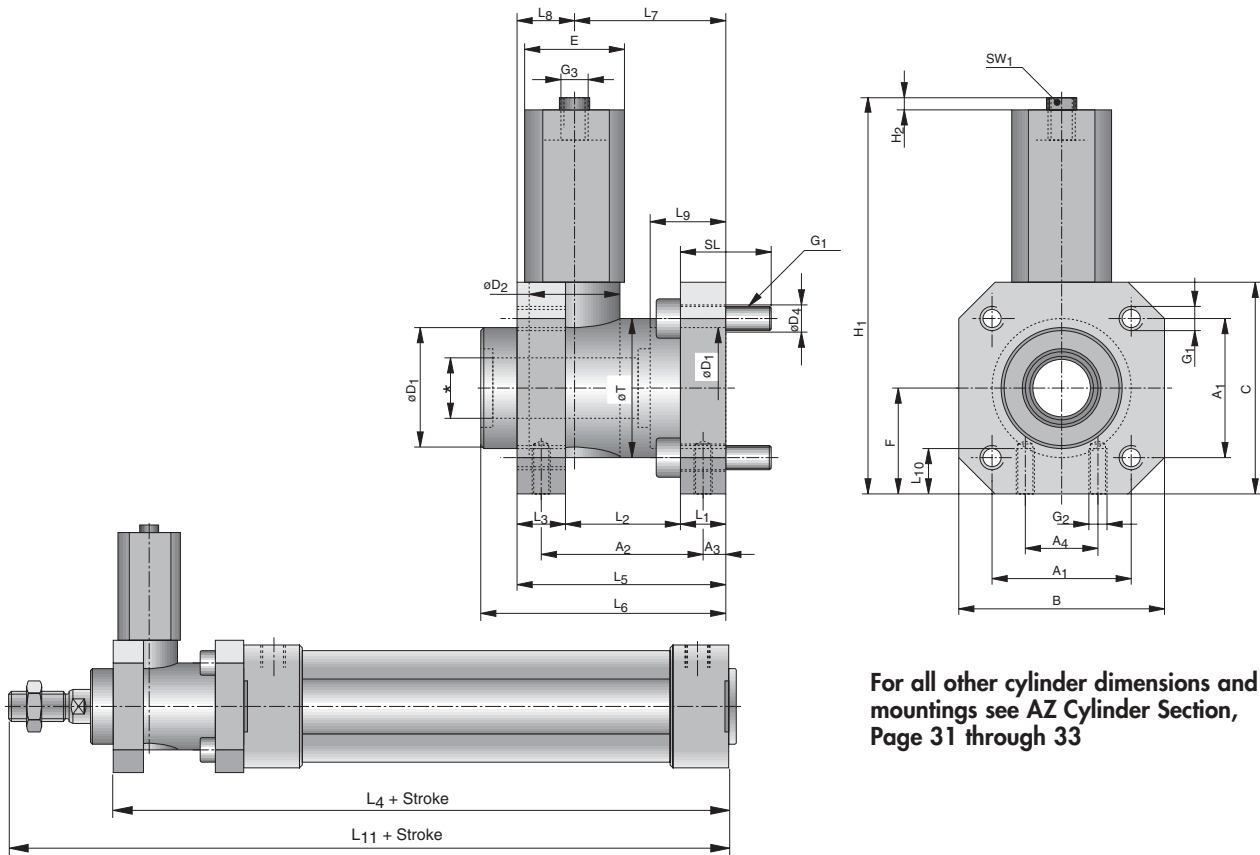
#### Example 3:

In contrast to Examples 1 and 2, a 5/3 valve is replaced by two 3/2 valves. It is similar to the control solution in Example 2. The choice will depend on the customer and the particular application.

# FSE Blocking Cylinder



## Dimensional Details



For all other cylinder dimensions and mountings see AZ Cylinder Section, Page 31 through 33

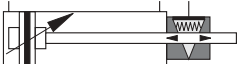
Bore Ø	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	B	C	øD <sub>1</sub>	øD <sub>2</sub>	øD <sub>4</sub>	E	F	G <sub>1</sub>	G <sub>2</sub>	G <sub>3</sub>	*	
32	1.28 32.5	1.57 40	0.17 4.2	0.63 16	1.89 48	1.97 50	1.18 30	0.79 20	0.26 6.6	0.89 22.7	0.98 25	M6	M5	M5	12	
40	1.50 38	1.81 46	0.18 4.5	0.83 21	2.20 56	2.28 58	1.38 35	0.94 24	0.26 6.6	1.09 27.7	1.14 29	M6	M5	M5	16	
50	1.83 46.5	2.13 54	0.45 11.5	0.94 24	2.68 68	2.76 70	1.57 40	1.18 30	0.33 8.5	1.29 32.7	1.38 35	M8	M6	G1/8	20	
63	2.22 56.5	2.17 55	0.30 7.5	1.26 32	3.23 82	3.35 85	1.77 45	1.50 38	0.33 8.5	1.61 41	1.67 42.5	M8	M8	G1/8	20	
80	2.83 72	2.76 70	0.39 10	1.73 44	3.94 100	4.13 105	1.77 45	1.57 40	0.43 11	1.96 49.7	2.07 52.5	M10	M8	G1/8	25	
100	3.50 89	2.76 70	0.39 10	2.36 60	4.72 120	5.12 130	2.17 55	1.89 48	0.43 11	2.15 54.7	2.56 65	M10	M8	G1/8	25	
125	4.33 110	3.74 95	0.43 11	2.95 75	5.51 140	5.91 150	2.36 60	2.56 65	0.51 13	2.56 64.9	2.95 75	M12	M10	G1/8	32	
Bore Ø	H <sub>1</sub>	H <sub>2</sub>	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	L <sub>4</sub> +Stroke	L <sub>5</sub>	L <sub>6</sub>	L <sub>7</sub>	L <sub>8</sub>	L <sub>9</sub>	L <sub>10</sub>	L <sub>11</sub> +Stroke	SL	SW <sub>1</sub>	øT
32	3.78 96	0.16 4	0.31 8	1.10 28	0.47 12	5.59 142	1.89 48	2.28 58	1.26 32.0	0.63 16.0	0.81 20.5	0.31 8	7.21 183	0.79 20	8	1.34 34
40	4.09 104	0.16 4	0.39 10	1.30 33	0.47 12	6.30 160	2.17 55	2.56 65	1.40 35.5	0.77 19.5	0.89 22.5	0.39 10	8.08 205	0.99 25	8	1.65 42
50	5.00 127	0.16 4	0.59 15	1.54 39	0.63 16	6.93 176	2.76 70	3.23 82	1.93 49.0	0.83 21.0	1.16 29.5	0.47 12	9.09 231	1.18 30	13	1.97 50
63	5.96 151.5	0.16 4	0.59 15	1.58 40	0.59 15	7.53 191	2.76 7.0	3.23 82	1.93 49.0	0.83 21.0	1.16 29.5	0.47 12	9.69 246	1.18 30	13	1.97 50
80	7.17 182	0.16 4	0.63 16	2.28 58	0.63 16	8.47 215	3.55 90	4.33 110	2.44 62.0	1.10 28.0	1.40 35.5	0.63 16	11.50 292	1.18 30	17	2.36 60
100	8.15 207	0.16 4	0.63 16	2.28 58	0.71 18	9.06 230	3.62 92	4.53 115	2.56 65.0	1.06 27.0	1.52 38.5	0.63 16	12.09 307	1.18 30	17	2.36 60
125	8.94 227	0.16 4	0.98 25	2.76 70	1.06 27	11.11 282	4.81 122	6.07 154	3.35 85.0	1.46 37	1.79 45.5	0.79 20	15.13 384	1.77 45	17	3.15 80



## FSE Blocking Unit

### Ordering Details

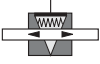
#### Ordering Details for AZ Cylinder with FSE Blocking Unit

Description	Symbol	Bore Ø	Type #	Order #
Double acting, with adjustable cushions, magnetic piston, Blocking unit and rod extension		32mm	AZ5032/...-FSE	PA 58347-....
		40mm	AZ5040/...-FSE	PA 59267-....
		50mm	AZ5050/...-FSE	PA 60347-....
		63mm	AZ5063/...-FSE	PA 61287-....
		80mm	AZ5080/...-FSE	PA 62187-....
		100mm	AZ5100/...-FSE	PA 63087-....
		125mm	DZ 5125/...-FSE (M24x2)	PA 64017-....
		125mm	DZ 5125/...-FSE (M27x2)	PA 64027-....

Add stroke length (mm, 4 digits)

- Stroke lengths: any mm increment up to 500mm standard
- Contact factory for special stroke lengths

#### Ordering Details for FSE Blocking Unit (without cylinder)

Description	Symbol	Bore Ø	Type #	Order #
Note: Requires cylinder with rod extension		32mm	FSE 032	KC 8227
		40mm	FSE 040	KC 8228
		50mm	FSE 050	KC 8229
		63mm	FSE 063	KC 8230
		80mm	FSE 080	KC 8231
		100mm	FSE 100	KC 8232
		125mm	FSE 125	KC 8233

Proximity Sensors/Brackets: See Page 73

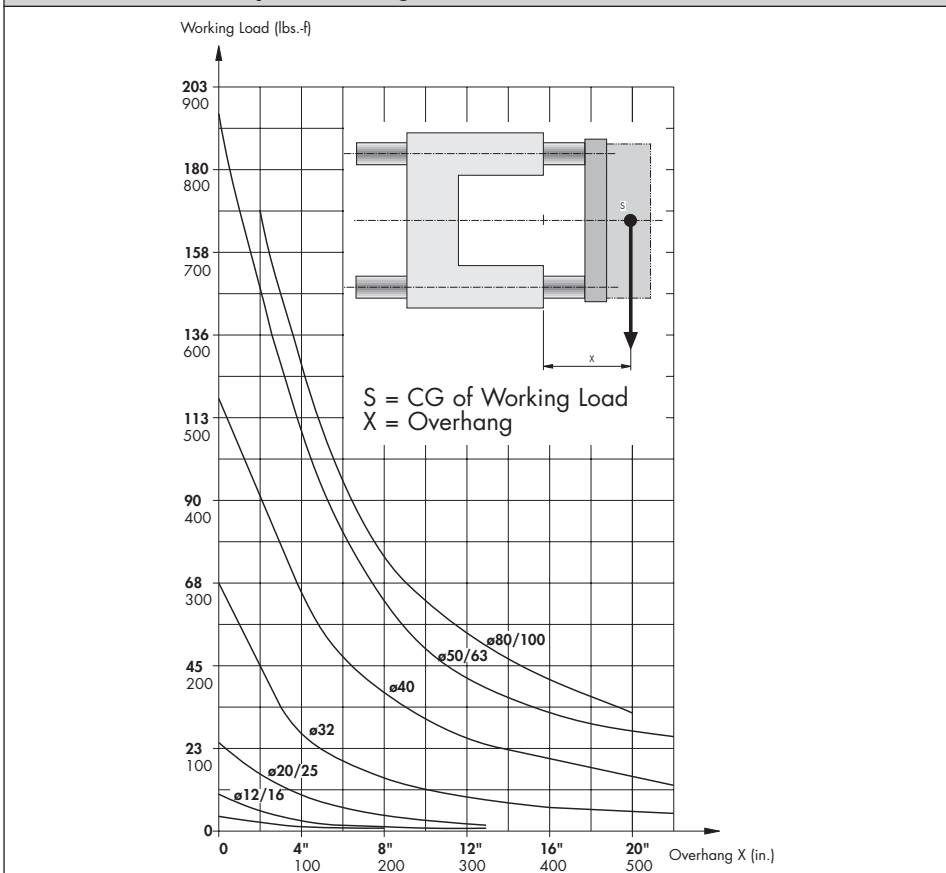
## FEU Linear Guide

### Specifications

**Series FEUG**  
**Linear Guide, "U-Form"**  
 For cylinders conforming to  
 ISO 6431/6432  
 Ø8mm - 100mm

Features							
Installation		In any Position					
Temperature Range		Min. -4° F (-20° C) Max. +176° F (+80° C)					
Material							
Guide Body		Aluminium, Anodized					
Guide Rods		Stainless Steel					
Guide Bushing		Sintered Bronze					
Mounting Plate		Aluminium, Anodized					
Piston Rod Mounting		Stainless Steel					
Weight	<b>Bore</b>	<b>ø8/10</b>	<b>ø12/16</b>	<b>ø20/25</b>			
With 100mm Stroke	<b>lbs. (kg)</b>	<b>0.44 (0.20)</b>	<b>0.84 (0.38)</b>	<b>1.50 (0.68)</b>			
Per add. 100mm Stroke	<b>lbs. (kg)</b>	<b>0.11 (0.05)</b>	<b>0.18 (0.08)</b>	<b>0.29 (0.13)</b>			
Weight (mass)	<b>Bore</b>	<b>ø32</b>	<b>ø40</b>	<b>ø50</b>	<b>ø63</b>	<b>ø80</b>	<b>ø100</b>
With 100mm Stroke	<b>lbs.</b>	<b>2.91</b>	<b>4.37</b>	<b>7.39</b>	<b>10.14</b>	<b>18.30</b>	<b>23.92</b>
	<b>kg</b>	1.32	1.98	3.35	4.60	8.30	10.85
Per add. 100mm Stroke	<b>lbs.</b>	<b>0.40</b>	<b>0.71</b>	<b>1.10</b>	<b>1.10</b>	<b>1.70</b>	<b>1.70</b>
	<b>kg</b>	0.18	0.32	0.50	0.50	0.77	0.77

### Maximum working load in relation to overhang - FEUG version with plain bearings



## FEU Linear Guide

### Ordering Information

### Linear Guide, "U-Form" Type: FEU

**Example:** Bore: Ø50mm  
Stroke: 160mm  
Type: FEUG 50/160  
Order No. PD 38019-0160

ISO 6432 Cylinders Plain Bearing: Type FEUG		8-10mm		12-16mm		20mm		25mm	
Bore Ø		FEUG 8-10/xx		FEUG 12-16/xx		FEUG 20/xx		FEUG 25/xx	
Type #		PD 38013-		PD 38014-		PD 38015-		PD 38016-	
Order #		PD 38013-		PD 38014-		PD 38015-		PD 38016-	
Strokes (MM)	(xx)								
25		0025		—		—		—	
50		0050		0050		0050		0050	
100		0100		0100		0100		0100	
160		—		—		0160		0160	
200		—		0200		0200		0200	
250		—		—		0250		0250	
320		—		—		0400		0400	

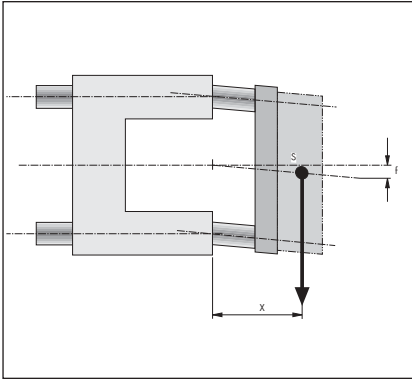
ISO 6431 Cylinders Plain Bearing: Type FEUG		32mm		40mm		50mm		63mm		80mm		100mm	
Bore Ø		FEUG 32/xx		FEUG 40/xx		FEUG 50/xx		FEUG 63/xx		FEUG 80/xx		FEUG 100/xx	
Type #		PD 38017-		PD 38018-		PD 38019-		PD 38020-		PD 38021-		PD 38022-	
Order #		PD 38017-		PD 38018-		PD 38019-		PD 38020-		PD 38021-		PD 38022-	
Strokes (MM)													
50		0050	0050	0050	0050	0050	0050	0050	0050	0050	0050	0050	0050
100		0100	0100	0100	0100	0100	0100	0100	0100	0100	0100	0100	0100
160		0160	0160	0160	0160	0160	0160	0160	0160	0160	0160	0160	0160
200		0200	0200	0200	0200	0200	0200	0200	0200	0200	0200	0200	0200
250		0250	0250	0250	0250	0250	0250	0250	0250	0250	0250	0250	0250
320		0320	0320	0320	0320	0320	0320	0320	0320	0320	0320	0320	0320

**Note:** All units use metric mounting threads only.  
Contact factory for special stroke lengths.

## Linear Guides Only: Corresponding Cylinders Need to be Ordered Separately!

## FEU Linear Guide

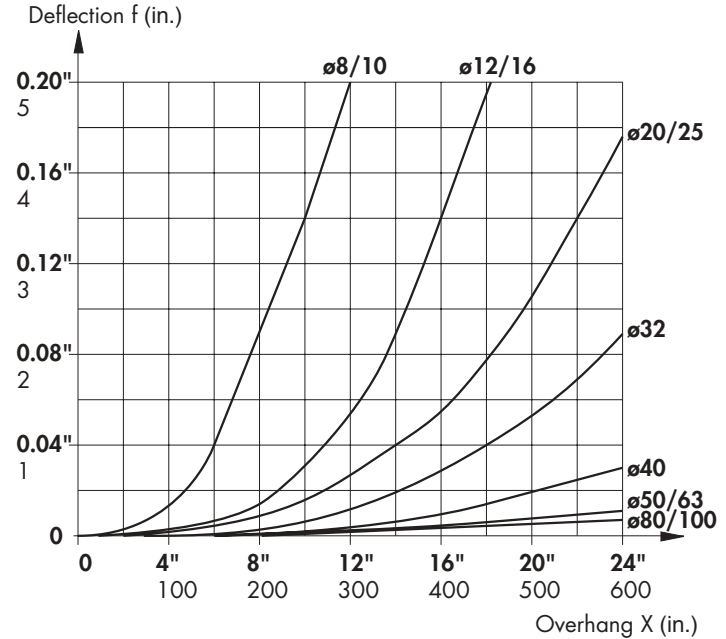
### Cylinder Details



- S = CG of working load
- X = Overhang
- f = Deflection

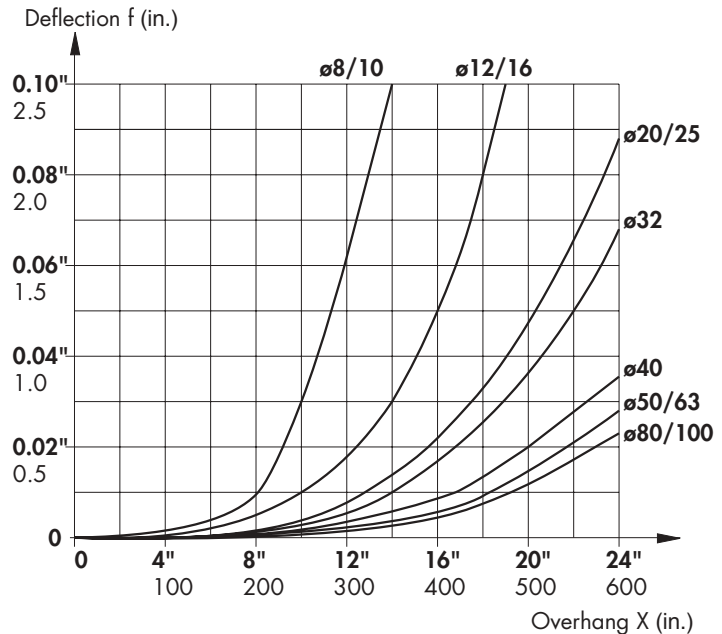
### Deflection -FEUG version with plain bearings

Diagram 1 - Deflection with a working load of 23 lbs.



The total deflection is the sum of the deflection under own weight (Diagram 2) and the deflection under load (Diagram 1).  
The deflection for every 23 lb. load is shown in Diagram 1.

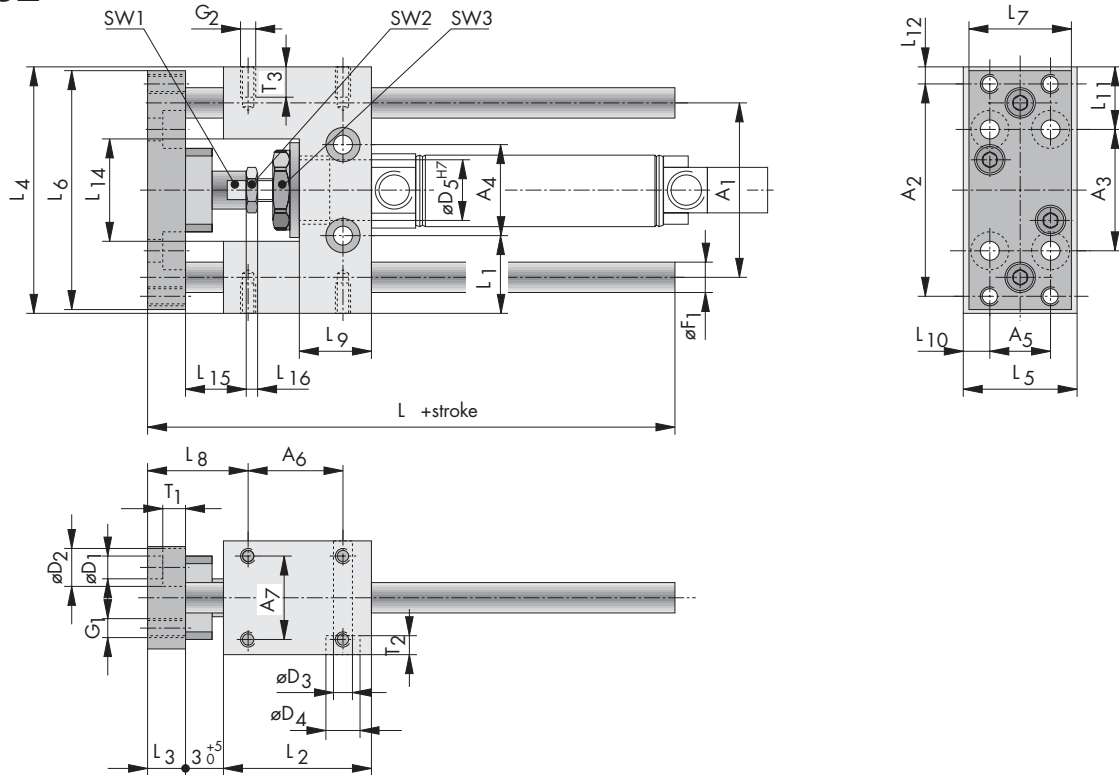
Diagram 2 - Deflection under own weight



## FEU Linear Guide

### Dimensional Details

### FEUG Ø8-25mm ISO 6432



Bore Ø	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>	A <sub>6</sub>	A <sub>7</sub>	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub> <sup>H7</sup>	F <sub>1</sub>	G <sub>1</sub>	G <sub>2</sub>	L <sub>1+stroke</sub>	L <sub>2</sub>	L <sub>3</sub>	L <sub>4</sub>
8	1.57 40	1.65 42	0.98 25	0.94 24	0.63 16	0.75 19	0.75 19	0.22 5.5	0.39 10	0.18 4.5	-	0.47 12	0.24 6	M5	M4	2.36 60	1.38 35	0.39 10	2.20 56
10	1.57 40	1.65 42	0.98 25	0.94 24	0.63 16	0.75 19	0.75 19	0.22 5.5	0.39 10	0.18 4.5	-	0.47 12	0.24 6	M5	M4	2.36 60	1.38 35	0.39 10	2.20 56
12	1.81 46	1.81 46	1.26 32	0.94 24	0.63 16	0.98 25	0.87 22	0.22 5.5	0.39 10	0.22 5.5	-	0.63 16	0.31 8	M5	M4	2.72 69	1.54 39	0.39 10	2.56 65
16	1.81 46	1.81 46	1.26 32	0.94 24	0.63 16	0.98 25	0.87 22	0.22 5.5	0.39 10	0.22 5.5	-	0.63 16	0.31 8	M5	M4	2.72 69	1.54 39	0.39 10	2.56 65
20	2.28 58	2.68 68	1.57 40	1.50 38	0.79 20	1.28 32.5	0.91 23	0.22 5.5	0.39 10	0.26 6.6	0.43 11	0.87 22	0.39 10	M5	M6	3.35 85	2.17 55	0.47 12	3.11 79
25	2.28 58	2.68 68	1.57 40	1.50 38	0.79 20	1.28 32.5	0.91 23	0.22 5.5	0.39 10	0.26 6.6	0.43 11	0.87 22	0.39 10	M5	M6	3.35 85	2.17 55	0.47 12	3.11 79
Bore Ø	L <sub>5</sub>	L <sub>6</sub>	L <sub>7</sub>	L <sub>8</sub>	L <sub>9</sub>	L <sub>10</sub>	L <sub>11</sub>	L <sub>12</sub>	L <sub>13</sub>	L <sub>14</sub>	L <sub>15</sub>	L <sub>16</sub>	SW1	SW2	SW3	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	
8	1.02 26	2.13 54	0.98 25	0.83 21 <sup>+5</sup> <sub>0</sub>	0.67 17	0.20 5	0.61 15.5	0.28 7	0.63 16	0.94 24	0.75 19	0.09 2.2	9	a	15	0.22 5.7	-	0.31 8	
10	1.02 26	2.13 54	0.98 25	0.83 21 <sup>+5</sup> <sub>0</sub>	0.67 17	0.20 5	0.61 15.5	0.28 7	0.63 16	0.94 24	0.75 19	0.09 2.2	9	a	15	0.22 5.7	-	0.31 8	
12	1.18 30	2.48 63	1.06 27	0.77 19.5 <sup>+5</sup> <sub>0</sub>	0.75 19	0.28 7	0.65 16.5	0.16 4	0.81 20.5	1.06 27	0.63 16	0.13 3.2	9	a	19	0.22 5.7	-	0.31 8	
16	1.18 30	2.48 63	1.06 27	0.77 19.5 <sup>+5</sup> <sub>0</sub>	0.75 19	0.28 7	0.65 16.5	0.16 4	0.81 20.5	1.06 27	0.63 16	0.13 3.2	9	a	19	0.22 5.7	-	0.31 8	
20	1.34 34	2.99 76	1.26 32	0.94 24 <sup>+5</sup> <sub>0</sub>	0.98 25	0.28 7	0.77 19.5	0.22 5.5	0.81 20.5	1.46 37	1.14 29	0.16 4	13	a	27	0.22 5.7	-	0.55 14	
25	1.34 34	2.99 76	1.26 32	0.94 24 <sup>+5</sup> <sub>0</sub>	0.98 25	0.28 7	0.77 19.5	0.22 5.5	0.81 20.5	1.46 37	0.91 23	0.24 6	13	a	27	0.22 5.7	0.28 7	0.55 14	



## FEHG & FEHK Linear Guide

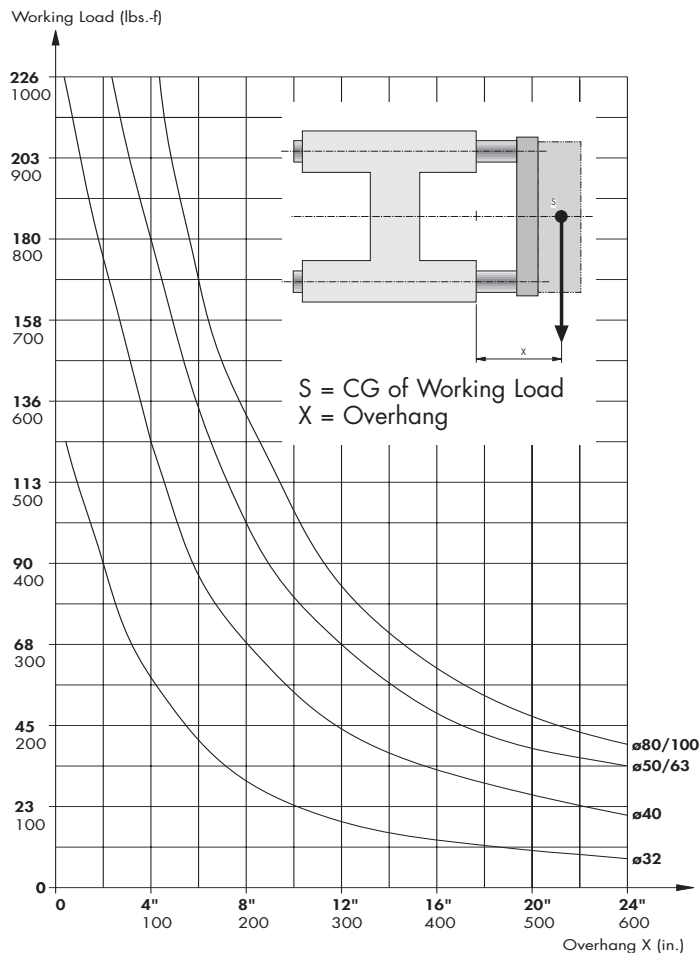
### Specifications

### Series FEHG & FEHK Linear Guide, "H-Form"

For cylinders conforming to  
ISO 6431  
Ø32mm - 100mm

Features							
Installation		In any Position					
Temperature Range		Min. -4° F (-20° C) Max. +176° F (+80° C)					
Material							
Guide Body		Aluminium, Anodized					
Guide Rods		Stainless Steel for FEHG Version Stainless Steel, Hardened for FEHK Version					
Guide Bushing		Sintered Bronze for FEHG Version Linear Ball Bearings for FEHK Version					
Mounting Plate		Aluminium, Anodized					
Piston Rod Mounting		Stainless Steel					
Weight (mass)	<b>Bore</b>	<b>ø32</b>	<b>ø40</b>	<b>ø50</b>	<b>ø63</b>	<b>ø80</b>	<b>ø100</b>
With 4" (100mm) Stroke	<b>lbs. (kg)</b>	<b>3.13 (1.42)</b>	<b>4.96 (2.25)</b>	<b>8.38 (3.80)</b>	<b>11.13 (5.05)</b>	<b>20.24 (9.18)</b>	<b>25.01 (11.8)</b>
Per add. 4" (100mm) Stroke	<b>lbs. (kg)</b>	<b>0.40 (0.18)</b>	<b>0.62 (0.28)</b>	<b>1.21 (0.55)</b>	<b>1.21 (0.55)</b>	<b>1.70 (0.77)</b>	<b>1.70 (0.77)</b>

### Maximum working load in relation to overhang - FEHG version with plain bearings



## FEHG & FEHK Linear Guide

### Ordering Information

### Linear Guide, "H-Form"

Type: FEH

**Example:** Bore: Ø50mm  
 Stroke: 160mm  
 Type: FEHG 50/160  
 Order No. PD 38003-0160

ISO 6431 Cylinders Plain Bearing: Type HG		32mm	40mm	50mm	63mm	80mm	100mm
Bore Ø		FEHG 32/xx	FEHG 40/xx	FEHG 50/xx	FEHG 63/xx	FEHG 80/xx	FEHG 100/xx
Type #							
Order #		PD 38001-	PD 38002-	PD 38003-	PD 38004-	PD 38005-	PD 38006-
Strokes (MM)							
50		0050	0050	0050	0050	0050	0050
100		0100	0100	0100	0100	0100	0100
160		0160	0160	0160	0160	0160	0160
200		0200	0200	0200	0200	0200	0200
250		0250	0250	0250	0250	0250	0250
320		0320	0320	0320	0320	0320	0320

ISO 6431 Cylinders Roller Bearing: Type HK		32mm	40mm	50mm	63mm	80mm	100mm
Bore Ø		FEHK 32/xx	FEHK 40/xx	FEHK 50/xx	FEHK 63/xx	FEHK 80/xx	FEHK 100/xx
Type #							
Order #		PD 38007-	PD 38008-	PD 38009-	PD 38010-	PD 38011-	PD 38012-
Strokes (MM)							
50		0050	0050	0050	0050	0050	0050
100		0100	0100	0100	0100	0100	0100
160		0160	0160	0160	0160	0160	0160
200		0200	0200	0200	0200	0200	0200
250		0250	0250	0250	0250	0250	0250
320		0320	0320	0320	0320	0320	0320

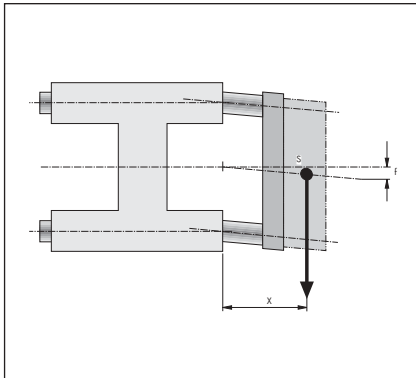
Note: All units use metric mounting threads only.  
 Contact factory for special stroke lengths.

## Linear Guides Only: Corresponding Cylinders Need to be Ordered Separately!



## FEHG & FEHK Linear Guide

### Cylinder Details

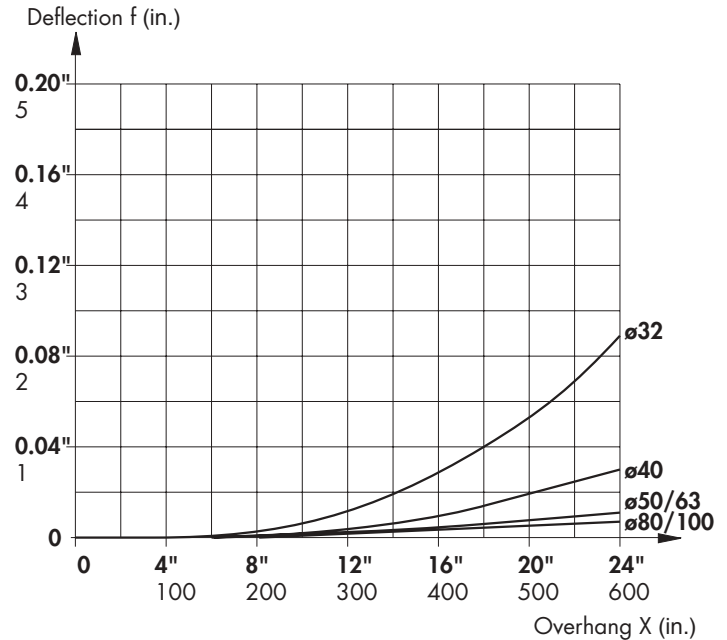


S = CG of working load  
 X = Overhang  
 f = Deflection

#### Deflection

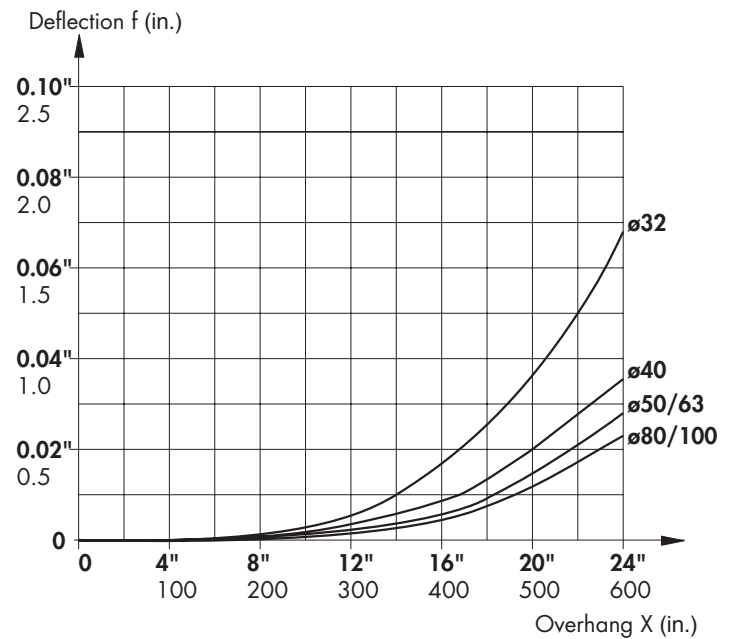
-FEHG version with plain bearings and FEHK version with ball bearings

Diagram 1 - Deflection with a working load of 23 lbs.



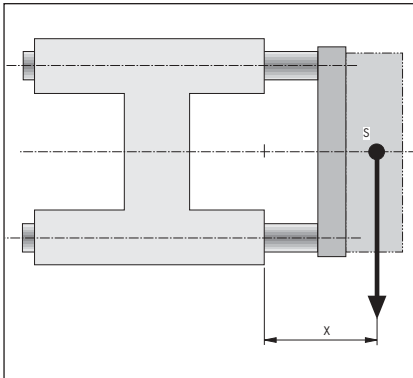
The total deflection is the sum of the deflection under own weight (Diagram 2) and the deflection under load (Diagram 1).  
 The deflection for every 23 lb. load is shown in Diagram 1.

Diagram 2 - Deflection under own weight



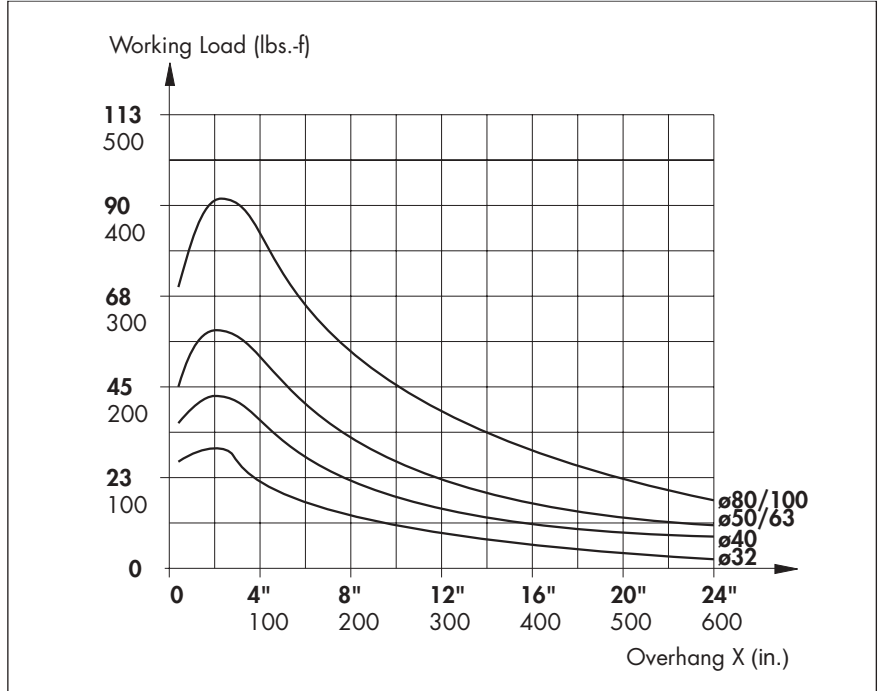
## FEHG & FEHK Linear Guide

### Cylinder Details



S = CG of working load  
X = Overhang

### Maximum working load in relation to overhang -FEHK version with ball bearings

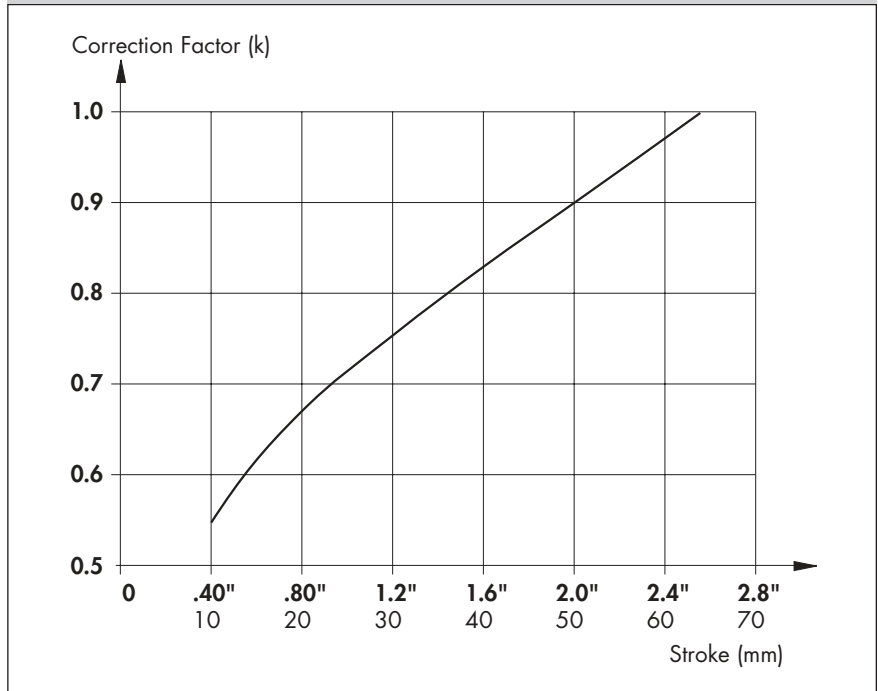


For short strokes, the working load figures obtained from the diagrams must be multiplied by a correction factor (k) (See Diagram).

In the working load curves for overhangs up to 60mm these short stroke corrections are already included.

In the case of impact loads, the maximum permissible working load must be halved.

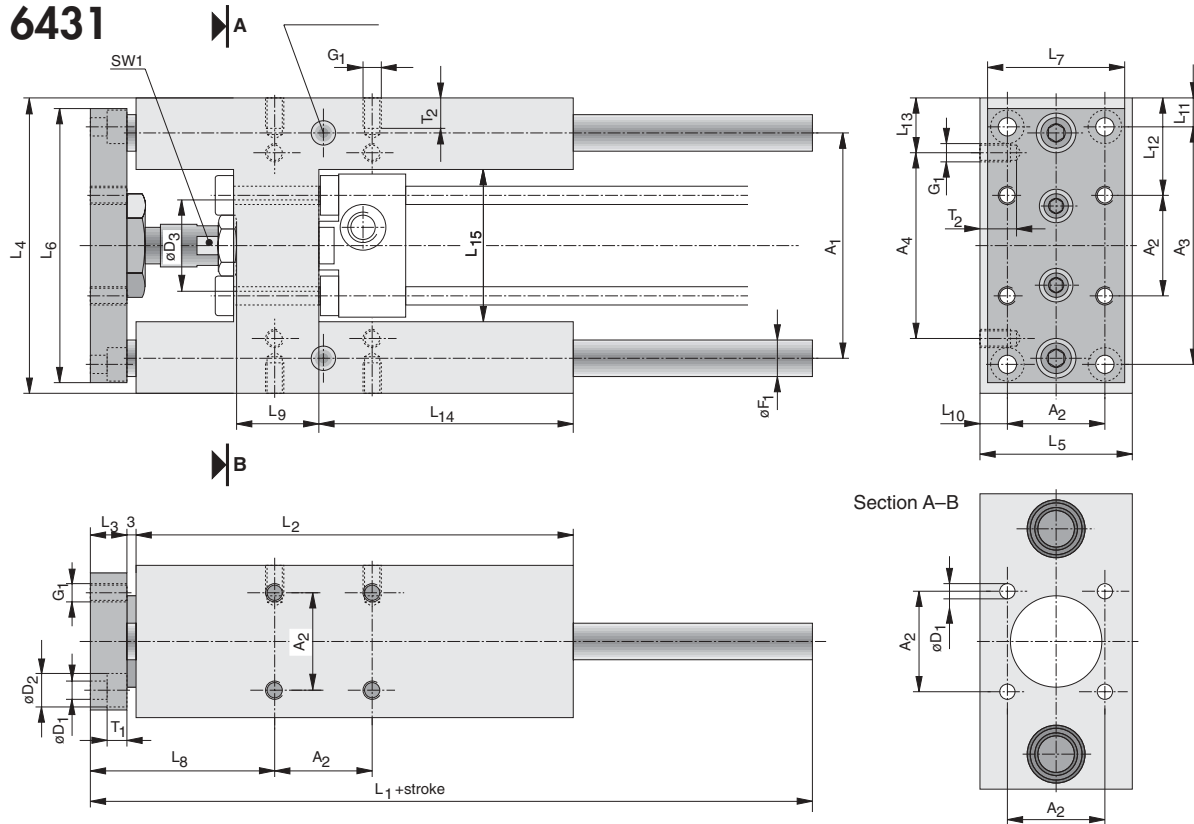
### Reduction of working load with short strokes -FEHK version with ball bearings



## FEHG & FEHK Linear Guide

### Dimensional Details

### FEHG & FEHK Ø32-100mm ISO 6431



Bore Ø	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	F <sub>1</sub>		G <sub>1</sub>	L <sub>1+stroke</sub>	L <sub>2</sub>	L <sub>3</sub>	L <sub>4</sub>	L <sub>5</sub>
								HG	HK						
32	2.91	1.28	3.07	2.4	0.26	0.43	1.18	0.55	(0.47)	M6	6.97	4.09	0.47	3.82	1.97
	74	32.5	78	61	6.6	11	30	14	(12)		177	104	12	97	50
40	3.43	1.5	3.31	2.72	0.26	0.43	1.38	0.70	(0.63)	M6	7.56	4.80	0.47	4.53	2.28
	87	38	84	69	6.6	11	35	18	(16)		192	122	12	115	58
50	4.09	1.83	3.94	3.35	0.35	0.59	1.57	0.87	(0.79)	M8	9.33	5.71	0.59	5.39	2.76
	104	46.5	100	85	9	15	40	22	(20)		237	145	15	137	70
63	4.69	2.22	4.13	3.94	0.35	0.59	1.77	0.87	(0.79)	M8	9.33	6.30	0.59	5.98	3.35
	119	56.5	105	100	9	15	45	22	(20)		237	160	15	152	85
80	5.83	2.83	5.12	5.12	0.43	0.71	1.77	0.98		M10	11.02	8.46	0.79	7.44	4.13
	148	72	130	130	11	18	45	25			280	215	20	189	105
100	6.77	3.5	5.91	5.91	0.43	0.71	2.17	0.98		M10	11.02	8.66	0.79	8.39	5.12
	172	89	150	150	11	18	55	25			280	220	20	213	130
Bore Ø	L <sub>6</sub>	L <sub>7</sub>	L <sub>8</sub>	L <sub>9</sub>	L <sub>10</sub>	L <sub>11</sub>	L <sub>12</sub>	L <sub>13</sub>	L <sub>14</sub>	L <sub>15</sub>	SW1	SW2	T <sub>1</sub>	T <sub>2</sub>	
32	3.54	1.77	2.35	1.1	0.34	0.37	1.27	0.71	1.73	1.99				0.26	0.39
	90	45	59.7	28	8.75	9.5	32.25	18	44	50.5	13	-	6.5	10	
40	4.33	2.13	2.48	1.3	0.39	0.61	1.52	0.91	2.01	2.30			0.26	0.39	
	110	54	63	33	10	15.5	38.5	23	51	58.5	15	-	6.5	10	
50	5.12	2.48	2.76	1.57	0.46	0.73	1.78	1.02	2.36	2.78			0.35	0.51	
	130	63	70.2	40	11.75	18.5	45.25	26	60	70.5	22	-	9	13	
63	5.71	3.15	2.89	1.57	0.56	0.93	1.88	1.02	2.95	3.37			8.35	0.51	
	145	80	73.5	40	14.25	23.5	47.75	26	75	85.5	22	-	9	13	
80	7.09	3.94	3.5	1.34	0.65	1.16	2.3	1.16	5.04	4.15			0.43	0.63	
	180	100	89	34	16.5	29.5	58.5	29.5	128	105.4	27	30	11	16	
100	7.87	4.72	3.56	1.54	0.81	1.24	2.44	1.24	5.04	5.13			0.43	0.63	
	200	120	90.5	39	20.5	31.5	62	31.5	128	130.4	27	30	11	16	

## Specifications

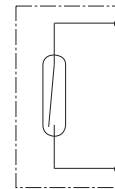
Features																																																																																											
Type	REED HALL EFFECT NPN or PNP																																																																																										
Applicable Series Configurations	All Cylinders Individual Mounts for Different Cylinder Types																																																																																										
Construction Materials																																																																																											
Body	Macrolon, Glass Fiber																																																																																										
Mounting Bracket	Aluminum, Anodized																																																																																										
Cable	PVC (Optional: PUR- Polyurethane)																																																																																										
Characteristics																																																																																											
Operating Temperature	-13° F (-25°C) to 167° F (+75°C)																																																																																										
Accuracy	±0.0039"(0.1mm)																																																																																										
Voltage	Cable Type: 10 - 230 vAC/DC Reed 10 - 30 DC Hall																																																																																										
	Plug Type: 10 - 70 vAC/DC Reed 10 - 30 DC Hall																																																																																										
Switch Current	DZ, SZ 0.5A 0.2A																																																																																										
	R, ROV, RDV 1.5A 0.2A																																																																																										
Switch Capacity	DZ, SZ 20W, 30VA max.																																																																																										
	R, ROV, RDV 10W, 10VA max.																																																																																										
Switching Procedures	2200/min 200/sec																																																																																										
Electrical Protection	IP67 according to DIN 40050																																																																																										
Insulation	F according to VDE 0580																																																																																										
Connection	Cable (PVC) or Plug-in																																																																																										
Cycle Rate	(40 hZ)																																																																																										
Installation	In any Position																																																																																										
Weight	See Dimensions																																																																																										
Design																																																																																											
Switching Characteristics																																																																																											
<p> <math>V_{max} =</math>                      H = Hysteresis                      S = Response time  <math>t_a</math> = response time for sensor                 </p>	<p><b>"S" value</b></p> <table border="1"> <thead> <tr> <th rowspan="2">Bore</th> <th colspan="2">SZ</th> <th colspan="2">DZ/B/Q/V</th> <th colspan="2">ROV</th> </tr> <tr> <th>Reed</th> <th>H.E</th> <th>Reed</th> <th>H.E</th> <th>Reed</th> <th>H.E</th> </tr> </thead> <tbody> <tr><td>8-12</td><td>10</td><td>9</td><td>--</td><td>--</td><td>22</td><td>10</td></tr> <tr><td>16</td><td>16</td><td>11</td><td>--</td><td>--</td><td>15</td><td>12</td></tr> <tr><td>20</td><td>8</td><td>9</td><td>--</td><td>--</td><td>17</td><td>13</td></tr> <tr><td>25</td><td>17</td><td>12</td><td>--</td><td>--</td><td>18</td><td>25</td></tr> <tr><td>32</td><td>14</td><td>9</td><td>11</td><td>10</td><td>16</td><td>13</td></tr> <tr><td>40</td><td>12</td><td>9</td><td>11</td><td>10</td><td>15</td><td>11</td></tr> <tr><td>50</td><td>17</td><td>12</td><td>13</td><td>11</td><td>16</td><td>11</td></tr> <tr><td>63</td><td>20</td><td>15</td><td>13</td><td>11</td><td>17</td><td>12</td></tr> <tr><td>80</td><td>17</td><td>11</td><td>15</td><td>12</td><td>--</td><td>--</td></tr> <tr><td>100</td><td>17</td><td>12</td><td>15</td><td>13</td><td>--</td><td>--</td></tr> <tr><td>125</td><td>--</td><td>--</td><td>--</td><td>--</td><td>--</td><td>--</td></tr> </tbody> </table>	Bore	SZ		DZ/B/Q/V		ROV		Reed	H.E	Reed	H.E	Reed	H.E	8-12	10	9	--	--	22	10	16	16	11	--	--	15	12	20	8	9	--	--	17	13	25	17	12	--	--	18	25	32	14	9	11	10	16	13	40	12	9	11	10	15	11	50	17	12	13	11	16	11	63	20	15	13	11	17	12	80	17	11	15	12	--	--	100	17	12	15	13	--	--	125	--	--	--	--	--	--
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## Sensors

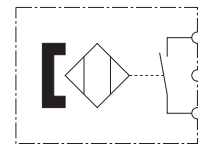
### All Cylinders

Ø8mm - 125mm

#### Reed Type



#### Hall Effect Type



#### Features:

##### Cable or Plug-In Types

##### Reed Type

- LED
- Surge Supression
- DC-Reverse Polarity Protection

##### Hall Effect Type

- LED
- Surge Supression
- Reverse Polarity Protection



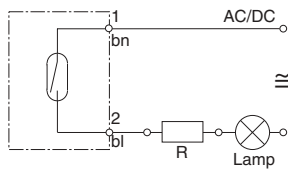
## Sensors

### Sensor Details

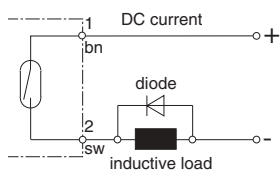
Description	Reed	Hall Effect PNP	Hall Effect NPN			
<b>Series: AZ, AZV, SZ, NZK</b>						
Cable Type: 8ft (2.5m)	KL 3043	KL 3055	KL 3059			
Plug-In Type:	KL 3046	KL 3054	KL 3060			
<b>Series: R, ROV, RDV, RK</b>						
Cable Type: 8ft (2.5m)	KL 3043	KL 3055	KL 3059			
Plug-In Type:	KL 3046	KL 3054	KL 3060			
<b>Mounting Brackets</b>						
Bore: 10	PD 45854	PD 45854	PD 45854			
Bore: 12	PD 45855	PD 45855	PD 45855			
Bore: 16	PD 45856	PD 45856	PD 45856			
Bore: 20	PD 45857	PD 45857	PD 45857			
Bore: 25	PD 45858	PD 45858	PD 45858			
Bore: 32	PD 45705	PD 45705	PD 45705			
Bore: 40	PD 45859	PD 45859	PD 45859			
Bore: 50	PD 45860	PD 45860	PD 45860			
Bore: 63	PD 45861	PD 45861	PD 45861			
<b>Cable Set for Plug-In Sensors</b>						
	<u>Push Type</u>	<u>Twist Type</u>	<u>Push Type</u>	<u>Twist Type</u>	<u>Push Type</u>	<u>Twist Type</u>
Length: 8 ft (2.5m)	KY 3240	KC 3102	KY 3240	KC 3102	KY 3240	KC 3102
Length: 16 ft (5m)	KY 3241	KC 3104	KY 3241	KC 3104	KY 3241	KC 3104
<b>Series: AZZ, DZB, DZBA, DZ</b>						
8ft (2.5m)	KY 3235	KL 3237	KC 3048			
	KY 3236	KL 3238	KC 3049			
<b>Mounting Brackets</b>						
Bore: 32, 40, 50, 63	KY 3217	KY 3217	KY 3217			
Bore: 80, 100, 125	KY 3218	KY 3218	KY 3218			
Bore: 160, 200	KY 3219	KY 3219	KY 3219			
Bore: 250	KC 3146	KC 3146	KC 3146			

### Reed Sensor Wiring Examples:

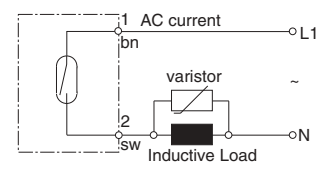
Using a Resistor in Series



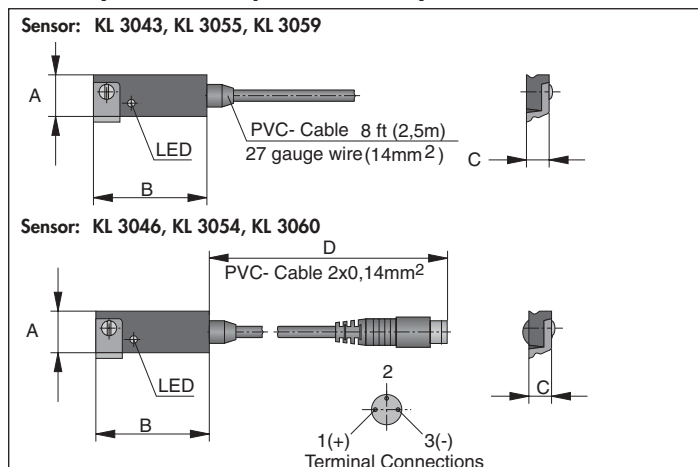
Using a DIODE



Using a VARISTOR



### For all cylinders except DZB & DZ cylinders



### Wiring Connections for all sensors

	1 (+)	2	3 (-)
Reed	Brown (br)		White
PNP	Brown (br)	Black (sw)	Blue (bl)
NPN	Brown (br)	Black (sw)	Blue (bl)

Dimensions	INCH/mm			
	A	B	C	D
Sensors- All	0.43/11	1.18/30	0.24/6	3.94/100
Weights	Sensor w/bracket			
Cable Type	1.59/0.045			
Plug-in Type	0.35/ 0.010			

# Sensors

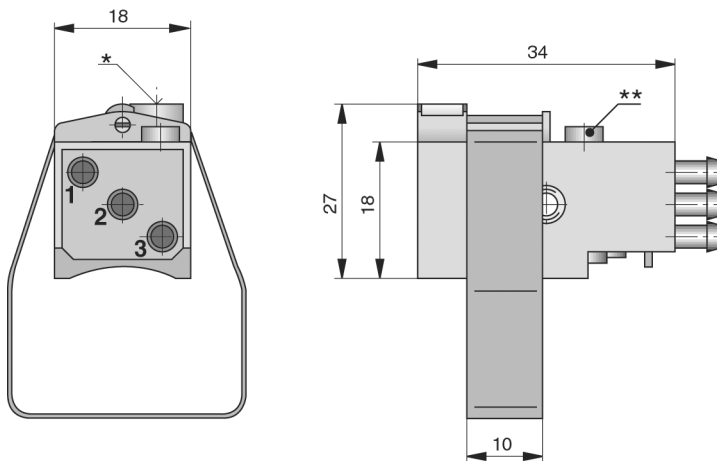
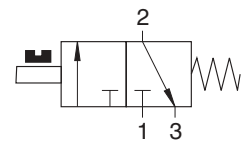
## Air Piloted Switch

## Sensors

Ø32mm - 100mm

Features	
Type	3/2 Valve- NC, 2 Position/Spring Return 3 way
Applicable Series	AZ, AZV
Construction Materials	
Body	Macrolon, Glass Fiber
Mounting Bracket	Aluminum, Anodized
Connection	3- 3mm O.D. Barbs
Characteristics	
Operating Temperature	14° F (-10°C) to 140°F (+60°C)
Operating Pressure	30 PSI (2 bar) to 90 PSI (6 bar)
Normal Operating Pressure	90 PSI (6 bar)
Flow	Cv 0.04 (40 l/min)
Cycle Rate	40 Hz
Switching Accuracy	± 0.008" (0.2 mm) w/o Air
Filtration	40 Micron
Media	Filtered and Regulated Compressed Air
Installation	In any Position
Weight	Sensor 0.49 ozs (0.014 kg) Sensor & Bracket 0.99 ozs (0.028 kg)
Part Number	
Sensor – Air Type	KZ 2364
Mounting Bracket	KC 8255

### 3-Way Normally Closed Valve





## Sensors

### Welding Proof Switch

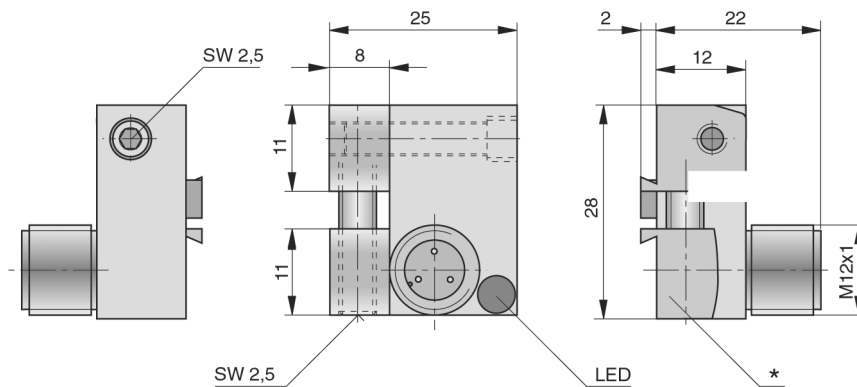
Features	
Type	Hall Effect; NPN or PNP
Applicable Series	AZ, SZ
Construction Materials	
Body	PA12-GF30 Metal Housing
Mounting Bracket	Aluminum, Anodized
Connection	3-Pole Connector M12x1
Characteristics	
Operating Temperature	-13° F (-25°C) to 158°F (70°C)
Service Life	10x10 <sup>6</sup> Switching Cycles
Hysteresis	≤1.0mm
Repeatability	≤0.1mm
Voltage	10-30 vDC
Current Drop	1.8 vDC Max.
Current Consumption	2.0 mA Max.
Switching Current	.2A Max.
Switching Frequency	40 Hz
Electrical Protection	IP 67
Operation Indicator	LED
Part Number	
Sensor – PNP Type	KC 3372
Sensor – NPN Type	KC 3375
Mounting Bracket	KC 8293

## Sensors

Ø32 - 100mm

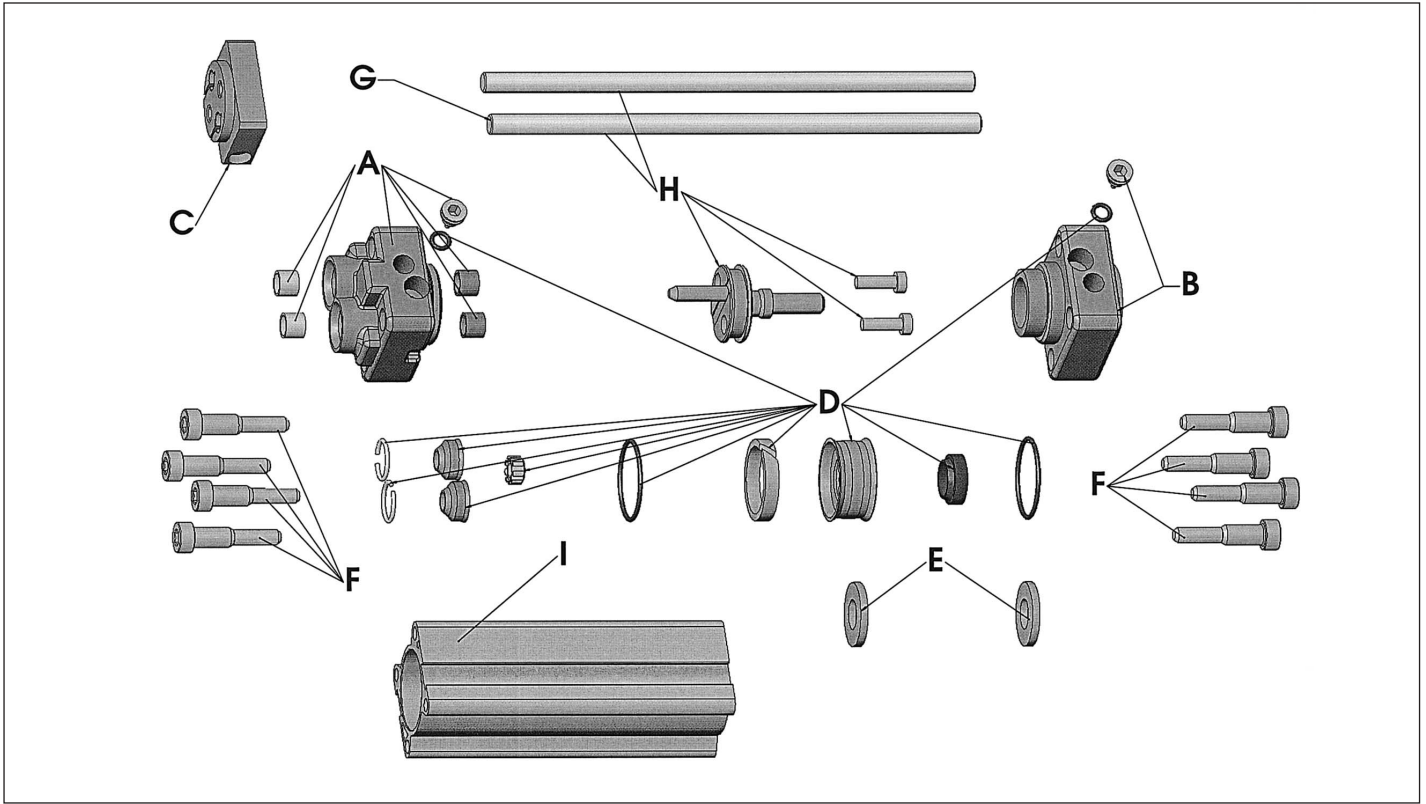
### Version

- PNP or NPN
- LED Light
- Short Circuit Protection
- Pole Reversal Protection



# Spare Parts

## AZV Replacement Parts





# Spare Parts



## AZV Twin Rod Cylinder

		Bore Ø						
		25mm	32mm	40mm	50mm	63mm	80mm	100mm
<b>A. Front Head</b> Twin Rod- AZV	<b>INCH</b> Metric		<b>PD 28543</b> PD 27147	<b>PD 28544</b> PD 27148	<b>PD 28545</b> PD 27149	<b>PD 28546</b> PD 27150	<b>PD 28547</b> PD 27151	<b>PD 28548</b> PD 27152
<b>Front Head</b> Sgl Rod- AZV 3D	<b>INCH</b> Metric		<b>PD 26432</b> PD 21230	<b>PD 26433</b> PD 21231	<b>PD 26434</b> PD 21232	<b>PD 26435</b> PD 21233	<b>PD 26436</b> PD 23041	<b>PD 26437</b> PD 21235
<b>B. Rear Head</b> Twin Rod- AZV	<b>INCH</b> Metric		<b>PD 24505</b> PD 21236	<b>PD 24511</b> PD 21237	<b>PD 24517</b> PD 21238	<b>PD 24523</b> PD 21239	<b>PD 24529</b> PD 23047	<b>PD 24535</b> PD 21241
<b>C. Tooling Plate</b> Assembly	<b>INCH</b> Metric		<b>PD 24506</b> PD 23981	<b>PD 24512</b> PD 23982	<b>PD 24518</b> PD 23983	<b>PD 24524</b> PD 23984	<b>PD 24530</b> PD 23985	<b>PD 24536</b> PD 23986
<b>D. Seal Kits*</b> AZV Std cylinder	NBR VITON	PD 29168	PD 23003 PD 25555	PD 23004 PD 25556	PD 23005 PD 25557	PD 23006 PD 25558	PD 23007 PD 25031	PD 23008 PD 25030
<b>Seal Kits</b> AZV 3D	NBR VITON		PD 24464	PD 24465 Contact factory for details	PD 24147 Contact factory for details	PD 24466	PD 24467	PD 24468
<b>Seal Kits</b> AZV 4D	NBR VITON		PD 24475	PD 24476 Contact factory for details	PD 24477 Contact factory for details	PD 24478	PD 24479	PD 24480
<b>E. Magnet Ring</b>			PD22466	PD 22465	PD22188	PD22298	PD22543	PD22544
<b>F. End Cap Screws</b>	<b>INCH</b> MM		<b>2014-0352</b> 2014-0301	<b>2014-0352</b> 2014-0301	<b>2014-0552</b> 2014-0501	<b>2014-0552</b> 2014-0501	<b>2014-0852</b> 2014-0802	<b>2014-0852</b> 2014-0802
<b>G. Piston Rod</b> Each rod	(+ stroke) <b>INCH</b> MM		4410-0351+ 4410-0301+	4410-0451+ 4410-0401+	4410-0551+ 4410-0501+	4410-0651+ 4410-0601+	4410-0851+ 4410-0801+	4410-1051+ 4410-1001+
<b>H. Piston/Rod Assy</b> (Piston, magnet, Rods and complete seal kit)	(+ stroke) <b>INCH</b> MM		4354-0351+ 4354-0301+	4354-0451+ 4354-0401+	4354-0551+ 4354-0501+	4354-0651+ 4354-0601+	4354-0851+ 4354-0801+	4354-1051+ 4354-1001+
<b>I. AZV-U Barrel-</b> With 8 assy screws	(+ stroke) <b>INCH</b> MM		4330-0351+ 4330-0301+	4330-0451+ 4330-0401+	4330-0551+ 4330-0501+	4330-0651+ 4330-0601+	4330-0851+ 4330-0801+	4330-1051+ 4330-1001+

\* NOTE: Seal Kits include all rubber seals in the cylinder. Piston, cushion, barrel, & rod seals

## Spare Parts

### Seal Kits

#### ISO CYLINDER - AZ

##### Seal Kits: AZ

Bore Ø	Order # NBR	Order # Viton
32mm	PD 39169	PD 39499
40mm	PD 39170	PD 39500
50mm	PD 39171	PD 39501
63mm	PD 39172	PD 39502
80mm	PD 39173	PD 39503
100mm	PD 39174	PD 39504

##### AZD

Order # NBR
PD 39381
PD 39382
PD 39383
PD 39384
PD 39385
PD 39386

#### ISO CYLINDER - DZ

##### Seal Kits: DZ

Bore Ø	Order # NBR	Order # Viton
125mm	PD 23011	PD 26969
160mm	PD 23013	PD 26995
200mm	PD 25006	PD 27427
250mm	PD 25872	PD 27976

#### COMPACT CYLINDER - SZ

##### Seal Kits: SZ, SZV

Bore Ø	Order # NBR
12mm	PD 35419
16mm	PD 35420
20mm	PD 35421
25mm	PD 35422
32mm	PD 44381
40mm	PD 44382
50mm	PD 44383
63mm	PD 44384
80mm	PD 44385
100mm	PD 44386

##### SZD

Order # NBR
—
—
—
—
PD 44489
PD 44490
PD 44491
PD 44492
PD 44493
PD 44494

#### COMPACT CYLINDER - NZK

##### Seal Kits: NZK

Bore Ø	Order # NBR	Order # Viton
32mm	PD 41478	PD 41574
40mm	PD 41479	PD 41575
50mm	PD 41480	PD 41576
63mm	PD 41481	PD 41577
80mm	PD 41482	PD 41578
100mm	PD 41483	PD 41579

##### NZKD

Order # NBR
PD 42095
PD 42096
PD 42097
PD 42098
PD 42099
PD 42100

#### BLOCKING CYLINDER - DZB

##### Seal Kits: DZB

Bore Ø	Order # NBR	Order # Viton
32mm	PD 30091	PD 30147
40mm	PD 30093	PD 30149
50mm	PD 30095	PD 30151
63mm	PD 27727	PD 28770
80mm	PD 26059	PD 28771
100mm	PD 26060	PD 28772
125mm	PD 26061	PD 28773

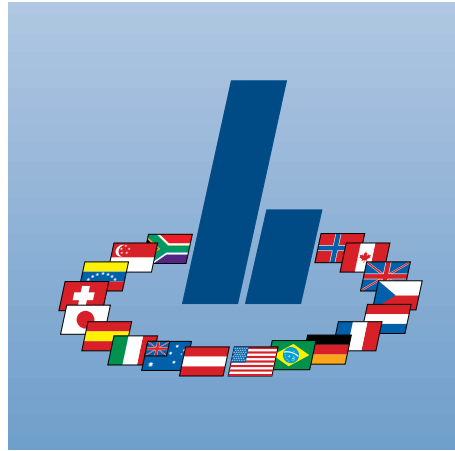
##### Seal Kits: DZBA

Bore Ø	Order # NBR	Order # Viton
32mm	PD 30092	PD 30147
40mm	PD 30094	PD 30149
50mm	PD 30096	PD 30151
63mm	PD 27727	PD 28770
80mm	PD 26059	PD 28771
100mm	PD 26060	PD 28772
125mm	PD 30743	PD 28745

#### All SEAL KITS INCLUDE:

Piston Seal, Rod Seal(s), Rod Seal Retaining Ring(s), Cushion Seals, Cushion Needle Seals, End Cap Seals.

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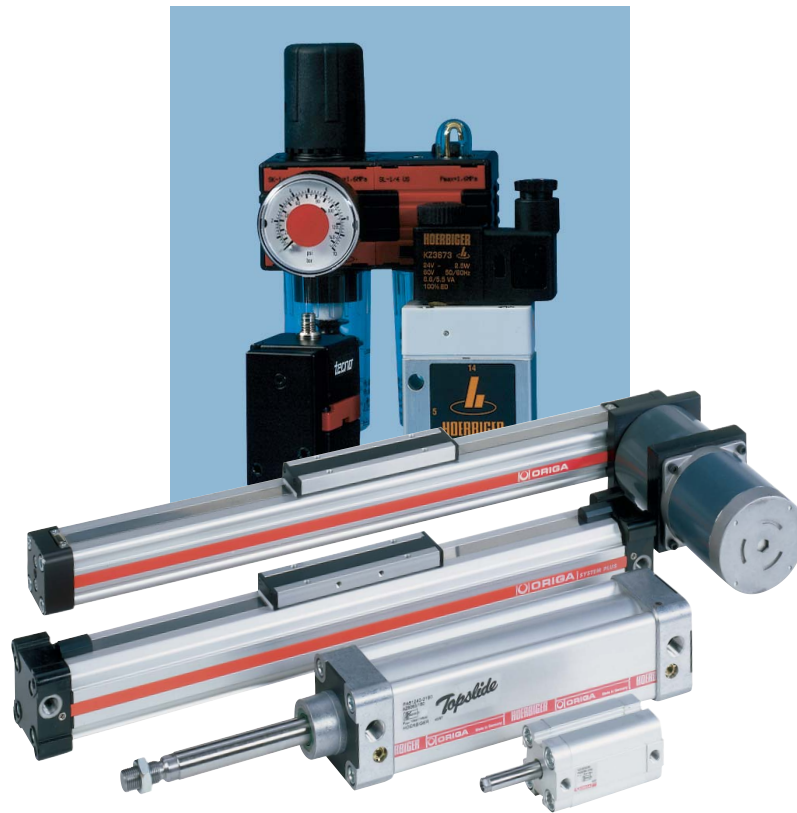


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