Servo Cylinders
Types: ZAED, ZBED and ZFED



Application
Opening, closing and stepless positioning of valves, slides, flappers, engine speed governors and injection pumps, louvers etc.

Function
The cylinder is designed for exact positioning proportional to the servo pressure at inlet E:
The servo pressure acts against the force of the control spring (5) via the roller diaphragm (6) and the piston (3). Diagram No. 1 shows the cylinder stroke over servo pressure for standard control springs.
The high performance rolling diaphragm (6) is pressure tight and stick-slip free. The active area of the diaphragm is constant. Polished surfaces contacts the active surface of the roller diaphragm. They are protected against incoming dirt by a filter plug.

⚠ **Attention! Never attempt to disassamble a cylinder whilst under pressure!**

Servo Cylinder ZAED

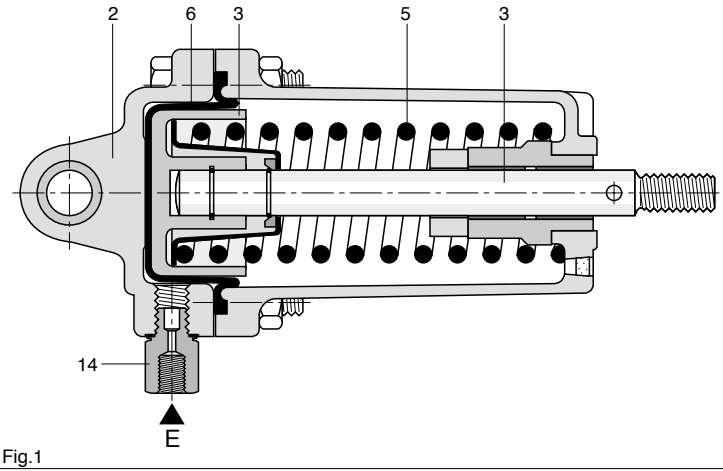


Fig.1

Portable screw compressor with ZAED **Example**

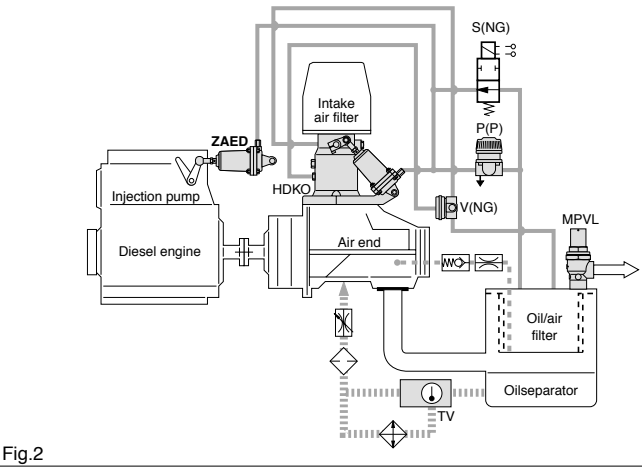


Fig.2

An inlet nozzle (14) protects the diaphragm against pressure shocks. It can be removed, if the cylinder is pressurized via proportional controller (e.g. HOERBIGER types P2... and P3...).
The cylinder is designed for non-lub service. The diaghragm surface facing the piston (3) is threated with a special powder (gray) for low friction and long service life. The piston rod (3) is made of polished stainless steel and guided by Teflon threated sliding bearings.

Installation
The signal pressure inlet E of the servo cylinder is connected to the control system (see Fig. 2)

Fastening of the Servo Cylinder
Types ZAED and ZBED are fastened via the bearing at the top of the cylinder cover (2)

ZAED (fig. 3): standard design with bronze bearing (fastening to fig. 6, fastening kit to fig. 8).

ZBED (fig. 4): shock dampening design with Delrin bearings (fastening to fig. 7, fastening kit to fig. 9).

Cylinders ZFED (fig. 5) are flange types.
The cylinder housing assembly ZF is equipped with a fastening thread and a counter nut.

Construction units which are actuated by the servo cylinder have to be connected to the cylinder rod (3), either directly (ZFED) or via ball joint and lever (ZAED, ZBED). Butterfly valves and louvers can be positioned within an angle of 90° by using standard equipment to fig. 10, 11, 12. Standard cylinder stroke is 40 mm (maximum stroke). Shorter strokes can be made available on request.
Free movement of the positioning and fastening equipment across the whole cylinder stroke ensures low friction and precise positioning. The cylinder rod might be turned around its axis for assembling and adjustment purposes.
Installation with inlet E facing downwards is recommended with humid air for drain of condensate.

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Details

Types		ZAED	ZBED	ZFED
Nominal diameter DN	mm	23		
Max.working pressure PS	bar (g)	10		
Installation dimensions	mm	Fig. 3	Fig. 4	Fig. 5
Cylinder stroke	mm	up to 40, standardstrokes 30, 40 • others on request		
Active diaphragm area	mm^2	approx. 1670		
Maximum pressure	bar (g)	up to 7 with a HOERBIGER type proportional controller connected to inlet E up to 10		
Stroke characteristic		according to select spring; see diagram 1		
Medium		perbunan compatible oil or pressurized air, filtered•recommended compressed air quality according to DIN ISO 8573-1, class 5		
Signal pressure connection		E: G1/8, female thread		
Temperature range	°C	-20 to +90, dried air for temperature below zero degree		
Installation attitude		optional, in case of arising condensate with inlet E downwards		
Materials		housing, cover, piston: aluminium cylinder rod: stainless steel control spring: spring steel, greased roller diaphragm: perbunan cover bearing: bronze (ZAED), Delrin (ZBED) cylinder rod bearing: copper-Teflon compound, in brass bushing stroke damping: polyamide filter plug: bronze bolts, nuts: zinc plated steel		
Weight	kg	ca. 0.95		

Servo Cylinder types ZAED (dimensions in mm)

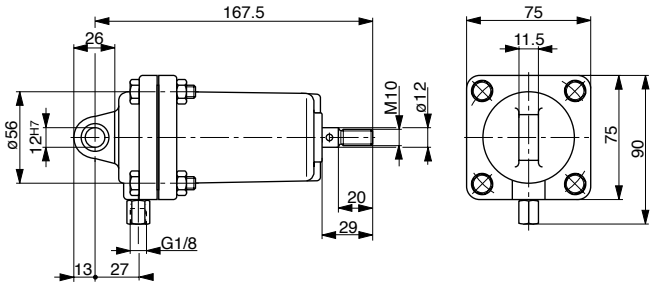
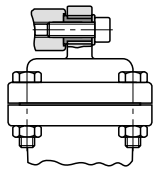


Fig.3

Fastening of types ZAED



recommended bush clearances (mm):
end play: 0.05 - 0.2
diameter: 0.02 - 0.05

Fig.6

Servo Cylinder types ZBED (dimensions in mm)

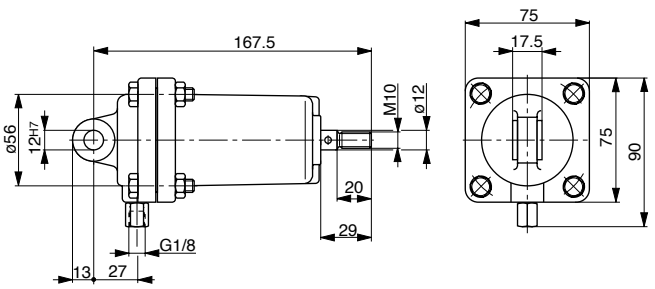
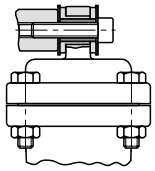


Fig.4

Fastening of types ZBED



recommended bush clearances (mm):
end play: 0.05 - 0.1
diameter: 0.02 - 0.05

Fig.7

Servo Cylinder types ZFED (dimensions in mm)

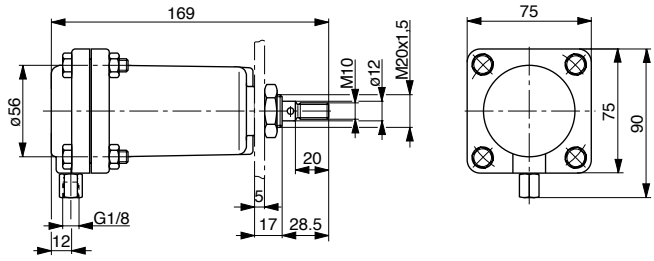


Fig.5

Maintenance
The service manual W266RCC contains information regarding the maintenance intervals. While disassembling the valve for inspection, cleaning or retrofitting purposes, also refer to the respective information contained in the service manual W266RCC. For the actual service manuals visit our homepage www.hoerbigerkompressortechnik.de.

Ordering details

Servo Cylinder:
Type and article No. of the servo cylinder.
If the article No. is unknown please specify leaflet No. R266E plus number of figure showing the requested cylinder, spring no. to diagram 1 (data for a special spring), and cylinder stroke, if < 40 mm.

Special fastening components:
Fig. 8: for types ZAED
Fig. 9: for types ZBED
Bushing and shims - fixing screw is included (8 mm diameter)

Levers:
32 mm - fig. 10 and 11, fixing screw is included
Ball Joint:
AS16 - fig. 12 - connects the lever to the cylinder rod

Cylinder stroke depending on pressure at inlet E

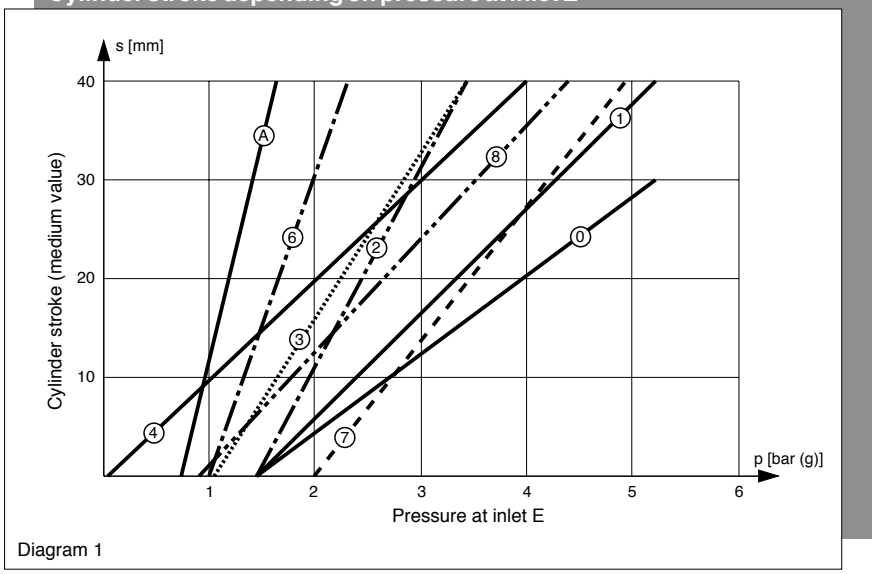


Diagram 1

Fastening comp. for types ZAED

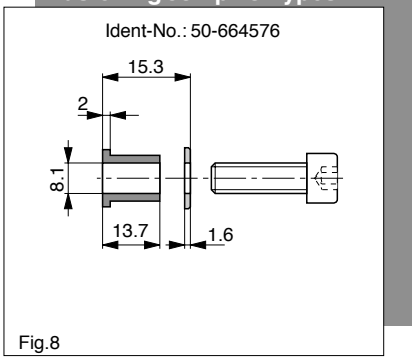


Fig.8

Fastening comp. for types ZBED

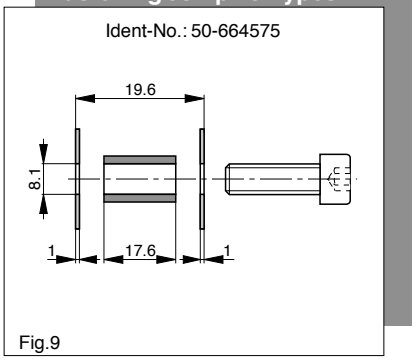


Fig.9

Lever DIA 12 for butterfly valves

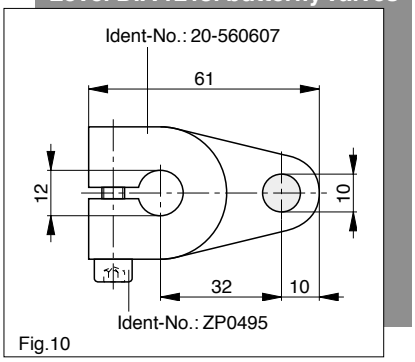


Fig.10

Lever DIA 16 for butterfly valves

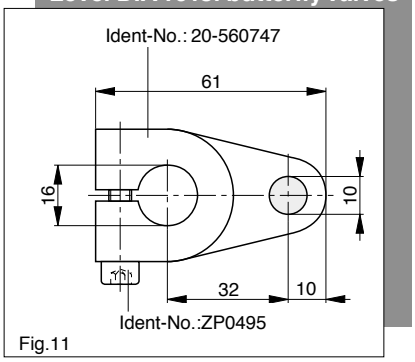


Fig.11

Ball joint CS16

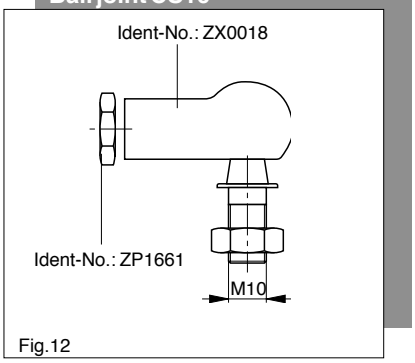


Fig.12

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