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Note: the numbers in parenthesis refer to the components in the exploded view of page 3.

VALBIA supplies pneumatic rotary actuators, RACK and PINION Design, quarter turn, with rotation 0°-180°, Double Acting type, from model 52 to 160.

CAUTION:

Remove from the actuator all dust that may cause sparks; clean periodically to prevent dusting on the actuator. Do not hit the actuators with metallic objects, as they may give off sparks.

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0 Warning

- The installation and the maintenance of pneumatic actuators must be assigned to trained and qualified personnel.
- The use of the actuators out of the allowed temperature and pressure ranges may cause damage to the internal and external components.
- Prior to any installation and maintenance of the actuator, close and disconnect any kind of power or air supply.
- Disassembling the spring return type actuators (springs inside) may cause severe injuries. The maintenance must be assigned to qualified expert personnel in full observance of the instruction described at paragraph 5 Otherwise the actuator has to be returned to VALBIA.

1 Service conditions

- AIR SUPPLY: dehumidified or lubricated air (standard). Other non corrosive gases or fluids are a possible alternative option, if compatible to the
 materials of the actuator components (internal parts and lubricant).
- WORKING PRESSURE : min. 2,5 bar max 8 bar
- TEMPERATURE : min. -20°C to max. + 85 °C standard execution NBR gaskets
 - min. -20°C to max. + 150°C HIGH temperature execution FKM (Viton) gaskets
 - min. -40°C to max. + 85 °C LOW temperature execution silicone gaskets

Warning: in case of high or low temp. executions a special grease is used as lubricant and such conditions may alter the torque generated by the actuator. For further information please refer to VALBIA

- ROTATION: half turn, 0°- 180° adjustable +5° for the open position, and ±5° in close position.
- LUBRICATION: The actuators are equipped with filled-for-life lubrication for normal service conditions.
- OPERATING TIME : please refer to the technical documentation. The operating time depends on various parameters such as air supply
 pressure, capacity of the air supply installation (size of piping, control equipment), type of valve and fluid, selected safety factor, temperature etc.



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2 Function

The air pressure acts on the surface of the pistons (12) causing their alternate movement, which is converted into rotation (standard 0°-180°) of the pinion (2). As a result the pneumatic actuators can be used for remote operation of the valves.



Supplying air through port P1 the external chambers fill up and the pressure on the surface of the pistons (12) creates a force (F) pushing them close to the pinion, generating a torque with CLOCKWISE rotation (top view).



When the pistons (12) are closed to the oinion, supplying air through port P2, the internal chamber fill up and the pressure on the surface of the pistons creates a force (F1) pushing them away from each other, generating a torque with COUNTECLOCKWISE rotation (top view).



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3 Storage

It is recommended that the actuator be kept in clean and dry place. The state of preservation during the storage time is improved if the actuator is preserved in the original packing box.

For a long storage period we recommend to effect periodically one complete cycling by pressurizing the chambers.

The actuators have two air ports which should be plugged during storage to avoid any intrusion

4 Maintenance

The maintenance of the actuator is permitted to Valbia personnel or to properly trained personnel. Valbia supplies the spare parts (gaskets, guide elements) in appropriate kits (except for lubricating grease). The maintenance may become necessary between 500.000 and 1.000.000 cycles, according to the local service conditions.



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5 Exploded view

Exploded view for actuators from mod 52 to 160



Pos.	DESCRIZIONE / Description	MATERIALE / Material	TRATTAMENTO / Treatment	Q.TA′
1	Corpo - Body	Alluminio estruso - Extruded aluminium	Ossidato duro - Hard anodized	1
2	Pignone antiespulsione - Anti-blowout pinion	Acciaio - Steel	Nichelato - Nickel plated	1
* 3	O-ring	NBR		1
* 4	Anello distanziale - spacer ring	POM		1
* 5	O-ring	NBR		1
* 6	O-ring	NBR		1
7	Camma - Cam	Acciaio inox - Stainless steel		1
8	Anello camma – spacer	POM		1
* 9	Anello sotto Seeger – spacer	POM		1
10	Rondella – washer	Acciaio inox - Stainless steel		1
**11	Seeger - snap ring	Acciaio - Steel	Nichelato - Nickel plated	1
12	Pistone – Piston	Alluminio pressofuso - Die cast aluminium		2
* 13	O-ring	NBR		2
* 14	Anello antifrizione - Antifriction ring	POM		2
* 15	Pattino reggispinta - thrust block	POM		2 [4]
16	Dado di bloccaggio reg Stop bolt retaining nut	Acciaio inox - Stainless steel		1
17	Vite di regolazione - Stop bolt	Acciaio inox - Stainless steel		1
18	Tappo sinistro - Left end cap	Alluminio pressofuso - Die cast aluminium	Verniciato - Painted	1
19	Tappo destro - Right end cap	Alluminio pressofuso - Die cast aluminium	Verniciato - Painted	1
20	Guarnizioni Tappi - End cap seats	NBR		2
21	O-ring	NBR		2
22	Vite di serraggio tappi - End cap fixing screw	Acciaio inox - Stainless steel		8
23	Vite di regolazione - Stop bolt	Acciaio inox - Stainless steel		2
24	Dado di bloccaggio reg Stop bolt retaining nut	Acciaio inox - Stainless steel		2
25	Rondella – washer	Acciaio inox - Stainless steel		2
26	O-ring	NBR		2
27	Rondella – washer	Acciaio inox - Stainless steel		2
28	Indicatore di posizione - position indicator	Gomma termoplastica TPE Thermoplastic rubber TPE		1

[x] mod. 140-160

* Part subject to wear ** Reinforced series DIN471 - UNI 7436



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6 Disassembling

CAUTION : it is recommended to use suitable safety equipment during the handling for maintenance because of heavy and/or bulky parts.

- 1. Disconnect pneumatic and electric supplies from the actuator;
- 2. After having disconnected their power supply, remove carefully any accessory attached to the actuator, preventing any damage during the handling;
- 3. Detach the actuator from the valve taking carefully note of all references that may be helpful for the attachment after maintenance;
- 4. Place the actuator on a support with a square of the same size of the pinion (2) so as to easily execute the below listed operation (see Fig. 1):
- 5. Disassemble the end caps (18-19), unscrew in crossed sequence the screws (22) (see Fig. 2;
- 6. Loosen nuts (16) and unscrew completely screws (17) see Fig. 3;
- Rotate the cylinder (1) in CLOCKWISE direction (top view) holding the pinion (2) so as to release the rack of the pistons (12) from the pinion (2) and to push the pistons towards to the cylinder ends. Now both pistons (12) can be removed see Fig. 4.
 NOTE: Do not use compressed air to remove the pistons (12) from the cylinder (1);
- 8. Remove the indicator (28) from the pinion (2), the seeger (11), the spacer (10), the washer (9) and the O-ring (6) see Fig. 5;
- 9. Extract the pinion (2) from the cylinder (1) by pushing it down, with special caution for all sealings, see Fig. 5 (if necessary use a rubber hammer);
- 10. Remove the cam (7) from the cylinder (1) sliding it out see Fig. 5







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7 Assembling

CAUTION : It is recommended to use suitable safety equipment during the handling for maintenance because of heavy and/or bulky parts.

- 1. Before assembling clean all components preferably with degreaser.
- Place the pinion (2) on a support with a square of the same size of the female attachment. Make sure that the pinion is provided with lower O-ring (3), spacer (4) and upper O-ring (5). Lubricate the O-rings (see arrows fig. 6); The recommended lubricating grease is "HELIOS SYNTH 1EP"
- 3. Screw the adjustment screw (17) with nut (16) in the right adjustment hole of the cylinder (1) and let the cam (7) with o-ring (8) slide down on the guiding rail on the cylinder (1) (see detail A Fig.7) until it stops against the screw;
- 4. Lay the cylinder (1) down on the pinion (2) holding it with the NAMUR surface rotated by approx. 50° to the upper slot of the pinion, see fig. 15;
- 5. Fit on the pinion (2) the O-ring (6), the spacer (9), the washer (10), the seeger (11), the indicator (28), see Fig. 9; ATTENTION : verify the perfect closure of the seeger.
- 6. Grease the internal chamber of the cylinder (1) and both pistons (12) provided with O-ring (13) antifriction ring (14) and thrust block (15) and washer (27) The recommended lubricating grease is "HELIOS SYNTH 1EP".
- 7. For the standard execution (clockwise rotation opens) insert the pistons (12) into the cylinder (1) while turning the cylinder (1) in counterclockwise direction (top view) until the pistons come into contact, see fig. 10;
- 8. Adjust the close position see paragraph 8;
- 9. Assemble the end cap (18-19) with O-ring (21) gasket (20), screw (23), o-ring (26), washer (25) and nut (24) on the cylinder (1) and screw down in crossed sequence the screws (22), see fig. 11. Repeat the operation on the opposite side.
- 10. Adjust the open position through the screw (23) into the end caps (18-19) see paragraph 8;
- 11. Execute some test cycles to check the correct functioning of the actuator before







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Fig.10

Fig.11

8 Adjustment

Unscrewing completely the end caps screws (A) it is fixed the open position at 180° - see Fig. 12, while the close position is fixed thought the end stop bolt (C) – see Fig. 13.

Fig.12



Fig.13

N.B. : During the adjustment do not block the pinion on the support

8.1 Adjustment procedure, actuator in open position

- Put the actuator in closed position;
- Adjust the end caps screws (A-A) maintaining the same position for both;
- Put the actuator in open position and check the adjustment;
- Repeat the operation until the achievement of the desired adjustment;
- Keep the screw in the desired position and tight the nut.

8.2 Adjustment procedure, actuator in close position

- Put the actuator in open position;
- Ad just the end caps screws (C);
- Put the actuator in closed position and check the adjustment;
- Repeat the operation until the achievement of the desired adjustment;
- Keep the screw in the desired position and tight the nut;



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9 Actuator plate (label)

