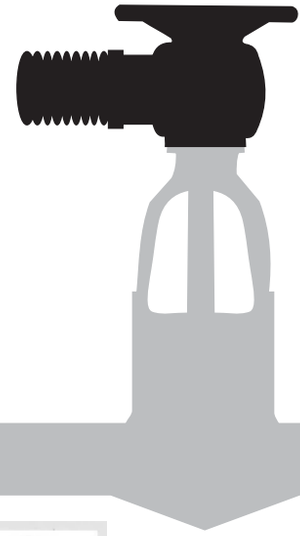
auma® india pvt ltd

Operation & Instructions Manual

SA 3 - SA 100

SAR 3 - SAR 100



Warnings and notes

Failure to observe the warnings and notes may lead to serious injuries or damage. Qualified personnel must be thoroughly familiar with all warnings and notes in these operation instructions.

Correct transport, proper storage, mounting and installation, as well as careful commissioning are essential to ensure a trouble-free and safe operation.

The following references draw special attention to safety-relevant procedures in these operation instructions. Each is marked by the appropriate pictograph.

This pictograph means: Note!

"Note" marks activities or procedures which have major influence on the correct operation.

Non-observance of these notes may lead to consequential damage.

⚠ **This pictograph means : Warning!**

"Warning" marks activities or procedures which, if not carried out correctly can affect the safety of persons or material.

Only original AUMA spare parts should be used for the proper functioning of the equipments. Failure to use original spare parts voids the warranty and exempts AUMA from any liability.

Transport and Storage

Transport:

- Transport to the place of Installation (till the last destination)
- Avoid packages from exposing to open atmospheres during transit
- Protect against rains

Storage:

- Store in well ventilated and dry rooms
- Protect against humidity from floor by storage on wooden frame, on pallets, in cage boxes or on shelves
- Cover actuators with plastic foil to protect against dust and dirt etc.
- Protect suitably against mechanical damages
- During long time storage, protect bright surfaces especially output drive parts and mounting surface by applying long life corrosion protection agent. Also check once in six months for corrosion. If corrosion has started, clean and apply corrosion protection agent.

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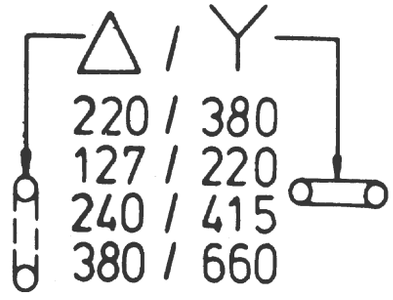
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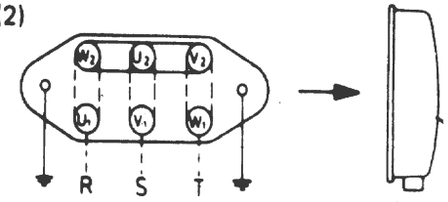
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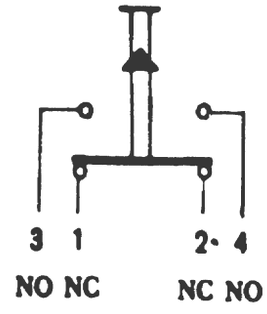
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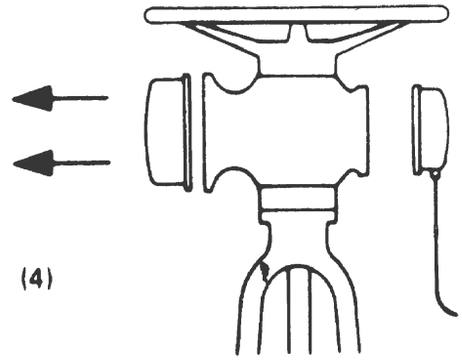

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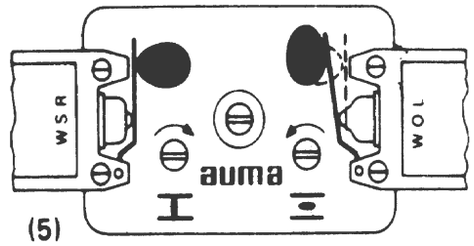
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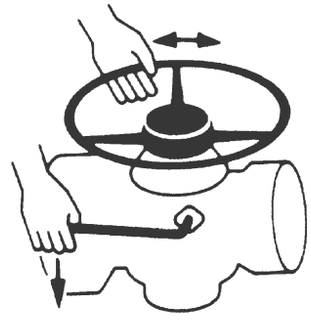

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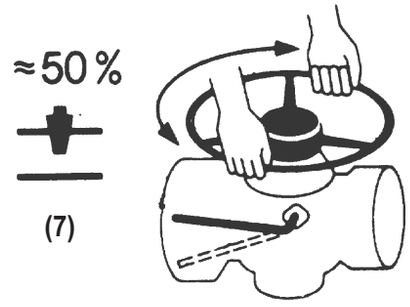
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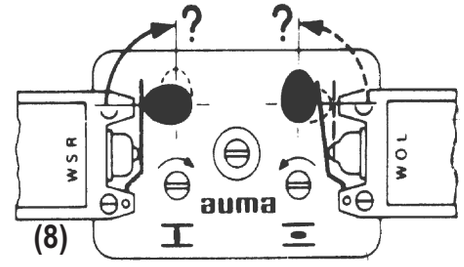
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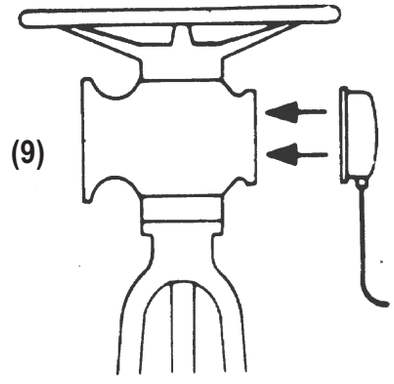

⚠ CAUTION
Thermo switches are provided to protect Motor windings. These should be connected in panel control circuit (Refer Terminal Plan), else our warranty is void.

⚠ 1. Electric connection

For 3 phase AC - motors:

Check whether terminal links are fitted to suit type of motor and power supply (fig.1).
Connect wires R-S-T to terminal pins U_1-V_1-W_1 (fig. 2), for flame proof enclosure at clip-on terminals.

For single - phase or DC - motors, see instructions in terminal compartment.

Connect control wires according to the wiring diagram.
Terminal plan is inside the terminal compartment.

Note : The two circuits of each switch (fig. 3) are suitable only for the same potential.

2. Remove cover at switch compartment (fig.4) Check whether limit-switch has tripped (fig.5)
Valve completely closed : WSR tripped Valve completely opened : WOL tripped

3. Engage manual drive :
Push declutch lever as indicated by arrow (fig. 6). If resistance is felt, turn handwheel slowly while lever is pressed till manual drive engages.

4. Operate valve to intermediate position manually (fig. 7)
Direction OPEN (⚌) turn handwheel anti-clockwise. Direction CLOSED (⚍) turn handwheel clockwise. Switch cam at ⚍ (Z) or ⚌ (O) should rotate 90° and release the switch (fig. 8) if set properly.

5. Ensure sealing faces at control plug are clean and check whether O-ring is ok. Apply thin film of non - acid grease to sealing faces, then replace plug cover (fig. 9).

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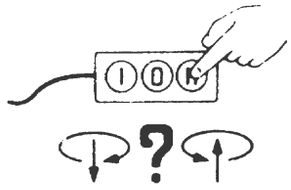

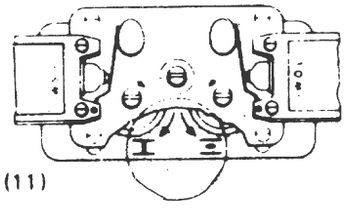

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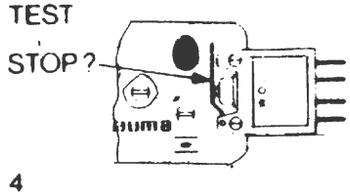

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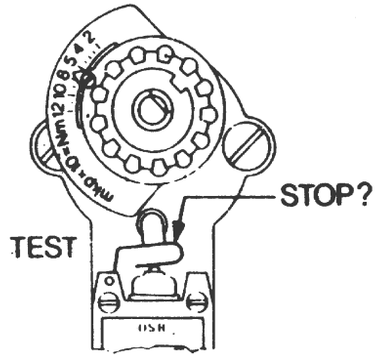

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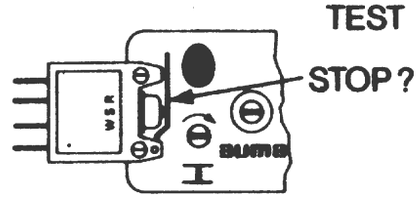

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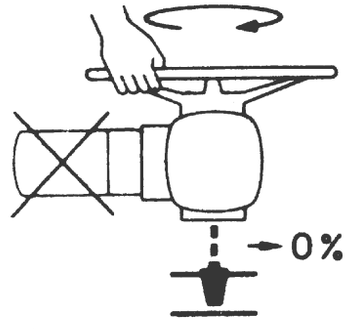

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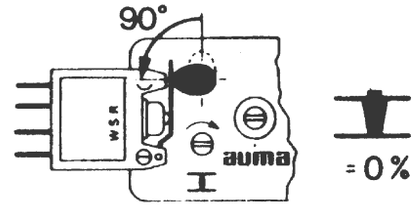

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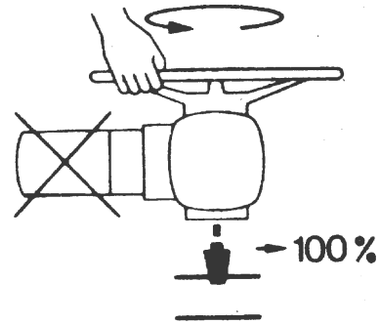

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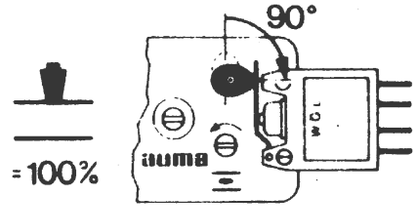

(18)

⚠ 6. Connect to mains. Switch on motor momentarily. Manual drive will be disengaged automatically.
Check direction of rotation (fig. 10), observing arrows at limit switch counter gear (fig.11). If incorrect, stop immediately and change sense of rotation (if 3 phase AC-motor, exchange any two phases).

⚠ 7. Start actuator in OPEN direction and switch off by manually tripping limit switch WOL (fig. 12).

⚠ 8. Start actuator in CLOSED direction and switch off by manually tripping torque switch DSR. Trip switch by operating lever easily only! (fig. 13). For actuators with double torque switch, check OPEN direction in the same way.

⚠ 9. For position seated closing: Start actuator in CLOSED direction and switch off by manually tripping limit switch WSR (fig. 14).

⚠ 10. If actuator does not stop, check connection of terminals and the control wiring.

11. Determine over-run of actuator in both directions by visual inspection (amount of additional rotation of spindle or valve movement after actuator is switched off).

12. Engage manual drive and operate actuator to fully closed position (fig. 15), while observing the switch cam for limit switch WSR.

For position seating : When the switch has tripped (fig. 16) continue turning handwheel to the final position and check whether the remaining travel corresponds to the over-run. If not, reset to suit. See point 14.

For torque seating : Limit switch WSR must trip shortly before reaching end-position CLOSED (fig. 16).

13. Operate actuator manually to OPEN-position (fig. 17). Check in the same way as described above for position seating, see point 12 (fig. 18).

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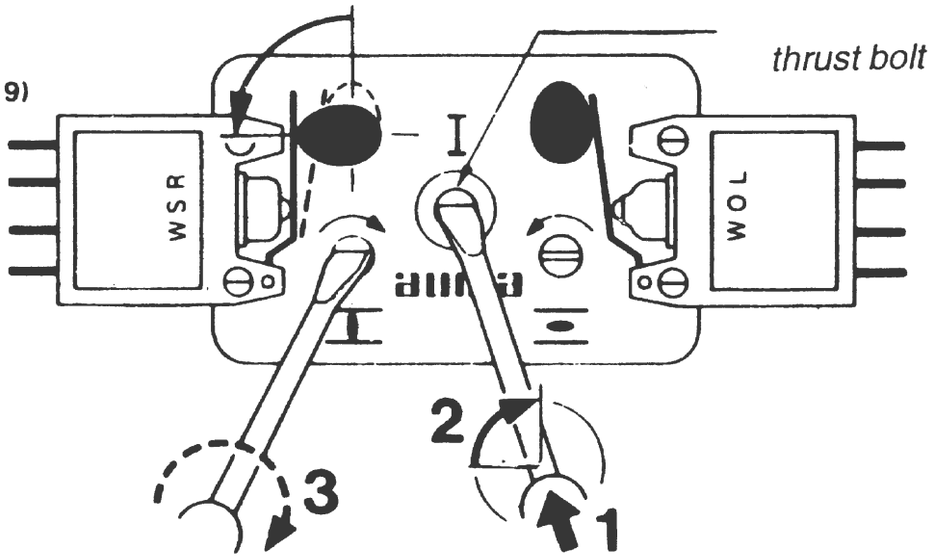

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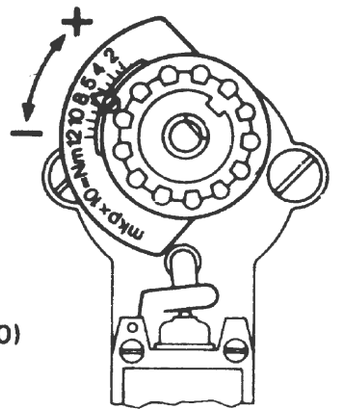

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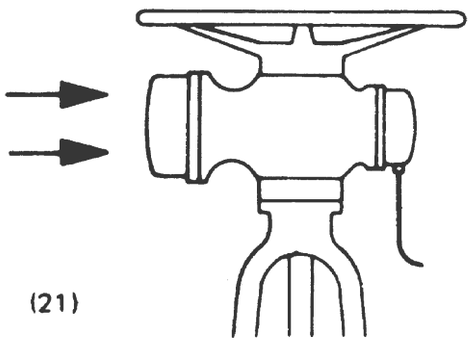


14. Resetting limit-switching:

— Operate valve away from end-position to account for over-run or to the desired switch tripping point.

— Push thrust bolt I inwards and turn (fig. 19). The bolt remains in this position.

— For CLOSED position turn spindle marked ⊥ (Z), (for OPEN position spindle marked, ⊤ O) slowly as indicated by arrow (fig. 19). Distinct "clicks" can be felt and heard. Continue turning the spindle until the cam operates the switch. At this stage, the spindle should not "click" any more and should not be turned any further.
If inadvertently you override the tripping point, continue turning the spindle slowly in the same direction till the switch cam goes back to its original position. Repeat setting instructions as above described.

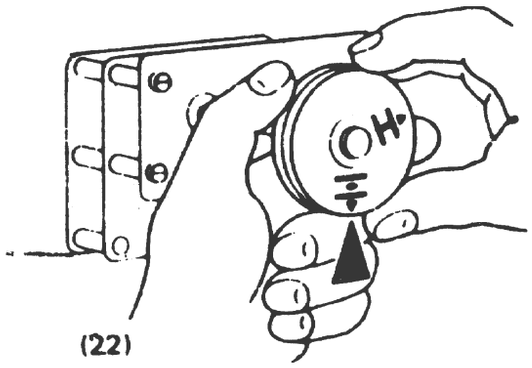
— Turn thrust bolt I till it snaps back into its original position by spring action.

15. **Torque switching (fig. 20)**
If the actuator is switched off by torque switch over its travel before reaching an end-position, please check whether the valve stem is damaged or dirt adhering to it. If necessary, and with the valve maker's consent, the setting of the tripping torque may be raised slightly.

16. Setting : Figures on the torque switch operating cam indicate the valves in Nm (1 mkp = 10 Nm. 1 lbsft. = 1.36 Nm).
Loosen screw and turn the cam till the desired torque coincides with the arrow mark, then fasten lock-screw.

17. Immediately after start-up : Ensure sealing faces at cover and housing are clean. Check whether O-ring is correctly in position and apply a thin film of non-acid grease. Replace the cover and fasten with 4 screws (fig. 21).

18. **Fasten control cover screws and tighten glands at conduit entries.**



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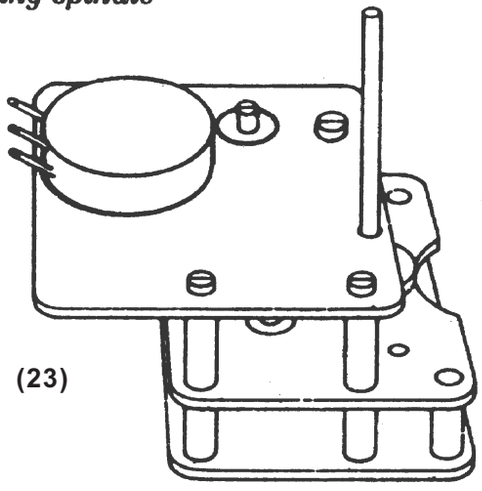
setting spindle



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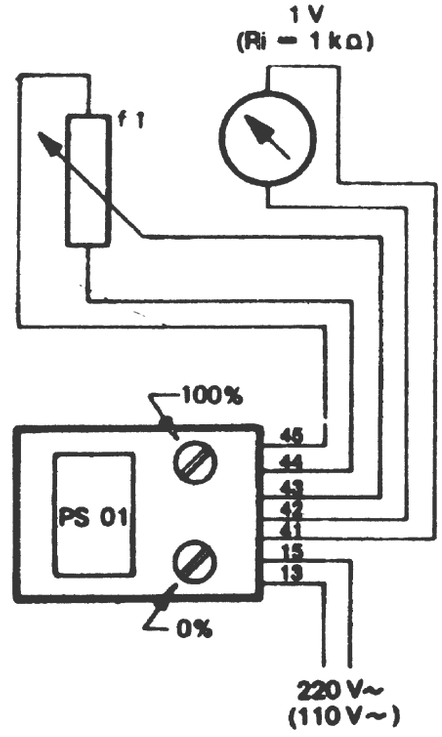

Setting of optional equipment

19. Mechanical position indicator : The two dials have a slip clutch for easy adjustment. At valve fully closed, turn dial ⊥ (CLOSED) till the arrow is in alignment with the mark on the show glass. Operate valve into fully OPEN position and adjust dial marked ⊤ (OPEN) till the arrow mark is in alignment with the mark on the cover.

Note: The dial ⊥ (CLOSED) must be held in position while adjusting dial ⊤ (OPEN). (fig. 22).

20. Electric position transmitter

Through a reduction gearing (selected to suit turns required by valve travel) a potentiometer will be driven. A suitable power supply unit supplies a low voltage current. The valve position can be read on a remote instrument with a percentage scale.

⚠ 21. Setting

Operate valve to the fully CLOSED position (= 0%). Set potentiometer to its starting position by turning the wiper [1]), which has a slip clutch (fig. 23).

Adjust the position meter to zero by trimming potentiometer in the power supply unit (fig. 24). Operate valve to the fully OPEN position (= 100%). Adjust the position meter to max. range with the help of the trimming potentiometer in the power supply unit (fig. 24). Check indication for both end positions. If required, make slight re - adjustment.

[1]) applies only to open potentiometer as shown in figure 23.

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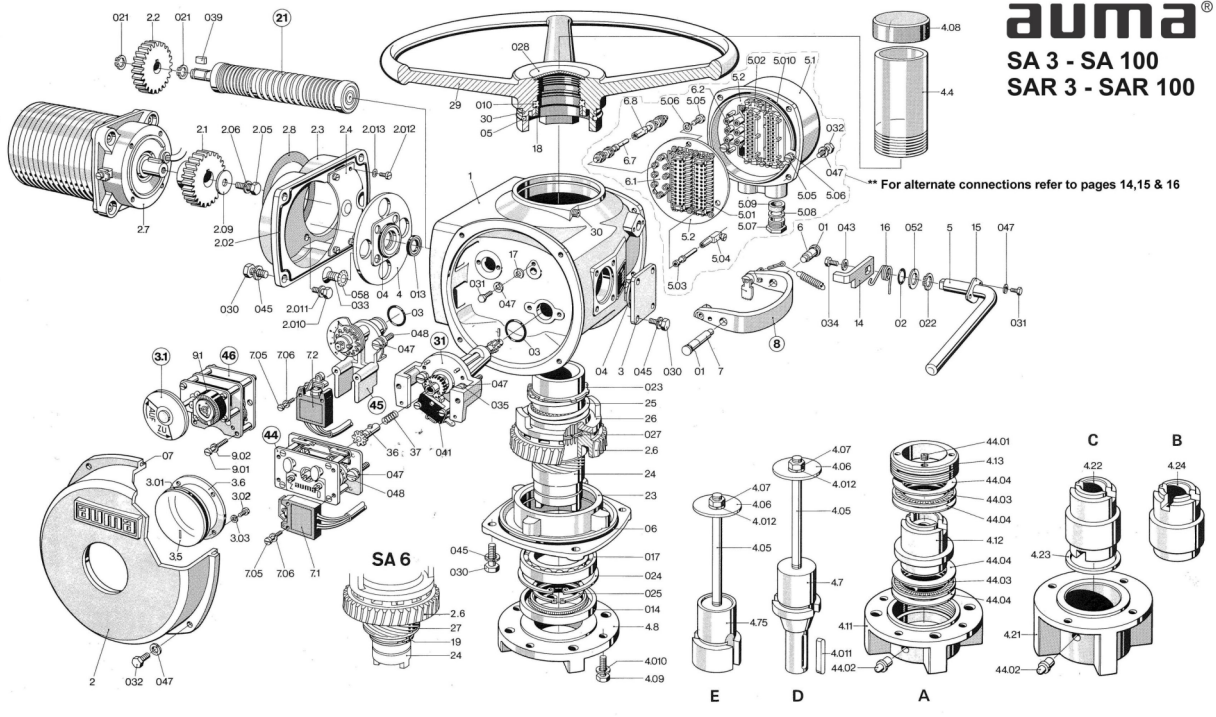
SA 3 - SA 100
SAR 3 - SAR 100



Spare Parts

SA 3 - SAR 100
SAR 3 - SAR 100

When placing orders for spare parts it is essential to mention order number, work's number and type of the actuator (refer to name plate). Parts with number in a circle, e.g. (8), will be supplied complete only.

Part No.	Designation	Part No.	Designation	Part No.	Designation
1	Gear box housing	041	Blinker switch (SPST)	44.01	Set screw
2	Switch compartment cover	043	Spring washer	44.02	Grease nipple
3	External bearing retainer	045	Lock washer	44.03	Thrust bearing
4	Internal bearing retainer	047	Lock washer	44.04	Thrust bearing race
5	Declutch lever	048	Fillister head screw		
6	Clutch roller pin, short	052	Support washer	5.1	Terminal box cover
7	Clutch roller pin, long	058	Star washer	5.2	Terminal mounting plate
(8)	Clutch fork assembly			5.01	Pin carrier (control)
14	Declutch tripping arm	2.1	Motor pinion	5.02	Socket carrier (control)
15	Retaining plate	2.2	Spur gear	5.03	Plug pin (control)
16	Return spring	2.3	Motor mounting flange	5.04	Plug socket (control)
17	Spacer	2.4	Shield	5.05	Fillister head screw
18	Bushing	2.6	Worm gear	5.06	Lock washer
19	Retaining ring (SA 6 only)	2.7	Motor	5.07	Conduit gland
(21)	Worm shaft assembly	2.8	O-ring	5.08	Thrust washer
23	Bearing flange	2.02	O-ring	5.09	Seal ring
24	Hollow drive shaft	2.05	Hexagon head bolt	5.010	O-ring
25	Compressing spring	2.06	Lock washer		
26	Clutch Ring	2.09	Flat washer	6.1	Pin carrier (motor)
27	Helical gear (SA 6 only)	2.010	Hexagon head bolt	6.2	Socket carrier (motor)
29	Handwheel	2.011	Lock washer	6.7	Plug pin (motor)
30	Handwheel retainer	2.012	Fillister head screw	6.8	Plug socket (motor)
36	Pinion gear (Shaft assembly)	2.013	Lock washer		
37	Compression spring			7.1	Limit switch (SPDT)
		(3.1)	Indicator assembly	7.2	Torque switch (SPDT)
01	O-ring (Clutch roller pin)	3.5	Indicator glass	7.05	Fillister head screw
02	O-ring (Declutch lever)	3.6	Glass retaining ring	7.06	Lock washer
03	O-ring (drive assly. flanges)	3.01	O-ring		
04	O-ring (bearing retainer)	3.02	Fillister head screw	9.1	Potentiometer *
05	O-ring (Handwheel)	3.03	Lock washer	9.1	Potentiometer with Drive Gears*
06	O-ring (Bearing flange)			9.01	Fillister head screw
07	O-ring (Switch comp. cover)	4.4	Stem protection tube	9.02	Lock washer
010	Quad ring	4.7	Stub shaft (type D)		
013	Oil seal	4.8	Mounting flange (type D & F)	(31)	Limit switch drive assembly
014	Oil seal	4.11	Mounting flange (type A)	(44)	Limit switch counter gear
017	Ball bearing	4.12	Stem nut (type A)	(45)	Torque switch drive assembly
021	Circlip	4.13	Bearing locknut	(46)	Reduction gearing assembly
022	Circlip	4.21	Mounting flange (types B & C)		
023	Circlip	4.22	Dog drive sleeve (type C)		Optional Accessories:
024	Circlip	4.23	Thrust ring		
025	Circlip	4.24	Keyway drive sleeve (type B)		Resistive Position Transmitter :
027	Snap ring	4.75	Drive socket (type E)		RWG 2002
028	Lid	4.05	Stud bolt		RWG 1001
030	Hexagon head bolt	4.06	Flat washer		RWG 2002G
031	Hexagon head bolt	4.07	Hexagon nut		RWG 2002DG
032	Thin shank hex head bolt	4.08	Cap		
033	Counter sunk oval head screw	4.09	Hexagon head bolt		Inductive Position Transmitter:
034	Hexagon head bolt	4.010	Lock washer		IWG 1002
035	Fillister head screw	4.011	Parallel key		IWG 1003
039	Parallel key	4.012	Lock washer		
					Power Supply Unit PS01
					Electronic Positioner CU01
					*state resistance when ordering

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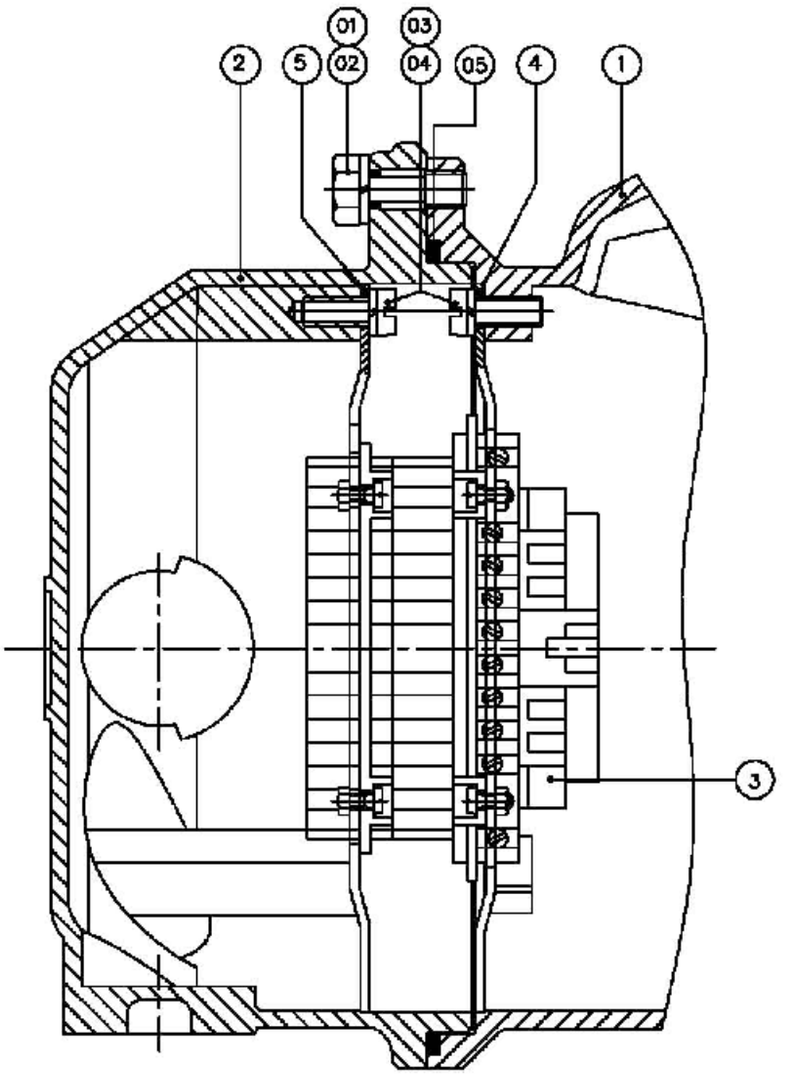
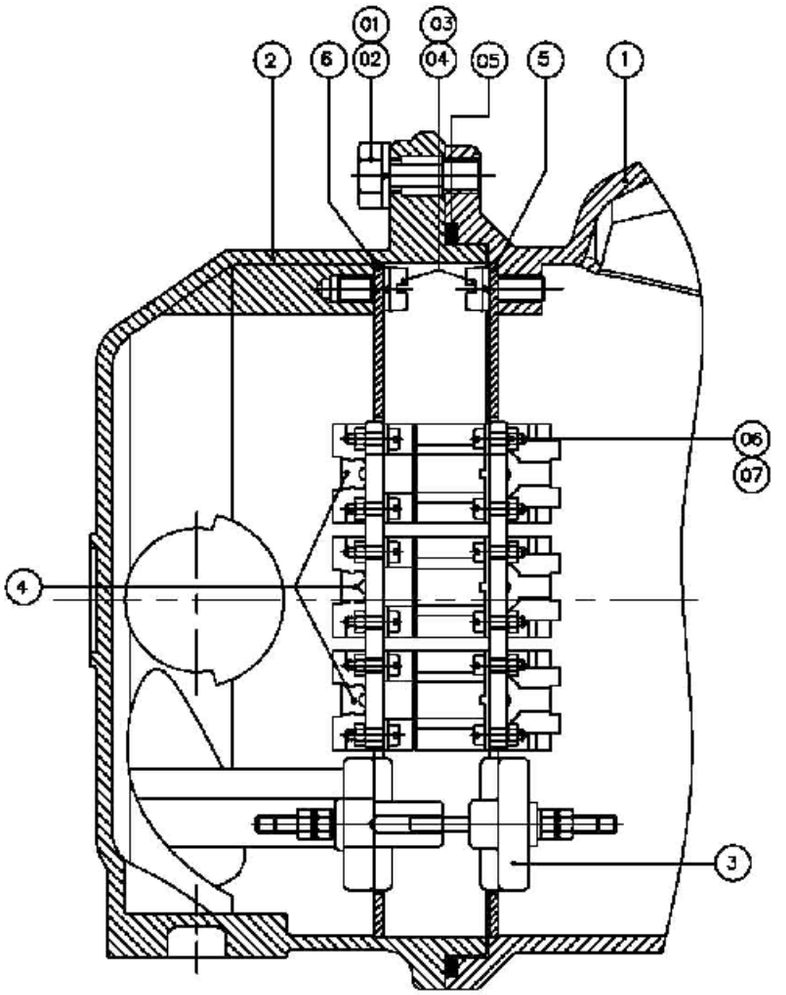
Electrical connection with Auma 50 Pin circular Plug/Socket Connector



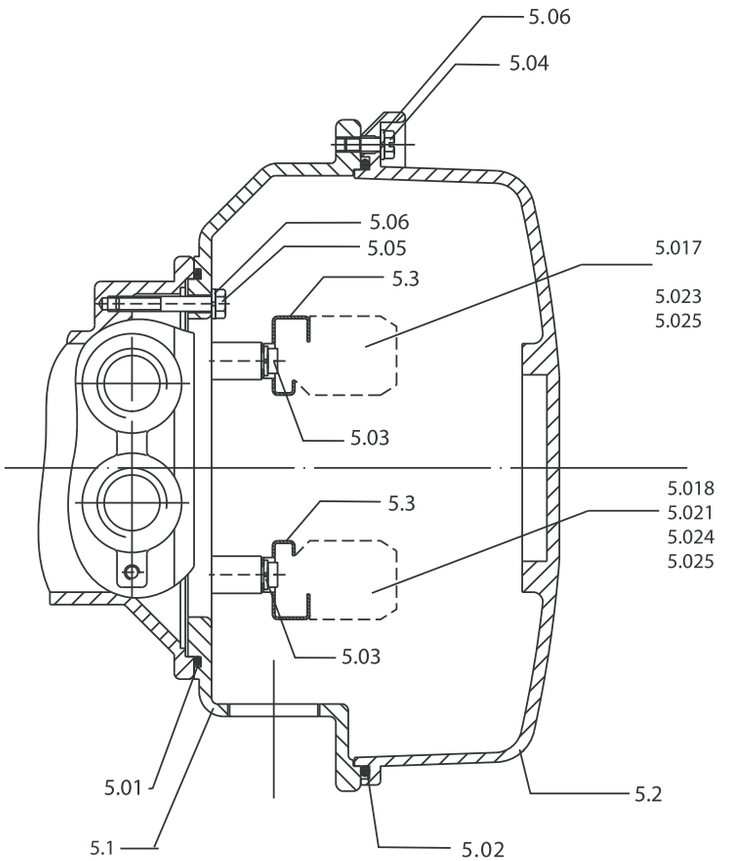
PART No.	DESCRIPTION	PART No.	DESCRIPTION
1	Intermidiate Housing	01	Hex. bolt
2	Terminal Cover	02	Spring lock washer
3	50 Pin Circular connector (Socket-Carrier)	03	Spring lock washer
4	Plate	04	Slotted cheese hd. screw
5	Plate	05	'O' Ring

Electrical connection with Auma 72 Pin(24X3) Plug/Socket Connector



PART No.	DESCRIPTION	PART No.	DESCRIPTION
1	Intermidiate Housing	01	Hex. bolt
2	Terminal Cover	02	Spring lock washer
3	Motor plug complete	03	Spring lock washer
4	Multi pin connector(Plug-Socket)	04	Slotted cheese hd. screw
5	Plate	05	'O' Ring
6	Plate	06	Slotted cheese hd. screw
		07	Hex. nut

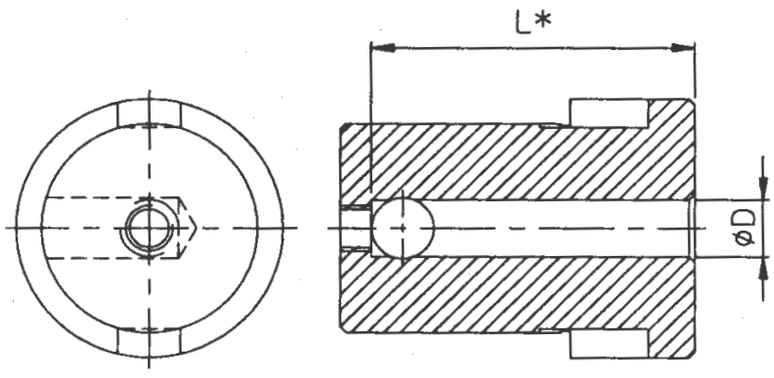
Electrical connection with screw type terminals



No.	Designation	No.	Designation
5.1	KLK cover	5.017	Control terminal max. 2.5 mm ^{2}
5.2	Terminal compartment cover	5.018	Motor terminal max. 4.0 mm ^{2}
5.3	Snap on rail		
		5.021	Protective earth terminal max. 4.0 mm ^{2}
5.01	O-ring	5.023	End plate
5.02	O-ring	5.024	End plate
5.03	Slotted cheese hd. screw	5.025	End clamp
5.04	Hexagon bolt		
5.05	Hexagon bolt		
5.06	Lock washer		

Cross sections for connection: Control cables max. 2.5 mm ^{2}
Motor connection max. 4.0 mm ^{2}

Procedure for enlarging the pilot bore of 'E' Type output drive sockets used in actuators and gearboxes.



'E' type Dreive socket 9Pilot bore)

Actuator Model	Pilot bore Dia (D)	Max bore Dia	Keyway length (L*)
SA3 - SA6	10	20	67
SA12 - SA15	10	32	67
SA25 - SA60	15	45	72
SA100	20	60	112
Note : All dimensions are in mm			

Procedure:-

Dismantle the Drive socket Part No.4.75 by loosening draw bolt part No.4.06.

Enlarge the pilot bore to required size.

Enlarge bore lenght of the drive socket shall not exceed the length L* as indicated in the table.

Key way position should be in line with the relief hole provided in the drive socket.

The hole is provided to do the keyway slotting on slotting machine.

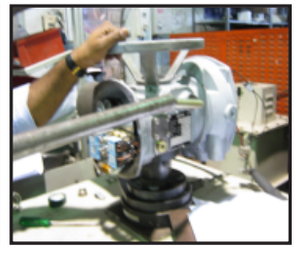
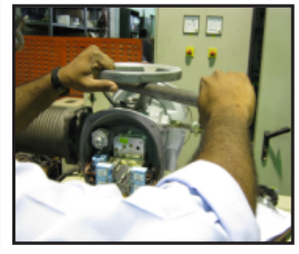
Note: If you find any difficulty while enlarging the pilot bore drive socket, please feel free to contact auma India for assistance at email ID : service@auma.co.in

Do's and Don't's - Troubleshooting tips

Setting of Limit switches:

- Improper methods of declutch mechanism leading to premature failure of tripping arm



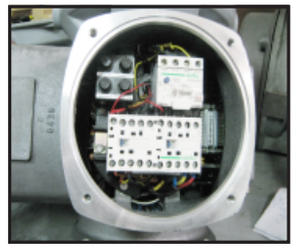




- Re - set torque by loosening the adjustment screw


- Improper tightening of covers or missing of o-rings during fitment


- In the events of interchangeability check for the e-pac wiring diagram number

Do not press mechanical interlock of reversing contactors manually



Additional Tips

- Do not operate the actuator with improper wiring.
- Do not interchange the cards without checking the e-pac code.
- Do not interchange the e-pac without checking the OLR rating.
- Improper sealing of cable glands resulting in water entry at site inadvertently damaging all the electronic cards.
- Do not operate the actuator in manual mode while electrically operating.
- Please check the input voltage rating of the motor before giving supply.
- Do not run the NORM actuator without panel.
- Do not bypass the thermo-switch connection in the loop

All auma actuators are 100% tested and factory checked. Actuators are supplied ready for service. Most of the actuators are supplied to valve manufacturers for mounting to valves. It is usual for the valve manufacturer to set the switches and test the motorized valve.

Special care should be taken when commissioning. Wrong connection or faulty control wiring may result in damage to the motorized valve.

In case the actuators will not be mounted or commissioned for a long period, take care for adequate (dry) storage, refer to our instruction sheet “Transport, Storage and Commissioning of auma - actuators”.

auma® india pvt ltd

Regd. Office & Works :
38-A & 39-B, II Phase, Peenya Industrial Area
Bangalore - 560 058.
Ph : 080-28394366 Fax: 080-28392809
E-mail : info@auma.co.in

Delhi Branch:
1310, Tower 'A', Corenthum Complex
Sector - 62, Noida - 201 301
Mb: 93111 95850 (Veeresh), 92120 39339 (Ragesh)
E-mail : aumandl@auma.co.in

Pune Branch:
712, 713, Bldg. No. 1, "Siddharth Towers"
Kothrud, Pune - 411 038.
Ph : 020 - 25410465 Telefax: 020 - 25443186
E-mail : aumapune@auma.co.in

DD/MN-001 ISSUE 7/13

PROCUREMENT OF SPARES AND SERVICES FROM UNAUTHORIZED AGENCIES

It has come to our notice that some unauthorized agencies are offering spares and/ or service for AUMA Group products to end-users. It is clarified through this note that AUMA India is one of the Global Service Hubs of AUMA Group and responsible for offering Service support in Indian sub-continent. AUMA India as a policy does not authorize any external agency to offer service support on AUMA Group products in view of competency and product liability issues and all such services are coordinated by AUMA India directly. In case of availing the services of external agencies, AUMA India would not be able to offer any future support on the products handled by unauthorized third parties. However, routine maintenance activities carried out by the end-users or their representatives is very much acceptable.

AUMA India sells the spares of AUMA Group products either directly or through the authorized dealers. AUMA India products contain some standard catalogue parts such as fasteners, connectors etc, but majority of items are manufactured according to AUMA design and drawings. It is extremely important that spurious and sub-standard parts are **not** used in repair and overhauling of AUMA Group products to ensure desired performance in critical operations controlled by AUMA products. While end-users can buy standard catalogues parts of other manufacturers directly from authorized sources, all special parts as per AUMA design have to be necessarily procured from AUMA dealers or directly from AUMA. AUMA Service Engineers are instructed no to carry out any service using spares procured from unauthorized agencies.