MOUNTING, OPERATING, TESTING & MAINTENANCE INSTRUCTIONS FOR ROTEX 3/2 DIRECT ACTING HIGH ORIFICE, UNIVERSAL TYPE, SUBBASE MOUNTED SOLENOID VALVE MODEL: 30316

All details within this manual and the catalogue are subject to change without manner.

ROTEX will not be responsible for any damage whatsoever arising from the use of the Solenoid Valve, due to misuse or incorrect installation or misinterpretation of the information contained herein.

SPECIFICATION OF THE SOLENOID VALVE

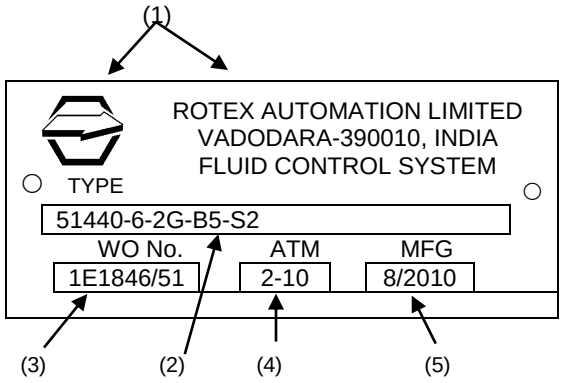
TYPE	:	3 Port 2 Position
OPERATION	:	DIRECT ACTING HIGH ORIFICE SUBBASE MOUNTED SOLENOID VALVE
ORIFICE = NW	:	5 mm
OPERATING PRESSURE	:	0-10 bar
MANUAL OVERRIDE	:	No MA / Push & Turn MA / Push MA
COIL INSULATION	:	Class F, Class H

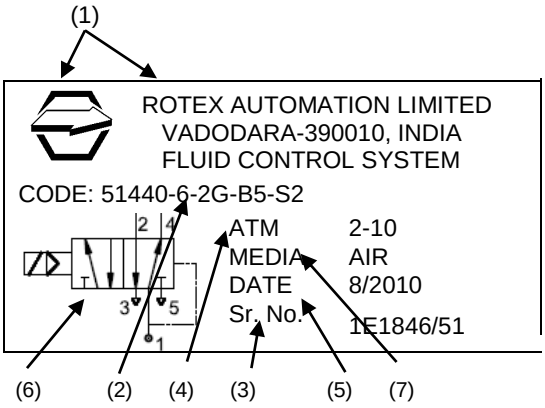
Body Internal	Aluminium Al, SS	(※)	SS316 SS316	(B5)			
Core Tube	SS304						
Core Plug & Plunger	SS430, Electro less Nickel Plated						
Seals	NBR (※)	Viton (S2)	EPDM (S1)				
Springs	SS302						
Manual Override	Nil (MO)		Push & Turn (M6) ※		Push Type (M8)		
Coil voltage	6, 12, 24, 48, 72, 110, 220V, 230V, 240V						
Current	Dc, 50Hz, 60Hz						

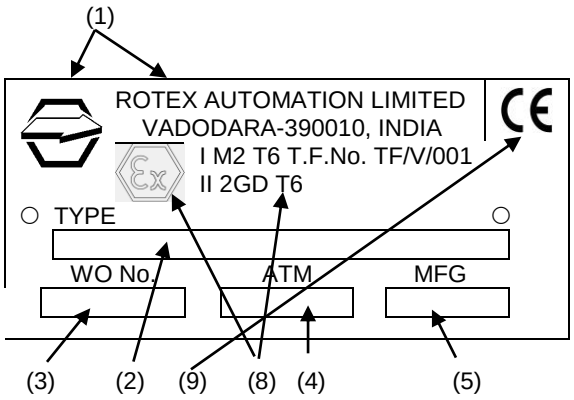
IDENTIFICATION ON THE SOLENOID VALVE

a) VALVE LABEL

Label on the **ROTEX** Solenoid Valve shows the following details:





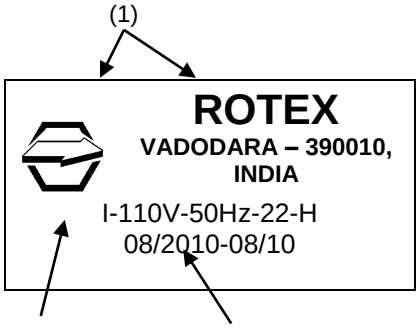


(1) Logo + Manufacturer's Name & address
(2) Valve Type / Code

51440	=	Valve Model
Suffix	=	Nil
6	=	Orifice
2G/3G	=	1/4" / 3/8" Port Connection (BSP)
B5	=	Body Material (SS316)
S2	=	Seal Material (Viton)
-	=	Manual Override (Push & Turn)
110V	=	Solenoid Voltage
50Hz	=	Current (AC)
22	=	Solenoid Construction (Enclosure: Plug in)
H	=	Solenoid Class 'H' Insulation
Sp. Version	=	Nil

(3) Manufacturer's Work Order reference / Sr. No. of the Valve
(4) Operating Pressure
(5) Manufacturing Month & Year
(6) Valve Symbol
(7) Media
(8) ATEX Ex mark for Valve (Non Electrical Part)
(9) "CE" mark for ATEX and/or PED compliance.

b) **SOLENOID LABEL**



(1) Logo + Name of the Manufacturer
(2) Solenoid Type

I	=	Solenoid Size I
110V	=	Solenoid Voltage
50 Hz	=	Solenoid Current
22	=	Solenoid Construction (Plug In DIN)
H	=	Solenoid Class H Insulation

(3) Plan No. & Manufacturing Month / Year

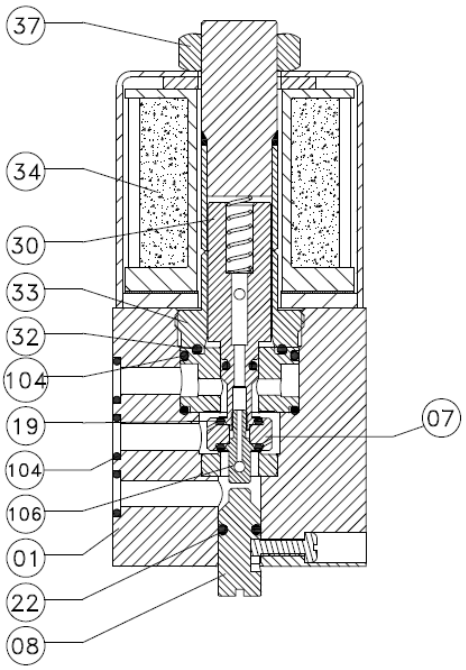
CONNECTION

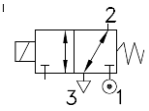
VALVE TYPE	FUNCTION	IN	OUT	EXHAUST
30316	NC	1	2	3

(A) OPERATING PRINCIPLE

In de-energized condition of the solenoid, applied the pressure at inlet port # 1 up to the Duse hole which is blocked by plunger assembly and remaining pressure will act on the upper side of the Anker through the hole of M-holder and Anker hole. Thus pressure will support to push the assembly downwards. in this state inlet port # 1 and outlet port # 2 are disconnected. Outlet port # 2and exhaust port # 3 are connected. Media cannot come out from the outlet port # 2.

In energized condition of the solenoid, plunger assembly moves up now when we applied the pressure at inlet port # 1 media pressure come out from the outlet port # 2 through the Duse hole. In this state inlet port #1 & outlet port # 2 is connected and exhaust port # 3 is blocked. So media comes from the outlet port # 2





01	M HOLDER	12	106	SS	
02	SLEEVE "O" RING	11	104	NBR/Viton/EPDM	
02	NUT	10	37	NYLON	
01	COIL ASSLY.	09	34	---	
01	GUIDE ASSLY.	08	33	SS304+SS430F	
01	GUIDE "O" RING	07	32	NBR/Viton/EPDM	
01	PLUNGER ASSLY.	06	30	SS430F	
01	MA "O" RING	05	22	NBR/Viton/EPDM	
02	SEAT "O" RING	04	19	NBR/Viton/EPDM	
01	MANUAL ACTUATOR	03	08	SS	
01	VENTILTELLER	02	07	BR/SS	
01	GEHAUSE	01	01	AL/BR/SS	
QTY.	DESCRIPTION	SR.No.	POS.No.	MATERIAL	REMARK

B) MOUNTING/INSTALLATION PROCEDURE:

1. ENSURE THAT:
   - a) While storing, keep the valve in cool, dry, dust free area.
   - b) On receipt of the valve, in case if the same is to be removed from the sealed plastic bag for inspection/testing, put them back with dust plugs on its ports and sealing the plastic bag as soon as the inspection/testing is over.
   - c) The valve should be removed from its card board and/or plastic bag just before the installation.
   - ⚠ d) Flush lines before installing the valve.
   - ⚠ e) To avoid pressure drop and to achieve optimum parameters, Pipe / Tube / Fitting from the source of pressure to the valve and to the connected equipment should have ID which is ≥ NW (Orifice) of the valve.
   - f) To avoid pressure drop, if more than one valve is being operated simultaneously from a common header, then minimum ID of the header can be calculated as under.
     ID Header = $\sqrt{(NW^2 \times n)}$

n = Number of Valves operating at a time and which are connected to a common header,
NW = Orifice of the Valve.

⚠ g) Incorporate filter in the line to avoid hard particles entering into the valve.

⚠ h) The valve should be installed for the media for which it is intended for. This is to avoid the malfunction of seals and the valve. In case if you intend to use valve for media other than the one specified on that valve, check compatibility of media to Body Seal material and grease. Consult **ROTEX** in case if any doubt.

i) Do not try to drill any additional holes or machine, modify any of the valve components.

j) In case if the valve is used for dangerous fluid gas/liquid then, the user is hereby advised to maintain during operation and maintenance of the valve below LEL or above UEL to avoid explosion due to internal spark as the valves have not been assessed for the same.

k) Inlet pressure does not exceed rated pressure.

l) Hemp-Filaments, 'Jute' or even Teflon-Ribbons are normally not required, as the port connections of ROTEX Valve is accurately machined.

m) To avoid over lap of the Teflon ribbon or cuts generated while tightening, getting carried away into the valve. Do not cover first two thread pitches with Teflon tape or sealant.

⚠ 2. Provide Dust Cap on the exhaust port or ensure that the valve is mounted such a way that dust particles / rain water / process fluid do not enter into the valve through exhaust port of the valve. You can connect bend pipe of ID $\geq$ NW of the valve so that the exhaust port is not directly (straight) open into the atmosphere.

3. The process fluid etc.: do not fall on the valve body.

4. In case if the surrounding atmosphere has traces or some other substance other than Air, check its compatibility with the Body material of the valve, Solenoid enclosure & other exposed parts.

⚠ 5. In case if the valve is installed in potentially Hazardous area, check for the temperature class of the Solenoid to avoid explosion due to heated Solenoid / other components.

⚠ 6. Provide fuse of proper rating to avoid excess current passing through the Solenoid and thereby avoiding over heating.

⚠ 7. It is not likely however, the user is advised to protect the valve against lightening as the same is not assessed.

8. Check internal components (wetted) parts for its compatibility with fluid passing through the valve.

⚠ 9. **It is recommended to replace all the Rubber Parts including Plunger Assembly (Repair Kit – Code 99) in case if the valve is to be installed and put in service after 2 years from the date of manufacture.**

ELECTRICAL

1. Verify name plate affixed on the Solenoid.
2. **For AC Voltage (50Hz or 60Hz), select solenoid with option "FR"**.
3. Connect the power supply according to the voltage rating of the Solenoid
4. Ensure that the cover of Junction Box/Terminal Box is properly tightened wherever applicable.

⚠ 5. Install valve in such a way that the rain water / other process fluid dripping along the cable does not fall on the SOV and has no possibility to run along the cable and enter into the Terminal area.

6. Fill in the space between cable and gland entry with a proper sealant. If necessary, you may mount the valve upside down or in any other direction.
7. Ensure that the Solenoid enclosure meets process and local authority requirement.
8. The Plug in, Terminal Box, FPJB, IS Solenoids are provided with test leads. Remove them before final installation.

⚠ 9. Check for proper connections for the Solenoid which are polarity sensitive e.g. (a) Latched Solenoid.

TESTING OF THE VALVE AT THE TEST BENCH

⚠ Check at least once in 3 years or following your routine maintenance schedule.

For Valve Model --- 30316

a) Apply rated pressure at inlet port of the valve.
b) Plug outlet port.
c) Check operation of the valve and leakage at the exhaust ports and pilot vent at the rated and minimum working pressure by applying 75% to 120% rated voltage.
d) While keeping the solenoid de-energised, check operation and leakage from exhaust and pilot vent ports of the valve at the rated and minimum working pressure by operating Manual Override.
⚠ e) Without connecting air supply to the valve, operate Manual Override. Energized and De-Energized Solenoid to check for the plunger movement (normally movement should not be there) which can be checked by click sound. After operating Manual Override if plunger movement is found, reduce length of the manual override by 0.3mm from its taper end. Continue this till click sound stops.
f) Check the insulation resistance of the Solenoid by applying 500V DC at terminals and the solenoid housing. It should be more than 100 Mega Ohms.

For Valve Model --- 30316

a) Apply rated pressure at inlet port of the valve.

b) Do not Plug outlet port.
c) For NC valve, without energizing the solenoid, check leakage at outlet port.

SPECIAL TOOLS

- Guide Opening Tool: Spanner 12-13.

RECOMMENDED MAINTENANCE	**PREVENTIVE**
• Replacement of the Solenoid … … …	As and when required.
• Check of Insulation Resistance, Resistance of the Solenoid…	Once in a year (should be ≥ 100 MOhms @ 500V DC.
• Check Resistance of the Solenoid… … … (Not applicable for Solenoid with IS, RC options or AC Solenoid with ≥ 11 Watt power).	Replace Solenoid if the resistance reduces more than 5% computed at 20ºC as compared to its Initial value.

MAINTENANCE – GENERAL INSTRUCTION

- The Solenoid Valve must be removed from the site and has to be maintained under safe conditions.
- All air and electrical connections must be switched off before removing valve from the line.
- It is recommended to replace complete set of O Ring even if one of the O Ring is damaged. This is to ensure trouble free operation of the valve and will avoid its premature failure.
- Using Grease other than Silicon base Molykote M55 will lead to premature failure of O Rings of the **ROTEX** Solenoid valve.
- If necessary to clean the components, **do not use Kerosene, Diesel, Petrol to clean valve as this damages the O Rings and other rubber material. Instead use light Detergent Soap Solution.**
- Ensure that the components are free from dust, dirt, lint and metal burrs.
- Twisting of O Ring should be avoided. Ensure that the twist is removed before fitting matching part.
- While closing the matching part, the matching part should be pushed in a straight line. Turning motion should be avoided.
- Pinching of O Ring at the groove corner at the time of closing gland should be avoided.
- User is requested to use safe practice for maintenance.
- It is important to place the dismantled Valve Parts on a clean paper or cloth in same sequence in which you have dismantled them.
- Ensure to keep all the components of the valve separately to avoid their mixing up. The component appears to be same may have small differences which will cause malfunction if interchanged.
- In case of difficulty you should contact the Agent, Distributor or **ROTEX** directly.
- Using **ROTEX** genuine spares will **Guarantee** you trouble free operation and will avoid premature failure.

(A) **TO REPLACE SOLENOID**

1) Open dome nut (Part 37) and pull out solenoid (Part 34)
2) Replace new solenoid ensuring the construction, voltage and current meets the requirements.
3) Tighten the dome nut (Part 37) applying torque of 0.2 kgm to 0.35 kgm to avoid over tightening of the solenoid.
4) Measure and record resistance of the Solenoid.

(B) **TO REPLACE GUIDE ASSEMBLY (CORE TUBE) (Part 33) / PLUNGER (Part 30), SET OF 'O' RING**

1) Open dome nut (Part 37) and pull out solenoid (Part 34).
2) Open Guide Assembly (Core Tube) (Part 33) using guide opening tool / spanner.
3) Pull out Plunger Assembly (30) along with Sleeve (Parts 101 & 07).
4) Insert a small pin in the hole of magnet holder (Part) and second pin in the Plunger (Part 30).
5) Open the same by rotating anti clockwise. Remove old 'O' Rings and clean metallic parts.
6) Replace all the 'O' Rings like Plunger O Ring (Part 80), Seat O Ring (Part 19) and reassemble magnet holder I (Part 107) into the Plunger (Part 30) using small amount of Locktite 242 on the thread of magnet holder (Part 107).
7) Reassemble Sleeve (Part 07) along with Sleeve O Ring (Part 105) and insert assembly in the body.
8) Fix the Guide Assembly (Part 33) ensuring that Guide O Ring (Part 32) and Sleeve O Ring (Part 105) are well placed.
9) Check the valve for operation and leakage.

(C) **REPLACEMENT OF MANUAL OVERRIDE OF MANUAL OPERATED VALVE (AWS/DMB-VLV01)**

1) Remove Grub Hex Socket Set Screw (Part 115) and pull out Manual Override (Part 8).
2) Replace new Manual Override applying light layer of Silicon Grease Molykot M55 and tighten the grub screw fully till the Manual Override stops traveling in and out.
3) Open the Grub Hex Socket Set Screw slightly (1/4 turn) and check the smooth movement of the grub screw.

⚠ 4) Without connecting air supply to the valve, operate Manual Override. Energized and De-Energized Solenoid to check for the plunger movement (normally movement should not be there) which can be checked by click sound.
After operating Manual Override if plunger movement is found, reduce length of the manual override by 0.3mm from its tapper end. Continue this till click sound stops.

STORING, CLEANING AND MOUNTING OF ELASTOMERS: SYNTHETIC RUBBER PRODUCTS

- Store Plunger, O Ring Set in sealed polyethylene bag, kept in cool, dry, dust free area and avoid direct contact with all light sources emitting ultra violet rays, or contact with fumes, solvents, fuels, lubricants, chemicals, acids, disinfectants.
- Follow Maintenance General Instruction & specific procedures to replace O Ring set as listed above.

Guide Opening Tool M-22
Photo - 1

Manual Override “OFF”
Photo – 2

Manual Override “ON “
Photo – 3

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