

MI0287 IVP - J55

Installation, Operation and Maintenance Instructions

GENERAL NOTES

- THESE INSTRUCTIONS APPLY ONLY TO THE J55 SERIES.
- THIS MANUAL MUST BE READ IN CONJUNCTION WITH GENERAL ARRANGEMENT DRAWING J55.
- THE PRESSURES SUPPLYING AND CONTROLLED BY THIS PRESSURE REDUCING VALVE (PRV) ARE SUFFICIENTLY HIGH TO ENDANGER HUMAN LIFE. SUITABLY TRAINED, QUALIFIED AND AUTHORISED PERSONNEL MUST CARRY OUT ALL INSTALLATION AND MAINTENANCE PROCEDURES. UNAUTHORISED PERSONS MUST BE PROHIBITED FROM TAMPERING WITH, OR OPERATING THIS EQUIPMENT.
- IT IS ASSUMED THAT THE SYSTEM INTO WHICH THIS PRV IS TO BE SET, IS PROVIDED WITH ADEQUATE ISOLATION AND SAFETY DEVICES.
- THE VENT HOLE IN THE SPRING HOUSING MUST NOT BE OBSTRUCTED IN ANY WAY WHICH WOULD RESTRICT THE FREE VENTING OF MEDIA TO ATMOSPHERE.
- THIS PRV IS NOT DESIGNED FOR USE WITH 'HAZARDOUS' MEDIA. (THE J55 MODEL SHOULD BE USED FOR SUCH PURPOSES).
- SHOULD THE PRV BE PLACED INSIDE A CONTAINER OR CABINET, THEN THE CONTAINER/CABINET MUST INCORPORATE A VENTING SYSTEM.

TECHNICAL INFORMATION

- Maximum Inlet Pressure - 420 Bar
- Hydraulic Test Pressure – 630 Bar
- Outlet Pressure Range:
 - 0 – 5 Bar
 - 0 – 20 Bar
 - 0 – 52 Bar
 - 0 – 103 Bar
- CV – 0.84 (kV – 0.72)

ATEX MARKING INDICATOR

| MARKING (STANDARD) | DESCRIPTION |
|----------------------|---|
| EX II 2 G D | EQUIPMENT IS SUITABLE FOR USE IN NON MINING, EX ENVIRONMENTS, GAS AND DUST |
| Exc IIC | NON ELECTRICAL EQUIPMENT SUITABLE FOR AN EX ENVIRONMENT |
| T4 Ta (-10 - +100°C) | T RATED EX EQUIPMENT NOT TO BE USED OUTSIDE THE SPECIFIED TEMPERATURE RANGES (Ta) |
| INLET, OUTLET | PIPEWORK SHOULD BE CONNECTED SUCH THAT IT FUNCTIONS AS PORT MARKINGS |
| SERIAL No. | FOR YEAR OF MANUFACTURE REFER TO CERTIFICATE OF CONFORMITY |

ATEX SEAL TABLE

| POLYMER | Ta TEMP | NON ATEX |
|---------|--------------|---------------|
| NITRILE | -10 TO 100°C | -10 TO +100°C |
| VITON | -20 TO 135°C | -20 TO +150°C |
| EPDM | -30 TO 115°C | -30 TO +115°C |

1.0 DESCRIPTION

- The J55 is a single stage, spring loaded, Pressure Reducing Valve (PRV), of 0.84 CV.
- The PRV is suitable for use in high-pressure gas systems where a reduction of pressure is required.
- The range of pressure reduction is made possible by the availability of varying combinations of piston or diaphragm and load spring packs.
- The standard option incorporates a release feature. This is a small valve adjusted to a set lift and responds to any increase over the set pressure by venting the excess media to atmosphere. It makes possible the re-setting, up or down, from the set pressure whilst the PRV remains in the line. **IT MUST NOT BE REGARDED AS A FULL FLOW CAPACITY RELIEF VALVE!**
- As standard, a 6mm. Diameter, balanced valve is fitted.
- Internal sealing is achieved with "O" rings.
- The Inlet/Outlet connections are suitable for mounting into lines of DN12 (nom.).
- It is recommended that connecting pipe-work be suitably supported.
- An optional panel mounting kit is available.
- Approximate weight of the equipment is, 4.3Kg. Therefore, the equipment may be regarded as portable.

1.1 FUNCTION

With the hand-wheel (7) wound **anti-clockwise**, (over winding will result in the handwheel being removed) flow is prevented from flowing through the PRV as the main valve (5) is maintained firmly against its seat (6) by spring (13).

Turning the hand-wheel clockwise loads the spring (37). This load is applied, via the piston (30,31 or 44) to the valve (5) which, once the applied load exceeds that of spring (13), will be forced off its seat (6) allowing media to flow to the outlet and, via the feed hole, to the underside of the piston or diaphragm. When this pressure balances the load generated by the spring (27), the valve will move toward closed until the flow is balanced to maintain the set outlet pressure.

Should the outlet pressure rise above the set pressure, the piston will continue to travel upwards until the ball-valve (spherical end of valve stem) is displaced from its seat (12). This allows excess media to pass via the vent port to atmosphere. (See also General Notes).

In closed circuits the main valve (5) closes when the set pressure is reached in the system.

2.0 INSTALLATION

BEFORE COMMENCEMENT OF ANY INSTALLATION WORK, IT IS IMPORTANT THAT ANY SOURCE OF PRESSURISED MEDIA BE TURNED OFF OR ISOLATED FROM THE POINT AT WHICH THE PRV WILL BE INSTALLED. AT ALL TIMES, IT IS ESSENTIAL THAT ISOLATING VALVES MUST BE ACTUATED SLOWLY TO AVOID THE RISK OF EXPLOSION DUE TO DIESELING.

- Remove packaging and ensure that there are no obviously loose parts or visual signs of damage.
- **Check that the information listed on the "DATA LABEL" confirms that the PRV supplied is suitable for the intended service.**
- **Wind the hand-wheel anti-clockwise** to ensure that the load spring is "off load".

- The system into which the PRV is to be set must be clean and free of any solid inclusion which could be a source of damage to soft seated components.
- The PRV is set directly into the line using the threaded inlet and outlet connections. **CARE SHOULD BE TAKEN WHEN USING ANY FORM OF SEALING TAPE THAT ANY LOOSE FRAGMENTS ARE NOT ALLOWED TO COME INTO CONTACT WITH THE SEATING AREAS OF THE PRV.**
- The two ports are diametrically opposite **and it is important that the PRV is correctly oriented into the pipe-work.** A "FLOW DIRECTION" arrow is visible on the body. Other than for ease of maintenance, the **ANGULAR** orientation of the PRV in the line is not important.
- Two mounting holes, M6x1, are located in the base of the PRV.
- If the PRV is to be panel mounted, it is recommended that a factory supplied kit be used, this is specifically designed for use with the J50 and J55 PRV's.

2.1 SETTING TO WORK

- Ensure that supply and outlet isolation valves are closed.
- **SAFETY NOTE "OPEN AND CLOSE ALL ISOLATING VALVES SLOWLY!"**
- Check that hand-wheel is wound **anti-clockwise**, ensuring that the "load spring" is unloaded.
- Gauges must be provided in line, in order that inlet and outlet pressures may be monitored during setting up.
- Ensure that **correct supply pressure** is available, before **SLOWLY** opening supply isolation valve. Outlet isolating valve remains closed. **Turning hand-wheel clockwise** (See "DIRECTION ARROW" on end of hand-wheel), adjust to required outlet pressure. Monitor pressure on gauge throughout this process. When satisfied that the correct pressure has been set, **VERY SLOWLY** open outlet isolating valve to run system.

3.0 MAINTENANCE

- Having few moving parts, the J55 will require only periodic inspection of those items subject to wear, or deterioration to, ensure long service and reliability. When servicing or repair becomes necessary, it is recommended that the PRV be returned for factory refurbishment. However, the design of the J55 does enable it to be serviced in the field, with minimal inconvenience, to satisfy plant operations and minimise down times. **It is recommended that all repairs and servicing be carried out using only quality assured spares supplied by the manufacturer.**

3.1 PREVENTATIVE MAINTENANCE

- In a clean system, the J55 will continue to deliver trouble free service over long periods of time. Under these conditions, maintenance intervals may be as long as 24-36 months. In more arduous conditions or in aggressive media service, the periods may be shorter, 6-12 months. It is however, important that units in safety related applications be inspected more frequently. During these preventative maintenance periods, the following procedure is suggested :
 - a) Inspect all "O" seals for wear, brittleness or other signs of damage. All those displaying any indication of damage or deterioration should be replaced. However, it is recommended that all seals, regardless of any damages should be routinely replaced.
 - b) The valve (5) and seat (6) should be removed and inspected, closely, for wear or other damage. Typical signs of damage will be nicks or raised burrs around the seating edge of the valve (5), or indentations, abrasions and hard particle inclusions in the soft seat (6) sealing area.

Severe wear and/or very apparent nick's burrs or particle inclusion would indicate that replacement is necessary. Light wear and the presence of a clean, continuous seating ring on both parts would indicate that they are suitable for re-use.

- c) Any components showing signs of corrosion should be inspected for indications of permanent damage (ie. pitting etc.) and replaced if any are present.

3.2 REMEDIAL MAINTENANCE

- If the J55 is maintained to a planned program, it is unlikely, unless the system becomes contaminated or an operating system problem causes damage to one of the control elements, that the PRV will malfunction, and the need for remedial service arise. In general it is recommended that damaged PRV's be returned to the factory for repair. To facilitate field repair, and minimise plant down-time, **Table 1.** Lists some possible faults and probable causes/solutions. The following recommendations are also made :
- It is preferable that the PRV be repaired or serviced under workshop conditions, as the opened equipment must be protected from ingress of dirt and other foreign material. Should operational requirements make it necessary to service the PRV in the pipe-line, then precautions should be taken to avoid contamination of the unit or parts.
- SAFETY NOTE: WHEN UNDERTAKING ANY REPAIR OR SERVICING IN WHICH THE PRV REMAINS IN THE LINE, IT IS ESSENTIAL THAT THE EQUIPMENT IS ISOLATED FROM THE PRESSURISED MEDIA, AND THAT ALL ISOLATING VALVES ARE ACTUATED SLOWLY TO AVOID THE RISK OF EXPLOSION THROUGH DIESELING.**

Table 1.

| SYMPTOM | CAUSE | SOLUTION |
|--|---|---|
| Rise in outlet pressure above that set. | Damaged valve (5) and/or seat (6) Dirty valve (5) and/or seat (6) Damaged spring (13) Damaged "O" ring (160) | Replace part(s). Clean part(s). Replace part. Replace part. |
| Continuous bleed from vent port. | Damaged valve (5) and/or seat (6) Dirty valve (5) and/or seat (6) Damaged "O" ring (14) Damaged "O" ring (26) OR for DIAPHRAGM VERSIONS: Damaged diaphragm (30) | Replace part(s). Clean part(s). Replace part. Replace part. Replace part. |
| <i>This problem could also be indicated by the causes of rise in set pressure (see above).</i> | | |
| Loss of control in pressure regulation. | Damaged spring (27/28) | Replace part. |

4.0 STRIPPING AND RE-ASSEMBLY

Having few parts, stripping and re-assembly of the J55 may be regarded as straightforward, provided certain conditions are observed.

- SAFETY NOTE: IF THE PRV IS TO BE WORKED ON WHILST REMAINING IN THE PIPE-LINE, IT MUST AT ALL TIMES BE TOTALLY ISOLATED FROM HIGH PRESSURE MEDIA.**
- Cleanliness is of the utmost importance; even the smallest of inclusions may seriously affect the operation of the PRV.
- Tool List:
Adjustable Wrench (medium – up to 26mm. a/f opening)-body plug.
Adjustable Wrench (large – up to 50mm. a/f opening) – spring cover.
- Re- assembly should be made using only sparing amounts of grease. That recommended for rubbers is "Dow Corning MS4" and for threads etc. "Bostic Never-Seez", **any alternatives should be checked carefully. Use of lubricants AT ALL with media other than air, MUST BE VERIFIED WITH LUBRICANT SUPPLIERS!**
- For safety, all tightening torque values must be adhered to.**

4.1 STRIPPING

- Remove Plastic Protection Cap (19)
- Unscrew handwheel (7) and remove.
- Using adjustable wrench, remove Spring Housing (2). The Body of the PRV (1) **must be rigidly held for this operation, and care must be exercised to avoid damage to pipe- work if the PRV is to remain in the line for servicing.**
- Once the Spring Housing (2) is clear of its thread, carefully lift clear of the Body (1). The Load Spring (37), Ball (20), and spring plate (3) should then be lifted from the Body.
- The Piston may be removed by pulling out between finger and thumb. The release seat (12) can be gently prised from its housing using the smooth, rounded end of a small diameter bar or screwdriver but will have to be replaced by a new part.
- Withdraw the Piston Plate (32/33), using fingers or a simple hook shaped tool and lift the component clear.
- FOR DIAPHRAGM VERSIONS ... Lift out the complete diaphragm assembly in the same way as the piston version. Lift off the Clamp Ring (39). Hold piston (44) in a soft jawed vice and unscrew retainer (32) using suitable grips and remove the Diaphragm (40). Remove the release seat as for the piston version. Remove support ring and "o"ring (31&33) from body.**
- To remove the Valve (5) and Seat (6), it is first necessary to remove the Body Plug (4), Spring (13), Valve (5) and spacer or filter (40or41) will be withdrawn with the Bottom Plug. It is possible that the Seat (6) will remain in situ and may have to be removed separately.
- Some difficulty may be encountered in attempting to remove the Valve (5) and Seat (6), if the PRV is **not mounted in the vertical position (see 2.0)**. For ease of handling, it is recommended that the line connections be loosened, and the PRV swung to the **vertical** during servicing.
- On completion of strip down, all parts should be cleaned, using a suitable proprietary cleaner, and dried. Whether the PRV is fully or only partially stripped will depend upon the level of servicing being undertaken. In all cases, parts should be examined as described in **3.1** and **3.2**, and those selected for re-use should be stored under clean conditions until required.

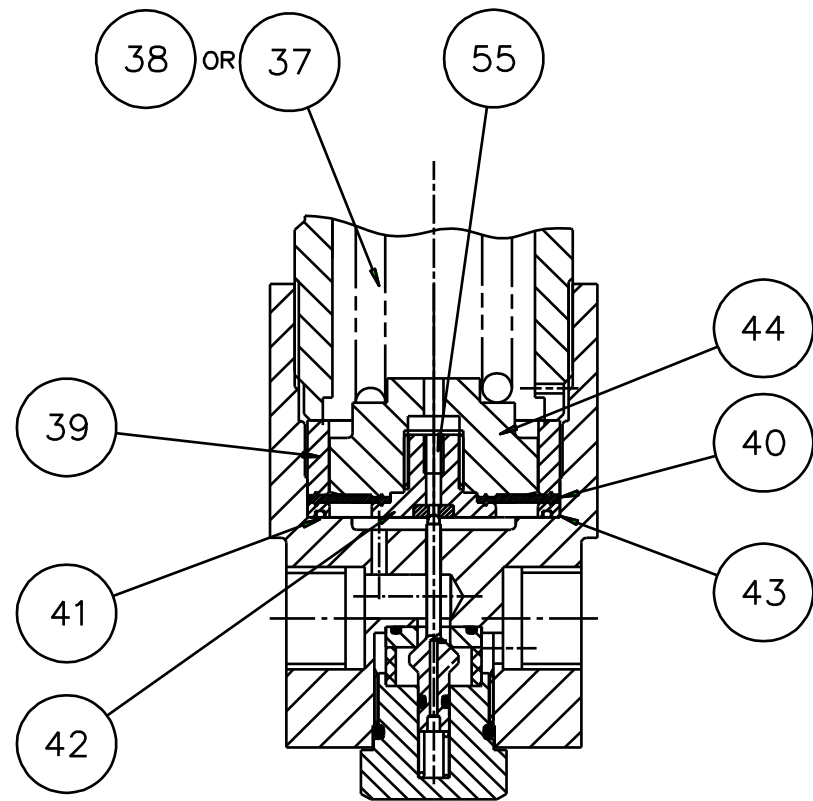
4.2 RE-ASSEMBLY

- SAFETY REMINDER: IF THE PRV IS TO BE RE-ASSEMBLED IN THE PIPE-LINE, IT MUST BE FULLY ISOLATED FROM HIGH PRESSURE MEDIA WHILST WORK TAKES PLACE AND UNTIL THE PRV IS SET BACK TO WORK (SEE 2.1). ALL LUBRICANTS MUST BE USED SPARINGLY AND BE APPROVED FOR THE SERVICE MEDIA; FAILURE TO OBSERVE THIS COULD RESULT IN FIRE OR EXPLOSION. ISOLATION VALVES MUST BE ACTUATED SLOWLY TO AVOID DIESELING AND THE RISK OF EXPLOSION.**
- Ensure that all parts are available to complete assembly, and that they are clean and free of damage. It is recommended that all "O" rings be replaced regardless of damages, and that they are smeared sparingly with a suitable lubricant (**see warning note above**). If the PRV is to be re-assembled while in the pipe-line, some difficulty may be encountered when assembling the Seat (6) and Valve (5). For this reason it is recommended that the PRV be vertically mounted for servicing (**see 4.1**).
- To refit the Seat (6) and Valve (5). Assemble Body Plug (4) with "O" ring (15), Spring (8), spacer or filter (40or41) and Valve (3)fitted with "o" ring (15). Place "O" ring (14) into its groove on Seat (6). The Seat is then placed ("O" ring facing outward) onto the valve assembly, this whole is then carefully screwed into the M24 hole in the bottom of the Body (1), and **tightened to 20Nm**.
- "O" ring (36) is now assembled to the Piston Plate (32or33), and carefully assembled to the Body (1).
- Make assembly of Piston (30or31), "O" ring (34or35). Press Release Seat (12) into its housing in piston. Slide complete assembly into Piston Plate. Drop Load Spring (37) over its guide on the Piston. Add spring plate(3) to top of spring.
- FOR DIAPHRAGM VERSIONS ...Make assembly of Release Seat (12) into its housing in Retainer (42). Assemble together, the piston(44), Diaphragm (40) and Retainer (42) and tighten using same method as stripping. Slide over the Clamp Ring (39),fit support ring and "o"ring(41&43) in body. Drop diaphragm assembly into Body (1) and drop Load Spring (27or38) over its guide on the piston (34), followed by spring plate (3)... Continue with sequence below to complete re-assembly.**
- Assemble Spring Cover over the Load Spring and screw into the Body (1). **IMPORTANT Torque to 90Nm (piston types) and 50Nm (diaphragm types)**

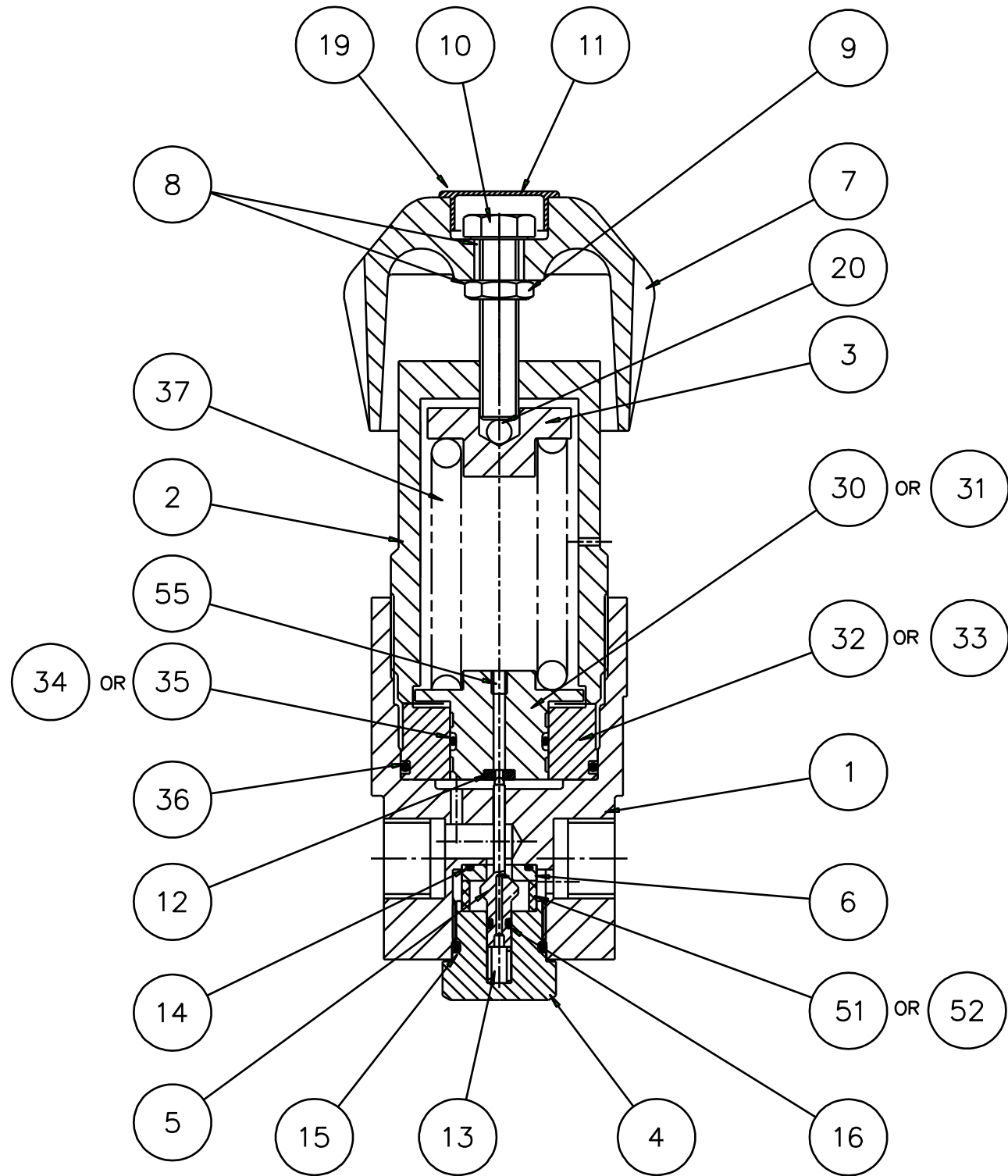
Manufacturer:

In the event of fire the seals on this valve may become ineffective and/or give off toxic fumes.

With respect to unstable and dangerous fluids intended for use with this valve, refer to Transport and Handling sections of the Manufacturers Safety Data Sheet for that fluid or contact Thompson Valves Technical Sales for advice.



ARRGT.FOR DIAPHRAGM VARIANTS
PRESSURE OPTIONS M & R



TORQUE
20Nm
←
FLOW DIRECTION

ARRGT. FOR PISTON VARIANTS
PRESSURE OPTIONS W & Y