MI0339
IVP
L50 Type

Pressure Maintaining Valve

Installation, Operation and Maintenance Instructions

GENERAL NOTES

- **THESE INSTRUCTIONS APPLY ONLY TO THE L50 SERIES.**
- **THESE INSTRUCTIONS MUST BE READ IN CONJUNCTION WITH THE RELEVANT GENERAL ARRANGEMENT DRAWING. (SEE ASSOCIATED DOCUMENTS)**
- **THE PRESSURES SUPPLYING AND CONTROLLED BY THIS PRESSURE MAINTAINING VALVE 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 PRESSURE MAINTAINING VALVE IS TO BE SET, IS PROVIDED WITH ADEQUATE ISOLATION AND SAFETY DEVICES.**
- **SHOULD THE PRESSURE MAINTAINING VALVE BE PLACED INSIDE A CONTAINER OR CABINET, THEN THE CONTAINER/CABINET MUST INCORPORATE A VENTING SYSTEM.**

TECHNICAL INFORMATION

- Maximum Inlet Pressure – 250 Bar
- Hydraulic Test Pressure – 375 Bar
- Set Pressure Ranges:
  - 0 – 10 Bar
  - 0 – 52 Bar
  - 0 – 103 Bar
- CV – 1.1 (KV – 0.95)
- Valve Temperature Range - -40°C to +150°C

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 EQUIPMNET NOT TO BE USED OUTSIDE THE SPECIFIED TEMPERATURE RANGES (Ta)
INLET, OUTLET, VENT	PIPEWORK SHOULD BE CONNECTED SUCH THAT IT FUNCTIONS AS PORT MARKINGS
SERIAL No.	FOR YEAR OF MANUFACTURE REFER TO CERTIFICATE OF CONFORMITY

TEMPERATURE GUIDELINES

VITON VERSION	-20 TO +150°C
NITRILE VERSION	-10 TO +100°C
EPDM VERSION	-30 TO +115°C

1.0 DESCRIPTION

- The L50 is a single stage, spring loaded, Pressure Maintaining Valve of 1.1 CV.
- The Pressure Maintaining valve is suitable for use with high pressure fluids or gases and will relieve with extreme accuracy over a wide variable range. This is achieved by the incorporation of a number of alternative piston/diaphragm assemblies in conjunction with various loading springs.
- Internal sealing is achieved with "O" rings.
- The Inlet/Outlet connections are suitable for mounting into lines of DN8 (nom.).
- It is recommended that connecting pipe-work be suitably supported.
- An optional panel mounting kit is available.
- Approximate weight of the equipment is, for Stainless Steel version, 4.3Kg. Therefore, the equipment may be regarded as portable.

1.1 FUNCTION

With the hand-wheel (12) wound fully **anti- clockwise**, thereby relaxing all pressure on the main loading spring the main valve is only kept on its seat by a small return spring. Therefore the introduction of pressure through the inlet port will act upon the underside of the piston or diaphragm and raise the valve from its seat permitting flow to take place to the outlet port.
Turning the hand-wheel clockwise loads the spring (14). This load prevents pressure passing to the outlet port until such time as the load exceeds that of the main spring thus permitting the valve to rise from its seat and relieve off excess pressure past the set point of the valve.
Flow will continue to take place until the inlet pressure drops sufficiently to allow the greater pressure exerted by the loading spring to close the main valve on its seat thereby stopping flow taking place tot the outlet port.
To increase the desired relief pressure, turn the control knob clockwise, conversely to decrease relief pressure turn the control knob anti-clockwise.

1.0 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 PRESSURE MAINTAINING VALVE 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 Pressure Maintaining Valve supplied is suitable for the intended service**.
- **Wind the hand-wheel fully anti-clockwise** to ensure that the load spring is "off load".
- The system into which the Pressure Maintaining Valve 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 Pressure Maintaining Valve 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 PRESSURE MAINTAINING VALVE.*
- The two ports are diametrically opposite **and it is important that the Pressure Maintaining Valve 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 Pressure Maintaining Valve in the line is not important.
- Two mounting holes, M6x1, are located in the base of the Pressure Maintaining Valve.
- If the Pressure Maintaining Valve is to be panel mounted, it is recommended that a factory supplied kit be used; this is specifically designed for use with the L50.

2.1 SETTING TO WORK

- Ensure that inlet and outlet connections are leak-tight. Check with "leak detection" fluid if necessary.
- Ensure that supply and outlet isolation valves are closed.
- **SAFETY NOTE "*OPEN AND CLOSE ALL ISOLATING VALVES SLOWLY!"***
- Check that hand-wheel is wound fully **anti-clockwise,** ensuring that the "load spring" is unloaded. Apply load to spring by turning hand wheel clockwise. Apply inlet pressure to determine valve setting. Adjust hand wheel until the valve closes. WARNING – ANY DOWNSTREAM EQUIPMENT SHOULD BE ISOLATED FROM OVERPRESSURISATION.
- An inlet gauge must be provided, in line in order that the relieving pressures may be monitored during setting up.

3.0 MAINTENANCE

- Having few moving parts, the L50 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 Pressure Maintaining Valve be returned for factory refurbishment. However, the design of the L50 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 L50 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 :
- 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.
- The piston assembly (46) and seat retainer(14) should be removed and inspected, closely, for wear or other damages. Typical signs of damage will be nicks or raised burrs around the seating edge of the seat (11), or indentations, abrasions and hard particle inclusions in the soft (seating) 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.

a) 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 L50 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 Pressure Maintaining Valve will malfunction, and the need for remedial service arise. In general it is recommended that damaged Pressure Maintaining Valves' 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 Pressure Maintaining Valves 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 Pressure Maintaining Valves 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 PRESSURE MAINTAINING VALVES 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
Valve will not relieve at set point.	Control Knob setting incorrect. Piston assembly sticking when attempting to move piston by hand.	Re-adjust set pressure. Clean part(s) and lubricate Replace part.
Continuous leak on outlet before pressure reaches set relief point reached. *This problem could also be indicated by the causes of rise in set pressure (see above).*	Damaged seat or stem. Contamination on seat.	Re-Adjust. Replace part(s). Clean part(s). Replace part. Replace part. Replace part.
Loss of control in pressure regulation.	Damaged spring (14)	Replace part.

4.0 STRIPPING AND RE-ASSEMBLY

Having few parts, stripping and re-assembly of the L50 may be regarded as straightforward, provided certain conditions are observed.

- **SAFETY NOTE: IF THE PRESSURE MAINTAINING VALVES 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 PRESSURE MAINTAINING VALVES.
- Tool List:
  M10 Socket – *hand-wheel retaining nut.*
  Adjustable Wrench (small – *up to 20mm. a/f opening).*
  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 (4)
- Remove M10 Nut (10) and Washer (2)
- Lift off Hand-Wheel (128) and Thrust Washer (94)
- Remove M4 Socket Head Screw (20)
- Using adjustable wrench or special tool (see above), remove Spring Housing (2). The Body of the PRESSURE MAINTAINING VALVES (1) **must be rigidly held for this operation, and care must be exercised to avoid damage to pipe- work if the PRESSURE MAINTAINING VALVES is to remain in the line for servicing.**
- Once the Spring Housing (1) is clear of its thread, carefully lift clear of the Body (30). The Load Spring (44) should then be lifted from the Body.
- The Loading Stem may be removed from the Spring Housing (1), by grasping the M14 thread and pulling it clear. Take care that the components of the Needle Roller Bearing (6/7) *are not allowed to fall and be lost, contaminated, or damaged*.
- Withdraw the Piston (46) complete with valve (15) and bush (13) .
- Seat Retainer (14) can be unscrewed and removed with seat(11).
- On completion of strip down, all parts should be cleaned, using a suitable proprietary cleaner, and dried. Whether the PRESSURE MAINTAINING VALVES 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

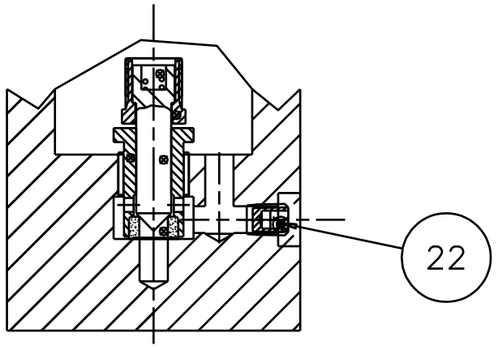
- This is a direct reversal of stripping.
- **<u>SAFETY REMINDER</u>: IF THE PRESSURE MAINTAINING VALVES IS TO BE RE-ASSEMBLED IN THE PIPE-LINE, IT MUST BE FULLY ISOLATED FROM HIGH PRESSURE MEDIA WHILST WORK TAKES PLACE AND UNTIL THE PRESSURE MAINTAINING VALVES IS SET BACK TO WORK (SEE 2.1). ALL LUBRICANTS 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).**
- The PRESSURE MAINTAINING VALVES is ready to return to work (**see 2.1).**

ASSOCIATED DOCUMENTS:
GENERAL ARRANGEMENT DRAWING – L50
This drawing details all part numbers and materials for identification of spare parts.

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.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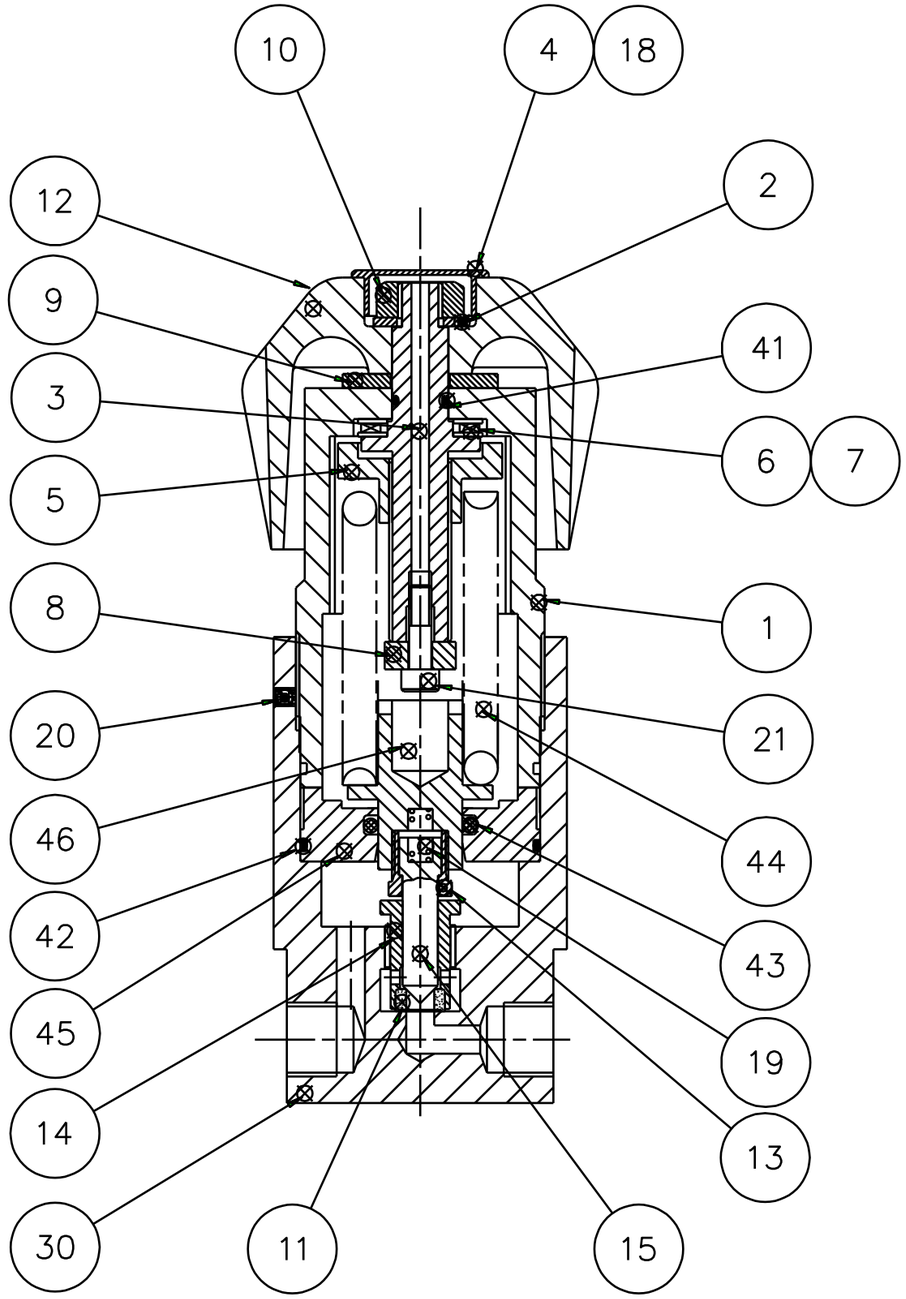
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