

**CRANE** FLUID SYSTEMS

OUR GENIUS IS VALVES

# METREX™ COMMISSIONING SET

## DM950L / DM950G – PN16

### INTRODUCTION

DM950L / DM950G Metrex™ is a combined water flow rate measurement device and regulating butterfly valve with adjustable stop feature. When the correct flow rate is achieved, the stop is fixed such that the valve can be closed and then re-opened to the correct setting.

**Pressure temperature:** 16Bar at -10 to 120°C Liquid Service

**Pressure rating:** Test pressure maximum = 24Bar shell hydrostatic

**Seat:** 17.6Bar (as per the requirements of BS EN 12266)

**End connections:** Flange and lugs for connection to BS EN 1092-1 & BS EN 1092-2 PN16 flanges.

**Pressure test valves:** Crane P82 / P84 Pressure test point.

**Flow direction:** Butterfly valve at downstream end of assembly.

**Joint gaskets:** Only one flange jointing gasket required at upstream end of assembly. No gasket to be used on Butterfly end.

### GENERAL INSTALLATION

#### Preparation

- Ensure valve is suitable for service conditions e.g. pressure, temperature, service media.
- Remove the plywood protection discs from both ends of the assembly. The hexagon headed screws or bolts used to secure the protection disc to the butterfly valve must now be refitted into the other side of the butterfly valve, through the unused holes in the flange of the extension piece. Check that all holes in the extension piece flange now have a screw or bolt connecting it to the butterfly valve, and that they are all tightened securely.
- The installation shall be designed to provide adequate means of draining and venting to permit cleaning, inspection and maintenance in the correct manner.
- The complete piping system must be flushed through prior to commissioning to ensure all foreign matter is removed. The primary cause of valve failure is dirt and other material left in the pipeline.

**GENERAL INSTALLATION (CONTINUED)****Handling / Important****ATTENTION**

- This unit incorporates a precision made orifice plate. Take care not to damage this orifice plate in any way during handling or installation, do not grip or insert any object into the bore of the assembled unit when lifting.

**ATTENTION**

- The orifice plate is secured to the extension piece pipe flange by means of an orifice plate retainer and four small fixing screws. The small screws are incorporated merely to ensure that the various parts remain correctly assembled and centered during installation and are not intended to be load bearing. When handling the assembled unit ensure that no additional load is applied to the screws. Do not lift by or apply any lateral load or force to the orifice plate retainer.

**Assembling the Pressure Test Fittings**

Refer to diagram 1

- The following pressure test fittings are supplied with each operator kit:-

P82 pressure test valve with red colour tie (2)

P82 pressure test valve with blue colour tie (2)

P83 pressure test point extension piece (3)

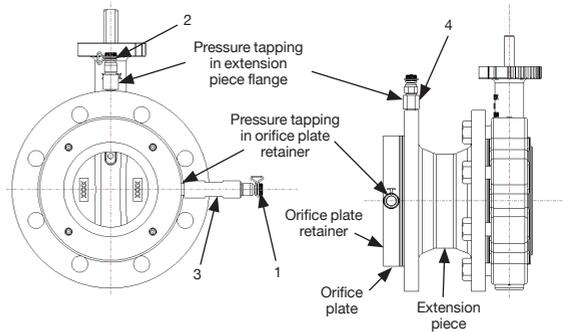
1/8 to 1/4 BSP Adaptor (4) (kits for valve sizes DN50 – DN125 only)

**ATTENTION**

- The above items should be assembled as described below. All threaded connections should be made with the aid of a suitable thread sealant taking care not to obstruct the holes.
- The P82 valve with the red coloured tie (1) should be assembled with the P83 test point extension piece (3), to the tapping in the orifice plate retainer.
- The P82 valve with the blue coloured tie (2) should be assembled to the pressure tapping in the rim of the extension piece flange (P83 extension piece not required). With the valve sizes DN50 – DN125, it will be necessary to first fit the 1/8 to 1/4 BSP adaptor (4) into the tapping in the rim of the flange.

**GENERAL INSTALLATION (CONTINUED)**

Part No.	Description
1	P82 Valve (Red tie)
2	P82 Valve (Blue tie)
3	P83 pressure test point extension piece
4	1/8 to 1/4 BSP adaptor



**DIAGRAM 1 - DM950 QUARTER TURN FIXED ORIFICE DOUBLE REGULATING VALVE**

**ATTENTION**

**Valve Location**

- Valves should be located to ensure ease and safe operation of the valve.
- The unit should be installed in a run of pipe of the same nominal size. To ensure flow measurement accuracy. It is essential that the piping on the inlet and outlet sides are straight and have a minimum length equivalent to 10 diameters at inlet and 5 diameters at outlet.
- The unit must be installed in the pipeline such that the butterfly valve is positioned at the downstream (outlet) end of the assembly. It may be installed in any attitude i.e. pipeline horizontal, inclined or vertical. The lever handle/hand wheel should be positioned to give convenient and comfortable operation of the butterfly valve and may also be located in any attitude i.e. on top, at side, inclined or upside down. The unit should also be orientated or configured to allow access to the two P82 pressure test valves preferably avoiding locating either of them at the bottom of the unit where they could be susceptible to blockage from pipeline debris. With lever handle operated valves, take care to ensure that the unit is also configured such that the pressure test valves are sufficiently clear of the lever handle when is moved to the fully open position.

- The unit is supplied with two pressure test valve tapings spaced 90° apart. If necessary, this spacing can be altered by repositioning the orifice plate retainer. If the orifice plate retainer is repositioned, it will first be necessary to remove the four small hexagon socket screws securing the orifice plate retainer and orifice to the extension piece. Care must be taken to support the orifice plate during this process.
- When installing the unit in the pipeline, a gasket is needed at the upstream end of the unit only. A gasket should not be used with the butterfly valve as its elastomer seat extends beyond the valve faces and provides a leak proof seal with the matching pipe flange faces. The gasket used at the upstream end must not protrude into the pipe bore.

## GENERAL INSTALLATION (CONTINUED)

### Piping Supports

- Pipe supports must be carefully aligned and at the correct distance between centres for the size and types of pipe, and must be adequate for the combined weights of pipe and valves.
- The improper alignment of the pipe and the valve during installation can lead to unbalanced tightening of the flanges which may cause excessive stress on the bolts and lead to leakage.

### Handling

- Care should be taken when handling these valves. Weights of valves can be provided on request. It is the responsibility of the installer to ensure that all lifting equipment is rated for the required lifting weight, and is properly maintained and safe to use. When unloading, lifting and positioning of these valves, care must be taken to avoid damage to the faces of the valves as these are used as sealing faces on the pipe flanges.

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## OPERATION

- The operating conditions shall be consistent with the requirements in the performance specification.
- Occasionally operate valves that remain open or closed for long periods to ensure they are in good working order, thus avoiding the possibility of being inoperable in a time of emergency.
- The memory stop position can be adjusted from 0° to 90° by slacking the bolt (4) nut (5) positioning bolt (7) and nut (8) and rotating the indicator plate via the handle until the required valve opening position is attained, the angle of rotation can be determined by aligning the pointer on the handle with the indicator plate scale (2), then tighten the positioning bolt (7) and nut (8) firmly. The valve can now be closed engaging the latching lever and opened to the fixed memory stop by disengaging the latching lever.

### General

- Flow regulation is achieved by adjusting the valve setting until the required flowrate, as derived from the 'signal' measured across the pressure test valves, is obtained. (Flow charts are available on request for all sizes.) All valves may be set in infinite positions. The setting at which the required flow is achieved may be retained by means of the adjustable Memory Stop facility as described below.
- If a permanent locked valve open position is required then this can be achieved by adjusting/tightening the position tightening bolt (4) nut (5). (This will keep the latching lever fully engaged with the slot in the indicator plate).

### Lever handle operation (Diagrams 2)

- The valve can be opened to a memory stop by rotating the lever handle (1) up to the stop surface on the indicator plate (2) and allowing the latching lever (11) to engage with the slot on the indicator plate.

## OPERATION

Part No.	Description
1	Lever handle
2	Indicator plate
3	Base plate
4	Socket head screw
5	Hex lock nut
6	Washer
7	Positioning bolt
8	Hex lock nut
9	Washer
10	Socket screw
11	Latching lever

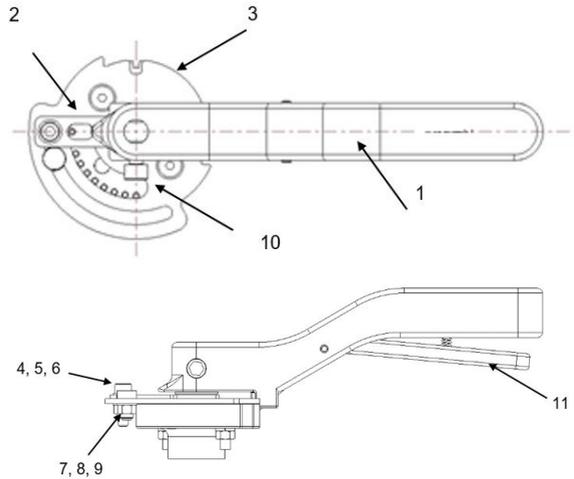


DIAGRAM 2 - LEVER HANDLE WITH MEMORY STOP

### Gearbox operation (Diagram 3)

- The gearbox allows the valve to be set and left in any position. When the valve has been set in the required position, the memory stop may be set to retain or memorise this position. To set the memory stop, slacken the hexagon headed screw (3) located in the slot in the stop arm (4) attached to the top of the gearbox. Rotate the stop arm clockwise until it contacts the upturned leg on the stop disk (5) and then re-tighten the hexagon headed screw (3).

### Valve operation

- With the memory stop set, the valve may be closed and re-opened to the set point.

Part No.	Description
1	Open travel stop
2	Closed travel stop
3	Hex head screw
4	Stop arm
5	Stop disk

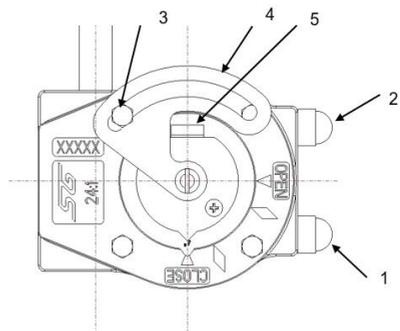


DIAGRAM 3 - GEARBOX WITH MEMORY STOP

## INSPECTION AND MAINTENANCE

- For enhanced life of the valve and better operability, it is recommended to carry out periodic inspections and maintenance of the valves. The frequency of observation depends on its application. Crane recommends the valve shall be inspected every 50 cycles or three months (whichever is earlier) for smooth operation and leak free performance. This is also recommended even for stored valves also. It is advisable to maintain a record of the performance of the valve.
- The valve should be at zero pressure and ambient temperature prior to any maintenance inspection.
- Maintenance Engineers & Operators are reminded to use correct fitting tools and equipment. A full risk assessment and methodology statement must be compiled prior to any maintenance.
- The risk assessment must take into account the possibility of the limits of use being exceeded whereby a potential hazard could result.
- A maintenance programme should therefore include checks on the development of unforeseen conditions, which could lead to failure.
- Other than regular inspection for operability, Crane Butterfly Valves are maintenance free. For any technical queries, please contact Crane Technical Department.
- Crane Fluid Systems do not offer spares for this product.
- If product is disassembled, warranty is void.

## GENERAL CONSIDERATIONS

- The surfaces of valves in service may be subject to extreme temperatures; care should be taken when handling.
- Care must be taken to avoid any damage to faces of these valves. The rubber facings are used to seal valves against pipe flanges, and any damage to these faces may result in leakage.

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## LIMITS OF USE

These valves have been categorised in accordance with the Pressure Equipment Directive 2014/68/EU and the Pressure Equipment (Safety) Regulations 2016.

**The fluid to be transported is limited to those shown in the product table below. On no account must these valves be used on any unstable fluids, or for the fluids groups not specified in the product table.**

**Note:** Valves that are classified as SEP (Sound Engineering Practice) are not CE marked and therefore do not require a declaration of conformity.

Products conforming to Cat I of the PED 2014/68/EU and the Pressure Equipment (Safety) Regulations 2016 shall include the CE Mark.

Products conforming to Cat II and above of the PED 2014/68/EU and the Pressure Equipment (Safety) Regulations 2016 shall include the CE Mark and applicable Notified Body Number.

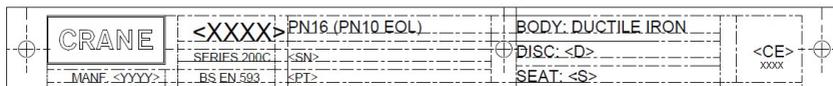
**LIMITS OF USE (CONTINUED)**

Fig. No.	Material	PED Category by Valve Size (DN)				Product Applications			
		SEP	1	2	3	Group 1 Gas	Group 2 Gas	Group 1 Liquid	Group 2 Liquid
DM950L	Ductile Iron	50-150	-	-	-	-	-	-	✓
DM950G	Ductile Iron	50-300	350-400	-	-	-	-	-	✓

- Valves must be installed into a well-designed system and it is recommended that the system be inspected in accordance with the appropriate national and regional legislation.
- Valves must be installed by trained personnel only.
- Service temperature and pressure indicated on the identification plate or body marking should not be exceeded.
- The installation should be designed to provide adequate means of draining and venting to avoid harmful effects such as water hammer, vacuum collapse, corrosion and uncontrolled chemical reactions and to permit cleaning, inspection and maintenance in the correct manner.
- Valves are not designed to operate under high shock loadings. Where pressure increases occur due to shock loading (water hammer), they should be added to the working pressure to obtain the total pressure acting on the valve. The total must not exceed the pressure rating of the valve. A pressure surge, or shock, is usually caused by the rapid closure of a check valve or quarter turn valve resulting in a sudden reduction in flow rate.
- It is the responsibility of the installer to ensure that the valves do not exceed the allowable limits of pressure. However, the equipment is designed to withstand a momentary pressure surge of up to 10% above the maximum working pressure.
- The product has not been designed to include corrosion, erosion or abrasion allowances. Any queries regarding service applications should be addressed to the Crane Fluid Systems - Technical Sales Department.
- The valves have been designed for loadings, appropriate to its intended use and other reasonably foreseeable operating conditions. Loadings caused by traffic, wind and earthquake have not been taken into account.
- Not suitable for fatigue loading, creep conditions, fire testing, fire hazard environment, corrosive or erosive service, transporting fluids with abrasive solids.
- The piping system shall be designed to reduce the risk of fatigue due to vibration of pipes.
- Maximum operating pressure reduces as service temperature increases. Pressure and temperature limitations are shown by the valve body marking or on the identification plate.
- Crane valves have not been designed as fire safe valves.

## OPERATING PRESSURE AND TEMPERATURE

Fig. No.	Maximum Operating Pressure Conditions	Maximum Operating Temperature Conditions
DM950L	16bar	-10°C to 120°C
DM950G	16bar	-10°C to 120°C



**EXAMPLE OF IDENTIFICATION PLATE SHOWING SERVICE PRESSURE AND TEMPERATURE LIMITATIONS.**

## STRESS CORROSION CRACKING

The use of chemicals for system dosing must be determined by the user as all aspects of the system must be established and considered, and the effect of the chemicals used (including compounds arising from chemical combinations) must also be established in order to accurately determine compatibility.

Crane (and its related brands) manufacture hardware (valves, couplings, etc) for the Building Services industry and Utilities industries. However, we are not system designers or operators and cannot make recommendations regarding chemical compatibility for the system, as a result of the above variables. Any comments from Crane regarding chemical compatibility shall relate solely to the Crane product and does not constitute a recommendation on compatibility for the wider system, resultant chemical compounds, components, substances or materials, in whole or in part.

For reference, and not exhaustive, certain austenitic stainless steels and aluminium alloys crack in the presence of chlorides, mild steel cracks in the presence of alkali and nitrates, copper alloys crack in ammoniacal solutions and iron with almost any caustic species (hydrogen presence notwithstanding).

For more information on how SCC can occur, please visit [www.cranefs.com](http://www.cranefs.com)

The safety instructions in this manual are identified by the following symbols:



Indicates a failure to observe the instructions could risk damage to persons and/or property.

**ATTENTION**

Indicates a failure to observe the instruction could result in damage to the products.



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