



# Differential Pressure Control Valve (DPCV)

F300 – F Denotes Flow Mounted

R300 – R Denotes Return Mounted

The F300/R300;

- is a self-acting differential pressure control valve designed to absorb unwanted head pressure
- limits the differential pressure across circuit
- has an adjustable differential pressure control range of 20 - 80kPa
- 2 versions available: flow or return mounted. Installation in the return pipework renders the sub-circuit at a higher pressure than if installed in the flow pipework. This is particularly important when being used at higher differential temperatures to minimise the risk of cavitation
- when installed with the DP1732 Fixed Orifice Companion Valve it allows measurement and regulation of flow
- has an operating temperature: -10 to 100°C
- has a maximum operating pressure: 16bar

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## LIMITS OF USE

These installation, operation and maintenance instructions have been categorised in accordance with the Pressure Equipment Directive – PED.

**The fluid to be transported is limited to Group 2 liquids i.e. non-hazardous. On no account must these valves be used on any Group 1 liquids, Group 1 gases or Group 2 gases.**

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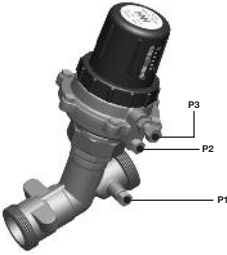
## INSTALLATION - DPCV

These instructions are issued as guidelines only and do not cover all installed conditions – if unsure please contact our Technical Helpline before installation.

- Hattersley products are designed for installation and use within suitably designed systems reflecting CIBSE, BSRIA and HVAC guidelines. Particular care should be taking with regards to;
  - accessibility to valve for setting/adjustment
  - tube cutting
  - jointing
  - bracketing/supports
- DPCVs can be installed in either the flow or return pipework, check version, before installing
- the F300/R300 should be installed and commissioned by a suitably qualified person
- valves must be installed in pipework of the same nominal diameter
- the direction of flow must comply with the arrow marked on the body
- the valve can be installed in any orientation
- the DPCV should be isolated along with the two port control valve and the terminal unit whilst flushing the system, except final reverse flushing if carried out
- end connections are male threaded ISO228-1 parallel, therefore require a flat face sealing gasket suitable for the service. BSP male & female adaptors are available from Hattersley. Other adaptors are available from the specific pipework system supplier

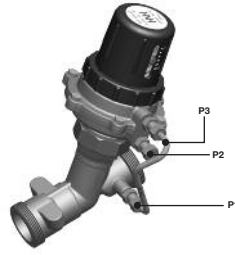
## INSTALLATION - IMPULSE TUBE

The impulse tube is supplied with the DPCV and is used to link the system pressure from the flow pipework (when DPCV installed in return) or from return pipework (when DPCV installed in flow pipework) to the DPCV. When installing, the tube length should not be reduced but coiled to use unwanted tube – this reduces the risk of the tube 'work hardening' due to vibration and subsequent failure. An isolation valve, if required, can be installed anywhere along the length of the tube depending on installation conditions.



**R300 - Return**

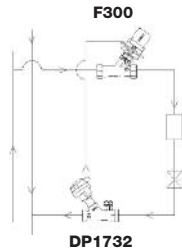
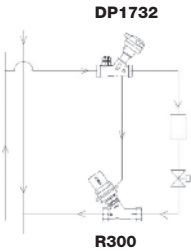
When the DPCV is installed in the return pipework the impulse tube from the flow pipework should be connected to P3. P1 & P2 supplied blanked off.



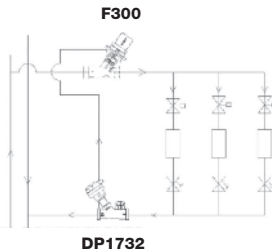
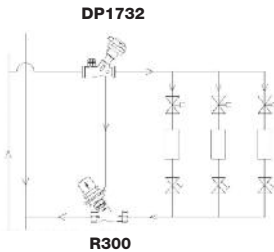
**F300 - Flow**

When the DPCV is installed in the flow pipe work the impulse tube from the return pipework should be connected to P2. P1 & P3 supplied linked.

## TYPICAL INSTALLATION LAYOUTS



DPCV installed across flow and return pipework of a single terminal unit to maintain 2-port control valve authority or control flow rate.



DPCV installed across flow and return pipework of a sub-circuit containing several terminal units to maintain 2-port valve authority or control flow rate.

## COMMISSIONING

DPCVs need to be commissioned before use. The following is a general guide; if unsure please contact the Hattersley Technical Helpline.

NOTE: As DPCVs are dynamic valves the position of the adjuster can only be recorded when pump is turned off or the circuit is isolated from the pump.

In general, DPCVs are commissioned in one of two ways;

1. Set to limit the Maximum Differential Pressure in a sub-circuit or across the two port control valve. Typically used to give the two port very high valve authority or prevent the two port control valve operating against high differential pressures
2. When used in conjunction with the DP1732 Companion Valve, it prevents a rise in flow rate to the sub-circuit. This also maintains the two port control valve authority.

### 1 - Maximum Differential Pressure

- Note – test points required in pipework to enable differential pressure measurement
- with pumps running at full design speed and all valves fully open, set the DPCV to position 5 (highest differential pressure setting) then set the required flow rate using the DP1732 Companion Valve
- measuring the differential pressure between flow and return pipework, manually close the two port control valve until the required maximum differential pressure is measured
- adjust the DPCV until the differential pressure reading starts to fall. At this point, the DPCV is set to control the differential pressure to the level required
- turn off pumps and record DPCV setting
- with two port fully open, turn on pumps, record differential pressure reading. Slowly close two port until maximum differential pressure set point is reached. Further closing of the two port will not increase the differential pressure above the set point.
- the valve is now set to control the maximum differential pressure in the circuit nullifying the effects of pressure variation caused by control valves in other branches
- lower differential pressures may be experienced depending on other parts of the system and the pump set up

### 2 - Set Flow Rate

- with pumps running at full design speed and all valves fully open, determine the flow rate using the DP1732 companion valve
- adjust the DPCV until the required flow rate is measured at the companion valve. If too much of the DPCV adjustment is used to reach the required flow rate, the DPCV should be backed off and some of the excess pumped head removed using the regulating feature on the Companion Valve. The DPCV can then be used to reduce flow rate to the design flow
- turn off pumps and record DPCV setting
- with two port fully open, turn on pumps, record flow rate and Companion Valve setting, this should be the set design flow rate
- the DPCV will open and close depending on available pumped pressure
- the valve is now set to control the differential pressure and hence the flow rate in the circuit nullifying the effects of pressure variation caused by control valves in other branches
- Note – differential cannot rise above DPCV setting but flow rate falls as two port closes

## ASSOCIATED ITEMS

### Companion Valve

DP1732 - Fixed Orifice Double Regulating Valve (FODRV). Used to measure and regulate flow.



### End Connections

Male & female BSP – for use with threaded pipework. Connection to alternative pipework should have ISO228/1 ends.



### Isolating Ball Valve

Installing a ball valve in the impulse tube allows isolation of the tube during flushing. This helps to ensure that the tube is kept free from debris.



### Impulse tube

Alongside the DPCV, an impulse tube is supplied as standard. It is essential to the valve's performance as it taps pressure from the other side of the circuit and links it to the valve's chambers.



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FM311  
ISO 9001

- Designed and manufactured under quality management systems in accordance with BS EN ISO 9001-2008

The Company reserve the right to amend any product without notice.

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