Versatile

Technical/Application Information

VERSATILE ZONE CONTROL VALVE SET



- Heating & Cooling Duty -10˚C - +120˚C
- Static pressure 20 Bar maximum
- Differential pressure up to 800 kPa depending upon PICV insert selection
- Pressure Independent Automatic Balancing and Zone Control
- Electrical Modulating Thermal Actuator Control
- Accurate flow measurement at the terminal unit

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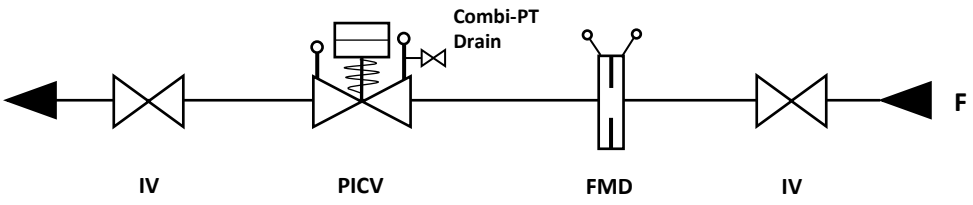
1.0 ZONE VALVE CONCEPT

The Zone Valve offers a pre-assembled, tested and set compact “Ready to Fit” valve set direct on to the FCU with 40mm centres, over an extended drip tray; comprising all of the valves and fittings required to dynamically flush the system, forward flush the FCU, automatically balance the system, and control the temperature at the FCU.

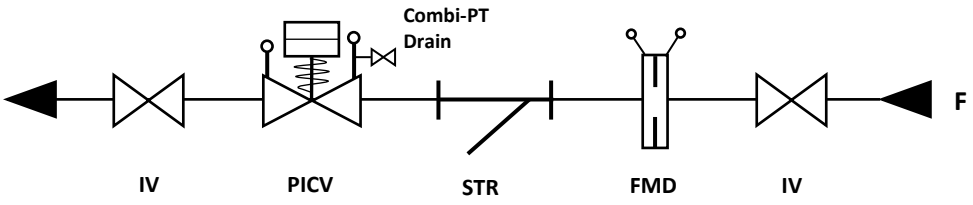
The module comprises of ball valves on the inlet and outlet. Flow measuring metering station and green pressure independent control valve fitted with combined PT Plug & Drain. PICV paired with a FT.0.2/3/4 thermal actuator. 15mm-25mm female threaded connections.

Schematic

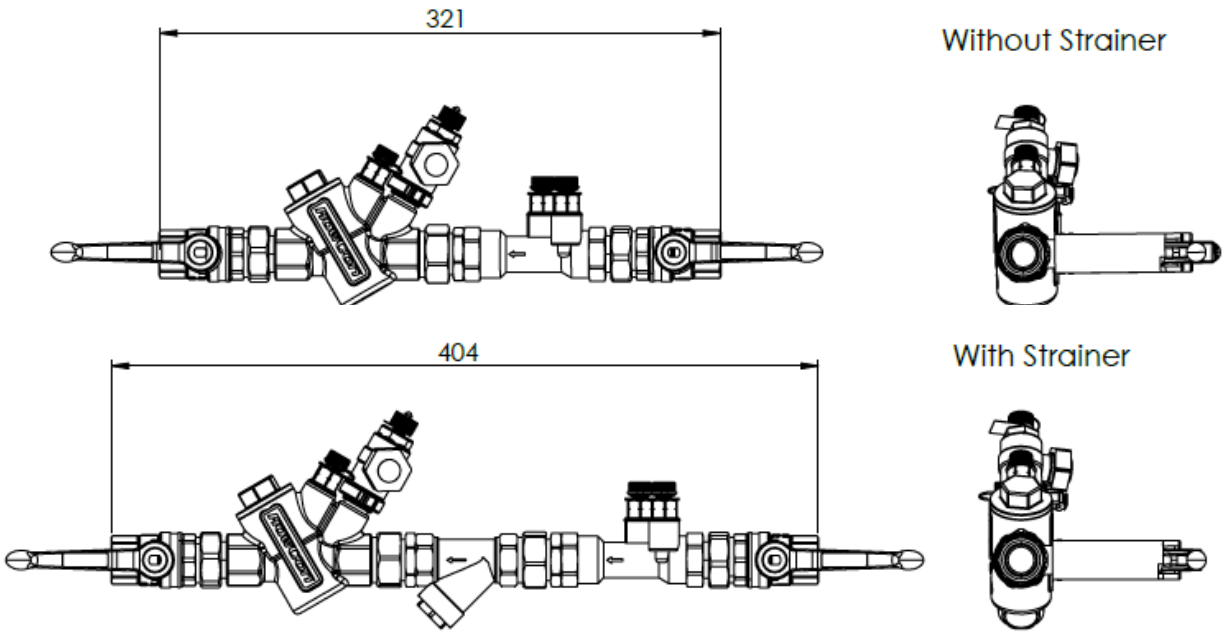
Without Strainer



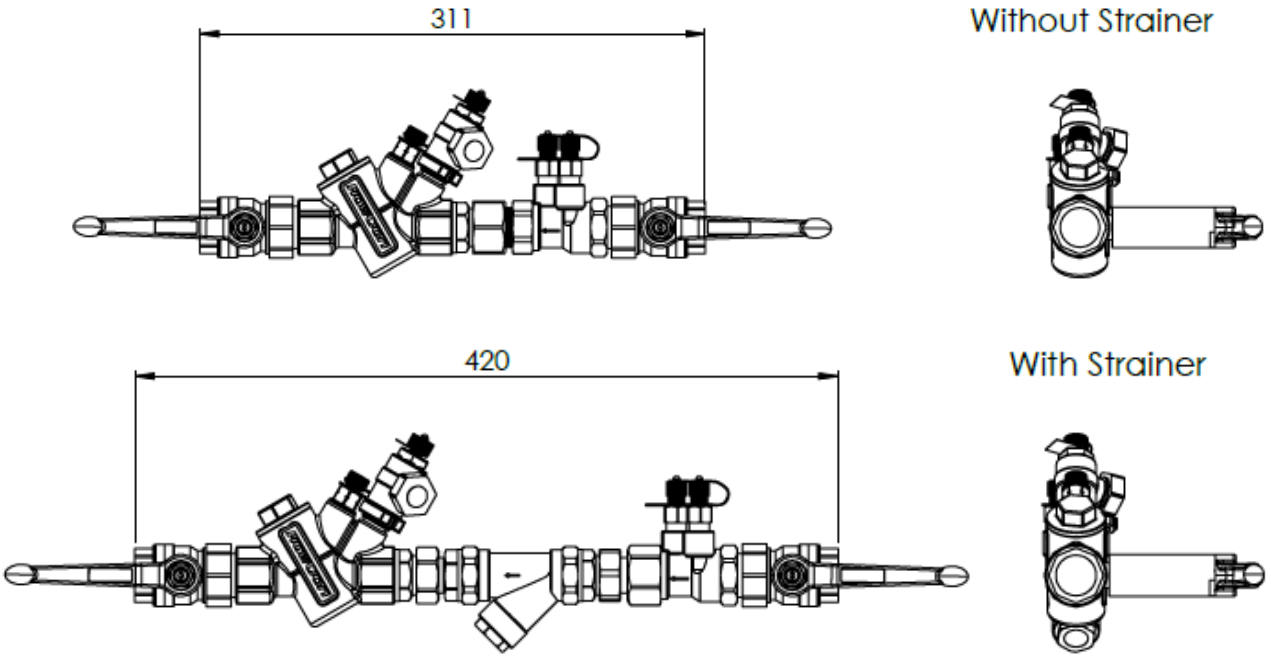
With Strainer



15mm PICV Zone Valve Drawing



20mm PICV Zone Valve Drawing



2.0 THE PRINCIPAL MODULE COMPONENTS DESCRIBED

2. A Ball Valve

Specification:

- Pressure Rating 25 Bar
- Temperature Rating -15˚C to +110˚C
- Full bore
- Anti blow out stem
- High resistance PTFE seat
- Standard female connection according to UNI ISO 228/1



2. B Combined PT Plug & Drain Valve

Specification:

- Pressure Rating 25 bar
- Temperature Rating -10˚C to +130˚C

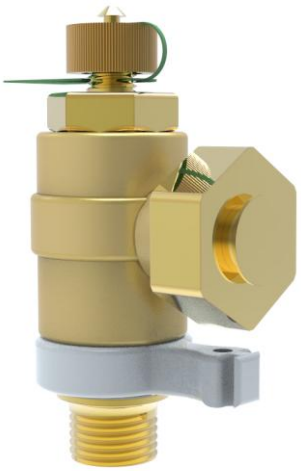
- Material:

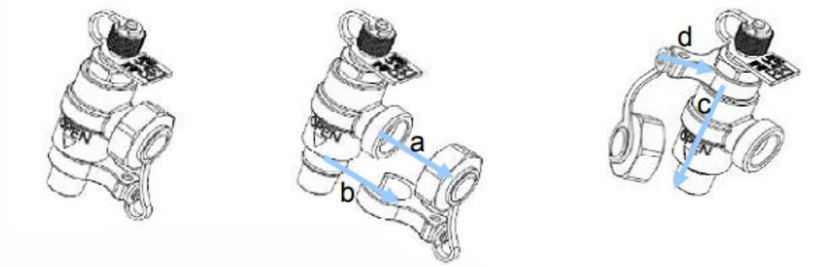
  - Housing incl. drain: DZR brass CW602N
  - Drain Cap: Brass CW617N
  - P/T Cap: Brass CW617N
  - O-rings: EPDM
  - Inner Gasket: EPDM
  - Drain Cap Gasket: EPDM
  - P/T Cap Gasket: NBR
  - Safety Ring: Nylon PA-6
  - Ribbons: Polypropylene

- Drain Connection: Fixed Male ½" ISO 228/1
- P/T Connection: Fixed Male ¼" ISO 228/1

- Operation:

  a) Remove drain cap
  b) Remove clip
  c) Press drain body down to open valve
  d) Lift drain body to close valve





2. C Flow Measuring Metering Station

Specification:

- Pressure Rating 25 Bar
- Temperature Rating -10˚C to +130˚C

- Material

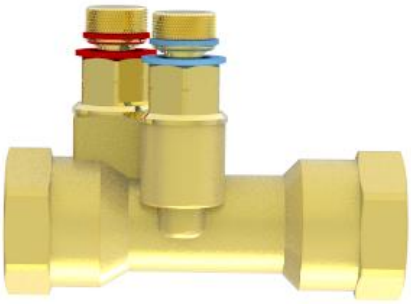
    - Housing: DZR Brass EN12164 CW602N
    - Venturi Insert: DZR Brass EN12164 CW602N
    - P/T Plugs: DZR Brass EN12164 CW602N
    - P/T Gasket: EPDM

- End Connections: Fixed Female ISO
- Housing Taps: ¼" ISO

- Insert Kvs Value:

    - **1** = Kvs 0.263
    - **2** = Kvs 0.550
    - **3** = Kvs 1.15
    - **4** = Kvs 2.80
    - **5** = Kvs 5.40

- Fitted with Combined PT Plug & Drain



2. D Flow Measuring Metering Station

Specification:

- Pressure Rating 25 Bar
- Temperature Rating -10˚C to +130˚C

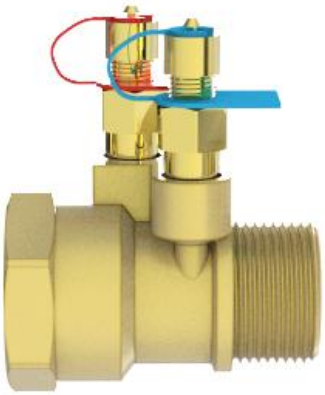
- Material

    - Housing: DZR Brass EN12164 CW602N
    - Venturi Insert: DZR Brass EN12164 CW602N
    - P/T Plugs: DZR Brass EN12164 CW602N
    - P/T Gasket: EPDM

- End Connections: Fixed Female ISO
- Housing Taps: ¼" ISO

- Kvs Value:

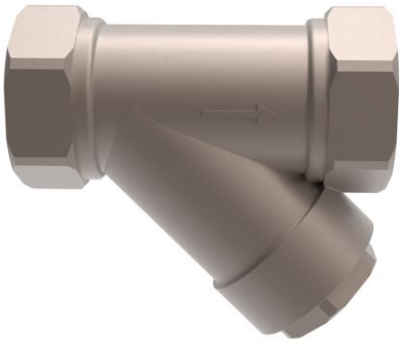
    - **6** = Kvs 9.72



2. E Y Type Strainer (Optional)

Specification:

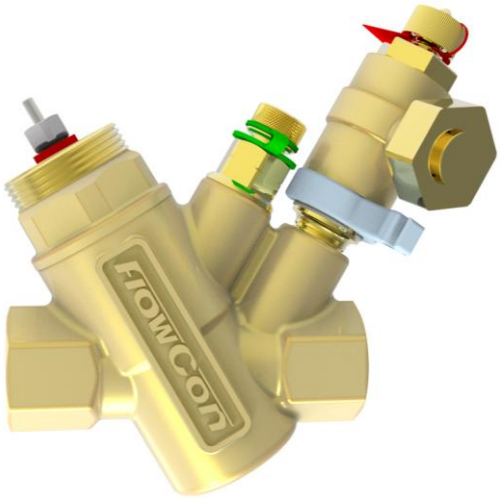
- Working Pressure: PN20
- Max. Temperature: 170°C
- Size range: ½" – 2"
- Temperature range: -10 to 85 °C
- Non-WRAS: -10 to 100 °C
- Max. working pressure: 20 bar
  7 bar at 170 °C
- Material
  - Body: Bronze CC491K
  - Cap: Bronze CC491K
  - Screen: Stainless Steel
  - Gasket: PTFE



2. F Green PICV

Specification:

- Pressure rating 25bar
- Temperature rating -20˚C to +120˚C
- Maximum operational ΔP 800 kPa (GreEQ.0Green.0/1/1HF)
- Maximum close off pressure 800 kPa (GreEQ.0/Green.0/1/1HF)
- Shut of leakage ANSI/FCI 70-2 2006/IEC 60534-4 Class V
- Removable insert (up to 32mm)
- Flow range 0.005 – 0.736 l/s (GreEQ.0/Green.0/1/1HF)
- Stroke 3.4mm (GreEQ.0/Green.0/1/1HF)
- Linear characteristic (EQ% available)
- Blank Cap for flushing (optional)
- Fitted with PT Plug and Combined PT Plug & Drain Valve
- Fitted with Union Connections
- Full stroke modulating control at all flow settings
- Suitable for VDI 2035, BSRIA BG50 or equivalent water standards



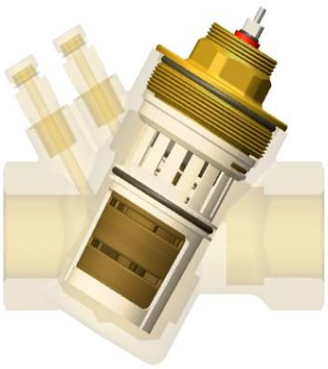
One of the problems associated with conventional 2 port control valves is sizing and ensuring all the control valves have adequate authority. Whilst this problem is helped by the use of a differential pressure controller, it can still be difficult to maintain good authorities without specifying that each terminal unit require a DPCV. Using conventional valves this would be a very expensive design approach.

The valve incorporates an easy removable Green PICV insert, which is designed as a 3-in-1 solution combining a 100% authority full stroke modulating control valve with an automatic balancing valve, which is differential pressure independent.

The insert includes an innovative self-adjusting feature, which enables each valve continuously to self-balance.

This ensures delivery of precisely the correct flow rate required by each terminal unit, independent of pressure fluctuations in the hydronic system.

The Green, 3 Functions in 1 Insert

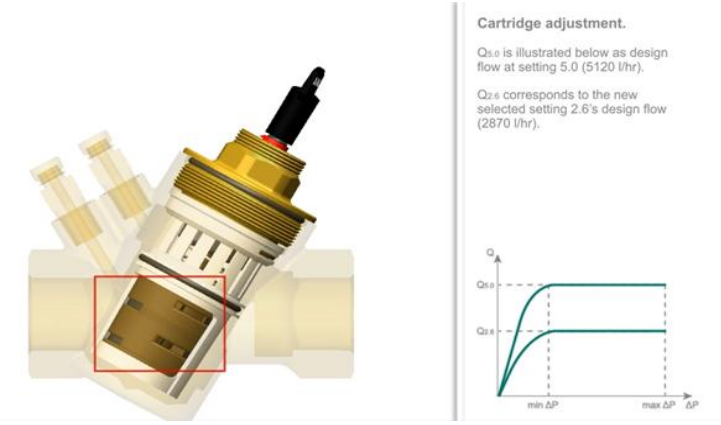




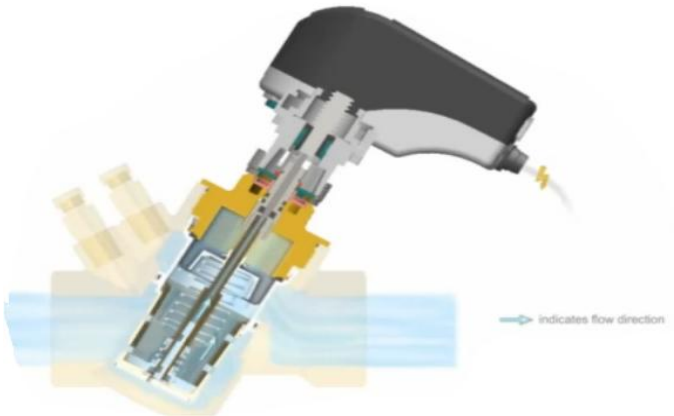
Insert Adjustments



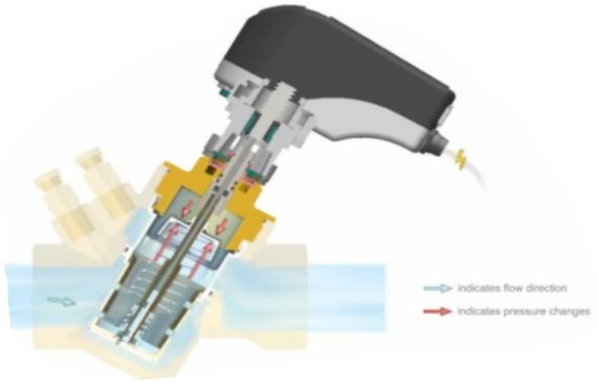
The insert can be easily set to 39 linear progression flow rates by turning the inner cylinder with the adjustment key.



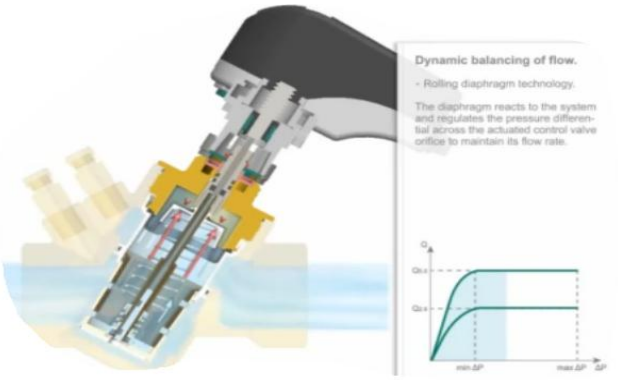
Automatic Balancing Operating Principle



Water enters the insert chamber to subject the underside of the rolling diaphragm to intermediate pressure. It also passes through the spindle to subject the top side of the rolling diaphragm to inlet pressure.

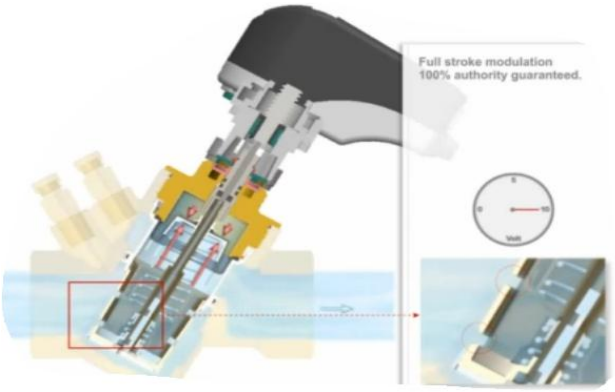


By maintaining a constant differential across the rolling diaphragm constant flow through the insert is achieved independent of the pressure differential.

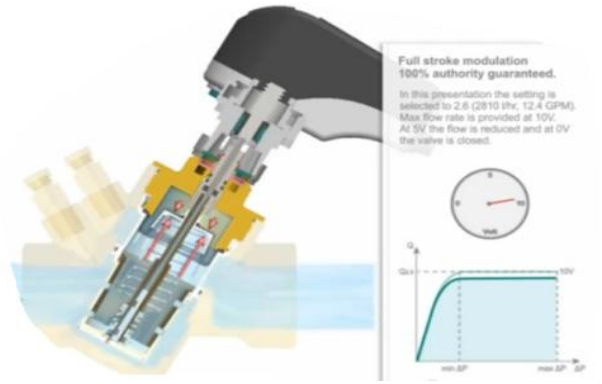


As the ΔP across the valve increase & decrease the set flow rate is held constant.

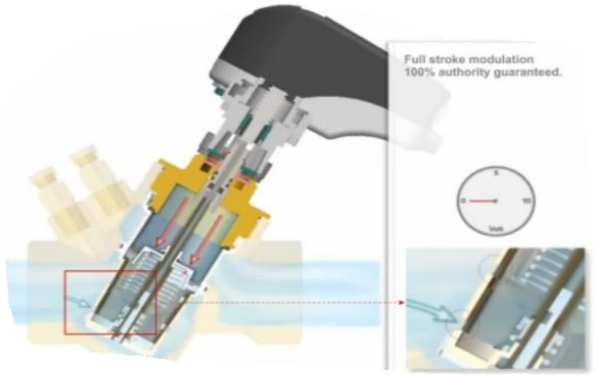
Control Valve Function



At the set flow rate the inner cylinder is positioned to be fully open at the required flow rate. This Control Valve function has full stroke and 100% authority.



The inner cylinder is connected to a control spindle. As the actuator responds to the control signal the control spindle moves the inner cylinder in an axial direction.



Due to the way the Green PICV valve controls the flow rate irrespective of differential pressure, terminal unit, branch and sub mains balancing valves and pressure differential control valves are not required. The flow rate is maintained at the terminal unit regardless of system conditions making the valve ideal for systems with inverter driven pumps.

2. G FT Thermal ActuatoR

FT.0.2

3. Supply Voltage: 24V AC -10%...+20%, 50/60 Hz
4. Type: Thermal
5. Power consumption: 1.2W
6. Control signal: Analog 0-10V
7. Failsafe function: Yes, normally closed
8. Operation time: Approximately 4.5 minutes
9. Actuating Force: 125N ±5%
10. Ambient temperature: 0°C to +60°C / +32 °F to +140 +32 °F
11. Protection: IP54 including upside-down, class III
12. Cable: Plug-in, 3 wires x 0.22mm^2, 1m
13. Plug-in, 3 wires x AWG24, 3.3 ft

FT.0.3

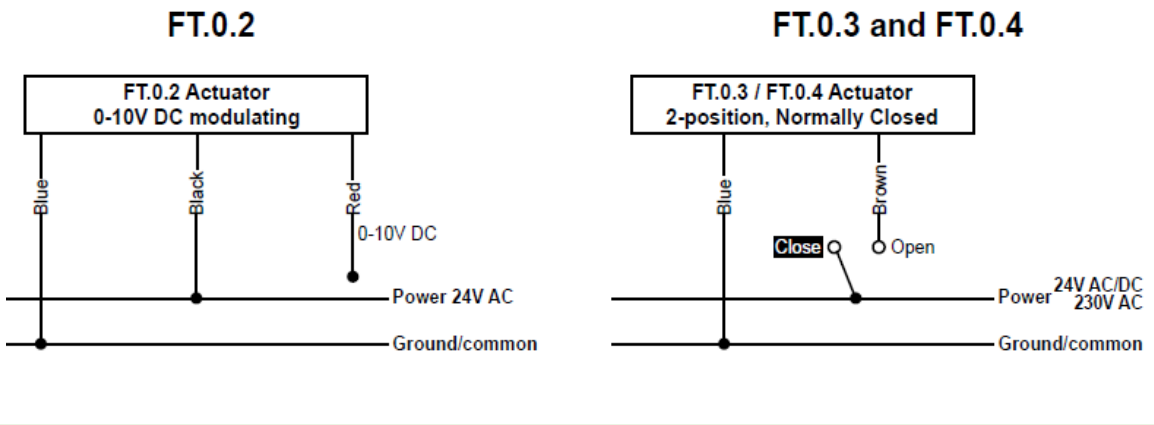
- Supply Voltage: 230V AC ±10% 50/60 Hz
- Type: Thermal
- Power consumption: 1.2W
- Control signal: ON/OFF
- Failsafe function: Yes, normally closed
- Operation time: Approximately 4.5 minutes
- Actuating Force: 125N ±5%
- Ambient temperature: 0°C to +60°C / +32 °F to +140 +32 °F
- Protection: IP54 including upside-down, class III
- Cable: Fixed, 2 wires x 0.75mm^2 1m
  Fixed, 2 wires x AWG18, 3.3ft



FT.0.4

- Supply Voltage: 24V AC/DC -10%...+20%, 50/60 Hz
- Type: Thermal
- Power consumption: 1.2W
- Control signal: ON/OFF
- Failsafe function: Yes, normally closed
- Operation time: Approximately 4.5 minutes
- Actuating Force: 125N ±5%
- Ambient temperature: 0°C to +60°C / +32 °F to +140 +32 °F
- Protection: IP54 including upside-down, class III
- Cable: Fixed, 2 wires x 0.75mm^2 1m
  Fixed, 2 wires x AWG18, 3.3ft

Wiring Instruction:



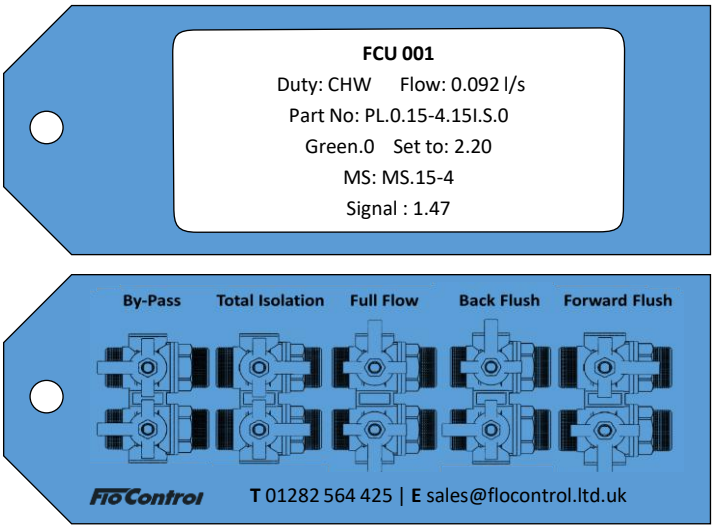
3.0 PRODUCT IDENTIFICATION

Labelling

Each Compact has a unique label containing project and valve set specific information; which consists of the following information:

- FCU Reference
- Duty – CHW/LTHW
- Selected Flow Rate
- Valve Set Part Number
- Valve Insert
- Valve Setting
- Metering Station Selection
- Metering Station Signal

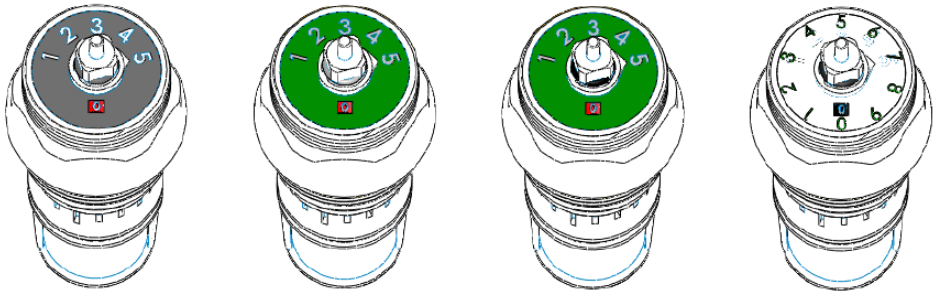
On the reverse side, each label displays the five functions of operation for the flushing by-pass. Tags and cable ties are colour coded for easily identifying cooling [blue] and heating [red] valves sets.



Label Data & Functions of Operation (CHW Example)

FlowCon Green Series Identification

The Green 0 & 1 series both have Green settings plates and can be identified by the colour of the O-ring located above the setting scale; for which a Green 0 is Grey and the Green 1 is Black. The GreEQ.0 has a Grey setting plate with a Grey O-ring; a Green 1 High Flow has a reversed scale setting and features a White setting plate with a Black O-ring.



GreEQ.0 **Green.0** **Green.1** **Green.1HF**

4.0 COMMISSIONING

The Zone Valve includes the Pressure Independent Control Valve which is supplied set and identified to the specific FCU indicating whether it is to be installed into the heating or cooling circuit.

The insert will control the flow rate through the valve at the fully open position to the design flow specified.

To commission the system, all terminal unit valves shall be in the fully open position.

The index circuit/index valve should be identified and a monometer fitted to the two PT plugs supplied with the PICV body.

The pump should be started in the turned down position.

The pump speed/flow rate is progressively increased until the ΔP across the index circuit/valve reaches the minimum ΔP specified for the valve. At this ΔP the index PICV flow will be in line with the design set flow and in balance along with all the other PICV's & ABV's in the system. This can be confirmed by checking the ΔP across any other valve.

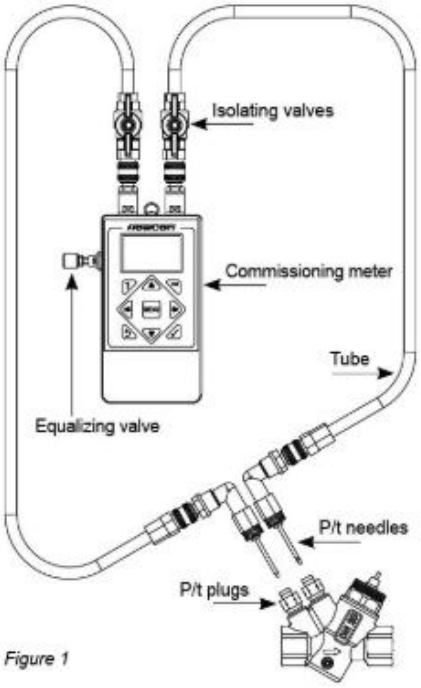


Figure 1

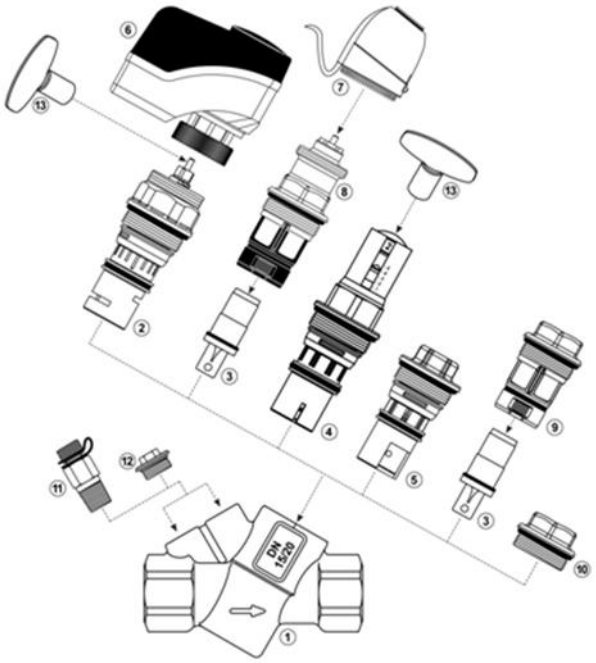


For the valve (PICV) to function as intended, water must always be suitably treated, clean, free of debris and maintained as per the relevant water quality standards (VDI2035, BSRIA BG50 or equivalent).

5.0 MAINTENANCE

The FloSet Compact is virtually maintenance free.

All components are interchangeable and readily available from FloControl stock in the UK.



- Changing the actuator - the easily removable actuator can be replaced without affecting the FlowCon Green setting.
- Changing the PICV insert - the valve can be isolated in line, the insert removed and replaced with a pre-set insert in a matter of minutes.