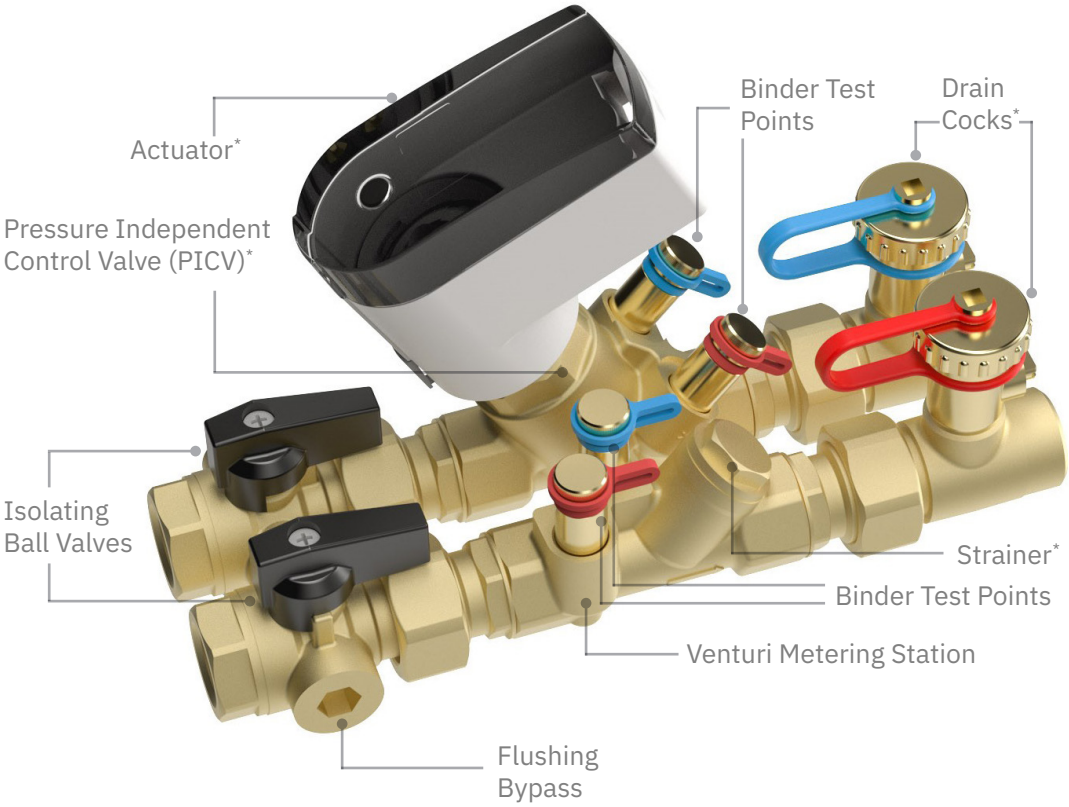
Fan Coil Valve Assembly (FCVA)

For the control and measurement of flow rate to fan coils



Overview

The Essco Fan Coil Assembly Valve (FCVA) is a pre-assembled control group designed for connection of fan coils, ceiling conditioning systems and cold beams on to primary heat networks within multi-dwelling buildings, such as apartments and office blocks.

The FCVA provides flow rate control via pressure independent control valve (PICV), isolation, flushing and commissioning of the terminal units. The PICV allows design flow rates to be set at commissioning stage and maintained during normal operation as the differential pressure within the heat network changes. They fit directly onto the FCU with 40mm centres over the FCU drip tray.

See ancillaries' section for cartridges and the range of flow rates.

Insulation - Ordered separately.

Features and benefits

- Compact and space saving with class-leading dimensions of 225 x 84 x 141mm
- Preassembly means less installation time required on site, with only four connections to make
- Range of handed assemblies to suit both heating and cooling applications
- Flow limitation cartridges allow for a much larger range of flow rates through the same metering station
- Supplied pre-tested to save time on site
- Robust, with minimal service and maintenance requirements
- Control via a standalone thermostat or Building Management System (BMS)

*Order options available.

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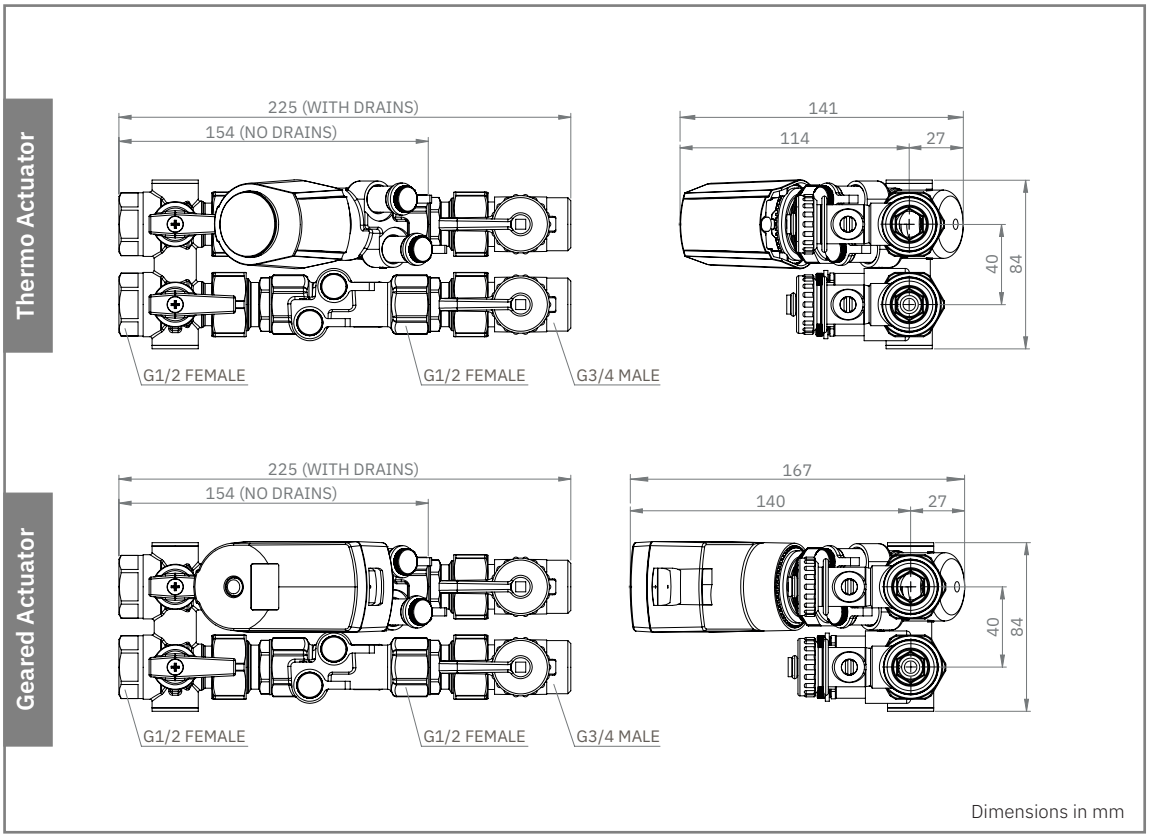
 MAY-2022

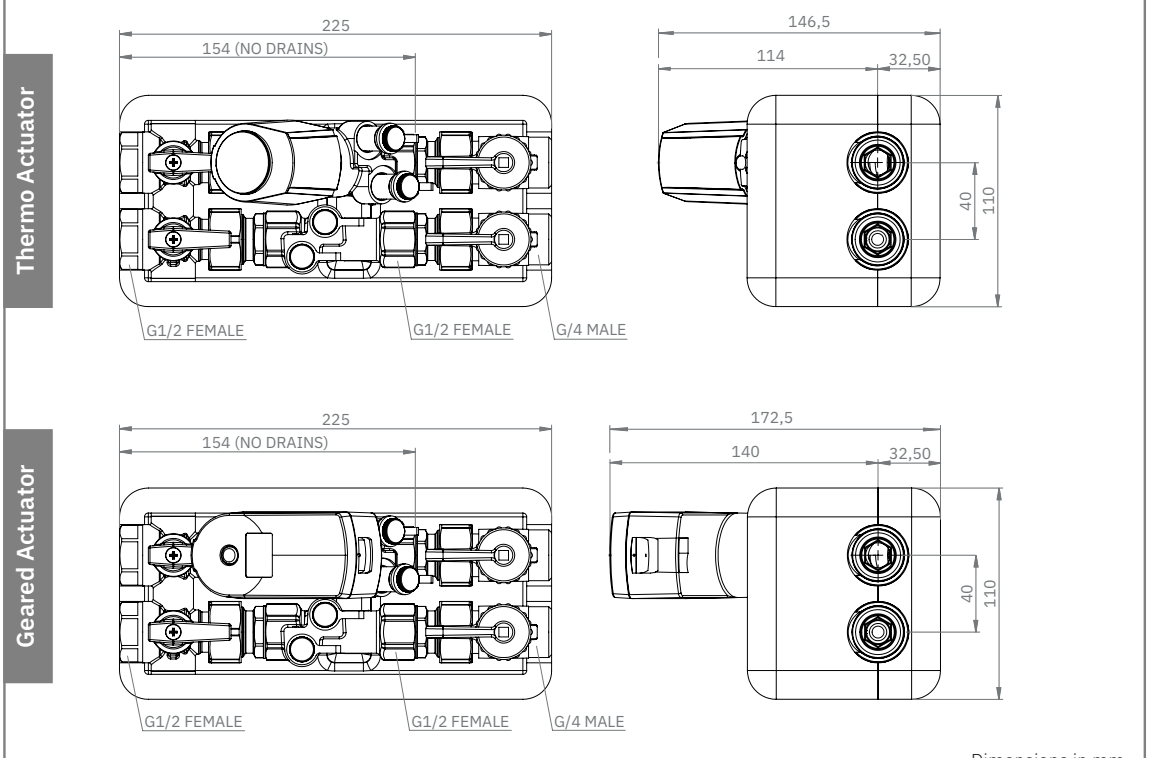
Dimensions

Dimensions - FCVA



Dimensions in mm

Dimensions - FCVA with Insulation



Dimensions in mm

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Technical Information

Materials

Component	Material	Grade
Body	Brass	CW602N
Strainer mesh	Stainless steel	AISI304
O-rings	Rubber	EPDM
Ball valve	Brass	CW617N chrome plated
Ball valve seal	Plastic	PTFE
Ball valve stem	Brass	CW614N
Drain body, cap, ball	Brass	CW617N
Drain ball valve seal	Plastic	PTFE
Drain valve o-ring	Rubber	EPDM
Isolating valve handle	Aluminium	N/A
Isolating valve screw	Steel	Zinc plated
PICV housing, body, flow, regulator and locking nuts	Brass	CW617N
PICV insert	Plastic	PSU
PICV seals	Rubber	EPDM
PICV adjustment dial	Plastic	POM

Valve

Specification	
Medium	Water, glycol solutions
Max. percentage of glycol	30%
Max. working pressure	PN25
Max. differential pressure with actuator	1 bar
Working temperature range	-10 to +120°C
Nominal Δp control range	LF = 16.5 - 400 kPa MF/HF = 26 - 400 kPa
Flow rate regulation range	LF = 15 - 190 l/h MF = 64 - 280 l/h HF = 378 - 1390 l/h
Strainer size	50 mesh
Actuator connection	M30x1.5mm

Insulation

Specification	Internal Side	External Side
Material	PE	PE
Density	30 kg/m3	80 kg/m3
Thermal conductivity at 10°C	ISO 8301 W/m K	0.0320
Thermal conductivity at 40°C	ISO 8301 W/m K	0.0404
Fire resistance	>7mm Din 75200 mm/min	<100

Technical Information

FCVA Order Options

Model	Flow Range (l/h)	Kv Bypass (without strainer)	Kv Bypass (with strainer)
Low Flow (LF)	15 – 190	0.37	0.35
Medium Flow (MF)	64 – 280	0.72	0.68
High Flow (HF)	378 – 1390	3.37	2.41

Flow Ranges and Set-Points

Setting	FCVA LF			FCVA MF / HF		
	Δp: 16.5-400 kPa			Δp: 26-400 kPa		
	l/s	l/h	Δp min	l/s	l/h	Δp min
1.0	0.004	15	16.5	0.018	64	26
1.2	0.009	32	16.5	0.033	118	26
1.4	0.011	40	16.5	0.058	210	26
1.6	0.014	52	16.5	0.078	280	26
1.8	0.017	60	16.5	0.105	378	26
2.0	0.018	64	16.5	0.129	466	26
2.2	0.019	68	16.5	0.154	554	26
2.4	0.022	80	16.5	0.168	606	26
2.6	0.024	88	16.5	0.181	650	26
2.8	0.026	92	16.5	0.199	718	26
3.0	0.028	100	16.5	0.216	778	26
3.2	0.029	104	16.5	0.228	822	26
3.4	0.029	106	16.5	0.241	866	26
3.6	0.031	110	16.5	0.253	912	26
3.8	0.034	124	16.5	0.280	1008	26
4.0	0.039	140	16.5	0.302	1086	26
4.2	0.042	150	16.5	0.312	1122	26
4.4	0.042	152	16.5	0.345	1242	26
4.6	0.044	158	16.5	0.364	1310	26
4.8	0.051	182	16.5	0.380	1368	26
5.0	0.053	190	16.5	0.386	1390	26

Accuracy:
Control accuracy will be the greatest of either +/-10% of controlled flow rate or +/-5% of maximum flow rate.

Technical Information

24v Systems (generally)

Recommended cable lengths for a 24v system:

Cable	Section	Length
Standard DDC line	0.22 mm²	20 m
J-Y(ST)Y	0.80 mm²	45 m
NYM / NYIF	1.50 mm²	136 m

230v Systems (generally)

Recommended cable lengths for a 230v system:

Cable	Section
Light plastic-sheathed cable	NYM 1.50 mm²
Flat webbed building wire	NYIF 1.50 mm²

Transformer/Power Supply

A safety isolating transformer according to EN 61558-2-6 (for the AC variant) or a switching power supply according to EN 61558-2-16 (for DC variant) must always be used.

Please refer to the FCVA Installation & Operations Manual (IOM) for actuator wiring diagrams.

Actuators - Thermal Type

Actuator	Thermo 0-10V	Thermo 24V 2-Point	Thermo 230V 2-Point
Supply voltage	24 V AC, -10 % to +20 %, 50-60 Hz 24 V DC, -20 % to +20 %	24 V AC/DC, +20% to -10%	230 V AC, -10 to +10 %, 50 Hz
Max. inrush current	< 320 mA for 2 min max.	< 300 mA for 2 min max.	< 550 mA for 100 ms max.
Power consumption	1W*		
Control signal	Analog 0-10V	24V	230V
Stroke	4mm		
Actuating force	100N +10%		
Operation time	Approx. 2 minutes for full stroke (30 sec / mm)	Approx. 3.5 mins for full stroke	
Ambient temperature	0°C to 60°C		
Media temperature	0°C to 100°C		
Storage temperature	0°C to +60°C	-25°C to +60°C	
Protection	IP54*, class III		IP54*, class II
Surge strength according to EN 60730-1	1.0 kV		2.5 kV
Cable	Light Grey PVC 3 x 0.22 mm² 1m length	Light Grey PVC 2 x 0.75 mm² 1m length	Light Grey PVC 3 x 0.22 mm² 1m length
Weight (inc. 1m cable)	111g	100g	
Features	All round light to indicate valve opening CE conformity to EN 60730		

Technical Information

Actuators - Geared Type

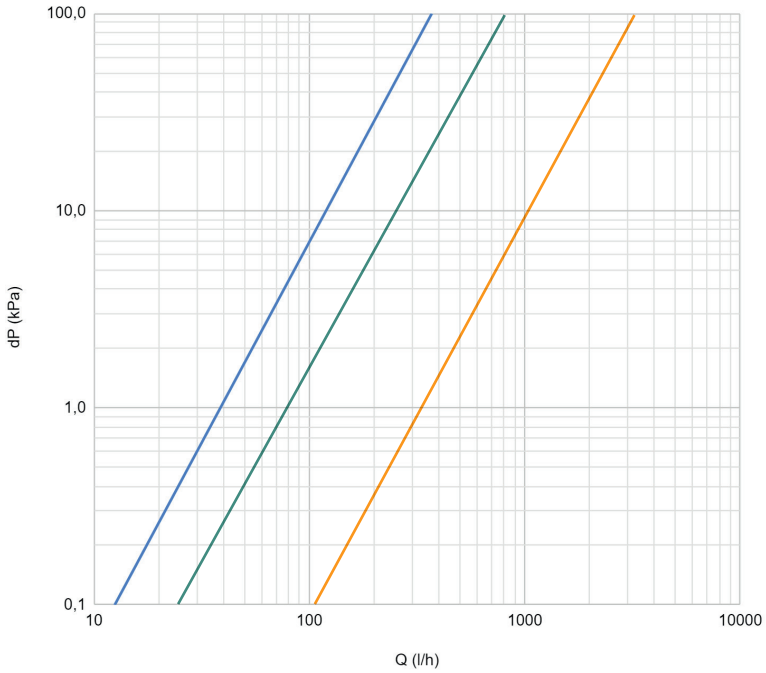
Actuator	MPR 46845 Geared 24V 0-10V	M3P 468x5 Geared 24V 2or3 point	M3P 278x5 Geared 230V 2or3 point
Supply voltage	24 V AC, -10 % to +20 %, 50-60 Hz 24 V DC, -20 % to +20 %		230 V AC, -10 to +10 %, 50 Hz
Standby power	< 10 mA (end position)		< 5 mA
Power consumption	< 100 mA AC: < 110 mA DC: < 60 mA		< 15 mA
Control signal	Analog 0-10V	24V	230V
Stroke	4mm		
Actuating force	100 N at -20 to +40%		
Operation time	Approx. 2 minutes for full stroke (30 sec / mm)		
Ambient temperature	0°C to 50°C		
Media temperature	0°C to 100°C		
Storage temperature	-20°C to +70°C		
Protection	IP54*, class III		IP54*, class II
Surge strength according to EN 60730-1	1.0 kV		2.5 kV
Cable	Light Grey PVC 3 x 0.75 mm² 1m length		White PVC 3 x 0.22 mm² 1m length
Weight (inc. 1m cable)	155g		200g
Features	Stroke setting can be set manually with flathead screwdriver 0.3x2mm Actuator features a display showing stroke setting Multi-coloured LED to indicate voltage, errors and valve readiness Anti-theft feature CE conformity to EN 60730		

Essco warranty is voided using actuators other than those supplied by Essco Group.
*IP rating is based on indoor use only, when cable is fitted and the protective plug is also in place (covering manual valve setting).

Pressure Loss Graphs

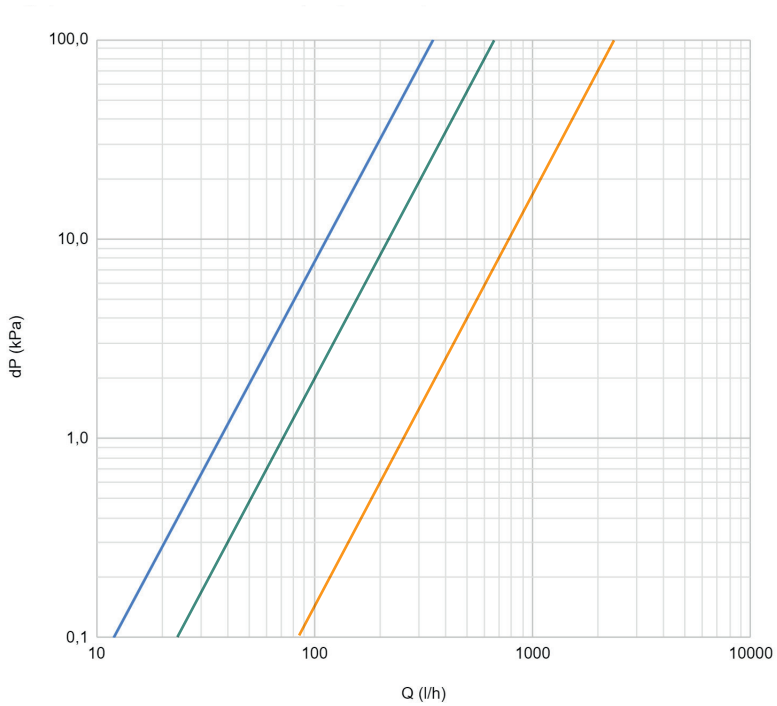
Kv FCVA

By-pass Kit Without Strainer - Low/Medium/High Flow (LF/MF/HF)



Low Flow (LF) - Kvs =0.37
Medium Flow (MF) - Kvs = 0.72
High Flow (HF) – Kvs = 3.37

By-pass Kit With Strainer - Low/Medium/High Flow (LF/MF/HF)

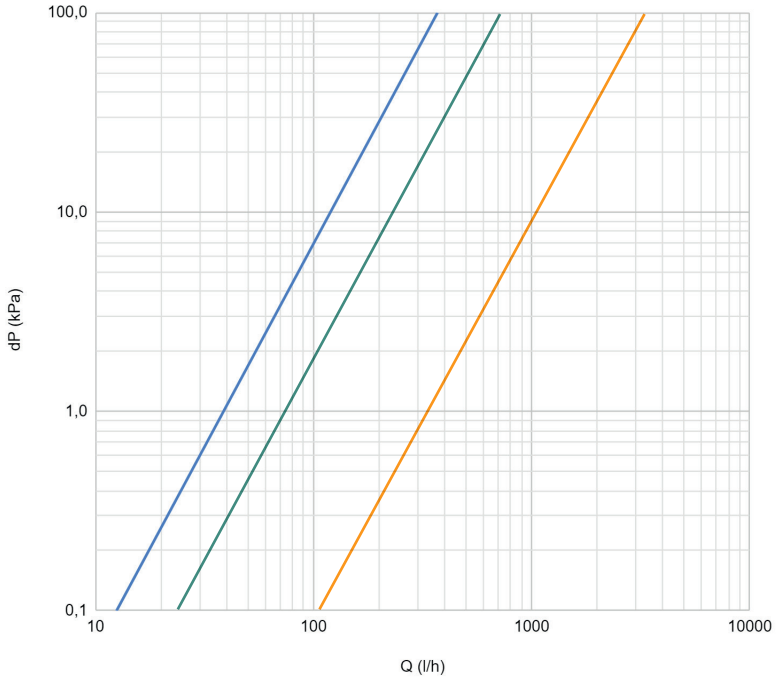


Low Flow (LF) - Kvs = 0.35
Medium Flow (MF) - Kvs = 0.68
High Flow (HF) – Kvs = 2.41

Pressure Loss Graphs

Kv Venturi (Signal)

Low/Medium/High Flow (LF/MF/HF)



Low Flow (LF) - Kvs =0.37
Medium Flow (MF) - Kvs = 0.72
High Flow (HF) – Kvs = 3.37

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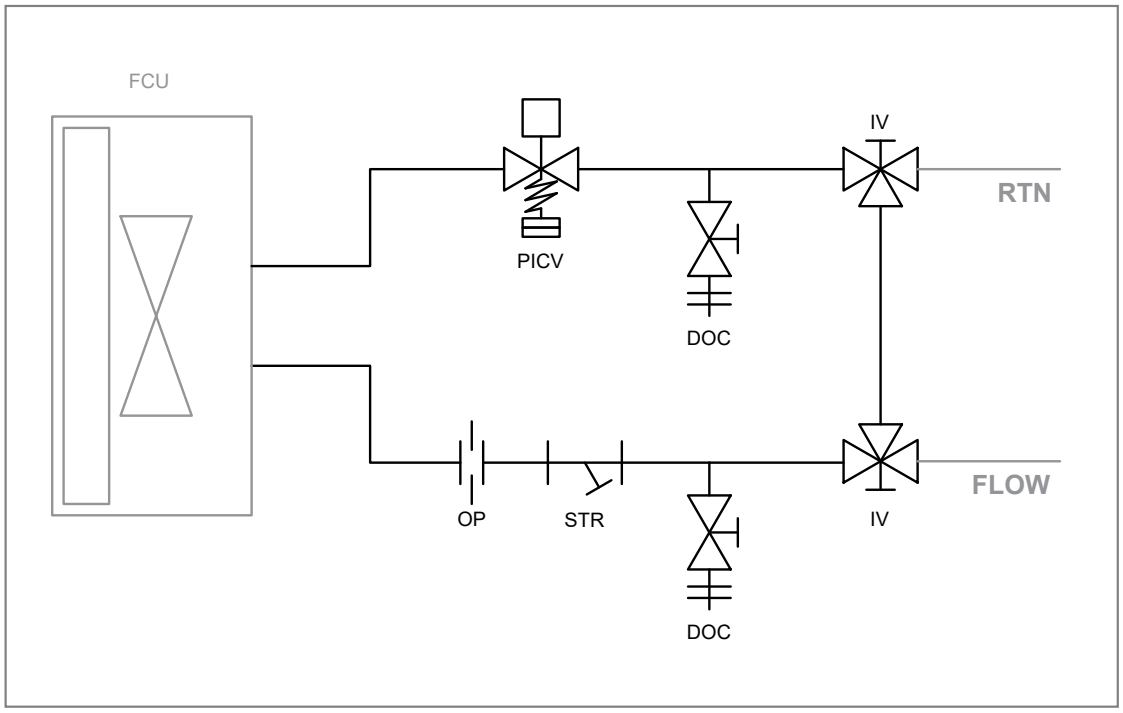
Technical Information

Hydraulic Schematic



Schematic Legend

SYMBOL	ABVR	PRODUCT
	FCU	FAN COIL UNIT
	PICV	PRESSURE INDEPENDENT CONTROL VALVE
	STR	STRAINER
	OP	ORIFICE PLATE
	DOC	DRAIN OFF COCK
	IV	ISOLATION & FLUSHING BYPASS SET

Download the **Installation, Operation & Maintenance Manual** by scanning the QR code below.

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Technical Information

Performance Specification Text

PN25 rated DZR Brass (CW602N) Fan Coil Valve Assembly ('FCVA'), suitable for both heating and cooling applications with water temperatures from -10°C to 120°C.

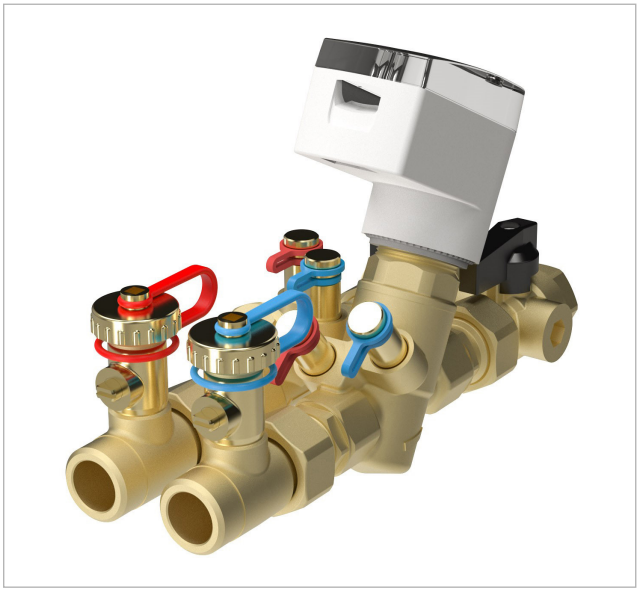
Left or right-handed and pre-assembled to meet the requirements of each individual terminal unit. Assembly to include a flushing by-pass with integrated isolation valves, Pressure Independent Control Valve (PICV), venturi measurement devices suited for both low, mid and high ranges of flow rate, strainer and drain cocks. Binder test points must feature on both the return side for flow verification across metering station and across the PICV on the return side to check pressure at index circuit and where needed, pressure over the terminal unit. Actuators to be specified and pre-fitted to suit specific application, on/off or modulating, 24v or 230v. UK tested to BTS 1/2019 test method for PICV's and DPCV's.

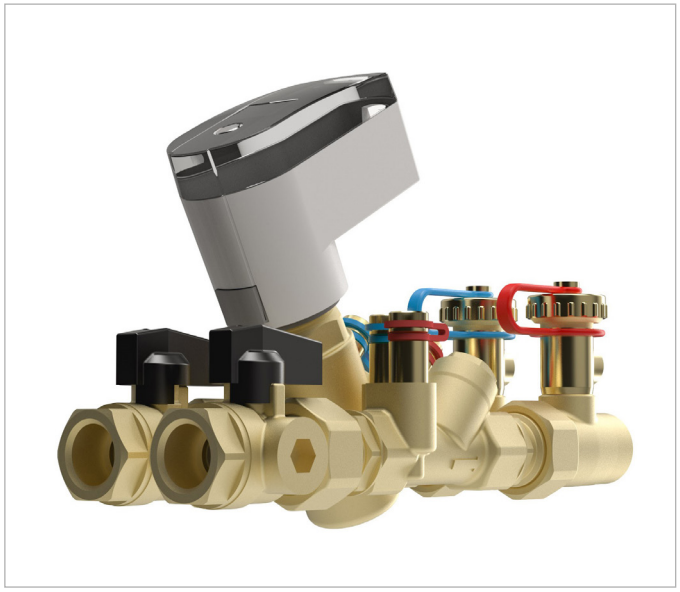
Valve assembly must be labelled after commissioning using Essco FCVA Label Tag to ensure correct terminal reference number and flow rate are indicated at point of use. The flow and return connections of the assembly must be 40mm to accommodate a standard fan coil and compact in design to minimalise space required.

Accessories

- Insulation jacket
- Actuator options
- Handed versions

Download the **Performance Specification Text** by scanning the QR code below.





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Product Codes

Due to the number of possible variations of pre-assembled FCVAs available, a full list of product codes is available on request. Information about how we generate part codes is below for reference.

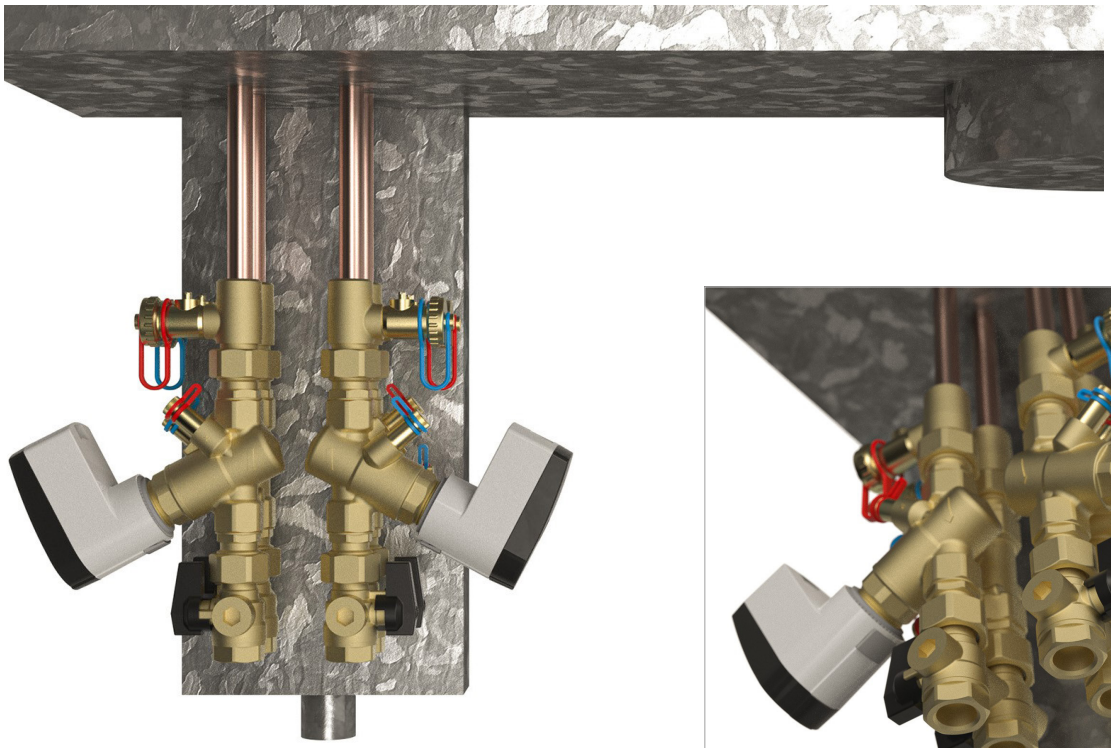
FCVA Product Codes:									
Flow	Low Flow	**ESS-FCVA-**	LF						
	Medium Flow		MF						
	High Flow		**HF**						
Actuator	Thermo ON/OFF			1					
	Geared 2-3 Points			2					
	Thermo 0-10V			3					
	Geared 0-10V			**4**					
Actuator Power Supply	N/A				0				
	24V				**1**				
	230V				2				
Strainer	No					0			
	Yes					**1**			
Insulation	No						0		
	Yes						**1**		
Drain Valves	No							0	
	Yes							**1**	
Version	Left-Handed								L
	Right-Handed								**R**

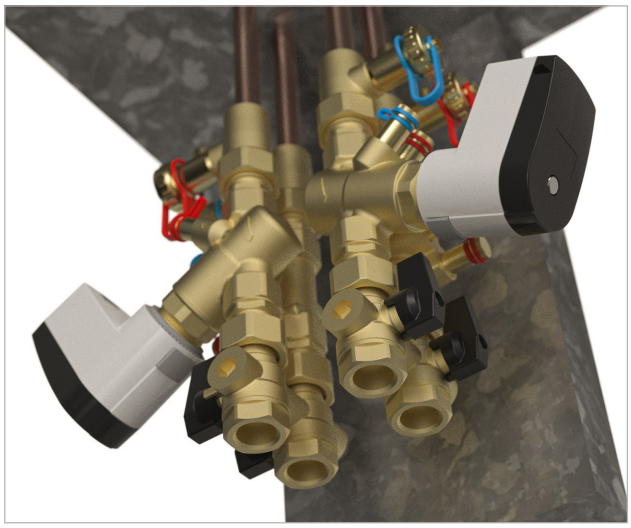
Highlighted Example =
FCVA, high-flow, 24V geared actuator with proportional 0-10v control, with strainer, insulation and drain cocks included, right-handed assembly for cooling.

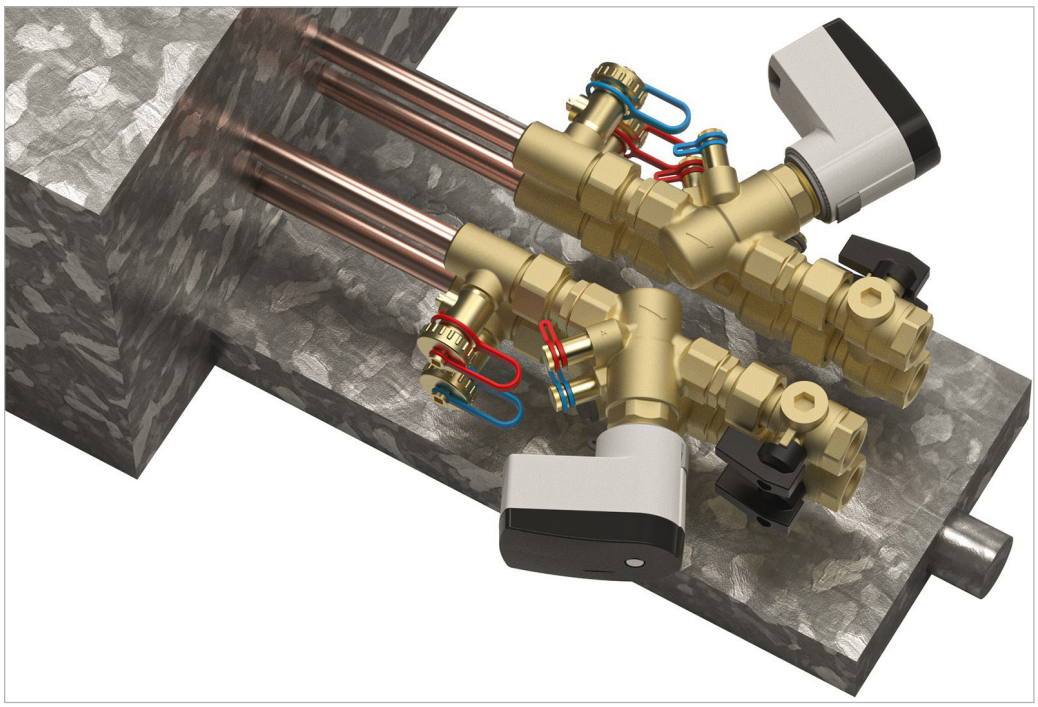
Full Order Code: **ESS-FCVA-HF41111R**

Application Example

Typical FCU Installation







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