FlowCon EDP

Externally Adjustable Differential Pressure Control Valve
DN15-50 / 1/2”-2”

SPECIFICATIONS

Insert:

Static pressure:	2500 kPa / 360 psi
Media temperature:	-20°C to +120°C / -4°F to +248°F
Material:	
- Insert:	Glass-reinforced PPS/POM
- Metal components (internal):	Stainless steel
- O-rings:	EPDM
- Diaphragm:	EPDM
Maximum operational ΔP:	500 kPaD / 72 psid
Controlled ΔP[1]:	EDP.1: 3-50 kPaD / 0.44-7.3 psid EDP.2: 5-60 kPaD / 0.7-8.7 psid EDP.3: 5-100 kPaD / 0.7-14.5 psid
Flow rate range:	15-14000 l/hr / 0.066-61.6 GPM

Valve:

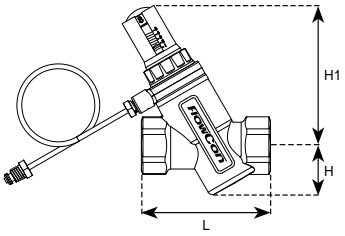
Material:	
- Housing:	A DN15-20 / 1/2”-3/4”: Forged DZR brass ASTM CuZn36Pb2As A DN25 / 1”: Forged brass ASTM CuZn40Pb2 AB DN15-25 / 1/2”-1”: Forged DZR brass ASTM CuZn36Pb2As AB DN25-50 / 1”-2”: Forged brass ASTM CuZn40Pb2 AB DN40-50 / 1 1/2”-2”: Ductile iron QT450-10 GB1348 / EN-GJS-450-10 ABV DN15-40 / 1/2”-1 1/2”: Forged brass ASTM CuZn40Pb2
- Ball valve:	ABV: Chemically nickel-plated brass ASTM CuZn40Pb2
- End connection:	ABV: Brass alloy
End connections[2]:	A/AB: Fixed female ISO or NPT ABV: Double union end connection ISO or NPT
Housing taps:	AB/ABV: 1/4” ISO
Capillary tube:	Ø3 mm, length: 1.0 meter copper / Ø0.118 in, length: 3.3 ft copper.

Note 1: Controlled ΔP at 200 l/hr / 0.88 GPM (FlowCon EDP.1), 2000 l/hr / 8.81 GPM (FlowCon EDP.2) and 4000 l/hr / 17.6 GPM (FlowCon EDP.3).
Note 2: NPT only available ex. US-factory.

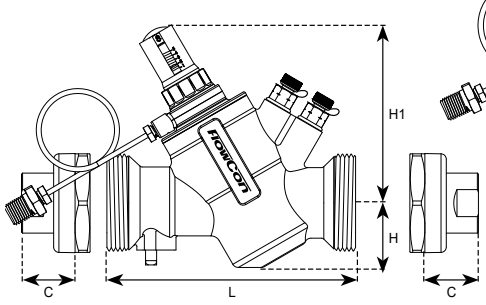
DIMENSIONS AND WEIGHT (NOMINAL)

Model no.	Valve model	Valve size	Insert size	L	H	H1	End connections C[3]			Weight[4]	Kvs/Cvs[5]
							Female	Male	Sweat		
		mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	ISO (NPT)	ISO (NPT)	ISO	kg (lb)	m^3/hr (GPM)
EDP.1.04	A	15 (1/2)	20 (3/4)	80 (3.2)	31 (1.2)	87 (3.4)	-	-	-	0.63 (1.39)	3.7 (4.3)
EDP.1.05		20 (3/4)								0.57 (1.26)	
EDP.1.06		25 (1)		91 (3.6)						0.71 (1.57)	
EDP.1.01	AB	15 (1/2)	20 (3/4)	81 (3.2)	31 (1.2)	87 (3.4)	-	-	-	0.61 (1.34)	3.7 (4.3)
EDP.1.02		20 (3/4)		85 (3.3)						0.62 (1.37)	
EDP.1.07		25 (1)		102 (4.0)						0.80 (1.76)	
EDP.2.14		25 (1)	40 (1 1/2)	128 (5.0)	47 (1.9)	114 (4.5)	-	-	-	1.94 (4.28)	26 (30)
EDP.2.15		32 (1 1/4)								1.78 (3.92)	
EDP.3.40		40 (1 1/2)	50 (2)	169 (6.7)	54,5 (2.1)	151 (5.9)	-	-	-	3.84[6] (8.47)[6]	51 (59)
EDP.3.50		50 (2)								3.44[6] (7.58)[6]	
EDP.1.03	ABV	15 (1/2)	20 (3/4)	122 (4.8)	33 (1.3)	87 (3.4)	22 (0.87)	24 (0.95)	20	1.02 (2.25)	3.7 (4.3)
		20 (3/4)					22 (0.87)	25 (0.99)	20		
		25 (1)					-	39 (1.54)	22		
EDP.2.17		25 (1)	40 (1 1/2)	162 (6.4)	42 (1.7)	111 (4.5)	35 (1.38)	40 (1.57)	34	2.78 (6.13)	26 (30)
		32 (1 1/4)					33 (1.3)	40 (1.57)	34		
		40 (1 1/2)					33 (1.3)	42 (1.65)	-		

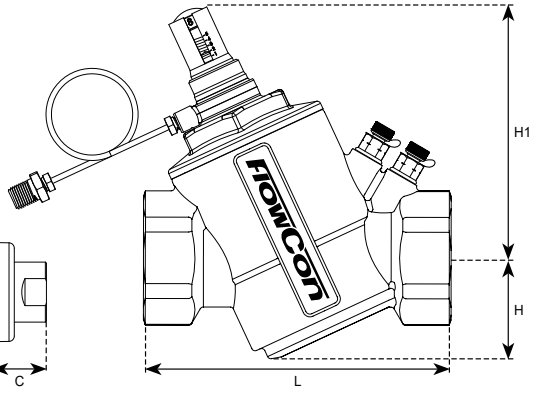
Note 3: Add end connection length to body length.
Note 4: Weight does not include end connections.
Note 5: For FlowCon EDP insert and valve body combined.
Note 6: Weight is valid for brass housings only.



FlowCon EDP.1 in FlowCon A valve DN15/20/25 (1/2", 3/4", 1")



FlowCon EDP.2 in FlowCon ABV2 valve DN25/32/40 (1", 1 1/4", 1 1/2")



FlowCon EDP.3 in FlowCon AB valve DN40/50 (1 1/2", 2")

MODEL NUMBER SELECTION

EDP . . . . . . 2 .

EDP insert size:

1 = 20 mm / 3/4” insert
2 = 40 mm / 1 1/2” insert
3 = 50 mm / 2” insert

Type of housing:

20 mm / 3/4” insert:

01 = AB DN15 / 1/2”
02 = AB DN20 / 3/4”
03 = ABV.1 DN15-25 / 1/2”-1”
04 = A DN15 / 1/2”
05 = A DN20 / 3/4”
06 = A DN25 / 1”
07 = AB DN25 / 1”

40 mm / 1 1/2 insert:

14 = AB DN25 / 1”
15 = AB DN32 / 1 1/4”
17 = ABV.2 DN25-40 / 1”- 1 1/2”

50 mm / 2” insert:

40 = AB DN40 / 1 1/2” (forged brass)
41 = AB DN40 / 1 1/2” (ductile iron)
50 = AB DN50 / 2” (forged brass)
51 = AB DN50 / 2” (ductile iron)

P/t plug requirements:

0 = no (p/t) plugs
B = pressure/temperature plugs
P = taps plugged

Union end connections (inlet x outlet):

0.0 = no union ends

Model and size	Female threaded	Male threaded	Sweat
ABV.1 with EDP insert, 20 mm	**E** = 15 mm / 1/2” **F** = 20 mm / 3/4”	**H** = 15 mm / 1/2” **I** = 20 mm / 3/4” **J** = 25 mm / 1”	**K** = 15 mm **L** = 18 mm **M** = 22 mm
ABV.2 with EDP insert, 40 mm	**G** = 25 mm / 1” **P** = 32 mm / 1 1/4” **Q** = 40 mm / 1 1/2”	**J** = 25 mm / 1” **S** = 32 mm / 1 1/4” **T** = 40 mm / 1 1/2”	**N** = 28 mm **W** = 35 mm

Capillary tube connection - defined by partner valve connection type:

2 = Capillary tube with 1/4” to M8 adaptor according to ISO 7.1 (compatible with FlowCon p/t port drillings)

Connection standard:

I = ISO
N = NPT

Example:
EDP.1.01.B.0.0.2.I = 20 mm (3/4”) FlowCon EDP insert in FlowCon AB housing, DN15 (1/2”) ISO threaded with p/t plugs and with capillary tube for connection to Partner Ball.

DESCRIPTION

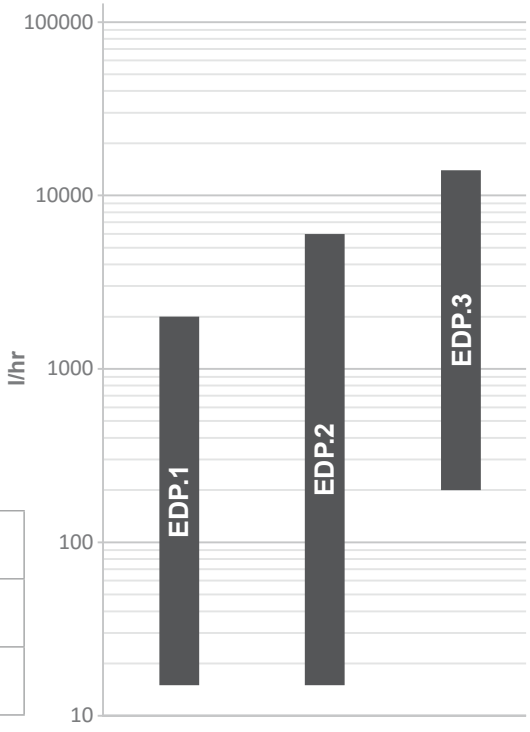
The FlowCon EDP series is a range of externally adjustable differential pressure control valves. The purpose of the valve is to keep a constant differential pressure and thereby avoid noise in the sub-system that the valve is controlling. The FlowCon EDP insert can be mounted in multiple valve housings meeting multiple installation demands and allowing valve servicing without removing the housing from the pipework.

The FlowCon EDP insert holds a patented dual spring construction ensuring a large differential pressure adjustment range. Setting of the specific ΔP required over the controlled sub-system is externally operated and can easily be adjusted even when the valve is installed and in operation.

The main purpose of the FlowCon EDP is to provide a valve with a large ΔP range in a flexible insert construction and still ensure easy selection, installation and maintenance of the product.

Flow range, l/hr (GPM)						
	Setting:	1.0	2.0	3.0	4.0	5.0
EDP.1	Q_{min}	15 (0.066)	15 (0.066)	15 (0.066)	15 (0.066)	15 (0.066)
	Q_{max}	330 (1.45)	810 (3.57)	1390 (6.12)	1970 (8.67)	2000 (8.81)
EDP.2	Q_{min}	15 (0.066)	15 (0.066)	15 (0.066)	15 (0.066)	15 (0.066)
	Q_{max}	1720 (7.57)	2970 (13.1)	5820 (25.6)	5890 (25.9)	5980 (26.3)
EDP.3	Q_{min}	200 (0.88)	300 (1.32)	200 (0.88)	270 (1.19)	640 (2.82)
	Q_{max}	3670 (16.2)	5550 (24.4)	13600 (59.9)	13900 (61.2)	14000 (61.6)

As the FlowCon EDP is insert-based, it is not required to let pipe size determine selected design flow and design ΔpC. The column chart to the right shows the flow span for each EDP insert size and each EDP insert will fit into valve housings available for more than one pipe diameter.



Example: Based on the EDP.1 insert (DN15, DN20 or DN25 pipe size) and a flow velocity of 0.8 m/sec, the following example flows and corresponding ΔpV_{MIN} are calculated:

EDP.1	Pipe size	mm (in)	15 (1/2)	20 (3/4)	25 (1)
	Example flow	l/hr (GPM)	500 (2.20)	900 (3.96)	1400 (6.16)
	ΔpV_{MIN}	kPaD (psid)	1.9 (0.28)	5.9 (0.86)	14 (2.0)

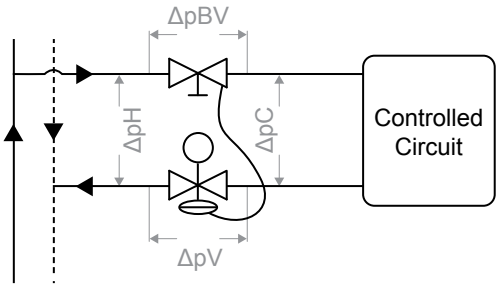
ACCESSORIES

- ACC00110: Capillary tube with fittings for connection to FlowCon QuickDisc® partner valve.
- ACC00210: Capillary tube with fittings and adaptor for connection to FlowCon standard body tappings.
- ACC00121: 1/4” to M8 adaptor according to ISO 7.1 - compatible with FlowCon standard body tappings.
- ACC0001: Adjustment key.

HOW TO SELECT

The FlowCon EDP valve is to be selected based on the required flow rate and calculated differential pressure across the controlled circuit (ΔpC) at design flow (see flow curves next page for reference).

EXAMPLE:
Design flow = 800 l/hr (3.52 GPM)
Pipe size = DN20 (3/4”)
ΔpC = 16 kPaD (2.32 psid) (design condition)



ΔpC = Controlled Δp Circuit
ΔpV = Δp across FlowCon EDP
ΔpBV = Δp across Partner Valve
ΔpH = Δp Pump Head

❶ **Select valves** (partner valve and DPCV) based on line size and system requirements to eliminate pipe modifications. In this example it will be FlowCon QuickDisc® and FlowCon EDP.1.

❷ **Select FlowCon EDP setting** based on required (calculated) ΔpC at design flow.

From the EDP.1 flow curves, proper setting is found in the intersection between needed ΔpC and design flow.

To optimize the system energy efficiency, select the setting providing closest higher ΔpC.
In this case setting 3.1 will be the proper choice. EDP.1 will with this setting allow 800 l/hr (3.52 GPM) at the design ΔpC.
Note that the maximum flow value is to be limited either on the partner valve or on the radiator thermostats.

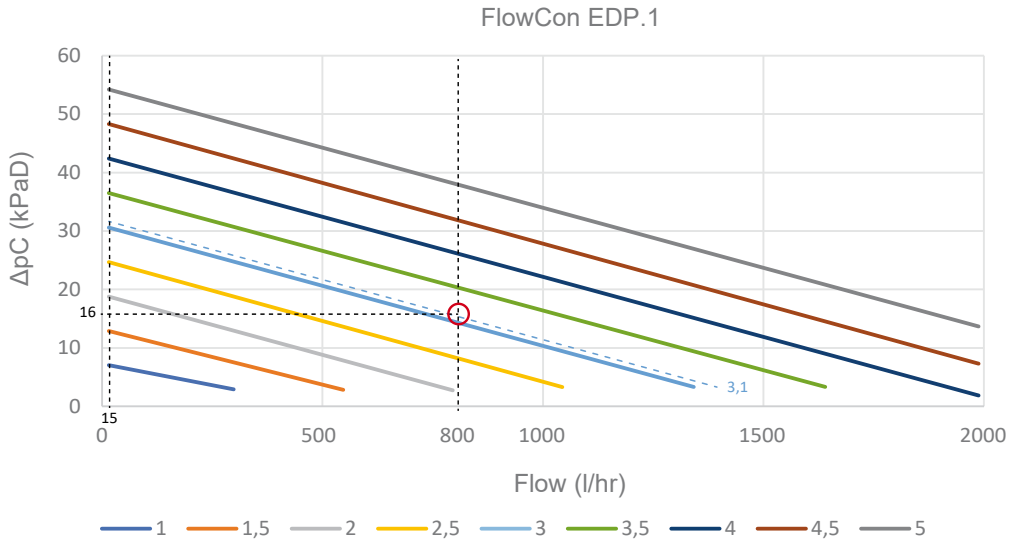
❸ **Calculate ΔpV_{MIN}** using the standard formula $\Delta pV_{MIN} = (Q_{design} / Kvs)^2 * 100$
In this case $\Delta pV_{MIN} = (0.8\ m^3/hr / 3.7\ m^3/hr)^2 * 100 = 4.7$ kPaD (0.68 psid).

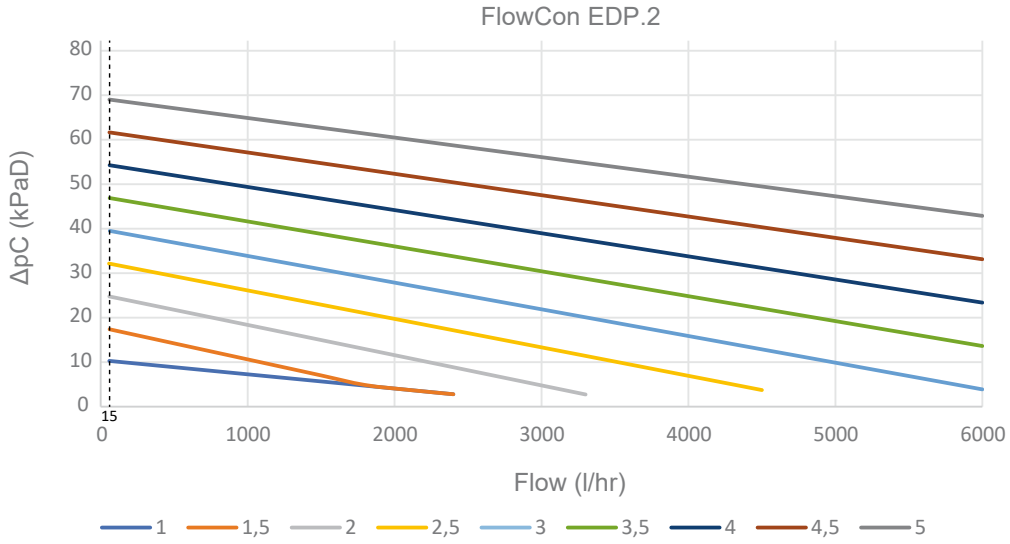
❹ **Select Partner Valve** – preferably a balancing valve – and determine the ΔpBV.
In this case a FlowCon QuickDisc® is selected. From its specification ΔpBV is calculated to 2.0 kPaD (0.29 spid).

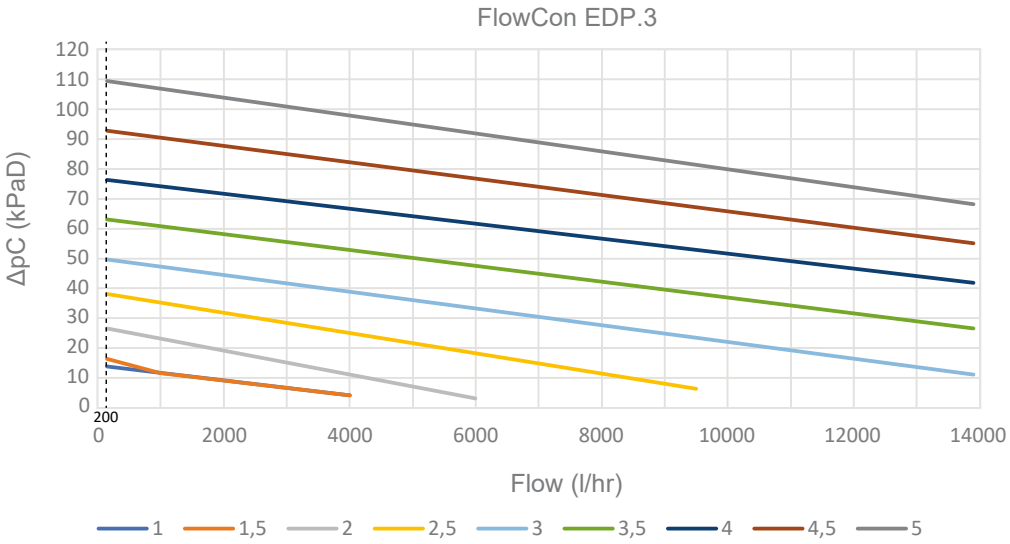
❺ **Determine minimum pump head:**
$\Delta pH = \Delta pBV + \Delta pC + \Delta pV_{MIN} = 2.0 + 16 + 4.7 = 22.7$ kPaD (3.29 psid)
The pump can now be selected considering a pressure drop of 25 kPaD (3.63 psid).

❻ **FlowCon EDP in setting 3.1** will hereafter ensure that the ΔpC never exceeds 16 kPaD (2.32 psid) + tolerance in the specified flow range.

FLOW CURVES AND SETTINGS







GENERAL SPECIFICATIONS

1. DIFFERENTIAL PRESSURE CONTROL VALVES - FLOWCON EDP

1.1. Contractor shall install the differential pressure control valves where indicated in drawings.

1.2. Valve shall be an insert based, mechanically operated, differential pressure control device, which shall accurately control differential pressure over a sub-system independent of system pressure fluctuation.

1.3. Valve housing shall be permanently marked to show direction of flow.

2. VALVE HOUSING

2.a. FlowCon A

2.a.1. Valve housing shall consist of forged brass ASTM CuZn40Pb2 or DZR ASTM CuZn36Pb2As depending on size, rated at no less than 2500 kPa (360 psi) static pressure at +120°C (+248°F).

OR….

2.b. FlowCon AB

2.b.1. Valve housing shall consist of forged brass ASTM CuZn40Pn2 or DZR brass ASTM CuZn36Pb2As or ductile iron QT450-10 GB1348 / EN-GJS-450-10, rated at no less than 2500 kPa (360 psi) static pressure at +120°C (+248°F).

2.b.2. Pressure/temperature test plugs for verifying accuracy of performance shall be available for all valve sizes.

OR….

2.c. FlowCon ABV

2.c.1. Valve housing shall consist of forged brass ASTM CuZn40Pb2, rated at no less than 2500 kPa (360 psi) static pressure at +120°C (+248°F).

2.c.2. Valve ball shall consist of chemically nickel plated brass (ASTM CuZn40Pb2).

2.c.3. Pressure/temperature test plugs for verifying accuracy of performance shall be available for all valve sizes.

3. PRESSURE REGULATION UNIT

3.1. Regulation unit shall consist of glass reinforced PPS/POM and stainless steel spring.

3.2. Regulation diaphragm must be an EPDM in-line rolling diaphragm. Flat diaphragm or external disc regulation are not accepted.

3.3. Regulation unit shall be insert based and readily accessible for change-out or maintenance.

3.4. Regulation unit shall be externally adjustable with the valve in-line and the system in operation.

3.5. Regulation unit shall be mounted with double spring system allowing differential pressure adjustment within minimum 5-50 kPaD (0.7-7.3 psid) (in the same insert without adjustment to the housing).

3.6. Regulation unit must protect the system against noise and must have a clearly defined differential pressure range within a flow range of 15-2000 l/hr (0.066-8.81 GPM) for DN15/20/25 (1/2”, 3/4”, 1”) or 15-6000 l/hr (0.066-26.4 GPM) for DN25/32/40 (1”, 1 1/4”, 1 1/2”) or 200-14000 l/hr (0.88-61.6 GPM) for DN40/50 (1 1/2”-2”).

UPDATES

For latest updates please see www.flowcon.com