

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: 5-50 kPaD / 0.7-7.3 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:

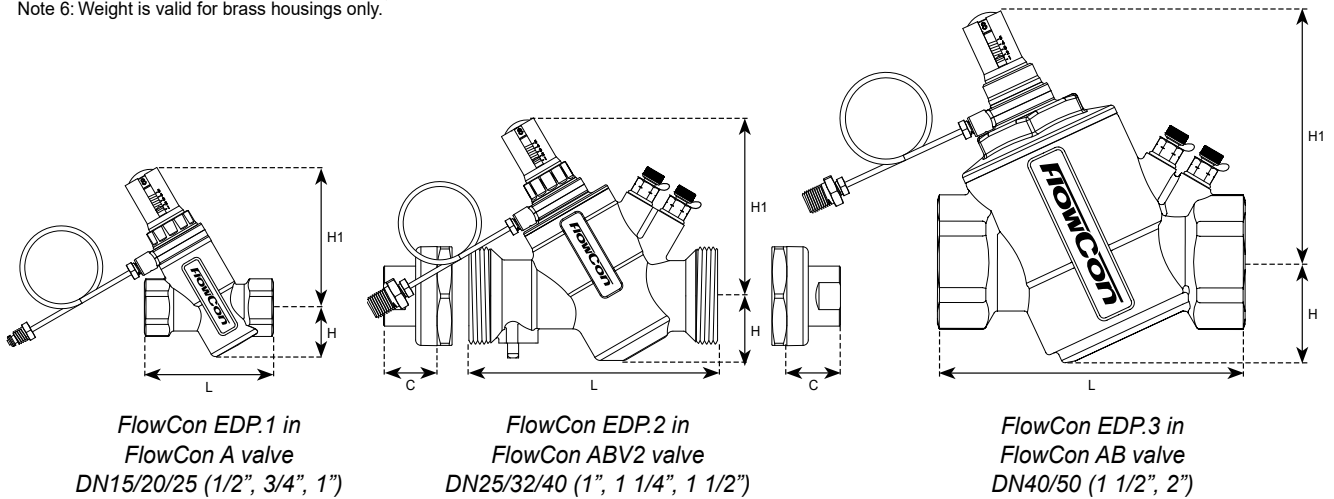
Material:	
- Housing:	Forged brass ASTM CuZn40Pb2 or DZR ASTM CuZn36Pb2As or Ductile iron ASTM A395 Grade 60-40-18
- Ball valve:	ABV: Chemically nickel plated brass ball
End connections ² :	A: Fixed female ISO or NPT (only available for EDP insert 20 mm / 3/4") AB: Fixed female ISO or NPT ABV: Union end connection in brass alloy 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 mm (in)	Insert size mm (in)	L mm (in)	H mm (in)	H1 mm (in)	End connections C ³			Weight ⁴ kg (lb)	Kvs/Cvs ⁵ m ³ /hr (GPM)
							Female ISO (NPT)	Male ISO (NPT)	Sweat ISO (NPT)		
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)								0.71 (1.57)	
EDP.1.01		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		85 (3.3)		0.62 (1.37)							
EDP.1.07		102 (4.0)		0.80 (1.76)							
EDP.2.14	AB	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 (0.79)	1.02 (2.25)	3.7 (4.3)
		20 (3/4)					22 (0.87)	25 (0.99)	20 (0.79)		
		25 (1)					-	39 (1.54)	22 (0.87)		
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 (1.34)	2.78 (6.13)	26 (30)
		32 (1 1/4)					33 (1.3)	40 (1.57)	34 (1.34)		
		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.



MODEL NUMBER SELECTION

EDP

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:

- B** = pressure/temperature plugs (standard)
 - P** = taps plugged
- leave **blank** if A-housing or no p/t plugs required

Union end connections (inlet x outlet):

Model and size	Female threaded	Male treaded	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 O = 1/2" R = 3/4" U = 1"
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 V = 1 1/4" W = 1 1/2"

- leave **blank** if A- or AB housing or no end connections required

Capillary tube connection - defined by partner valve connection type:

- 1** = Capillary tube for connection to QuickDisc® partner valve
- 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.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.

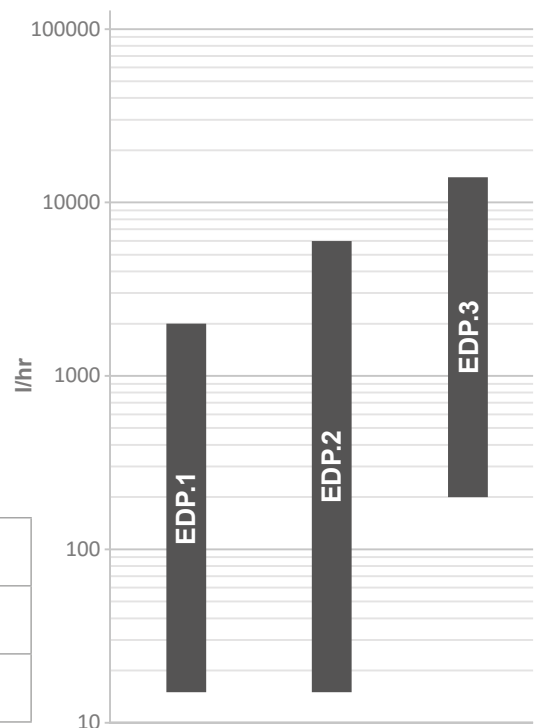
The main purpose of the FlowCon EDP is to provide a valve with a large ΔP range in a flexible insert construction and still ensure easy selection, installation and maintenance of the product.

		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 Δp_C . 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 $\Delta p_{V_{MIN}}$ 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)
	$\Delta p_{V_{MIN}}$	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 (Δp_C) at design flow (see flow curves next page for reference).

The installed FlowCon EDP will hereafter ensure that Δp_C never exceeds the valve set kPaD even at partial load conditions down to the minimum flow values listed.

EXAMPLE:

Design flow = 800 l/hr (3.52 GPM)

Pipe size = DN20 (3/4")

$\Delta p_C = 16 \text{ kPaD}$ (2.32 psid) (design condition)

- 1 **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.

- 2 **Select FlowCon EDP setting** based on required (calculated) Δp_C at design flow.

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

To optimize the system energy efficiency, select the setting providing closest higher Δp_C .

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 Δp_C .

Note that the maximum flow value is to be limited either on the partner valve or on the radiator thermostats.

- 3 **Calculate $\Delta p_{V_{MIN}}$** using the standard formula $\Delta p_{V_{MIN}} = (Q_{design} / Kvs)^2 * 100$

In this case $\Delta p_{V_{MIN}} = (0.8 \text{ m}^3/\text{hr} / 3.7 \text{ m}^3/\text{hr})^2 * 100 = 4.7 \text{ kPaD}$ (0.68 psid).

- 4 **Select Partner Valve** – preferably a balancing valve – and determine the Δp_{BV} .

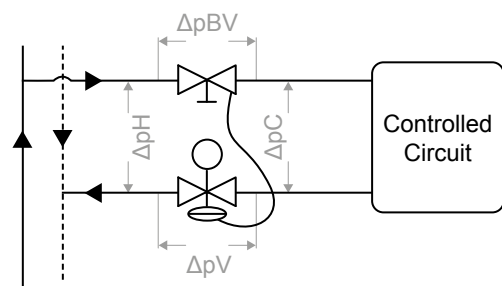
In this case a FlowCon QuickDisc® is selected. From its specification Δp_{BV} is calculated to 2.0 kPaD (0.29 psid).

- 5 **Determine minimum pump head:**

$\Delta p_H = \Delta p_{BV} + \Delta p_C + \Delta p_{V_{MIN}} = 2.0 + 16 + 4.7 = 22.7 \text{ kPaD}$ (3.29 psid)

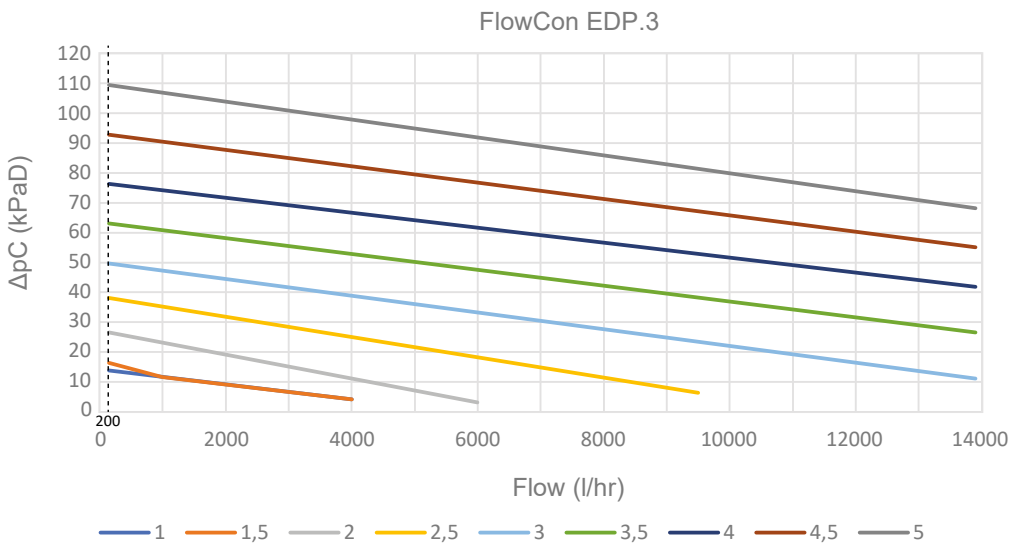
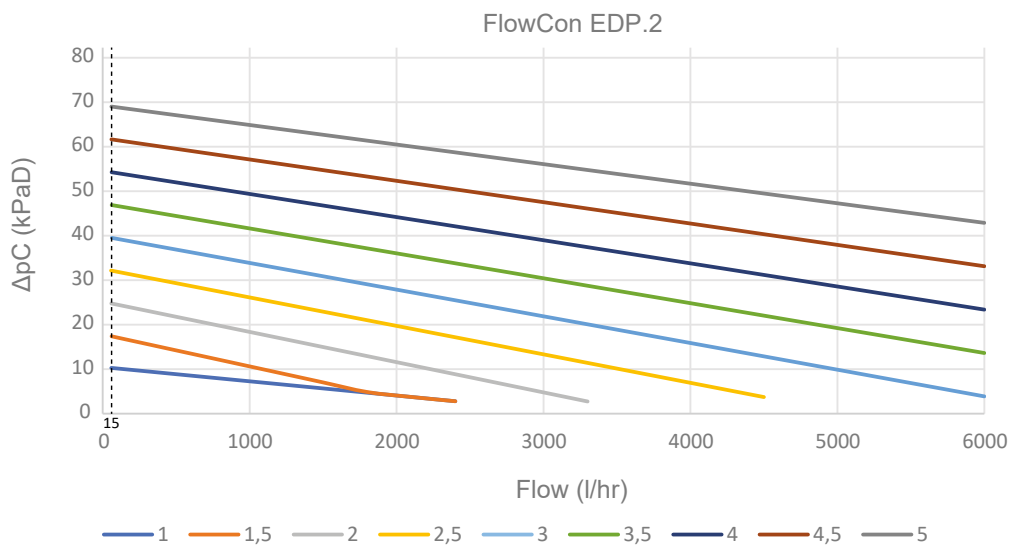
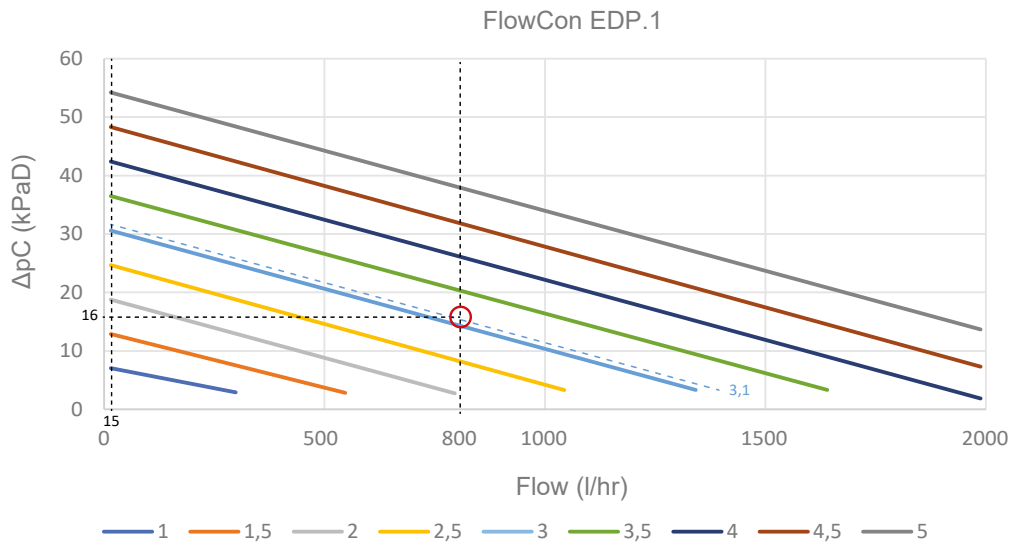
The pump can now be selected considering a pressure drop of 25 kPaD (3.63 psid).

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



Δp_C = Controlled Δp Circuit
 Δp_V = Δp across FlowCon EDP
 Δp_{BV} = Δp across Partner Valve
 Δp_H = Δp Pump Head

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 CuZn40Pb2 or DZR ASTM CuZn36Pb2As or ductile iron ASTM A395 Grade 60-40-18 depending on size, 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

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