

# FlowCon SDP

## Simple Differential Pressure Control Valve DN15-25 / 1/2"-1"



### 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 $\Delta P$ :	500 kPaD / 72 psid
Controlled $\Delta P^1$ :	SDP 10: 10 kPaD / 1.45 psid SDP 20: 20 kPaD / 2.90 psid SDP 30: 30 kPaD / 4.35 psid
Flow rate range:	35-1420 l/hr / 0.154-6.25 GPM

#### **Valve:**

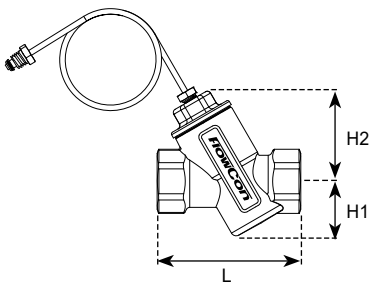
Material:	
- Housing:	Forged brass ASTM CuZn40Pb2 or DZR ASTM CuZn36Pb2As
- Ball valve:	ABV: Chemically nickel plated brass ball
End connections <sup>2</sup> :	A: Fixed female ISO or NPT AB: Fixed female ISO or NPT ABV: Union end connection in brass alloy ISO or NPT
Housing taps:	AB / ABV: 1/4" ISO
Capillary tube:	Ø3 mm, length: 1.0 meter copper / Ø0.118 in, length: 3.3 ft copper.

Note 1: Controlled  $\Delta P$  at 200 l/hr (0.88 GPM).  
Note 2: NPT only available ex. US-factory.

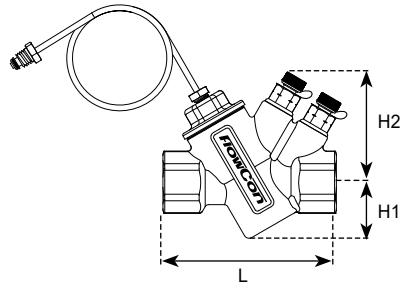
## DIMENSIONS AND WEIGHT (NOMINAL)

Model no.	Valve model	Valve size mm (in)	Insert size mm (in)	L mm (in)	H1 mm (in)	H2 mm (in)	End connections C <sup>3</sup>			Weight <sup>4</sup> kgs. (lb)	Kvs/Cvs <sup>5</sup> m <sup>3</sup> /hr (GPM)
							Female ISO (NPT)	Male ISO (NPT)	Sweat ISO (NPT)		
SDP.X0.04	A	15 (1/2)	20 (3/4)	80 (3.2)	31 (1.2)	50 (2.0)	-	-	-	0.51 (1.12)	3.7 (4.3)
SDP.X0.05		20 (3/4)								0.48 (1.06)	
SDP.X0.06		25 (1)								0.61 (1.34)	
SDP.X0.01	AB	15 (1/2)	20 (3/4)	81 (3.2)	31 (1.2)	63 (2.5)	-	-	-	0.51 (1.12)	3.7 (4.3)
SDP.X0.02		20 (3/4)								0.53 (1.17)	
SDP.X0.07		25 (1)								0.70 (1.54)	
SDP.X0.03	ABV	15 (1/2)	20 (3/4)	122 (4.8)	33 (1.3)	63 (2.5)	22 (0.87)	24 (0.95)	20 (0.79)	0.91 (2.01)	3.7 (4.3)
		22 (0.87)					25 (0.99)	20 (0.79)			
		-					39 (1.54)	22 (0.87)			

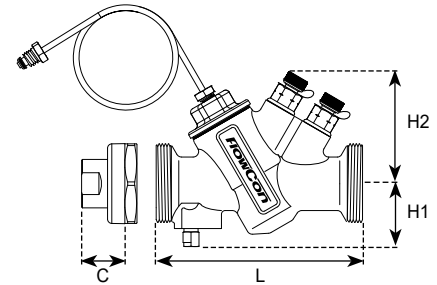
Note 3: Add end connection length to body length.  
 Note 4: Weight does not include end connections.  
 Note 5: For insert and valve body combined.



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



*FlowCon SDP in  
FlowCon AB valve  
DN15/20/25 (1/2", 3/4", 1")*



*FlowCon SDP in  
FlowCon ABV1 valve  
DN15/20/25 (1/2", 3/4", 1")*

## MODEL NUMBER SELECTION

### SDP

ΔpC defining SDP insert:

- 10** = 10 kPaD / 1.45 psid
- 20** = 20 kPaD / 2.90 psid
- 30** = 30 kPaD / 4.35 psid

Type of housing:

- 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"

P/t plug requirements:

- P** = taps plugged
- B** = p/t plugs

- 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 SDP insert, 20 mm	<b>E</b> = 15 mm / 1/2" <b>F</b> = 20 mm / 3/4"	<b>H</b> = 15 mm / 1/2" <b>I</b> = 20 mm / 3/4" <b>J</b> = 25 mm / 1"	<b>K</b> = 15 mm <b>L</b> = 18 mm <b>M</b> = 22 mm <b>O</b> = 1/2" <b>R</b> = 3/4" <b>U</b> = 1"

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

Capillary tube connection - defined by partner valve connection size:

- 1** = Capillary tube for connection to QuickDisc® partner valve
- 2** = Capillary tube with union M8 to 1/4" adaptor according to ISO 7.1  
(compatible with FlowCon p/t port drillings)

Connection standard:

- I** = ISO
- N** = NPT

Example:

**SDP.10.03.B.EE.1.I**=FlowCon SDP (10 kPaD / 1.45 psid) in FlowCon ABV.1 housing with p/t plugs and ISO female union end connections (DN15 / 1/2") and with capillary tube for connection to QuickDisc® partner valve.

## DESCRIPTION

The FlowCon SDP series is a range of differential pressure control valves. The purpose of the valve is to keep a constant differential pressure and thereby avoid noise in the sub-system, which the valve is controlling. Furthermore, the FlowCon SDP can be used as a shut off valve with FlowCon ABV housing.

The FlowCon SDP insert comes in three models. Each model has a fixed differential pressure limitation of 10, 20 and 30 kPaD (1.45, 2.90 and 4.35 psid), so no need of any additional adjustment at site.

The main purpose of the FlowCon SDP is to be as basic as possible, resulting in low costs and easy installation without the necessity of adjustment. This can be beneficial in many cases where fast and tamper proof solutions are preferred.

Flow range, l/hr (GPM)				
Selection:		SDP.10	SDP.20	SDP.30
DN15 / 1/2"	Q <sub>min</sub>	35 (0.154)	50 (0.220)	50 (0.220)
DN20 / 3/4"				
DN25 / 1"	Q <sub>max</sub>	864 (3.80)	960 (4.23)	1420 (6.25)

## 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 taps.
- ACC00121: Union M8 to 1/4" adaptor according to ISO 7.1 - compatible with FlowCon standard body taps.

## SIZING - HOW TO SELECT

The FlowCon SDP valve is to be selected based on the required flow rate and the calculated differential pressure across the controlled circuit ( $\Delta p_C$ ) at design flow (see flow rate table and flow curves elsewhere in this technote for reference).

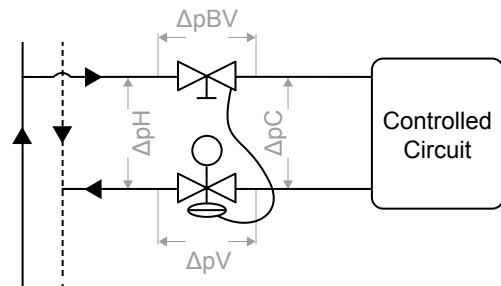
The installed FlowCon SDP will hereafter ensure that the differential pressure across the controlled circuit ( $\Delta p_C$ ) never exceeds the valve rated kPaD (10, 20 or 30 kPaD + tolerance / 1.45, 2.90 or 4.35 psid + tolerance) even at partial load conditions down to the minimum flow values listed.

### Example:

Design flow = 800 l/hr / 3.52 GPM

Pipe size = DN20 / 3/4"

$\Delta p_C = 11$  kPaD / 1.60 psid (design condition)

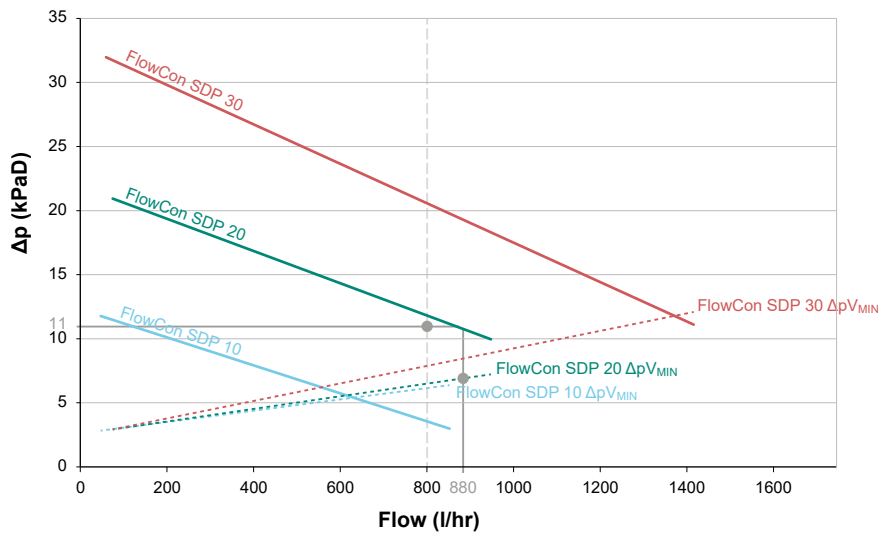


$\Delta p_C$  = Controlled  $\Delta p$  Circuit  
 $\Delta p_V$  =  $\Delta p$  across FlowCon SDP  
 $\Delta p_{BV}$  =  $\Delta p$  across Partner Valve  
 $\Delta p_H$  =  $\Delta p$  Pump Head

- ❶ **Select valves** (Supply and Return valves) based on line size and system requirements to eliminate pipe modifications.
- ❷ **Select FlowCon SDP insert** based on required (calculated)  $\Delta p_C$  at design flow.  
 From the flow curves, proper SDP model is found in the intersection between needed  $\Delta p_C$  and design flow. In this case find 800 l/hr (3.52 GPM) on the horizontal axis and 11 kPaD (1.60 psid) on the vertical axis. To optimize the system energy efficiency, select the model with closest higher  $\Delta P$  at design flow compared to design condition (see flow curve next page). In this case SDP.20 will be the proper choice.  
 SDP.20 will allow 880 l/hr (3.87 GPM) at the respective  $\Delta p_C$  and will thus be capable of supplying the required flow rate. Note that the maximum flow value is to be limited either on the partner valve or on the radiator thermostats.
- ❸ **Determine  $\Delta p_{V_{MIN}}$**  from the dotted flow curves (see next page).  
 In this case SDP.20 has just been selected and the dotted SPD.20 line will at  $\Delta p_C = 11$  kPaD (1.60 psid) providing 880 l/hr (3.87 GPM) give a  $\Delta p_{V_{MIN}}$  of 7 kPaD (1.02 psid).
- ❹ **Select Partner Valve** - preferably a balancing valve - and determine the  $\Delta p_{BV}$ .  
 In this case a FlowCon QuickDisc<sup>®</sup>, which can also limit the flow, is selected. From its specification  $\Delta p_{BV}$  is calculated to 2.0 kPaD (0.29 psid).
- ❺ **Determine pump head.** Calculate the minimum pump head,  $\Delta p_H$  using the standard formula:  
 $\Delta p_H = \Delta p_{BV} + \Delta p_C + \Delta p_{V_{MIN}} = 2 + 11 + 7 = 20$  kPaD (0.29 + 1.60 + 1.02 = 2.91 psid)
- ❻ **FlowCon SDP.20** will hereafter ensure that the  $\Delta p_C$  never exceeds 11 kPaD + tolerance (1.60 psid + tolerance) and FlowCon QuickDisc<sup>®</sup> will ensure that specified flow rate is not exceeded.

## FLOW CURVES

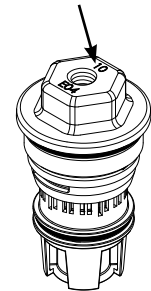
Controlled  $\Delta p_C$  circuit and  $\Delta p_{V_{MIN}}$



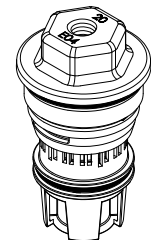
## FLOW RATE TABLE - VALVE SIZE DN15-25 / 1/2"-1"

$\Delta p_C$		FlowCon SDP.10			FlowCon SDP.20			FlowCon SDP.30		
		10 kPaD / 1.45 psid			20 kPaD / 2.90 psid			30 kPaD / 4.35 psid		
kPaD	psid	l/sec	l/hr	GPM	l/sec	l/hr	GPM	l/sec	l/hr	GPM
1	0.1									
2	0.3									
3	0.4	0.240	864	3.80						
4	0.6	0.215	773	3.40						
5	0.7	0.189	682	3.00						
6	0.9	0.164	591	2.60						
7	1.0	0.139	500	2.20						
8	1.2	0.114	409	1.80						
9	1.3	0.088	318	1.40						
10	1.5	0.063	227	0.999	0.267	960	4.23			
11	1.6	0.038	136	0.599	0.244	880	3.88	0.394	1420	6.25
12	1.7	0.010	35	0.154	0.222	800	3.52	0.378	1360	5.99
13	1.9				0.200	720	3.17	0.358	1290	5.68
14	2.0				0.178	640	2.82	0.342	1230	5.42
15	2.2				0.156	560	2.47	0.322	1160	5.11
16	2.3				0.133	480	2.11	0.306	1100	4.84
17	2.5				0.111	400	1.76	0.286	1030	4.54
18	2.6				0.089	320	1.41	0.269	968	4.26
19	2.8				0.067	240	1.06	0.251	903	3.98
20	2.9				0.044	160	0.704	0.233	839	3.69
21	3.0				0.022	80	0.352	0.215	774	3.41
22	3.2				0.014	50	0.220	0.197	710	3.13
23	3.3							0.179	645	2.84
24	3.5							0.161	581	2.56
25	3.6							0.143	516	2.27
26	3.8							0.126	452	1.99
27	3.9							0.108	387	1.70
28	4.1							0.090	323	1.42
29	4.2							0.072	258	1.14
30	4.4							0.054	194	0.854
31	4.5							0.036	129	0.568
32	4.6							0.018	65	0.286
33	4.8							0.014	50	0.220

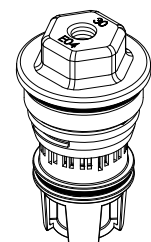
The model of FlowCon SDP is engraved at the top of the insert



FlowCon SDP.10  
10 kPaD / 1.45 psid



FlowCon SDP.20  
20 kPaD / 2.90 psid



FlowCon SDP.30  
30 kPaD / 4.35 psid

## GENERAL SPECIFICATIONS

### 1. DIFFERENTIAL PRESSURE CONTROL VALVES – FLOWCON SDP

- 1.1. Contractor shall install the differential pressure control valves where indicated in drawings.
- 1.2. Valve shall be an insert based, differential pressure control device, which shall accurately control differential pressure over a sub-system independent of system 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 DZR brass ASTM CuZn36Pb2As, 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 tamper-proof without possibility of adjustment and shall be available in minimum 3 pressure ranges with 10 kPaD (1.45 psid) in between each model.
- 3.5. Regulation unit shall be capable of controlling the differential pressure across the controlled circuit within the pressure range of 3-33 kPaD (0.4-4.8 psid) and within the flow range of 35-1420 l/hr (0.154-6.25 GPM).
- 3.6. Regulation unit shall be capable of maintaining specified maximum flow rates within a differential pressure range up to 400 kPaD (58 psid).
- 3.7. Regulation unit's upper limit at minimum flow should be maximum +25% of the specified  $\Delta P$ .

## UPDATES

**For latest updates please see [www.flowcon.com](http://www.flowcon.com)**

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