FlowCon ADP

Combined Δp Controller, Balancing and 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 PSU/POM/PPS
- Cone:	PPS
- Metal components (internal):	Stainless steel
- O-rings:	EPDM
- Diaphragm:	EPDM
Maximum close off pressure:	600 kPa / 87 psi
Maximum operational Δp :	500 kPaD / 72 psid
Controlled Δp:	ADP.0: 3-17 kPaD / 0.4-2.5 psid
	ADP.1: 3-35 kPaD / 0.4-5.1 psid
Shut-off leakage:	ANSI / FCI 70-2 2006, Class IV / IEC 60534-4, Class IV
Flow rate range:	ADP.0: 9-680 l/hr / 0.040-2.99 GPM
	ADP.1: 26-1100 l/hr / 0.115-4.84 GPM

Valve:

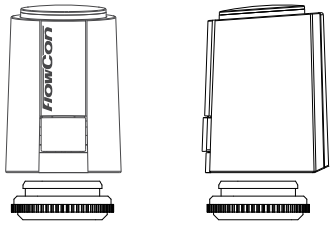
Material:	
- Housing:	Forged brass ASTM CuZn40Pb2 or DZR ASTM CuZn36Pb2As
- Ball valve:	ABV: Chemically nickel plated brass ball
End connections[1]:	A: Fixed female ISO or NPT
	AB: Fixed female ISO or NPT
	ABV: Union end connection in brass alloy ISO or NPT
Housing taps:	AB / ABV: 1/4” ISO
Capillary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

Note 1: NPT only available ex. US-factory.

SPECIFICATIONS (...continued)

FlowCon Actuators available for FlowCon ADP

FlowCon Actuator[1]	FT.0.3	FT.0.4
Supply voltage	230V AC ±10%, 50/60Hz	24V AC/DC -10%... +20%, 50/60Hz
Type	Thermal	Thermal
Power consumption	1.2W	1.2W
Control signal	ON/OFF, Normally closed	ON/OFF, Normally closed
Failsafe function	Yes	Yes
Operation time[2]	App. 4.5 minutes	App. 4.5 minutes
Ambient temperature[3]	+1°C to +50°C	+1°C to +50°C
Protection	IP54 including upside-down, class II	IP54 including upside-down, class III
Cable	Fixed, 1 meter	Fixed, 1 meter
Weight	0.11 kg	0.11 kg



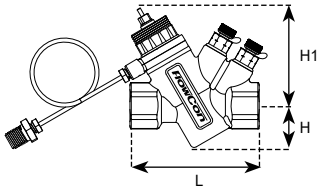
FlowCon FT.0.3/0.4

Note 2: FlowCon warranty is voided using other actuators than supplied by FlowCon International.
Note 3: Closing time is approximately the double dependent on ambient temperature.
Note 4: Stated temperature rating is defined due to no external insert condensation.

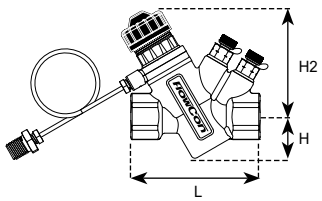
DIMENSIONS AND WEIGHT (NOMINAL)

Model no.	Valve model	Valve size mm (in)	Insert size mm (in)	L mm (in)	H mm (in)	H1 mm (in)	H2 with cap mm (in)	H3 with actuator mm (in)	End connections C[5] Female ISO (NPT)	End connections C[5] Male ISO (NPT)	End connections C[5] Sweat ISO	Weight[6] kgs. (lb)	Kvs/Cvs[7] m³/hr (GPM)
ADP.X.04	A	15 (1/2)	20 (3/4)	80 (3.2)	31 (1.2)	72 (2.8)	78 (3.1)	125 (4.9)	-	-	-	0.68 (1.50)	3.7 (4.3)
ADP.X.05		20 (3/4)										0.64 (1.41)	
ADP.X.06		25 (1)		91 (3.6)								0.73 (1.61)	
ADP.X.01	AB	15 (1/2)	20 (3/4)	81 (3.2)	31 (1.2)	72 (2.8)	78 (3.1)	125 (4.9)	-	-	-	0.64 (1.41)	3.7 (4.3)
ADP.X.02		20 (3/4)		85 (3.3)								0.66 (1.46)	
ADP.X.07		25 (1)		102 (4.0)								0.86 (1.90)	
ADP.X.03	ABV	15 (1/2)	20 (3/4)	122 (4.8)	33 (1.3)	72 (2.8)	78 (3.1)	125 (4.9)	22 (0.87)	24 (0.95)	20	1.03 (2.27)	3.7 (4.3)
		20 (3/4)							22 (0.87)	25 (0.99)	20		
		25 (1)							-	39 (1.54)	22		

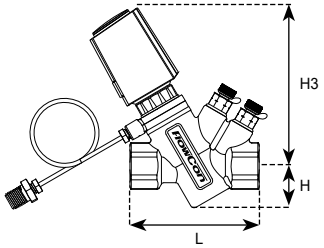
Note 5: Add end connection length to body length.
Note 6: Weight does not include end connections or actuator.
Note 7: For FlowCon ADP insert and valve body combined.



FlowCon ADP.0/1 in FlowCon AB DN15/20/25 (1/2", 3/4", 1")



FlowCon ADP.0/1 in FlowCon AB DN15/20/25 (1/2", 3/4", 1") and with FlowCon Protection Cap



FlowCon ADP.0/1 in FlowCon AB DN15/20/25 (1/2", 3/4", 1") and with FlowCon FT actuator

MODEL NUMBER SELECTION

ADP . . . . 2 .

Pressure range:
0 = Low pressure
1 = High pressure

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”

Type of actuator:
00 = No actuator
23 = FT.0.3
24 = FT.0.4

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 ADP 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

Capillary tube connection:
2 = Capillary tube with union 1/4” to M8 adaptor FlowCon Partner Ball

Connection standard:
I = ISO
N = NPT

Example:
ADP.0.01.00.B.0.0.2.I = FlowCon ADP, low pressure, in FlowCon AB housing (DN15 / 1/2”) ISO threaded with p/t plugs, no actuator but including capillary tube for connection to FlowCon Partner Ball.

DESCRIPTION

The FlowCon ADP series is a combination of a pressure independent control valve as well as a differential pressure controller. The range features the traditional advantageous of a PICV - pressure independent maximum flow limitation, 100% authority if mounted with actuator - but does simultaneously ensure that the differential pressure across the controlled circuit does not exceed 17 kPaD for ADP.0 and 35 kPaD for ADP.1.

The differential pressure safety feature makes the valve perfect for locations, where a traditional PICV is not suitable due to noise concerns, such as heating system branches or equivalent.

The ADP will in other words ensure a stable differential pressure across the controlled circuit and simultaneously ensure that the maximum flow never exceeds the design value. The integration of the PICV and DPCV ensures full functionality of both valves without any conflict and at a minimal pressure drop.

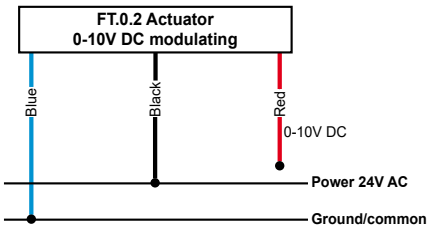
	Flow (l/hr)														
ΔpC (kPaD)	FlowCon ADP.0 settings (grey o-ring)														
	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0	3.5	4.0	4.5	5.0
3	84	120	170	230	280	330	370	400	420	450	470	550	610	630	680
4	79	110	160	210	260	310	340	370	390	420	440	510	570	590	630
5	73	100	150	190	240	290	320	340	360	380	410	470	520	540	590
6	67	96	130	180	220	260	290	320	330	350	380	440	480	500	540
7	61	88	120	160	200	240	270	290	310	320	340	400	440	460	490
8	55	79	110	150	190	220	240	260	280	290	310	360	400	410	450
9	50	71	99	130	170	190	220	230	250	260	280	320	360	370	400
10	44	63	88	120	150	170	190	210	220	230	250	280	320	330	350
11	38	54	76	100	130	150	170	180	190	200	210	250	270	280	310
12	32	46	64	86	110	130	140	150	160	170	180	210	230	240	260
13	26	38	53	70	88	100	120	120	130	140	150	170	190	200	210
14	21	30	41	55	69	81	90	97	100	110	120	130	150	150	170
15	15	21	30	39	49	58	65	70	74	78	83	96	110	110	120
16	12	17	24	32	40	47	52	56	59	63	66	77	86	88	96
17	9	13	18	24	30	35	39	42	45	47	50	58	65	67	72

DESCRIPTION

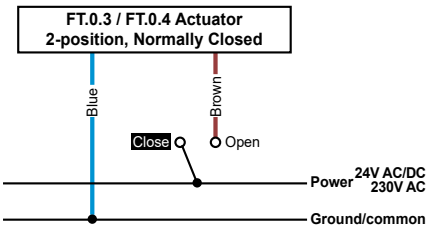
ΔpC (kPaD)	Flow (l/hr)														
	FlowCon ADP.1 settings (black o-ring)														
	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0	3.5	4.0	4.5	5.0
3	210	300	400	510	610	680	720	750	790	830	880	1000	1000	1100	1100
4	210	290	390	500	590	660	700	730	770	810	860	990	1000	1000	1000
5	200	280	380	480	570	640	680	710	740	780	830	960	990	990	1000
6	190	270	370	470	560	620	660	690	720	760	810	930	960	960	970
7	190	260	360	460	540	600	640	670	700	740	780	900	930	930	940
8	180	260	350	440	520	580	620	650	680	710	760	880	900	910	910
9	180	250	340	430	510	560	600	630	660	690	730	850	870	880	880
10	170	240	330	410	490	550	580	610	640	670	710	820	840	850	850
11	170	230	310	400	470	530	560	590	610	650	690	790	810	820	830
12	160	220	300	390	460	510	540	570	590	620	660	760	780	790	800
13	150	220	290	370	440	490	520	550	570	600	640	740	760	760	770
14	150	210	280	360	420	470	500	530	550	580	610	710	730	730	740
15	140	200	270	340	410	450	480	510	530	560	590	680	700	700	710
16	140	190	260	330	390	430	460	480	510	530	570	650	670	680	680
17	130	180	250	320	370	420	440	460	480	510	540	620	640	650	650
18	120	180	240	300	360	400	420	440	460	490	520	600	610	620	620
19	120	170	230	290	340	380	400	420	440	460	490	570	580	590	590
20	110	160	210	270	320	360	380	400	420	440	470	540	560	560	560
21	110	150	200	260	310	340	360	380	400	420	440	510	530	530	530
22	100	140	190	240	290	320	340	360	380	400	420	490	500	500	510
23	95	130	180	230	270	300	320	340	350	370	400	460	470	470	480
24	90	130	170	220	260	290	300	320	330	350	370	430	440	440	450
25	84	120	160	200	240	270	290	300	310	330	350	400	410	420	420
26	78	110	150	190	220	250	270	280	290	300	320	370	380	390	390
27	72	100	140	170	210	230	250	260	270	280	300	350	360	360	360
28	66	93	130	160	190	210	230	240	250	260	280	320	330	330	330
29	61	85	120	150	170	190	210	220	230	240	250	290	300	300	300
30	55	77	100	130	160	170	190	190	200	210	230	260	270	270	270
31	49	69	93	120	140	160	170	170	180	190	200	230	240	240	240
32	43	61	82	100	120	140	150	150	160	170	180	210	210	210	210
33	37	52	71	90	110	120	130	130	140	150	150	180	180	180	190
34	32	44	60	76	90	100	110	110	120	120	130	150	150	160	160
35	26	36	49	62	73	81	87	91	95	100	110	120	130	130	130

WIRING INSTRUCTION

FlowCon FT (analog)



FlowCon FT (digital)

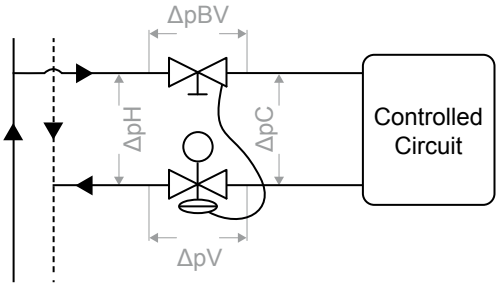


ACCESSORIES

- ACC00210: Capillary tube with fittings and adaptor for connection to FlowCon standard housing taps.
- ACC0001: Adjustment key.
- ACC0086: Protection cap.

HOW TO SELECT

The FlowCon ADP 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 rate table and flow curves below for reference).



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

EXAMPLE:
Design flow rate = 340 l/hr (1.50 GPM)
Pipe size = DN15 (1/2")
ΔpC = 7 kPaD (1.02 psid) (design condition)

❶ **Select valves** (DPCV and partner valve) based on line size and system requirements to eliminate pipe modifications.
In this example it will be FlowCon ADP.0 and FlowCon Partner Ball.

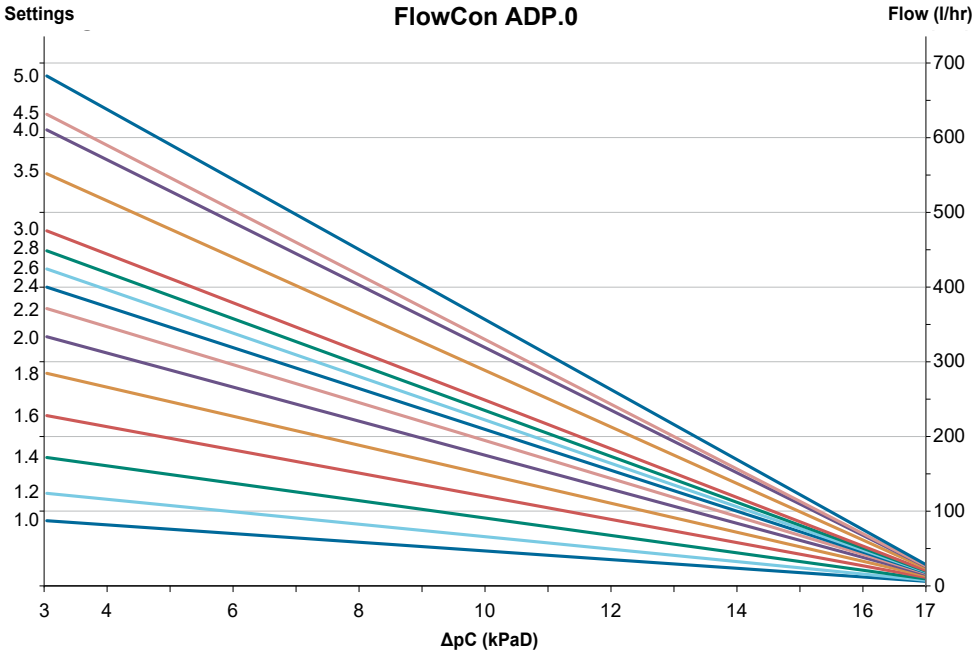
❷ **Select FlowCon ADP setting** based on required (calculated) ΔpC at design flow.
From the ADP.0 flow rate table, proper setting is found in the intersection between needed ΔpC and design flow. To optimize the system energy efficiency, select the setting providing closest higher ΔpC. In this case setting 3.0 will be the proper choice. ADP.0 will with this setting allow 340 l/hr (1.50 GPM) at the design ΔpC.

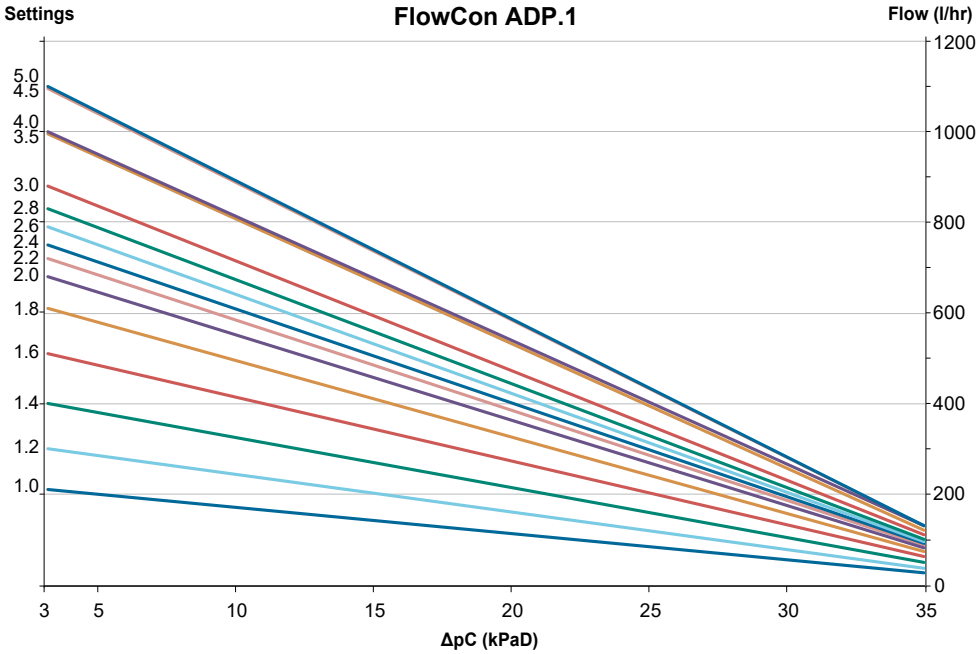
❸ **Select your partner valve** (FlowCon Partner Ball is recommended) and determine the ΔpBV:
In this case recommendations are followed, and a FlowCon Partner Ball is selected.
From its specification ΔpBV is calculated to 1.11 kPaD (0.16 pisd).

❹ **Determine minimum pump head:**
Note that ΔpV_{MIN} + ΔpC is always 17 kPaD for an ADP.0 + calculated Δp of the DPCV housing.
Δp is calculated using the standard formula $\Delta p = (Q_{design} / Kv)^2 * 100$.
In this case $\Delta p = (0.34\ m^3/hr / 3.1\ m^3/hr)^2 * 100 = 1.2$ kPaD (0.17 pisd)
$\Delta pH = \Delta pBV + (\Delta pC + \Delta pV_{MIN}) + \Delta p = 1.11 + 17 + 1.2 = 19.31$ kPaD (2.8 psid)
The pump can now be selected considering a pressure drop of 20 kPaD (2.9 psid).

❺ **FlowCon ADP.0 in setting 3.0** will hereafter ensure that design flow never exceeds 340 l/hr (1.50 GPM) at the desing ΔpC. Applying a thermal actuator on the FlowCon ADP will allow design ΔpC and flow when open and a full shut-off function when the actuator is closed.

FLOW RATE AND SETTINGS





GENERAL SPECIFICATIONS

1. FLOW LIMITING DIFFERENTIAL PRESSURE CONTROLLER - FLOWCON ADP

1.1 Contractor shall install the flow limiting differential pressure controller where indicated in drawings.

1.2 Valve shall be an insert based, mechanically operated, differential pressure and flow control device with the option of adding an actuator making it a pressure independent control device.

1.3 Flow limiting differential pressure control valve shall accurately control flow and ensure that the differential pressure across the controlled circuit never exceeds the valve value, independent of system pressure fluctuation.

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

2. VALVE ACTUATOR - FLOWCON FT

2.1 Valve actuator housing shall be rated to IP54, including up-side-down mounting.

2.2 Actuator shall be driven by 24V or 230V AC, and shall accept ON/OFF control signal.

2.3 Actuator shall have visible indication of stroke position.

2.4 Failsafe function shall be available on all version.

3. VALVE HOUSING

3.a FlowCon A

3.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….

3.b FlowCon AB

3.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).

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

OR….

3.c FlowCon ABV

3.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).

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

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

4. FLOW AND PRESSURE REGULATION UNIT

4.1 Regulation unit shall consist of glass-reinforced PSU/POM/PPS and stainless steel spring.

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

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

4.4 Regulation unit shall be externally adjustable to 1 of 41 different flow rates without limiting the stroke length and with the valve in-line and the system in operation.

4.5 Regulation unit shall be mounted with double spring system allowing differential pressure adjustment within 3-17 kPaD (0.4-2.5 psid) or 3-35 kPaD (0.4-5.1 psid)

4.6 Regulation unit must protect the system against noise and must have a clearly defined differential pressure range within a flow range of 9-680 l/hr (0.040-2.99 GPM) or 26-1100 l/hr (0.115-4.84 GPM).

UPDATES

For latest updates please see www.flowcon.com