Revision Date September 9, 2013

Automatic Flow Balancing Control Ball valves

Installation and Operation Instructions

Table 1 - Automatic Flow Balancing Control with 2-way Characterized Ball Valve Model Number Selection Table

Connection		Valve Body	Pipe	Ball	Options	Actuator	Flow Coefficient		Flow Control Range	Close-off Pressure ΔP	
Inches	mm	Model Number	Connection	Material		Model Number	Cv	Kv	m³/h	PSI	kPa
3/4	20	VFB30-020B2x	B= BSP and D = DIN flanges are Standard	2 = stainless steel is standard	X:: 0 = None	SPAyy3A0 or SPAyy4A0 Where SPA = SPA Series flow balancing valve actuator Input signal type 3 = 3-wire floating 4 = 0-10 VDC proportional Actuator type yy = 04 for 20 to 50 mm yy = 05 for 65 to 80 mm yy = 06 for 100 to 150 mm Supply voltage A = 24 VAC only Options 0 = None	7.4	6.3	0.5~5.0	85	600
1	25	VFB30-025B2x					11.7	10	1.0~10.0		
1-1/4	32	VFB30-032B2x					18.7	16	3.2~16.0		
1-1/2	40	VFB30-040B2x					29.3	25	5.0~25.0		
2	50	VFB30-050B2x					46.8	40	8.0~40.0		
2-1/2	65	VFB30-065D2x					75	64	12.0~64.0		
3	80	VFB30-080D2x					119	102	20.0~102.0		
4	100	VFB30-100D2x					190	163	32.0~163.0		
5	125	VFB30-125D2x					306	260	52.0~260.0		
6	150	VFB30-150D2x					487	416	83.0~416.0		

Ordering Instruction

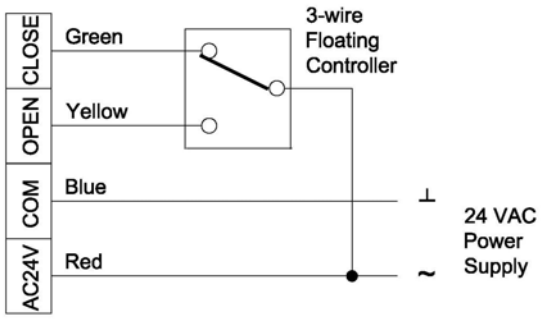
To order, specify both the valve body and actuator model numbers for factory mounting. Preset flow limit can also be requested on ordering.

Flow Balancing Control Ball Valve Selection Example:

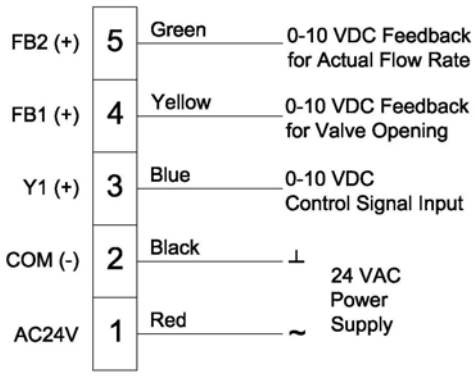
Example 1: 25 mm valve, 2-way, Cv=11.7, BSP threads, stainless steel ball, 3-wire floating input, 24 VAC
= VFB30-025B20 + SPA043A0

Wiring Diagrams

With 3-Wire Floating Actuators



With 0-10 VDC Actuators

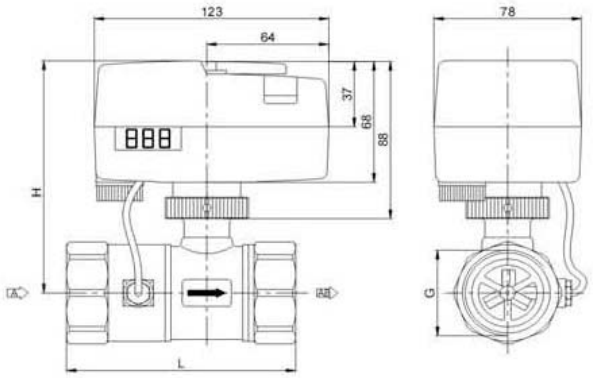


Dimensions and Weights

THREADED BALL VALVES

Connection		Max. Pipe Thread Size mm	Flow Control Range (m^3/h)	L		H		G		Weight*
Inches	mm			Inches	mm	Inches	mm	Inches	mm	kg
3/4	20	15	0.5~5.0	3-3/4	95	4-1/2	114	3/4	20	0.96
1	25	17	1~10	4-1/8	105	4-11/16	119	1	25	1.2
1-1/4	32	19	3.2~16	5	125	5	128	1-1/4	32	1.2
1-1/2	40	19	5~25	5	125	5	128	1-1/2	40	1.83
2	50	22	8~40	5-1/16	144	5-3/16	132	2	50	2.27

* Weight includes mounting bracket and actuator

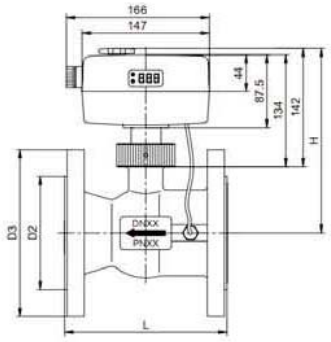


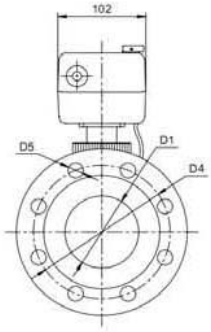
20 to 50 mm

FLANGED BALL VALVES

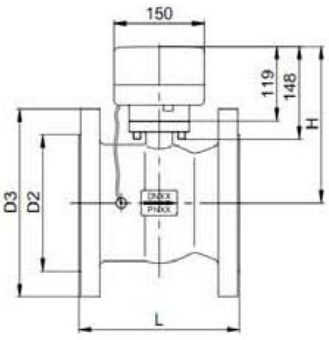
Connection		Flow Control Range (m^3/h)	L		H		D1		D2		D3		D4		D5		No. of Bolt Holes	Weight*
Inches	mm		Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm		kg
2-1/2	65	12~64	7-1/2	190	8-3/4	222	3-1/4	82	4-3/4	120	7-1/4	185	5-3/4	145	23/32	18	8	14.5
3	80	20~102	7-1/2	190	8-3/4	222	3-1/4	82	5-3/8	136	7-7/8	200	6-1/4	160	23/32	18	8	15.9
4	100	32~163	9	230	9-1/8	232	4	102	6-3/8	162	9-1/4	235	7-1/2	190	15/16	23	8	21.6
5	125	52~260	10	254	9-1/8	232	5	125	7-1/4	188	10-5/8	270	8-5/8	220	1-1/32	26	8	30.8
6	150	83~416	10-1/2	267	5-1/4	250	6	154	8-1/2	215	11-7/8	300	10	250	1-1/32	26	8	40.8

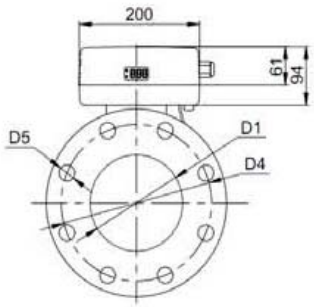
* Weight includes mounting bracket and actuator





65 to 80 mm





100 to 150 mm

Flow Rate Settings for Various Valve Sizes

JP2 DIP Switch Settings				LED Display	Valve Size	Flow Limit Range (m^3/h)
Switch 1	Switch 2	Switch 3	Switch 4			
1	0	0	NA	A01	DN20	0.5~5.0
0	1	0	NA	A02	DN25	1.0~10
1	1	0	NA	A03	DN32	3.0~16
0	0	1	NA	A04	DN40	5.0~25
1	0	1	NA	A05	DN50	8.0~40
0	0	0	0	H05	DN65	12~64
1	0	0	0	H06	DN80	20~102
0	1	0	0	H07	DN100	32~163
1	1	0	0	H08	DN125	52~260
0	0	1	0	H09	DN150	83~416

Piping and Installation Notes

The preferred location for the flow balancing valves is the return side of the terminal equipment, which is recommended by ASHRAE and many engineers because it will:

- Minimize air entrapment
- Reduce noise problems
- Decrease the possibility of valve cavitations

Always install Y-trap type filter in front of the flow balancing valve or terminal equipment.

If and when the flow balancing valve is used on headers, install it at the discharge side of the water pumps to avoid cavitations caused by low pressure bubbles.

Install the flow balancing valve on a straight pipe run of at least 5 pipe diameters on each side from nearest elbow or other pipe restriction, as the flow detector in the valve is sensitive to flow turbulence.

Always readjust the flow balancing valves when the number of pipe branches or loops has changed or when additional HVAC equipment are added to the system.

Operation Notes

- JP2 DIP switch is factory set according to water pipe size. Always check for proper setting before applying power to the actuator.
- LED will show the current operating flow rate and maximum flow limit setting alternatively. When the upper LED is lit, the reading will represent Maximum flow rate set point and when the lower LED is lit, the reading will represent current operating flow rate.
- Maximum flow limit set point can be changed by adjusting the potentiometer provided above the LED. The LED will display the maximum flow limit set point adjustment when the potentiometer is being adjusted and the LED display will return to normal operation automatically when adjustment is completed. Make sure that the flow limit setpoint setting is within the operating range of the JP2 DIP switch setting.
- When branches or terminal equipment are added or removed from the system, it is recommended to reset the maximum flow limit of the flow balancing valve to assure optimal operation.
- When setting the flow limit set point, observe the minimum and maximum permissible flow rates as stated in Flow Control Range of Table 1.