

## Simple Set™ PIC Valves - 2-Way, 1/2" - 2" — PA(M) Series Actuators

### IOM Manual



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## Simple Set™ - Valve Body Specifications

Technical Specifications - Valve Body		
Service	Hot Water, Chilled Water, Up to 50% Glycol	
Size Range	2-Way - 1/2" through 2" (DN 15 to 50)	
Body Cold Working Pressure Ratings	375 psi (25 Bar)	
Media Temperature Range	32°F to 248°F (0°C to 120°C)	
Operational ΔP	Minimum	Varies by size. See pages 5 & 6
	Maximum	58 psid (400kPa)
Max. Close-Off Pressure	58 psid (400kPa)	
Valve Operation	Push Down to Close, Normally Open	
Shut-Off Leakage	ANSI Class IV (0.01%)	
Stroke	1/2" to 1-1/4" = 0.22" (5.5mm) 1.5" to 2" = 0.59" (15mm)	
Rangeability	>100:1	
End Connections	NPT Threaded	
Materials	Body	DZR Brass
	Flow Regulation Unit	PPS 40% Glass
	Diaphragm	HNBR
	Spring	Stainless Steel
	O-Rings	EPDM
Weights (Valve Body Only)	1/2"	1.98 lb. (.90 kg)
	3/4"	1.98 lb. (.90 kg)
	1"	2.21 lb. (1.00 kg)
	1-1/4"	3.35 lb. (1.60 kg)
	1-1/2"	6.34 lb. (2.90 kg)
	2"	8.70 lb. (4.00 kg)
Warranty	5 Years limited from time of shipment.	
Approvals & Certifications	PED 2014/68/EU, ROHS 2011/65/EU	

**Disclaimer** - The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Bray office. Bray, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.

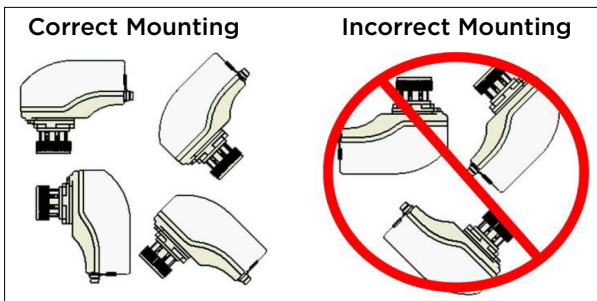
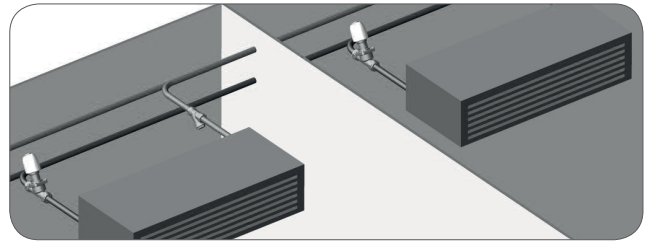


## Mounting

Simple Set valves combines an externally adjustable automatic balancing valve with a full authority modulating control valve.

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The Simple Set can be mounted in either the supply or the return line. To avoid temperature extremes, it is recommended on the return line. Installation of strainers and isolation ball valves are recommended. No minimum straight pipe lengths are required before or after the valve. The temperature in and about the actuator should not be below 32° F (0° C).



1. The actuated valve installation should be easily accessible and provide sufficient clearance for service and replacement.
2. Horizontal and vertical positions are preferred orientations for the installation of actuated valve. However, this actuator can be installed at any in between angle.



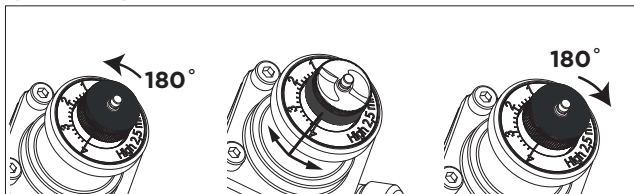
Caution:  
Do not install at more than 90° from horizontal

The Pre-Setting Scale on the Simple Set PIC valve must be set to the desired maximum flow rate in accordance with the respective Flow Rate Chart's Pre-Set column (tables are found in this IOM manual).

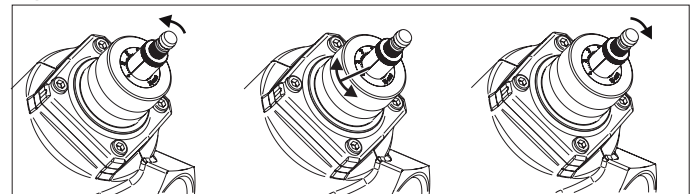
The numerical scale is visible from the top of the valve. The actuator must be removed in order to adjust the dial setting.

## Dial Settings

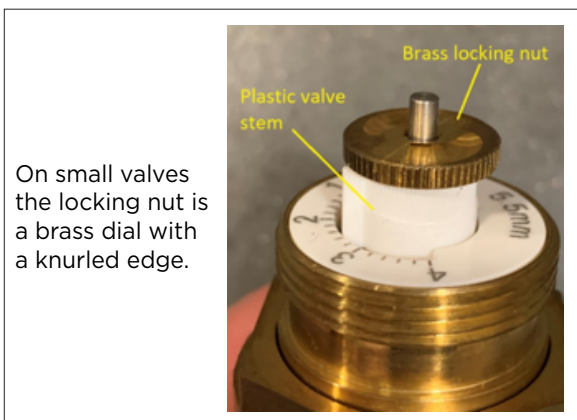
1/2" to 1-1/4"



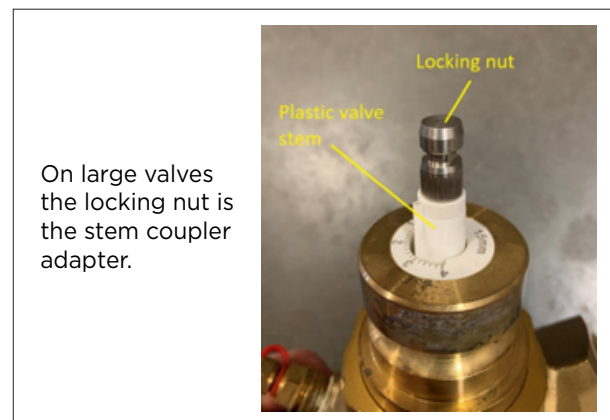
1-1/2" to 2"



After determining the desired setting, read the actual setting. If the valve must be reset, loosen the locking nut and turn the plastic valve stem to the desired setting. Re-tighten the locking nut.



On small valves the locking nut is a brass dial with a knurled edge.



On large valves the locking nut is the stem coupler adapter.



**Function**

Unlike conventional control valve sizing where valves are sized to a Cv, the Simple Set valves are simply sized for flow and pipe size. Refer to the ordering table for the wide range of flow values available.

**Notice**

If valve size differs from pipe size, dP across the valve can not exceed the rating of the valve.

**Design**

The design of Simple Set combines high performance with small size and compact construction. The main components of the valve are:

**Pre-Setting Dial (Detail)**



**3. Pre-Setting Dial**  
Sets maximum flow allowed through the valve.

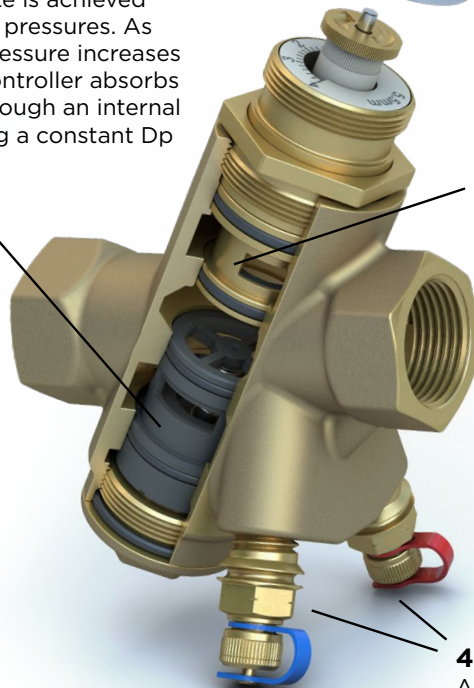
**5. Actuator**

Reacts to building controller call for more or less flow.



**1. Pressure Control Cartridge**

Ensures constant flow rate is achieved under fluctuating system pressures. As the system differential pressure increases and decreases, the Dp controller absorbs and releases pressure through an internal capillary tube maintaining a constant Dp across the valve.



**2. Modulating Control Component**

- 1. Rotates laterally to limit max flow through the valve per the Pre-Setting Scale.
- 2. Moves vertically in response to the actuator call for more or less flow.

**4. P/T Plugs**

Allows for measurement of pressure and temperature.



## Simple Set - Flow Rate Charts

1/2"		1/2" Low Flow Rate Cartridge		
Model Number	Pre-Set	Min. Delta P (psid)	Flow l/h	Flow GPM
SS-050-N-L-0.3	0.3	2.2	75.0	0.3
SS-050-N-L-0.4	0.4	2.2	81.8	0.4
SS-050-N-L-0.5	0.6	2.2	106.7	0.5
SS-050-N-L-0.6	0.8	2.2	134.0	0.6
SS-050-N-L-0.7	1	2.2	161.3	0.7
SS-050-N-L-0.8	1.2	2.5	190.8	0.8
SS-050-N-L-1.0	1.4	2.5	222.6	1.0
SS-050-N-L-1.1	1.6	2.5	256.7	1.1
SS-050-N-L-1.3	1.8	2.5	290.7	1.3
SS-050-N-L-1.4	2	2.5	327.1	1.4
SS-050-N-L-1.6	2.2	2.5	365.7	1.6
SS-050-N-L-1.8	2.4	2.5	404.3	1.8
SS-050-N-L-2.0	2.6	2.5	442.9	2.0
SS-050-N-L-2.1	2.8	2.5	481.5	2.1
SS-050-N-L-2.3	3	2.5	520.1	2.3
SS-050-N-L-2.5	3.2	2.5	556.5	2.5
SS-050-N-L-2.6	3.4	2.5	592.8	2.6
SS-050-N-L-2.8	3.6	2.5	629.1	2.8
SS-050-N-L-3.0	3.8	2.5	672.3	3.0
SS-050-N-L-3.1	4	2.5	699.5	3.1

1/2"		1/2" Standard Flow Rate Cartridge		
Model Number	Pre-Set	Min. Delta P (psid)	Flow l/h	Flow GPM
SS-050-N-S-1.3	0.3	2.8	291.0	1.3
SS-050-N-S-1.4	0.4	2.8	308.0	1.4
SS-050-N-S-1.7	0.6	2.8	378.0	1.7
SS-050-N-S-2.0	0.8	2.8	459.0	2.0
SS-050-N-S-2.5	1	2.8	575.0	2.5
SS-050-N-S-2.9	1.2	2.8	654.0	2.9
SS-050-N-S-3.4	1.4	2.8	765.0	3.4
SS-050-N-S-3.9	1.6	2.9	875.0	3.9
SS-050-N-S-4.3	1.8	2.9	977.0	4.3
SS-050-N-S-4.7	2	2.9	1066.0	4.7
SS-050-N-S-5.0	2.2	3.0	1145.0	5.0
SS-050-N-S-5.3	2.4	3.0	1213.0	5.3
SS-050-N-S-5.6	2.6	3.0	1274.0	5.6
SS-050-N-S-5.9	2.8	3.0	1329.0	5.9
SS-050-N-S-6.1	3	3.0	1390.0	6.1
SS-050-N-S-6.3	3.2	3.1	1424.0	6.3
SS-050-N-S-6.5	3.4	3.2	1466.0	6.5
SS-050-N-S-6.6	3.6	3.2	1505.0	6.6
SS-050-N-S-6.8	3.8	3.3	1542.0	6.8
SS-050-N-S-6.9	4	3.3	1576.0	6.9

3/4"		3/4" Low Flow Rate Cartridge		
Model Number	Pre-Set	Min. Delta P (psid)	Flow l/h	Flow GPM
SS-075-N-L-0.3	0.3	2.3	77.2	0.3
SS-075-N-L-0.4	0.4	2.3	81.8	0.4
SS-075-N-L-0.5	0.6	2.3	106.7	0.5
SS-075-N-L-0.6	0.8	2.3	136.3	0.6
SS-075-N-L-0.7	1	2.3	168.1	0.7
SS-075-N-L-0.9	1.2	2.6	197.6	0.9
SS-075-N-L-1.0	1.4	2.6	227.1	1.0
SS-075-N-L-1.2	1.6	2.6	268.0	1.2
SS-075-N-L-1.3	1.8	2.6	304.3	1.3
SS-075-N-L-1.5	2	2.6	345.2	1.5
SS-075-N-L-1.7	2.2	2.6	388.4	1.7
SS-075-N-L-1.9	2.4	2.6	431.5	1.9
SS-075-N-L-2.1	2.6	2.6	474.7	2.1
SS-075-N-L-2.3	2.8	2.6	517.8	2.3
SS-075-N-L-2.5	3	2.6	567.8	2.5
SS-075-N-L-2.6	3.2	2.6	599.6	2.6
SS-075-N-L-2.8	3.4	2.6	635.9	2.8
SS-075-N-L-3.0	3.6	2.6	672.3	3.0
SS-075-N-L-3.1	3.8	2.6	706.4	3.1
SS-075-N-L-3.3	4	2.6	745.0	3.3

3/4"		3/4" Standard Flow Rate Cartridge		
Model Number	Pre-Set	Min. Delta P (psid)	Flow l/h	Flow GPM
SS-075-N-S-1.3	0.3	2.8	305.0	1.3
SS-075-N-S-1.5	0.4	2.8	333.0	1.5
SS-075-N-S-1.8	0.6	2.9	406.0	1.8
SS-075-N-S-2.1	0.8	3	487.0	2.1
SS-075-N-S-2.6	1	3.2	598.0	2.6
SS-075-N-S-3.0	1.2	3.2	672.0	3.0
SS-075-N-S-3.4	1.4	3.2	775.0	3.4
SS-075-N-S-3.9	1.6	3.2	884.0	3.9
SS-075-N-S-4.4	1.8	3.2	993.0	4.4
SS-075-N-S-4.8	2	3.2	1100.0	4.8
SS-075-N-S-5.3	2.2	3.2	1201.0	5.3
SS-075-N-S-5.7	2.4	3.2	1294.0	5.7
SS-075-N-S-6.1	2.6	3.2	1379.0	6.1
SS-075-N-S-6.4	2.8	3.2	1457.0	6.4
SS-075-N-S-6.8	3	3.2	1544.0	6.8
SS-075-N-S-7.0	3.2	3.2	1593.0	7.0
SS-075-N-S-7.3	3.4	3.2	1653.0	7.3
SS-075-N-S-7.5	3.6	3.3	1709.0	7.5
SS-075-N-S-7.8	3.8	3.3	1761.0	7.8
SS-075-N-S-8.0	4	3.3	1821.0	8.0

**Note:** Min. Delta P Available at Selected Flow Rate.  
See Website for Specific Flow Rate Settings Calculator



## Simple Set - Flow Rate Charts

1"		1" Standard Flow Rate Cartridge		
Model Number	Pre-Set	Min. Delta P (psid)	Flow l/h	Flow GPM
SS-1-N-S-1.8	0.3	3.9	400.0	1.8
SS-1-N-S-1.8	0.4	3.9	414.0	1.8
SS-1-N-S-2.1	0.6	3.9	470.0	2.1
SS-1-N-S-2.3	0.8	3.9	532.0	2.3
SS-1-N-S-2.7	1	3.9	618.0	2.7
SS-1-N-S-3.0	1.2	3.9	676.0	3.0
SS-1-N-S-3.4	1.4	3.9	762.0	3.4
SS-1-N-S-3.8	1.6	4	857.0	3.8
SS-1-N-S-4.2	1.8	4	961.0	4.2
SS-1-N-S-4.7	2	4	1071.0	4.7
SS-1-N-S-5.2	2.2	4	1182.0	5.2
SS-1-N-S-5.7	2.4	4	1286.0	5.7
SS-1-N-S-6.1	2.6	4	1381.0	6.1
SS-1-N-S-6.5	2.8	4	1467.0	6.5
SS-1-N-S-6.9	3	4.1	1560.0	6.9
SS-1-N-S-7.1	3.2	4.1	1611.0	7.1
SS-1-N-S-7.4	3.4	4.2	1673.0	7.4
SS-1-N-S-7.6	3.6	4.3	1730.0	7.6
SS-1-N-S-7.8	3.8	4.4	1781.0	7.8
SS-1-N-S-8.1	4	4.5	1830.0	8.1

1-1/4"		1-1/4" Standard Flow Rate Cartridge		
Model Number	Pre-Set	Min. Delta P (psid)	Flow l/h	Flow GPM
SS-125-N-S-3.0	0.3	3	690.0	3.0
SS-125-N-S-3.2	0.4	3.1	735.0	3.2
SS-125-N-S-4.0	0.6	3.1	910.0	4.0
SS-125-N-S-4.8	0.8	3.1	1079.0	4.8
SS-125-N-S-5.5	1	3.2	1245.0	5.5
SS-125-N-S-6.2	1.2	3.2	1406.0	6.2
SS-125-N-S-6.9	1.4	3.2	1564.0	6.9
SS-125-N-S-7.6	1.6	3.2	1718.0	7.6
SS-125-N-S-8.2	1.8	3.2	1869.0	8.2
SS-125-N-S-8.9	2	3.2	2017.0	8.9
SS-125-N-S-9.5	2.2	3.2	2162.0	9.5
SS-125-N-S-10.1	2.4	3.2	2304.0	10.1
SS-125-N-S-10.8	2.6	3.2	2444.0	10.8
SS-125-N-S-11.4	2.8	3.2	2581.0	11.4
SS-125-N-S-12.1	3	3.2	2748.0	12.1
SS-125-N-S-12.3	3.2	3.2	2787.0	12.3
SS-125-N-S-12.5	3.4	3.3	2837.0	12.5
SS-125-N-S-12.7	3.6	3.3	2887.0	12.7
SS-125-N-S-12.9	3.8	3.4	2938.0	12.9
SS-125-N-S-13.2	4	3.5	3000.0	13.2

1-1/2"		1-1/2" Standard Flow Rate Cartridge		
Model Number	Pre-Set	Min. Delta P (psid)	Flow l/h	Flow GPM
SS-150-N-S-2.4	0.3	3.0	541.0	2.4
SS-150-N-S-3.1	0.4	3.0	695.0	3.1
SS-150-N-S-5.7	0.6	3.0	1291.0	5.7
SS-150-N-S-8.2	0.8	3.0	1856.0	8.2
SS-150-N-S-10.9	1	3.0	2480.0	10.9
SS-150-N-S-12.8	1.2	3.1	2912.0	12.8
SS-150-N-S-15.0	1.4	3.2	3409.0	15.0
SS-150-N-S-17.1	1.6	3.4	3887.0	17.1
SS-150-N-S-19.1	1.8	3.5	4346.0	19.1
SS-150-N-S-21.1	2	3.6	4797.0	21.1
SS-150-N-S-23.0	2.2	3.7	5231.0	23.0
SS-150-N-S-24.9	2.4	3.8	5653.0	24.9
SS-150-N-S-26.7	2.6	3.9	6064.0	26.7
SS-150-N-S-28.5	2.8	3.9	6465.0	28.5
SS-150-N-S-30.3	3	4.0	6875.0	30.3
SS-150-N-S-31.0	3.2	4.2	7051.0	31.0
SS-150-N-S-31.6	3.4	4.4	7183.0	31.6
SS-150-N-S-32.2	3.6	4.5	7315.0	32.2
SS-150-N-S-32.8	3.8	4.7	7447.0	32.8
SS-150-N-S-33.4	4	4.9	7582	33.4

2"		2" Standard Flow Rate Cartridge		
Model Number	Pre-Set	Min. Delta P (psid)	Flow l/h	Flow GPM
SS-2-N-S-2.6	0.3	4.9	596.0	2.6
SS-2-N-S-3.5	0.4	4.9	797.0	3.5
SS-2-N-S-7.1	0.6	4.9	1613.0	7.1
SS-2-N-S-10.8	0.8	4.9	2449.0	10.8
SS-2-N-S-15.5	1	4.9	3514.0	15.5
SS-2-N-S-18.3	1.2	4.9	4161.0	18.3
SS-2-N-S-22.1	1.4	4.9	5025.0	22.1
SS-2-N-S-25.9	1.6	4.9	5885.0	25.9
SS-2-N-S-29.7	1.8	4.9	6736.0	29.7
SS-2-N-S-33.3	2	4.9	7572.0	33.3
SS-2-N-S-36.9	2.2	4.9	8387.0	36.9
SS-2-N-S-40.4	2.4	4.9	9180.0	40.4
SS-2-N-S-43.8	2.6	4.9	9946.0	43.8
SS-2-N-S-47.1	2.8	4.9	10686.0	47.1
SS-2-N-S-50.9	3	4.9	11568.0	50.9
SS-2-N-S-53.2	3.2	5.0	12082.0	53.2
SS-2-N-S-56.1	3.4	5.1	12740.0	56.1
SS-2-N-S-58.9	3.6	5.3	13372.0	58.9
SS-2-N-S-61.6	3.8	5.4	13988.0	61.6
SS-2-N-S-64.7	4	5.5	14700.0	64.7

**Note:** Min. Delta P Available at Selected Flow Rate.  
See Website for Specific Flow Rate Settings Calculator