RCV
Research Control® | ReCo® Valves

Small Control Valve

Type SMV

DESCRIPTION

The Type SMV valve has performed in some of the world's most demanding applications. If your application requires critical control of liquid, gas or steam, your choice of control valves is one of the most important decisions you will make.

When it comes to specifying a control valve, the variables are complicated and exacting. That is why Research Control® Valves are available in a broad range of options—so we can design a truly engineered solution that matches your requirements.

APPLICATIONS

Processing plants, research facilities and government agencies worldwide rely on Research Control Valves for repeatable performance and durability. Built for applications 1 in. (25.4 mm) and under, our SMV control valve is an integral component in systems ranging from petrochemical to pharmaceutical manufacturing. It is an ideal choice for additive injection or flow and pressure control.

Type SMV Valve

MATERIALS

Body – Bonnet	
Standard cast body	316 stainless steel
Optional cast body	Alloy 20, Alloy B & C, Alloy 400, WCB
Optional barstock body	All the above plus Alloy 600 & 800, titanium, zirconium, 316L, 304/304L, 347SST and others
Standard end connections	NPT
Optional	Flanges (ANSI/ASME, DIN, ISO and others), tube fittings (screwed and backwelded), socket weld (our patented WELD-A-CATOR®), butt weld (for pipe or tubing), plus others
Innervalve	
Standard	316 stainless steel
Optional	Stellite®, titanium nitride coating
Packing	
Standard	PTFE chevron rings
Optional	Graphite, Reduced Emissions Kalrez® (REK) chevron ring, glass-filled chevron

STANDARD FEATURES

- 1/4 in. (6.4 mm), 1/2 in. (12.7 mm), 3/4 in. (19.1 mm) and 1 in. (25.4 mm) models
- Interchangeable trim sets
- Threaded bonnet for quick disassembly
- Trim characteristics: Linear, equal percent, quick open or double taper
- TFE chevron packing
- Anodized aluminum tee-handle
- Coated stem threads

OPTIONAL FEATURES

- Butt and socket weld ends, BSPP, tube connection and others
- Bonnet extensions for temperature extremes
- Bellows packing solutions
- Angle pattern bodies
- Reduced Emissions Kalrez® (REK), graphite, spring-loaded chevron and others
- Exotic alloys for complete valves or trims
- Stellited trims & soft seats (PTFE & Kel-F)
- TiN coating of innervalve stem and seat
- Purge or leak ports

Badger Meter

RCV-DS-00575-EN-04 (January 2021)

Product Data Sheet

SPECIFICATIONS

The pressure/temperature ratings listed below are based on material cross sections at the joint between the body and bonnet where a gasketed screwed type bonnet is used. When the proper torque levels are used, the valve should not experience rupture of the joint or the material. The torque levels listed below were used in hydrostatic tests at the factory at 70° F (21.1° C)at maximum body rating and were found to provide acceptable seating. Other factors such as high or cyclic temperatures, light process gases, or poor gasket surfaces can dictate the ability of a seal to be made. Under such conditions, the only way to be assured of tight sealing is to perform a test under the actual process conditions.

Pressure vs Temperature Ratings for Valve Superstructure

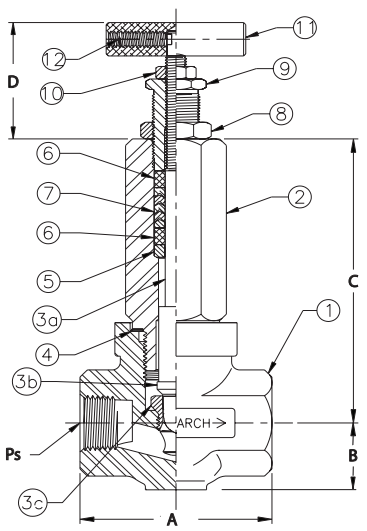
The following tables exclude packing and end fittings:

1/4 in. (6.4 mm) Research Control Valve						
Temp	**316 S/S**	**Carbon Steel**	**Alloy B or =**	**Alloy C or =**	**Monel**	**Alloy 20**
100° F (37.8° C)	5000	4000	5000	5000	4000	5000
200° F (93.3° C)	5000	3700	5000	5000	4000	5000
300° F (148.9° C)	4750	3500	5000	5000	3880	4850
400° F (204.4° C)	4190	3200	5000	5000	3770	4700
500° F (260° C)	4000	2900	4900	4900	3740	4500
600° F (315.6° C)	3820	2600	4850	4850	3740	4200
700° F (371.1° C)	3640	2300	4800	4800	3640	3900
800° F (426.7° C)	3580	—	4750	4750	3580	3700
900° F (482.2° C)	2840	—	—	4500	2280	3000
1000° F (537.8° C)	1160	—	—	4000	940	1500
1100° F (593.3° C)	Consult factory for higher temperatures.			3500	—	—
1200° F (648.9° C)				3000	—	—
Rec. Torque ft-lb (+/–2 ft-lb)	37	37	39	37	31	35

1/2 in. (12.7 mm) Research Control Valve						
Temp	**316 S/S**	**Carbon Steel**	**Hastelloy B or =**	**Hastelloy C or =**	**Monel**	**Alloy 20**
100° F (37.8° C)	5000	4000	5000	5000	4000	5000
200° F (93.3° C)	4750	3800	5000	5000	3780	5000
300° F (148.9° C)	4310	3600	5000	5000	3520	4950
400° F (204.4° C)	3860	3300	5000	5000	3420	4850
500° F (260° C)	3640	3100	4900	4900	3390	4600
600° F (315.6° C)	3470	2900	4850	4870	3390	4300
700° F (371.1° C)	3310	2700	4800	4610	3310	4200
800° F (426.7° C)	3255	—	4750	4430	2090	4000
900° F (482.2° C)	3190	—	—	4200	2070	3000
1000° F (537.8° C)	1860	—	—	4000	850	1500
1100° F (593.3° C)	Consult factory for higher temperatures.			3400	—	—
1200° F (648.9° C)				3000	—	—
Rec. Torque ft-lb (+/– 2 ft-lb)	122	122	131	124	102	117

3/4 in. (19.1 mm) and 1 in. (25.4 mm) Research Control Valve				
Temp	**316 S/S**		**Carbon Steel**	
	3/4 in.	1 in.	3/4 in.	1 in.
100° F (37.8° C)	1500	1500	1500	1500
200° F (93.3° C)	1450	1450	1350	1350
300° F (148.9° C)	1325	1325	1325	1325
400° F (204.4° C)	1175	1175	1275	1275
500° F (260° C)	1100	1100	1200	1200
600° F (315.6° C)	1050	675	1100	1100
700° F (371.1° C)	840	250	1075	1075
800° F (426.7° C)	575	—	—	4430
3/4 in. and 1 in. torque = 290 ft-lb				

DIMENSIONS



1. Valve Body
2. Valve Bonnet
3. Trim Set (innervalve)
4. Body Bonnet Gasket
5. Packing Adaptor
6. Packing Wiper
7. Packing (cv-ring)
8. Jam nut
9. Packing Gland
10. Jam nut
11. Handle
12. Set Screw

PS	A	B	C	D	Stroke
0.25 in. (6 mm)	2.12 in. (54 mm)	0.68 in. (17 mm)	4.00 in. (102 mm)	1.75…2.36 in. (44…60 mm)	0.437 in. (11 mm)
0.50 in. (13 mm)	2.75 in. (70 mm)	1.00 in. (25 mm)	4.25 in. (108 mm)		0.562 in. (13 mm)
0.75 in. (19 mm)	3.37 in. (86 mm)	1.18 in. (30 mm)	4.75 in. (121 mm)		
1 in. (25 mm)	4.00 in. (102 mm)	1.50 in. (38 mm)	4.74 in. (120 mm)		

Notes

Stem Thread: 5/16-24

Turns to Full Open: 1/4 in. = 10.5 Turns
1/2 in., 3/4 in., 1 in. = 13.5 Turns

Max Stem Thread Load: 140 lb/force

INNERVALVE CHART

Valve Size	Trim Designation	Max Cv	Orifice Dia. in. (mm)	Orifice Area in.² (mm²)	Nominal Rangeability Linear	Equal %
1 in. (25.4 mm)	6.0	6.0	0.6250 (15.9)	0.3068 (197.9)	50:1	60:1
	5.0	5.0	0.6250 (15.9)	0.3068 (197.9)	50:1	60:1
	4.5	4.5	0.5000 (12.7)	0.1963 (126.6)	50:1	60:1
3/4 in. (19.1 mm) and 1 in. (25.4 mm)	4.0	4.0	0.5000 (12.7)	0.1963 (126.6)	50:1	60:1
	3.5	3.5	0.5000 (12.7)	0.1963 (126.6)	50:1	60:1
1/2 in. (12.7 mm), 3/4 in. (19.1 mm) and 1 in. (25.4 mm)	A	2.5	0.3750 (9.5)	0.1104 (71.2)	40:1	50:1
	B	2.0	0.3750 (9.5)	0.1104 (71.2)	40:1	50:1
	C	1.25	0.2810 (7.1)	0.0620 (40.0)	40:1	50:1
	D	0.8	0.2500 (6.4)	0.0491 (31.7)	40:1	50:1
	E	0.5	0.2500 (6.4)	0.0491 (31.7)	40:1	50:1
1/4 in. (6.4 mm), 1/2 in. (12.7 mm), 3/4 in. (19.1 mm) and 1 in. (25.4 mm)	F	0.32	0.1560 (3.9)	0.0191 (12.3)	30:1	40:1
	G	0.2	0.1560 (3.9)	0.0191 (12.3)	30:1	40:1
	H	0.13	0.1560 (3.9)	0.0191 (12.3)	30:1	40:1
	I	0.08	0.1560 (3.9)	0.0191 (12.3)	30:1	40:1
	J	0.05	0.1560 (3.9)	0.0191 (12.3)	30:1	40:1
	K	0.03	0.0860 (2.2)	0.0058 (3.7)	25:1	—
	L	0.02	0.0860 (2.2)	0.0058 (3.7)	25:1	—
	M	0.01	0.0860 (2.2)	0.0058 (3.7)	25:1	—
	N	0.006	0.0860 (2.2)	0.0058 (3.7)	25:1	—
	O	0.003	0.0860 (2.2)	0.0058 (3.7)	25:1	—

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