

Unique.

Precise.

Quality.

Reliable.



R1 SERIES CONTROL VALVES

FEATURES & Benefits

The R1 Series Control Valve features several unique design characteristics that minimize wear and maximize service life.

The nozzle and external sleeve trim is designed to contain turbulence and wear by managing the flow into the nozzle and centralizing it into bore causing the flow streams to impinge on each other. The valve body and outlet are protected from wear because the energy conversion as a result of the pressure drop is concentrated in the trim cavity before flow enters the outlet. This eliminates the typical wear problems in the valve outlet.

The sleeve design greatly reduces the breakaway and closing thrust requirements to lift the sleeve on and off seat as well as during stem travel making the control stable and precise yielding better accuracy and repeatability.

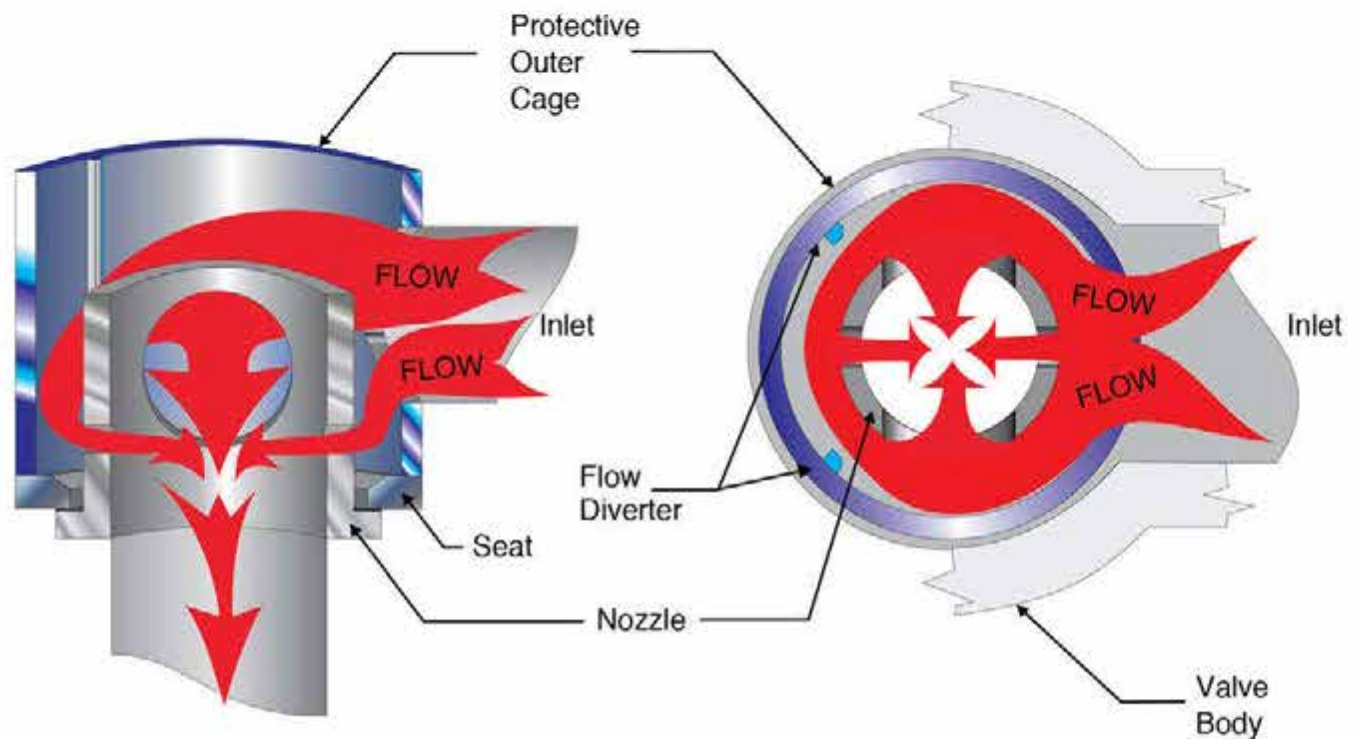
- **Accurate Control** - Multi-Orifice Nozzle design provides precise control over a wide range of flows.
- **Bolted Bonnet** - A bolted bonnet prevents corrosion, cross-threading and galling of large threaded connections. The design allows for simple assembly and disassembly.
- **Extended Mean Time Between Service** - Robust design, application of hardened materials, and efficient flow geometry results in maximum production potential and minimum service requirements.
- **Easy Maintenance** - All Control Choke Valves are designed with special actuator mounting systems so the choke can be maintained without disassembly of the actuator and components or instrument connections.
- **High Turndown Ratio** - Clean flow geometry, high capacity and accurate control means the valve is suitable for both start-up and end-of field-life-process scenarios. In short, our control choke valves offer a one-valve solution for the full process life.
- **Optional Features** - Control Valves can have trims and actuators custom designed for specific requirements. Such as special noise reduction trims, reduced port and maximum orifice trims for very high pressure or minimum pressure loss for a declining field.



Applications:

- Well Site Automated and Manual Application
- Water Injection Control Valve
- CO2 Injection Control Valve
- High Pressure Drop Applications
- Gas Lift Injection Control

Dynamic Energy Conversion



Side view of the fluid flow through the valve

Flow converging in the center of the nozzle

When the valve is open and flow enters through the inlet of the valve into the protective cage, it is circulated around the annulus created by the cage, nozzle and sleeve assembly. The symmetry of the ports in the nozzle cause the high velocity fluid streams created by the pressure drop to collide into each other in the center of the trim. The impact of the streams converts the energy and protects the downstream components from damage.

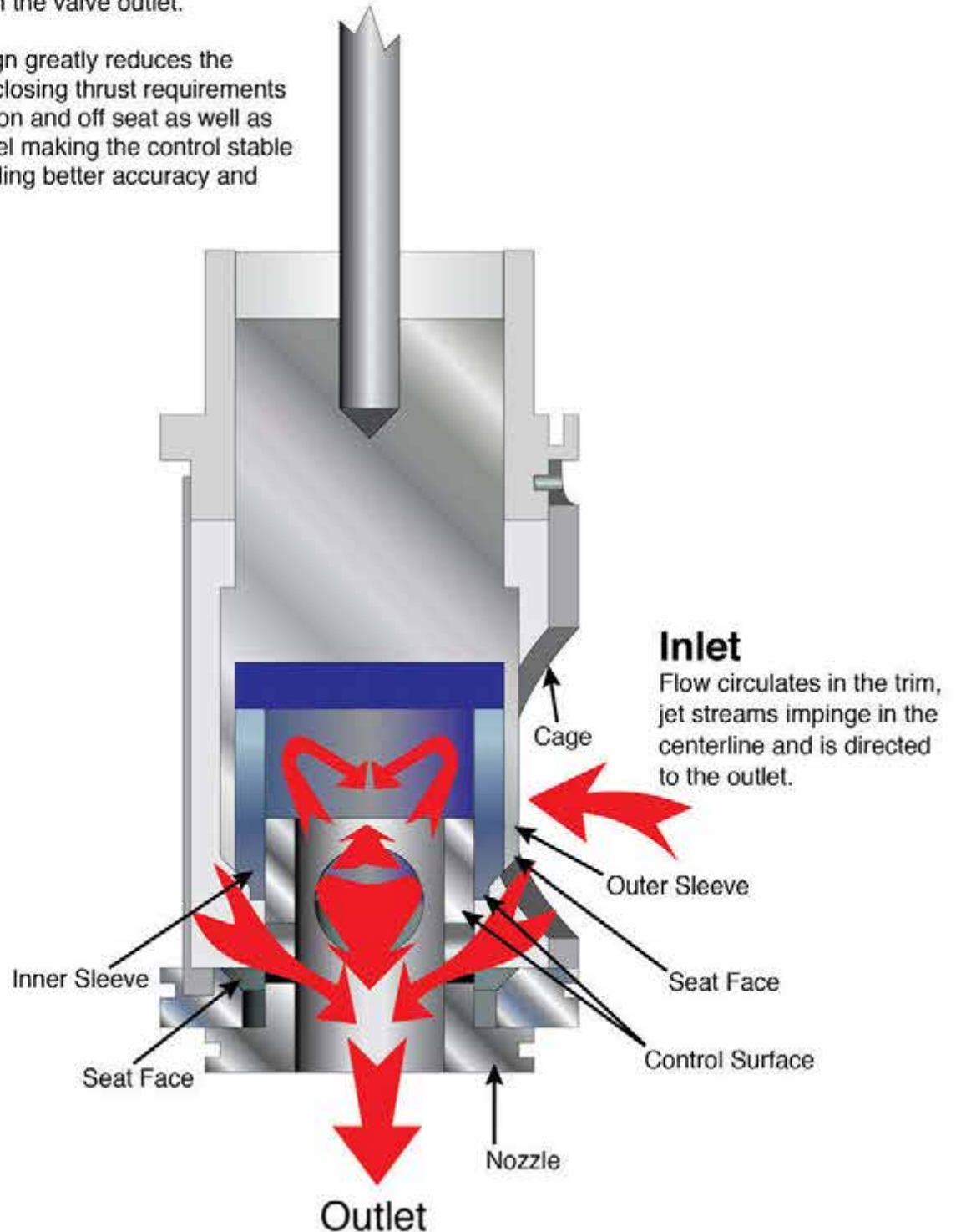
Multi-Orifice Nozzle Technology

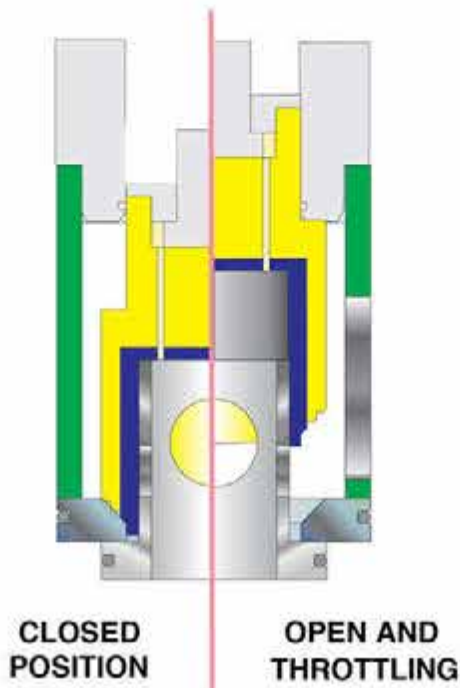
Control Element

The R1 Series valve features several unique design characteristics that minimize wear and maximize service life.

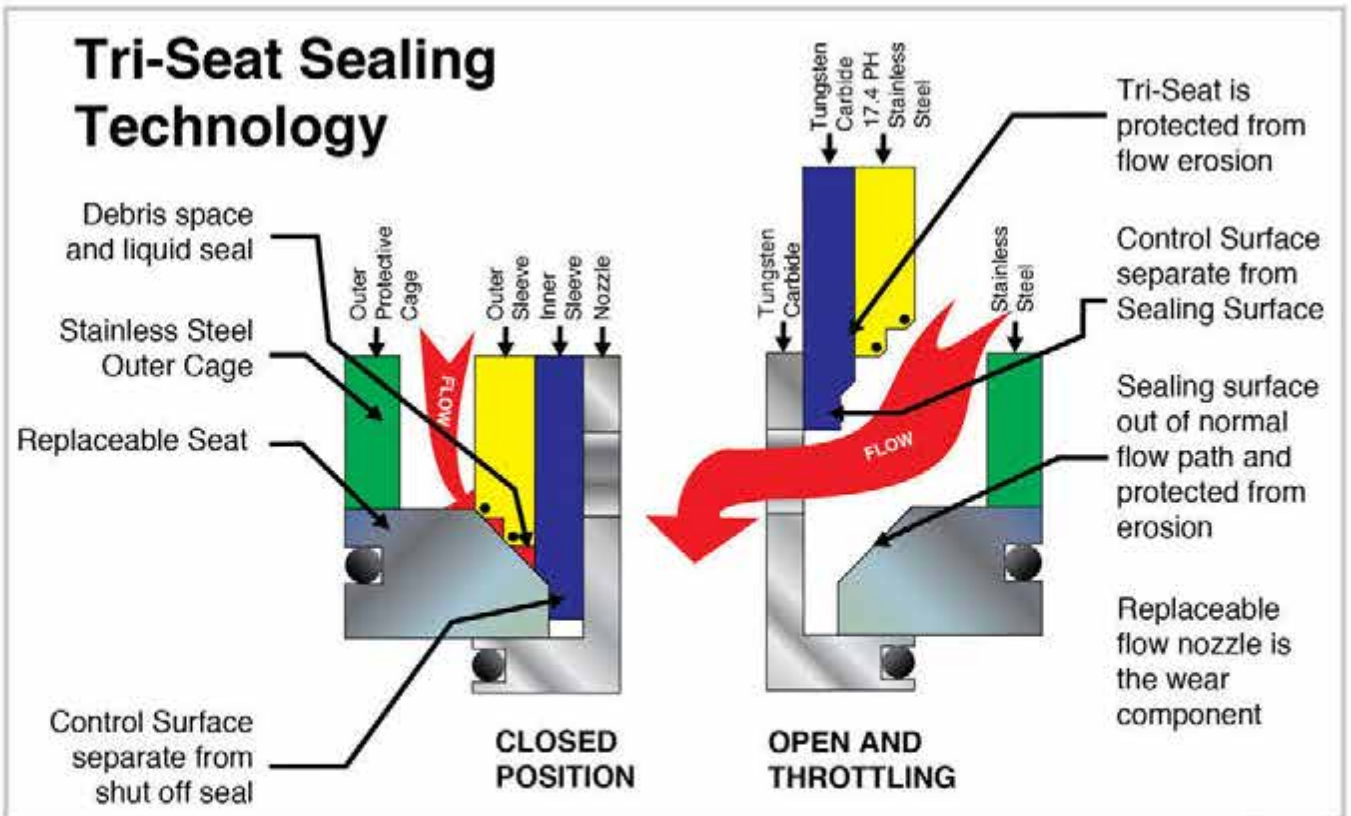
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The Trim configuration has been field-tested and proven to deliver superior wear resistance and performance. The trim controls high velocity fluid during pressure reduction by directing the flow to the center of the flow nozzle. The Erosive Energy is contained within the expendable trim components away from the valve wall which is additionally protected by a replaceable sleeve, reducing the potential for release of fluids to the environment. The seat and Tri-seating surfaces on the sleeve are separate from the controlling surfaces and out of the flow path to maintain an ANSI class V shut off.



R1 Cutaway View

R1 Control Choke

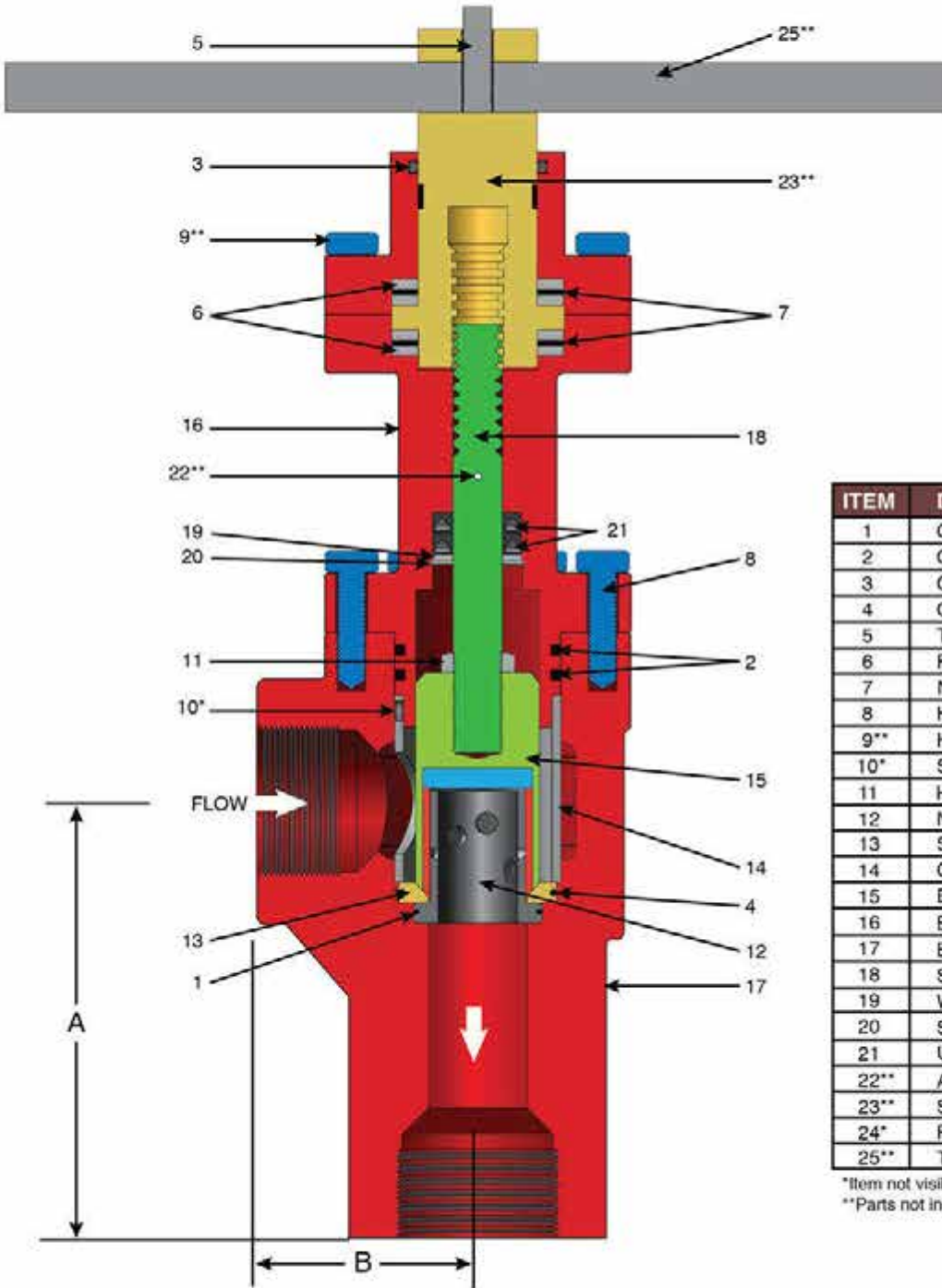
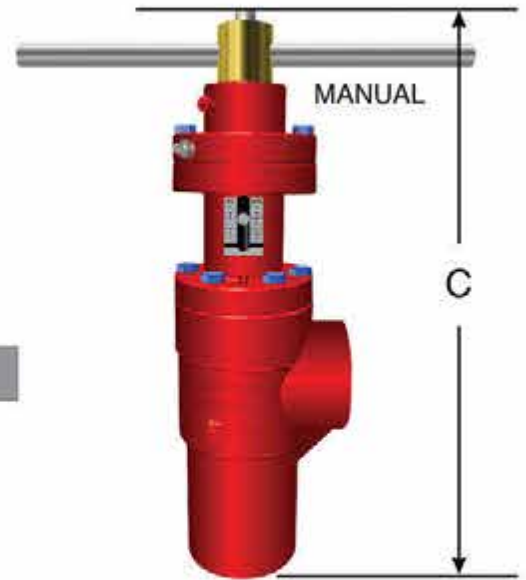
Cv = 12 (Standard), 6, 3

Bean Size = 47/64ths

Stroke Length = 1"

Stem Diameter = 0.625"

MAWP = 5,000 PSIG



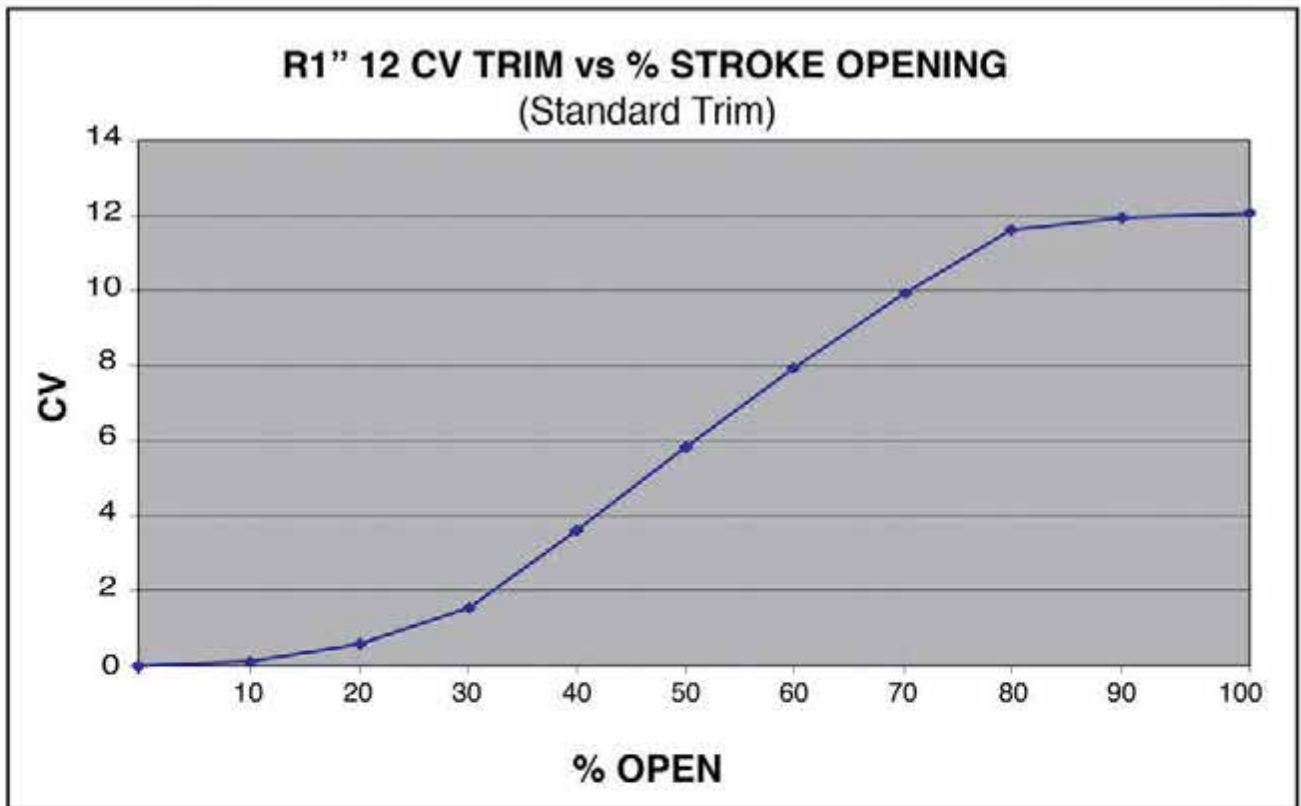
ITEM	DESCRIPTION	QTY
1	O-RING 2-029	1
2	O-RING 2-225	2
3	O-RING 2-222	1
4	O-RING 2-032	1
5	THUMB SCREW	1
6	FLAT WASHER	4
7	NEEDLE ROLLER BEARING	2
8	HEX BOLT	6
9**	HEX BOLT	4
10*	SET SCREW	1
11	HEX NUT (Lock Nut)	1
12	NOZZLE	1
13	SEAT	1
14	CAGE	1
15	EXTERNAL SLEEVE ASSEMBLY	1
16	BONNET	1
17	BODY/FLANGE WELDMENT	1
18	STEM	1
19	WASHER	1
20	SNAP RING	1
21	U-CUP SEALS	2
22**	ANTI-ROTATIONAL DEVICE	1
23**	STEM ADAPTER/DRIVE PLATE	1
24*	PIPE PLUG	1
25**	TURN HANDLE	1

*Item not visible in sectioned view

**Parts not included on actuator

R1 Dimensions and Weights

1" BODY STANDARD DIMENSIONS AND WEIGHTS						2" BODY STANDARD DIMENSIONS AND WEIGHTS					
CONNECTIONS		DIM. END-to-END IN. (MM.) +/- .10		WEIGHT		CONNECTIONS		DIM. END-to-END IN. (MM.) +/- .10		WEIGHT	
INLET	OUTLET	A	B	LB.	KG.	INLET	OUTLET	A	B	LB.	KG.
1" FNPT	1" FNPT	5.53 (140)	2.80 (71)	23	10.44	2" FNPT	2" FNPT	5.58 (142)	2.74 (70)	22	9.99
1" FNPT	1" FNPT	5.58 (142)	2.74 (70)	23	10.44	2" BUTT WELD	2" BUTT WELD	5.58 (142)	2.74 (70)	22	9.99
1" BUTT WELD	1" BUTT WELD	5.58 (142)	2.74 (70)	22	9.99	2" 150 RFJ	2" 150 RFJ	8.17 (208)	5.33 (135)	33	14.98
1" 150 RFJ	1" 150 RFJ	7.86 (200)	5.02 (128)	28	12.71	2" 150 RTJ	2" 150 RTJ	8.36 (212)	5.52 (140)	33	14.98
1" 150 RTJ	1" 150 RTJ	8.05 (204)	5.21 (132)	28	12.71	2" 300 RFF	2" 300 RFF	8.42 (214)	5.58 (142)	39	17.71
1" 300 RFF	1" 300 RFF	8.11 (206)	5.27 (134)	30	13.62	2" 300 RTJ	2" 300 RTJ	8.67 (220)	5.83 (148)	39	17.71
1" 300 RTJ	1" 300 RTJ	8.30 (211)	5.46 (139)	30	13.62	2" 600 RFF	2" 600 RFF	8.80 (224)	5.96 (151)	45	20.43
1" 600 RFF	1" 600 RFF	8.36 (212)	5.52 (140)	30	13.62	2" 600 RTJ	2" 600 RTJ	8.86 (225)	6.02 (153)	45	20.43
1" 600 RTJ	1" 600 RTJ	8.36 (212)	5.52 (140)	30	13.62	2" 900/1500 RFF	2" 900/1500 RFF	9.92 (252)	7.08 (180)	72	32.69
1" 900/1500 RFF	1" 900/1500 RFF	8.80 (224)	5.96 (151)	40	18.16	2" 900/1500 RTJ	2" 900/1500 RTJ	9.98 (253)	7.14 (181)	72	32.69
1" 900/1500 RTJ	1" 900/1500 RTJ	8.80 (224)	5.96 (151)	40	18.16	2" 2500 RFF	2" 2500 RFF	10.92 (277)	8.08 (205)	108	48.12
1" 2500 RFF	1" 2500 RFF	9.42 (239)	6.58 (167)	46	20.88	2" 2500 RTJ	2" 2500 RTJ	10.98 (279)	8.14 (207)	106	48.12
1" 2500 RTJ	1" 2500 RTJ	9.42 (239)	6.58 (167)	46	20.88	2-1/16" 3000 API	2-1/16" 3000 API	9.98 (253)	7.14 (181)	74	33.60
						2-1/16" 5000 API	2-1/16" 5000 API	9.98 (253)	7.14 (181)	76	34.50
						2-9/16" 3000 API	2-9/16" 3000 API	10.11 (257)	7.27 (185)	94	42.68
						2-9/16" 5000 API	2-9/16" 5000 API	10.11 (257)	7.27 (185)	96	43.58



Choke Nomenclature

Choke Series
CA
CI
MC
MCX
MDA
MDAS
MDI
MDIS
RB
R

Size
1 1"
2 2"
3 3"
4 4"
6 6"

Service Type
0 Standard
1 Nace
2 Steam/High Temp.
3
4 Low Temp.

Style
0 Non-flanged
1 RFF
2 RTJ
3 RFF X RTJ
4 RTJ X RFF

Trim Material
03 CARBIDE DISC - STELLITE WR SLV
04 CERAMIC DISC - STELLITE WR SLV
05 CARBIDE DISC - CARBIDE WR SLV
15 CERAMIC DISC - NO WR SLV
16 CARBIDE DISC - NO WR SLV
32 CERAMIC DISC/CARBIDE FLOW TUBE
44 R/RB-SERIES
47 Bean 17-4 SS

Actuation Type
0 Manual Handle
1 Manual Gear
2 Electric
3 Pneumatic
4 Hydraulic
5 Electric w/Bracket
7 Positive Bean

Schedule
0 Non-flanged
1 40
2 80
3 160
4 XS
5 XXS
6 SLIP-ON
7 API
8 120

Body Material
00 DUPLEX SS
01 SPECIAL METAL
02 COATED STEEL
03 CARBON STEEL
04 LOW ALLOY (4130 LACS)
05 316 SS (CF8M)
06 316 SS "L" (CF3M)
07 ALUMINUM BRONZE
08 A350 LF2
09 LCC

EXAMPLE R - 1 0 1 08 08 2 2 56 44 04 04 = R-10108082256440404
 Choke part number has to be 17 digits.

Inlet Connection		Outlet Connection	
01 1" FNPT	37 4" 1500		
02 1" BUTT WELD	38 4" 2500		
03 1" SOCKET WELD	39 6" 150		
04 1" VICTAULIC	40 6" 300		
05 1" 150	41 6" 600		
06 1" 300	42 6" 900		
07 1" 600	43 6" 1500		
08 1" 900/1500	44 6" 2500		
09 1" 2500	45 8" 150		
10 2" FNPT	46 8" 300		
12 2" BUTT WELD	47 8" 600		
13 2" SOCKET WELD	48 8" 900		
14 2" VICTAULIC	49 8" 1500		
15 2" 150	50 8" 2500		
16 2" 300	51 2-1/16" 3000		
17 2" 600	52 2-1/16" 5000		
18 2" 900/1500	53 2-1/16" 10000		
19 2" 2500	54 2-9/16" 3000		
20 3" FNPT	55 2-9/16" 5000		
21 3" BUTT WELD	56 2-9/16" 10000		
22 3" SOCKET WELD	57 3-1/8" 3000		
23 3" 150	58 3-1/8" 5000		
24 3" 300	59 3-1/8" 10000		
25 3" 600	60 4-1/16" 3000		
26 3" 900	61 4-1/16" 5000		
27 3" 1500	62 1-3/16" 10000		
28 3" 2500	63 3-1/16" 5000		
29 4" FNPT	65 1.5" 900/1500		
30 4" BUTT WELD	67 7-1/16" 5000		
31 4" SOCKET WELD	75 1" UNION		
32 4" VICTAULIC	80 10" 600		
33 4" 150	81 10" 900		
34 4" 300	82 10" 1500		
35 4" 600	83 10" 2500		
36 4" 900			

Orifice Size			
01 (2) 1/8" RND PORTS	27 38/64 BEAN		
02 (2) 3/16" RND PORTS	28 36/64 BEAN		
03 (2) 1/4" RND PORTS	29 48/64 BEAN		
04 (2) 3/8" RND PORTS	34 32/64 BEAN		
05 (2) 1/2" RND PORTS	43 40/64 BEAN		
06 (2) 5/8" PIE PORTS	44 34/64 BEAN		
07 (2) 3/4" RND PORTS	45 28/64 BEAN		
08 (2) 7/8" RND PORTS	46 30/64 BEAN		
10 (2) 1-3/16" RND PORTS	53 10/64 BEAN		
11 (2) 1-1/4" RND PORTS	63 11/64 BEAN		
14 (2) 1-1/2" RND PORTS	64 14/64 BEAN		
30 (2) 3/4" PIE PORTS	65 15/64 BEAN		
35 (2) 1" ROUND PORTS	68 16/64 BEAN		
38 (2) 2" PIE PORTS	67 19/64 BEAN		
40 (2) 1-1/4" PIE PORTS	68 20/64 BEAN		
41 (2) 1-3/8" PIE PORTS	69 24/64 BEAN		
42 (2) 1-1/8" PIE PORTS	70 21/64 BEAN		
47 (2) 1-1/2" PIE PORTS	71 22/64 BEAN		
49 (2) 5/8" RND PORTS	72 23/64 BEAN		
54 (2) 2.92 PIE HOLES	73 27/64 BEAN		
55 3 CV	74 29/64 BEAN		
56 12 CV	75 25/64 BEAN		
57 164 CV	76 1/7" RND PORTS		
58 420 CV	77 7/64 BEAN		
59 64 CV	78 54/64 BEAN		
60 35 CV	79 44/64 BEAN		
22 17/64 BEAN	80 45/64 BEAN		
23 18/64 BEAN	81 47/64 BEAN		
24 8/64 BEAN	82 51/64 BEAN		
25 13/64 BEAN	83 35/64 BEAN		
26 4/64 BEAN	84 37/64 BEAN		

Seal Material	
00 HNBR/HSN	
01 NBR	
02 POLYURETHANE	
03 EPDM	
04 FKM	
05 NEOPRENE	
06 NBR (PEROXIDE CURED)	
07 STEAM SEALS	
08 PTFE	
09 AFLAS	

PINS	
I INCONEL (Optional)	

Butt weld connections MUST specify a schedule.
 All API connections are "RTJ" style by default.
 API flange bore (SCHEDULE) is specified by API.

REVISED: 8-17-15