

2020 Flow Control Choke Valve

Application

This versatile and proven valve is ideal for use in well head control, in gas gathering systems to regulate flow, for CO₂ and water or steam injection systems as well as pressure separators. Suitable for water, gas and other liquid service.

Features

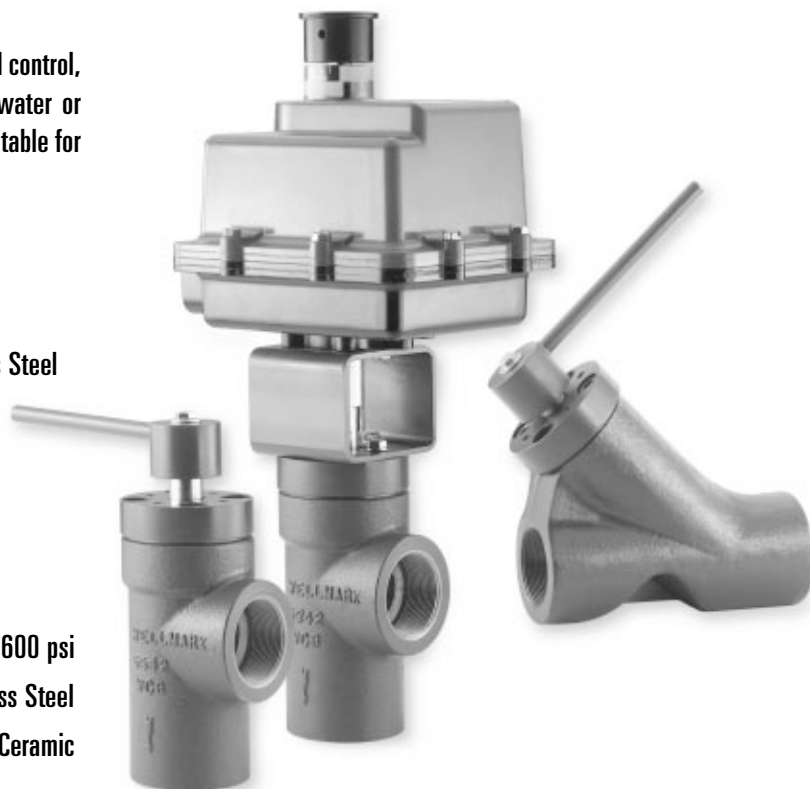
- Choice of Manual, Electric, or Pneumatic Actuation
- Choice of Angle or "Y" Body Style in Carbon or Stainless Steel
- Choice of Tungsten Carbide or Ceramic Disc Material
- Multiple Orifice Sizes for Greater Control
- Low Torque At High Differential Pressure

Specifications

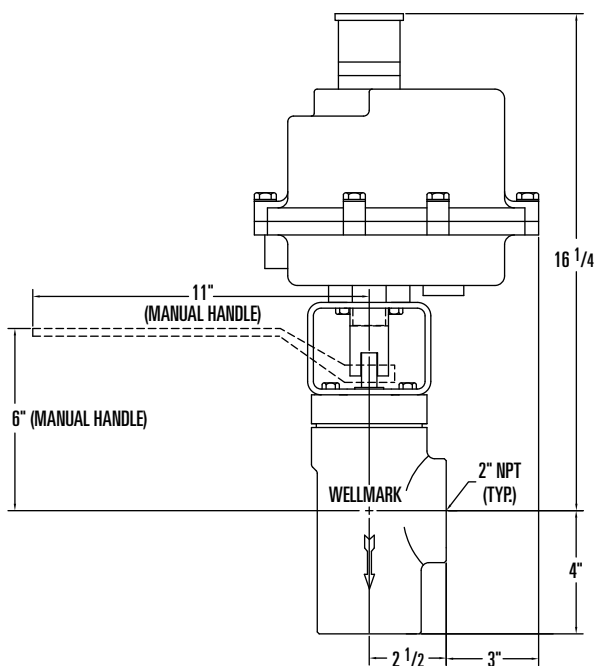
Working Pressure To 3600 psi

Body Material WCB Carbon Steel or CF8M Stainless Steel

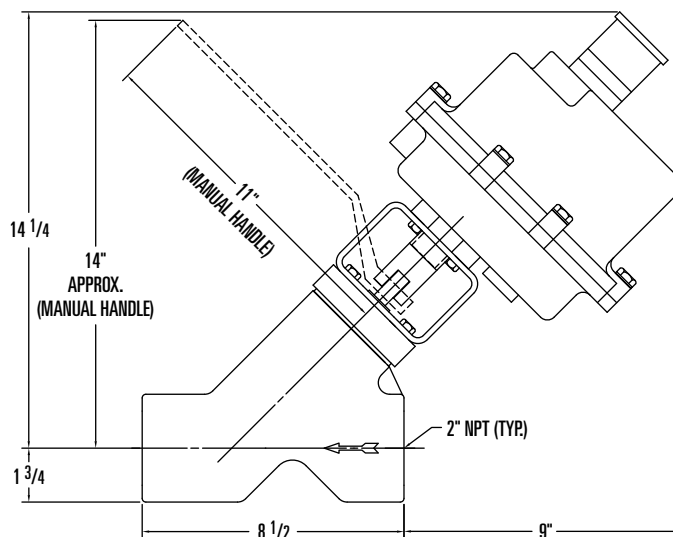
Disc Material Tungsten Carbide or Ceramic



Dimensional Data



2" ANGLE VALVE



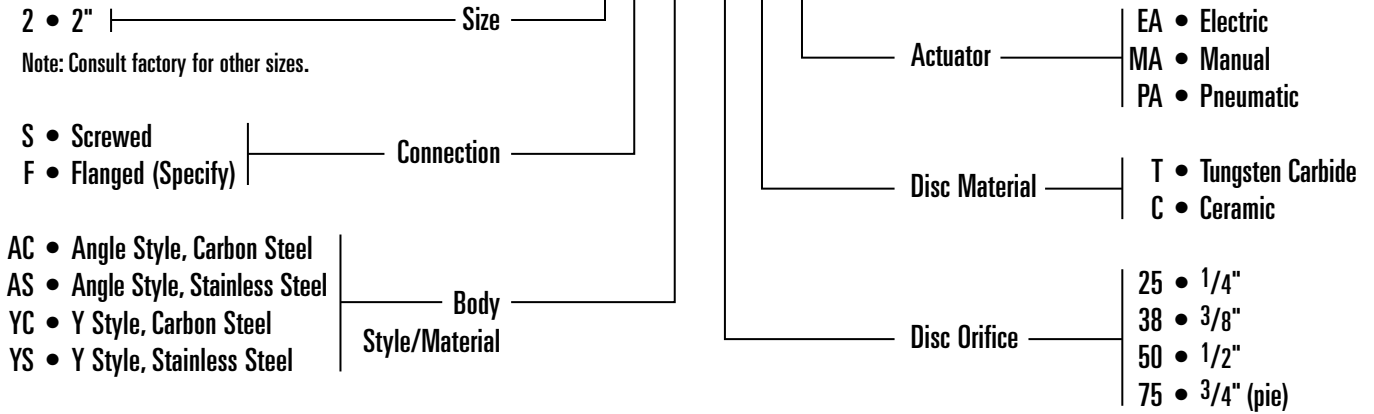
2" "Y" VALVE

2020 Flow Control Choke Valve

Determining the Model Number

Example given: A 2" Model 2020 Choke Valve with Screwed Ends in the Angle Style Body Configuration Constructed of Carbon Steel, Utilizing a 3/4" Disk Orifice and Tungsten Carbide Disc Material with Electric Actuation.

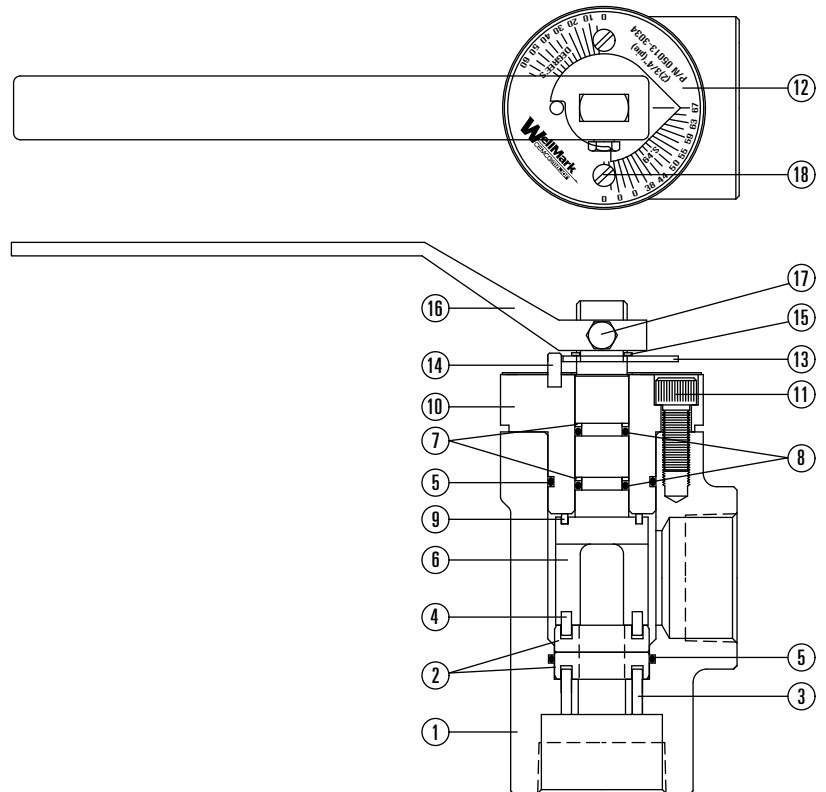
MODEL 2 S AC-75 T EA



Parts List Series 2020 w/Manual Handle

Item	Description	Qty.	Part No.
1	BODY, 2" ANGLE, STEEL WCB	1	05013-2879
	BODY, 2" "Y", STEEL WCB	1	05013-3000
2*	DISC, 1/4" DIA., TUNGSTEN CARBIDE	2	06000-8741
	DISC, 3/8" DIA., TUNGSTEN CARBIDE	2	06000-8775
	DISC, 1/2" DIA., TUNGSTEN CARBIDE	2	06000-8809
	DISC, 3/4" PIE, TUNGSTEN CARBIDE	2	06000-8534
	DISC, 1/4" DIA., CERAMIC	2	06000-8759
	DISC, 3/8" DIA., CERAMIC	2	06000-8783
	DISC, 1/2" DIA., CERAMIC	2	06000-8817
	DISC, 3/4" PIE, CERAMIC	2	06000-8725
3	PIN, 17-4PH, ANGLE BODY ONLY	2	05013-2961
4	PIN, 17-4PH	2**	05013-2953
5*	O-RING, BUNA-N	2	05000-2914
6	STEM, STEEL PLATED	1	05013-2887
7*	BACK UP RING, TEFLON®	2	05000-5844
8*	O-RING, BUNA-N	2	05000-0447
9	BEARING, BRONZE	1	05013-2929
10	BONNET, STEEL	1	05013-2895
11	SOCKET HEAD SCREW, 18-8 S.S.	4	05000-2021
12	INDICATOR, 1/4", ALUMINUM	1	05013-3105
	INDICATOR, 3/8", ALUMINUM	1	05013-3155
	INDICATOR, 1/2", ALUMINUM	1	05013-3163
	INDICATOR, 3/4" PIE, ALUMINUM	1	05013-3034
13	STOP PLATE, STAINLESS STEEL	1	05013-3042
14	PIN, STAINLESS STEEL	1	06000-8700
15	RETAINER RING, STEEL	1	936200000
16	HANDLE, DUCTILE IRON	1	929200000
17	HANDLE SCREW, STEEL PLATE	1	915000000
18	INDICATOR SCREW, STEEL	2	05000-5878

*Recommended Spare Part
 **4 Req'd on 2" "Y" Valve



2020 Flow Control Choke Valve

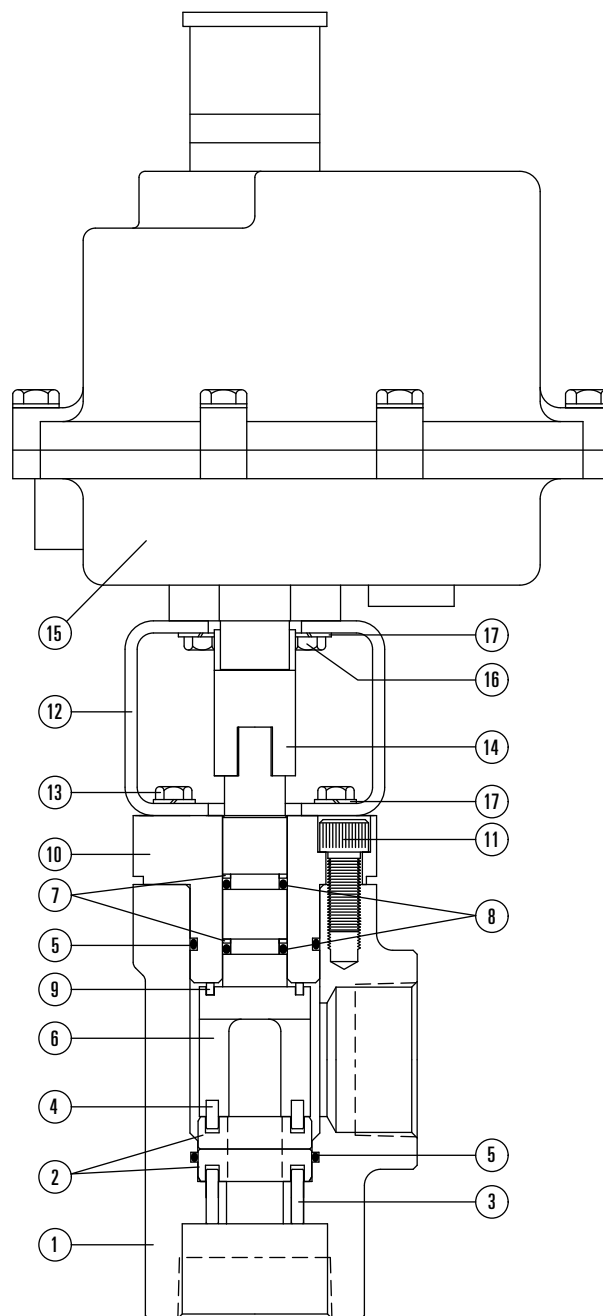
Parts List Series 2020 w/Electric Actuator

Item	Description	Qty.	Part No.
1	BODY, 2" ANGLE, STEEL WCB	1	05013-2879
	BODY, 2" "Y", STEEL WCB	1	05013-3000
2*	DISC, 1/4" DIA., TUNGSTEN CARBIDE	2	06000-8741
	DISC, 3/8" DIA., TUNGSTEN CARBIDE	2	06000-8775
	DISC, 1/2" DIA., TUNGSTEN CARBIDE	2	06000-8809
	DISC, 3/4" PIE, TUNGSTEN CARBIDE	2	06000-8534
	DISC, 1/4" DIA., CERAMIC	2	06000-8759
	DISC, 3/8" DIA., CERAMIC	2	06000-8783
	DISC, 1/2" DIA., CERAMIC	2	06000-8817
	DISC, 3/4" PIE, CERAMIC	2	06000-8725
3	PIN, 17-4PH, ANGLE BODY ONLY	2	05013-2961
4	PIN, 17-4PH	2**	05013-2953
5*	O-RING, BUNA-N	2	05000-2914
6	STEM, STEEL PLATED	1	05013-2887
7*	BACK UP RING, TEFLON®	2	05000-5844
8*	O-RING, BUNA-N	2	05000-0447
9	BEARING, BRONZE	1	05013-2929
10	BONNET, STEEL	1	05013-2895
11	SOCKET HEAD SCREW, 18-8 S.S.	4	05000-2021
12	BRACKET, STEEL	1	05013-2945
13	SCREW, STEEL PLATED	4	05000-5198
14	DRIVER, STEEL PLATED	1	05013-2937
15	ELECTRIC ACTUATOR***	1	06000-8526
16	SCREW, STEEL PLATED	4	05000-5852
17	LOCK WASHER, STEEL PLATED	8	05000-5860

*Recommended Spare Part

**4 Req'd on 2" "Y" Valve

***Consult Factory for Actuation Details



2020 Flow Control Choke Valve

Flow Data

C _v Factor Chart				
VALVE ORIFICE	1/4"	3/8"	1/2"	3/4" (pie)
C _v FACTOR	2.98	6.84	11.83	31.3

Using the C_v factors above for any valve, its approximate flow capacity can be determined by the formulas at right.

If required flow capacity is known and valve selection is desired, solve for C_v with the formulas below and select appropriate valve from C_v Factor Chart above.

For Liquids:

$$C_v = \frac{Q}{34.3 \sqrt{\frac{\Delta P}{G}}}$$

For Gas:

$$C_v = \frac{Q}{.0234 \sqrt{\frac{\Delta P (P_1 + P_2)}{GT}}}$$

For Liquids:

$$Q = 34.3 C_v \sqrt{\frac{\Delta P}{G}}$$

Q = Flow (Barrels/Day)

C_v = Flow factor

ΔP = Pressure drop across valve

G = Specific gravity (water=1.0)

For Gas:

$$Q = .0234 C_v \sqrt{\frac{\Delta P (P_1 + P_2)}{GT}}$$

Q = Flow (MMSCFD)

C_v = Flow factor

P₁ = Inlet pressure (psia)

P₂ = Outlet pressure (psia)

ΔP = Pressure drop (P₁-P₂).

When P₂ is less than 1/2 P₁, use 1/2 P₁ for P₂ in formula.

G = Specific gravity (air= 1.0)

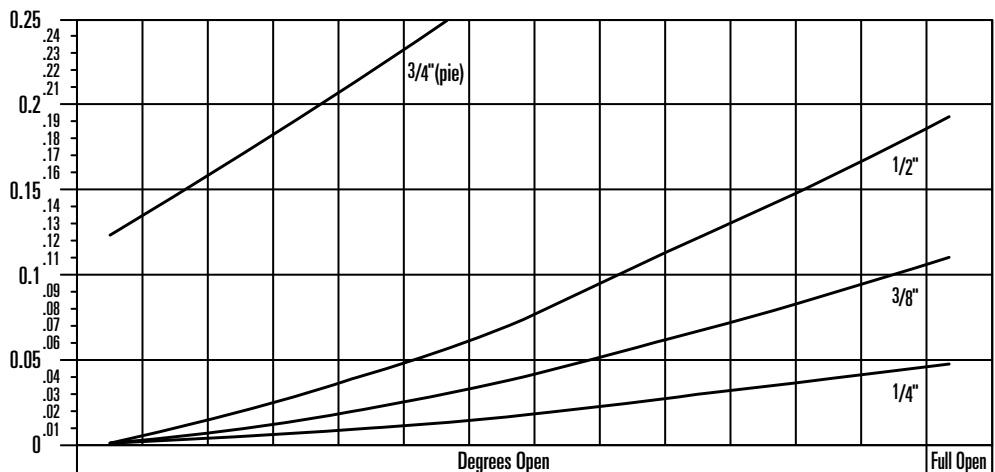
T = Flowing temperature absolute (°F + 460)

Conversion Chart To Determine Open Area of Disc Orifice to 64th's

Degrees Open	Orifice Size							
	1/4"		3/8"		1/2"		3/4" (pie)	
	64th's	Area Open (Sq. in.)	64th's	Area Open (Sq. in.)	64th's	Area Open (Sq. in.)	64th's	Area Open (Sq. in.)
0-20°	0	0	0	0	0	0	0	0
25°	2.04	.0004	3.23	.001	5.59	.003	34.93	.117
30°	4.57	.002	6.46	.004	9.69	.009	38.35	.141
35°	6.54	.0041	9.63	.0089	13.7	.018	41.55	.1655
40°	8.42	.0068	12.42	.0148	17.39	.029	44.52	.19
45°	10.16	.0099	15.08	.0218	20.68	.041	47.3	.2145
50°	11.82	.0134	17.57	.0296	23.95	.055	49.93	.239
55°	13.39	.0172	19.94	.0381	27.02	.07	52.43	.2635
60°	14.87	.0212	21.21	.0473	29.95	.086	54.81	.288
65°	16.3	.0255	24.38	.057	32.78	.103	57.05	.312
70°	17.69	.03	26.48	.0672	35.53	.121	59.19	.336
75°	18.99	.0346	28.47	.0777	38.08	.139	61.32	.3605
80°	20.27	.0394	30.37	.0884	40.59	.158	63.37	.385
85°	21.47	.0442	32.19	.0994	42.97	.177	65.35	.4095
90°	22.6	.049	33.87	.11	45.21	.196	67.28	.434

Conversion formula for converting known open orifice area to 64th's:

$$64th's = 128 \sqrt{\frac{2 \times \text{Area Open}}{3.1416}}$$



Orifice Open Area Data

Open area of one hole in sq. in.

Area Open	Degrees Open														
	Orifice	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°	90°
1/4"	0.0004	0.002	0.0041	0.0068	0.0099	0.0134	0.0172	0.0212	0.0255	0.03	0.0346	0.0394	0.0442	0.049	
3/8"	0.001	0.004	0.0089	0.0148	0.0218	0.0296	0.0381	0.0473	0.057	0.0672	0.0777	0.0884	0.0994	0.11	
1/2"	0.003	0.009	0.018	0.029	0.041	0.055	0.07	0.086	0.103	0.121	0.139	0.158	0.177	0.196	
3/4" (pie)	0.117	0.141	0.1655	0.19	0.2145	0.239	0.2635	0.288	0.312	0.336	0.3605	0.385	0.4095	0.434	