

Wellmark Series 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

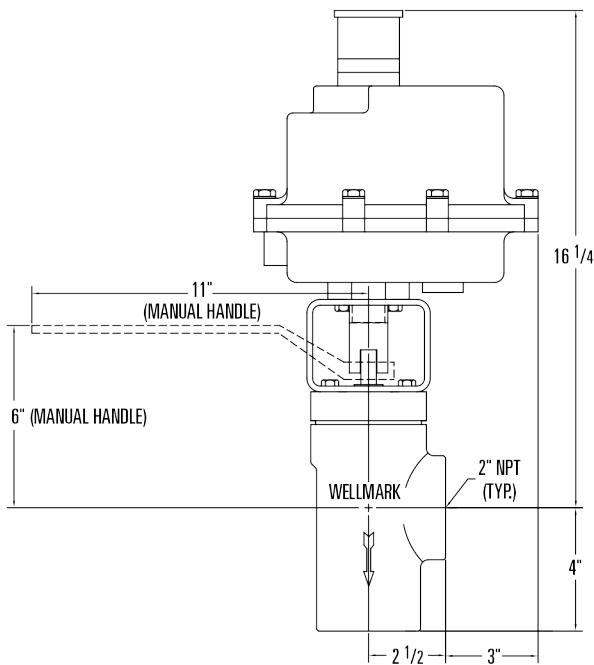
- Choice of manual, electric, or pneumatic actuation
- Choice of angle or “Y” body style in carbon or stainless steel
- Choice of tungsten carbide or ceramic disc material
- Multiple orifice sizes for greater control
- Low torque at high differential pressure

Specifications

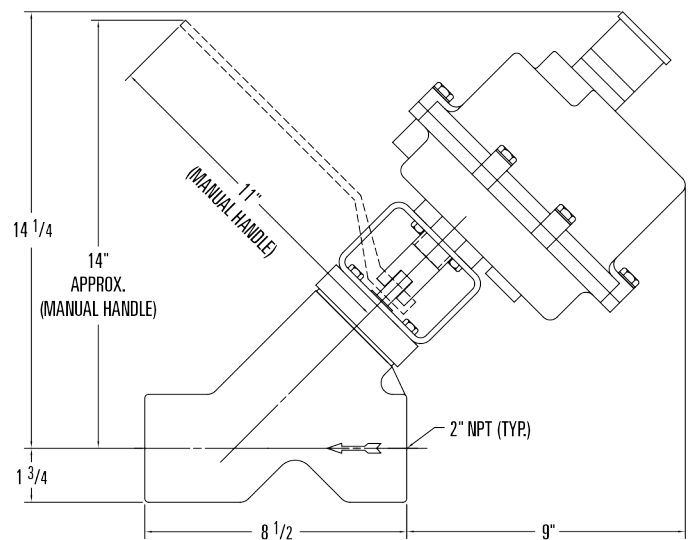
Working pressure To 3600 psi
 Body material WCB Carbon Steel or CF8M Stainless Steel
 Disc material Tungsten Carbide or Ceramic



Dimensional data



2" ANGLE VALVE

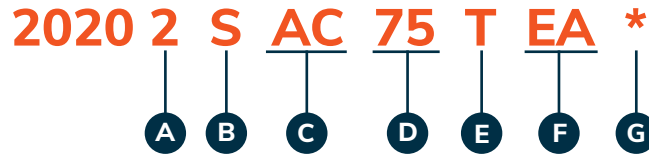


2" "Y" VALVE

Model code

Determining the model code

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.



A

VALVE END/CONNECTION SIZE	
Code	Size (Inches)
2	2

B

BODY END CONNECTION	
Code	Type
S	Female NPT
F	Flanged (Specify Rating)

C

BODY STYLE/MATERIAL		
Code	Style	Style
AC	Angle	Carbon Steel
AS	Angle	Stainless Steel
YC	"Y" Shape	Carbon Steel
YS	"Y" Shape	Stainless Steel

D

DISC ORIFICE	
Code	Size
25	1/4"
38	3/8"
50	1/2"
75	3/4" (pie)

E

DISC MATERIAL	
Code	Material
T	Tungsten® Carbide
C	Ceramic

F

ACTUATOR TYPE		
Code	Type	Operation
MA	Manual	On-Off Handle
EA	Electric	12 VDC (Asahi)

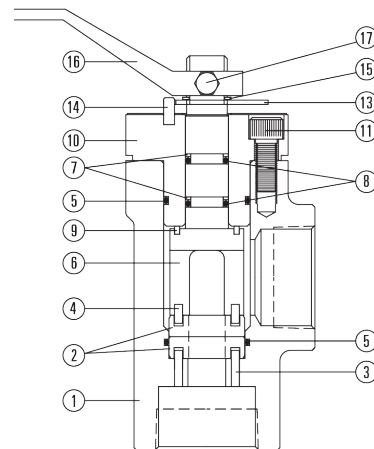
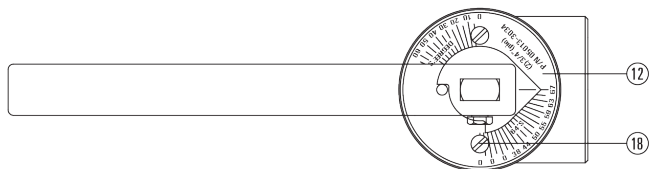
G

EXTRA OPTIONS	
Code	Option
X	Bracket & Driver less Actuator
NACE	NACE Compliant (includes Viton Seals)
	Flange Rating Specification up to 1500#

Parts list

Parts list Series 2020 w/manual handle

ITEM	DESCRIPTION	QTY.	PART NO.
1	BODY, 2" ANGLE, STEEL WCB	1	1120322
	BODY, 2" "Y", STEEL WCB	1	1125609
2*	DISC, 1/4" DIA., TUNGSTEN CARBIDE	2	1119596
	DISC, 3/8" DIA., TUNGSTEN CARBIDE	2	1121618
	DISC, 1/2" DIA., TUNGSTEN CARBIDE	2	1123617
	DISC, 3/4" PIE, TUNGSTEN CARBIDE	2	1126028
	DISC, 1/4" DIA., CERAMIC	2	1127156
	DISC, 3/8" DIA., CERAMIC	2	C/F
	DISC, 1/2" DIA., CERAMIC	2	1127245
	DISC, 3/4" PIE, CERAMIC	2	1121617
3	PIN, 17-4PH, ANGLE BODY ONLY	2	1119561
4	PIN, 17-4PH	2**	1124608
5	O-RING, BUNA-N	2	1011476
6	STEM, STEEL PLATED	1	1121013
7	BACK UP RING, TEFLON®	2	1126239
8	O-RING, BUNA-N	2	1022360
9	BEARING, BRONZE	1	1122612
10	BONNET, STEEL	1	1125608
11	SOCKET HEAD SCREW, 18-8 S.S.	4	1124550
12	INDICATOR, 1/4", ALUMINUM	1	1119924
	INDICATOR, 3/8", ALUMINUM	1	1126135
	INDICATOR, 1/2", ALUMINUM	1	1125038
	INDICATOR, 3/4" PIE, ALUMINUM	1	1124016
13	STOP PLATE, STAINLESS STEEL	1	1126701
14	PIN, STAINLESS STEEL	1	1120087
15	RETAINER RING, STEEL	1	1121451
16	HANDLE, DUCTILE IRON	1	1121923
17	HANDLE SCREW, STEEL PLATE	1	1118793
18	INDICATOR SCREW, STEEL	2	1120508



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

Parts list

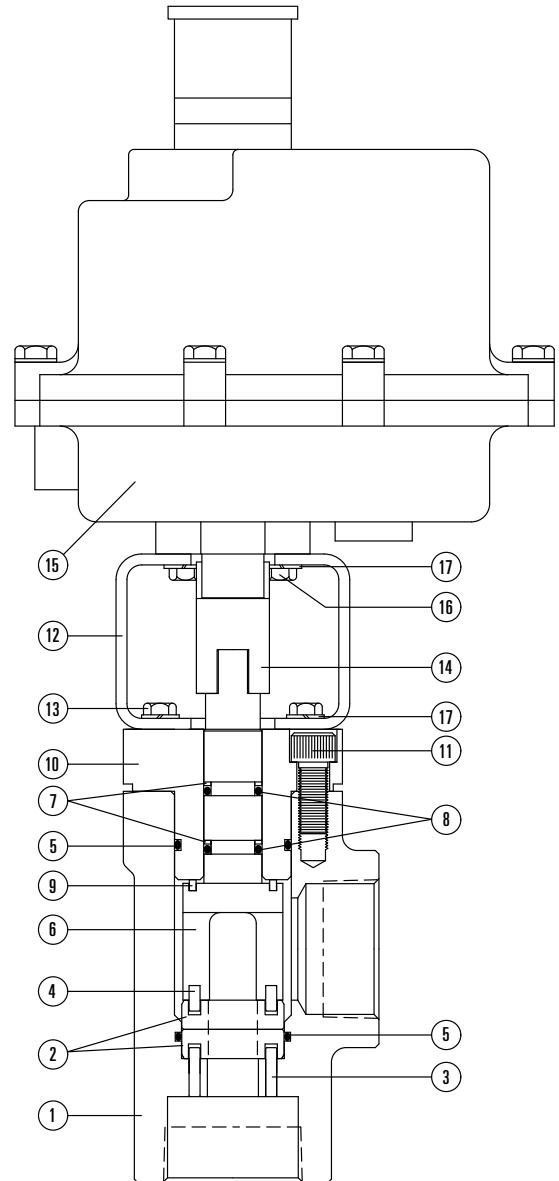
Parts list Series 2020 w/electric actuator

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	BODY, 2" "Y", STEEL WCB	1	1125609
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	DISC, 3/8" DIA., CERAMIC	2	C/F
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8*	O-RING, BUNA-N	2	1022360
9	BEARING, BRONZE	1	1122612
10	BONNET, STEEL	1	1125608
11	SOCKET HEAD SCREW, 18-8 S.S.	4	1124550
12	BRACKET, STEEL	1	1120017
13	SCREW, STEEL PLATED	4	1120507
14	DRIVER, STEEL PLATED	1	1120538
15	ELECTRIC ACTUATOR***	1	1120594
16	SCREW, STEEL PLATED	4	1126352
17	LOCK WASHER, STEEL PLATED	8	1124514

* Recommended Spare Part

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

***Consult Factory for Actuation Details



Flow data

C _v FACTOR CHART				
VALVE ORIFICE	1/4"	3/8"	1/2"	3/4"
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: $Q = 34.3 C_v \sqrt{\frac{\Delta P}{G}}$

Q = Flow (Barrels/Day)
 C_v = Flow factor
 ΔP = Pressure drop across drop
 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)

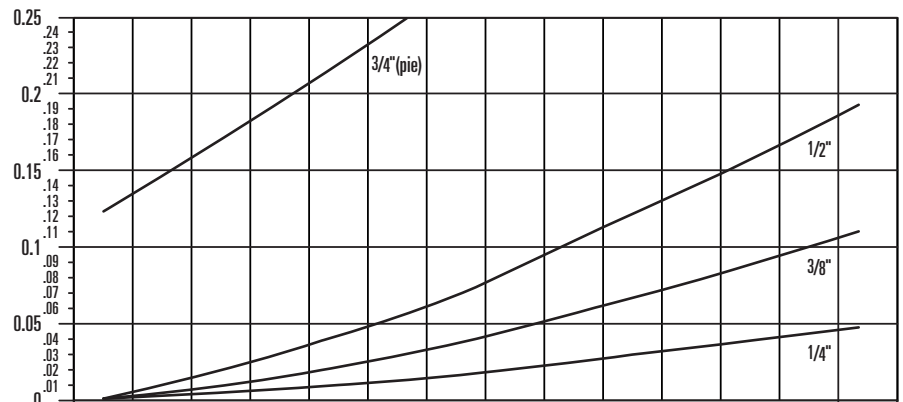
For Liquids: $C_v = \frac{Q}{34.3 \sqrt{\frac{\Delta P}{G}}}$

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

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	Orifice	Degrees Open													Full Open
		25°	30°	35°	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°	
Area Open	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

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Norriseal-Wellmark | 11122 W Little York Rd | Houston, TX 77041

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