WellMark CEMCO major

Series 2020

Controls and Valves for Industry

WellMark's Choke Valve Offers Greater Control And A Wider Range of Options To Best Suit Your Needs

A new quarter-turn "Y" style body or angle body control valve with the options you need. Ideally suited to control production at the well-head by utilizing Remote Transmitting Units (RTU's), simply by equipping the valve with electric actuation.

Flow Control Choke Valve (Throttling Valve)

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 pressure differential

Application

This versatile and proven valve is ideal for use in well-head control, in gas gathering systems to regulate flow, for CO_2 and water or steam injection systems as well as pressure separators. Suitable for water, gas and other liquid service.

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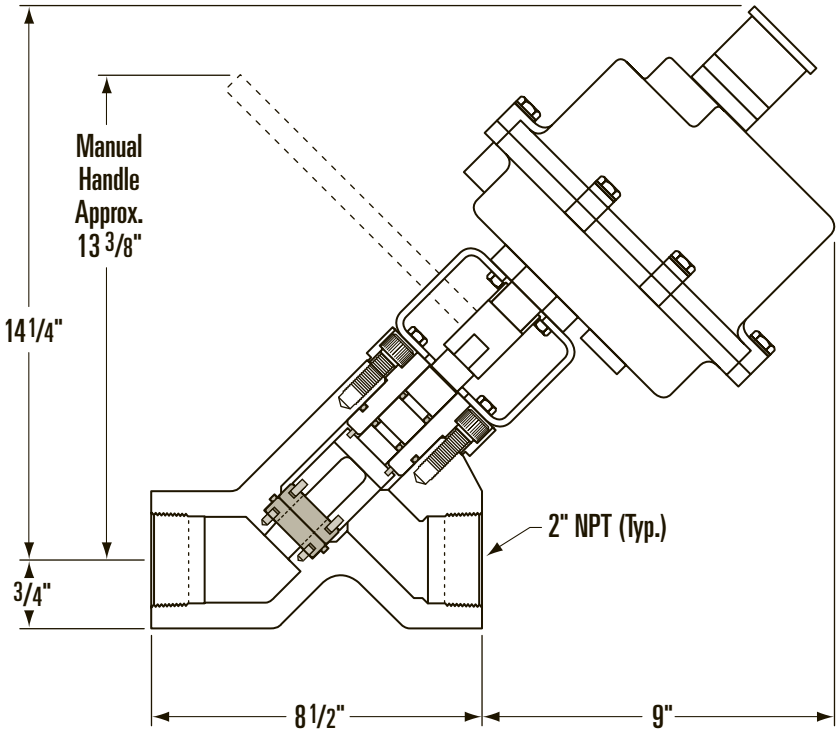
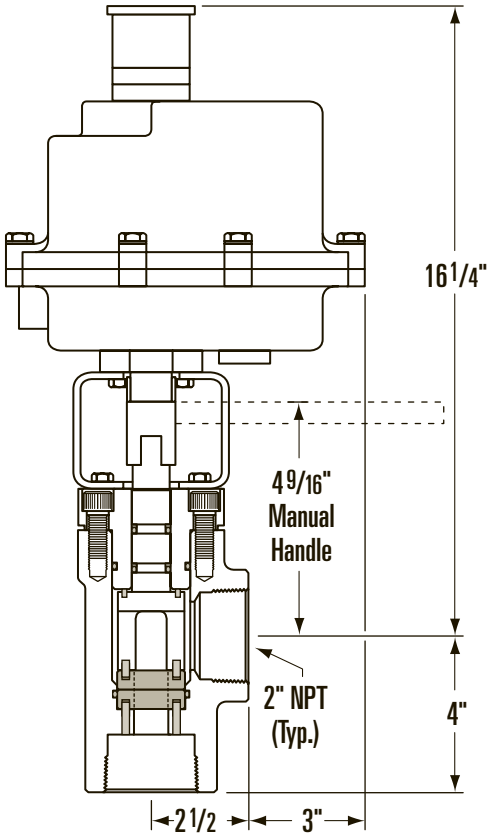
Dimensional Data



"Y" Style Configuration



Angle Style Configuration

Specifications

Working Pressure	To 3600 psi
Body Material	WCB Carbon Steel or CF8M Stainless Steel
Disc Material	Tungsten Carbide or Ceramic

Determining The Model Number

The Model number example shown below specifies the following valve:

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.

Consult factory for other materials.

Valve Size	1 • 1" 2 • 2"
Connection	S • Screwed F • Flanged (Specify)
Body Configuration/Material	AC • Angle Style, Carbon Steel AS • Angle Style, Stainless Steel YC • Y Style, Carbon Steel YS • Y Style, Stainless Steel
Disc Orifice	25 • 1/4" 38 • 3/8" 50 • 1/2" 75 • 3/4" (pie)
Disc Material	T • Tungsten Carbide C • Ceramic
Actuator	EA • Electric MA • Manual PA • Pneumatic

Model 2020: 2 S AC - 75 T EA

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.

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: $Q = .0234\ C_V \sqrt{\frac{\Delta P\ (P1+P2)}{G\ T}}$

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)

If flow capacity required 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: $C_V = \frac{Q}{34.3 \sqrt{\frac{\Delta P}{G}}}$

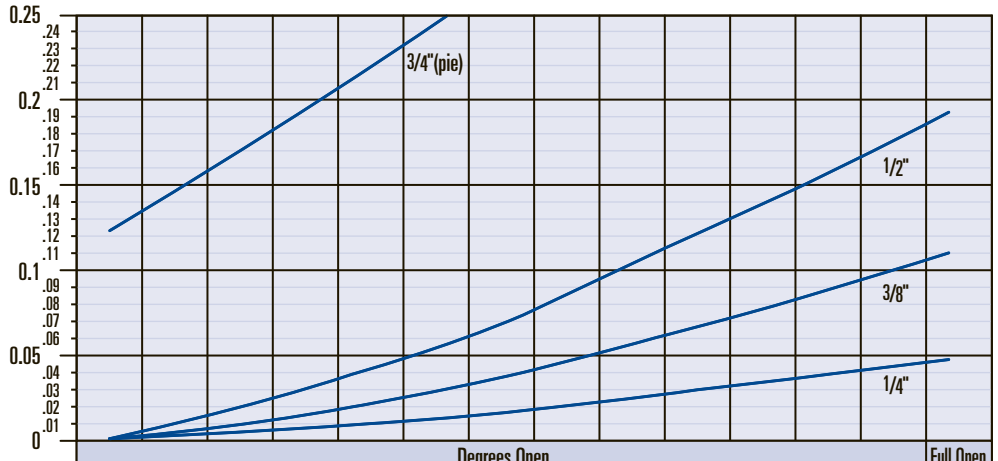
For Gas: $C_V = \frac{Q}{.0234 \sqrt{\frac{\Delta P\ (P1+P2)}{G\ T}}}$

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:

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



Orifice Open Area Data

Open area of one hole in sq. in.

	Orifice	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°	90°
		Degrees Open													Full Open
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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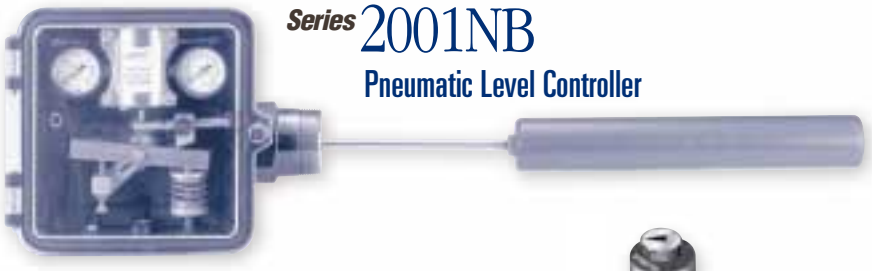
WellMark offers greater control of all your fluids throughout the entire production process by offering a number of fine innovative flow control products.



Series 2001NB
Pneumatic Level Controller

Series PTP
Chemical Injection Pump

Series 685
Liquid Level Monitor

Taking Liquid Level Management To A Higher Level

Contact your WellMark representative today for more information about these and other quality flow control products.

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