

# 8000 Series Cryogenic Option

## Fractional Flow Control Valves

CRN Registration Number Available

### FRACTIONAL FLOW CONTROL VALVES

The cryogenic option offers an 8" bonnet extension that provides protection for the packing and actuator by preventing the formation and build-up of ice, which can interfere with movement of the valve stem and affect valve performance and control. This model is for use on cryogenic services with temperatures as low as -320°F (-195°C).

The Mark 8000 Series is a heavy-duty pneumatic control valve developed for cryogenic services. It is recommended for use with process below -40°F (-40°C).

#### Features:

- Extended bonnet protects the packing and actuator by preventing ice build-up, which can interfere with stem movement and/or damage packing
- For services as low as -320°F (-195°C).
- Barstock construction eliminate possible porosity concerns
- For industrial process applications requiring precision low flow control and durable construction

#### **SPECIFICATIONS**

Sizes: 1/2" – 2" (DN15 – DN50)

#### End Connections

- Threaded – NPT, BSPT
- Raised-face flanges (300#, 600#, 900#)
- Ring-type joint flanges (150#, 300#, 600#)
- Socket weld (schedule 40, 80, or 160)
- Special connections upon request

#### Actuator (*Positioner required with all actuators*)

- Standard – 35M (35 in<sup>2</sup>) multi-spring
- Optional – 55M (55 in<sup>2</sup>) or 85M (85 in<sup>2</sup>). See Maximum Allowable  $\Delta P$  Ratings Chart



**MK8000 SERIES CRYOGENIC OPTION SPECIFICATIONS**

Body Material: 316 Stainless Steel

Trim Material

- 316 SST
- Monel

Bonnet Material: 316 SST

Actuator Material: Steel

Diaphragm Material: Buna-N

Stem Packing Material

- Standard – Teflon V-Rings
- Optional – braided

Service: gas or liquid

Shutoff

- Standard – ANSI Class III (Cv's < 3.5/3,01 Kv); ANSI Class IV (Cv's 3.5/3,01 Kv and higher)
- Optional – ANSI Class VI with soft RPTFE seat (consult factory for other soft seat material options)

Ranges: 3-15 (0,2-1,0); 3-9 (0,2-0,6); 9-15 (0,6-1,0); 6-30 (0,4-2,1) psi (bar). Note: valves using 55M or 85M are not available with 9-15 psi (0,6-1,0 bar) range

Valve Action

- Direct (ATC)
- Reverse (ATO)

Flow Characteristics:

- Linear
- Equal Percentage
- Quick Opening

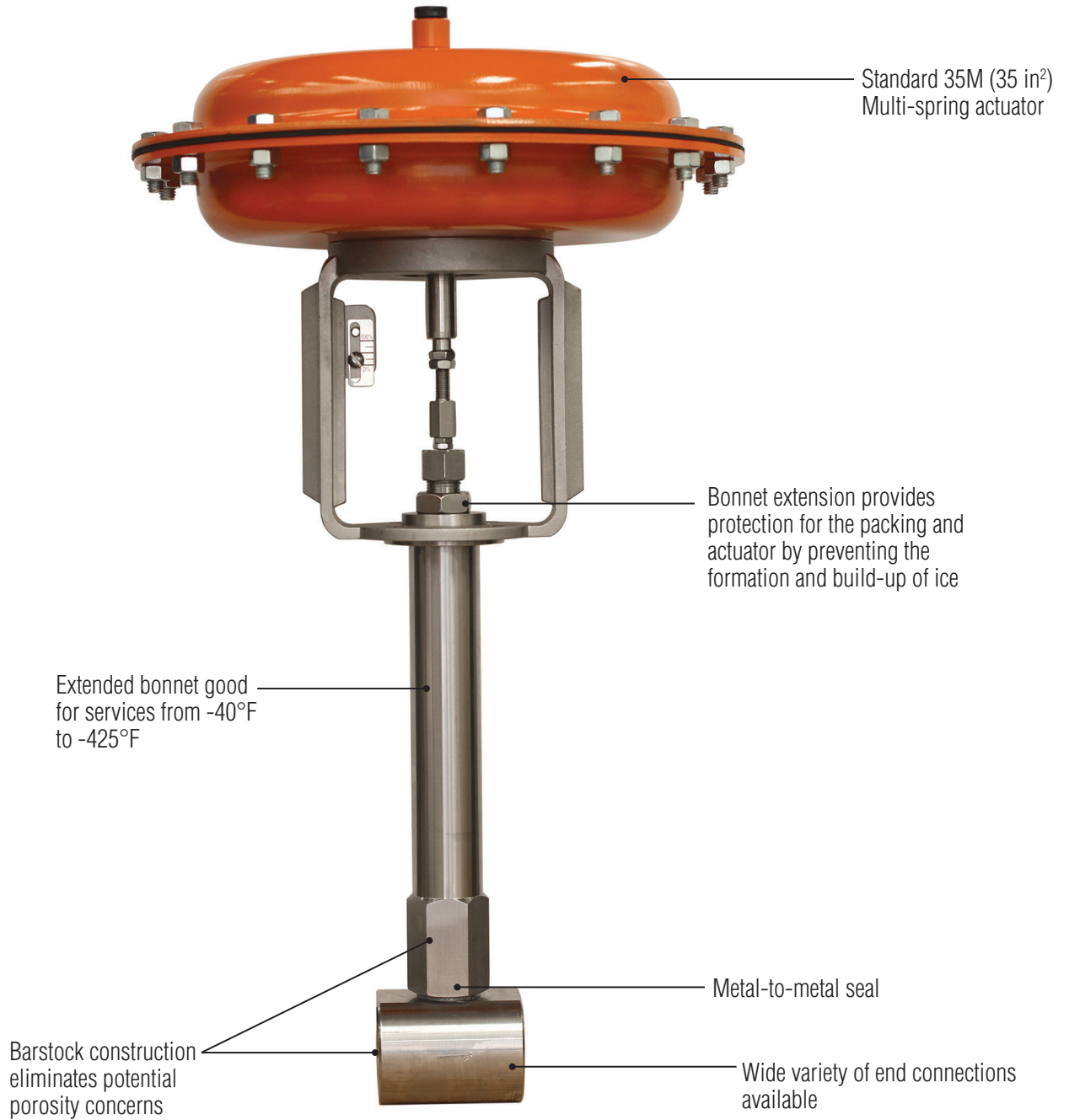
Cv (Kv) Selection

Valve Size	Standard Cv (Kv)
1/2"/DN15	0.05; 0.1; 0.2; 0.5; 1.0; 1.8 (0,04; 0,09; 0,17; 0,43; 0,86; 1,6)
3/4"/DN20	1.0; 2.0; 3.0 (0,86; 1,7; 2,6)
1"/DN25	2.0; 4.0; 4.3 (1,7; 3,4; 3,7)
1-1/4"/DN32	4.0; 6.5; 7.1 (3,4; 5,6; 6,1)
1-1/2"/DN40	6.5; 9.0; 17.0 (5,6; 7,7; 10,8)
2"/DN50	9.0; 16.0; 17.0 (7,7; 13,8; 14,6)

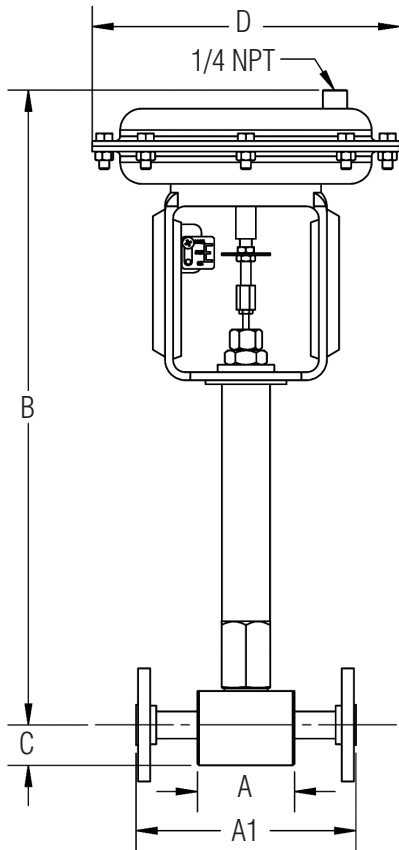
Maximum Allowable  $\Delta P$  Ratings

Act. Size	Cv (Kv)	Air to Open		Air to Close		Pos. @ 40 psi
		3-15 @ 20 psi	6-30 @ 40 psi*	3-15 @ 20 psi	6-30 @ 40 psi	
35M	0.05-0.2 (0,4-0,2)	5000 (345)	5000 (345)	5000 (345)	5000 (345)	N/A
	0.5-1.0 (0,4-0,9)	3030 (209)	5000 (345)	5000 (345)	5000 (345)	N/A
	1.25-2.0 (1,1-1,7)	950 (66)	1900 (131)	1580 (109)	3160 (218)	N/A
	3.0-4.0 (2,6-3,4)	600 (41)	1300 (90)	1000 (69)	2200 (152)	N/A
	4.3-6.5 (3,7-5,6)	400 (28)	800 (55)	650 (45)	1400 (97)	3500 (241)
	7.1-9.0 (6,1-7,7)	270 (19)	550 (38)	450 (31)	950 (66)	2400 (165)
	12.5-16.0 (10,8-13,8)	150 (10)	300 (21)	250 (17)	500 (34)	1300 (90)
	55M	4.3-6.5 (3,7-5,6)	550 (38)	1100 (76)	900 (62)	1900 (131)
7.1-9.0 (6,1-7,7)		370 (26)	750 (52)	600 (41)	1250 (86)	N/A
12.5-16.0 (10,8-13,8)		200 (14)	400 (28)	350 (24)	700 (48)	N/A
17.0 (14,6)		130 (9)	250 (17)	225 (16)	448 (31)	N/A
85M	4.3-6.5 (3,7-5,6)	850 (59)	1700 (117)	1400 (97)	2930 (202)	N/A
	7.1-9.0 (6,1-7,7)	570 (39)	1150 (79)	920 (63)	1930 (133)	N/A
	12.5-16.0 (10,8-13,8)	300 (21)	610 (42)	540 (37)	1080 (74)	N/A
	17.0 (14,6)	200 (14)	380 (26)	350 (24)	690 (48)	N/A

*MK8000 SERIES CRYOGENIC OPTION FEATURES & BENEFITS*



## MK8000 SERIES CRYOGENIC OPTION, THREADED & FSW DIMENSIONS



Dimensions shown with 8" bonnet. Contact factory for optional 14" dimensions.

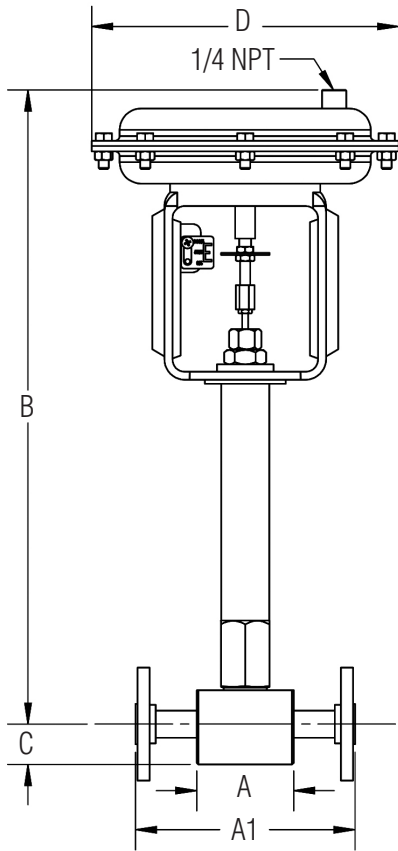
- Mark 8000CRY Series, Threaded & Socket Weld**

VALVE SIZE	DIMENSIONS, INCHES								WEIGHT, LBS		
	A	B			C	D			ACTUATOR SIZE		
		35M	55M	85M		35M	55M	85M	35M	55M	85M
1/2"	3.00	19.65	19.88	-	1.25	9.50	12.50	-	23	30	37
3/4"	3.00	19.65	19.88	-	1.25	9.50	12.50	-	23	30	37
1"	3.75	19.28	19.51	20.95	1.50	9.50	12.50	15.00	26	33	40
1-1/4"	5.00	19.61	19.84	21.28	1.65	9.50	12.50	15.00	29	36	43
1-1/2"	4.75	-	21.94	23.38	2.00	-	12.50	15.00	-	30	41
2"	5.75	-	21.77	23.21	2.25	-	12.50	15.00	-	39	50

- Mark 8000CRY Series, Threaded & Socket Weld, Metric**

VALVE SIZE	DIMENSIONS, MILLIMETERS								WEIGHT, KGS		
	A	B			C	D			ACTUATOR SIZE		
		35M	55M	85M		35M	55M	85M	35M	55M	85M
1/2"	76,2	499	505	-	31,8	241	318	-	10	14	17
3/4"	76,2	499	505	-	31,8	241	318	-	10	14	17
1"	95,3	190	496	532	38,1	241	318	381	12	15	18
1-1/4"	127	498	504	541	41,9	241	318	381	13	16	20
1-1/2"	121	-	557	594	50,8	-	318	381	-	14	19
2"	146	-	553	590	57,2	-	318	381	-	18	23

## MK8000 SERIES CRYOGENIC OPTION, FLANGED DIMENSIONS



- Mark 8000CRY Series, Flanged End**

VALVE SIZE	ANSI FLANGE	DIMENSIONS, INCHES									WEIGHT, LBS		
		A1	B			C	D			ACTUATOR SIZE			
			35	55	85		35	55	85	35	55	85	
1/2"	150#	7.00	19.65	19.88	-	1.25	9.5	12.50	-	26	33	-	
	300#	7.50	19.65	19.88	-	1.25	9.5	12.50	-	27	34	41	
	600#	8.00	19.65	19.88	-	1.25	9.5	12.50	-	29	36	43	
3/4"	150#	7.00	19.65	19.88	-	1.25	9.5	12.50	-	26	33	40	
	300#	7.63	19.65	19.88	-	1.25	9.5	12.50	-	29	36	43	
	600#	8.12	19.65	19.88	-	1.25	9.5	12.50	-	30	37	44	
1"	150#	7.25	19.28	19.51	20.95	1.50	9.5	12.50	15.00	30	37	44	
	300#	7.75	19.28	19.51	20.95	1.50	9.5	12.50	15.00	33	40	47	
	600#	8.25	19.28	19.51	20.95	1.50	9.5	12.50	15.00	34	41	48	
1-1/4"	150#	8.75	19.61	19.84	21.28	1.625	9.5	12.50	15.00	34	41	48	
	600#	9.50	19.61	19.84	21.28	1.625	9.5	12.50	15.00	39	46	53	
1-1/2"	150#	8.75	-	21.94	23.38	2.00	-	12.50	15.00	-	48	55	
	300#	9.25	-	21.94	22.38	2.00	-	12.50	15.00	-	53	60	
	600#	9.88	-	21.94	22.38	2.00	-	12.50	15.00	-	57	64	
2"	300#	10.50	-	21.77	23.21	2.25	-	12.50	15.00	-	53	60	
	600#	11.25	-	21.77	23.21	2.25	-	12.50	15.00	-	58	65	

- Mark 8000CRY Series, Flanged End, Metric**

VALVE SIZE	ANSI FLANGE	DIMENSIONS, MILLIMETERS									WEIGHT, KGS		
		A1	B			C	D			ACTUATOR SIZE			
			35	55	85		35	55	85	35	55	85	
1/2"	150#	178	499	505	-	31,8	241	317,5	-	12	15	-	
	300#	190,5	499	505	-	31,8	241	317,5	-	12	15	19	
	600#	203,2	499	505	-	31,8	241	317,5	-	13	16	20	
3/4"	150#	178	499	505	-	31,8	241	317,5	-	12	15	18	
	300#	193,8	499	505	-	31,85	241	317,5	-	13	16	20	
	600#	206,22	499	505	-	31,8	241	317,5	-	14	17	20	
1"	150#	184,2	490	496	532	38,1	241	317,5	381	14	17	20	
	300#	196,9	490	496	532	38,1	241	317,5	381	15	18	21	
	600#	209,3	490	496	532	38,1	241	317,5	381	15	19	22	
1-1/4"	150#	222,3	498	504	541	41,3	241	317,5	381	15	19	22	
	600#	241,3	498	504	541	41,3	241	317,5	381	18	21	24	
1-1/2"	150#	222,3	-	557	594	50,8	-	317,5	381	-	22	25	
	300#	235	-	557	594	50,8	-	317,5	381	-	24	27	
	600#	251	-	557	594	50,8	-	317,5	381	-	26	29	
2"	300#	266,7	-	553	590	57,2	-	317,5	381	-	24	27	
	600#	285,8	-	553	590	57,2	-	317,5	381	-	26	29	

**MARK 8000 SERIES ORDERING SCHEMATIC**

Model No.	Size	Body Mat'l	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

MODEL	
8000G	Two-Way Globe Valve
8000GTP	with Top Mounted Positioner
8000GSP	with Side Mounted Positioner
8000GMV	with Motor Actuator
8000A	Two-Way Angle Valve
8000ATP	with Top Mounted Positioner
8000ASP	with Side Mounted Positioner
8000T	Three-Way Globe Valve
8000TTP	with Top Mounted Positioner
8000TSP	with Side Mounted Positioner

SIZE	
050	1/2" (DN15)
075	3/4" (DN20)
100	1" (DN25)
125	1-1/4" (DN32)
150	1-1/2" (DN40)
200	2" (DN50)

BODY MATERIAL	
CB	Carbon Steel
SB	316SS
BR	Brass
MN	Monel
HC	Hastelloy C
A2	Alloy 20
KN	Kynar
PV	PVC

1 & 2	END CONNECTIONS
PT	FNPT
BT	BSPT
BP	BSPP
SW	FSW
R5	150# RF
J5	150# RTJ
R3	300# RF
J3	300# RTJ
R6	600# RF
J6	600# RTJ
R9	900# RF
J9	900# RTJ
R1	1500# RF
J1	1500# RTJ
R2	2500# RF
J2	2500# RTJ
B4	BWE Sch 40
B8	BWE Sch 80
B6	BWE Sch 160
ZZ	Non-standard

3 & 4	BONNET/PACKING
METAL BODIES	
ET	8" Extended/TFE (Cryogenic)

# SPECIFICATIONS



## MARK 8000 SERIES ORDERING SCHEMATIC

5 PLUG & SEAT	
Stem/Plug/Seat Material	
8000G/GTP/GSP/GMV	
Metal Bodies	
A	Standard – Linear Hard
B	Standard – =% Hard
C	Standard – Q.O. Hard
D	Standard – Linear Soft (RPTFE)
E	Standard – =% Soft (RPTFE)
F	Standard – Q.O. Soft (RPTFE)
G	316/Stellite/Stell – Linear Hard
H	316/Stellite/Stell – =% Hard
I	316/Stellite/Stell – Q.O. Hard
M	Alloy 20/AL20/AL20 – Linear Hard
N	Alloy 20/AL20/AL20 – % Hard
P	Alloy 20/AL20/AL20 – Q.O. Hard
Q	Alloy 20/AL20/AL20 – Linear Soft (RPTFE)
R	Alloy 20/AL20/AL20 – % Soft (RPTFE)
S	Alloy 20/AL20/AL20 – Q.O. Soft (RPTFE)
T	Monel/Mon/Mon – Linear Hard
U	Monel/Mon/Mon – =% Hard
V	Monel/Mon/Mon – Q.O. Hard
W	Monel/Mon/Mon – Linear Soft (RPTFE)
X	Monel/Mon/Mon – =% Soft (RPTFE)
Y	Monel/Mon/Mon – Q.O. Soft (RPTFE)
1	Hastelloy C/H-C/H-C – Linear Hard
2	Hastelloy C/H-C/H-C =% Hard
3	Hastelloy C/H-C/H-C – Q.O. Hard
4	Hastelloy C/H-C/H-C – Linear Soft (RPTFE)
5	Hastelloy C/H-C/H-C =% Soft (RPTFE)
6	Hastelloy C/H-C/H-C – Q.O. Soft (RPTFE)
Z	Non-standard

6 CV (KV)	
A	0.05 (0,043)
B	0.1 (0,086)
C	0.2 (0,17)
D	0.5 (0,43)
E	1.0 (0,86)
F	2.0 (1,72)
G	4.0 (3,44)
H	6.5 (5,63)
I	9.0 (7,74)
J	16.0 (13,8)
K	25 (21,5)
M	1.5 (1,3)
N	1.8 (1,6)
P	3.0 (2,6)
Q	3.5 (3,01)
R	4.3 (3,7)
S	7.1 (6,1)
T	12.5 (10,8)
U	17 (14,6)

7 & 8		ACTUATOR	
TYPE		SIZE	
ALL VALVES EXCEPT SP			
D	Air-to-Close	3	35M
R	Air-to-Open	5	55M
FOR SP		8	85M
S	W/SMP		
Z	Non-standard		
8000GMV			
N	On-Off	2	NEMA 12
M	Ma/Voltage	4	NEMA 4 & X-P
ZZ	Non-standard		

**MARK 8000 SERIES ORDERING SCHEMATIC**

9 & 10		RANGE	
	RANGE	ACTUATOR	
A	3-15 DIR	3	35M
B	3-15 REV	5	55M
G	6-30 DIR	8	85M
H	6-30 REV		
Z	Non-standard		
8000GMV			
NF	On-Off		
42	4-20 mA		
41	4-12 mA		
12	12-20 mA		
V5	0-5V		
V1	0-10V		
ZZ	Non-standard		

11 & 12		LIMIT SWITCHES (2LS)	
	ACTUATOR	ACTION/TYPE	
3	35M	D	Direct/Standard
5	55M	X	Direct/X-P
8	85M	R	Reverse/Standard
		P	Reverse/X-P
00	None		
ZZ	Non-standard		

13 & 14		SOLENOID & HARDWARE	
00	None		
SD	Standard Solenoid		
WT	Water-Tight Solenoid		
XP	X-Proof Solenoid		
H3	Handwheel 35M Dir		
H5	Handwheel 55M Dir		
H8	Handwheel 85M Dir		
R3	Handwheel 35M Rev		
R5	Handwheel 55MK Rev		
R8	Handwheel 85M Rev		
ZZ	Non-standard		

15		ACCESSORIES	
0	None		
A	Air Regulator		
B	I/P 35M Act. 4-20Ma/3-15 psi		
C	I/P 55M Act. 4-20Ma/3-15 psi		
D	I/P 85M Act. 4-20Ma/3-15 psi		
E	I/P 35M/55M/85M Act. 4-20Ma/6-30 psi		
1	1 Gauge for Tmp.		
2	2 Gauge for Tmp.		
3	3 Gauge for Tmp.		
X	Oxygen Clean		
Z	Non-standard		

16		ACTION	
D	Direct (Air-To-Close)		
R	Reverse (Air-To-Open)		

17		SMP	
0	None		
A	SMP Direct/Reverse 3-15		
D	SMP-IP Direct/Reverse 4-20		
G	SMP 16IQ-S Direct/Reverse		
H	SMP 16IQ-B Direct/Reverse		
Z	Non-standard		

18		PED COMPLIANCE	
0	Not Required		
F	CE Category 1		
Z	Non-standard		