

# 8000 Series

## Fractional Flow Control Valves

CRN Registration Number Available

### HEAVY DUTY CONTROL VALVES

The Mark 8000 Series is a group of heavy-duty control valves specifically designed for process applications requiring full flow or fractional flow control. Available in a wide selection of body sizes and styles, this valve can be configured in two-way or three-way designs, for diverting or mixing service, and with globe or angle valve style seats. It can be ordered with a bellows stem seal, or an extended bonnet extension for cryogenic applications down to  $-425^{\circ}\text{F}$  ( $-218^{\circ}\text{C}$ ), or with an electric motor actuator. It has a totally enclosed multi-spring actuator, which minimizes deadband and is field reversible without the use of special tools or extra parts. LowFlow Valve can also install a wide variety of positioners and actuators on the Mark 8000 Series, to provide a valve that meets specific requirements.

The Mark 8000 Series valve subassembly is manufactured completely from barstock, which combined with the standard heavy duty yoke and actuator, gives the valve the ability to handle pressure up to 6000 psi (414 bar), while still being able to offer Cv's ranging from 0.05 - 17 (Kv's 0,04 – 14,6). The barstock body design also allows greater flexibility when specialty materials are required. While the standard body materials are Stainless Steel and Carbon Steel, the Series 8000 can be manufactured in almost any exotic alloy, including Alloy 20, Hastelloy, Inconel, and Monel. This makes the Mark 8000 Series ideal for corrosive or harsh process conditions. The Mark 8000 body material is not limited to alloys. It can also be manufactured in PVC or Kynar for applications where thermoplastics offer a better solution over alloy materials.



#### Features:

- Heavy-duty barstock construction for pressures up to 6000 psi (414 bar)
- Speciality alloys are readily available, making the Mark 8000 Series ideal for corrosive or harsh process environments
- Application flexibility: wide selection of body sizes and types including 2-way and 3-way designs
- Globe design to 2" (DN50); angle pattern to 1" (DN25)
- In-line maintainable for quick, easy trim repairs

**MK8000 SERIES SPECIFICATIONS**

Sizes: 1/2" – 2" (DN15 – DN50)

**End Connections**

- NPT, BSPT
- Raised-face flanges (ANSI, DIN, JIS)
- Ring-type joint flanges
- Socket weld (schedule 40, 80, or 160)
- Bolt-thru flanged (plastic body only)
- Special connections upon request

**Actuator** (see maximum allowable  $\Delta P$  charts)

- Standard – multi-spring (35M, 55M, 85M)

**Body Style**

- 2-way globe
- 2-way angle (to 1"/DN25)
- 3-way globe

**Bonnet Type**

- Standard screwed
- 8" extended (cryogenic)
- Multi-ply bellows seal
- Extended multi-ply bellows seal

**Trim Material**

- 316SST seat & stem / 17-4 pH SS plug
- 316SS seat, stem and plug
- 316SS / Stellite
- Monel
- Hastelloy C
- Alloy 20
- Stellite
- Kynar
- PVC
- Other materials

**Actuator Material:** 35M/55M/85M – steel; optional - nickel plated steel and 304SS

**Diaphragm Material:** Buna-N/Nylon

**Stem Packing**

- Alloy bodies: Teflon V-ring; graphite/graphite (use of positioners recommended and required for bellows stem seal\*)
- Plastic bodies: Teflon V-ring positioner required with Viton bonnet gasket; Teflon V-ring with Buna-N bonnet gasket

**Service:** high pressure chemicals, steam, air, gas, oil, water

**Shutoff**

- Standard – ANSI Class III (Cv's < 3.5 / Kv's < 3,0) or ANSI Class IV (Cv's 3.5 and higher / Kv's 3,0)
- Optional – ANSI Class VI with soft RPTFE seats (consult factory for other soft seat material options)

**Ranges:** 3-15 psi or 6-30 psi (0,21-1,03 or 0,41-2,07 bar)

**Action**

- Direct (air signal closes valve)
- Reverse (air signal opens valve)

**Flow Characteristic:** Equal percentage, linear, quick opening

**Positioners:** Pneumatic, electro-pneumatic and digital positioners on all sizes and actuators; contact factory for mounting positioners on PVC or Kynar valves

**Cv (Kv) Selection – 2-Way Valves**

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; 3.5; 4.0; 4.3 (1,7; 3,0; 3,4; 3,7)
1-1/4"/DN32	2.0; 3.5; 4.0; 6.5; 7.1 (1,7; 3,0; 3,4; 5,6; 6,1)
1-1/2"/DN40	6.5; 9.0; 12.5 (5,6; 7,7; 10,8)
2"/DN50	9.0; 16.0; 17.0 (7,7; 13,8; 14,6)

**Sizing Notes**

- For sizing to your specific application parameters, LowFlow Valve recommends the use of the Sizing & Selection program available free-of-charge from our factory sales office, our representatives or our website.
- Any Cv (Kv) listed as a standard can be provided as optional low flow trim in a larger sized valve

\* Bellows limited to 1/2 thru 1-1/4" max ( 1/2" stroke )

## MK8000 SERIES SPECIFICATIONS

### Maximum Allowable $\Delta P$ Ratings

Cv (Kv)	ATO 3-15	ATO 6-30*	ATC 3-15	ATC 6-30	ATC w/pos. @ 40 psi (3 bar)
<b>35M Actuator**</b>					
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 (6,1)	270 (19)	550 (38)	450 (31)	950 (66)	2400 (165)
<b>55M Actuator</b>					
3.0-4.0 (2,6-3,4)	950 (66)	1900 (131)	1500 (103)	3100 (214)	N/A
4.3-6.5 (3,7-5,6)	550 (38)	1100 (76)	900 (62)	1900 (131)	N/A
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
<b>85M Actuator</b>					
3.0-4.0 (2,6-3,4)	1400 (97)	2900 (200)	2400 (165)	4800 (331)	N/A
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

\* ATO with positioner and 40 psi supply has same rating

\*\* 35M actuator available for 1/2" – 1-1/4" only

### Cv Versus Travel Chart (% Cv Versus % Travel)

Size	Type	5%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
1/2"-3/4"	Linear	8	12	21	31	40	50	61	72	83	91	100
	Equal Percentage	4	5	7	10	14	19	25	37	57	78	100
1"-2"	Linear	8	15	30	42	54	65	78	85	94	99	100
	Equal Percentage	2	3	6	10	16	24	34	49	73	95	100

### Pressure/Temperature Ratings

- Stainless Steel Body

Valve Size	Packing Material	Temperature, °F (°C)	PSIG (Bar) @ 100°F (38°C)
1/2" to 1" DN15 to DN25)	Standard	-20 to 450 (-29 to 232)	6000 (414)
	High Temp	-20 to 1000 (-29 to 538)	6000 (414)
1-1/4" & 1-1/2" (DN32 & DN40)	Standard	-20 to 450 (-29 to 232)	4000 (276)
	High Temp	-20 to 1000 (-29 to 538)	4000 (276)
2" (DN50)	Standard	-20 to 450 (-29 to 232)	2500 (172)
	High Temp	-20 to 1000 (-29 to 538)	2500 (172)

- Carbon Steel Body

Valve Size	Packing Material	Temperature, °F (°C)	PSIG (Bar) @ 100°F (38°C)
1/2" to 1" DN15 to DN25)	Standard	-20 to 450 (-29 to 232)	6000 (414)
	High Temp	-20 to 800 (-29 to 429)	6000 (414)
1-1/4" & 1-1/2" (DN32 & DN40)	Standard	-20 to 450 (-29 to 232)	4000 (276)
	High Temp	-20 to 800 (-29 to 429)	4000 (276)
2" (DN50)	Standard	-20 to 450 (-29 to 232)	2500 (172)
	High Temp	-20 to 800 (-29 to 429)	2500 (172)

- PVC or Kynar Body

Valve Size	Packing Material	Temperature, °F (°C)	PSIG (Bar) @ 100°F (38°C)
1/2" to 2" DN15 to DN50)	Standard	-20 to 140 (-29 to 60)	**

### Notes:

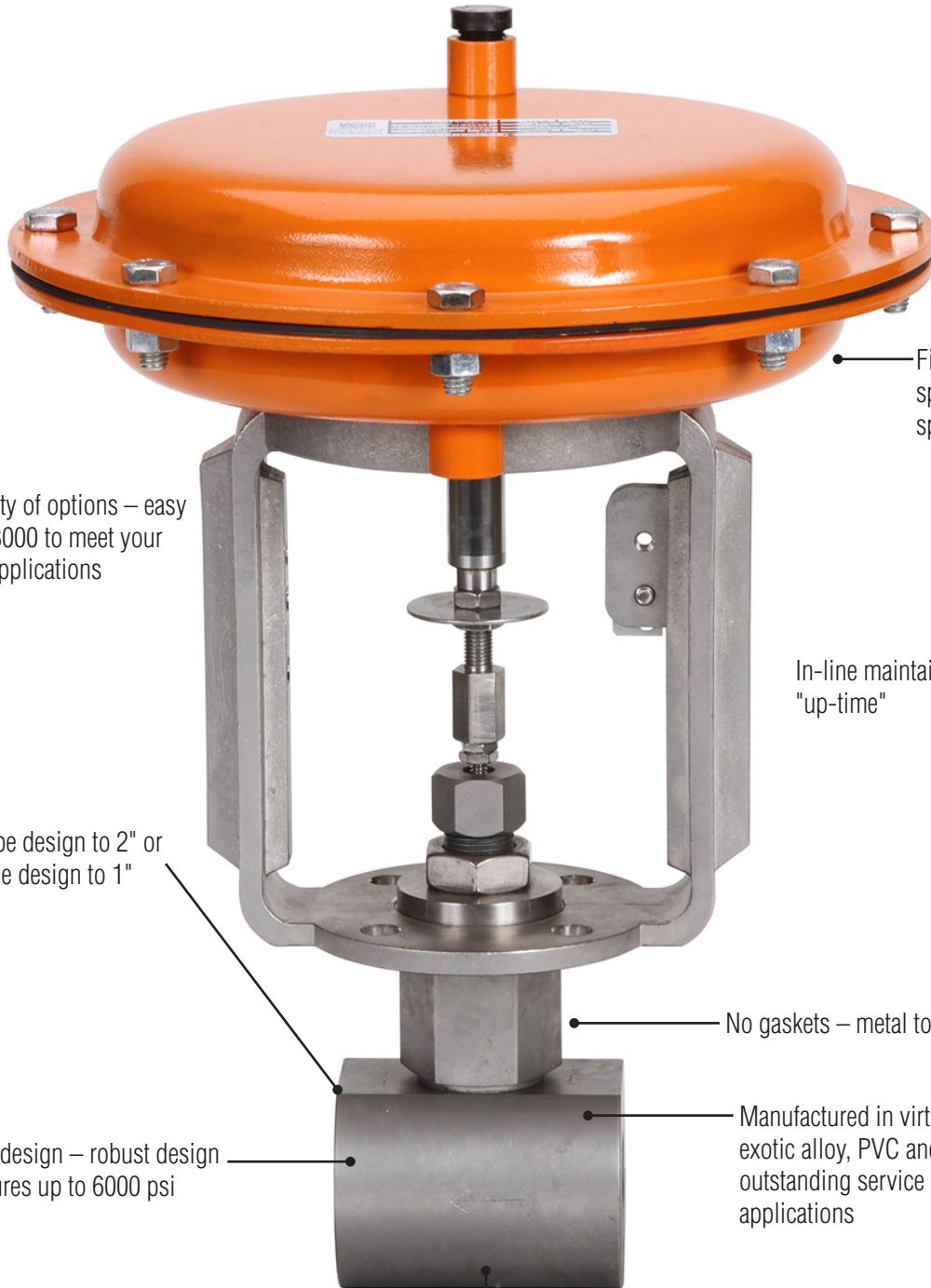
\* Actual pressure rating determined by end connection

\*\* Kynar: rated at 230 psig @ 100°F (16 bar @ 38°C); 185 psig @ 150°F (13 bar @ 66°C)

\*\* PVC: rated at 335 psig @ 100°F (23 bar @ 38°C); 110 psig @ 140°F (8 bar @ 60°C)

*For other materials, please consult factory*

**MARK 8000 SERIES FEATURES & BENEFITS**



Available in a variety of options – easy to specify a Mark 8000 to meet your most demanding applications

Field reversible multi-spring actuator. No special tools required

In-line maintainable – more process "up-time"

Globe design to 2" or angle design to 1"

No gaskets – metal to metal seals

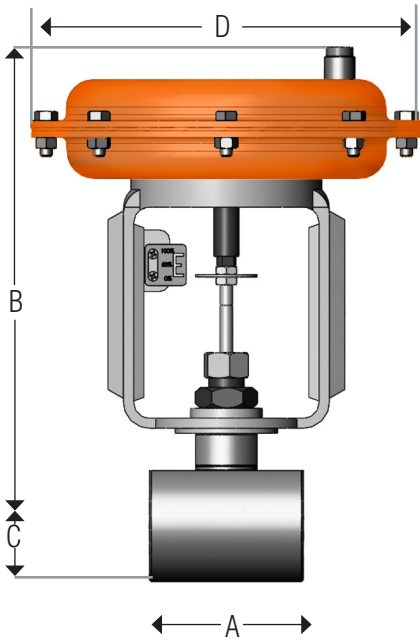
Barstock body design – robust design handles pressures up to 6000 psi

Manufactured in virtually any exotic alloy, PVC and Kynar – provides outstanding service life in corrosive applications

Body available in two way or three way configurations

## MARK 8000 SERIES DIMENSIONS

- Globe Design



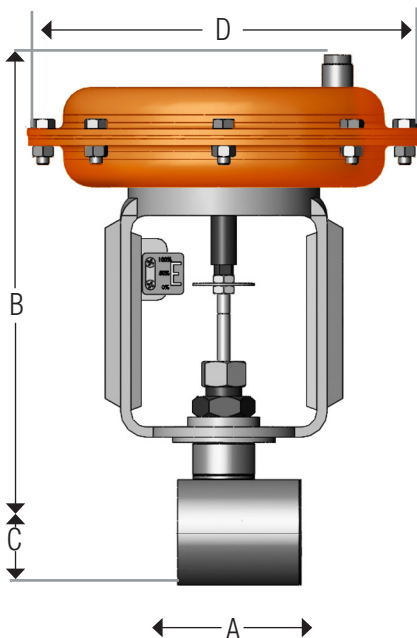
- Mark 8000 Series (with 35M actuator)

VALVE SIZE	DIMENSIONS				WEIGHT LBS
	A	B	C	D	
1/2"	3.00	11.62	1.25	9.50	19
3/4"	3.00	11.62	1.25	9.50	19
1"	3.75	11.62	1.50	9.50	21
1-1/4"	5.00	12.00	1.65	9.50	25
1-1/2"	4.75	13.62	2.00	9.50	29
2"	5.75	13.87	2.20	9.50	31

- Mark 8000 Series, Metric (with 35M actuator)

VALVE SIZE	DIMENSIONS				WEIGHT KGS
	A	B	C	D	
DN15	76	295	32	241	9
DN20	76	295	32	241	9
DN25	95	295	38	241	10
DN32	127	305	42	241	11
DN40	121	346	51	241	13
DN50	146	352	57	241	14

- Angle Design



- Mark 8000 Series Angle Valve

VALVE SIZE	DIMENSIONS			
	A	B	C	D
1/2"	1.38	11.62	1.00	9.50
3/4"	1.88	11.62	1.50	9.50
1"	1.88	11.62	1.44	9.50

- Mark 8000 Series Angle Valve, Metric

VALVE SIZE	DIMENSIONS			
	A	B	C	D
DN15	35	295	25	241
DN20	35	295	38	241
DN25	35	295	37	241

**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
BU	Bolt-thru for KN/PV
ZZ	Non-standard

3 & 4 BONNET/PACKING	
METAL BODIES	
ST	Standard/TFE
SH*	Standard/High Temperature
ET	8" Extended/TFE (Cryogenic)
EH*	8" Extended/High Temperature
BT	Multi-ply Bellows/TFE
BH**	Multi-ply Bellows/High Temperature
ZZ	No-standard
PLASTIC BODIES	
SB	Standard/TFE w/Buna-N Bonnet Gasket
SV	Standard/TFE w/Viton Bonnet Gasket
BB	Bolt-thru Body/TFE w/Buna
BV	Bolt-thru Body/TFE w/Viton
ZZ	Non-standard

\* Positioner recommended or high temperature packing

\*\* Positioner Required

# 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
PLASTIC BODIES	
A	Standard Body – Linear
B	Standard Body – Equal Percentage
C	Standard Body – Quick Opening
D	Bolt thru Body – Linear
E	Bolt thru Body – Equal Percentage
F	Bolt thru Body – Quick Opening
Z	Non-Standard
8000A/ATP/ASP & 8000T/TTP/TSP	
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 A-T-C		
R	Reverse A-T-O		

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		