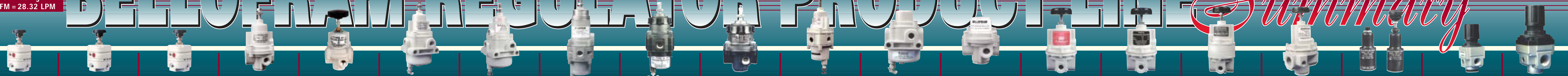


KEYS
INDICATES KEY SPECIFICATION OR CHARACTERISTIC FOR THAT REGULATOR
1 psig = 6.9 kPa
1 psig = 0.069 BAR
1 inch = 25.4 mm
1 lb. = .45 kg
1 SCFM = 28.32 LPM

BELLOFRAM REGULATOR PRODUCT LINE

Summary



SPECIFICATION CHARACTERISTIC	TYPE 10	TYPE 10HR / EXHR	TYPE 10LR	TYPE 40	TYPE 41	TYPE 50	TYPE 50 NACE	TYPE 51SS	TYPE 51FR	TYPE 51R	TYPE 51 CORROSIVE TEC	TYPE 60	TYPE 65	TYPE 70	TYPE 70BP	TYPE 77 VACUUM REGULATOR	TYPE 78	TYPE 91 TYPE 91 LOW BLEED	TYPE M1R / FR	TYPE M2R/FR
Sensitivity	1/8" Water Column	1/8" Water Column	1/8" Water Column	1" Water Column	1" Water Column	1" Water Column	1" Water Column	1" Water Column	1" Water Column	1" Water Column	1" Water Column	1" Water Column	1" Water Column	1/4" Water Column	1/8" Water Column	1/2" Water Column	1" Water Column	N/A	N/A	N/A
Flow Capacity @ 100 psig Supply and 20 psig outlet	14 SCFM	14 SCFM	4 SCFM at 50 psig supply and 10 psig outlet pressure	20 SCFM	25 SCFM	20 SCFM	20 SCFM	20 SCFM	20 SCFM	20 SCFM	20 SCFM	20 SCFM	20 SCFM	40, 50, or 80 SCFM	50 SCFM	2.5 SCFM @ 29" Hg Vacuum 40 SCFM @ 100 psig supply	200 SCFM	2.5 SCFM 1.4 SCFM	40 SCFM (70 psig outlet)	90 SCFM (70 psig outlet)
Effect of Supply Pressure variation (25 psig) on Outlet Pressure	< 0.005 psig	< 0.005 psig	< 0.005 psig	< 0.2 psig	± 0.35 psig	< 0.2 psig	< 0.2 psig	0.45 psig max	0.45 psig max	0.2 psig	0.45 psig	< 0.2 psig	< 0.2 psig	< 0.025 psig	N/A	< 0.1 psig	< 0.2 psig	< 0.25 psig < 0.5 psig	< 0.2 psig	< 0.2 psig
Exhaust Capacity (5 psig above 20 psig set point)	2 SCFM	10 SCFM / 15 SCFM	2 SCFM	0.1-0.45 SCFM Typical	0.1-0.45 SCFM Typical	0.1-0.45 SCFM Typical	0.1-0.45 SCFM Typical	0.1-0.45 SCFM Typical	0.1-0.45 SCFM Typical	0.1 SCFM Typical	0.1-0.45 SCFM Typical	0.1-0.4 SCFM Typical	0.1-0.4 SCFM Typical	4 SCFM	N/A	4 SCFM	14 SCFM	0.1-0.3 SCFM Typical	< 0.25 SCFM	< 0.25 SCFM
Max Supply Pressure	150 psig	150 psig	50 psig	250 psig	250 psig	250 psig	250 psig	250 psig	250 psig	250 psig	250 psig	250 psig	250 psig	250 psig	250 psig (system pressure)	250 psig	400 psig	250 psig / 150 psig	165 psig	165 psig
Effect of Changes in Flow on Regulated Pressure (100 psig Supply)	0.25 psig over change of 10 SCFM (2-25 psig range, and 10 psig set point)	0.25 psig over change of 10 SCFM (2-25 psig range, and 10 psig set point)	0.25 psig over change of 10 SCFM (2-25 psig range, and 10 psig set point)	2 psig over flow of 10 SCFM (0-30 psig range, 1/4" NPT, 20 psig set point)	1 psig over flow of 10 SCFM (0-30 psig range, 1/4" NPT, 20 psig set point)	4 psig over flow of 10 SCFM (0-30 psig range, 1/4" NPT, 20 psig set point)	4 psig over a flow of 10 SCFM (0-30 psig range, 1/4" NPT, 20 psig set point)	3 psig over flow of 10 SCFM (0-30 psig range, 1/4" NPT, 20 psig set point)	2.5 psig over flow of 10 SCFM (0-30 psig range, 1/4" NPT, 20 psig set point)	3 psig over flow of 10 SCFM (0-30 psig range, 1/4" NPT, 20 psig set point)	2.5 psig over flow of 10 SCFM (0-30 psig range, 1/4" NPT, 20 psig set point)	3 psig over flow of 10 SCFM (1/4" NPT, 0-20 psig range, 10 psig set point)	2.5 psig over flow of 10 SCFM (1/4" NPT, 0-20 psig range, 10 psig set point)	2.5 psig over flow of 50 SCFM (3/8" NPT, 0-30 psig range, 15 psig set point)	N/A	2.0 psig over flow of 10 SCFM (3/8" NPT, 0-30 psig range, 15 psig set point)	2.0 psig over flow of 50 SCFM (3/8" NPT 0-30 psig range, 30 psig set point)	N/A	6 psig over flow of 10 SCFM (1/4" NPT, 20 psig set point)	3.5 psig over flow of 10 SCFM (1/2" NPT, 20 psig set point)
Output Pressure Ranges	2-25 psig 2-60 psig 2-120 psig	2-120 psig	0.5-25 psig	0-30 psig 0-60 psig 0-120 psig	0-2 psig, 0-10 psig 0-30 psig, 0-60 psig 0-60 psig 0-120 psig	0-10 psig 0-30 psig 0-60 psig 0-120 psig	0-30 psig 0-60 psig	0-30 psig, 0-60 psig 0-100 psig, 2-150 psig	0-30 psig 0-60 psig 0-100 psig	0-30 psig 0-60 psig 0-100 psig	0-30 psig 0-60 psig 0-120 psig	0-20 psig 20-40 psig 40-60 psig	0-20 psig 20-40 psig 40-60 psig	0-2 psig, 0-10 psig 0-30 psig, 3-200 psig 1-60 psig, 2-150 psig	0-2 psig, 0-10 psig 0-30 psig, 0-60 psig, 0-150 psig	Vacuum To: 2 psig, 10 psig, 30 psig, 100 psig, 150 psig	0-2 psig, 0-10 psig, 0-30 psig, 0-60 psig, 0-125 psig	0-5 psig, 0-10 psig 0-30 psig, 0-60 psig 0-100 psig	0-10 psig 0-30 psig 0-60 psig 0-120 psig	0-10 psig 0-30 psig 0-60 psig 0-120 psig
Total Air Consumption @ Maximum Output	8 SCFH	8 SCFH	8 SCFH	6 SCFH	6 SCFH (20 psi output)	6 SCFH	6 SCFH	6 SCFH	6 SCFH	6 SCFH	6 SCFH	6 SCFH	6 SCFH	from 1.0 to 12.5 SCFH	N/A	6 SCFH	12 SCFH	3 SCFH 0.3 SCFH	0.3 SCFH	0.3 SCFH
Port Size	1/8", 1/4", 3/8" NPT, BSPT	1/8", 1/4", 3/8", NPT, BSPT	1/4" NPT, BSPT	1/4" NPT, BSPT	1/4" NPT, BSPT	1/4" NPT, BSPT	1/4" NPT, BSPT	1/4", 3/8" NPT, BSPT	1/4" NPT, BSPT	1/4" NPT, BSPT	1/4" NPT, BSPT	1/4" NPT, BSPT	1/4" NPT, BSPT	1/4", 3/8", 1/2" NPT, BSPT	1/4", 3/8", 1/2" NPT, BSPT	1/4", 3/8" NPT, BSPT	3/8", 1/2", 3/4", 1" NPT, BSPT	1/16" - 27 NPT/ 5mm	1/8", 1/4" NPT	1/4", 3/8", 1/2" NPT
Size	2.06" X 2.06" X 4.26"	2.06" X 2.06" X 4.26"	2.06" X 2.06" X 4.26"	2.5" X 2.5" X 5.63"	2.5" X 2.5" X 5.75"	3.19" X 3.19" X 7.25"	3.19" X 3.19" X 7.25"	2.5" X 2.5" X 8.14"	2.5" X 2.5" X 6.95"	2.5" X 2.5" X 4.59"	2.5" X 2.5" X 8.1"	3.19 X 3.19 X 4.70	2.5" X 2.5" X 3.13"	3.0" X 3.0" X 6.0"	3.0" X 3.0" X 6.0"	3.0" X 3.0" X 7.25"	3.82" X 3.82" X 7.5"	.875" X .875" X 3.33"	M1R - 1.6 X 1.7 X 3.5" M1FR - 1.6 X 1.7 X 6.4"	M2R - 2.5 X 2.5 X 5.4" M2FR - 2.5 X 2.5 X 9.4"
Weight	1.4 lb.	1.4 lb.	1.4 lb.	0.82 lb.	0.84 lb.	1.81 lb.	1.81 lb.	3.0 lb.	1.09 lb.	0.58 lb.	1.1 lb.	1.59 lb.	0.69 lb.	1.41 lb.	1.5 lb.	1.92 lb.	5.0 lb.	2.2 oz.	M1R-0.4 lb. / M1FR-0.6 lb.	M2R - 1.0 lb. M2FR - 1.6 lb.
Materials of Construction	Body: Diecast zinc alloy with vinyl paint Capsule and Adjusting Screw: Stainless steel Trim: Stainless steel, brass, plated steel, acetal resin Diaphragm: Buna-N elastomer and polyester fabric Knob: Phenolic Plastic	Body: Diecast zinc alloy with vinyl paint Capsule and Adjusting Screw: Stainless steel Trim: Stainless steel, brass, plated steel, acetal resin Diaphragm: Buna-N elastomer and polyester fabric Knob: Phenolic Plastic	Body: Diecast zinc alloy with vinyl paint Capsule and Adjusting Screw: Stainless steel Trim: Stainless steel, brass, plated steel, acetal resin Diaphragm: Buna-N elastomer and polyester fabric Knob: Phenolic Plastic	Body: Diecast aluminum with vinyl paint Adjusting Screw: Plated steel Trim: Plated steel, brass, acetal resin Diaphragm: Buna-N elastomer and polyester fabric Knob: Phenolic Plastic (option) Spring: Music wire	Body: Diecast aluminum with vinyl paint Adjusting Screw: Plated steel Trim: Plated steel, brass, acetal resin Diaphragm: Buna-N elastomer and polyester fabric Knob: Phenolic Plastic Spring: Music wire	Body: Diecast aluminum with vinyl paint Adjusting Screw: Plated steel Trim: Plated steel, brass, acetal resin Diaphragm: Buna-N elastomer and polyester fabric Knob: Phenolic Plastic (option) Spring: Music wire	Body: Diecast aluminum with epoxy paint Adjusting Screw: Stainless Steel Trim: Stainless Steel, Neoprene, EPDM Diaphragm: Neoprene and Polyester fabric Spring: Inconel X-750	Body: 316 Stainless steel Adjusting Screw: Plated steel Trim: 316 SS, Polyethylene sulfide Diaphragm: Fluorocarbon and polyester fabric Spring: Inconel X-750	Body: Diecast aluminum with vinyl paint Adjusting Screw: Plated steel Trim: Plated steel, acetal resin, Buna-N (o-ring) Diaphragm: Buna-N elastomer and polyester fabric Knob: Phenolic plastic (option) Spring: Music wire	Body: Diecast aluminum with vinyl paint Adjusting Screw: Plated steel Trim: Plated steel, brass, acetal resin, Polyphenylene Sulfide, Fluorocarbon, Cellulose Diaphragm: Buna-N elastomer and polyester fabric Knob: Phenolic plastic (option) Spring: Music wire	Body: Aluminum Alloy Adjusting Screw: Stainless Steel Trim: Stainless Steel, Acetal, Polyphenylene Sulfide, Fluorocarbon, Cellulose Diaphragm: Buna-N elastomer and polyester fabric Knob: None Spring: Inconel X-750	Body: Diecast aluminum with vinyl paint Adjusting Screw: Plated steel Trim: Plated steel, brass, acetal resin Diaphragm: Buna-N elastomer and polyester fabric Knob: None Spring: Music wire	Body: Diecast aluminum with vinyl paint Adjusting Screw: Plated steel Trim: Plated steel, brass, acetal resin Diaphragm: Buna-N elastomer and polyester fabric Knob: Phenolic plastic Spring: Music wire	Body: Diecast aluminum with vinyl paint Adjusting Screw: Plated steel Trim: Plated steel, brass, acetal resin Diaphragm: Buna-N with polyester fabric Knob: Phenolic plastic Spring: Music wire	Body: Diecast aluminum with vinyl paint Adjusting Screw: Plated steel Trim: Acetal, brass, plated steel, nitrile Diaphragm: Buna-N with polyester fabric Knob: Phenolic plastic Spring: Music wire	Body: Diecast aluminum with vinyl paint Adjusting Screw: Plated steel Trim: Stainless steel, brass plated steel, Acetal and Buna-N Diaphragm: Buna-N with polyester fabric Knob: Phenolic plastic Spring: Music wire	Body: Diecast zinc with vinyl paint Adjusting Screw: Plated steel Trim: Brass, plated steel Diaphragm: Buna-N with polyester fabric Knob: Phenolic plastic Spring: Music wire	Body: Anodized aluminum Adjusting Screw: Plated steel Trim: Brass, Acetal Diaphragm: Fluorocarbon with polyester fabric Knob: Acetal resin Spring: Music wire	Body: Diecast Aluminum with Vinyl Paint Adjusting Screw: Plated Steel Trim: Aluminum, Engineered Plastic, Plated Steel Diaphragm: Buna-N with Polyester Fabric Knob: Engineered Plastic Spring: Music wire	Body: Diecast Aluminum with Vinyl Paint Adjusting Screw: Plated Steel Trim: Aluminum, Engineered Plastic, Plated Steel Diaphragm: Buna-N with Polyester Fabric Knob: Engineered Plastic Spring: Music wire
Preset Pressure	Yes	Yes	Yes	No	No	No	No	No	No	No	No	Standard	Standard	No	No	No	No	No	No	No
Tamper Proof Cover Option	Yes	Yes	Yes	Yes	No	Yes	Yes	No	No	No	Yes	Standard	Standard	Yes	Yes	No	Yes	No	Yes	Yes
Filter / Dripwell	No	No	No	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	No	No	No	No	No	No	M1R - No / M1FR - Yes	M2R - No / M2FR - Yes
Mounting Options	Pipe or Panel	Pipe or Panel	Pipe or Panel	Pipe, Panel or Bracket	Pipe, Panel or Bracket	Pipe Panel, Bracket or Thru Body Holes	Pipe Panel, Bracket or Thru Body Holes	Pipe, Panel or Bracket	Pipe, Panel or Bracket	Pipe, Panel or Bracket	Pipe, Panel or Bracket	Pipe, Bracket or Thru Body Holes	Pipe or Bracket	Pipe, Panel or Bracket	Pipe, Panel or Bracket	Pipe, Panel or Bracket	Pipe, Panel or Bracket	Pipe or Panel	Pipe, Panel or Bracket	Pipe, Panel or Bracket

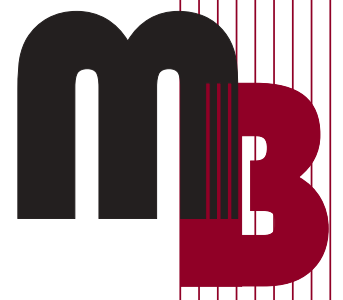
I/P & E/P

Electro-Pneumatic Transducers



Product Line Summary

SPECIFICATION CHARACTERISTIC	TYPE 1000 SERIES	TYPE 1000 SERIES EXTENDED RANGE	TYPE 1001 SERIES	TYPE 1500 SERIES	TYPE 1500 SERIES ZERO BASED	TYPE 2000 SERIES	SPC 1R, 2R, 4R	TYPE 3110 [3111]	TYPE 3200 SERIES	TYPE 3500 SERIES	SPECIFICATION CHARACTERISTIC
E/P Supply Requirements	loop-powered	loop-powered	9-28 (1/5), 9-40 VDC (<20mA)	loop-powered	loop-powered	5-28 VDC	15-24 VDC (80-325 mA)	15-24 VDC (80-250 mA) [24 VDC or 24 VAC]	15-24 VDC (80-325 mA)	15± 10% VDC, 24± 10% VDC (80-325 mA)	E/P Supply Requirements
I/P Supply Requirements	loop-powered	loop-powered	loop-powered	loop-powered	loop-powered	loop-powered	15-24 VDC (80-325 mA)	15-24 VDC (80-250 mA) [24 vdc or 24 VAC]	15-24 VDC (80-325 mA)	15-24 VDC (80-325 mA)	I/P Supply Requirements
Voltage Input Ranges (DC)	0-5, 1-9, 0-10, 1-5	0-5, 0-10	0-5, 1-5, 1-9, 0-10, 1-10	0-5, 1-9, 1-10, 0-10, 1-5	0-5, 1-9, 1-10, 0-10, 1-5	0-5, 1-9, 1-10, 0-10	0-10	0-10 [0-5, 0-10, 0-15]	0-10	0-10	Voltage Input Ranges (DC)
Impedance Voltage (ohms)	530-985	500-805	>6 K	250	250	1.75 K	10 K	10 K [2K - 100K]	10 K	2 K - 8 K	Impedance Voltage (ohms)
Current Input Ranges (mA)	4-20, 10-50	4-20, 0-60	4-20, 10-50	4-20	4-20	4-20	4-20	4-20 [0-20]	4-20	0-20, 4-20	Current Input Ranges (mA)
Impedance Current (ohms)	70-220	220-260	240-500	250	250	195 @ 20 mA DC	250	250	250	250	Impedance Current (ohms)
Analog Monitor Output	no	no	no	no	no	no	option	yes	yes	yes	Analog Monitor Output
Logic Output	no	no	no	no	no	no	option	yes [no]	yes	option	Logic Output
Internal Feedback (closed loop)	no	no	yes	no	no	yes	yes	yes	yes	yes	Internal Feedback (closed loop)
External Feedback	no	no	no	no	no	no	yes	option [no]	option	option	External Feedback
Reverse Acting	yes	yes	no	yes	yes	yes	yes	option	option	yes	Reverse Acting
Minimum Supply Pressure (psi)	3 psig above output	5 above output	see product literature	5 above output	10 above output	5 psi above output or 40 psi	100% of output	100% of output	100% of output	100% of output	Minimum Supply Pressure (psi)
Maximum Supply Pressure (psi)	100	150	see product literature	120	150	140	110% of output	See product literature	See product literature	See product literature	Maximum Supply Pressure (psi)
Output Pressure Range(s) (psi)	3-9, 9-15, 3-15, 3-27, 6-30, 1-17, psi and 0.2-1.0 BAR	2-60, 2-120, 3-120	0-5, 0-15, 0-30, 0-60, 0-100, 1-17, 3-15, 3-27, 6-30, 3-9, 9-15, 0-2, 0-120	3-15, 3-27, 6-30	0-15, 0-30, 0-60, 0-120	0-2, 0-5, 0-15, 3-15, 1-17, 0-30, 6-30, 3-27, 0-60, 0-100, 0-120	0-1, 0-5, 0-15, 0-30, 0-100, 0-300, 0-600	0-1, 0-5, 0-15, 0-30, 0-100, 0-150, (0-300, 0-600 in T3110 only)	0-1, 0-5, 0-15, 0-30, 0-100, 0-150, (0-300, 0-600 in T3210 only)	0-1, 0-5, 0-15, 0-30, 0-100, 0-150, (0-300, 0-600 in T3510 only)	Output Pressure Range(s) (psi)
Flow Rate (scfm)	12	24	14	6.5	9	21	1.2	1.2	1.2, 12, 50	1.2, 12, 50	Flow Rate (scfm)
@ supply (psi)=	100	150	100	120	150	140	110				@ supply (psi)=
@ output (psi)=	midrange	midrange	9	15	15	60	80				@ output (psi)=
Exhaust Capacity (scfm) @ 5 psid	2 (7 on HR version)	2	4.6	>1.0	>1.0	3.0	1.2	1.2	T3210 - 1.2, T3211 - 10 & T3212 - 15	T3510 - 1.2, T3511 - 10 & T3512 - 15	Exhaust Capacity (scfm) @ 5 psid
Exhaust Capture	option	option	option	option	option	option	yes	yes	option	option	Exhaust Capture
Air Consumption (scfh) @ midrange	6	4.2	4.2	3	18 (max. output)	4	negligible	negligible	negligible	negligible	Air Consumption (scfh) @ midrange
Repeatability (% of span, typ.)	0.5	0.5	0.1	<0.5	<0.5	0.1	0.2	0.2	0.2	0.1 to 0.2	Repeatability (% of span, typ.)
Independent Linearity (% of span, typ.)	1.0	1.5-2.0	<0.75	<0.75	<1.0	0.1	0.1	0.2	0.2	0.1 to 0.2	Independent Linearity (% of span, typ.)
Hysteresis (% of span, typ.)	1.0	0.5	0.1	<0.75	<1.0	0.1	0.5	0.5	0.5	0.1 to 0.5	Hysteresis (% of span, typ.)
Accuracy (% of span, typ.)			0.1			0.1	0.5	0.5	0.5	0.1 to 0.5	Accuracy (% of span, typ.)
Operating Temp (°C)	-29° to 60°	-29° to 60°	-29° to 71°	-28° to 66°	-28° to 66°	-28° to 71°	0° to 50°	0° to 60°	0° to 60°	0° to 60°	Operating Temp (°C)
Output Gauge Port	yes	yes	yes	yes	yes	yes	no	no	yes	yes	Output Gauge Port
Weight (lbs.)	2.1	2.1	1.0	1.3	1.6	1.4	1.9	0.5	T3210 - 1.2, T3211 - 1.4, T3212 - 2.0	T3511 - 1.2, T3511 - 1.4, T3512 - 2.0	Weight (lbs.)
Width (in.) – Depth (in.) – Height (in.)	2½" – 2½" – 4"	2½" – 2½" – 4"	1.9" – 3.5" – 4"	1.5" – 3.2" – 3.7"	1.5" – 3.2" – 5.2"	2.3" – 2.9" – 4.9"	3" – 3" – 4.4"	2.2" – 2.0" – 2.8"	2.3" – 2.3" – 5" max.	2.3" – 2.3" – 5" max.	Width (in.) – Depth (in.) – Height (in.)
Supply Port	1/4" NPT	1/4" NPT	1/4" NPT	1/4" NPT	1/4" NPT	1/4" NPT	1/8" NPT Female	1/8" NPT	1/8", 1/4", 3/8" NPT	1/8", 1/4", 3/8" NPT	Supply Port
Output Port	1/4" NPT	1/4" NPT	1/4" NPT	1/4" NPT	1/4" NPT	1/4" NPT	1/4" NPT Male & 1/8" NPT Female	1/8" NPT	1/8", 1/4", 3/8" NPT	1/8", 1/4", 3/8" NPT	Output Port
Tapped Exhaust Port	option	option	option	option	option	option	1/8" NPT Female	1/8" NPT	No. 10-32 UNF-2B	No. 10-32 UNF-2B	Tapped Exhaust Port
Electrical Port (STD)	1/2" NPT	1/2" NPT	1/2" NPT	1/2" NPT	1/2" NPT	1/2" NPT	Micro-Style	Terminal Block	micro style 6 pin micro	micro style 6 pin micro	Electrical Port (STD)
Electrical Connections (option)	Terminal Block, Din 43650-A	Terminal Block, Din 43650-A	Din 43650-A	DIN 43 650-A, Term Blk, 1/2" BSPT	DIN 43 650-A, Term Blk, 1/2" BSPT	DIN 43 650-A, Term Blk	DIN 43 650-A, Amphenol				Electrical Connections (option)
Mounting Options	Pipe, Panel, Bracket or DIN-rail	Pipe, Panel, Bracket or DIN-rail	Pipe, Panel, bracket, valve, DIN-rail	Inline, pipe, panel, DIN-rail, manifold	Inline, pipe, panel, DIN-rail, manifold	Pipe, panel, bracket, valve, DIN-rail, manifold	Bracket or Air-piloted Regulator	DIN-rail, Panel, Manifold	Pipe, Panel, Bracket (3211 - manifold)	Pipe, Panel, Bracket (3511 - Manifold)	Mounting Options
Mounting Orientation Insensitivity	some	some	excellent	some	some	excellent	excellent	excellent	excellent	excellent	Mounting Orientation Insensitivity
Vibration / Shock Insensitivity	some	some	excellent	good	good	excellent	excellent	excellent	excellent	excellent	Vibration / Shock Insensitivity
External Span / Zero Adjustment	yes	yes	no	yes	yes	no	no	yes	no	yes (electronic)	External Span / Zero Adjustment



Electrical Specifications

Performance Specifications

Physical Specifications