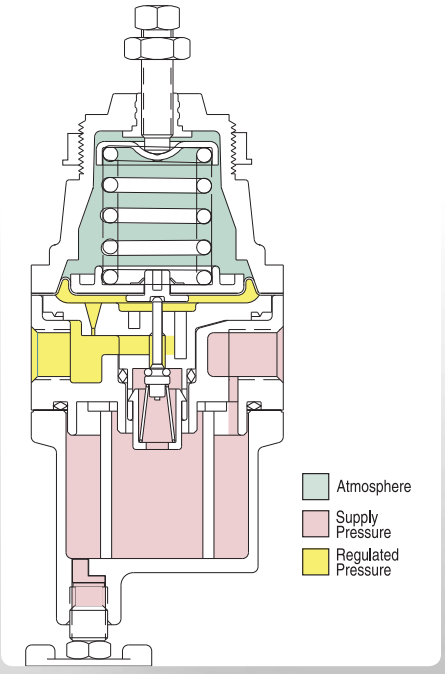
Type 51

Pressure Regulator Series

Features

- Excellent regulation, stability and repeatability
- Corrosion-resistant construction (no brass components, Type 51FR and Type 51AFR)
- NACE Constructed (Type 51FRCT Corrosive Tec)
- Low droop
- Small package size
- Panel, bracket or pipe mounting
- Fluorocarbon pintle seat (Type 51FR, Type 51AFR and Type 51FRCT)
- Auto drain option (Type 51AFR)
- Meets ATEX ⟨Ex⟩ II 2 G Dc T 6 (Non-electrical certification)



Description

The Bellofram Type 51 Precision Air Regulator series offers a high-performance regulator in a compact, low cost package. It operates in output pressure ranges up to 100 PSIG / 6.9 BAR (120 PSIG / 8.3 BAR in T-51FR Corrosive Tec), with a maximum supply pressure of 250 psi (17.3 BAR).

Materials of Construction for Standard Type 51 Series Regulators

Diecast aluminum for the body and dripwell; glass-reinforced thermoplastic polyester for the bonnet; acetal resin for the internals; BUNA-N for the diaphragm, gaskets and O-ring, fluorocarbon for the pintle seat, and aluminum for the drain valve (plated steel handle).

Materials of Construction for Corrosive Tec Type 51FRCT

Aluminum alloy bonnet, body, and filter bowl, 316 stainless steel internals, Inconel alloy range spring, nitrile diaphragm (fluorocarbon optional), 316 stainless steel valve assembly, and finished with an epoxy paint. All metallic parts for this unit conform to NACE material requirements #MR-01-75.

Materials of Construction for 51FRWT

Aluminum alloy bonnet, body, and filter bowl, acetal resin, plated steel and aluminum internals. Nitrile diaphragm and finished with an vinyl paint.

From industry to industry, Marsh Bellofram's Type 51 Series of Regulators offer a low-cost, high performance option for a wide range of applications.

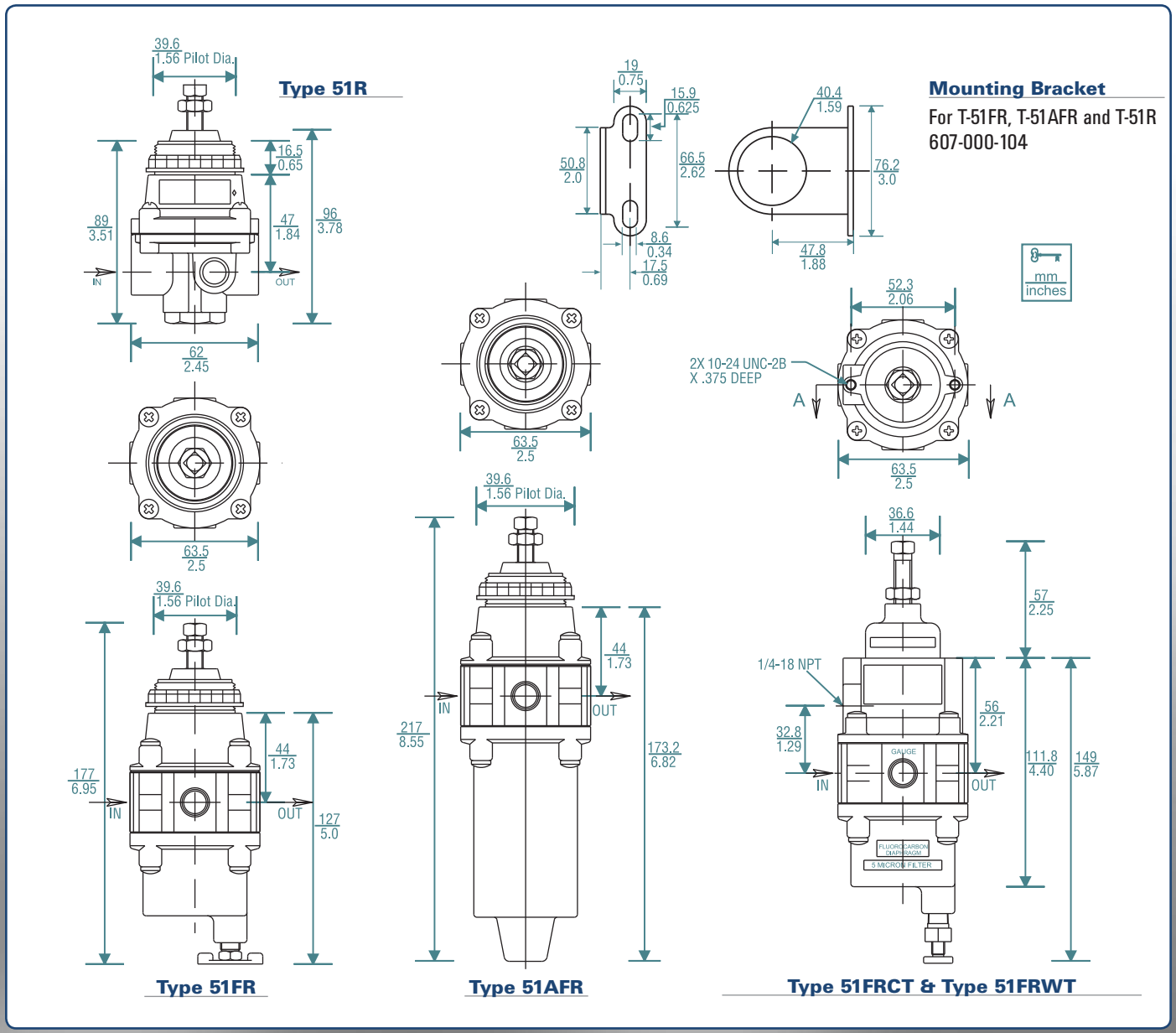
Type 51 Options

	• = option is available s = option is standard	Type 51FRWT	Type 51R	Type 51FR	Type 51AFR	Type 51FRCT
1	Fluorocarbon Pintle		•	s	s	s
2	Non-Relieving	•	•	•	•	•
3	Knob Sq. Head Adj. Screw	•	• s	• s	• s	 s
4	5 Micron Filter			•	•	•
5	Epoxy Finish	•	•	•	•	s
6	Tapped Vent Coalescing Filter	•			 •	s
7	Mounting Bracket	•	•	•	•	•
8	Pressure Gauge	•	•	•	•	•
9	Tamper Resistant Cover Panel Nut Mount	•	 s	 s	 s	•
10	Soft Relief Seat Low Bleed					 •
11	Fluorocarbon Diaphragm		•	•	•	•

These regulators are available standard (Type 51R) or as filter-regulators (Type 51FR and Type 51FRCT) and are even available with an automatic drain, for automated flushing out of contaminants (Type 51 AFR). These versatile regulators provide excellent regulation for a wide range of applications, including pneumatic instruments, controllers, chucks, and actuators. They can be through-panel mounted with the supplied mounting nut, bracket-mounted with the optional bracket or, due to their light weight, mounted by their ports. The Corrosive Tec is supplied with a tapped bonnet vent, to allow for the capture of exhaust air.

	Type 51R	Type 51FR Filter and Type 51AFR Auto Filter	Type 51FRCT Corrosive Tec	Type 51FRWT
Maximum Supply Pressure	250 PSIG (17.3 BAR)	250 PSIG (17.3 BAR)	250 PSIG (17.3 BAR)	250 PSIG (17.3 BAR)
Output Pressure Range	0-30 PSIG (0-2.1 BAR) 0-60 PSIG (0-4.1 BAR) 0-100 PSIG (0-6.9 BAR)	0-30 PSIG (0-2.1 BAR) 0-60 PSIG (0-4.1 BAR) 0-100 PSIG (0-6.9 BAR)	0-30 PSIG (0-2.1 BAR) 0-60 PSIG (0-4.1 BAR) 0-120 PSIG (0-8.3 BAR)	0-30 PSIG (0-2.1 BAR) 0-60 PSIG (0-4.1 BAR) 0-120 PSIG (0-8.3 BAR)
Supply Pressure Sensitivity @ 25 psig / 1.7 BAR change in supply	0.20 PSIG (0.01 BAR) output change	0.45 PSIG (0.03 BAR) output change	0.45 PSIG (0.03 BAR) output change	0.45 PSIG (0.03 BAR) output change
Sensitivity	1" (2.5 cm) of water	1" (2.5 cm) of water	1" (2.5 cm) of water	1" (2.5 cm) of water
Repeatability	0.1 PSIG (0.01 BAR)	0.1 PSIG (0.01 BAR)	0.1 PSIG (0.01 BAR)	0.1 PSIG (0.01 BAR)
Flow @ 100 psig (6.9 BAR) Supply 20 psig (1.4 BAR) outlet	15 SCFM (425 LPM)	20 SCFM (566 LPM)	20 SCFM (566 LPM)	20 SCFM (566 LPM)
Exhaust Capacity @ 5 psig (0.34 BAR) above setpoint	0.1 SCFM (2.8 LPM)	0.1 SCFM (2.8 LPM)	0.1 SCFM (2.8 LPM)	0.1 SCFM (2.8 LPM)
Temperature Range	-0 to 125˚F (-18 to 52˚C)	-0 to 125˚F (-18 to 52˚C)	0 to 180˚F (-18 to 82˚C)	-40 to 185˚F (-40 to 85˚C)
Air Consumption	6 SCFH (2.84 LPM) Maximum	6 SCFH (2.84 LPM) Maximum	6 SCFH (2.84 LPM) Maximum	6 SCFH (2.84 LPM) Maximum
Port Size	1/4 NPT	1/4 NPT	1/4 NPT	1/4 NPT
Materials of Construction	Aluminum, Plated Steel, Brass, Acetal Resin, Buna-N /Polyester, Music Wire	Aluminum, Plated Steel, Acetal Resin, Buna-N / Polyester, Music Wire, Fluorocarbon	Aluminum, Stainless Steel, Inconel, Buna-N / polyester, Fluorocarbon, acetal, polyphenylene sulfide	Aluminum, Plated Steel, Acetal Resin, Buna-N /Polyester, Music Wire

Type 51R, 51FR, 51AFR and 51FRCT Dimensional Drawings



Type 51 Ordering Information

	Part Number	Port Size (NPT)	Set Point Range	
			BAR	psig
T51R	960-222-000	1/4	0-2.1	0-30
	960-223-000		0-4.1	0-60
	960-224-000		0-6.9	0-100
T51FR	960-175-000	1/4	0-2.1	0-30
	960-176-000		0-4.1	0-60
	960-177-000		0-6.9	0-100
T51AFR	960-284-000	1/4	0-2.1	0-30
	960-285-000		0-4.1	0-60
	960-286-000		0-6.9	0-100
T51 FRCT	960-303-000	1/4	0-2.1	0-30
	960-304-000		0-4.1	0-60
	960-305-000		0-8.3	0-120
T51 FRWT	960-048-000	1/4	0-2.1	0-30
	960-049-000		0-4.1	0-60
	960-050-000		0-8.3	0-120

Type 51 Option Ordering Matrix

Replace last three digits of part number with digits from table below.

Option		1	2	3	4	5	6	7	8	9	10	11
1	Fluorocarbon Pintle	001	021	031	041	051	061	071	081	091	101	111
2	Non-Relieving		002	032	042	052	062	072	082	092		112
3	Knob			003	043	053	063	073	083		103	113
4	5 Micron Filter				004	054		074	084	094	104	114
5	Epoxy Finish					005	065	075	085	095	105	115
6	Coalescing Filter (Type 51AFR only)						006	076	086	096	106	116
7	Mounting Bracket							007	087	097	107	117
8	Pressure Gauge								008	098	108	118
9	Tamper-Resistant Cover									009	109	119
10	Soft Relief Seat										010	110
11	Fluorocarbon Diaphragm											011

Type 51 Regulator Options and Accessories

Non-Relieving

Used in applications where it is desirable to relieve pressure downstream and not at the regulator. Non-relieving regulators should not be used for low or no flow applications.

Knob

Replaces the standard square head adjusting screw. (except Type 51FRCT)

5 Micron Filter

Replaces the 40 micron filter for more complete air filtration. (Except Type 51R)

Epoxy Finish

An epoxy paint applied to the body and dripwell of the regulator exterior surfaces to provide increased corrosion resistance. (Standard for Type 51FRCT)

Mounting Bracket

Plated steel bracket for side mounting. (316 SS for Type 51FRCT)

Coalescing Filter

Replaces the 40 micron filter for both moisture and particulate filtration. (Type 51AFR only)

Pressure Gauge

Dual scale (psi/kPa) 2" (50mm) gauges. Ranges include 0-60 psi (0-4.1 BAR), 0-100 psi (0-6.9 BAR) and 0-120 psi (0-8.3 BAR). When specified with regulator, the correct range will be supplied.

Fluorocarbon Elastomers

Diaphragm, as well as gaskets and O-rings, are made with a special elastomer to prevent deterioration from elements in the air supply, such as flame retardant synthetic lubricants normally destructive to the standard BUNA-N material.

Tamper Resistant Cover

A 316 stainless steel hexagonal cover placed over the adjusting screw and threaded onto the bonnet of the regulator with a wrench, prevents ordinary hand adjustments. Supplied with an O-ring that is designed to seal the adjusting screws threads in captured bleed applications. (T-51FRCT and T-51FRWT)

Low Bleed Diaphragm (Soft Relief Seat)

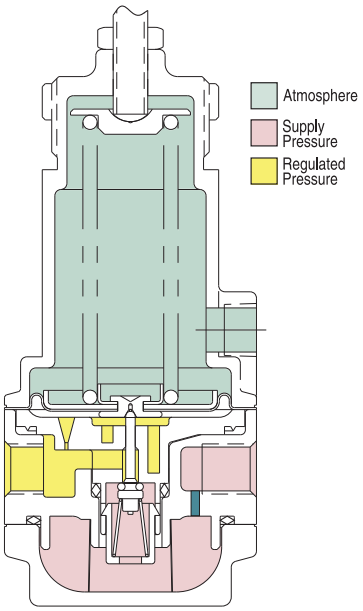
Used in applications where it is desirable to minimize the standard bleed rate of the regulator while maintaining the ability to relieve excess pressure at the regulator. Bleed rate is reduced from less than 6 SCFH (2.8 LPM) to less than 0.1 SCFH (0.05 LPM). (Type 51FRCT only)

Type 51 Stainless Steel

Pressure Regulator Series

Features

- Ideal for sour gas and corrosive applications or environments
- Excellent stability and repeatability
- Low droop
- Tapped vent for exhaust gas capture
- Built-in filter assemblies and dripwells
- Manual or automatic drain options
- Filter only assemblies available
- Panel, bracket or pipe mounting



Description

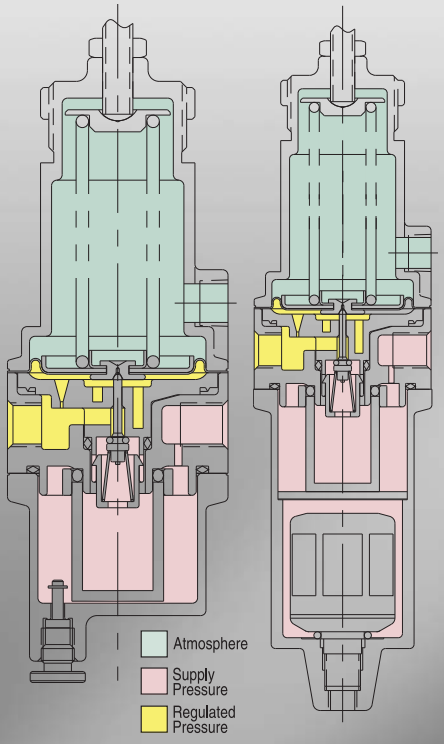
The Type 51SS regulator product line is designed for service with a wide variety of corrosive gases and environments. Special construction features include 316 stainless steel for the housing and filter assemblies, with fluorocarbon elastomers used for the control diaphragm and the supply valve.

These corrosion resistant materials are compatible with sour gas and for use in off-shore environments. Typical applications include petrochemical processing, chemical plants, food processing and paper/pulp mills.

This ruggedly built regulator operates in pressure ranges up to 150 PSIG (10.3 BAR). The Type 51SSFR and Type 51SSAR Regulators and the Type 51SSF and Type 51SSAF filter assemblies have built-in dripwells which trap water, oil and other contaminants. The contaminants are easily flushed out of the dripwell via a convenient manual or automatic drain valve. The 40-48 Micron Filter is constructed of sintered 316 stainless steel, and is easily removed.

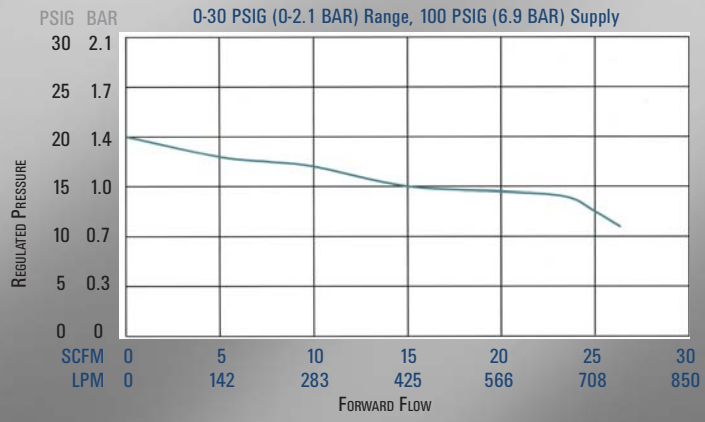
The Type 51SS products can be through-panel mounted with the mounting nut supplied (regulators only), bracket-mounted using the optional bracket (regulators only), or pipe mounted by its ports (regulators and filters).

The regulators and filter assemblies comply with NACE material requirement #MR-01-75 for sulfide stress cracking resistant metallic material for oil field equipment.



Once set to a desired pressure, the Marsh Bellofram Type 51 Stainless Steel Regulators maintain their settings permanently. The integral convoluted diaphragm provides constant adjustment to downstream pressure drop, downstream pressure increase and changes in forward flow.

Type 51SS: Regulated Pressure VS. Flow

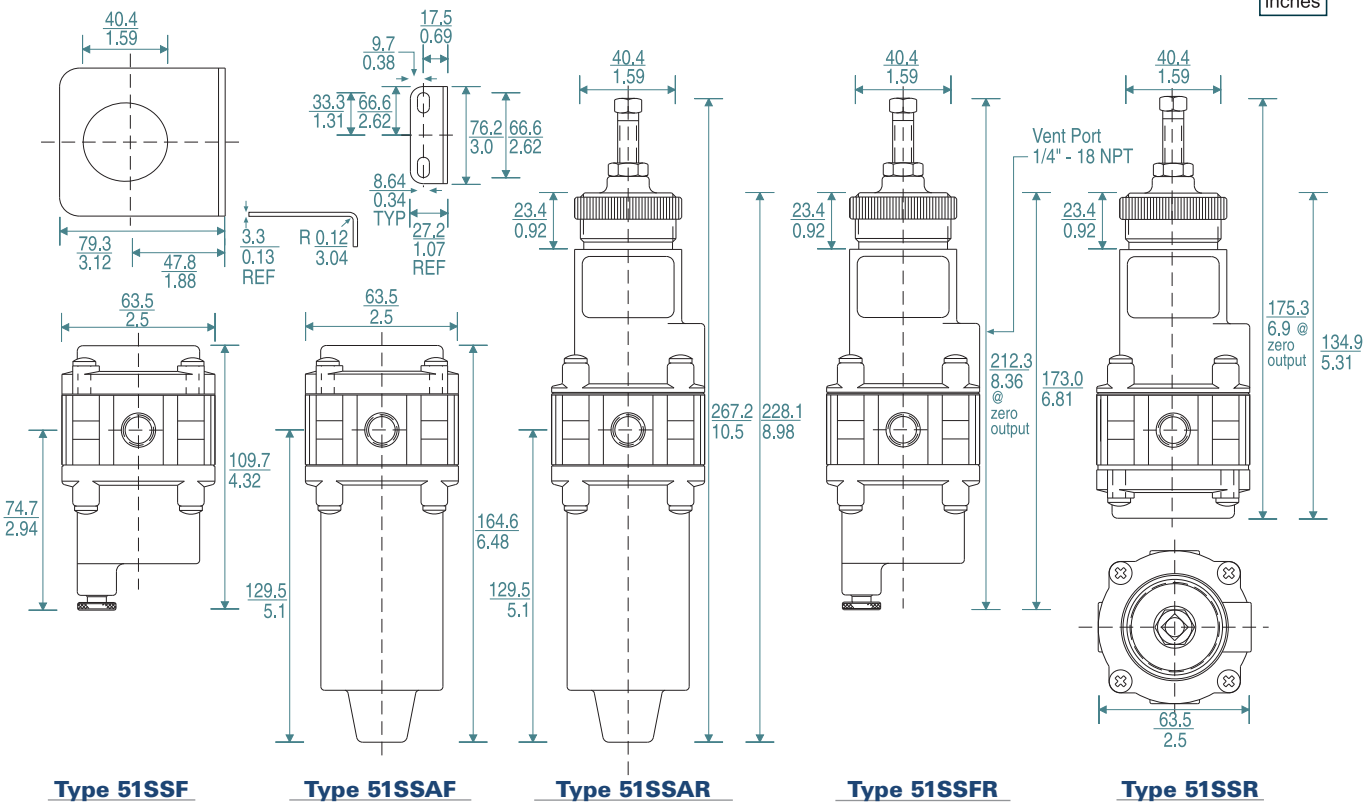


	Type 51SSR	Type 51SSFR	Type 51SSAR Auto Filter	Type 51SSF	Type 51SSAF
Filter	n/a	Built in 40 micron filter with manual drain	Built in 40 micron filter with auto-drain	40 micron filter	40 micron filter
Maximum Supply Pressure	250 PSIG (17.3 BAR)	250 PSIG (17.3 BAR)	250 psig (17.3 BAR)	250 PSIG (17.3 BAR)	250 PSIG (17.3 BAR)
Output Pressure Range	0-30 PSIG (0-2.1 BAR) 0-60 PSIG (0-4.1 BAR) 0-100 PSIG (0-6.9 BAR) 2-150 PSIG (0.1-10.3 BAR)	0-30 PSIG (0-2.1 BAR) 0-60 PSIG (0-4.1 BAR) 0-100 PSIG (0-6.9 BAR) 2-150 PSIG (0.1-10.3 BAR)	0-30 PSIG (0-2.1 BAR) 0-60 PSIG (0-4.1 BAR) 0-100 PSIG (0-6.9 BAR) 2-150 PSIG (0.1-10.3 BAR)	N/A	N/A
Supply Pressure Sensitivity @ 25 psig / 1.7 BAR change in supply	0.20 PSIG (0.01 BAR) output change	0.45 PSIG (0.03 BAR) output change	0.45 PSIG (0.03 BAR) output change	N/A	N/A
Sensitivity	1" (2.5 cm) of water	1" (2.5 cm) of water	01" (2.5 cm) of water	N/A	N/A
Repeatability	0.1 PSIG (0.01 BAR)	0.1 PSIG (0.01 BAR)	0.1 PSIG (0.01 BAR)	N/A	N/A
Flow @ 100 psig (6.9 BAR) Supply 20 psig (1.4 BAR) outlet	20 SCFM (566 LPM)	20 SCFM (566 LPM)	20 SCFM (566 LPM)	N/A	N/A
Exhaust Capacity @ 5 psig (0.34 BAR) above setpoint	0.1 SCFM (2.8 LPM)	0.1 SCFM (2.8 LPM)	0.1 SCFM (2.8 LPM)	N/A	N/A
Temperature Range	-0 to 180˚F (-18 to 82˚C)	-0 to 180˚F (-18 to 82˚C)	0 to 180˚F (-18 to 82˚C)	0 to 180˚F (-18 to 82˚C)	0 to 180˚F (-18 to 82˚C)
Air Consumption	6 SCFH (2.84 LPM) Maximum	6 SCFH (2.84 LPM) Maximum	6 SCFH (2.84 LPM) Maximum	N/A	N/A
Port Size	1/4 NPT or 3/8 NPT	1/4 NPT or 3/8 NPT	1/4 NPT or 3/8 NPT	1/4 NPT or 3/8 NPT	1/4 NPT or 3/8 NPT
Materials of Construction	316 Stainless Steel housing and screen fluorocarbon elastomers	316 Stainless Steel housing and filter assemblies fluorocarbon elastomers	316 Stainless Steel housing and filter assemblies fluorocarbon elastomers	316 Stainless Steel housing and filter assemblies fluorocarbon elastomers	316 Stainless Steel housing and filter assemblies fluorocarbon elastomers

Dimensional Drawings

Mounting Bracket

607-000-128



Type 51SS Ordering Information

	Part Number	Set Point Range	
		BAR	psig
51SSR	960-245-000	0-2.1	0-30
	960-246-000	0-4.1	0-60
	960-247-000	0-6.9	0-100
	960-248-000	0.1-10.3	2-150
51SSFR	960-242-000	0-2.1	0-30
	960-243-000	0-4.1	0-60
	960-244-000	0-6.9	0-100
	960-241-000	0.1-10.3	2-150
51SSAR	960-249-000	0-2.1	0-30
	960-250-000	0-4.1	0-60
	960-251-000	0-6.9	0-100
	960-252-000	0.1-10.3	2-150
51SSF	960-253-000	–	–
51SSAF	960-254-000	–	–

Type 51SS Option Ordering Matrix

Replace last three digits of part number with digits from table below.

Option		1	2	3	4	7	8	9	10	11
2	Non-Relieving		002	032	042	072	082	092		112
3	Socket Head Build Screw			003	043	073	083	093	103	113
4	5 Micron Filter				004	074	084	094	104	114
7	Mounting Bracket					007	087	097	107	117
8	Pressure Gauge						008	098	108	118
9	Tamper-Resistant Cover							009	109	119
10	Low Bleed								010	110
11	3/8 NPT Port									011

Options

	• = option is available	T-51SSR	T-51SSFR	T-51SSAR	T-51SSF	T-51SSF
2	Non-Relieving	•	•	•		
3	Socket Head Build Screw	•	•	•	•	•
4	5 Micron Filter		•	•	•	•
7	Mounting Bracket	•	•	•		
8	Pressure Gauge	•	•	•	•	•
9	Tamper Resistant Cover	•	•	•		
10	Low Bleed	•	•	•		
11	3/8" Port	•	•	•	•	•

Regulator Options and Accessories

Non-Relieving

Used in applications where it is desirable to relieve pressure downstream and not at the regulator. Non-relieving regulators should not be used for low or no flow applications.

Socket Head Build Screw

Socket head build screws are provided in place of phillips drive screws.

5 Micron Filter

Replaces the 40 micron filter for more complete air filtration. (Except Type 51SSR)
P/N 836-000-002

Mounting Bracket

316 Stainless Steel bracket for side mounting.
P/N 607-000-128

Pressure Gauge

Dual scale (PSI / kPa) 2-1/2" (63mm) gauges. Ranges include 0-60 PSI (0-410 kPa), 0-100 PSI (0-690 kPa) and 0-200 PSI 0-1400 kPa). When specified with regulator, the correct range will be supplied.

Tamper Resistant Cover

A 316 stainless steel hexagonal cover placed over the adjusting screw and threaded onto the bonnet of the regulator with a wrench, prevents ordinary hand adjustments.

Low Bleed Diaphragm (Soft Relief Seat)

Used in applications where it is desirable to minimize the standard bleed rate of the regulator while maintaining the ability to relieve excess pressure at the regulator. (Bleed rate is reduced from less than 6 SCFH (2.8 LPM) to less than 0.1 SCFH (0.05 LPM).