

Flow Control: FQPV, FQB3 & FQB2



FQPV2 & F-Series

MIN Flow Range
4 to 40 SCFH (1.89 to 18.9 LPM)

MAX Flow Range
0.1 to 1 SCFM (2.83 to 28.3 LPM)

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Electrical Connections | Page 4
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FQB3 & F-Series

MIN Flow Range
1 to 10 SCFM (28.3 to 283 LPM)

MAX Flow Range
2.5 to 25 SCFM (70.8 to 708 LPM)

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FQB2, PSR & F-Series

MIN Flow Range
3 to 30 SCFM (85 to 850 LPM)

MAX Flow Range
25 to 250 SCFM (708 to 7,080 LPM)

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Electrical Connections | Page 4
Dimensions & Part Numbering | Page 10

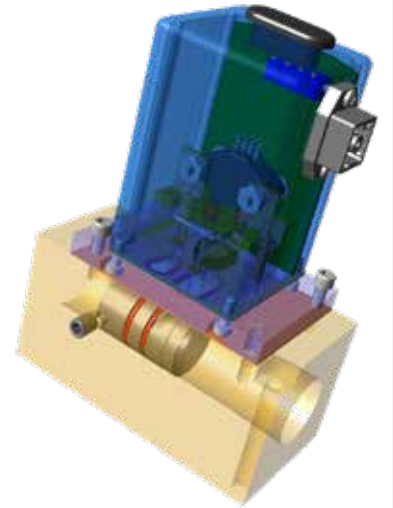
Functional Descriptions

F-Series Flow Monitor

The F-Series flow monitor is used in conjunction with all flow control assemblies. The F-Series is a transducer that measures compressed gas flow rates. This measurement is made with a differential pressure transducer. P1 measures the input pressure of a Venturi and P2 measures the pressure in the throat of the Venturi. The difference in these two measurements is used to calculate the actual flow through the F-Series. **Using an all analog circuit results in an extremely fast flow detection of less than 10ms, in most instances.** This high speed functionality also allows the F-Series products to be used in conjunction with Proportion-Air's proportional regulators for compressed gas flow control. To ensure high speeds, the F-Series products use analog electronics internally for signal amplification and calibration. All F-Series products are mass flow (*implied*) measurements.

THE F-SERIES IS AVAILABLE IN THREE DIFFERENT MODELS:

1. **Pressure Regulated (FRxxx):** This model requires a known and fixed regulated supply pressure to maintain its calibration. By regulating the input pressure, the incoming density of the gas is known and the FR model output is calibrated for that density.
2. **Pressure Compensated (FPxxx):** This model has a 2nd transducer that measures the absolute pressure of the incoming gas. This allows the unit to compensate for changes in gas density due to changes in pressure. The FP model can compensate from 50 to 100% of the maximum calibrated absolute supply pressure, as called out in the part number.
3. **Atmospheric (FAxxx):** This model must have its output port open to atmosphere in order to work properly. It is calibrated for the density of gas at atmosphere. The FA model is most commonly used to meter out gas in cylinder speed control applications.



FQPV2

The FQPV2 is a compressed gas flow device. The assembly consists of an FQPV2-Series proportional control valve and an F-Series high speed flow monitor. The FQPV2 control valve consists of one normally closed solenoid valve, one true proportional valve, a control circuit board and a protective canister. The FQPV2 operates by comparing the user's electronic command input signal to the signal being returned to the FQPV2 from the F-Series flow monitor. The on-board control circuit examines any differences between these signals and actuates the solenoid valves in response. The FQPV2 continuously monitors the user command and F-Series feedback signals to keep the assemblies flow rate at the desired point.

FQB3

The FQB3 is a compressed gas flow device. The assembly consists of an FQB3-Series proportional control valve and an F-Series high speed flow monitor. The FQB3 control valve consists of two normally closed solenoid valves, an integrated volume booster, a control circuit board and a protective canister. The FQB3 operates by comparing the user's electronic command input signal to the signal being returned to the FQB3 from the F-Series flow monitor. The on-board control circuit examines any differences between these signals and actuates the solenoid valves in response. The FQB3 continuously monitors the user command and F-Series feedback signals to keep the assemblies flow rate at the desired point.

FQB2/PSR

The FQB2 is a compressed gas flow device. The assembly consists of an FQB2-Series proportional control valve, a PSR volume booster and an F-Series high speed flow monitor. The FQB2 control valve consists of two normally closed solenoid valves, a control circuit board and a protective canister. The FQB2 operates by comparing the user's electronic command input signal to the signal being returned to the FQB2 from the F-Series flow monitor. The on-board control circuit examines any differences between these signals and actuates the solenoid valves in response. Opening one solenoid valve removes compressed gas from the dome of the PSR (*which may cause the PSR to exhaust downstream gas*) while opening the other solenoid valve adds compressed gas (*to the dome of the PSR*) from the supply. The volume of compressed gas on the dome of the PSR regulator sets the PSR main valve position to control the flow rate. The FQB2 continuously monitors the user command and F-Series feedback signals to keep the assemblies flow rate at the desired point.

General Specifications & Warnings

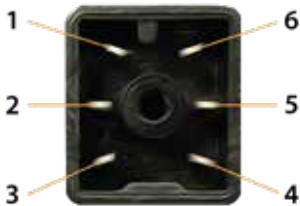
Before you start, please read these warnings:

- Examine the product. Ensure that you received what you ordered.
- Read this guide before you start and save it for later.
- You must have a good understanding of what the adjustments are on this product before using them.
- All compressed air and power should be shut off before installing, removing or performing maintenance on this product.
- Installation and use of this product should be under the supervision and control of properly qualified personnel to avoid the risk of injury or death.
- Please read the additional warnings, disclaimers and warranty material in this document.

ELECTRICAL

POWER REQUIREMENT
17-24 VDC

SUPPLY CURRENT
450 mA (MAX)



6-PIN HIRSCHMANN (pin numbers)

MECHANICAL

ACCURACY
 $\pm 4\%$ F.S.

REPEATABILITY
 $\pm 0.25\%$ F.S.

RESPONSE TIME
< 10 MS

SHOCK RATING
20 G Forces

TURNDOWN RATIO
10:1
20:1 available in some applications

PHYSICAL

MEDIA TEMPERATURE
32°F (0°C) to 122°F (50°C)

AMBIENT TEMPERATURE
32°F (0°C) to 158°F (70°C)

TEMPERATURE SENSITIVITY
0.25% / °C

Typical Applications

Air Cooling Molds
Atomizing Spray Control
Cylinder Speed Control
Die Cast Temperature Control
Glass Agitator
Painting, Spraying & Coating
Pig Velocity Control
Radiator Leak Monitoring

Shot Air Volume Sensing
Air Motor Control
Compressor Testing
Retort Oven
Sparging
Thermoforming
Temperature Control
Low Pressure Casting

Electrical Connections

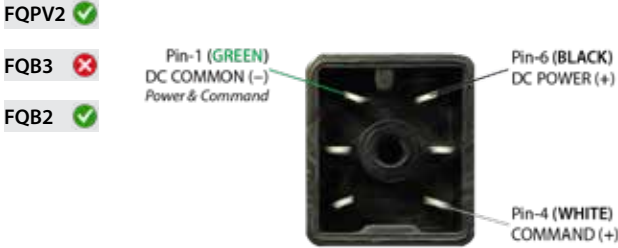
1. Turn off all power to valve.
2. Identify the valve's command input (*Input Signal Range*) and analog output (*Output Signal Range*) using the calibration card included in the package and the part number schematic in this document.
3. Proceed to the appropriate section corresponding to the type of valve being installed

NOTE: ALL COLOR CODES RELATE TO THE FACTORY WIRED QBT POWER CORD

COMMAND SIGNAL CONFIGURATIONS

Voltage Commanded (E, K, V)

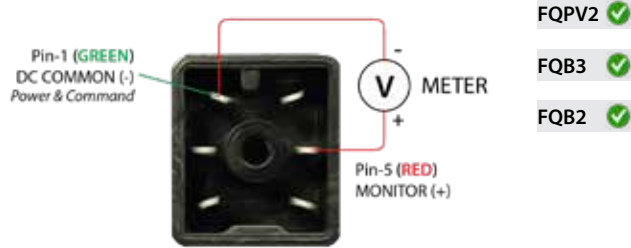
All VDC command controllers use common mode voltage, meaning the DC Common pin (*pin-1*) is the common reference for both power and command. Pin-1 is used as both the command signal command and power supply common.



MONITOR SIGNAL CONFIGURATIONS

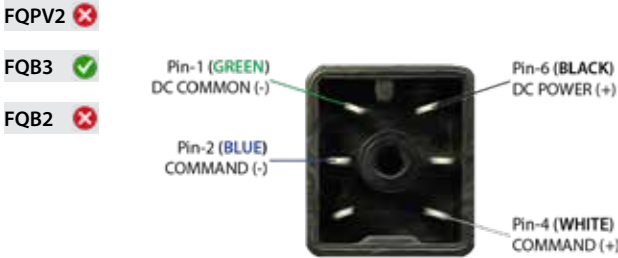
Voltage Monitor (E, K, V)

Voltage monitor out signal is applicable to all voltage output signal ranges including: 0-10 VDC, 0-5 VDC and 1-5 VDC.



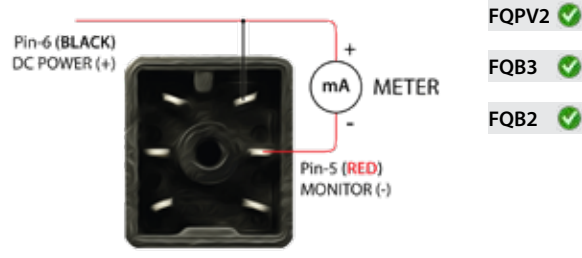
Voltage (Differential) Commanded (E, K, V)

All VDC command FQB3s use a differential command loop where the command flow is from Pin-4 to Pin-2. If a single ended voltage will be used, tie the command return wire to the DC Common.



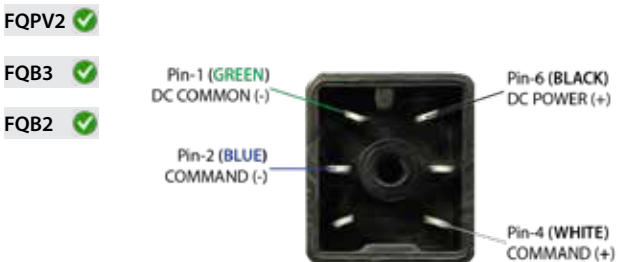
Current (Sinking) Monitor (C)

The 4-20 mA Sinking monitor requires external power (*most likely from your controller*) for the monitor out signal to be obtained.



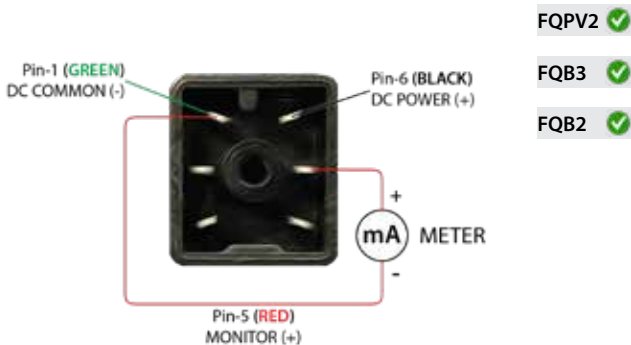
Current Commanded (I)

All current command controllers use a differential current loop scheme (*not isolated*), meaning current flow is from Pin-4 to Pin-2.



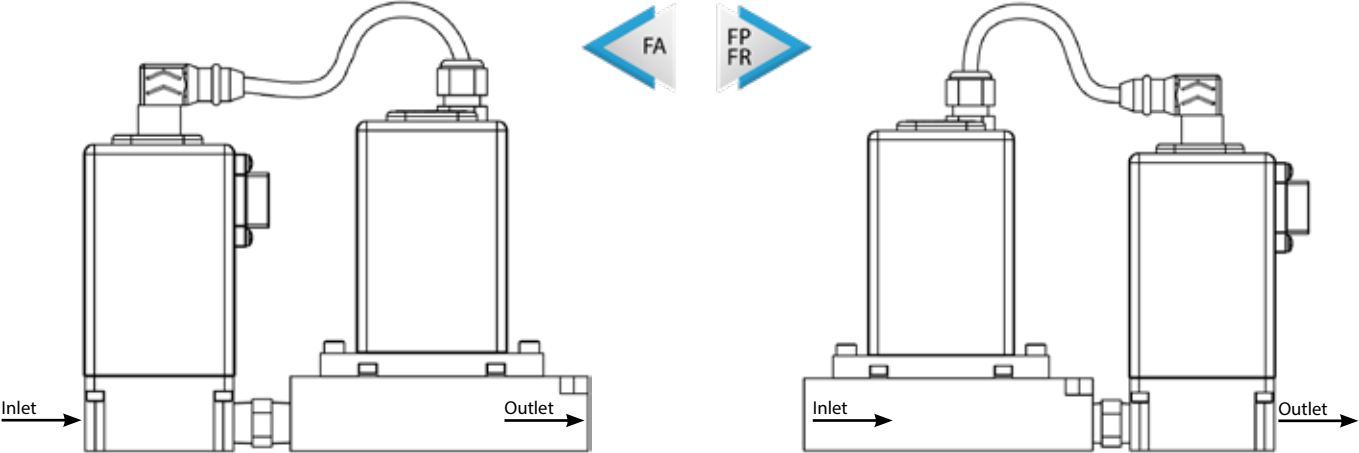
Current (Sourcing) Monitor (S)

The 4-20 mA Sourcing monitor requires an external ground reference for the monitor out signal to be obtained.

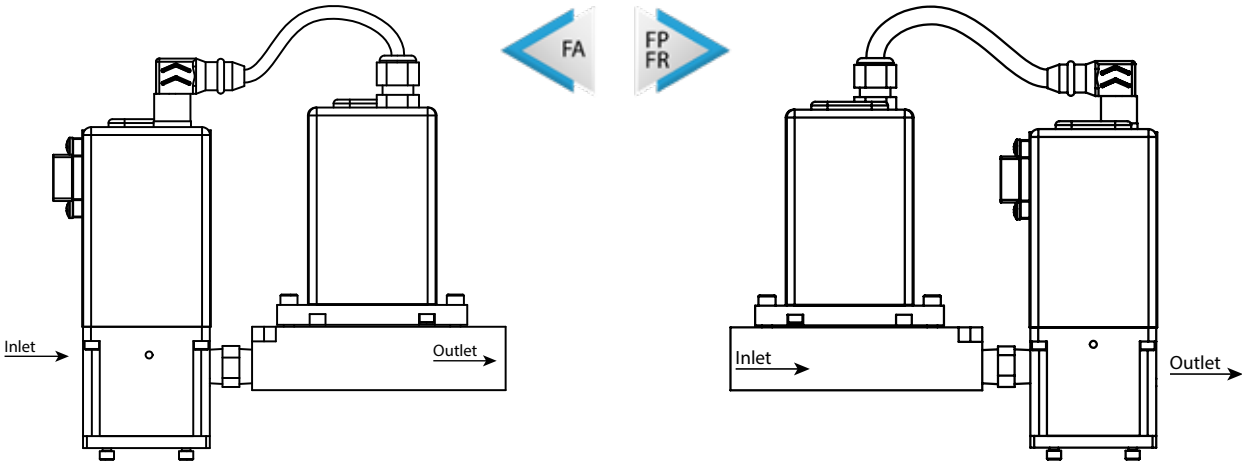


Pneumatic Connections

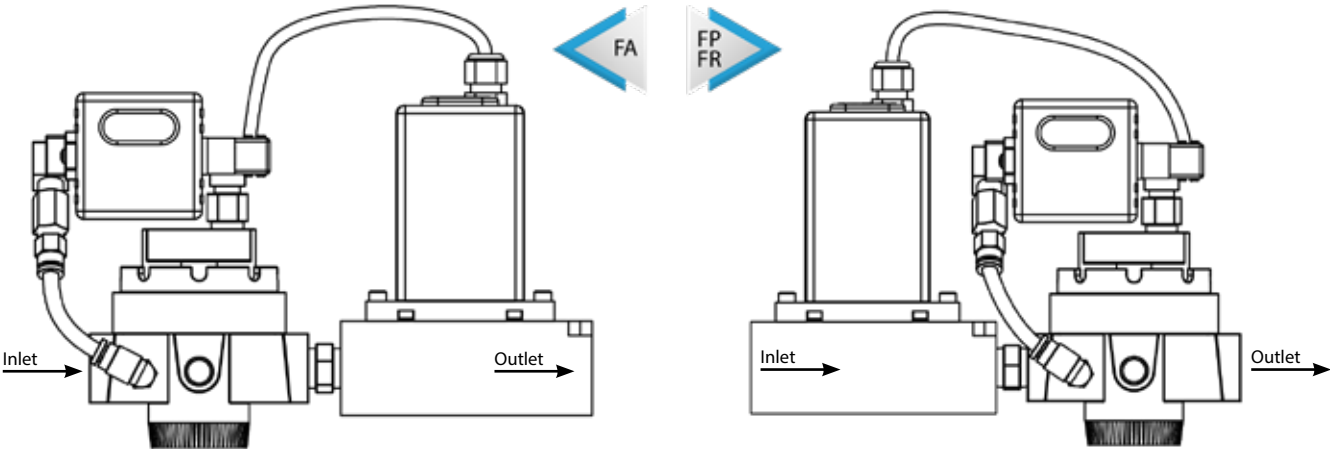
FQPV2



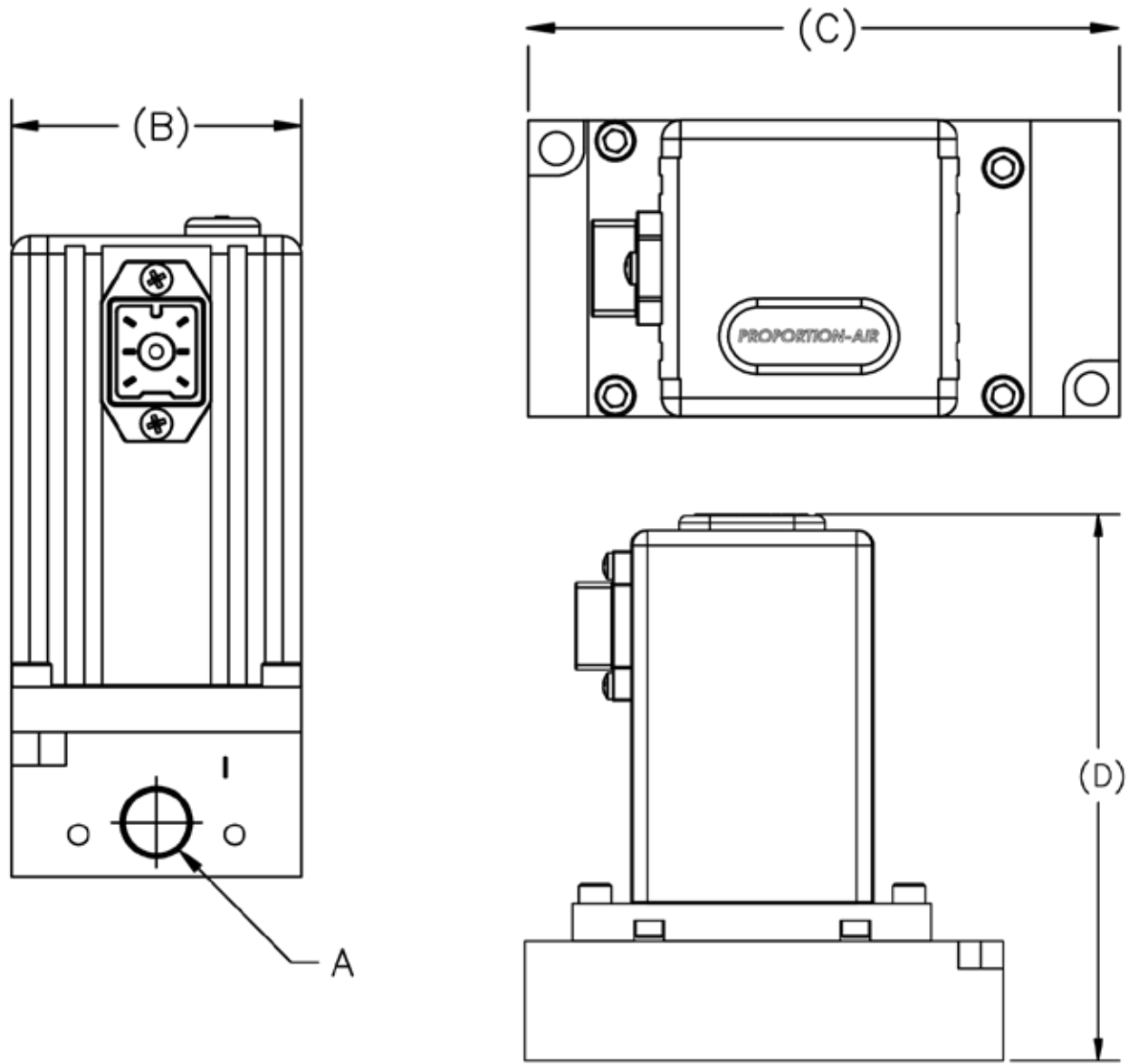
FQB3



FQB2/PSR



F-Series - Dimensions



F-SERIES	"A"	"B"		"C"		"D"	
FR2/FP2/FA2	1/4" NPT	2.00"	50.80	4.00"	101.60	4.56"	115.90
FR3/FP3/FA3	3/8" NPT	2.00"	50.80	4.00"	101.60	5.06"	128.52
FR4/FP4/FA4	1/2" NPT	2.00"	50.80	4.00"	101.60	5.06"	128.52
FR6/FP6/FA6	3/4" NPT	2.00"	50.80	4.00"	101.60	5.56"	141.22
FR8/FP8/FA8	1" NPT	2.00"	50.80	4.00"	101.60	5.56"	141.22
FRA/FPA/FAA	1-1/4" NPT	2.50"	63.50	5.00"	127.00	6.06"	153.92
FRB/FPB/FAB	1-1/2" NPT	2.50"	63.50	5.00"	127.00	6.06"	153.92

F-Series - Part Numbering

F Series	ACCURACY	±4% F.S.	MAX INLET	150 PSIG (10 Bar)
	PORT SIZE	1/4 to 1.5"	FLOW RANGES	2-20 SCFH up to 25-250 SCFM

Example Part Number	F	P	4	N	A	E	N	75	A	90	PS	A	A	BR	DD	O2	O3	P1	
Section Reference ->		1	2	3	4	5	6	7	8	9	10	11	12	OPTIONS					

1	Type
A	Atmospheric Pressure
P	Pressure Compensated
R	Regulated Pressure

2	Port Size
2	1/4"
3	3/8"
4	1/2"
6	3/4"
8	1"
A	1-1/4"
B	1-1/2"

3	Thread Type
N	NPT
P	BSPP

4	Manifold Material
A	Aluminum (Anodized Black)
B	Brass (Port size 2 & 3 only)

5	Monitor Signal Range
E	1 to 10 VDC
K	0.5 to 5 VDC
C	5.6 to 20 mADC (Sinking)
S	5.6 to 20 mADC (Sourcing)

6	Media		
A	Air	Carbon Dioxide (CO2)	C
R	Argon (Ar)	Helium (He)	H
L	Nitrous Oxide* (N2O)	Oxygen* (O2)	O
N	Nitrogen (N2)		

* Please Consult Factory for Application Assistance

7	Maximum Flow
Maximum Flow Based on 10:1 Turn-down. MIN: 2-20 SCFH, MAX: 25-250 SCFM	

8	Unit of Measure
A	SCFM
B	SCFH
C	SLPM
D	SLPH
E	SCMH

9	Maximum Pressure
Must be less than or equal to 150 psig	

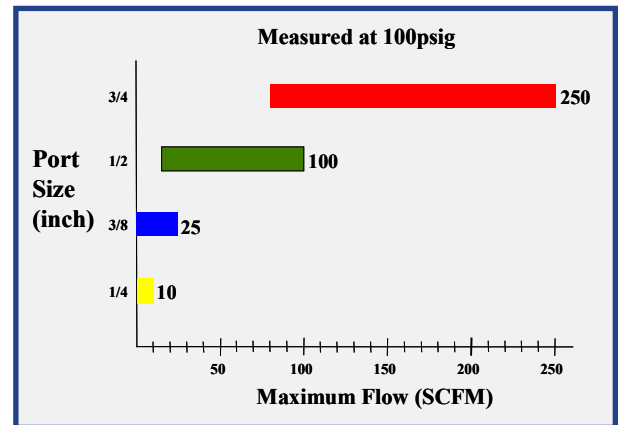
10	Pressure Unit		
PS	PSI	MPa	MP
KP	kPa	kg/cm ²	KG
BR	Bar		

11	Pressure Unit of Measure
A	Absolute Pressure (Pressure Compensated Model (P) Only)
G	Gauge Pressure (Atmospheric & Regulated Models (A and R) Only)

12	Electrical Connection
A	3' Cord with 3-pin Female*
C	18" Flying Leads
D	3-pin Male Connector
E	6-pin Hirschmann Connector
G	6' Shielded Cord with 3-pin Female
H	4-pin Hirschmann Connector

*A shorter cable will be used when F Series used in flow control assembly

1/2" F-Series



Port Selection Based on Maximum Flow (FR units only)

Options	
BR	Install Foot Bracket
DD	Digital Display
O2*	Oxygen Cleaned
O3	Oxygen Clean for Non-Oxygen Use
P1	12 VDC Power

*O2 cleaning only available on brass manifold.

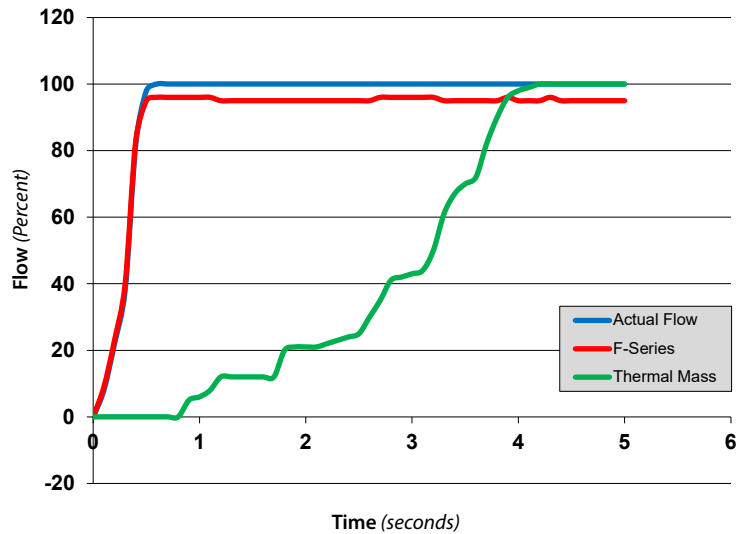
F-Series - Performance Characteristics

The differential pressure technology incorporated in Proportion-Air's F-Series flow transducer is ideally suited for rugged commercial and industrial applications. The benefits of the real-time measurement make the F-Series a must in many rapid sequence applications. For example, in the chart below, the response time to achieve the commanded flow rate of the 0.1% accurate thermal mass flow meter isn't even close. The F-Series provides a 96% accurate signal for more than four seconds before the thermal mass achieves the flow.

The response time and 'time to flow' of the F-Series flow transducer is very fast when compared to Thermal Mass Flow technology. This makes the accuracy of the F-Series extremely good in fast paced applications. The F-Series is also very rugged and designed for demanding industrial environments with an IP65 housing and shock rating of 20G.

The F-Series employs a large internal venturi that allows it to digest contaminants and moisture. It is also insensitive to mounting position and vibration.

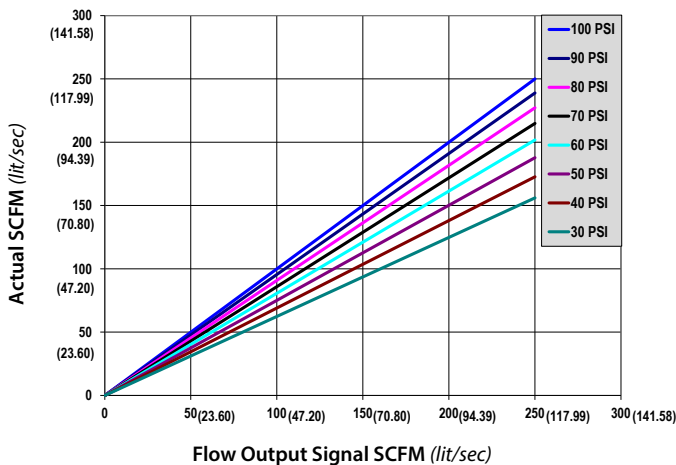
F-Series Flow Over Time



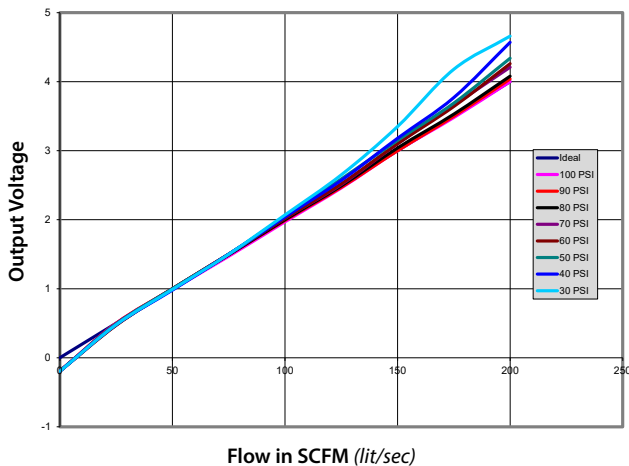
This graph illustrates the effect of varying supply pressures on the flow output signal of an FR Model Flow Transducer. This graph can be used to correct for variations in gas density due to the temperature and/or specific gravity of different gases by purposely altering the supply pressure with a Proportion-Air pressure control valve.

Regulating the inlet pressure to a constant value by fixing it to a specific pressure produces a linearly proportional signal.

Non-Pressure Compensated (FR)



Pressure Compensated (FP)

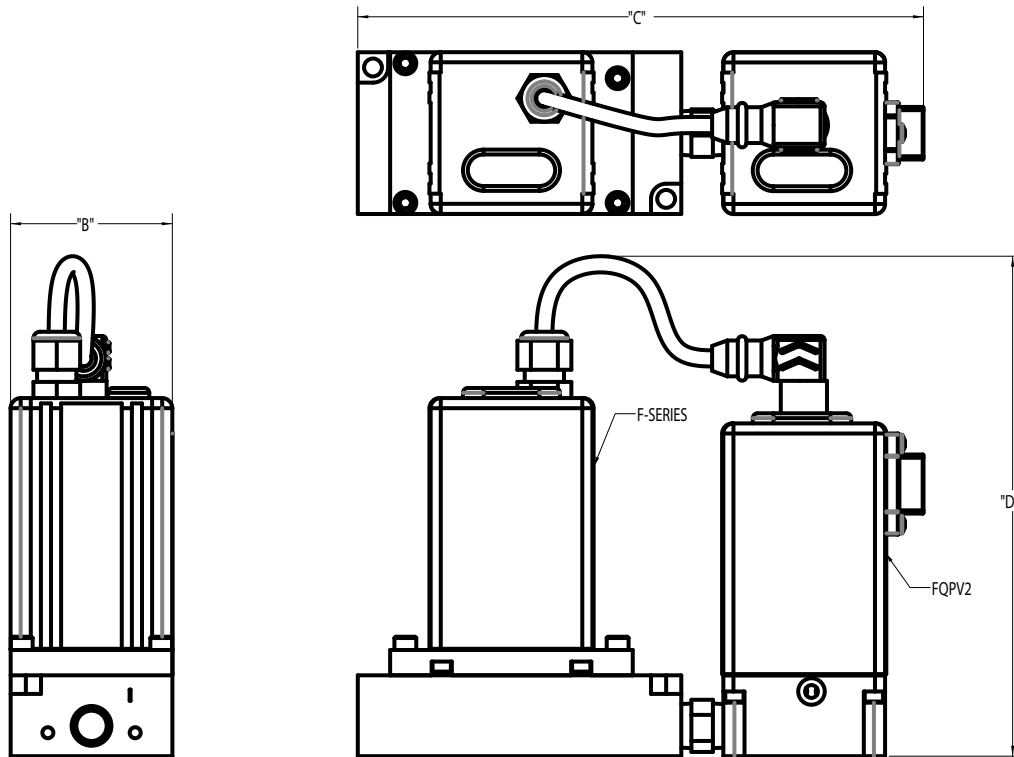


This graph illustrates how effectively the FP Model Flow Transducer automatically corrects the flow output signal when the supply pressure varies over a wide range.

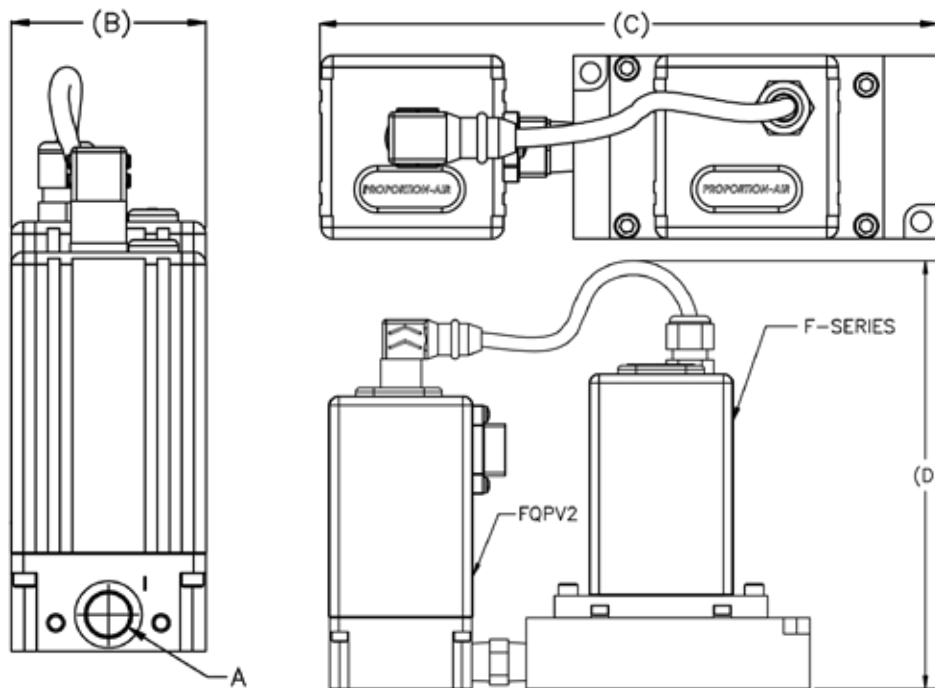
Compare this to the results of a traditional non-pressure compensated flow transducer as shown in the 'Non-Pressure Compensated' graph above. With the Pressure Compensated model, the max inlet pressure can drop by as much as 50% and the F-Series Flow Transducer will compensate and provide accurate flow measurements.

FQPV2 - Dimensions

F-SERIES	CONTROL VALVE	"A"	"B"	"C"	"D"
FR2/FP2	QPV2	1/4" NPT	2.07" [52.58]	7.00" [177.80]	6.00" [152.40]



F-SERIES	CONTROL VALVE	"A"	"B"	"C"	"D"
FA2	QPV2	1/4" NPT	2.07" [52.58]	6.78" [172.26]	6.00" [152.40]
-	-	-	-	-	-



FQPV2 - Part Numbering

FQPV2	ACCURACY	±4% F.S.	PRESSURE	Up to 150 psig (10 Bar)
	PORT SIZE	1/8"	FLOW CONTROL REGULATOR	

Example Part Number	FQPV2	T	A	N	E	E	9	BR	G	A	X	BR	DD
Section Reference ->		1	2	3	4	5	6	7	8	9	10	OPTIONS	

1	Type
T	-14.7 to 150 psig

2	Manifold Material
A	Aluminum
B	Brass

3	Thread Type
N	NPT
P	BSPP

4	Command Signal Range
E	1 to 10 VDC
I	5.6 to 20 mADC
K	0.5 to 5 VDC
A	RS232 Modbus Serial Command*
B	RS485 Modbus Serial Command*
P	P2 Profiler (Integrated)
*Requires X for Monitor Signal (#5)	

5	Monitor Signal Range
X	No Monitor
E	1 to 10 VDC
K	0.5 to 5 VDC*
C	5.6 to 20 mADC (Sinking)
S	5.6 to 20 mADC (Sourcing)
*Requires E, I or K for Command Signal Range (#4)	
*Requires V for Command Signal Range (#4)	

6	Full Scale Pressure
Must be less than or equal to 150 psig	

7	Pressure Unit		
PS	PSI	Bar	BR
KP	Kilo-pascal	Kilograms/cm ²	KG
MP	Mega-pascal		

8	Pressure Unit of Measure
G	Gauge Pressure

9	Inlet Valve
A	0.013"
B	0.025"
C	0.040"
D	0.060"

PLEASE CONTACT FACTORY FOR VALVE SELECTION



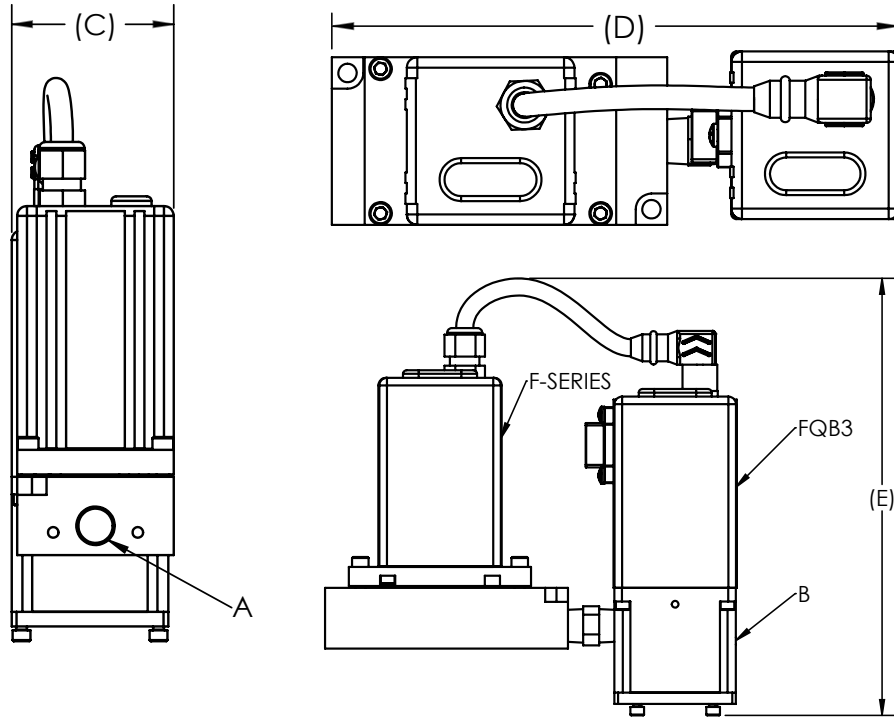
Remember to configure the F Series flow monitor when building a flow control assembly

Options	
DD	Digital Display
O2*	Oxygen Cleaned
O3	O2 Clean for Non-Oxygen Use
P1	12 VDC Power
*O2 cleaning only available on brass manifold.	

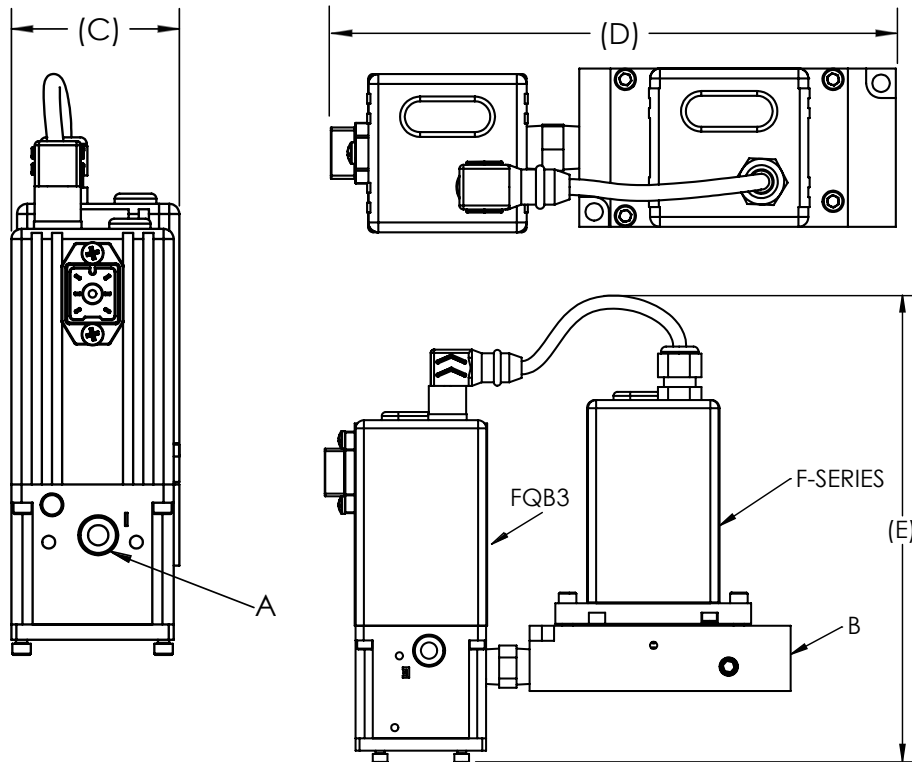
Recommended Accessories	
QBT-C-6	6 ft. Power/Command/Monitor Cable

FQB3 - Dimensions

F-SERIES CONTROL VALVE	"A"	"B"	"C"		"D"		"E"	
FR2/FP2 QB3	1/4" NPT	1/4" NPT	2.07"	52.58	6.78"	172.26	7.17"	182.16
FR3/FP3 QB3	3/8" NPT	1/4" NPT	2.07"	52.58	6.78"	172.26	7.30"	185.29



F-SERIES CONTROL VALVE	"A"	"B"	"C"		"D"		"E"	
FA2 QB3	1/4" NPT	1/4" NPT	2.07"	52.58	7.14"	181.36	7.17"	182.16
FA3 QB3	1/4" NPT	3/8" NPT	2.07"	52.58	7.14"	181.36	7.30"	185.29



FQB3 - Part Numbering

FQB3

ACCURACY	±4% F.S.	PRESSURE	Up to 150 psig (10 Bar)
PORT SIZE	1/4"	FLOW CONTROL REGULATOR	

Example Part Number	FQB3	T	A	N	E	E	90	PS	G	BR	O2
Section Reference ->		1	2	3	4	5	6	7	8	OPTIONS	

1	Type
T	-14.7 to 150 psig

2	Manifold Material
A	Nickel-Plated Aluminum
B	Nickel-Plated Brass

3	Thread Type
N	NPT
P	BSPP

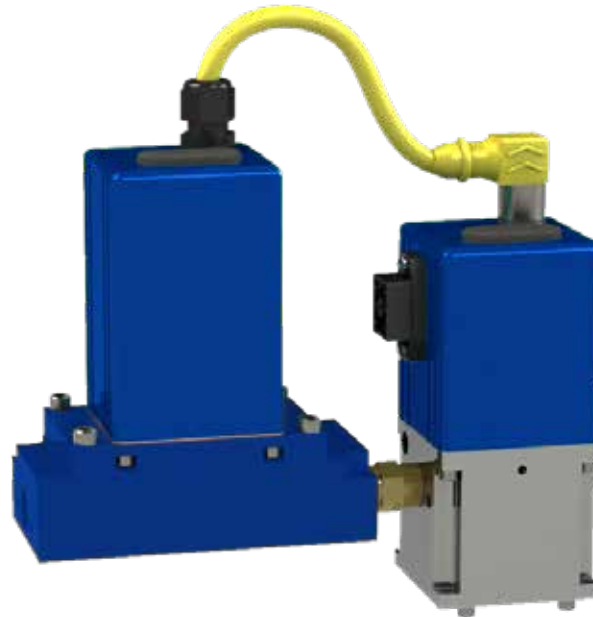
4	Command Signal Range
E	1 to 10 VDC
I	5.6 to 20 mADC
K	0.5 to 5 VDC
P	P2 Profiler (Integrated)
*Requires X for Monitor Signal (#5)	

5	Monitor Signal Range
X	No Monitor
E	1 to 10 VDC
K	0.5 to 5 VDC*
C	5.6 to 20 mADC (Sinking)
S	5.6 to 20 mADC (Sourcing)
*Requires E, I or K for Command Signal Range (#4)	
**Requires V for Command Signal Range (#4)	

6	Full Scale Pressure
Must be less than or equal to 150 psig	

7	Pressure Unit		
PS	PSI	Bar	BR
KP	Kilo-pascal	Kilograms/cm ²	KG
MP	Mega-pascal		

8	Pressure Unit of Measure
G	Gauge Pressure



Options	
BR	Install Foot Bracket
DD	Digital Display
O2*	Oxygen Cleaned
O3	O2 Clean for Non-Oxygen Use
P1	12 VDC Power
*O2 cleaning only available on brass manifold.	

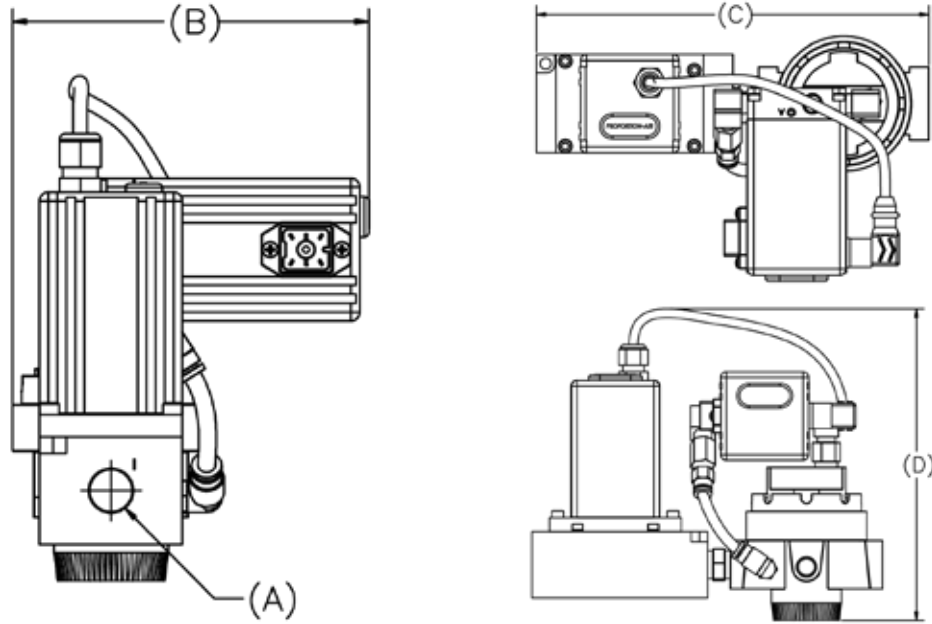
Recommended Accessories	
QBT-C-6	6 ft. Power/Command/Monitor Cable
QBT-03*	Uninstalled Foot-Mount Bracket and Screws
*Include BR option on part number for factory-installed foot mount bracket. We highly recommend the BR option to prevent contamination or product damage with the FQB3.	

Remember to configure the F Series flow monitor when building a flow control assembly

FQB2 - Dimensions

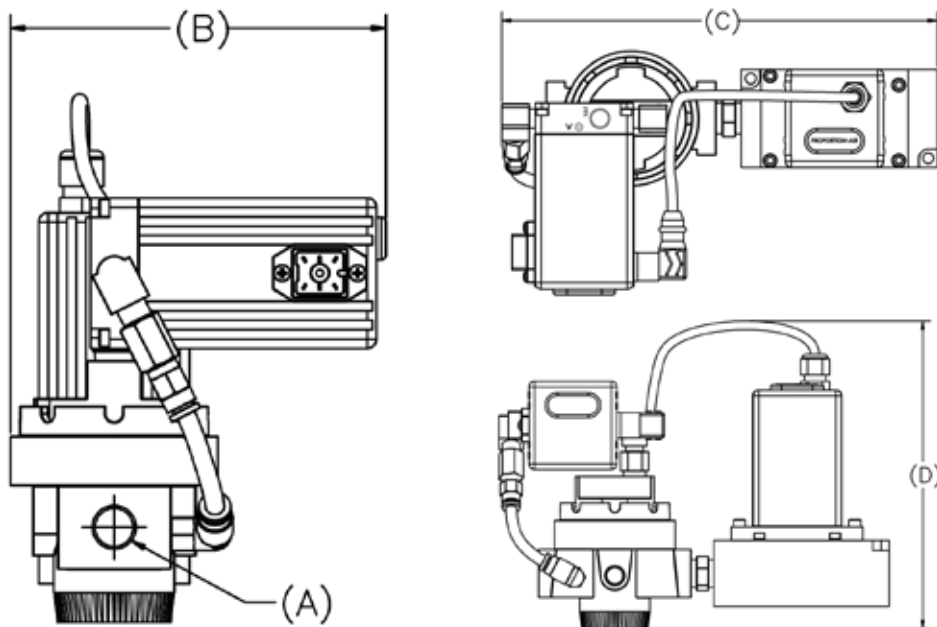
F-SERIES	CONTROL	BOOSTER	"A"	"B"	"C"	"D"
FR3/FP3	QB2X	PSR3	3/8" NPT	5.00"	127.00	8.00" 203.20 7.00" 177.80
FR4/FP4	QB2X	PSR4	1/2" NPT	5.00"	127.00	8.25" 209.55 7.00" 177.80
FR6/FP6	QB2X	PSR6	3/4" NPT	5.00"	127.00	9.37" 238.00 8.75" 222.25
FR8/FP8	QB2X	PSR8	1" NPT	5.00"	127.00	9.64" 244.86 8.75" 222.25
FRA/FPA	QB2X	PSRA	1-1/4" NPT	5.00"	127.00	11.00" 279.40 9.00" 228.60
FRB/FPB	QB2X	PSRB	1-1/2" NPT	5.00"	127.00	11.03" 280.25 9.00" 228.60

DIMENSIONS ARE FOR REFERENCE USE ONLY.



F-SERIES	CONTROL	BOOSTER	"A"	"B"	"C"	"D"
FA3	QB2X	PSR3	3/8" NPT	5.00"	127.00	8.00" 203.20 7.00" 177.80
FA4	QB2X	PSR4	1/2" NPT	5.00"	127.00	8.25" 209.55 7.00" 177.80
FA6	QB2X	PSR6	3/4" NPT	5.00"	127.00	9.37" 238.00 8.75" 222.25
FAB	QB2X	PSR8	1" NPT	5.00"	127.00	9.64" 244.86 8.75" 222.25
FAA	QB2X	PSRA	1-1/4" NPT	5.00"	127.00	11.00" 279.40 9.00" 228.60
FAB	QB2X	PSRB	1-1/2" NPT	5.00"	127.00	11.03" 280.25 9.00" 228.60

DIMENSIONS ARE FOR REFERENCE USE ONLY.



FQB2 - Part Numbering

FQB2

ACCURACY	±4% F.S.	PRESSURE	Up to 150 psig (10 Bar)
PORT SIZE	1/8"	FLOW CONTROL REGULATOR	

Example Part Number	FQB2	X	A	N	E	E	90	PS	G	BR	DD
Section Reference ->		1	2	3	4	5	6	7	8	OPTIONS	

1	Type
X	-14.7 to 175 psig

2	Manifold Material
A	Aluminum
B	Nickel-Plated Brass

3	Thread Type
N	NPT
P	BSPP

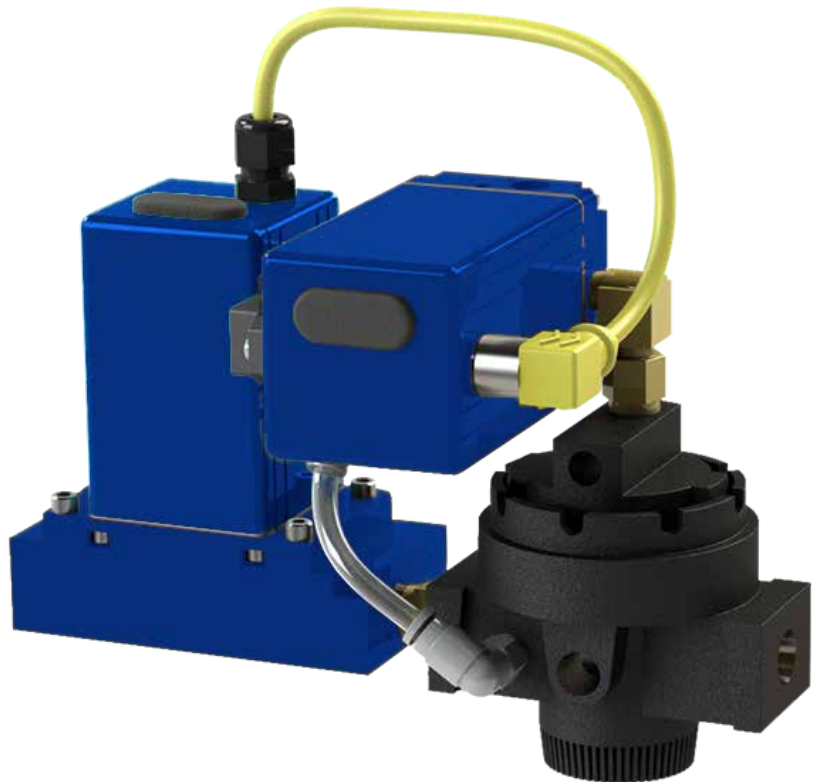
4	Command Signal Range
E	1 to 10 VDC
I	5.6 to 20 mADC
K	0.5 to 5 VDC
A	RS232 Modbus Serial Command*
B	RS485 Modbus Serial Command*
P	P2 Profiler (Integrated)
*Requires X for Monitor Signal (#5)	

5	Monitor Signal Range
X	No Monitor
E	1 to 10 VDC
K	0.5 to 5 VDC*
C	5.6 to 20 mADC (Sinking)
S	5.6 to 20 mADC (Sourcing)
*Requires E, I or K for Command Signal Range (#4)	
**Requires V for Command Signal Range (#4)	

6	Full Scale Pressure
Must be less than or equal to 150 psig	

7	Pressure Unit (no fee)	
PS	PSI	Bar BR
KP	Kilo-pascal	Kilograms/cm ² KG
MP	Mega-pascal	

8	Pressure Unit of Measure (no fee)
G	Gauge Pressure



Options	
DD	Digital Display
O2*	Oxygen Cleaned
O3	Oxygen Cleaned for Non-Oxygen Use
P1	12 VDC Power
*O2 cleaning only available on brass manifold.	

Recommended Accessories	
QBT-C-6	6 ft. Power/Command/Monitor Cable

Remember to configure the F Series flow monitor when building a flow control assembly

SAFETY PRECAUTIONS

Please read the following safety information before installing or operating any Proportion-Air, Inc. equipment or accessories. To confirm safety, observe 'ISO 4414: Pneumatic Fluid Power - General rules relating to systems' and other safety practices.

WARNING

Improper operation could result in serious injury or loss of life!

1. PRODUCT COMPATIBILITY

Proportion-Air, Inc. products and accessories are for use in industrial pneumatic applications with compressed air media. The compatibility of the equipment is the responsibility of the end user. Product performance and safety are the responsibility of the person who determined the compatibility of the system. Also, this person is responsible for continuously reviewing the suitability of the products specified for the system, referencing the latest catalog, installation manual, Safety Precautions and all materials related to the product.

2. EMERGENCY SHUTOFF

Proportion, Inc. products cannot be used as an emergency shutoff. A redundant safety system should be installed in the system to prevent serious injury or loss of life.

3. EXPLOSIVE ATMOSPHERES

Products and equipment should not be used where harmful, corrosive or explosive materials or gases are present. Unless certified, Proportion-Air, Inc. products cannot be used with flammable gases or in hazardous environments.

4. AIR QUALITY

Clean, dry air is not required for Proportion-Air, Inc. products. However, a 40 micron particulate filter is recommended to prevent solid contamination from entering the product.

5. TEMPERATURE

Products should be used with a media and ambient environment inside of the specified temperature range of 32°F to 158°F. Consult factory for expanded temperature ranges.

6. OPERATION

Only trained and certified personnel should operate electronic and pneumatic machinery and equipment. Electronics and pneumatics are very dangerous when handled incorrectly. All industry standard safety guidelines should be observed.

7. SERVICE AND MAINTENANCE

Service and maintenance of machinery and equipment should only be handled by trained and experienced operators. Inspection should only be performed after safety has been confirmed. Ensure all supply pressure has been exhausted and residual energy (compressed gas, springs, gravity, etc.) has been released in the entire system prior to removing equipment for service or maintenance.

CAUTION

Improper operation could result in serious injury to people or damage to equipment!

1. PNEUMATIC CONNECTION

All pipes, pneumatic hose and tubing should be free of all contamination, debris and chips prior to installation. Flush pipes with compressed air to remove any loose particles.

2. THREAD SEALANT

To prevent product contamination, thread tape is not recommended. Instead, a non-migrating thread sealant is recommended for installation. Apply sealant a couple threads from the end of the pipe thread to prevent contamination.

3. ELECTRICAL CONNECTION

To prevent electronic damage, all electrical specifications should be reviewed and all electrical connections should be verified prior to operation.

EXEMPTION FROM LIABILITY

1. Proportion-Air, Inc. is exempted from any damages resulting from any operations not contained within the catalogs and/or instruction manuals and operations outside the range of its product specifications.

2. Proportion-Air, Inc. is exempted from any damage or loss whatsoever caused by malfunctions of its products when combined with other devices or software.

3. Proportion-Air, Inc. and its employees shall be exempted from any damage or loss resulting from earthquakes, fire, third person actions, accidents, intentional or unintentional operator error, product misapplication or irregular operating conditions.

4. Proportion-Air, Inc. and its employees shall be exempted from any damage or loss, either direct or indirect, including consequential damage or loss, claims, proceedings, demands, costs, expenses, judgments, awards, loss of profits or loss of chance and any other liability whatsoever including legal expenses and costs, which may be suffered or incurred, whether in tort (including negligence), contract, breach of statutory duty, equity or otherwise.

WARRANTY

Proportion-Air, Inc. products are warranted to the original purchaser only against defects in material or workmanship for eighteen (18) months from the date of manufacture. The extent of Proportion-Air's liability under this warranty is limited to repair or replacement of the defective unit at Proportion-Air's option. Proportion-Air shall have no liability under this warranty where improper installation or filtration occurred.

PROPORTIONAIR

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Handcrafted in the USA

ISO 9001-2015 Certified