

# Brooks® QUANTIM® Low Flow Coriolis Precision Mass Flow Measurement and Control



NEMA 1 / IP40  
Downport Configuration



NEMA 4X / IP65  
Weather Proof  
Configuration



IP65XP  
Explosion Proof  
Configuration



*"QUANTIM Coriolis integrated flow controllers give you the power to measure and control precisely, as an element of the PlantWeb digital plant architecture."*

## QmB Series IP40, IP65, IP65XP

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### **Brooks® QUANTIM® Low Flow Coriolis Precision Mass Flow Measurement and Control**

Brooks QUANTIM family of products are the smallest lowest flow Coriolis meters and controllers available on the market. With a footprint the size of a handheld organizer, you can fit this instrument into any tight space. With a range of 0.001 to 28 kg/hr, you can measure mass or volume flow and density or temperature for drops of liquid, slurries, or gas. QUANTIM offers unsurpassed accuracy and unmatched zero stability in demanding low flow applications.

QUANTIM provides precision mass flow measurement, integral control, on line density and temperature measurement all in one compact package. The heart of the device is a patent pending Coriolis sensor design which measures low flows independent of the fluid type or process variables. This provides you with unsurpassed performance in even the most challenging low flow applications.

Most critical processes require control as well as measurement, therefore QUANTIM offers an optional integrally mounted, in-line control valve. No remote electronics are required as all the transmitting and control electronics are contained within the product housing.

QUANTIM supports HART® Communications Protocol Revision 5. The HART Communications protocol signal is superimposed on the 4-20 mA current output of the device which allows QUANTIM to communicate with any suitable HART network system or a standard 275/375 HART hand held communicator.

Emerson Process Management's PlantWeb architecture also is available to access all the benefits of AMS, Asset Management Solutions, as well as the HART protocol to give unmatched transparency of your controlling equipment.

Available with a variety of options and global approvals the Brooks QUANTIM meters and controllers provide unsurpassed performance, solving specific challenges in demanding low-flow applications.

### **APPLICATIONS**

Available for general purpose, hose down or hazardous area requirements, the Brooks QUANTIM family of products have been designed to accurately measure and control low flow rates for virtually any process fluid, independent of it's characteristics without the need for conversion factors. It has been designed for low flow applications in the demanding specialty chemical, petrochemical, pharmaceutical, semiconductor, analytical, laboratory and OEM markets. Brooks QUANTIM precisely measures and controls process fluids like catalysts, food additives, chemical vapor deposition precursors, hydrocarbons, inhibitors, nutrients, and other critical process fluids.

### **Brooks Instrument**

The Quality System at Brooks Instrument conforms to the quality standards set forth in ISO 9001: 2000. Brooks is known worldwide as offering the best low flow measurement and control solutions for your process needs.

FEATURES	BENEFITS
Lowest flow Coriolis meter or controller available.	Brooks QUANTIM meets the demands of ultra low flow direct mass measurement and control, where Coriolis flow measurement has never been available before.
Multiple functions including, Coriolis sensor, transmitter and in-line valve with full PID function, in a single package.	One stop shopping and simplified installation.
Industry leading mass flow measurement precision.	Provides accurate mass measurement of your fluids in demanding low flow processes, research and pilot plant applications.
Direct (not inferred) mass flow measurement.	Process chemistry and/or process conditions can be altered without the need to change or recalibrate the measurement system, providing the user with maximum flexibility.
No internal moving parts.	Minimizes maintenance requirements, reducing over all cost of ownership.
Small physical size.	Easily integrated into the most intricate of process systems.
Multivariable output including: Mass Flow or Volumetric Flow and Density or Temperature.	Multiple outputs from a single device improves and simplifies process monitoring and diagnostics, further reducing cost of ownership.
Gas, liquid and slurry measurement and control capability in one package.	The ultimate in process flexibility.
Variety of options, enclosure types and area classifications available.	The right product for your application.

## QmB Series IP40, IP65, IP65XP

## SPECIFICATIONS

**Performance Specifications:****Flow****Liquid Flow Specifications, Metric Units<sup>(8)</sup>**

Product Type	QUANTIM Model <sup>(1)</sup>	QUANTIM Tube Size	Maximum Flow Rate <sup>(2)</sup>	Nominal Flow Rate <sup>(2)</sup>	Minimum Full Scale	Minimum Measurable Flow
			Kg/hr or l/hr	Kg/hr or l/hr	Kg/hr or l/hr	Kg/hr or l/hr
Controller	QMBC	2	0.30	0.15	0.01	0.001
		3	1.00	0.78	0.10	0.010
		4	18.64	9.32	1.00	0.100
Meter	QMBM	2	0.38	0.19	0.01	0.001
		3	1.00	1.00	0.10	0.010
		4	27.00	13.50	1.00	0.100

**Liquid Flow Specifications, English Units<sup>(8)</sup>**

Product Type	QUANTIM Model <sup>(1)</sup>	QUANTIM Tube Size	Maximum Flow Rate <sup>(2)</sup>		Nominal Flow rate <sup>(2)</sup>		Minimum Measurable Flow
			lb/hr	gal/hr	lb/hr	gal/hr	lb/hr
Controller	QMBC	2	0.66	0.08	0.33	0.04	0.002
		3	2.21	0.26	1.72	0.21	0.022
		4	41.10	4.92	20.55	2.46	0.221
Meter	QMBM	2	0.84	0.10	0.42	0.05	0.002
		3	2.21	0.26	2.21	0.26	0.022
		4	59.54	7.13	29.77	3.57	0.221

**Gas Flow Specifications**

Flow rates that produce approximately 14.5 psid (1bar) pressure drop on air at 70°F (21°C) with inlet pressure of 500 psi (35 bar)

Product Type	QUANTIM Model <sup>(1)</sup>	QUANTIM Tube Size	Nominal Mass Flow Rate		Nominal Volume Flow Rate		
			lb/hr	Kg/hr	scfh <sup>(3)</sup>	sccm <sup>(3)</sup>	ml <sub>n</sub> /min <sup>(4)</sup>
Controller	QMBC	2	0.168	0.076	2.227	1051	975.2
		3	0.472	0.214	6.261	2955	2743
		4	4.653	2.110	61.67	29106	27018
Meter	QMBM	2	0.227	0.103	3.034	1432	1329
		3	0.893	0.405	11.86	5595	5193
		4	8.026	3.640	106.7	50350	46750

# Data Sheet

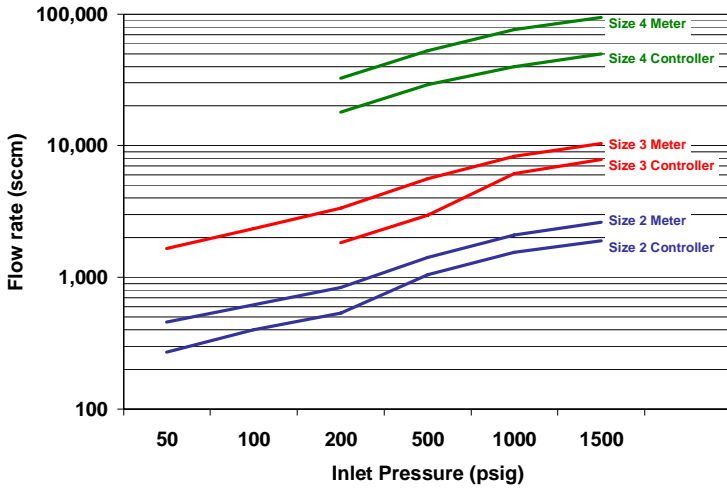
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April, 2006

QmB Series IP40, IP65, IP65XP

## Gas Flow Limits

Air, 70°F (21°C), 14.5 psi (1 bar) pressure drop



## Accuracy<sup>(5)</sup>

± measurement accuracy % of rate or [(zero stability/flowrate) x 100] % of rate, whichever is greater

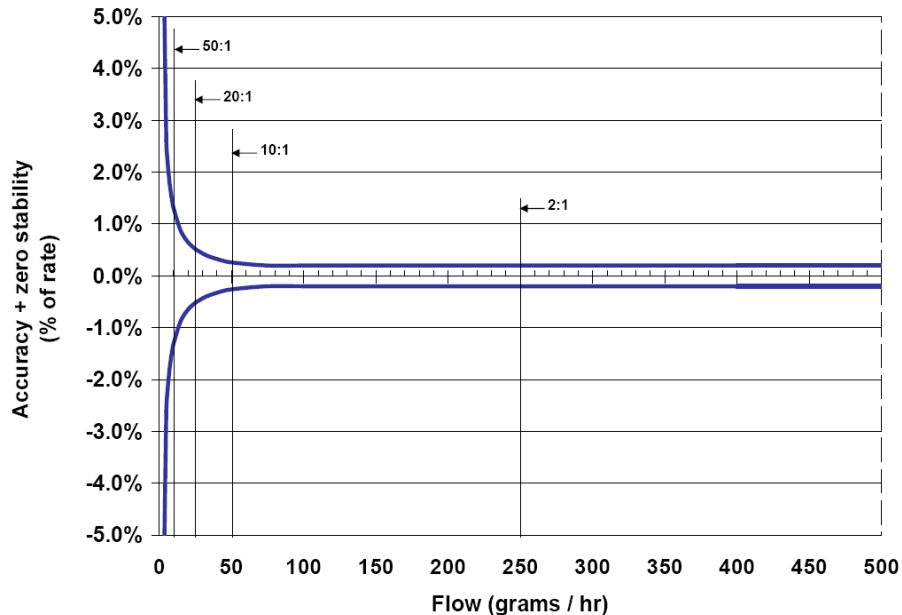
## Measurement Accuracy

Sensor Tube Material	Fluid Type	Standard Flow Measurement Accuracy (% of rate)	Optional Flow Measurement Accuracy (% of rate)
Stainless Steel	Liquid	0.2%	0.5%
	Gas	0.5%	1.0%
Hastelloy	Liquid	0.5%	1.0%
	Gas	0.5%	1.0%

## Zero Stabilities

Sensor Tube Material	Tube Size	Zero Stability (Kg/hr)	Zero Stability (Lb/hr)
Stainless Steel	2	0.00013	0.0003
	3	0.0010	0.0022
	4	0.0040	0.0088
Hastelloy	2	0.0002	0.0004
	3	0.0015	0.0033
	4	0.0120	0.0265

## Standard Measurement Accuracy vs Flow Rate Chart, Tube Size 2



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Repeatability<sup>(6)</sup>:

± 0.05% or ± [0.5 x (zero stability/flowrate) x 100]% of rate whichever is greater

Device Leak Integrity:

Elastomer Sealed Device: Outboard  $1 \times 10^{-9}$  atm. cc/sec., helium (maximum)  
 Metal Sealed Device:  $1 \times 10^{-10}$  atm. cc/sec., helium (maximum)

Turn Down:

Controller: 100:1 or down to the minimum measurable flow, whichever flow rate is greater  
 Meter: to minimum measurable flow

Settling Time:

Controller: Less than 2 seconds within 2 % full scale of final value, ± [(zero stability/flowrate) x 100]% of rate per SEMI Guideline E17-91  
 Meter: Less than 0.5 seconds within 2 % full scale of final value, ± [(zero stability/flowrate) x 100]% of rate per SEMI Guideline E17-91

Maximum Operating Pressure:

Standard: 3.5 MPa, 35 bar or 500 psi  
 Optional: 10 MPa, 100 bar or 1500 psi  
 Optional: 30 MPa, 300 bar or 4500 psi

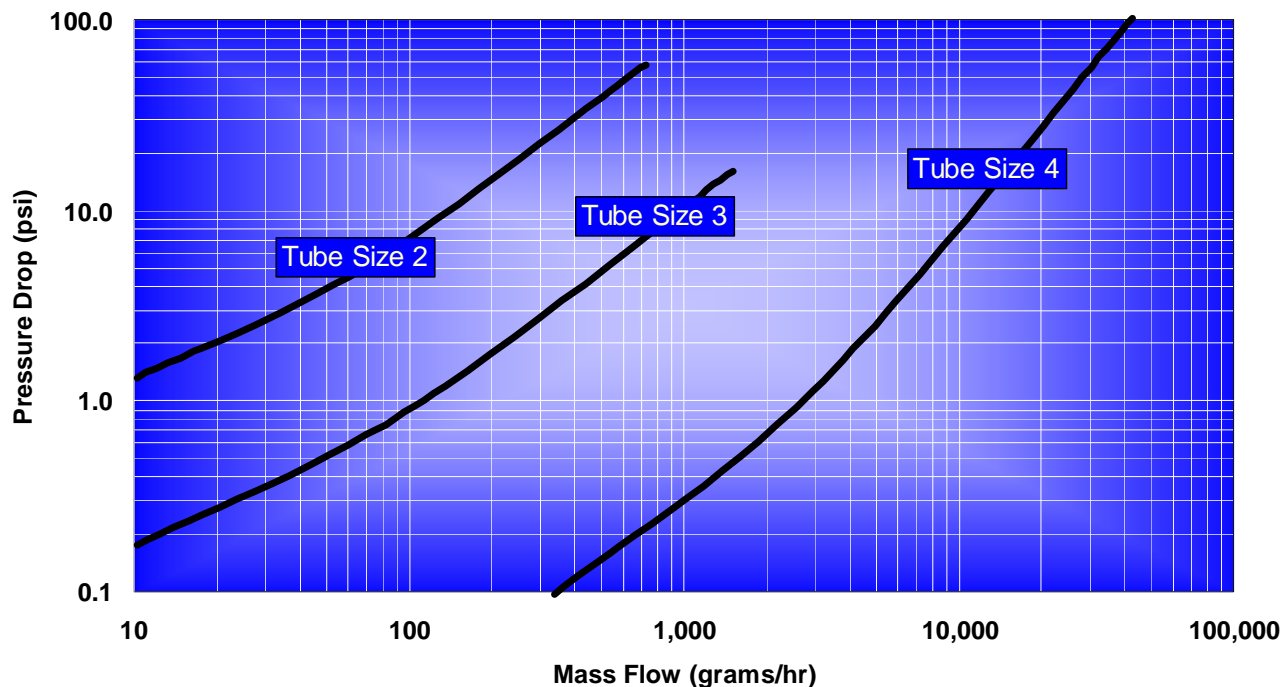
### Differential Pressure Requirements, Controller <sup>(7)</sup>

QUANTIM Model <sup>(1)</sup>	QUANTIM Tube Size	Liquid						Gas					
		kPa		bar		psi		kPa		bar		psi	
		Min	Max*	Min	Max*	Min	Max*	Min	Max*	Min	Max*	Min	Max*
QMBC	2	69	1034	0.7	10.3	10	150	69	1724	0.7	17.2	10	250
	3	69	1379	0.7	13.8	10	200	69	1724	0.7	17.2	10	250
	4	69	1379	0.7	13.8	10	200	69	1724	0.7	17.2	10	250

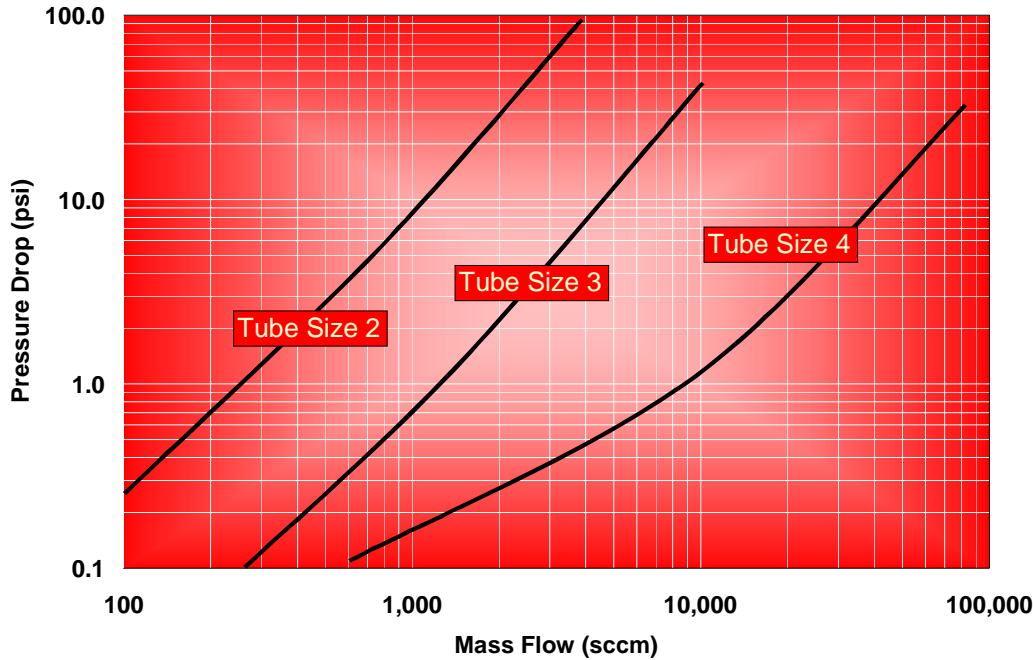
\*Actual maximum pressure drop will depend on process conditions and orifice selection.

### Differential Pressures , Meter<sup>(7)</sup>

Pressure Drop Liquid - (H<sub>2</sub>O)



Pressure Drop Air @ 500 psi Inlet Pressure



Density<sup>(8)</sup>:

Range:	0 to 0.3 and 0.5 to 2.0 grams/cc
Accuracy:	±0.005 grams/cc
Repeatability:	±0.002 grams/cc

Temperature<sup>(9)</sup>

Device Temperature Range:	0 to 65°C or 32 to 149°F
Accuracy:	± 0.5°C or ± 1.0°F

**Notes**

- <sup>(1)</sup> QMBC - Brooks QUANTIM controller with integral control valve. QMBM - Brooks QUANTIM meter (no valve).
- <sup>(2)</sup> The nominal flow rate is the flow rate at which water at reference conditions causes approximately 1 bar of pressure drop or the laminar to turbulent transition flow whichever is lower. Maximum flow rate is twice nominal flow rate or the laminar to turbulent transition flow whichever is lower.
- <sup>(3)</sup> Standard volumetric conditions are 14.696 psia and 70°F.
- <sup>(4)</sup> ml<sub>n</sub>/min Reference Conditions 0°C at 1013.25 mbar.
- <sup>(5)</sup> Accuracy includes combined repeatability, linearity, and hysteresis. Specifications are based on reference test conditions of water/nitrogen at 68 to 77°F (20 to 25°C) and 15 to 30 psig (1 to 2 bar).
- <sup>(6)</sup> Repeatability- The maximum difference between output readings when the same input is applied consecutively; the closeness of agreement among consecutive measurements of an output for the same value of input under the same operating conditions, approaching from the same direction.
- <sup>(7)</sup> Differential pressures are based on reference conditions of water and air at 68 to 77°F (20 to 25°C).
- <sup>(8)</sup> Contact Brooks for applications with fluid density in the range from 0.3 to 0.5 grams/cc. The density measurement at temperatures other than 21° C (70° F) has an additional error of approximately 0.0005 grams/cc per deg C.
- <sup>(9)</sup> A temperature rise of up to 20°C (68°F) from internal heating can occur in an open environment where ambient temperature is 23°C (73°F).

## QmB Series IP40, IP65, IP65XP

### Certifications and Approvals

#### IP40 Series

Non Incendive/ Non Sparking  
United States and Canada- UL Recognized E73889, Vol. 3, Sect. 3.

Non Incendive , Class I, Division 2, Groups A, B, C and D; T4  
Per UL 1604 and CSA 213

Ex nC IIC T4  
Per CSA E79-15

Class I, Zone 2, AEx nC IIC T4  
Per ANSI/ISA 12.12.02- 2003 and ANSI/UL 60079-15

Ambient Temperature: 0° C to 65° C

Enclosure: Type 1/ IP40

Europe - KEMA 04ATEX1241 X



II 3 G EEx nA II T4  
Per EN 50021

Ambient Temperature: 0° C to 65° C

Enclosure: IP40

#### IP65 Series

Non Incendive/ Non Sparking  
United States and Canada- UL Recognized E73889, Vol. 1, Sect. 26. (conduit entry)  
United States and Canada Recognized, UL E73889, Vol. 3, Sect. 3. (cable gland entry)

Non Incendive , Class I, Division 2, Groups A, B, C and D;  
Dust Ignition Proof, Class II, Division 2, Groups F and G; Suitable for Class III, Division 2; T4  
Per UL 1604 and CSA 213

Ex nC IIC T4  
Per CSA E79-15

Class I, Zone 2, AEx nC IIC T4  
Per ANSI/ISA 12.12.02- 2003 and ANSI/UL 60079-15

Ambient Temperature: 0° C to 65° C

Enclosure: Type 4X/ IP65

Europe - KEMA 05ATEX1068 X



II 3 G EEx nA II T4  
II 3 D T 135 C  
Per EN 50021(EN 60079-15)

Ambient Temperature: 0° C to 65° C

Enclosure: IP65

**Certifications and Approvals**

**IP65XP Series Explosion-proof/ Flame-proof**

United States and Canada- UL Recognized E73889, Vol. 1, Sect. 21.

Explosion-proof , Class I, Division 1, Groups C and D;  
Dust Ignition-proof, Class II, Division 1 Groups E, F, and G;  
Suitable for Class III, Division 1; T4  
Per UL 1203 and CSA 22.2 No. 30


Ex nC IIC T4  
Per CSA E79-1

Class I, Zone 2, AEx nC IIC T4  
Per ANSI/ISA 12.22.01 (IEC 60079-1 Mod) and UL 60079-15

Ambient Temperature: 0° C to 65° C

Enclosure: Type 4/ IP65

Europe - KEMA 05ATEX2052 X

 II 2 G EEx d IIB T  
II 2 D T 85° C  
Per EN 50014, EN 50018 and EN 50281-1-1

Ambient Temperature: 0° C to 65° C

Enclosure: IP65

**Environmental effects**

EMC effects:

The Brooks QUANTIM series meets the requirements of the EMC directive 89/336EEC per EN 50081-2 and EN 61326-1. To meet these specifications, the Brooks QUANTIM device must be directly connected to a low impedance (less than 1 Ohm) earth ground. Signals must use a standard twisted-pair, shielded instrument wire.

Pressure effects:

The Brooks QUANTIM series meets the requirements of the Pressure Equipment Directive 97/23/EC. The unit falls into the category "Sound Equipment Practice".

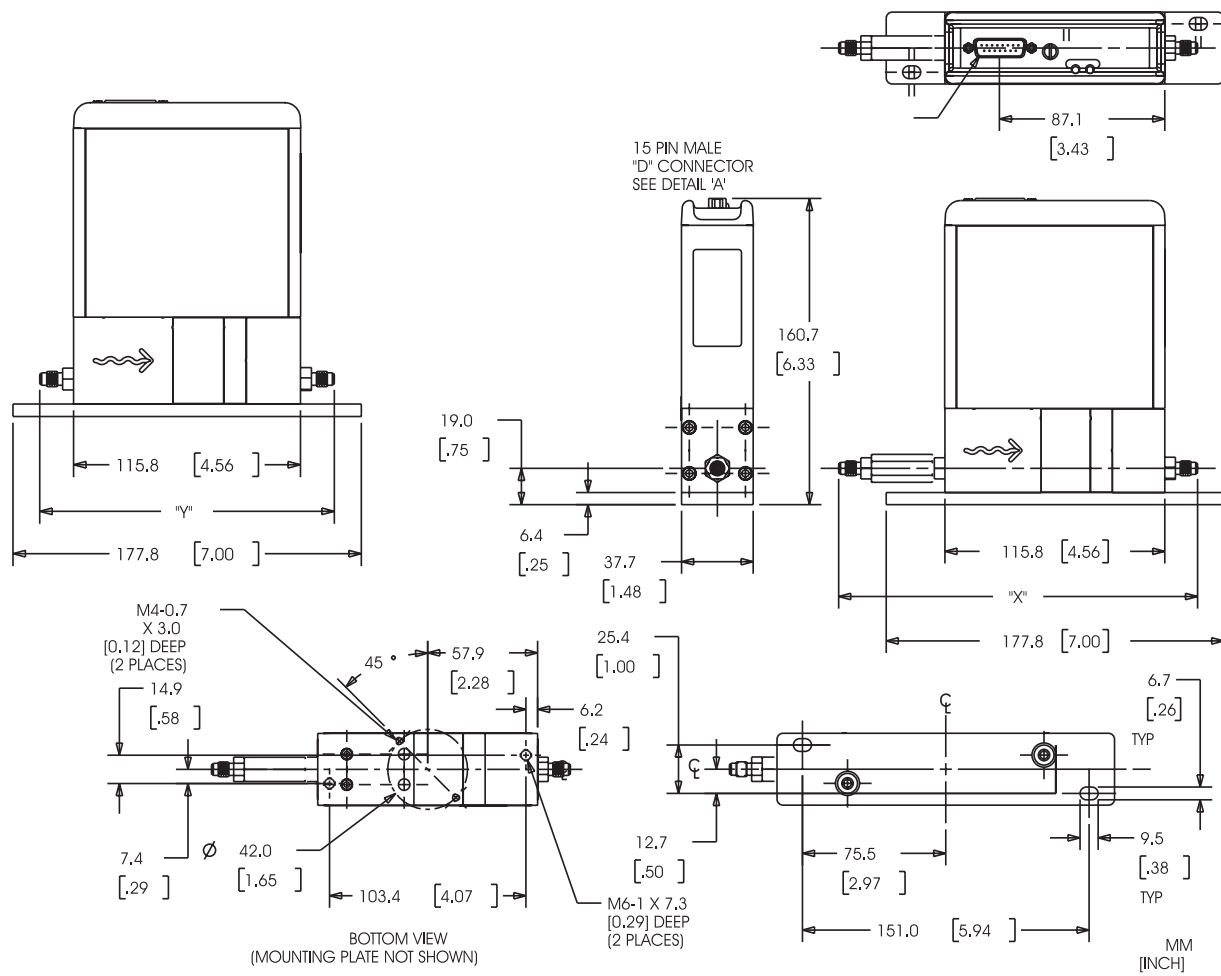
## QmB Series IP40, IP65, IP65XP

**Physical Specifications**

Materials of construction:	Process Wetted: 316L, 316L VAR, High Alloy Ferritic Stainless and 17-7PH Optional: Hastelloy sensor tube.
Process Seals:	Process Seals: Elastomer Seal: Stainless Steel or Nickel and Viton® fluoroelastomers, Buna, Kalrez® or EPDM Metal Seal: Stainless Steel or Nickel
Housing:	Housing: IP40: Polyurethane painted Aluminum IP65: Epoxy painted Aluminum IP65XP: Aluminum
Inlet Filter:	Tube Size 2 Controller: 1 micron or 10 micron inlet filter recommended Tube Size 3 or 4: 10, 20, 30 & 40 micron filters available
Weight:	Housing: IP40: 1.6 kg or 3.5 Lbs. Housing IP65: 1.9 kg or 4.2 Lbs. Housing IP65XP: 24 kg or 52 Lbs.
Moisture content:	Purged to exhaust dew point less than -40°C (-40°F) prior to shipment to remove calibration liquid, to prevent process contamination. Then vacuum bagged at ambient room conditions.
Process fitting options:	1/8", 1/4" or 6mm tube compression, VCR or NPT(F), Down Port ANSI/ISA 76.00.02 (See Ordering Information table).
Electrical connections:	IP40: 15 pin D-Type connector. IP65: Unpluggable Terminal Block 28-16 Awg. IP65XP: 3/4" NPT wiring access to IP40 Device with 15 pin D-Type connector.
Dimensions:	See Figures 1, 2, and 3.
<b>Functional Specifications</b>	
Output signals <sup>(10)</sup> :	<ul style="list-style-type: none"> <li>• 4-20 mA or 0-5 Vdc active outputs represent mass flow or volume flow.</li> <li>• And simultaneously available 4-20 mA active output, represents on-line density or temperature information.</li> </ul>
Input signals <sup>(10)</sup> :	<ul style="list-style-type: none"> <li>• Command (setpoint) that drives the (internally) installed control valve, either 4-20 mA or 0-5 Vdc input signals.</li> <li>• Valve Override Function: Left floating/unconnected - instrument controls flow at setpoint Connected to signal at or above 5.0 Volts -valve is forced open Connected to signal at or below 0.0 Volts -valve is forced closed</li> </ul>
Power Requirements:	
Voltage:	+14 to 27 Vdc.
Current:	Controller: 300 mA to 400 mA Meter: 100 mA to 150 mA



QmB Series IP40, IP65, IP65XP



LAY-IN DIMENSIONS

FITTING	"X" DIMENSION	"Y" DIMENSION
1/16" Tube Compression	184.1 [7.25]* 167.3 [6.59]**	151.9 [5.98]* 135.1 [5.32]**
1/8" Tube Compression	192.7 [7.59]* 167.3 [6.59]**	160.5 [6.32]* 135.1 [5.32]**
1/4" Tube Compression	197.3 [7.77]* 166.8 [6.57]**	165.1 [6.50]* 134.6 [5.30]**
6 mm Tube Compression	197.6 [7.78]* 167.0 [6.78]**	165.4 [6.51]* 134.8 [5.31]**
1/8" NPT (F)	179.9 [7.08]	147.7 [5.81]
1/4" NPT (F)	189.3 [7.45]	157.1 [6.19]
1/8" VCR	182.6 [7.19]	150.4 [5.92]
1/4" VCR	200.9 [7.91]	168.7 [6.64]
1/4" VCO	188.2 [7.41]	156.0 [6.14]

\* OVERALL LENGTH FINGER TIGHT  
 \*\* OVERALL LENGTH DIMENSION IS TO THE INTERNAL TUBE LOCATING SHOULDER

D-CONNECTOR CONNECTIONS

PIN #	FUNCTION
1	SETPOINT RETURN
2	0-5 VDC FLOW SIGNAL OUTPUT
3	(TTL) OPEN COLLECTOR ALARM OUTPUT
4	4-20 MA FLOW SIGNAL OUTPUT
5	+1.3.5 VDC TO +27 VDC POWER SUPPLY
6	NOT USED
7	4-20 MA SETPOINT INPUT (+)
8	0-5 VDC SETPOINT INPUT (+)
9	POWER SUPPLY COMMON
10	SIGNAL OUTPUT COMMON
11	+5 VOLT REFERENCE OUTPUT
12	VALVE OVERRIDE INPUT
13	4-20 MA DENSITY OR TEMPERATURE
14	NOT USED
15	NOT USED

Figure 1 Dimensional Drawing QmB IP40

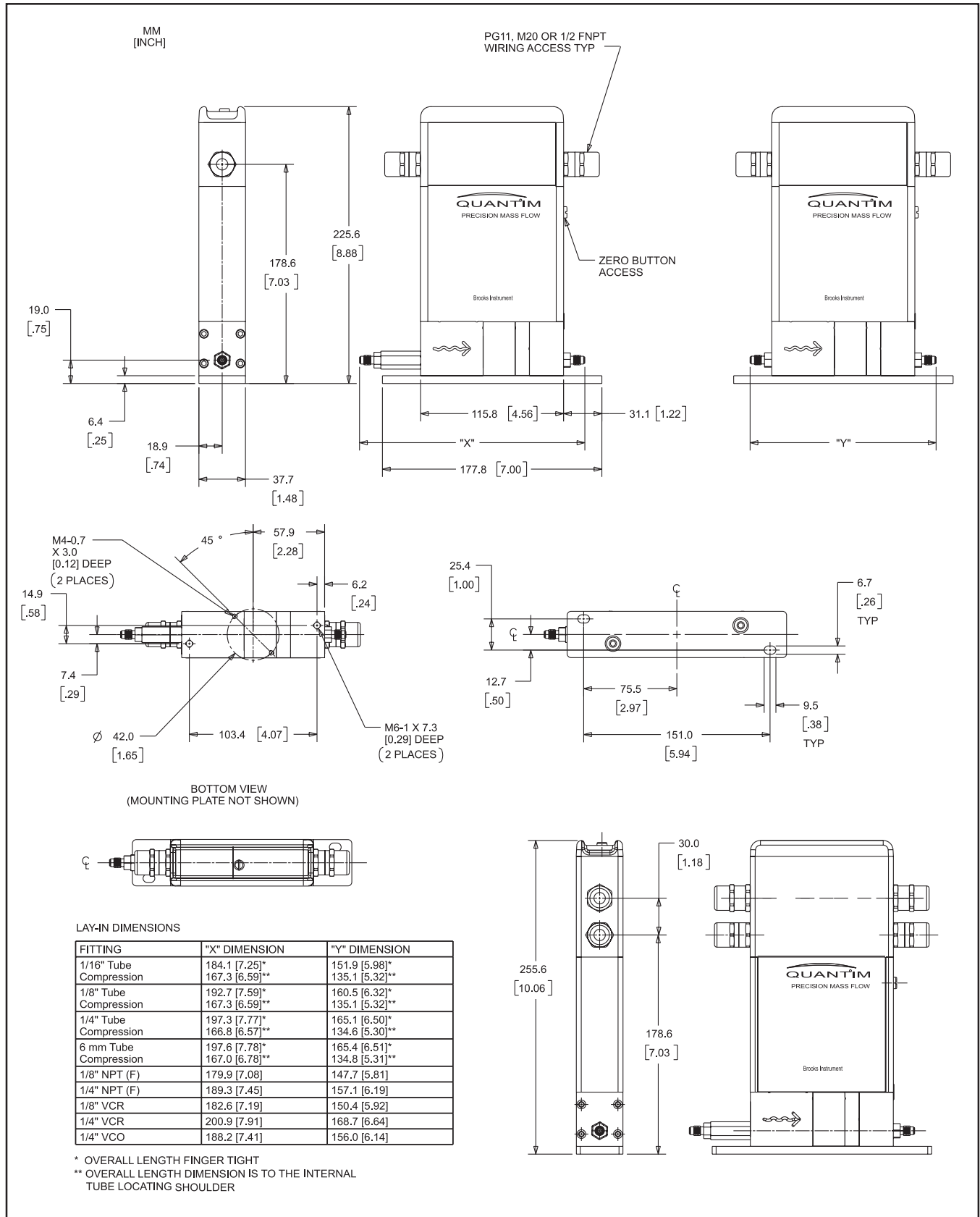
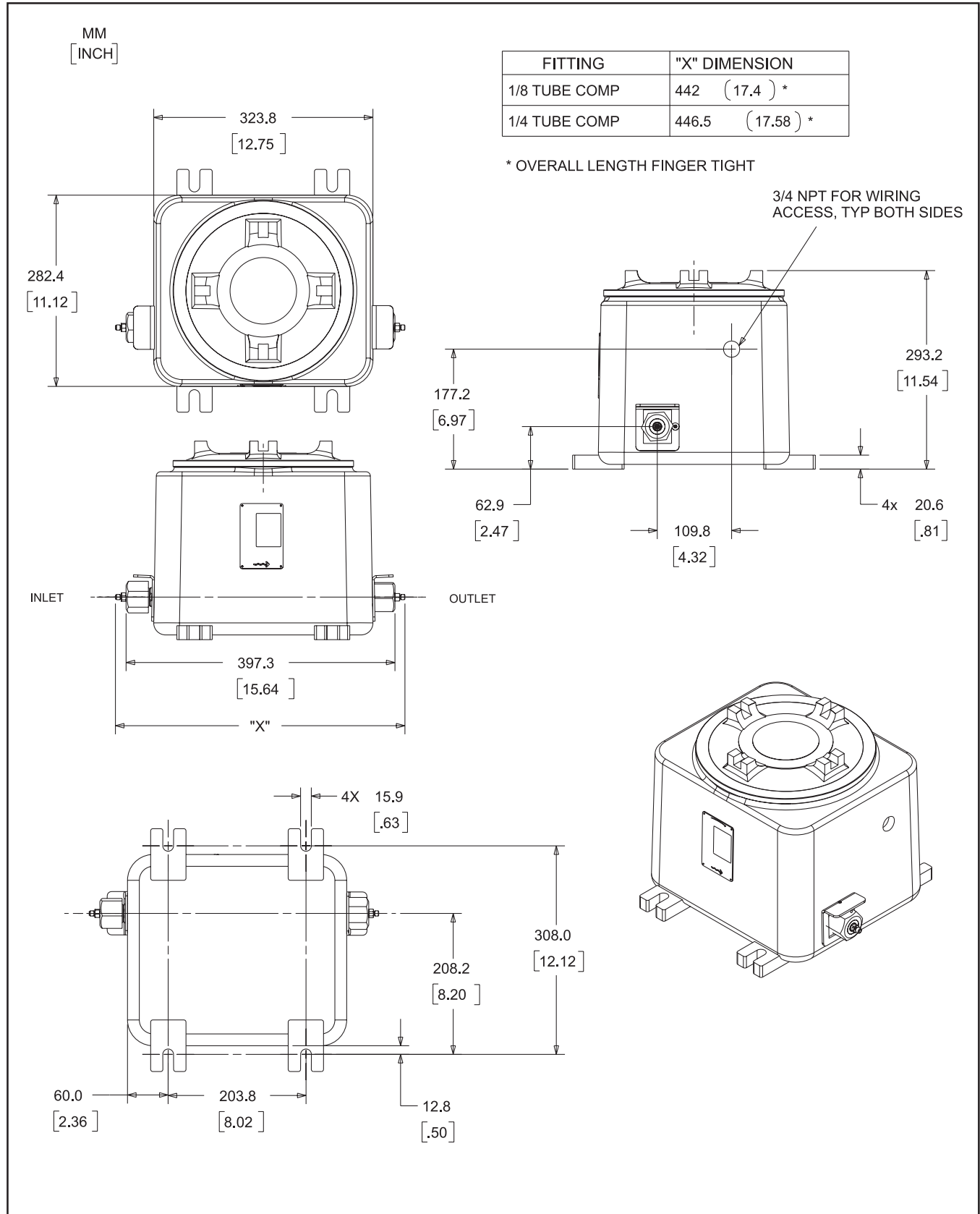


Figure 2 Dimensional Drawing QmB IP65

**QmB Series IP40, IP65, IP65XP**



Model Code for QmB

<b>Model: QM Series</b>					
<b>MULTIVARIABLE PRECISION MASS FLOW MEASUREMENT AND CONTROL</b>					
<b>BASE MODEL NUMBER, REVISION AND PRIMARY DEVICE DESCRIPTION</b>					
<b>QMBC</b>	FLOW CONTROLLER				
<b>QMBM</b>	FLOW METER				
	<b>TUBE SIZE</b>	<b>METER NOMINAL FLOW RATE</b>		<b>CONTROLLER NOMINAL FLOW RATE</b>	
		<b>LIQUID</b>	<b>GAS</b>	<b>LIQUID</b>	<b>GAS</b>
<b>2</b>	SMALL	190 grams/hour	1432 sccm	150 grams/hour	1051 sccm
<b>3</b>	MEDIUM	1.00 Kg/hour	5.595 SLPM	780 grams/hour	2.96 SLPM
<b>4</b>	LARGE	13.5 Kg/hour	50.35 SLPM	9.32 Kg/hour	29.11 SLPM
	<b>FLUID TYPE</b>				
<b>L</b>	LIQUID <b>NOTE: SELECT PRIMARY FLUID TYPE. USER CAN SWITCH FROM LIQUID TO GAS AND</b>				
<b>G</b>	GAS <b>VISA-VERSA. REZEROING IS REQUIRED.</b>				
	<b>PRESSURE TRANSDUCER</b>				
<b>1</b>	NO TRANSDUCER				
	<b>VALVE TYPE</b>				
<b>A</b>	NO VALVE (PRODUCT TYPE = FLOW METER)				
<b>B</b>	NORMALLY CLOSED VALVE				
	<b>ACCURACY</b>	<b>LIQUID AND STAINLESS STEEL</b>		<b>ACCURACY</b>	<b>GAS OR HASTELLOY</b>
<b>2</b>	STANDARD	0.2% OF RATE		<b>3</b>	STANDARD 0.5% OF RATE
<b>3</b>	OPTIONAL	0.5% OF RATE		<b>4</b>	OPTIONAL 1.0% OF RATE
	<b>ENCLOSURE TYPE AND AREA CLASSIFICATION</b>				
<b>A</b>	NEMA 1 / IP 40				
<b>B</b>	NEMA 1 / IP 40 CLASS 1 DIV 2 / ZONE 2				
<b>C</b>	NEMA 4X / IP 65				
<b>D</b>	NEMA 4X / IP 65 CLASS 1 DIV 2 / ZONE 2				
<b>E</b>	EXPLOSION PROOF DIVISION 1 / ZONE 1				
	<b>SURFACE FINISH</b>				
<b>1</b>	STANDARD SURFACE FINISH (32 Ra)				
	<b>SENSOR TUBE MATERIAL</b>				
<b>A</b>	STAINLESS STEEL, 316L MAXIMUM BODY PRESSURE <= 100 BAR OR 1500 PSI				
<b>B</b>	HASTELLOY, C22 (TUBES ONLY) (METER)				
	<b>MAXIMUM BODY PRESSURE RATING</b>				
<b>1</b>	35 BAR OR 500 PSI				
<b>2</b>	100 BAR OR 1500 PSI				
<b>3</b>	300 BAR OR 4500 PSI MUST SELECT HASTELLOYSENSOR TUBE MATERIAL				
	<b>MAXIMUM TEMPERATURE RATING</b>				
<b>A</b>	65 DEG C				
	<b>PROCESS CONNECTIONS</b>				
<b>1A</b>	STANDARD BODY CONNECTIONS - 5/16"-24 UNF				
<b>1B</b>	1/16" - TUBE COMPRESSION FITTINGS				
<b>1C</b>	1/4" TUBE COMPRESSION FITTINGS				
<b>1D</b>	1/8" TUBE COMPRESSION FITTINGS				
<b>1G</b>	6mm TUBE COMPRESSION FITTINGS				
<b>1J</b>	1/8" NPT(F)				
<b>1K</b>	1/4" NPT(F)				
<b>1L</b>	1/8" VCR				
<b>1M</b>	1/4" VCR				
<b>1P</b>	1/4" VCO				
<b>1Y</b>	DOWN PORT ANSI/ISA-76.00.02				
	<b>ELECTRICAL I/O - COMMUNICATIONS</b>				
<b>A</b>	0-5 VDC NOTE: SECONDARY OUTPUT IS ALWAYS 4-20mA.				
<b>B</b>	4-20 mA				
<b>H</b>	HART / 4-20 mA				
	<b>ELECTRICAL CONNECTION</b>				
<b>1</b>	15 PIN D - CONNECTOR				ENCLOSURE = NEMA 1 / IP40
<b>3</b>	PG11 CABLE GLAND				ENCLOSURE = NEMA 4X / IP65
<b>4</b>	1/2" FNPT CONDUIT, 2 ENTRY				ENCLOSURE = NEMA 4X / IP65
<b>5</b>	1/2" FNPT CONDUIT, 4 ENTRY				ENCLOSURE = NEMA 4X / IP65
<b>6</b>	M20 CONDUIT, 2 ENTRY				ENCLOSURE = NEMA 4X / IP65
<b>7</b>	M20 CONDUIT, 4 ENTRY				ENCLOSURE = NEMA 4X / IP65
<b>8</b>	3/4" FNPT CONDUIT				ENCLOSURE = EXPLOSION PROOF

## QmB Series IP40, IP65, IP65XP

Model Code for QmB (continued)

SEALS	SENSOR	VALVE STEM	FITTING	ORIFICE SEAL	
A	VITON	VITON	VITON	STAINLESS STEEL	
B	BUNA	BUNA	BUNA	STAINLESS STEEL	NOTE:
C	KALREZ	KALREZ	KALREZ	STAINLESS STEEL	DOWNPORT PROCESS
E	EPDM	EPDM	EPDM	STAINLESS STEEL	CONNECTION OPTION
F	NICKEL	NICKEL	VITON	STAINLESS STEEL	CODE 1Y HAS NO
G	NICKEL	NICKEL	BUNA	STAINLESS STEEL	FITTING O'RING IN THE
H	NICKEL	NICKEL	KALREZ	STAINLESS STEEL	ASSEMBLY.
J	NICKEL	NICKEL	EPDM	STAINLESS STEEL	
K	NICKEL	NICKEL	NICKEL	STAINLESS STEEL	(ALL METAL)
<b>VALVE SEAT MATERIAL</b>					
1	NONE				(METER)
7	METAL 17-7pH STAINLESS STEEL				(CONTROLLER)
<b>SPECIAL PROCESSING</b>					
A	NONE				
B	CERTIFIED MATERIALS 2.2 EN 10204				
C	CERTIFIED MATERIALS 3.1B EN 10204				
D	CLEANING FOR OXYGEN SERVICE				
E	CLEANING FOR OXYGEN SERVICE AND CERTIFIED MATERIALS 2.2 EN 10204				
F	CLEANING FOR OXYGEN SERVICE AND CERTIFIED MATERIALS 3.1B EN 10204				
<b>QUALITY CERTIFICATIONS</b>					
1	NONE				
2	CALIBRATION CERTIFICATION - TRACEABLE TO NIST				
4	CERTIFICATE OF CONFORMANCE				
5	CALIBRATION CERTIFICATION - TRACEABLE TO NIST AND CERTIFICATE OF CONFORMANCE				
<b>IN LINE FILTER</b>					
A	NONE				
B	IN LINE CARTRIDGE FILTER, 10 MICRON		B OR F REQUIRED FOR SIZE 2 CONTROLLER		
C	IN LINE CARTRIDGE FILTER, 20 MICRON				
D	IN LINE CARTRIDGE FILTER, 30 MICRON				
E	IN LINE CARTRIDGE FILTER, 40 MICRON				
F	IN LINE CARTRIDGE FILTER, 1 MICRON		B OR F REQUIRED FOR SIZE 2 CONTROLLER		
<b>OEM CODE</b>					
A	BROOKS				

**BROOKS LOCAL AND WORLDWIDE SUPPORT**

- Brooks Instrument provides sales and service facilities around the world.
- Calibration facilities are available in local sales and service offices. Certified by our local Weights and Measures Authorities and traceable to the relevant international standards.

**START-UP SERVICE AND IN-SITU CALIBRATION**

- Brooks Instrument can provide start-up service prior to operation when required, if necessary under in-situ conditions, and the results will be traceable to the relevant international quality standards.

**CUSTOMER SEMINARS AND TRAINING**

- Brooks® can provide customer seminars and dedicated training to engineers, end users and maintenance persons.

**HELP DESK**

In case you need technical assistance:

**SERV' INSTRUMENTATION**

Mesure et Contrôle vos fluides

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Process Management