

Features

- Close loop control
- 24 bit Analog digital converter (ADC)
- Output accuracy $\pm 0.1\%$, $\pm 2.5 \mu\text{A}$ (4~20mA)
Output accuracy $\pm 0.01\%$, $\pm 1\text{mV}$ (0~10VDC)
- Field adjustment of critical flow meter settings Smart interface (RS-232)
- Field validation of flow meter calibration
- Direct mass flow monitoring eliminates need for temperature and pressure compensation
- Greatly reduces upstream piping requirements
- Outstanding Range ability
- One-second response to changes in flow rate
- CE, EEx, CENELEC (Pending)



Description

ientek Instruments ientek 3100S Smart Insertion mass flow meter accommodates the change measurement requirements and instrument-validation demands of industrial gas flow monitoring installations.

The versatile microprocessor-based transmitter integrates the functions of flow measurement, flow range adjustment, meter validation and diagnostics, in either a probe-mounted or remote housing.

Mass flow rate and totalized flow, as well as other configuration variables, are displayed on the meter's optional 2×16 LCD panel. The programmable transmitter is easily configured via an RS-232 communication port and ientek's Smart Interface™ software, or via the display and magnetic switches on the instrument panel.

The ientek 3100S allows you to configure or change the following password protected parameters : flow range, totalize, alarm settings, time response, low flow cutoff and a calibration correction factor that compensates for flow profile flow variations.

ientek's Smart Interface™ software guides you through a procedure to fully validate instrument performance.

The meter is available with a variety of input power, output signal, mounting and packaging options.

The information contained herein is subject to change without notice.

3100 Series Smart-IN™ Mass Flow Meter

3100

Performance Specifications

Accuracy of Point Velocity

±2% of reading from 10 to 100% of calibrated range
±0.5% of full scale below 10% of calibrated range

Repeatability

±0.2% of full scale

Temperature Coefficient

±0.02% of reading per °F within ±50 °F of customer specified conditions.
±0.03% of reading per °F within ±50 °F to 100 °F of customer specified conditions.
±0.04% of reading per °C within ±25 °C of customer specified conditions.
±0.06% of reading per °C within ±25 °C to 50 °C of customer specified conditions.

Pressure Coefficient

0.02% per psi for air, consult factory for other gases

Response Time

One second 63% of final velocity value.

Operating Specifications

Gases

Most gases compatible with 316L stainless steel

Gas Pressure(2 limitations)

Compression fittings : 500 psia(34 barg)
1-inch 150 lb flange(-40°F to 150°F) : 185 psia(12.8 barg)
Low Pressure Hot Tap : 100 psia(7 barg)
High Pressure Hot Tap : 1000 psia(70 barg)
Application gas pressure :
See mass flow range tables for maximum application gas pressures.

Pressure Drop

Negligible for pipes three inches in diameter or larger

Gas & Ambient Temperature

Gas 15°F to 250°F (-10°C to 120°C)
Optional -40°F to 450°F (-40°C to 230°C),
Application dependent
Higher temperature available, consult factory
Ambient ... -5°F to 120°F (-20°C to 50°C)

Leak Integrity

5×10^{-4} atm cc/sec of helium maximum

Power Requirements

DC 24 V ±10% (regulated), 625mA maximum
90-240 VAC ±10% (regulated), 15watts maximum

Output Signal

Linear 0~10VDC , 1000 ohms minimum load resistance or
Linear 4~20mA proportional mass flow rate.
700 ohms maximum resistance power supply dependent
User - selectable ... Active non-galvanic ally separated or
passive galvanic ally separated (loop power required)

Alarms

Hard contact user-adjustable high and low
Dead band adjustable with Smart Interface™ software
Relay ratings - Maximum 42VDC or VAC, 140mA

Displays

Alphanumeric 2 × 16 digit backlight LCD
Adjustable variables via on-board switch's
(password protected) or with Smart Interface™ software
Adjustable variables ... Full scale (50 to 100%)
Time Response (1 to 7 seconds)
Correction factor setting (0.5 to 5)
Zero and span
High and low alarm settings

Totalize

Seven digits (9,999,999.9) in engineering units
Reset table by software, on-board switches or external magnet

Software

Smart Interface™ Windows® - bases software minimum 8 MB of RAM, preferred 16 MB of RAM
RS-232 communication
Additional features...Alarm dead band adjustment
Zero cut-off adjustment
Linearization adjustment
Save/Load configurations
Flow meter validation

Physical Specifications

Wetted Materials

316L stainless steel

Enclosure

Hazardous-Area Location Enclosure (IP67) or NEMA 4X (IP65)
Both are powder-coated cast aluminum

Electrical Connections

Two 3/4 inch NPT...Hazardous-Area Location Enclosure (IP67)
One 1/2 inch NPT...NEMA 4X Enclosure (IP65)

Mounting (optional)

ANSI 1-inch 150 lb flange
3/4-inch tube compression fitting with 1-inch male NPT.
Hot tap systems

Certifications*

CE (All enclosures)
CSA(Explosion-proof for Class 1, Division 1, Groups B,C,D)
EEx (EEx d IIC T6...T2)
FM (Explosion-proof for Class 1, Division 1, Groups B,C,D)
* Certifications Pending, Contact factory

Mass Flow Ranges

EEx approved meters maximum velocities and flow rate are 50% of standard values shown in charts.

3100S-Air-Gas Code 0 Application Temp.=15-250 °F

Spec (%rdg)	Pipe Size	Area (SqFt)	Max Vel (SFPM)	Max (SCFM)	Max nm ³ /hr	Max PSIA
standard accuracy	1"	0.0060	20,000	120	189	120
standard accuracy	1-1/2"	0.0142	20,000	284	448	120
standard accuracy	2"	0.0233	20,000	466	735	120
standard accuracy	3"	0.0513	20,000	1026	1618	120
standard accuracy	4"	0.0884	20,000	1768	2788	120
standard accuracy	6"	0.2010	20,000	4020	6340	120
standard accuracy	8"	0.3470	20,000	6940	10945	120
standard accuracy	10"	0.5480	20,000	10960	17285	120
standard accuracy	12"	0.7770	20,000	15540	24508	120
standard accuracy	14"	0.9390	20,000	18780	29618	120
standard accuracy	16"	1.2270	20,000	24540	38703	120
standard accuracy	18"	1.5530	20,000	31060	48985	120
standard accuracy	24"	2.7920	20,000	55840	88066	120
standard accuracy	36"	6.4920	20,000	129840	204773	120

3100S-Digester-Gas Code 4 Application Temp.=15-250 °F

Spec (%rdg)	Pipe Size	Area (SqFt)	Max Vel (SFPM)	Max (SCFM)	Max nm ³ /hr	Max PSIA
standard accuracy	1"	0.0060	17,200	103	163	30
standard accuracy	1-1/2"	0.0142	17,200	244	385	30
standard accuracy	2"	0.0233	17,200	401	632	30
standard accuracy	3"	0.0513	17,200	882	1392	30
standard accuracy	4"	0.0884	17,200	1520	2398	30
standard accuracy	6"	0.2010	17,200	3457	5452	30
standard accuracy	8"	0.3470	17,200	5968	9413	30
standard accuracy	10"	0.5480	17,200	9426	14865	30
standard accuracy	12"	0.7770	17,200	13364	21077	30
standard accuracy	14"	0.9390	17,200	16151	25472	30
standard accuracy	16"	1.2270	17,200	21104	33284	30
standard accuracy	18"	1.5530	17,200	26712	42127	30
standard accuracy	24"	2.7920	17,200	48022	75737	30
standard accuracy	36"	6.4920	17,200	111662	176105	30

3100S-Argon-Gas Code 1 Application Temp.=15-250 °F

Spec (%rdg)	Pipe Size	Area (SqFt)	Max Vel (SFPM)	Max (SCFM)	Max nm ³ /hr	Max PSIA
standard accuracy	1"	0.0060	28,000	168	265	120
standard accuracy	1-1/2"	0.0142	28,000	398	627	120
standard accuracy	2"	0.0233	28,000	652	1029	120
standard accuracy	3"	0.0513	28,000	1436	2265	120
standard accuracy	4"	0.0884	28,000	2475	3904	120
standard accuracy	6"	0.2010	28,000	5628	8876	120
standard accuracy	8"	0.3470	28,000	9716	15324	120
standard accuracy	10"	0.5480	28,000	15344	24199	120
standard accuracy	12"	0.7770	28,000	21756	34312	120
standard accuracy	14"	0.9390	28,000	26292	41486	120
standard accuracy	16"	1.2270	28,000	34356	54184	120
standard accuracy	18"	1.5530	28,000	43484	68579	120
standard accuracy	24"	2.7920	28,000	78176	123293	120
standard accuracy	36"	6.4920	28,000	181776	286683	120

3100S-Digester-Gas Code 5 Application Temp.=15-250 °F

Spec (%rdg)	Pipe Size	Area (SqFt)	Max Vel (SFPM)	Max (SCFM)	Max nm ³ /hr	Max PSIA
4% correlation	1"	0.0060	17,200	103	163	120
4% correlation	1-1/2"	0.0142	17,200	244	385	120
4% correlation	2"	0.0233	17,200	401	632	120
4% correlation	3"	0.0513	17,200	882	1392	120
4% correlation	4"	0.0884	17,200	1520	2398	120
4% correlation	6"	0.2010	17,200	3457	5452	120
4% correlation	8"	0.3470	17,200	5968	9413	120
4% correlation	10"	0.5480	17,200	9426	14865	120
4% correlation	12"	0.7770	17,200	13364	21077	120
4% correlation	14"	0.9390	17,200	16151	25472	120
4% correlation	16"	1.2270	17,200	21104	33284	120
4% correlation	18"	1.5530	17,200	26712	42127	120
4% correlation	24"	2.7920	17,200	48022	75737	120
4% correlation	36"	6.4920	17,200	111662	176105	120

3100S-CO₂-Gas Code 2 Application Temp.=15-250 °F

Spec (%rdg)	Pipe Size	Area (SqFt)	Max Vel (SFPM)	Max (SCFM)	Max nm ³ /hr	Max PSIA
standard accuracy	1"	0.0060	19,800	119	187	120
standard accuracy	1-1/2"	0.0142	19,800	281	443	120
standard accuracy	2"	0.0233	19,800	461	728	120
standard accuracy	3"	0.0513	19,800	1016	1602	120
standard accuracy	4"	0.0884	19,800	1750	2760	120
standard accuracy	6"	0.2010	19,800	3980	6277	120
standard accuracy	8"	0.3470	19,800	6871	10836	120
standard accuracy	10"	0.5480	19,800	10650	17112	120
standard accuracy	12"	0.7770	19,800	15385	24263	120
standard accuracy	14"	0.9390	19,800	18592	29322	120
standard accuracy	16"	1.2270	19,800	24295	38316	120
standard accuracy	18"	1.5530	19,800	30749	48495	120
standard accuracy	24"	2.7920	19,800	55282	87186	120
standard accuracy	36"	6.4920	19,800	128542	202726	120

3100S-Helium-Gas Code 6 Application Temp.=15-250 °F

Spec (%rdg)	Pipe Size	Area (SqFt)	Max Vel (SFPM)	Max (SCFM)	Max nm ³ /hr	Max PSIA
standard accuracy	1"	0.0060	12,400	74	117	120
standard accuracy	1-1/2"	0.0142	12,400	176	278	120
standard accuracy	2"	0.0233	12,400	289	456	120
standard accuracy	3"	0.0513	12,400	636	1003	120
standard accuracy	4"	0.0884	12,400	1096	1729	120
standard accuracy	6"	0.2010	12,400	2492	3931	120
standard accuracy	8"	0.3470	12,400	4303	6786	120
standard accuracy	10"	0.5480	12,400	6795	10717	120
standard accuracy	12"	0.7770	12,400	9635	15195	120
standard accuracy	14"	0.9390	12,400	11644	18363	120
standard accuracy	16"	1.2270	12,400	15215	23996	120
standard accuracy	18"	1.5530	12,400	19257	30371	120
standard accuracy	24"	2.7920	12,400	34621	54601	120
standard accuracy	36"	6.4920	12,400	80501	126959	120

3100S-Chlorine-Gas Code 3 Application Temp.=50-90 °F

Spec (%FS)	Pipe Size	Area (SqFt)	Max Vel (SFPM)	Max (SCFM)	Max nm ³ /hr	Max PSIA
5% correlation	1"	0.0060	3,261	1.5	1	120
5% correlation	1-1/2"	0.0142	3,333	6.5	10	120
5% correlation	2"	0.0233	3,380	12.0	19	120
5% correlation	3"	0.0513	3,333	20	32	120
5% correlation	4"	0.0884	3,169	45	71	120
5% correlation	6"	0.2010	3,219	75	118	120
5% correlation	8"	0.3470	3,411	175	276	120

Mass Flow Ranges

EEx approved meters maximum velocities and flow rate are 50% of standard values shown in charts.

3100S-Hydrogen-Gas Code 7 Application Temp.=50-90 °F

Spec (%FS)	Pipe Size	Area (SqFt)	Max Vel (SFPm)	Max (SCFM)	Max nm ³ /hr	Max PSIA
standard accuracy	1"	0.0060	9,600	58	91	135
standard accuracy	1-1/2"	0.0142	7,042	100	158	135
standard accuracy	2"	0.0233	4,290	100	158	135
standard accuracy	3"	0.0513	1,950	100	158	135
standard accuracy	4"	0.0884	1,130	100	158	135
standard accuracy	6"	0.2010	500	100	158	135
standard accuracy	8"	0.3470	290	100	158	135
See chart below for flows greater than 100 SCFM						
standard accuracy	1-1/2"	0.0142	9,600	136	215	85
standard accuracy	2"	0.0233	9,600	224	354	85
standard accuracy	3"	0.0513	4,873	250	395	85
standard accuracy	4"	0.0884	2,828	250	395	85
standard accuracy	6"	0.2010	1,243	250	395	85
standard accuracy	8"	0.3470	720	250	395	85
See chart below for flows greater than 250 SCFM						
standard accuracy	3"	0.0513	7,797	400	630	ambient
standard accuracy	4"	0.0884	4,525	400	630	ambient
standard accuracy	6"	0.2010	1,990	400	630	ambient
standard accuracy	8"	0.3470	1,153	400	630	ambient

3100S-CH₄-Gas Code 8 Application Temp.=15-250 °F

Spec (%rdg)	Pipe Size	Area (SqFt)	Max Vel (SFPm)	Max (SCFM)	Max nm ³ /hr	Max PSIA
standard accuracy	1"	0.0060	16,000	96	151	30
standard accuracy	1-1/2"	0.0142	16,000	227	358	30
standard accuracy	2"	0.0233	16,000	373	588	30
standard accuracy	3"	0.0513	16,000	821	1295	30
standard accuracy	4"	0.0884	16,000	1414	2231	30
standard accuracy	6"	0.2010	16,000	3216	5072	30
standard accuracy	8"	0.3470	16,000	5552	8756	30
standard accuracy	10"	0.5480	16,000	8768	13828	30
standard accuracy	12"	0.7770	16,000	12432	19607	30
standard accuracy	14"	0.9390	16,000	15024	23695	30
standard accuracy	16"	1.2270	16,000	19632	30962	30
standard accuracy	18"	1.5530	16,000	24848	39188	30
standard accuracy	24"	2.7920	16,000	44672	70453	30
standard accuracy	36"	6.4920	16,000	102872	163819	30

3100S-CH₄-Gas Code 9 Application Temp.=15-250 °F

Spec (%rdg)	Pipe Size	Area (SqFt)	Max Vel (SFPm)	Max (SCFM)	Max nm ³ /hr	Max PSIA
4% correlation	1"	0.0060	16,000	96	151	120
4% correlation	1-1/2"	0.0142	16,000	227	358	120
4% correlation	2"	0.0233	16,000	373	588	120
4% correlation	3"	0.0513	16,000	821	1295	120
4% correlation	4"	0.0884	16,000	1414	2231	120
4% correlation	6"	0.2010	16,000	3216	5072	120
4% correlation	8"	0.3470	16,000	5552	8756	120
4% correlation	10"	0.5480	16,000	8768	13828	120
4% correlation	12"	0.7770	16,000	12432	19607	120
4% correlation	14"	0.9390	16,000	15024	23695	120
4% correlation	16"	1.2270	16,000	19632	30962	120
4% correlation	18"	1.5530	16,000	24848	39188	120
4% correlation	24"	2.7920	16,000	44672	70453	120
4% correlation	36"	6.4920	16,000	102872	163819	120

3100S-Nitrogen-Gas Code 10 Application Temp.=15-250 °F

Spec (%rdg)	Pipe Size	Area (SqFt)	Max Vel (SFPm)	Max (SCFM)	Max nm ³ /hr	Max PSIA
standard accuracy	1"	0.0060	19,800	119	187	120
standard accuracy	1-1/2"	0.0142	19,800	281	443	120
standard accuracy	2"	0.0233	19,800	461	728	120
standard accuracy	3"	0.0513	19,800	1016	1602	120
standard accuracy	4"	0.0884	19,800	1750	2760	120
standard accuracy	6"	0.2010	19,800	3980	6277	120
standard accuracy	8"	0.3470	19,800	6871	10836	120
standard accuracy	10"	0.5480	19,800	10650	17112	120
standard accuracy	12"	0.7770	19,800	15385	24263	120
standard accuracy	14"	0.9390	19,800	18592	29322	120
standard accuracy	16"	1.2270	19,800	24295	38316	120
standard accuracy	18"	1.5530	19,800	30749	48495	120
standard accuracy	24"	2.7920	19,800	55282	87186	120
standard accuracy	36"	6.4920	19,800	128542	202726	120

3100S-Oxygen-Gas Code 11 Application Temp.=15-250 °F

Spec (%rdg)	Pipe Size	Area (SqFt)	Max Vel (SFPm)	Max (SCFM)	Max nm ³ /hr	Max PSIA
4% correlation	1"	0.0060	19,800	119	187	120
4% correlation	1-1/2"	0.0142	19,800	281	443	120
4% correlation	2"	0.0233	19,800	461	728	120
4% correlation	3"	0.0513	19,800	1016	1602	120
4% correlation	4"	0.0884	19,800	1750	2760	120
4% correlation	6"	0.2010	19,800	3980	6277	120
4% correlation	8"	0.3470	19,800	6871	10836	120
4% correlation	10"	0.5480	19,800	10650	17112	120
4% correlation	12"	0.7770	19,800	15385	24263	120
4% correlation	14"	0.9390	19,800	18592	29322	120
4% correlation	16"	1.2270	19,800	24295	38316	120
4% correlation	18"	1.5530	19,800	30749	48495	120
4% correlation	24"	2.7920	19,800	55282	87186	120
4% correlation	36"	6.4920	19,800	128542	202726	120

3100S-Propane-Gas Code 12 Application Temp.=15-250 °F

Spec (%rdg)	Pipe Size	Area (SqFt)	Max Vel (SFPm)	Max (SCFM)	Max nm ³ /hr	Max PSIA
standard accuracy	1"	0.0060	13,200	79	125	30
standard accuracy	1-1/2"	0.0142	13,200	187	296	30
standard accuracy	2"	0.0233	13,200	308	485	30
standard accuracy	3"	0.0513	13,200	677	1068	30
standard accuracy	4"	0.0884	13,200	1167	1840	30
standard accuracy	6"	0.2010	13,200	2653	4184	30
standard accuracy	8"	0.3470	13,200	4580	7224	30
standard accuracy	10"	0.5480	13,200	7234	11408	30
standard accuracy	12"	0.7770	13,200	10256	16176	30
standard accuracy	14"	0.9390	13,200	12395	19548	30
standard accuracy	16"	1.2270	13,200	16196	25544	30
standard accuracy	18"	1.5530	13,200	20500	32330	30
standard accuracy	24"	2.7920	13,200	36854	58124	30
standard accuracy	36"	6.4920	13,200	85694	135150	30

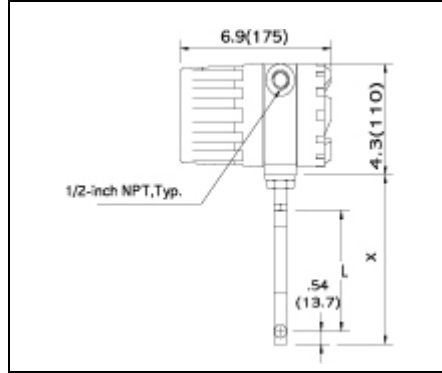
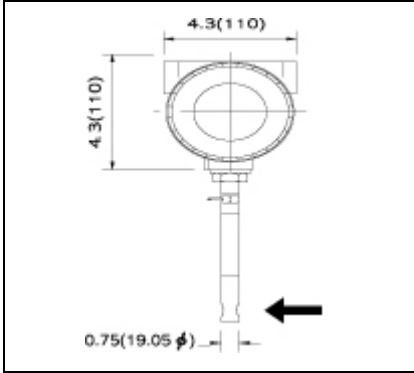
3100S-Propane-Gas Code 13 Application Temp.=15-250 °F

Spec (%rdg)	Pipe Size	Area (SqFt)	Max Vel (SFPm)	Max (SCFM)	Max nm ³ /hr	Max PSIA
4% correlation	1"	0.0060	13,200	79	125	120
4% correlation	1-1/2"	0.0142	13,200	187	296	120
4% correlation	2"	0.0233	13,200	308	485	120
4% correlation	3"	0.0513	13,200	677	1068	120
4% correlation	4"	0.0884	13,200	1167	1840	120
4% correlation	6"	0.2010	13,200	2653	4184	120
4% correlation	8"	0.3470	13,200	4580	7224	120
4% correlation	10"	0.5480	13,200	7234	11408	120
4% correlation	12"	0.7770	13,200	10256	16176	120
4% correlation	14"	0.9390	13,200	12395	19548	120
4% correlation	16"	1.2270	13,200	16196	25544	120
4% correlation	18"	1.5530	13,200	20500	32330	120
4% correlation	24"	2.7920	13,200	36854	58124	120
4% correlation	36"	6.4920	13,200	85694	135150	120

Dimensional Specifications

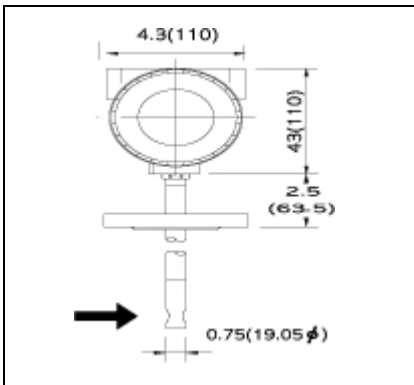
Tables

Compression Fitting - Front View (E2) Compression Fitting - Side View (E2)

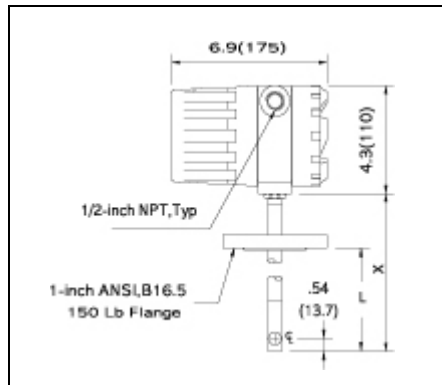


Length Chart		
Code	L	X
L06	6.0 (152.4)	7.0 (177.8)
L09	9.0 (228.6)	10.0 (254.0)
L13	13.0 (330.2)	14.0 (355.6)
L18	18.0 (457.2)	19.0 (482.6)
L24	24.0 (609.6)	25.0 (635.0)
L36	36.0 (914.4)	37.0 (939.8)

Flange Mounting - Front View (E2)

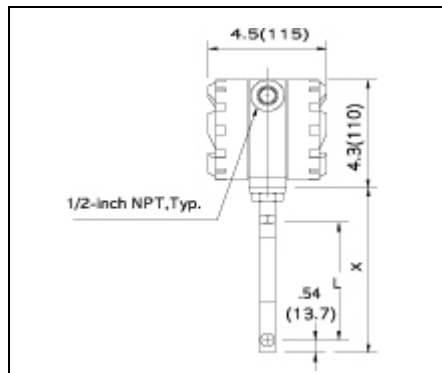
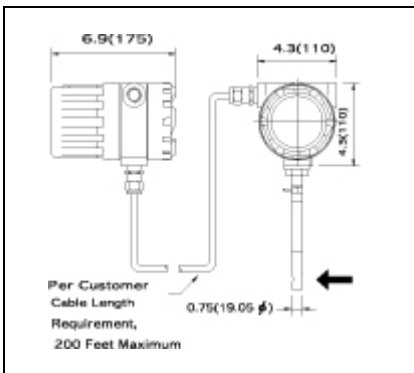


Flange Mounting - Side View (E2)



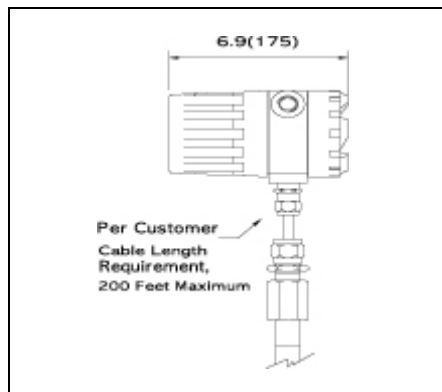
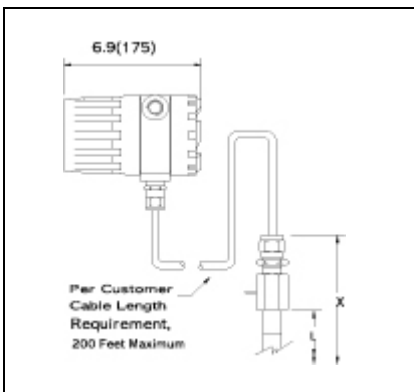
Length Chart		
Code	L	X
L06	6.0 (152.4)	9.0 (228.6)
L09	9.0 (228.6)	12.0 (304.8)
L13	13.0 (330.2)	16.0 (406.4)
L18	18.0 (457.2)	21.0 (533.4)
L24	24.0 (609.6)	27.0 (685.8)
L36	36.0 (914.4)	39.0 (990.6)

Remote Mount Junction Box - Front View (E4) Remote Mount Junction Box - Side View (E4)

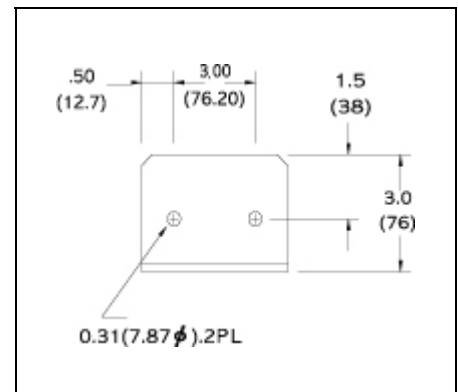


Length Chart		
Code	L	X
L06	6.0 (152.4)	7.5 (190.5)
L09	9.0 (228.6)	10.5 (266.7)
L13	13.0 (330.2)	14.5 (368.3)
L18	18.0 (457.2)	19.5 (495.3)
L24	24.0 (609.6)	25.5 (647.7)
L36	36.0 (914.4)	37.5 (952.5)

Remote Mount - Front View (E3, EEx only) Remote Mount - Side View (E3, EEx only)



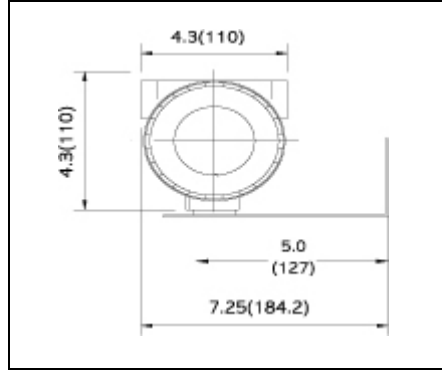
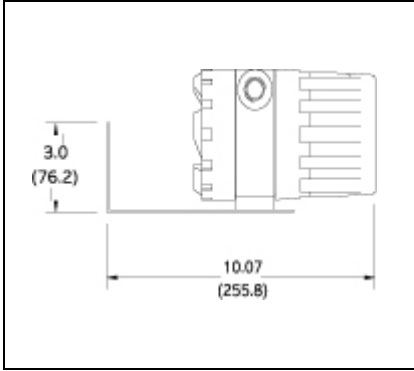
Mounting Holes for Remote Bracket



All dimensions are inches. Millimeters are in parentheses. Certified drawings are available on request.

Dimensional Specifications (I)

Remote Rear Bracket Mounted Electronics Remote Side Bracket Mounted Electronics

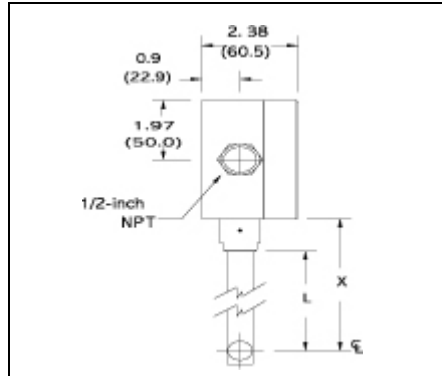
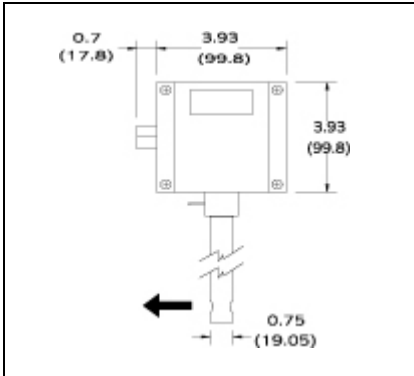


Tables

Length Chart		
Code	L	X
L06	6.1 (154.9)	7.1 (180.3)
L09	9.1 (231.1)	10.1 (256.5)
L13	13.1 (332.7)	14.1 (358.1)
L18	18.1 (459.7)	19.1 (485.1)
L24	24.1 (612.1)	25.1 (637.5)
L36	36.1 (916.9)	37.1 (942.3)

NEMA 4X Dimensional Specifications

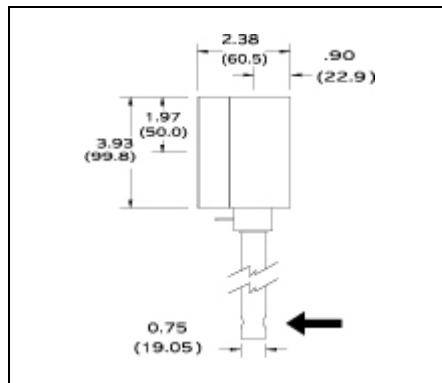
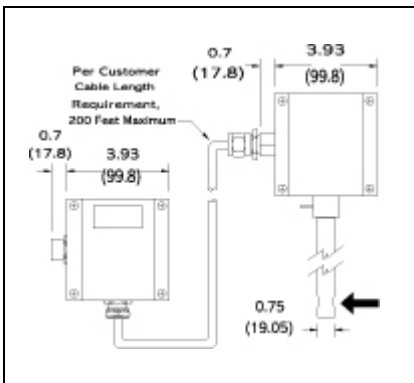
Compression Fitting - Front View (EN2) Compression Fitting - Side View (EN2)



Tables

Length Chart		
Code	L	X
L06	6.0 (152.4)	8.6 (218.4)
L09	9.0 (228.6)	11.6 (294.6)
L13	13.0 (330.2)	15.6 (396.2)
L18	18.0 (457.2)	20.6 (523.2)
L24	24.0 (609.6)	26.6 (675.6)
L36	36.0 (914.4)	38.6 (980.4)

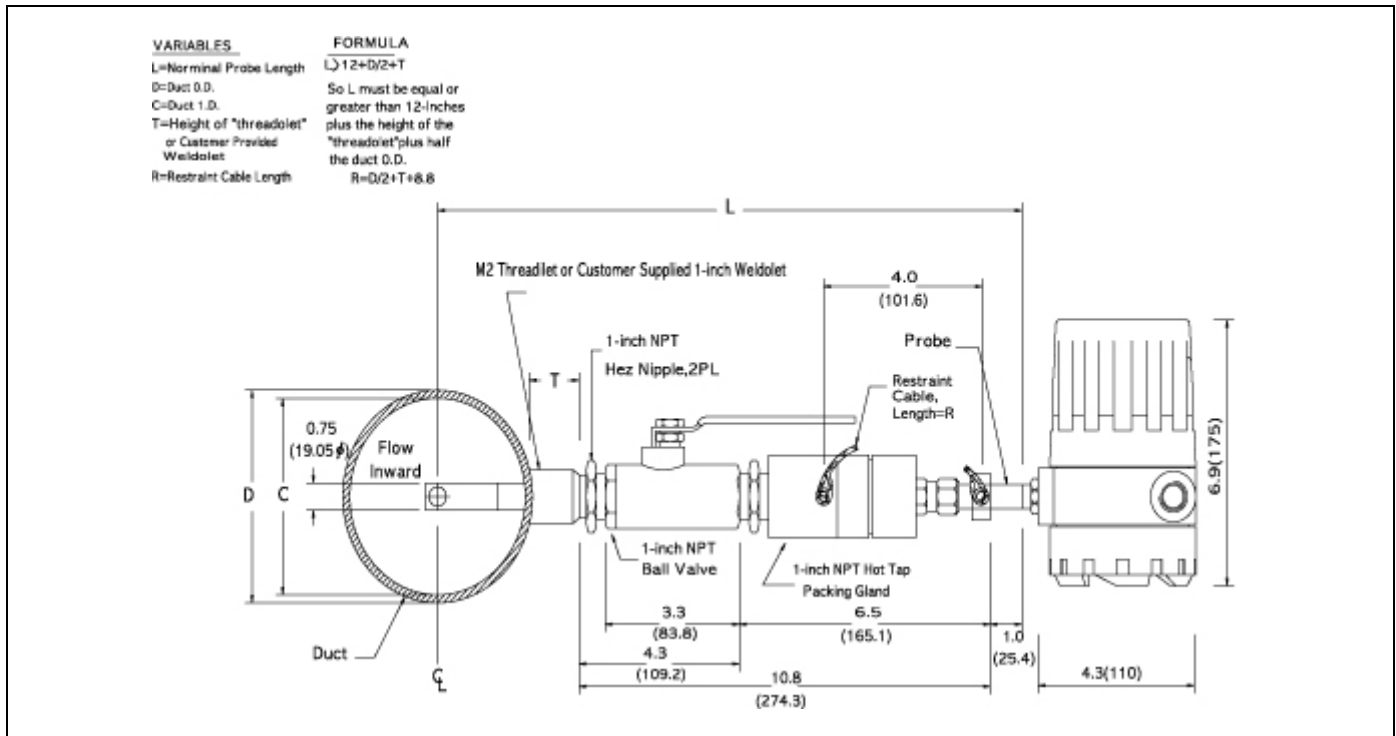
Remote Mount Junction Box - Front View (EN4) Remote Mount Junction Box - Side View (EN4)



All dimensions are inches. Millimeters are in parentheses. All drawings have a ± 0.25 inch(6.4mm) tolerance. Certified drawings are available on request.

Low Pressure Hot Tap Dimensional Specification

Side View



All dimensions are inches. Millimeters are in parentheses.

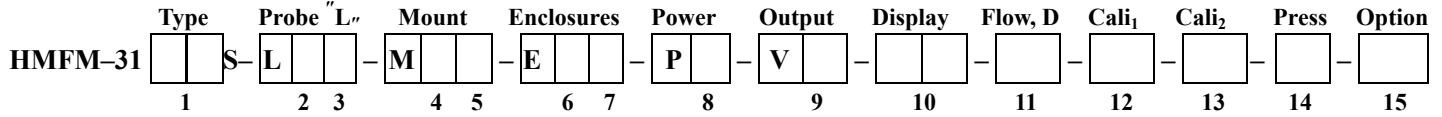
All drawings have a ± 0.25 inch (6.4mm) tolerance. Certified drawings are available on request.

Up & Downstream Requirements

Select an installation site that will minimize possible distortion in the flow profile. Valves, elbows, control valves and other piping components may cause flow disturbances. Check your specific piping condition against the examples shown below. In order to achieve accurate and repeatable performance install the flow meter using the recommended number of straight run pipe diameters upstream and downstream of the sensor.

Example	A-Upstream(1)Requirements	B-Downstream(2)Requirements
1	15D	5D
2	20D	5D
3	40D	10D
4	15D	5D
5	30D	10D
6	40D	5D

(1)Number of diameter(D)of straight pipe required between upstream disturbance and the flow meter.
 (2)Number of diameter(D)of straight pipe required downstream of the flow meter.



Model Direction	Code 1
NAEA 4X	10
Hazardous-Area Location Enclosure	20
Agency approved, customer specified	W

Input Power	Code 8
DC24V ±10%	2
90-240VAC ±10%, E20 ONLY.	3
Agency approved, customer specified	W

Calibration 2 ⁹	Code 13
70 °F (21.1 °C) ⁸ 14.7 psia (1.103 bar)	A
32 °F (0 °C) 14.7 psia (1.103 bar)	B
Agency approved, customer specified	W

Insertion Length ⁴	Code 2,3
6- inch (15cm)	06
9- inch (23cm)	09
13-inch (33cm)	13
18-inch (46cm)	18
24-inch (61cm)	24
36-inch (92cm)	36
Special Length	(in)
Probe with 1-inch 1501b Flange	(in)-M5
High Pressure Hot Top with Retractor	(in)-M9
Agency approved, customer specified	WW

Output	Code 9
Relay output(High, Low)	1
0-10 VDC, Linear	3
4-20 mA, Linear	4
Agency approved, customer specified	W

Pressure	Code 14
Low pressure 50 psia [3.5 bar] Max.	L
Medium pressure 250 psia [17 bar] Max.	M
Agency approved, customer specified	W

Display	Code 10
No Readout	NR
Digital Display	DD
Agency approved, customer specified	WW

Mounting	Code 4,5
None	0
Compression Fitting ² (3/4-inch tube x 1-inch Male NPT)	10
Thread let (3/4-inch Female NPT) Specify pipe O.D. in parentheses	2 ()
Flat Duct Bracket (3/4-inch tube compression Fitting)	3
Curved Duct Bracket (3/4-inch tube compression Fitting) Specify duct O.D. in parentheses	4 ()
Low Pressure Hot Tap. Specify duct O.D. in parentheses	8 ()
Quick Removal Tap. Maximum 40 psia (2.8 barg)	15 ()
Agency approved, customer specified	WW

Flow Direction	Code 11
Horizontal right to left, or Vertical up	1
Horizontal left to right, or Vertical down	2
Agency approved, customer specified	W

Option	Code 15
Pressure Test Certificate	PT
Certificate of Conformance	CC
NACE Certificate	NC
24VDC Supply Unit	DC
RS-232 Cable 1M	RS

Enclosures ⁵	Code 6,7
Hazardous-Area Location Enclosure	20
Remote Hazardous-Area Location Enclosure (Only with EEx Meters)	3(ft)
Remote Hazardous-Area Location Enclosure with Junction Box	4(ft)
NEMA 4X	N2
Remote NEMA 4X with Junction Box	N4(ft)
Agency approved, customer specified	WW

Calibration 1 ⁹	Code 12
Standard Calibration	A
Air, only for 3 inch and large pipe size	
Compressed Air, only for 3 inch and larger pipe sizes	D
Customer Calibration	B
Air	
Air equivalency (digester gas, flue, gas, etc).	C
Nitrogen, helium, argon, carbon dioxide, compressed air or digester gas	E
Hydrocarbons(natural gas, methane, ethane, propane, etc).	F
Hydrogen or hydrogen mixture	G
Agency approved, customer specified	W

Notes

- Flange is tapped and threaded on the compression fitting.
- Material matches the selection in Box 2. Metal ferrule permanently locks after tightening compression fitting.
- Flange must be ANSI or DIN specifications.
- Maximum length is 60 inches [1524 mm].
- Enclosure required for agency approvals.
T6 rated at 104°F [40°C].
- Wire resistance must be less than 8 ohms.
- Turndown ratio is 10:1 minimum and 100:1 maximum
- SFPS is the abbreviation for standard feet per second at 14.7 psia [1.01 bar(a)] and 70°F [21.1°C].
- Customer specified calibration must not exceed temperature and pressure limitations of the 1500. 1800.3000 series product specifications.
- Remote configuration is only available with aluminum local enclosure.

CUSTOMER INFORMATION

CUSTOMER INFORMATION																								
Customer Name & Address :			P.O. No :																					
			Customer Order No:																					
Contact :			Tag Number(s) :																					
Phone :																								
Fax :			E-mail :																					
PROCESS DETAILS			INSTRUMENT DETAILS																					
Application Description Describe type of application (example; boiler feed, flare gas, etc.)			Flow Element Mounting <input type="checkbox"/> Horizontal pipe, side mount, flow left to right <input type="checkbox"/> Horizontal pipe, side mount, flow right to left <input type="checkbox"/> Horizontal pipe, top mount, flow left to right <input type="checkbox"/> Horizontal pipe, top mount, flow right to left <input type="checkbox"/> Vertical pipe, Flow up <input type="checkbox"/> Vertical pipe, Flow down																					
Process Media Include gas name and percent composition by volume (moles) or Weight (mass). Please attach a gas composition list or fill in composition below. Total composition must add up to 100% Gas Components : <input type="checkbox"/> % Volume (moles) <input type="checkbox"/> % Weight (mass) _____ % _____ % _____ % _____ % _____ % _____ %			Flow Transmitter Setup Input Power : <input type="checkbox"/> 110VAC±10% <input type="checkbox"/> 220VAC±10% <input type="checkbox"/> 24VDC±10% <input type="checkbox"/> 90 ~ 240 VAC Application : <input type="checkbox"/> Flow (default) <input type="checkbox"/> Temperature Signal Output : <input type="checkbox"/> 4 to 20mA <input type="checkbox"/> 1 to 5VDC <input type="checkbox"/> 0 to 5VDC <input type="checkbox"/> 0 to 10VDC <input type="checkbox"/> RS-232C Output Units _____ _____ Zero Value _____ _____ Full Scale _____ _____ Alarm Set points _____ _____																					
Process Conditions <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 20%;"></th> <th style="width: 15%;">Nominal</th> <th style="width: 15%;">Minimum</th> <th style="width: 15%;">Maximum</th> <th style="width: 35%;">Flow Units</th> </tr> </thead> <tbody> <tr> <td>Flow Rate :</td> <td>_____</td> <td>_____</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>Temperature :</td> <td>_____</td> <td>_____</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>Pressure :</td> <td>_____</td> <td>_____</td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Nominal	Minimum	Maximum	Flow Units	Flow Rate :	_____	_____	_____	_____	Temperature :	_____	_____	_____	_____	Pressure :	_____	_____	_____	_____	Standard Temperature and Pressure 70 °F and 14.7 psia [21.1 °C and 1.013 bar(a)] is the factory calibration default for standard temperature and pressure unless otherwise indicated below. Standard <input type="checkbox"/> 70 °F [21.1 °C] <input type="checkbox"/> 14.7 psia [1.013 bar(a)] Other _____ _____	
	Nominal	Minimum	Maximum	Flow Units																				
Flow Rate :	_____	_____	_____	_____																				
Temperature :	_____	_____	_____	_____																				
Pressure :	_____	_____	_____	_____																				
Required Dimensions Pipe/Duct Size (ID and units of measurement) _____ B-dimension per diagram below : _____ Upstream straight length pipe/duct : _____ Downstream straight length pipe/duct : _____ Upstream disturbance _____			Note (Remark)																					
Installation Details or Drawing Hot tap <input type="checkbox"/> No <input type="checkbox"/> Yes																								