Features

- Close loop control
- 24 bit Analog digital converter(ADC)
- Output accuracy ± 0.1%, ± 2.5 μA(4~20mA)
  Output accuracy ± 0.01%, ± 1mV(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

The 3200S Smart-IN™ flow body eliminates velocity profile distortions, swirl and temperature stratifications in the gas stream and reduces the amount of upstream piping required for accurate flow measurement.
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 Series 3200S 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 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.

3200 Series Smart-IN™ FLG Mass Flow Meter

Performance Specifications

Accuracy
±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 ℃ within ±25℃ of customer specified conditions.
±0.06% of reading per ℃ within ±25℃ to 50℃ of customer specified conditions.

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

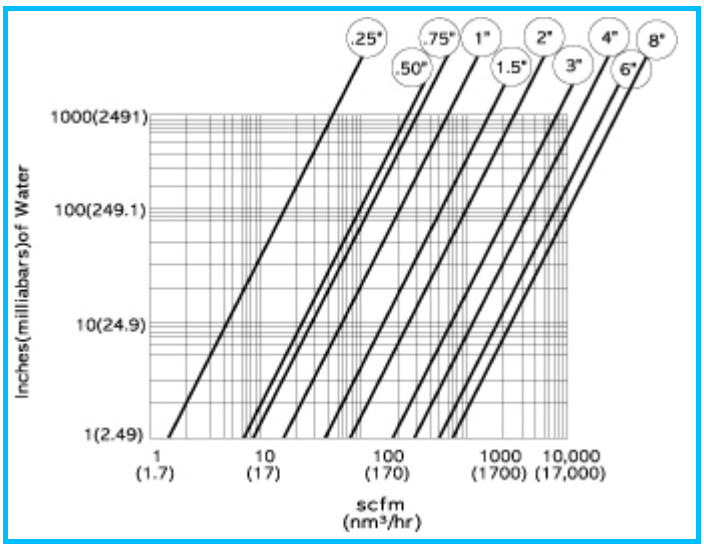
Response Time
One second 63% of final velocity value.

Operating Specifications

Gases
Most gases compatible with 316L stainless steel (consult factory)

Gas Pressure(2 limitations)
Mechanical design pressure :
Compression fittings : 500 psia(34.5 barg)
150 lb flange or PN16 DIN(-40˚F to 100˚F)
: 230 psia(15.9 barg)
150 lb flange or PN16 DIN(250˚F) : 185 psia(12.8 barg)
150 lb flange or PN16 DIN(450˚F) : 155 psia(10.7 barg)
NPT (-40˚F to 250˚F) : 500 psia (34.5 barg)
Application gas pressure : See mass flow range tables for maximum application gas pressures.

Pressure Drop



Gas & Ambient Temperature
Gas 15˚F to 250˚F (-10℃ to 120℃) Gas dependent. See mass flow range tables for details
Ambient -5˚F to 120˚F (-20℃ to 50℃)

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

Power Requirements
DC 24 V ±10% (regulated), 625mA maximum
90-240 VAC ±10% , 50/60Hz, 15watts maximum

Output Signal
Linear 0~10 VDC, 1000 ohms minimum load resistance or
Linear 4~20mA proportional to 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 400 VDC or VAC(peak), 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
Carbon steel flow bodies available in some sizes

Enclosure
Hazardous-Area Location Enclosure (IP67) or NEMA 4X (IP65)
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)

Piping Requirements

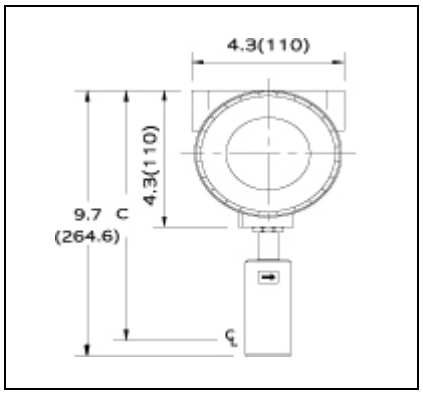
STRAIGHT PIPE LENGTH REQUIREMENTS AT 1 ATM			
Piping Condition	**3210S Smart-IN™**		**Orifice Plate(3)**
	Upstream(1)	**Downstream(2)**	
Single 90 Elbow or T-Piece	1D	0D	28D
Reduction(4:1)	3D	0D	14D
Expansion(4:1)	3D	0D	30D
After Control Valve	3D	0D	32D
Two 90 Elbows (In Same Plane)	3D	0D	36D
Two 90 Elbows (Different Planes)	5D	0D	62D

Notes : (1) Number of diameters (D) of straight pipe required between upstream disturbance and the flow meter.
(2) Number of diameters (D)of straight pipe required downstream of the flow meter.
(3) For comparison purposes only. Table shows number of diameters (D) of upstream straight pipe length required for an ISO Standard 5167 Orifice Plate with a beta ratio of 0.7
(4) Consult factory for pressure effects.

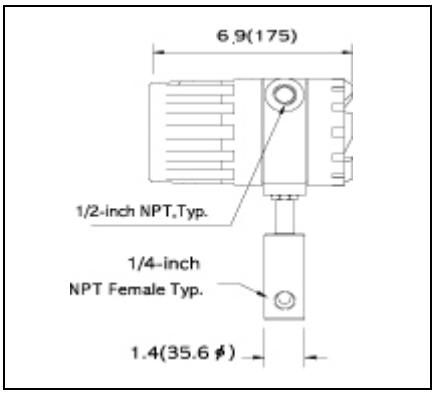
Certifications*
CE (All enclosures)
CSA (Explosion-proof for Class 1, Division 1, Groups B, C, D)
EEx (EEx d IIC T6…T2) CENELEC
FM (Explosion-proof for Class 1, Division 1, Groups B, C, D)
* Certifications Pending, Contact factory

Dimensional Specifications

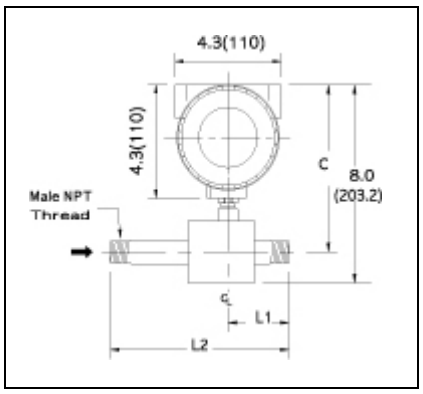
1/4 - inch NPT - Front View (E2)



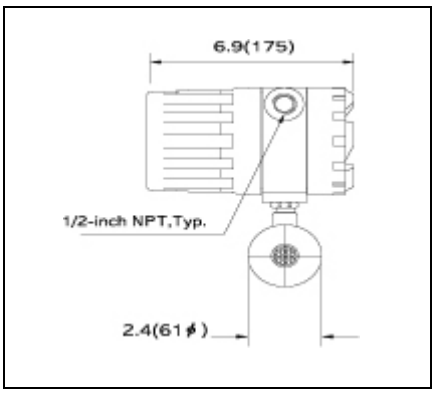
Compression Fitting - Side View (E2)



1/2, 3/4 - inch NPT - Front View (E2)

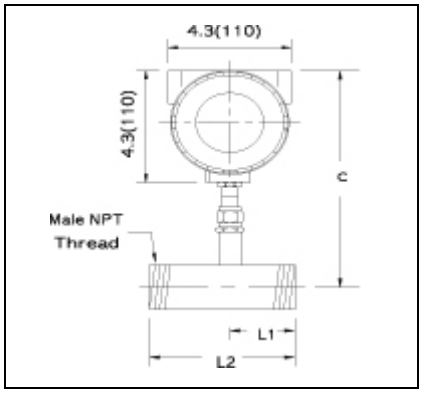


1/2, 3/4 - inch NPT - Side View (E2)

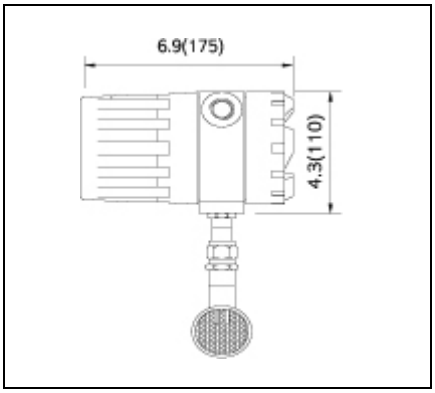


SIZES FOR NPT				
Size	**H1**	**C**	**L1**	**L2**
1/4-inch	8.41 (213.6)	9.28 (235.7)	—	—
1/2-inch	7.79 (197.9)	6.94 (176.3)	2.20 (55.9)	6.50 (165.1)
3/4-inch	7.79 (197.9)	6.94 (176.3)	2.20 (55.9)	7.00 (177.8)
1-inch	8.97 (227.8)	9.00 (228.6)	1.50 (38.1)	3.50 (88.9)
1.5inch	8.97 (227.8)	9.00 (228.6)	2.25 (57.2)	5.25 (133.4)
2-inch	8.97 (227.8)	10.45 (265.4)	3.50 (88.9)	7.50 (190.5)
3-inch	8.97 (227.8)	11.45 (290.8)	4.00 (101.6)	10.00 (254)
4-inch	8.98 (228.1)	11.45 (290.8)	4.00 (101.6)	12.00 (304.8)
6-inch	10.98 (278.9)	12.45 (316.2)	6.00 (152.4)	18.00 (457.2)
8-inch	12.98 (329.7)	13.45 (341.6)	8.00 (203.2)	24.00 (609.6)

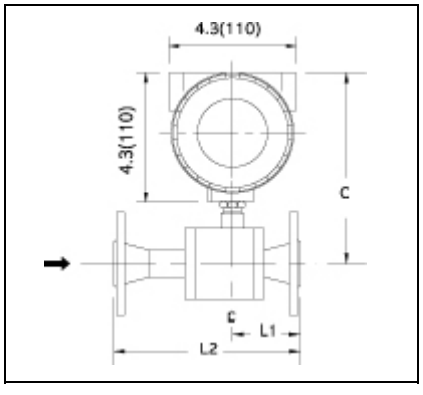
1 - inch Through 8 - inch NPT - Front View (E2)



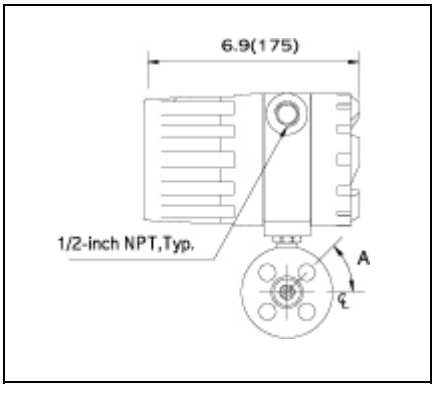
1 - inch Through 8 - inch NPT - Side View (E2)



1/2, 3/4 - inch 150 lb Flange - Front View (E2)



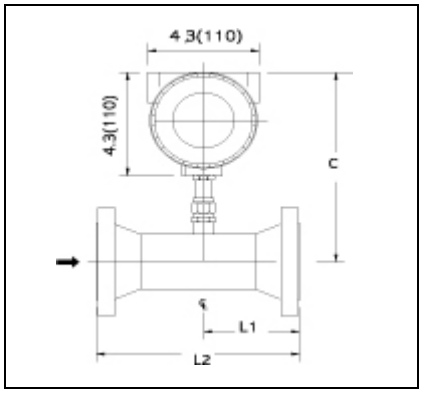
1/2, 3/4 - inch 150 lb Flange - Side View (E2)



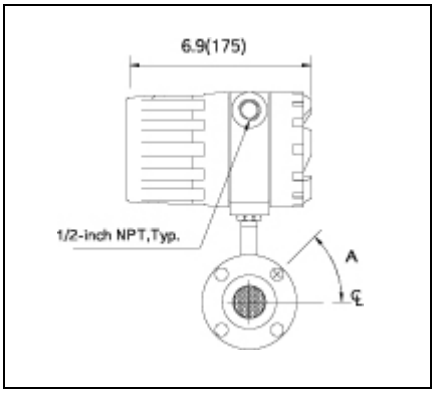
SIZES FOR 150 LB ANSI FLANGES					
Size	**H1**	**C**	**L1**	**L2**	**A**
1/2-inch	7.79 (197.9)	6.94 (176.3)	2.60 (66.0)	6.95 (176.5)	45°
3/4-inch	7.79 (197.9)	6.94 (176.3)	2.78 (70.6)	7.56 (192.0)	45°

Dimensional Specifications

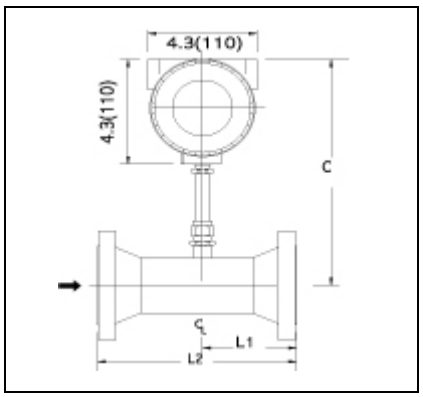
1″ Through 8″ 150 lb Flange - Front View (E2)



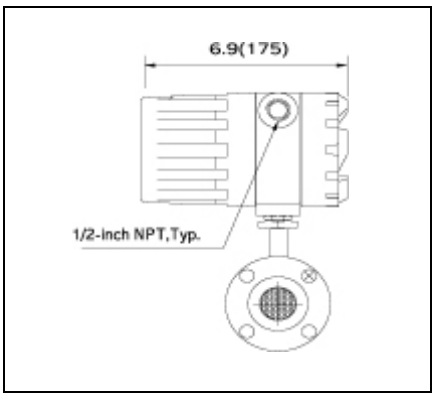
1″ Through 8″ 150 lb Flange - Side View (E2)



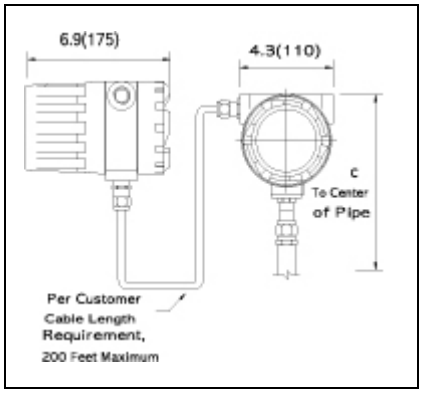
DIN Flange - Front View (E2)



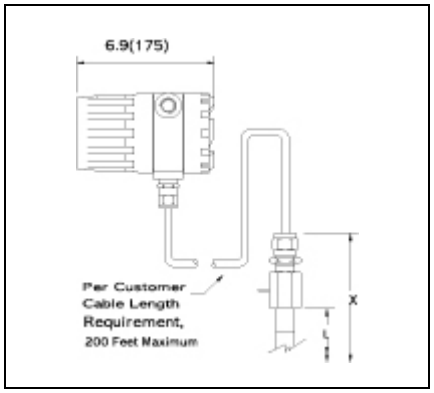
DIN Flange - Side View (E2)



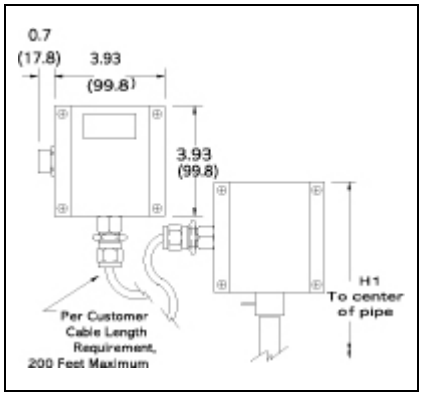
Remote Mounted with Junction Box (E4)



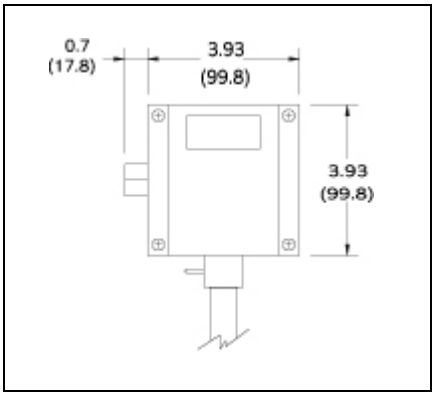
Remote Mounted



Remote Mounted with Junction Box (EN4)



NEMA 4X Enclosure (EN2)



Tables

SIZES FOR 150 LB ANSI FLANGES					
Size	**H1**	**C**	**L1**	**L2**	**A**
1-inch	6.35 (161.3)	9.47 (240.5)	3.60 (91.4)	7.40 (188.0)	45°
1.5-inch	7.35 (186.7)	9.47 (240.5)	3.80 (96.5)	7.50 (190.5)	45°
2-inch	7.35 (186.7)	9.47 (240.5)	3.50 (88.9)	7.50 (190.5)	45°
3-inch	8.35 (212.1)	9.47 (240.5)	4.00 (101.6)	10.00 (254.0)	45°
4-inch	8.35 (212.1)	9.47 (240.5)	4.00 (101.6)	12.00 (304.8)	22.5°
6-inch	9.35 (237.5)	11.47 (291.3)	6.00 (152.4)	18.00 (457.2)	22.5°
8-inch	10.35 (262.9)	13.47 (342.1)	8.00 (203.2)	24.00 (609.6)	22.5°

SIZES FOR PN16 DIN FLANGES				
Size	**H1**	**C**	**L1**	**L2**
DN25	8.30 (210.8)	8.88 (225.6)	3.18 (80.8)	7.40 (188.0)
DN40	8.90 (226.1)	9.50 (241.3)	3.61 (91.7)	7.40 (188.0)
DN50	10.10 (256.5)	10.70 (271.8)	3.34 (84.8)	7.10 (180.3)
DN80	9.90 (251.5)	10.50 (266.7)	4.14 (105.2)	10.20 (259.1)
DN100	10.00 (254.0)	10.60 (269.2)	4.57 (116.1)	12.60 (320.0)
DN150	11.80 (299.7)	12.40 (315.0)	6.77 (172.0)	18.90 (480.1)
DN200	13.90 (353.1)	14.50 (368.3)	8.47 (215.1)	24.40 (619.8)

SIZES FOR REMOTE MOUNTED	
Size	**H2**
1/4 - inch	6.28 (159.5)
1/2 - inch	5.21 (132.3)
3/4 - inch	5.21 (132.3)
1 - inch	6.41 (162.8)
1.5 - inch	6.41 (162.8)
2 - inch	7.32 (185.9)
3 - inch	8.32 (211.3)
4 - inch	6.32 (160.5)
6 - inch	8.32 (211.3)
8 - inch	10.32 (262.1)

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Order Information Sheet(OIS)

HMFM 3200S

High Flow Mass Flow Meter

	Type		Flange	Flange Spec.			Enclosures			Power		Output		Display		Flow, D	Cali$_1$	Cali$_2$	Press	Option
HMFM–32			S–		–				–	E			–	P		–	V		–			–			–			–		–		–	
	1			2		3	4	5		6	7			8			9			10			11			12			13			14			15	

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

Flange Standard	Code 2
DIN Flange	D
ANSI Flange	A
Agency approved, customer specified	W

Flange Spec.[1,3]	Code 3,4,5			
Size	NPT	150 1b	PN16	PN40
1/4 - inch	N1	—		
1/2 - inch	N2	F2		
3/4 - inch	N3	F3		
1 - inch(DN25)	N4	F4	D4	E4
1.5 - inch(DN40)	N5	F5	D5	E5
2 - inch(DN50)	N6	F6	D6	E6
2.5 - inch(DN65)	N7	F7	D7	E7
3 - inch(DN80)	N8	F8	D8	E8
3.5 - inch(DN90)	N9	F9	D9	E9
4 - inch(DN100)	N10	F10	D10	E10
5 - inch(DN125)	N11	F11	D11	E11
6 - inch(DN150)	N12	F12	D12	E12
7 - inch(DN175)	N13	F13	D13	E13
8 - inch(DN200)	N14	F14	D14	E14

Enclosures[5]	Code 6,7
Hazardous-Area Location Enclosure	20
Remote Hazardous-Area Location[10] 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

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

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

Display	Code 10
No Readout	NR
Digital Display	DD
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

Calibration 1[9]	Code 12
Standard Calibration Air, only for 3 inch and large pipe size	A
Compressed Air, only for 3 inch and larger pipe sizes	D
Customer Calibration Air	B
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

Calibration 2[9]	Code 13
70 °F (21.1 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

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

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

Notes

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

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www.flowcountry.com , www.flowcountry.co.kr

Application Data Sheet (ADS)
1000 and 3000 Series
7200 Series

CUSTOMER INFORMATION

Customer Name & Address :

P.O. No :

Customer Order No:

Contact :

Phone :

Tag Number(s) :

Fax :

E-mail :

PROCESS DETAILS

Application Description

Describe type of application (example; boiler feed, flare gas, etc.)

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 : □ % Volume (moles) □ % Weight (mass)

_____ _____ %
_____ _____ %
_____ _____ %
_____ _____ %
_____ _____ %
_____ _____ %
_____ _____ %

Process Conditions

	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 _____

Installation Details or Drawing

Hot tap □ No □ Yes

INSTRUMENT DETAILS

Flow Element Mounting

□ Horizontal pipe, side mount, flow left to right
□ Horizontal pipe, side mount, flow right to left
□ Horizontal pipe, top mount, flow left to right
□ Horizontal pipe, top mount, flow right to left
□ Vertical pipe, Flow up
□ Vertical pipe, Flow down

Flow Transmitter Setup

Input Power : □ 110VAC±10% □ 220VAC±10% □ 24VDC±10%
□ 90 ~ 240 VAC

Application : □ Flow (default)
□ Temperature

Signal Output : □ 4 to 20mA
□ 1 to 5VDC
□ 0 to 5VDC
□ 0 to 10VDC
□ RS-232C

Output Units _____ _____
Zero Value _____ _____
Full Scale _____ _____
Alarm Set points _____ _____

Standard Temperature and Pressure

70 °F and 14.7 psia [21.1 ℃ and 1.013 bar(a)] is the factory calibration default for standard temperature and pressure unless otherwise indicated below.

Standard □ 70 °F [21.1 °C] □ 14.7 psia [1.013 bar(a)]
Other _____ _____

Note (Remark)