

# Multivariable Mass Vortex Flow Meter

## FEATURES

- Mass and volumetric flow measurement of gas, liquid, and steam
- Multivariable outputs for five process parameters:
  - mass flow rate
  - volumetric flow rate
  - temperature
  - pressure
  - density
- Single process connection
- In-line (1/2 inch to 8 inch) and insertion (into pipes > 2 inch) configurations
- Field-configurable ranges, alarms, outputs and displays
- Field configurable via six push buttons or magnet through explosion-proof window
- Smart DSP electronics extends low flow range down to a Reynolds number of 5000
- Rangeability up to 30:1
- Temperature -330°F (-200°C) up to 750°F (400°C)
- Cryogenic version measures liquid O<sub>2</sub>, N<sub>2</sub>, Ar, and CO<sub>2</sub> down to -330°F (-200°C)
- Pressure up to 1500 psig (100 barg)
- High pressure version to 5000 psig (345 barg)
- Ideal for steam applications
- Flow computer integrates AGA-8 equations for natural gas
- Full implementation of HART protocol
- Optional MODBUS protocol
- FMC and ATEX approval



[www.sierrainstruments.com](http://www.sierrainstruments.com)

# InnovaMass<sup>®</sup> 240 & 241



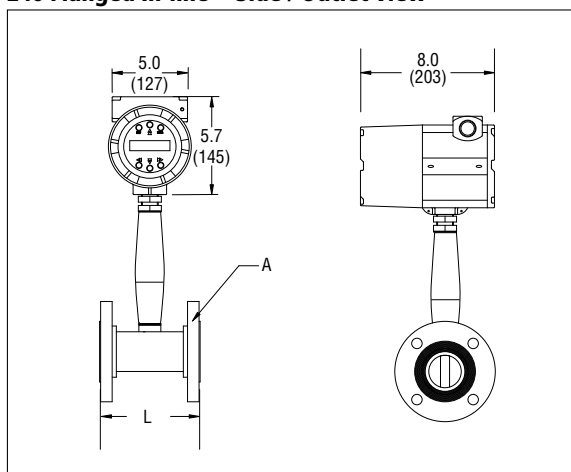
## DESCRIPTION

Sierra was the first to introduce a multivariable mass vortex flow meter to the market in the late 1990's. Sierra's multivariable product line features an in-line version, the InnovaMass<sup>®</sup> 240 and a unique insertion version, the InnovaMass<sup>®</sup> 241. The 241 has emerged recently as the proven instrument of choice in geothermal steam applications across the globe. Both the 240 and 241 measure the mass flow rate of any gas or liquid and are ideally suited for saturated or superheated steam. The InnovaMass offers customers one instrument and one process connection, measuring five process parameters simultaneously: mass flow rate, temperature, pressure, volumetric flow rate, and fluid density.

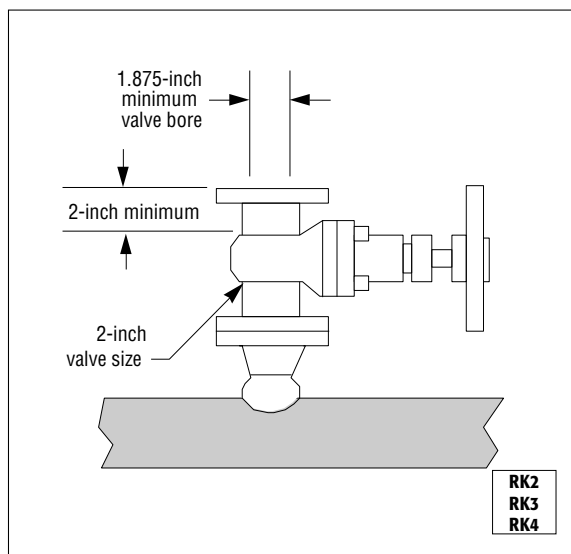
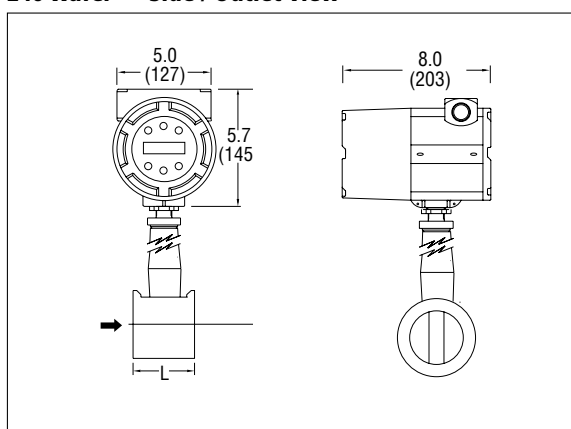
The 241 is available in high-pressure versions capable of mass flow measurement up to 5000 psig (345 barg), and the 240 cryogenic version is widely used for fluids down to -330°F (-200°C). All models are fully field-programmable, configurable and feature RS-485, MODBUS or HART protocols. InnovaMass is a true high performance, rugged, and reliable workhorse in industry.

## DIMENSIONAL SPECIFICATIONS

### 240 Flanged In-line—Side / Outlet View



### 240 Wafer — Side / Outlet View



## IN-LINE TABLE

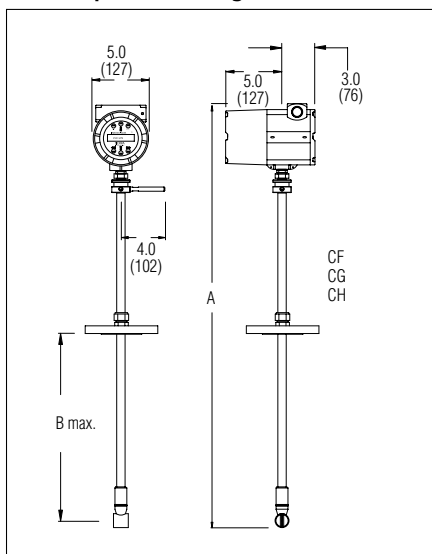
InnovaFlo® 240 Sizes			
Flow Body Size	A	L	H
<b>0.5-inch SCH 80</b>	150 lb flange	4.56 (116)	14.8 (376)
	300 lb flange	4.56 (116)	14.8 (376)
	600 lb flange	4.56 (116)	14.8 (376)
	1.4 flange wafer O.D.	4.56 (116)	14.8 (376)
<b>0.75-inch SCH 80</b>	150 lb flange	4.8 (122)	14.8 (376)
	300 lb flange	4.8 (122)	15.0 (381)
	600 lb flange	4.8 (122)	15.0 (381)
	1.7 flange wafer O.D.	4.8 (122)	15.0 (381)
<b>1-inch SCH 80</b>	150 lb flange	4.94 (125)	15.0 (381)
	300 lb flange	4.94 (125)	15.0 (381)
	600 lb flange	4.94 (125)	15.0 (381)
	2.0 flange wafer O.D.	2.8 (71)	14.8 (376)
<b>1.5-inch SCH 80</b>	150 lb flange	5.5 (140)	15.1 (384)
	300 lb flange	5.5 (140)	15.1 (384)
	600 lb flange	5.5 (140)	15.1 (384)
	2.9 flange wafer O.D.	2.8 (71)	15.1 (384)
<b>2-inch SCH 80</b>	150 lb flange	6.0 (152)	15.3 (389)
	300 lb flange	6.0 (152)	15.3 (389)
	600 lb flange	6.0 (152)	15.3 (389)
	3.7 flange wafer O.D.	3.0 (76)	15.3 (389)
<b>3-inch SCH 80</b>	150 lb flange	6.9 (175)	15.8 (401)
	300 lb flange	6.9 (175)	15.8 (401)
	600 lb flange	6.9 (175)	15.8 (401)
	5.0 flange wafer O.D.	4.0 (102)	15.8 (401)
<b>4-inch SCH 80</b>	150 lb flange	8.0 (203)	16.2 (411)
	300 lb flange	8.0 (203)	16.2 (411)
	600 lb flange	8.0 (203)	16.2 (411)
	6.2 flange wafer O.D.	4.7 (119)	16.2 (411)
<b>6-inch SCH 80</b>	150 lb flange	9.0 (229)	17.3 (439)
	300 lb flange	9.0 (229)	17.3 (439)
	600 lb flange	9.0 (229)	17.3 (439)
<b>8-inch SCH 80</b>	150 lb flange	10.5 (267)	18.2 (462)
	300 lb flange	10.5 (267)	18.2 (462)
	600 lb flange	10.5 (267)	18.2 (462)

All dimensions are inches (+/- .25-inch significant value). Millimeters are in parentheses. Certified drawings are available on request.

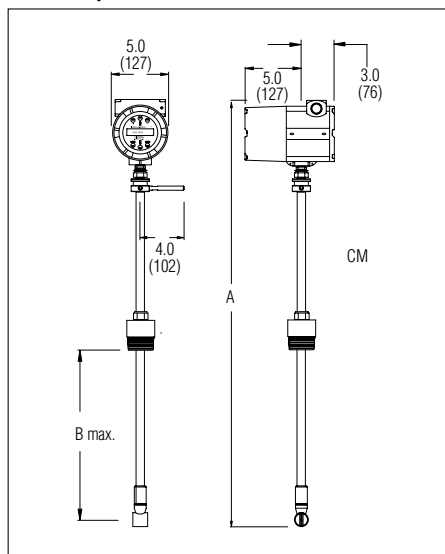
Notes: (1) Can be used with removable retractor.  
(2) Retractor is permanently mounted to meter.

## IN-LINE DIMENSIONAL SPECIFICATIONS

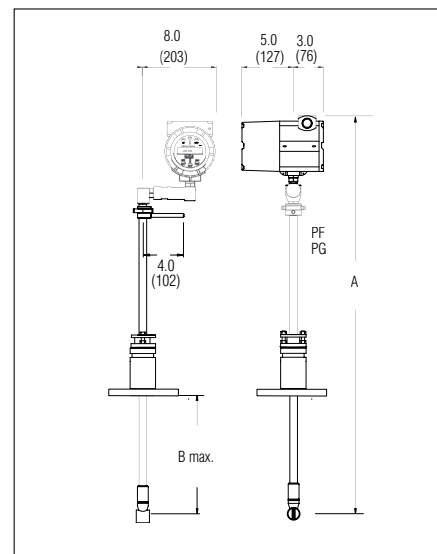
241 Compression, Flange



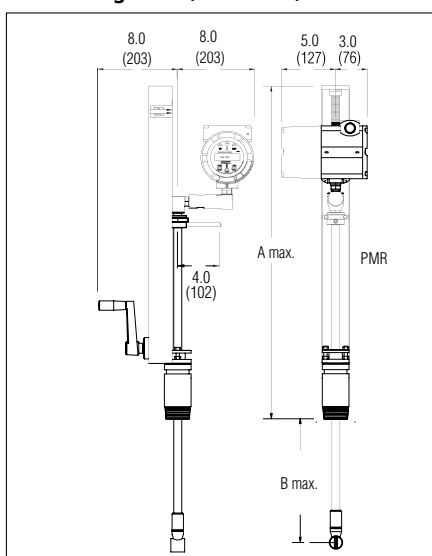
241 Compression, Male NPT



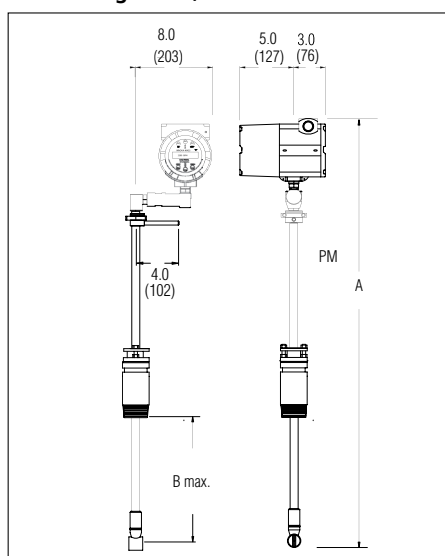
241 Packing Gland, Flange



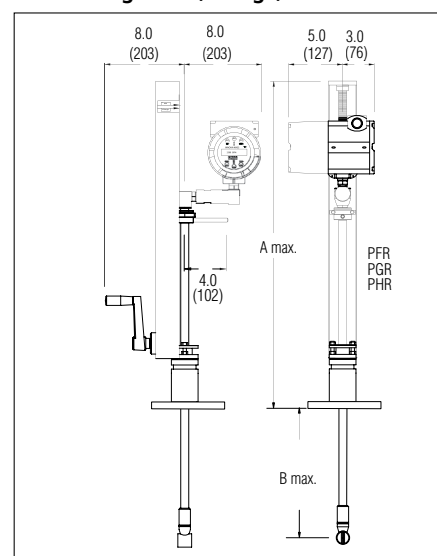
241 Packing Gland, Male NPT, Retractor



241 Packing Gland, Male NPT



241 Packing Gland, Flange, Retractor

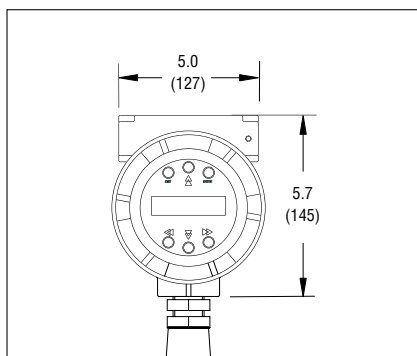


## InnovaMass® 241 Sizes

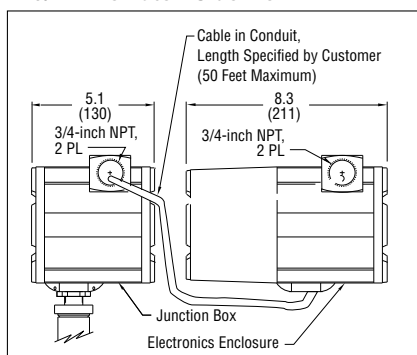
Model Code / Probe Seal / Process Connection	Standard Probe		Compact Probe		Extended Probe	
	A	B	A	B	A	B
CM / Compression / 2-in Male NPT	41.0 (1041)	26.2 (665)	24.6 (625)	9.8 (249)	53.0 (1346)	38.2 (970)
CF / Compression / 150 lb Flange	41.0 (1041)	27.3 (693)	24.6 (625)	10.9 (277)	53.0 (1346)	39.3 (998)
CG / Compression / 300 lb Flange	41.0 (1041)	27.2 (691)	24.6 (625)	10.8 (274)	53.0 (1346)	39.2 (996)
CH / Compression / 600 lb Flange	41.0 (1041)	26.8 (681)	24.6 (625)	10.4 (264)	53.0 (1346)	38.8 (986)
PM / Packing Gland / 2-in Male NPT	40.5 (1029)	21.5 (546)	N/A	N/A	53.0 (1346)	33.5 (851)
PMR / Packing Gland / 2-in Male NPT with Retractor	40.5 (1029)	21.5 (546)	N/A	N/A	53.0 (1346)	33.5 (851)
PF / Packing Gland / 150 lb Flange	40.5 (1029)	21.1 (536)	N/A	N/A	53.0 (1346)	33.1 (841)
PFR / Packing Gland / 150 lb Flange with Retractor	40.5 (1029)	21.1 (536)	N/A	N/A	53.0 (1346)	33.1 (841)
PG / Packing Gland / 300 lb Flange	40.5 (1029)	21.1 (536)	N/A	N/A	53.0 (1346)	33.1 (841)
PGR / Packing Gland / 300 lb Flange w/ Retractor	40.5 (1029)	21.1 (536)	N/A	N/A	53.0 (1346)	33.1 (841)
PHR / Packing Gland / 600 lb flange w/ Retractor	40.5 (1029)	21.1 (536)	N/A	N/A	53.0 (1346)	33.1 (841)

## ORDERING SPECIFICATIONS

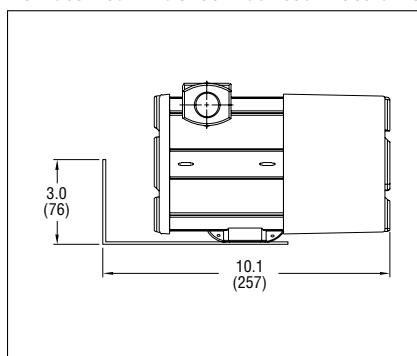
240/241 Remote—Front View



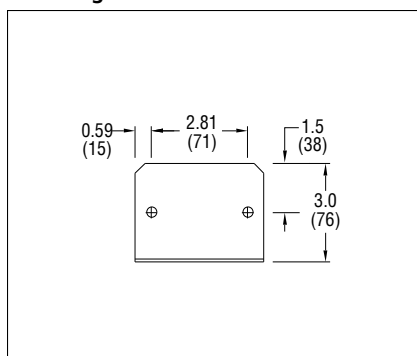
240/241 Remote—Side View



Remote Rear Bracket Mounted Electronics



Mounting Holes for Remote Rear Bracket



## Straight Pipe Length Requirements (in number of internal diameters, D)

	Upstream	Downstream
One 90° elbow before meter	10 D	5 D
Two 90° elbows before meter	15 D	5 D
Two 90° elbows before meter out of plane (If three 90° bends present, double recommend length)	25 D	10 D
Reduction before meter	10 D	5 D
Expansion before meter	20 D	5 D
Regulator or valve partially closed before meter (If valve wide open, base length requirements on fitting directly preceding it.)	25 D	10 D

## Weight

Connection Size	240 In-Line Meter					
	ANSI 150 lb		ANSI 300 lb		ANSI 600 lb	
	lb	kg	lb	kg	lb	kg
0.5-inch Flange	12.0	5.5	12.5	5.7	13	5.9
0.75-inch Flange	13.0	5.9	14	6.4	14.5	6.6
1-inch Flange	13.5	6.1	16.4	7.4	16.4	7.4
1.5-inch Flange	14.6	6.6	22.7	10.3	24.8	11.2
2-inch Flange	19.5	8.8	26.9	12.2	33.2	15.1
3-inch Flange	27.5	12.5	39.5	17.9	56.3	25.5
4-inch Flange	43.5	19.7	60.5	27.4	96.2	43.6
6-inch Flange	48.4	22.0	96.2	43.6	178	80.8
8-inch Flange	71.0	32.2	149	67.4	300	136
1-inch Wafer	—	—	—	—	10.1	4.6
1.5-inch Wafer	—	—	—	—	11.8	5.4
2-inch Wafer	—	—	—	—	14.2	6.4
3-inch Flange	—	—	—	—	22.7	10.3
4-inch Flange	—	—	—	—	33.0	15.0

## 241 Insertion Meter

Connection Size	lb	kg
Compression Fitting, Male NPT	13.8	6.2
Compression Fitting, 150 lb Flange	16.3	7.3
Compression Fitting, 300 lb Flange	18.3	8.3
Compression Fitting, 600 lb Flange	19.3	8.7
Packing Gland, Male NPT	15.8	7.1
Packing Gland, Male NPT with Reactor	25.3	11.5
Packing Gland, 150 lb Flange	20.8	9.4
Packing Gland, 150 lb Flange with Reactor	30.3	13.7
Packing Gland, 300 lb Flange	24.8	11.3
Packing Gland, 300 lb Flange with Reactor	34.3	15.5
Packing Gland, 600 lb Flange with Reactor	35.3	16.0

PERFORMANCE SPECIFICATIONS

Accuracy

240 In-Line Meter				
Process Variables	240 Series In-Line Meters		241 Insertion Meters <sup>(1)</sup>	
	Liquids	Gas and Steam	Liquids	Gas and Steam
Mass Flow Rate	+/- 1.0% of rate over a 30:1 range <sup>(3)</sup>	+/- 1.5% of rate <sup>(2)</sup> over a 30:1 range <sup>(3)</sup>	+/- 1.0% of rate over a 30:1 range <sup>(3)</sup>	+/- 2.0% of rate <sup>(2)</sup> over a 30:1 range <sup>(3)</sup>
Volumetric Flow Rate	+/- 0.7% of rate over a 30:1 range <sup>(3)</sup>	+/- 1.0% of rate over a 30:1 range <sup>(3)</sup>	+/- 1.2% of rate over a 30:1 range <sup>(3)</sup>	+/- 1.5% of rate over a 30:1 range <sup>(3)</sup>
Temperature	+/- 2°F (+/- 1°C)	+/- 2°F (+/- 1°C)	+/- 2°F (+/- 1°C)	+/- 2°F (+/- 1°C)
Pressure	0.4% of transducer full scale	0.4% of transducer full scale	0.4% of transducer full scale	0.4% of transducer full scale
Density	0.3% of reading	0.5% of reading <sup>(2)</sup>	0.3% of reading	0.5% of reading <sup>(2)</sup>

Notes: (1) Accuracies stated are for the total mass flow through the pipe. (2) Over 50 to 100% of the pressure transducer's full scale. (3) Nominal rangeability is stated. Precise rangeability depends on fluid and pipe size.

Repeatability

- Mass Flow Rate . . . +/- 0.2% of reading
- Volumetric Flow Rate +/- 0.1% of reading
- Temperature. . . . . +/- 0.2° F (+/- 0.1° C)
- Pressure . . . . . +/- 0.05% of full scale
- Density. . . . . +/- 0.1% of reading

Stability Over 12 Months

- Mass Flow Rate . . . +/- 0.2% of reading maximum
- Volumetric Flow Rate Negligible error
- Temperature. . . . . +/- 0.1° F (+/- 0.5° C) maximum
- Pressure . . . . . +/- 0.1% of full scale maximum
- Density. . . . . +/- 0.1% of reading maximum

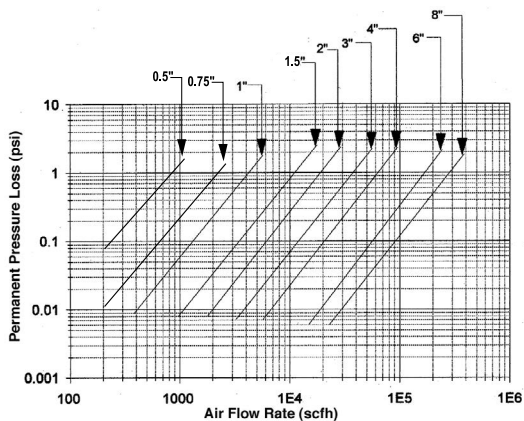
Response Time

Adjustable from 1 to 100 seconds

Differential Pressure Requirements, Δ P

Permanent pressure loss of in-line meters for air at 68°F (20°C) and 14.70 psi (1.104 bara).

Permanent pressure loss of in-line meters for water at 68°F (20°C)



Material Compatibility

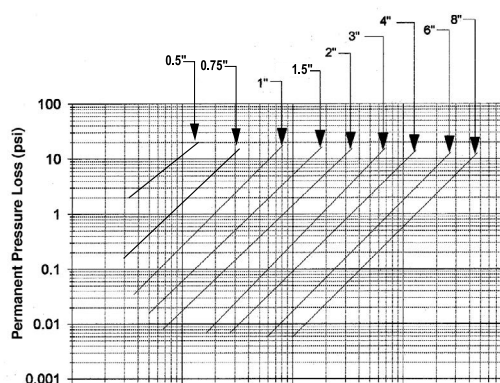
240. . . . . Any gas, liquid or steam compatible with 316L stainless steel, C276 Hastalloy® or A105 carbon steel. Not recommended for multi-phase fluids.

241. . . . . Any gas, liquid or steam compatible with 316L stainless steel. Not recommended for multi-phase fluids.

Linear Range

Smart electronics corrects for lower flow down to a Reynolds number of 5,000. The Reynolds number is calculated using the fluid's actual temperature and pressure monitored by the meter. Rangeability depends on the fluid, process connections and pipe size. Consult factory for your application. Velocity rangeability under ideal conditions is as follows:

- Liquids 30:1 . . . . . 1 foot per second velocity minimum  
30 feet per second velocity maximum
- Gases 30:1 . . . . . 10 feet per second velocity minimum  
300 feet per second velocity maximum



## OPERATING SPECIFICATIONS

### Flow Rates

Typical mass flow ranges are given in the following table. Precise flow ranges depend on the fluid and pipe size. 241 insertion meters are applicable to pipe sizes from 2 inches and greater. Consult factory for sizing program.

Water Minimum and Maximum Flow Rates									
Pressure	0.5-inch	0.75-inch	1-inch	1.5-inch	2-inch	3-inch	4-inch	6-inch	8-inch
<b>gpm</b>	0.9 22	1.4 40	2.2 67	5.5 166	9.2 276	21 618	36 1076	81 2437	142 4270
<b>m<sup>3</sup>/hr</b>	0.2 5	0.3 9	0.5 15	1.3 38	2.1 63	4.7 140	8.1 244	18 554	32 970

Air Minimum and Maximum Flow Rates (scfm) <sup>(1)</sup>									
Pressure	0.5-inch	0.75-inch	1-inch	1.5-inch	2-inch	3-inch	4-inch	6-inch	8-inch
<b>0 psig</b>	1.8 18	3 41	5 90	13 221	22 369	50 826	87 1437	198 3258	347 5708
<b>100 psig</b>	5 138	9 325	15 704	38 1730	63 2890	141 6466	245 11254	555 25515	972 44698
<b>200 psig</b>	7 258	13 609	21 1322	52 3248	86 5427	193 12140	335 21131	761 47911	1332 83931
<b>300 psig</b>	8 380	15 896	25 1944	63 4775	104 7978	234 17847	407 31064	922 70431	1615 123375
<b>400 psig</b>	10 502	18 1183	29 2568	72 6309	120 10542	269 23580	467 41043	1060 93057	1857 163000
<b>500 psig</b>	11 624	20 1472	33 3195	80 7849	134 13115	300 28034	521 51063	1182 115775	2071 203000

Note: (1) Standard conditions are 70° F and 1 atmosphere.

Saturated Steam Minimum and Maximum Flow Rates (lb/hr)									
Pressure	0.5-inch	0.75-inch	1-inch	1.5-inch	2-inch	3-inch	4-inch	6-inch	8-inch
<b>5 psig</b>	6.5 52	12 122	20 265	49 650	82 1087	183 2431	318 4231	722 9594	1264 16806
<b>100 psig</b>	15 271	27 639	46 1386	112 3405	187 5690	419 12729	728 22156	1652 50233	2893 87998
<b>200 psig</b>	20 493	37 1163	62 2525	151 6203	253 10365	565 23184	983 40354	2229 91494	3905 160279
<b>300 psig</b>	24 716	45 1688	74 3664	182 9000	304 15040	680 33642	1184 58556	2685 132763	4704 232575
<b>400 psig</b>	28 941	51 2220	85 4816	209 11831	349 19770	780 44222	1358 76971	3079 174516	5393 305717
<b>500 psig</b>	31 1170	57 2760	95 5988	233 14711	389 24582	870 54987	1514 95710	3433.2 17001	6014 380148

## OPERATING SPECIFICATIONS

### Process Fluid Pressure

240 Pressure Ratings				
Probe Seal	Process Connection	Material	Rating	Ordering Code
Compression Fitting	2-inch male NPT	316L SS	ANSI 600 lb	CM
	2-inch 150 lb flange	316L SS	ANSI 150 lb	CF
	2-inch 300 lb flange	316L SS	ANSI 300 lb	CG
	2-inch 600 lb flange	316L SS	ANSI 600 lb	CH
Packing Gland	2-inch male NPT	316L SS	50 psig	PM
	2-inch 150 lb flange	316L SS	50 psig	PF
	2-inch 300 lb flange	316L SS	50 psig	PG
Packing Gland w/ Removable Retractor	2-inch male NPT	316L SS	ANSI 300 lb	PM, RR
	2-inch 150 lb flange	316L SS	ANSI 150 lb	PF, RR
	2-inch 300 lb flange	316L SS	ANSI 300 lb	PG, RR
Packing Gland w/ Permanent Retractor	2-inch male NPT	316L SS	ANSI 600 lb	PMR
	2-inch 150 lb flange	316L SS	ANSI 150 lb	PFR
	2-inch 300 lb flange	316L SS	ANSI 300 lb	PGR
	2-inch 600 lb flange	316L SS	ANSI 600 lb	PHR

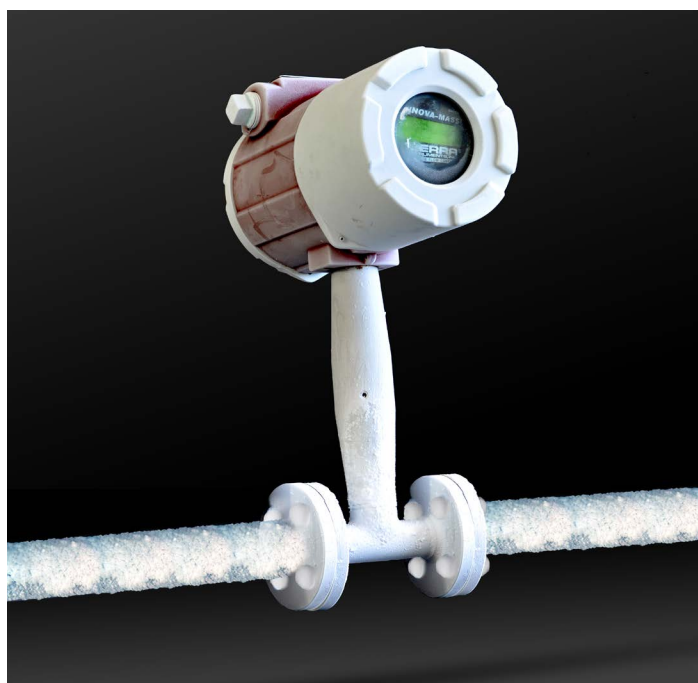
### Process Fluid Pressure

240 Pressure Ratings		
Process Connection	Material	Rating
Flanged	316L SS, A105 carbon steel, C276 Hastalloy®	150, 300, 600 lb
Wafer	316L SS, A105 carbon steel, C276 Hastalloy®	600 lb

### Pressure Transducer Ranges

Pressure Sensor Ranges <sup>(1)</sup> psia (bara)			
Full Scale Operating Pressure		Maximum Over-Range Pressure	
psia	(bara)	psia	(bara)
30	2	60	4
100	7	200	14
300	20	600	41
500	34	1000	69
1500	100	1500	100

Note: (1) To maximize accuracy, specify the lowest full scale operating pressure range for the application. To avoid damage, the flow meter must never be subjected to pressure above the over-range pressure shown above.





**OPERATING SPECIFICATIONS (continued)****Power Requirements**

12 to 36 VDC, 100 mA (add 20mA per output up to 60mA)  
100 to 240 VAC, 50/60 Hz, 25 watts

**Display**

Alphanumeric 2x16 LCD digital display  
Six push buttons switches (up, down, right, left, enter, exit) operable through the display glass of the explosion-proof enclosure viewing at 90° mounting intervals

**Process Fluid & Ambient Temperature**

Process Fluid . . . . . Cryogenic Temperature Sensor:  
-330°F to -40°F (-200°C to -40°C)  
Standard Temperature Sensor:  
-40°F to 500°F (-40°C to 260°C)  
High Temperature Sensor:  
-40°F to 750°F (40°C to 400°C)  
Ambient . . . . . Operating:  
-5°F to 140°F (-20° to 60°C)  
Storage:  
-40°F to 150°F (-40° to 65°C)  
0-98% relative humidity, non-condensing conditions

**Output Signals<sup>(1)</sup>**

Analog . . . . . One to three field rangeable, simultaneous linear 4-20 mA output signals (1000 ohms maximum loop resistance) selected by user from the five parameters—mass flow rate, volumetric flow rate, temperature, pressure and density  
Pulse . . . . . Pulse output for totalization is a 50-millisecond duration pulse operating a solid-state relay capable of switching 40 VDC, 40 mA maximum HART standard, optional MODBUS RTU

Note: (1) All outputs are optically isolated and require external power for operation.

**Alarms**

Up to three programmable solid-state relays for high, low or window alarms capable of switching to 40 VDC, 40 mA maximum

**Totalizer**

Based on user-determined flow units, nine full digits, with rollover at 4, 294, 967, 295; total stored in non-volatile memory.

**PERFORMANCE SPECIFICATIONS****Wetted Materials**

240. . . . . 316L stainless steel standard  
C276 Hastalloy® or A105 carbon steel optional  
Teflon-based thread sealant on pressure transducer  
241. . . . . 316L stainless steel  
Teflon® packing gland below 500°F (260°C)  
Graphite packing gland above 500°F (260°C)  
Teflon-based thread sealant on pressure transducer

**Enclosure**

NEMA 4x/7 (IP65) cast enclosure

**Electrical Ports**

Two 3/4-inch female NPT ports

**Mounting Connections**

240. . . . . Wafer or 150, 300, 600 lb ANSI flange  
241. . . . . Permanent Installation:  
Two-inch male NPT; 150, 300, 600 lb ANSI flange with compression fitting probe seal  
Hot Tap<sup>(1)</sup> Installation:  
Two-inch male NPT; 150, 300, 600 lb ANSI flange; and optional retractor with packing gland probe seal

Note: (1) Removable under line pressure.

**Mounting Position**

240. . . . . No effect  
241. . . . . Meter must be perpendicular within +/- 5° of the pipe centerline

**FMC Approval**

Explosion proof for Class I, Division 1, Groups B, C & D.  
Dust-ignition proof for Class II/III, Division 1, Groups E, F & G.  
NEMA Type 4x/7 and IP66  
T6 at Tamb=60°C

**ATEX Approval**

II 2 G Ex d II B + H2 T6  
II 2 D Ex t D A 21 IP66 T6  
KEMA 08 ATEX 0143

**CE Approval**

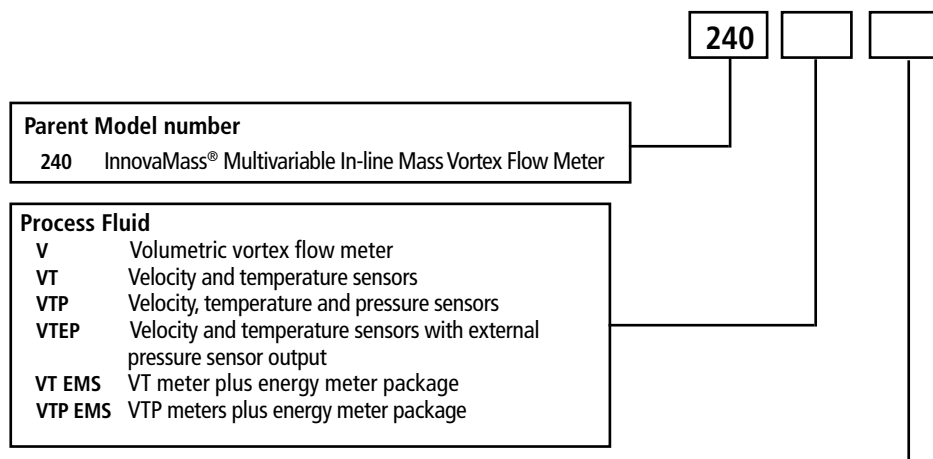
0344

**Optional Certifications**

Construction and inspection (ANSI/ASME B31.3)  
Materials (NACE MR-01-75(90))



## ORDERING THE 240 IN-LINE

**Flow Body—316L Stainless Steel**

- F2** 1/2-inch ANSI 150 lb flanged, 316L  
**F3** 3/4-inch ANSI 150 lb flanged, 316L  
**F4** 1-inch ANSI 150 lb flanged, 316L  
**F5** 1.5-inch ANSI 150 lb flanged, 316L  
**F6** 2-inch ANSI 150 lb flanged, 316L  
**F7** 3-inch ANSI 150 lb flanged, 316L  
**F8** 4-inch ANSI 150 lb flanged, 316L  
**F9** 6-inch ANSI 150 lb flanged, 316L  
**F10** 8-inch ANSI 150 lb flanged, 316L

*Also available in C276 Hastalloy®. Consult factory for pricing/delivery*

- G2** 1/2-inch ANSI 300 lb flanged, 316L  
**G3** 3/4-inch ANSI 300 lb flanged, 316L  
**G4** 1-inch ANSI 300 lb flanged, 316L  
**G5** 1.5-inch ANSI 300 lb flanged, 316L  
**G6** 2-inch ANSI 300 lb flanged, 316L  
**G7** 3-inch ANSI 300 lb flanged, 316L  
**G8** 4-inch ANSI 300 lb flanged, 316L  
**G9** 6-inch ANSI 300 lb flanged, 316L  
**G10** 8-inch ANSI 300 lb flanged, 316L

*Also available in C276 Hastalloy®. Consult factory for pricing/delivery*

- H2** 1/2-inch ANSI 600 lb flanged, 316L  
**H3** 3/4-inch ANSI 600 lb flanged, 316L  
**H4** 1-inch ANSI 600 lb flanged, 316L  
**H5** 1.5-inch ANSI 600 lb flanged, 316L  
**H6** 2-inch ANSI 600 lb flanged, 316L  
**H7** 3-inch ANSI 600 lb flanged, 316L  
**H8** 4-inch ANSI 600 lb flanged, 316L  
**H9** 6-inch ANSI 600 lb flanged, 316L  
**H10** 8-inch ANSI 600 lb flanged, 316L

*Also available in C276 Hastalloy®. Consult factory for pricing/delivery*

- W2** 0.5-inch wafer connection, 316L  
**W3** 3/4-inch wafer connection, 316L  
**W4** 1-inch wafer connection, 316L  
**W5** 1.5-inch wafer connection, 316L  
**W6** 2-inch wafer connection, 316L  
**W7** 3-inch wafer connection, 316L  
**W8** 4-inch wafer connection, 316L

*Also available in carbon steel and C276 Hastalloy®. Consult factory for pricing/delivery*

- FC4** 1-inch ANSI 150 lb flanged, carbon steel  
**FC5** 1.5-inch ANSI 150 lb flanged, carbon steel  
**FC6** 2-inch ANSI 150 lb flanged, carbon steel  
**FC7** 3-inch ANSI 150 lb flanged, carbon steel  
**FC8** 4-inch ANSI 150 lb flanged, carbon steel  
**FC9** 6-inch ANSI 150 lb flanged, carbon steel  
**FC10** 8-inch ANSI 150 lb flanged, carbon steel

**Flow Body—316L Stainless Steel (continued)**

- GC4** 1-inch ANSI 300 lb flanged, carbon steel  
**GC5** 1.5-inch ANSI 300 lb flanged, carbon steel  
**GC6** 2-inch ANSI 300 lb flanged, carbon steel  
**GC7** 3-inch ANSI 300 lb flanged, carbon steel  
**GC8** 4-inch ANSI 300 lb flanged, carbon steel  
**GC9** 6-inch ANSI 300 lb flanged, carbon steel  
**GC10** 8-inch ANSI 300 lb flanged, carbon steel

- HC4** 1-inch ANSI 600 lb flanged, carbon steel  
**HC5** 1.5-inch ANSI 600 lb flanged, carbon steel  
**HC6** 2-inch ANSI 600 lb flanged, carbon steel  
**HC7** 3-inch ANSI 600 lb flanged, carbon steel  
**HC8** 4-inch ANSI 600 lb flanged, carbon steel  
**HC9** 6-inch ANSI 600 lb flanged, carbon steel  
**HC10** 8-inch ANSI 600 lb flanged, carbon steel

- FD2** DN15/PN16 flanged, 316L  
**FD3** DN20/PN16 flanged, 316L  
**FD4** DN25/PN16 flanged, 316L  
**FD5** DN40/PN16 flanged, 316L  
**FD6** DN50/PN16 flanged, 316L  
**FD7** DN80/PN16 flanged, 316L  
**FD8** DN100/PN16 flanged, 316L  
**FD9** DN150/PN16 flanged, 316L  
**FD10** DN200/PN16 flanged, 316L

*Also available in C276 Hastalloy®. Consult factory for pricing/delivery*

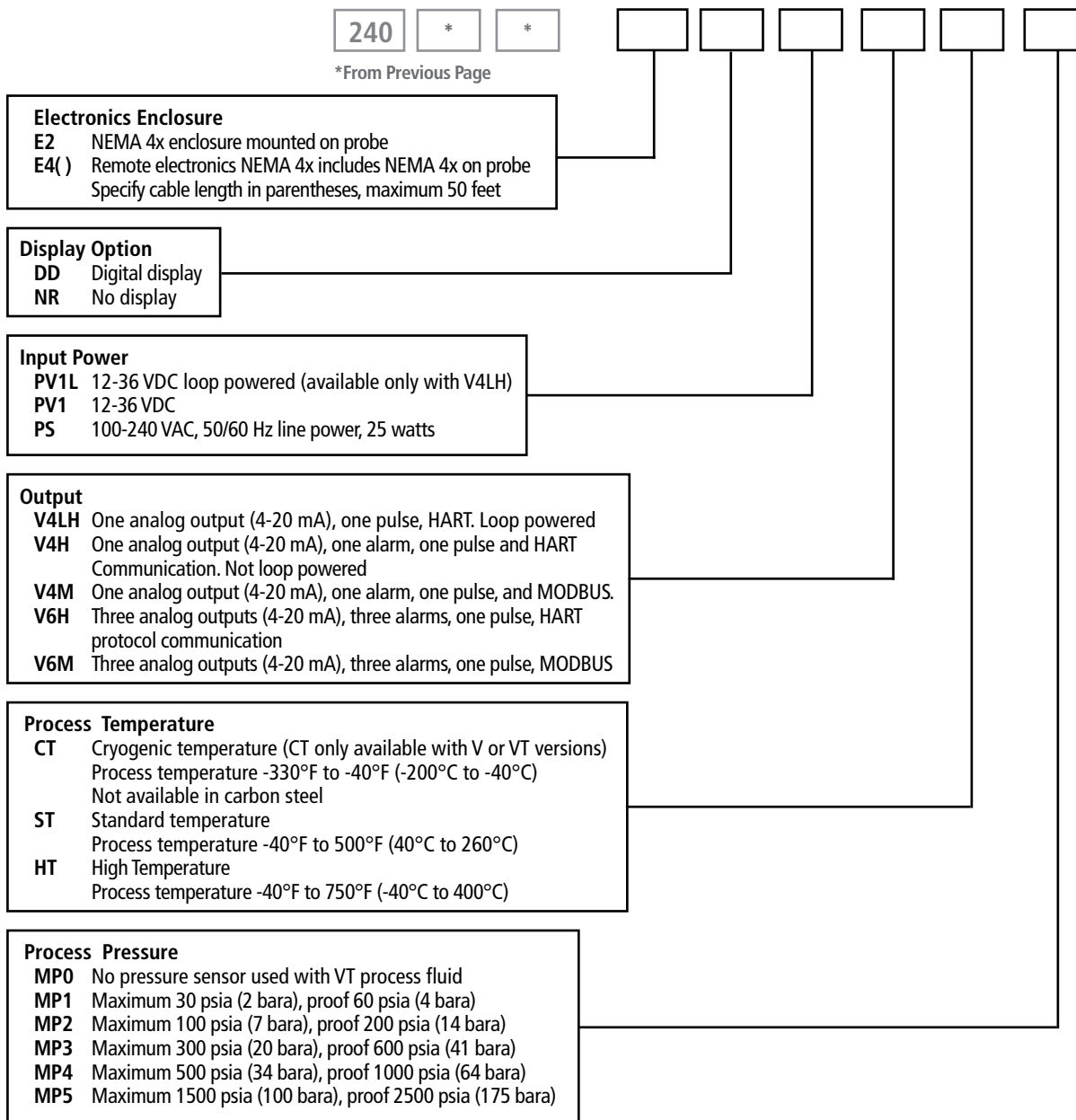
- GD2** DN15/PN40 flanged, 316L  
**GD3** DN20/PN40 flanged, 316L  
**GD4** DN25/PN40 flanged, 316L  
**GD5** DN40/PN40 flanged, 316L  
**GD6** DN50/PN40 flanged, 316L  
**GD7** DN80/PN40 flanged, 316L  
**GD8** DN100/PN40 flanged, 316L  
**GD9** DN150/PN40 flanged, 316L  
**GD10** DN200/PN40 flanged, 316L

*Also available in C276 Hastalloy®. Consult factory for pricing/delivery*

- HD2** DN15/PN64 flanged, 316L  
**HD3** DN20/PN64 flanged, 316L  
**HD4** DN25/PN64 flanged, 316L  
**HD5** DN40/PN64 flanged, 316L  
**HD6** DN50/PN64 flanged, 316L  
**HD7** DN80/PN64 flanged, 316L  
**HD8** DN100/PN64 flanged, 316L  
**HD9** DN150/PN64 flanged, 316L  
**HD10** DN200/PN64 flanged, 316L

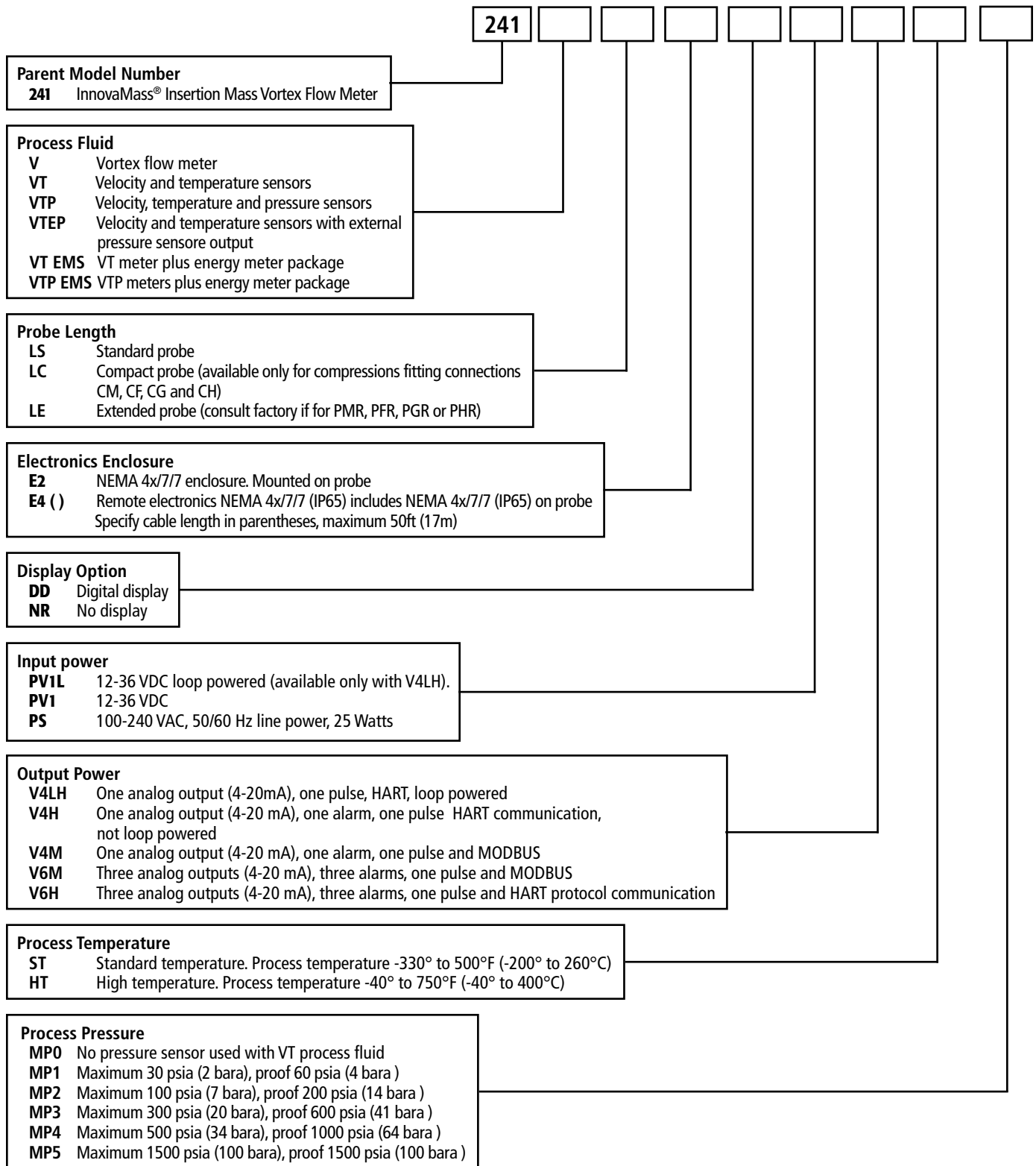
*Also available in C276 Hastalloy®. Consult factory for pricing/delivery*

## ORDERING the 240 In-Line (Continued)



ACCESSORIES (Consult Factory) removable retractors, isolated gate valves, mounting kits, material certificates, pressure certificates, certificate of conformance, NACE certification

## ORDERING THE 241 INSERTION



ACCESSORIES (consult factory) Removable retractors, isolated gate valves, mounting kits, material certificates, pressure certificates, certificate of conformance, NACE certification

## ORDERING THE 241 INSERTION (Continued)

241	*	*	*	*	*	*	*	
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\*From Previous Page

Process Connection ANSI		Process Connection DN	
<b>CM</b>	Compression fitting 2-inch male NPT, 600 lb pressure rating	<b>CFD</b>	Compression fitting DN50/PN16 flange
<b>CF</b>	Compression fitting 2-inch 150 lb flange	<b>CGD</b>	Compression fitting DN50/PN40 flange
<b>CG</b>	Compression fitting 2-inch 300 lb flange	<b>CHD</b>	Compression fitting DN50/PN64 flange
<b>CH</b>	Compression fitting 2-inch 600 lb flange	<b>PFD</b>	Packing gland DN50/PN16 flange, 50 psig (3.5 barg) maximum process pressure
<b>PM</b>	Packing gland 2-inch male NPT, 50 psig (3.5 barg) maximum process pressure without removable retractor	<b>PFDR</b>	Packing gland DN50/PN16 flange, with retractor
<b>PMR</b>	Packing gland 2-inch male NPT with retractor, 600 lb pressure rating	<b>PFDR-LE</b>	Packing gland DN50/PN16 flange, with retractor For use with extended probe length (see LE option)
<b>PMR-LE</b>	Packing gland 2-inch male NPT with retractor, 600 lb pressure rating (for LE)	<b>PGD</b>	Packing gland DN50/PN40 flange, 50 psig (3.5 barg) maximum process pressure
<b>PF</b>	Packing gland 2-inch 150 lb flange, 50 psig (3.5 barg) maximum process pressure without removable retractor	<b>PGDR</b>	Packing gland DN50/PN40 flange, with retractor
<b>PFR</b>	Packing gland 2-inch 150 lb flange with retractor	<b>PGDR-LE</b>	Packing gland DN50/PN40 flange, with retractor For use with extended probe length (see LE option)
<b>PFR-LE</b>	Packing gland 2-inch 150 lb flange with retractor For use with extended probe length (see LE option)	<b>PHDR</b>	Packing gland DN50/PN64 flange, with retractor
<b>PG</b>	Packing gland 2-inch 300 lb flange, 50 psig (3.5 barg) maximum process pressure without removable retractor	<b>PHDR-LE</b>	Packing gland DN50/PN64 flange, with retractor For use with extended probe length (see LE option)
<b>PGR</b>	Packing gland 2-inch 300 lb flange with retractor		
<b>PGR-LE</b>	Packing gland 2-inch 300 lb flange with retractor For use with extended probe length (see LE option)		
<b>PHR</b>	Packing gland 2-inch 600 lb flange with retractor		
<b>PHR-LE</b>	Packing gland 2-inch 600 lb flange with retractor For use with extended probe length (see LE option)		



**SIERRA**<sup>®</sup>  
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