

Flow Products Safety Information

Contents

1. General Warnings	1
Local Code Warning	1
ATEX Warning	1
Intrinsically Safe Warning	1
Process Fluid Warning	1
Abrasive Fluid Warning	2
Loss of Flow Signal Warning	2
Parts Replacement Warning	2
2. 83 Series Vortex Flowmeters	3
Flowmeter Identification	3
Origin Code	4
Electrical Certification Rating	4
Explosionproof/Flameproof and Enclosure Warning	5
Type n Warning	5
PED Certification	5
Maximum Working Pressure	6
83F Flanged Body Flowmeters	6
83W Wafer Body Flowmeters	8
83S Sanitary Flowmeters	8
Isolation Valves	8
Flowmeter Materials	9
Flowmeter Body	9
Sensor Diaphragm and Fill Fluid	9
Sensor Replacement	10
3. Mass Flow Products	11
CFS10 and CFS20 Mass Flowtube	11
Flowtube Identification	11
Electrical Certification Rating	11
Origin Code	13
Process Wetted Parts	13
PED Certification	14
Maximum Working Pressure	14
CFT50 Mass Flow Transmitters	16
Transmitter Identification	16
Electrical Certification Rating	16
Origin Code	17
Operating Temperature Limits	17

Safety Grounding	17
Unused Conduit Entries	17
Connection Diagrams	18
4. Magnetic Flow Products.....	21
8000A Magnetic Flowtubes	21
PED Certification	21
Flowtube Identification	21
Origin Code	21
Process Pressure and Temperature Limits	22
Process Wetted Parts	22
9100A and 9200A Magnetic Flowtubes	23
PED Certification	23
Flowtube Identification	23
Process Pressure and Temperature Limits	23
Process Wetted Parts	23
9300A Magnetic Flowtubes	24
PED Certification	24
Flowtube Identification	24
Origin Code	24
Process Pressure and Temperature Limits	25
Flange Pressure-Temperature Limits	26
Process Wetted Parts	27

1. General Warnings

Local Code Warning

—  **WARNING** —

These products must be installed to meet all applicable local installation regulations, such as hazardous location requirements, electrical wiring codes, and mechanical piping codes. Persons involved in the installation must be trained in these code requirements to ensure that the installation takes maximum advantage of the safety features designed into the flowmeter.

ATEX Warning

—  **WARNING** —

Apparatus marked as Category 1 equipment and used in hazardous areas requiring this category must be installed in such a way that, even in the event of rare incidents, the versions with an aluminum alloy enclosure can not be an ignition source due to impact and friction.

Intrinsically Safe Warning

—  **WARNING** —

Since Invensys Foxboro does not specify live maintenance, to prevent ignition of flammable atmospheres, disconnect power before servicing unless the area is certified to be nonhazardous.

Process Fluid Warning

—  **WARNING** —

If process containing parts are to be disassembled:

1. Make sure that process fluid is not under pressure or at high temperature.
 2. Take proper precautions concerning leakage or spillage of any toxic or otherwise dangerous fluid. Follow any Material Safety Data Sheet (MSDS) recommendations.
-

—  **WARNING** —

These flowmeters are built using materials that are corrosion resistant to a wide variety of fluids. However, with aggressive fluids, a potential exists for corrosive failure. Therefore, verify the material compatibility with the NACE guidelines and/or user knowledge of the flowmeter material compatibility with the process fluid at operating conditions.

Abrasive Fluid Warning

—  **WARNING** —

Fluids containing abrasive particles and flowing at high rates can cause significant wear to pipes. If these conditions exist, check the flowmeter periodically for wear.

Loss of Flow Signal Warning

—  **WARNING** —

If the flowrate signal appears to have a calibration shift or goes to zero, check the flowmeter for corrosion or wear.

Parts Replacement Warning

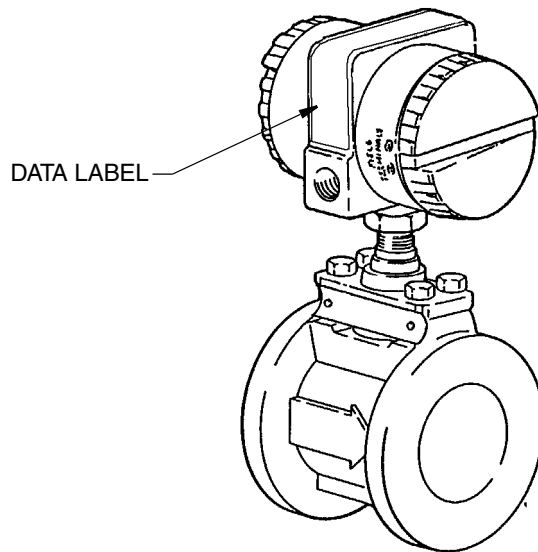
—  **WARNING** —

If replacing parts, do not use parts made of other materials or that in any other way change the product as described in the model code on the data plate.

2. 83 Series Vortex Flowmeters

Flowmeter Identification

A typical data plate is shown in Figure 1.






MODEL 83 F-D02S1SRTJE	ST A	 <input type="checkbox"/>  KEMA 01ATEX1006 X <input type="checkbox"/>  KEMA 01ATEX1008 X APPLICABLE PROTECTION TICKED SEE CERTIFICATE FOR DATA CAUTION: CABLE ENTRIES 1/2-14 NPT
REF. NO.	ORIGIN 2A0125	
SUPPLY 12.5- 50 Vdc	MWP @ 100° F 720 PSI	
METER BODY MATL	CF8M	
MAX. AMB. TEMP.	185°F	
TEMP. LIMIT	0 TO 400°F	
REF K-FACT.	PULSES/	
CUST. DATA		
<small>This product and its components are protected by one or more of the following U.S. Patents: 4,620,678; 4,220,046; 5,003,827; 5,209,125; 5,576,497 and others pending. Corresponding patents have been issued or are pending in other countries.</small>		

Figure 1. Sample 83 Vortex Flowmeter Identification

Refer to the data plate to determine the origin code, supply voltage, maximum working pressure, flowmeter body material, maximum ambient temperature, maximum process temperature, and electrical certification rating.

When the flowmeter is remotely mounted, the junction box on the flowtube body has an additional agency plate showing its hazardous location rating. See Figure 2.

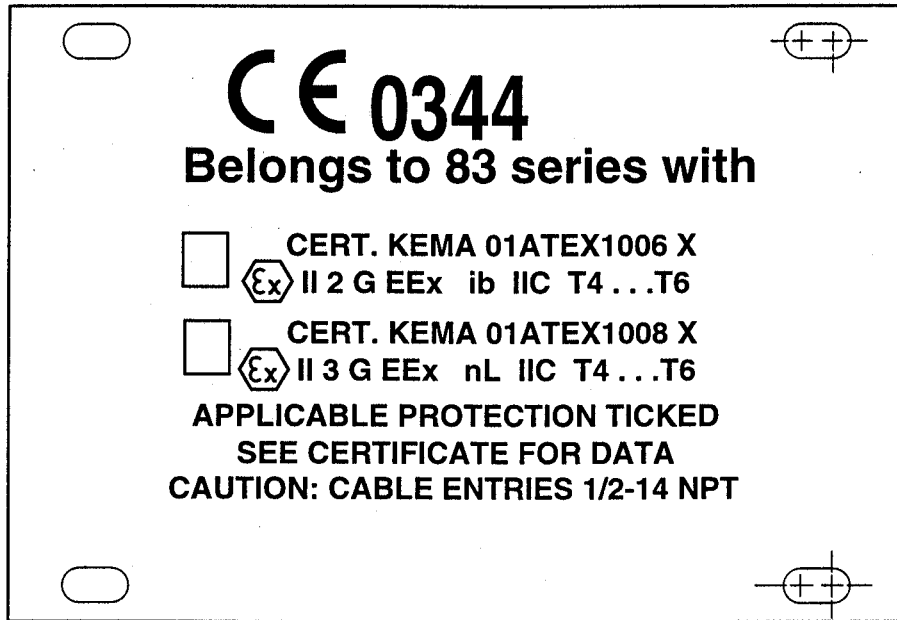


Figure 2. Sample Flowmeter Junction Box Agency Plate

Origin Code

The origin code identifies the area of manufacture and the year and week of manufacture. See Figure 1. In the example, 2A means the product was manufactured in the Measurement and Instrument Division, 01 identifies the year of manufacture as 2001, and 25, the week of manufacture in that year.

Electrical Certification Rating

The electrical safety design code is printed on the data plate as part of the model code. The location of the code within the model number is shown below:

83F-A02S2SDTAA
 └─── ELECTRICAL SAFETY DESIGN CODE

See Table 1 to identify this code. The type of protection is also marked on the data plate.

Table 1. Electrical Safety Specifications

Testing Laboratory, Type of Protection, and Area Classification	Application Conditions	Electrical Safety Design Code
ATEX energy limited II3G EEx nL IIC, Zone 2.	83(F and W) -A, -D, and -T Temperature Class T4-T6.	N
ATEX intrinsically safe for II2G EEx ib IIC, Zone 1.	83(F and W) -A, -D, -F, and -T Temperature Class T4 at 0.8 W. Temperature Class T5 at 0.5 W. Temperature Class T6 at 0.3 W. Maximum ambient 80°C. See certificate for electrical data.	E
CENELEC flameproof for EEx d [ib] Gas Group IIC, Zone 1.	83(F and W) -A, -D, -F, and -T Temperature Class T6. Maximum ambient 80°C. See certificate for electrical data.	H

— NOTE —

These flowmeters have been designed to meet the electrical safety descriptions listed in the table above. For detailed information, or status of testing laboratory approvals/certifications, contact Invensys Foxboro.

Explosionproof/Flameproof and Enclosure Warning

— ⚠ WARNING —

To prevent possible explosion and to maintain explosionproof/flameproof and dust-ignitionproof protection, plug unused openings with the provided metal pipe plug. This plug must be engaged a minimum of five full threads. The threaded housing covers must be installed. Turn covers to seat O-ring into the housing and then continue to hand tighten until the cover contacts the housing metal-to-metal.

Type n Warning

— ⚠ WARNING —

On flowmeters certified for ATEX protection nL, CSA Class I, Division 2, or FM nonincendive for Class I, Division 2, the threaded housing covers must be installed.

PED Certification

Invensys Foxboro offers the PED (Harmonized Pressure Equipment Directive for the European Community) certification only with flowmeters ordered with ATEX or CENELEC Electrical Safety Design Code selections. ATEX electrical certifications are in place for Codes N and E; therefore, the CE marking carries the ATEX number 0344. The H certification is CENELEC and

is marked with CE mark and no ATEX number. Flowmeters which are 1 1/2 in (40 mm) or larger have PED certification and therefore the CE marking carries the PED number 0575. See Table 2.

Table 2. PED Marking

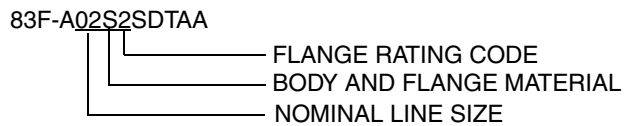
Flowmeter Size	Electrical Safety Design Code	PED Marking
3/4 in (15 mm) and 1 in (25 mm)	N or E	CE 0344
	H	CE
1 1/2 in (40 mm) and larger	N or E	CE 0344 0575
	H	CE 0575

Maximum Working Pressure

83F Flanged Body Flowmeters

The maximum working pressure (MWP) of the flowtube at 100°F is shown on the data label.

The MWP at other temperatures for the 83F Flanged Body Flowmeter is given in Figure 3 and Figure 4. The nominal line size, body and flange material, and flange rating required to use these figures is found within the model number on the data label as follows:



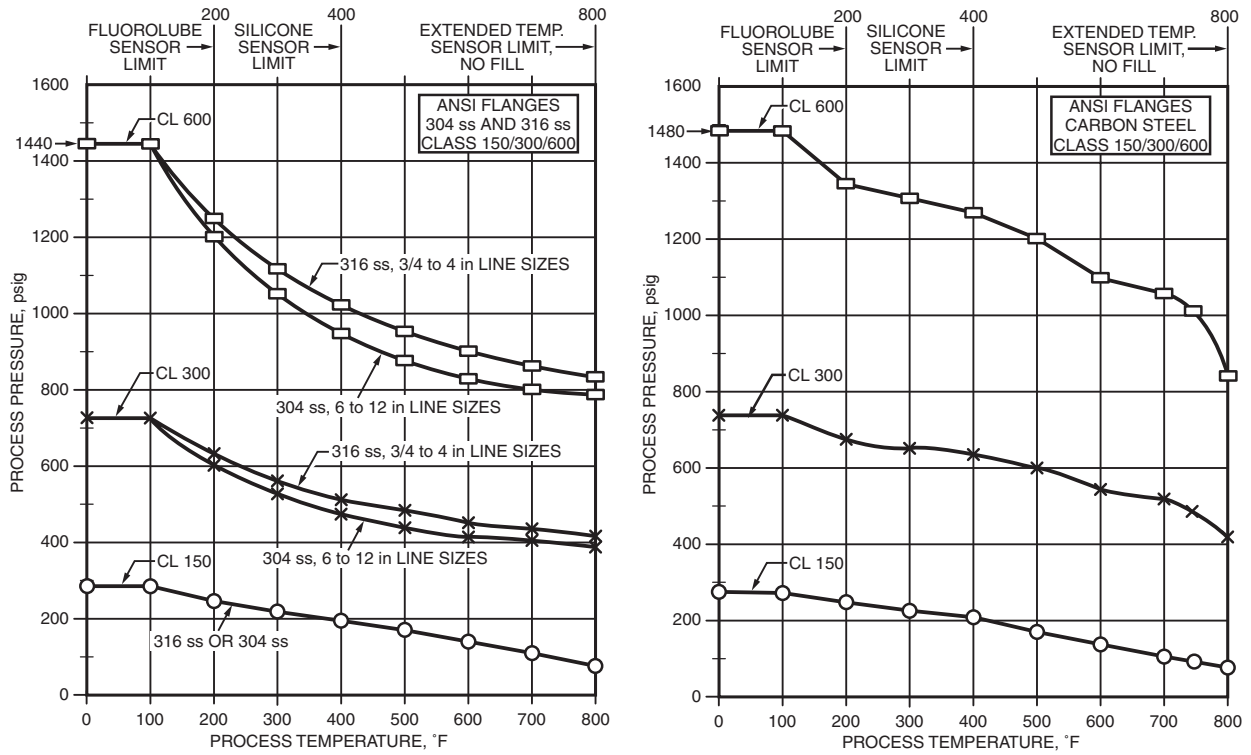


Figure 3. Pressure -Temperature Limits with ANSI Flanges

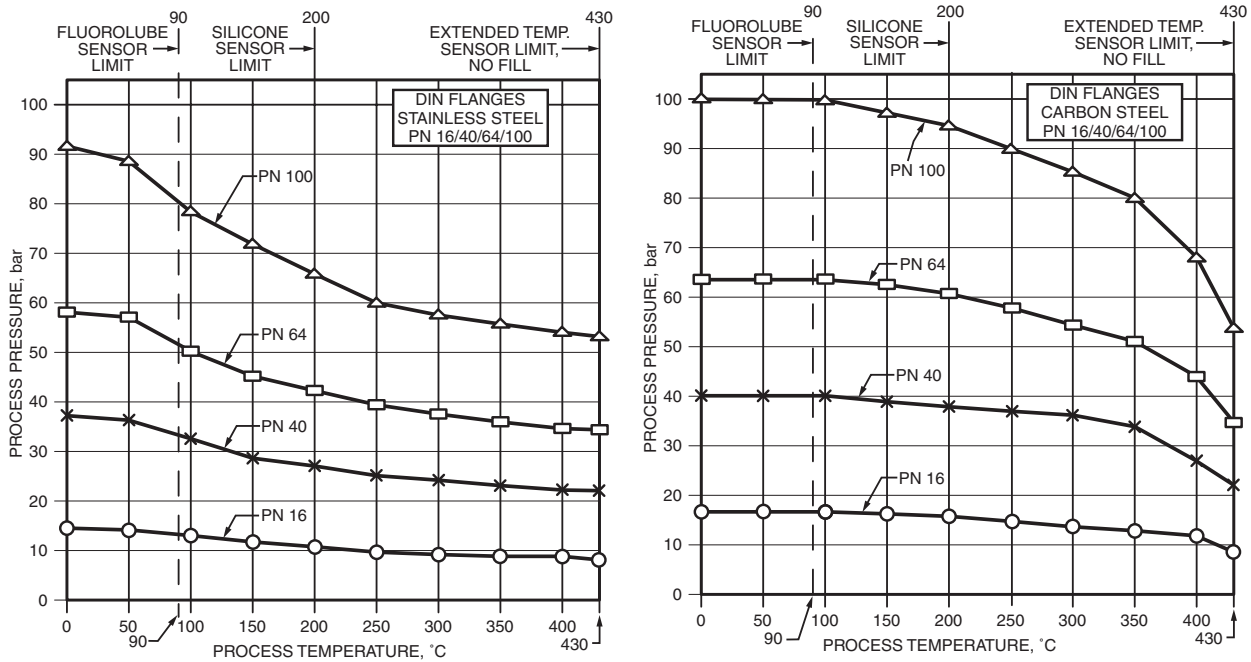


Figure 4. Pressure -Temperature Limits with Metric Flanges

83W Wafer Body Flowmeters

The maximum working pressure (MWP) of the flowtube at 100°F is shown on the data label. The flowmeters are designed to withstand pressure within carbon steel ANSI Class 600 and PN 100 flange ratings. The flowmeters have been designed to withstand the full pressure rating for carbon steel flanges.

83S Sanitary Flowmeters

The maximum working pressure (MWP) of the flowtube at 100°F is shown on the data label. The actual pressure-temperature limit is this value or the pressure-temperature limit of your connections, whichever is less.

Isolation Valves

Flowmeters equipped with an isolation valve have a maximum pressure rating of 1440 psi at 100°F (99 bar at 38°C). Isolation valves used with standard temperature range and with extended temperature range flowmeters are further limited to values shown in Figure 5. The temperature range of your flowmeter is found within the model number on the data label as follows:

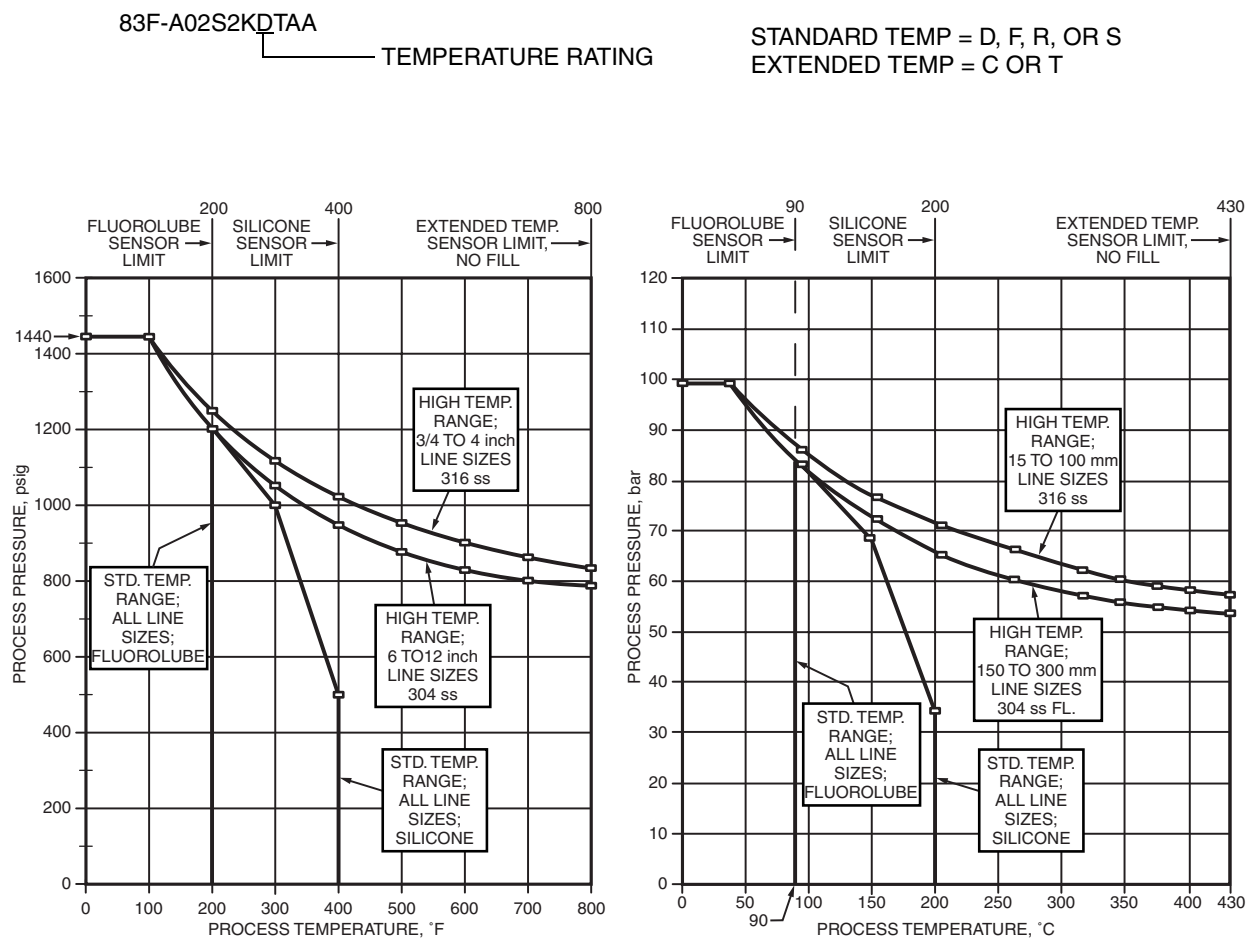


Figure 5. Pressure -Temperature Limits with Isolation Valves

Flowmeter Materials

Flowmeter Body

The flowmeter body material is shown on the data label.

- ◆ CF8M = cast 316 stainless steel body and shedder per ASTM A351 grade CF8M
- ◆ 304 SS = welded pipe and flange body with 304 ss pipe and shedder per ASTM 312 and 304 ss flanges per ASTM 182
- ◆ 304/A105 = welded pipe and flange body with 304 ss pipe and shedder per ASTM 312 and carbon steel flanges per ASTM A105
- ◆ CW2M = cast Hastelloy[®] C body and shedder per ASTM A494-CW2M
- ◆ 316 SS = AISI Type 316 stainless steel.

Sensor Diaphragm and Fill Fluid

The sensor diaphragm and fill fluid for the 83F and 83W Flowmeters are found within the model number on the data label as follows:

83F-A02S2KD TAA
 └──────────┬────────── DIAPHRAGM MATERIAL AND FILL FLUID

Code	Diaphragm Material	Fill Fluid
D	Hastelloy C-276	Fluorolube
F	316L Stainless Steel	Fluorolube
R	Hastelloy C-276	Silicone (DC550)
S	316L Stainless Steel	Silicone (DC550)
C	Hastelloy C-276	Unfilled
T	316L Stainless Steel	Unfilled

The sensor diaphragm for the 83S Flowmeter is 316 Stainless Steel (meets both 316 and 316L properties); the fill fluid is Silicone (DC550).

The isolation valve materials are as follows:

- Valve Body:** ASTM A351 grade CF8M stainless steel
- Valve Ball:** AISI Type 316 stainless steel
- Valve Seats:** Glass Filled ptfе for standard temperature flowmeters
Graphite for extended temperature flowmeters

The temperature range of your flowmeter is found within the model number on the data label as follows:

83F-A02S2KD TAA
 └──────────┬────────── TEMPERATURE RATING

STANDARD TEMP = D, F, R, OR S
 EXTENDED TEMP = C OR T

Sensor Replacement

—  **CAUTION** —

For ATEX certified flameproof units, take special care not to scar, mar, ding, or dent the surface of the sensor stem during assembly. This is critical to the integrity of the flameproof surface finish.

—  **WARNING** —

To prevent injury from escaping process fluids, to maintain agency certification of this product, and to prove the integrity of the parts and workmanship in containing process pressure, a hydrostatic pressure test must be performed after the sensor replacement is complete. The flowmeter must hold the appropriate pressure from Table 3 for one minute without leaking.

Table 3. Test Pressure

Model	End Connection	Test Pressure
83F	ANSI Class 150	450 psi
	PN 16	3.2 MPa
	ANSI Class 300	1125 psi
	PN 40	6 MPa
	PN 64	9.6 MPa
	ANSI Class 600	2250 psi
83W	All	15 MPa (2250 psi)

3. Mass Flow Products

CFS10 and CFS20 Mass Flowtube

Flowtube Identification

A typical data plate is shown in Figure 6.

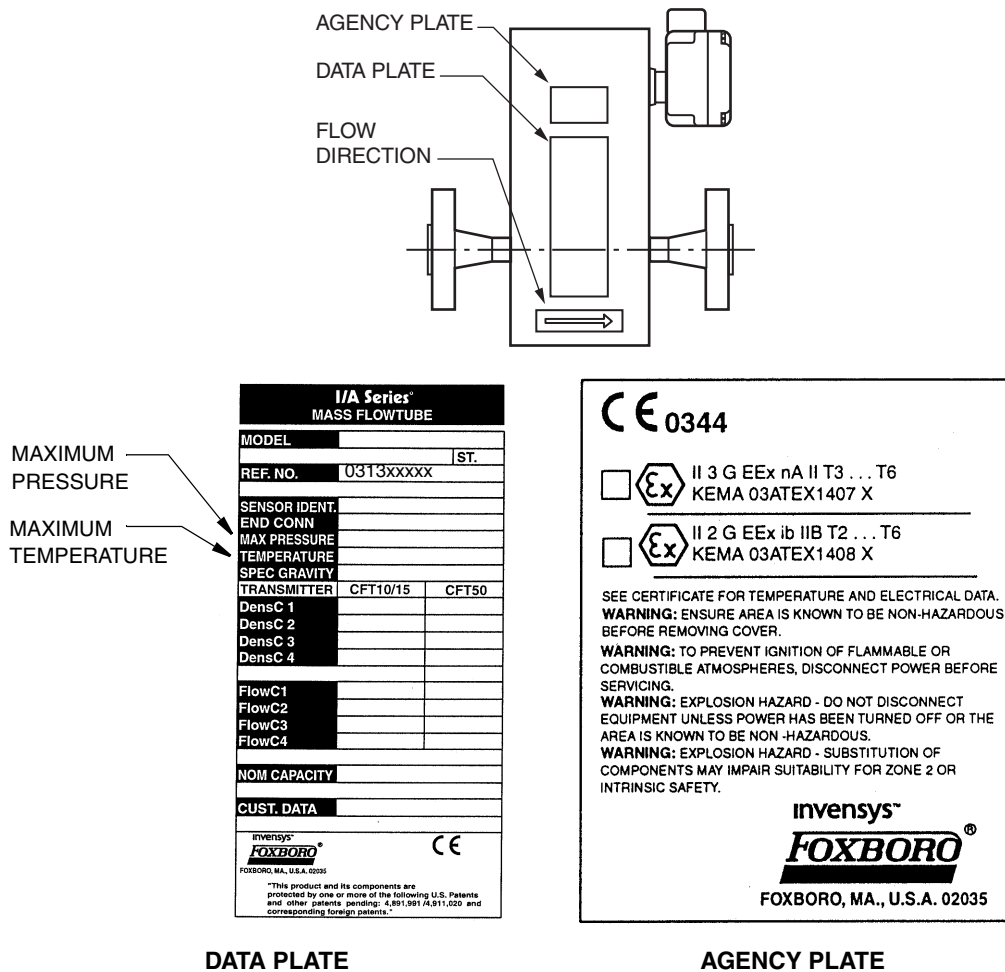


Figure 6. Sample CFS10 or CFS20 Mass Flowtube Identification

Refer to the data plate to determine the maximum pressure and temperature limits.

Electrical Certification Rating

Electrical certification information is printed on the agency plate (located above the data plate). The electrical design safety code is also printed on the data plate as part of the model number.

Table 5. Process Temperature Range in Accordance with Flowtube Size and Electrical Safety Design Code

Flowtube Model	Flowtube Size		Process Temperature Range for Electrical Safety Design Code LLL	Process Temperature Range for Electrical Safety Design Code MMM	Process Temperature Range for Electrical Safety Design Code EBB
	mm	in			
CFS10	3	1/8	–130 to +180° C (–202 to +356° F)	–130 to +180° C (–202 to +356° F)	–130 to +180° C (–202 to +356° F)
	6	1/4	–200 to +180° C (–328 to +356° F)	–200 to +180° C (–328 to +356° F)	–150 to +180° C (–238 to +356° F)
	15	1/2	–200 to +180° C (–328 to +356° F)	–200 to +180° C (–328 to +356° F)	–200 to +180° C (–328 to +356° F)
	20	3/4	–200 to +180° C (–328 to +356° F)	–200 to +180° C (–328 to +356° F)	–200 to +180° C (–328 to +356° F)
	25	1	–200 to +180° C (–328 to +356° F)	–55 to +165° C (–67 to +329° F)	–50 to +180° C (–58 to +356° F)
	40	1-1/2	–200 to +180° C (–328 to +356° F)	–55 to +165° C (–67 to +329° F)	–50 to +140° C (–58 to +284° F)
	50	2	–200 to +180° C (–328 to +356° F)	–55 to +165° C (–67 to +329° F)	–50 to +140° C (–58 to +284° F)
CFS20	40	1-1/2	–200 to +180° C (–328 to +356° F)	–55 to +165° C (–67 to +329° F)	–50 to +140° C (–58 to +284° F)
	80	3	–200 to +180° C (–328 to +356° F)	–55 to +165° C (–67 to +329° F)	–50 to +140° C (–58 to +284° F)

Origin Code

The origin code identifies the year and week of manufacture. It is the first four characters of the Reference Number (**REF. NO.**). See Figure 6. In the example 0313, 03 identifies the year of manufacture as 2003, and 13, the week of manufacture in that year.

Process Wetted Parts

The flowtube wetted material is found within the model number on the data label as follows:

CFS10-02SAMMM

 FLOWTUBE WETTED MATERIAL

Code	Wetted Material
S	316L Stainless Steel
H	Hastelloy C-22
C	316L Stainless Steel (as prepared for Sanitary Applications, 3A Authorization No. 224)

PED Certification

Invensys Foxboro offers the PED (Harmonized Pressure Equipment Directive for the European Community) certification only with flowmeters ordered with ATEX Electrical Safety Design Code selections. ATEX electrical certifications are in place for Electrical Safety Design Code MMM and LLL; therefore, the CE marking carries the ATEX number 0344. Flowmeters which are 1 1/2 in (40 mm) or larger having PED certification have a CE marking that also carries the PED number 0575. See Table 6.

Table 6. PED Marking

Flowmeter Size	Electrical Safety Design Code	PED Marking
3/4 in (15 mm) and 1 in (25 mm)	EBB, LLL or MMM	CE 0344
	CGZ, CNN, FBB or FNN	CE
1 1/2 in (40 mm) and larger	EBB, LLL, or MMM	CE 0344 0575
	CGZ, CNN, FBB, FNN	CE 0575(a)

(a) Exceptions: Sanitary end connections for mating with Tri-Clamp ferrule.

Maximum Working Pressure

Maximum process pressure is dependent on the process temperature, flowtube size, and end connections used. The following tables specify the maximum process pressure for either the type of end connection (Table 7) or process temperature (Table 8). Interpolation is required for process temperatures between those listed. Use the lesser of the pressures determined from these tables.

Table 7. End Connection Process Temperature/Pressure Limits (a)

End Connection Type	Process Temp.	MWP (b)	
		316/316L ss	Hastelloy C-22
ANSI [®] Class 150 Flange	100°F	275 psig	290 psig
	200°F	240 psig	260 psig
	300°F	215 psig	230 psig
	356°F	208 psig	217 psig
ANSI Class 300 Flange	100°F	720 psig	750 psig
	200°F	620 psig	750 psig
	300°F	560 psig	730 psig
	356°F	540 psig	719 psig
ANSI Class 600 Flange	100°F	1440 psig	1500 psig
	200°F	1240 psig	1500 psig
	300°F	1120 psig	1455 psig
	356°F	1080 psig	1435 psig

Table 7. End Connection Process Temperature/Pressure Limits (a) (Continued)

End Connection Type	Process Temp.	MWP (b)	
		316/316L ss	Hastelloy C-22
BS 4504 (DIN) PN 10/16 PN 25/40 Flange	40°C	40.0 bar(c)	41.7 bar(c)
	100°C	34.2 bar(c)	37.1 bar(c)
	150°C	30.8 bar(c)	32.9 bar(c)
	180°C	29.3 bar(c)	30.6 bar(c)
Flange to Mate with BS 4504 (DIN), PN 100/2	40°C	96 bar (c)	103 bar (c)
	100°C	82 bar (c)	103 bar (c)
	150°C	75 bar (c)	100 bar (c)
	180°C	72 bar (c)	98 bar (c)
Threaded, NPT, ANSI B2.1	MWP limited by threaded end connection limits per Table 8.		
Sanitary (Tri-Clamp [®] Ferrule and DIN 11851) (d)	Maximum working pressure is 10 bar at 25°C (145 psig at 77°F).		

(a) Linear interpolation is acceptable.

(b) See Model Codes for flowtube configurations available with 316 ss, 316L ss, and Hastelloy C-22 end connections.

(c) To obtain MPa values, divide bar value by 10.
To obtain kPa values, multiply bar value by 100.

(d) If higher MWPs are required, contact Invensys Foxboro.

**Table 8. Flowtube Process Temperature/Pressure Limits
Threaded End Connections (a)**

Nominal Flowtube Size		Process Temperature		Maximum Working Pressure (MWP)			
				316/316L ss		Hastelloy C-22	
mm	in	°C	°F	bar (b)	psig	bar (b)	psig
3 and 6	1/8 and 1/4	40	100	207	3000	217	3150
		100	200	174	2530	217	3150
		150	300	156	2270	213	3050
		180	356	148	2144	207	3010
15 and 20	1/2 and 3/4	40	100	100	1440	103	1500
		100	200	85	1240	103	1500
		150	300	78	1120	100	1455
		180	356	75	1080	98	1435

(a) Linear interpolation is acceptable.

(b) To obtain MPa value, divide bar value by 10.
To obtain kPa value, multiply bar value by 100.

CFT50 Mass Flow Transmitters

Transmitter Identification

A typical data plate is shown in Figure 7.

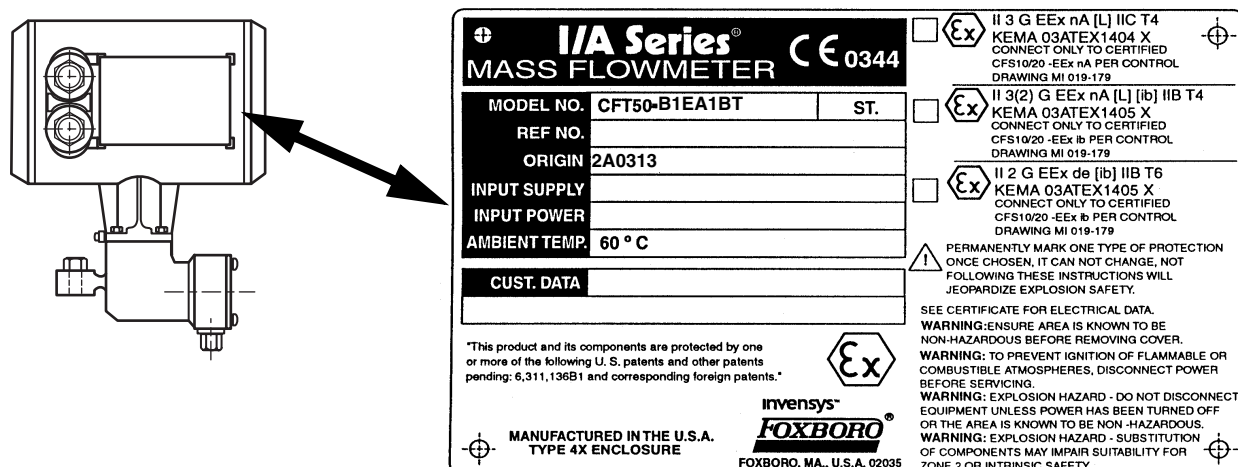


Figure 7. Sample CFT50 Series Mass Flowmeter Identification

Refer to the data plate to determine the electrical certification rating, origin code, input supply voltage, input power, and ambient temperature limit.

Electrical Certification Rating

Electrical safety design code is printed on the data plate as part of the model number. The location of the code within the model number is shown below. See Table 9 for additional information.



Table 9. Electrical Safety Specifications

Testing Laboratory, Type of Protection and Area Classification	Conditions of Certification	Electrical Safety Design Code
KEMA (ATEX) nonsparking with nonsparking flowtube and I/O connections; II 3 G EEx nA [L] IIC; Zone 2	Connect to nonsparking flowtube and inputs/outputs. Temperature Class T4.	T
KEMA (ATEX) nonsparking with intrinsically safe flowtube connections; II 3(2) G EEx nA [ib] [L] IIB; Zone 2	Connect to intrinsically safe flowtube and nonsparking inputs/outputs. Temperature Class T4.	M
KEMA (ATEX) flameproof with intrinsically safe flowtube connections; II 2 G EEx de [ib] IIB; Zone 1	Connect to intrinsically safe flowtube. Temperature Class T6.	Q

— NOTE

These transmitters have been designed to meet the electrical safety descriptions listed in the table above. For detailed information, or status of testing laboratory approvals/certifications, contact Invensys Foxboro.

Origin Code

The origin code identifies the area of manufacture and the year and week of manufacture. See Figure 7. In the example 2A0313, 2A means the product was manufactured in the Measurement and Instrument Division, 03 identifies the year of manufacture as 2003, and 13, the week of manufacture in that year.

Operating Temperature Limits

The operating temperature limits of the electronics are -20 and +60°C (-4 and +140°F). Ensure that the transmitter is operated within this range.

Safety Grounding

Ground connection of the transmitter enclosure must be connected to the potential equalizer system within the hazardous area per national installation standard.

Unused Conduit Entries

On Type CFT50-B1....M, the cable entry devices, conduit entries, and the closing elements of unused apertures shall provide a degree of ingress protection of at least IP54 according to EN 60529 and shall be correctly installed.

On Type CFT50-B1....Q, the cable entry devices and the closing elements of unused apertures shall be of a certified flameproof type, suitable for the conditions of use and correctly installed.

Connection Diagrams

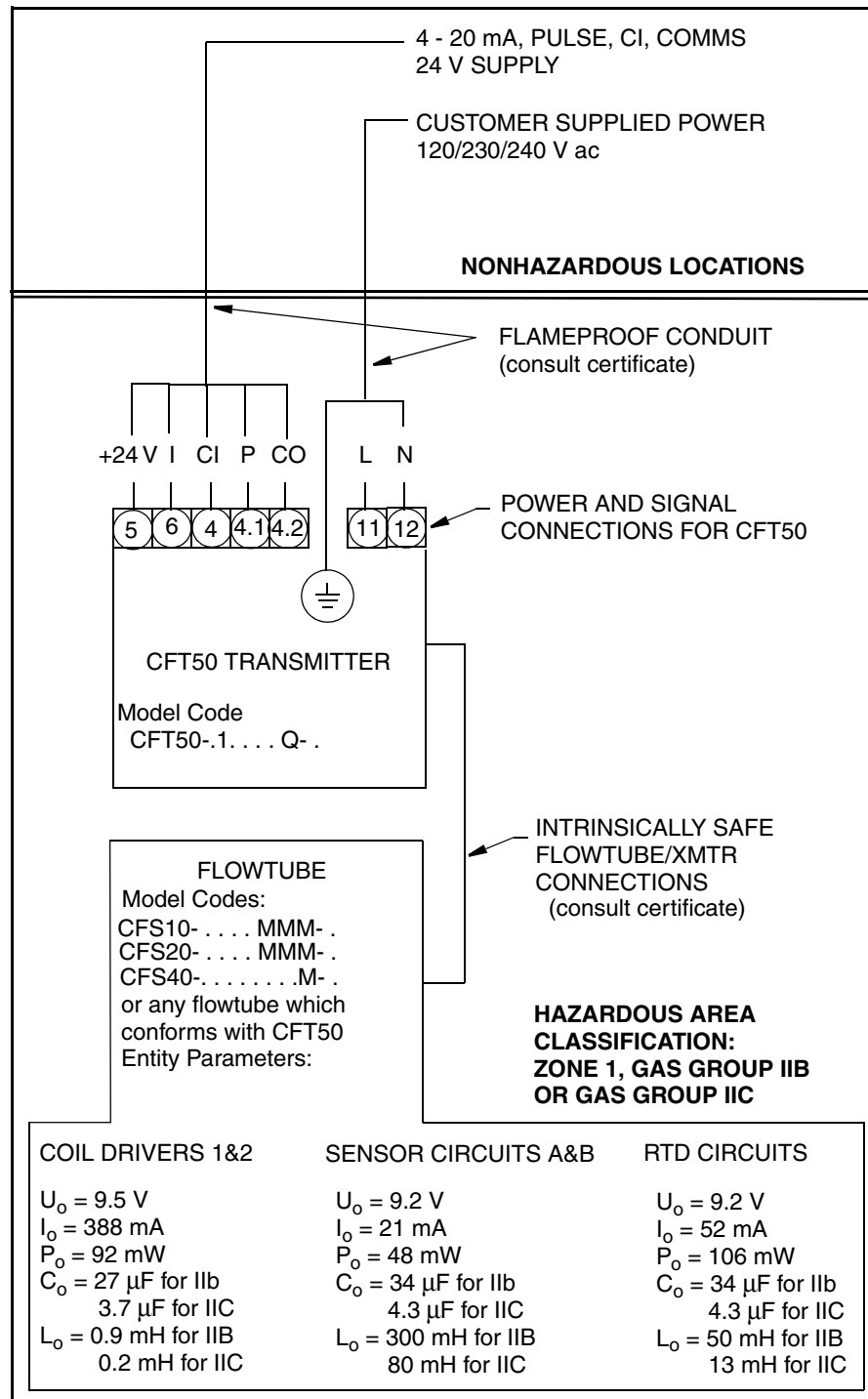


Figure 8. Flowtube and Transmitter Located in Zone 1 Area

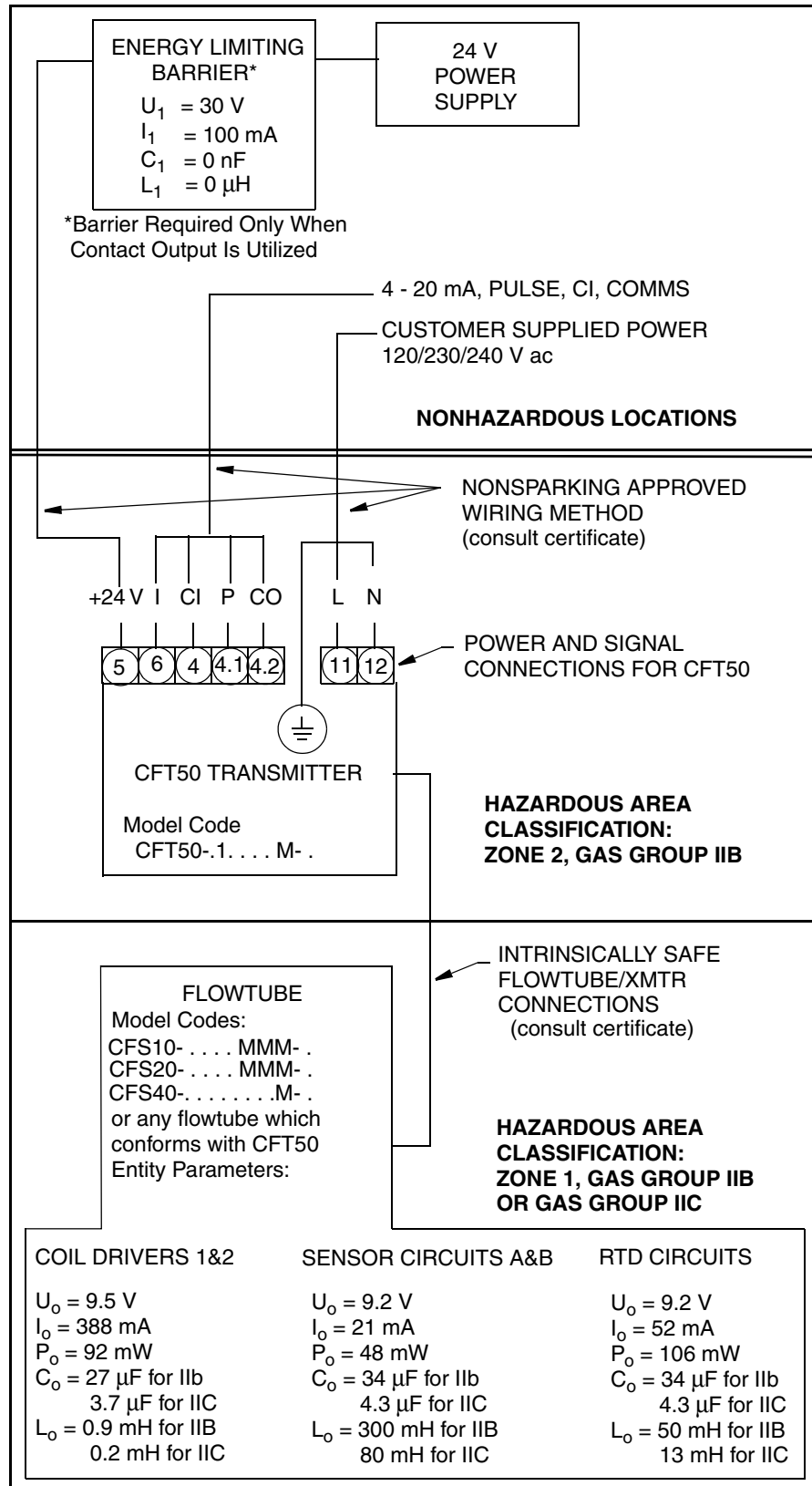


Figure 9. Flowtube in Zone 1 and Transmitter in Zone 2 Area

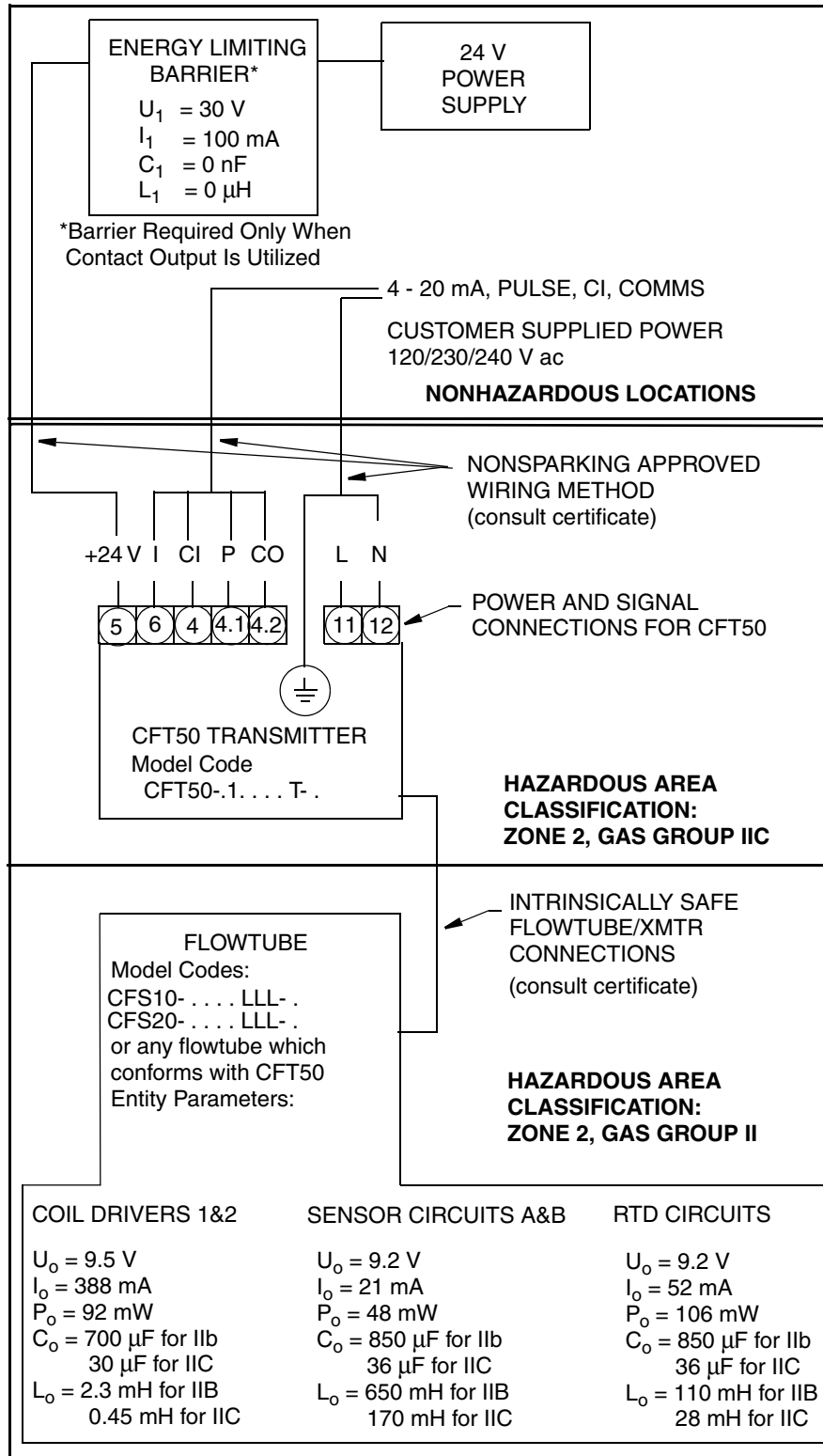


Figure 10. Flowtube and Transmitter Located in Zone 2 Area

4. Magnetic Flow Products

8000A Magnetic Flowtubes

PED Certification

Invensys Foxboro offers the PED (Harmonized Pressure Equipment Directive for the European Community) certification only on 2-inch through 6-inch wafer body flowmeters with pfa lining material. The CE marking on these flowmeters carries the PED number 0575.

— NOTE
The information below applies to PED certified 2-inch through 6-inch wafer body flowmeters with pfa lining material.

Flowtube Identification

Typical data plates are shown in Figure 11.

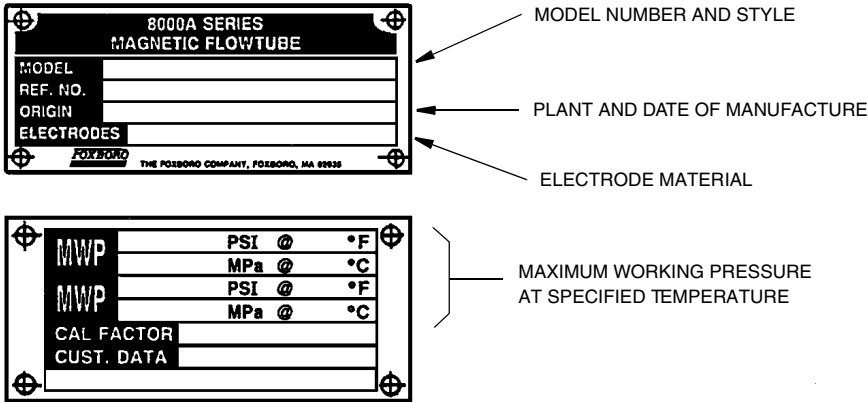


Figure 11. Sample 8000A Series Magnetic Flowtube Identification

— NOTE
A third data plate contains the CE mark with the PED number 0575 on flowmeters with PED certification.

Refer to the data plate to determine the model code, origin code, electrode material, and maximum working pressures at specified temperatures.

Origin Code

The origin code identifies the area of manufacture and the year and week of manufacture. See Figure 11. In the example 2A0312, 2A means the product was manufactured in the Measurement and Instrument Division, 03 identifies the year of manufacture as 2003, and 12, the week of manufacture in that year.

Process Pressure and Temperature Limits

Process pressure and temperature limits are dependent on the flowtube lining (which is pfa), end connection, and the gasket material.

The end connection and lining material codes are printed on the data plate as part of the model number. The location of the codes within the model number is shown below:

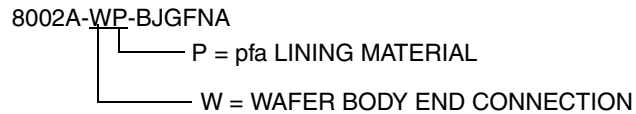


Table 10. Process Pressure and Temperature Limits - Wafer Body End Flowtubes with pfa Lining

Flowtube Model Code	Process Pressure and Temperature Limits	Gasket Material
8002A-WP through 8006A-WP	Full Vacuum to 5.1 MPa from -40 to +38°C (Full Vacuum to 740 psi from -40 to +100°F)	Customer to Supply (No special gasket required)
	Decreasing to 4.4 MPa at 180°C (Decreasing to 580 psi at 356°F)	

— NOTE —

For process temperatures >120 °C (>250 °F), the transmitter must be remotely mounted.

Process Wetted Parts

The process wetted parts are the flowtube lining, the electrodes, and the gaskets. The lining for PED certified flowmeters is pfa, the electrode material is shown on the data plate, and the gaskets are supplied by the user.

9100A and 9200A Magnetic Flowtubes

PED Certification

Invensys Foxboro offers the PED (Harmonized Pressure Equipment Directive for the European Community) certification on flowmeters with DIN flanges. All other flange types are available with PED certification upon special request. The CE marking on 9100A and 9200A Flowmeters with PED certification carries the PED number 0086.

Flowtube Identification

A typical data plate is shown in Figure 12.





 9200A SERIES MAGNETIC FLOWTUBE	
MODEL NO	TEMP
CODE NO	LINING
SERIAL NO	ELECTRODES
SIZE	IMT25 CAL FACT
TAG	INPUT 35V max, 0.25A max
  	
<small>0086</small> <small>APPROVED TYPE 4X, ENCLOSURE</small> <small>MADE IN U.K.</small>	

Figure 12. Sample 9200A Series Flowtube Identification

Refer to the data plate to determine the model number, maximum temperature, lining material and electrode material.

Process Pressure and Temperature Limits

The maximum process temperature is shown on the data label. See Figure 12.

The process pressure limits are equal to the pressure limits of the flanges used.

Process Wetted Parts

The Foxboro supplied process wetted parts are the flowtube lining and the electrodes. The lining and electrode material codes are printed on the data plate.

9300A Magnetic Flowtubes

PED Certification

Invensys Foxboro offers the PED (Harmonized Pressure Equipment Directive for the European Community) certification only on 3-inch through 6-inch flowmeters of all flange types. The CE marking on these flowmeters carries the PED number 0575.

— NOTE

The information below applies to PED certified 3-inch through 6-inch flowmeters.

Flowtube Identification

Typical data plates are shown in Figure 13.

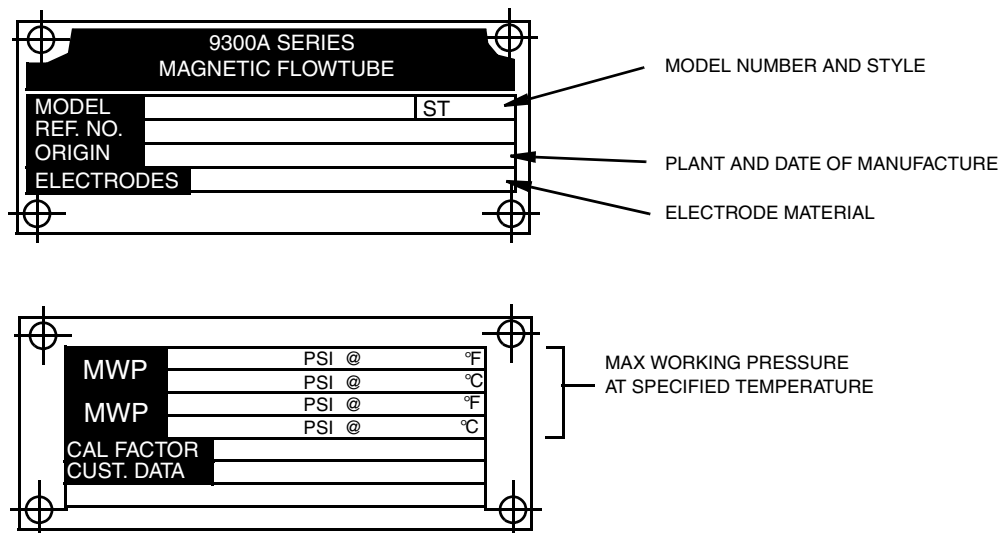


Figure 13. Sample 9300A Series Flowtube Identification

— NOTE

A third data plate contains the CE mark with the PED number 0575 on flowmeters with PED certification.

Refer to the data plate to determine the model code, origin code, electrode material, and maximum working pressures at specified temperatures.

Origin Code

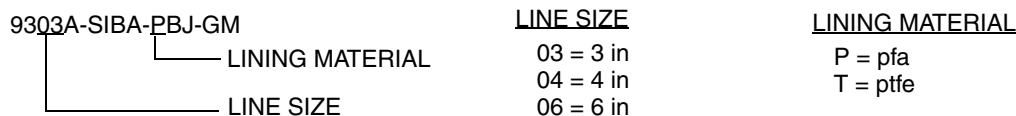
The origin code identifies the area of manufacture and the year and week of manufacture. See Figure 13. In the example 2A0312, 2A means the product was manufactured in the Measurement and Instrument Division, 03 identifies the year of manufacture as 2003, and 12, the week of manufacture in that year.

Process Pressure and Temperature Limits

The process temperature limits are dependent on the line size and lining material.

The line size and lining material codes are printed on the data plate as part of the model number.

The location of the codes within the model number is shown below:



*Table 11. Pressure and Temperature Limits - Remote Mounted Transmitter
pfa-Lined Tubes*

Influence	Normal Operating Condition Limits
Process Temperature	-40 and +180°C -40 and +356°F
Process Pressure	Full Vacuum and 5.1 MPa at 38°C (740 psi at 100°F) Full Vacuum and 4.4 MPa at 180°C (645 psi at 356°F)

*Table 12. Pressure and Temperature Limits - Remote Mounted Transmitter
ptfe-Lined Tubes*

Influence	Normal Operating Condition Limits
Process Temperature	-40 and +180°C -40 and +356°F
Process Pressure	No vacuum and 2.0 MPa at 38°C (285 psi at 100°F)
	No vacuum and 1.5 MPa at 180°C (213 psi at 356°F)

*Table 13. Pressure and Temperature Limits - Tube Mounted Transmitter
pfa-Lined Tubes*

Influence	Normal Operating Condition Limits
Process Temperature	-40 and +120°C -40 and +250°F
Process Pressure	Full Vacuum and 5.1 MPa at 38°C (740 psi at 100°F)
	Full Vacuum and 4.7 MPa at 120°C (665 psi at 250°F)

**Table 14. Pressure and Temperature Limits - Tube mounted Transmitter
ptfe-Lined Tubes**

Influence	Normal Operating Condition Limits
Process Temperature	-40 and +120°C -40 and +250°F
Process Pressure	No vacuum and 2.0 MPa at 38°C (285 psi at 100°F)
	No vacuum and 1.7 MPa at 120°C (245 psi at 250°F)

Flange Pressure-Temperature Limits

Table 15. Flange Pressure-Temperature Limits of 9300A pfa-Lined/ptfe-lined Flowtubes

DIN Flange Rating	Maximum Permissible Operating Pressure at Temperature Listed							
	316 SS Stainless Steel				Carbon Steel (ASME/ANSI Group No. 1.1)			
	-40° C	50° C	100° C	180° C	-40° C	50° C	100° C	180° C
PN 16 ^(a,c)	16 bar	16 bar	16 bar	12.8 bar	13.6 bar	16 bar	16 bar	13.6 bar
PN 40 ^(a,c)	40 bar	40 bar	35 bar	32.8 bar	34 bar	40 bar	40 bar	36.3 bar
PN 10	9.0 bar	9.0 bar	7.6 bar	6.4 bar	10.0 bar	10.0 bar	10.0 bar	8.4 bar
PN 25	22.6 bar	22.6 bar	18.9 bar	16.1 bar	25.0 bar	25.0 bar	25.0 bar	20.2 bar
ANSI Flange Rating ^(b)	-40° F	100° F	200° F	356° F	-40° F	100° F	200° F	356° F
Class 150 ^(a,c)	275 psig	275 psig	240 psig	205 psig	285 psig	285 psig	260 psig	213 psig
Class 300 ^(a,c)	720 psig	720 psig	620 psig	538 psig	740 psig	740 psig	675 psig	644 psig

(a) 80 mm (3 in) pfa-lined flowtubes are supplied with ANSI 150, 300, and PN 40 flanges (can mate to PN 10, 16, 25, or 40); 100 and 150 mm (4 and 6 in) pfa-lined flowtubes are supplied with PN 16 flanges (can mate to PN 10 or 16) or PN 40 flanges (can mate to PN 25 or 40).

(b) Per ASME/ANSI Standard B16.5-1988.

(c) 80 mm (3 in) ptfe-lined flowtubes are supplied with ANSI 150 and PN 40 flanges; 100 and 150 mm (4 and 6 in) ptfe-lined flowtubes are supplied with ANSI 150 and PN16 flanges.

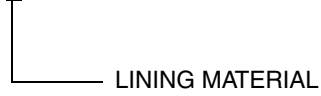
— NOTE —

For process temperatures >120° C (>250° F), the transmitter must be remotely mounted.

Process Wetted Parts

The Invensys Foxboro supplied process wetted parts are the flowtube lining and the electrodes. The electrode material is printed on the data label. The lining material code is printed on the data plate as part of the model number. The location of the code within the model number is shown below:

9303A-SIBA-PBJ-GM



LINING MATERIAL

P = pfa

T = PTFE

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