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Datasheet
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Daniel™ 3812

Two-Path Liquid Ultrasonic Flow Meter

DANIEL™

EMERSON™

3812 Two-Path Liquid Ultrasonic Flow Meter

A Reliable, Economical Solution

The advanced Daniel 3812 Liquid Ultrasonic Flow Meter combines a field-proven two-path meter design with innovative electronics to provide accurate, repeatable measurement for a variety of non-custody transfer applications. Available in DN100 to DN900 (4-in to 36-in) line sizes, the cost-efficient meter is easy-to-install with no need for filters, flow strainers or supports against vibrations. In addition, no moving parts eliminate wear, drift and pressure loss for reliable, long term performance.

The 3812 meter measures the transit times of ultrasonic pulses passing through the liquid in two parallel paths, downstream with the flow and upstream against the flow. Transducers are integrally mounted on the two paths in pairs with each pair acting alternately as transmitter and receiver. The difference in transit times is proportional to the measured fluid velocity along the two paths. This data is converted into an output signal and displayed as the volumetric flow rate.

Powerful Daniel 3810 Electronics work with the meter to significantly increase the sampling rate and provide high-volume data capture, including extensive hourly and daily logs to simplify auditing and dispute resolution. The streamlined electronics feature a plug-in ready, integrated CPU and I/O board assembly and a local LCD display (optional) to increase reliability, simplify maintenance and facilitate future expansion.

Operators can easily monitor and troubleshoot the 3812 meter in real time from a PC or laptop. Daniel MeterLink™ Diagnostics Software is an intuitive user interface that provides critical information, including functional, process and systematic diagnostics, to enhance reliability and reduce measurement uncertainty.

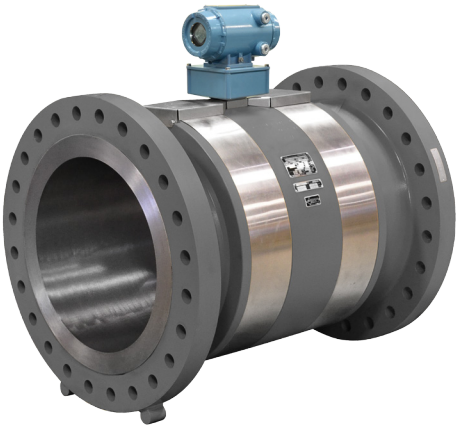

Figure 1: Daniel 3812 Liquid Flow Meter

Typical Applications

Oil and Gas Industry

- Allocation measurement
- Effluent flow measurement
- Loading and unloading

Pipelines

- Leak detection
- Crude and refined product flow measurement

Terminal

- Loading and offloading
- Tank farms/ storage measurement

Industrial Processes

- Batch and blending processes
- Cooling water measurement
- Plant utilities and offtake measurement

Features and Benefits

- Full bore design eliminates incremental pressure drop and reduces energy costs
- No moving parts reduce maintenance costs
- Non-wetted transducers allow field replacement
- Measurement stability improves process control
- Wide flow range provides design flexibility
- Bi-directional flow capabilities simplify installation
- Integrated diagnostics monitor meter performance
- 3810 Series Electronics provide fast sampling and output, an expandable electronics platform, and an extensive data log
- Local LCD display (optional) with up to ten user-selectable scrolling variables
- Daniel MeterLink Diagnostics Software allows access to expert flow analysis and provides an intuitive view of meter health
- Wireless HART® and Ethernet for easy integration
- Predictive diagnostics are communicated and variable information is processed allowing plant personnel to quickly detect and respond to abnormal situations to avoid process upsets and unscheduled downtime
- The 3812 Liquid Ultrasonic Meter is part of Emerson's broad range of intelligent field devices that power the PlantWeb® digital plant architecture

Standard Specifications[1]

Please consult a Daniel technical specialist if requirements are outside of the listed specifications. Improved performance for other product and material offerings may be available depending on the application.

Meter Specifications

Characteristics

- Transit-time based measurement
- Full bore spool piece with integral mount transducers
- Dual-path (four transducer) chordal design

Meter Performance

- Linearity is ± 0.30% of measured value over a 1.2 to 12.2 m/s (4 to 40 ft/s) range
- Repeatability is ± 0.10% of measured value

Velocity Range

- 1.2 to 12.2 m/s (4 to 40 ft/s) with an over-range of 0.3 to 14.6 m/s (1 to 48 ft/s)

Transducer Capsule

- Field replaceable
- Intrinsically safe

Electronics Performance

Power

- 10.4 to 36 VDC
- 8 watts typical; 15 watts maximum

Meter Mechanical Ratings

Line sizes

- DN100 to DN900 (4-in to 36-in)[1]

Operating Product Temperature

- -50°C to +150°C (-58°F to +302°F)[2]

Operating Pressure Range

- 0 to 155 Bar (0 to 2,250 psig)

Flanges[3]

- Raised Face and Ring Type Joint (RTJ) for PN ANSI Classes 150, 300, 600 and 900 (PN 20, 50, 100 and 150)[2]

NACE and NORSOK Compliance

- Designed for NACE compliance[3]
- NORSOK available upon request

Electronics Ratings

Operating Temperature

- -40 to +60°C (-40 to +140°F)

Operating Relative Humidity

- Up to 95% non-condensing

Storage Temperature

- -50°C to +85°C (-58°F to +185°F)

Electronic Housing Options

- Integral mount (standard)
- Remote mount (optional) with 4.6 m (15 ft) cable
  - Required for process temperature above +60°C (+140°F)

(1) Consult factory on sizes above DN 900 (36-in) and on pressure ratings greater than PN 150 (ANSI 900).

(2) Dependant on material selection.

(3) It is the equipment user's responsibility to select the materials suitable for the intended services.

Materials of Construction

Material Specifications

Body and Flange

Cast

- ASTM A352 Gr LCC carbon steel[1]
  -46°C to 150°C (-50°F to 302°F)
- ASTM A351 Gr CF8M 316 stainless steel
  -46°C to 150°C (-50°F to 302°F)
- ASTM A995 Gr 4A duplex stainless steel[2]
  -50°C to 150°C (-58°F to 302°F)

Forgings

- ASTM A350 Gr LF2 carbon steel[1]
  -46°C to 150°C (-50°F to 302°F)
- ASTM A182 Gr F316 SS
  -46°C to 150°C (-50°F to 302°F)
- ASTM A182 Gr F51 duplex SS
  -50°C to 150°C (-58°F to 302°F)
- ASTM A105 carbon steel
  -29° C to 150°C (-20°F to 302°F)

Enclosure Housing

- ASTM B26 Gr A356.0 T6 aluminum
- ASTM A351 Gr CF8M stainless steel

Transducer Components

Transducer Housing O-ring

- Standard: Nitrile Butadiene Rubber (NBR)
- Other materials available

Transducer Housing

- ASTM A479 316L stainless steel with proprietary Matching Layer Material
- INCONEL ASTM B446 (UNS N06625) Gr 1 (optional)

Shroud Material

- ASTM A240 316 stainless steel

Cable Gland

- Chloroprene / Nitrile Rubber

Paint Specifications

Body and Flange

Carbon Steel Body

- 2 coat paint; zinc primer and acrylic lacquer topcoat (standard)

Stainless Steel or Duplex Body

- Paint (Optional)

Enclosure Housing

Aluminum

- Chromate conversion coated with a polyurethane enamel

Stainless Steel

- Passivated (Unpainted)

Table 1A: Body and Flange Maximum Pressure Ratings
Metric Units[4]

Nominal Meter Size (DN)	PN	Carbon Steel	316 Stainless Steel
100 to 900	20	20.0	19.0
	50	51.7	49.6
	100	103.4	99.3
	150	155.1	148.9

Table 1B: Body and Flange Maximum Pressure Ratings
US Customary Units[4]

Nominal Meter Size (in)	ANSI	Carbon Steel	316 Stainless Steel
4 to 36	150	290	275
	300	750	720
	600	1500	1440
	900	2250	2160

(1) Impact tested per specified ASTM standard.

(2) A995 4A material is not available in Canada.

(3) Zinc primer prevents corrosion.

(4) Pressure rating information is for -29°C to +38°C (-20°F to +100°F). Other temperatures may reduce the maximum pressure rating of the materials.

Standard Flow Ranges

Table 2A: Daniel 3812 Flow Ranges Metric Units								
Nominal Meter Size (DN)	Meter I.D. (mm)	Pipe Schedule	Fluid Velocity (m/s)			Flow Rate (m^3/hr)		
			Min	Max	Over-Range	Min	Max	Over-Range
100	102.3	Sch 40	0.61	12.2	14.6	18	360	433
150	154.1	Sch 40	0.61	12.2	14.6	41	818	982
200	202.7	Sch 40	0.61	12.2	14.6	71	1,417	1,700
250	254.5	Sch 40	0.61	12.2	14.6	112	2,233	2,679
300	303.2	Sch 40	0.61	12.2	14.6	158	3,170	3,803
350	333.4	SCh 40	0.61	12.2	14.6	192	3,831	4,597
400	381.0	Sch 40	0.61	12.2	14.6	250	5,004	6,005
450	428.65	Sch 40	0.61	12.2	14.6	317	6,334	7,601
500	477.82	Sch 40	0.61	12.2	14.6	394	7,871	9,445
600	574.65	Sch 40	0.61	12.2	14.6	569	11,383	13,660
750	742.95	STD	0.61	12.2	14.6	951	19,028	22,833
900	895.35	STD	0.61	12.2	14.6	1,382	27,635	33,162

Table 2B: Daniel 3812 Flow Ranges US Customary Units											
Nominal Meter Size (in)	Meter I.D. (in)	Pipe Schedule	Fluid Velocity (ft/s)			Flow Rate (BPH)			Flow Rate (GPM)		
			Min	Max	Over-Range	Min	Max	Over-Range	Min	Max	Over-Range
4	4.026	Sch 40	2	40	48	113	2,267	2,721	79	1,587	1,905
6	6.065	Sch 40	2	40	48	257	5,146	6,175	180	3,602	4,322
8	7.981	Sch 40	2	40	48	446	8,910	10,692	312	6,237	7,485
10	10.020	Sch 40	2	40	48	702	14,045	16,853	492	9,831	11,797
12	11.938	Sch 40	2	40	48	997	19,936	23,923	698	13,955	16,746
14	13.124	Sch 40	2	40	48	1,205	24,094	28,913	843	16,866	20,239
16	15.000	Sch 40	2	40	48	1,574	31,474	37,769	1,102	22,032	26,438
18	16.876	Sch 40	2	40	48	1,992	39,839	47,807	1,394	27,887	33,465
20	18.812	Sch 40	2	40	48	2,475	49,504	59,405	1,733	34,653	41,583
24	22.624	Sch 40	2	40	48	3,580	71,599	85,920	2,506	50,120	60,144
30	29.25	STD	2	40	48	5984	119,680	143,617	4189	83,776	100,531
36	35.25	STD	2	40	48	8691	173,816	208,580	6084	121,671	146,005

Local LCD Display

The 3810 Series Electronics offer an optional local LCD display that utilizes three lines to indicate the variable name, variable value and engineering units. The local display configuration is supported via MeterLink software or the handheld Fisher AMS 475 Field Communicator utilizing the HART interface protocol.

The local display shows up to 10 items which are user selectable from 26 variables. The display can be configured to scale volume units as actual or 000's, with an adjustable time base of seconds, hours or days. The scroll rate can be adjusted from 1 to 100 seconds (default 5 seconds).

Figure 2: Local LCD display.

Table 3: User Selectable Display Variables

Variables	Description
Volumetric Flow Rate	Uncorrected (actual) Corrected (standard or normal)
Average Flow Velocity	(no description necessary)
Average Speed of Sound	(no description necessary)
Pressure	Flowing, if utilized
Temperature	Flowing, if utilized
Frequency Output	1A, 1B, 2A or 2B
Frequency Output K-factor	Channel 1 or 2
Analog Output	1 or 2
Current Day's Volume Totals	Uncorrected or Corrected (forward or reverse)
Previous Day's Volume Totals	Uncorrected or Corrected (forward or reverse)
Total Volume Totals (non-reset)	Uncorrected or Corrected (forward or reverse)

Input/Output

Table 4: CPU Module I/O Connections (maximun wire gauge is 18 AWG)

	I/O Connection Type	Qty	Description
Serial Communications	Serial RS232/RS485 Port	1	▪ Modbus RTU/ASCII ▪ RS232/RS485 Full Duplex ▪ 115 kbps baud rate ▪ RS485 Half Duplex
	Ethernet Port (TCP/IP) 100BaseT	1	▪ Modbus TCP
Digital Input(1)	Contact Closure	1	▪ Status ▪ Single polarity
Analog Inputs(2)	4-20 mA	2	▪ AI-1 Temperature(3) ▪ AI-2 Pressure (3)
Frequency/Digital Outputs	TTL/Open Collector	3	▪ User Configurable
Analog Output(2, 4)	4-20 mA	2	▪ Independently configurable analog output ▪ HART® 7 Compliant, consult factory for HART 5

Table 5: Optional I/O Expansion Module

	I/O Connection Type	Qty	Description
Serial Communications	Serial RS232/RS485 Port	1	▪ Modbus RTU/ASCII ▪ 115 kbps baud rate ▪ RS232/RS485 Half Duplex
	Ethernet Port	1	▪ 100BaseT ▪ Three Ports
Analog Output	4-20mA	1	▪ Reserved for future use

(1) The analog-to-digital conversion accuracy is within ±0.05% of full scale over the operating temperature range.

(2) A 24 volt DC power supply is available to provide power to the sensors.

(3) AI-1 and AI-2 are electronically isolated and operate in sink mode. The input contains a series resistance for HART® Communicators to be connected for sensor configuration.

(4) The analog output zero scale offset error is within ±0.1% of full scale and gain error is within ±0.2% of full scale. The total output drift is within ±50 ppm of full scale per °C.

Meter Software

MeterLink Overview

Innovative Daniel MeterLink software gives users access to extensive diagnostic information, presented in an intuitive graphical format that takes complexity out of flow measurement.

This critical information empowers staff to work predictively, instead of reactively.

- MeterLink software is supplied with meter at no charge
- MeterLink is required for transmitter configuration
- MeterLink software requires RS-232, RS-485 full duplex or Ethernet (recommended)
- Supports Microsoft® Windows Vista, 7, 8.1 and 10 as well as Microsoft Office® 2003 to 2016

Table 6: MeterLink Features

Powerful Analysis	▪ View, analyze and save waveforms ▪ Daily and hourly alarm logs and audit history retrieval in Excel or CSV files ▪ Daily and hourly log graphing ▪ Reverse flow alert display ▪ Alarms list primary cause first ▪ Separate latched alarm display ▪ Trend maintenance logs ▪ Compare meter configurations stored in Excel logs ▪ Calibrate analog inputs	**Intuitive Interface**	▪ Summarized and detailed views for meter performance information ▪ Built-in maintenance logs and inspection reports ▪ Meter directory support ▪ View multiple graphs simultaneously ▪ Automatic file naming and organized saving, supports hundreds of meters
Quick Startup	▪ Easy upgrade of meter firmware ▪ Modbus and HART configuration ▪ Field setup wizard ▪ Local display setup	**Versatile Connectivity**	▪ Ethernet ▪ Serial port ▪ Modem

PlantWeb

- Meters also configurable with AMS™ Device Manager or 375 / 475 Field Communicator if HART® is used

Safety and Compliance

The Daniel 3812 ultrasonic flow meter meets worldwide industry standards for electrical and intrinsic safety certifications and approvals. Consult a Daniel technical specialist for a complete list of agencies and certifications.

Safety Classifications

Underwriters Laboratories (UL / cUL)

- Hazardous Locations — Class I, Division 1, Groups C and D

CE Marked to Directives

- Explosive Atmospheres (ATEX)
- Certificate — Demko II ATEX 1006133X
- Marking — Ⓔx II 2G Ex d ia IIB T4 Gb (-40°C ≤ T ≤ +60°C)
- Pressure Equipment Directive (PED)
- Electromagnetic Compatibility (EMC)

INMETRO

- Certificate — NCC 11.0163 X
- Marking — Ex d [ia] IIB T4 Gb IP66W

International Electrotechnical Commission (IECEx)

- Marking — Ex d ia IIB T4

Figure 3: Aluminum enclosure for 3810 Series Electronics with optional display.

Environmental Ratings

Aluminum

- NEMA 4
- IP66 to EN60529

Stainless Steel

- NEMA 4X
- IP66 to EN60529

Weights and Dimensions

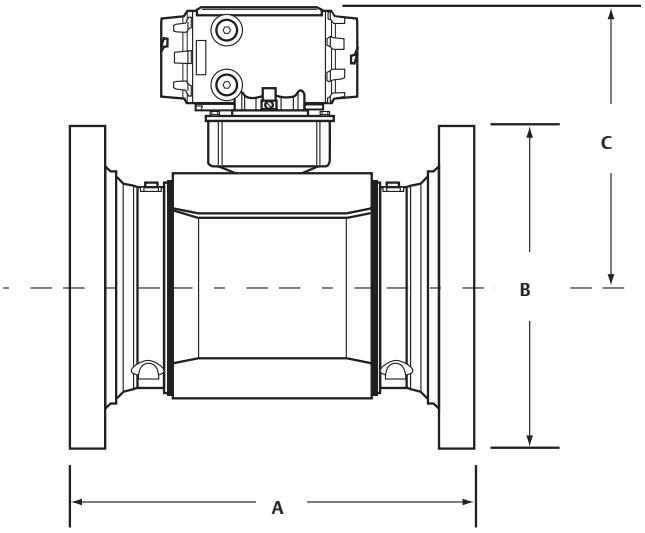

Figure 4A: Meter Dimension Key (See Tables 7A and 7B)

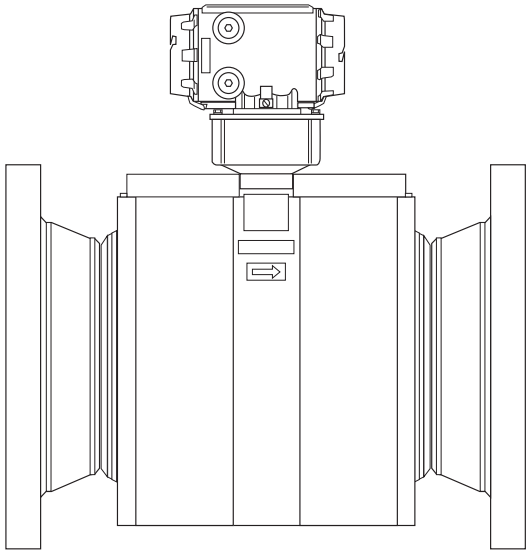

Figure 4B: Side View of Banded 3812 Meter (12-in and larger meters only)

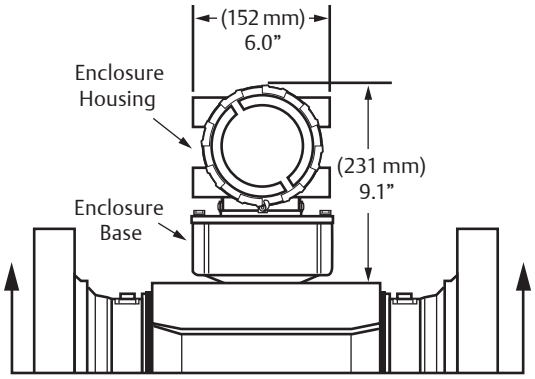

Figure 4C: Standard installed position of enclosure housing(1)(2)

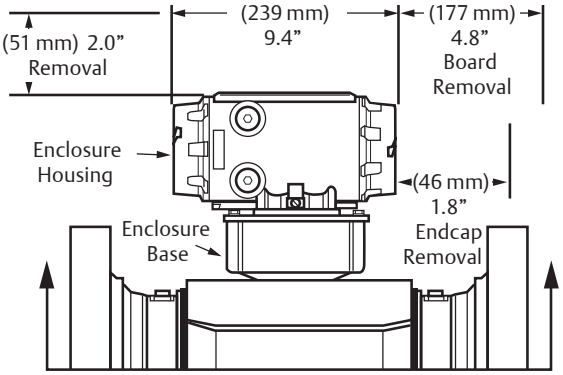

Figure 4D: Optional installed position of enclosure housing(2)

(1) Enclosure housing may be rotated 360 degrees in 90 degree increments.

(2) 4-in to 10-in meter body shown.

Weights and Dimensions

The Meter Dimension Key diagram (Figure 4A) illustrates the meter component measurements that correspond to A, B and C in the chart below. Weights and dimensions are only for factory standard carbon steel material. Consult factory for all other materials. Certified approval drawings will include the actual weights and dimensions.

Table 7A: Weights and Dimensional Data [Metric Units]

Nominal Line Size (DN)		100	150	200	250	300	350	400	450	500	600	750	900
PN 20	Weight (kg)	44	60	82	116	406	469	555	678	818	1136	1012	1579
	A (mm)	350	356	406	500	686	737	787	826	867	965	711	791
	B (mm)	229	279	343	406	483	533	597	635	699	813	984	1168
	C (mm)	309	339	363	389	482	497	516	545	567	615	701	793
PN 50	Weight (kg)	53	74	104	145	442	546	655	809	977	1323	1422	2202
	A (mm)	350	356	406	500	718	768	826	864	902	997	870	1010
	B (mm)	254	318	381	445	521	584	648	711	775	914	1092	1270
	C (mm)	309	339	363	389	482	497	516	545	567	615	701	793
PN 100	Weight (kg)	81	142	204	301	537	619	782	950	1168	1635	1780	2678
	A (mm)	419	476	552	629	781	826	902	927	972	1080	959	1105
	B (mm)	273	356	419	508	559	603	686	743	813	940	1130	1314
	C (mm)	358	384	408	434	482	497	516	545	567	615	701	793
PN 150	Weight (kg)	93	170	260	378	669	746	891	1154	1431	2306	3062	4298
	A (mm)	445	521	610	692	902	927	965	1029	1105	1257	1168.40	1314
	B (mm)	292	381	470	546	610	641	705	787	857	1041	1231.90	1461
	C (mm)	358	384	408	434	482	497	516	545	567	615	662.43	793

Table 7B: Weights and Dimensional Data [US Customary Units]

Nominal Line Size (in)		4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"	36"
150 ANSI	Weight (lb)	98	133	181	256	894	1034	1224	1486	1797	2217	2230	3480
	A (in)	13.78	14.00	16.00	19.69	27.00	29.00	31.00	32.50	34.13	38.00	28.00	31.13
	B (in)	9.00	11.00	13.50	16.00	19.00	21.00	23.50	25.00	27.50	32.00	38.75	46.00
	C (in)	12.17	13.33	14.30	15.30	18.96	19.58	20.33	21.46	22.33	24.20	27.58	31.21
300 ANSI	Weight (lb)	116	163	230	320	1006	1204	1437	1778	2140	2917	3135	4855
	A (in)	13.78	14.00	16.00	19.69	28.25	30.25	32.50	34.00	35.50	39.25	34.25	39.75
	B (in)	10.00	12.50	15.00	17.50	20.50	23.00	25.50	28.00	30.50	36.00	43.00	50.00
	C (in)	12.17	13.33	14.30	15.30	18.96	19.58	20.33	21.46	22.33	24.20	27.58	31.21
600 ANSI	Weight (lb)	179	314	449	664	1184	1356	1715	2094	2569	3613	3925	5905
	A (in)	16.50	18.75	21.75	24.75	30.75	32.50	35.50	36.50	38.25	42.50	37.75	43.50
	B (in)	10.75	14.00	16.50	20.00	22.00	23.75	27.00	29.25	32.00	37.00	44.50	51.75
	C (in)	14.08	15.14	16.08	17.08	18.96	19.58	20.33	21.46	22.33	24.20	27.58	31.21
900 ANSI	Weight (lb)	204	374	574	834	1489	1640	1964	2544	3149	5168	5870	9475
	A (in)	17.50	20.50	24.00	27.25	35.50	36.50	38.00	40.50	43.50	49.50	44.75	51.75
	B (in)	11.50	15.00	18.50	21.50	24.00	25.25	27.75	31.00	33.75	41.00	48.50	57.50
	C (in)	14.08	15.14	16.08	17.08	18.96	19.58	20.33	21.46	22.33	24.20	27.58	31.21

Recommended Installation

Recommended Pipe Lengths

The drawings below represent recommended pipe lengths for the installation of the Daniel 3812 Liquid Ultrasonic Flow Meter. Please consult a Daniel technical specialist for installation recommendations of specific applications. Other lengths or flow conditioners can be accommodated.

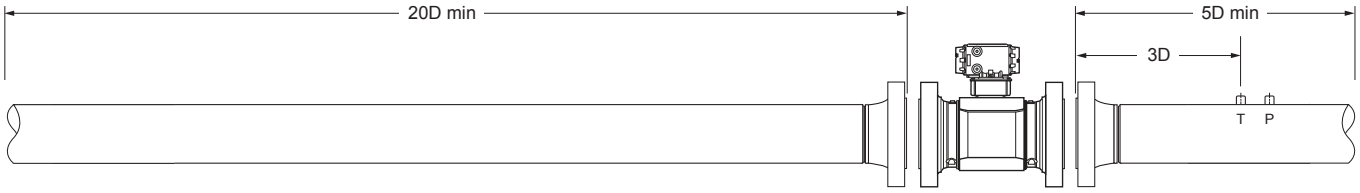

Figure 5A: Piping Recommendation for Liquid Ultrasonic Meter (No Flow Conditioner)

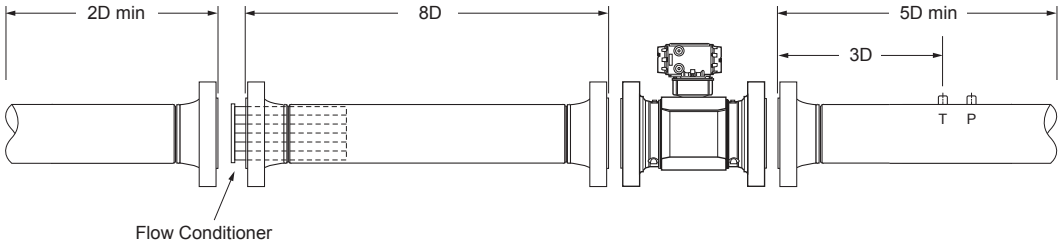

Figure 5B: Piping Recommendation for Liquid Ultrasonic Meter with a Flow Conditioner

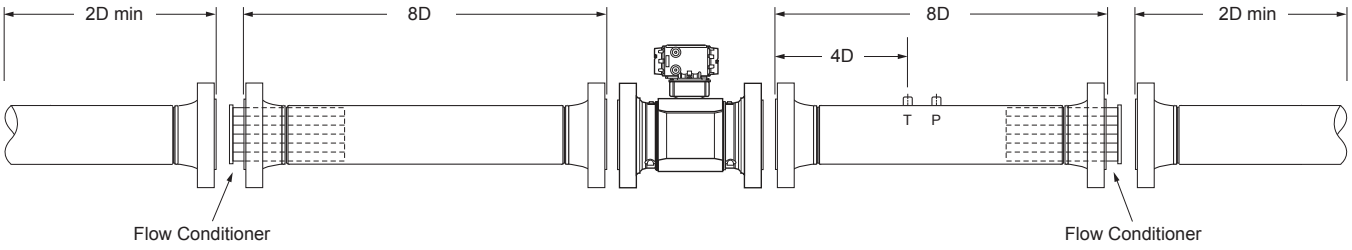

Figure 5C: Piping Recommendation for Bi-directional Liquid Ultrasonic Meter with Flow Conditioners

Notes:

1. *For best results flow conditioning is recommended*
2. *D = Nominal pipe size in inches (i.e. 6-in pipe size; 10D = 60-in)*
3. *P = Pressure measurement location*
4. *T = Temperature measurement location*
5. *4-in to 10-in meter body shown.*

Daniel 3812 Liquid Ultrasonic Flow Meter

Product Datasheet 38 12 XX XX XXX XX XXX - X X X X X X X X X X

Line Size
- DN100 (4-in) 04
- DN150 (6-in) 06
- DN200 (8-in) 08
- DN250 (10-in) 10
- DN300 (12-in) 12
- DN350 (14-in) 14
- DN400 (16-in) 16
- DN450 (18-in) 18
- DN500 (20-in) 20
- DN600 (24-in) 24
- DN700 (28-in) 28
- DN750 (30-in) 30
- DN900 (36-in)(1) 36

Pressure Rating
- PN 20 / 150 ANSI 01
- PN 50 / 300 ANSI 03
- PN 100 / 600 ANSI 05
- PN 150 / 900 ANSI(1) 06

Flange Type
- RF/RF S01
- RTJ / RTJ S02

Body and Flange Material
- ASTM A352 Gr. LCC Carbon Steel M1
- ASTM A351 Gr. CF8M 316 SST M2
- ASTM A995 Gr. 4A Duplex SST M4
- ASTM A352 Gr. LCC Carbon Steel (-50°C to +150°C) M5
- ASTM A350 Gr. LF2 Carbon Steel (-46°C to +150°C) F1
- ASTM A182 Gr. F316 SST F2
- ASTM A182 Gr. F51 Duplex SST F3
- ASTM A350 Gr. LF2 Carbon Steel (-50°C to +150°C) F4
- ASTM A105 Carbon Steel (-29°C to +150°C) F5

Schedule (Pipe Bore)
- Schedule 40 040
- Schedule 80 080
- Schedule STD (30-in and 36-in only) STD
- Schedule XS (30-in and 36-in only) XS0

Transducer Assembly
- LT-10 (-50°C to +135°C) with NBR O-rings 316L Housing 1
- LT-10 (-40°C to +150°C) with FKM O-rings 316L Housing 2
- LT-10 (-50°C to +135°C) with NBR O-rings Inconel Housing 3
- LT-10 (-40°C to +150°C) with FKM O-rings Inconel Housing 4
- LT-11 (-50°C to +135°C) with NBR O-rings 5
- LT-11 (-40°C to +150°C) with FKM O-rings 6
- LT-11 (-50°C to +135°C) with NBR O-rings Inconel Housing 7
- LT-11 (-40°C to +150°C) with FKM O-rings Inconel Housing 8
- LT-16 (-50°C to +135°C) with NBR O-rings 316L Housing 9
- LT-16 (-40°C to +175°C) with FKM O-rings 316L Housing A
- LT-16 (-50°C to +135°C) with NBR O-rings Inconel Housing B
- LT-16 (-40°C to +175°C) with FKM O-rings Inconel Housing C
- LT-17 (-50°C to +135°C) with NBR O-rings D
- LT-17 (-40°C to +175°C) with FKM O-rings E
- LT-17 (-50°C to +135°C) with NBR O-rings Inconel Housing F
- LT-17 (-40°C to +175°C) with FKM O-rings Inconel Housing G
- LT-12 (-50°C to +135°C) with NBR O-rings 316L Housing H
- LT-12 (-40°C to +150°C) with FKM O-rings 316L Housing J
- LT-12 (-50°C to +135°C) with NBR O-rings Inconel Housing K
- LT-12 (-40°C to +150°C) with FKM O-rings Inconel Housing M
- LT-13 (-50°C to +135°C) with NBR O-rings N
- LT-13 (-40°C to +150°C) with FKM O-rings P
- LT-13 (-50°C to +135°C) with NBR O-rings Inconel Housing Q
- LT-13 (-40°C to +150°C) with FKM O-rings Inconel Housing R

Enclosure Type/Input Power
- 1 Aluminum housing, indoor/outdoor; 10.4-36 VDC
- 2 Stainless steel; 10.4-36 VDC

Future
- 1

Conduit Type
- 1 3/4-in NPT
- 2 M20 Reducer

Electronics Mounting
- A Integral Mounted (Up to +60°C)
- C Remote Mounted with 8-ft Armored Conduit (Up to +150°C)

CPU/Display
- C Full I/O, no Display
- D Full I/O, with Display

Expansion Module
- A None
- B One Serial RS232
- C One Serial RS485
- G Expansion I/O Module

Wireless
- A None
- B THUM

Tagging Format
(Line Size / Pressure Rating / Flow Parameters)
- 1 Inch / ANSI / US Customary
- 2 Inch / ANSI / Metric
- 3 DN / PN / US Customary
- 4 DN / PN / Metric

Tagging Language (for all tags)
- 1 English
- 2 French
- 3 Russian
- 4 Chinese

Pressure Directive Certification
- 1 None
- 2 PED (must select electrical approval code 2)
- 3 CRN (Canadian Boiler Branch)

Electrical Approvals
- 1 UL / c-UL Approval
- 2 ATEX / IECEx
(Must select pressure directive cert code 2)
- 3 INMETRO

Future
- A None

This is for informational purposes only. Not every option is listed and some options are contingent on others. Please consult factory for assistance designing your optimal meter.

(1) Consult factory on sizes above DN900 (36-in) and on pressure ratings greater than PN 150 (ANSI 900).

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