

Rosemount[™] 3814

Liquid Ultrasonic Flow Meter



Rosemount 3814 Liquid Ultrasonic Flow Meter

Digital intelligence at work

Designed for custody transfer applications, the new Rosemount 3814 Liquid Ultrasonic Flow Meter is engineered to deliver highly accurate measurement of liquid hydrocarbons in accordance with API Chapter 5.8 and OIML R117. The advanced 4-path meter offers exceptional rangeability and linearity to minimize lost and unaccounted for liquids.

The meter measures the transit times of ultrasonic pulses passing through the liquid in four parallel planes. Integrally mounted ultrasonic transducers transmit and receive signals with the difference in transit times of the downstream and upstream pulses directly proportional to the measured fluid velocity. With accurate upstream/downstream transit time measurement and no moving parts, the meter is ideal for bi-directional measurement.

Powerful next-generation Rosemount 3810 Electronics work with the meter to significantly increase the sampling rate and provide high-volume data capture, including extensive hourly and daily logs. 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 3814 meter in real time from a PC or laptop. 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.

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Figure 1: Rosemount 3814 Liquid Ultrasonic Flow Meter



Typical application

Custody transfer

Application sites

- Floating Production Storage and Off-loading (FPSO)
- Offshore platforms
- Crude oil pipelines
- Refined product pipelines
 - Ethane/LPG/gasoline/diesel/aviation fuel
- Loading and off-loading – ships, barges, and railcars
- Tank farms

Features and benefits

- Custody transfer accuracy and repeatability with high capacity data logs for accountability and auditing.
- Measurement stability reduces uncertainty of meter factor.
- Full bore design eliminates incremental pressure drop and reduces energy costs.
- No moving parts reduce maintenance costs and eliminate periodic calibration unless required by local metrology authorities or company guidelines.
- Field replaceable non-wetted transducers.
- Wide flow range provides design flexibility.
- Bi-directional flow capabilities simplify installation and reduce startup time.
- 3810 Series Electronics provide fast sampling and output, an expandable electronics platform, and an archive data log with detailed hourly and daily information.
- Local LCD display (optional) with up to ten user-selectable scrolling variables.
- MeterLink™ diagnostics software allows access to expert flow analysis and provides an intuitive view of meter health.

- 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 Rosemount 3814 flow meter is part of Emerson's broad range of intelligent field devices that power the PlantWeb™ digital plant architecture.

Access information when you need it with asset tags

Newly shipped devices include a unique QR code asset tag that enables you to access serialized information directly from the device. With this capability, you can:

- Access device drawings, diagrams, technical documentation, and troubleshooting information in your MyEmerson account.
- Improve mean time to repair and maintain efficiency.
- Ensure confidence that you have located the correct device.
- Eliminate the time-consuming process of locating and transcribing nameplates to view asset information.

Standard specifications

Please consult an Emerson Ultrasonics product 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 meter body
- 4-path (eight transducer) chordal design

Meter performance

- Linearity is $\pm 0.15\%$ of measured value over a 1.2 to 12.2 m/s (4 to 40 ft/s) range
- Linearity is $\pm 0.20\%$ of measured value over a 0.6 to 12.2 m/s (2 to 40 ft/s) range (optional)

Uncertainty of meter factor

$< \pm 0.027\%$ (API MPMS, Chapter 5, Section 8, Table B-1)

Velocity range

0.6 to 12.2 m/s (2 to 40 ft/s) with an extended range of 0.3 to 14.6 m/s (1 to 48 ft/s)

Calibration

- ISO 17025 certified flow calibration laboratory available for all meters
- Additional calibration options available upon request

Electronics performance

Power

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

Mechanical ratings

Line sizes

DN100 to DN600 (4 in. to 24 in.)⁽¹⁾

Operating product temperature

- Standard: -58 °F to +212 °F (-50 °C to +100 °C)
- Optional: -58 °F to +302 °F (-50 °C to +150 °C)

Operating pressure range

- 0 to 155 bar (0 to 2250 psig)⁽¹⁾

Flanges

- Raised Face and Ring Type Joint (RTJ) for PN 20, 50, 100 and 150 (ANSI 150, 300, 600, and 900)⁽²⁾
- Higher ANSI ratings available upon request

NACE and NORSOK compliance

- Designed for NACE compliance⁽²⁾
- NORSOK available upon request

Electronic ratings

Operating temperature

-40 °F to +140 °F (-40 °C to +60 °C)

Operating relative humidity

Up to 95% non-condensing

Storage temperature

-40 °F to +185 °F (-40 °C to +85 °C)

Electronic housing options

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

(1) Consult factory for sizes above DN600 (24 in.), pressure ratings greater than PN 150 (ANSI 900) or other flange options.

(2) 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⁽³⁾
–50 °F to +302 °F (–46 °C to +150 °C)
- ASTM A351 Gr CF8M 316 Stainless Steel
–50 °F to +302 °F (–46 °C to +150 °C)
- ASTM A351 Gr CF8M 316L Stainless Steel
–50 °F to +302 °F (–46 °C to +150 °C)
- ASTM A995 Gr 4A Duplex Stainless Steel⁽⁴⁾
–58 °F to +302 °F (–50 °C to +150 °C)

Forgings

- ASTM A350 Gr LF2 Carbon Steel⁽³⁾
–50 °F to +302 °F (–46 °C to +150 °C)
- ASTM A182 Gr F316 Stainless Steel
–50 °F to +302 °F (–46 °C to +150 °C)
- ASTM A182 Gr F316L Stainless Steel
–50 °F to +302 °F (–46 °C to +150 °C)
- ASTM A182 Gr F51 Duplex Stainless Steel⁽⁴⁾
–58 °F to +302 °F (–50 °C to +150 °C)
- ASTM A105 Carbon Steel
–20 °F to +302 °F (–29 °C to +150 °C)

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)

(3) Impact tested per specified ASTM standard.

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

- Other materials available

Transducer Housing

- ASTM A479 316L Stainless Steel with proprietary matching layer material
- INCONEL® ASTM B446 (UNS N06625) Gr 1 (optional)

Cable Gland

Chloroprene/Nitrile Rubber

Paint specifications

Body and flange

Carbon steel body

Two 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

Table 1: Body and Flange Maximum Pressure Ratings by Construction Materials (bar Meter Sizes DN100 to DN600)⁽¹⁾

PN	Cast Carbon Steel	Forged Carbon Steel	Cast 316 SS, 316L SS, Forged 316 SS	Forged 316L SS	Duplex SS
20	20.0	19.7	19.0	15.9	20.0
50	51.7	51.1	49.6	41.4	51.7
100	103.4	102.1	99.3	82.7	103.4
150	155.1	153.2	148.9	124.1	155.1

⁽¹⁾ Pressure rating information is for -20 °F to +100 °F (-29 °C to +38 °C). Other temperatures may reduce the maximum pressure rating of the materials.

Table 2: Body and Flange Maximum Pressure Ratings by Construction Materials (psi Meter Sizes 4 in. to 24 in.)⁽¹⁾

ANSI Class	Cast Carbon Steel	Forged Carbon Steel	Cast 316 SS, 316L SS, Forged 316 SS	Forged 316L SS	Duplex SS
150	290	285	275	230	290
300	750	740	720	600	750
600	1,500	1,480	1,440	1,200	1,500
900	2,250	2,220	2,160	1,800	2,250

Standard flow ranges

Table 3: Flow Ranges (Metric Units)

Nominal Meter Size (DN)	Meter ID (millimeters)	Pipe Schedule	Fluid Velocity (m/s)			Flow Rate (m ³ /hr)		
			Min	Max	Over-Range	Min	Max	Over-Range
100	102.26	Sch 40	0.61	12.2	14.6	18	360	433
150	154.05	Sch 40	0.61	12.2	14.6	41	818	982
200	202.72	Sch 40	0.61	12.2	14.6	71	1,417	1,700
250	254.51	Sch 40	0.61	12.2	14.6	112	2,233	2,679
300	303.23	Sch 40	0.61	12.2	14.6	158	3,170	3,803
400	381.00	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

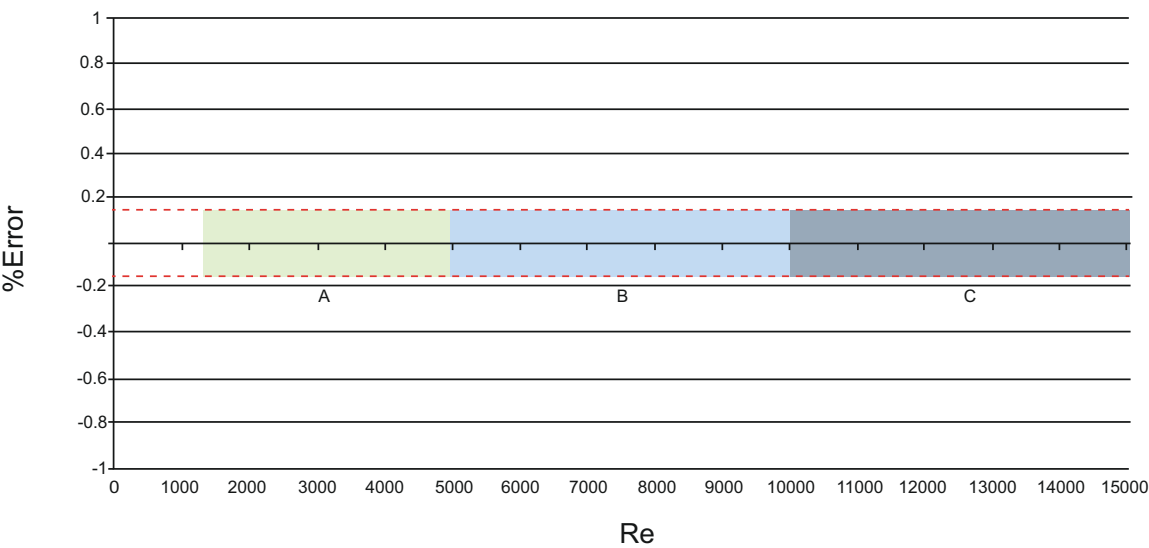
Table 4: Flow Ranges (US Customary Units)

Nominal Meter Size (inches)	Meter ID (inches)	Pipe Schedule	Fluid Velocity (ft/s)			Flow Rate (BPH)		
			Min	Max	Over-Range	Min	Max	Over-Range
4	4.026	Sch 40	2	40	48	113	2,267	2,721
6	6.065	Sch 40	2	40	48	257	5,146	6,175
8	7.981	Sch 40	2	40	48	446	8,910	10,692
10	10.020	Sch 40	2	40	48	702	14,045	16,853
12	11.938	Sch 40	2	40	48	997	19,936	23,923
16	15.000	Sch 40	2	40	48	1,574	31,474	37,769
18	16.876	Sch 40	2	40	48	1,992	39,839	47,807
20	18.812	Sch 40	2	40	48	2,475	49,504	59,405
24	22.624	Sch 40	2	40	48	3,580	71,599	85,919

Typical meter performance

The charts below represent meter performance, on two higher viscosity fluids, showing meter error based on Reynolds number (Re) and flow rate (m³/hr).

Figure 2: High Viscosity Flow Conditioning Recommendations



- A. Low Reynolds Flow Conditioning Solution (13000 to 5000 Re)
- B. Daniel Profiler or CPA 50E Flow Conditioner (5000 to 10000 Re)
- C. Tube Bunde Flow Conditioning (10000 Re and above)

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 five seconds).

Figure 3: Local LCD display



Table 5: 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 6: CPU Module I/O Connections (maximum wire gauge is 18 AWG)

	I/O Connection Type	Qty	Description
Serial Communications	Serial RS232/RS485 Port	1	- Modbus RTU/ASCII 115 kbps baud rate - RS232/RS485 Full Duplex - 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

(1) The analog-to-digital conversion accuracy is within $\pm 0.05\%$ 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 $\pm 0.1\%$ of full scale and gain error is within $\pm 0.2\%$ of full scale. The total output drift is within ± 50 ppm of full scale per °C.

Table 7: 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	4–20 mA	1	Reserved for future use

Meter software

MeterLink™ overview

Innovative 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

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

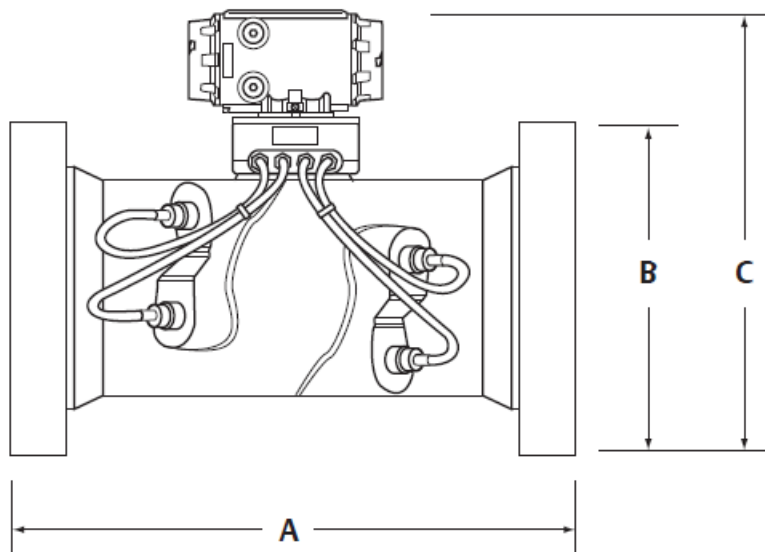
- Ethernet
- Serial port
- Modem

PlantWeb™

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

Weights and dimensions

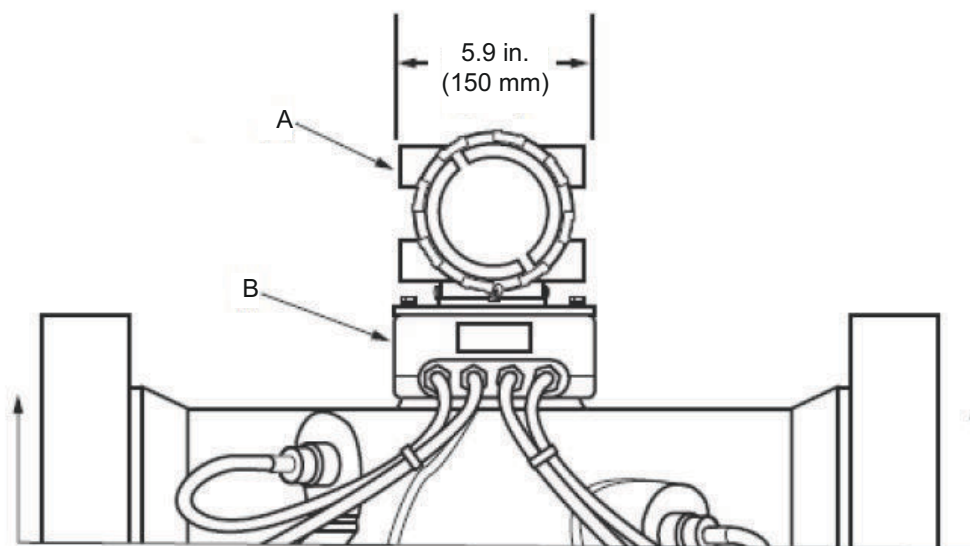
Figure 4: Meter Dimension Key



Note

See [Table 8](#) and [Table 9](#).

Figure 5: In-line Position of Enclosure Housing

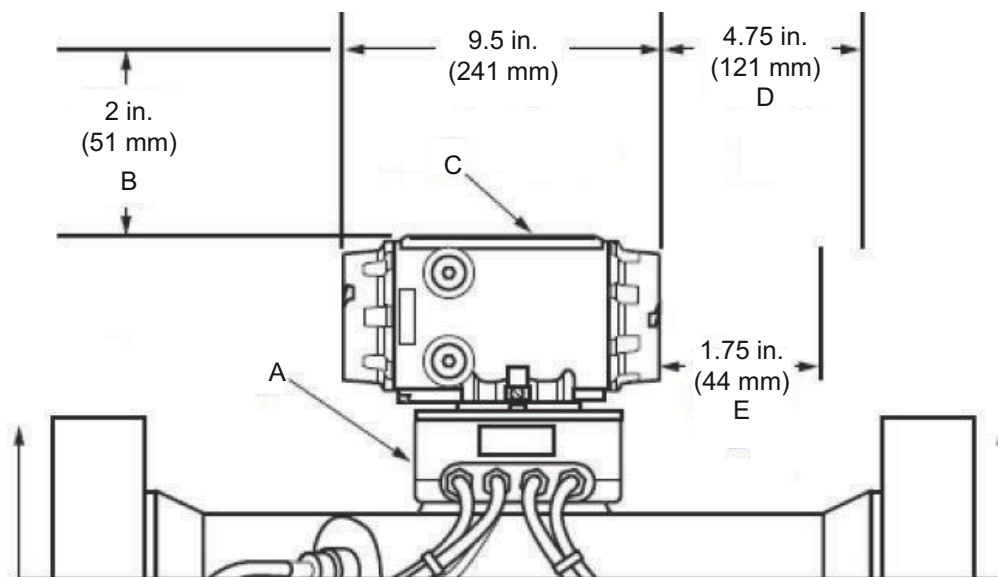


A. Enclosure housing

B. Enclosure base

Note

Dimensions are in inches (millimeters).

Figure 6: Optional Position of Enclosure Housing

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

- A. Enclosure base
- B. Removal
- C. Enclosure housing
- D. Board removal
- E. Endcap removal

Note

Dimensions are in inches (millimeters).

Weights and dimensions tables

The Meter Dimension Key diagram ([Figure 4](#)) 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 8: Approximate Weights and Dimensional Data (Metric Units)

Nominal Line Size (DN)		100	150	200	250	300	400	450	500	600
PN 20	Weight (kg)	94	137	192	282	368	463	522	567	817
	A (mm)	406.4	457.2	546.1	622.3	660.4	762	800	901.7	990.6
	B (mm)	228.6	279.4	342.9	406.4	482.6	596.9	635	698.5	812.8
	C (mm)	449.6	505.5	563.9	627.4	688.3	789.9	846	891.5	1005.8
PN 50	Weight (kg)	103	152	218.6	320.2	415.5	567	628	1084	1669
	A (mm)	406.4	457.2	546.1	622.3	660.4	762	800	902	991
	B (mm)	254	317.5	381	444.5	520.7	648	711	775	914
	C (mm)	462.3	525.8	581.7	645.2	708.7	813	869	930	1057
PN 100	Weight (kg)	112	177.8	250.8	385.6	465.8	631	678	1189	1801
	A (mm)	406.4	457.2	546.1	622.3	660.4	762	800	902	991
	B (mm)	273.1	355.6	419.1	508	558.8	685.8	743	813	940
	C (mm)	472.4	543.6	602	678.2	726.4	833.1	884	930	1212
PN 150	Weight (kg)	122.9	202.8	372	459	815	1202	1420	1667	3261
	A (mm)	419.1	470	698.5	774.7	876.3	1054	914	940	1499
	B (mm)	292.1	381	469.9	546.1	609.6	705	787	857	1041
	C (mm)	480.1	556.3	640.1	703.6	645.2	866	922	1001	1151

Table 9: Approximate Weights and Dimensional Data (US Customary Units)

Nominal Line Size (in.)		4 in.	6 in.	8 in.	10 in.	12 in.	16 in.	18 in.	20 in.	24 in.
150 ANSI	Weight (lb.)	207	301	424	622	811	1020	1150	1250	1800
	A (in.)	16.0	18.0	21.5	24.5	26.0	30.0	31.5	35.5	39
	B (in.)	9.0	11.0	13.5	16.0	19.0	23.5	25	27.5	32
	C (in.)	17.7	19.9	22.2	24.7	27.1	31.1	33.3	35.1	39.6
300 ANSI	Weight (lb.)	227	335	482	706	916	1250	1385	2390	3680
	A (in.)	16.0	18.0	21.5	24.5	26.0	30.0	31.5	35.5	39
	B (in.)	10.0	12.5	15.0	17.5	20.5	25.5	28	30.5	36
	C (in.)	18.2	20.7	22.9	25.4	27.9	32	34.2	36.6	41.6
600 ANSI	Weight (lb.)	247	392	553	850	1027	1391	1495	2622	3970
	A (in.)	16.0	18.0	21.5	24.5	26.0	30.0	31.5	35.5	39
	B (in.)	10.8	14.0	16.5	20.0	22.0	27.0	29.25	32.0	37
	C (in.)	18.6	21.4	23.7	26.7	28.6	32.8	34.8	37.3	47.7
900 ANSI	Weight (lb.)	271	447	820	1012	1797	2650	3130	3675	7190
	A (in.)	16.5	18.5	27.5	30.5	34.5	41.5	36	37	59
	B (in.)	11.5	15.0	18.5	21.5	24	27.75	31	33.75	41
	C (in.)	18.9	21.9	25.2	27.7	25.4	34.1	36.3	39.4	45.3

Note

CF: Consult factory for sizes greater than DN600 (24 in.).

Safety and compliance

The Rosemount 3814 Ultrasonic Flow Meter meets worldwide industry standards for electrical and intrinsic safety certifications and approvals. Consult an Emerson Ultrasonics product 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 —  II 2G Ex d ia IIB T4 Gb ($-40\text{ °C} \leq T \leq +60\text{ °C}$)
- Pressure Equipment Directive (PED)
- Electromagnetic Compatibility (EMC)

INMETRO

- Certificate — UL-BR 16.0144X
- Marking — Ex d [ia] IIB T4 Gb IP66W

International Electrotechnical Commission (IECEx)

- Marking — Ex d ia IIB T4

Environmental ratings

Aluminum

- NEMA 4
- IP66 to EN60529

Stainless steel

- NEMA 4X
- IP66 to EN60529

Metrology approvals

European Union (TC 8224)

- WELMEC Guide 8.8 under MID
- OIML R117-1 Edition 2007 (E)
- MID Class 0.3

Figure 7: Aluminum Enclosure for 3810 Series Electronics with Optional Display



Recommended installation

Recommended pipe lengths

The drawings below represent recommended pipe lengths for the installation of the Rosemount 3814 Liquid Ultrasonic Flow Meter. Please consult an Emerson Ultrasonics product specialist for installation recommendations for specific applications (i.e., low Reynolds number measurement). Other lengths or flow conditioners can be accommodated.

Figure 8: Piping Recommendation for Liquid Ultrasonic Meter (No Flow Conditioner)

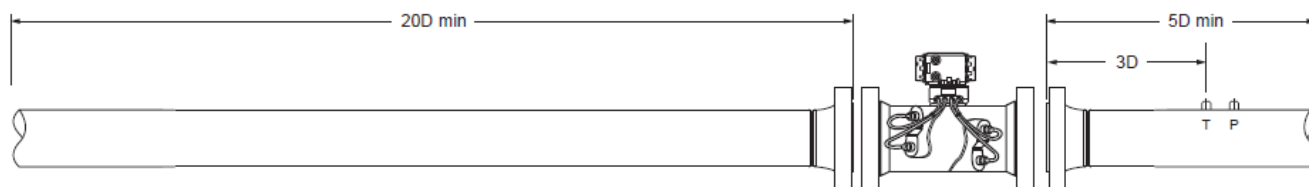
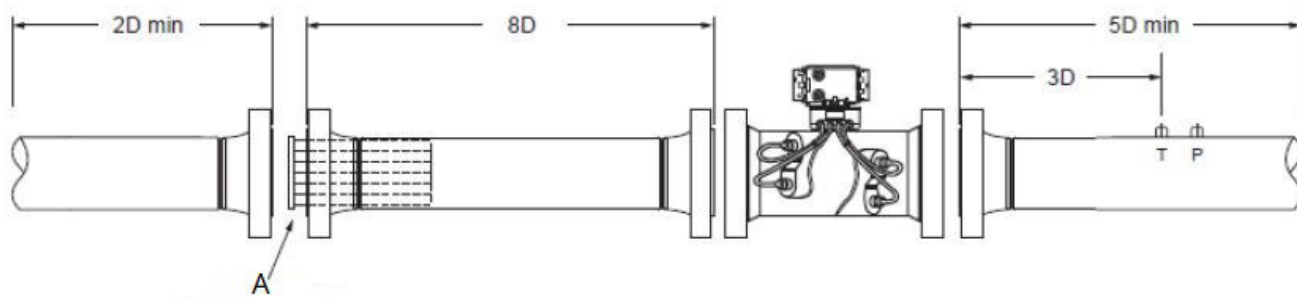
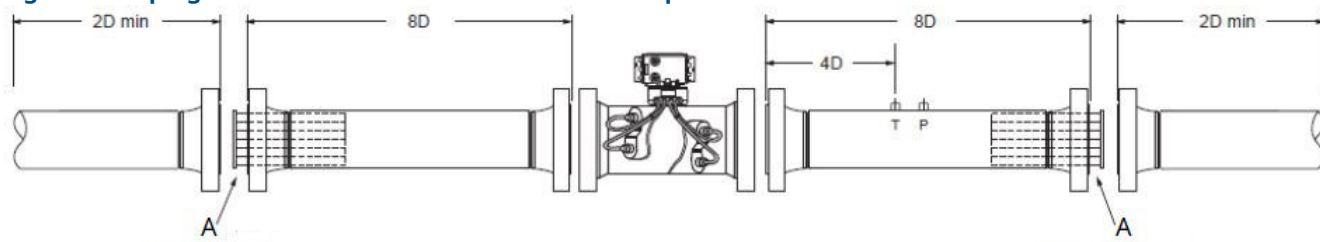


Figure 9: Piping Recommendation for Liquid Ultrasonic Meter with Flow Conditioner



A. Flow conditioner

Figure 10: Piping Recommendation for Bi-directional Liquid Ultrasonic Meter with Flow Conditioners



A. Flow conditioner

Note

- A. For best results, Emerson recommends flow conditioning.
- B. D = Nominal pipe size in inches (i.e., 6 in. pipe size; $10D = 60$ in.)
- C. P = Pressure measurement location
- D. T = Temperature measurement location
- E. Tube bundles recommended; high performance flow conditioners (i.e., Rosemount Profiler) acceptable.

Ordering information

Online product configurator

Many products are configurable online using our Product Configurator. Select the **Configure** button or visit [Emerson.com/MeasurementInstrumentation](https://emerson.com/measurementinstrumentation) to start. With this tool's built-in logic and continuous validation, you can configure your products more quickly and accurately.

Specifications and options

See the Specifications and options section for more details on each configuration. Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See the Material selection section for more information.

Model codes

Model codes contain the details related to each product. Exact model codes will vary; an example of a typical model code is shown in [Model Code Example](#).

Model Code Example

3814060803S01M0805111ACAA1111A

Required model components

Device

Code	Description
3814	3814 4-Path

Line size

Code	Description
04	DN100 (4 in.)
06	DN150 (6 in.)
08	DN200 (8 in.)
10	DN250 (10 in.)
12	DN300 (12 in.)
16	DN400 (16 in.)
18	DN450 (18 in.)
20	DN500 (20 in.)
24	DN600 (24 in.)

Pressure rating

Code	Description
01	PN 20 / 150 ANSI
03	PN 50 / 300 ANSI
05	PN 100 / 600 ANSI
06	PN 150 / 900 ANSI

Flange type

Code	Description
S01	RF / RF
S02	RTJ / RTJ
S04	Compact Flange (NORSOK)

Body and flange material

Code	Description
M ⁽¹⁾	Cast LCC / 316 SS / 316L SS / Duplex SS
F ⁽¹⁾	Forged carbon steel / 316 SS / Duplex SS

(1) Consult factory for specific material model coding.

Schedule (pipe bore)

Code	Description
LW0	Schedule LW
020	Schedule 20
030	Schedule 30
040	Schedule 40
060	Schedule 60
080	Schedule 80
100	Schedule 100
120	Schedule 120
140	Schedule 140
160	Schedule 160
STD	Schedule STD
XS0	Schedule XS
XXS	Extra, Extra Strong / use in DN150 and DN200 (6 in. and 8 in.) line sizes only

Transducer assembly

Code	Description
5	LT-08 (-58 °F to 275 °F [-50 °C to +135 °C]) with NBR O-rings DN100 to DN250 (4 in. to 10 in. [101 mm to 254 mm])

Code	Description
6	LT-09 (-58 °F to 275 °F [-50 °C to +135 °C]) with NBR O-rings DN300 to DN600 (12 in. to 24 in. [304.8 mm to 609 mm])
7	LT-08 (-40 °F to 302 °F [-40 °C to +150 °C]) with FKM O-rings
8	LT-09 (-40 °F to 302 °F [-40 °C to +150 °C]) with FKM O-rings
A	LT-04 (-58 °F to 275 °F [-50 °C to +135 °C]) with NBR O-rings DN100 to DN250 (4 in. to 10 in. [101 mm to 254 mm])
B	LT-05 (-58 °F to 275 °F [-50 °C to +135 °C]) with NBR O-rings DN300 to DN600 (12 in. to 24 in. [304.8 mm to 609 mm])
C	LT-04 (-40 °F to 302 °F [-40 °C to +150 °C]) with FKM O-rings
D	LT-05 (-40 °F to 302 °F [-40 °C to +150 °C]) with FKM O-rings

Enclosure type/ input power

Code	Description
1	Aluminum; 10.4 to 36 VDC
2	Stainless Steel; 10.4 to 36 VDC

Future

Code	Description
1	None

Conduit type

Code	Description
1	¾ in. NPT
2	M20 Reducer

Electronics mounting

Code	Description
A	Integral Mounted (up to +140 °F [+60 °C])
B	Remote Mounted with 15 ft. (4.5 m) Transducer Cables (up to +212 °F [+100 °C])
C	Remote Mounted 15 ft. (4.5 m) (up to +302 °F [+150 °C])
E	Integral Mount (up to +140 °F [+60 °C]) with Armored Cover Cables

CPU/display

Code	Description
J	Full I/O, no Display
K	Full I/O, with Display

Expansion module

Code	Description
A	None
B	Serial RS-232
C	Serial RS-485 (2-wire)
G	Expansion I/O Module

Wireless

Code	Description
A	None
B	THUM

Tagging format

(Line Size/ Pressure Rating/ Flow Parameters)

Code	Description
1	Inch / ANSI / US Customary
2	Inch / ANSI / Metric
3	DN / PN / US Customary
4	DN / PN Metric

Tagging language (for all tags)

Code	Description
1	English
2	French
3	Russian
4	Chinese

Pressure directive cert

Code	Description
1	None
2	PED (must select electrical approval code 2)
3	CRN (Canadian Boiler Branch)

Electrical approvals

Code	Description
1	UL / c-UL Approval
2	ATEX / IECEx

Note

Must select pressure directive cert code 2.

Metrology approvals

Code	Description
A	None
B	European Union (TC 8224), OIML

Note

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

For more information: [Emerson.com/global](https://emerson.com/global)

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