Product Data Sheet
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Rosemount™ SeniorSonic™ 3414

4-Path Gas Ultrasonic Flow Meter

ROSEMOUNT™

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Intelligence for custody transfer

Engineered for custody transfer applications, the Rosemount SeniorSonic™ 3414 4-Path Gas Ultrasonic Flow Meter offers high accuracy and reliable, long-term performance to minimize lost and unaccounted for natural gas.

To reduce measurement risk and minimize operating costs, the advanced meter is available in 4 to 42 in. (DN100 to DN1050)(1) line sizes and offers bidirectional flow capabilities, increased flow capacity, and no incremental pressure drop.

Powerful next-generation Rosemount 3410 Series Electronics work with the SeniorSonic 3414 Flow 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 central processing unit (CPU) and input/output (I/O) board assembly and a local LCD display (optional) to increase reliability, simplify maintenance, and facilitate future expansion. Operators can also easily monitor and troubleshoot the meters in real time from a personal computer (PC). MeterLink™ Diagnostics Software is an intuitive user interface that provides critical information, including expert flow analysis, flow disturbance alerts, and suggested corrective actions to enhance reliability and improve functionality.

The SeniorSonic 3414 Flow Meter is also supplied with robust titanium non-wetted T-200 transducers that ensure reliable measurement in harsh environments where wet, rich, and/or dirty gas is present. The transducers are engineered to simplify servicing and maximize meter uptime.

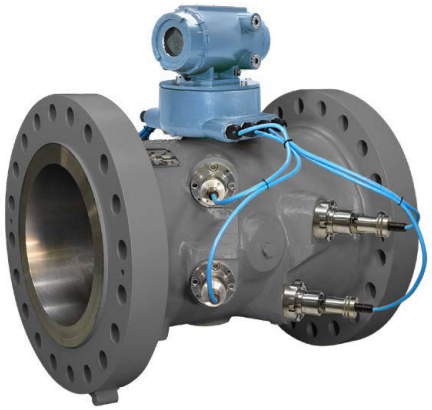
Contents

(1) Consult factory on meter sizes above 36 in. (DN900).

Typical application

- Custody transfer for natural gas transmission lines

Figure 1: Rosemount SeniorSonic™ 3414 Gas Ultrasonic Flow Meter



Application sites

- Power plants – inlets
- Gas processing plants – inlets/outlets
- Underground storage sites – inlets/outlets
- Gas production – onshore/offshore
- City gate stations – receipt/delivery points

Features and benefits

- 4-path chordal design allows accuracy, stability, redundancy, and operational cost savings.
- Excellent long-term performance reduces maintenance costs.
- High rangeability of >100:1 ensures fewer meter runs, smaller line sizes, and lower capital costs.
- Cast or forged body construction minimizes measurement uncertainty caused by pressure changes.
- Equipped with robust titanium encapsulated T-200 transducers for optimal performance in wet and corrosive environments (standard for line sizes up to 36 in. or DN900 and optional for 42 in. or DN1050).
- T-200 transducers are safely extractable under pressure without special tools, and the non-wetted design eliminates the possibility of greenhouse gas emissions.
- Rosemount 3410 Series Electronics provide fast sampling, an expandable electronics platform, and an archive data log containing pressure, temperature, and gas composition information, allowing the meter to calculate standard condition flow rates like a redundant flow computer.
- 3410 Series Electronics calculate corrected volume rates, mass rates, and energy rates.
- 3410 Series Electronics calculate speed of sound from pressure, temperature, and gas composition using American Gas Association (AGA) 10 2003 and GERG-2008 (AGA 8 Part 2, 2017).
- Local LCD display (optional) with up to ten user-selectable scrolling variables.

- The Rosemount 3414 Gas Ultrasonic Flow Meter is now available with SMART™ Meter Verification, giving users access to expert flow analysis and providing a simplified and intuitive overall measurement status, resulting in minimized time spent analyzing data. You can access this new feature through Modbus® or Rosemount MeterLink™ Diagnostic Software.
- Predictive diagnostics allow personnel to quickly detect and respond to abnormal situations to avoid process upsets and unscheduled downtime.
- The Rosemount SeniorSonic™ 3414 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

If requirements are outside of the listed specifications, consult an Emerson Ultrasonics product specialist. Depending on the application, other product and material offerings may be available.

Meter specifications

Characteristics

- 4-path (eight transducers) chordal design.

Meter performance

- Flow calibrated accuracy is ±0.1 percent of reading over entire flow calibration range.
- Repeatability is ±0.05 percent of reading for 5 to 100 ft/s (1.5 to 30.5 m/s).

Velocity range

- Nominal 1.7 to 100 ft/s (0.5 to 30 m/s) with over-range performance exceeding 125 ft/s (38 m/s) on some sizes.
- Meter meets or exceeds American Gas Association (AGA) 9 2022 / International Organization for Standardization (ISO) 17089 performance specifications.

Table 1: AGA 9 / ISO 17089 Flow Rate Values (Imperial Units)

Meter size (inches)	4 to 24	30	36
q_{min} (ft/s)	1.7	1.7	1.7
q_t (ft/s)	10	8.5	7.5
q_{max} (ft/s)	100	85	75

Table 2: AGA 9 / ISO 17089 Flow Rate Values (Metric Units)

Meter size (DN)	100 to 600	750	900
q_{min} (m/s)	0.5	0.5	0.5
q_t (m/s)	3.048	2.591	2.29
q_{max} (m/s)	30.48	25.91	22.86

Electronics performance

Power

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

Mechanical ratings

Line sizes

- DN100 to DN1050 (4 to 42 in.)(2)
- DN100 to DN150 (4 to 6 in.) are 45° dual X orientation.
- DN200 (8 in.) and larger are British Gas (BG) orientation.

Operating gas temperature (transducers)

- T-200(3): –58 °F to +257 °F (–50 °C to 125 °C)
- T-21: –4 °F to +212 °F (–20 °C to +100 °C)
- T-41: –58 °F to +212 °F (–50 °C to +100 °C)
- T-22: –58 °F to +212 °F (–50 °C to +100 °C)

Operating pressure range (transducers)

- T-200(3): 15 to 3,750 psig (1.03 to 258.55 bar)
- T-21/T-41/T-22: 100 to 4,000 psig (6.89 to 275.79 bar)
- T-21/T-41/T-22: 50 psig (3.44 bar) available with reduced Q_{max}
- T-22: 0 to 3,750 psig (0 to 258.55 bar)(4)

Flanges

- raised face and ring type joint (RTJ) for ANSI Classes 300 to 2,500 (PN 50 to 420)
- compact flanges and hub end connectors (optional)

NACE, NORSOK, and PED compliance

- designed for NACE compliance(5)
- NORSOK available upon request

(2) Consult factory on meter sizes above DN900 (36 in.).
(3) Available for line sizes up to DN1050 (42 in). Minimum operating pressure varies by line size. Consult factory for minimum pressures below 100 psig (6.89 bar).
(4) To use T-22 for low pressure applications below 100 psig (6.89 bar), the meter must be equipped with isolated transducer mounts.
(5) It is the equipment user's responsibility to select the materials suitable for the intended services.

- PED available upon request

Related information

Operation limits

Electronics ratings

Operating temperature

- –40 °F to +140 °F (–40 °C to +60 °C)

Operating relative humidity

- Up to 95 percent non-condensing

Storage temperature

- –40 °F to +185 °F (–40 °C to +85 °C) with a low temperature storage limit of –4 °F (–20 °C) for T-21 transducers and –58 °F (–50 °C) for T-41/T-22 transducers

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)

Materials of construction

The materials of construction are dependent upon application requirements that must be specified by the customer. If needed, an Emerson representative can provide material guidance.

Material specifications

Body and flange

Cast

- ASTM A352 Gr LCC carbon steel[6]
  –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[7]
  –58 °F to +302 °F (–50 °C to +150 °C)

Forgings

- ASTM A350 Gr LF2 carbon steel[6]
  –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[7]
  –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

- Standard: ASTM B26 Gr A356.0 T6 aluminum
- Optional: ASTM A351 Gr CF8M stainless steel
- Optional: (retrofit): ASTM B26-92A aluminum

Transducer components

Transducer mounts and holders O-rings

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

Transducer mounts and holders

- ASTM A564 Type 630 stainless steel mounts

(6) Impact tested per specified ASTM standard.
(7) A995 4A material is not yet approved in Canada.

- ASTM A479 316L stainless steel holders
- Inconel® ASTM B446 (UNS N06625) Gr 1 mount (optional)
- Inconel ASTM B446 (UNS N06625) Gr 1 holder (optional)

Paint specifications

Body and flange exterior

Carbon steel body material

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

Stainless steel or duplex body material

- Paint (optional)

Enclosure housing

Aluminum material

- Standard: 100 percent conversion coated and exterior coated with a polyurethane enamel
- Optional (retrofit): 100 percent conversion coated and exterior coated with a polyurethane enamel

Stainless steel material

- Optional: passivated

Table 3: Body and Flange Maximum Pressure Ratings by Construction Materials (psi Meter Sizes 4 to 42 in.)(1)

ANSI Class	Cast carbon steel	Forged carbon steel	Cast 316 SS, 316L SS, Forged 316 SS	Forged 316L SS	Duplex SS
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
1,500	3,750	3,705	3,600	3,000	3,750
2,500	6,250	6,170	6,000	5,000	6,250

(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 4: Body and Flange Maximum Pressure Ratings by Construction Materials [bar Meter Sizes DN100 to DN1050](1)

DN	Cast carbon steel	Forged carbon steel	Cast 316 SS, 316L SS, Forged 316 SS	Forged 316L SS	Duplex SS
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
200	258.6	255.3	248.2	206.8	258.6
250	430.9	425.5	413.7	344.7	430.9

(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.*

Flow meter sizing

US Customary units

Use Table 5 and Table 6 to determine the flow range at reference conditions for all meter sizes.

All calculations are based on Schedule 40 bore, 60 °F (15.6 °C) and typical gas composition (American Gas Association [AGA] 8 Amarillo). These values are intended to be a guide in sizing.

Calculating meter capacity

To calculate a volume rate for a given velocity, first find the capacity (flow rate) in Table 5 or Table 6 for the meter size and operating pressure. Next, multiply the capacity by the ratio of the desired velocity divided by 100 ft/s to obtain the desired volume rate.

Example: Determine the hourly flow rate at 70 ft/s for an 8-inch meter operating at 800 psig.

$$\text{Flow rate} = 7{,}842 \text{ MSCFH} \quad \text{Velocity} = 70 \text{ ft/s} \quad \text{Answer} = \frac{7{,}842 \text{ MSCFH} \times 70 \text{ ft/s}}{100 \text{ ft/s}} = 5{,}489.4 \text{ MSCFH}$$

Table 5: Flow Rates (MSCFH) Based upon Maximum Rated Velocity [4 to 24 in. = 100 ft/s] [30 in. = 85 ft/s] [36 in. = 75 ft/s]

Meter size (in.)		4	6	8	10	12	16	18	20	24	30	36
Operating pressure (psig)	100	252	571	989	1,559	2,213	3,494	4,423	5,495	7,948	10,910	13,862
	200	478	1,086	1,880	2,963	4,207	6,641	8,406	10,446	15,108	20,738	26,349
	300	712	1,616	2,799	4,412	6,263	9,888	12,515	15,552	22,493	30,875	39,229
	400	954	2,164	3,747	5,906	8,384	13,236	16,754	20,819	30,111	41,331	52,515
	500	1,202	2,729	4,725	7,448	10,572	16,690	21,126	26,251	37,968	52,117	66,219
	600	1,459	3,311	5,733	9,037	12,828	20,252	25,635	31,854	46,071	63,239	80,350
	700	1,723	3,911	6,772	10,675	15,153	23,923	30,281	37,627	54,422	74,701	94,914
	800	1,996	4,529	7,842	12,362	17,547	27,703	35,065	43,572	63,020	86,504	109,910
	900	2,276	5,165	8,943	14,096	20,009	31,590	39,986	49,686	71,863	98,642	125,333
	1,000	2,563	5,817	10,073	15,877	22,537	35,581	45,038	55,964	80,943	111,105	141,169
	1,100	2,858	6,486	11,231	17,702	25,128	39,671	50,214	62,393	90,246	123,875	157,394
	1,200	3,159	7,169	12,414	19,567	27,774	43,850	55,504	68,969	99,752	136,923	173,973
	1,300	3,466	7,865	13,619	21,467	30,471	48,107	60,893	75,665	109,437	150,217	190,865
	1,400	3,777	8,571	14,842	23,395	33,208	52,428	66,362	82,462	119,267	163,711	208,009
	1,500	4,092	9,285	16,079	25,344	35,975	56,797	71,892	89,333	129,205	177,352	225,341
	1,600	4,408	10,004	17,323	27,306	38,760	61,193	77,456	96,247	139,205	191,079	242,782
	1,700	4,725	10,724	18,570	29,270	41,548	65,595	83,029	103,172	149,221	204,826	260,250
	1,800	5,041	11,441	19,811	31,227	44,326	69,981	88,580	110,069	159,197	218,520	277,649
	1,900	5,354	12,151	21,041	33,166	47,079	74,327	94,081	116,905	169,083	232,090	294,891
	2,000	5,663	12,852	22,255	35,079	49,793	78,612	99,505	123,645	178,832	245,472	311,894

Table 6: Flow Rates (MMSCFD) Based upon Maximum Rated Velocity [4 to 24 in. = 100 ft/s] [30 in. = 85 ft/s] [36 in. = 75 ft/s]

Meter size (in.)		4	6	8	10	12	16	18	20	24	30	36
Operating pressure (psig)	100	6.0	13.7	23.7	37.4	53.1	83.9	106.1	131.9	190.8	261.8	332.7
	200	11.5	26.1	45.1	71.1	101.0	159.4	201.8	250.7	362.6	497.7	632.4
	300	17.1	38.8	67.2	105.9	150.3	237.3	300.4	373.2	539.8	741.0	941.5
	400	22.9	51.9	89.9	141.8	201.2	317.7	402.1	499.6	722.7	991.9	1,260.4
	500	28.9	65.5	113.4	178.7	253.7	400.6	507.0	630.0	911.2	1,250.8	1,589.3
	600	35.0	79.5	137.6	216.9	307.9	486.1	615.2	764.5	1,105.7	1,517.7	1,928.4
	700	41.4	93.9	162.5	256.2	363.7	574.2	726.7	903.1	1,306.1	1,792.8	2,277.9
	800	47.9	108.7	188.2	296.7	421.1	664.9	841.6	1,045.7	1,512.5	2,076.1	2,637.8
	900	54.6	123.9	214.6	338.3	480.2	758.2	959.7	1,192.5	1,724.7	2,367.4	3,008.0
	1,000	61.5	139.6	241.7	381.1	540.9	854.0	1,080.9	1,343.1	1,942.6	2,666.5	3,388.1
	1,100	68.6	155.7	269.5	424.8	603.1	952.1	1,205.1	1,497.5	2,165.9	2,973.0	3,777.5
	1,200	75.8	172.1	297.9	469.6	666.6	1,052.4	1,332.1	1,655.3	2,394.0	3,286.2	4,175.4
	1,300	83.2	188.8	326.9	515.2	731.3	1,154.6	1,461.4	1,816.0	2,626.5	3,605.2	4,580.7
	1,400	90.6	205.7	356.2	561.5	797.0	1,258.3	1,592.7	1,979.1	2,862.4	3,929.1	4,992.2
	1,500	98.2	222.9	385.9	608.3	863.4	1,363.1	1,725.4	2,144.0	3,100.9	4,256.4	5,408.2
	1,600	105.8	240.1	415.8	655.3	930.2	1,468.6	1,858.9	2,309.9	3,340.9	4,585.9	5,826.8
	1,700	113.4	257.4	445.7	702.5	997.2	1,574.3	1,992.7	2,476.1	3,581.3	4,915.8	6,246.0
	1,800	121.0	274.6	475.5	749.5	1,063.8	1,679.5	2,125.9	2,641.7	3,820.7	5,244.5	6.663.6
	1,900	128.5	291.6	505.0	796.0	1,129.9	1,783.8	2,257.9	2,805.7	4,058.0	5,570.2	7,077.4
	2,000	135.9	308.4	534.1	841.9	1,195.0	1,886.7	2,388.1	2,967.5	4,292.0	5,891.3	7,485.5

Metric units

Use Table 7 and Table 8 to determine the flow range at reference conditions for all meter sizes.

All calculations are based on Schedule 40 bore, 15 °C and typical gas composition (American Gas Association [AGA] 8 Amarillo). These values are intended to be a guide in sizing.

Calculating meter capacity

To calculate a volume rate for a given velocity, first find the capacity (flow rate) in Table 7 or Table 8 for the meter size and operating pressure. Next, multiply the capacity by the ratio of the desired velocity divided by 30.5 m/s to obtain the desired volume rate.

Example: Determine the hourly flow rate at 21 m/s for a DN200 meter operating at 4,500 kPag.

$$\text{Flow rate} = 178 \text{ MSCMH} \quad \text{Velocity} = 21 \text{ m/s} \quad \text{Answer} = \frac{178 \text{ MSCMH} \times 21 \text{ m/s}}{30.5 \text{ m/s}} = 122.6 \text{ MSCMH}$$

Table 7: Flow Rates (MSCMH) Based upon Maximum Rated Velocity [DN100 to DN600 = 30.5 m/s] [DN750 = 25.9 m/s] [DN900 = 22.9 m/s]

Meter size (DN)		100	150	200	250	300	400	450	500	600	750	900
Operating pressure (kPag)	1,000	10	23	39	62	88	139	175	218	315	432	550
	1,500	15	33	58	91	129	204	258	320	463	635	809
	2,000	19	44	77	121	171	270	342	425	615	843	1,074
	2,500	24	55	96	151	214	339	429	533	770	1,056	1,345
	3,000	29	67	116	182	259	408	517	642	929	1,274	1,622
	3,500	35	78	136	214	304	480	607	754	1,091	1,496	1,905
	4,000	40	90	156	247	350	553	700	869	1,257	1,724	2,195
	4,500	45	103	178	280	397	627	794	987	1,427	1,957	2,491
	5,000	51	115	199	314	446	704	891	1,107	1,600	2,195	2,794
	5,500	56	128	221	349	495	781	989	1,229	1,778	2,438	3,104
	6,000	62	141	244	384	545	861	1,090	1,354	1,959	2,686	3,420
	6,500	68	154	267	420	597	942	1,193	1,482	2,143	2,939	3,742
	7,000	74	168	290	457	649	1,025	1,297	1,612	2,331	3,197	4,071
	7,500	80	181	314	495	702	1,109	1,404	1,744	2,523	3,460	4,405
	8,000	86	195	338	533	757	1,195	1,512	1,879	2,718	3,727	4,745
	8,500	92	209	363	572	812	1,281	1,622	2,015	2,915	3,997	5,090
	9,000	99	224	388	611	867	1,369	1,733	2,154	3,115	4,272	5,439
	9,500	105	238	413	651	924	1,458	1,846	2,294	3,318	4,550	5,793
	10,000	112	253	438	691	981	1,548	1,960	2,435	3,522	4,830	6,149

Table 8: Flow Rates (MMSCMD) Based upon Maximum Rated Velocity [DN100 to DN600 = 30.5 m/s] [DN750 = 25.9 m/s] [DN900 = 22.9 m/s]

Meter size (DN)		100	150	200	250	300	400	450	500	600	750	900
Operating pressure (kPag)	1,000	0.240	0.544	0.941	1.484	2.106	3.325	4.208	5.229	7.563	10.372	13.205
	1,500	0.352	0.799	1.384	2.182	3.097	4.889	6.188	7.690	11.122	15.251	19.418
	2,000	0.467	1.061	1.837	2.895	4.110	6.489	8.213	10.206	14.761	20.242	25.773
	2,500	0.585	1.328	2.300	3.626	5.147	8.126	10.285	12.780	18.485	25.348	32.273
	3,000	0.706	1.602	2.774	4.373	6.207	9.800	12.404	15.414	22.293	30.571	38.923
	3,500	0.829	1.882	3.259	5.137	7.292	11.512	14.572	18.107	26.189	35.914	45.725
	4,000	0.956	2.168	3.755	5.919	8.401	13.264	16.789	20.862	30.174	41.378	52.682
	4,500	1.085	2.461	4.262	6.718	9.536	15.055	19.056	23.679	34.248	46.964	59.795
	5,000	1.216	2.760	4.780	7.535	10.695	16.885	21.373	26.558	38.412	52.674	67.065
	5,500	1.351	3.066	5.309	8.369	11.880	18.755	23.740	29.499	42.665	58.508	74.492
	6,000	1.489	3.378	5.850	9.221	13.089	20.664	26.156	32.502	47.009	64.463	82.075
	6,500	1.629	3.697	6.401	10.090	14.322	22.612	28.621	35.565	51.439	70.538	89.810
	7,000	1.772	4.021	6.963	10.975	15.579	24.596	31.133	38.686	55.953	76.729	97.692
	7,500	1.917	4.351	7.535	11.877	16.859	26.616	33.690	41.863	60.549	83.031	105.716
	8,000	2.065	4.687	8.116	12.793	18.160	28.670	36.290	45.094	65.221	89.438	113.873
	8,500	2.215	5.028	8.706	13.723	19.480	30.754	38.928	48.372	69.962	95.940	122.151
	9,000	2.368	5.373	9.304	14.666	20.818	32.866	41.601	51.694	74.766	102.528	130.539
	9,500	2.521	5.722	9.909	15.619	22.170	35.002	44.304	55.053	79.625	109.190	139.021
	10,000	2.677	6.075	10.519	16.580	23.535	37.157	47.032	58.442	84.527	115.913	147.581

T-200 titanium encapsulated transducers

New non-wetted design

Designed for today's challenging application requirements, Ultrasonics T-200 Transducers are robustly designed for high performance in the harshest environments, such as process gases containing oil, wet gas, and corrosive chemicals.

The possibility of hydrocarbon corrosion is virtually eliminated due to the full metal, non-wetted design for increased longevity and stability. The T-200 design is also easy to use and maintain. The innovative transducer smart capsule, a single part, is retractable under pressure with no special tools, simplifying maintenance, minimizing downtime, and maximizing safety and convenience.

T-200 transducers are standard in flow meters sized DN100 to DN1050 (4 to 42 in.) but may also be available in additional sizes upon request.

Figure 2: T-200 Transducer Assembly

Features and benefits

- Patented MiniHorn™ array technology mechanically amplifies the transducer signal, overcoming any signal attenuation or effects from reverberation.
- Non-wetted: Full metal encapsulated transducer located outside the process is impervious to liquid-borne dirt and corrosive fluids.
- Retrofittable: Easily upgrade existing flow meters equipped with T-11/T-12 or T-21/T-22 transducers.
- Long-term reliability: Isolated transducer design provides a barrier from corrosive hydrocarbon fluids and extends the life of transducer components.
- Extractable under pressure: The simplified smart capsule design is easily retractable without depressurizing the line and does not require a high-pressure extraction tool.
- Non-wetted design eliminates possibility of greenhouse gas emissions during extraction operations.
- Higher temperature rating: Allows for higher operating temperature and cleaning while inline.
- Extended warranty: three years standard.

Transducer specifications

Product compatibility

- Line sizes DN100 to DN1050 (4 to 42 in.)

Materials of construction

- Ti Gr12 housing/316/316L stainless steel stalk assembly (standard)
- Ti Gr12 housing/Inconel® stalk assembly (optional)

Fluid types

- Hydrocarbons, industrial gases

Fluid temperature

- –58 °F to +257 °F (–50 °C to 125 °C)

Operating pressure

- 15 to 3,750 psig (1.03 to 258.55 bar)

Operating frequency

- 125 kHz

Figure 3: Transducer Smart Capsule

Safety and compliance

Safety classifications

Underwriters Laboratories (UL/cUL)

- Hazardous Locations – Class 1, Division 1, Groups C and D

CE Marked Directives

- Explosive Atmospheres (ATEX)

International Electrotechnical Commission (IECEx)

Metrology approval

- Measurement Canada

NMI/MID

- OIML R137 Class 0.5
- MID Class 1.0

Local LCD display

The Rosemount 3410 Series Electronics offer an optional local LCD display that uses three lines to indicate the variable name, variable value, and engineering units.

The local display configuration is supported via Rosemount MeterLink™ software or Emerson's AMS Trex Device with HART® interface protocol.

The local display shows up to ten items, which are user selectable from 26 variables. You can configure the display 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 4: Local LCD Display

Table 9: 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 ▪ 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 (I/O)

Table 10: Central Processing Unit (CPU) Module I/O Connections (Maximum Wire Gauge is 18 AWG)

	I/O connection type	Quantity	Description
Serial communications	Serial RS-232/RS-485 port	1	■ Modbus® RTU/ASCII ■ 115 kbps baud rate ■ RS-232/RS-485 full duplex ■ RS-485 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	6	■ User configurable (can configure digital input as 6th frequency/ digital output)
Analog output(2)(4)	4–20 mA	1	■ Independently configurable analog output ■ HART® 7 Compliant, consult factory for HART 5

(1) *The analog-to-digital conversion accuracy is within ±0.05 percent of full scale over the operating temperature range.*
(2) *A 24 Vdc 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 percent of full scale and gain error is within ±0.2 percent of full scale. The total output drift is within ±50 ppm of full scale per °C.*

Table 11: Optional I/O Expansion Module

	I/O connection type	Quantity	Description
Serial communications	Serial RS-232/RS-485 port	1	■ Modbus RTU/ASCII ■ 115 kbps baud rate ■ RS-232/RS-485 half duplex
	Ethernet switch	3	■ 100BaseT ■ Three ports
Analog input	4–20 mA	1	■ Reserved for future use

Optional I/O expansion slot: RS-232/RS-485 half duplex, 2-wire, or 1 I/O expansion module.

Diagnostics and software

Significantly reduce time previously spent on data analysis and troubleshooting with the new SMART™ Meter Verification (SMV) feature now included in the latest meter firmware update.

Walk away with more confidence in your measurement with a clear measurement verification result as well as flow meter and process status results.

Every Ultrasonic Flow Meter works with advanced Rosemount MeterLink™ software to simplify monitoring and troubleshooting. This advanced software displays a number of performance-based diagnostics that indicate flow meter health. In addition, dynamic flow-based diagnostics help operators identify flow disturbances that may affect measurement uncertainty. Emerson has optimized the latest version of MeterLink to work with SMART Meter Verification, allowing for easy collection of monthly scheduled or on-demand SMV reports.

Figure 5: MeterLink Baseline Viewer

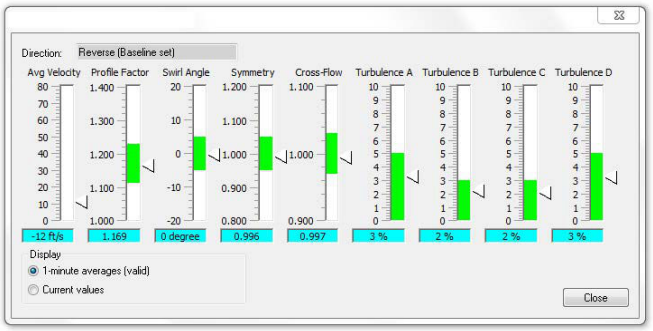
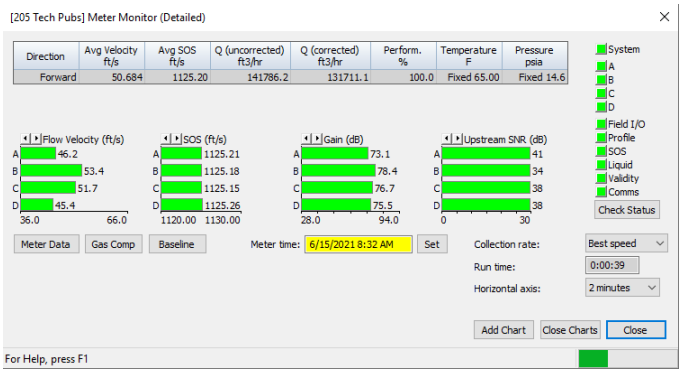


Figure 6: MeterLink Monitor Screen



- MeterLink software is available to download at no charge.
- MeterLink is required for transmitter configuration.
  - Flow meter also configurable with AMS Device Manager or TREX Device if HART® is used.
- MeterLink connects to flow meters using Ethernet (recommended), RS-232, or RS-485 full duplex
- Supports Microsoft® Windows® 7, 8.1, and 10
- Microsoft Office 2010-2019

Table 12: Features of Flow Meter, MeterLink, and Net Monitor(1)

		Flow meter	Accessible through MeterLink	Accessible through Net Monitor
SMV	Scheduled or on-demand reports (PDF or XML)		•	•

Table 12: Features of Flow Meter, MeterLink, and Net Monitor[1] *(continued)*

		Flow meter	Accessible through MeterLink	Accessible through Net Monitor
	Clear measurement verification results	•	•	•
	Automatic report collection by meter group			•
	Last scheduled SMV result status multiple flow meter overview			•
	Bundle all scheduled flow meter reports		•	•
	Alarm prioritization	•	•	•
Operation	Configurable Modbus® Gas Chromatograph (GC) component data table	•		
	Speed of sound comparison[2]	•	•	
	Transducer health monitoring	•	•	
	Baseline viewer		•	
	Monitor screen		•	
	Multiple charts with green limit bands		•	
	View waveforms		•	
	Speed of sound calculator[2]		•	
	Help topics/troubleshooting guidance		•	
	Maintenance logs		•	
History	Hourly logs (180 days) and daily logs (five years)	•	•	
	Trend maintenance logs		•	
	Hourly/daily log graphing		•	
Configuration	Field Setup Wizard and Baseline Configuration Wizard		•	
	User name identified on audit log	•	•	
	Write protect switch	•		
	Compare configuration from logs		•	
	GC Master - Modbus serial/TCP	•		
	Modbus TCP slave	•		
Alarms	Alarm/audit/system logs	•	•	
	Bore buildup alarm	•	•	
	Blockage alarm	•	•	
	Abnormal profile alarm	•	•	
	Liquid detection alarm	•	•	
	Latched alarms	•	•	
	Severity alarm display		•	
	Reverse flow alarm	•	•	

(1) *Net Monitor is an application automatically available with MeterLink that allows you to access and monitor all Ultrasonic Flow Meters that are part of a network.*

(2) *American Gas Associatin (AGA) 10 2003 and GERG-2008 (AGA 8 Part 2, 2017) supported.*

Safety and compliance

The Rosemount SeniorSonic™ 3414 gas ultrasonic flow meter meets worldwide industry standards for electrical and intrinsic safety certifications and approvals.

For a complete list of agencies and certifications, consult an Emerson Ultrasonics technical specialist.

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 db ia IIB T4 Gb (-40 °C ≤ T ≤ +60 °C)
- Pressure Equipment Directive (PED)
- Electromagnetic Compatibility (EMC)

INMETRO

- Certificate — UL-BR 16.0144X
- Marking — Ex db ia IIB T4 Gb

International Electrotechnical Commission (IECEx)

- Certificate — 11.0004X
- Marking — Ex db ia IIB T4 Gb

Canadian Registration Number

- Certificate — 0F14855

Figure 7: Standard Aluminum Electronics Enclosure with Optional Display on Rosemount SeniorSonic 3414 Meter

Environmental ratings

Aluminum

- NEMA 4
- IP66 to EN60529

Stainless steel

- NEMA 4X
- IP66 to EN60529

Metrology approval

ISO 17089-1 : 2010 (E)

OIML

- OIML R137-1 and 2 Edition 2012(E)
- Class 0.5

MID

- Directive 2014/32/EU (MID MI-002)
- Class 1.0

China Pattern Approval (CPA)

Measurement Canada

- Approval — AG-0623

Figure 8: Optional Larger, Retrofit Electronics Enclosure on Rosemount SeniorSonic 3414 Meter (No Optional Display Available)

Operation limits

If requirements are outside of the operation limits shown in the following tables for T-21/T-41/T-22/T-200 transducers, consult an Emerson Ultrasonics product specialist.

Table 13: Recommended Maximum Velocity for 12 in. and Smaller Line Size Meters (US Customary Units)

Nominal meter size (inches)	Max velocity rating at 0 psig or greater (ft/s)(1)	Capacity at max rated velocity (ACFH)(1)
4	100	31,826
6	100	72,226
8	100	125,068
10	100	197,136
12	100	282,743

(1) *T-22 transducers and isolated transducer mounts required for DN300 (12 in.) and smaller line size meters to achieve 0 to 100 psig (0 to 345 kPag).*

Table 14: Recommended Maximum Velocity for 16 in. and Larger Line Size Meters (US Customary Units)

Nominal meter size (inches)	Max velocity rating at 50 psig (ft/s)	Capacity between 50 to 100 psig (ACFH)(1)	Max velocity rating at 100 psig (ft/s)	Capacity at max rated velocity (ACFH)(1)
16	80	228,318	100	456,635
18	80	292,131	100	584,263
20	80	363,799	100	727,598
24	80	530,696	100	1,061,392
30	45	755,952	85	1,427,909
36	37.5	914,912	75	1,829,824

(1) *Capacities are for meter ID equivalent to Schedule 40 (or STD).*

Table 15: Recommended Maximum Velocity for DN300 and Smaller Line Size Meters (Metric Units)

Nominal meter size (DN)	Max velocity rating at 0 kPag or greater (m/s)(1)	Capacity at max rated velocity (ACMH)(1)
100	30.5	901
150	30.5	2,045
200	30.5	3,541
250	30.5	5,582
300	30.5	8,006

(1) *Isolated transducer mounts required for DN300 (12 in.) and smaller line size meters to achieve 0 to 100 psig (0 to 345 kPag).*

Table 16: Recommended Maximum Velocity for DN400 and Larger Line Size Meters (Metric Units)

Nominal meter size (DN)	Max velocity rating at 345 kPag (m/s)	Capacity between 345 and 689 kPag (ACMH)(1)	Max velocity rating at 689 kPag or greater (m/s)	Capacity at max rated velocity (ACMH)(1)
400	15.2	6,465	30.5	12,930
450	15.2	7,917	30.5	15,835
500	15.2	10,301	30.5	20,603
600	15.2	15,027	30.5	30, 055
750	13.7	21,406	26	40,433

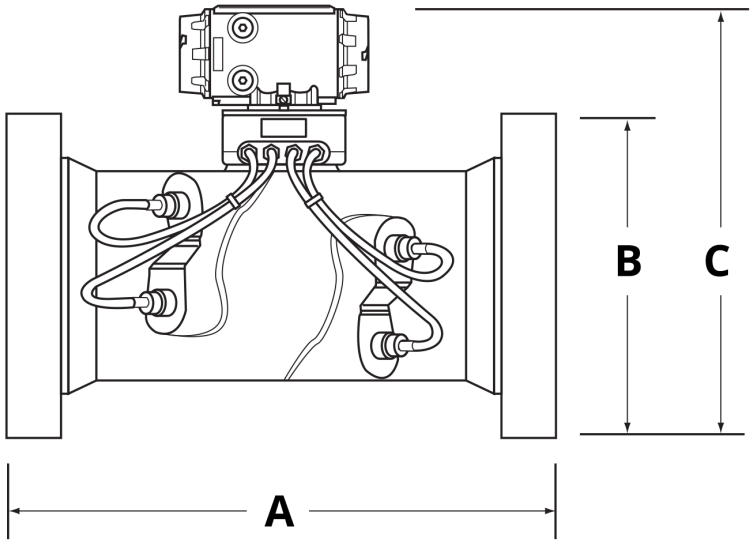
Table 16: Recommended Maximum Velocity for DN400 and Larger Line Size Meters (Metric Units) *(continued)*

Nominal meter size (DN)	Max velocity rating at 345 kPag (m/s)	Capacity between 345 and 689 kPag (ACMH)(1)	Max velocity rating at 689 kPag or greater (m/s)	Capacity at max rated velocity (ACMH)(1)
900	11.4	25,907	23	51,814

(1) *Capacities are for meter ID equivalent to Schedule 40 (or STD).*

Weights and dimensions

Figure 9: Meter Dimension Key



To determine the values of A, B and C, see Table 17 and Table 18.

Tables

The Meter Dimension Key diagram (Figure 9) illustrates the meter component measurements that correspond to A, B, and C in the chart below. All weights and dimensions based on standard electronics enclosure. The certified approval drawing will include the actual weights and dimensions.

Table 17: Weights and Dimensional Data (US Customary Units) [Line Sizes 4 to 6 in. Port Angle = 45°] [Line Sizes 8 to 26 in. Port Angle = 60°] [Line Sizes 30 to 36 in. Port Angle = 75°]

Nominal line size (in.)		4	6	8	10	12	14	16	18	20	24	26	30	36
300 ANSI	Weight (lb.)	365	445	445	605	765	CF	1,255	CF	1,875	2,415	CF	CF	CF
	A (in.)	29	29.5	21.5	24.5	26	CF	30	31.5	35.5	39	40.5	CF	CF
	B (in.)	10	12.5	15	17.5	20.5	CF	25.5	28	30.5	36	38.3	CF	CF
	C (in.)	18.6	20.7	22.9	25.4	27.9	CF	32.1	34.2	36.6	41.6	44.9	CF	CF
600 ANSI	Weight (lb.)	395	515	665	785	915	CF	1,475	1,655	2205	3,235	CF	5,135	CF
	A (in.)	29	29.5	21.5	24.5	26	CF	30	31.5	35.5	39	47	38.8	43.75
	B (in.)	10.8	14	16.5	20	22	CF	27	29.3	32	37	40	44.5	51.8
	C (in.)	19	21.4	23.7	26.7	28.6	CF	32.8	34.8	37.3	42.1	45.6	50.2	56.2
900 ANSI	Weight (lb.)	394	754	814	1,194	1,644	CF	2,644	2,414	3,484	5,824	CF	6,740	CF
	A (in.)	31	37	27.5	30.5	34.5	CF	41.5	36	37	52	CF	45.5	CF
	B (in.)	11.5	15	18.5	21.5	24	CF	27.8	31	33.8	41	CF	48.5	CF
	C (in.)	19.3	22.3	25.2	27.7	30.4	CF	34.1	36.3	39.5	45.3	CF	52.4	CF

Table 17: Weights and Dimensional Data (US Customary Units) [Line Sizes 4 to 6 in. Port Angle = 45°] [Line Sizes 8 to 26 in. Port Angle = 60°] [Line Sizes 30 to 36 in. Port Angle = 75°] *(continued)*

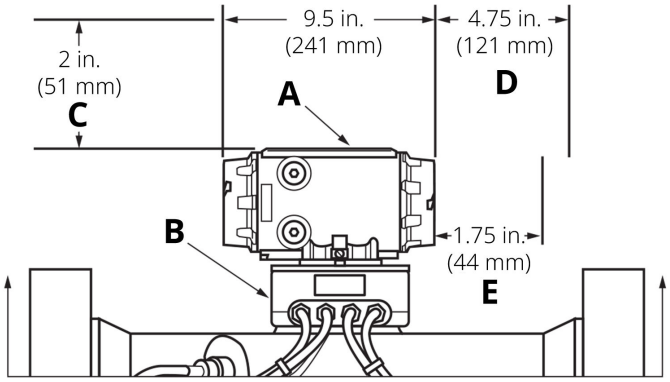
Nominal line size (in.)		4	6	8	10	12	14	16	18	20	24	26	30	36
1500 ANSI	Weight (lb.)	434	854	914	1,464	2,204	CF	3,584	CF	CF	CF	CF	CF	CF
	A (in.)	31	37	27.5	30.5	34.5	CF	41.5	CF	60	68	CF	CF	CF
	B (in.)	12.3	15.5	19	23	26.5	CF	32.5	CF	38.8	46	CF	CF	CF
	C (in.)	19.7	22.4	25.4	28.4	31.7	CF	36.4	CF	42	47.8	CF	CF	CF

Table 18: Weights and Dimensional Data (Metric Units) [Line Sizes DN100 to DN150 Port Angle = 45°] [Line Sizes DN200 to DN650 Port Angle = 60°] [Line Sizes DN750 to DN900 Port Angle = 75°]

Nominal line size (DN)		100	150	200	250	300	350	400	450	500	600	650	750	900
DN 50	Weight (kg)	166	202	202	274	347	CF	569	CF	850	1,095	CF	CF	CF
	A (mm)	736.6	749.3	546.1	622.3	660.4	CF	762	800.1	901.7	990.6	1,029	CF	CF
	B (mm)	254	318	381	444.5	520.7	CF	647.7	711.2	774.7	914.4	973	CF	CF
	C (mm)	472	526	582.7	645	709	CF	814.3	869	930	1,057	1,141	CF	CF
DN 100	Weight (kg)	179	234	302	356	415	CF	669	751	1,000	1,467	CF	2,329	CF
	A (mm)	737	749	546	622	660	CF	762	800	902	991	1194	985	1,111.2
	B (mm)	273	356	419	508	559	CF	686	743	812.8	939.8	1016	1,130	1,314.5
	C (mm)	481.3	544.6	601.7	677.9	727.2	CF	833.4	884.5	947.7	1,068.6	1,157.5	1,275	1,428
DN 150	Weight (kg)	179	342	370	542	746	CF	1,199	1,095	1,580	2,642	CF	3057	CF
	A (mm)	787.4	940	698.5	774.7	876.3	CF	1,054	914.4	939.8	1,321	CF	1,156	CF
	B (mm)	292.1	381	469.9	546.1	609.6	CF	705	787.4	857.3	1,041.4	CF	1,231.9	CF
	C (mm)	490	566	640	703.3	773.2	CF	866	922.3	1,002	1,150.9	CF	1,332	CF
DN 250	Weight (kg)	197	387	415	664	1,000	CF	1,626	CF	CF	CF	CF	CF	CF
	A (mm)	787	940	699	775	876	CF	1,054	CF	1,524	1,727	CF	CF	CF
	B (mm)	292	381	470	546	610	CF	706	CF	984.3	1,168	CF	CF	CF
	C (mm)	500	569	645	721	805	CF	925	CF	1,066	1,213	CF	CF	CF

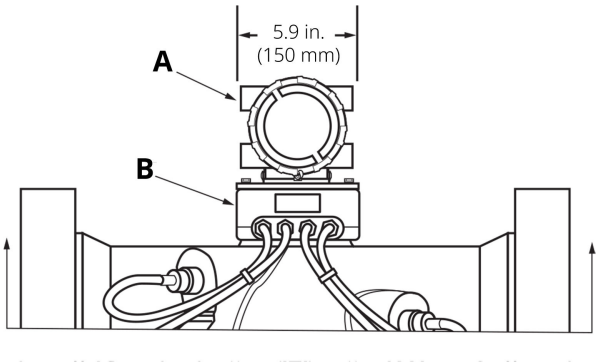
CF: Consult factory

Figure 10: Position of Enclosure Housing



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

Figure 11: Optional Position of Enclosure Housing[8]



A. Enclosure housing
B. Enclosure base

Dimensions are in inches (millimeters).

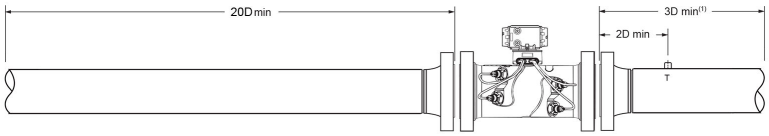
(8) Enclosure housing may be rotated 360 degrees in 90 degree increments

Recommended installation

Recommended pipe lengths

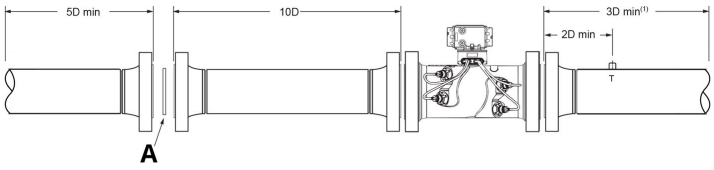
The drawings below represent recommended minimum pipe lengths for the installation of the Rosemount SeniorSonic 3414 Gas Ultrasonic Flow Meter. Consult an Emerson Ultrasonics technical specialist for installation recommendations for the specific application. Other lengths or flow conditioners can be accommodated.

Figure 12: Piping Recommendation for Gas Ultrasonic Meter (No Flow Conditioner)



3D min(1) = Additional pipe length may be required for additional taps (i.e., sample probe, test well, etc.).

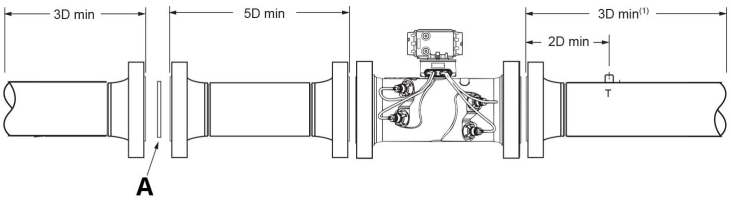
Figure 13: Piping Recommendation for Gas Ultrasonic Meter with a Flow Conditioner



A. Approved flow conditioner - Consult local metrology agencies for approvals

3D min(1) = Additional pipe length may be required for additional taps (i.e., sample probe, test well, etc.).

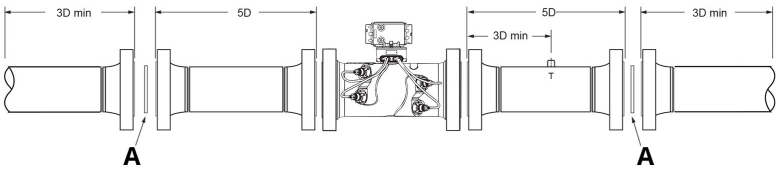
Figure 14: Piping Recommendation for Gas Ultrasonic Meter with a Flow Conditioner (Compact Installation)(9)



A. Approved flow conditioner - Consult local metrology agencies for approvals

3D min(1) = Additional pipe length may be required for additional taps (i.e. sample probe, test well, etc.).

Figure 15: Piping Recommendation for Bi-directional Gas Ultrasonic Meter with Flow Conditioners (Compact Installation)(9)



A. Approved flow conditioner - Consult local metrology agencies for approvals

Note

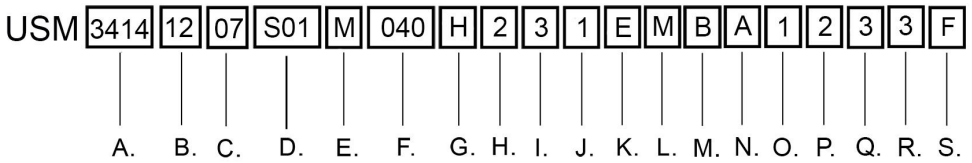
- For best results, flow conditioning is recommended
- D = Nominal pipe size in inches (i.e., 6-in. pipe size; 10D = 60 in.)

(9) Longer upstream lengths can increase long term baseline diagnostics stability. This configuration not applicable to OIML installations.

- T = Temperature measurement location
- Pressure measurement location provided on meter body

Configurator code

This is an example of a configurator code. This is for informational purposes only. Not every option is listed and some options are contingent on others. For assistance designing your optimal meter, consult factory.



A. Device (see Table 19)

B. Line size (see Table 20)

C. Pressure rating (see Table 21)

D. Flange type (see Table 22)

E. Body and flange material (see Table 23)

F. Schedule (pipe bore) (see Table 24)

G. Transducer assembly (see Table 25)

H. Enclosure type (see Table 26)

I. Pressure taps (see Table 27)

J. Conduit type (see Table 28)

K. Electronics mounting (see Table 29)

L. CPU/Displays/Keys (see Table 30)

M. Expansion module (see Table 31)

N. Wireless (see Table 32)

O. Tagging format (see Table 33)

P. Tagging language (see Table 34)

Q. Pressure Directive Certification (see Table 35)

R. Electrical approvals (see Table 36)

S. Metrology approval (see Table 37)

Table 19: Device

Code	Description
3414	3414 4-Path

Table 20: Line Size

Code	Description
04	DN100 (4 in.)
06	DN150 (6 in.)
08	DN200 (8 in.)
10	DN250 (10 in.)
12	DN300 (12 in.)
14	DN350 (14 in.)
16	DN400 (16 in.)
18	DN400 (18 in.)
20	DN500 (20 in.)
24	DN600 (24 in.)
26	DN650 (26 in.)
30	DN750 (30 in.)
36	DN900 (36 in.)(1)

(1) *Consult factory on meter sizes above DN900 (36 in.).*

Table 21: Pressure Rating

Code	Description
03	PN 50 / ANSI 300
05	PN 100 / ANSI 600
06	PN 150 / ANSI 900
07	PN 250 / ANSI 1500
08	PN 420 / ANSI 2500

Table 22: Flange Type

Code	Description
S01	RF / RF
S02	RTJ / RTJ
S03	FEFA / FEFA
S04	Compact flange (special)

Table 23: Body and Flange Material

Code	Description
M(1)	Cast: LCC / Carbon Steel / SS / Duplex
F(1)	Forged: Carbon Steel / 316 SS / Duplex SS

(1) *Consult factory for specific model code for desired material.*

Table 24: 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

Table 25: Transducer Assembly

Code	Description
4	T200 [–40 °F to +257 °F (–40 °C to +125 °C)] - Inconel Stalk, FKM O-ring(1)
5	T200 [–58 °F to +257 °F (–50 °C to +125 °C)] - 316/316L SS Standard Stalk, NBR O-ring(1)
6	T200 [–40 °F to +257 °F (–40 °C to +125 °C)] - 316/316L SS Standard Stalk, FKM O-ring(1)
G	T-21 [–4 °F to +212 °F (–20 °C to +100 °C)] - Standard Mounts / Holders, NBR O-ring

Table 25: Transducer Assembly *(continued)*

Code	Description
I	T-22 [–58 °F to +212 °F (–50 °C to +100 °C)] - Isolated Standard Mounts / 316L Holders, NBR O-ring
J	T-21 [–4 °F to +212 °F (–20 °C to +100 °C)] - Inconel Mounts / 316L Holders, NBR O-ring
L	T-21 [–4 °F to +212 °F (–20 °C to +100 °C)] - Inconel Mounts / Inconel Holders, FKM O-ring
N	T-41 [–58 °F to +212 °F (–50 °C to +100 °C)] - Standard Mounts / Holders, NBR O-ring
O	T-21 [–4 °F to +212 °F (–20 °C to +100 °C)] - Inconel Mounts/316L Holders, FKM O-ring
Z	T-22 [–40 °F to +212 °F (–40 °C to +100 °C)] - Isolated Inconel Mounts / Inconel Holders, FKM O-ring

Table 26: Enclosure Type

Code	Description
1	Standard Aluminum
2	Optional Stainless Steel
3	Optional (Retrofit) Aluminum(1)

(1) *Expansion module selections D, E, and F only available with aluminum retrofit enclosure. Retrofit enclosure only available with electrical approval selections 1 and 2.*

Table 27: Pressure Taps

Code	Description
1	½–in. NPT
3	Pipette

Table 28: Conduit Type

Code	Description
1	¾–in. NPT
2	M20 (reducers required)

Table 29: Electronics Mounting

Code	Description
A	Integral mount [up to +140 °F (+60 °C)]
B	Remote mount with 15-foot cables
E	Integral mount [up to +140 °F (+60 °C)] with armored cables
F	Remote mount with 5-foot armored, covered cable

Table 30: CPU/Display

Code	Description
J	I/O Type 4 (6 Frequency/Digital Outputs, 1 Analog Output)
K	I/O Type 4 (6 Frequency/Digital Outputs, 1 Analog Output)

Table 31: Expansion Module

Code	Description
A	None
B	One Serial RS232

Table 31: Expansion Module *(continued)*

Code	Description
C	One Serial RS485
D	Two Serial RS232(1)
E	Two Serial RS485 (2-wire)(1)
F	Serial RS232 and Serial RS485(1)
G	Expansion I/O Module
H	Serial RS-232 and Expansion I/O Module(1)
J	Serial RS-485 (2-wire) and Expansion I/O Module(1)

(1) *Expansion module selections D, E, and F only available with aluminum retrofit enclosure. Retrofit enclosure only available with electrical approval selections 1 and 2.*

Table 32: Wireless

Code	Description
A	None
B	THUM

Table 33: Tagging Format

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

Table 34: Tagging Language

Code	Description
1	English
2	French
3	Russian
4	Chinese

Table 35: Pressure Directive Certification

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

Table 36: Electrical Approvals

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

Table 36: Electrical Approvals *(continued)*

Code	Description
3	INMETRO
4	Russia (EAC)

Table 37: Metrology Approval

Code	Description
A	None
B	European Union - MID Directive
C	China (CPA-2005-F101)
D	Brazil (INMETRO)
F	Russia (EAC)

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