MPU™ 1600c

Bulletin SSKS009 Issue/Rev. 0.3 (1/24)

Gas Ultrasonic Flowmeter

The MPU 1600c ultrasonic gas flowmeter is our most advanced solution for custody-transfer gas-flow measurement with minimal pressure drops and only a 5-diameter (D) upstream straight run required. The meter's path geometry enables the cancellation of swirl velocities for installations without flow conditioning. Combined with the enhanced features of the next generation Series C electronics, the MPU 1600c is the leader in ultrasonic gas-flow measurement accuracy, diagnostic intelligence, and installation flexibility.

Principle of Operation

The MPU 1600c calculates flow rates by measuring the acoustic transit time of ultrasonic signals traveling back and forth across the flow. The signal transmission and detection is achieved using two piezoelectric transducers located on each side of the measurement path. The high-speed electronics measure the transit time in both the upstream and downstream directions. This information is used to accurately calculate the flowing velocity and volumetric flow rate of gas through the meter.

Features

- Cancellation of swirl—The eight-path design meets International Organization of Legal Metrology (OIML) R137 accuracy class 0.5 with just 5D upstream straight run from a double elbow out of plane disturbance without the use of a flow conditioner.

Features

- Accuracy—The nominal accuracy is +/-0.1% and repeatability of +/-0.05% or better with flow calibration.
- On-board memory for diagnostic analysis—The eight gigabytes (GB) of memory is enough storage for 28 days worth of process data. A detailed diagnostic analysis of process conditions and meter operation is possible following any process upset or alarm condition by simply downloading the file; no logging time necessary.
- Compliance to international standards—The MPU 1600c has been field tested and verified to AGA-9 Welmec 7.2, OIML R137-1 and 2 and ISO 17089 performance specifications.
- Advanced noise immunity—The digital-signal filtering and processing enhances noise immunity, enabling accurate measurement in difficult, high-noise installations.
- Integrated or remote color touchscreen display—The optional color touchscreen display can be attached as the front panel of the meter electronics or remotely mounted using the optional wall-mounted display.
- Web-based interface—The meter can be directly accessed with a web browser to serve as the operator-interface display, eliminating the need for specialized software interfacing and improving accessibility and ease of use.
- Low maintenance—The meter does not have any moving parts that need replacement due to wear, providing stable measurement over the life of the meter. Non-intrusive parts help avoid product build-up on equipment.
- In-line transducer replacement—The transducers can easily and safely be removed under pressure using a transducer retraction tool with isolation valves, eliminating the need for process shut-down or recalibration due to servicing.

Options

Integrated or remote color touchscreen display—The optional color touchscreen display can be attached as the front panel of the meter electronics or remotely mounted using the optional wall-mounted display.

Operating Specifications								
Size	**Velocity (meters per second (m/s))**		**Velocity (feet per second (ft/s))**		**Flow Rate (actual cubic meters per hour (am^3/h))**		**Flow Rate (actual cubic feet per hour ((aft^3/h))**	
	Minimum	**Maximum**	**Minimum**	**Maximum**	**Minimum**	**Maximum**	**Minimum**	**Maximum**
6"	0.40	30.0	1.31	98.4	27	2,010	954	70,982
8"	0.40	30.0	1.31	98.4	47	3,485	1,660	123,071
10"	0.40	30.0	1.31	98.4	73	5,495	2,578	194,054
12"	0.40	30.0	1.31	98.4	105	7,880	3,708	278,279
16"	0.40	30.0	1.31	98.4	170	12,730	6,003	449,555
20"	0.30	30.0	0.98	98.4	200	20,280	7,063	716,181
24"	0.30	30.0	0.98	98.4	300	29,580	10,594	1,044,607
30"	0.30	30.0	0.98	98.4	470	46,820	16,598	1,653,432
36"	0.20	25.0	0.66	82.0	450	56,670	15,892	2,001,282
48"	0.20	25.0	0.66	82.0	815	101,810	28,781	3,595,386
60"	0.20	25.0	0.66	82.0	1,280	160,090	45,203	5,653,524

Actual volumetric flow rates (AVF) correspond to conditions of actual temperature and pressure. For volumetric flow in units of standard volumetric flow (SVF), use the following equation:

$$SVF = AVF\left(\frac{Pactual}{Pstandard}\right)\left(\frac{Tstandard}{Tactual}\right)$$

where:

- SVF = Volumetric flow at standard conditions
- AVF = Volumetric flow at nonstandard conditions
- Tstandard = Temperature at standard conditions
- Pstandard = Pressure at standard conditions
- Tactual = Temperature at nonstandard conditions
- Pactual = Pressure at nonstandard conditions

Flow rates calculated for schedule STD pipe; other schedules will vary. Consult the factory for additional pipe sizes and schedules, as well as flow velocities outside of the normal minimum and maximum values.

Operating Pressure Range

The operating pressure range is 1-275 bar absolute (bar_a)/15 to 3,990 pounds per square inch absolute (psi_a)

Consult the factory for pressures up to 350 bar.

Maximum Working Pressure		
ASME Flange Class	**Carbon Steel**	**Stainless Steel**
150	285 psi (20 bar)	275 psi (19 bar)
300	740 psi (51 bar)	720 psi (50 bar)
600	1,480 psi (102 bar)	1,440 psi (99 bar)
900	2,220 psi (153 bar)	2,160 psi (149 bar)
1500	3,703 psi (255.3 bar)	3,600 psi (248 bar)

Nominal Accuracy

For OIML R137-1 Accuracy Class 0.5 with 5D upstream and no flow conditioning:

- Without flow calibration: ≤ ±0.35% of measured value sizes 12 inches (") and larger; ≤ ±0.5% of measured value sizes 10" and smaller
- With flow calibration: ≤ ±0.1% of measured value
- Repeatability: ≤ ±0.05% of measured value

Weights and Measures Approvals and Compliance

WELMEC 7.2

OIML R137-1

American Gas Association (AGA) Report No. 9

ISO 17089-1

Temperature Range of Process Fluid Temperature	
Gas temperature	-4 to 158 °F (-20 to 70 °C)
Ambient temperature	-13 to 140 °F (-25 to 60 °C)
Storage temperature	-40 to 140 °F (-40 to 60 °C)

Standard Flange Connections

Typically, this flowmeter uses American National Standards Institute (ANSI) B16.5 raised face (RF) or ring-type joint (RTJ) face flanges. Other flange type connections are available on request.

NACE Compliant

This flowmeter is designed for National Association of Corrosion Engineers (NACE) International Standard MR0175 compliance.

Meter Body and Flanges Material

- Carbon steel: A350 LF2
- Stainless steel: A182 F316

For other options, consult the factory.

Transducer

This meter has a piezoelectric element that is fully encapsulated in a titanium housing. A special solution is necessary for hydrogen sulfide (H_2S) and hexanes and heavier (C_6+) applications.

Instrument Power

This flowmeter uses direct current (DC) instrument input power to field-mounted electronics with 24 volts direct current (VDC), +20% to -15%, 0.5 ampere (amp) without an integrated display or 0.7 amp with an integrated display.

The power inrush is 10 amps for less than 20 milliseconds (ms) at 24 VDC. The DC power input circuitry is reverse-current protected and fused.

The unit is tested to 20 ms power dropout and 100 ms power brownout without shutdown. The meter restarts orderly after power loss.

Electrical Inputs

Digital Inputs

Quantity: Two

Function:

- Input 1—Consult the factory
- Input 2—Dedicated to external weights and measures switch input

Type: Optically isolated, internally current limited digital input

Input voltage range (volt (V)-high): 5 to 28 VDC

Maximum input frequency: 10 kilohertz (kHz)

V (high): 5.5 VDC minimum to 28 VDC maximum

V (low): 1 VDC maximum

Note: The input pulse must rise above V (high minimum) for a period of time, then fall below V (low) to be recognized as a pulse.

Current at maximum voltage: 20 milliamperes (mA)

Maximum input impedance: 1.67 kiloohm

Analog Input (4-20 mA)

Quantity: Two

Type: Two-wire, 4-20 mA current loop receiver, common neutral isolated from system ground, configurable as to function

Span adjustment: 3.8 to 22 mA span, user-configurable inside these limits

Input burden: 50 ohms

Resolution: 24 bits

Voltage drop: 2 V maximum

Recommended cable: Belden 8729, 9940, or equivalent

Analog Input (Temperature Probe—Resistance Temperature Detector (RTD))

Quantity: One

Type: Four-wire, 100-ohm platinum-resistance temperature detector (PRTD)

Temperature coefficient: 0.00385 ohm/ohm/°C at 0 °C

Temperature range: -60 to 180 °C

Offset: Temperature probe offset is user configurable

Self calibrating: Lead-length compensation that does not require resistance balancing of leads

Electrical Output Communications

Ethernet

Quantity: Two

- IEEE 802.3 Ethernet operating at 10/100 megabits per second (Mbps)
- Modbus transmission control protocol/internet protocol (TCP/IP) at port 502

10/100Base-TX (Ethernet Over Twisted Pair)

Quantity: One if integrated display is fitted

- Automatic medium dependent interface crossover (MDI-X) interface works with straight or crossover cable automatically
- RJ-45 connector per port
- Maximum distance between Ethernet devices is 100 meters (m) (328 feet (ft))
- Recommended cable is Category 5 or better

100Base-FX (Ethernet over fiber optic)

Quantity: One

- 1300-nanometer (nm) wavelength mechanical transfer registered jack (MT-RJ) connector
- Maximum distance between Ethernet devices is is two kilometers (km) (6,561 ft)

Note: Optical losses in cables, connectors, and couplers can reduce this maximum limit.

- Recommended cable is one pair 62.5/125 micrometer (µm) multimode glass
- Transmitter output minimum optical power is -20 decibel volt (dBV) average
- Receiver input minimum optical power is -31 decibel milliwatts (dBm) average optical power budget (OPB) at 0.5 km with 9 decibel recommended cable
- OPB at 2 km with 6 decibels (dB) recommended cable

Serial Communication

Quantity: One

EIA-485 port: Two wire

Termination: 120-ohm endpoint termination resister included in circuit, user selectable via jumper

Configuration: Multidrop network

Line protocol: Half duplex

Data rate: Selectable asynchronous data (Baud) rates of 1200, 2400, 4800, 9600,19200, 38400, 57600, or 115200 bits per second (bps)

Word length: 7 or 8 bits

Parity: None, odd, or even

Protocol: Modbus remote terminal unit (RTU) or Modbus American Standard Code for Information Interchange (ASCII)

Recommended cable: Belden 3106A, 9841, or equivalent low capacitance cable

HART

The optional Highway Addressable Remote Transducer (HART) interface operates over the 4-20 mA analog output and supports the following commands.

All universal commands:

- Read up to four dynamic variables
- Read and write Tag name
- Read range values and sensor limits
- Read and write user messages and dates

Common practice commands required for:

- Selection of engineering units
- Burst mode control

Digital/Pulse Outputs

Quantity: Two

Volume output: Configurable K-factor

Configuration selections:

1. Quadrature (I, Q)
2. Pulse (forward, reverse)
3. Pulse (pulse, direction)
4. Pulse (pulse, direction inverted)

Type: Current-limited active output or open collector; jumper selectable

Switch-blocking voltage (switch off): 30 VDC maximum

Frequency range: 0 to 10 kHz nominal, over range up to 15 kHz

Minimum pulse width: > 66 microseconds (µs) (50% duty cycle nominal)

24-VDC input power supply: No load of 23 ±0.3 volts peak-to-peak (Vpp) square wave

270-ohm load: 12 ±0.3 Vpp square wave (minimum)

12-VDC external power supply for pulse output circuitry: No load of 11 ±0.3 Vpp square wave

270-ohm load: 6 ±0.3 Vpp square wave (minimum)

Current: Maximum sink current of 300 mA @ 29 VDC

Maximum source current: 80 mA @ 29 VDC

Recommended cable: Belden 9402; up to 2,000 ft use 20 American Wire Gauge (AWG), up to 3000 ft use 18 AWG. Shielded cable is recommended with the shield connected only at the receiving instrument. When using dual (quadrature) pulse output, the two conductors carrying the outputs must not be in the same pair and should ideally be individually shielded.

Analog Output (4-20 mA)

Quantity: One

Type: Two-wire, loop powered, isolated from ground, user configurable as to function

Span adjustment: 3.8 to 21 mA

User adjustable alarm output: 22.5 mA

Resolution: 16 bits

Compliance voltage range: 6 to 28 VDC

Maximum load resistance @ 10 VDC: 250

Recommended cable: Belden 8729, 9940, or equivalent

Alarm Output

Quantity: One

Type: Optically isolated solid-state output

Polarity: Open during alarm and power off

Switch blocking voltage: 30 VDC maximum

Load current: 125 mA maximum with 0.6 V drop

Safety Classification

Model (Ultrasonic Transducer)

Explosion/flame-proof certifications: Underwriter Laboratories (UL), Canadian Underwriter Laboratories (CUL), ATEX, and International Electrotechnical Commission System for Certification to Standards Relating to Equipment for Use in Explosive (IECEx)

ATEX (European Community)

PTB 07 ATEX 1018 Ex d IIC T4/T5
Type US-A -40 to 80 °C Type US-B -55 to 100 °C IP66 enclosure

Note: Transducers US-A and US-B are included in the IECEx (global approach) and are listed by UL for North America; see Model UTS.

Model UTS (Ultrasonic Transducer System)

ATEX (European Community)

DEMKO 09 ATEX 0907098X

Ex d IIB T4/T5 Gb

UTS-GA -40 to 80 °C

UTS-GB -55 to 100 °C IP66 enclosure

IECEx (Global Approach)

IECEx UL 09.0023X

Ex d IIB T4/T5 Gb

UTS-GA -40 to 80 °C

UTS-GB -55 to 100 °C

IP66 enclosure

INMETRO (Brazil) UL-BR 19.00079X (same ratings as IECEx)

UL/CUL (North American)

UL File E23545

Class I, Division 1, Groups C & D; Class I, Zone 1, Groups IIB

Type 4X

UTS-GA -40 to 80 °C

UTS-GB -55 to 100 °C

Electronics Enclosure: Ultrasonic Meter Control (UMC)

Explosion/flame-proof certification UL, C-UL, ATEX, IECEx

ATEX (European Community)

DEMKO 13 ATEX 1204991X

Ex d ia op is IIB T5 Gb (Um = 250v) IP66 enclosure

Temperature ambient (Tamb) = -40 to 60°C (display version)

Ex d op is IIB T5 Gb IP66

Tamb = -40 to 60°C (non-display version)

IECEx (Global Approach)

IEC Ex UL 13.0019X

Ex d ia op is IIB T5 Gb (Um = 250v) IP66 enclosure

Tamb = -40 to 60 °C (display version)

Ex d op is IIB T5 Gb IP66 enclosure

Tamb = -40 to 60 °C (non-display version)

INMETRO (Brazil) UL-BR 19.00087X (Same ratings as IECEx)

UL/CUL (North American)

UL File E23545

Class I, Division 1, Groups C & D; Class I, Zone 1, Groups IIB T5, IP66 enclosure

Tamb = -40 to 55 °C (display version)

Tamb = -40 to 60 °C (non-display version)

Remote Mounted Display: Touch Screen Control Interface (TCI)

Explosion/flame-proof certification UL, C-UL, ATEX, IECEx

ATEX (European Community)

DEMKO 13 ATEX 1204991X

Ex d ia op is IIB T5 Gb (Um = 250v) IP66

Tamb = -40 to 60 °C (display version)

IECEx (Global Approach)

IECEx UL 13.0019X

Ex d ia op is IIB T5 Gb (Um = 250v) IP66 enclosure

Tamb = -40 to 60 °C (display version)

UL/CUL (North American)

UL File E23545

Class I, Division 1, Groups C & D; Class I, Zone 1, Groups IIB T5, IP66 enclosure

Tamb = -40 to 55 °C (display version)

Electronic Enclosure: (UMH)

Flame-proof certifications ATEX and IECEx only.

ATEX (European Community)

BVS 17 ATEX E 052 X

Ex db op is IIB + H_2 T5

Tamb = -50 to 60 °C

IECEx (global approach)

IECEx BVS 17.0046X

Ex db op is IIB + H_2 T5

Tamb = -50 to 60 °C

Pressure Safety Information

American Society of Mechanical Engineers (ASME)

Designed to ASME B31.3/ASME Section VIII Division 1.

Canadian Registration Number (CRN)

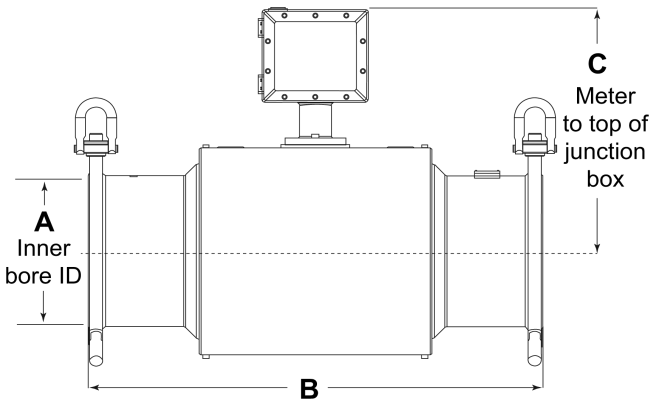
CRN certificates are available; consult the factory for the issuing provinces.

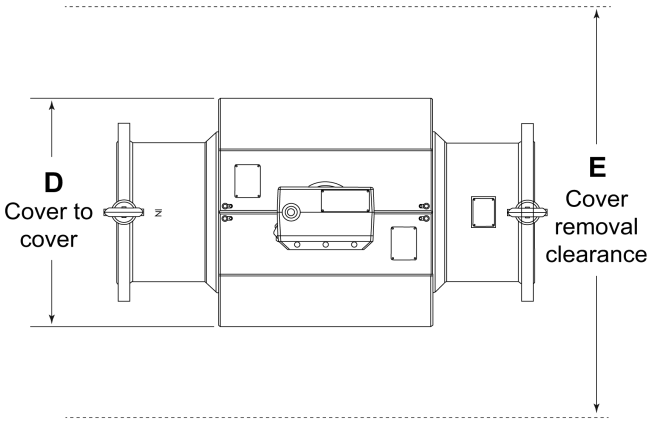
Pressure Equipment Directive (PED)

EU Declaration of conformity is available; consult the factory.

Dimensions and Weight

Dimensions are in inches (") to the nearest tenth (millimeters (mm) to the nearest whole mm). Each drawing is independently dimensioned from respective engineering drawings. Weight is measured in pounds (lb) (kilograms (kg)). For custom inside diameter (ID), larger sizes, other flange types, classes, and ASME 900, 1500 Class, consult the factory.





ASME Class 150 Flange						
Size	**A**	**B**	**C**	**D**	**E**	**Weight**
6"	5.761" (146.3 mm)	29.0" (737 mm)	18.5" (470 mm)	15.7" (398 mm)	32" (813 mm)	466 lb (202 kg)
8"	7.625" (193.7 mm)	33.5" (850 mm)	19.4" (493 mm)	19.7" (499 mm)	40" (1,016 mm)	674 lb (305 kg)
10"	9.562" (242.9 mm)	37.0" (940 mm)	20.3" (516 mm)	20.6" (524 mm)	42" (1,067 mm)	859 lb (390 kg)
12"	11.374" (288.9 mm)	39.0" (990 mm)	21.3" (541 mm)	22.6" (575 mm)	46" (1,168 mm)	1,090 lb (494 kg)
16"	14.312" (363.5 mm)	43.3" (1,100 mm)	22.8" (579 mm)	26.0" (661 mm)	53" (1,346 mm)	1,360 lb (616 kg)
20"	17.938" (455.6 mm)	45.5" (1,156 mm)	24.6" (624 mm)	30.5" (775 mm)	62" (1,575 mm)	2,325 lb (1,054 kg)
24"	21.562" (547.7 mm)	52.6" (1,337 mm)	26.6" (675 mm)	35.2" (893 mm)	71" (1,803 mm)	3,380 lb (1,533 kg)
30"	27.500" (698.5 mm)	66.25" (1,682 mm)	29.8" (757 mm)	44.5" (1,130 mm)	55" (1,397 mm)	5,516 lb (2,502 kg)

ASME Class 300 Flange						
Size	**A**	**B**	**C**	**D**	**E**	**Weight**
6"	5.761" (146.3 mm)	29.0" (737 mm)	18.5" (470 mm)	15.7" (398 mm)	32" (813 mm)	500 lb (226 kg)
8"	7.625" (193.7 mm)	33.5" (850 mm)	19.4" (493 mm)	19.7" (499 mm)	40" (1,016 mm)	715 lb (324 kg)
10"	9.562" (242.9 mm)	37.0" (940 mm)	20.3" (516 mm)	20.6" (524 mm)	42" (1,067 mm)	930 lb (421 kg)
12"	11.374" (288.9 mm)	39.0" (990 mm)	21.3" (541 mm)	22.6" (575 mm)	46" (1,168 mm)	1,200 lb (544 kg)

ASME Class 300 Flange						
16"	14.312" (363.5 mm)	43.3" (1,100 mm)	22.8" (579 mm)	26.0" (661 mm)	53" (1,346 mm)	1,485 lb (673 kg)
20"	17.938" (455.6 mm)	45.5" (1,156 mm)	24.6" (624 mm)	30.5" (775 mm)	62" (1,575 mm)	2,485 lb (1,127 kg)
24"	21.562" (547.7 mm)	52.6" (1,337 mm)	26.6" (675 mm)	35.2" (893 mm)	71" (1,803 mm)	3,510 lb (1,592 kg)
30"	27.500" (698.5 mm)	66.25" (1,682 mm)	29.8" (757 mm)	44.5" (1,130 mm)	55" (1,397 mm)	6,100 lb (2,767 kg)

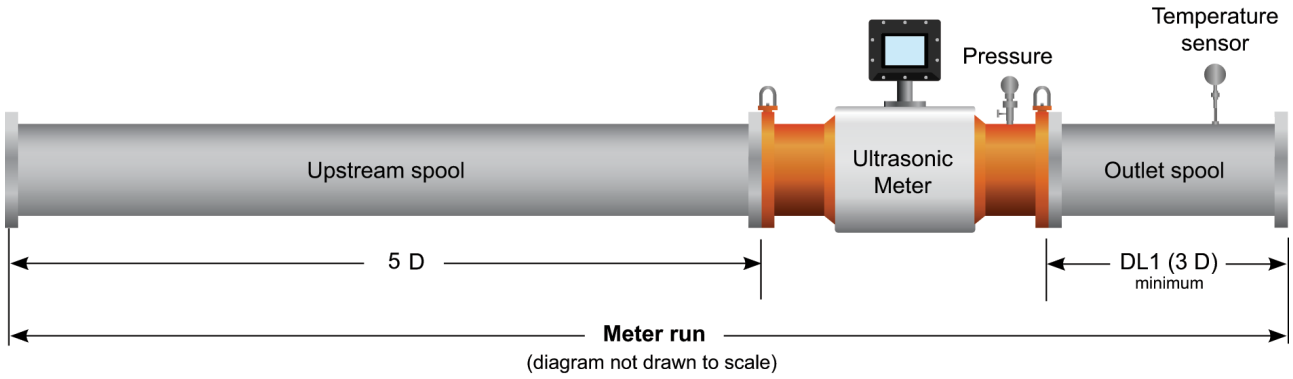
ASME Class 600 Flange						
Size	**A**	**B**	**C**	**D**	**E**	**Weight**
6"	5.761" (146.3 mm)	29.0" (737 mm)	18.5" (470 mm)	15.7" (398 mm)	32" (813 mm)	546 lb (248 kg)
8"	7.625" (193.7 mm)	33.5" (850)	19.4" (493)	19.7" (499)	40" (1,016 mm)	791 lb (359 kg)
10"	9.562" (242.9 mm)	37.0" (940 mm)	20.3" (516 mm)	20.6" (524 mm)	42" (1,067 mm)	1,058 lb(480 kg)
12"	11.374" (288.9 mm)	39.0" (990)	21.3" (541)	22.6" (575)	46" (1,168 mm)	1,306 lb (592 kg)
16"	14.312" (363.5 mm)	43.3" (1,100 mm)	22.8" (579 mm)	26.0" (661 mm)	53" (1,346 mm)	1,947 lb (883 kg)
20"	17.938" (455.6 mm)	45.5" (1,156 mm)	24.6" (624 mm)	30.5" (775 mm)	62" (1,575 mm)	2,632 lb (1194 kg)
24"	21.562" (547.7 mm)	52.6" (1,337 mm)	26.6" (675 mm)	35.2" (893 mm)	71" (1,803 mm)	3,776 lb (1713 kg)
30"	27.500" (698.5 mm)	66.25" (1,682 mm)	29.8" (757 mm)	44.5" (1,130 mm)	55" (1,397 mm)	6,600 lb (2,994 kg)

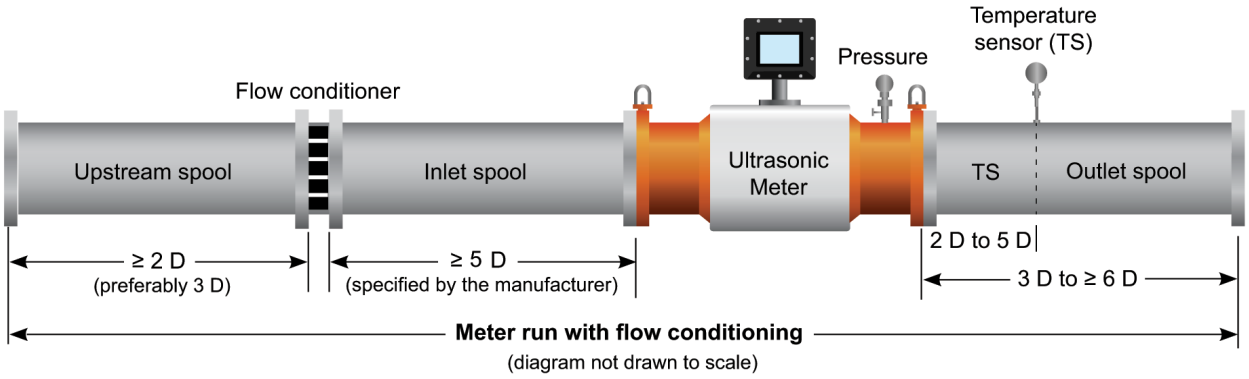
Recommended Installation

Without flow conditioning, the recommended installation for the MPU 1600c is a 5-diameter (D) upstream straight run. For optimum performance, it is recommended to keep partial restrictions or variable flow devices, such as control valves, away from the upstream area. Consult the factory for confirmation of suitability of the upstream piping geometry.

With flow conditioning, the recommended installation is minimum 3 D, then the flow conditioner, then 5 D minimum upstream straight pipe before the meter. Downstream of the meter is minimum 3 D. For bidirectional measurement, the same upstream installation is repeated on both sides of the meter.

The meter run must be the same pipe diameter as the meter inlet and concentrically centered so that neither the pipe edge nor the gasket protrude into the flow stream. For correct centering, it is recommended to use the centering dowel pin provided on the meter flange.





Thermowells, sample probes, and densitometer installation locations should follow the applicable guidelines of AGA9 or ISO 17089 for unidirectional or bidirectional flow.

Catalog Code

The following guide defines the correct ultrasonic flowmeter for a given application and the respective catalog code. This code is part of the ordering information and should be included on the purchase order.

Standard Configuration

- 24 VDC instrument power
- Two 4-20 mA analog inputs
- One 4-wire RTD analog inputs
- One 4-20 mA analog output
- One optically isolated solid-state digital output digital that is dedicated to alarms
- Two digital inputs, one dedicated to weights and measures switch
- Two solid-state pulse outputs (0 to 10 kHz) user-configurable K-factor, quadrature
- Two 2-twisted pair Ethernet cables (10Base-T and 100Base-T)
- One 2-wire EIA-485 serial cable

Ultrasonic Meter Body									
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
MPU16	S	0	6	1	1	S	S	B	S

Position 1: Model

MPU16—MPU 1600c

Position 2: Transducer Hazardous Location Certifications

S—Standard: UL/CUL; ATEX; IECEx

Positions 3 and 4: Diameter

06"

08"

10"

12"

16"

20"

24"

For meter sizes above 24", consult the factory.

Position 5: End Connections

1—Class 150 ASME flange

2—Class 300 ASME flange

3—Class 400 ASME flange

4—Class 600 ASME flange

5—Class 900 ASME flange

6—Class 1500 ASME flange

7—Class 2500 ASME flange (consult the factory)

8—For all DIN nominal pressure (PN) flanges as per European standards, consult the factory.

Position 6: Body Housing Materials

1—Carbon steel

2—316 series stainless steel

X—Special

Position 7: Transducer Material

S—Standard titanium

X—Special

Position 8: Transducer Type

S—Standard transducer

L—Special

Position 9: Mechanical Certification

B—ASME B31.3

P—PED

C—CRN

X—Special

Position 10: Ethernet Connection

S—Standard

Meter Mounted Electronics Enclosure Ultrasonic Meter Control (UMC)								
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
UMC	E	A	P	N	S	0	B	0

Position 1: Hazardous Location Certification

E—Explosion-proof certification UL, CUL, ATEX, IECEx

Position 2: Housing Material

A—Aluminum

S—300-series stainless steel

Position 3: Housing Style

P—Pedestal mount

H—Pedestal mount with height extension (high-temperature product applications)

C—Custom enclosure

Position 4: Housing Electrical Entrances

M—M20 thread

N—½" NPT thread

Position 5: Software

S—Standard UMC software

X—Special

Position 6:

0—Reserved

Position 7: Housing Cover

B—Blind cover

T—5.7" touchscreen

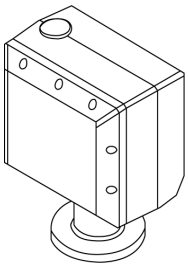
Local display required for MID if integral/remote-mounted display or microFlow.net is not selected.

Position 8: Additional Communication Options

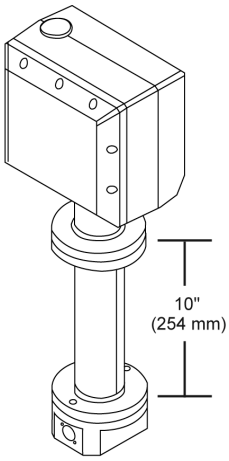
0—None

1—HART

Model	Options and Option Combinations	Maximum Power (based on estimates)
UMC - E - (A or S) - (P or H) - (M or N) - S - 0 - T - (0 or 1)	UMCB board assembly (with display)	14.2 watts (W)
UMC - E - (A or S) - (P or H) - (M or N) - S - 0 - B - (0 or 1)	UMCB board assembly (without display)	6 W



Pedestal mount



Pedestal mount
with height extension

Special sunshade can be made available. Consult the factory for pricing option.

Meter-Mounted Electronic Enclosure: (UMH) Ultrasonic Meter Housing								
	1	2	3	4	5	6	7	8
UMH		H	A	M	S	0	0	0

Position 1: Housing Material

Blank—Aluminum

X—300-series stainless steel

Position 2: Housing Height

H—170 mm

Position 3: Enclosure Type

A—Alternative enclosure

Position 4: Housing Electrical Entrances

M—M20 thread

N—½" NPT thread

Position 5: Software

S—Standard

Position 6:

0—Reserved

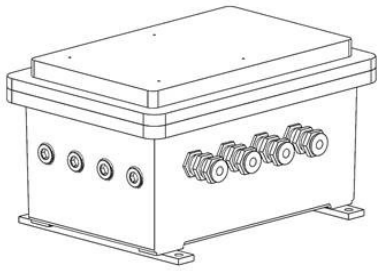
Position 7:

0—Reserved

Position 8: Additional Communication Options

0—None

1—HART



ATEX/IECEx only

Remote Mounted Display with 5.7" TCI					
	1	2	3	4	5
TCI	E	A	S	N	S

Position 1: Hazardous Location Certification

E—Explosion-proof certification UL, CUL, ATEX, IECEx Class I, Division 1, Groups C and D; Exd IIB Zone 1

Position 2: Housing Material

A—Aluminum

S—300-series stainless steel

Position 3: Housing Style

S—Surface mount

Position 4: Housing Entrances

M—M20 thread

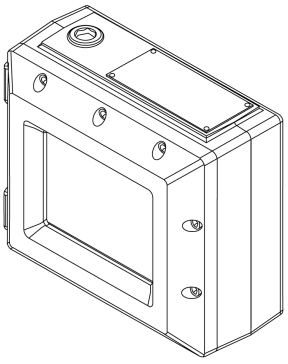
N—½" NPT thread

Position 5: Software

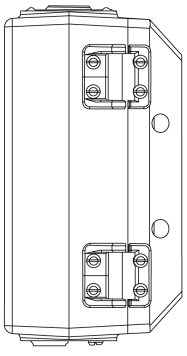
S—Standard

X—Special

Model	Options and Option Combinations	Maximum Power (based on estimates)
TCI - E - (A or S) - S - (M or N) - S	Display board assembly	8 W



Housing with display surface mount



Housing with display side view

The specifications contained herein are subject to change without notice and any user of said specifications should verify from the manufacturer that the specifications are currently in effect. Otherwise, the manufacturer assumes no responsibility for the use of specifications which may have been changed and are no longer in effect.

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