User's Manual

US300PM Ultrasonic Flowmeter

Manual Change No. 15-021-E

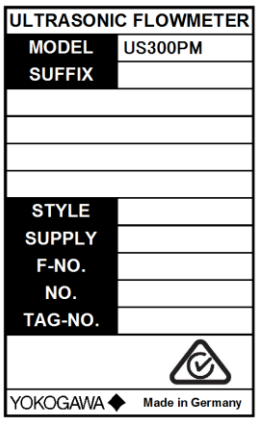
This is the supplement for the original manual (No. IM 01G05B02-01E, 1st Edition) regarding the added and changed items as below. Please also refer to this supplement when you read the manual.

Addition to the chapter "2. Handling Precautions" (page 7) :

Attention!	The instrument must not be used in a corrosive atmosphere.

Changes to the section "2.1 Scope of Delivery" (page 7) and the section "3.4.2 Rear Panel" (page 13):

Change the figure of a nameplate to as below.



Addition to the section "2.3 General Precautions" (page 8) :

- The power supply adapter and the AC cable are dedicated to US300PM. Please do not use them with other devices.
- Do not disassemble or remodel.

Addition to the chapter "4. Getting Started" (page 15) :

Attention!	The current outputs may temporarily turn unstable during the switch-on sequence and parameter display / setting mode. Take care of your process not to be affected by this behavior.

Addition to the section “4.2.1 Key Operations” (page 16) and related pages :

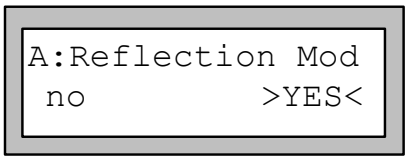
Refer to the following table for the function of corresponding key operations.
The correct explanations for these key operations in the related pages are also as the table below.

Related pages: “16.2 US300PM doesn’t react anymore” (page 113)

BRK – INIT – C ENTER RESET	[Operation during the measurement or menu display] RESET: Press these three keys simultaneously to recover from an error. This has the same effect as restarting the unit. Data will not be affected. INIT (cold start): Press these three keys simultaneously and release **ENTER** first. After acknowledging the display of main menu, release (i) **BRK** key first and then (ii) **C** key. This will initialize the instrument. Most parameters and settings are reset to the factory default values. The memory will not be cleared. Note that when the data logging function is activated, the `DELETE MEAS.VAL.` display will appear instead of main menu. In this case, after releasing (i) **BRK** key first and then (ii) **C** key, select `NO` or `YES` and then press **ENTER** to finish the procedure.
ON BRK – INIT – C	[Operation when powering the instrument on] INIT (coldstart): Pressing these two keys simultaneously and after acknowledging the display of main menu, release (i) **BRK** first and then (ii) **C**. This will initialize the instrument. Most parameters and settings are reset to the factory default values. The same procedure is required as above when the `DELETE MEAS.VAL.` display appears.

Addition to the section “5.6 Selection of the Sound Path Factor” (page 30) :

When you select “auto” for “Sound Path” described at the section “11.2 Settings for Dialogues and Menus”, the setting for the sound path factor will be automatic. In this case, “Reflection Mod” display will appear and you can select either “Diagonal Mode” by “no” or “Reflection Mode” by “yes”.



When the pipe outer diameter is more than 600mm, the sound path factor as “1” (one) is recommended. Otherwise, the measurement may become unstable when flow velocity or fluid temperature changed.

Addition to the section “5.7.2 Mounting of the Transducers” (page 31) :

The pipe wall thickness may slightly vary from part to part. Check it in advance by applying a wall thickness probe or some other ways and avoid mounting the transducers on such parts.

Addition to the section “5.7.2.4 Mounting with Fixtures” (page 32) :

Attention!	When using mounting fixtures, there may arise some air gap between the transducer surface and pipe wall because of any distortion of the pipe wall. Make sure to avoid having such air gap between them.

Addition to the section “6.1 Selection of the Physical Quantity and of the Unit of Measurement” (page 37) :

Attention!	In case of mass flow, select “Other Medium” as a measured fluid. When “Other Medium” has been selected, US300PM requests to enter the density which is used to calculate mass flow.

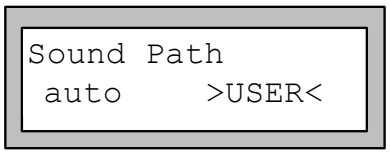
Changes to the section “7.2 Flow Totalizers” (page 41) :

Two of the key operations have been changed as below.

To reset the two flow totalizers to zero:	Press key Q_{ON} **8** three times when a totalizer is displayed.
To deactivate flow totalizing:	Press key **2** Q_{OFF} three times when a totalizer is displayed.

Addition to the section “11.2 Settings for Dialogues and Menus” (page 72) :

“Sound Path” setting appears next to “Meas.Point No.” and you can select “auto” or “user”. When you select “auto”, the setting for the sound path factor will be automatic.



Changes to the section “11.6 Charging the Battery” (page 77) :

Change “The chargeable NiCd-batteries guarantee an operating time of approximately 14 hours.”
to “The chargeable NiCd-batteries guarantee an operating time of approximately 10 hours at room temperature (20°C / 68°F), with full charge.”

Addition to the section “15.5 Activation of a Pulse Output” (page 101) :

Maximum pulse output rate is 2 pulse per second (+/-20%).

Set the “Pulse Value” and the “Pulse Width” so that the actual maximum flow in the pipe is less than half the displayed value (“Max – Value”).
Example:
The actual maximum flow 120m^3/h
Pulse Value = 0.02m^3
Pulse Width = 150ms

INFO: Max – Value
240.0m^3/h

Attention!	It is necessary to activate flow totalizers by pressing key Q_{ON} **8** to get the actual pulse output. Refer to the section 7.2 for flow totalizers.

Changes to the chapter “A Standard Specification” (page 117 to 124) :

Please use the following sheets for this chapter.

A Standard Specifications

US300PM

General

Fluid:
Liquid (Turbidity < 10,000 mg/L, Sound velocity 800 to 3,500 m/s, Temperature –30 to +200°C / –22 to +392°F)

Measured Quantities:
- Volume flow, mass flow (by setting density), flow velocity, sound velocity in the fluid
- Wall thickness of the pipe (available when optional wall thickness probe is provided)

Measuring Principal:
Transit time method using ultrasonic signal

Pipe Sizes:
25 to 6,500 mm (1 to 255 inches)
(covered by three types of transducers)

Pipe and Lining Materials:
Carbon steel, Stainless steel, Grey cast iron, Ductile iron, Copper, Glass, PVC, etc

Flow Velocity Range:
±0.01 to ±25 m/s (±0.033 to ±82 ft/s)

Resolution:
0.025 cm/s (0.01 in/s)

Repeatability:
0.15% of reading ±0.01 m/s (0.033 ft/s)

Accuracy:
(Note) Under fully developed rotationally symmetrical flow profile
Volumetric flow:
±1 to 3% of reading ±0.01 m/s (0.033 ft/s) depending on pipe geometry and accuracy of entered pipe dimensions.
Flow velocity:
±0.5% of reading ±0.01 m/s (0.033 ft/s) over sonic path

Measuring Cycle:
100 to 1000 Hz (per one channel)

Straight Pipe Run in the Upstream:
10 to 50 pipe diameters, depending on the kind of flow disturbances

Ultrasonic Flowmeter, Main Unit

Housing Material:
Aluminum

Painting:
Powder coating

Dust and Water-proof:
- IP54 (EN60529)

Measuring Input (flow / wall-thickness):
Two as standard (Channel A, Channel B). Both flow transducers and a wall thickness probe can be connected freely to whichever channel.

Current Output:
- None (standard), one, or two (optional)
- Range 4 to 20 mA (Load resistance 0 to 500 Ω)

Note: The current outputs may temporarily turn unstable during the switch-on sequence and parameter display / setting mode. Take care of your process not to be affected by this behavior.

Frequency Output:
- None (standard), or one (optional)
- Range 0 to 1 kHz
- Contact type: Open-collector, 24 V / 4 mA

Binary Output:
- None (standard), one, or two (optional)
- Contact type: Open-collector, 24 V / 4 mA

Input / Output Terminal Configuration:
Round socket connectors for flow and wall-thickness measuring inputs on the front panel. Banana plug jacks (+,–) for current, frequency, and binary outputs in the rear panel.

LCD Display:
2 line x 16 character LCD display with backlight that can be switched on/off.
Configurable to display two measured values (e.g., flow rate and total flow) simultaneously, or to display values from dual input channels alternately.

LED Lamp:
SIGNAL Lamp (green/red):
Indicates input signal status with green/red light, equipped for each channel.
BATTERY Lamp (red):
Indicates battery charging status with red light.

Keyboard:
15 keys (numerical, functional, or both) including four arrow-shaped keys for cursor operation, enabling easy access through its interactive menu structure.

Display Language:
Czech, Danish, Dutch, English (default), French, German, Norwegian, Polish, Turkey

Flow Measurement:
Flow velocity, Volume flow, Mass flow

Sound Velocity / Signal Amplitude Measurement (On-line):
Sound velocity and signal amplitude in the fluid available on-line simultaneously with flow measurement.

Totalization Function:
Totalizes the volume flow or mass flow. Ten-digit number for both forward/reverse directions of each channel.

Damping Function:
Time constant 0 to 100 seconds, moving average.

Sound Velocity Measurement (Off-line):
Measures the sound velocity of unknown fluid starting from its estimated sound velocity. The result can be transferred to the current fluid parameter.

Wall Thickness Measurement (Off-line):
Measures the wall thickness of unknown pipe (material-known) using optional wall thickness probe.
The result can be transferred to the current pipe parameter.

Arithmetic Operation on Dual-Channel / Dual-Path Inputs:
Arithmetic operations get the outcomes for calculation channel Y and Z by taking sum, average, or difference of two flow values from input channel A and B. Taking absolute values of each input independently in the calculation is also possible.
Note: Two sets of transducers are necessary.

Pulse Output (optional):
Available via optional binary outputs.
- Pulse value: 0.01 to 1000 of totalization unit
- Pulse width: 100 to 1000 ms (±20%)
- Maximum output rate: 2pps (pulse/second) ±20%

Alarm Output (optional):
Available via optional binary outputs where each alarm item is assigned one-to-one. Alarm properties are also selectable for each alarm one-by-one.
- Alarm items: High limit, Low limit, Flow direction change, Quantity limit (for batch operation), and Error (measurement impossible)
- Alarm properties: Normal open / Normal close, Non-hold / Hold (at the alarm detection)

Output Signal Configuration:
Freely configurable including independent dual flow value outputs.
- Current / frequency outputs: Flow velocity, Volume flow, Mass flow, Sound velocity, or Signal amplitude
- Binary outputs: Pulse or Alarm

Data Logging Function:
Data storage capacity of 27,000 values (standard) or 100,000 values (optional).
Storage rate is selectable from 1 s, 10 s, 1 min, 10 min, 30 min, 1 h, or any other rate between 1 s to 43200 s (12 h) by the second. For each period of measurement, stored values are grouped by a user-defined measuring point name.
Stored values can be transferred to a personal computer via RS232 serial communication port.

Communication Function:
Transfers the measured values to a personal computer or a serial printer. Both on-line/off-line transfer during/after the measurement available.
- Output item: Flow value (flow velocity, volume flow, or mass flow), Totalization (forward, reverse), Sound velocity, Signal amplitude
- Output format setting: Spacing (for printer), Decimal point character, Data delimiter
- Communication interface: RS232
- Communication port: D-sub 9-pin, male

Time-Programmable Measurement Function:
Automatic start / stop of the measurement without human operation using internal clock for specific systems. Can be used with current output, binary output, data logging function, and/or communication function for recording the measurement.

Site Parameters Storage Function:
Eliminates the necessity of re-entering parameters for additional measurement on a site.
Totally 80 sets of site parameters for pipe/fluid settings are available with user-defined site names.
Additionally, 14 sets of separate site parameters for not only pipe/fluid but also output-options setting in sets available.

Material / Fluid List Customization Function:
The lists of material / fluid in the parameter menu are editable. Unnecessary items can be cut off from the menu for user's convenience. Registration of new material / fluid data is also possible totally up to 13 items with user-defined names.

Power Supply:
Power supply system:
- Built-in rechargeable battery (6V/4Ah)
- Power supply adapter (Input: 100 to 240VAC, 50/60 Hz, works also as battery charger)

Battery operating time (with full charge):
Maximum around 10 hour continuous measurement at room temperature (20°C / 68°F)
Power consumption: Less than 15W

Safety and EMC Standard:
General safety: EN61010-1:2010
EN61010-2-030:2010
- Altitude at installation site:
  Max. 2000 m above sea level
- Overvoltage category:
  Overvoltage category II
- Pollution degree:
  Pollution degree 2

EMC regulation: EN61326-1:2006

Operating Conditions:
Ambient temperature: –10 to +60°C (14 to 140°F)
Ambient humidity: 0 to 95% RH or less (Non-condensation)
(Note) Lengthy operation at 80% or more is not recommended.

● Transducers

Basic Construction:
A set of transducers are composed of a pair of sensor elements (often called just as "transducers"), and transducer cables with a connector at one end, which is to be inserted into the measuring input sockets in the front panel of US300PM main unit. The transducer cables are armed with stainless steel flexible tube.
(Note) Fixing hardware (mounting fixtures, chains) and acoustic couplant are usually included in a set of transduces, specified in its model code by their kinds or with/without.

Material:
Case of sensor elements:
Stainless steel EN/DIN 1.4571
(JIS SUS 316Ti, AISI 316Ti SS equivalent)
Sensing surface of sensor elements:
General temperature type: PEEK (Poly Ether Ether Keton)
High temperature type: Polyimid

Dust and Water-proof:
General type: IP65 (EN60529)
Immersible type: IP67 (EN60529)

Applicable Pipe Sizes (inner diameter):
Medium type: 25 to 400 mm (1 to 16 inches)
Lager type: 100 to 2,500 mm (4 to 98 inches)
Very large type: 2,000 to 6,500 mm (78 to 255 inches)
(Note) Only "6,500 mm" above is the size for outer diameter.

Fluid Temperature Range:
General temperature type:
–30 to +130°C (–22 to +266°F)
High temperature type:
–30 to +200°C (–22 to +392°F)
Note: Pay attention also to temperature specification of the couplant you choose.

Mounting Fixture Variety and Usage:
Retaining clip:
Inserted into the groove on the upper side of transducers. Transducers are fixed onto the pipe by fixing chains hooked at the retaining clip.
Mounting fixture standard type:
Consisted of two metal blocks with a slide-in ruler to hold transducers in place and adjust their distance easily. Transducers are fixed onto the pipe by fixing chains hooked at the mounting fixture.
Mounting fixture magnetic type:
Pieces of magnet are attached onto both sides of blocks for the "standard type" above. When the pipe material is what magnet pulls, transducers are fixed onto the pipe by magnetic power eliminating the use of fixing chains. If necessary, magnet pieces can be easily added for stronger magnetic power.

● Optional Extension Cable

Extends the length of transducer cable when the standard length is not enough for the site conditions. Select the extension length from 5 m (16 ft), 10 m (32 ft), or 20 m (65 ft).

● Wall Thickness Probe

Specified in the option code of US300PM main unit. Model codes as accessories also available for separate/additional orders (listed later).

Fluid Temperature Range:
General temperature type: –20 to +60°C (–4 to +140 °F)
High temperature type: 0 to +200°C (32 to 392°F)

Measuring Performance:
Measuring range: 1.0 to 200 mm (0.04 to 7.8 inches), depends on the material
Resolution: 0.01 mm (0.0004 inch)

● Accessories

Standard Accessories for US300PM Main Unit:
Transportation case, Measuring tape, and Built-in battery set always come with US300PM.

Fixing Hardware, Couplant, etc:
Specified in the suffix code of US300FT transducers. Model codes as accessories also available for separate/additional orders (listed later).

Power Supply Adapter and AC cable:
The power supply adapter and the AC cable are dedicated to US300PM. Please do not use them with other devices.

● Data Transfer Software

General:
The software installed on a personal computer receives one or more records of logging data and parameter sets stored in US300PM main unit via RS232 communication port.
Data can be viewed or graphed on a PC monitor, or exported as a text file.
This software works while US300PM is off-line (not measuring flow) where current output goes down to zero.

Function:

Displaying Parameter Record:
Display parameter record of selected measuring data set.

Displaying Measured Data in Table:
Display measured data of selected measuring data set in table format.

Displaying Data in Graph:
Display measured data of selected measuring data set in graphic format. Marker type and color for each line of values selectable. Scales for time-axis and value-axis can be changed from default condition of automatic scaling. Graph printing function embedded.

Displaying Statistical Data:
Display statistical data of the measurement. Total data points, minimum, maximum, average and standard deviation of the measured data can be shown. Data range for statistical processing can be designated if necessary.

Exporting Text File:
Parameter record and measured data can be exported to a text file. Options for exporting items or their formats are available.

Entering Remarks:
User's remarks for each measured data can be entered and edited in the transferred data file on a personal computer. Remarks can be displayed in the main window of the software.

Display Language:
English, German
(Note) Help is available only in English.

Operating Environment:

Personal Computer:
Microsoft® Windows® hardware compatible, one or more RS232 port

Operating System:
Microsoft® Windows® 98, ME, NT, 2000, XP

Standard Accessories:
RS232 cable, RS232 adapter 9/25

* Microsoft® and Windows® are registered trademarks of Microsoft Corporation in the United States and/or other countries.

■ Units of Measurement

Volume flow	Flow velocity	Mass flow	Totalizers		Sound velocity
			Volume	Mass	
m3/h	m/s	g/s	m3	g	m/s
m3/min	inch/s	t/h	l	kg	
m3/s		kg/h	gal	t	
l/h		kg/min			
l/min					
l/s					
USgph					
USgpm					
USgps					
bbl/d					
bbl/h					
bbl/m					

1 gallon [US] = 3.78 l; 1 barrel = 42 gallons = 158.76 l

■ Model and Suffix Code

Ultrasonic flowmeter, portable type

Model	Suffix code	Specification
US300PM	·····	Ultrasonic flowmeter, portable type
Output	**-A0** ·····	No current output
	-A1 ·····	One current output
	-A2 ·····	Two current outputs
Power Supply Adapter and AC cable	**1** ·····	Japan
	2 ·····	USA
	3 ·····	Europe
	4 ·····	United Kingdom
	5 ·····	Australia
	6 ·····	South Africa
	-2 ·····	Always 2
	-N ·····	Always N
Option	**/PU1** ····	One binary (pulse or alarm) output (open-collector) (*1)
	/PU2 ····	Two binary (pulse or alarm) outputs (open-collector) (*1)
	/FQ1 ····	Frequency output (open-collector, 0 to 1kHz)
	/DLX ····	Data logging extension (100,000 values)
	/BGT ····	Tag number on nameplate (in the nameplate label, maximum 16 characters)
	/WTG ···	Wall thickness probe for general temperature (–20 to +60°C / –4 to +140°F)
	/WTH ···	Wall thickness probe for high temperature (0 to +200°C / 32 to 392°F)

*1: Option /PU1 and /PU2 are exclusive.

Optional extension cable for portable type

Model	Suffix code	Specification
US300PC	·····	Optional extension cable for portable type
Length	**-A005** ·····	Cable length 5 m (16 ft)
	-A010 ·····	Cable length 10 m (32 ft)
	-A020 ·····	Cable length 20 m (65 ft)

Data transfer software

Model	Suffix code	Specification
US300SA	·····	Data transfer software (Windows version) Including connecting kit (RS232 cable for connection, RS232 adapter 9/25)
Language	**-1** ·····	English / German version
	00 ····	Always 00

Transducers for portable type (*2)

Model	Suffix code	Specification
US300PT	·····	Transducers for portable type
Usage	**-G** ·····	General purpose (IP65)
	-W ·····	Immersible (IP67)
Pipe Size / Fluid Temperature (*3)	**BG** ·····	Medium & General (with 3 m / 9.8 ft cable)
	BH ·····	Medium & High (with 3 m / 9.8 ft cable)
	CG ·····	Large & General (with 4.4 m / 14.4 ft cable)
	CH ·····	Large & High (with 4.4 m / 14.4 ft cable)
	DG ·····	Very large & General (with 12 m / 39.4 ft cable)
Mounting fixture (*4)	**-C** ·····	Retaining clip type (set of two clips)
	-S ·····	Standard type (set of two blocks, including ruler marked length 320 mm, equivalent to 12.6 in.)
	-M ·····	Magnetic type for general temp. (–30 to +100°C / –22 to +212°F, set of two blocks, including ruler marked length 320 mm, equivalent to 12.6 in.)
	-N ·····	None
Fixing chain (*4)	**B** ·····	For 25 to 1200 mm (1 to 47 in.) Fixing chains of 2 m / 6.5 ft length (2 x 2)
	C ·····	For 1200 to 3000 mm (47 to 118 in.) Fixing chains of 2 m / 6.5 ft length (5 x 2)
	D ·····	For 3000 to 6500 mm (118 to 255 in.) Fixing chains of 2m / 6.5 ft length (11 x 2)
	N ·····	None
Acoustic couplant	**G** ·····	General temperature type (–30 to +130°C / –22 to +266°F)
	H ·····	High temperature type (–30 to +200°C / -22 to +392°F)
	N ·····	None
Option	**/TTP** ·····	Transducer tag plate (maximum 16 characters)

*2: Two sets of transducers are necessary when applying dual channel/path measurement.
*3: The alphabetic characters in the suffix code represent pipe sizes and fluid temperature ranges are below.
B: Medium type (25 to 400 mm / 1 to 16 in.)
C: Large type (100 to 2,500 mm / 4 to 98 in.)
D: Very large type (2,000 to 6,500 mm / 78 to 255 in.)
G: General temperature (–30 to +130°C / –22 to +266°F)
H: High temperature (–30 to +200°C / –22 to +392°F)
*4: When selecting code –C or –S for mounting fixture, always select code B, C, or D for fixing chain. When selecting code –M for mounting fixture, fixing chains are optional. When selecting code –N for mounting fixture, select also code N for fixing chain.

Accessories (for ultrasonic flowmeter US300PM)

Model	Description
USPA301	Wall thickness probe for general temperature (–20 to +60°C / –4 to +140°F)
USPA302	Wall thickness probe for high temperature (0 to +200°C / 32 to 392°F)
USPA311	Power supply adapter (100 to 240 V AC input)
USPA321	AC cable (Japan)
USPA322	AC cable (USA)
USPA323	AC cable (Europe)
USPA324	AC cable (United Kingdom)
USPA325	AC cable (Australia)
USPA326	AC cable (South Africa)
USPA331	Battery set (6 V 4Ah) (*5)
USPA341	Transportation case (*5)

*5: Always comes with US300PM.

Accessories (others)

Model	Description
USPA401	RS232 cable (*6)
USPA402	RS232 adapter 9/25 (*6)
USPA411	Measuring tape (*7)

*6: Included in data transfer software US300SA as standard.
*7: Included in US300PM as standard.

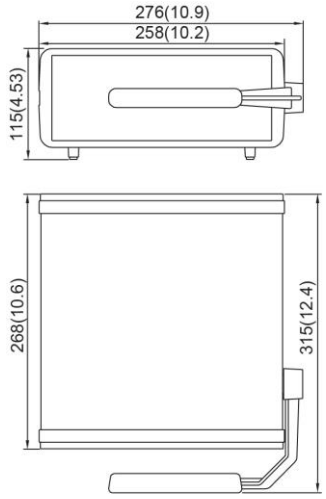
Accessories (for transducers US300PT)

Model	Description
USPA001	Fixing strap (10 m / 32 ft length)
USPA002	Fixing strap (20 m / 65 ft length)
USPA011	Fixing clips (medium type, for pipe size 40 to 100 mm / 1.5 to 4 in., set of two clips)
USPA012	Fixing clips (large type, for pipe size 100 to 6500 mm / 4 to 255 in., set of two clips)
USPA021	Fixing bands (only for pipe size 25 to 50 mm / 1 to 2 in.)
USPA032	Fixing chains (set of two extensible chains) (2 m / 6.5 ft length, equal to 600 mm / 23 in. diameter)
USPA033	Repair set for fixing chains
USPA034	Retaining clips (set of two clips, used with fixing chains)
USPA036	Fixing chains (set of two extensible chains) (0.5m / 1.6 ft length, equal to 150mm / 5.9 in. diameter)
USPA037	Fixing chains (set of two extensible chains) (1 m / 3.2 ft length, equal to 300 mm / 11.8 in. diameter)
USPA053	Mounting fixture short ruler type (for transducers medium pipe size type, temperature range –30 to +200°C / –22 to +392°F, set of two blocks with 120 mm / 4.7 in. ruler)
USPA054	Mounting fixture standard type (for transducers medium pipe size type, temperature range –30 to +200°C / –22 to +392°F, set of two blocks with 320 mm / 12.6 in. ruler)
USPA055	Mounting fixture magnetic general temperature type (for transducers medium pipe size type, temperature range –30 to +100°C / –22 to +212°F, set of two blocks with 320 mm / 12.6 in. ruler)
USPA057	Mounting fixture standard type (for transducers large or very large pipe size type, temperature range –30 to +200°C / –22 to +392°F, set of two blocks with 320 mm / 12.6 in. ruler)
USPA058	Mounting fixture magnetic general temperature type (for transducers large or very large pipe size type, temperature range –30 to +100°C / –22 to +212°F, set of two blocks with 320 mm / 12.6 in. ruler)
USPA073	Additional magnets for mounting fixture magnetic general temperature type (for transducers medium pipe size type, temperature range –30 to +100°C / –22 to +212°F, set of two magnets)
USPA075	Additional magnets for mounting fixture magnetic general temperature type (for transducers large or very large pipe size type, temperature range –30 to +100°C / –22 to +212°F, set of two magnets)
USPA081	Ruler for mounting fixture (marked length 120 mm, equivalent to 4.7 in.)
USPA082	Ruler for mounting fixture (marked length 320 mm, equivalent to 12.6 in.)
USPA091	Acoustic couplant general temperature type (100 g, –30 to +130°C) (0.22 lb, –22 to +266°F)
USPA092	Acoustic couplant high temperature type (100 g, –30 to +200°C) (0.22 lb, –22 to +392°F)

■ Dimensional Drawings

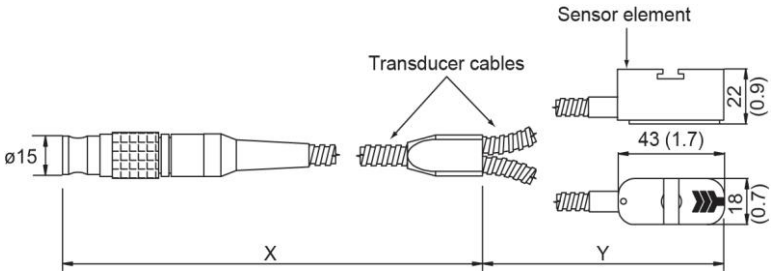
Unit: mm (inch)

Ultrasonic flowmeter US300PM

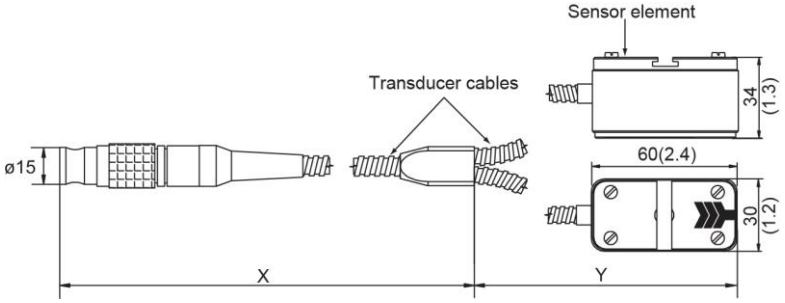


Weight: 3.9 kg (8.60 lb)
(incl. battery set)

Transducers US300PT-□B□



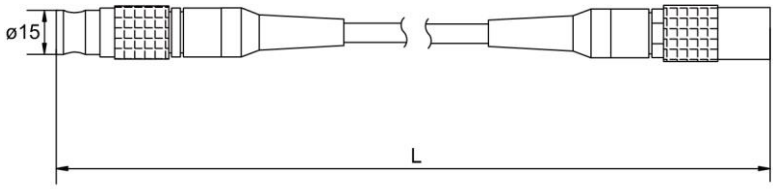
Transducers US300PT-□C□, US300PT-□D□



Length / Weight

Transducer	X m (inch)	Y m (inch)	X+Y m (inch)	Weight kg (lb)
US300PT-□B□	2.0 (78.7)	1.0 (39.4)	3.0 (118.1)	0.6 (1.32)
US300PT-□C□	2.0 (78.7)	2.4 (94.5)	4.4 (173.2)	1.2 (2.65)
US300PT-□D□	5.0 (196.9)	7.0 (275.6)	12.0 (472.4)	2.2 (4.85)

Optional extension cable US300PC-A□□□

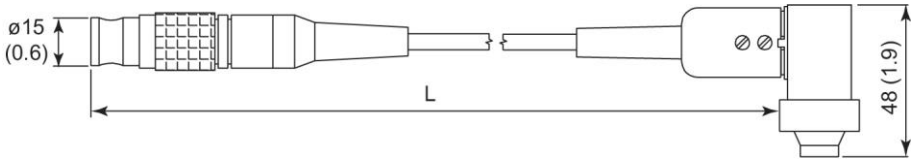


Length / Weight

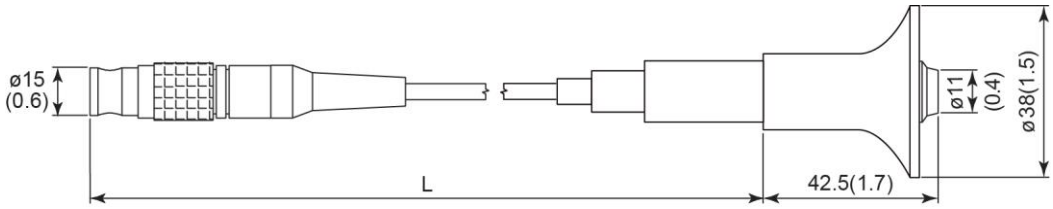
Optional extension cable	L m (inch)	Weight kg (lb)
US300PC-A005	5.0 (196.9)	0.4 (0.88)
US300PC-A010	10.0 (393.7)	0.6 (1.32)
US300PC-A020	20.0 (787.4)	1.6 (3.53)

**Wall thickness probe for general temperature (–20 to +60°C / –4 to +140°F)
(option /WTG or model USPA301)**

Unit: mm (inch)



**Wall thickness probe for high temperature (0 to +200°C / 32 to 392°F)
(option /WTH or model USPA302)**



Length / Weight

Wall thickness probe	L m (inch)	Weight kg (lb)
/WTG or USPA301	1.5 (59.1)	0.17 (0.37)
/WTH or USPA302	1.5 (59.1)	0.24 (0.53)