




Tek-Clamp 1200A

Ultrasonic Clamp-On Flow Meter



Quick Start Guide

1. Before You Begin

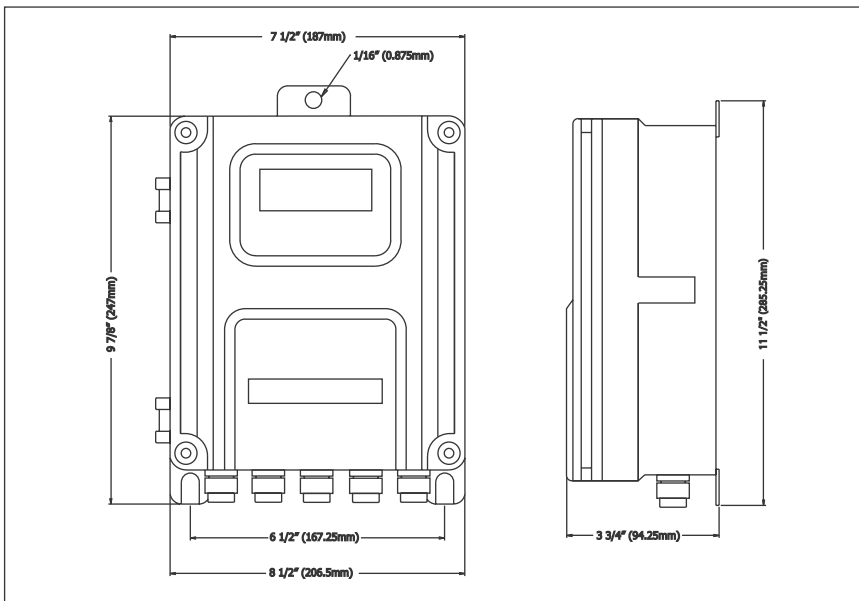
-  Make sure the transmitter is installed by qualified personnel and in accordance with the applicable code of practice.
-  Disconnect the power before servicing, to prevent ignition of flammable or combustible atmospheres.
-  Turn off the main power source to the Tek-Clamp 1200A and ensure lines to any other external power sources are disconnected, or not powered while wiring the flow meter.

2. Unpack

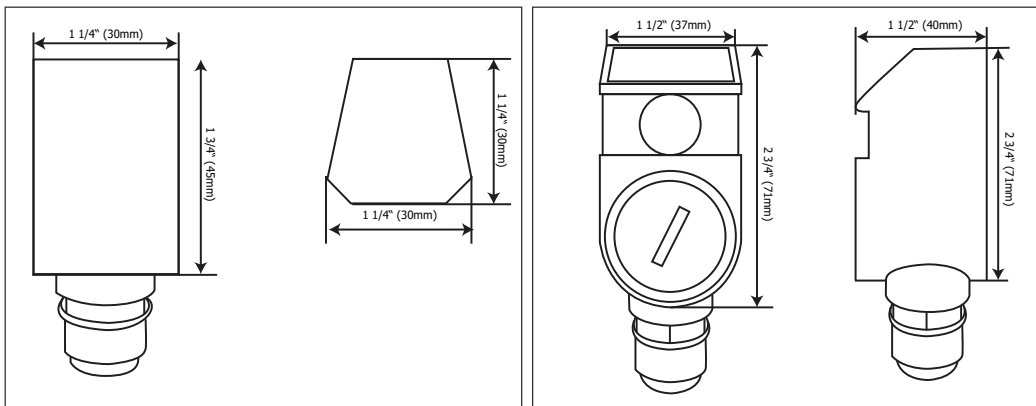
Tek-Clamp 1200A Ultrasonic Clamp-On Flow Meter

3. Dimensional Drawing

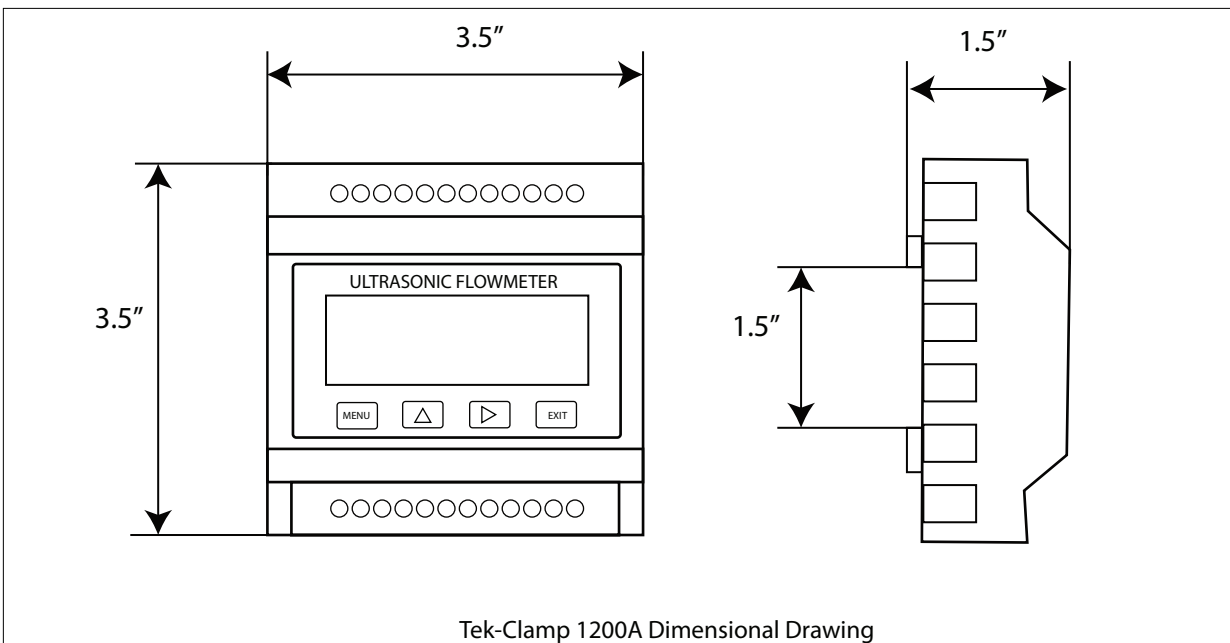
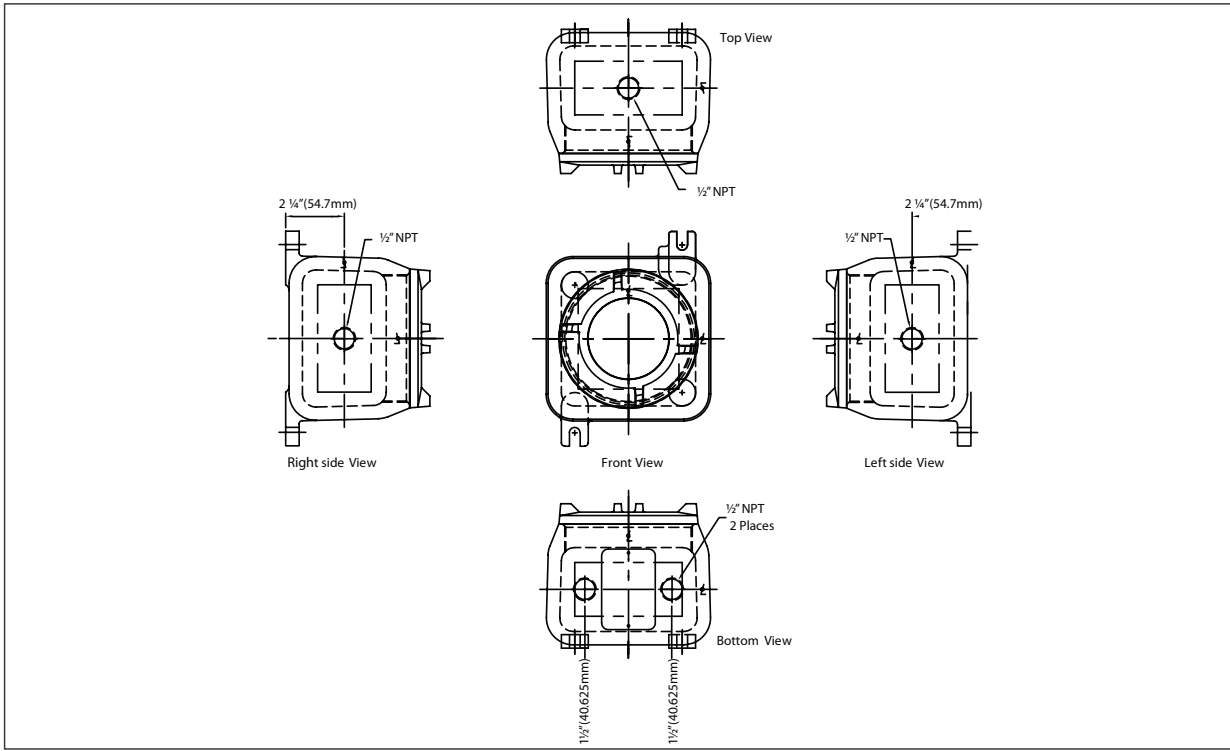
Dimension for Tek-Clamp 1200A-100F1



Sensor Drawings



Dimension for Tek-Clamp 1200A-100EXP

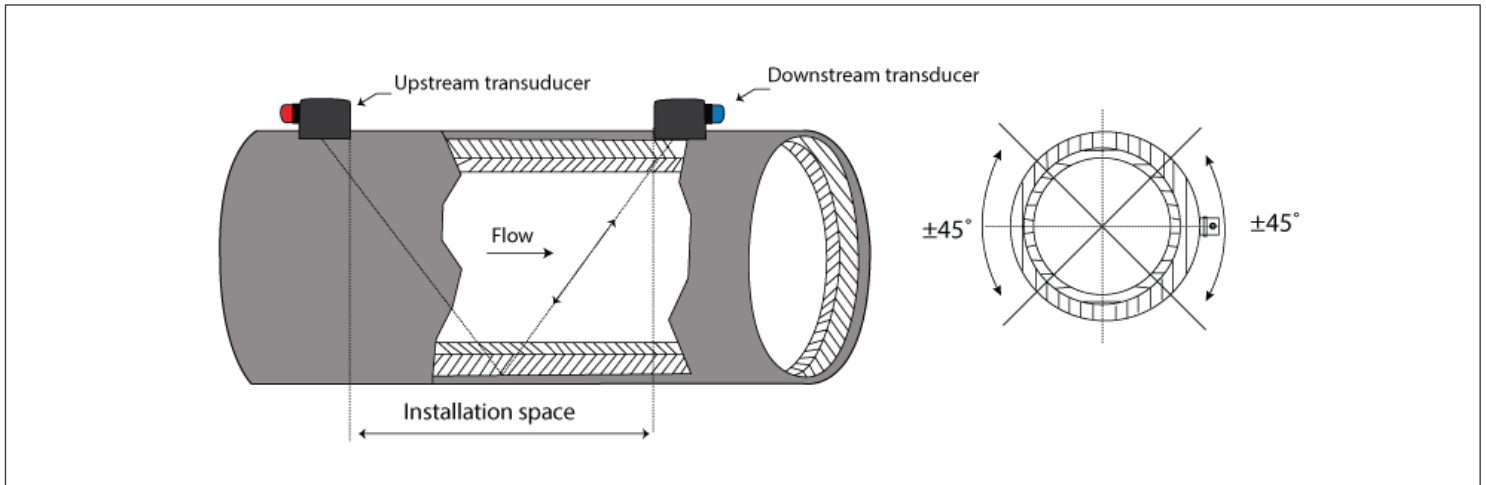


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4. Mounting

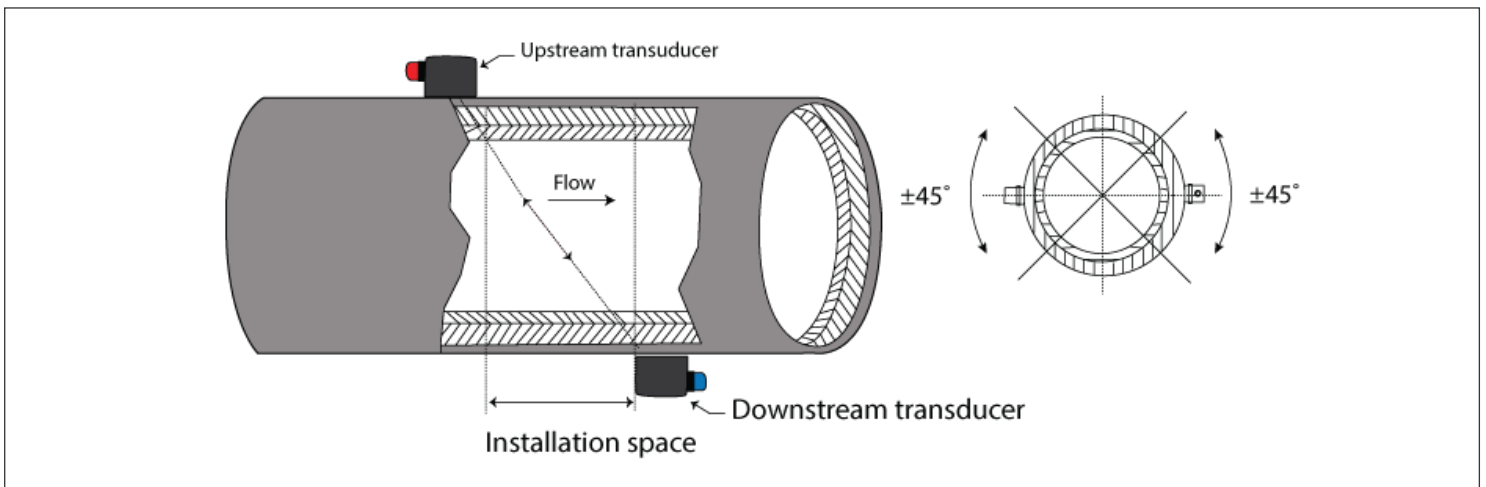
The transducers of the Tek-Clamp 1200A-100F1 can be mounted in 2 ways: the V method and the Z method.

V Method



The V method is a standard installation method and convenient to use for precise measurement of flow. While installing the two transducers, they are horizontally aligned. The transducers center lines are parallel with the pipe axis line. They are suitable for pipe diameter range $\frac{1}{2}$ " to 16" (DN15 mm-DN400 mm).

Z Method

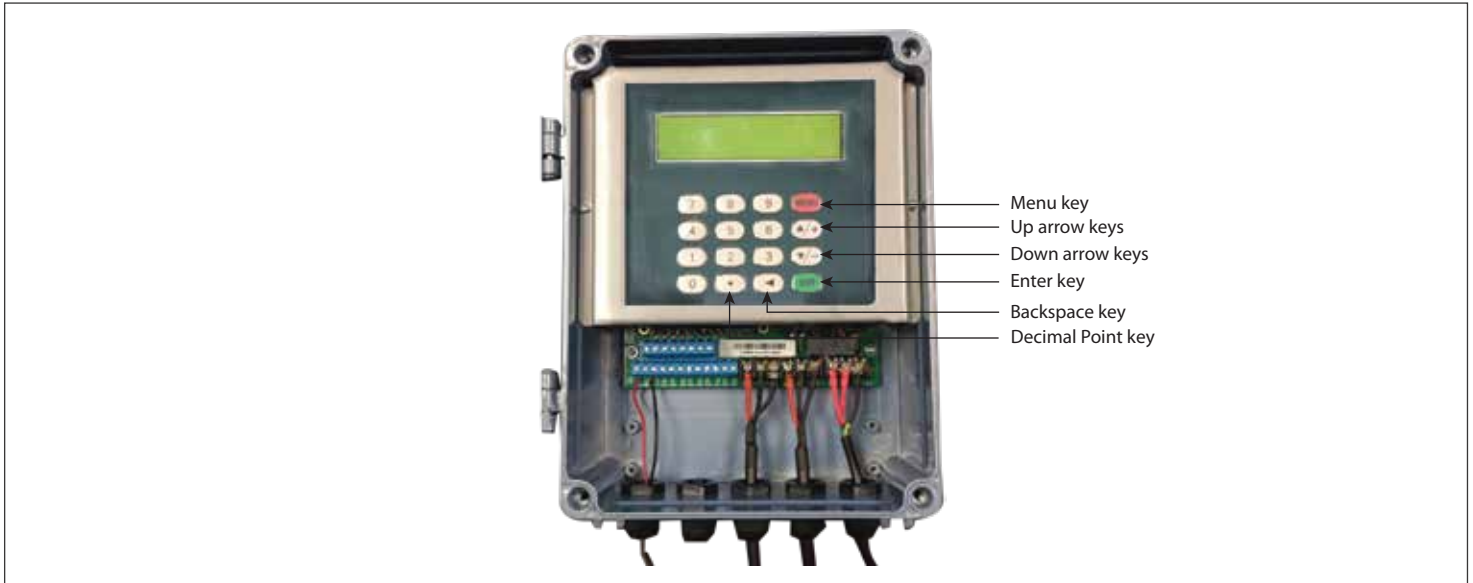


When the pipe diameter is wide, there are suspended matters in the fluid, or the scaling is too thick, it can interfere with the normal functioning of the flow meter, this weakens the signal in a V method installation. If this happens, the Z method of installation is used. It is also called the single sound path as it can directly transfer the pulse without any reflection required, which is required in V method and therefore has less signal attenuation.

5. Display

The Tek-Clamp 1200A Ultrasonic Flow Meter uses of a 16 key keyboard monitor. The 16 keys include: 10 Digit keys, 2 Up/Down arrow keys, 1 Menu key, 1 Enter key, 1 Decimal Point key and 1 Backspace key. The keyboard allows users to program quickly and easily. It has a 2 line x 20 characters LCD display.

- 1200A-100F1 Enclosure



- 1200A-100M



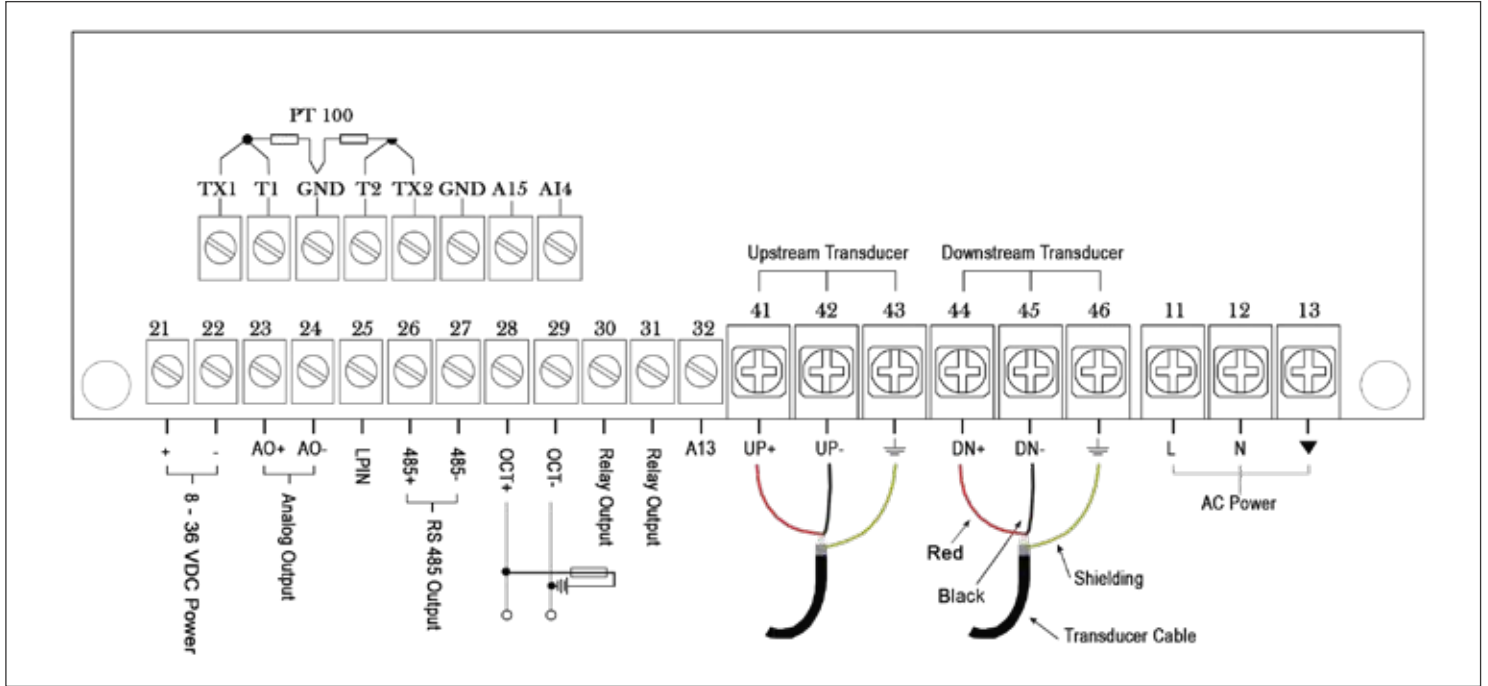
- 1200A-100EXP



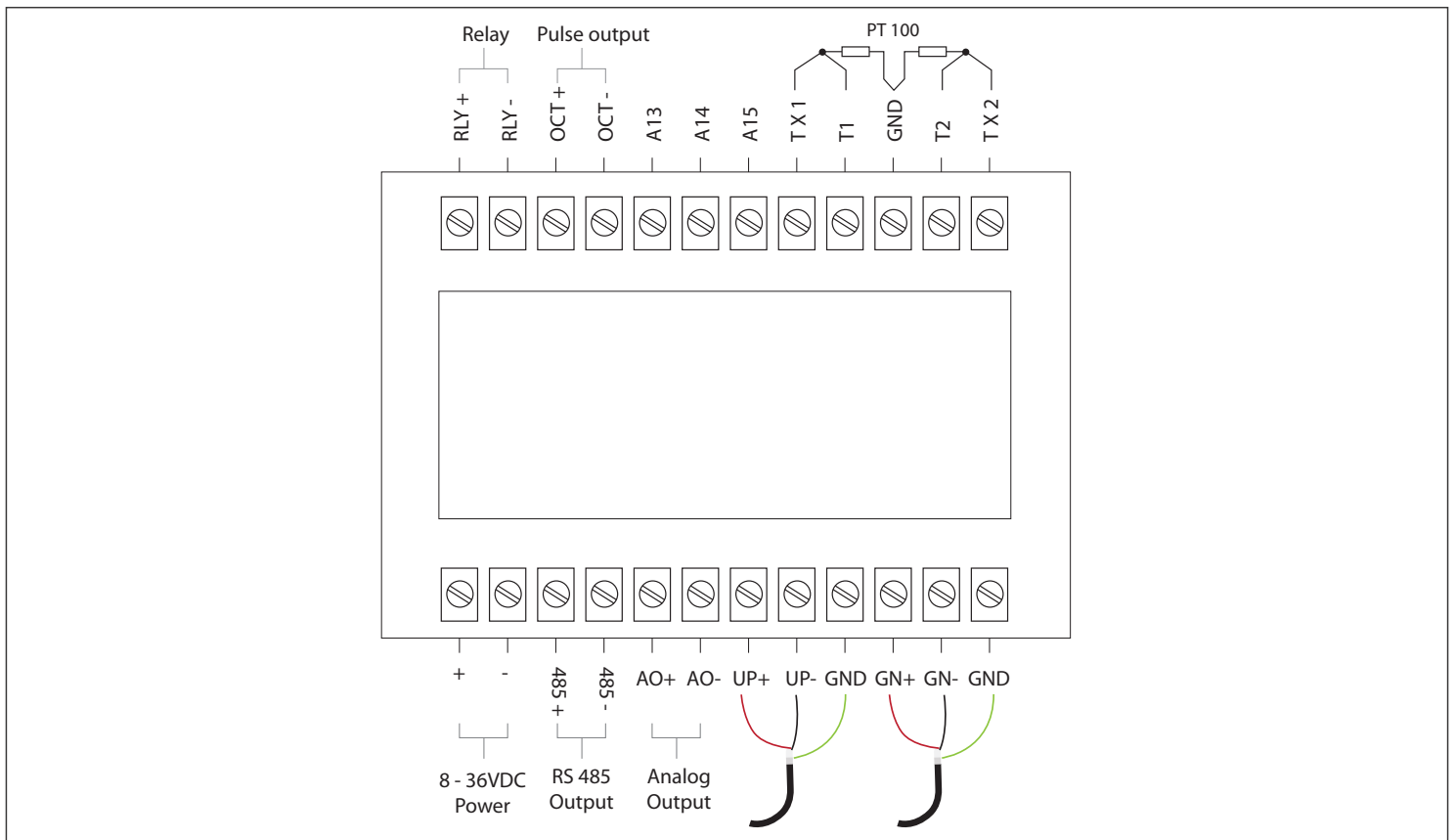
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6. Power Supply

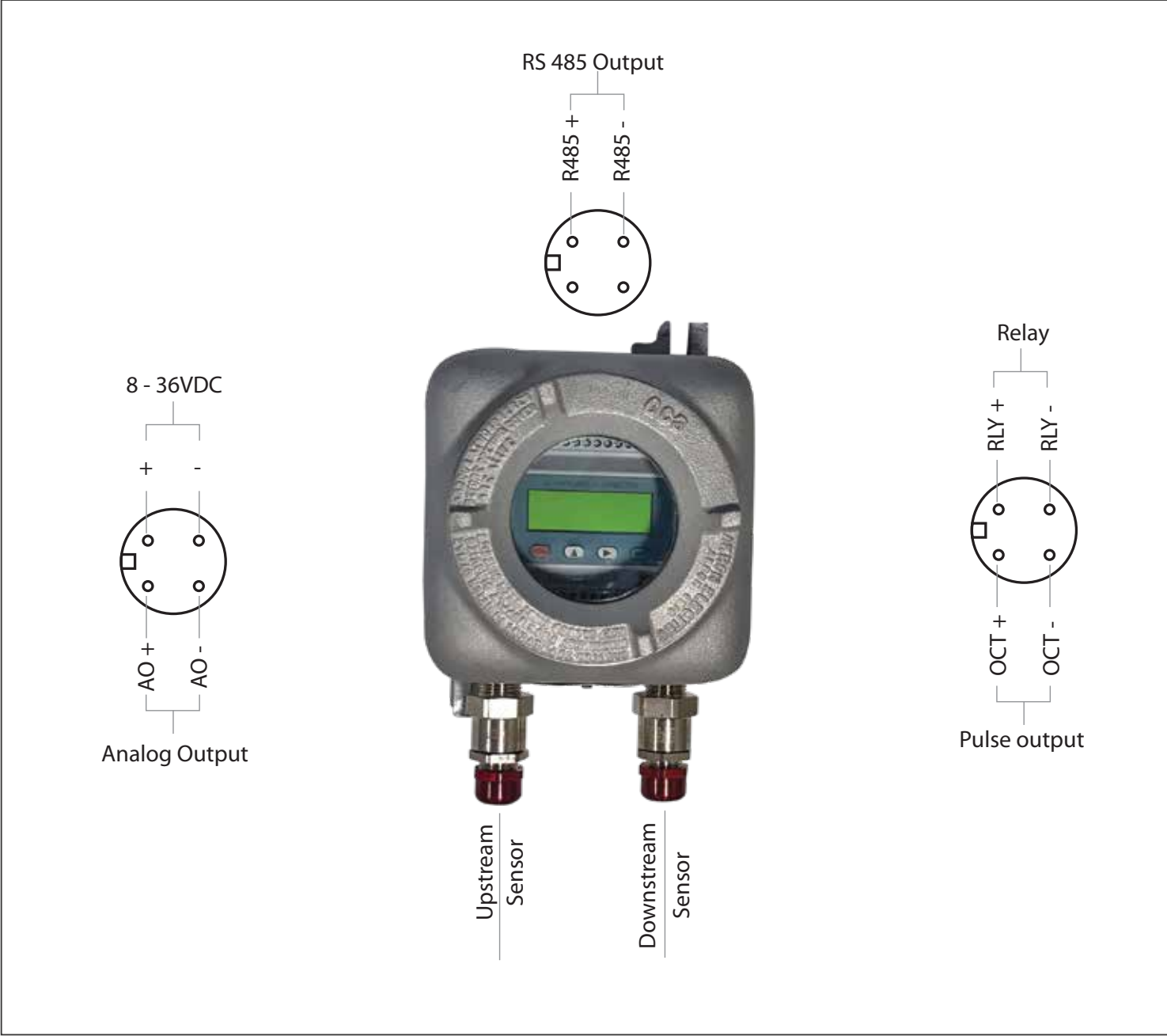
- Signal Wiring Diagram of 1200A-100F1 Enclosure




- Signal Wiring Diagram of 1200A-100M




- Signal Wiring Diagram of 1200A-100EXP



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 Cut off power before connecting cables. The power voltage must match that indicated in the junction box of the transmitter and the earth connector must be well connected with earth wire to ensure its intrinsic safety performance.

 Make sure that the power is shut off to avoid electric shock when installing the transmitter. Follow the installation and operation instruction manual to ensure the safe operation.

7. Grounding

Note: Make sure the power board terminal block is grounded.

8. Communication

Communication can be done with the help of RS485.

Note: Please connect the cables to the RS485 terminal as shown in Power Supply section of this quick start guide.

9. Configuration

The Tek-Clamp 1200A-100F1 can be configured with the help of a 16 key keyboard monitor. Below, some of the keyboard uses are outlined:

- '0-9' and '.' are used to input numerical values and menu numbers.
- '◀' key is used to left backspace or delete left characters.
- '◀/+' and '▶/- >' are used to shift to the Upper and Lower menu. When inputting the digits, these are equal to the "+" or "-" keys.
- The 'Menu' key brings up the main menu.
- The 'Enter' key is mainly used to ensure the digit and chosen content has been input the other function is to press it to enter Modify status before setting parameters.

Menu Window Details

	Menu Window No.	Function
Flow rate/flow totalizer display	M00	Display instant flow rate/net totalizer. Adjust the units in M30-M32
	M01	Display instant flow rate/instant flow velocity. Adjust the units in M30-M32
	M02	Display instant flow rate/positive totalizer. Adjust the units in M30-M32
	M03	Display instant flow rate/negative totalizer. Adjust the units in M30-M32
	M04	Display instant flow rate/date time

	M05	Display heat flow rate/total heat quantity. Adjust the units in M84, M88
	M06	Display temperature input T1, T2
	M07	Display present battery voltage
	M07	Display analogue input AI3, AI4
	M08	Display system error code
	M09	Display today net totalizer
Initial setup	M10	Input outside perimeter of pipe
	M11	Input pipe outer diameter, data range:0-18000mm
	M12	Input pipe wall thickness
	M13	Input pipe inner diameter
	M14	Choose the kinds of pipe materials
	M15	Input sound velocity of pipe material
	M16	Choose kinds of liner
	M17	Input the sound velocity of liner
	M18	Input the thickness of liner
	M19	Input inner pipe wall absolute degree of roughness
	M20	Choose kinds of fluids
	M21	Input fluid velocity
	M22	Input fluid viscosity
	M23	Choose the types of transducers, including more than 20 types to use
	M24	Choose transducer installation method
	M25	Display transducer installation space
	M26	Parameter solidifying and setup
	M27	Store and read installation parameters on installation point
	M28	When signal set is turning poor, the transmitter keeps the last data. Choosing 'yes' means when the signal is turning poor, the flow meter will display last correct measured data
	M29	Input signal strength when the pipe flow is set to be empty. For example: inputting 65 means when the signal strength is lower than 65, the flow meter will think that there is no liquid in the pipe and display the flow value as zero

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Flow unit setup	M30	Choose metric or imperial unit
	M31	Choose instant flow rate unit
	M32	Choose totalizer unit
	M33	Choosing the totalizer multiplying factor which function is to multiply totalizer data rang, normally set it as x1
	M34	Net totalizer switch
	M35	Positive totalizer switch
	M36	Negative totalizer switch
	M37	Restore parameters setup before leaving factory and reset totalizer
	M38	Manual totalizer (the key to control on/off)
	M39	Choose operating language, including 8 kinds of different languages for international users to use
	M3•	Setup the LCD display method, inputting 0 or 1 means regular displaying content inputting, 2-39 means automatically cycle displaying method, displaying the previous menu of 2-39, time interval is 8 seconds. When there is no input operation, it will automatically enter cycle displaying status.
Choosing Setup	M40	Damper coefficient
	M41	Input low flow velocity cut-off value
	M42	Setup static zero point
	M43	Clear the zero-point value and restore the solidified zero-point value.
	M44	Set up zero-point deviant by hand
	M45	Flow meter coefficient, rectification coefficient
	M46	Input Network address identification number (IDN)
	M47	Password protecting operation, after the flow meter is setup with password, only browse menus without any modification.
	M48	Input degree of linearity broken line rectification data. At most there is 12 segments broken line, used for users to rectify meter nonlinear.
	M49	Network communication tester, on this window to visit the data transferred from upper computer to judge the problems arise during communication.
Scheduled time output	M50	Optional setup of data output at scheduled time, choose output content at scheduled time to print, more than 20 to select
	M51	Setup output time at scheduled time

	M52	Printing data flow direction control. By default printing data will flow directly to the thermal printer hanged inside bus. Setup printing data output to outside serial port (RS485 port)	
AI5 setup	M53	Display analogue input AI5(reserved for the Tek-Clamp 1200A mainboard)	
Input and output setup	M54	Setup of OCT totalizer pulse output, pulse width, range:6 Ms-1000Ms.	
	M55	Choose current loop mode	
	M56	Corresponding data to output of current loop 4mA or 0mA	
	M57	Corresponding data to output of current loop 20mA	
	M58	Verification of current loop output applied to check whether current loop is normal or not.	
	M58	Verification of current loop output applied to check whether current loop is normal or not.	
	M59	Present output of current loop	
	M60	Date time and setup of the date time of the new is realized by CPU, when upgrading software, time will be slow. So after upgrading, recommended to adjust the date and time to display correctly	
	M61	Software version information and Electronic Serial Number (ESN)	
	M62	Setup serial port parameter	
	M63	Communication protocol choosing (including compatible protocol choosing), two options, choosing MODBUS-RTU means using binary system MODUS-RTU protocol. Choosing MODBUS-ASCII+previous protocol means using ASCII protocol, at this time can support several protocols simultaneously, including MOSBUS-ASCII, previous 7 version protocol, FUJI protocol, Meter-BUSx protocol etc.	
	M64	Analogue input AI3	By inputting the measuring range, the flow meter will turn current signal into data range users need
	M65	Analogue input AI4	
	M66	Analogue input AI5	
M67	Setup frequency range of frequency output signal. Frequency signal output represents instant flow rate value by signal frequency value. Default: 0-1000Hz, Max-range:0-999Hz. Output frequency signal by special frequency output unit.		

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Input and output setup	M68	Setup lower limit flow of frequency signal output	
	M69	Setup upper limit flow of frequency signal output	
	M70	LCD backlit control	
	M71	LCD contrast ratio control	
	M72	Work timer, logging work time of the flow meter by unit of second. It can reset.	
	M73	Setup lower limit flow of frequency signal output	By adjusting the lower and upper limit of alarm, confirm a range. When actual flow is over the range set in this window, then it creates an alarm signal output that is transferred to outside by setup OCT or relay.
	M74	Setup upper limit flow of frequency signal output	
	M75	LCD backlit control	
	M76	LCD contrast ratio control	
	M77	Beeper setup options	
	M78	Setup Open Collector Transistor output(OCT) output options	
	M79	Setup relay(OCT2) output options	
	M80	Choose input signal of batch controller	
	M81	Batch controller	
Heat quantity measuring	M82	Day/month/year totalizer, check the flow rate and heat quantity of the totalizers	
	M83	Automatically replenish flow switch during the period of power off, default status: off this function is not available under special conditions.	
	M84	Choosing heat quantity unit, 1. GJ(default) 2. KCal 3. KW 4. BTU (imperial unit)	
	M85	Choose temperature signal origin, if choosing inputting temperature signal by AI3, AI4, then need temperature transmitter that can output 4-20mA current signal.	
	M86	Heat capacity, default: GB-CJ128 enthalpy potential method. Temperature difference method is available also.	
	M87	Heat quantity totalizer switch	
M88	Heat quantity multiplier factor.		

	M89	Display present temperature difference and setup temperature difference sensitivity.
	M8•	Options of installation of heat meter on supply water pipe or return water pipe
Diagnosis	M90	Display the signal strength and signal quality
	M91	Display the transit time ratio
	M92	Display the calculated fluid sound velocity.
	M93	Display the total transit time and the delta time
	M94	Display the Reynolds number and the pipe coefficient
	M95	Display positive, negative heat quantity totalizer, start cycle display function.
Added menu windows	+0	Display the time of power on/off and flow rate
	+1	Display the total working time of the flow meter
	+2	Display the last time of power off.
	+3	Display the flow rate of last power off
	+4	Display total times of power on
	+5	Scientific calculator
	+6	Setup threshold value of fluid sound velocity
	+7	Net totalizer of this month
	+8	Net totalizer of this year
	+9	Operating time with trouble (including power off time)
Hardware adjustment menu windows	.2	store static zero point
	.5	setup threshold value of Q value
	.8	max instant flow rate of this day and this month
	.9	Serial port testing window with CMM direct output
	-0	Circuitry hardware parameter adjusting entrance (only inputting password to enter following windows)
	-1	4-20mA current loop calibration
	-2	AI3 inputting calibration of analogue input 4 mA
	-3	AI3 inputting calibration of analogue input 20mA
	-4	AI4 inputting calibration of analogue input 4mA

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	-5	AI4 inputting calibration of analogue input 20mA
	-6	AI5 inputting calibration of analogue input 4mA
	-7	AI5 inputting calibration of analogue input 20mA
	-8	Zero-point setup of PT100 at lower temperature(
	-9	PT100 setup zero point at higher temperature (>55°C)
	-A	PT100 standard calibration at 50°C
	-B	PT100 standard calibration at 84.5°C

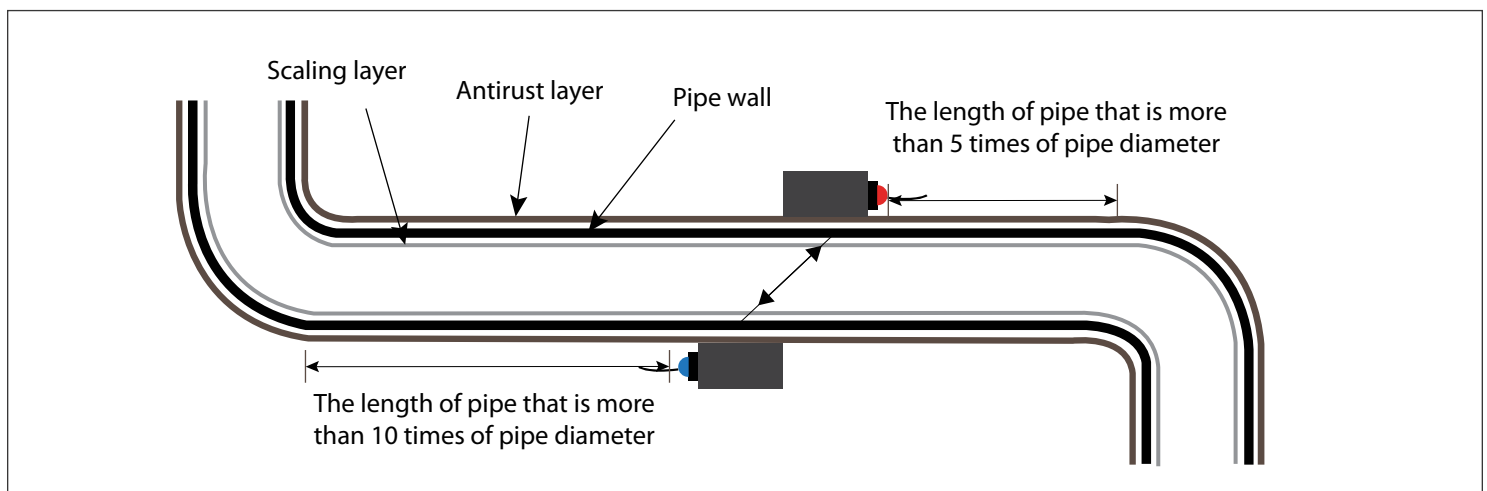
- Note:**
- Violet colour indicates new added or changed functions
 - Blue colour means the menus related with heat quantity measurement

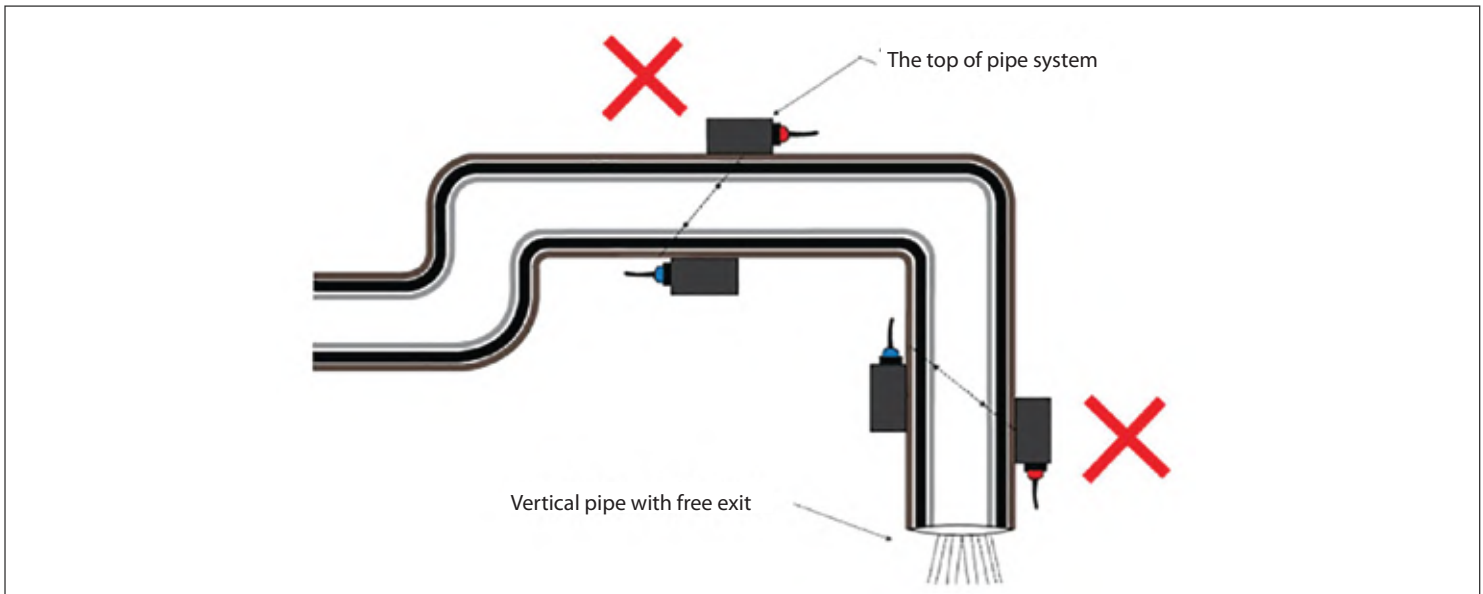
10. Installation

Installation of the Transducers

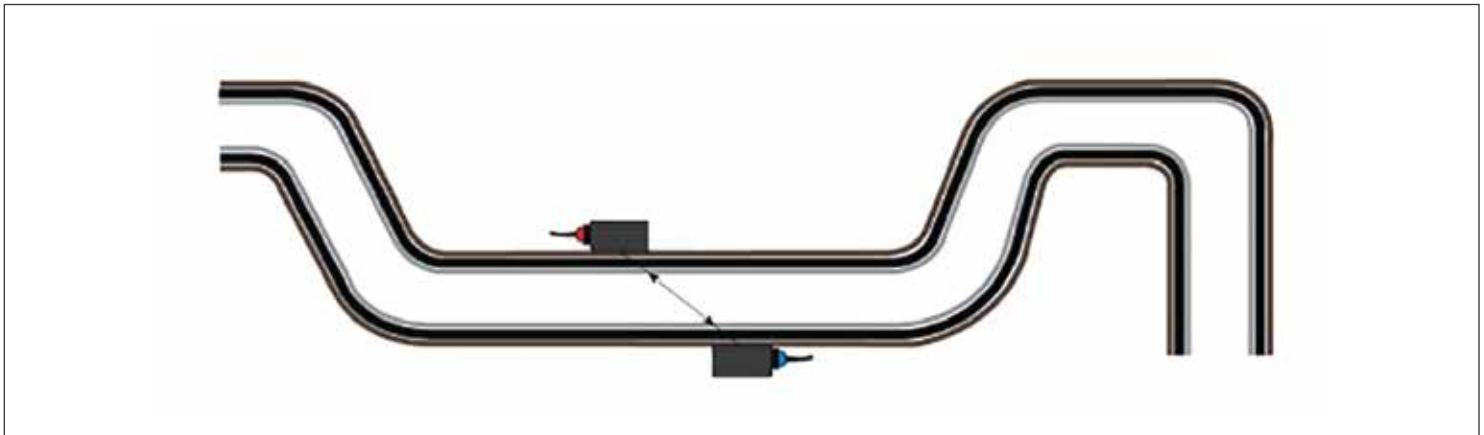
To ensure measurement accuracy and stability, the installation point of transducers should be on the straight pipe full of well-distributed fluid (when installing, the pipe must be full of liquid), and should follow the points below:

- The pipe must be full of uniform liquid that is easy for the ultrasonic pulse to travel through (vertical pipe or horizontal pipe).
- Avoid installing the transducer at the highest point of the pipe system or on the vertical pipe with free exit (down flow).





- For an open pipe or half full pipe, transducers should be installed at the bottom of the U pipe.



- The temperature and pressure on the installation point should be within the work-ability of the transducers.
- Pay attention to the pipe's inner wall and check for pollution build-up. Select a pipe without any or very little build-up of sediment because it may interfere with the signal.
- In cases of horizontal piping, mount the detector within $\pm 45^\circ$ of the horizontal plane. Otherwise, the measurement may be impossible if bubbles stay in the upper part of piping or if deposits are accumulated in the lower part of piping. In cases of vertical piping, the detector may be mounted at any position on its periphery provided that the flow is upward.

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Installation of the Wall Mount Enclosure

- Find an easily accessible location where wire connections can be made and meter readings can be taken from floor level.
- Mount the enclosure on a vibration-free surface.
- Avoid sites such as the plenum of a fan coil, heat exchanger, or other housings containing motors.
- Avoid mounting the enclosure in close proximity to VFD's, electric motors or other strong sources of electrical interference.

Note: Secure at least 4 inch (0.33 ft) of space between the flow transmitter and the nearby wall. Also secure a space for opening the front cover for maintenance. Secure a cable wiring space under the enclosure.



Improper installation has the potential to cause injury and to damage the instrument.

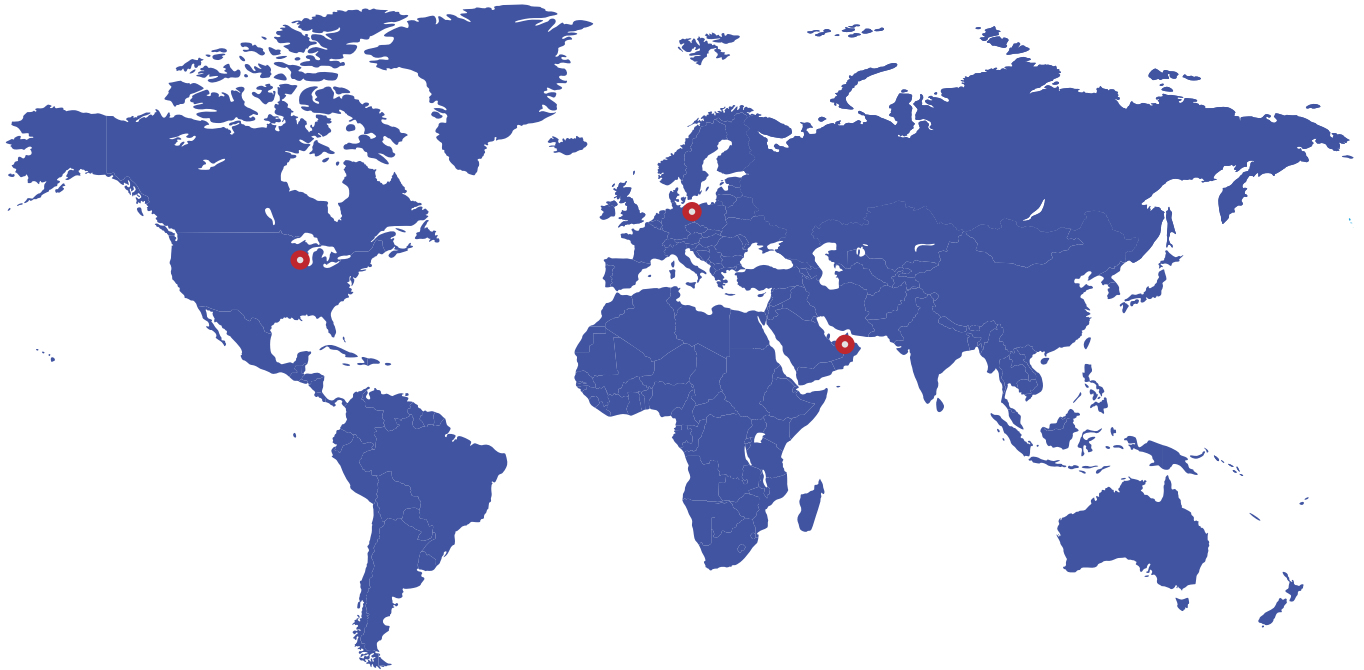


Periodically inspect the power cables, transducer cables, cable glands, and the enclosure for signs of damage. Inspect the transducer installation and mounting hardware for loose connections.

Note: For additional information regarding installation, refer to the detailed manual.

Note: For error messages and menu window details, refer to the detailed manual.





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