



SENSORS &
CONTROLLERS



ANALYZERS
& SAMPLERS



LEVEL, FLOW
& PRESSURE



WEB APP &
DATALOGGING



ACCESSORIES

200H DATASHEET

PORTABLE ULTRASONIC “TRANSIT TIME” PRESSURE PIPE
FLOW METERS



MAIN FEATURES

- Instruments comprise digital converter and two ultrasonic clamp-on or insertion transducers
- Digital Signal Processing (DSP) technology ensures low sensitivity to disturbing factors
- Suitable for pipe dimensions from 20 to 4,000mm
- Transmitter resistant to damage by wear, deposits or pressure
- Password-protected EEPROM

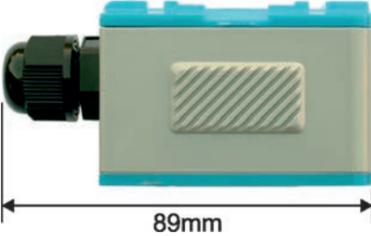
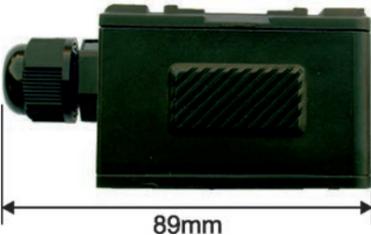
APPLICATIONS

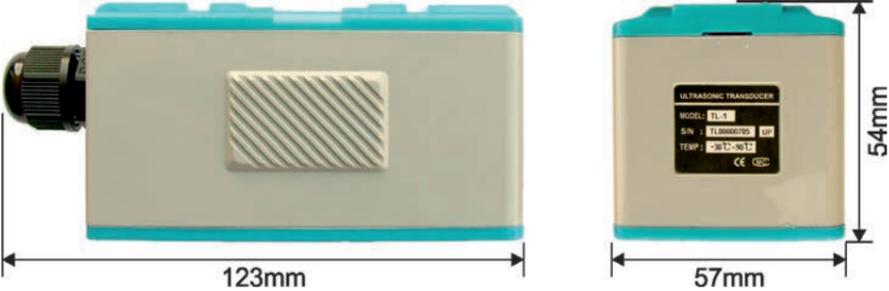
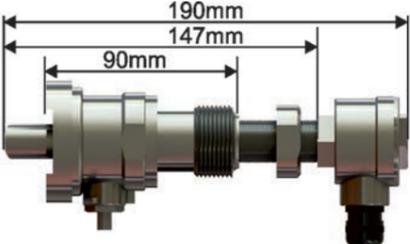
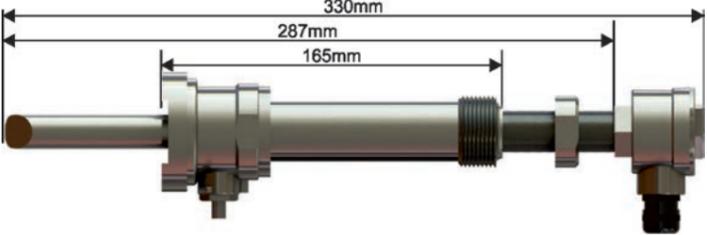
- Ultra-pure water
- Drinking water
- Chemicals
- Cooling water
- River water

TECHNICAL DATA

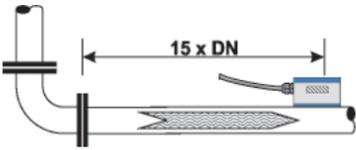
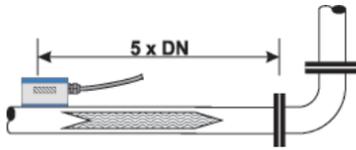
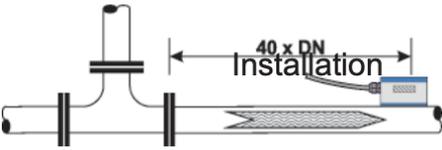
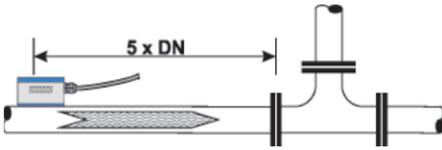
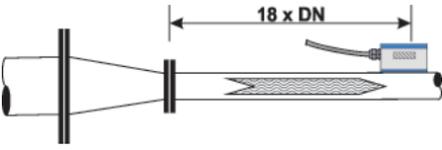
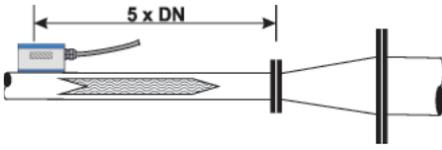
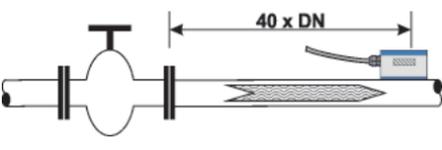
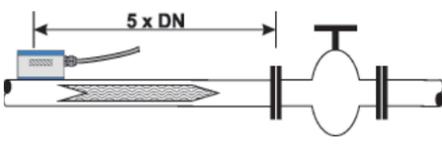
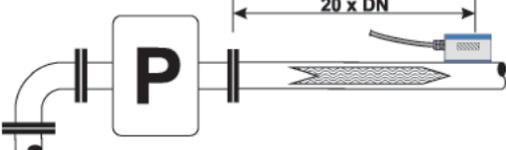
Measurement on pipes	From DN 20 to 4000mm
Piping material	Steel, stainless steel, cast iron, copper, PVC, aluminium, fibreglass-reinforced plastic (cement with insertion transducers)
Measurement units (user selectable)	Metres, cubic metres, litres, feet, cubic feet, U.S. gallons, imperial gallons, oil barrels, U.S. oil barrels, imperial oil barrels, millions of U.S. gallons
Type of liquid	Conductive fluids and not, even with the presence of suspended material (< 10g / l; < Ø1mm)
Speed range	± 12m/s
Linearity	0.5% ; repeatability: 0.2% ; total accuracy ± 1%
Display	3.5"; 320 × 240 px
Keypad	8 buttons
Internal data logger	Storage capacity up to 32GB with SD card
Displayed data	Instantaneous flow rate; total flow; other
Safety	Setup and change settings password protected
Selectable output	-
Frequency output	-
Output relay	-
Signal interface	RS485
Communication protocol	Modbus RTU; ASCII+ (Optional)
Power supply	External p. supply 100 ± 253Vac
Rechargeable batteries	Three (3) AAA Ni-mH integrated with autonomy >24 hours
Mounting	Portable
Housing	ABS
Dimensions (L x H x P)	218 × 103 × 35mm
Weight	0.4Kg
Operating temperature	-
Maximum humidity	-
Process temperature	Sensor -40...160°C in reference to sensor type
Sensor protection	IP68

DIMENSIONS

Transducer Type		Features	
TS-2	Dimensions		
	Pipe Ø range	20÷100mm (¾" ÷ 4")	
	Temperature	-30 ÷ +90°C	
	Menu 23	>19. Clamp-On TS-2	
TS-2-HT	Dimensions		
	Pipe Ø range	20÷100mm (¾" ÷ 4")	
	Temperature	-30 ÷ +160°C	
	Menu 23	>19. Clamp-On TS-2	
TM-1	Dimensions		
	Pipe Ø range	50÷700mm (2" ÷ 40")	
	Temperature	-30 ÷ +90°C	
	Menu 23	>16. Clamp-On TM-1	
TM-1-HT	Dimensions		
	Pipe Ø range	50÷700mm (2" ÷ 40")	
	Temperature	-30 ÷ +160°C	
	Menu 23	>16. Clamp-On TM-1	

Transducer Type		Features
TL-1	Dimensions	
	Pipe Ø range	300÷4000mm (3" ÷ 160")
	Temperature	-30 ÷ +900°C
	Menu 23	>20. Clamp-On TL-1
TC-1 (standard)	Dimensions	
	Pipe Ø range	80÷4000mm (3" ÷ 160")
	Temperature	-40 ÷ +400°C
	Max pressure	1.6Mpa (16bar)
Menu 23	>17. Insertion TC-1	
TLC-2 (for non-metallic pipes)	Dimensions	
	Pipe Ø range	80÷4000mm (3" ÷ 160")
	Temperature	-40 ÷ +400°C
	Max pressure	1.6Mpa (16bar)
Menu 23	>21. Insertion TLC-2	

INSTALLATION

Flow resistance element	Upstream side	Downstream side
90° curves		
T junction		
Adaptors		
Valves		
Pumps		

In the event that the minimum values shown in table 4 can not be met, it is necessary to adopt every mechanical devices to mitigate the flow turbulence and improve the homogeneity of the flow velocity in the pipe. One of the best devices is the transducers upstream installation of a fluid threads rectifier, which allows to have a straight section length of the pipe less than indicated.

The pipe where the transducers are placed must have the following characteristics:

- smooth surface without rust or other surface deterioration;
- circular cross section

The ideal points for the transducer positioning are:

- hydraulic circuit lowest point (fig.9-1/a);
- vertical pipes with the upward flow (fig.9-1/b);
- inclined pipes with the upward flow (fig.9-1/c);
- vertical open drain pipes with a section restriction to avoid sudden pipe emptying during flow measurement (fig.9-2)

Correct transducers positioning example

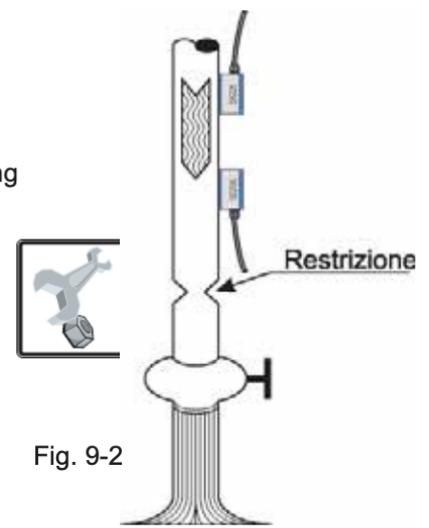
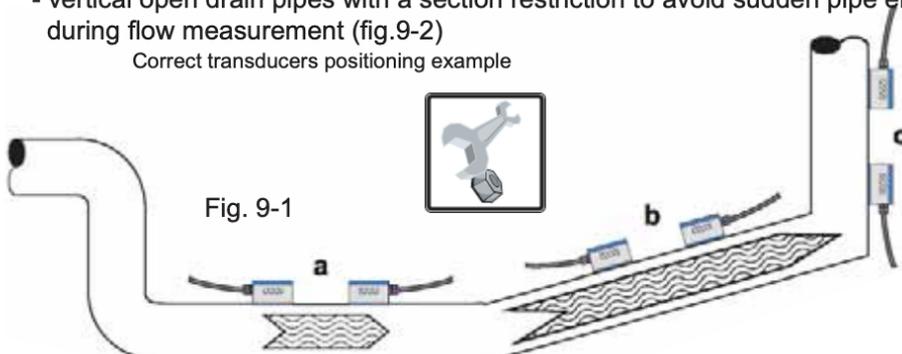


Fig. 9-2

Correct transducers positioning example

In the case of a horizontal pipe, the transducers positioning should be between $\pm 45^\circ$ relative to the horizontal center line of the pipe. This is to avoid that any air bubbles can interfere with the flow velocity detection, Furthermore, in the case of buried pipe must observe the following measures:
with insertion type transducers $L > 600\text{mm}$; with clamp-on type transducers $L > 400\text{mm}$

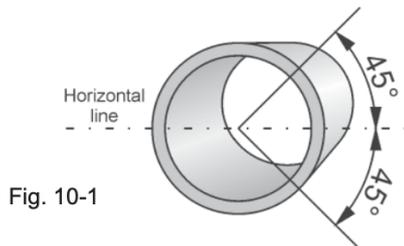


Fig. 10-1

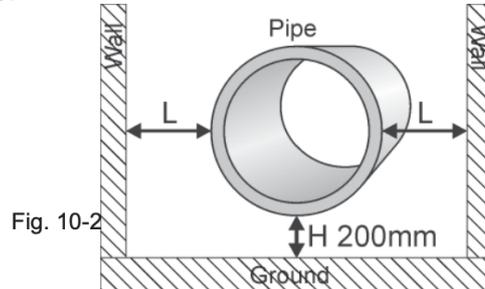


Fig. 10-2

Transducers positioning on a horizontal tube

The transducers positioning points to be avoided are:

- vertical pipes with the downward flow, because they may not be completely filled with fluid
- inclined pipes with the downward flow, because they may not be completely filled with fluid
- the transducers must never be placed in the highest point of the concerned hydraulic circuit, because there is greater chance that in that pipeline section will create air pockets
- vertical open drain pipes without a section restriction to avoid sudden pipe emptying during flow measurement

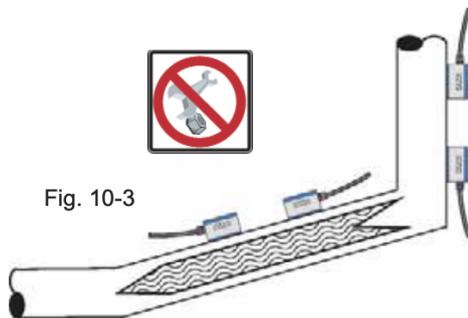


Fig. 10-3

Positioning to avoid example

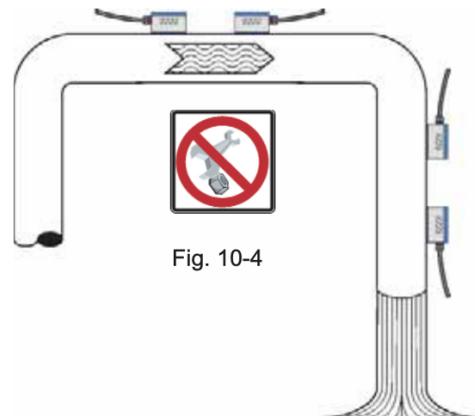


Fig. 10-4

Positioning to avoid example