

Flow Measurement

SITRANS F US Clamp-on

Thickness gauge

Overview



The thickness gauge is used to measure the wall thickness of the pipe that a clamp-on ultrasonic flowmeter is installed on. The wall thickness value is a vital factor in the flow computation model and a prerequisite for precise clamp-on ultrasonic flow measurement. When measuring any pipe wall thickness the thickness gauge can also be used as a stand-alone tool used to measure the wall thickness of any metallic or non-metallic pipe materials capable of acting as an ultrasonic wave conductor.

Benefits

The thickness gauge is an indispensable tool in accurate clamp-on ultrasonic flow measurement. For a flowmeter to measure correctly it needs to know the exact wall thickness of the pipe it is measuring on. Since even the smallest miscalculation can have a major effect on the flow reading, the pipe thickness gauge has to be extremely precise. This is why the standard probe operates at a 5 MHz frequency making it capable of measuring pipe thickness ranging from 0.1 to 200 mm (0.03" to 7.9") with a very high resolution of up to 0.1 mm (0.004").

Application

The thickness gauge can be used in any field application where there is a need for flow measurement.

Design

The hand-held micro-processor controlled gauge is designed to measure the thickness of various metallic or non-metallic pipe. Such materials include steel, aluminum, titanium, plastics and ceramics. Measurement results are shown in either inches or millimeter; only a simple pre-calibration to a known thickness or sound velocity is required. The simple-to-read 4-digit LCD display featuring a basic user friendly menu is easily navigable with only three conveniently located push buttons. The lightweight computing unit weighs a mere 150 g (5.3 oz) making it ideal for quick and easy on-site pipe wall thickness measurement and with two AAA alkaline batteries trouble-free operation is ensured for 250 hours.

Function

The thickness gauge measurement is based on the transit time ultrasonic wave propagation principle: a high frequency ultrasonic beam is transmitted into the pipe being measured through a probe acting as a sender and receiver. When the probe subsequently retrieves that same signal, an internal counter calculates the time taken for the signals to be sent and received through the pipe. This value is used to evaluate the speed of sound through the pipe and consequently, the thickness of the pipe wall.

Technical specifications

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| Display type | 4-digit LCD |
| Display resolution | 0.1 mm (0.004") |
| Measurement units | Metric and imperial |
| Sound velocity range | 1 000 ... 9 999 m/s (3 280 ... 32 805 ft/s) |
| Operating temperature | -10 ... +50 °C (14 ... 122 °F) |
| Probe/pipe temperature | 70 °C (158 °F) |
| Update rate | 4 Hz |
| Frequency | 5 MHz |
| Power source | 2 x 1.5 V AAA dry cells |
| Power consumption | Working current is less than 3 mA |
| Battery life | Approx. 250 h on a set of batteries |
| Dimensions (W x H x D) | 61 x 108 x 28 mm (2.4 x 4.3 x 1.1") |
| Weight | 150 g (5.3 oz) |

Selection and Ordering data

Article No.

Thickness gauge

7ME3951-0TG20