

Ultrasonic interface & spheres detectors

Control in multiproduct pipelines



MINISONIC® ISD MINISONIC® PSD

Interface & Sphere functions Spheres & Pig Detection

- ✓ external clamp-on probe (may be buried)
- ✓ in hazardous area : EEx 'm' protection for probe, standard or explosion-proof converter
- ✓ optional pressure and temperature compensation
- ✓ no moving parts, no wear or maintenance
- ✓ fast response time
- ✓ high sensitivity & accuracy
- ✓ user friendly

Principle

MINISONIC ISD measures the speed of sound in the product. This value is a precise characteristic of the product which is associated with its density.

For both models PSD & ISD, the ultrasonic path is interrupted by the passage of the sphere (product separator) or pig even when they are travelling at high speed.

Typical applications

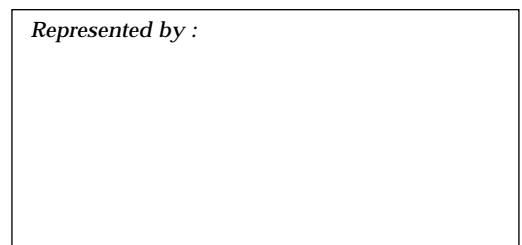
- Early warning of approaching interface of hydrocarbon products in a pipeline of refined or crude petroleum products : analysis of density, concentration and speed of sound.
- Detection of spheres or pigs
- Pipe sizes : 4" to 60"
- Programmable measurement range 500-2000 m/s
- Wide range of fluids with possibility of measurement on gas (insertion probe)



Ultrasonic Measurements



Represented by :



MINISONIC ISD & PSD

DESCRIPTION

Using advanced acoustic-signal processing, MINISONIC ISD & PSD use the signals of the associated probe to track :

- the change of products in the pipeline : ISD
- the passages of spheres or pigs : PSD & ISD

PERFORMANCE - SPECIFICATION

- Resolution of the sound speed measurement
ISD : +/- 0,1 m/s (equivalent to $< 10^{-4}$ of density)
PSD : +/- 10 m/s
- Response time < 1 s - optimized pulse sampling rate
- Output signals :
 - serial RS 232 & 485 - JBUS/MODBUS Protocol
 - 2 relays : passage of spheres even if they are touching
 - 4-20 mA for speed of sound (ISD only)
- Keyboard and PC software for user friendly calibration - LS_ISD
- Storage of the 20 last records of spheres or pigs detection in a date & time logger available for interrogation by serial link
- Two lines backlight LCD display : sound speed, counting of spheres and event messages

DIGITAL CORRECTOR M 1189N

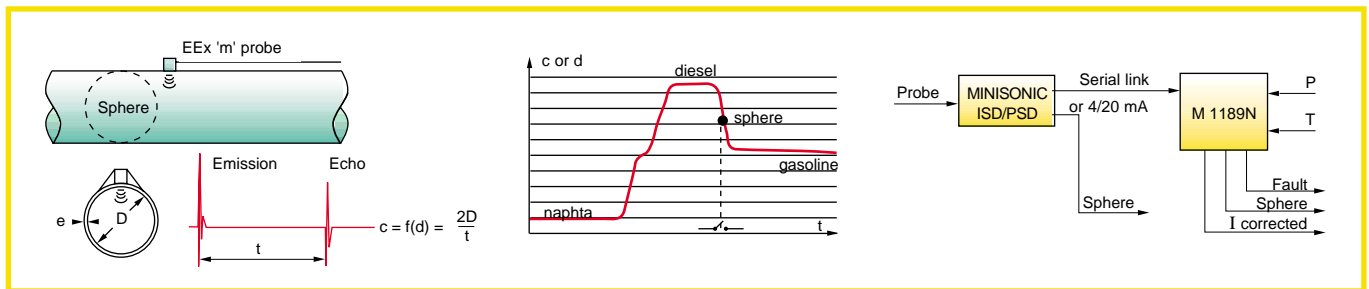
DESCRIPTION

This equipment allows the compensation of the influence of pressure (P) & temperature (T).

M1189 N exists in rack or wall mounting cabinet versions and can integrate the MINISONIC.

PERFORMANCE - SPECIFICATION

- Correction accuracy : M 1189 N : 1% or +/- 3 m/s
- Calibration with PC - LS_1189N software
- 3 analog inputs (4-20 mA) : P, T & I_e (input current)
- 1 analog output (4-20 mA) for I_c (corrected current)
- 2 relays : detection of sphere(s) & faults
- Input-output galvanic isolation
- backlight display and keyboard for the cabinet version



c, t : speed of sound and time of propagation in the product - d : density of the product

ELECTRICAL CHARACTERISTICS

- Power supply
 - MINISONIC : 9 to 36 V_{DC} (25 V_{AC}), or 18 to 60 V_{DC} (40 V_{AC})
 - External transformer module for 110 V or 220 V_{AC} supply
 - M 1189N : 110 V or 220 V_{AC}
- Output 4-20 mA / 1000 Ω - galvanic isolated
- 2 static relays - 100 V / 100 mA / 10 VA max.

Installation and commissioning :

- Straight pipe lengths and probe positioning not critical,
- Permanent coupling of the probe to the pipe,
- Indicate the pipe outside diameter, the wall thickness and the measurement scales.

MECHANICAL CHARACTERISTICS

- Protection and temperature classes
 - Probes : IP 68, - 25°C to 50°C, EEx'm'
 - MINISONIC : IP 67, -20°C to 50°C
 - M 1189N : IP 20 (rack), IP 67 (cabinet), -25°C to 50°C
- Dimensions - Weights
 - MINISONIC : 237 x 108 x 79 mm (LxHxD) - 1,5 Kg
 - Version EXD: 244 x 130 x 232 (LxHxP) - 6,6 Kg
 - M 1189N : Rack 19" - 3 U - 360 mm - 2,5 Kg



Agreements :

MINISONIC EXD : EEx d II C T6, LCIE N° 01.E.6023

Probes Ex 'm', Ex 'me', Ex 'md' : LCIE N° 98.D6099X