



MPCFN-LO

Ultrasonic insert for flow measurement in full/partially full pipes

ELECTRONIC EQUIPMENT

ACOUSTIC

WEIGHING

ANTI-TILTING

VALVES

TEMPERATURE

DETECT A FIRE®

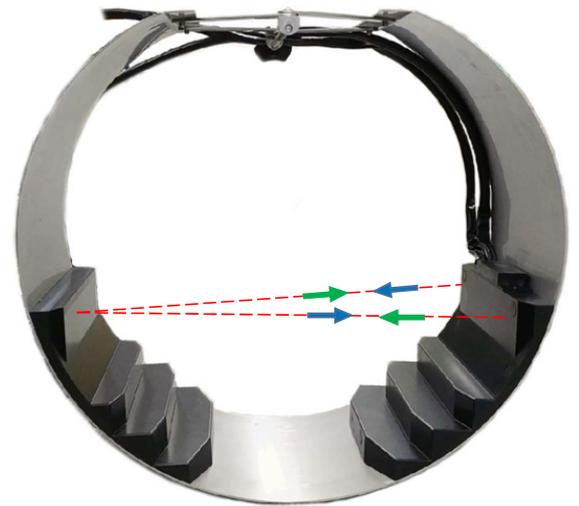
FLOW/RATE

DENSITY

INTERFACE

PRESSURE

LEVEL



“LO” is an insert specially designed for use in pipes, sewers and/or full/partially full pipes.

It is equipped with four pairs of “V”-mounted insertion ultrasonic transducers.

The “LO” insert is combined with a transit time flow meter model MPCFNLO that uses the ultrasonic transit time method to determine the average flow velocity in its measuring section.

To then calculate the flow rate, this signal processing

electronics needs to know the degree of filling of the pipeline, and this information is provided to it by a 4 ÷ 20mA analogue signal input from a dedicated, external level gauge.

The MPCFNLO can maintain accuracy even with very low water levels, and is also able to measure even when the pipe is full. As this newly developed electronics also has very sophisticated diagnostic functions to improve its performance.



The MPCFNLO measures the speed at which the liquid moves within the insert in the various dedicated measuring sections. For this it uses special ultrasonic transducers encapsulated in the structure itself. In addition, to calculate the flow rate, a 4÷20mA hydraulic level/flap signal is also sent to the MPCFNLO, from which the electronics automatically extrapolate the equivalent wetted area.

The transducers are encapsulated on one side of the insert, which is made of PE plastic, and transmit an acoustic wave in the direction of the opposite side. The opposite side has the function of

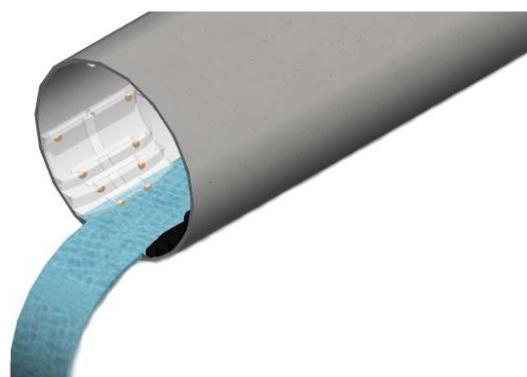
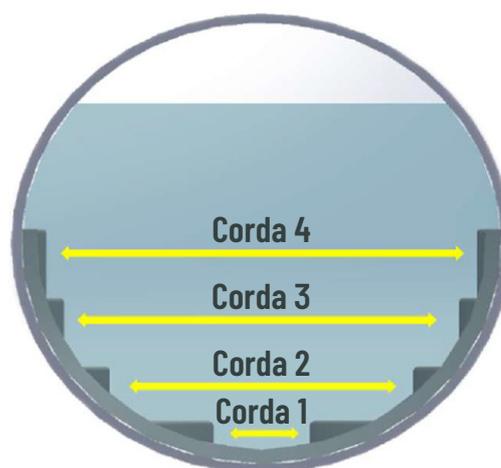
reflecting the signals received from the two transducers and lengthening the acoustic trajectory. The "LO" insert does not disturb the liquid flow and does not generate accumulations of sand, debris, various sludge, dissolved or suspended materials. The shape of the insert also guarantees a very effective self-cleaning action.

For easy and simple installation, the "LO" insert is assembled on an AISI304 stainless steel expansion band. The "LO" insert can be mounted either at the inlet or the outlet of the pipe.

Installation with reflected ultrasonic beam - Suitable for pipes up to DN1200

The transducers measure the time-of-flight difference using the "V" mounting method, which is preferable to the "Z" method in cases where the length of the direct acoustic chord is too short.

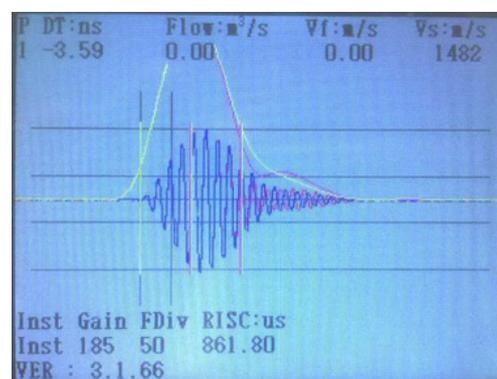
MODEL	Frequency of Work	Pipeline	N. of Sonic Wires
LO (ultrasonic insert for flow measurement in pipelines full/partially full)	1MHz	LO-150mm	3
		LO-200mm	3
		LO-250mm	3
		LO-300mm	4
		LO-350mm	4
		LO-400mm	4
		LO-450mm	4
		LO-500mm	4
		LO-600÷1200mm	4



The transit time technique uses a pair of transducers for each acoustic chord, and each transducer sends and receives encoded ultrasonic signals through the fluid. When the fluid flows, the transit time signal in the downstream direction is less than that in the upstream direction: the speed at which the liquid moves is given by the difference between these

two times of flight.

The MPCFNLO flow meter measures the time-of-flight difference and uses the programmed parameters of the pipeline to determine the direction and flow rate travelled.



Technical specifications

Measuring principle	In transit time with 3/4 acoustic chords depending on the diameter of the tubing/insert - Cross Correlation - Fast Fourier Transform - Anti-Round, patented automatic tuning system for determining the best coupling frequency of transducers
Electronics MPCFNLO:	IP65, suitable for wall mounting
Speed range	0 ÷ ±12m/s
Accuracy	±2%
Sensitivity	± 0.03m/sec
Solution	0.001m/sec
Display	Backlit colour graphic LCD (128x64) - Display: instantaneous flow rate - totalization - signal shape - Oscilloscope function for diagnostics
Power supply	12Vdc 5W on request 220Vac with external power supply
Outputs	N.2 analogue 4 ÷ 20mA; N.2 SPST relays; N.1 RS-232C; N.1 RS-485 Modbus
Input	N.2 analogue 4 ÷ 20mA (level signal, etc.)
Datalogger	32MB
Remote calibrator	32 (4x8) membrane keys
Electronic Temperature	-20 ÷ +75°C
LO insert material	PE (Polyethylene)
Transducers	IP68, 3/4 pair encapsulated in the insert
Transducers Temperature	0 ÷ +60°C
Cables length	10m standard (max. 200m)

Note: For flow measurement, an associated level meter in two-wire current loop 4/20mA @ 24 VDC or multi-wire design is required.

Typical installations: LO insertion on pipe inlet or outlet

