

Solartron 7828 Long Stem Density Transmitter

the complete density solution

Data sheet
IP7828L

Advantages of the 7828

- ▶ Fully integrated 'fit and forget' digital density measurement for monitoring and control
- ▶ Direct analog (4-20mA) output of density, base density, or special calculation (% solids, °API, Specific Gravity, etc.)
- ▶ RS485/Modbus communications
- ▶ Low maintenance
- ▶ PC configuration tool for diagnostics and data logging



Description

The 7828 long stem density transmitter is a sensor for continuous real time measurement of fluid density in open or closed tanks. It has been designed specifically for tank applications where top entry only is possible. Stem lengths of up to 4000mm are available.

The 7828 long stem density transmitter is a further development of our successful 7828 Insertion Density Transmitter. It can be used in process control where density is the primary control parameter for the end product, or as an indicator of some other quality control parameter such as % solids or % concentration.

Typical industries include:

- ▶ Oil and petrochemical
- ▶ Brewing
- ▶ Food
- ▶ Pharmaceutical
- ▶ Minerals processing (clays, carbonates, silicates, etc.)

Applications include:

- ▶ Wort gravity
- ▶ Slurries
- ▶ % alcohol
- ▶ Coatings
- ▶ Evaporator control
- ▶ Product mixing
- ▶ End point detection in batch reactions
- ▶ Solvent separation

Principle of operation

All Solartron Mobrey liquid density transducers operate on the same general principle and can be likened to that of a mass spring system. When a mass on a spring is displaced and released it will oscillate at a natural frequency

until it comes to a rest due to viscous damping. When a driving force is applied to the mass to overcome the effect of damping, the vibration is maintained in resonance.

As the measured product density changes, it in turn changes the vibrating mass of the density transducer, which is then detected by a change in the resonant frequency.

Features

Its features include a configured microprocessor-based electronic module which places the full signal conditioning, calculation and diagnostic facilities within the transmitter itself. Remote electronics are not required for signal processing.

The 7828 long stem is **factory calibrated** and *no further calibration is necessary*. The calibration is traceable to **UK National Standards** through Solartron Mobrey's own UKAS approved laboratory.

The 7828 long stem operates with fluid viscosities of up to 20,000cP, making it suitable to measure wide range of liquids.

It measures line density and temperature, and calculates base density using API tables or a matrix referral as well as parameters such as °API, °Brix, % solids, % mass, % volume and Specific Gravity (there is even a user-defined quadratic equation calculation available).

Any of these parameters can be used to drive the integral analog

(4-20mA) output, enabling it to be used as the process variable in control applications, without the need for additional processing electronics.

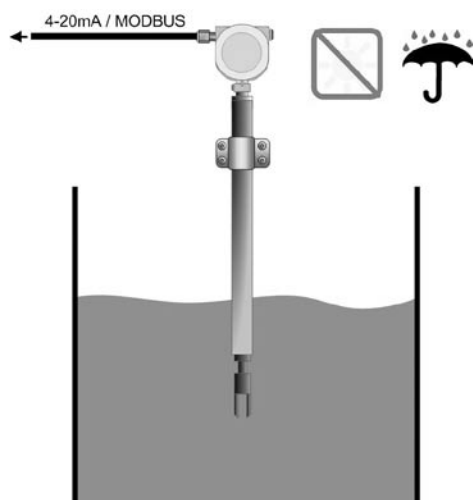
All measurements are available digitally via the built-in RS485/Modbus communications interface, for integration into plant data systems.

The design of the 7828 ensures accurate and reliable results. Maintenance is minimal, leading to lower overall operating costs.

Installation

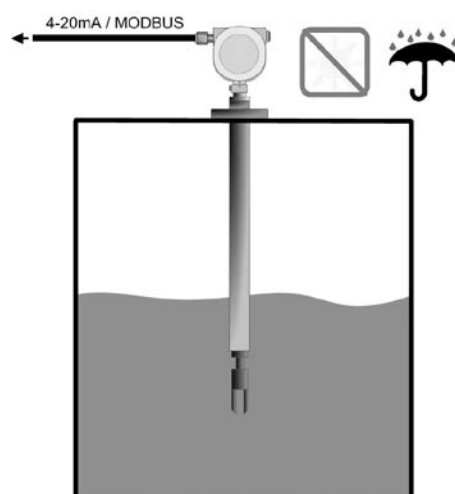
Open-tank installation

For open-tank installations, the 7828 long stem is clamped to structure. The position of the clamp determines the insertion depth.

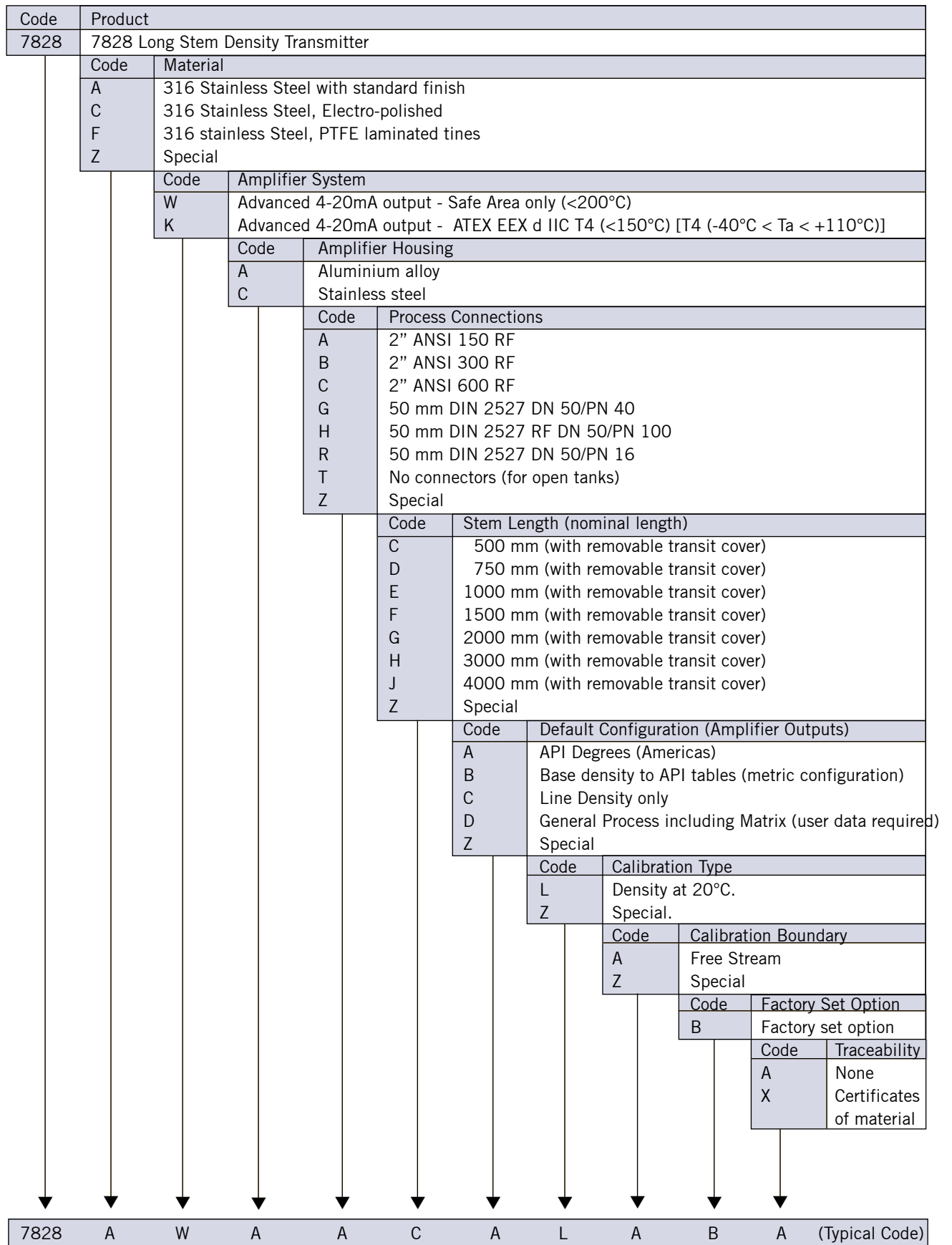


Closed-tank installation

For closed-tank installations, the 7828 long stem is clamped to structure. The position of the clamp determines the insertion depth.



Part Number Identification



Diagnostic Tool

ADView is a software package provided by Solartron Mobrey to enable you to:

- ▶ Configure our density and viscosity transmitters.
- ▶ View and save data from them.
- ▶ Check that they are functioning correctly.

ADView is installed on a PC and interacts with the 7828 long

stem insertion density transmitter through one of the PC's standard serial (RS-232) ports.

ADView provides many useful facilities, such as:

- ▶ Setting up serial link to communicate with the 7828 long stem density transmitter.
- ▶ Configuring the 7828 long stem density transmitter.

- ▶ Displaying data in real time, or as a graph.
- ▶ Logging data to a file.
- ▶ Verifying correct operation of the system, and diagnosing faults.
- ▶ Loading or storing Modbus register values.
- ▶ Read/write to individual Modbus registers.

Specification

Density operating range:	0 - 3g/cc (0 - 3000kg/m ³) (0-187.4 lb/ft ³)
Calibrated range:	0.6 - 1.25g/cc (600-1250kg/m ³) (38.5-80.25 lb/ft ³)
Accuracy:	±0.001g/cc (±1.0kg/m ³) (±0.06 lb/ft ³)
Repeatability:	±0.0001g/cc (±0.1kg/m ³) (±0.006 lb/ft ³)
Temperature range:	
Process**	-50°C to +200°C (-60°F to +392°F)
Ambient	-40°C to +85°C (-40°F to +185°F)
Pressure range (max working)	100bar (1450psi)
Viscosity range:	up to 20,000cP
Temperature sensor (integral):	PT100 BS1904 Class B, DIN 43760 Class B
4-20mA analog output:	Isolated, not self-powered
Controlled by:	Any user-selected parameter
Accuracy:	±0.1% reading, ±0.05%FS @20°C (68°F)
Repeatability:	±0.05%FS over range -40°C to +85°C(-40°F to +185°F)
RS485 Interface:	9600baud, Modbus (Modicon)
Electrical connection	Screw terminal, cable entry to suit 1/2" NPT gland (20mm adaptor available)
Environment:	IP66
Power Supply:	20 to 28Vdc, 35-45mA
Wetted materials:	Stainless Steel
Tine finish:	Standard, PTFE coated or Electro-polished
Connections:	ANSI 150 to 600RF; DIN 50 PN40 and PN100 1.5" compression; IDF and RJT hygienic
Approvals:	ATEX II 2G EEx d IIC T4 EMC EN50081-2, EN50082-2 (Industrial)

** NOTE: Where ATEX is required the process temperature is further limited to -40°C to +150°C / -4°F to +302°F.

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