process measurement solutions

Solartron

7826 density & 7827 viscosity transducers installation accessories

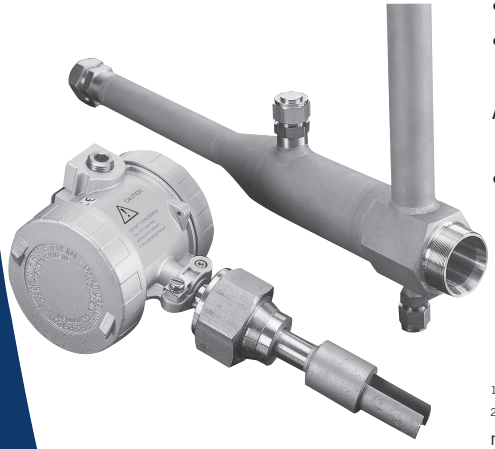
Data sheet
IP7004

The Solartron tuning fork sensors for density (7826) and viscosity (7827) measurement are designed for installation in the tank or in the process pipeline, including slip stream (by-pass) installations. A range of accessories has been created to simplify the installation task:

- Eliminate the requirement for in-situ calibration
- Sustained performance without the need for periodic re-calibration
- Virtually eliminate maintenance and service
- Improved "on stream factor" (API 555)
- Simplified installation using normal pipeline fabrication skills.
- True in-line installation

7826 and 7827 fork transducer[1]

The accessories in this brochure are for the 7826 digital density transmitter and the 7827 digital viscosity transducers.



Sensor & Flow through chamber

These transmitters are usually to be installed directly in the side of tanks, in the side of pipelines at 4" (100mm) NB and above, or in slip streams or bypasses with controlled flowrate.

All the fabrication accessories are designed for use where a cone seat fitting has been specified for the sensor.

If alternate fittings have been specified, the appropriate equivalent fittings accessories can be simply fabricated by the fitter using the drawings shown in the full manual.

With these accessories installation and start up couldn't be easier. Simply select the appropriate fittings, follow the simple rules of installation, install the sensor, then just switch on.

Accessories in this brochure :

- Flow through chambers
- Pipeline weldolets
- Tank pockets
- Insulation
- Temperature Transmitters
- Blanking plug (1½")

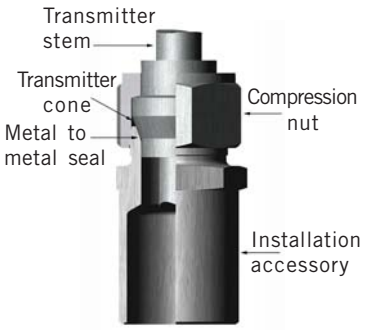
Accessories from other sources :

- Static Mixers

Cone Seat Fittings

The cone seat fitting is Solartrons preferred method of connecting the sensor into the process, as it will guarantee optimum performance in all applications.

All Solartron fork sensors are available with the cone seat fitting specially designed by Solartron for compactness, low mass and high integrity sealing. This fitting is proof against leaks even when rapid and frequent extremes of temperature are encountered in the process. Using a metal to metal seal (produced using different tapers on the fork and in the fitting) eliminates the need for consumables such as gaskets and "O" rings.[2]



The cone seat fitting

[1] For the 7828 and 7829 Advanced Amplifier transmitters accessories, refer to brochure B782703.
[2] Please note that the seal is created by the metal-to-metal seating of the conical surfaces of the mating halves of the fitting and does not depend on thread sealing in the compression nut

Flow-through chamber

Flow rate must be maintained at a constant rate e.g. with a PD pump in the slip stream. Ideal is a PD pump with a variable frequency drive rated at 6-301/min (typical)

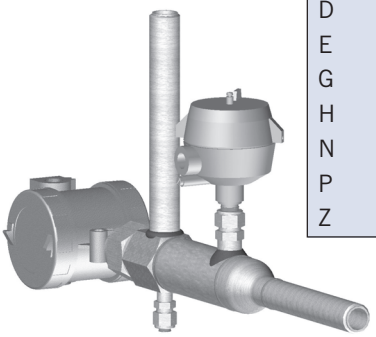
1" Industrial flow through chamber

All with 1.5" cone seat fitting to receive the sensor; ½" drain compression-fitting ; ¾" temperature port compression fitting.

782791	Flow chambers with Swagelock drain and temp		
Code	**Pipe Size**	**Transducer Port**	**Calibration Option**
1	1" (25mm) N.B.	1.5" cone seat	2" Pocket

Code	Materials	
A	316 Stainless Steel	Standard
E	Hastelloy C22	Refer to factory
H	Monel 400	Refer to factory
Z	Special	Refer to factory

Code	Process Connections	
A	ANSI 150 RF	
B	ANSI 300 RF	
C	ANSI 600 RF	
D	ANSI 900 RF	
E	ANSI 1200 RF	
G	DIN 2527 DN 25/PN40	
H	DIN 2527 DN 25/PN100	
N	Swagelock Compression	
P	Weld Prepared ends	
Z	Special	Refer to factory



Code	Traceability
A	None
P	Material Certificate

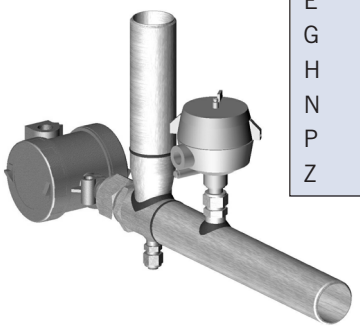
2" Industrial flow through chamber

All with 1.5" cone seat fitting to receive the sensor; ½" drain compression-fitting ; ¾" temperature port compression fitting.

782791	Flow chambers with Swagelock drain and temp		
Code	**Pipe Size**	**Transducer Port**	**Calibration Option**
2	2" (25mm) N.B.	1.5" cone seat	2" Pocket

Code	Materials	
A	316 Stainless Steel	Standard
E	Hastelloy C22	Refer to factory
H	Monel 400	Refer to factory
Z	Special	Refer to factory

Code	Process Connections	
A	ANSI 150 RF	
B	ANSI 300 RF	
C	ANSI 600 RF	
D	ANSI 900 RF	
E	ANSI 1200 RF	
G	DIN 2527 DN 25/PN40	
H	DIN 2527 DN 25/PN100	
N	Swagelock Compression	
P	Weld Prepared ends	
Z	Special	Refer to factory



Code	Traceability
A	None
P	Material Certificate

Note : All inlet and outlet pipes are recommended to be supplied with weld prepared ends. (Illustrated)

Pipe line Weldolets

Weldolets may be used with all fork sensors which have cone seat fittings.

Pipeline Weldolets are designed to allow the 7826 or 7827 to be installed directly into the side of pipe in pipe sizes of 4" and greater. Two styles are possible:

- Free stream where the sensor fork is fully exposed to the flow (7826 / 7827 free stream calibrated)
- Recess mounting where the sensor is fully withdrawn from the flow. (7826/7827 2" pocket calibrated)

There are no intermediate fittings because of the difficulties of matching the installation in the factory calibration.

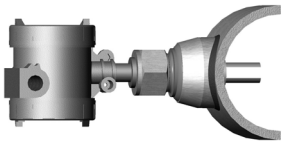
782781 Weldolets for free stream (2" N.B. with 1.5" cone seat for the transmitter)

Code	Materials of construction	
A	316 Stainless Steel	Standard
E	Hastelloy C22	Refer to factory
H	Monel 400	Refer to factory
Z	Special	Refer to factory

Code	Main Pipe Diameter
A	4"
P	6"
B	8"
E	10"
Z	Special

The sensor protudes into the flow stream. The maximum flow velocity at the sensor is 0.5m/s, minimum 0.3m/s.

Code	Traceability
A	None
P	Material Certificate



Pipe diameter should be increased or decreased to obtain the appropriate flow velocities (min. diameter 4" {100mm})

782782 Weldolets for recess mounting (2" N.B. with 1.5" cone seat for the transmitter) Max 100cP

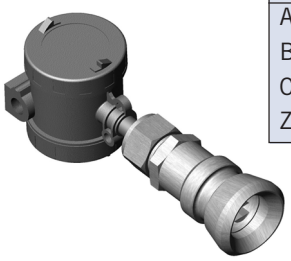
Code	Materials of construction	
A	316 Stainless Steel	Standard
E	Hastelloy C22	Refer to factory
H	Monel 400	Refer to factory
P	Carbon Steel & St. St.	(Hydrocarbon pipe line standard)
Z	Special	Refer to factory

Code	Main Pipe Diameter
A	4"
P	6"
B	8"
E	10"
Z	Special

The sensor is recessed from the flow stream. The maximum flow velocity in the pipe is shown below

Code	Flow velocity table 3 (pocket dimension is velocity specific)	
A	0.5 - 3m.s-1	When ordering, please specify schedule of
B	2.0 - 4m.s-1	main pipe
C	3.0 - 5m.s-1	e.g. schedule 40 or schedule 80.
Z	Special	alternatively, specify pipe wall thickness

Code	Traceability
A	None
P	Material Certificate



1. **Notice** free stream installation velocity limits are >0.3 to <0.5 m/s
2. **Notice** recessed mounting velocity limits >0.5 to <5.0 m/s
3. **Notice** maximum fluid viscosity for recessed mounting is 100cPs
4. Pipe size should be increased or decreased to enable the velocity limits to be met. There are no intermediate ranges e.g. for pipe lines with flow velocities 0.4 to 0.6 m/s the pipe diameter must be increased so that a free steam weldolet can be used or decreased so that a recessed weldolet can be used.
5. Be sure that the corresponding codes for the materials, the cone seat fitting and the calibration are specified for the associated 7826 or 7827 sensor.

Temperature Transmitters

The 7827 and 7826 transducers are often used for quality measurements where the density or viscosity at a reference temperature is required to be calculated from the density or viscosity at a process temperature. Though they have an integral Class B PT100 for Youngs modulus correction it is important to know accurately the fluid temperature and to respond as fast as possible to changes in fluid temperature.

These Class A PT 100 temperature sensors are designed for direct insertion into the fluid flow i.e. the temperature sensor sheath material is wetted by the process fluids. The industrial flow chambers use a cone seat fitting for their installation.

782771	Temperature Transmitters : for Industrial flow chambers 1" to 2" (25mm to 50mm)		
	Code	**Materials of construction**	
	A	316 Stainless Steel	Standard
	E	Hastelloy C22	Refer to factory
	H	Monel 400	Refer to factory
	Z	Special, refer to factory	

	Code	**Main Pipe Diameter**
	A	Single element 4 wire Class A PT100
	B	Dual element 4 wire Class A PT100
	Z	Special, refer to factory

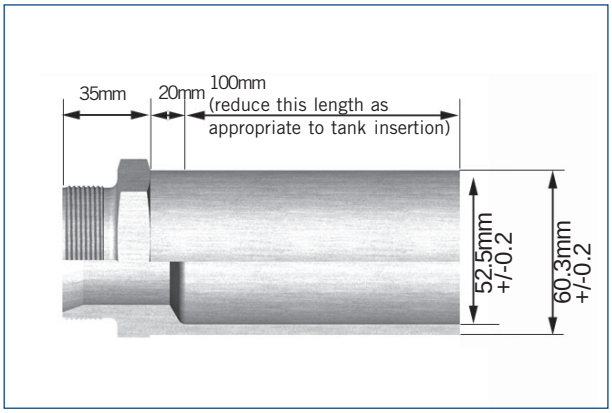
	Code		
	C	Cenelec Approved Eex IIc T4	
	D	CSA Class 1, Division 1, Groups C & D	
	Z	Special	Refer to factory

	Code	**Traceability**
	A	None
	P	Material

Tank Weldolets

All fork sensors can be installed in tanks (refer to Solartron Mobrey for advise on individual applications) The use of the cone seat fitting is less critical in tank applications but may be considered more convenient. The fitting offered here is designed to allow 7826 and 7827 transmitters with cone seats to be installed in the side of tanks.

For other fittings, the installer may fabricate appropriate tapping in the tank.



Tank installation weldolet. Part no: 78277217A

Notice these fittings are supplied in one size only.

The length of the fitting is longer than necessary to allow for profiling to match the tank shape and to allow the end installer to reduce or extend the length of the fitting as required. The tines normally should extend fully into the tank and the sensor should then be specified with a free stream calibration. If the tines are to be recessed, and welding on a section of 2" schedule 40 pipe makes up the length of the fitting to the desired dimension; then a 2" pocket calibration should be specified.

It is recommended that all tank applications are discussed with Solartron Mobrey.

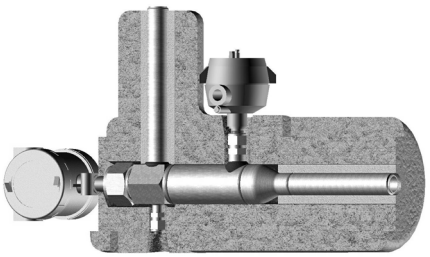
782783	Tank Weldolets	
	Code	**Materials of construction**
	A	316 Stainless Steel
	Z	Special

	Code	**Traceability**
	A	None
	P	Material certificate

Insulation Jackets

All density and viscosity transducers should be adequately and thoroughly insulated. Flow chambers upto 2" size and with a 2" pocket calibration requirement may be fitted with a Solartron Mobrey molded calcium silicate insulation jacket. At larger sizes insulation may be fabricated on site. The insulation standard recommended is the locally approved standard for high temperature steam pipe work. i.e. based on calcium silicate insulation.

Insulation jackets:	Moulded Calcium Silicate
7 8 2 7 7 2	fabric reinforced with external paint finish



Blanking Plug

If at any time it is necessary to remove the 7826 or 7827 sensor and to restore flow with the sensor removed e.g. for service or to flush the installation, a blanking plug is necessary to close the opening. The blanking plug consists of a securing nut and a cone seat plug providing the same sealing integrity as the fork sensor.

782784	Blanking Plug : 1½"	
	Code	size
	C	1½"
	Code	Materials
	A	316 Stainless Steel
	E	Hastelloy C22
	H	Monel 400
	Z	Special
	Code	Traceability
	A	None
	X	Material Certificate

Application

The flow chambers are normally used with the 7826 and 7827 transducers for density and viscosity; these are usually analytical measurements requiring a critical fluid temperature measurement. They may be used in slip streams (by-passes) where flow rate control is critical or where temperature conditioning is required.

Slip stream (by pass) installation during commissioning

Static Mixers

Static mixers are used to homogenise the fluid flow before it reaches the sensor. They should be installed in accordance with the manufacturers recommendations. Contact Solartron Mobrey for advise or visit the website. Typical suppliers:

Chemineer: www.chemineer.com/main.php
Statiflo: www.interlog.com/~statiflo/
Koch-Glitch: www.koch-glitsch.com/mixers.htm

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