

Solartron

7828 density & 7829 ViscoMaster & Visconic viscosity fork sensor “Advanced” transmitter installation accessories

Data sheet
IP7005

The Solartron tuning fork sensors for density (7828) and viscosity (7829) measurement are designed for installation in the tank or in the process pipeline. 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
- ▶ Eliminate maintenance and service
- ▶ Improved “on stream factor” (API 555)
- ▶ Simplified installation using normal pipeline fabrication skills.
- ▶ No need for fast sample loops, slip streams or by-passes
- ▶ True in-line installation

7828 and 7829 fork transducers¹

The accessories in this brochure are for the 7828 digital density transmitter, the 7829 Visconic and 7829 ViscoMaster™ digital viscosity transducers.



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 inline in pipelines of 3” (80mm) or less.

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

If alternate connections have been specified, the appropriate equivalent fittings 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 for installation, install the sensor; then just switch on.

Accessories in this brochure:

- Flow through chambers
- Pipeline weldolets
- Tank pockets
- Insulation
- RS 232/485 converters
- ADView Windows based data logging and configuration tool
- Blanking plug (1½”)

Accessories from other sources:

- Static Mixers
- RS232/485 converters

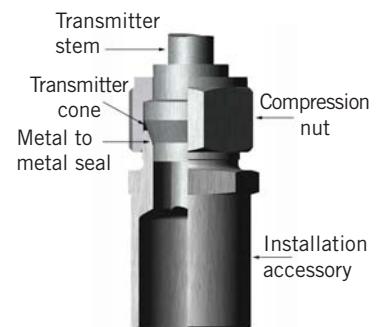
Cone Seat Fittings

The cone seat fitting is Solartron's 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 7826 and 7827 transducer 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

They are for use where all the fluid flows through the chamber. For flow rates outside those listed in the table below, choose a Weldolet or consult the sales office.

Choose a flow chamber

- Select by the appropriate flow rate
- Then choose the best inlet/outlet pipe size
- Finally select the material needed

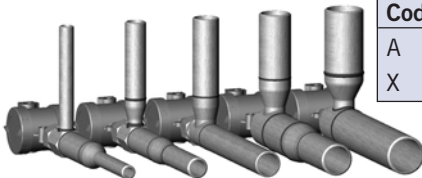
Notice the required calibration for the fork sensor:

- 2" pocket calibration
- 3" pocket calibration

Be sure that the corresponding codes for the materials, the cone seat fitting and the calibration are specified for the associated 7828 or 7829 fork sensor.

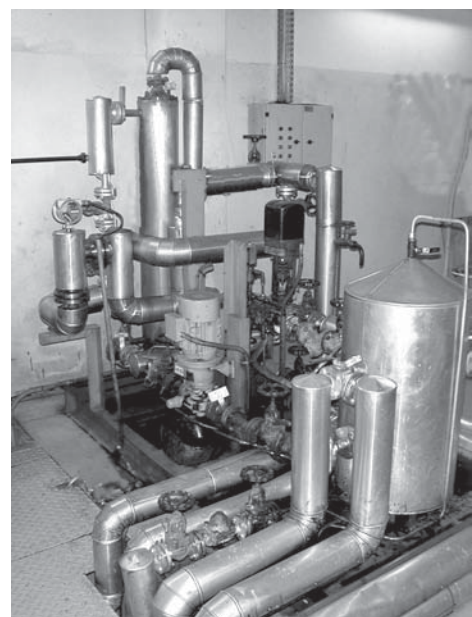
All inlet and outlet pipes are normally supplied with weld prepared ends. It is recommended that the flow chambers are welded into the pipeline. Flanges are not recommended due to cost and maintenance (of the gasket) and the potential to leak but may be fitted by the installer if required or may be factory fitted on request.

782791	1" to 3" ViscoMaster and Visconic Flow-through chambers			
Code	Inlet/outlet Pipe Size	Calibration Boundary	Allowable flow rates	
A	1" (25mm)	2" Pocket, schedule 40	2.3-7.6m ³ hr	
B	1¼" (30mm)	2" Pocket, schedule 40	2.3-7.6m ³ hr	
C	1½" (40mm)	2" Pocket, schedule 40	2.3-7.6m ³ hr	
D	2" (50mm)	2" Pocket, schedule 40	2.3-7.6m ³ hr	
E	2" (50mm)	3" Pocket, schedule 40	5.4-18m ³ hr	
F	2½" (65mm)	3" Pocket, schedule 40	5.4-18m ³ hr	
G	3" (80mm)	3" Pocket, schedule 40	5.4-18m ³ hr	
Z	Special	Refer to factory		
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 for the above flow chambers (A-E)			
P	Weld Prepared ends only			
Z	Special	Refer to factory		
Code	Traceability			
A	None			
X	Material Certificate			



Application

The flow chambers are normally used with the 7828 and 7829 transducers for density and viscosity measurement. These are usually analytical measurements not requiring a critical fluid temperature measurement. They may be used in slip streams (by-passes) where flow rate control is critical but are normally used to accommodate the full process flow rate.



Pipeline Weldolets

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

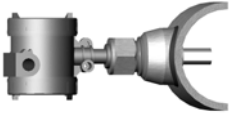
Pipeline Weldolets are designed to allow the 7828 or 7829 to be installed directly into the side of pipes with a diameter of 4" or greater. Two styles are possible:

- Free stream where the sensor fork is fully exposed to


the flow (7828 / 7829 free stream calibrated)

- Recess mounting where the sensor is fully withdrawn from the flow. (7828/7829 2" pocket calibrated)

There are no intermediate fittings because of the difficulties of matching the installation to 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		
E	Hastelloy C22		
H	Monel 400		
Z	Special		
Code	Main Pipe Diameter		
A	4"		The sensor protrudes into the flow stream. The maximum flow velocity at the sensor is 0.5m/s, minimum 0.1m/s.
P	6"		
B	8"		
E	10"		
Z	Special		
Code	Traceability		
A	None		
X	Material Certificate		

Pipe diameter should be increased or decreased to obtain the appropriate flow velocities (minimum 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		
E	Hastelloy C22		
H	Monel 400		
P	Carbon Steel weldolets, St. St.pocket (Hydrocarbon pipe line standard)		
Z	Special		
Code	Main Pipe Diameter		
A	4"		The sensor is recessed from the flow stream. The maximum flow velocity in the pipe is shown below
P	6"		
B	8"		
E	10"		
Z	Special		
Code	Flow velocity table 3 (pocket dimension is velocity specific)		
A	0.5 - 3m/s	When ordering, please specify schedule of	
B	2.0 - 4m/s	main pipe	
C	3.0 - 5m/s	e.g. schedule 40 or schedule 80.	
Z	Special	alternatively, specify pipe wall thickness	
Code	Traceability		
A	None		
X	Material Certificate		

1. **Notice** free stream installation velocity limits are >0.1 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. Hence where 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 stream 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 7828 or 7829 fork sensor.

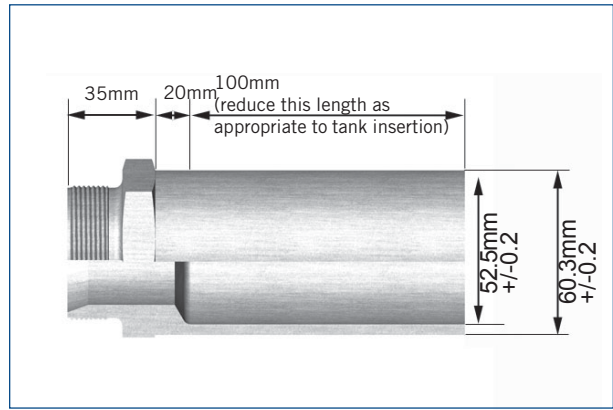
Tank Weldolets

All fork sensors can be installed in tanks (refer to Solartron Mobrey for advice 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 7828 and 7829 transmitters with cone seats to be installed in the side of tanks.

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

Notice these fittings are supplied in one size only.



Tank installation weldolet. Part no: 78277217A

The length of the tank weldolet is designed to allow for matching the tank shape to the fitting as well as allowing the end installer to reduce or extend the length 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.

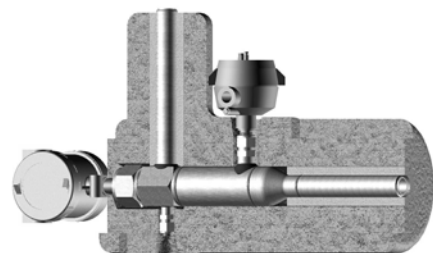
It is recommended that all tank applications are discussed with Solartron Mobrey.

782783	Tank Weldolets	
	Code	Materials of construction
	A	316 Stainless Steel
	Z	Special
	Code	Traceability
	A	None
	X	Material Certificate

Insulation Jackets

All density and viscosity transducers should be thoroughly insulated. For flow chambers with import and output tubes up to a 2" size and a 2" calibration may be fitted with a Solartron Mobrey moulded 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		



ADView

7826 and 7827 advanced amplifiers have a single MODBUS communications channel. This may be interrogated using read and write MODBUS commands using a computer or DCS system or similar.

Alternatively, the user may communicate using ADView, a Windows based program.

This program allows multidrop communications.

ADView is used for transmitter configuration, download of configuration to hard drive, or from hard drive to device; diagnostics and data logging.

ADView is available free and may be downloaded from the website (www.solartronmobrey.com)

It may be available from Solartron as a package with the appropriate RS232/485 converters and the fittings to make up a signal cable. The cable is not supplied as it is recommended that the cable used for the permanent installation is a multi core cable to the appropriate standard with spare cores for the MODBUS communications.

ADview (program only) supplied on 3 off 3½" floppy discs	
7 8 2 8 1 A	Software version as current

RS 232/485 converters

These converters have been selected to enable communication between the transmitter and the PC using MODBUS protocols.



RS232/485 Converters					
Part No	Type	Use	Description	RS485 Connector	RS232 Connector
550003030	K2 ADE	Windows 3.1/95/98	PC powered(option: 9Vdc)	9 pin socket	25 pin plug
550003030	K485-STD	Windows 3.1/95/98	DIN Rail Mounted	Screw terminal	Screw terminal
550003030	K485-ADE	Windows 3.1/95/98	DIN Rail Mounted	Screw terminal	Screw terminal

Accessories sourced from manufacturers:

RS 232/485 converters:

See above. The converters specified may be ordered from Solartron Mobrey or they may be purchased from KK Systems or their distributors or from other suppliers offering equivalent converters.

KK Systems : www.kksystems.com

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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