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## SUBMERSIBLE PRESSURE TRANSMITTER Mod. TPSM 54

- Hydrostatic level measurement
- Fixing thread between the mechanical body and the cable
- Outer diameter: 23 mm.
- Ceramic measurement sensor
- Body material in AISI-316.L stainless steel
- Cable with Kevlary<sup>®</sup> portor compensation tube

CE



#### **DESCRIPTION – APPLICATIONS**

The **TPSM 54** submersible pressure transmitter, made of 23 mm AISI-316.Ly stainless steel. in diameter, it is appropriate for continuous hydrostatic level measurement and is designed to withstand immersion in fluids (level measurement in tanks, storage...).

The **TPSM 54** has in its structure a  $\frac{1}{2}$ "G (BSP) thread to be able to isolate the CS-700 cable from the liquid to be controlled by means of a tube that has a  $\frac{1}{2}$ "G female thread at its end; The cable is introduced inside this and threaded to the mechanical structure. In this way, double protection is guaranteed. IP68 waterproofing, protect the cable from chemical or mechanical attacks or violent agitations of the fluid.

The submersible level probe has a wide range of fixed measurement ranges from 0...0.25 Bar up to 0...40 Bar

(on request it is supplied with the appropriate depression range for each installation).

#### **GENERAL CHARACTERISTICS:**

- Ceramic sensor (membrane) with high precision, linearity and long-term stability
- Resistant to climate changes due to its encapsulated electronics and compensation system atmospheric pressure
- Output signal: 4÷20 mAdc. 2 wires
- Standard includes 10 meters of CS-700 or CS-800 model cable (upon request supplied with the appropriate additional lengths for each installation)
- The model CS-700 or CS-800 cable, which is part of the measuring set, has a double chamber of sealed, a braided Kevlar cable, which acts as a tutor against traction efforts, and a tube through which the pressure transmitter takes the atmospheric pressure reference for its balance
- Protection against voltage surges
- The atmospheric compensation tube includes an environmental protection filter
- Repairable level probes

#### **TECHNIQUE USED**

The measurement sensor of the submersible pressure transmitter is made of ceramic, the piezoresistive technique used. This technology is related to the deformation of the ceramic membrane of the sensor, in which four electrical resistances are engraved forming a Wheatstone bridge. Consequently, any deformation due to pressure will unbalance the electronic circuit that will form an output signal proportional and linear to the pressure supported by the ceramic cell. The ceramic sensors used are internally temperature compensated using PTC resistors.

The use of ceramic technique, in the field of pressure transmitters, provides excellent reliability due to:

- Apply pressure directly on the diaphragm of the ceramic sensor
- There should be no fluid chamber inside the sensor (synthetic oil, glycerin, etc.) that could produce variations due to expansion effects or mounting position, providing high stability against the effects of temperature
- Excellent mechanical memory and repeatability against pressure variations
- Compatibility with aggressive products

#### MEASUREMENT RANGE

Input pressure range								
Nominal pressure (Bar)	0,25	0,3	0,5	0,6	0,75	1	1,6	2
Level (m.H <sub>2</sub> O)	2,5	3	5	6	7,5	10	16	20
Overload limit (Bar)	1	1	1	1	1	2	2	5
Burst pressure ≥ (Bar)	2	2	2	2	2	4	4	10
Input preassure range								
Nominal pressure (Bar)	2,5	4	5	6	10	16	25	40
Level (m.H <sub>2</sub> O)	25	40	50	60	100	160	250	400
Overload limit (Bar)	5	5	10	10	20	20	50	50
Buret pressure > (Bar)	10	10	20	20	40	40	100	100

The measurement ranges detailed in the table are standard; On demand and at no added cost, it can be supplied with a specific range (depending on the different physical – chemical parameters of a 2 process) or different work units (PSI, m.H2O, Kg/cm, KPa, MPa, mmHg,...)



Materials in contact	Body	AISI.316.L Stainless steel (WN 1.4404)			
	Sensor membrane	Aluminum oxide ceramic (AL <sub>2</sub> O <sub>3</sub> 96%)			
	Sealing O-ring	NBR (acrylonitrile butadiene – Buna N nitrile) On request: Vitón (FPM.FKM), EPDM			
	Protective cone	Polypropylene (PP)			
	Cable – 2 versions	Mod. <b>CS-700</b> : Acrylic PVC TM5 (standart) Mod. <b>CS-800</b> : Polyethylene			
Technical data	Pressures	Relatives			
	Measuring ranges	From 00,25 Bar to 040 Bar - preassure ranges on request -			
	Sensor resolution	0,01 to 0,014% FE			
	Combined sensor error	< 0,3 % FE (Linearity, hysteresis and repeatability)			
	Response time	< 1 ms.			
	Normalized output signal	420 mAdc. – 2 wire – Lineal			
	Supply voltage	1035 Vdc.			
	Maximum load resistance	$R_{max}(\Omega) \leq [Ub(Vdc) - 10(Vdc)] / 0,02 Adc$			
	Electric protections	Polarity, overvoltage and short circuit			
	Long term stability	≤±0,2% FE / year under reference conditions			
Constructive features	Sensor type	Ceramic			
	Protection grade	IP-68 with protective tube for cable insulation (IEC 60529) - Permanent hermetic closure			
	Thread – mechanical structure	<sup>1</sup> / <sub>2</sub> " G (BSP) – M			
	Electrical connection	Via three-pole cable (3x0,34 mm <sup>2</sup> )			
	Temperature	Process: -570 °C Storage: -1080 °C			
	Outer diameter of the probe	23 mm.			
	Dimensions	See plans			
	Preassure intake connection	Internal thread G. <sup>1</sup> / <sub>4</sub> " - female (max. 5 mm.)			
	Weight	≤ 1,00 Kg. - transmissor + 10 mts. cable mod. CS-700 -			
	Cable weight every 10 meters	≈ 0,75 Kg.			
	Cable outer diameter	≈ 8,5…9 mm.			
	Enviromental protection filter	Included – porosity 0,45µm			
	Compliance RoHS	Yes – 2011/65/EU			
	Compliance CE	Directive EMC 2004/108/CE - EN61326.G1/B			

#### Cable features

The submersible level transmitter cable is a fundamental element for the correct operation and durability of the transmitter.

There are two versions according to needs::

- mod. CS-700 of acrilyc PVC TM5
- mod. CS-800 of polyethylene

The **CS-700/800** cable is made up of three conductors, plus a nylon tube to compensate for pressure. atmospheric pressure and a flexible braided Kevla<sup>®</sup> (polyparaphenylene terephthalamide) carrier that acts as a protector against tensile stresses (withstands a breaking load of 110 Kg). All of them wired and screened with polyester aluminum tape and tinned copper drainage.

The mod. **CS-700** is prepared for immersion in saline waters and both types are free of dangerous products according to Annex 3 of RD.208/2005.

The submersible level probes include 10 meters of cable mod. **CS-700** in a standardized manner (upon request it is supplied with cable **mod. CS-800** and with the additional length appropriate for each installation).

### **CONNECTION DIAGRAM**



#### ACCESORIES





- Reading instrument for viewing (IPD mod.)
- Surge protector (mod. PS 4)
- Environmental protection filter (mod. FI-500)
- Tie down clip/clamp (PAC mod.) .
- Measurement converters .
- Power supplies -
- Amplifier relays -





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