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## APT 1000 Intelligent Hydrostatic Level Transmitter for Marine Tank Gauging



### Key features

- Robust all welded submersible construction suitable for harsh environments
- Choice of construction materials compatible with all common marine liquid measurement applications
- Process connections and fixings for side of tank or submersible installation
- Simple to install, accurate and stable, robust and reliable
- Gauge or Absolute options with a wide measuring span and 0.1% performance
- Dual-mode operation provides outputs as 4-20mA and RS485 Modbus
- DNV-GL Type Approved and IECEx / ATEX certified for hazardous areas (Zone 0)

Part of the **TankWatch** product group

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DAT 57C JULY 2019



PSM is a Scanjet Group Company



## Designed and constructed for marine tank gauging

PSM has drawn upon nearly 40 years of global marine application experience in developing the APT 1000 to provide a liquid level transmitter that delivers the highest possible standards in terms of performance, versatility, functionality and reliability.

The APT 1000 provides a reduced weight and size compared to previous generations and takes full advantage of advancements in electronic design to provide enhanced accuracy and stability under varying operating temperatures. Body construction is all laser welded, eliminating any possibility of leaks, and all versions are IP68 certified suitable for full immersion to a minimum of 50M WG. A choice of construction materials, Stainless Steel, Titanium, and Hastelloy, ensure corrosion resistance in all applications and all measurement ranges will tolerate an overload of 2 x nominal range with no adverse effects to performance or calibration.

The transmitters electronics are fully integrated within the body and incorporate a powerful micro-controller to precisely monitor and process the output of the pressure cell. On-board non-volatile memory allows each transmitter to be fully configured for its intended duty either during manufacture or subsequently while in operation.

The transmitter is certified according to ATEX and IECEx regulations for installation in a hazardous area and Type Approved by DNV-GL as suitable for use in marine applications.

## Digital and analogue operation

The APT 1000 is a dual- mode transmitter providing both an analogue 4 -20 mA signal and multi-drop RS485 Serial communication based on industry standard Modbus RTU protocol. The unit is fully programmable using the ISS application available as free download from PSM.

## Save money and time with digital operation in multi-tank installations

When installing multiple tank applications digital mode enables significant cost and weight savings, removing the need for separate cable runs to each transmitter by utilising a single cable multi-drop RS485 network In conjunction with PSM RFM series termination and Safety barrier modules more than 50% of installation time and costs can typically be saved

## Complete solutions

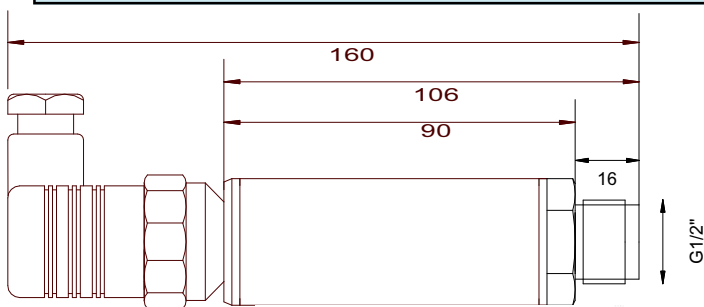
Partnering the APT 1000 PSM can offer display options to provide a complete tank gauging solution.

The VPM4300 Series touch screen display provides a clear presentation of all tank data for smaller tank gauging systems, while our TankView PC based package provides comprehensive functionality for larger Vessels. Both systems provide full configuration capability for the APT1000 eliminating the need for specialist calibration equipment and both are capable of delivering tank level status via serial link to other onboard systems such as Load Computers or Alarm Monitoring Systems.

Part of the **TankWatch** product family

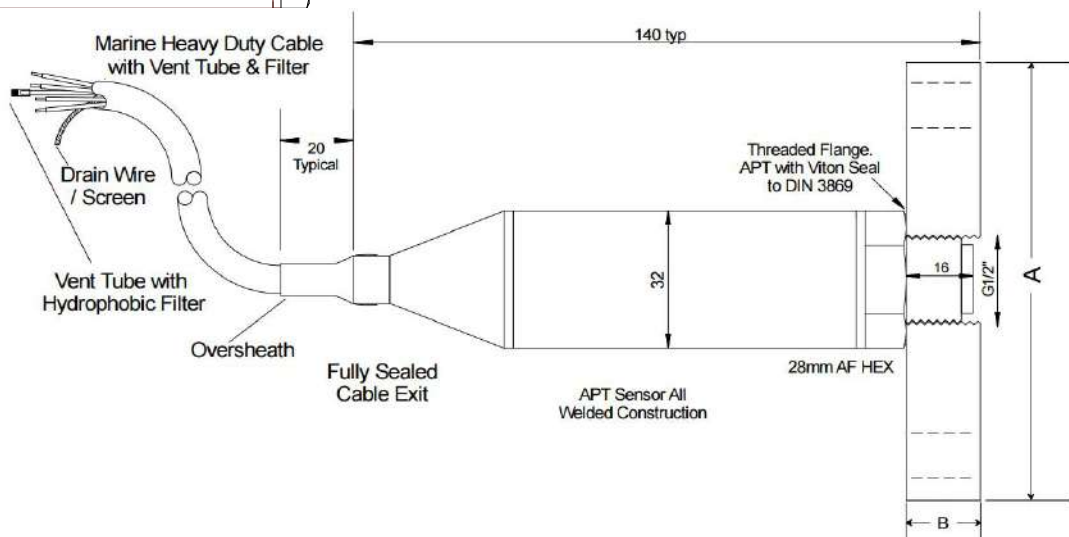
Specifications		
Materials	Sensor body	316L Stainless Steel or Titanium. Hastelloy C276 option for Wetted parts for external (to tank) mounting.
	Diaphragm	316L or Titanium to match body material. Hastelloy C276 process ports use Tantalum diaphragm.
Standard Measurement Ranges (Bar)	0.2, 0.5, 1.0, 2.5, 4.0, 10, 25, 40, 60. (Other ranges to special order)	
Measurement type	Vented Gauge or Absolute (Absolute version minimum range 1 bar)	
Overload	2 x Nominal range with no effect	
Burst Pressure	15 x Nominal range up to 10 Bar. 7 x Nominal range above 10 Bar	
Turndown	5:1 from Nominal range (relevant to 4-20mA scaling only)	
Temperature measurement span / accuracy	0 to +85°C +/- 1°C (reading only available in digital mode)	
Total Error Band (pressure monitoring)	+/- 0.1% of Nominal range including thermal effect	
Thermal compensation	No thermal effect within the range 0 to 70°C	
Long term stability	Error not exceeding +/- 0.1% Per Annum	
Max / Min process temperature	-35 to +85°C	
IP Rating	IP68 suitable for continuous immersion	
IECEX certification	Refer to PSM for copies of current Certification	
ATEX certification	Refer to PSM for copies of current Certification	
Signal Output / Power supply	4-20mA & RS485 Modbus RTU / 10 to 30V DC	
Maximum load	Supply dependant. Vs-10/0.02 = Load in Ohms	
Reverse polarity protection	Yes	
Weight	0.3Kg typical for body. Cable 0.1Kg / metre	

## Dimensions



Flange	Holes	PCD	Bolt Size	A	B
DN20 PN16	4	75	M12	105	18
DN25 PN16	4	85	M12	115	18
DN40 PN16	4	110	M16	150	18
DN50 PN16	4	125	M16	165	18

Note: Flange Thickness (B) Must be Minimum 18mm to Provide Protection for Sensor Diaphragm





APT1000 Level / Pressure Transmitter							
1000S	APT 1000 Dual Mode 4-20mA & RS485 Modbus Intelligent Transmitter - Submersible construction with cable						
1000D	APT 1000 Dual Mode 4-20mA & RS485 Modbus Intelligent Transmitter - DIN Plug Type 43650 connection						
1000H	APT 1000 Dual Mode 4-20mA & RS485 Modbus Intelligent Transmitter - Terminal Head						
<b>Certification</b>							
S	Hazardous Area Approval NOT APPLICABLE						
I	Certified Intrinsically Safe to ATEX - Hazardous Area Approved						
X	Certified Intrinsically Safe to IECEx - Hazardous Area Approved						
IX	Dual Certification ATEX / IECEx - Hazardous Area Approved						
<b>Measurement Type</b>							
A	Absolute						
G	Gauge						
<b>Nominal Range</b>							
<b>Absolute</b>				<b>Gauge</b>			
	TI	SS	HT		TI	SS	HT
A	N/A	N/A	N/A	A	0.2 Bar	0.2 Bar	0.2 Bar
B	N/A	N/A	N/A	B	0.5 Bar	0.5 Bar	0.5 Bar
C	1.0 Bar	1.0 Bar	1.0 Bar	C	1.0 Bar	1.0 Bar	1.0 Bar
D	2.5 Bar	2.5 Bar	2.5 Bar	D	2.5 Bar	2.5 Bar	2.5 Bar
E	4.0 Bar	4.0 Bar	4.0 Bar	E	4.0 Bar	4.0 Bar	4.0 Bar
F	10 Bar	10 Bar	10 Bar	F	10 Bar	10 Bar	10 Bar
H	25 Bar	25 Bar	25 Bar	H	25 Bar	25 Bar	25 Bar
I	40 Bar	40 Bar	40 Bar	I	40 Bar	40 Bar	40 Bar
J	60 Bar	60 Bar	60 Bar	J	60 Bar	60 Bar	60 Bar
<b>Process Connections &amp; Fitting Options (** not available for TI versions)</b>							
1	1/2" BSP Male (Standard connection). Material is as specified for the main body						
2	3/4" BSP Male Adapter in 316 Stainless Steel						
3	1" BSP Male Adapter in 316 Stainless Steel						
4	DN25 PN16 316 Stainless Steel Flange						
5	Special connection - refer for availability and cost						
6	G1/2" to DIN EN837 (Special order, refer for delivery time)						
7	Pole Adapter Threaded G 1/2" Female Adapter in 316 Stainless Steel**						
8	Pole Adapter Threaded G 3/4" Female Adapter in 316 Stainless Steel**						
9	1/2" BSP Male Process Connection / 3/4" BSP Male Head Adapter Back End						
10	1/2" BSP Female Adapter in 316 Stainless Steel (ICT Retrofit)						
11	St.Steel Sensor with Drain wire adapter						
12	St.Steel Sensor with Stainless Steel Stilling Pipe Retainers						
13	Not used						
14	Titanium Sensor with Drain wire adapter						
15	Titanium Sensor with Anti-rattle fins						
16	Not used						
17	Sensor body fitted with flexible pipe insertion cage (both St.Stl. and Ti bodies)						
<b>Cable Length mtrs (only applicable to APT 1000 versions)</b>							
**	Heavy Duty Vented Cable - 3 Metres included as standard						
Q**	As above but cable outer jacket PTFE coated (Subject to Availability)						
R**	As above but cable outer jacket Flame Retardant (Subject to Availability)						
S**	As above but cable outer jacket FEP Coated (Subject to Availability)						
Z**	Custom cable (refer to discuss requirements)						
<b>Transmitter Body Material</b>							
TI	Titanium (Body & Diaphragm)						
SS	Stainless Steel (Body & Diaphragm)						
HT	Hastelloy / Tantalum wetted parts (St. Stl. Body)						
<b>Transmitter Orientation</b>							
H	Horizontal						
V	Vertical - Diaphragm facing down						
U	Vertical - Diaphragm facing up						

Example: 1000S S A E 1 30 TI H  
Written as 1000S/SA/E/1/30/TI/V

Note: Transmitter will be calibrated for 4-20mA over Nominal range as standard  
Where a specific calibration range is required this must be advised separately  
Actual calibration can be a maximum of 5:1 turndown from Nominal range.

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