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TECHNICAL BROCHURE

## TIDE MONITORING SYSTEM - OVERVIEW

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### THE SYSTEM

## **Highly Precise Level Trasmitter**

The TIDE MONITORING SYSTEM is an hydrostatic pressure sensor placed at a certain depth in the water, with the scope to measure the pressure at that depth. It is used to monitor the tide trend, measuring the variation of hydrostatic pressure in real-time; in case of existing tide tables (provided by client or third parties), this system is used to validate those theoretical tables, giving more accurate tide values. The aim of this tool is to have a real trend analysis of the tides' movements in a determined period of time (days) in order to guarantee a safer loading/unloading operation. With the use of this Hydrostatic Pressure Sensor we are constantly able to monitor the tide 24 / 24h for several days before the operation, and compare the tide variations issued by the forecaster authority. This is extremely useful to better understand the feasibility of "demanding" performances involving items and modules to be loaded out/in, especially where the tide variation is significant. The sensor is a small metal cylinder to be positioned at a known depth, connected by 50 m cable to a small black box connected to a standard PC by common USB port. The sensor is fixed to a rigid rod (tube) to prevent movement into the water (and therefore keep a constant depth measurement and data readings).



This pressure transmitter is designed for level measurements where the highest accuracy is required.

### **Digital Output of Transmitter**

This Series is based on the stable, piezoresisitive transducer and a micro-processor electronics with integrated 16 bit A/D converter. Temperature dependencies and non-linearities of the sensor are mathematically compensated. With its dedicated software and the converter, the calculated pressure can be displayed on a computer. The software also allows the recording and graphic display of pressure signals. Up to 128 transmitters can be hooked together to a Bus-system.

### Programming

With the dedicated software(CCS30), a converter and a PC (Laptop), the pressure can be displayed, the units changed, a new gain or zero set. The analog output can be set to any range within the compensated range.

### **PR-36 X W** : Gauge, Zero at atmospheric Pressure

This probe is fitted with durable cable with an integral vent tube to the atmosphere. These level transmitters can be subject to internal condensation caused by installations in cold water on warm, humid days. If the reference tube is not terminated in a warm, dry enclosure, KELLER recommends the use of a purpose built cartridge filled with a silica gel which is fitted at the end of the reference tube



STANDARD PRESSURE RANGES (FS)									
PR-36 X W	0.3 (1)		1	3	10	30	bar		
Water column approx.	3	1	0	30	100	300	mH2O		
Overpressure	2		2	5	20	40	bar		
Туре	RS485*	420 mA (2-wire)		010 V (3-w)	0.12.5 V (3-w				
Digital Interface	RS485	RS4	85		RS485	RS485	5		
Supply (U)	832 V	832 V			1332 V	3.232 V			
Accuracy (2) @ RT (digital) typ.	0.02 %FS	0.04 %FS		0.02 %FS	0.02 %FS				
Total Error Band (3) (050 °C)	0.10 %FS	0.15	%FS	(4)	0.15 %FS	0.15 %	6FS		
Power Cons. (without communication)	< 8 mA	3.2.		mA	< 8 mA	< 5 m/	Ą		

Accuracy and temperature error within the source of the 4...20 mA signal occurs during cor Disturbance of the 4...20 mA signal occurs during cor



# **Tide Trend Comparison Analysis (Example)**



# **Tide Monitoring System Installation Scheme (Example)**

### TIDE MONITORING SYSTEM

## **Installation Procedures and Measurements**



## Software CCS30: applications



### Example: Measurement Software Output - Graphic

### **Example: Measurement Software Output - Table**

Measurement		XI Ameasurement	
Measurement bar		Measurement bar -	
Measurement	r	Measurement	1
Name:	New Measure 15.01.10	Name: Zeit (119630:CH0) 119630:CH0 Zeit (119630:P1) 11963	1(
New Measure 15 01 10	0.985	New Measure 15.01.10 15.01.2010 09:59:19.736 0.9820 15.01.2010 09:59:19.647 0.9643	
1		15.01.2010 09:59:19.867 0.9820 15.01.2010 09:59:19.780 0.9643	3
Channels:		Channels: 15.01.2010 09:59:19.999 0.9820 15.01.2010 09:59:19.911 0.9643	3
Channel Value	0.980 24.60	Channel Value 15.01.2010 09:59:20.131 0.9820 15.01.2010 09:59:20.043 0.9643	3
11.113030 [3304]	t 2 / 1	15.01.2010 09:59:20.265 0.9820 15.01.2010 09:59:20.177 0.9643	3
P1 0.9643	⊆ 24.40 Q	P1 15.01.2010 09:59:20.396 0.9820 15.01.2010 09:59:20.308 0.9643	3
TUB1 24.69	<u>e</u> 0.975 <u>-</u> <u>e</u>	ISO1.2010 09:59:20.528 0.9820 15.01.2010 09:59:20.440 0.9643	3
		15.01.2010 09:59:20.660 0.9820 15.01.2010 09:59:20.572 0.9643	3
		15.01.2010 09:59:20.791 0.9820 15.01.2010 09:59:20.703 0.9643	3
1		15.01.2010 09:59:20.923 0.9820 15.01.2010 09:59:20.835 0.9643	3
	- + 24.00 2	15.01.2010 09:59:21.055 0.9820 15.01.2010 09:59:20.967 0.9643	3
Intervall:	D 965	Intervali: 15.01.2010 09:59:21.189 0.9820 15.01.2010 09:59:21.101 0.9643	3
100:00:00.0020000	zoom back	15.01.2010 09:59:21.320 0.9820 15.01.2010 09:59:21.233 0.9643	3
Save to File:	cet zoom to default	Save to File: 15 01 0010 09:59:21.452 0.9820 15.01.2010 09:59:21.364 0.9643	3
ŀ	3 Set scaling to default	15.01.2010 09:59:21.496 0.9643	3
	59:00 00:00 01:00 Properties	15.0 2010 09:59:21.715 0 9820 15.01.2010 09:59:21.628 0 9643	ī
Stop Start	Time	Stop Start 15.01.2010 09:59:21.846 2 0 15.01.2010 09:59:21.758 0.9643	3 -1
Delete Measurement		Delete Measurement	ſ
	Properties Zoom: Window 26	I Show all Time Scales Refresh <<< < 1 ▼ >	>>
Config. Measurement >>	Graph Table 5	Config. Measurement >> Graph Table	_

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