




**KLAY**

## 'INTELLIGENT' LEVEL TRANSMITTERS Hydrobar 'S'



- MICROPROCESSOR BASED
- EASY CALIBRATION WITHOUT TEST PRESSURE BY 3 PUSH BUTTONS
- ACCURACY 0,1%
- 4-20 mA AND HART® PROTOCOL
- "ALL STAINLESS" DESIGN
- WIDE RANGEABILITY
- LOCAL DISPLAY
- ADJUSTABLE DAMPING
- INTRINSICALLY SAFE ATEX  II 1 G Ex ia IIC T4 Ga



*Easy calibration  
without test pressure  
by 3 pushbuttons  
and display (standard)*

### Description

The Series "2000-Hydrobar" is a complete range of micro-processor based **submersible level transmitters** for top mounting, with a local display and adjustment by three push buttons. **Zero and span can be calibrated very easy without test pressure.**

The display which can indicate a number of chosen engineering units is also used during programming. Process temperatures can be indicated and damping times adjusted from 0 to 25 secs. A 4-20 mA Current Simulation can be performed. Also a tanklinearisation can be done. The Intelligent Series 2000-Hydrobar are fully temperature compensated, and are equipped with strong flush diaphragms who are laser welded, this results in a **perfect long term stability.**

HART® is a registered trademark of the HART Communication Foundation

Made by:

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# General information series 2000

## Calibration

The standard Series 2000 Transmitter is always equipped with a display and 3 pushbuttons for easy calibration. Both the measured and the calibrated value can be read locally. A full calibration can be completed using the three pushbuttons or with the optional handheld terminal (HART®), or by PC with special software from Klay Instruments.

Zero and span can be calibrated very easy, without testpressure, also in vacuum ranges. Linearisation can be made for horizontal tanks (P111). For all other adjustable points see table right.

The series 2000 will as standard be delivered with 2 closed covers, so the 3 pushbuttons and the standard display are behind the cover.

A transparent cover can be delivered as an option. In that case you can use the display as a local indicator.



*Easy Programmable*

*Display with 3 pushbuttons (Standard)*

## Adjustable points

- P101 Zero adjustment (4 mA)
- P102 Span adjustment (20 mA)
- P103 Cancel mounting position effect
- P104 Adjustment pressure unit  
(see conversion table)
- P105 4 - 20 mA \*  
20 - 4 mA (reverse output)
- P106 Damping adjustment (0 to 25 sec)
- P107 Indication of processtemperature  
(read out on display)
- P108 0 = CELC °C \*  
1 = FAHR °F
- P109 Read out on display:  
0 = current (4 - 20 mA) \*  
1 = pressure unit  
2 = percent %
- P110 Current simulation (4 - 20 mA)
- P111 Linearisation  
(Various tankshapes)

\* = factory setting

## Temperature compensation

All "2000-Hydrobar" leveltransmitters from Klay Instruments are fully temperature compensated. A temperature sensor, which monitors the process temperature, is mounted directly behind the diaphragm. The output of this sensor is used to compensate the transmitter for temperature variations.

## RFI/EMC/CE

Klay Instruments manufactures all pressure- and leveltransmitters according to the new RFI/EMC and CE rules. All transmitters are equipped with RFI filters as standard.

## Intrinsic safe certificate

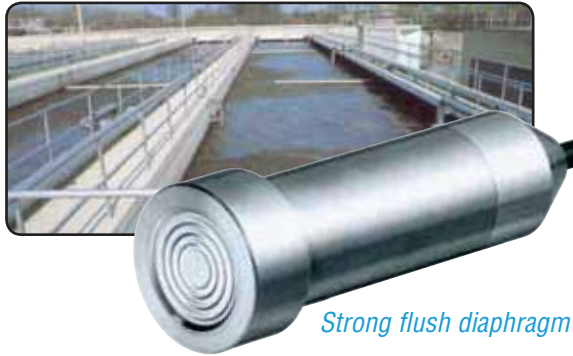
The Hydrobar series are available with the Intrinsic safe certificate acc. to ATEX<sup>Ex</sup> II 1G Ex ia IIC T4 Ga

## HART® Protocol and Profibus PA

The complete "2000-Hydrobar" series is available with HART® Protocol or PROFIBUS-PA output (option).



### Level measurement in concrete basins



## Specifications

Accuracy	: 0,1% of adjusted span
Measuring ranges	: 0,04 bar to 0-4 bar
Output signal	: 4 - 20 mA / 2-wire HART® protocol (option)
Adjustment	: by 3 pushbuttons or H.H.T. (HART®)
Power supply	: 12 to 36 Vdc (Exi: 13-26,5 Vdc)
Electrical connection	: PG9, 1/2" NPT or M20
External load	: 600 Ohm/24V to 1400 Ohm/40Vdc
Protection grade	: IP68 (cable/SS tube) IP66 (electr. housing)
Process temperature	: -10°C to +70°C
Temperature sensitivity	: ±0,015% / K
Electronic housing	: AISI 304
Wetted parts	: AISI 316 (standard)
Material cable	: Polyethylene (option: Hytrel or PTFE)

Specifications can change without notice

## Accessoires

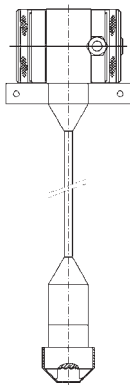
- Cable clamp for Hydrobar-cable
- Wall mounting bracket for SS tube extension
- Extra cable length (standard 3 m, max 100 m)
- Extra SS tube length (standard 2 m, max 4 m)
- Other cable material (Hytrel or PTFE) (specify)
- Other diaphragm materials (specify)

## Applications

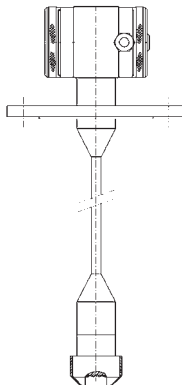
The 2000-Hydrobar submersible level transmitters can be used in fluids, like: water, waste water, pulp, mud, chemicals etc. For the following industries: water and waste water industry, marine / shipbuilding, pulp and paper, others. For other level and pressure transmitters, see page 4 of this brochure.

Series 2000 'Hydrobar'

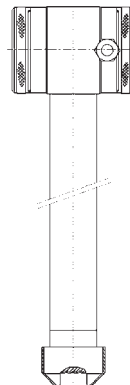
Hydrobar-Cable



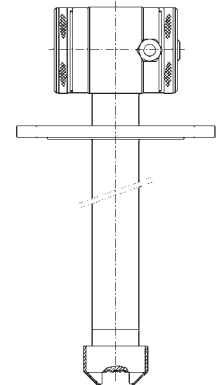
Hydrobar-Cable-F



Hydrobar-EXTD



Hydrobar-EXTD-F



## Ordering Codes

\* Always specify cable or SS extension length at order code

Order code cable extension:*		2000 - Hydrobar-cable (length) -							
Order code SS extension:*		2000 - Hydrobar-EXTD (length) -							
Ranges (bar)	Maximum overpressure (bar)	Adjustable span range (bar)		↑	↑	↑	↑	↑	↑
0 - 0,04...0,4	6,4	0 - 0,04 to 0 - 0,4	1						
0 - 0,12...1,2	10,5	0 - 0,12 to 0 - 1,2	2						
0 - 1...4	30	0 - 1 to 0 - 4	3						
- Mounting connection: Flange DIN or ANSI (specify size)								F	
- Special mounting connections: Example 2" BSP (specify)								X	
<b>OPTIONS</b>									
- Transparant cover, display functions as <b>local indicator</b>									I
- Intrinsically safe: ATEX  II1G Ex ia IIc T4 Ga									EX
- HART® Protocol									H
- PROFIBUS-PA output (not available in Ex)									P
- SPECIALS: Other wetted parts or other cable material (specify)									G

# Klay Instruments b.v.

Klay Instruments b.v. is an **ISO 9001-2008 certified** company who develops and manufactures a wide range of electronic Pressure and Level transmitters, "Intelligent" transmitters with HART® protocol or Profibus PA and pressure and level switches. All instruments are designed and manufactured in our factory in Dwingeloo, The Netherlands. Klay Instruments has a world wide service and sales distribution network.



Factory Klay Instruments B.V. in Dwingeloo, The Netherlands

## Other Klay pressure- and level transmitters

### 'Intelligent' pressure- and level transmitters

The Klay series 2000 is a complete range of microprocessor based pressure- and level transmitters with local display and adjustment by three pushbuttons. Zero and span can be adjusted without testpressure. The display can be used during programming to assist the operation. An engineering unit can be chosen and also the process temperature can be shown on the display. Also a damping (0-25 sec) and a current simulation (4-20 mA) can be performed. Over 40 different process connections are available including many flush diaphragm designs. The series 2000 are also available with HART® Protocol or Profibus PA. Detailed brochure available.



**HART**  
COMMUNICATION PROTOCOL

### Pressure transmitter 'Peramic'

The "Peramic" is an "All Stainless" pressure transmitter based on a ceramic pressure cell which can withstand high overpressures. The "Peramic" can be used for all gauge- and absolute pressure measurements on steam, liquids, gases and vapours. The available process connections are G $\frac{1}{2}$ " (1/2" BSP) or 1/2" NPT. Zero and span are internally adjustable over wide ranges. Ranges are available from 0 - 0.2 bar to 0 - 350 bar. The Peramic is also available in an "Intelligent" version, Peramic "S" (series CER-2000) including the HART® protocol. Detailed brochures of both versions are available.



### Pressure- and level transmitters

Klay Instruments manufactures a wide range of electronic level and pressure transmitters with strong flush mounted diaphragms and various process connections. These "All Stainless" transmitters series 8000-SAN, are fully temperature compensated. Ranges are available from 0,1 bar till 60 bar. Zero and span are internally adjustable over wide ranges. The series 8000-SAN is also available in an "Intelligent" version, Series 2000-SAN. From both series a detailed brochure is available.



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