‘INTELLIGENT’ PRESSURE- AND LEVEL TRANSMITTERS

For all industries

Series 2000

- “ALL STAINLESS” DESIGN
- **EASY CALIBRATION WITHOUT TEST PRESSURE** BY 3 PUSH BUTTONS
- ACCURACY 0,1%
- 4-20 mA AND HART® PROTOCOL
- ATEX Ex II 1 G and II 1 D
- WIDE RANGEABILITY
- LOCAL DISPLAY
- ADJUSTABLE DAMPING
- MORE THAN 40 DIFFERENT PROCESS CONNECTIONS
- OPTION: HART® PROTOCOL

HART COMMUNICATION PROTOCOL

Description

The Series 2000 is a complete range of ‘intelligent’ pressure and level transmitters with local display and adjustment by three pushbuttons. The pushbuttons are used to set Zero and Span. Test pressures are not required for calibration.

The display which can indicate a number of chosen engineering units is also used during programming to assist the easy operation. Process temperatures can be shown and damping times can be adjusted from 0 to 25 secs. Also a 4-20 mA Current Simulation can be performed.
The Series 2000 is **fully temperature compensated**. Over 40 different process connections are available including many flush diaphragm designs. Options include ATEX Ex approval or HART® protocol.

Stainless steel housing

HART® is a registered trademark of the HART Communication Foundation

KLAY-INSTRUMENTS B.V.

Nijverheidsweg 5
P.O. Box 13
Tel. +31-521-591550
Fax +31-521-592046

7991 CZ DWINGELOO
7990 AA DWINGELOO
The Netherlands
Website: www.klay.nl

Series 2000

Description

The series 2000 pressure transmitter has been specially designed for measuring pressure in pulp- and paper mills and similar industries where plugging is a problem. The transmitters are fully temperature compensated, and have **very strong, flush mounted diaphragms**. Zero and span can be *adjusted without testpressure* by 3 pushbuttons or by hand-held-terminal (HART®, option).

Specifications

Accuracy	: 0,1% of adjusted span
Measuring ranges	: 0 - 0,1 bar to 0 - 100 bar
Output signal	: 4 - 20 mA / 2-wire HART® protocol (option)
Adjustment	: by 3 pushbuttons or H.H.T.
Power supply	: 12 - 36 Vdc (Exi: 13 - 26,5 Vdc)
Protection grade	: IP66 (Option: IP68)
Process temperature	: -20°C to +80°C (Option: 100°C)
Ambient temperature	: -20°C to +70°C*
Temperature effect	: ±0,010% / K
Wetted parts	: AISI 316 (standard)
Electronic housing	: AISI 304
Process connections	: See below. Also available PMC, Vega, E+H, etc... Specify code X..

Process connections

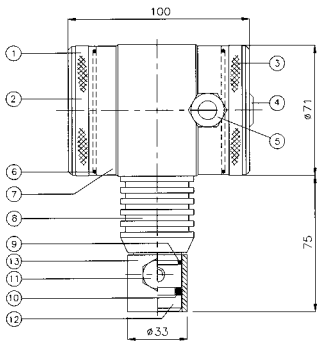
Code W
Weld-on
nipple ø 33 mm

Code X12
PASVE®
connection

Code S
1˝ BSP
(G1˝)

Dimensions (mm)

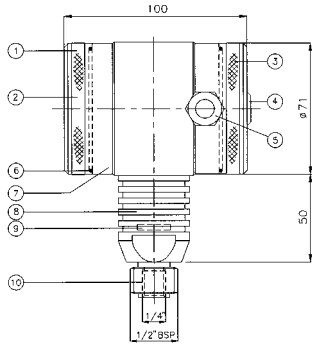
Code W



Parts description

1. Cover
2. Push buttons + display (behind cover)
3. Cover with Venting
4. Venting
5. Cable entry
6. O-ring
7. Electronics housing
8. Foot with cooling fins
9. O-ring (code W), code S = G1" thread
10. O-ring
11. M8 Bolt
12. Diaphragm
13. Weld-on nipple ø 33 mm

Code S



See page 6 for ordering code and ranges.

PASVE® is a registered trade name from Satron Instruments

Series 2000-SAN

Description

The **2000-SAN** series are designed for all pressure and level measurements in the food and beverage, chemical and pharmaceutical industries. **All hygienic process connections are available, most of them are according to the EHEDG, 3-A and FDA regulations.** The transmitters are fully temperature compensated, and have very strong, flush mounted diaphragms. Zero and span can be *adjusted without testpressure*, over wide ranges, by 3 push-buttons, or hand-held terminal (HART®, option).

Specifications

Accuracy	: 0,1% of adjusted span
Measuring ranges	: 0 - 0,04 bar to 0 - 100 bar
Output signal	: 4 - 20 mA / 2-wire HART® protocol (option)
Adjustment	: by 3 pushbuttons or H.H.T.
Power supply	: 12 - 36 Vdc (Exi: 13 - 26,5 Vdc)
External load	: 600 Ohm / 24V to 1200 Ohm / 36V
Protection grade	: IP66 (Option: IP68)
Process temperature	: -20°C to +100°C (145° / 45 min)
Ambient temperature	: -20°C to +70°C*
Temperature effect	: ±0,010% / K
Wetted parts	: AISI 316 (standard)
Option	: Hastelloy C, Tantalum or Goldplated
Electronic housing	: AISI 304
Process connections	: all industrial process connections available (more than 40*)

Process connections

**More than 40 different process connections available (Tri-clamp, SMS, IDF, 1 ½" BSP, Varivent, etc.*

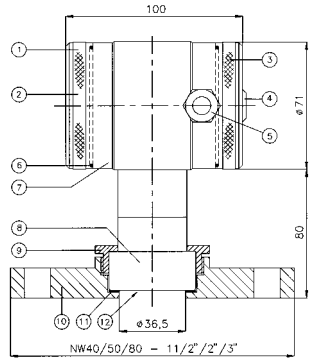
Code M
Milkcoupling
(DN 25, 40 or 50)

Code F
Flange
(DIN or ANSI)

Code W85
Weld-on nipple
ø 85 mm

Dimensions (mm)

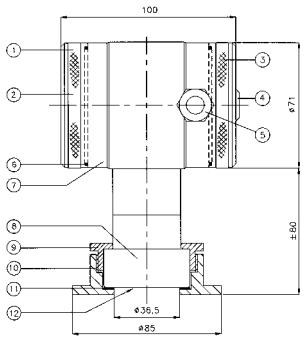
Code F



Parts description

1. Cover
2. Push buttons + display (behind cover)
3. Cover with venting
4. Venting
5. Cable entry
6. O-ring
7. Electronics housing
8. Foot
9. Lockring
10. Weld-on nipple (W) or Flange (F)
11. Packing
12. Flush diaphragm

Code W



See page 6 for ordering code and ranges.

Also available with separate (remote) electronics. Vented cable between processconnection and SS electronics housing, type: 2000-SAN-Cable

Peramic 'S' Series CER 2000

Description

The Peramic 'S', series **CER-2000**, is a pressure transmitter based on a *ceramic measuring sensor*. The CER-2000 series is fully temperature compensated and is made for all pressure applications in clean liquids, gases and vapours. The ceramic measuring cell *can withstand high overpressures*, and is sealed by an o-ring (viton as standard, other materials on request). Zero and span can be *adjusted without testpressure* over wide ranges, by 3 pushbuttons or by a hand-held terminal (HART®, option).

Specifications

Accuracy	: 0,1% of adjusted span
Measuring ranges	: 0 - 2 bar to 0 - 400 bar
Output signal	: 4 - 20 mA / 2-wire HART® protocol (option)
Adjustment	: by 3 pushbuttons or H.H.T.
Power supply	: 12 - 36 Vdc (Exi: 13 - 26,5 Vdc)
Protection grade	: IP66 (Option: IP68)
Process temperature	: -20°C to +90°C
Ambient temperature	: -20°C to +70°C*
Temperature effect	: ±0,010% / K
Measuring sensor	: ceramic (Al_2O_3)
Sensor sealing	: viton o-ring (standard) other materials on request
Other wetted parts	: AISI 316 (standard)
Material housing	: AISI 304

Process connections

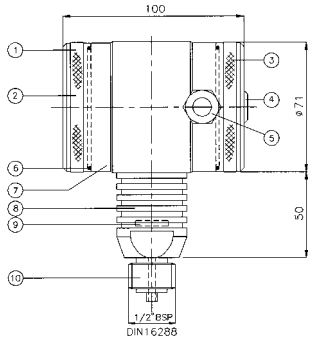
Code R
1/2″ BSP
(DIN 16288)

Code S
1/2″ BSP M and
1/4″ BSP F

Code N
1/2″ NPT M and
1/4″ NPT F

Dimensions (mm)

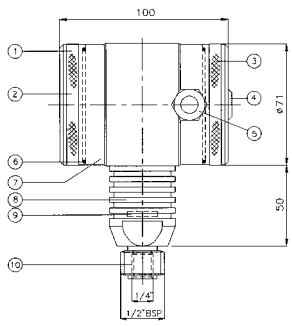
Code R



Parts description

1. Cover
2. Push buttons + display (behind cover)
3. Cover with venting
4. Venting
5. Cable entry
6. O-ring
7. Electronics housing
8. Foot with cooling fins
9. Ceramic sensor
10. Process connection

Code S



See page 6 for ordering code and ranges.

General information series 2000

Calibration

As standard the Series 2000 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 cali-bration can be completed using the three pushbuttons or with the optional handheld terminal (HART®), or with special software from Klay Instruments.

Zero and span can be calibrated very easy, without testpressure, also in vacuumranges. Linearisation can be made for various tankshapes like horizontal and conical 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 cover with transparant plastic can be delivered as an option (I). 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

Certificates and options

Temperature Compensation

All our transmitters are fully temperature compensated. All Klay transmitters with flush diaphragm are equipped with the unique KLAY **Flush Diaphragm Technology**. (Detailed documentation available).

For **High Temperature Applications** where the process temperature is continuously above 100°C we manufacture special transmitters with cooling fins to reduce the temperature (Series 2000-SAN with HT option). With a compact 2000-SAN transmitter with option HT we can go up to 200°C and with seperation by a cable between process connection and electronics housing (Type: 2000-SAN-Cable-HT) we can go up to 300°C continuously!
The HT option is only available on series 2000-SAN (except range 1 and 2)

* Transparant cover (I) with option Ex: Min. amb. temp. -10°C

2000-SAN-HT

Orderingcodes 2000, 2000-SAN and CER-2000 series

SERIES 2000 (info on page 2)

SERIES 2000 -

Ranges (bar)	Max. overpressure (bar)	Adjustable span range:	
0 - 0,1 ...0,4	6,4	0 - 0,1 to 0 - 0,4 bar	1
0 - 0,3 ...1,2	10,5	0 - 0,3 to 0 - 1,2 bar	2
0 - 1 ...10	30	0 - 1 to 0 - 10 bar	3
0 - 5 ...30	100	0 - 5 to 0 - 30 bar	4
0 - 20 ...100	200	0 - 20 to 0 - 100 bar	5

PROCESS CONNECTIONS:

– Weld-on nipple diam. 33 mm. (flush diaphragm / pulp & paper)	W
– G1″ (1″BSP) threaded connection (flush diaphragm)	S
– PASVE® 1″ connection (Valmet/Satron)	X12
– Other process connections: i.e. PMC(X2), Valcom, Vega, etc. (specify X code)	X..

OPTIONS:

– Transparant cover, display functions as **local indicator**	I
– Vacuum Ranges (Specify Relative or absolute) Compound ranges available (example -1 / +1 bar)	V
– Intrinsically safe: ATEX Ex II 1 G Ex ia IIC T4 Ga and/or II 1 D Ex ia IIIC T100°C Da IP6X	Ex
– HART® Protocol	H
– Profibus PA output, not available anymore on series 2000. Ask for Series 4000	

SERIES 2000-SAN (info on page 3)

SERIES 2000 SAN -

Ranges (bar)	Max. overpressure (bar)	Adjustable span range:	
0 - 0,04 ...0,4	6,4	0 - 0,04 to 0 - 0,4 bar	1
0 - 0,12 ...1,2	10,5	0 - 0,12 to 0 - 1,2 bar	2
0 - 1 ...10	30	0 - 1 to 0 - 10 bar	3
0 - 5 ...30	100	0 - 5 to 0 - 30 bar	4
0 - 20 ...100	200	0 - 20 to 0 - 100 bar	5

PROCESS CONNECTIONS:

– Milk coupling DIN 11851, DN 25 (only ranges 3 and 4), DN 40, DN 50 (all ranges)	M..
– Hygienic weld-on nipple diam 62 mm or 85 mm (specify, for example: W85)	W..
– Tri-clamp 1½″, 2″ or 3″ (specify size)	L..
– Flange: DN 25, 40, 50 or 80 (DIN) or 1½″, 2″ or 3″ (ANSI) (specify size)	F..
– Other connections: G1½″(X3), Varivent(X4), IDF(X5), DRD(X7), SMS (X9), etc... (specify X code)	X..

OPTIONS:

– Transparant cover, display functions as **local indicator**	I
– Vacuum Ranges (Specify Relative or absolute) Compound ranges available (example -1 / +1 bar)	V
– HIGH Temperature version with cooling fins. Always specify Process Temperature	HT
– Intrinsically safe: ATEX Ex II 1 G Ex ia IIC T4 Ga and/or II 1 D Ex ia IIIC T100°C Da IP6X	Ex
– HART® Protocol	H
– Profibus PA output, not available anymore on series 2000. Ask for Series 4000	

SERIES CER-2000 (info on page 4)

SERIES CER-2000 -

Ranges (bar)	Max. overpressure (bar)	Adjustable span range:	
0 - 2 ...10	50	0 - 2 to 0 - 10 bar	3
0 - 10 ...40	120	0 - 10 to 0 - 40 bar	4
0 - 40 ...200	350	0 - 40 to 0 - 200 bar	5
0 - 150 ...400	600	0 - 150 to 0 - 400 bar	6

PROCESS CONNECTIONS:

– G ½″ (½″ BSP) manometer (gauge) connection DIN 16288	R
– G ½″ (male) and G ¼″ (female)	S
– ½″ NPT (male) and ¼″ NPT (female)	N

OPTIONS:

– Transparant cover, display functions as **local indicator**	I
– Vacuum Ranges (Specify Relative or absolute) Compound ranges available (example -1 / +1 bar)	V
– Intrinsically safe: ATEX Ex II 1 G Ex ia IIC T4 Ga and/or II 1 D Ex ia IIIC T100°C Da IP6X	Ex
– HART® Protocol	H
– Profibus PA output, not available anymore on series 2000. Ask for Series 4000	

D/E/2000/10-16/05