



TYPE APPROVAL CERTIFICATE
No. ELE335608CS/002



This is to certify that the product below is found to be in compliance with the applicable requirement of the RINA type approval system.

<i>Description</i>	Pressure transmitters/ Level transmitters
<i>Type</i>	Series 8000; Series 8000-SAN; Series CER- 8000
<i>Applicant</i>	KLAY INSTRUMENTS B.V. Nijverheidsweg 5 7991 CZ Dwingeloo The Netherlands
<i>Manufacturer</i>	KLAY INSTRUMENTS B.V.
<i>Place of manufacture</i>	Nijverheidsweg 5 7991 CZ Dwingeloo The Netherlands
<i>Reference standards</i>	Rules for the Classification of Ships - Part C - Machinery, Systems and fire protection - Ch.3, Sect.6, Tab.1.

Issued in **Genoa** on **July 29, 2008**. This Certificate is valid until **July 29, 2013**


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This certificate consists of this page and 1 enclosure



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Series 8000; Series 8000-SAN; Series CER- 8000

Series 8000 diaphragm, piezoresistive pressure/ level transmitter

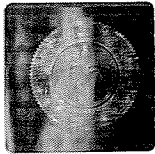
Measurement principle	piezoresistive monocrystalline silicon sensor
Accuracy	0,2 % of adjusted span
Measuring ranges	0,1 bar to 50 bar
Output signal	4 - 20 mA / 2 - wire
Adjustment	zero and span internally
Power supply	13 - 40 Vdc
External load	550 Ohm / 24V to 1250 Ohm / 40V
Mechanical protection	IP 66
Process temperature	-20°C to +80 °C
Temperature effect	± 0,015 % / K (temperature compensated)
O-ring	Viton
Wetted parts	AISI 316 (Std.) flush mounted diaphragm
Electronic housing	AISI 304
Intrinsically safe certificate	KEMA 03ATEX 1219 X
Marking	II 1 G EEx ia IIC T4

Ranges (bar)	Max. overpressure	Adjustable span range
0- 0,1 ... 0,4	6,4	0-0,1 to 0-0,4
0- 0,4 ... 0,7	6,4	0- 0,4 to 0-0,7
0-0,7 ... 1,5	10,5	0-0,7 to 0-1,5
0- 1 ... 4	16	0-1 to 0-4
0- 2,5 ... 10	30	0-2,5 to 0-10
0- 7,5 ... 16	80	0 -7,5 to 0-16
0 - 16 ... 50	120	0 -16 to 0-50

Series 8000-SAN diaphragm, piezoresistive relative pressure / level transmitter with integral 3 ½ digit LCD indicator (option)

Measurement principle	piezoresistive monocrystalline silicon sensor
Accuracy	0,2 % of adjusted span
Measuring ranges	0 - 0,08 bar to 0-50 bar
Output signal	4 - 20 mA / 2 - wire
Adjustment	zero and span internally
Power supply	13 - 40 Vdc
External load	550 Ohm / 24V to 1250 Ohm / 40V
Mechanical protection	IP 66
Process temperature	-20°C to +100 °C or: -20 °C to + 140°C for 8000-SAN -cable
Temperature effect	± 0,015 % / K (temperature compensated)
Packing ring	PTFE
Wetted parts	AISI 316 (Std.) Option: HastelloyC, ... flush mounted diaphragms 8000 - SAN - cable is provided with standard 3m cable length
Electronic housing	AISI 304
Intrinsically safe certificate	KEMA 03ATEX 1219 X
Marking	II 1 G EEx ia IIC T4

Range (bar)	Max. overpressure	Adjustable span range
0- 0,08 ... 0,4	6,4	0-0,08 to 0-0,4
0- 0,4 ... 0,7	6,4	0- 0,4 to 0-0,7
0- 0,7 ... 1,5	10,5	0-0,7 to 0-1,5
0- 1 ... 4	16	0-1 to 0-4
0- 2,5 ... 10	30	0-2,5 to 0-10
0 - 7,5 ... 16	60	0-7,5 to 0-16
0- 16 ... 50	120	0-16 to 0-50



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Series PERAMIC CER -8000 diaphragm, gauge pressure / level transmitter
(Local indicator optional)

Measurement principle	resistive on bridge network
Accuracy	0,2 % of adjusted span
Measuring ranges	0 - 0,2 bar to 0-350 bar
Output signal	4 - 20 mA / 2 - wire
Adjustment	zero and span internally
Power supply	12 - 40 Vdc
External load	600 Ohm / 24V to 1400 Ohm / 40V
Mechanical Protection	IP 66
Process temperature	-20°C to +100 °C
Temperature effect	± 0,015 % / K (temperature compensated)
Measuring sensor	Ceramic (Al ₂ O ₃)
Sensor sealing	Viton o-ring seal (standard)
Wetted parts	Ceramic (Aluminiumoxide 96%) other parts AISI 316
Electronic housing	AISI 304
Intrinsically safe certificate	KEMA 03ATEX 1219 X
Marking	II 1 G EEx ia IIC T4

Ranges (bar)	Max. overpressure	Adjustable span range
0- 0,2 ... 0,8	6	0-0,2 to 0-0,8
0- 0,8 ... 1,6	12	0- 0,8 to 0-1,6
0- 1,6 ... 4	20	0-1,6 to 0-4
0- 2,5 ... 10	50	0-2,5 to 0-10
0- 10 ... 40	120	0-10 to 0-40
0- 40 ... 150	350	0-40 to 0-150
0- 100 ... 350	600	0-100 to 0-350

Reference documentation:

KLAY-INSTRUMENTS Instruction Manual : " Pressure and Level Transmitters"

Series 8000-SAN, SERIES 8000, doc. n° H/E/8000/07-2003/05

KLAY-INSTRUMENT, data sheet: Pressure and level transmitters Series 8000

KLAY-INSTRUMENT, data sheet: Pressure and level transmitters All Stainless Series 8000 - SAN

KLAY-INSTRUMENT, data sheet: Peramic Pressure transmitter

Test Reports:

KLAY-INSTRUMENTS Performance test (August 5 th. 1999)

KLAY-INSTRUMENTS Power variation test (July 28th 1999),

KLAY-INSTRUMENTS Powersupply failure test (July 28th 1999)

KLAY-INSTRUMENTS Dry Heat test (July 28th 1999)

KLAY-INSTRUMENTS Low temp. test (July 28th 1999)

KLAY-INSTRUMENTS Humidity test (August 3nd/5th. 1999)

ELS - EMC report (02/05/1997)

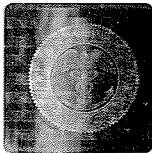
NMI - EMC test report , project 10112176

TNO - Salt mist test report , BU 4.00/036506-1/AA (25/04/2000)

PNO - PROFIBUS test report, itm/DP-Slave 514/02/14 (21/06/2000)

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RINA Società per azioni
Via Corsica, 12 - 16128 Genova
Tel +39 010 53851
Fax +39 010 5351000



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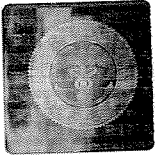
This is to certify that the product below is found to be in compliance with the applicable requirement of the RINA type approval system.

<i>Description</i>	Pressure transmitters/ Level transmitters
<i>Type</i>	Series 2000; Series 2000-SAN; Series CER- 2000
<i>Applicant</i>	KLAY INSTRUMENTS B.V. Nijverheidsweg 5 7991 CZ Dwingeloo The Netherlands
<i>Manufacturer</i>	KLAY INSTRUMENTS B.V.
<i>Place of manufacture</i>	Nijverheidsweg 5 7991 CZ Dwingeloo The Netherlands
<i>Reference standards</i>	Rules for the Classification of Ships - Part C - Machinery, Systems and fire protection - Ch.3, Sect.6, Tab.1.

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Series 2000; Series 2000-SAN; Series CER- 2000

Series 2000 diaphragm, piezoresistive pressure/ level transmitter with local display

Measurement principle	piezoresistive monocristalline silicon sensor	
Accuracy	0,1 % of adjusted span	
Measuring ranges	0 - 0,1 bar to 0-100 bar	
Output signals	4 - 20 mA / 2 - wire HART protocol Profibus - PA (not available in Ex)	
Adjustment	by 3 pushbuttons or Hand Held Terminal	
Power supply	12 - 40 Vdc	
External load	600 Ohm / 24V to 1400 Ohm / 40V	
Mechanical Protection	IP 66	
Process temperature	-20°C to +80 °C	
Temperature effect	± 0,015 % / K (temperature compensated)	
Wetted parts	AISI 316 (Std.) - flush mounted diaphragms	
Electronic housing	AISI 304	
Intrinsically safe certificate	KEMA 03ATEX 1092 X	
Marking	II 1 G EEx ia IIC T4 or II 1 GD EEx ia IIC T4 T100°C IP 6X	
Ranges (bar)	Max. overpressure	Adjustable span range
0- 0,1 ... 0,4	6,4	0-0,1 to 0-0,4
0- 0,3 ...1,2	10,5	0- 0,3 to 0-1,2
0- 1 ...10	30	0-1 to 0-10
0- 5 ...30	100	0-5 to 0-30
0- 20 ...100	200	0-20 to 0-100

Series 2000-SAN diaphragm, piezoresistive relative pressure / level transmitter

Measurement principle	piezoresistive monocristalline silicon sensor	
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 Profibus - PA (not available in Ex)	
Adjustment	by 3 pushbuttons or Hand Held Terminal	
Power supply	12 - 40 Vdc	
External load	600 Ohm / 24V to 1400 Ohm / 40V	
Mechanical Protection	IP 66	
Process temperature	-20°C to +100 °C	
Temperature effect	± 0,015 % / K (temperature compensated)	
Wetted parts	AISI 316 (Std.) Option: HastelloyC, ... flush mounted diaphragms	
Electronic housing	AISI 304	
Intrinsically safe certificate	KEMA 03ATEX 1092 X	
Marking	II 1 G EEx ia IIC T4 or II 1 GD EEx ia IIC T4 T100°C IP 6X	
Ranges (bar)	Max. overpressure	Adjustable span range
0- 0,04 ... 0,4	6,4	0-0,04 to 0-0,4
0- 0,12 ... 1,2	10,5	0- 0,12 to 0-1,2
0- 1 ...10	30	0-1 to 0-10
0- 5 ...30	100	0-5 to 0-30
0- 20 ...100	200	0-20 to 0-100



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Series CER 2000 diaphragm, relative or absolute pressure / level transmitter

Measurement principle	resistive on bridge network
Accuracy	0,1 % of adjusted span
Measuring ranges	0 - 0,2 bar to 0-320 bar
Output signal	4 - 20 mA / 2 - wire HART protocol Profibus - PA (not available in Ex)
Adjustment	by 3 pushbuttons or Hand Held Terminal
Power supply	12 - 40 Vdc
External load	600 Ohm / 24V to 1400 Ohm / 40V
Mechanical Protection	IP 66
Process temperature	-20°C to +90 °C
Temperature effect	± 0,015 % / K (temperature compensated)
Measuring sensor	Ceramic (Al ₂ O ₃)
Sensor sealing	Viton o-ring (standard)
Other wetted parts	AISI 316
Electronic housing	AISI 304
Intrinsically safe certificate	KEMA 03ATEX 1092 X
Marking	II 1 G EEx ia IIC T4 or II 1 GD EEx ia IIC T4 T100°C IP 6X

Ranges (bar)	Max. overpressure	Adjustable span range
0- 0,2 ... 0,8	5	0-0,2 to 0-0,8
0- 0,8 .. .2	10	0- 0,8 to 0-2
0- 2 ...10	50	0-2 to 0-10
0- 10 ...40	120	0-10 to 0-40
0- 40 ...200	350	0-40 to 0-200
0- 150 ...320	600	0-150 to 0-320

Reference documentation:

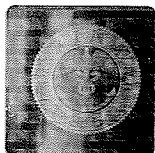
KLAY-INSTRUMENTS Instruction Manual : " Intelligent Pressure and Level transmitters"
Series 2000-SAN, SERIES 2000, SERIES CER-2000, Doc. n° H/EN/2000-HART/09-2007/14

Test Reports:

KLAY-INSTRUMENTS Performance test (August 5 th. 1999)
KLAY-INSTRUMENTS Power variation test (July 28th1999),
KLAY-INSTRUMENTS Powersupply failure test (July 28th1999)
KLAY-INSTRUMENTS Dry Heat test (July 28th 1999)
KLAY-INSTRUMENTS Low temp. test (July 28th 1999)
KLAY-INSTRUMENTS Humidity test (August 3nd/5th. 1999)
ELS - EMC report (02/05/1997)
NMI - EMC test report , project 10112176
TNO - Salt mist test report , BU 4.00/036506-1/AA (25/04/2000)
PNO - PROFIBUS test report, itm/DP-Slave 514/02/14 (21/06/2000)

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RINA Società per azioni
Via Corsica, 12 - 16128 Genova
Tel +39 010 53851
Fax +39 010 5351000



TYPE APPROVAL CERTIFICATE

No.

ELE335608CS/003



This is to certify that the product below is found to be in compliance with the applicable requirement of the RINA type approval system.

<i>Description</i>	Level transmitters
<i>Type</i>	Series HYDROBAR Cable - FR; Series HYDROBAR - I - Cable
<i>Applicant</i>	KLAY INSTRUMENTS B.V. Nijverheidsweg 5 7991 CZ Dwingeloo The Netherlands
<i>Manufacturer</i>	KLAY INSTRUMENTS B.V.
<i>Place of manufacture</i>	Nijverheidsweg 5 7991 CZ Dwingeloo The Netherlands
<i>Reference standards</i>	Rules for the Classification of Ships - Part C - Machinery, Systems and fire protection - Ch.3, Sect.6, Tab.1.

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**Series HYDROBAR Cable - FR;
Series HYDROBAR - I - Cable**

Hydrobar FR Series submersible level transmitter

Measurement principle	piezoresistive monocrystalline silicon sensor
Accuracy	0,2 % of adjusted span
Measuring ranges	0,1 bar to 4 bar (fixed range)
Output signal	4 - 20 mA / 2 - wire
Adjustment	no
Power supply	13 - 40 Vdc (Exi: 17-28Vdc).
External load	550 Ohm / 24V to 1400 Ohm / 40V
Mechanical Protection	IP 68 (cable / SS tube extension) IP 66 (electronic housing)
Process temperature	-10°C to + 70 °C
Temperature effect	± 0,015 % / K (temperature compensated)
Cable	Polyethylene (Std.) option : Hytrel or PTFE
Wetted parts	AISI 316 L (Std.) flush mounted diaphragm
Intrinsically safe certificate	KEMA 03ATEX 1219 X
Marking	II 1 G EEx ia IIC T4

Hydrobar I Series submersible level transmitter (with digital local indicator 3½ digit)

Measurement principle	piezoresistive monocrystalline silicon sensor
Accuracy	0,2 % of adjusted span
Measuring ranges	0,1 bar to 4 bar
Output signal	4 - 20 mA / 2 - wire Hart Protocol
Adjustment	zero and span internally via Hart protocol
Power supply	13 - 40 Vdc (Exi: 17-28Vdc).
External load	550 Ohm / 24V to 1400 Ohm / 40V
Mechanical Protection	IP 68 (cable / SS tube extension) IP 66 (electronic housing)
Process temperature	-10°C to + 70 °C
Temperature effect	± 0,015 % / K (temperature compensated)
Cable	Polyethylene (Std.) option : Hytrel or PTFE
Wetted parts	AISI 316 L (Std.) flush mounted diaphragm
Intrinsically safe certificate	KEMA 03ATEX 1092 X
Marking	II 1 G EEx ia IIC T4 or II 1 GD EEx ia IIC T4 T 100°C IP6X

Ranges (bar)	Max. overpressure	Adjustable span range
0- 0,1 ... 0,4	6,4	0-0,1 to 0-0,4
0- 0,4 ... 0,7	6,4	0- 0,4 to 0-0,7
0- 0,7 ... 1,5	10,5	0-0,7 to 0-1,5
0- 1 ... 4	16	0-1 to 0-4



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Reference documentation:

KLAY-INSTRUMENTS data sheet: Submersible level transmitters HIDROBAR

Test Reports:

KLAY-INSTRUMENTS **Performance test** (August 5 th. 1999)

KLAY-INSTRUMENTS **Power variation test** (July 28th1999),

KLAY-INSTRUMENTS **Powersupply failure test** (July 28th1999)

KLAY-INSTRUMENTS **Dry Heat test** (July 28th 1999)

KLAY-INSTRUMENTS **Low temp. test** (July 28th 1999)

KLAY-INSTRUMENTS **Humidity test** (August 3nd/5th. 1999)

ELS - **EMC report** (02/05/1997)

NMI - **EMC test report** , project 10112176

TNO - **Salt mist test report** , BU 4.00/036506-1/AA (25/04/2000)

PNO - **PROFIBUS test report**, itm/DP-Slave 514/02/14 (21/06/2000)

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