Thank you for choosing a NIVELCO instrument.
We are sure that you will be satisfied throughout its use.

NIVOPRESS

HYDROSTATIC LEVEL TRANSMITTER

USER'S MANUAL

NIVELCO

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CE 1418

1. APPLICATION

The NIVOPRESS N submersible hydrostatic level transmitters are applicable for the continuous level measurement of clean or chemically faintly contaminated liquids in bored wells, open reservoirs or tanks. The NC type is recommended for level detection of polluted water. The NIVOPRESS is easy to install in already existing tanks and in deep bored wells and is especially recommended for controlling of submersible pumps. The use of the supplemental accessories is recommended. Using the NAW-104 sewage adapter direct contact between the sewage and the diaphragm of the built-in pressure sensor can be avoided. 2-wire types are available with built-in 4-wire Pt100 temperature sensor or separate 2-wire temperature transmitter.
The N□K-5□□-□ Ex types can be used in explosion hazardous environment.

2. TECHNICAL DATA

PROBE

		2-wire		3-wire	
TYPE		NP, NZ	NCK-2/NCP-2	NCH	NPH, NZH
Measuring range		0 … 200 m water head	0 … 20 m water head		0 … 200 m water head
		See order code			
Overload allowed (versus range)		3x	20x (h ≤ 3 m w.h.) 10x (> 3 m w.h..)		3x
Output		4 ... 20 mA and HART		0...+10 V (0 V ≤ 80 mV)	
Power supply		12 ... 30 V DC		18 ... 30 V DC / 6mA	
Max. load (Ut = power supply; Umin = min. power supply)		$R_{min} = \frac{(U_t - U_{min})}{0{,}02\,A}$		≥ 5 kohm	
Temperature transmitter NPD, NZD types		Power supply:12…30VDC / 4…20mA; 0…+60°C, accuracy ±3°C			
Temperature sensor, Pt100 B		NPP, NZP types	NCP-2 type	–	
Linearity (level transmitter)		±0.25%			
Temperature error		≤ ± 0.1 % / 10 K		≤ ± 0.2 % / 10 K	
Operating temperature*		-10 ... +60°C	0 ... +60°C		-10 ... +60°C
Mechanical connection		NAA-209 cable mounting wedge clamp, NZ and NM types: ¾" BSP thread			
Mechancal protection		IP 68			
Electrical protection		Class III.			
Electrical connection		Shielded cable with breathing capillary Ø 7 mm			
Wire cross section		0.34 mm²			
Cable length		0 ... 300 m as order code			
Dimensions		NP : Ø 22x145mm NZ : Ø 38x152 mm	Ø40x140mm		NPH: Ø 22x145 mm NZH: Ø 38x152 mm
Mass		NP : probe: 0.2 kg NZ : probe: 0.3kg	probe: 0.4 kg		probe: 0.2 kg
		Cable: ~ 0.06 kg/m			
Wetted parts	Sensor	1.4404	Al_2O_3 ceramic		1.4404
	Probe	1.4571			
	Cable coating	Polyurethane			
	Sealing	VITON (FKM)			
	Protecting cap	ABS	–		ABS

* special order max. +75°C

2.1 ACCESSORIES

- User's Manual
- Certificate of Warranty
- Declaration of Conformity

ADDITIONAL DATA FOR EX APPROVED MODELS

Tyoe	NPK/NPP/NZK/NZP-5□□-□
Power supply	14…30 V DC
Ex marking	Ex II 1 G EEx ia IIC T6
Intrinsical safety	U_i = 30 V, I_i = 100 mA, P_i = 0.8 W C_i = 12 nF+ h x 0.04 nF; L_i = 1.3mH + h x 0.9 µH (h = cable length)

ACCESSORIES

Cable terminal box	NAA-101	
Dimensions	93 x 93 x 55 mm	
Ingress protection	IP 65	
Operating temperature	–40 °C … +70 °C	
Material	Plastic	
Cable gland	M20x1.5 5 (cable ∅ 5… ∅ 10 mm)	
Electrical connection	Terminal block for cable with max. cross section of 2.5 mm²	
Cable terminal box with overvoltage protection *	NAA-102	
Data	See: NAA-101	
Electrical data	See: OVP	
Cable mounting wedge clamp	NAA-209	
Max. mech. load	300 m cable	
Operating temperature	-20 °C … + 60 °C	
Overvoltage protection	OVP12/33 *	OVP32/33 *
Mounting	outdoor	DIN 35 mm rail
Dimensions	72 x 42 x 19 mm	62 x 65 x 18 mm
Ingress protection	IP 54	IP 20
Breakdown voltage	33 V	
Absorbed energy	600 W / 1 ms	
Serial resistance	13 ohm	
Leakage current	≤ 10 µA	

* only for 2-wire 4…20mA equipments

2.2 ORDER CODE

NIVOPRESS N ☐☐ – ☐☐☐ – ☐

TYPE	CODE
Capacitive	C
Piezo	P
Piezo, threaded	Z

OUTPUT	CODE
2-wire 4 … 20 mA +HART	K
3-wire 0 …10 V DC	H
4…20mA, level + HART and 4…20mA temperature	D
4…20mA + HART and Pt100B	P

VERSION	CODE
Normal NC	2
Normal	4
Ex	5

MEASURING RANGE *	CODE
1 m w.h.	1
2 m w.h.	2
5 m w.h.	3
10 m w.h.	4
20 m w.h.	5
50 m w.h.	6
100 m w.h.	7
200 m w.h.	8

LENGTH	CODE
0 m	0
10 m	1
:	:
90 m	9
100 m	A
200 m	B
300 m	C

	LENGTH	CODE
Up to 100m	0 m	0
	1 m	1
	:	:
	9 m	9
Over 100m	0 m	0
	10 m	1
	:	:
	90 m	9

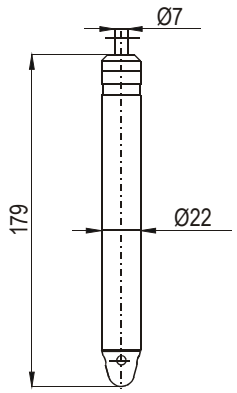
** can be set within the range on special request*

ACCESSORIES

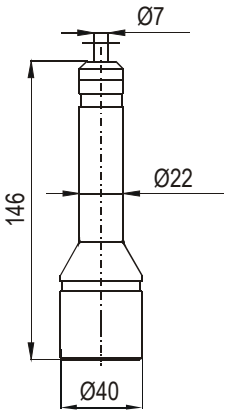
Cable terminal box	NAA-101	Sewage adapter	NAW-104 (for NP types)
Cable terminal box with OVP	NAA-102		
Cable holding assy	NAA-105	OVP units	OVP12/33 (outdoor)
Cable mounting wedge clamp	NAA-209		OVP32/33 (DIN rail)

2.3 DIMENSIONS

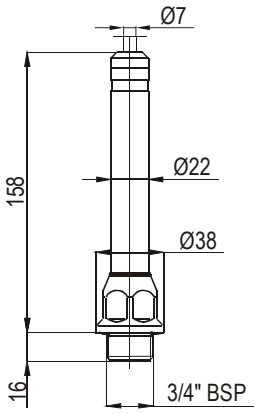
NIVOPRESS NP PROBE



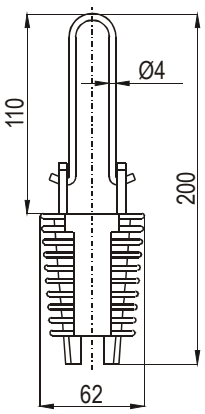
NIVOPRESS NC PROBE



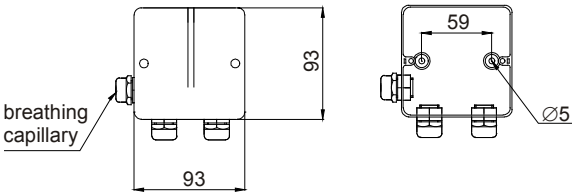
NIVOPRESS NZ PROBE



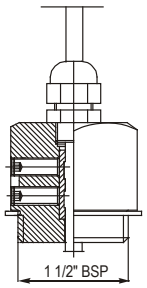
CABLE HOLDING WEDGE CLAMP NAA-209



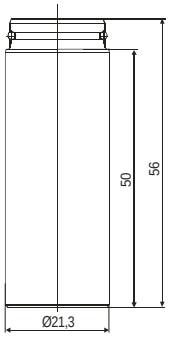
CABLE TERMINAL BOX
NAA-101 and NAA-102



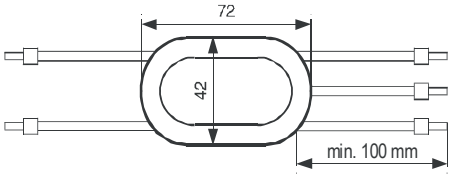
CABLE HOLDING ASSY
NAA-105



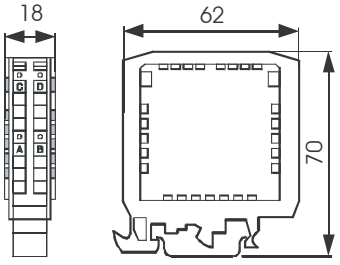
SEWAGE ADAPTER
NAW-104



OVP 12/33 OVERVOLTAGE PROTECTION UNIT



OVP 32/33 OVERVOLTAGE PROTECTION UNIT



3. INSTALLATION

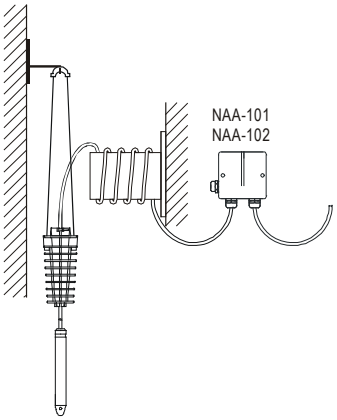
For fastening the cable use cable mounting wedge clamp NAA-209 that provides a solution for hanging the cable without slipping and risk of rupture.
For the NP, NE types the NAW-104 sewage adapter can be snapped in the place of the plastic protecting cap.

STEPS OF INSTALLATION

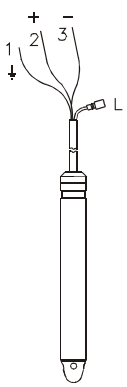
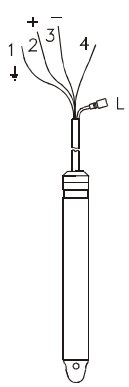
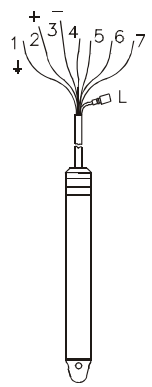
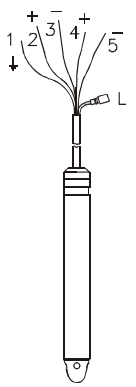
- Feed the special cable through the glands, arrange proper length of cable and fasten the cable with the glands.
- Excessive cable parts has to be wound on a pipe with a min. diameter of 100 mm.
  The special cable must not be cut short!
- Let the probe down to the lowest possible point, as only the height of the liquid above the probe will be measured.

For connecting the special breathing cable and the signal cable use the cable terminal box NAA101 or NAA102 (with IP65), that accommodates the cable end in an ambience free of dust and humidity. Fasten the cable termminal box (e.g. by the use of 2 pcs of M4 screw) to a plain surface. In open air or industrial applications the transmitter should be protected against transient surges / overvoltage.
The GND of the OVP must be connected with the shortest possible wire to the protecting ground. In this case it is suggested the NAA-102 terminal box (with OVP) is installed close to the location of the measurement. At the opposite end of the cabling the use of an additional over-voltage protection (OVP12/33 or OVP32/33) is advised close to the processing unit.

MOUNTING EXAMPLE



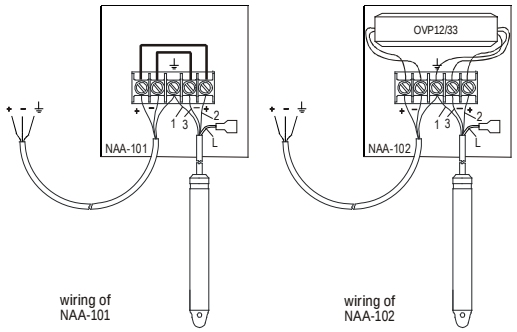
4. WIRING

2-WIRE LEVEL 4...20mA	3-WIRE LEVEL 0...10V	2-WIRE 4...20mA + Pt100	4...20mA + HART LEVEL + TEMPERATURE
			

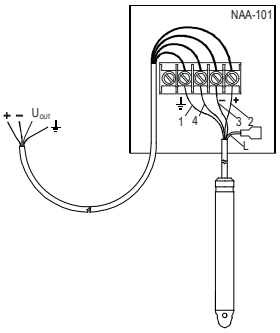
Legend:

	CABLE CORE	COLOUR
1	Shielding	Yellow
2	Positive power supply	Red
3	Negative power supply	Black with an additional blue-coloured insulation
4	Voltage output (3-wire types); NPP/NZP types: Pt100 sensor current drive; NPD/NZD types: positive power supply of the temperature transmitter	Uncoloured
5	NPP/NZP types: Pt100 sensor current drive; NPD/NZD types: negative power supply of the temperature transmitter	Uncoloured + blue shrikable tube
6	NPP/NZP types: Pt100 sensing	Black
7	NPP/NZP types: Pt100 sensing	Black / red
L	Breathing capillary with vapour filter	–

2-WIRE 4 ... 20 mA



3-WIRE 0 ... 10 V DC



Wiring of OVP 12/33

IN1, IN2 – inputs
OUT1, OUT2 – outputs
GND – grounding

WIRING OF OVP 32/33

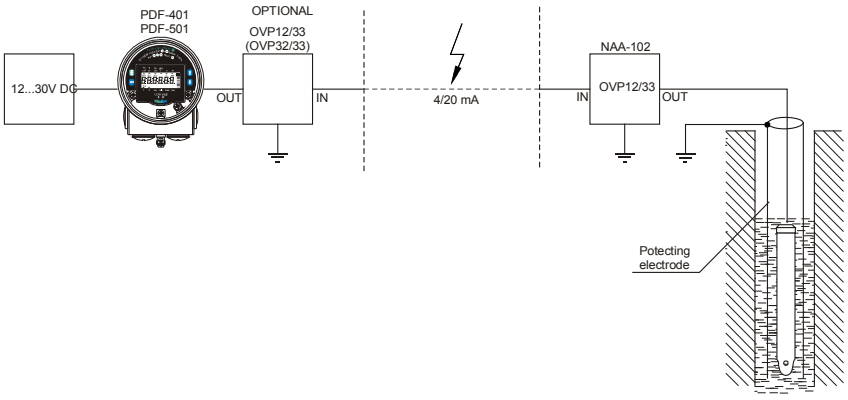
H	G
F	E
O_1	O_2
I_1	I_2
C	D
A	B

I1 (C), I2 (D) – inputs
O1 (F), O2 (E) – outputs
A, B, H, G – grounding

4.1 SAFETY REGULATIONS FOR THE EX APPROVED UNITS

The 'Ex' type hydrostatic level transmitter must be operated in intrinsically safe circuit only (see values in technical data for Ex approved units).
The metal housing of the device must be connected to the EP network using the connection cable marked with 1.

INSTALLATION EXAMPLE USING OVP UNITS



5. PUTTING INTO OPERATION, ADJUSTMENT

The unit installed and wired according to the specification is immediately operable, however the specified accuracy will be reached in six-hour time with short cable and in twenty four hour time with a cable of 300 m length. If correction of insertion length is needed loosen the cable holding assy then place the probe to the desired level and finally fasten the cable holding assy.

5.1 HART capable transmitters can communicate using standard HART commands with Nivelco's Multicont universal process controller or through a HART-USB adapter (SAT-304) with a PC. The instrument can be programmed from Multicont or from a PC using the attached software (NPCAL). With the help of the NPCAL software the measuring range can be downscaled to 50% of the nominal range. The Multicont can power the two-wire transmitters and can transmit the measured values via RS485 communication line (for further details see the manual of Multicont).

5.2 The parameter set

P0: - - - a Pressure value assigned to 4mA

P1: - - - a Pressure value assigned to 20mA

The pressure values that can be assigned to the 4mA and 20mA current output values.

When changing the factory set values make sure that the entered values fall within the specified range of the pressure transmitter otherwise the instrument will indicate error.

FACTORY SETTING:
P0 = [minimum measurable pressure value of the sensor] mH_2O (usually 0000)
P1 = [maximum measurable pressure value of the sensor] mH_2O

P9: Current generator test (mA)

By setting this parameter the user can test the current output by entering a value between 3.9 and 20.5mA and test it with an ammeter.

Warning: the test mode can be cancelled only by entering 0000 to P9.

P10: - - - a Measuring mode

a		Measuring mode
0	mbar	Pressure
1	psi	
2	m H_2O	Level (water head)
3	ft H_2O	

FACTORY SETTING: P10=2

P12: - - - a Error indication by the current output

a	Error indication
0	< 3.9 mA
1	> 21 mA

FACTORY SETTING: P12=0

P13: HART short address (Polling address)

If multiple HART capable transmitters are used in a loop the instruments have to be distinguished by their polling addresses. If polling address is 0 (default) the current output is 4...20mA and HART communication works on the 4...20mA current signal. Conforming to the HART standard max. 15 HART devices can be connected to a HART loop with polling addresses between 1 and 15. Thus the output current will be set to 4mA and only the digital HART communication will work. Instruments connected to the same loop should not have same polling addresses or 0 polling address set.

FACTORY DEFAULT: P13=0

P14: Software version

It is a read-only parameter, identifies the software version of the instrument.

P19: Secret code

The settings can be protected by a 4 digit secret code.

If the secret code is active the parameters can be read out but not changed.

To change or clear the secret code the old code should be entered first and then the P19 can be changed to the new code or 0000 (disable secret code).

FACTORY SETTING: P19=0000

Error codes

Code	Error	Procedure
0	Sensor error - the signal of the sensor is out of the calibration range	Contact Nivelco
1	Memory error	Contact Nivelco
3	Programming error: value of P0 and P1 is not correct	Modify the programming

6. MAINTENANCE, REPAIR

The unit does not require regular maintenance. In some instances, however, the probe may need occasional cleaning to remove surface deposits within the protective cap that can be easily snapped off (NPK types). Do not touch the sensor membrane. Repairs during or beyond the guarantee period are to be carried out solely by the Manufacturer. Equipments sent back for repair should be cleaned or sterilised by the User. The User must declare that the above has been carried out.

7. STORAGE CONDITIONS

Ambient temperature: -10 °C … +50 °C
Relative humidity: max. 85%

8. WARRANTY

All Nivelco products are warranted free of defects in materials or workmanship for a period of two years from the date of purchase, as indicated in the Certificate of Warranty