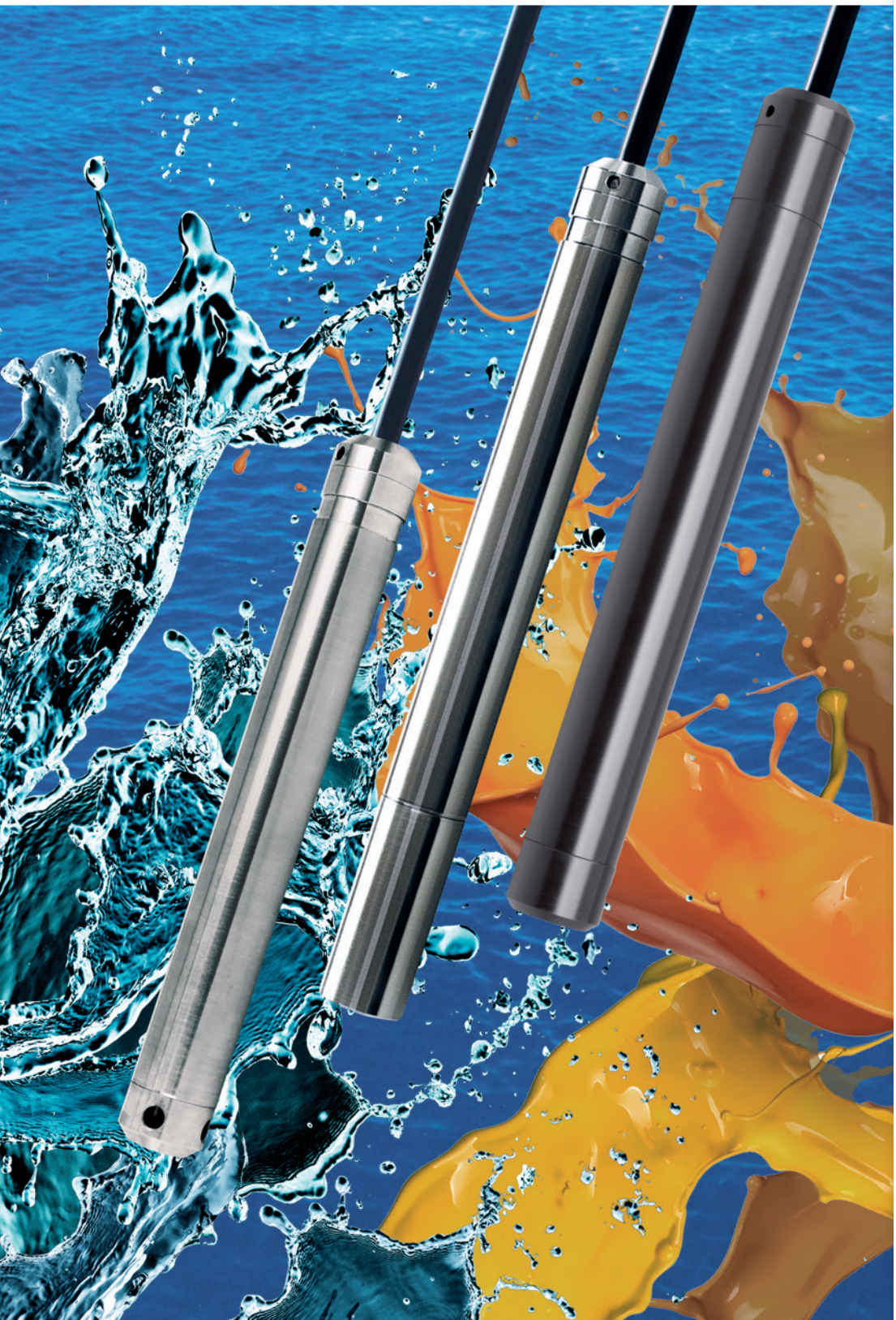
NIVOPRESS N

HYDROSTATIC LEVEL TRANSMITTERS
FOR CLEAN WATER AND SEWAGE WATER



5 YEARS WARRANTY

NIVELCO

LEVEL TRANSMITTERS

MAIN FEATURES

- Measuring range up to 200 m (656 ft)
- IP68 protection
- Remote programmable
- Submersible or screw-in types
- Ø22 / 24 mm (Ø0.85 / 1 inch) tube
- HART® communication
- 2- or 3-wire versions
- 2x 4 – 20 mA output (level + temperature)
- Built-in Pt100 temperature sensor
- Overvoltage and inverse polarity protection
- Wide range of accessories
- Ex version
- Can be certified for potable water
- Available with capacitance ceramic, piezorezistive stainless steel or ceramic sensor

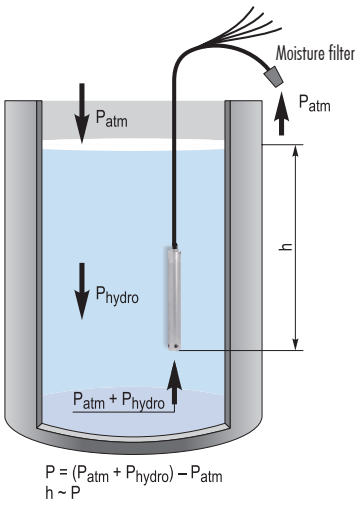
APPLICATIONS

- Level and temperature measurement of drinking water wells, tanks, pools
- Submersible pump control
- Screw-in submersible type with IP68 protection for applications with risk of flooding
- Clean or slightly contaminated liquids
- Sewage, wastewater
- Draw-down protection
- Sewage lift station control
- Saline solutions, seawater

CERTIFICATIONS

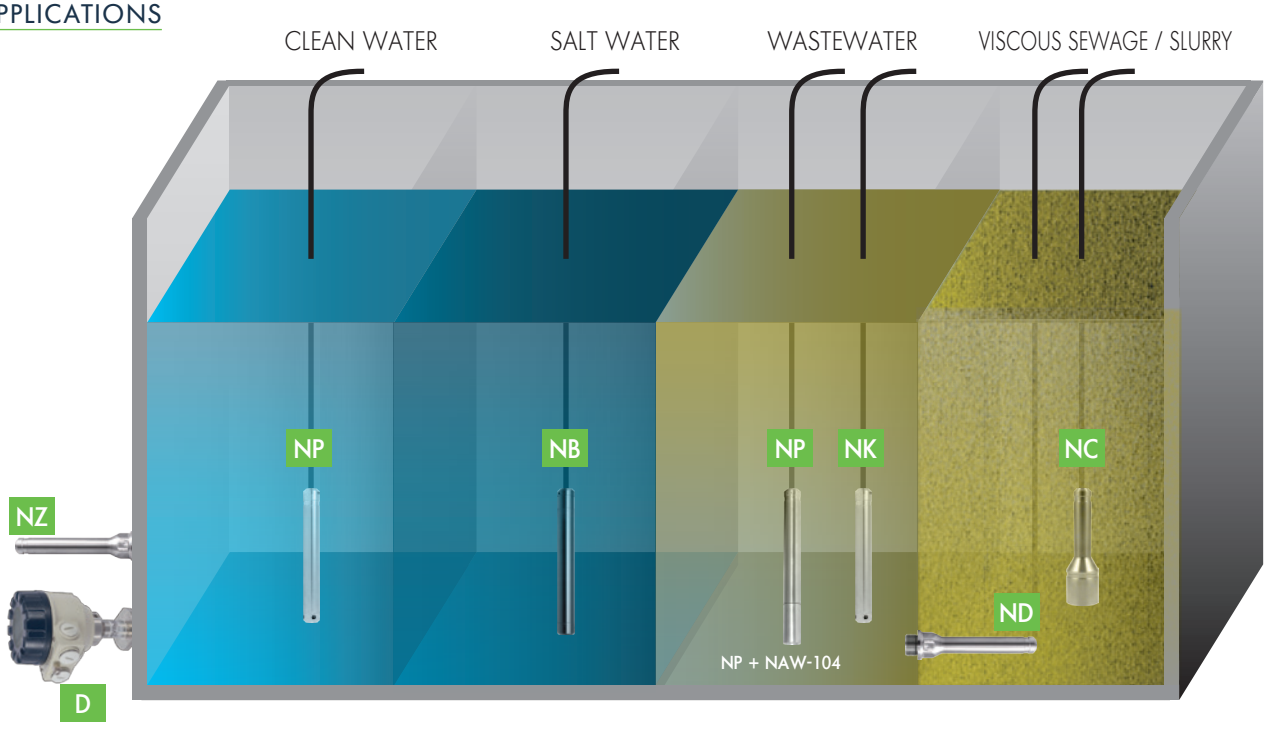
- ATEX (Ex ia)

GENERAL DESCRIPTION



The **NIVOPRESS N** hydrostatic borehole level transmitters are designed to measure the level of clean or contaminated liquids. The pressure sensor at the bottom of the probe measures the hydrostatic pressure (P_{hydr}) of the liquid column above it and compares with the atmospheric pressure (P_{atm}). The atmospheric pressure is led to the sensor through a breathing capillary which is equipped with a moisture filter that prevents the moisture reaching the electronics and decreasing the accuracy of the measurement. This enables the atmospheric pressure to be subtracted from the measured pressure to get the hydrostatic pressure which is proportional to the height of the liquid column (h). The electronics converts the sensor's signal into an output signal. If temperature measurement (of the liquid) is needed beside the level measurement a combined (level + temperature) transmitter should be used. The installation and wiring of the transmitter is helped by the wide variety of accessories. A sewage adapter working on the principle of the diving bell can be snapped **(NP)** or can be screwed **(NZ)** into the place of the protecting cap to avoid the direct contact between the sensor and the measured contaminated liquid. An extra mechanical protection is built in the **NZ** type sewage adapters in the form of a mechanical filter. The **N-500** types can be used in hazardous environments. The **NZ** screw-in type transmitters are recommended for applications where there is a risk of flooding. The **NB / NG** plastic housing types are designed for those applications where the aggressive medium (e.g. saline solutions or seawater) could cause galvanic corrosion of the stainless steel body.

APPLICATIONS



TECHNICAL DATA

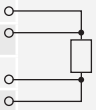
Type		2-wire				3-wire
		NB, NG	NK, NN / ND, NH	NC, NT	NP, NF / NZ, NR	NPH, NFH / NZH, NRH
Sensor type	Principle	Piezoresistive		Capacitance	Piezoresistive	
	Material	Ceramic			Stainless steel	
Housing		Plastic	Stainless steel			
Measuring range		0 – 20 m (0 – 65 ft) water head			0 – 200 m (0 – 656 ft) water head	
		As per order code; the current output can be customized in the pressure range from 2% to 130% with remote programming				
Overload allowed (versus range)		3x		20x (h ≤ 3 mH_2O) 10x (h > 3 mH_2O)	3x	
Output		4 – 20 mA + HART®		4 – 20 mA	4 – 20 mA + HART®	0 – 10 V (0 V ≤ 80 mV) measured to the power supply
Power supply		12 – 30 V DC				18 – 30 V DC / 6 mA
Temperature measurement		NPD and NZD types 2-wire 4 – 20 mA output (power supply: 12 – 30 V DC), 0 °C … +60 °C (32 °F … 140 °F), accuracy: ±3 °C (±5,4 °F)				–
		N□P types: 4-wire Pt100 B temperature sensor. Other types with HART® output: temperature can be queried as HART® Secondary Value, 0 °C … +60 °C (32 °F … 140 °F), accuracy: ±3 °C (±5,4 °F)				
Linearity error (level)		±0.45%		±0.25%		
Temperature error		≤ ±0.1% / 10 K				≤ ±0.2% / 10 K
Process temperature [1]		-30 °C … +60 °C (-22 °F … 140 °F)				
Process connection		NAA-209 cable mounting wedge clamp, NZ, NR, ND, NH types: ¾" BSP thread				
Ingress protection		IP68				
Electrical protection		Class III				
Electrical connection		Shielded cable with breathing capillary				
Cable		Ø7 mm; 0.34 mm^2 (Ø0.275 inch; AWG22)				
Cable length		0 – 300 m (0 – 985 ft) as order code				
Dimensions		Ø24 x 212 mm	NK, NN: Ø22 x 173 mm (Ø0.87 x 6.8 inch) ND, NH: Ø38 x 174 mm (Ø1.5 x 6.85 inch)	Ø40 x 146 mm (Ø1.55 x 5.75 inch)	NP, NF: Ø22 x 173 mm (Ø0.87 x 6.8 inch) NZ, NR: Ø38 x 174 mm (Ø1.5 x 6.85 inch)	
Mass		Probe: 0.2 kg (0.44 lb)	NK, NN: Probe: 0.2 kg (0.44 lb) ND, NH: Probe: 0.3 kg (0.66 lb)	Probe: 0.4 kg (0.88 lb)	NP, NF: Probe: 0.2 kg (0.44 lb) NZ, NR: Probe: 0.3 kg (0.66 lb)	
Material of wetted parts	Sensor	Al_2O_3			1.4404 (316L)	
	Housing	POM	1.4571 (316Ti)			
	Cable coating	Polyurethane (PUR) or FEP				
	Sealings	Viton® (FKM)				
	Protecting cap	POM	1.4571 (316Ti)	–	1.4571 (316Ti)	

[1] High temperature (up to +75°C (167 °F)) version is available on special request

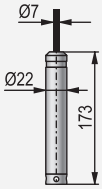
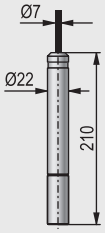
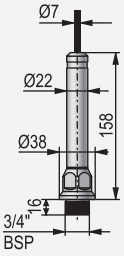
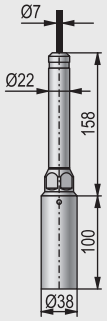
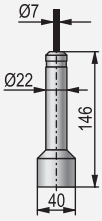
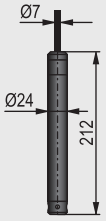
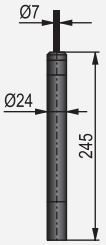
SPECIAL DATA FOR Ex CERTIFIED MODELS

Type	NP / NF / NZ / NR / NK / NN / ND / NH□-□□5-□Ex
Protection type	Intrinsically safe
Ex marking	Up to 100 m (328 feet) cable length: ⟨Ex⟩ II 1G Ex ia IIC T6 Ga, between 100 m (328 feet) and 300 m (985 feet) cable length: ⟨Ex⟩ II 1G Ex ia IIB T6 Ga
Intrinsically safe data	Ui = 30 V, Ii = 100 mA, Pi = 0.8 W for IIC gas group: Ci ≤ 52 nF, Li ≤ 1.4 mH (calculated with 100 m [328 feet] integrated cable), for IIB gas group: Ci ≤ 132 nF, Li ≤ 1.6 mH
Power supply	14 – 30 V DC
Operation temperature range	-30 °C … +60 °C (-22 °F … 140 °F)

WIRING

Cable wire / Type		N□K	N□H	N□D	N□P
1	yellow	⏚	⏚	⏚	⏚
2	red	I+	U+	I+	I+
3	black / blue	I-	U-	I-	I-
4	uncolored	–	U_{out}	I + (°C)	 Pt100
6	black	–	–	–	
7	black / red	–	–	–	
5	uncolored / blue	–	–	I - (°C)	
L	breathing capillary with moisture filter	L	L	L	L

DIMENSIONS

NP / NK	NP / NK + NAW-104	NZ / ND	NZ / ND +NAZ-103	NC	NB / NG	NB / NG + NAW-107
						

ACCESSORIES

A wide range of accessories make an easier and safer installation and usage of the NIVOPRESS N hydrostatic level transmitters.

NAA-101: Cable terminal box with moisture filter and terminals for wiring the unit

NAA-102: Cable terminal box with moisture filter and terminals with built-in OVP-22/33 type overvoltage protection unit for wiring the level transmitter

NAA-209: Cable mounting wedge clamp

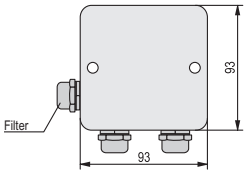
OVP-22/33: Outdoor overvoltage protection unit for use in 4 – 20 mA loop with IP54 protection

OVP-32/33: Indoor overvoltage protection unit for use in 4 – 20 mA loop with IP20 protection, EN 60715 rail mountable type

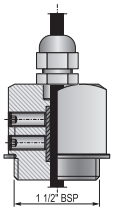
NAW-104, NAW-107, NAZ-103: Sewage adapter made from 1.4571 (316Ti) stainless steel or plastic (POM). The NP / NK / NB type probes can be equipped with the suitable sewage adapter (NAW-104 or NAW-107) by snapping instead of the sensor protective cap. The NAZ-103 type sewage adapters can be screwed to the NZ / ND types with ¾" threaded process connection. The air layer below the sewage adapter helps to avoid the direct contact between the sensor and the measured contaminated liquid.

NAA-105, NAA-106: Cable sliding sleeve with 1½" BSP or NPT thread; material: st. steel 1.4571 (316Ti)

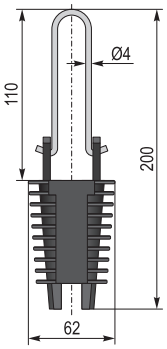
NAA-101/102



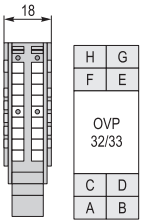
NAA-105



NAA-209

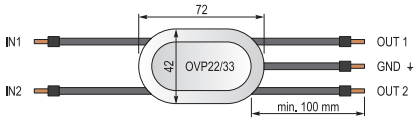


OVP-32/33



IN_1 (C) ; IN_2 (D); Out_1(F); Out_2(E); A, B, H, G = ⏚

OVP-22/33

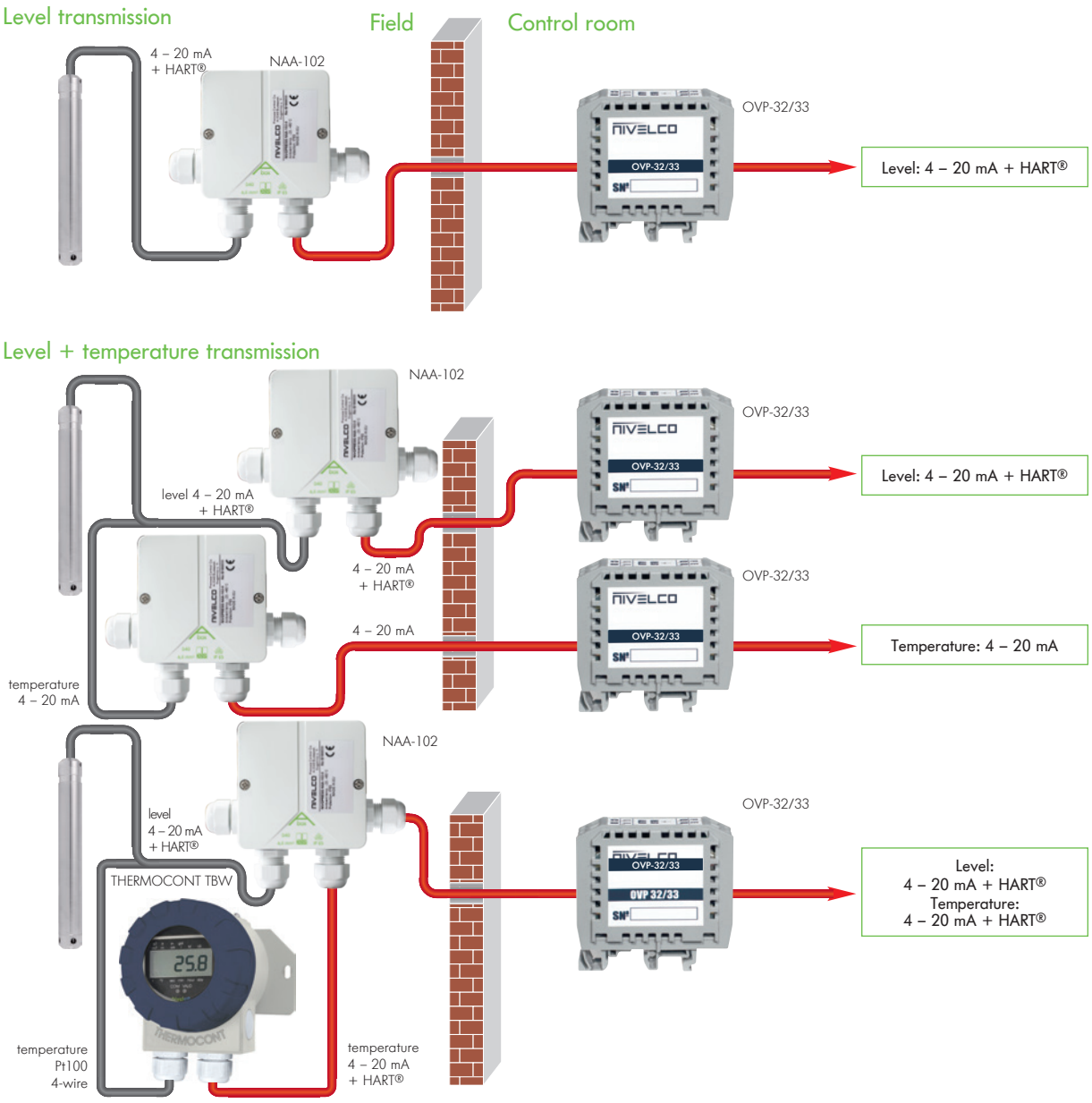


Technical data of the accessories

Cable terminal box	NAA-101	
Dimensions	93 x 93 x 55 mm (3.66 x 3.66 x 2.16 inch)	
Ingress protection	IP65	
Operating temperature	-40 °C … +70 °C (-40 °F … +158 °F)	
Material	Plastic	
Cable gland	M20x1.5 (cable Ø5 – 10 mm (0.2 – 0.4 inch)	
Electrical connection	Terminal block for cable with max. cross section of 2.5 mm² (AWG13)	
Cable terminal box with overvoltage protection	**NAA-102[2]**	
Data	See NAA-101	
Electrical Data	See OVP	
Cable mounting wedge clamp	**NAA-209**	
Max. mechanical load	300 m (985 ft) cable	
Material	Polyamide, stainless steel wedge clamp	
Operating temperature	-20 °C … + 60 °C (-4 °F … +140 °F)	
Overvoltage protection unit	**OVP-22/33[2]**	**OVP-32/33[2]**
Type	field use	EN 60715 rail mountable
Dimensions	72 x 42 x 19 mm (2.8 x 1.65 x 0.75 inch)	62 x 65 x 18 mm (2.44 x 2.56 x 0.7 inch)
Ingress protection	IP54	IP20
Breakdown voltage	33 V	
Absorbed energy	600 W / 1 ms	
Serial resistance	13 Ω	
Leakage current	≤10 µA	

[2] *Only for 2-wire 4 – 20 mA equipments!*

MEASURING CIRCUITS



NIVOPRESS N TRANSMITTERS IN SYSTEM WITH A PC

Instruments with HART® output can be connected to a PC interfaced by a **UNICOMM** HART®-USB modem, or can be connected wirelessly with the SAT-504 HART®-Bluetooth® modem. A HART® multidrop loop can consist of a maximum of 15 transmitters. All measured values can be visualized and/or the **NIVOPRESS N** transmitters can be remote programmed by the PC. Applicable software: **EView2** configuration software or **NIVISION** process visualization software.

NIVOPRESS N TRANSMITTERS IN HART® MULTIDROP LOOP

The **MultiCONT** processes and displays measurement data supplied by NIVELCO's HART® equipped transmitters connected to a Multidrop loop. Up to 15 transmitters (also mixed models) can be connected and remote programming can be also performed through the **MultiCONT**. Re-transmission of the data is possible via RS485 communication line to a PC or PLC when needed.

npk4s19a0604b

ORDER CODES (NOT ALL COMBINATIONS AVAILABLE)

NIVOPRESS N hydrostatic level transmitters

NIVOPRESS N ☐☐-☐☐☐-☐ (1)

Sensor / housing (conn.) / cable		Code
Stainless steel	Piezoresistive sensor	
	S. steel housing / PUR	P
	S. steel housing / FEP	F
	S.s. housing, threaded / PUR	Z
	S.s. housing, threaded / FEP	R
Ceramic(3)	S. steel housing / PUR	K
	S. steel housing / FEP	N
	S.s. housing, threaded / PUR	D
	S.s. housing, threaded / FEP	H
	POM housing / PUR	B
	POM housing / FEP	G
	Capacitive sensor	
	S. steel housing / PUR	C(2)
	S. steel housing / FEP	T

Version	Code
Normal – with ceramic sensor	2(3)
Normal – with piezo sensor	4
Ex – with piezo sensor	5(5)

Range(4)	Code
0 – 1 mvo (0 – 100 mbar)	1
0 – 2 mvo (0 – 200 mbar)	2
0 – 5 mvo (0 – 500 mbar)	3
0 – 10 mvo (0 – 1000 mbar)	4
0 – 20 mvo (0 – 2000 mbar)	5
0 – 50 mvo (0 – 5000 mbar)	6
0 – 100 mvo (0 – 10 000 mbar)	7
0 – 200 mvo (0 – 20 000 mbar)	8

Code	Cable length		Code
0	0 m (0 ft)	until 100 m	0 m (0 ft) 0
1	10 m (32.8 ft)		1 m (3.28 ft) 1
2	20 m (65.6 ft)		2 m (6.56 ft) 2
3	30 m (98.4 ft)		3 m (9.84 ft) 3
4	40 m (131.2 ft)		4 m (13.12 ft) 4
5	50 m (164 ft)		5 m (16.4 ft) 5
6	60 m (196.8 ft)		6 m (19.68 ft) 6
7	70 m (229.6 ft)		7 m (22.96 ft) 7
8	80 m (262 ft)		8 m (26.2 ft) 8
9	90 m (295 ft)		9 m (29.5 ft) 9
A	100 m (328 ft)	over 100 m	0 m (0 ft) 0
B	200 m (656 ft)		10 m (32.8 ft) 1
C	300 m (985 ft)		20 m (65.6 ft) 2
			30 m (98.4 ft) 3
			40 m (131.2 ft) 4
			50 m (164 ft) 5
			60 m (196.8 ft) 6
			70 m (229.6 ft) 7
			80 m (262 ft) 8
			90 m (295 ft) 9

Output	Code
4 – 20 mA + HART®(6)	K
0 – 10 V DC(2)(7)	H
Level: 4 – 20 mA + HART® Temperature: 4 – 20 mA(2)(7)	D
Level: 4 – 20 mA + HART® Temperature: Pt100(6)	P

(1) *The order code of an Ex version should end in 'Ex'*

(2) *Not available in Ex version*

(3) *For maximum 20 m (65 ft) water height*

(4) *For HART capable units the current output can be customized in the pressure range from 2% to 130% with remote programming*

(5) *NB, NG: Ex version not available*

(6) *HART communication is not available for N☐K-200 and N☐P-200 types*

(7) *Only with stainless steel sensor*

ACCESSORIES AND AUXILIARY DEVICES TO ORDER

Accessories	NAA-101	Cable terminal box with moisture filter
	NAA-102	Cable terminal box with moisture filter with OVP 22/33 (only for 2-wire types)
	NAW-104	Sewage adapter, can be mounted instead of the protective cap (stainless steel)
	NAW-107	Sewage adapter, can be mounted instead of the protective cap (plastic – POM)
	NAZ-103	Sewage adapter (for ¾" threaded process connection (stainless steel)
	NAA-105	Cable sliding sleeve with cable gland and 1½" BSP thread
	NAA-106	Cable sliding sleeve with cable gland and 1½" NPT thread
	NAA-209	Cable mounting unit with stainless steel wedge clamp
	OVP-22/33	IP54 rated outdoor overvoltage protection unit for 4 – 20 mA loop
	OVP-32/33	IP20 rated indoor overvoltage protection unit for 4 – 20 mA loop, rail mountable
Auxiliary devices	MultiCONT P-200	Multichannel process controller / display unit, wall mountable
	NIPOWER PPK-331	24 V DC power supply unit, rail mountable
	THERMOCONT TBW-500	Field display / temperature transmitter unit for Pt100 sensor output, wall mountable
	UNICONT PKK-312	Current controlled limit switch with SPDT relay output, rail mountable
	UNICONT PDF-401	Universal current loop indicator for 4 – 20 mA transmitters, wall mountable
	UNICONT PMM-511	Universal controller / display panel unit
	UNICONT PGK-301 Ex	Intrinsically safe isolator power supply unit, rail mountable
	UNICOMM SAK-305	HART®-USB/RS485 modem for remote programming via PC, rail mountable
	UNICOMM SAT-304	HART®-USB modem for remote programming via PC
	UNICOMM SAT-504	HART®-USB/Bluetooth® modem for remote programming
	EView2	Configuration software for remote programming via PC. FREE download!

NPK + NAW-104

NIVELCO reserves the right to change technical data without notice! Specifications in metric & US units!

NIVELCO PROCESS CONTROL CO.
H-1043 Budapest, Dugonics u. 11.
Tel.: (36-1) 889-0100 ▪ Fax: (36-1) 889-0200
E-mail: sales@nivelco.com
NIVELCO.COM