NIVETEC
Instrumentação
e Controle

AnaCONT

LIQUID ANALYTICAL TRANSMITTERS

ANALYTICAL INSTRUMENTS

AnaCONT COMPACT pH, ORP and DO TRANSMITTERS

MAIN FEATURES

- Compact and integrated versions
- Separated versions up to 10m
- Measurement range: pH: 0-14, ORP: ±1000 mV, DO: 0-20 ppm
- Wide probe selection suitable for most applications
- Temperature compensation
- Graphic display
- 4-20 mA, HART, relay output
- IP67 / IP68 protection
- Ex version

APPLICATIONS

- Checking of water quality
- Wastewater treatment
- Pharmaceutical industry
- Food and beverage industry
- Effluent treatment
- Checking of aeration in potable water
- Pools

OPERATION

The **AnaCONT** liquid analytical transmitters are designed to measure pH, redox potential, or dissolved oxygen values of liquids and aqueous solutions.

pH measurement: Continuous measurement of acidity (pH<7) and of basicity (pH>7) in liquids can be performed by the help of AnaCONT transmitters. The necessary feeding of chemicals and other technological functions can be controlled by the processed measured values. The potential difference between the submerged measuring and reference probe generates a voltage proportional to the concentration of the hydrogen ion in the measured fluid. This voltage is evaluated by the signal processing electronic module of the instrument. Based on the signals of the submerged probe and the temperature sensor the smart signal processing electronic module calculates a pH value normalized to 25°C and generates a proportional output signal. The long term stability and accuracy of the measurement requires a periodic calibration of the sensors using the standard buffer solutions.

Redox potential (ORP) measurement: Similarly to the pH measurement, the measurement of the redox potential is based on the potential difference between measuring and reference probes. Oxidation or reduction occurs on the platinum surface of the measuring probe. Redox potential is a parameter that indicates the sum of oxidants and reducers in the measured medium. The output signals of the probes are processed by the electronic unit and it converts them into a proportional output signal. In order to get the desired medium parameters the reduction of liquids or feeding of suitable oxidant is executed based on the formerly processed values.

Dissolved oxygen (DO) measurement: The dissolved oxygen (DO) measurement gives the quantity of dissolved oxygen gas in the liquid, in ppm or mg/l values. The sensor with oxygen-permeable membrane immersed in the liquid provides an electronic signal proportional to the oxygen concentration. The intelligent electronics calculates and transmits the DO value normalized to 25°C on the basis of the output current of the DO sensor and the potential of the temperature sensor immersed in the medium.

PROBE SELECTION

pH probes

Medium	Max. temp. (°C)	Max. pressure (bar)	Min. conductivity (µS/cm)	pH	Material	Mounting angle	Application area
Clean liquid	60	0,5	150	1-12	glass	max. 45°	potable water, pool
	60	3		1-12			potable water, pool
	80	6		1-12			process water, galvanic
	80	8		1-12			process water, treated wastewater
	100	3 / 100°C; 6 / 25°C		3-14			chemical industry
	60	3		1-12	polycarbonate	max. 90°	potable water, pool
Solid particles in the medium	80	6	50	1-12	glass	max. 45°	treated wastewater
	100	6 / 100°C; 16 / 25°C	500	1-12			sludge, emulsion

ORP probes

Medium	Max. temp. (°C)	Max. pressure (bar)	Min. conductivity (µS/cm)	Material	Mounting angle	Application area
Clean liquid	60	1	150	glass	max. 45°	potable water, pool
	60	3				potable water, pool
	80	6				process water
	60	3		polycarbonate	max. 90°	potable water, pool, treated wastewater
Solid particles in the medium	80	6	50	glass	max. 45°	sludge, emulsion
	100	6 / 100°C; 16 / 25°C	500			sludge, emulsion

DO sensors

Type		4x085g0023ydo	4x085g0022ydo
DO sensor	Application area	Fish- and crawfish farms, water conditioning of large aquariums. Controlling of oxygen concentration in water plants, determination of biological condition in surface water. 	Potable water production, river monitoring, water treatment sites, controlling of dissolved oxygen level in wastewater plants, determination of biological condition in surface water. 
	DO range	0-20 ppm	0-10 ppm
	Process temperature	max. 50°C	
	Process pressure	max. 1 bar	
	Speed of medium-flow	min. 0.05m/s	
	Material / thickness of membrane	PTFE / 125 µm	PTFE / 50 µm

TECHNICAL DATA

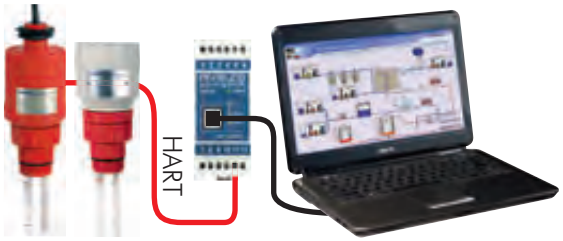
General data		L□P - pH transmitter	L□R - ORP transmitter	L□D - DO transmitter
Measurement data	Range	0…14pH	±1000 mV	0 – 20 ppm v. 0 – 10 ppm
	Reserve	±2pH	±200 mV	20%
	Resolution	0.01pH (internal resolution 0.004 pH)	1 mV (internal resolution 0.8 mV)	0.01 ppm (internal resolution 0.005 ppm)
	Linearity	±0.004 pH	±0.4 mV	±0.05 ppm
	Accuracy*	0.1% of the measured value ±1 digit ±0.01% / °C		0.5% of the measured value ±1 digit ±0.01% / °C
	Measuring cycle	300 msec, on display: 1 sec		
Temperature measuring (semiconductive sensor)		Range: -50…130 °C, Accuracy: ±0.5 °C, Resolution: 0.1 °C		
Liquid potential (complementary) electrode		Housing of the temperature sensor: stainless steel (1.4571), connection: SN6		
Electrode input		Combined electrode, galvanic isolated, input impedance: $>10^{12}$ Ohm, connection: SN6		DO sensor input: Galvanic isolated current input, 0.725V polarisation voltage, connection: SN6
Power supply / Power consumption		12…36 V DC / 48 mW…720 mW, galvanic isolated, protection against surge transients		
Output	Analogue	4 – 20 mA, (3.9 – 20.5 mA), R_{tmax} = 1200 Ohm galvanic isolated, protection against surge transients (only for compact type)		
	Relay	SPDT: 30 V DC, 1A DC		
	Display	SAP-300 LCD graphic display, units of measure and bar graph (only for compact type)		
	Digital communication	HART interface, terminal resistance ≥ 250 Ohm		
Medium temperature (pressure dependent)*		PP probe housing: -10 °C…+90 °C, PVDF probe housing: -15 °C…+100 °C		
Pressure (absolute)*		with pH and ORP probe: 0.05...1 MPa (0.5...10bar) at +25 °C; with DO sensor: 0.1...0.2 MPa (1...2 bar) at +25 °C		
Ambient temperature		Aluminium housing: -30 °C…+70 °C, Plastic housing: -25 °C…+70 °C, With display: -20 °C…+70 °C		
Sealing		PP probe housing: EPDM, all other probe housing: FPM (Viton)		
Ingress protection		Compact type: Probe housing: IP 68, Electronic housing: IP 67; Integrated type: IP 68		
Housing material		Compact type: plastic (PBT) or paint coated aluminium, Integrated type: same as probe housing		
Material of probe housing		Polypropylene (PP), KYNAR (PVDF)		
Electrical connection		Compact type: 2xM20x1,5 plastic cable glands for cable: Ø6…12 mm, or 2xM20x1.5 metal cable glands for cable: Ø7…13 mm wire cross section: 0.5…1.5 mm^2 (shielded cable is recommended), + 2 x NPT 1/2" internal thread for cable protective pipe Integrated type: 6x0.5 mm^2 shielded cable, Ø6 mm x 5 m standard (up to max. 30 m cable length)		
Electrical protection		Class III. electric shock protection		

* Depends on the applied probe

Special data for Ex certified models	
Ex marking	ATEX ⟨Ex⟩ II 1G Ex ia IIB T6 Ga
Intrinsically safe data	Ci ≤ 15 nF, Li ≤ 200 µH, Ui ≤ 30 V, Ii ≤ 140 mA, Pi ≤ 1 W, For Ex transmitter only Ex ia power supply should be used!
Ex power supply, max. load	U_0 < 30 V, I_0 < 140 mA, P_0 < 1 W, Supply voltage range: 12 V … 30 V, Rt max = (Ut - 12 V) / 0.02 A
Medium temperature	PP probe housing: -10 °C…+70 °C, PVDF probe housing: -15 °C…+80 °C; DO transmitter: 0 °C...+50 °C
Ambient temperature	Aluminium housing: -30 °C…+70 °C, Plastic housing: -20 °C…+70 °C, With display: -20 °C…+70 °C

AnaCONT IN SYSTEM WITH A PC

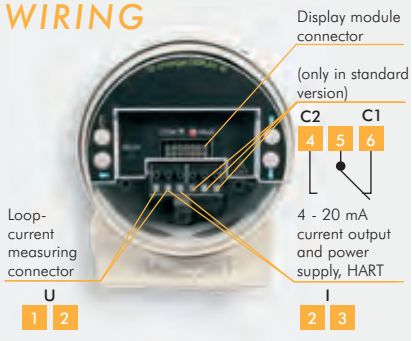
The instrument with HART output can be connected to a PC using a **UNICOMM** HART-USB modem. Max. 15 normal instruments can be connected to a HART line. Measured values can be visualised and/or the instruments can be programmed via digital HART communication. Applicable software: **EView** configuration software or **NIVISION** process visualization software.

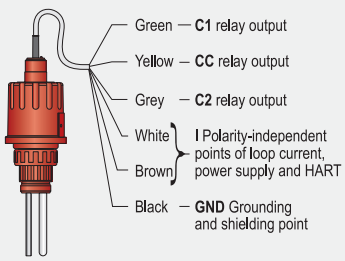


AnaCONT IN SYSTEM WITH MultiCONT

The **MultiCONT** can handle digital data from up to 15 HART transmitters for the measuring of different values (e.g. DO temperature, level, pressure). The digital (HART) information is processed, displayed and if needed it can be transmitted via RS485 communication line to a PC. Remote programming of the transmitter is also possible. Visualisation on a PC can be accomplished with **NIVISION** process visualisation software.

WIRING





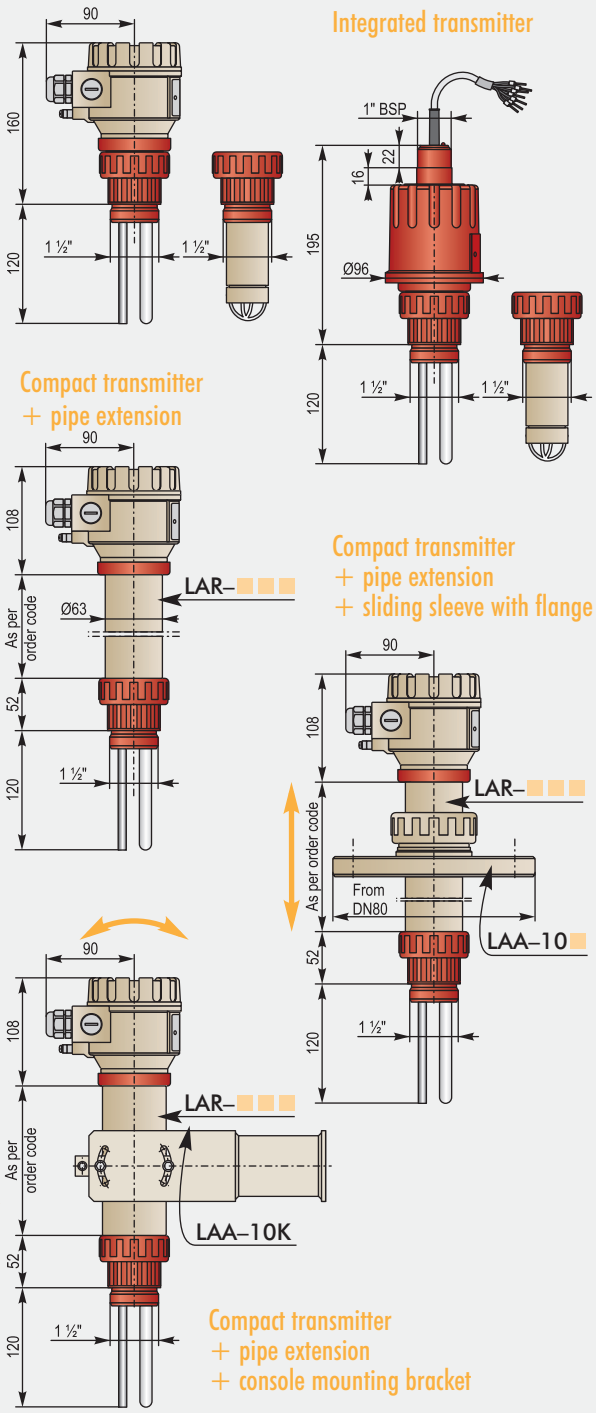
CONFIGURATIONS

The constructions of the sensors on the compact and integrated versions are identical, so all accessories are applicable for both types.

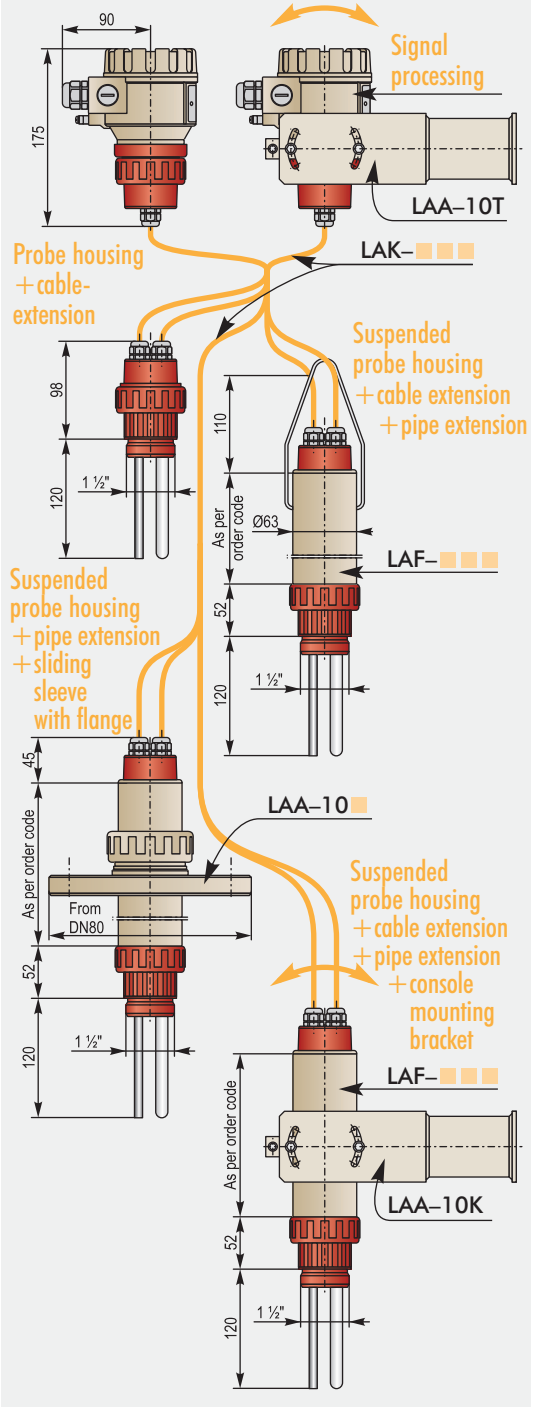
The applications of the special accessories make the optimal installation of the transmitters into the technologic process easier.

By using extension pipes or extension cables the separated versions allow the mounting of the electronics and the sensor part at any distance from each other.

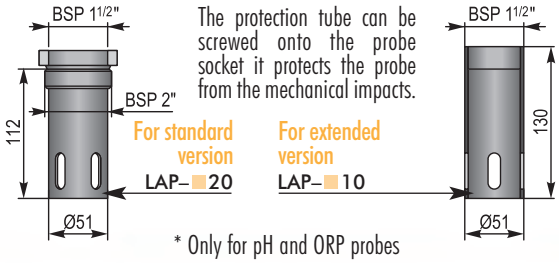
COMPACT TRANSMITTER



SEPARATED TRANSMITTER



SENSOR PROTECTION TUBE*



The protection tube can be screwed onto the probe socket it protects the probe from the mechanical impacts.

* Only for pH and ORP probes

ORDER CODES (PROBES, SOLUTIONS)

Wide range of measurement probes are available to order for continuous and reliable operation.
The originally included sensor can be replaced when case its lifespan is over. Sensor replacement can be necessary also if the used technology changes significantly. The offered solutions are recommended for required periodic calibrations, and storing or cleaning of the probes.

PH PROBES

Probes

Order code	Type
4xpher112seph	1-12 pH / 50 µS/cm / 6 bar / 80°C
4xphed112seph	1-12 pH / 150 µS/cm / 8 bar / 80°C
4xphex112seph	1-12 pH / 500 µS/cm / 16 bar (25°C); 6 bar (100°C)
4xpheph314sph	3-14 pH / 150 µS/cm / 6 bar / 100°C
4xphe1120seph	1-12 pH / 150 µS/cm / 0.5 bar / 60°C
4xphes112seph	1-12 pH / 150 µS/cm / 3 bar / 60°C
4xphep112seph	1-12 pH / 150 µS/cm / 6 bar / 80°C
4xphekl112sph	1-12 pH / 150 µS/cm / 3 bar / 60°C

Solutions

Order code	Name
4vpuf4ph50mph	Buffer solution pH4 / 50 ml
4vpuf4ph250ph	Buffer solution pH4 / 250 ml
4vpuf4ph100ph	Buffer solution pH4 / 1 l
4vpuf7ph50mph	Buffer solution pH7 / 50 ml
4vpuf7ph250ph	Buffer solution pH7 / 250 ml
4vpuf7ph100ph	Buffer solution pH7 / 1 l
4vpuf10ph50ph	Buffer solution pH10 / 50 ml
4vpuf10ph25ph	Buffer solution pH10 / 250 ml
4vpuf10ph10ph	Buffer solution pH10 / 1 l
4vtarkcl350ph	Storage solution KCl 3 mol / 50 ml
4vtarkcl250ph	Storage solution KCl 3 mol / 250 ml
4vtarkcl310ph	Storage solution KCl 3 mol / 1 l
4vtiszold25ph	Cleaning solution / 250 ml

ORP PROBES

Probes

Order code	Type
4xorrherpseor	50 µS/cm / 6 bar / 80°C
4xorrhexpseor	500 µS/cm / 16 bar (25°C); 6 bar (100°C)
4xorrheptseor	150 µS/cm / 1 bar / 60°C
4xorrhespseor	150 µS/cm / 3 bar / 60°C
4xorrheppseor	150 µS/cm / 6 bar / 80°C
4xorrheklseor	150 µS/cm / 3 bar / 60°C

Solutions

Order code	Name
4vpuf46550mor	Buffer solution ORP 465 mV / 50 ml
4vpuf465250or	Buffer solution ORP 465 mV / 250 ml
4vpuf465100or	Buffer solution ORP 465 mV / 1 l
4vpuf22050mor	Buffer solution ORP 220 mV / 50 ml
4vpuf220100or	Buffer solution ORP 220 mV / 1 l
4vtarkcl350ph	Storage solution KCl 3 mol / 50 ml
4vtarkcl250ph	Storage solution KCl 3 mol / 250 ml
4vtarkcl310ph	Storage solution KCl 3 mol / 1 l
4vtiszold25ph	Cleaning solution / 250 ml

DO PROBES

Sensors

Order code	Type
4x085g0023ydo	0 - 20 ppm
4x085g0022ydo	0 - 10 ppm

ORDER CODES (NOT ALL COMBINATIONS AVAILABLE)

AnaCONT liquid analytical transmitters

AnaCONT L ■ ■ - ■ ■ ■ - ■ [1]

Type	Code
Transmitter	E
Transmitter + display	G
Integrated	P

Function	Code
pH	P
ORP	R
DO	D

Housing	Code
Plastic	1
Aluminium	2

Process conn. / Material	Code
BSP 1 1/2" / PP	1
BSP 1 1/2" / PVDF	2
NPT 1 1/2" / PP	4
NPT 1 1/2" / PVDF	5

Output / Ex	Code
4 – 20 mA	2
4 – 20 mA / HART	4
4 – 20 mA / Ex	6
4 – 20 mA / HART / Ex	8
4 – 20 mA / Relay	R
4 – 20 mA / HART / Relay	H

Probe

pH probe	Code
4xpher112seph	1
4xphed112seph	2
4xphex112seph	3
4xpheph314sph	4
4xphe1120seph	5
4xphes112seph	6
4xphep112seph	7
4xphekl112seph	8

ORP probe	Code
4xorrherpseor	1
4xorrhexpseor	2
4xorrheptseor	3
4xorrhespseor	4
4xorrheppseor	5
4xorrheklseor	6

DO probe	Code
4x085g0023ydo / 20ppm	1
4x085g0022ydo / 10ppm	2

1 The order code of an Ex version should end in "Ex"

ACCESSORIES

Extension units

L A ■ - ■ ■ ■

Type	Code
Pipe	R [1]
Cable	K [2]
Pipe extension for separate mounting	F [3]

Material	Code
PP	1
PVDF	2

Code	Extension length [4]		Code
0	0 m	0 m	0
1	1 m	0.1 m	1
2	2 m	0.2 m	2
3	3 m	0.3 m	3
4	4 m	0.4 m	4
5	5 m	0.5 m	5
6	6 m	0.6 m	6
7	7 m	0.7 m	7
8	8 m	0.8 m	8
9	9 m	0.9 m	9
A	10 m		

1 *All cables of the required length and terminals are included*
2 *Terminals are included in the cable set*
3 *Cables and terminals are not included!*
LAK-■ ■ ■ for the pipe extended version for separate mounting has to be ordered separately (L + the distance between mounting point and the electronics)
4 *Pipe extended version is available up to 3m, Cable extended version up to 10m*

Sliding sleeve

L A A – 1 0 ■

Process conn. / Material	Code
DN80 PN16 / PP	2
DN100 PN16 / PP	3
DN125 PN16 / PP	4
DN150 PN16 / PP	5
DN200 PN16 / PP	6
Console mounting bracket 200 mm (for extended version)	K
Console mounting bracket 200 mm (for standard version)	T

Probe protection tube

L A P – ■ ■ 0

Material	Code
PP	1
PVDF	2

Size	Code
BSP 1 1/2" (internal thread) for extended version	1
BSP 2" (external thread) for standard version	2

Display: SAP-300

HART modem: UNICOMM SAK-305

Ex isolator: UNICONT PGK-301 Ex