



Level



Pressure



Flow



Temperature



Liquid
Analysis



Registration



Systems
Components



Services



Solutions

Technical Information

Stamosens CNM750 / CNS70

Online nitrate determination

Photometric analysis system for the determination of nitrate



Application

- Monitoring of nitrate content in the outlet of wastewater treatment plants
- Monitoring and optimising denitrification processes
- Monitoring of potable water treatment plants
- Nitrate measurement in natural waters

Your benefits

- Economy-priced and ecological measuring process:
 - No sampling or conditioning system required
 - No chemicals required
 - Service friendly design
- Measured value preparation in the sensor:
 - Low interference susceptibility on signal transfer
 - Very short response time
 - In-situ calibration
- Recognition of load peaks:
 - In time
 - Instantaneous
 - Without gap
- Measured values stored by data logger

Function and system design

Measuring principle

Nitrate ions absorb UV light in the range of approx. 190 to 230 nm. Nitrite ions have a similar absorption in that range.

Ultra violet light of a pulsed, highly stable photoflash lamp lights through the measurement section. The nitrate and nitrite ions of the sample absorb this light proportionally to their concentration.

The intensity of the attenuated light beam is measured by photodiodes at two fixed wave lengths (measuring and reference wave length). Interferences, e.g. by turbidity, dirt or organic hydrocarbons are mathematically eliminated.

The nitrate concentration is determined by a stored calibration function.

Interferencies

The measuring range is effected by the:

- dry substance
- age of the sludge
- colour
- chemical oxygen demand (COD)
- temperature.

Trends:

- Higher dry substance content reduces the maximum measured value, i.e. narrows the measuring range.
- Equal dry substance content, but different colour, leads to different measuring ranges/measuring values.
- COD > 100 mg/l effects the measured value at nitrate concentrations below 1 mg/l.

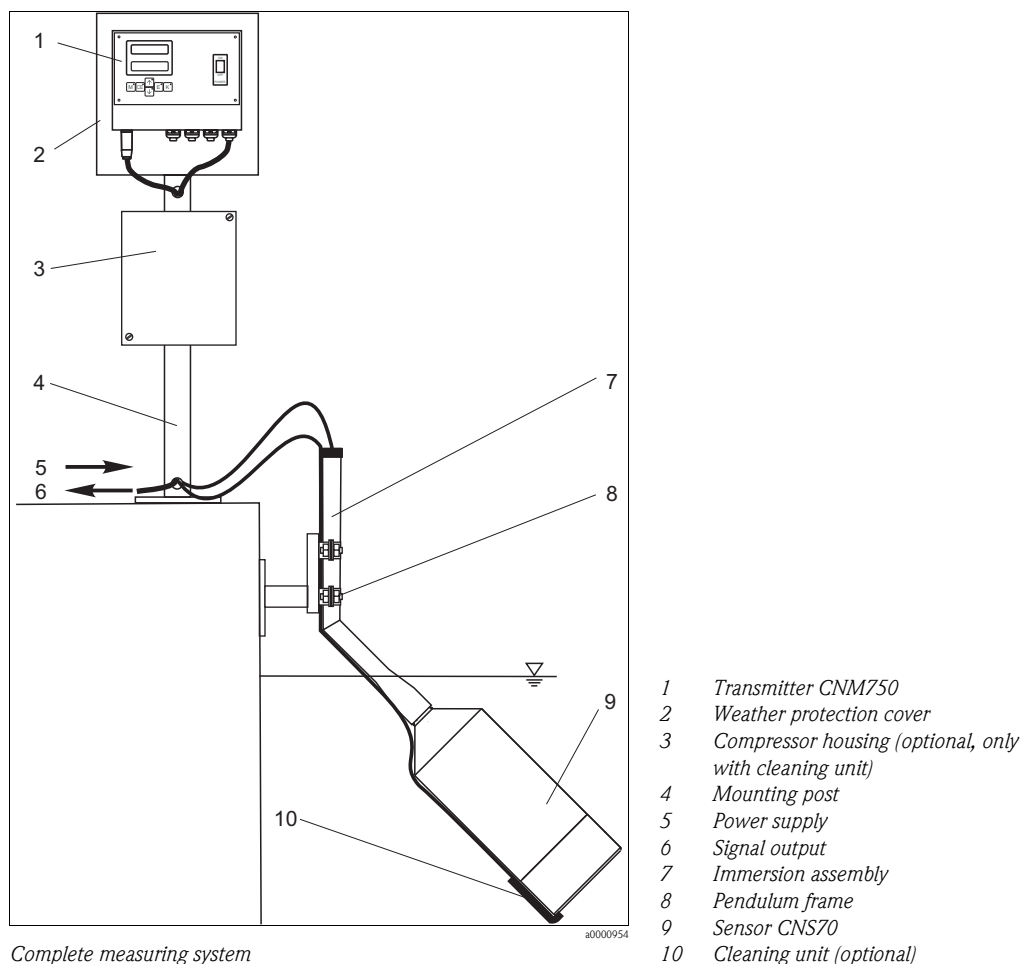
Measuring system

A complete measuring system comprises:

- a CNM750 transmitter
- a CNS70 sensor
- an immersion assembly with pendulum frame

Optional:

- Cleaning unit with compressor
- Mounting post and weather protection cover



Input

Measured variable	NO ₃ -N [mg/l], NO ₃ [mg/l]	
Measuring range	Clear water Activated sludge ¹	0.2 ... 60 mg/l NO ₃ -N bzw. 0 ... 260 mg/l NO ₃ 0.2 ... 30 mg/l NO ₃ -N bzw. 0 ... 130 mg/l NO ₃
	1) Please, care for the notes on the interferences.	
Wavelength	Nitrate absorbance maximum	

Output

Output signal	0/4 ... 20 mA, galvanically separated
Signal on alarm	2 limit contact, 1 alarm contact
Contact switching power	230 V AC / 3 A, 30 V DC / 1 A
Load	max. 500 Ω
Data interface	RS 232 C, slot for bus extension

Power supply

Electrical connection

51509157

Duo-Version: Sensor 1 Sensor 2

- 33 32 + 31

30 29 + 28

Shield/ Schirm I 1 I 2

0/4-20 mA

Output / Ausgang

27 26 +24V

25 24 0V

24V DC / 100mA

Input / Eingang

23 22 21 20 19

TxD

RxD

CTS

GND

Shield/ Schirm

Relais: Load/Last max. 250V~/2A, 30V=/1A

NO 18 15 12 9 6

NC 17 14 11 8 5

COM 16 13 10 7 4

Cleaning/ Reinigung

Error/ Störung

Hold

Alarm 1/ GW 1

Alarm 2/ GW 2

Supply / Netz: 80-250 V~

F1

3 2 1

⏏

N

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T 500 mA

Terminals voltage to ground even when the unit is switched off !!!

Klemmen führen auch bei ausgeschaltetem Gerät Spannung !!!

Electrical connection transmitter with power supply 80 ... 250 V AC

a0000952

51509391

Duo-Version: Sensor 1 Sensor 2

- 33 32 + 31

30 29 + 28

Shield/ Schirm I 1 I 2

0/4-20 mA

Output / Ausgang

27 26 +24V

25 24 0V

24V DC / 100mA

Input / Eingang

23 22 21 20 19

TxD

RxD

CTS

GND

Shield/ Schirm

Relais: Load/Last max. 250V~/2A, 30V=/1A

NO 18 15 12 9 6

NC 17 14 11 8 5

COM 16 13 10 7 4

Cleaning/ Reinigung

Error/ Störung

Hold

Alarm 1/ GW 1

Alarm 2/ GW 2

Supply voltage only 24V DC/AC !!!

Versorgungsspannung nur 24V DC/AC !!!

F1

3 2 1

⏏

L⁺

L⁻

T 2 A

Electrical connection transmitter with power supply 24 V AC/DC

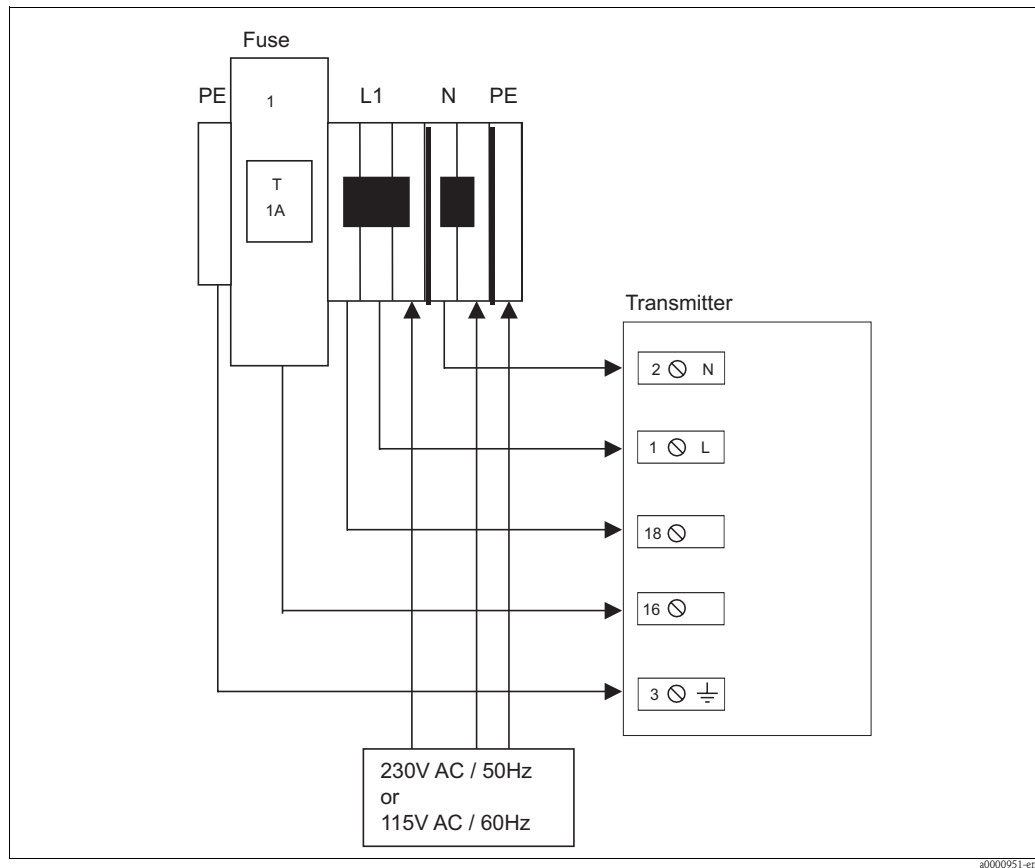
a0000953

Supply voltage	80 ... 250 V AC ±10%, 50/60 Hz 24 V AC/DC
Power consumption	max. 15 VA

Endress+Hauser

3

Connection of the cleaning unit



Connection of the cleaning unit

a0000951-en

Performance characteristics

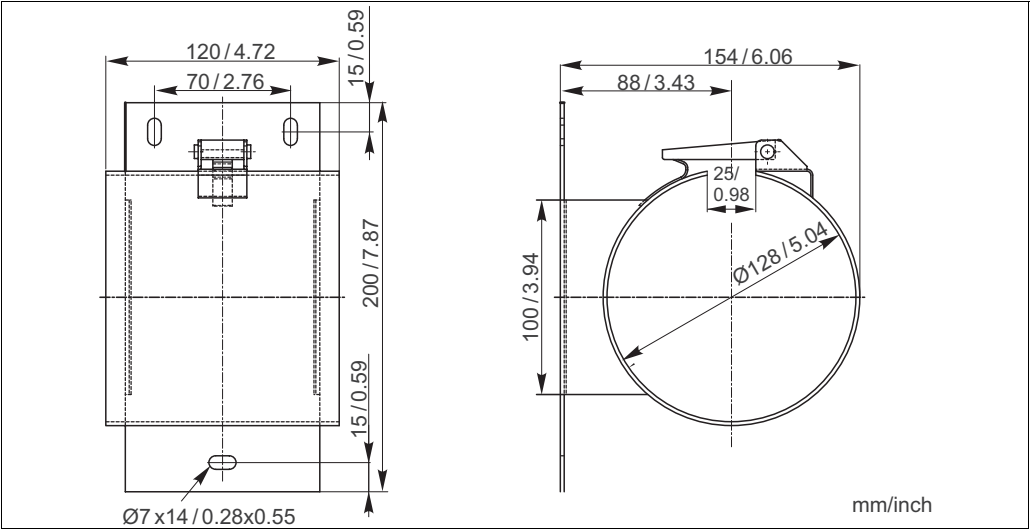
Response time t_{90}	≥ 60 s, selectable
Maximum measured error	2 % of upper range value or $\pm 0,1$ mg/l with clear water resp. $\pm 0,3$ mg/l with activated sludge, depending on which is the higher value
Repeatability	0,5 % (with homogeneous media)
Measuring interval	≥ 40 s, selectable

Installation

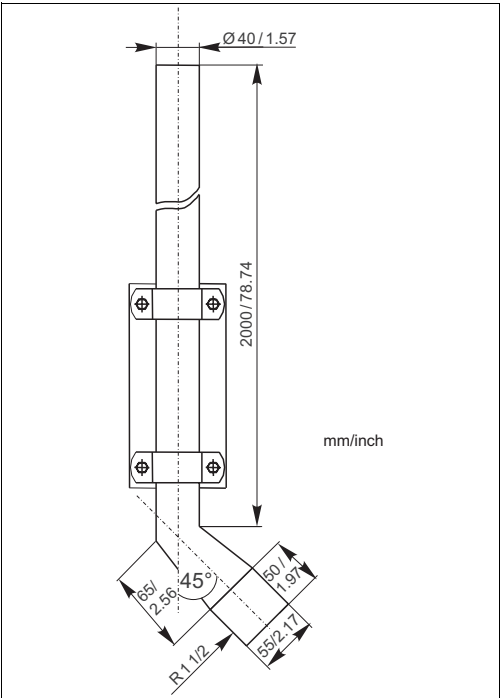
Installation instructions



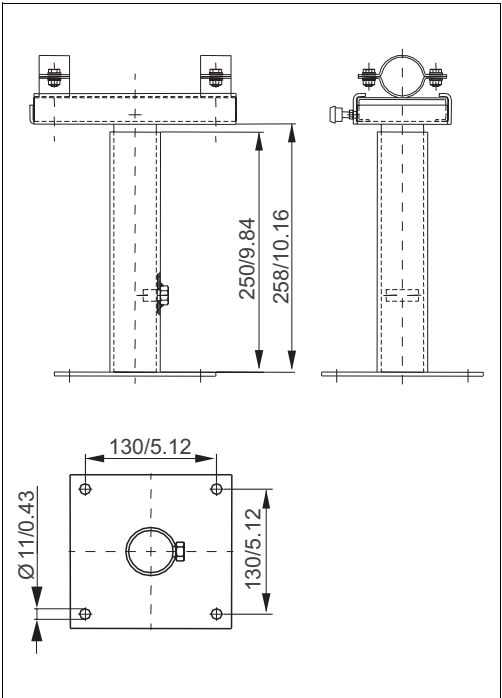
Caution!
Do not install the sensor suspended from the cable. Use a wall bracket or an immersion assembly with pendulum frame for sensor mounting.



Wall bracket for sensor

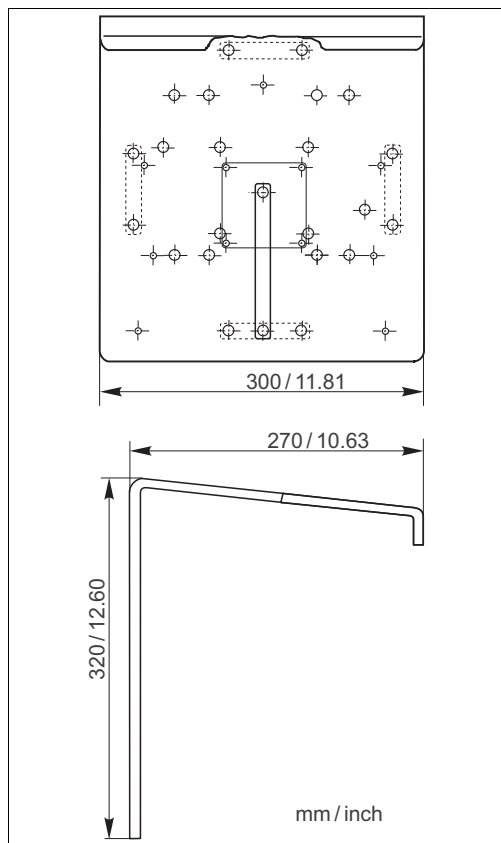


Immersion assembly for sensor

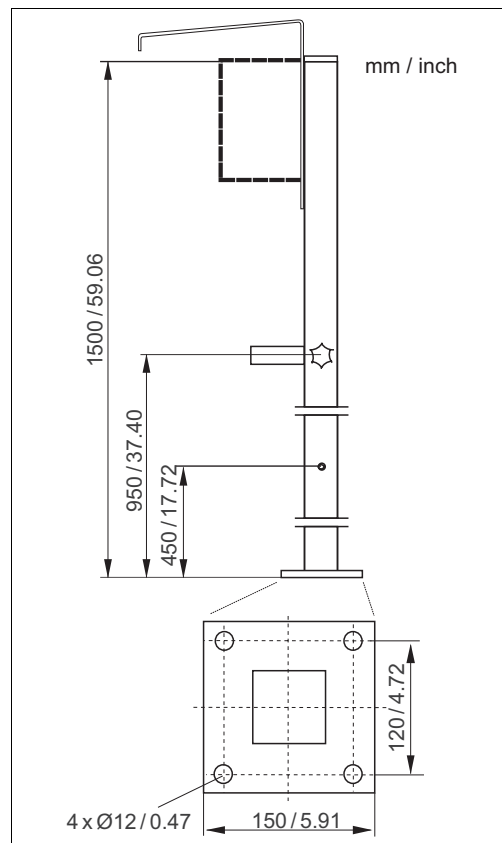


Pendulum frame for immersion assembly

**Weather protection cover and
round post mount
(accessories, optional)**



Weather protection cover CYY 101



Round post mount CYY 102

Environment

Ambient temperature	−10 ... 50 °C (14 ... 122 °F)
Ingress protection	Sensor, up to 1 bar (14.5 psi): IP 68 Transmitter: IP 68 Cleaning unit (compressor): IP 68

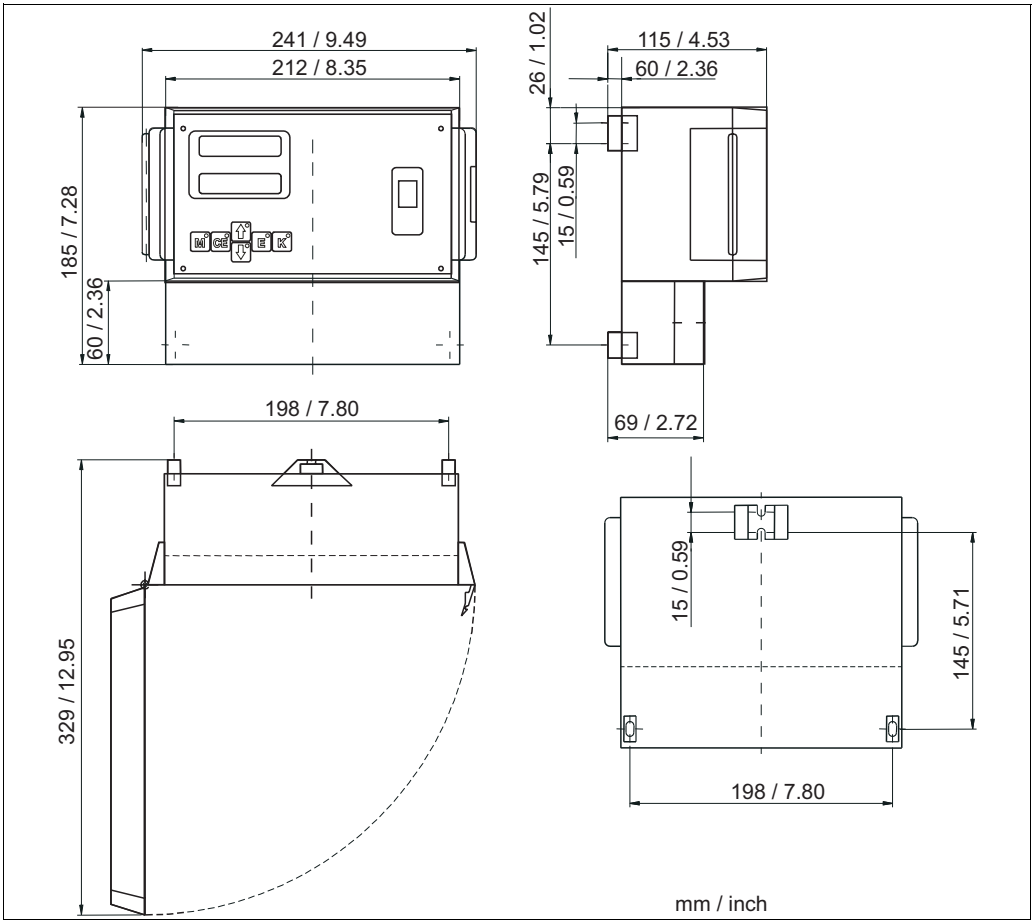
Process

Medium temperature	2 ... 40 °C (36 ... 104 °F)
Medium pressure	max. 1 bar (14.5 psi)
Solid content	Activated sludge sensor ¹ 2.5 g/l ... < 8 g/l Clear water sensor < 2 g/l

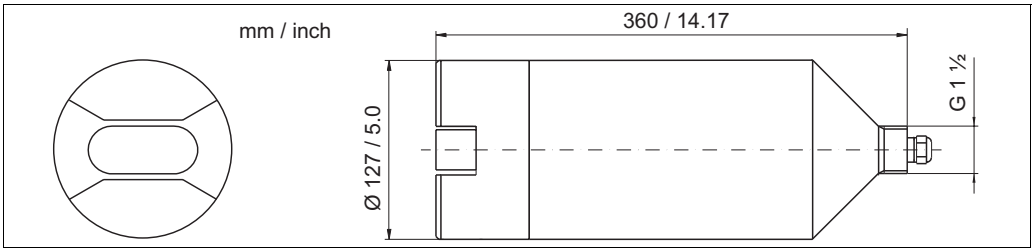
1) Please, care for the notes on the interferences.

Mechanical construction

Design, dimensions



Transmitter dimensions

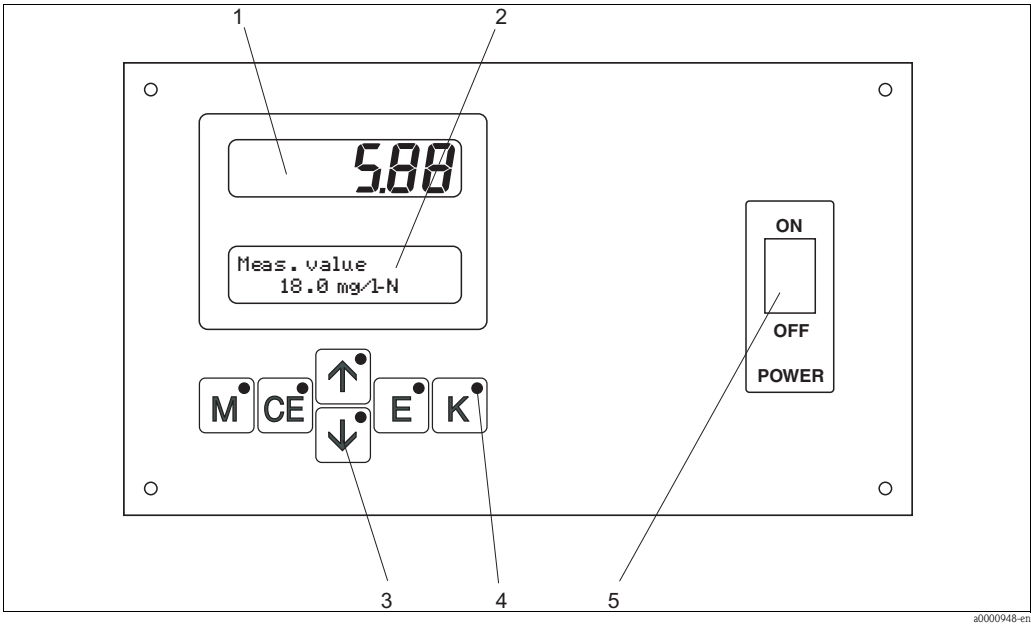


Sensor dimensions

Weight	Transmitter	approx. 1,6 kg (3.5 lb)
	Sensor	approx. 5 kg (11 lb)
Materials	Sensor head	Stainless steel 1.4571 (AISI 316 L)
	Optical sensor windows	Quartz glass
	Sensor housing	POM
Process connection	Sensor head G 1 1/2	
Cable specification	Cable length:	2 m (6.6 ft), 5 m (16.4 ft), 7 m (23 ft) or 15 m (49.2 ft) (cable with plug) up to 200 m (656 ft) (with sensor connection box, s. accessories)
	Cable extension:	

Human Interface

Display elements



Display and operating elements

- 1 LED (measured value)
- 2 LC display (status)
- 3 Operating keys
- 4 Indicator LEDs
- 5 Mains switch

Ordering information

Scope of delivery

- The scope of delivery comprises:
- a transmitter (device type and version acc. to the nameplate)
 - a sensor (sensor type and version acc. to the nameplate)
 - a quality certificate
 - Operating Instructions (English).

Product structure

	Power supply			
	7	80 ... 250 V AC		
	8	24 V AC/DC		
	9	Special version acc. to customers specification		
		Communication / Output		
	A	RS 232 + 0/4 ... 20 mA		
	Y	Special version acc. to customers specification		
		Version		
	1	One channel version		
	9	Special version acc. to customers specification		
		Additional equipment		
	A	Quality certificate		
	Y	Special version acc. to customers specification		
CNM 750 –				complete order code

Cleaning unit			
	A	Without	
	B	230 V	
	C	115 V	
	Y	Special version acc. to customers specification	
Measuring range			
	4	0.2 ... 30 mg/l NO ₃ -N (activated sludge)	
	5	0.2 ... 60 mg/l NO ₃ -N (clear water)	
	9	Special version acc. to customers specification	
Cable length			
	A	2 m	
	B	7 m	
	C	5 m	
	D	15 m	
	Y	Special version acc. to customers specification	
Version			
	1	Without assembly	
	3	Sea water version	
	4	Immersion assembly 2 m, 90° offset + pendulum frame w. 250 mm wall spacing	
	9	Special version acc. to customers specification	
Additional equipment			
	A	Quality certificate	
	Y	Special version acc. to customers specification	
CNS70 –			complete order code

Certificates and approvals

CE approval

Declaration of conformity

The product meets the legal requirements of the harmonised European standards.
The manufacturer confirms compliance with the standards by affixing the **CE** symbol.

Test reports

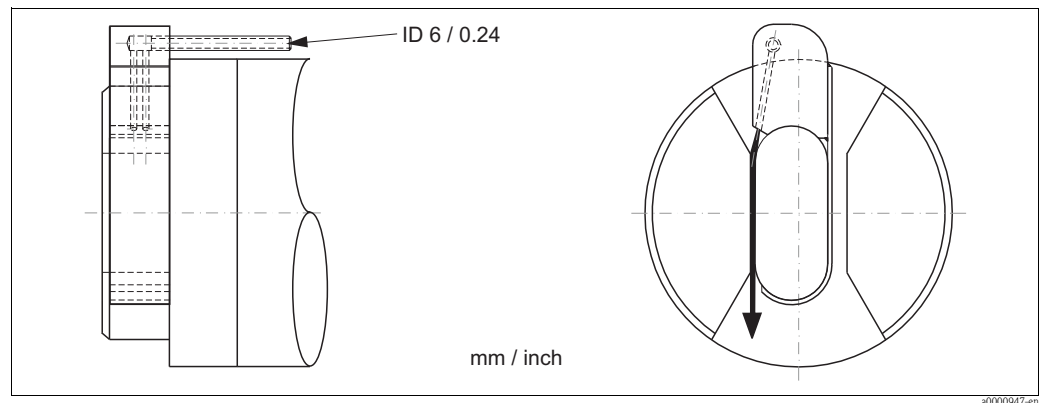
Quality certificate

Depending on the order code, you receive a quality certificate.
With the certificate the manufacturer confirms compliance with all technical regulations and the successful individual testing of your product.

Accessories

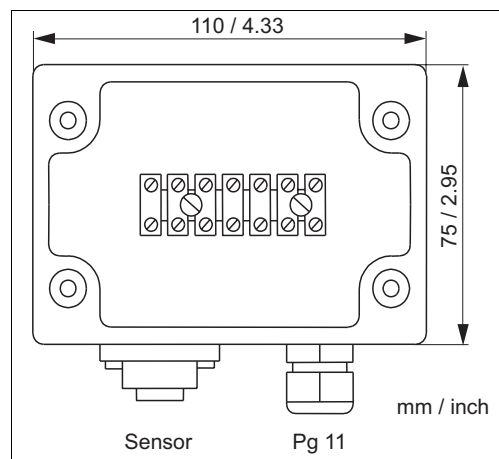
- Weather protection cover CYY101,
for field mounting of the transmitter;
order no. 50061258
- Round post mount CYY102,
for weather protection cover mounting to vertical or horizontal pipes;
order no. 50064291
- Immersion assembly, offset 45°
length 2 m; order no. 51511771
- Immersion assembly, straight
length 2 m; order no. 51502959
length 3 m; order no. 51502960
special length; order no. 50066036
- Wall bracket for sensor;
order no. 51508576
- Pendulum frame for sensor;
wall spacing 250 mm; order no. 51502962
special version; order no. 50066036
- Compressor attachment;
order no. 51505419

- Cleaning unit,
230 V; order no. 51504764
115 V; order no. 51504765

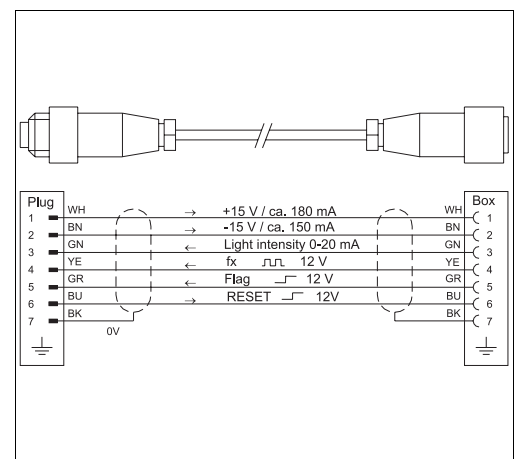


Cleaning unit for sensor

- Extension cable,
cable length 10 m, with plug and coupling;
order no. 51502953
- Plug,
7-pin plug, IP 67;
order no. 51502954
- Coupling;
order no. 51502955
- Control line,
50 m, 6 x 0,34;
order no. 51503015
- Sensor terminal housing,
for cable extension from transmitter to sensor;
order no. 51502956

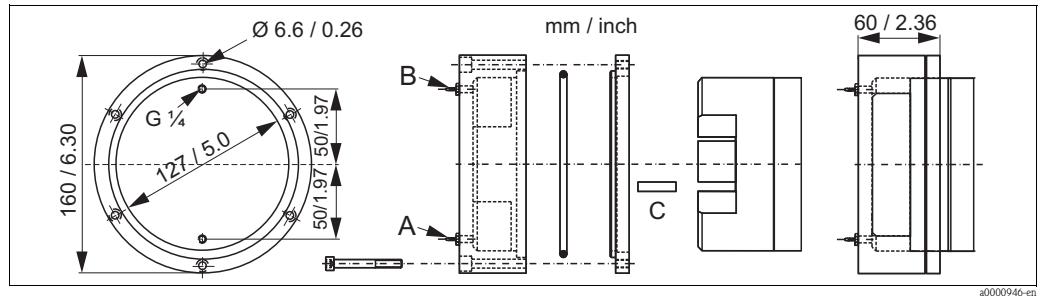


Sensor terminal housing



Sensor connection to sensor terminal housing

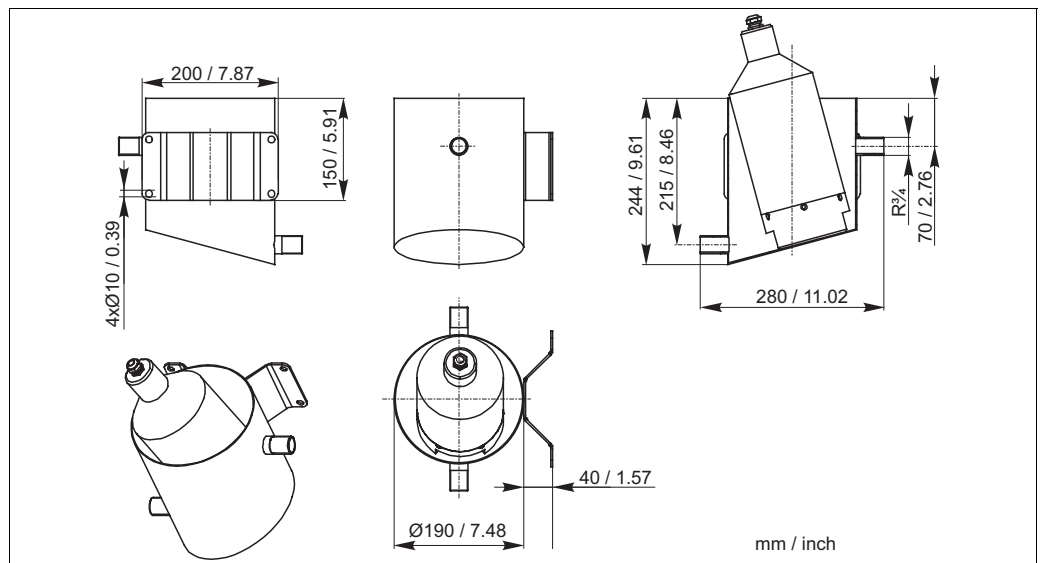
- Flow assembly for drinking water application,
with reduction of the dead volume, stainless steel 1.4571 (AISI 316 Ti) / PVDF;
order no. 51509332
without reduction of the dead volume, stainless steel 1.4571 (AISI 316 Ti) / PVDF;
order no. 51509333



Flow assembly

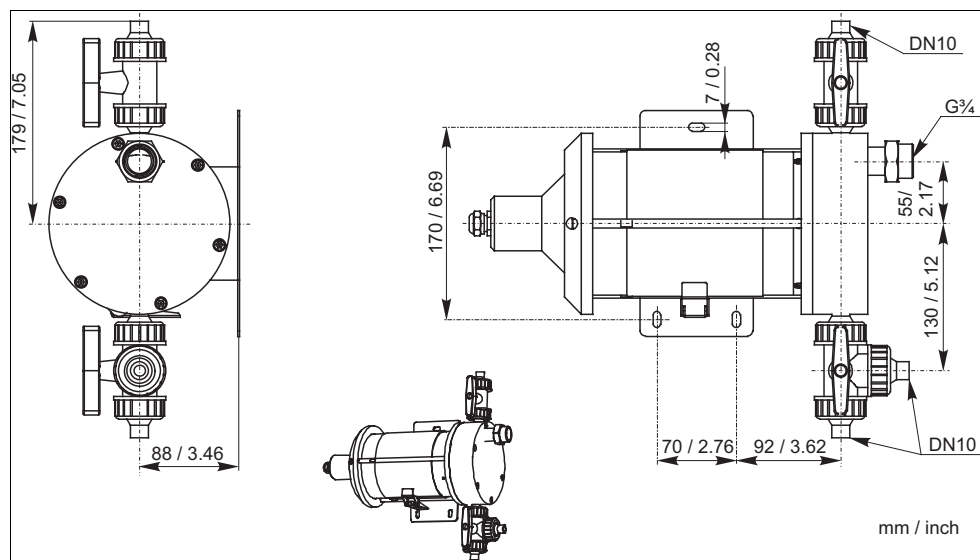
- A Hose connection inlet
ID 1.6 mm (with dead volume reduction)
ID 6.4 mm (without dead volume reduction)
- B Hose connection inlet
ID 1.6 mm (with dead volume reduction)
ID 6.4 mm (without dead volume reduction)
- C Split pin for dead volume reduction

- Flow vessel,
open version; with inlet and outlet
order no. 51515762



Flow vessel

- Flow assembly,
 - with dead volume reduction and overpressure protection, order no. 51515803
 - without dead volume reduction, with overpressure protection; order no. 51515804
 - PVDF, without dead volume reduction, with stop valves and overpressure protection, order no. 51515765
 - PVC, without dead volume reduction, with stop valves and overpressure protection; order no. 51515769



Flow assembly

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