



Services



# Technical Information

# Stamolys CA71NO

Nitrite analyzer

Compact photometric analysis system for the nitrite measurement in drinking water, wastewater and in mineral waters



### Application

- Nitrite monitoring in drinking water
- Nitrite monitoring in sewage treatment plants
- Nitrite monitoring in the mineral water production

### Your benefits

- Stainless steel or glass-fibre reinforced carbon housing available
- Two channel version available
- Measured value storage using integrated data logger
- Automatic calibration and self-cleaning
- Free selectable measuring, cleaning and calibration intervals



### Function and system design

#### Measuring principle

After sample conditioning, the analyzer sample pump conveys a part of the filtrate to a mixing vessel. The reagent pump adds reagent at a specific ratio. As a result of the reaction, the sample turns a characteristic colour. The photometer determines the sample's absorption of an emitted light at a specific wavelength (s. Fig., Pos. 2). The wavelength is parameter specific. The absorbance is proportional to the concentration of the specified parameter in the sample (Pos. 3). Additionally, the absorption of a reference light is determined to receive a genuine measuring result. The reference signal is subtracted from the measuring signal to prevent any effects due to turbidity, contamination and ageing of the LEDs.

The temperature in the photometer is controlled thermostatically so that the reaction is reproducible and takes place within a short period of time.



Photometric principle

Nitrite	<ul> <li>Nitrite is a metastable intermediate stage of bacterial oxidation: proteins, urea → ammonium → nitrite → nitrate.</li> <li>Thus nitrite serves as an indicator in sewage treatment plant processes or in discharge streams of incomplete nitrification.</li> <li>Nitrite is often added to process and cooling water as a corrosion inhibitor. The Food Industry uses it as a preservative (e.g. pickling salt).</li> <li>Nitrite occurs very rarely in surface waters since it easily oxidizes to nitrate in the presence of air. High nitrit concentrations in water therefore indicate the presence of partially disintegrated, organic wastes.</li> <li>There should be no nitrite present in drinking water due to its toxicity (limit value according to the Drinking Water Ordinance: 0.1 mg/litre). Nitrite causes haemoglobin to convert to methaemoglobin which suppresse take up of oxygen in the blood ("inner asphyxiation").</li> </ul>				
Photometric nitrite determination	Naphthylamine method for nitrite determination acc. to DIN 38405-D10 Under acidic conditions, nitrite ions diazotices sulphonamido, which forms a red dye in conjunction with N-(1-naphthyl)-ethylenediamine. The absorption is determined at a wavelength of 565 nm. The absorption intensity is proportional to the nitrite concentration in the sample. The reference wavelength is 880 nm.				
Interferences	No interferences up to th	ne given concentration:			
	Concentration [mg/l]	Interference			
	1,000	Cl <sup>-</sup> , SO <sub>4</sub> <sup>2-</sup>			
	700	Cd <sup>2+</sup>			
	500	Na +, K +, Ca <sup>2+</sup>			
	50	Pb $^{2+}$ , Zn $^{2+}$ , Ni $^{2+}$ , Fe $^{2+}$ , Fe $^{3+}$ , Co $^{2+}$ , Hg $^{2+}$ , Ag $^+$ , NiO_3 $^-$ , CO_3 $^{2-}$			
	25 Sn <sup>2+</sup>				
	10	Cr (VI)			

Copper causes decreases in nitrite measured value.

Sample conditioning	Micro/ultrafiltration (Stamoclean CAT430, optional)					
	A membrane filter element is suspended directly into the wastewater basin or channel. A hose pump is located in a pump box on the basin rim. The pump creates a vacuum between the membrane and the carrier plate of the filter element. This vacuum makes the filtrate pass through the filter membrane. Suspended materials, particles, algae and bacteria are collected on the surface of the membrane. Due to alternating pumping and pause, intervals of more than one month are achieved between cleaning cycles. Parallel connection of two or four filter elements increases the sampling quantity up to approx. 1 1/h. The hose pump pressure transports the sample to a collecting vessel near the analyzer over a distance of 20 m. For distances up to 100 m the sample is transported to the collecting vessel by means of compressed air. The analyzers suck the needed sample volume from the collecting vessel.					
	Membrane filtration (Stamoclean CAT411, optional)					
	A sample flow of 0.8 to 1.8 m <sup>3</sup> /h is continuously conducted through the micro filter via a pressure pipe. A part of the sample passes the filter membrane and is then conveyed to the measuring device as filtrate. Sampling is based on the cross flow filtration principle. The PTFE filter membrane separates particles with sizes > 0.45 µm from the filtrate. These particles are collected in front of the membrane and are washed away with the sample flow. The medium is conducted in a meander-like channel through the filter element. This results in a constantly high flow rate. The high flow rate generates the self cleaning effect. Therefore, mechanical drives for the generation of a flow at the filter surface are not necessary.					
	Backwash filter (Stamoclean CAT221, optional)					
	A sample flow of 1 to 2.5 m <sup>3</sup> /h is permanently conveyed through the backwash filter by means of a sampling pump or compressed air or rinse water. The filtrate passes through the wedge wire sieve and is then transported to the measuring device. Clogging is minimized by the flow at the wedge wire sieve. Automatic backwashing results in a filter operating time of several weeks. The automatic backwashing and a small compressor or compressed air resp. rinse water supply guarantee low-maintenance and low-energy operation.					
	Customer specific solution					
	Before analysis, the sample has to be conditioned and to be transported to an external or to the delivered collecting vessel.					
Measuring system	<ul><li>A complete measuring system comprises:</li><li>An analyzer</li><li>A sample conditioning system (optionally):</li></ul>					

- Micro filtration / ultra filtration Stamoclean CAT430 or Stamoclean CAT411
- Backwash filter Stamoclean CAT221
- Customer specific solution
- Collecting vessel (see product structure)

#### Micro / ultra filtration



Measuring system with Stamoclean CAT430

- 1 Control box
- Pump
- Control unit
- Collecting unit (optional) Collecting vessel
- 2 3 4 5
- 6 Overflow
- 7 Analyzer
- 8 Aeration basin
- 9 Membrane filter



Measuring system with Stamoclean CAT411

### Backwash filter



Measuring system with Stamoclean CAT221

- Stamoclean CAT411
- 2 Inlet 3

1

- Sample pump or hydraulic main
- 4 Filtrate line
- 5 Collecting vessel
- Overflow 6
- 7 Analyzer 8
  - Analyzer sample line
- 9 Outlet
- 1 Stamoclean CAT221 2
  - Compressor or compressed air
- 3 Sample pump or hydraulic main
  - Sample outlet
- 4 5 Collecting vessel
- Overflow 6
- 7 Analyzer

## Input

Measured variable	NO <sub>2</sub> -N μg/l] / [mg/l]
Measuring ranges	10 500 μg/l 0.10 1.00 mg/l 0.20 3.00 mg/l
Wavelength	565 nm
Reference wavelength	880 nm

# Output

Output signal	0/4 20 mA
Signal on alarm	Contacts: 2 limit contacts (per channel), 1 system alarm contact optional: end of measurement (with two channel version display of channel no. available)
Load	max. 500 $\Omega$
Data interface	RS 232 C
Data logger	1024 data pairs per channel with date, time and measured value 100 data pairs with date, time and measured value for calibration factor determination (diagnostic tool)
Load capacity	230 V / 115 V AC max. 2 A, 30 V DC max. 1 A

### Power supply

#### **Electrical connection**

Caution!

(^)

The following figure ( $\rightarrow$   $\bigcirc$  1) shows the connection department sticker as an example. Terminal assignment and cable core colors can be different to the originals.

For connecting your analyzer only use the terminal assignment of the connection department sticker in the device  $(\rightarrow \square 2)!$ 



Fig. 1: Example of the connection sticker



Fig. 2: Analyzer from top (open version resp. swung out)

- 1 Connection department sticker
- *2 Printed circuit board with terminal strip*
- *3 Backside of the analyzer*

Supply voltage	115 V AC / 230 V AC ±10%, 50/60 Hz					
Power consumption	approx. 50 VA					
Current consumption	approx. 0.2 A at 230 V approx. 0.5 A at 115 V					
Fuses	1 x time-lag 0.5 A for electronics 2 x medium time-lag 0.2 A for photometer 1 x time-lag 0.5 A for motors					

Time between two measurements	$t_{mes}$ = reaction time + rinse time + waiting time + rinse again time + tilling time + sampling time + reagent refusal time (min. waiting time = 0 min)					
Maximum measured error	$\pm 2$ % of measuring range end					
Measuring interval	t <sub>mes</sub> to 120 min					
Reaction time	2 minutes					
Sample requirement	15 ml (0.004 US.gal.) per measurement					
Reagent requirement	1 x 0.21 ml (0.000055 US.gal) 0.91 l (0.24 US.gal) per reagent per month with 10 minute measuring interval					
Calibration interval	0 to 720 h					
Rinse interval	0 to 720 h					
Rinse time	selectable from 20 to 300 s (standard = $60$ s)					
Rinse again time	30 s					
Filling time	22 s					
Maintenance interval	6 months (typical)					
Servicing requirement	15 minutes per week (typical)					

# Performance characteristics

# Environment

Ambient temperature	5 40 °C (41 104 °F), avoid strong fluctuations
Humidity	below the condensation limit, installation in usual, clean rooms outdoor installation only possible with protective devices (customer supplied)
Ingress protection	IP 43

# Process

Sample temperature	5 to 40 °C (41 to 104 °F)
Sample flow rate	min. 5 ml (0.0013 US.gal.) per min
Consistence of the sample	low solid content (< 50 ppm)
Sample inlet	pressureless

### Mechanical construction

Design, dimensions

Stainless steel housing



Stainless steel version

#### GFR housing



GFR version

#### **Open version**



Open version (without housing)

### Collecting vessel

			$\begin{array}{c} 145 \\ 27 \\ 60 \\ 6 \\ 7 \\ 7 \\ 7 \\ 7 \\ 7 \\ 7 \\ 7 \\ 7 \\ 7$				
	Collecting vessel at analyzer (optic1Ventilation2Sample inlet from sampling3Collecting vessel4Electrical connections5Analyzer sample inlet	nal)	<ul> <li>Collecting vessel dimensions</li> <li>variable, freely adjustable dimensions</li> <li>Sampling for analyzer</li> <li>Analyzer outlet</li> <li>Sample overflow</li> </ul>				
Weight	GFR housing Stainless steel housing Without housing	approx. 28 kg (61.7 lb approx. 33 kg (72.8 lb approx. 23 kg (50.6 lb					
Material	Housing: Front windows: Endless hose: Pump hose: Valves:	Stainless steel 1.4301 glass-fibre reinforced c Polycarbonate <sup>®</sup> C-Flex <sup>®</sup> , Norprene <sup>®</sup> Tygon <sup>®</sup> , Viton <sup>®</sup> Tygon <sup>®</sup> , silicone	AISI 304) or arbon(GFR)				
Connecting the sample line	<b>One channel version</b> <i>Collecting vessel</i> (at analyzer, Connection	with or without level m	easurement) hose ID 3.2 mm (0.13")				
	<i>Customer collecting vessel</i> Connection Max. distance from collecting v Max. height difference from col	ressel to analyzer llecting vessel to analyz	hose ID 1.6 mm (0.06") 1 m (3.28 ft) er 0.5 m (1.64 ft)				
	Two channel version						
	<ul> <li>Depending on the ordered version included in the scope of delive</li> <li>Level measurement is only performed only one collecting vessel care</li> </ul>	ersion, one or two colled very. ossible for one channel. n be mounted at the ho	ting vessels (with or without level measurement) are using. The second is to be placed nearby the analyzer.				
Sample outlet	Connection	Hose ID 6.4 mm (0. – Max. length of clo – Open outlet dowr – No combination o	25") osed loop: 1 m (3.28 ft) ograde installed f several devices to a closed-loop system				
	Min. volume per measurement	20 ml (0.005 US.gal	.)				

### Human Interface

# Display and operating elements



Display and operating elements

- 1 LED (measured value)
- 2 LC display (measured value and status)
- 3 Serial interface RS 232
  4 Operating keys and control LEDs

# Ordering information

### Product structure

	Meas	uring 1	ange					
	А	Measu	Measuring range 10 500 $\mu$ g/l NO <sub>2</sub> -N					
	В	Measuring range 0.1 1 mg/l NO <sub>2</sub> -N						
	С	Measuring range 0.2 3 mg/1 NO <sub>2</sub> -N						
	Y	Special	version	acc. to o	custome	r's specif	ication	
		Samp	le tran	sfer				
		1	From c	ne meas	suring po	oint (one	channe	l version)
		2	From t	wo mea	suring po	oints (tw	o chann	el version)
			Powe	r supp	ly			
			0	230 V	AC / 50	) Hz		
			1	115 V	AC / 60	) Hz		
			2	115 V	AC / 50	) Hz		
			3	230 V	AC / 60	) Hz		
				Colle	cting v	essel f	or up t	o 3 analyzers
				А	Withou	ut collect	ting vess	el
				B With collecting vessel without level measurement				
				С	C With collecting vessel with level measurement (one-channel version only)			
ļ			ļ	D With two collecting vessels without level measurement (two-channel version)				
			Housing version					
			1 Without housing					
				2 With GFK housing				
			3 With stainless steel 1.4301 (AISI 304) housing					
		Communication						
						А	0/4	20 mA, RS 232
							Addi	tional equipment
							1	Quality certificate
							2	Quality certificate + set of inactive reagents
							3	Quality certificate + three sets of inactive reagents
CA71NO -								complete order code

Scope of delivery

The scope of delivery comprises:

- an analyzer with mains plug
- a cleaning injector

- a tin of silicone spray
- a Norprene hose, length 2.5 m (8.2 ft), ID 1.6 mm (0.06")
- a C-flex hose, length 2.5 m (8.2 ft), ID 6.4 mm (0.25")
- a C-flex hose, length 2.5 m (8.2 ft), ID 3.2 mm (0.12")
- two hose fittings of each size:
  - 1.6 mm x 1.6 mm (0.06" x 0.06")
  - 1.6 mm x 3.2 mm (0.06" x 0.12")
  - 6.4 mm x 3.2 mm (0.25" x 0.12")
- two T-hose fittings of each size:
  - 1.6 mm x 1.6 mm x 1.6 mm (0.06" x 0.06" x 0.06")
  - 3.2 mm x 3.2 mm x 3.2 mm (0.12" x 0.12" x 0.12")
- $\hfill \ensuremath{\,\bullet\,}$  an interference suppressor for the current output
- 4 edge covers

Note!

- a quality certificate
- Operating Instructions (English).



Please, order reagents separately with analyzer version CA71XX-XXXXX1.

With all other versions, inactive reagents are included in the scope of delivery. You have to mix the reagents before using them. Please, read the instructions attached to the reagents.

### Certificates and approvals

€ approval	<b>Declaration of conformity</b> The product meets the legal requirements of the harmonised European standards. The manufacturer confirms compliance with the standards by affixing the $C \in$ symbol.
Test reports	<b>Quality certificate</b> 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.

Reagents and standard solutions	<ul> <li>Reagent NO1 active, 1 l; order no. CAY343-V10AAE</li> <li>Reagent NO1 inactive, 1 l; order no. CAY343-V10AAE</li> <li>Cleaning agent R; order no. CAY344-V10AAE</li> <li>Standard (parent solution) 250 mg/l NO<sub>2</sub> - N; order no. CAY345-V05C25AAE</li> </ul>
Cleaner for hoses	<ul> <li>Cleaning agent, alkaline, 100 ml; order no. CAY746-V01AAE</li> <li>Cleaning agent, acidic, 100 ml; order no. CAY747-V01AAE</li> </ul>
Collecting vessel	<ul> <li>for sampling from pressurised systems</li> <li>results in an unpressurised continuous sample stream</li> <li>Collecting vessel without level measurement; order no. 51512088</li> <li>Collecting vessel with level measurement (conductive); order no. 51512089</li> </ul>
Maintenance kit	<ul> <li>Maintenance kit CAV 740:</li> <li>1 set pump hoses yellow/blue</li> <li>1 set pump hoses black/black</li> <li>1 set hose connectors per hose set order no. CAV 740-1A</li> </ul>
Additional accessories	<ul> <li>Interference suppressor for control, power and signal lines order no. 51512800</li> <li>Silicon spray order no. 51504155</li> <li>Valve set, 2 pieces, for two-channel version</li> </ul>

### Accessories

order no. 51512234

 Upgrade kit for upgrading from one-channel to two-channel version order no. 51512640

### Documentation

- Technical Information Stamoclean CAT430, TI 338C/07/en
- Technical Information Stamoclean CAT411, TI 349C/07/en
- Technical Information Stamoclean CAT221, TI 384C/07/en

#### **International Head Quarters**

Endress+Hauser GmbH+Co. KG Instruments International Colmarer Str. 6 79576 Weil am Rhein Deutschland

Tel. +49 76 21 9 75 02 Fax +49 76 21 9 75 34 5 www.endress.com info@ii.endress.com

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