

Iron Analyzer *StamoLys CA 71 FE*

**Compact photometric analysis system for
iron measurement in drinking water and
sewage treatment plants**



Application

- Residual iron monitoring after precipitation, flocculation and filtration processes
- Iron containing process water monitoring

Your benefits

- Direct reaction in photometer at constant temperature
- Fast response time due to low system volume and short distances
- Low reagent requirement
- Low sample requirement
- Three selectable measuring ranges
- User-friendly interface
- Sample stream monitoring and plain text error menu
- Measured value storage using integrated data logger
- Automatic self-cleaning
- Automatic calibration
- With two channel version: measurement sequences programmable
- Two housing versions and an open version available

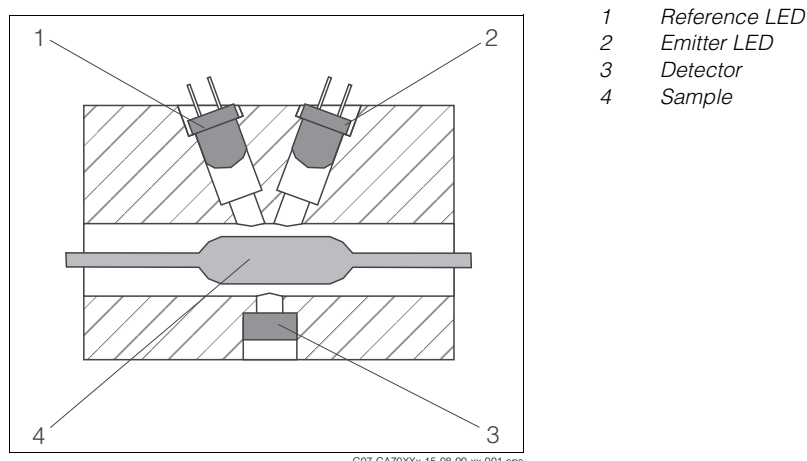
Function and system design

Measuring principle

Photometric 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 absorption of an emitted light at a specific wavelength (s. Fig., Pos. 2). The wavelength is parameter specific. The absorption intensity is proportional to the concentration of the specified parameter in the sample (Pos. 4). 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

Ferrozine method for iron determination

In the presence of iron the reagent indicator turns the sample colour to violet.

The absorption is determined at a wavelength of 565 nm. The absorption intensity is proportional to the iron concentration in the sample.

The reference wavelength is 880 nm.

Sample conditioning

Analyzer in connection with membrane filtration (StamoClean CAT 430, optionally)

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 an alternating pumping periods, 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 1 l/h approx.

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.

Analyzer without E+H sample conditioning

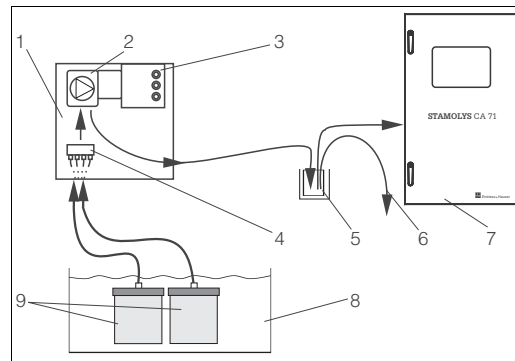
Before analysis, the sample has to be conditioned and to be transported to an external or to the delivered collecting vessel.

Measuring system

A complete measuring system comprises:

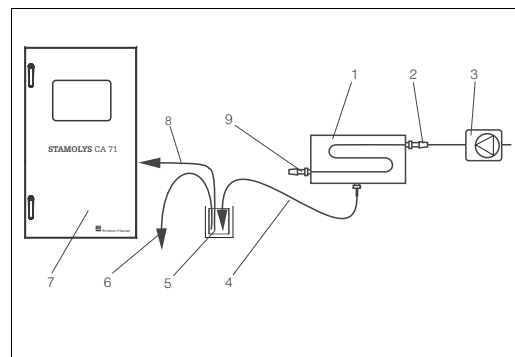
- An analyzer StamoLys CA 71
- A sample conditioning system (optionally):
 - Micro filtration / ultra filtration StamoClean CAT 430 or StamoClean CAT 411
 - Backwash filter StamoClean CAT 220
 - Customer specific solution
- Collecting vessel (see product structure)

Micro / ultra filtration



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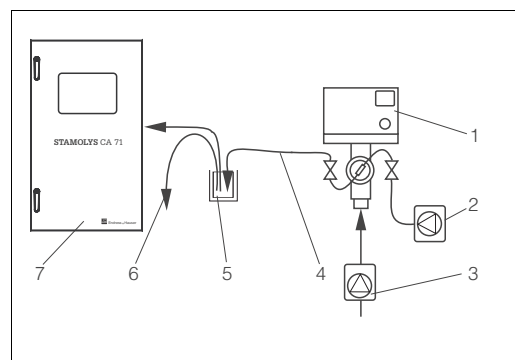
Measuring system with StamoClean CAT 430



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Measuring system with StamoClean CAT 411

Backwash filter



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Measuring system with StamoClean CAT 220

Standard applications**Drinking water quality monitoring at the outlet of the water treatment plant**

Sampling from hydraulic main, pressureless collecting vessel with level monitoring:

- Analyzer with collecting vessel, StamoLys CA 71 FE-A1xC2A1

Outlet monitoring in the water treatment plant

Sampling from hydraulic main, pressureless collecting vessel with level monitoring:

- Backwash filter StamoClean CAT 220, 230 V (order no. 51509419) resp. 115 V (order no. 51509420)
- Compressor for CAT 220 (order no. 51511868)
- Analyzer with collecting vessel, StamoLys CA 71 FE-C1xB2A1

Input

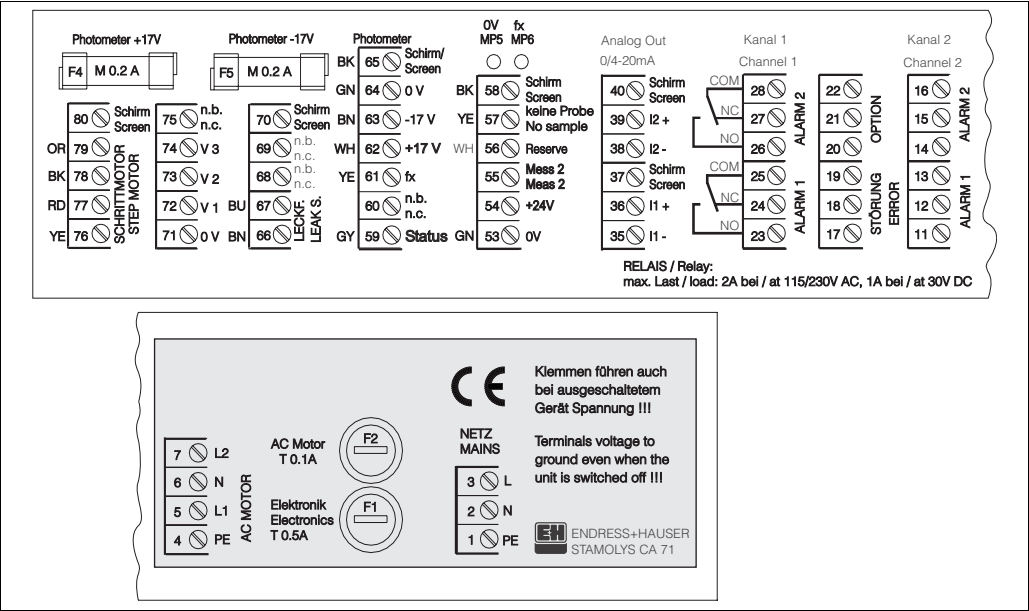
Measured variable	Fe [$\mu\text{g/l}$] / [mg/l]
Measuring ranges	10 ... 500 $\mu\text{g/l}$ (FE-A) 0.05 ... 2.00 mg/l (FE-B) 0.10 ... 5.00 mg/l (FE-C)
Wavelength	565 nm
Reference wavelength	880 nm

Output

Output signal	0/4 ... 20 mA
Signal on alarm	Contacts: 2 limit contacts (per channel), 1 system alarm contact optionally: end of measurement (with two channel version display of channel no. available)
Load	max. 500 Ω
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 the 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



Connection sticker CA 71

Supply voltage 115 V AC / 230 V AC $\pm 10\%$, 50/60 Hz

Power consumption approx. 50 VA

Current consumption ca. 0.2 A at 230 V
ca. 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 0.1 A for motors

Performance characteristics

Response time t_{100}	Time between two measurements: reaction time + rinse time + waiting time + rinse again time + filling time (minimum waiting time = 0 min)
Maximum measured error	2 % of measuring range end
Measuring interval	2 ... 120 minutes
Reaction time	2 minutes
Sample requirement	15 ml / measurement
Reagent requirement	1 x 0.15 ml / measurement 0.65 l of reagent per month with 10 minute measuring interval
Calibration interval	0 ... 72 h
Rinse interval	0 ... 72 h
Rinse time	selectable from 20 to 300 s (standard = 80 s)
Rinse again time	30 s
Filling time	22 s
Maintenance interval	6 month (typically)
Servicing requirements	15 minutes / week (typically)

Environment

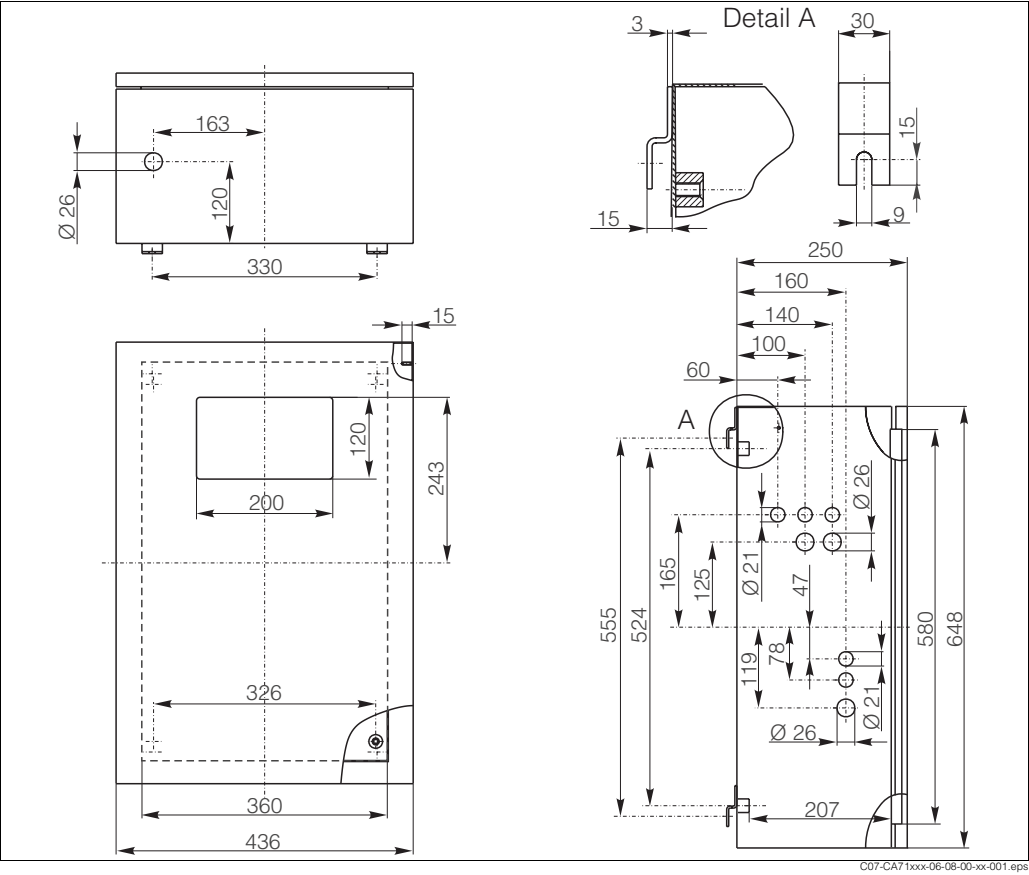
Ambient temperature	5 ... 40 °C (avoid markable fluctuations)
Ingress protection	IP 43

Process

Sample flow rate	min. 5 ml per min
Consistence of the sample	low solid content (< 50 mg/l)
Sample inlet	pressureless

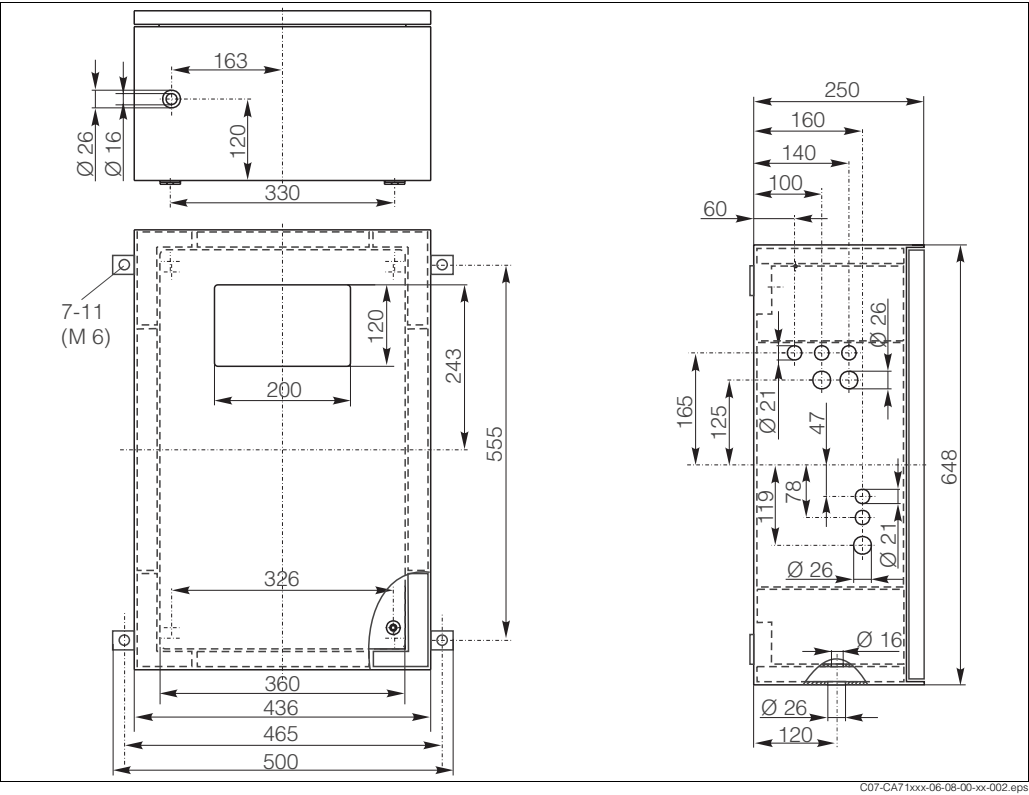
Mechanical construction

Design, dimensions
stainless steel version



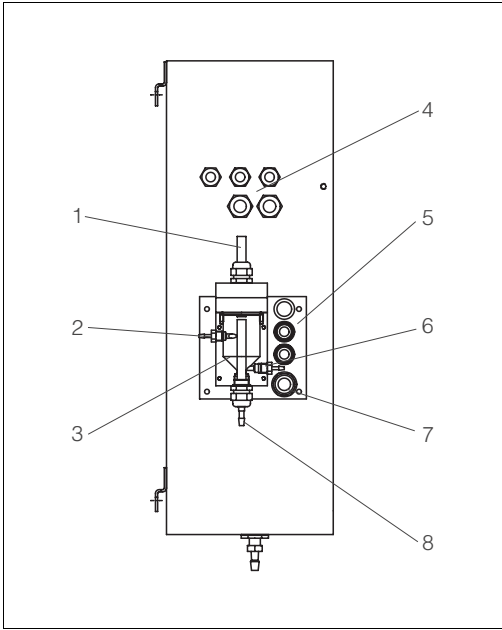
CA 71 dimensions, stainless steel version

Design, dimensions
GFK version



CA 71 dimensions, GFK version

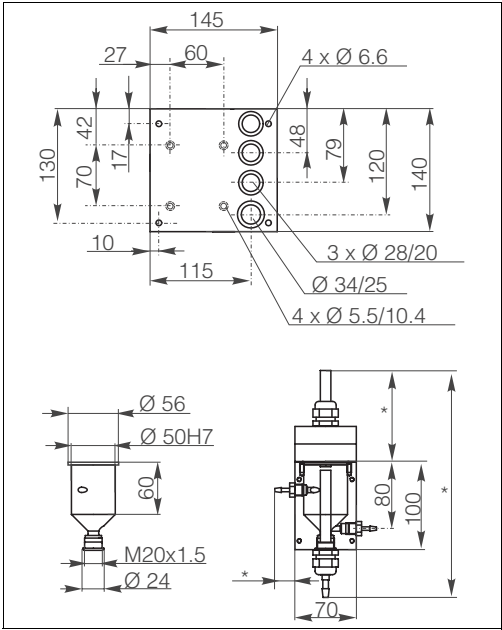
Design, Dimensions
collecting vessel



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Collecting vessel at analyzer (optional)

- 1 Ventilation
- 2 Sample inlet from sampling
- 3 Collecting vessel
- 4 Electrical connections
- 5 Analyzer sample inlet



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Collecting vessel dimensions

- * variable, freely adjustable dimensions
- 6 Sampling for analyzer
- 7 Analyzer outlet
- 8 Sample overflow

Weight	GFK housing	approx. 28 kg
	Stainless steel housing	approx. 33 kg

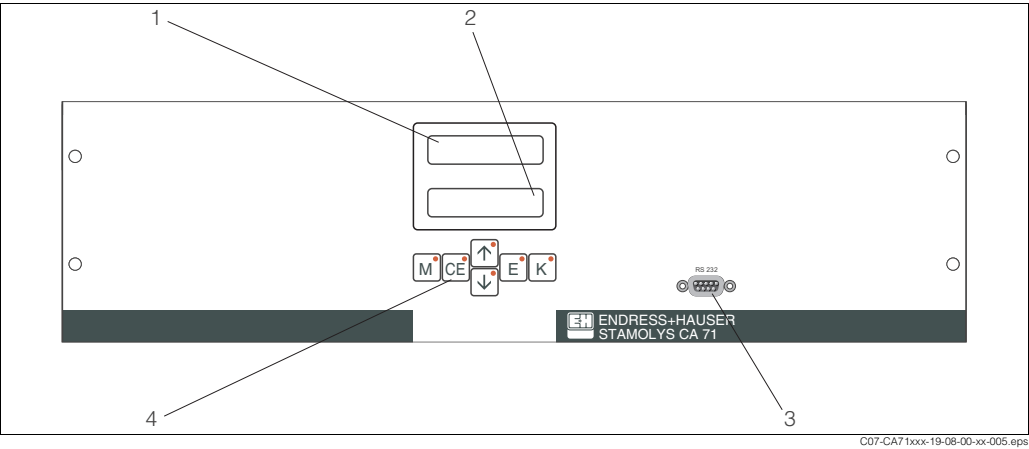
Materials	Housing	Stainless steel 1.4301 (AISI 304) or GFK
	Front windows	Plexiglass®
	Endless hose	C-Flex®, Norprene®
	Pump hose	Tygon®, Viton®
	Valves	Tygon®

Sample line connection	One channel version	
	<i>E+H Collecting vessel</i> (at CA 71, with or without level measurement)	
	Connection	hose ID 3.2 mm
	<i>Customer collecting vessel</i>	
	Connection	hose ID 1.6 mm
	Max. distance from collecting vessel to analyzer	1 m
	Max. height difference from collecting vessel to analyzer	0.5 m
	Two channel version	
	• In scope of delivery only a collecting vessel without level measurement • Order a second collecting vessel separately • Only one collecting vessel can be mounted at housing • Level measurement not available	

Sample outlet	Connection	hose ID 6.4 mm
		– Max. length of closed loop: 1 m – Open outlet downgrade installed – No combination of several devices to a closed-loop system
	Min. volume per meas.	20 ml

Human Interface

Display and operating elements



CA 71 display and operating elements

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

Certificates and approvals

CE approval

Declaration of conformity

The product meets the legal requirements of the harmonised European standards. Endress+Hauser 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 Endress+Hauser confirms compliance with all technical regulations and the successful testing individually for your product.

Ordering information

Product structure

Measuring range						
A	Measuring range 10 ... 500 µg/l Fe					
B	Measuring range 0.05 ... 2 mg/l Fe					
C	Measuring range 0.1 ... 5 mg/l Fe					
Y	Special version acc. to customers specification					
Sample transfer						
1	Sample transfer from one measuring point (one channel version)					
2	Sample transfer from two measuring points (two channel version)					
Power supply						
0	Power supply 230 V AC / 50 Hz					
1	Power supply 115 V AC / 60 Hz					
Collecting vessel for up to 3 analyzers						
A	Without collecting vessel					
B	With collecting vessel without level control					
C	With collecting vessel with level control (one channel version only)					
Housing version						
1	Without housing					
2	With GFK housing					
3	With stainless steel 1.4301 (AISI 304) housing					
Communication						
A	0/4 ... 20 mA, RS 232					
Additional equipment						
1	Quality certificate					
CA 71 FE - 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 Nopren hose, length 2.5 m, ID 1.6 mm
- a C-flex hose, length 2.5 m, ID 6.4 mm
- a C-flex hose, length 2.5 m, ID 3.2 mm
- two hose fittings of each size:
 - 1.6 x 1.6 mm
 - 1.6 x 3.2 mm
 - 6.4 x 3.2 mm
- a quality certificate
- Operating Instructions (english).



Note!

Reagents, please order separately.

Accessories

Reagents and standard solutions

- ☐ Reagent, 1 l reagent FE1; order no. CAY840-V10AAE
- ☐ Standard solution 0.5 mg/l Fe; order no. CAY842-V10C05AAE
- ☐ Standard solution 2.0 mg/l Fe; order no. CAY842-V10C20AAE

Cleaner for hoses

- ☐ Cleaning agent, alkaline, 100 ml; order no. CAY746-V01AAE
- ☐ Cleaning agent, acidic, 100 ml; order no. CAY747-V01AAE

Collecting vessel

- for sampling from pressurized systems
- results in an unpressurized continuous sample stream
- ☐ Collecting vessel without level measurement; order no. 51512088
- ☐ Collecting vessel with level measurement (conductive); order no. 51512089

Maintenance kit

- ☐ Maintenance kit CAV 740:
 - 1 set pump hoses yellow/blue
 - 1 Satz pump hoses black/black
 - per 1 set hose connectors
- order no. CAV 740-1A

Documentation

- ☐ Technical Information StamoClean CAT 430, TI 338C/07/en (order no. 51508729)
- ☐ Technical Information StamoClean CAT 411, TI 349C/07/en (order no. 51508785)
- ☐ Technical Information StamoClean CAT 220, TI 317C/07/en (order no. 51509817)
- ☐ Operating Instructions StamoClean CAT 430, BA338C7/07/en (order no. 51508731)
- ☐ Operating Instructions StamoClean CAT 220, BA349C7/07/en (order no. 51509815)

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