

Phosphate Analyzer *StamoLys CA 70 PH*

**Compact photometric analysis system for the
phosphate measurement in sewage treatment plants**



Application

- Monitoring and optimising the cleaning capacity of wastewater treatment plants
- Controlling of precipitants
- Monitoring of activated sludge basins
- Monitoring of wastewater treatment plant outlet
- Monitoring of cooling water

Your benefits

- Direct reaction in photometer at constant temperature
- Low system volume required due to short distances
- Low reagent requirement
- Small sample volume
- Four 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

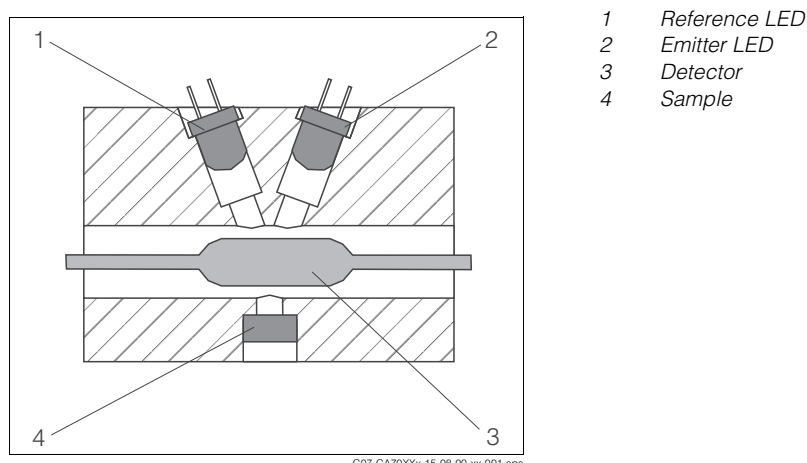
Function and system design

Measuring principle

Photometric principle

After sample conditioning, the Analyzer sample pump conveys a defined 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 absorbed light intensity 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

Molybdenum blue method for orthophosphate determination in deviation to DIN EN 1189 (versions PH-A and PH-C)

Molybdate ions and antimony ions form a blue dye in conjunction with phosphate.

The absorption is determined at a wavelength of 660 nm. The intensity of absorbed light is proportional to the orthophosphate concentration in the sample.

The reference wavelength is 565 nm.

Molybdate vanadate method for orthophosphate determination

(versions PH-B and PH-D)

Vanadate ions and molybdate ions form a yellow dye in conjunction with phosphate.

The absorption is determined at a wavelength of 430 nm. The intensity of absorbed light is proportional to the ammonium concentration in the sample.

The reference wavelength is 565 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

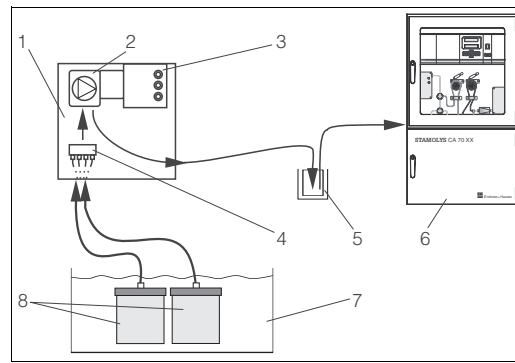
Before analysis, the sample has to be conditioned and to be transported to an external or to the delivered collecting vessel.

Measuring system

A complete measuring system complies:

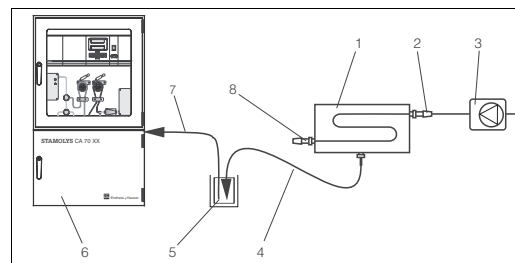
- An analyzer StamoLys CA 70
- A sample conditioning system (optionally):
 - Micro filtration / ultra filtration StamoClean CAT 430 or StamoClean CAT 411
 - Backwash filter StamoClean CAT 220
 - Customer specific solution
- Wall mounting set (optionally)
- Collecting vessel (optionally)

Micro / ultra filtration



C07-CA70XXx-14-08-00-xx-001.eps

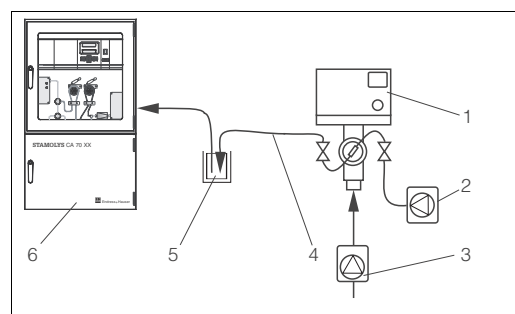
Measuring with StamoClean CAT 430



C07-CA70XXx-14-08-00-xx-002.eps

Measuring system with StamoClean CAT 411

Backwash filter



C07-CA70XXx-14-08-00-xx-002.eps

Measuring system with StamoClean CAT 220

Input

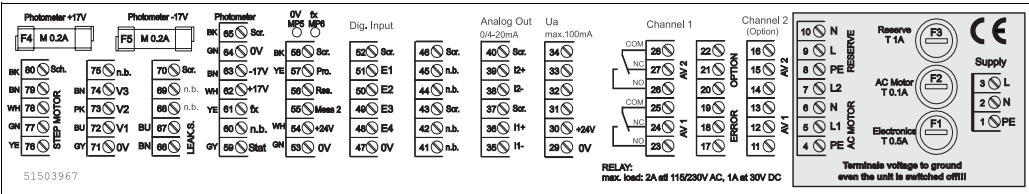
Measured variable	PO ₄ -P [mg/l]
Measuring ranges	0.05 ... 2.5 mg/l (PH-A) 0.5 ... 20 mg/l (PH-B) 0.1 ... 25 mg/l (PH-C) 1.0 ... 50 mg/l (PH-D)
Wavelength	880 nm (PH-A) 430 nm (PH-B und PH-D) 660 nm (PH-C)
Reference wavelength	565 nm

Output

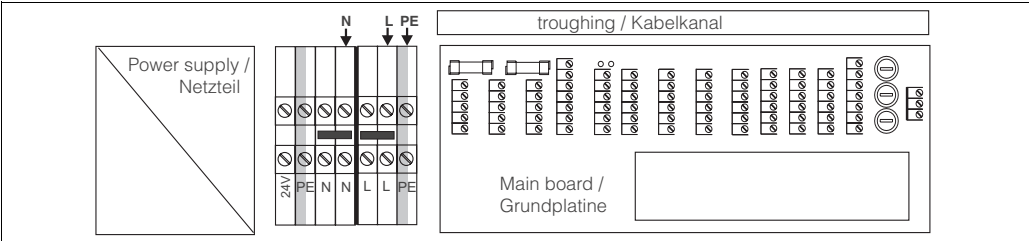
Output signal	0/4 ... 20 mA
Signal on alarm	2 limit contacts (per channel), 1 system alarm contact
Load	max. 500 Ω
Data interface	RS 232 C
Load capacity	30 VA max. 48 V AC, 30 V DC at 0.5 A

Power supply

Electrical connection



Connection sticker CA 70



Power supply reagent cooling device

Supply voltage	115 V AC / 230 V AC ±10%, 50/60 Hz
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Power consumption	without reagent cooling	ca. 40 VA
	with reagent cooling	ca. 200 VA

Current consumption	without reagent cooling	ca. 0.15 A
	with reagent cooling	ca. 0.9 A

Fuses	medium time-lag 0.2 A, time-lag 0.5 A
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Performance characteristics

Response time t_{100}	Reaction time + flushing time + waiting time (minimum waiting time = 0 min)
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Maximum measured error	3 % of measuring range scope
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Measuring interval	2 ... 120 min
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Measuring time	6 minutes
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Sample requirement	15 ml per measurement
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Reagent requirement	2 x 0.2 ml per measurement (molydenum blue method)
	1 x 0.2 ml per measurement (molybdate vanadate method)

Calibration interval	0 ... 72 h
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Flushing interval	0 ... 72 h
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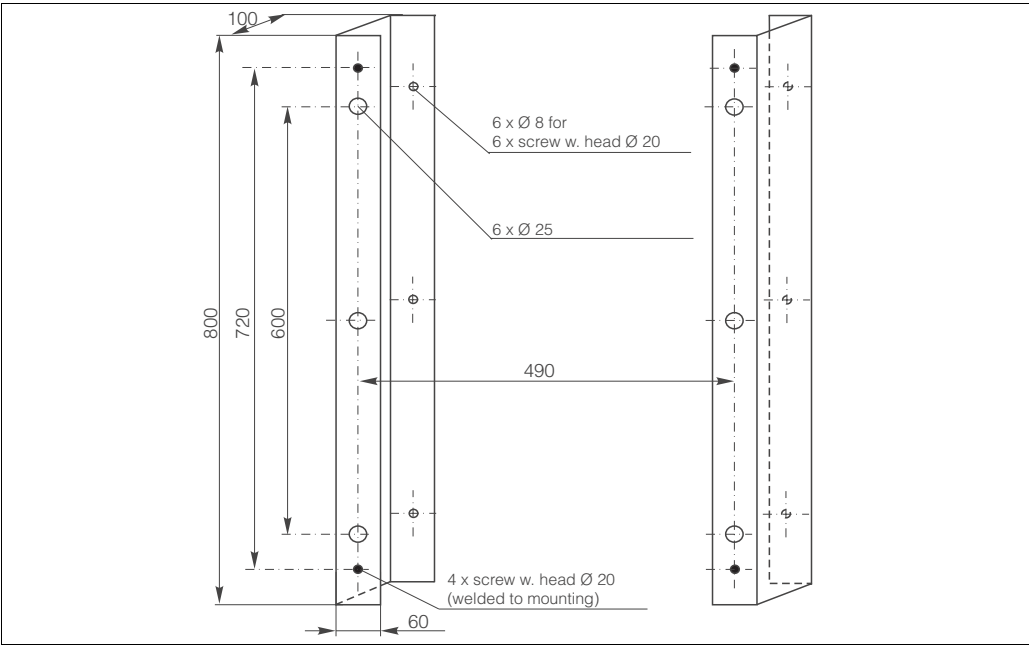
Maintenance interval	3 month
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Servicing requirements	15 minutes a week
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Installation

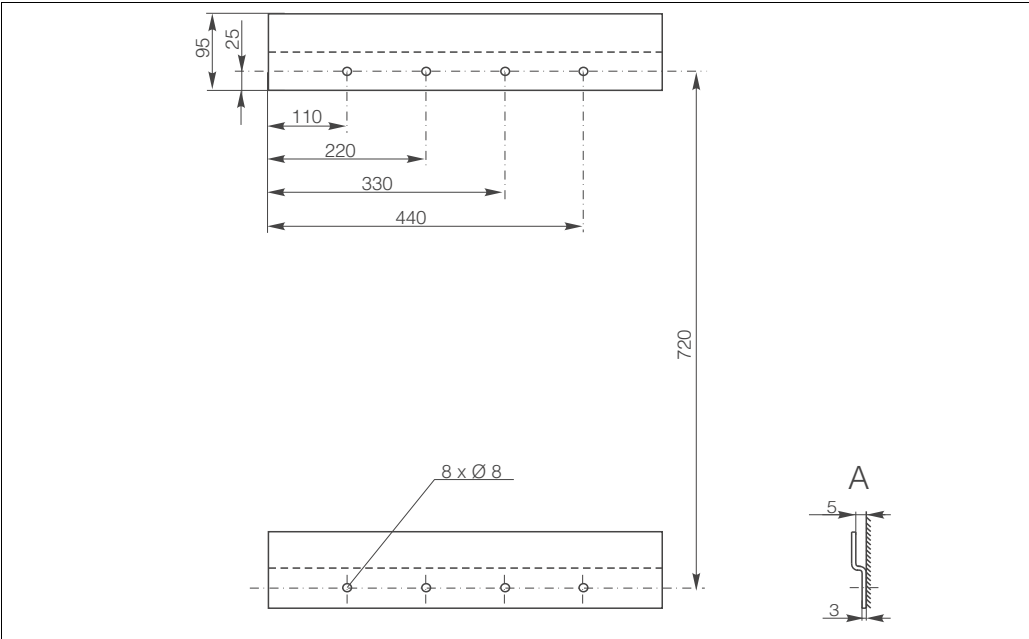
Installation instructions

Wall mounting set (Accessories, with reagent cooling essentially)



C07-CA70xxxx-17-08-00-xx-001.eps

Wall mounting set for analyzer with reagent cooling device



C07-CA70xxxx-17-08-00-xx-002.eps

Wall mounting set for analyzer without reagent cooling device

Environment

Ambient temperature limit 5 ... 40 °C (with temperatures > 25 °C a reagent cooling device is essential)

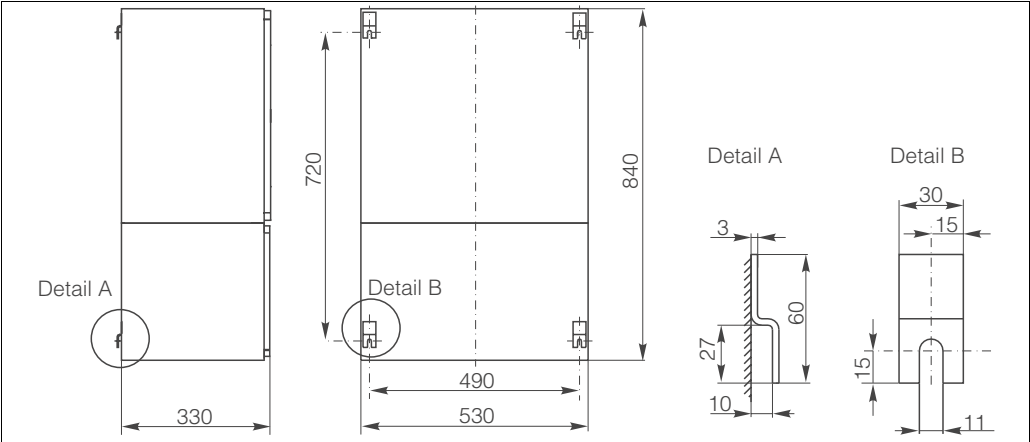
Ingress protection IP 43

Process

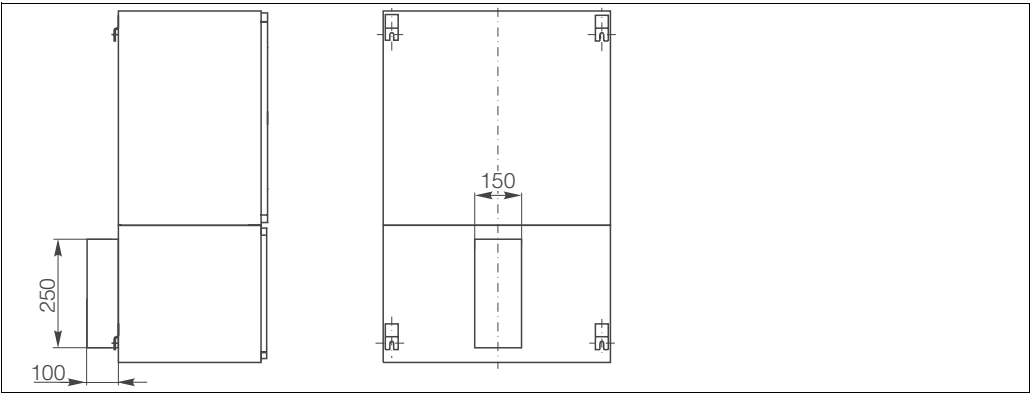
Sample flow rate	min. 5 ml per min
Consistence of the sample	low solid content (< 50 mg/l)
Sample requirement per measurement	20 ml
Sample inlet	pressureless

Mechanical construction

Design, dimensions



CA 70 dimensions



Reagent cooling device dimensions

Weight	Without reagent cooling With reagent cooling	ca. 40 kg ca. 50 kg
Materials	Housing Front windows Endless hose Pump hose	Stainless Steel 1.4573 (AISI 316 Ti) Plexiglas® C-Flex®, Norprene® Tygon®, Viton®

Connection sample line

One channel version

<i>Internal collecting vessel</i>	
Connection	hose ID 3.2 mm
<i>External 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

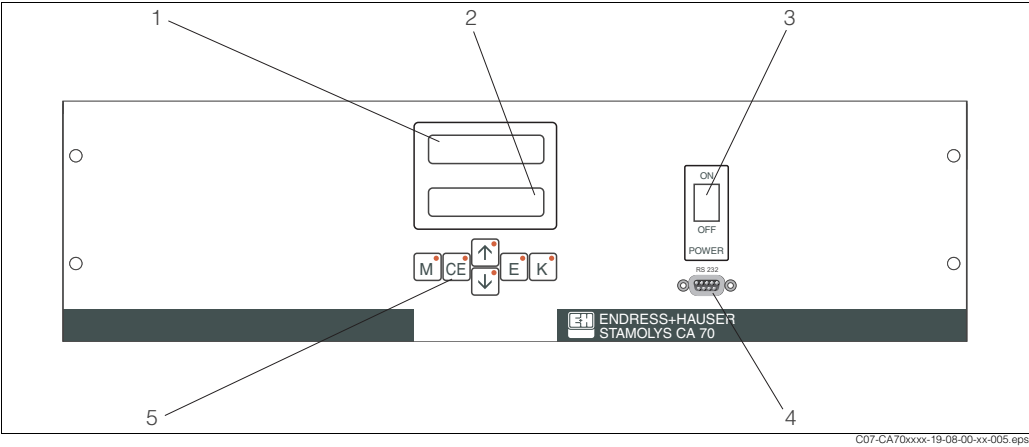
<i>With option "collecting vessel": two external collecting vessels on a PVC plate mounted</i>	
Connection collecting vessel to analyzer	2 x hose ID 1.6 mm
Connection collecting vessel to customer specific sample inlet	2 x hose ID 3.2 mm
<i>without collecting vessel</i>	2 x hose ID 1.6 mm

Sample outlet

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

Human Interface

Display and operating elements



- Display and operating elements CA 70
- 1 LED display (measured value)
 - 2 LC display (measured value + status)
 - 3 Toggle switch on/off
 - 4 RS 232 serial interface
 - 5 Operating keys with indicator 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 0.05 ... 2.5 mg/l (blue = molybdenum blue method)
B							Measuring range 0.5 ... 20 mg/l (yellow = molybdate vanadate method)
C							Measuring range 0.1 ... 25 mg/l (blue = molybdenum blue method)
D							Measuring range 1.0 ... 50 mg/l (yellow = molybdate vanadate method)
Y							Special version acc. to customers specification
Sample transfer							
1							Sample transfer from one measuring point (one channel version)
2							Alternating sample transfer from two measuring points (two channel version)
9							Special version acc. to customers specification
Power supply							
0							Power supply 230 V AC
1							Power supply 115 V AC
9							Special version acc. to customers specification
Collecting vessel							
A							Without collecting vessel
B							With collecting vessel
Y							Special version acc. to customers specification
Equipment							
1							Without reagent cooling device
2							With reagent cooling device
9							Special version acc. to customers specification
Communication							
A							RS 232 + 0/4 ... 20 mA
Y							Special version acc. to customers specification
Additional equipment							
1							Quality certificate
9							Special version acc. to customers specification
CA 70 PH-							complete order code

Accessories

Installation accessories

- ☐ Wall mounting set for version without reagent cooling device; order no. 51503061
 - ☐ Wall mounting set for version with reagent cooling device; order no. 51503063
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Reagents and standard solutions

- ☐ Reagent set activ, per 1 l reagent PH1+PH2 (blue); order no. CAY240-V10AAE
- ☐ Reagent set inactiv, per 1 l reagent PH1+PH2 (blue); order no. CAY240-V10AAH
- ☐ Cleaning agent R; order no. CAY241-V10AAE
- ☐ Reagent activ PH1, 1 l (yellow); order no. CAY243-V10AAE
- ☐ Reagent inactiv PH1, 1 l (yellow); order no. CAY243-V10AAH
- ☐ Standard solution 1.0 mg/l PO₄ - P; order no. CAY242-V10C01AAE
- ☐ Standard solution 1.5 mg/l PO₄ - P; order no. CAY242-V10C03AAE
- ☐ Standard solution 2.0 mg/l PO₄ - P; order no. CAY242-V10C02AAE
- ☐ Standard solution 5 mg/l PO₄ - P; order no. CAY242-V10C05AAE
- ☐ Standard solution 10 mg/l PO₄ - P; order no. CAY242-V10C10AAE
- ☐ Standard solution 15 mg/l PO₄ - P; order no. CAY242-V10C15AAE
- ☐ Standard solution 20 mg/l PO₄ - P; order no. CAY242-V10C20AAE
- ☐ Standard solution 25 mg/l PO₄ - P; order no. CAY242-V10C25AAE
- ☐ Standard solution 30 mg/l PO₄ - P; order no. CAY242-V10C30AAE
- ☐ Standard solution 40 mg/l PO₄ - P; order no. CAY242-V10C40AAE
- ☐ Standard solution 50 mg/l PO₄ - P; order no. CAY242-V10C50AAE

Documentation

- ☐ Technical Information StamoClean CAT 430, TI 338C/07 (order no. 51508729)
- ☐ Technical Information StamoClean CAT 411, TI 349C/07 (order no. 51508785)
- ☐ Technical Information StamoClean CAT 220, TI 317C/07 (order no. 51509817)

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