

StamoLys CA 50 Sedimentation Unit for Sample Conditioning

Operating Instructions

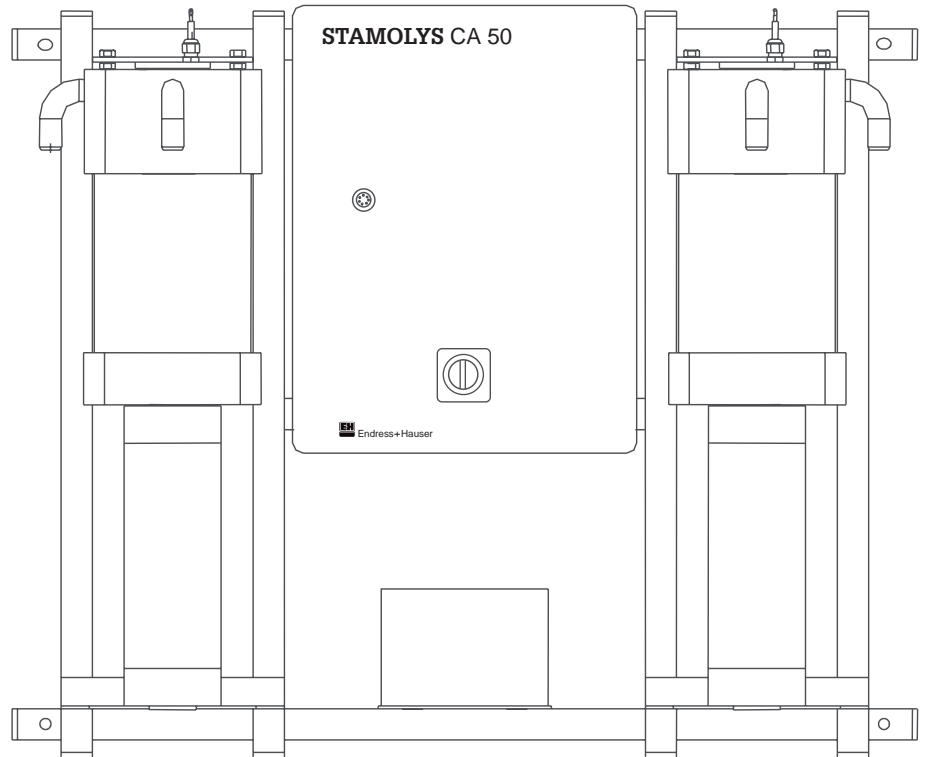


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1 Safety instructions

1.1 Intended application

The CA 50 sedimentation unit is a sample conditioning system for max. 3 concatenated StamoLys CA 70 Analyzers for use in sewage treatment plants.

1.2 General safety instructions

The instrument has been designed according to the state of the art and complies with the applicable regulations and EN standards (see "Technical Data"). It is built in accordance with EN 61010-1 and has left our plant in perfect condition with regard to safety aspects.

However, if it is used improperly or other than for its intended purpose, it may pose a hazard, e.g. due to improper connection.

1.2.1 Safety instructions for the instrument

- If the device is used for any application other than those described in these operating instructions, it may lead to unsafe and improper functioning of the measuring system and is therefore not permitted.
- Make sure you strictly adhere to the warnings and notes in these operating instructions.
- Technical personnel must be familiar with the instructions in this manual and must adhere to them. Personal injury and damage to property can occur as a result of improper handling.
- Only trained skilled personnel authorised by the plant operator may carry out installation, electrical connection, start-up, operation and maintenance of the measuring system.
- Before connecting the instrument, ensure that the mains supply complies with the ratings specified on the nameplate.
- A clearly marked mains disconnecting device must be installed in the vicinity of the instrument.
- Before switching on the system check all the connections again for correctness.
- Switch off the main switch before intervention in the controller or in the mechanics (danger of limbs being crushed by moving parts).
- Do not operate damaged instruments, which could pose a danger, and mark them as defective.
- Measuring point faults may only be repaired by authorised and trained personnel.
- If faults cannot be repaired, the instrument must be taken out of service and secured against unintentional start-up.
- Repairs not described in these operating instructions may only be carried out directly by the manufacturer or by the Endress+Hauser service organisation.

1.2.2 Safety instructions for handling cleaning concentrates

- Refer to the safety data sheets when handling cleaning concentrates.
- Wear protective clothing, protective gloves and protective goggles when handling cleaning concentrates.
- Never add water to cleaning concentrates! There is a danger of splashing and heat generation.

1.3 Safety symbols

**Warning!**

This symbol alerts you to hazards which could cause serious injuries as well as damage to the instrument if ignored.

**Caution!**

This symbol alerts you to possible faults which could arise from incorrect operation. They could cause damage to the instrument if ignored.

**Note:**

This symbol indicates important items of information.

2 Instrument description

2.1 Design and functional description of the instrument

The mechanics of the sedimentation unit are designed to condition samples for water analysis. A sampling vessel is mounted in the basin and it fills up with the basin medium via a non-return valve protected against soiling. This fills the sedimentation cylinder. Optionally, the sampling vessel can also be filled by a pump.

After a variable sedimentation time, sludge becomes deposited in the cylinder so that a zone of clear water forms in the upper section. A sample free from solids can then be drawn in by the downstream analyzers through a sintering filter which is cleaned with compressed air after every measuring cycle. After the sample is taken, the sedimentation cylinder is emptied by the O-ring piston and cleaned.

In 2-channel mode (sampling from two measuring points) the 2 sedimentation cylinders are filled at staggered times so that each basin has identical measuring intervals.

The minimum possible measuring cycle is dependent on the distance to the sampling point and on the settling behaviour of the sludge. On 2-channel instruments the process time of the analyzers must be considered.

The sedimentation unit controller switches automatically to automatic mode when the power is switched on. Manual starting is not necessary.

An optional LCD operator terminal can be plugged into the parameter entry port to enter set-up parameters and carry out maintenance. All functions can then be controlled by hand and the process times in automatic mode are preselectable. Current system states are displayed. However, the function terminal is not required for the control program to run.

The parameter entry function can define whether the controller operates as a single-channel or 2-channel instrument or what channel is switched to active. For example, Basin 1 can be switched off if no analysis is conducted there.

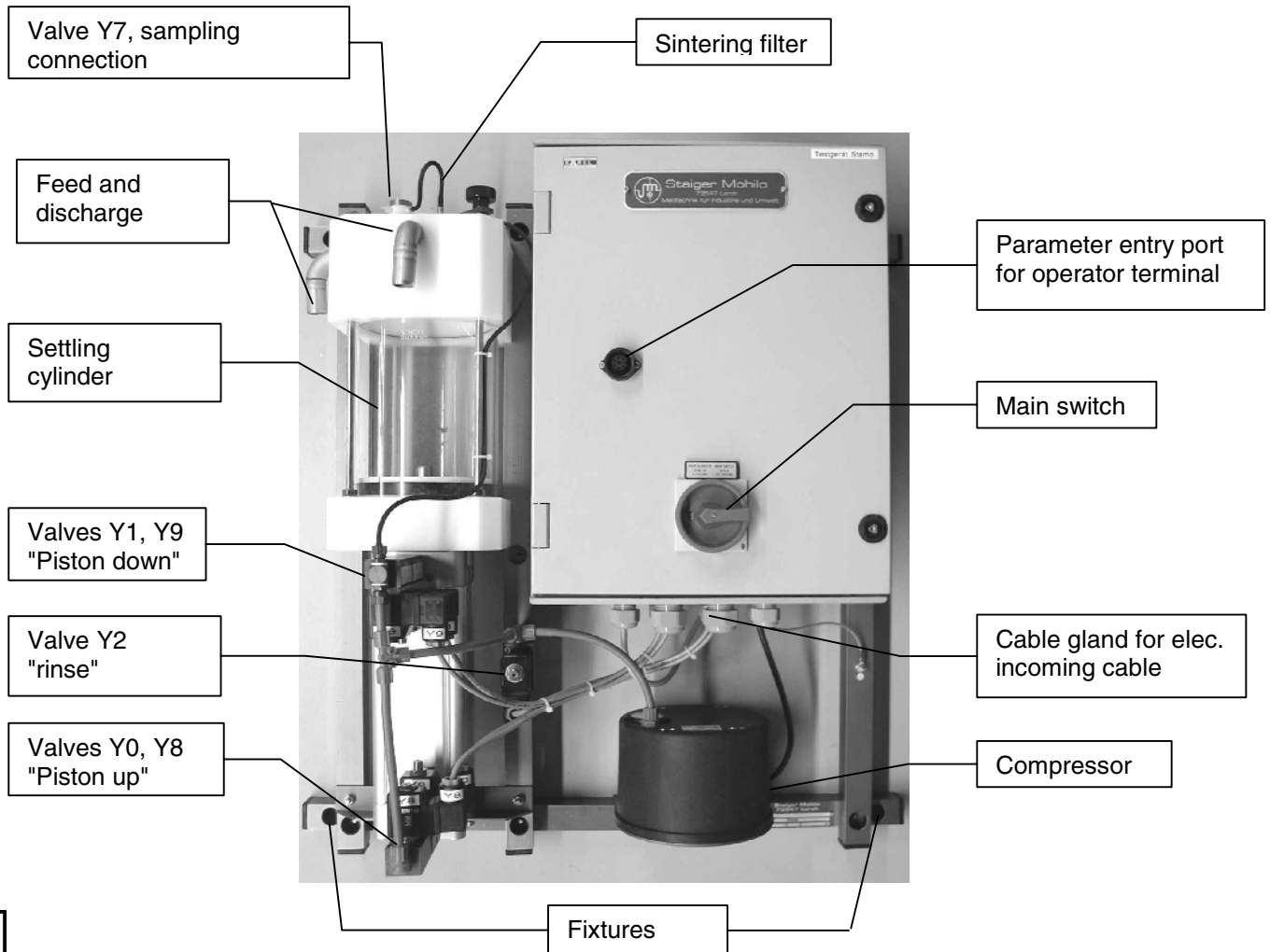
All operating parameters are saved to a flash EPROM which is holding on supply failure. A back-up battery is not required.

A switch strip in the control cabinet provides for auxiliary operation and single channel activation. This does not require the operator terminal. However, it is not possible to change the parameter entry with the control switches.

Defining modes

Sedimentation cylinder	left	right
Channel	1	2
Assign measurement	1 or 2	2 or 1

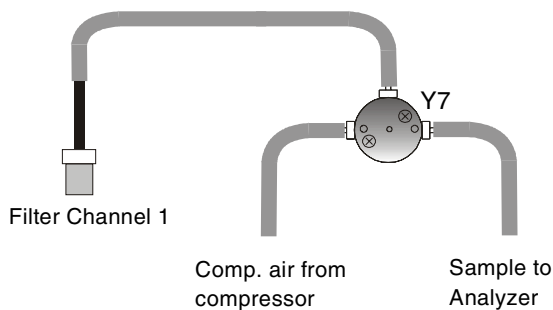
2.2 Mechanical design of 1-channel version



Note:

- The connections for feed and discharge are freely assignable.

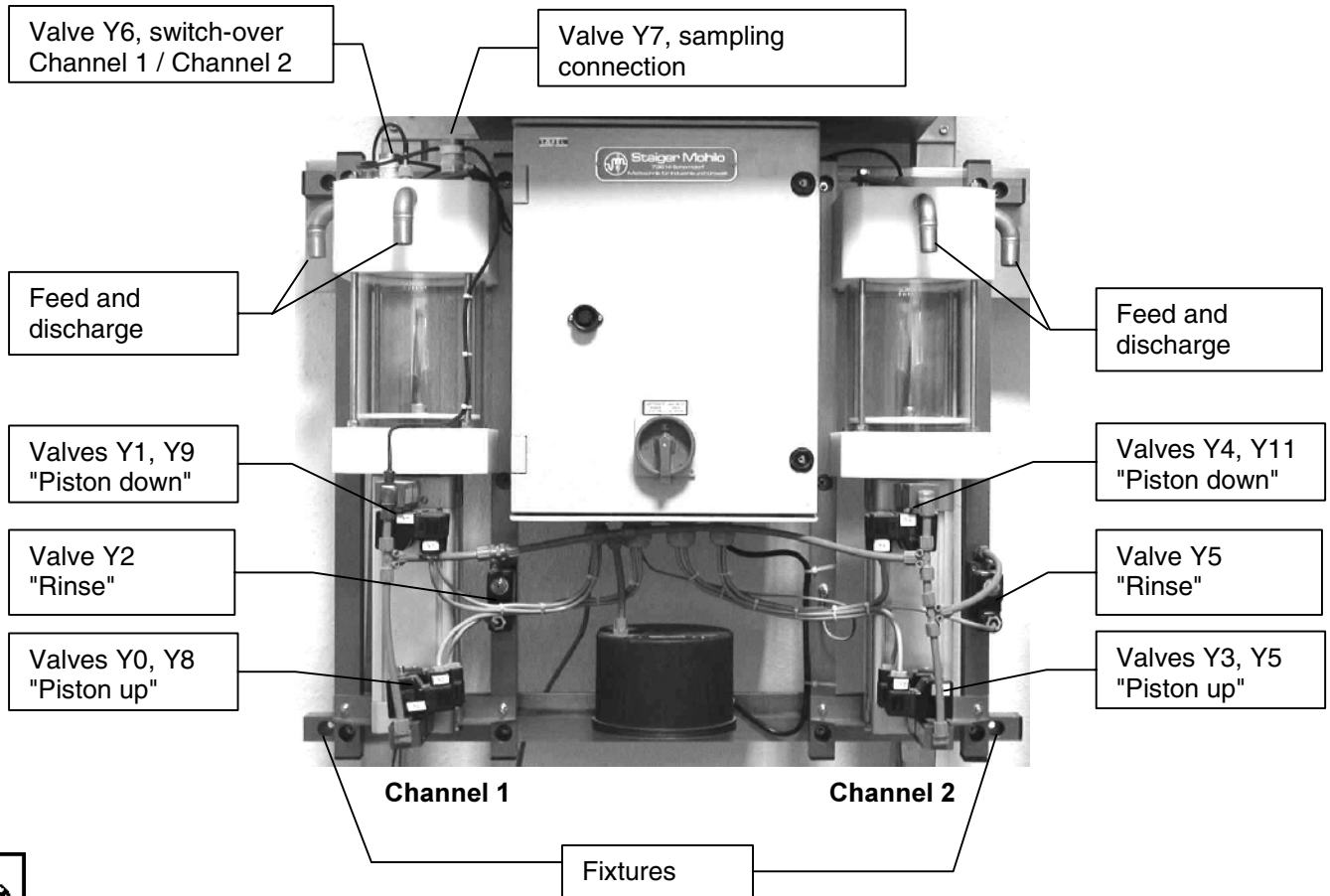
2.2.1 Sampling valves in 1-channel version



Note:

- Depending on the number of analyzers connected, this combination is provided one to three times.

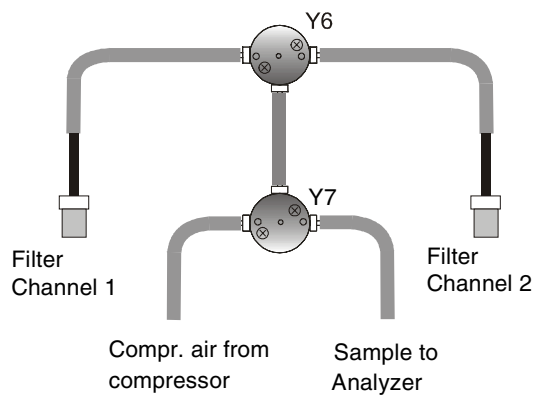
2.3 Mechanical design of 2-channel version



Note:

- The connections for feed and discharge are freely assignable.

2.3.1 Sampling valves in 2-channel version



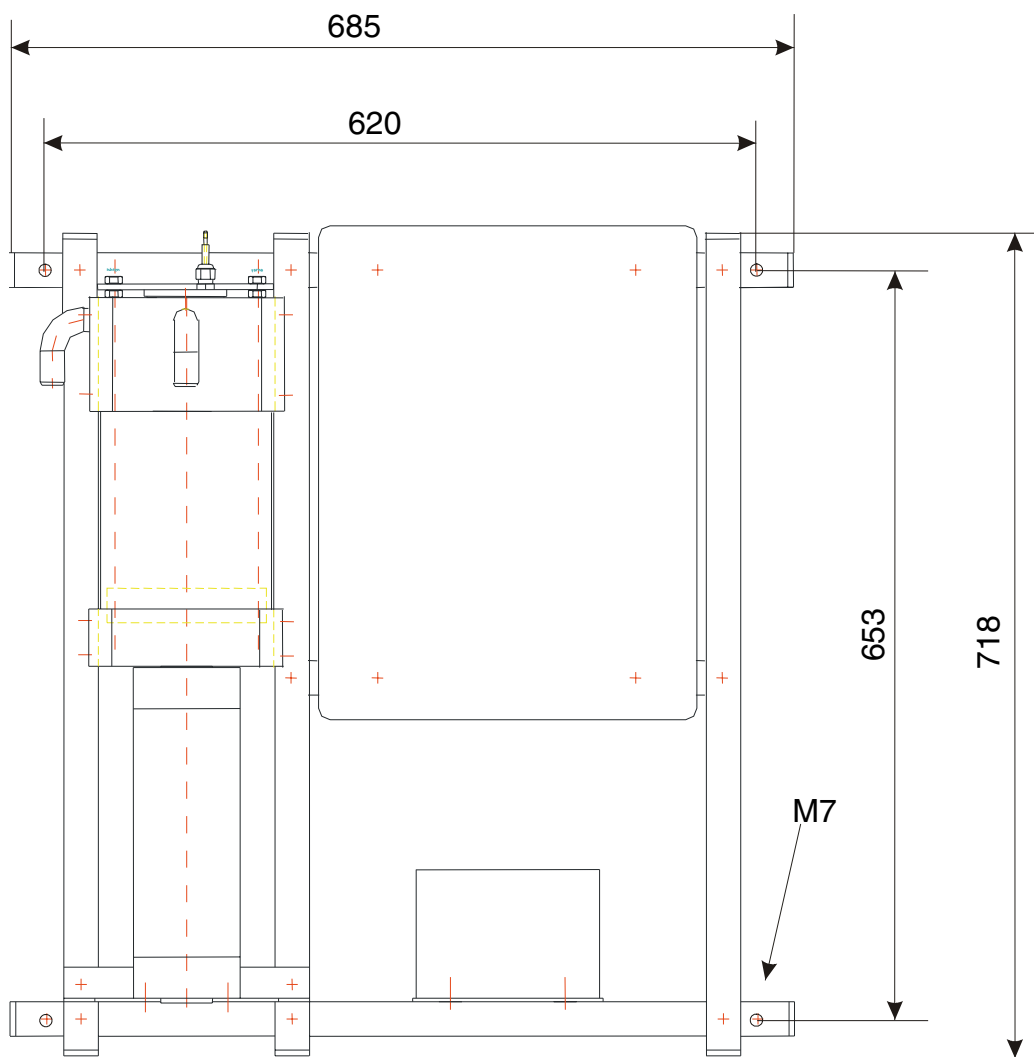
Note:

- Depending on the number of analyzers connected, this combination is provided one to three times.

3 Installation

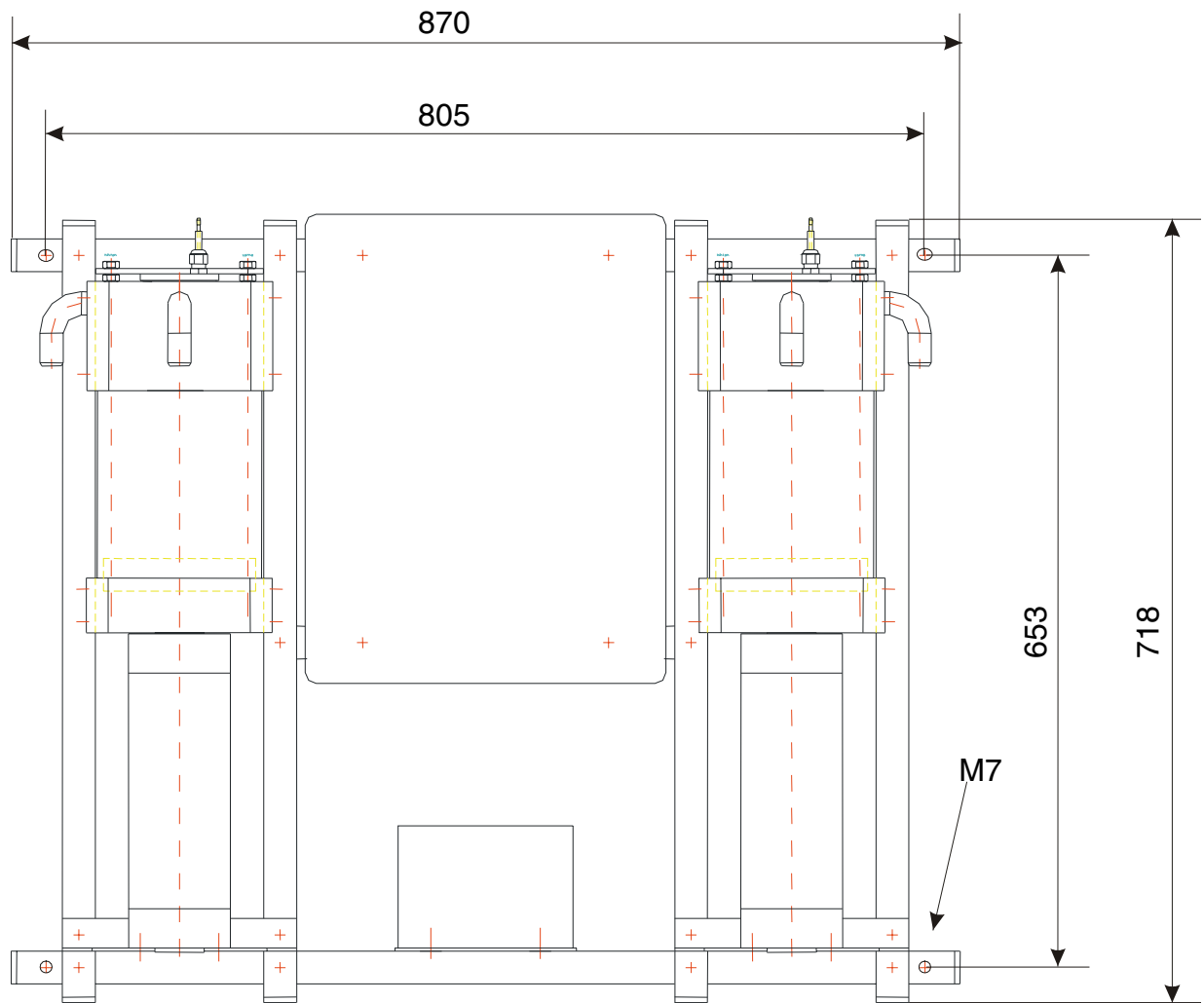
3.1 Dimensions

3.1.1 Dimensions of 1-channel version



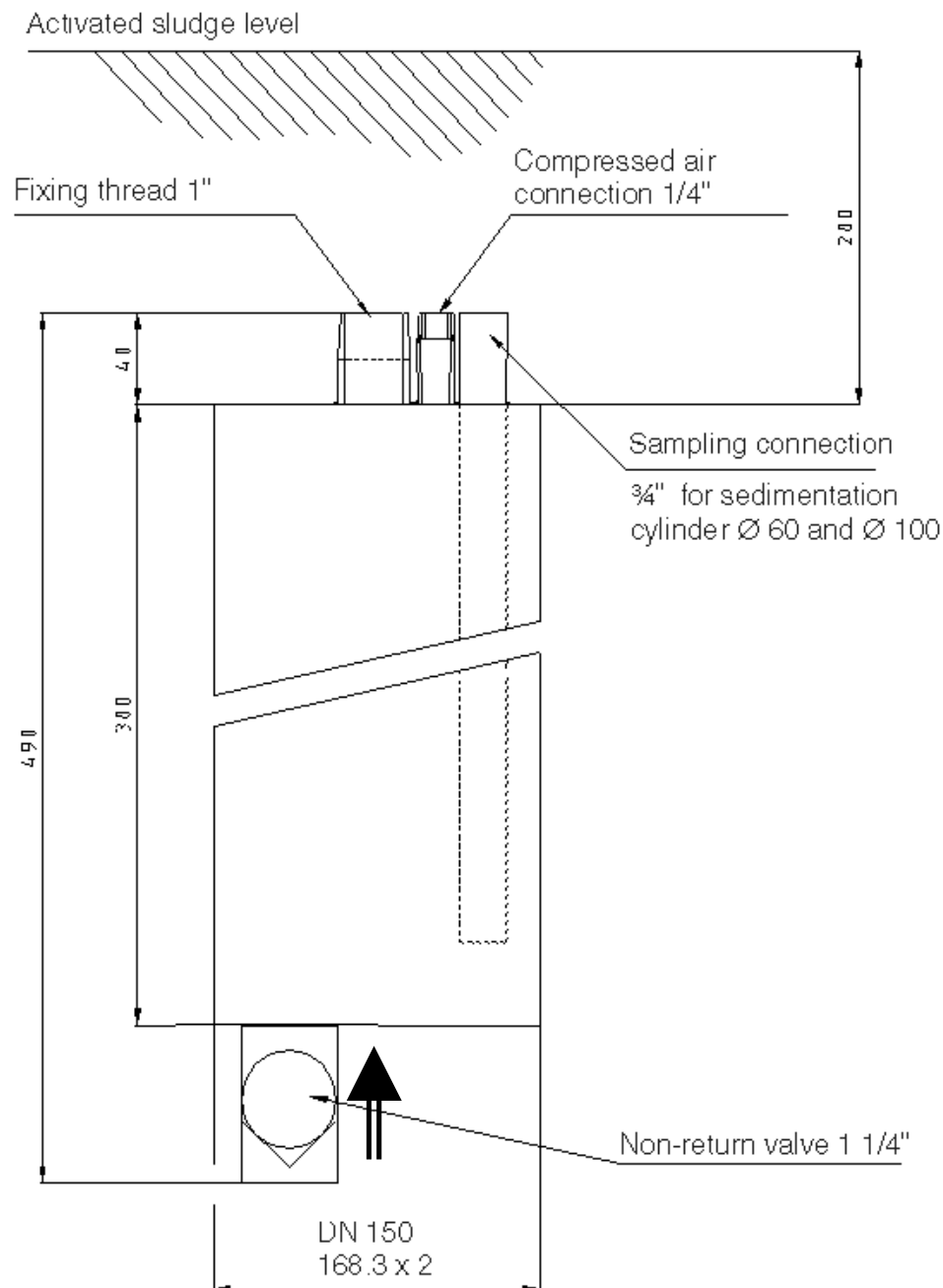
Sedi1.wmf

3.1.2 Dimensions of 2-channel version



Sedi2.wmf

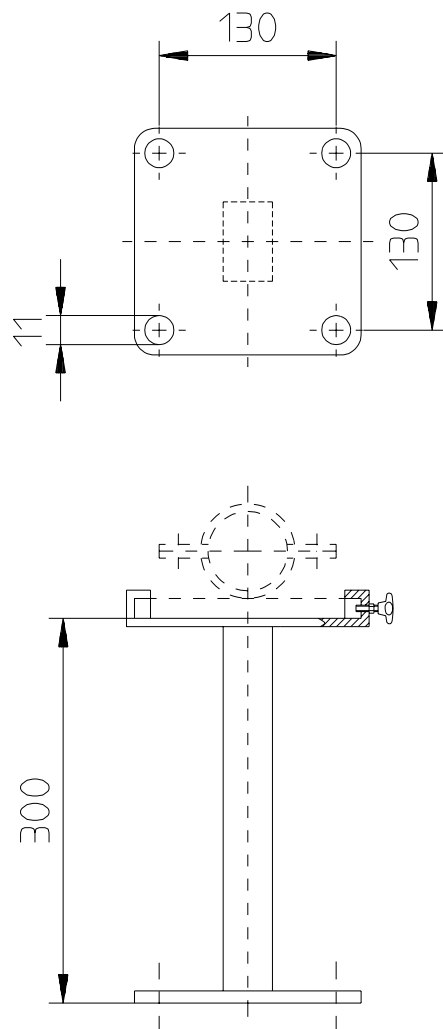
3.1.3 Design of sampling vessel



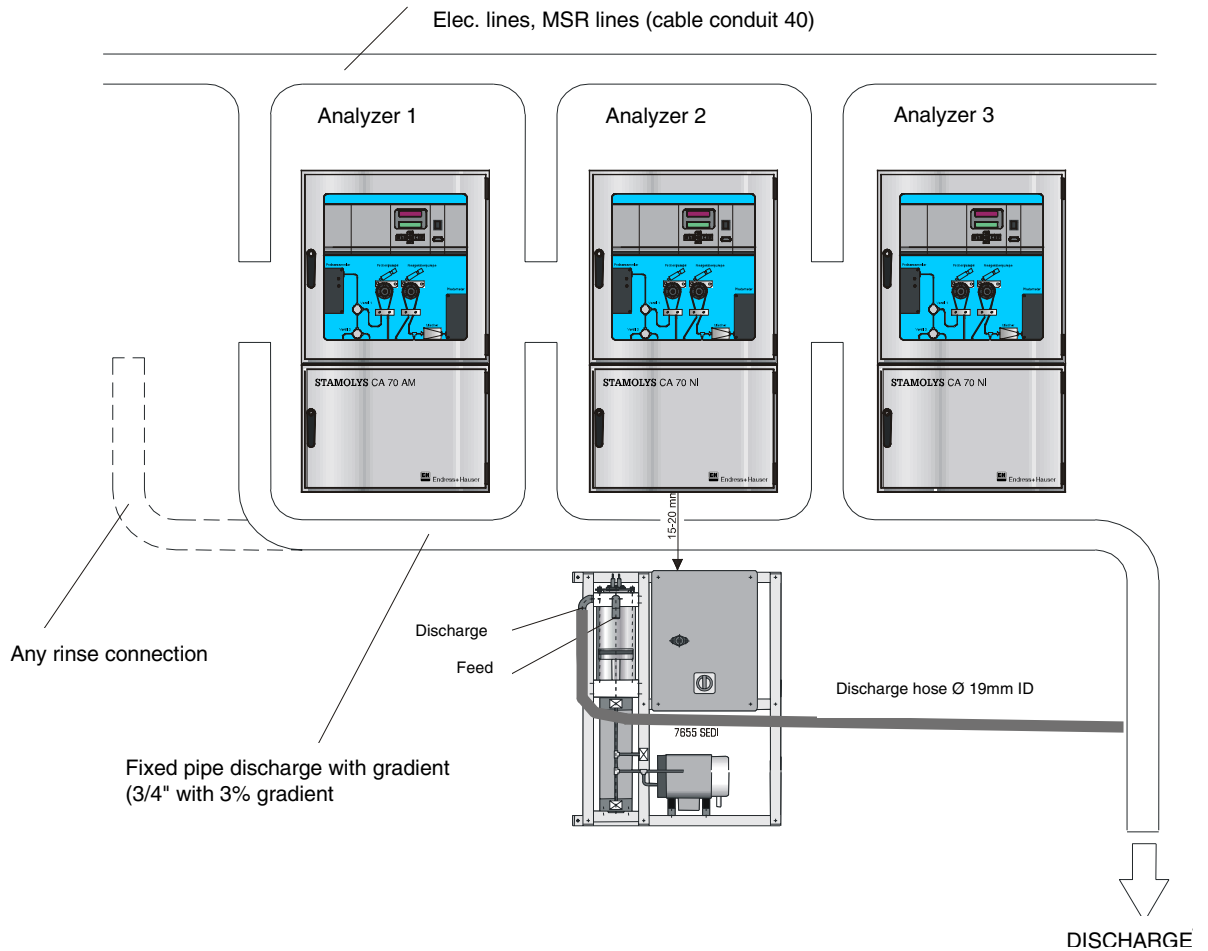
Note:

- The vessel has a capacity of 6.5 litres.
- Install the non-return valve so that the direction of flow is towards the sampling vessel.

3.1.4 Design of wall bracket for sampling vessel



3.2 Instrument arrangement



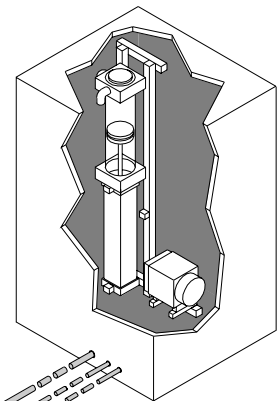
Note:

- The 2-channel version has feed and discharge pipes accordingly.

3.3 Installing the instrument

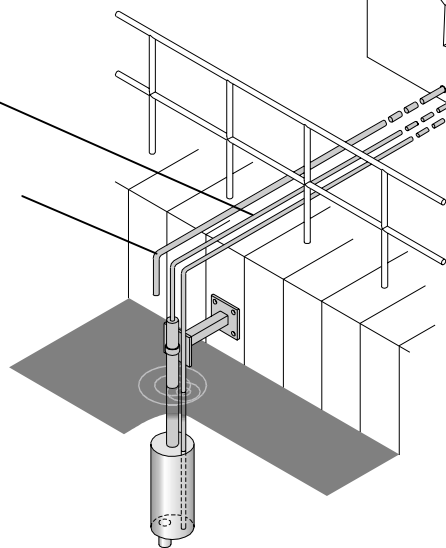
3.3.1 Installing the CA 50 sedimentation unit

1. Install the analyzer and sedimentation unit as closely above each other as possible. On systems with several analyzers, arrange the sedimentation unit in the middle of the analyzers. Make sure that the hoses between the sedimentation unit and the analyzer are as short as possible!
2. Install discharges for analyzer (make sure the gradients are min. 3%)
3. Install sampling unit as described on page 14
4. Connect lines to sampling unit and sedimentation unit:
 - Connect sampling connection and sedimentation cylinder feed
 - Connect compressed air connection to compressed air connection of associated "Rinse" valve
5. Route discharge of sedimentation unit; make sure discharge is free! No suction action should occur. Lay hoses along frost-proof routes with a gradient of min. 3%.
6. Connect sampling connection of analyzer to sampling connection of sedimentation unit.
7. Wire up analyzer of sedimentation unit control as depicted in circuit diagram (see page 17 et seq.)
8. Connect power supply line.
9. Connect operator terminal.

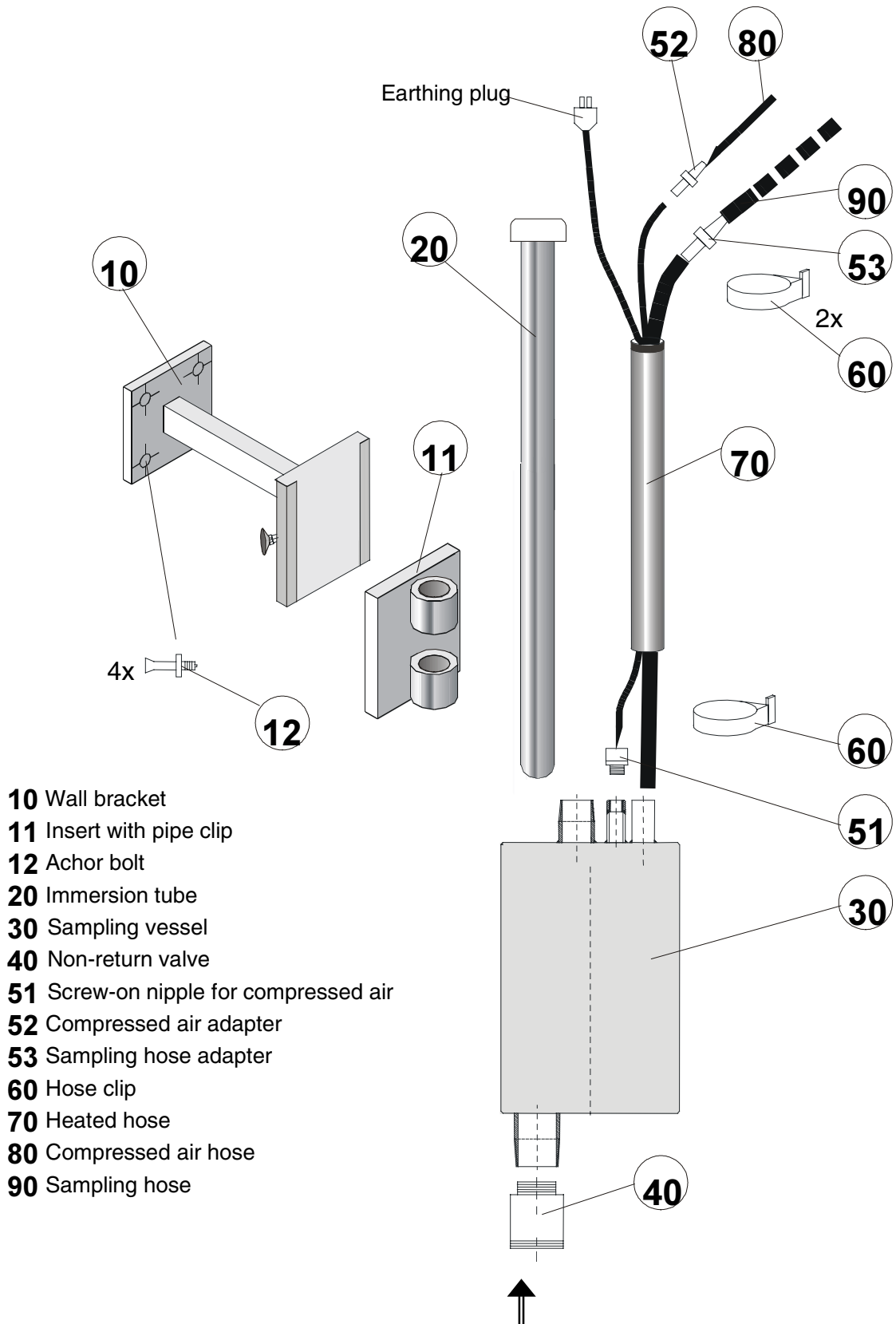


Note:

- Lay the connecting hoses along frost-free routes or provide auxiliary heater.
- The discharge must be free. Route discharge with gradient. No suction action should occur!



3.3.2 Installing the CA 30 sampling assembly



Installation instructions for CA 30

1. Attach screw-on nipple for compressed air connection (item 51 on page 14) to sampling vessel (seal thread with teflon tape).
2. Screw on non-return valve (item 40 on page 14) to sampling vessel (seal thread with teflon tape); make sure direction of flow is correct: from basin to interior of sampling vessel!
3. Screw immersion tube (item 20 on page 14) on sampling vessel (seal thread with teflon tape).
4. Connect heated hose (item 70 on page 14) to sampling vessel. Attach sampling hose using hose clip.
5. Mount ties for sampling and compressed air hoses (items 52+53 on page 14) on end of heated part.
6. Select sampling point on basin: the part of the basin which should be selected from a process aspect to take measurements.
7. Mount wall bracket (item 10 on page 14) to easily accessible point by means of anchor bolts (item 12): For drilling template, see page 11.
8. Attach insert and clips (item 11 on page 14) to immersion tube.
9. Insert sampling assembly in wall bracket.
10. Adjust immersion depth of sampling vessel so that top edge of vessel is 20cm below water surface (see also page 10).
11. Route compressed air and sampling hoses (items 80+90 on page 14) from basin edge to installation location of sedimentation unit and connect to connecting pieces (items 52+53). Either lay the hoses along frost-proof routes or install hose heating system (ready-to-operate systems are contained in the package depending on the version or they are available as accessories – see page 37).
12. Install power connection for heated hose within a area of 4 m from the tapping points.

4 Electrical connection

4.1 Signal outputs

4.1.1 Check message

Terminal strip X1 has a floating contact for linking to a higher-level process control system. The contact can be used as follows:

1. Ready-to-operate message:

The sedimentation unit its availability to the process control system. If the supply voltage fails or the PLC program is not running properly, the contact opens.

2. Group alarm:

In addition to the ready-to-operate message, the fault-signalling contacts of downstream analyzers can be connected to the control. The sedimentation unit then generates a group alarm: As soon as a live analyzer signals a fault or enters one of the state listed above, the contact opens. (The **alarm signal** on the **analyzers** must be set up as **working current!**).

4.1.2 Communication with analyzers

The control unit provides the following signals to communicate with the downstream analyzers:

- Control voltage (+24V / OV)
- 'No sample' (start signal for analyzer)
- 'Measurement 2' (measured value assignment on 2-channel version)

4.1.3 Optional inputs and outputs

1. Input 'Start delay':

In conjunction with special software versions, you can default an external start delay for the sedimentation cycle by means of an analogue signal (0-10V).

2. Output 'Pump start':

In conjunction with special software versions, you can tap a start signal from the control unit to control external pumps or valves to fill the sedimentation cylinder in the bypass of a pressure line.

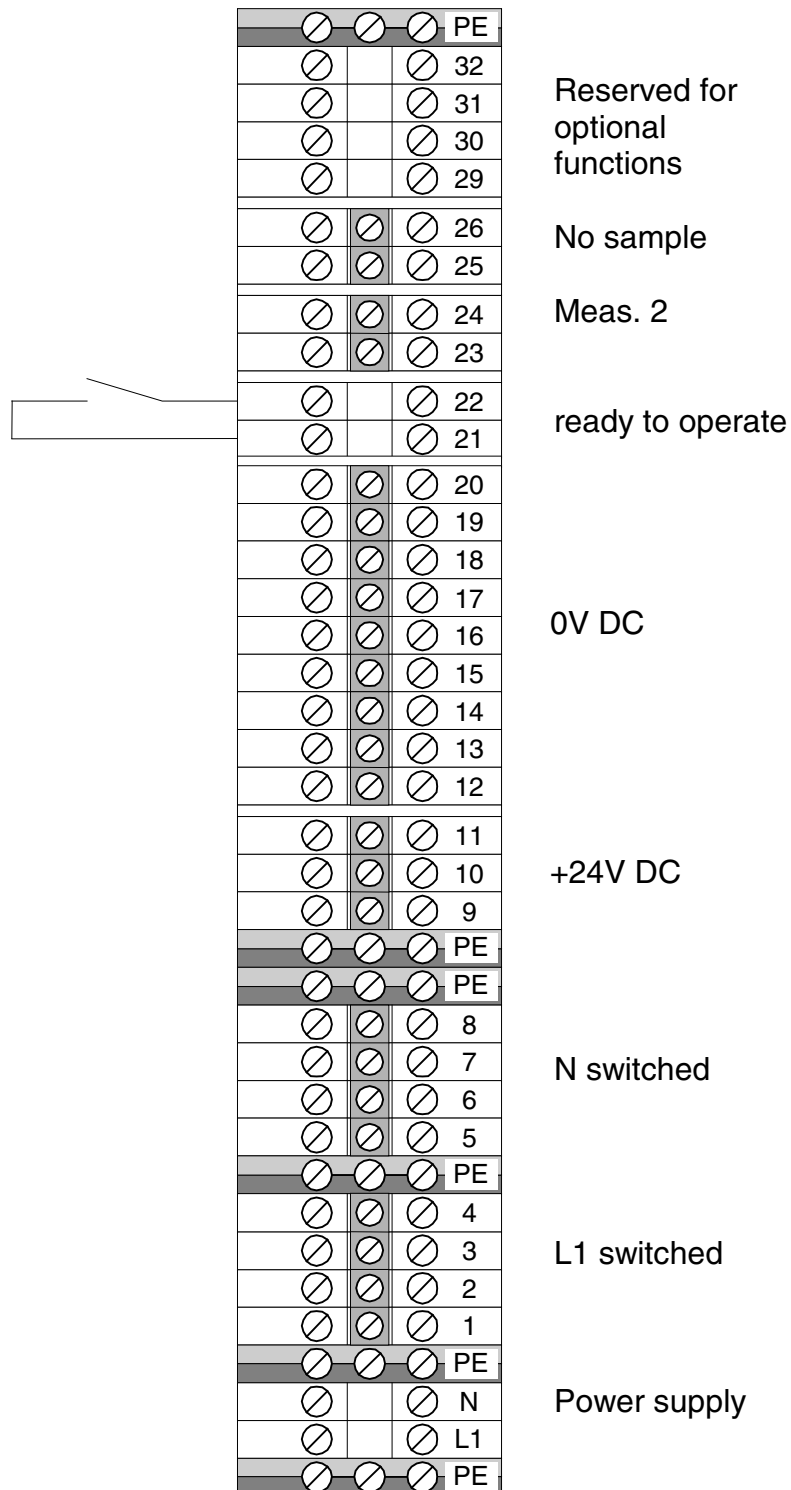
4.1.4 Relay functions

In the standard version, there are 2 relays in the control cabinet. They have the following functions:

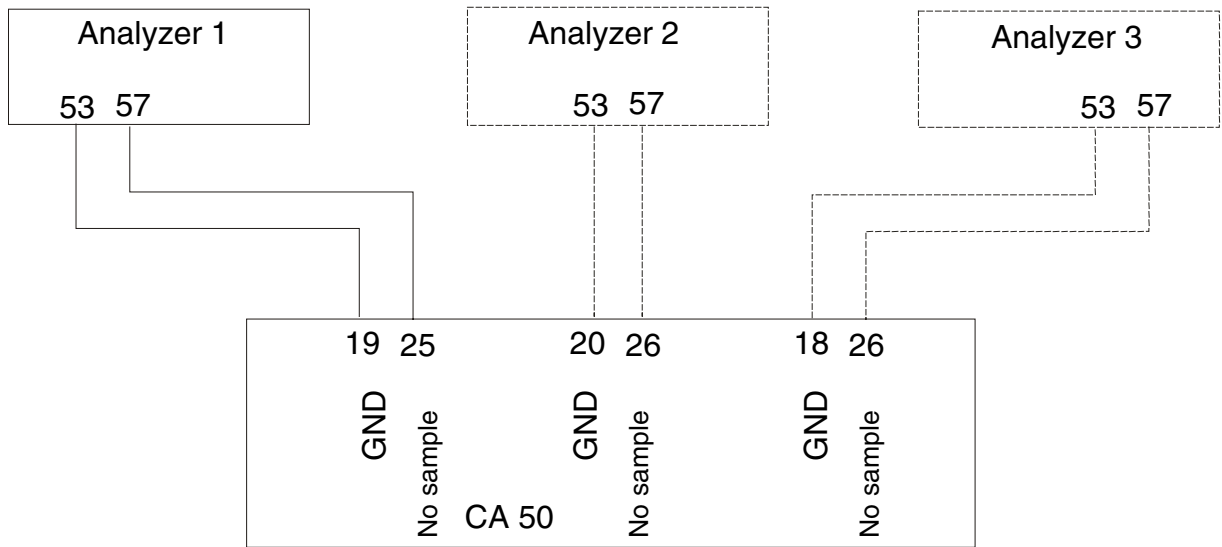
Relay	Function
K1	Compressor on
K2	Ready to operate (group alarm)

The relays are equipped with indicators which display the switching state clearly.

4.2 Pin assignment

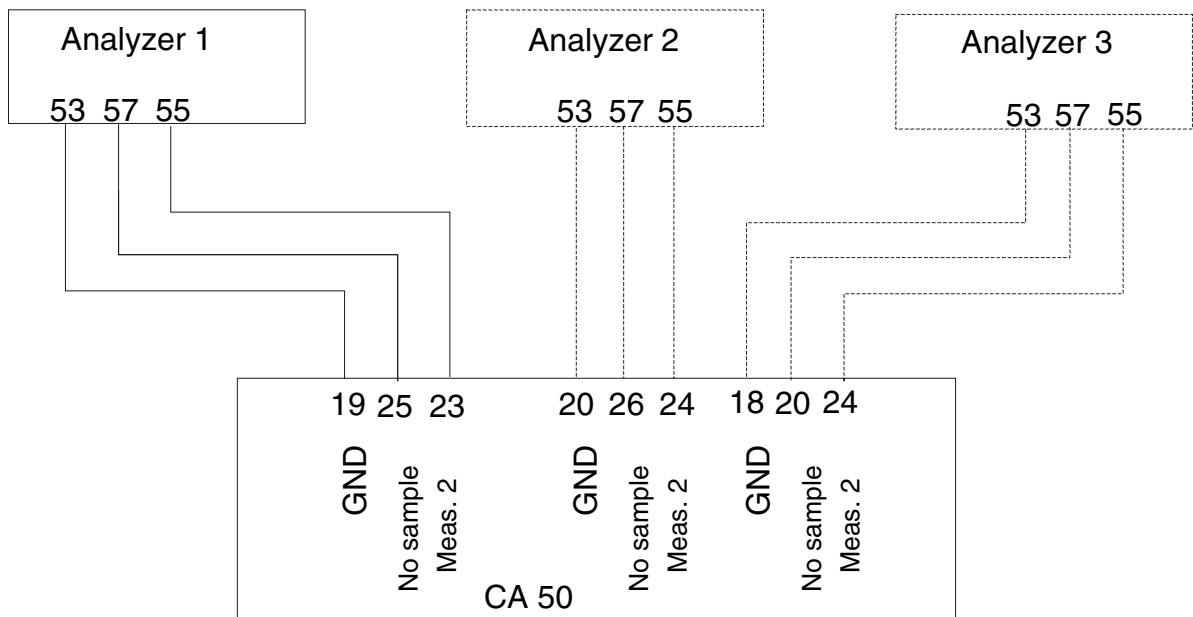


4.3 Connection from CA 50 1-channel to analyzer



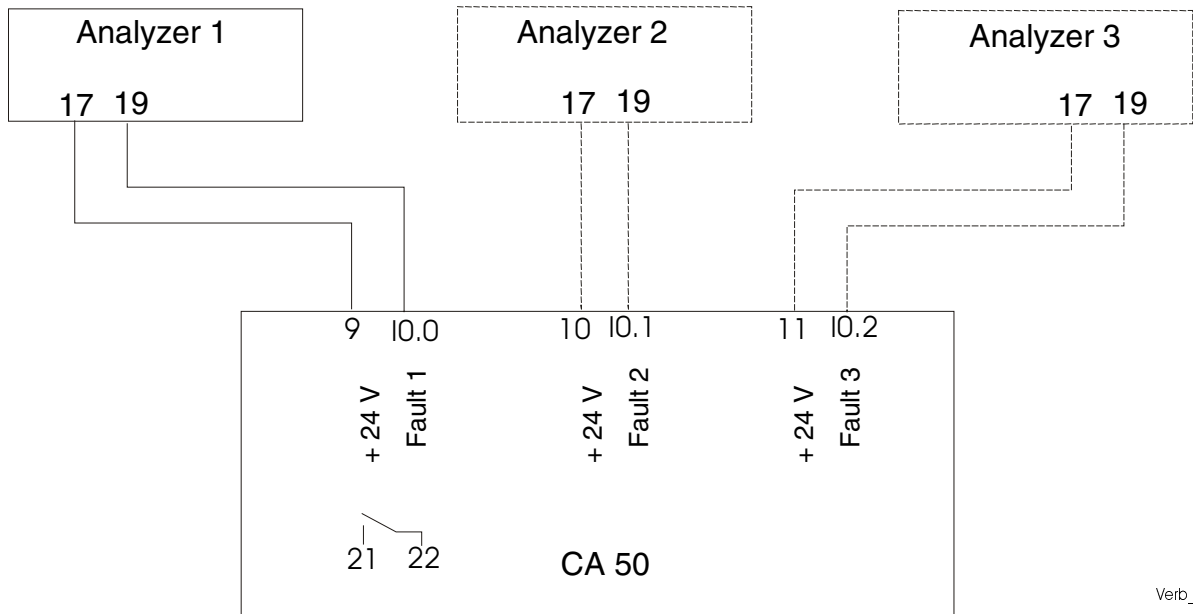
Verb_Sed12

4.4 Connection from CA 50 2-channel to analyzer



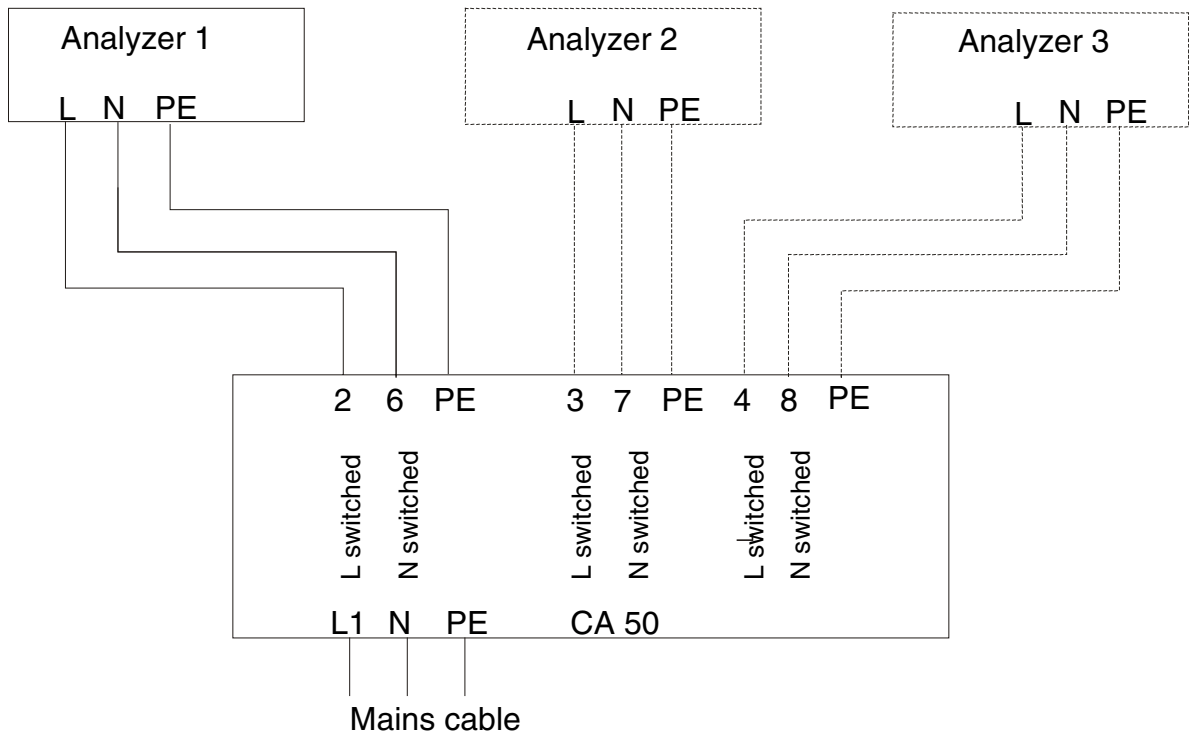
Verb_Sed12

4.5 Connections to generate group alarm



Verb_Sediz

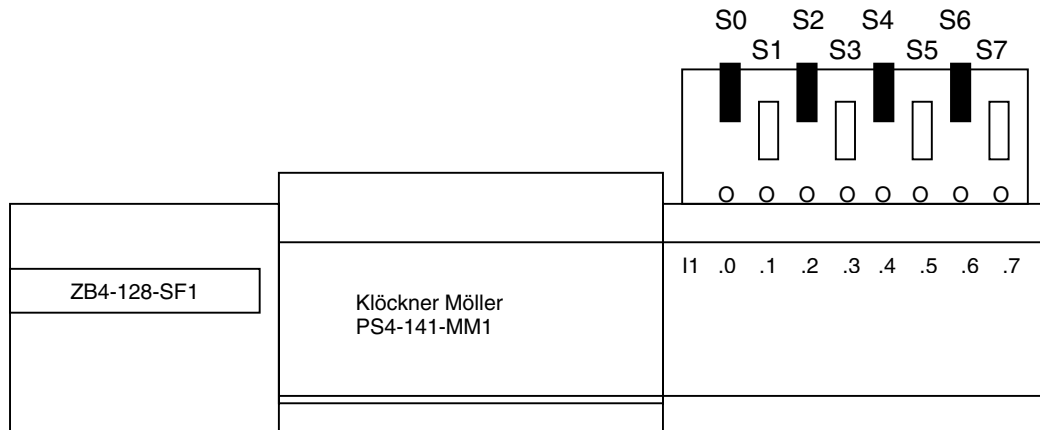
4.6 Mains connection of analyzer via CA 50



Verb_Sediz

4.7 Control switch

A switch module is installed in the control cabinet in the right-hand input module of the PLC. Here you can control any channel separately without using an operator terminal and execute all functions manually. The active switches are indicated by LEDs on the PLC inputs.



Switch	Function	Remark
S0	Channel 1 active	Switch on for automatic mode
S1	Channel 2 active	
S2	Piston up	Manual mode Function only when S0 and S1 are off
S3	Piston down	
S4	Rinse	
S5	Blow out	
S6	Start measurement	
S7	Switch over to channel 2*	

* if off, channel 1 is preselected



Note:

- In manual mode there is no safety interlock.
- Only switch a channel on when the control unit is off!
- Automatic mode always has priority, i.e. when switches S0 and/or S1 are active, the switch positions S2 to S7 are not considered.

5 Start-up



Warning!

- Before connecting the instrument, ensure that the mains supply complies with the ratings specified on the nameplate.
- Before switching on the system check all the connections again for correctness.

To start up, proceed as follows:

1. Switch instrument on.
2. In manual mode make a function check of each function and signal output.
3. In manual mode determine and save all the necessary operating parameters (see Parameter entry on page 26): Fill vessel, Rinse time, Sedi(mentation) pause, Suction time.
4. Define parameters and operating data.
5. Start and check automatic mode (enable channels with control switches and start automatic mode on operator terminal).



Note:

- For manual mode please refer to the notes on measuring interval on page 25.

6 Operation

An operator terminal is provided for the purpose of setting up and controlling system functions in the sedimentation unit. It is either integrated in the instrument (instrument version CA 50 –xxxB) or can be connected to the set-up interface.

Operator errors are avoided by the software plausibility checks. The function keys are assigned check LEDs to indicate operating states clearly and quickly.

6.1 Key functions



Select the various operating modes by pressing the function keys. You can select functions F1, F2 or F5 directly.

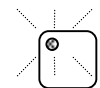
When you select an active operating mode, it resets it to initial state.



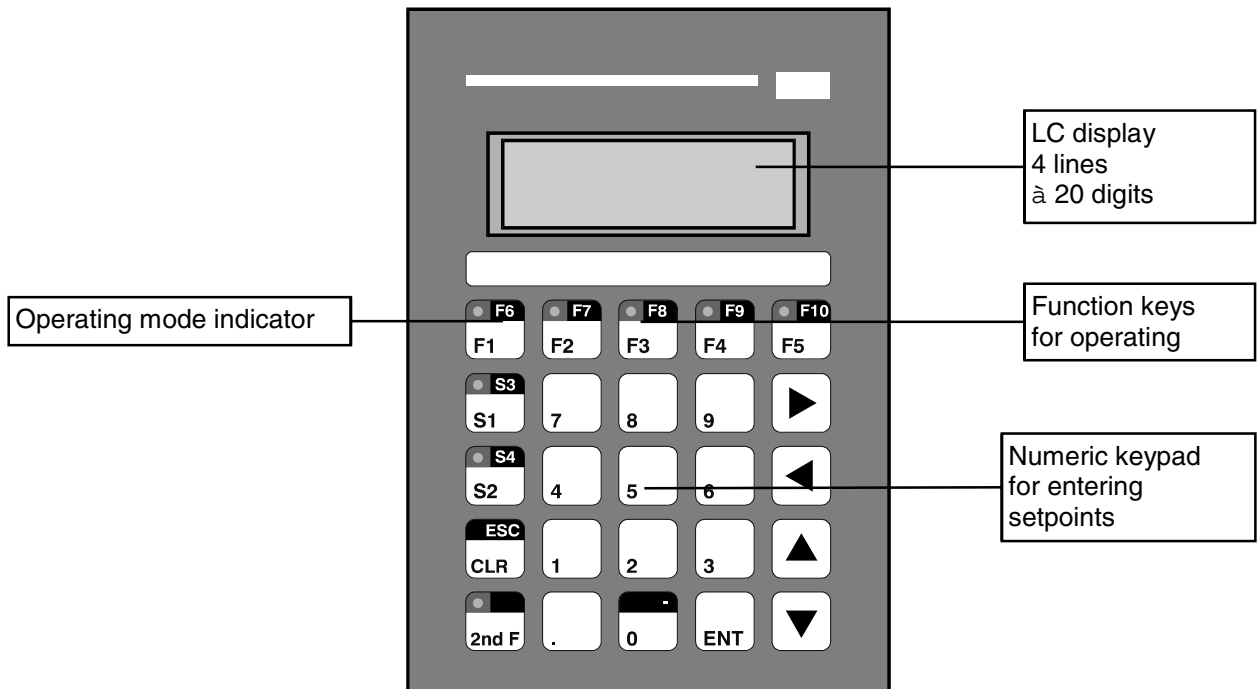
Switch on Edit mode (setpoint input) on and off for setting up.



To select Functions F6, F7 or F10 first press the Shift key and its LED comes on.
















The indicator LEDs come on permanently for operating modes F1 to F5 and flash for operating modes F6 to F10.



6.2 Keypad short overview

Manual mode

- | | |
|---|--|
|  Compressor on |  Cylinder up |
|  S1 | |
|  Preselect measurement 1-2 |  Cylinder down |
|  S2 | |
|  Rinse |  Channel 2 active |
|  CLR | |
|  Start measurement |  Channel 1 active |
|  Blow out | |
|  0 | |

Automatic mode

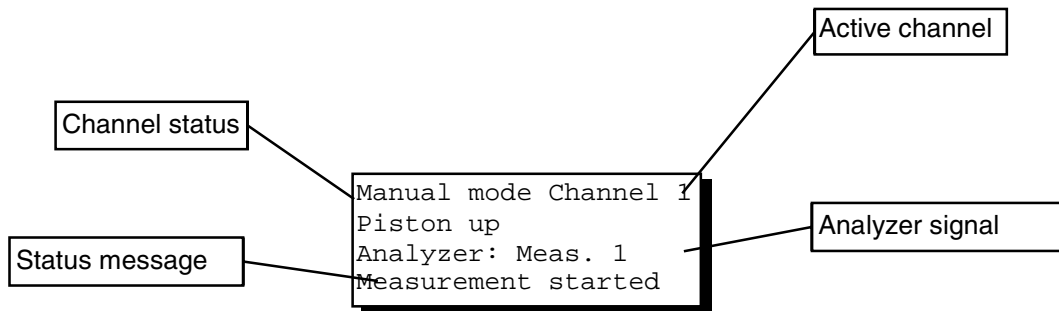
Measured value

... **Parameter entry 1 - 3**

- | | |
|--|--|
|  Switch on setpoint input or cancel |  Select next variable |
|  Accept new value |  Select previous variable |

About manufacturer

6.3 Manual mode



Switch over the control depending on the sedimentation cylinder you require. It is not possible to control Channels 1 and 2 at the same time. You can also preselect the measurement for the analyzer, e.g. for signal test. A complete automatic mode can be simulated in a single step in this way. Whereas piston movement and measurement start signal are executed as often as the key is pressed, the Rinsing function must be switched off every time. The compressor switches off automatically when a valve is controlled. Manual switch-on is also possible.



Note:

- In manual mode there is no safety interlock.



Piston up



Piston down



Rinse piping system



Channel 2 active



Channel 1 active



Compressor on. The indicator in the key comes on.



Activate measurement 2 of the analyzer. The indicator in the key flashes.

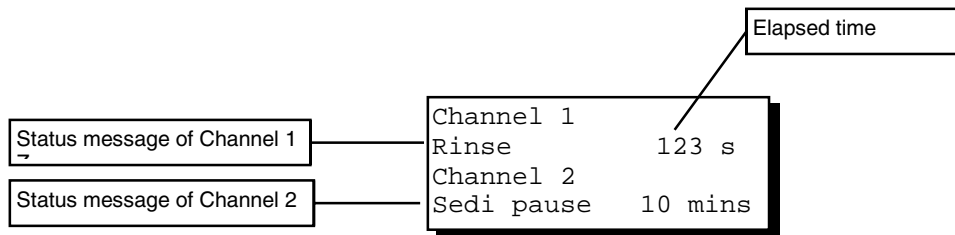


Start measurement



Blow out (to clean sintering filter)

6.4 Automatic mode



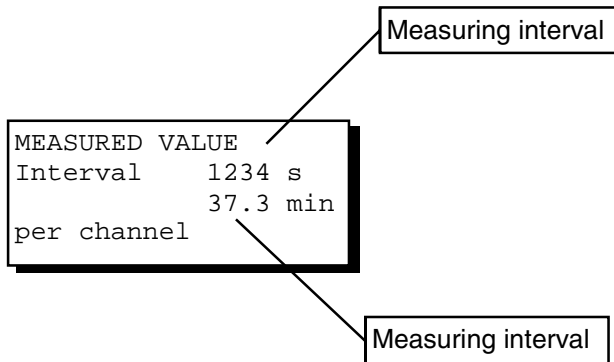
The control program is executed as specified in the set-up. The elapsed time or executed functions are displayed.

No manual mode or switching is possible.

6.5 Measured value



Here, the measuring interval, i.e. the measured value update, is displayed in automatic mode for each channel depending on the parameters entered.



Note:

To ensure the correct program flow, check the following settings:

- The interval time must be greater than the measuring cycle of the downstream analyzer. In 2-channel mode the interval time must also be greater than the complete process time of 'slowest' analyzer (= pre-rinse time+pauses+response time).
- If necessary, increase the length of the 'sedi(mentation) pause'.

6.6 Parameter entry

All the parameters are stored holding on supply failure in a flash EPROM of the PLC. No battery change is required. The parameters are determined and checked in manual mode.

6.6.1 Parameter entry



Fill vessel

Waiting time to fill sampling vessel in basin to a sufficient level. When the sampling vessel is filled, air escapes through the "Rinse" valve and causes a low hiss.

Adjustment:

In manual mode empty the vessel completely using the "Rinse" (ESC) function. Then measure the time until there is no hiss audible at the vent valve.

Adjustment range	1 - 999 seconds
-------------------------	-----------------

SET-UP 1
Fill vessel xxx s
Rinse time xxx s
Rinse cycles x
Sedi pause xxx m
Suction time xxx s
Blow out x s
Empty vessel xx s
Piston up x.x s

Rinse time

To obtain correct measured values, rinse the piping system and the sampling vessel (blow out with compressed air) until all the residual water flows past the sedimentation cylinder. Depending on the distance from the sampling vessel to the sedimentation cylinder.

Adjustment:

In manual mode activate the "Rinse" function (ESC) when the sampling vessel is full and measure the time until air comes through the feed hose.

Adjustment range	1 - 999 seconds
-------------------------	-----------------

SET-UP 1
Fill vessel xxx s
Rinse time xxx s
Rinse cycles x
Sedi pause xxx m
Suction time xxx s
Blow out x s
Empty vessel xx s
Piston up x.x s

Rinse cycles

Number of rinse cycles needed to empty the piping system. Depending on the distance from the sampling vessel to the sedimentation cylinder.

Adjustment range	1 - 9
Default	1

SET-UP 1
Fill vessel xxx s
Rinse time xxx s
Rinse cycles x
Sedi pause xxx m
Suction time xxx s
Blow out x s
Empty vessel xx s
Piston up x.x s

Sedi pause

Sedimentation pause in sedimentation cylinder to permit a sufficiently large zone of clear water to form in the vicinity of the sintering filter. Dependent on settling behaviour of the sludge.

Adjustment:

In manual mode fill the sample completely using the "Rinse" function (ESC). Measure the time until there is a clear water zone under the sintering filter. Add a sufficient safety margin to the measured time to avoid excessive loading of the sintering filter when settling behaviour is poor.

SET-UP 1	
Fill vessel	xxx s
Rinse time	xxx s
Rinse cycles	x
Sedi pause	xxx m
Suction time	xxx s
Blow out	x s
Empty vessel	xx s
Piston up	x.x s



Note:

- 2-channel version: If settling behaviour is good, the cycle of the two channels may be shorter than the process time of the analyzers. In this case the sedi(mentation) pause should be artificially prolonged (a repeated start signal may only occur when all the downstream analyzers have generated the last measured value).

Adjustment range	1 - 999 minutes
-------------------------	-----------------

Suction time

Time which the analyzer requires to draw in the sample from the sedimentation cylinder in order to pre-rinse the photometer. Dependent on the "Take sample" time configured in the analyzer.

Adjustment:

In manual mode activate "Start measurement" function (ENTER). Measure suction time of analyzer (time from which both pumps in the analyzer become idle and the response time starts running).

SET-UP 1	
Fill vessel	xxx s
Rinse time	xxx s
Rinse cycles	x
Sedi pause	xxx m
Suction time	xxx s
Blower free	x s
Empty vessel	xx s
Piston up	x.x s



Note:

- If the 'Take sample' parameter is changed in the analyzer, the 'Suction time' must also be adapted in the sedimentation unit.

Adjustment range	1 - 999 seconds
Default	240 s

Blow out

A valve is controlled in order to control the sampling connection and the sintering filter with compressed air.

Adjustment range	0 - 9 seconds
Default	3 s

```

SET-UP 1
Fill vessel   xxx s
Rinse time   xxx s
Rinse cycles  x
Sedi pause   xxx m
Suction time xxx s
Blow out     x s
Empty vessel  xx s
Piston up    x.x s
    
```

Empty vessel

To prevent water from rising in the compressed air line when the sedimentation cylinder is emptied, the sampling vessel can first be partly emptied. The sampling vessel need not be completely emptied (this shortens the cycle time!).

Adjustment:
approx. 1/2 to 2/3 of the 'Rinse' parameter

Adjustment range	0 – 99 seconds
-------------------------	----------------

```

SET-UP 1
Fill vessel   xxx s
Rinse time   xxx s
Rinse cycles  x
Sedi pause   xxx m
Suction time xxx s
Blow out     x s
Empty vessel  xx s
Piston up    x.x s
    
```

Piston up

Time the piston needs to move from the lower to the upper stop.

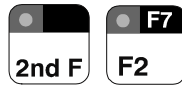
Adjustment:
In manual mode move the piston to the lower stop using the "Cylinder down" function. Press the "Piston up" key and measure the time the piston takes to reach the upper stop.

Adjustment range	1.0 – 99.9 s
Default	8.0 seconds

```

SET-UP 1
Fill vessel   xxx s
Rinse time   xxx s
Rinse cycle   x
Sedi pause   xxx m
Suction time xxx s
Blow out     x s
Empty vessel  xx s
Piston up    x.x s
    
```

6.6.2 Parameter entry 2



Channel 1

Enable or disable Channel 1 (left sedimentation cylinder).

Code	Function
0	Channel disabled
1	Channel enabled

SET-UP 2	
Channel 1	x
Channel 2	x
Reverse meas.	x

Channel 2

Enable or disable Channel 2 (right sedimentation cylinder).

Code	Function
0	Channel disabled
1	Channel enabled

SET-UP 2	
Channel 1	x
Channel 2	x
Reverse meas.	x

Reverse measurement

To optimise the assignment of analyzer measured values, measurement 2 can be assigned to Channel 1 and vice versa. In this way, measurement 2 can always refer to basin 2 and measurement 1 to basin 1.

Code	Function	Assignment
0	Default meas.	Channel 1 - Meas. 1
1	Reverse meas.	Channel 1 - Meas. 2

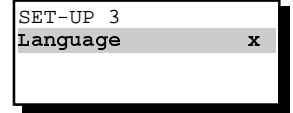
SET-UP 2	
Channel 1	x
Channel 2	x
Reverse meas.	x

6.6.3 Parameter entry 3



Language

Setting the language for the menu texts

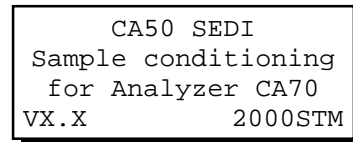
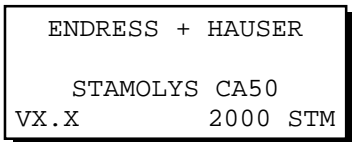


Code	Function
0	German
1	English

6.7 About manufacturer



The About manufacturer screen is displayed:






6.8 Functional description

The display shows various status messages depending on the operating mode and the operating state. They inform you about the current state of the control unit.

Display text	Explanation
Analyzer : Meas. 1	Next measurement in manual mode is sent on Channel 1
Analyzer : Meas.2	Next measurement in manual mode is sent on Channel 2
Blow out xxx s	The cleaning valve is controlled and the sintering filter is cleaned
Fill vessel xxx s	Remainder of fill time of sampling vessel in automatic mode
Piston down	Sedimentation cylinder piston moves down
Piston up	Sedimentation cylinder piston moves up
Rinse pipe	Piping system is rinsed, i.e. blown out with compressed air
Start measurement	Measurement is started; sample is drawn into photometer
Start measurement	Measurement is started in automatic mode
Not active	Associated channel in automatic mode off
Normalisation	Pistons move up after power supply is switched on
Take sample 123 s	Remainder of time to take in sample into photometer in automatic mode
Sedi pause 123 m	Remainder of time of sedi(mentation) pause in automatic mode
Rinse 123 s	Remainder of rinse time in automatic mode
Start delay 123 s	Remainder of start delay for Channel 2 in automatic mode
Empty vessel	Sampling vessel in basin is empties (protection of pneumatic line)
Fill cyl. 123 s	Remainder of fill time of sedimentation cylinder in automatic mode


6.9 Programming example

 Change rinse time to 40 seconds

  Select Parameter entry 1
Key indicator flashes


Example display

```
SET-UP 1
Fill vessel 123 s
Rinse time 20 s
Rinse cycles 1
```

 Confirm to select variable

```
SET-UP 1
Fill vessel 123 s
Rinse time 20 s
Rinse cycles 1
```

last digit flashes _

 Edit mode (setpoint input)
Enable

```
SET-UP 1
Fill vessel 123 s
Rinse time 20 s
Rinse cycles 1
```



last digit flashes █

  Entering new figures

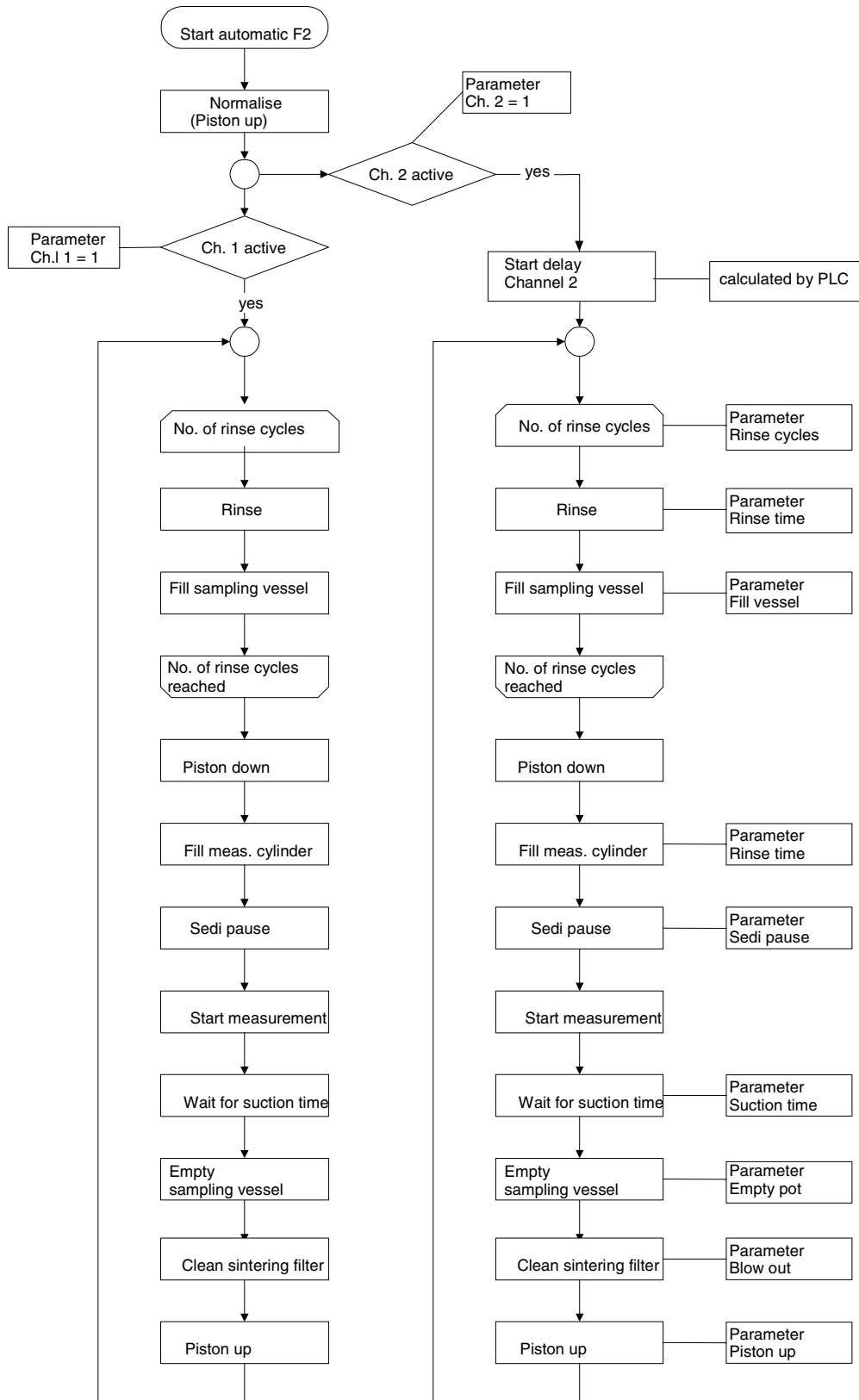
 Confirm input

```
SET-UP 1
Fill vessel 123 s
Rinse time 40 s
Rinse cycles 1
```

New value is displayed

  Select other set-up options

7 Program flowchart



8 Maintenance

8.1 Maintenance and spare parts

8.1.1 Maintenance kits

Maintenance kit CA 50-1C 3 months (Order No. 51503030)

Contains cleaner for 1-channel version with up to 3 analyzers connected which are required three times a year; this includes:

- 1 bottle concentrated cleaner, acid
- 1 bottle concentrated cleaner, alkaline

Maintenance kit CA 50-1A 12 months (Order No. 51503031)

Contains wear parts for 1-channel version with 1 analyzer connected which is required once a year; this includes:

- 1 bottle concentrated cleaner, acid
- 1 bottle concentrated cleaner, alkaline
- 1 sintering filter (see page 36 / Item 200)
- 1 set of connecting nipples for valves
- 0.2m permeate hose

Maintenance kit CA 50-1B 12 months (Order No. 51503033)

Contains wear parts for 1-channel version with 2 analyzers connected which is required once a year; this includes:

- 1 bottle concentrated cleaner, acid
- 1 bottle concentrated cleaner, alkaline
- 2 sintering filter (see page 36 / item 200)
- 2 set of connecting nipples for valves
- 0.4m permeate hose

Maintenance kit CA 50-1C 12 months (Order No. 51503034)

Contains wear parts for 1-channel version with 3 analyzers connected which is required once a year; this includes:

- 1 bottle concentrated cleaner, acid
- 1 bottle concentrated cleaner, alkaline
- 3 sintering filter (see page 36 / item 200)
- 3 set of connecting nipples for valves
- 0.6m permeate hose

Maintenance kit CA 50-2C 3 months (Order No. 51503035)

Contains wear parts for 2-channel version with up to 3 analyzers connected which are required three times a year; this includes:

- 2 bottles of concentrated cleaner, acid
- 2 bottle of concentrated cleaner, alkaline

Maintenance kit CA 50-2A 12 months (Order No. 51503036)

Contains wear parts for 2-channel version with 1 analyzers connected analyzer which is required once a year; this includes:

- 2 bottles of concentrated cleaner, acid
- 2 bottle of concentrated cleaner, alkaline
- 2 sintering filter (see page 36 / item 200)
- 2 set of connecting nipples for valves
- 0.6m permeate hose

Maintenance kit CA 50-2B 12 months (Order No. 51503037)

Contains wear parts for 2-channel version with 2 analyzers connected which is required once a year; this includes:

- 2 bottles of concentrated cleaner, acid
- 2 bottle of concentrated cleaner, alkaline
- 4 sintering filter (see page 36 / item 200)
- 4 set of connecting nipples for valves
- 0.8m permeate hose

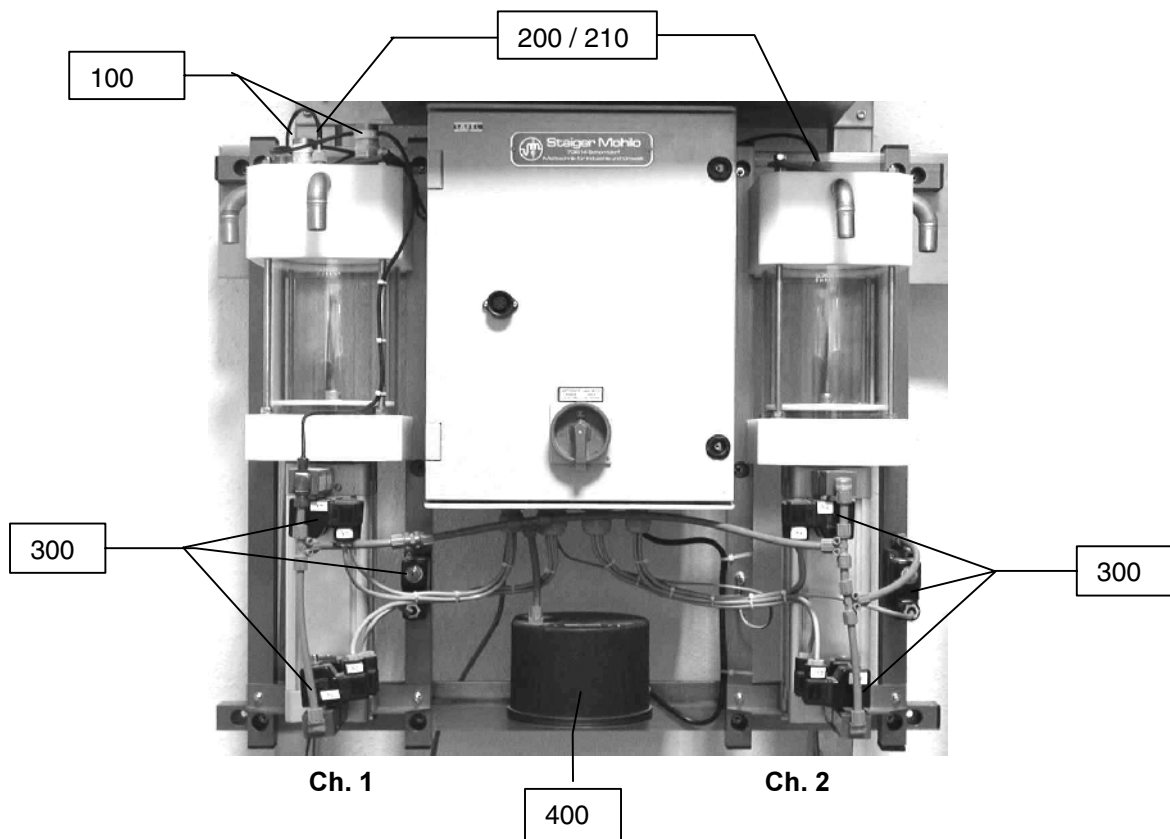
Maintenance kit CA 50-2C 12 months (Order No. 51503038)

Contains wear parts for 2-channel version with up to 3 analyzers connected which is required once a year; this includes:

- 2 bottles of concentrated cleaner, acid
- 2 bottles of concentrated cleaner, alkaline
- 6 sintering filters (see page 36 / item 200)
- 6 sets of connecting nipples for valves
- 1.2m permeate hose

⇒ For order form, see Chapter 11

8.1.2 Spare parts kits



Item	Description
100	Sampling valve, 3-way 24V DC
200	Sintering filter
210	Cover with insert for sintering filter
300	Compressed air valve with 24V DC coil
400	Compressor

Spare parts kit for CA 30 unheated hose 5m (Order No. 51503212)

Contains 5m unheated hose for conveying sample

- Sampling hose ID19mm
- Compressed air hose 6mm
- Hose clips

Spare parts kit for CA 30 unheated hose 15m (Order No. 51503213)

Contains 15m unheated hose for conveying sample

- Sampling hose ID19mm
- Compressed air hose 6mm
- Hose clips

Spare parts kit for CA 30 unheated hose 30m (Order No. 51503214)**Contains 30m unheated hose for conveying sample**

- Sampling hose ID19mm
- Compressed air hose 6mm
- Hose clips

Spare parts kit for CA 30 heated hose 2m (Order No. 51503215)**Contains 2m heated hose for conveying sample (see page 14 / item70)**

- Sampling hose ID19mm
- Compressed air hose 6mm
- Hose clips

Spare parts kit for CA 30 heated hose 5m (Order No. 51503216)**Contains 5m heated hose for conveying sample**

- Sampling hose ID19mm
- Compressed air hose 6mm
- Hose clips

Spare parts kit for CA 30 heated hose 15m (Order No. 51503217)**Contains 15m heated hose for conveying sample**

- Sampling hose ID19mm
- Compressed air hose 6mm
- Hose clips

Spare parts kit for CA 30 heated hose 30m (Order No. 51503218)**Contains 30m heated hose for conveying sample**

- Sampling hose ID19mm
- Compressed air hose 6mm
- Hose clips

Spare parts kit for CA 30 hose couplings (Order No. 51503219)**contains a coupling set for conveying sample**

- 1 coupling for sampling hose (see page 14 / item 53)
- 1 coupling for compressed air hose (see page 14 / item 52)
- 1 connection for sampling vessel (see page 14 / item 51)
- Hose clips

Spare parts kit for CA 30 non-return valve (Order No. 51503220)**Contains a non-return valve:**

- 1 non-return valve (see page 14 / item 40)

Spare parts kit for CA 50 compressed air valve (Order No. 51503221)**Contains a compressed air valve**

- 1 compressed air valve and coil (see page 36 / item 300)
- 2 compressed air connection ties

Spare parts kit for CA 50 compressor (Order No. 51503222)**Contains a compressor:**

- 1 compressor (see page 36 / item 400)

Spare parts kit for CA 50 sampling valve (Order No. 51503223)**Contains a sampling valve:**

- 1 sampling valve (see page 36 / item 100)
- 1 set of connecting nipples

Spare parts kit for CA 50 sintering filter (Order No. 51503224)**Contains a sintering filter:**

- 1 sintering filter (see page 36 / item 200)

Spare parts kit for CA 50 cover of sedimentation vessel (Order No. 51503225)**Contains a cover with insert for sintering filter**

- 1 cover (see page 36 / item 210)
- 3 sealing inserts for sintering filter
- 2 blind caps

⇒ For order form, see Chapter 11

8.2 Maintenance plan

Caution:

- Parts made of POM (top and bottom end pieces of cylinder and cover cap with sintering filter insert) are not acid-resistant and may only be cleaned using P3 Ultrasil!



Note:

- By concluding a maintenance contract you can increase operational reliability and prolong the warranty period for one year. Contact our field sales service!

8.2.1 Weekly cleaning

Rinse through sampling lines to the analyzers and sintering filters:

1. Disable automatic mode on analyzer and sedimentation unit.
2. Disconnect sampling line to analyzer at sedimentation unit valve and analyzer inlet.
3. Dilute alkaline cleaning solution (P3 Ultrasil) in ratio 1:20 with hot water 40-50°C
4. Rinse through line running from analyzer to sedimentation unit with cleaning agent. Flush in both directions several times and allow to soak in. (At the same time, we recommend cleaning the analyzer – see Operating Instructions of CA 70).
5. Fill cleaning agent in sedimentation unit valve until solution flows out of sintering filter . Flush in both directions several times and leave to soak in.
6. On 2-channel version: Switch instrument to Channel 2 and repeat Step 6.
7. Rinse through hose system at both ends with hot water under pressure (disposable syringe).
8. Restart Auto mode on analyzer and sedimentation unit.

8.2.2 Servicing every 2 to 4 weeks

1. Remove sintering filter. Slacken knurled nut from lock and lift of to the front.
2. Remove cover and sintering filter insert (prise off with blunt object).
3. Place sintering filter in hot cleaning solution (P3 Ultrasil) then rinse through with hot water under pressure (in opposite direction of flow) and replace.
4. If necessary, clean non-return ball valve (check fill volume).



Note:

- Replacement locks are available in single units. This allows you to place removed filters in a cleaning bath for long period of time while continuing measurements with the second set of filters.

8.2.3 Servicing as required

- ⇒ Rinse sampling and compressed air lines to sampling vessel and discharge line on sedimentation cylinder
- ⇒ Replace sealing ring on sedimentation cylinder depending on wear.



Note:

- Shorten the servicing intervals if the SS content is high or if settling behaviour is poor!

8.2.4 Servicing every three months

Every three months, service the complete system using the maintenance kits for 3 months (for maintenance kit, see page 34).

8.2.5 Annual servicing

Every year, service the complete system using the maintenance kit for 12 months (for maintenance kit, see page 34).

8.2.6 Withdrawal from service

Caution:

- Before withdrawing the instrument from service, thoroughly rinse all the lines of the measuring system with clean water to prevent dissolved substances from drying on!

To withdraw the sedimentation unit from service, proceed as follows:

- Fill sampling lines to analyzers with cleaning solution. Allow to soak in and then rinse with clean water.
- Filling with pump or pressure pipe system with bypass: Switch off pump or close feed valve.
- In manual mode move (both) pistons up (see page 24), switch off main switch.
- Rinse through sintering filter with cleaning syringe.

9 Troubleshooting

Fault	Cause	Remedial action
Automatic mode fails to start or Program stops in automatic mode	Main switch off	Switch instrument on at main switch
	No mains or control voltage	Open control cabinet and check whether yellow LEDs are on on power supply unit: <ul style="list-style-type: none"> • No LED on: Check power supply One LED on: Check fine-wire fuse on power supply unit
	Control switch set to manual mode	Open control cabinet and: <ul style="list-style-type: none"> • Press switch S0 on 1-channel version • Press switches S0 + S1 on 2-channel version
	Disabled by operator terminal	If the optional operator terminal is connected: Key F2 on operator terminal must be activated. "Auto mode" must appear in LCD
	Disabled by analyzer	If analyzer fault-signalling contacts are routed via sedimentation unit: At least 1 analyzer is signalling a fault. Remedy fault on analyzer
Piston moves up and down but cylinder does not fill	Non-return valve blocked	Take sampling vessel out of water, unscrew non-return valve and clean
	Non-return valve mounted incorrectly	Check direction of flow: direction of flow must always be from basin to interior of sampling vessel
	Sample or compressed air line frozen	Make sure that lines are protected from frost along entire route and support heaters are switched on
	Leak in air line	Check line and connections
Cylinder only partly full	Rinse time too short	Check rinse time; if necessary modify in parameter entry menu (see page 26)
	Compressor supplies insufficient pressure	Replace compressor
	Non-return valve starts to block	Remove sampling vessel from basin and clean non-return valve
Old sample is withdrawn from discharge line when piston moves down	Discharge blocked	Free discharge
Sample stream to feed does not stop although sedimentation pause starts	Sedimentation unit wrongly installed	The installation height of the sedimentation unit must not be lower than the water level
	Siphoning effect	Discharge blocked; clear discharge

Fault	Cause	Remedial action
Sludge splashes out of vent valve	Sampling vessel mounted incorrectly	Sampling vessel immersed too deep: mount higher so that top edge of vessel is 20cm below water level
	Sedimentation unit wrongly installed	The installation height of the sedimentation unit must not be lower than the water level
Analyzer fails to start	No enable signal	Check control lines to analyzer
Analyzer only starts with second measurement	Analyzer process time is greater than interval time of sedimentation unit	Modify Sedi pause (see page 26f)
	No enable signal since channel is inactive	Activate channel with control switches (see page 20) and if operator terminal connected, activate automatic mode by pressing F2
Shortly before end of suction time, there are still air bubbles in the feed line to the analyzer	Sintering filter blocked	Clean or replace sintering filter
	Valve blocked or defective	Rinse or replace valve
POM parts are porous	Effect of acid	Parts were cleaned with acid cleaner or have come into contact with acid: replace affected part
'Battery' indicator on PLC comes on	No fault	The instrument does not require a battery since all parameters are stored holding on supply failure in a flash EPROM of the PLC.

In case of any other queries, please contact the E+H sales centre responsible for your region (see back page of these Operating Instructions for addresses).

10 Technical Data

General specifications

Manufacturer	Endress+Hauser
Equipment name	StamoLys Sedimentation Unit CA 50

Physical data

Dimensions of 1-channel instrument (h x w x d)	720 x 690 x 300 mm
Dimensions of 2-channel instrument (h x w x d)	720 x 870 x 300 mm
Weight of 1-channel instrument	approx. 28 kg
Weight of 2-channel instrument	approx. 44 kg
Sedimentation volume of glass cylinder	3100 ml / channel
Volume of sampling vessel CA30	6500 ml

Materials

Housing	Anodised aluminium
Settling cylinder	Glass cylinder Schott Duran®
Upper and lower clamping element, cover with sintering filter insert and piston	Polyoxymethylene POM (acetal resin) black
Feed and discharge	Stainless steel
Permeate hose	Norpren® ID 1.6
Sampling hose	Fabric hose Griflex ID 19x4

Process connection

Size of sampling and discharge hoses	¾" (DN 20)
max. distance sampling point - analyzer	35 m
Discharge	Free discharge with min. 3% gradient
Compressed air hose	ID 6

Signal outputs

External use: Floating contact "ready to operate" or "Group alarm"	Contact rating: 230V / 3A
Internal communication to analyzer: Contact "no sample" Contact "measurement 1/2"	Start signal for up to 3 analyzers Measuring point assignment for up to 3 analyzers

Electrical data

Power supply	115V AC / 230V AC, 50/60 Hz
Power consumption	150 VA
Current drain	0.65 A

Ambient conditions

Temperature	5...40°C
Protection class	IP 54

Maintenance

Cleaning interval	1-2 weeks (dependent on sludge consistency)
Servicing requirements	15 – 30 min/week (dep. on model)
Maintenance interval	3 months

Supplementary documentation

Technical Information CA 70 AM	Order No.: 51502581
Technical Information CA 70 NI	Order No.: 51502639
Technical Information CA 70 PH	Order No.: 51502641

Subject to modifications.

11 Forms

11.1 Maintenance plan of Sedimentation Unit CA 50

Instrument no.

Weekly

⇒ Rinse through sampling lines to analyzers and valve with water under pressure (disposable syringe)

done	Wk 1	Wk 2	Wk 3	Wk 4	Wk 5	Wk 6	Wk 7	Wk 8	Wk 9	Wk 10	Wk 11	Wk 12
Date												
done	Wk 13	Wk 14	Wk 15	Wk 16	Wk 17	Wk 18	Wk 19	Wk 20	Wk 21	Wk 22	Wk 23	Wk 24
Date												
done	Wk 25	Wk 26	Wk 27	Wk 28	Wk 29	Wk 30	Wk 31	Wk 32	Wk 33	Wk 34	Wk 35	Wk 36
Date												
done	Wk 37	Wk 38	Wk 39	Wk 40	Wk 41	Wk 42	Wk 43	Wk 44	Wk 45	Wk 46	Wk 47	Wk 48
Date												
done	Wk 49	Wk 50	Wk 51	Wk 52	Wk 53							
Date												

Every 2-4 weeks (dependent on condition of sewage)

⇒ Remove sintering filter and place in cleaning solution
 ⇒ If necessary, clean non-return ball valve (check fill volume).

done	Week 1	Week 3	Week 5	Week 7	Week 9	Wk 11	Wk 13	Wk 15	Wk 17
Date									
done	Wk 19	Wk 21	Wk 23	Wk 25	Wk 27	Wk 29	Wk 31	Wk 33	Wk 35
Date									
done	Wk 37	Wk 39	Wk 41	Wk 43	Wk 45	Wk 47	Wk 49	Wk 51	Wk 53
Date									

If necessary

⇒ Rinse sampling and compressed air lines to sampling vessel and discharge line on sedimentation cylinder

done	Week	Week	Week	Week	Week	Week	Week	Week	Week
Date									



Note:

- Shorten the servicing intervals if the SS content is high or if sedimentation is poor!

11.2 Settings of Sedimentation Unit CA 50

Place: _____

Serial number: _____

Software Version: _____

Date: _____

1-Channel 2-Channel Sintering filter

Fill vessel: _____ s

Rinse time: _____ s

Rinse cycles: _____

SEDI pause: _____ min

Suction time: _____ s

Blow out: _____ s

Empty vessel: _____ s

Piston up _____ s

Cycle time: _____ min

Installation

Sensor extension tube _____ m

Sampling vessel _____ l

Hose length: per _____ m

Remarks: _____

11.3 Telefax Wear Parts Order

to (for address of your E+H representative see rear page)	from (Invoice address)
	Company:
	Subject:.....
	Address:
	Postcode/Town:.....
	Fax/ Tel:.....

Delivery address (if different from address above)

Company / Name:.....

Address /Postcode / Town:.....

Qty	Article	Name
	51503030	Maintenance kit CA 50-1C 3 months (for 1-ch. instr. with 1-3 analyzers)
	51503031	Maintenance kit CA 50-1A 12 months (for 1-ch. instr. with 1 analyzer)
	51503033	Maintenance kit CA 50-1B 12 months (for 1-ch. instr. with 2 analyzers)
	51503034	Maintenance kit CA 50-1C 12 months (for 1-ch. instr. with 3 analyzers)
	51503035	Maintenance kit CA 50-2C 3 months (for 2-ch. instr. with 1-3 analyzers)
	51503036	Maintenance kit CA 50-2A 12 months (for 2- ch. instr. with 1 analyzer)
	51503037	Maintenance kit CA 50-2B 12 months (for 2- ch. instr. with 2 analyzers)
	51503038	Maintenance kit CA 50-12 months (for 2- ch. instr. with 3 analyzers)

Qty	Article	Name
	51503212	Spare parts kit CA 30 hose, unheated 5m
	51503213	Spare parts kit CA 30 hose, unheated 15m
	51503214	Spare parts kit CA 30 hose, unheated 30m
	51503215	Spare parts kit CA 30 hose, heated 2m
	51503216	Spare parts kit CA 30 hose, heated 5m
	51503217	Spare parts kit CA 30 hose, heated 15m
	51503218	Spare parts kit CA 30 hose, heated 30m
	51503219	Spare parts kit CA 30 hose couplings
	51503220	Spare parts kit CA 50 non-return valve
	51503221	Spare parts kit CA 50 compressed air valve
	51503222	Spare parts kit CA 50 compressor
	51503223	Spare parts kit CA 50 sampling valve
	51503224	Spare parts kit CA 50 sintering filter
	51503225	Spare parts kit for CA 50 cover of sedimentation vessel

Place

Date

Signature

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Europe

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Belarus

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Minsk
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Belgium / Luxembourg

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Athens
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Hungary

Mile Ipari-Elektro
Budapest
Tel. ++36 (1) 2615535, Fax (1) 2615535

Iceland

Vatnshreinsun HF
Reykjavik
Tel. ++354 (5) 619616, Fax (5) 619617

Ireland

Flomeaco Company Ltd.
Kildare
Tel. ++353 (45) 868615, Fax (45) 868182

Italy

□ Endress+Hauser Italia S.p.A.
Cernusco s/N Milano
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Fax (02) 92107153

Latvia

Raita Ltd.
Riga
Tel. ++371 (7) 312897, Fax (7) 312894

Lithuania

Agava Ltd.
Kaunas
Tel. ++370 (7) 202410, Fax (7) 207414

Netherlands

□ Endress+Hauser B.V.
Naarden
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□ Endress+Hauser A/S
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□ Endress+Hauser Polska Sp. z o.o.
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