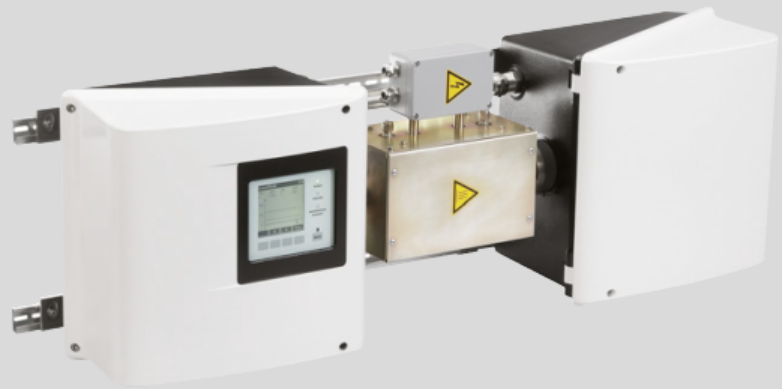
OPERATING INSTRUCTIONS

SCPS3300

Gas Sampling System

SICK
Sensor Intelligence.



Described Product	SCPS3300
Document ID	8025339
Manufacturer	SICK AG AG Erwin-Sick-Str. 1 · 79183 Waldkirch · Germany www.sick.com
Production Location	SICK AG AG Gisela-Sick-Str. 1 · 79276 Reute · Germany
Legal Information	This work is protected by copyright. Any rights derived from the copyright shall be reserved for SICK AG. Reproduction of this document or parts of this document is only permissible within the limits of the legal determination of Copyright Law. Any modification, reduction or translation of this document is prohibited without the express written permission of SICK AG. The trademarks stated in this document are the property of their respective owner. © SICK AG. All rights reserved
Original Document	This document is an original document of SICK AG.

Content

1 About this Document

Note

This document regarding the SCPS3300:

- contains information required during the life cycle of the System.
- is available to all those people who work with the System.
- read this document carefully and make sure that you understand the content fully before working with the System.

1.1 Limitation of Liability

Note

Applicable standards and regulations, the latest state of technological development and many years of knowledge and experience have all been taken into account, when assembling the data and information contained in this document.

The manufacturer accepts no liability for damage caused by:

- Failing to observe this document.
- Non-compliance of notices and regulations.
- Unauthorized mounting and installations.
- Arbitrary technical and other modifications.
- Use of unauthorized spare parts, consumables and accessories.
- Unauthorized modifications, adjustments and/or manipulation of software.
- Do not carry out regular maintenance work and its documentation.

With special variants, where optional extras have been ordered, or owing to the latest technical changes, the actual scope of delivery may vary from the features and illustrations shown here.

1.2 Purpose of this Document

This document describes the SCPS3300 - Gas Sampling System.

1.3 Target Group

This document is intended for qualified personnel which are authorized to work on the SCPS3300.

1.4 Further Information

Special local conditions

Follow all local laws, technical rules, and company-internal operating directives applicable at the respective installation site of the SCPS3300.

Preserving the documents

This document and the additional technical documentation and information must be:

- Available for reference.
- Passed on to new system operator or new employees.

1.5 Additional Technical Documentation/Information

- Technical System-Documentation (EPLAN):
  - SCP3000 - Gas Sampling System
    - › Technical data
    - › Wiring diagram
    - › Terminal diagram
  - MCS300P - Multicomponent Analysis System
    - › Gas flow diagram
    - › Wiring diagram
    - › Terminal diagram
- Operating instructions of the following system components:

Component	Manufacturer
MCS300P - Multicomponent Analysis System	SICK
SCP3000 - Gas Sampling System	SICK

1.6 Document Conventions

🛠 Required tools

▶ Instruction

Instruction result

Refer to another document.

All units of measurement in this document are originally metric units.

Subject to change without notice.

Images might differ from actual design.

2 Important Safety Instructions

2.1 Intended Use

The SCPS3300 consist of the SCP3000 Gas Sampling System and the MCS300P - Multi-component Analysis System.

The SCP3000 is used for sampling gas in high-temperature processes (up to 1,400 °C) with high dust loads (up to 2,000 g/m3). The SCPS3300 is specially designed for sampling gas at rotary kiln inlets in cement works.

The MCS300P measuring equipment serves for process monitoring of raw gas.
The measured medium is extracted at a sampling point and led through the cell of the MCS300P (extractive measurement).

Intended use also includes compliance with this operating instructions, in particular the safety instructions and the repair and maintenance conditions.

2.2 Supplemental Directives

- Before working on the SCPS3300, read this document carefully and follow all safety instructions and information.
- Only qualified persons from the respective areas are permitted to work on the SCPS3300.
- Follow operating procedures.
- Follow local regulations.
- Observe local regulations for working with gas and electrical components.
- Access to the SCPS3300 is restricted to authorized personnel only.

System damage/transport damage

- Damage to individual components can lead to malfunctions of the entire system.
- Do not ignore system components damaged during transport.
- In the event of damage, contact SICK Service.

2.3 Requirements for the Qualification of Personnel

Only qualified personnel from the respective field are permitted to work on the system.

- Qualified personnel have the specialist training, skills, and experience, as well as knowledge of the relevant regulations and standards, to be able to perform tasks delegated to them and to detect and to avoid any potential dangers independently.
- Electricians have the specialist training, skills, and experience, as well as knowledge of the relevant standards and provisions to be able to carry out work on electrical systems and to detect and avoid any potential dangers independently.

2.4 Potential Hazards

Toxic gases

Toxic gases can lead to poisoning if the following is not observed:

- Operate the system in adequately ventilated areas or rooms.
- Use gas monitoring systems.
- Only enter contaminated areas with PPE (breathing apparatus, gas detector).
- Perform regular leakage tests.

Insertion/retraction

Insertion/retraction during operation can lead to death or serious injury.

- Note if yellow light on the on-site control panel flashes.
- Leave dangerous area around the retraction device immediately.
  Dangerous areas:
  - in front of the sealing box at the kiln inlet chamber.
  - close to the dust filter during probe rotation.
  - on the retraction device drive.

Automatically retraction

Automatically retracted probe due to power failure can lead to death or serious injury.

- Leave the area around the retraction device immediately.
- The pneumatic emergency drive triggers the retraction of the probe.
- Due to power failure the yellow light at the signal column does not flash.

Unintentional insertion

Unintentional insertion / retraction of the probe can lead to death or serious injury.

- During all kind of works at the system secure the device against unintentional insertion or retraction of the probe.
- Lockout-Tagout the system.
- Secure the working area against unauthorized interventions.

Explosive atmosphere

Risk of explosion in an explosive atmosphere.

- Do not operate the SCPS3300 in potentially explosive atmospheres.

Electric voltage

Touching components that are live may result in death, burns or shock from electric shock. Only qualified personnel may carry out electrical work on the system.

- Before working on electrical components, observe the following safety rules:
  - Disconnecting
  - Secure against restarting
  - Determine the absence of voltage
  - Grounding and short-circuiting
  - Cover or barrier adjacent live parts.

Hot surfaces

Risk of injury from hot surfaces.

- Do not touch hot surfaces.
- Wear safety gloves and protective clothing.

Suspended loads

Suspended loads can lead to injuries if the following is not observed:.

- Never step under suspended loads.
- Pay close attention when lifting loads.
- Observe the lifting instructions to avoid injuries and accidents.
- Use suitable undamaged lifting equipment.
- Wear personal protective equipment (safety helmet, safety shoes).

2.5 Safety Devices

Enclosure:

- Enclose the SCPS3300 if necessary.
- Do not remove safety covers and barriers during operation.

2.6 System Warranty

Any warranty claim expires if:

- Safety instructions and measures in this document are not observed.
- Parts or components of the SCPS3300 are installed, assembled or modified without authorization.
- The SCPS3300 is changed or modified.
- Software is changed, adapted and/or manipulated without authorization.

2.7 RoHS-Directive

This product is designed for applications in large industrial plants according to Article 2 (4) e, RoHS 2011/65/EU and can therefore only be used in such systems.

The product is neither suitable nor approved for use outside of these systems. SICK cannot assume any kind of warranty or liability for use outside of these systems..

2.8 Safety Conventions

The warnings used in this manual have the following meanings:

DANGER

Indicates a hazardous situation with a high risk level, which if not avoided, will result in death or serious injury.

WARNING

Indicates a hazardous situation with a middle risk level, which if not avoided, could result in death or serious injury.

CAUTION

indicates a potentially dangerous situation with a low risk level, which if not avoided may lead to minor or moderates injuries.

NOTICE

Indicates a situation which, if not avoided, may result in property damage to the system or products in its vicinity.

Note

Indicates important information and useful hints..

2.9 Warning Signs on System Components

Do not remove or cover warning stickers. Damaged or missing stickers must be replaced.

Sign	Significance
	Warning of a danger point
	Warning of dangerous electrical voltage
	Warning of remotely started equipment
	Warning of hot surfaces
	Warning of suspended loads
	Warning of corrosive substances
	Warning of toxic substances

Sign	Significance
	Harmful to health
	Irritant
	Environmental risk

2.10 Mandatory Signs

Sign	Significance
	Read instructions manual
	Wear safety gloves
	Wear eye protection
	Wear hard hat
	Wear safety boots
	Disconnect before maintenance or repair

2.11 Safety Instructions

DANGER
Overhead loads - crush hazard.
Suspended loads could fall and cause death or serious injuries.
- Never stand under suspended loads.
- Exert extreme caution when hoisting the system.
- Adhere to standard lifting procedures to prevent head injury and other accidents.
- Wear personal protective equipment (hard hat, safety boots).

DANGER
Toxic gases.
Risk of intoxication by inhalation. Serious injuries or death.
- Operate the system only in sufficient ventilated areas or rooms.
- Use gas monitoring or gas warning detector.
- In case of container contamination:
  - note the signal horn and flash light at the container.
  - wear appropriate respiratory protection before open the container door.
  - open the door to ventilate the container for at least 10 minutes.
- Perform leakage test in appropriate time intervals.

DANGER
Hazardous voltage.
The system is supplied with mains voltage from the grid. Danger of electrocution - contact will cause electric shock, burn or death.
- Always exercise caution when handling cables and connectors.
- Be aware of the risk of secondary accidents occurring if you are startled.
- Before working on the system:
  - Follow operational procedures such as Lockout-Tagout.
  - Check that there is no residual voltage by measuring AC voltages.

DANGER
Insertion/retraction during operation
Serious injury or death.
- Note if yellow light on the on-site control panel flashes.
- Leave dangerous area around the retraction device immediately.
  Dangerous areas:
  - in front of the sealing box at the kiln inlet chamber.
  - close to the dust filter during probe rotation.
  - on the retraction device drive.

DANGER
Automatically retracted probe due to power failure
- Leave the area around the retraction device immediately.
- The pneumatic emergency drive triggers the retraction of the probe.
- Due to power failure the yellow light at the signal column does not flash.

DANGER

Unintentional insertion / retraction of the probe

- During all kind of works at the system secure the device against unintentional insertion or retraction of the probe.
- Lockout-Tagout the system.
- Secure the working area against unauthorized interventions.

WARNING

Hot surfaces

Contact may cause burn and serious injuries.

- Do not touch hot surfaces.
- Use appropriate safety gloves.

3 System Description

The SCPS3300 consist of the SCP3000 Gas Sampling System and the MCS300P - Multi-component Analysis System.

The SCP3000 is used for sampling gas in high-temperature processes (up to 1,400 °C) with high dust loads (up to 2,000 g/m3). The SCPS3300 is specially designed for sampling gas at rotary kiln inlets in cement works.

The MCS300P measuring equipment serves for process monitoring of raw gas.
The measured medium is extracted at a sampling point and led through the cell of the MCS300P (extractive measurement).

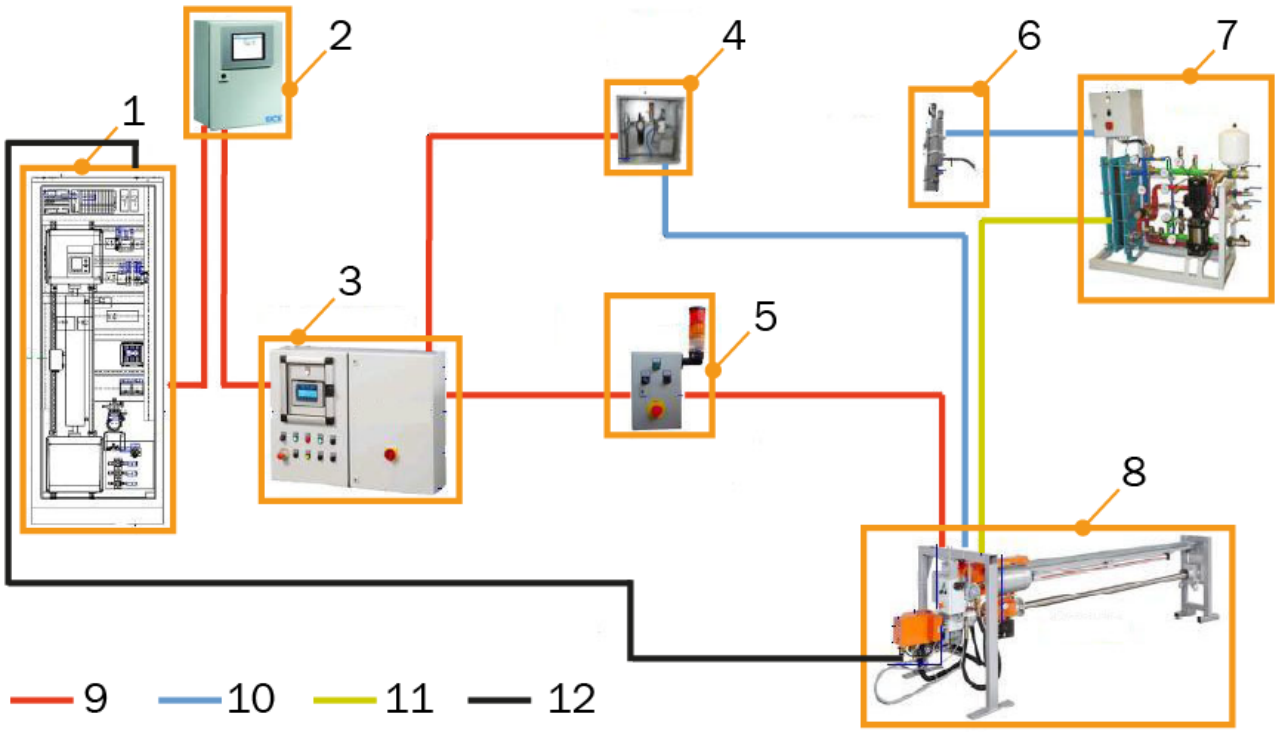


Fig. 1: System overview

Legend	
1	MCS300P - Multicomponent Analysis System
2	MPR - Meeting Point Router (option)
3	Control cabinet
4	Pneumatic/compressed air service unit
5	On-site control panel with signal column
6	Air exhaust valve
7	Cooling unit
8	SCP3000 - Gas Sampling System
9	Power cable
10	Instrument air hose
11	Hydraulic line
12	Heated sample gas line

3.1 SCP3000 - Gas Sampling System

The SCP3000 Gas Sampling System is used for sampling gas in high-temperature processes (up to 1,400 °C) with high dust loads (up to 2,000 g/m3).

The SCP3000 Gas Sampling System is specially designed for sampling gas at rotary kiln inlets in cement works.

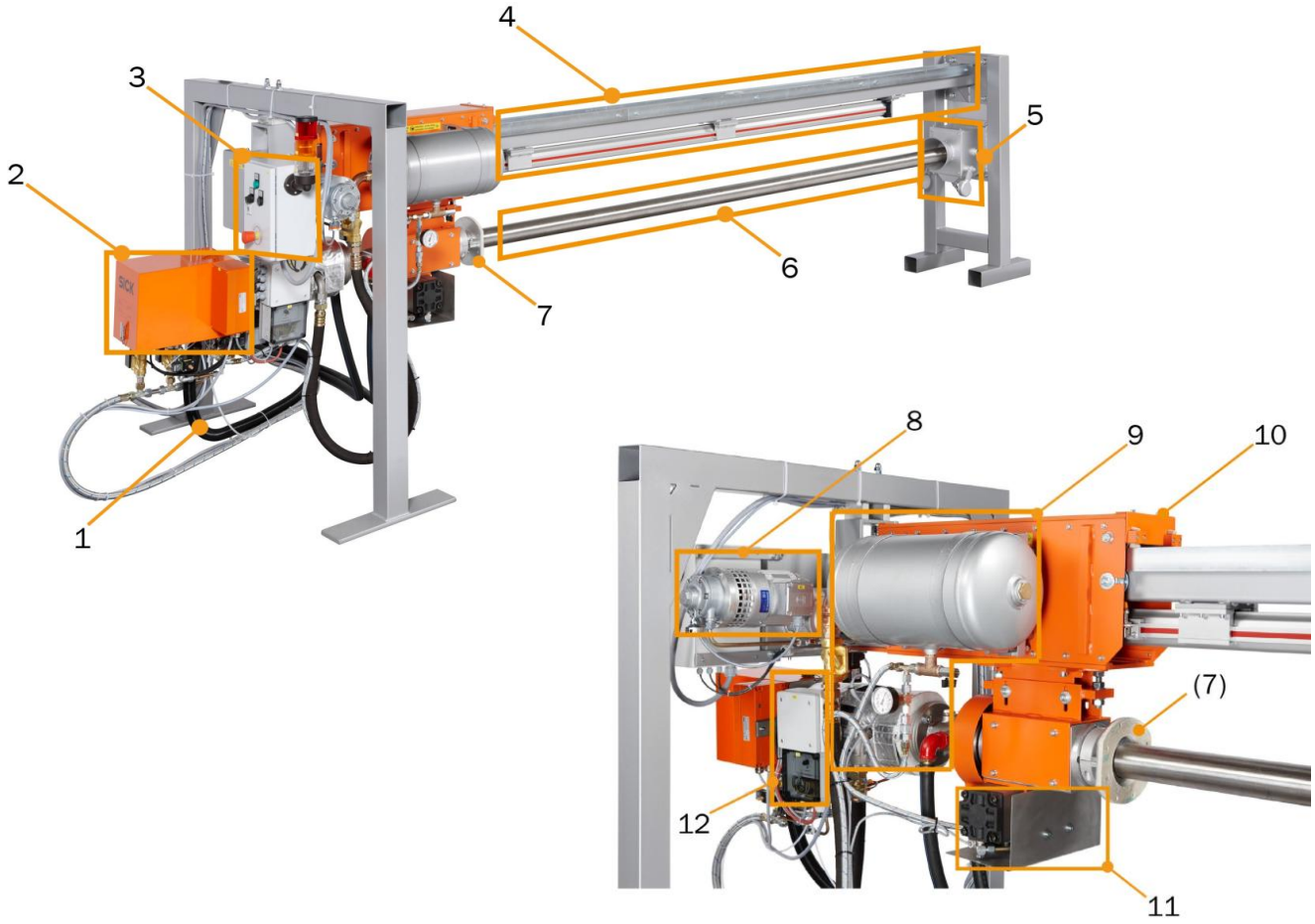


Fig. 2: SCP3000 components

Legend	
1	Heated sample gas line
2	Dust filter unit
3	On-site control panel with signal column
4	Retraction device
5	Sealing box
6	Water cooled gas sampling probe
7	Sealing flange
8	Retraction device (electrical, pneumatic)
9	Shock blow device
10	Carriage
11	Rotation unit
12	Temperature regulator / indicator

3.1.1 Water Cooled Gas Sampling Probe

Specifications

- Material: stainless steel (1.4841)
- Sampling aperture enables relatively dust-free gas flow.
- Continuous waster cooled.
- Controlled water cooling system. Gas temperature always stays above the acid dew point of the gas to prevent deposits on and in the probe.
- Shock blow inlet to clean the gas sampling tube inside.

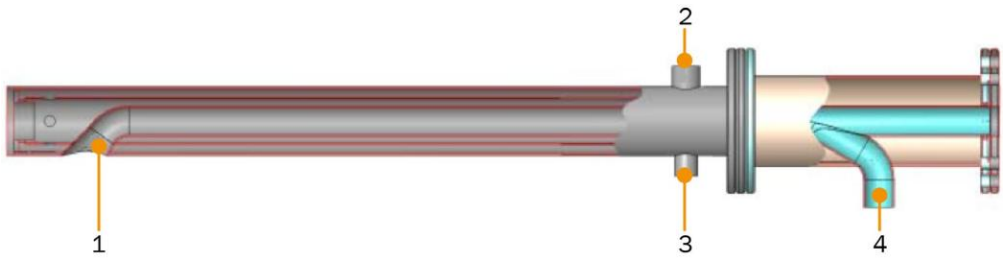


Fig. 3: Gas sampling probe, cross-section

Legend	
1	Sampling aperture
2	Cooling water outlet
3	Cooling waster inlet
4	Shock blow inlet

3.1.2 Shock Blow Device

Specifications

- Placed between SCP3000-F dust filter and probe.
- Directly mounted in line of the gas sampling tube of the probe.
- Pneumatic operated ball valve to cut off the sampling line to the dust filter.
- Heated sleeve on the inlet body with a maximum temperature of 160 °C.
- 20 l tank filled with blast air.
- Valve to activate the air blast.
- Only proceeded when the probe is in measuring position inside the kiln.
- Activated at the beginning of the periodic back flushing routine, before the dust filter will be cleaned.
- Check of the ball valve position by LEDs at the limit switches of the ball valve.
- In the event of loss of electrical power, the ball valve automatically closes the gas line to the dust filter.

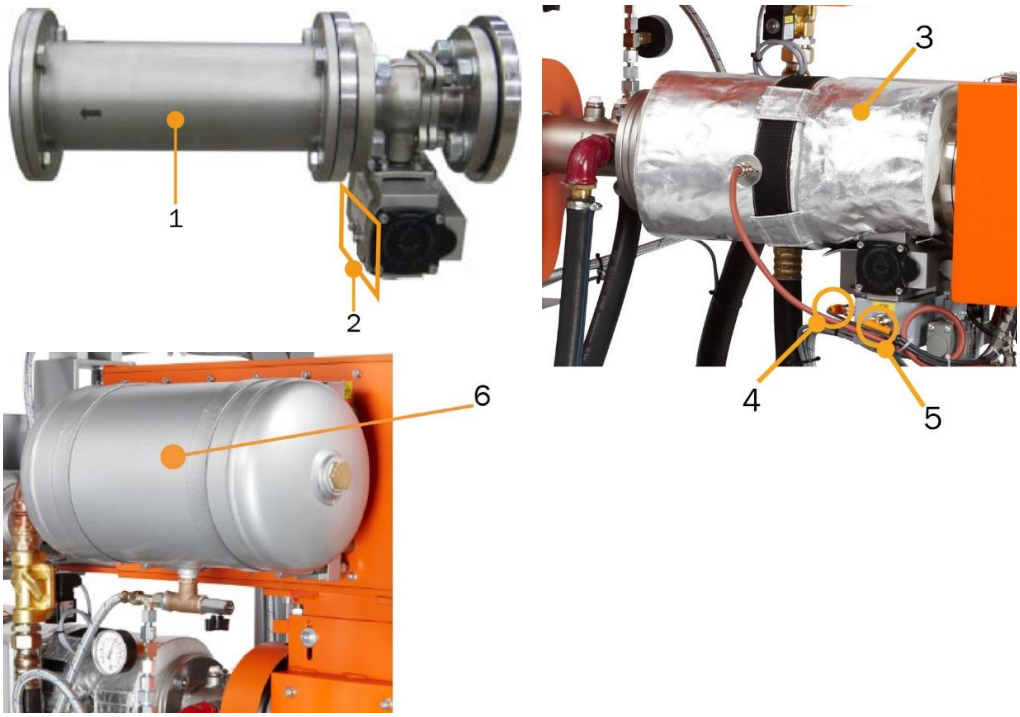


Fig. 4: Shock blow device

Legend	
1	Shock blow inlet body (without heated sleeve)
2	Pneumatic operated ball valve
3	Heated sleeve
4	Limit switch ball valve open
5	Limit switch ball valve closed
6	Blast air tank

3.1.3 Dust Filter

Specifications

- Fitted directly onto the end of the gas sampling probe to prevent thermal bridge between probe and filter.
- Heated to approx. 180 °C to prevent deposits and blockages.
- Glass metal mesh fiber filter element with a porosity of 0.1 µm.
- Equipped with two heated back flushing valves to enable a 2-step back flushing process. During back flushing the sample gas line is sealed by a stop valve to prevent pressure surges.

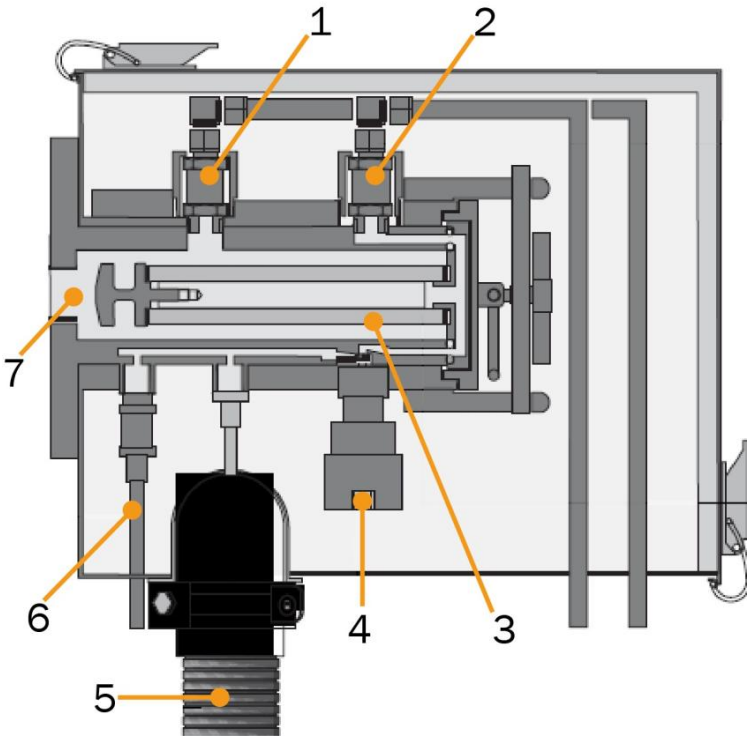


Fig. 5: Dust filter SCP3000

Legend	
1	Check valve (filter chamber flushing)
2	Check valve (filter flushing)
3	Filter
4	Stop valve to seal sample gas line
5	Sample gas line
6	Test gas line
7	Filter chamber (connection to sampling probe)

3.1.4 Heated Sampling Line

Specifications

- Material: PVC
- Connected between the dust filter and the MCS300P.
- Power supply by MCS300P.

3.1.5 Rotation Device

Specifications

- Periodic moves to shake off any raw meal that may have collected on the probe:
  - 10 cm forwards and backwards
  - 45 ° rotation clockwise and counter-clockwise
- Movements during the probe is inserted into the kiln.
- The probe is inserted in the rotation device where it is secured axially in a collet. The collet is shaped such a way that is firmly positioned with two ball bearings.
- Driven by means of a helical gear.
- A rotary piston cylinder initiates the rotational movement.

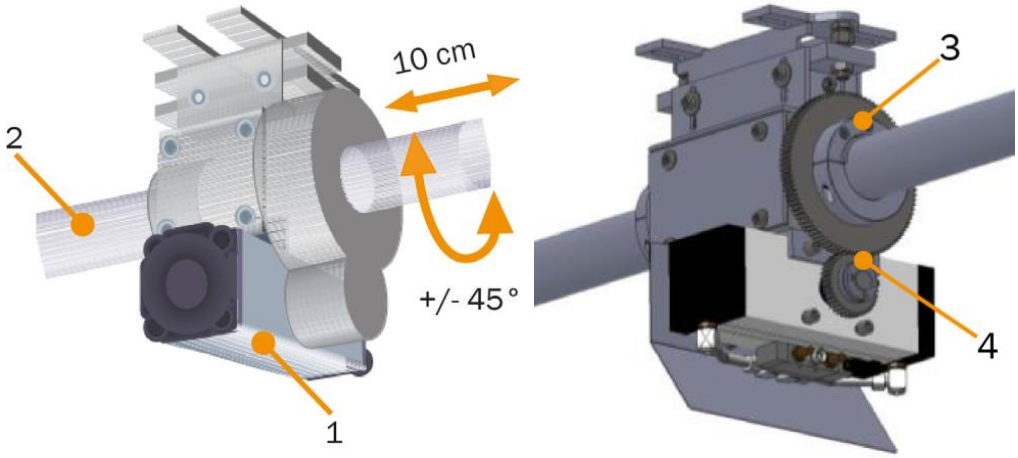


Fig. 6: Rotation device

Legend	
1	Drive
2	Probe
3	Collet
4	Helical gear

3.1.6 Retraction Device

Specifications

- The sampling probe, the dust filter, and the rotation device are mounted on the carriage.
- Used for inserting and retracting the probe.
- Equipped with an AC motor with high retraction force (approx. 1,000 kg).
- At a power failure a pneumatic emergency drive automatically retracts the probe to prevent it from being damaged.
- The end positions are set by means of contact-free limit switches.
- Via the on-site control panel the probe can be inserted and retracted manually.

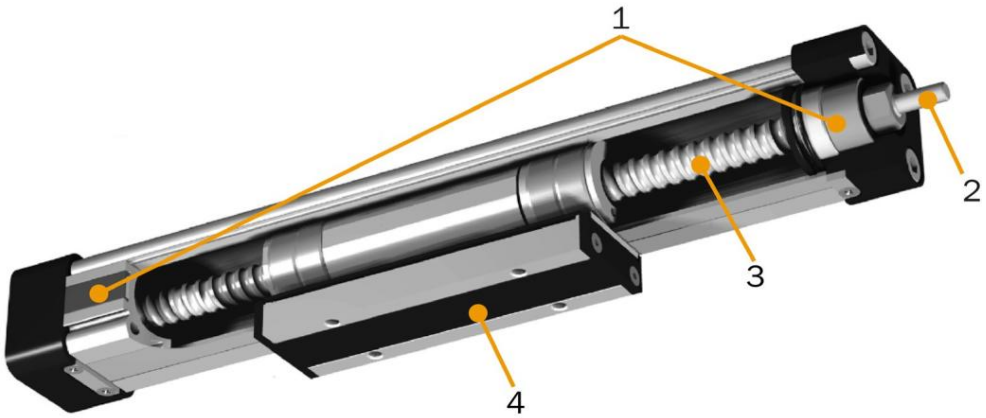


Fig. 7: Spindle drive for the retraction device

Legend	
1	Ball bearings
2	Drive shaft
3	Tetragonal thread spindle
4	Carriage

3.1.7 Sealing Box

Specifications

- Flanged via the mounting plate with the protection tube onto the rotary kiln.
- Seals the aperture when the probe is being retracted.
- Fitted with a reverse air cleaning system:
  - blows loose raw meal back into the kiln during retraction.
  - prevents raw meal and hot gases from escaping.

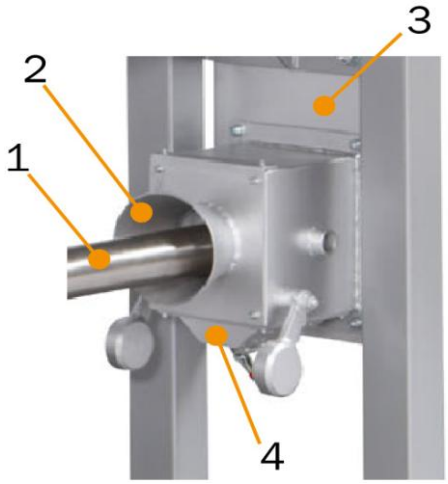


Fig. 8: Sealing box (protection tube not shown in figure)

Legend	
1	Probe
2	Inlet guide
3	Mounting plate
4	Raw meal outlet

3.1.8 Protection Tube

Specifications

- The protection tube covers the probe inside the kiln.
- Fixed on the mounting plate.

Fig. 9: Protection tube

3.1.9 On-site Control Panel with Signal Column

Specifications

- Enables to insert and retract the sampling probe manually during maintenance and commissioning.
- Signal light column indicates the system status:

Signal light	System status
Red flashing	Malfunction
Yellow flashing	Probe is being inserted/retracted
Yellow	Maintenance work is carried out
White flashing	Automatic mode requests “START“ button
White light	Device works proper (automatic mode)

- Buttons only available during maintenance and commissioning:

Button	Function
Local release	To release the local operating mode for inspection and maintenance
Probe out/in	To move the probe in and out of the kiln
Blow out manual	To start the shock blow device manually
EMERGENCY RETRACT	To retract the probe in emergency cases

Fig. 10: On-site control panel with column

3.1.10 Cooling Device

Specifications

- Water cooling in the closed probe cooling circuit.
- In the standard version the water is colled via a second, open water circuit.
- Minimal water requirements for the open circuit.
- In areas with an insufficient water supply, the water can also be cooled using a water-to-air cooler.

Fig. 11: Water-to-water cooling system

Fig. 12: Water-to-air cooling system

3.1.11 Control Cabinet

Specifications

- Power supply.
- Monitoring of the entire system and functions.
- Detect and process the signals and alarms.
- Monitoring performed by a programmable logic controller (PLC).

Fig. 13: Control and power supply cabinet

3.1.12 Pneumatic/Compressed Air Service Unit

Specifications

- Connection point for customer compressed air.
- Compressed air connection to every part of the SCP3000.
- Greasing of the retraction device with oil.
- Compressed air monitoring.

Fig. 14: Pneumatic/compressed air service unit

3.1.13 MCS300P - Multicomponent Analysis System

Specifications

- Measuring and monitoring raw gas in rotary kiln.
- Connected directly to the dust filter by heated gas sampling line.
- Measured medium is extracted and led through the cell.

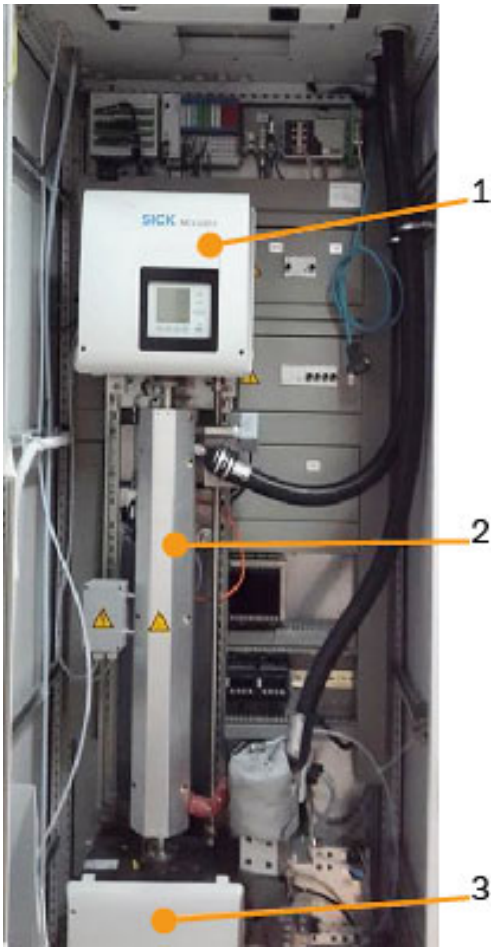


Fig. 15: MCS300P - Multicomponent analysis system

Legend	
1	Sender unit with operator panel
2	Heating cell
3	Receiver unit

For further information about the MCS300P - Multicomponent Analysis System, refer to the respective SICK Operating Instructions.

3.1.14 MPR - Meeting Point Router (option)

Specifications

- Links the system (SCPS3300) to the SICK remote architecture.
- Allows a SICK service technician to maintain the system via remote service.
- Integrated firewall disconnects the machine network from the internet or the operating company network after maintenance.
- Activated via touchscreen.

Fig. 16: MPR - Meeting point router

For further information about the MPR - Meeting Point Router, refer to the respective SICK Operating Instructions.

4 Installation

Note

Only qualified personnel from the respective field are permitted to work on the system.

- Qualified personnel have the specialist training, skills, and experience, as well as knowledge of the relevant regulations and standards, to be able to perform tasks delegated to them and to detect and to avoid any potential dangers independently.
- Electricians have the specialist training, skills, and experience, as well as knowledge of the relevant standards and provisions to be able to carry out work on electrical systems and to detect and avoid any potential dangers independently.

DANGER
Overhead loads - crush hazard.
Suspended loads could fall and cause death or serious injuries.
- ▶ Never stand under suspended loads.
- ▶ Exert extreme caution when hoisting the system.
- ▶ Adhere to standard lifting procedures to prevent head injury and other accidents.
- ▶ Wear personal protective equipment (hard hat, safety boots).

DANGER
Hazardous voltage.
The system is supplied with mains voltage from the grid. Danger of electrocution - contact will cause electric shock, burn or death.
- ▶ Always exercise caution when handling cables and connectors.
- ▶ Be aware of the risk of secondary accidents occurring if you are startled.
- ▶ Before working on the system:
  - ▸ Follow operational procedures such as Lockout-Tagout.
  - ▸ Check that there is no residual voltage by measuring AC voltages.

DANGER
Insertion/retraction during operation
Serious injury or death.
- ▶ Note if yellow light on the on-site control panel flashes.
- ▶ Leave dangerous area around the retraction device immediately.
  Dangerous areas:
  - in front of the sealing box at the kiln inlet chamber.
  - close to the dust filter during probe rotation.
  - on the retraction device drive.

4.1 Requirements for the System Location

- Ensure enough space for:
  - installing the system.
  - inserting / retracting the probe.
  - perform maintenance work
  - supply cables.

4.2 Probe Position

- Do not position the probe in the directly or in the immediate vicinity of the raw meal inlet from the preheater/calciner so that the material does not fall directly on the probe.
- Depending on the raw inlet, the probe must be installed laterally or on the other side of the kiln inlet chamber.
- Kiln rotation clockwise:
  - probe aperture must be positioned in the top-right quadrant of the kiln as seen in direction of material flow.
- Kiln rotation counter-clockwise:
  - probe aperture must be positioned in the top-left quadrant of the kiln as seen in direction of material flow.

The rotation direction always relates to the line of sight from the inlet chamber, along the axis of the kiln, and towards the burner.

- Insert the probe tip approx. 30 cm (11.8 in) into the rotary kiln.
  Positioned behind the seal of rotary kiln.
- Distance from the interior wall of the kiln as seen in direction of material flow at least 20 cm (7.8 in). Take in account expansions caused by hight operating temperatures.
- The axis of the probe/retraction device must be inclined downward minimum 3 ... 5° in relation to the kiln axis.

Note

Large inclination angles (up to max. 60°) are also possible but this will cause an increased stress on the spindle drive.
This will reduce the lifetime of the drive and increase the maintenance effort.

- The relationship between probe length, movement distance of the retraction device, and insertion depth can be derived from Fig. 17: "Probe position in the rotary kiln", page 33, Fig. 18: "SCP3000 dimensions", page 34.

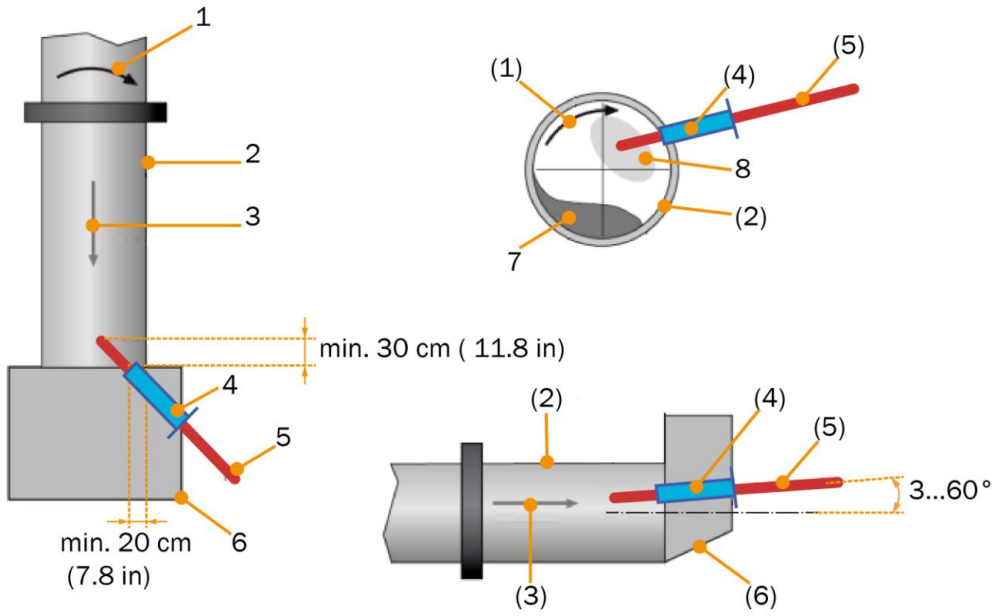


Fig. 17: Probe position in the rotary kiln

Legend	
1	Rotation direction
2	Rotary kiln
3	Gas flow direction
4	Protection tube
5	Probe
6	Kiln inlet chamber
7	Raw meal
8	Sampling area

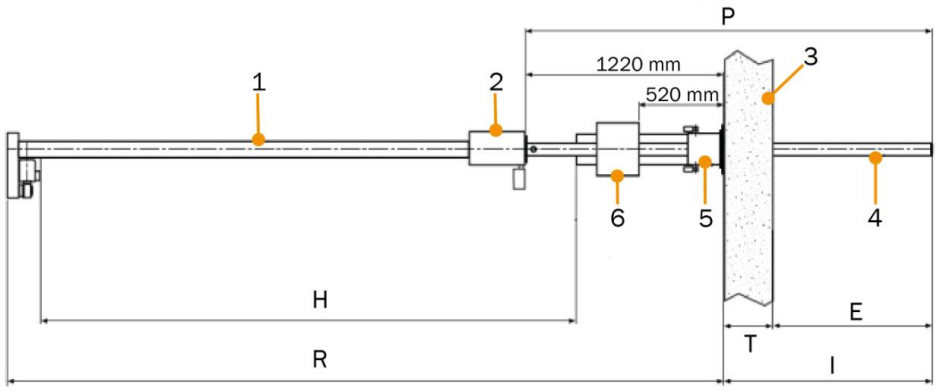


Fig. 18: SCP3000 dimensions

Legend	
1	Retraction device
2	Dust filter unit
3	Kiln wall
4	Probe inside the kiln
5	Sealing box
6	Rotation device

Length measurement (mm)

Movement **H**	Retraction device lenght	Probe length **P**	Insertion length	Kiln wall thickness	Effective insertion
2300	3400	2500	1280	Depends on customer specifications	I - T = E
		3000	1780		
2800	3900	3000	1780		
		3500	2280		
3300	4400	3500	2280		
		4000	2780		

4.3 Retraction Device

The retraction device and the sealing box must be installed in accordance with the SPC3000 dimensions and the retraction device installation figure below.

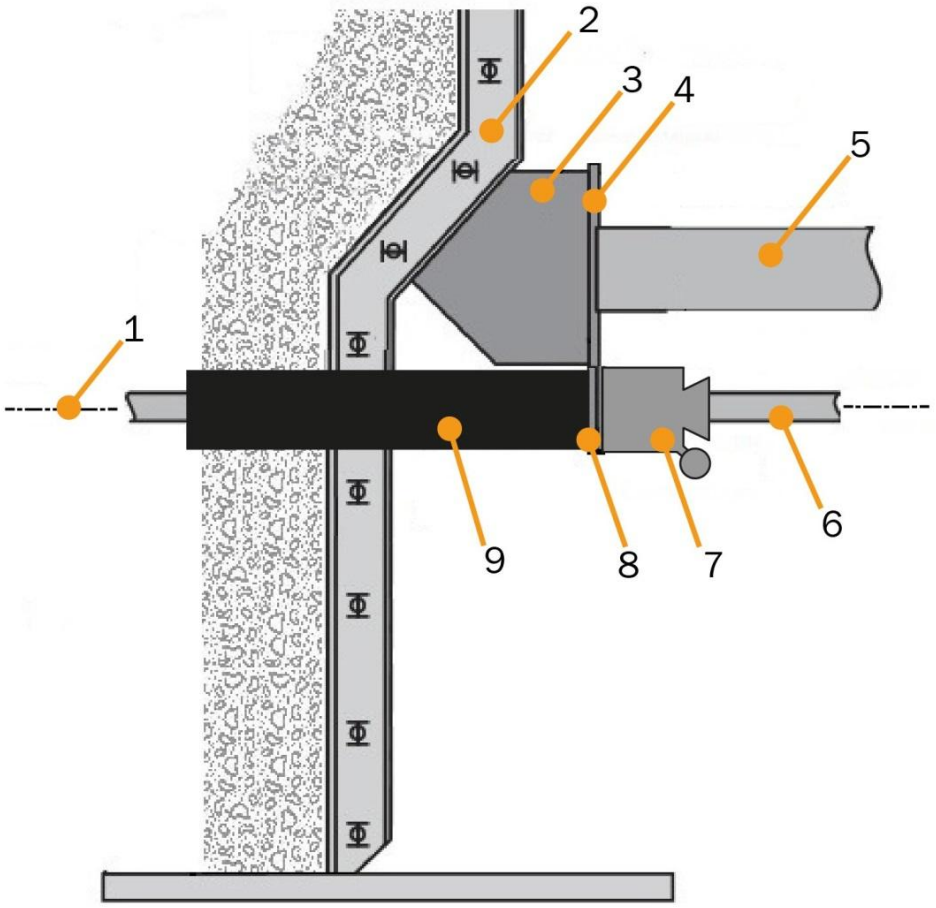


Fig. 19: Retraction device installation

Legend	
1	Probe axis
2	Inlet chamber outer wall
3	Steel sheet angular plate welded on inlet chamber outer wall and mounting plate
4	Mounting plate
5	Retraction device
6	Probe
7	Sealing box
8	Flange plate
9	Protection tube (material Sicromal)

4.3.1 Installation Procedure

- Cut an opening in the inlet chamber to enable the installation of the protection tube.

Fig. 20: Opening in the inlet chamber (example)

- To ensure a high-grade connection between protection tube and refractory concrete inside the kiln, weld the protection tube with anchoring metal pieces.

Note

Choose the right dimension of the anchoring metal pieces so that the protection plate fits through the opening of the mounting plate-

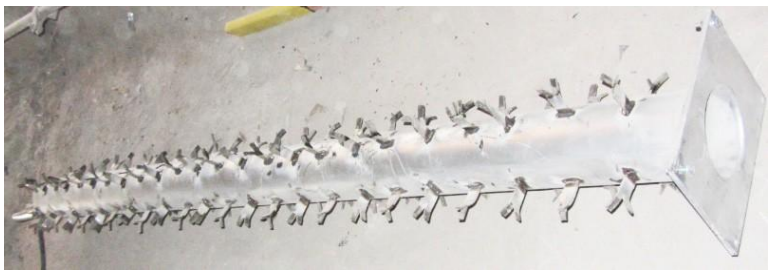


Fig. 21: Protection tube with welded anchoring metal pieces

- Guide the protection tube through the opening of the mounting plate.
- Tight the four M10 bolt and nuts.
- Weld the flange plate on the mounting plate.

Fig. 22: Protection tube flange plate welded with mounting plate

- Align the mounting plate into the requested position in relation to the probe axis (parallel).
- Connect the mounting plate to the outer wall of the kiln using a steel sheet angular plate or similar stabilizing material, see Fig. 19: "Retraction device installation", page 35.
- Connect (welding) the protection tube inside the kiln with stabilizing material.

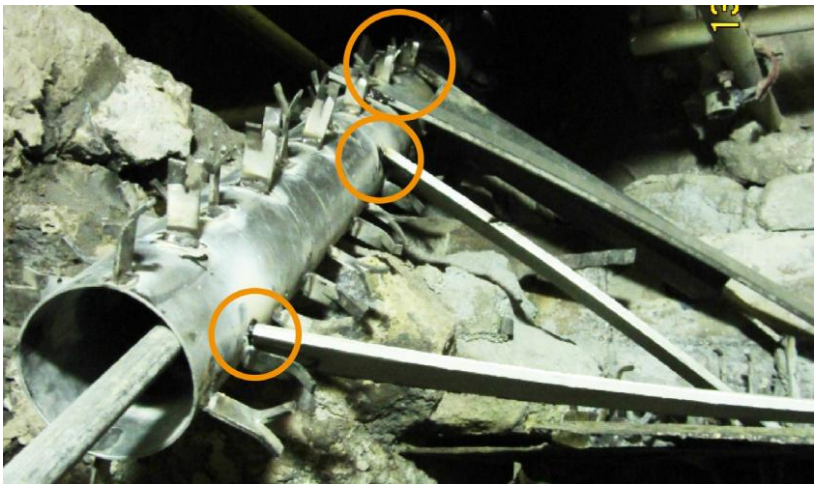


Fig. 23: Protection tube inside kiln secured with stabilizing material

- The installed protection tube needs to be fixed and covered inside the kiln by refractory concrete. The concrete must be armed by armoring iron and fixed to the walls.
  Note the following examples:

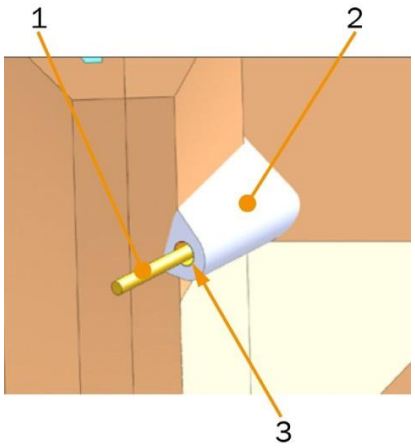


Fig. 24: Protection tube covered with refractory concrete inside the kiln (example)

Legend	
1	Probe
2	Refractory concrete
3	Protection tube

- Unscrew the four M10 bolts and nuts.
- Mount the sealing box onto the flange plate and secure it using the four M10 bolts and nuts.

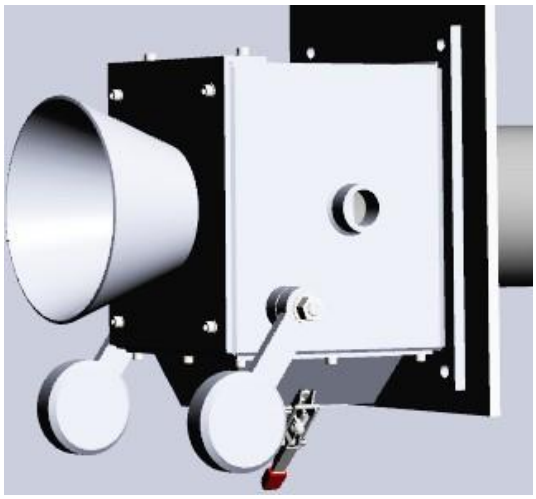


Fig. 25: Sealing box mounted onto the mounting plate

- Ensure that the probe axis is centrally aligned to the center of the sealing box.
- Unscrew the four M16 bolts and nuts above the sealing box
- Place the retraction device mounting plate onto the protection tube mounting plate and secure it with the M16 bolts and nuts.

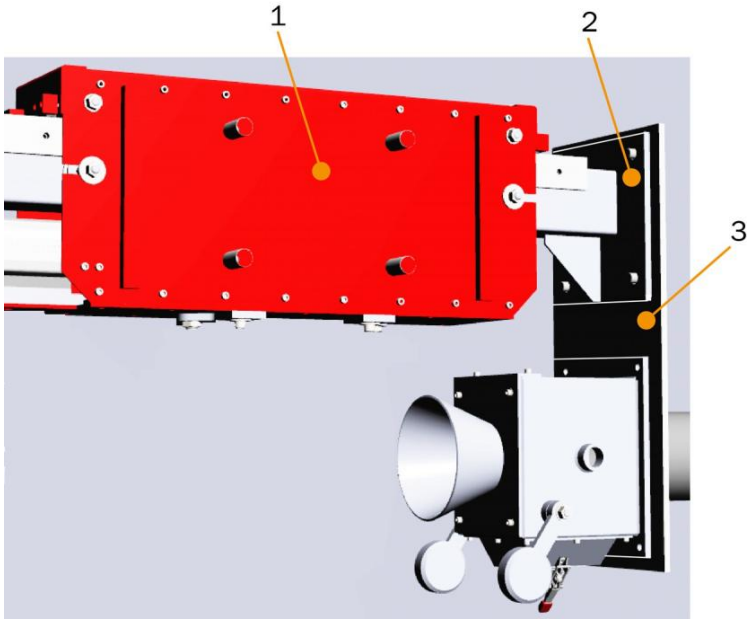


Fig. 26: Retraction device mounted on the mounting plate

Legend	
1	Retraction device
2	Retraction device mounting plate
3	Protection tube mounting plate

Fig. 27: Installed retraction device (example)

- The opposite end of the retraction device must be attached for example to a support bar, the ceiling or similar.
  Note the correct inclination of the retraction device. See the following examples.

Fig. 28: Support bar installation (example)

Fig. 29: Ceiling installation (example)

Note

For questions and help contact SICK Service.

- Install the hose support close to the retraction device.
  The hose support can be attached on a mast secured at the floor or on the ceiling.
- Secure the hoses such a way they do not impede the movement of the retraction device.
  Note the following examples:

Fig. 30: Hose support mounted on the ceiling (example)

Fig. 31: Hose support on a mast and on the floor (example)

4.4 Rotation Device and Sampling Probe

NOTICE

Heat Protection

- To protect the rotation device against emitted heat from the kiln, the safety distance of 520 mm (20.27 in) must be maintained.

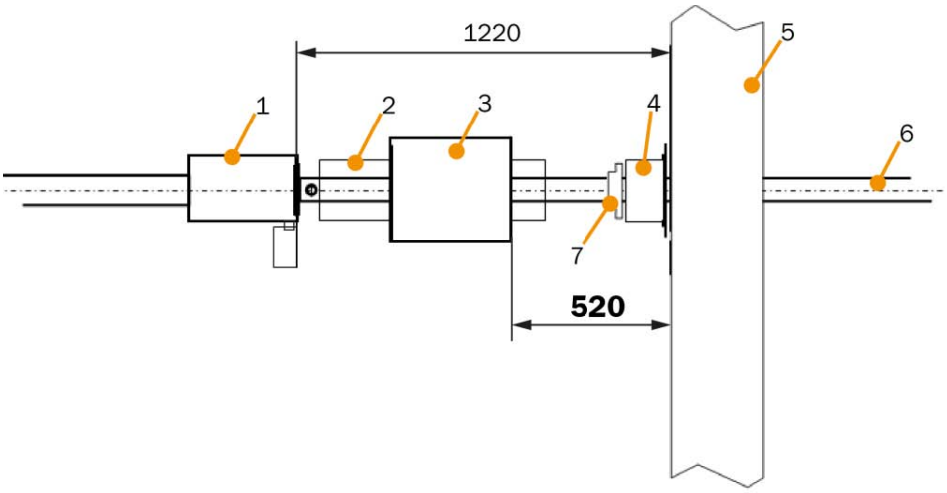


Fig. 32: Required rotation device position

Legend	
1	Dust filter
2	Carriage
3	Rotation device
4	Sealing box
5	Inlet chamber wall
6	Probe
7	Sealing flange

- The probe will be delivered inserted in the rotation device, where it is secured axially in a collet.
- Calculate the insert depth of the probe inside the kiln inlet chamber, using the following table:

Movement **H**	Retraction device lenght	Probe length **P**	Insertion length	Kiln wall thickness	Effective insertion
2300	3400	2500	1280	Depends on customer specifications	I - T = E
		3000	1780		
2800	3900	3000	1780		
		3500	2280		
3300	4400	3500	2280		
		4000	2780		

- The distance between rotation device and rotary kiln wall must be at least 520 mm (20.47 in).
- Tighten the collet using a clamping ring.

4.4.1 Probe Axis Fine Tuning

- To perform a fine tuning of the probe axis use the two adjusting bolts (1) on the rotation device.
- Open the four (two on the left and two on the right side) securing bolts (2) on the brackets of the rotation device.

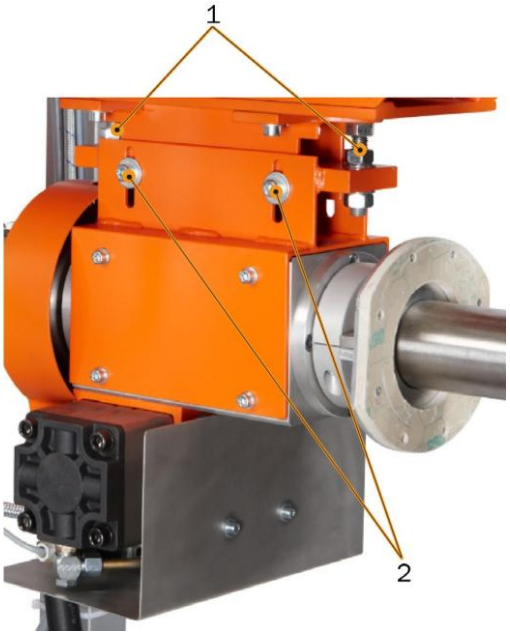


Fig. 33: Adjusting bolts on the rotation device

- Bring the probe axis into a correct position using the adjusting bolts (1).
- Secure the securing bolts (2).

4.4.2 Sealing Flange

- Secure the sealing flange (1) approx. 300 mm in front of the rotation device.

Fig. 34: Sealing flange in front of the rotation device

- If the probe is fully inserted, secure the sealing flange (2) carefully close to the sealing box (1).

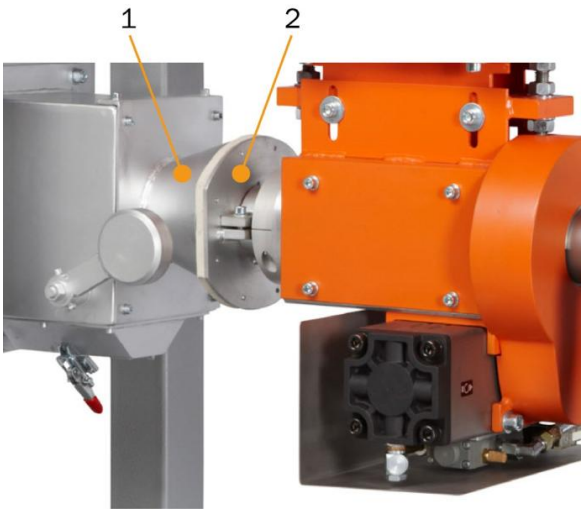


Fig. 35: Sealing flange close to the sealing box.

4.5 Control Cabinets

- Installed in a separate room to minimize the influence of dust and dirt to the sensitive electrical parts.
- Use the supplied U-profiles to mount the cabinet on the wall.
- Protect the cables by tubes or cable ducts against mechanical damage.
- The on-site control panel and the pneumatic air service unit box should be installed near to the probe to minimize the supply pipes and cables length.

Fig. 36: Installed control cabinet

4.5.1 Electrical Connections

Note

Only qualified personnel from the respective field are permitted to work on the system.

- Cables must be laid in a way that they remain free moving and do not have contact with hot surfaces of the probe or block the retraction device.
- A special support device that enables the cables and hoses to move freely is supplied with the probe.
- The construction of the support device allows an installation on the ground or on the ceiling.

Fig. 37: Probe with cable and hose device completely installed (example)

4.5.2 Pneumatic Connections

- Make sure that all pneumatic connections are tightened well to prevent leakages.
- Hoses must be laid in a way that the remain free moving and do not have contact with hot surfaces oft the probe or block the retraction device.
- Pneumatic connection between pneumatic/compressed air service unit and the pneumatic switch for the retraction device has to be done by customer (air hose NW08).
- Pneumatic connection between pneumatic/compressed air service unit and the SCP3000 has to be done by customer (air hose NW13).

4.6 MCS300P - Multicomponent Analysis System

Note

For questions and help contact SICK Service.

For further information about installation of the MCS300P - Multicomponent Analysis System, refer to the respective SICK Operating Instructions and the wiring diagram.

- To minimize the influence of dust and dirt to the sensitive optical sensor and other electrical components place the MCS300P in separate room or area.
- Connect the heated gas sampling line.
- Electrical connections need to be done in reference to wiring diagram of the MCS300P.

4.6.1 Bus Connections

- Electrical connections need to be done in reference to wiring diagram of the MCS300P.

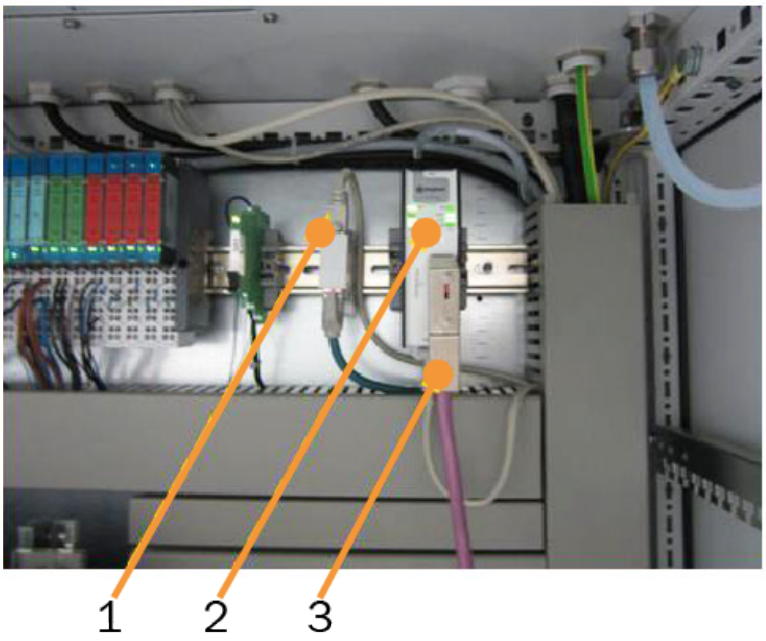


Fig. 38: Bus connection MCS300P

Legend	
1	Ethernet Modbus TCP port
2	Customer interface, Profibus converter (example)
3	Profibus connector to customer (optional)

4.7 Cooling Unit

- Installation near the probe to minimize the length of the supply hoses, Position right next to the probe is not necessary.

4.7.1 Water to Water Cooling Unit

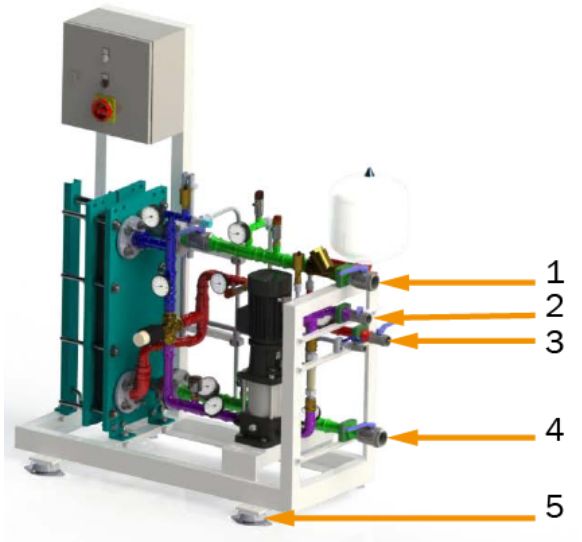


Fig. 39: Water to Water cooling unit connections

Legend	
1	On-site water inlet
2	Water to probe
3	Water from probe
4	Antifreeze fill in
5	Mounting plate

- Connect the cooling network to the on-site inlet and outlet of the cooling unit.
- Place the water lines for probe cooling in a way that they move freely.
- Use the supplied support device.
- Fix the cooling unit using the mounting plates (5).
- The vent and filling unit should be installed in the coolant line from cooler to probe at the highest point of the cooling circuit to remove residual air bubbles.
- The power supply of the water to water cooling unit and the cables for alarms and signals have to be connected to the control cabinet.

Note

If there is a risk that the ambient temperatures at the installation location of the water-to-water cooler could fall below 0 °C, the customer must take measures to protect against freezing in the feed pipes of the primary circuit.

For the secondary circuit use the delivered Antifreeze liquid.

4.7.2 Water to Air Cooling Unit

Fig. 40: Water to air cooling unit, completely installed

- To ensure maximum performance install the cooling unit in area out of direct sunlight.
- The unit is equipped with two connections points:
  - Water to probe
  - Water from probe
- The vent and filling unit should be installed in the coolant line from cooler to probe at the highest point of the cooling circuit to remove residual air bubbles.
- The power supply of the water to air cooling unit and the cables for alarms and signals have to be connected to the control cabinet.

5 Commissioning

Prerequisites Complete the following steps before commissioning the system:

- ▶ Check all cables, pipes and cooling hoses for properly installation.
- ▶ Fill up the cooling water circuit.
- ▶ Set the monitoring devices.
- ▶ Power up the system.
- ▶ Ensure that the system is working properly.

5.1 Operating Modes

The SCP3000 can be operated in two different modes:

- local mode
- automatic mode.

To set the operating mode, use the key switch S1 on the control cabinet.

5.1.1 Local Mode

The local mode is used for:

- initial commissioning
- inspection
- maintenance

When switching to local mode, the yellow signal lamp on the local cabinet is permanently illuminated to indicate that local mode is activated.
In this mode, SCP 3000 can be only commanded from control cabinet or local cabinet.

Following commands can be activated in local mode:

- ▶ Inserting and retracting the probe.
- ▶ Start back flushing.
- ▶ Initiate probe rotation.
- ▶ Initiate emergency retract.

5.1.2 Automatic Mode

Automatic mode is used for routine activity of the SCP3000.
For starting automatic mode:

- ▶ set S1 switch on the control cabinet to automatic and press “Start Automatic Mode” on the HMI Panel.
  - the green indicator lamp (H3) on the control cabinet and the white signal lamp (H6) on the local panel indicate that automatic mode is active.
  - Starting the automatic mode is not possible if there is any alarm signal activated.

Following commands can be activated in automatic mode:

- ▶ Trigger back flushing mode directly regardless of the set cycle time.
- ▶ Insert and retract the gas sampling probe.

5.2 Dust Filter Unit

Before commissioning the dust filter:

- ▶ check the electrical connections.
- ▶ check the thermostat settings.
- ▶ set the thermostat temperature.
- ▶ press the “RESET“ key.

↳ The dust filter can be put in operation now.

5.3 Water to Water Cooling Unit

Note

Before filling the water circuits, ensure that all water lines are properly connected.

Primary circuit

- ▶ Open the manually actuated shut-off valve for the on-site water inlet and on-site water outlet (green lines).

↳ Water flows through the plate heater exchanger.

- – The pressure increases.
- – The primary water temperature can be monitored.
- – Failures in the primary water circuit:
  - › lead to retraction of the probe
  - › monitored by flow meter in the water outlet.

Secondary Circuit

To fill the cooling water circuit for the probe, coolant containers (20 l) are supplied with a premixed coolant. This mix not only contains antifreeze (to -30 °C) but also an anti corrosion and antimicrobial agent. A filling pump, which can be operated using a conventional hand held drill, is also supplied.

To fill the secondary circuit coolant containers with a pre-mixed coolant and a filling pump are supplied.

To fill the secondary circuit, proceed as follows:

- ▶ Insert the intake hose of the filling pump into one of the coolant containers.
- ▶ Connect the other filling pump hose to the shut-off valve. To do so, close the shut-off valve in the connection to the primary circuit and connect the filling hose to the shut-off valve.
- ▶ Open the vent valve on the probe outlet duct and vent unit until no air will exhaust anymore.
- ▶ Use the filling pump (at max. 2.500 rpm) to pump coolant from the coolant container to the probe supply line (with max. 2 bar).
- ▶ During the filling process, the air that is displaced at the vent valve escapes to the highest section of the cooler.
- ▶ Keep pumping in coolant until the pressure monitor reaches approx. 1.5 bar.
- ▶ Close the shut-off valve and open the vent valve on the circulating pump.

For further information about commissioning of the SCP3000- Gas Sampling System, refer to the respective SICK Operating Instructions.

5.4 Water to Air Cooling Unit

Filling To fill the secondary circuit coolant containers with a pre-mixed coolant and a filling pump are supplied.

To fill the secondary circuit, proceed as follows:

- Insert the inlet hose of the filling pump into a coolant container.
- Connect the outlet hose of the filling pump to the filling inlet cock on the cooler.
- Open all cocks of the cooler, and the vent valve on the vent and filling device.
- Start the filling pump until the coolant escapes from the vent valves.
- Close the filling cock, open the vent valve on the pump and start the coolant circulating pump.
- Repeat this process until the pressure remains about 4bar and the circulating pump is running properly.
- When the cooling circuit is filled up open both vent valves on the probe to remove residual air out of the probe.

NOTICE

Overheating can damage the probe. Reaching a coolant temperature more than 90 °C causes an alarm and the probe will retract.

5.5 Setting and Monitoring Devices

All sensors have been pre-configured by manufacturer.

5.6 Probe Position Check

When then probe is installed, make sure that the probe enters the sealing box centrally. Thereby the probe enters the sealing box in the right position inside the protection tube.

To carry out the check, proceed as follows:

- Switch on power in the control cabinet (Q1).
- Switch on power for cooler (Q2).
- Press the acknowledge hey (S3). If there are still fault messages present, rectify any faults.
- Use the local panel to check probe position. Press the key (S9) for inserting the probe.
- If the probe does not enter the sealing box centrally, press (S9) again. The probe will retract directly.
- For adjusting the probe see chapter 4.4.1 Probe Axis Fine Tuning /page 42.
- Repeat the procedure until the probe is centralized.
- Check if the rotation device works properly by pressing the key (S16) on the control cabinet.
- Check that the probe stays in a central position after it has been rotated.
- When you finished the checks, switch the key-operator switch (S1) on the control cabinet to automatic.

5.7 Automatic Mode

To commission the automatic mode, all supply medias must be available and all alarms must be acknowledged.

To acknowledge an alarm press S3 on the control cabinet. When all alarms are cleared you can activate automatic mode via the control panel. For parameterizing back flushing times and anti-stick-routine see SICK manual SCP3000 chapter 5.9.1 and 5.9.2.

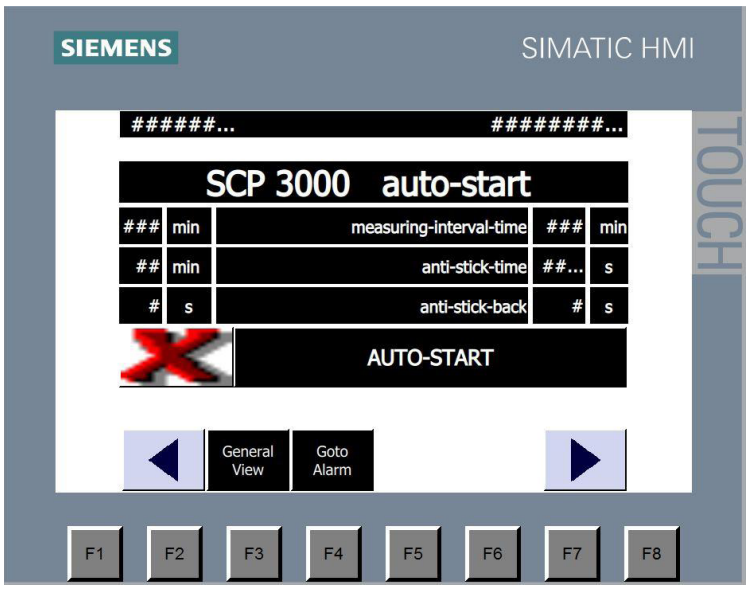


Fig. 41: KTP700 surface auto-start

5.8 MCS300P - Multicomponent Analysis System

- Before powering the MCS300P remove the three transport safety-screws.
- Power up the MCS300P -> LED POWER lights green.
- If the MCS is not on site while commissioning the SCP3000, you can set the Signal whit/ or without MCS from 0 to 1 for testing the probe.

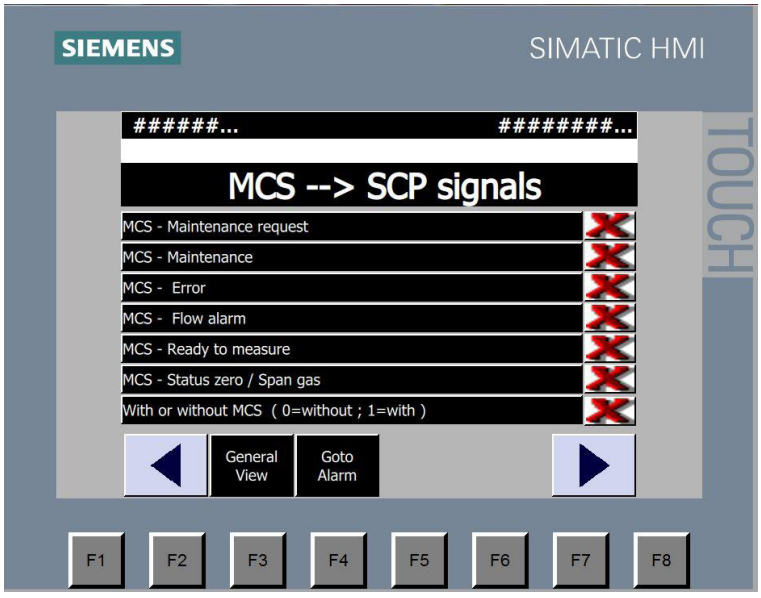


Fig. 42: KTP700 surface MCS300P -> SCP3000 signals

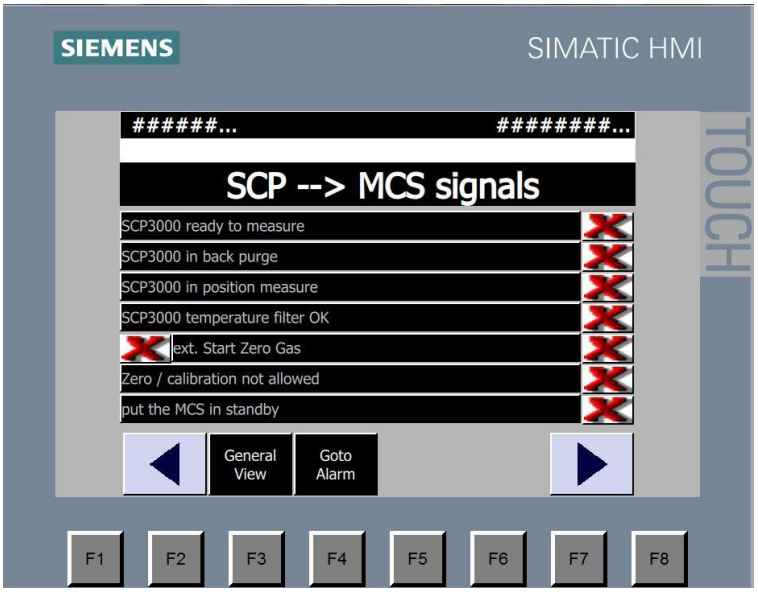


Fig. 43: KTP700 surface SCP3000 -> MCS300P signals

6 Operation

6.1 Control Cabinet

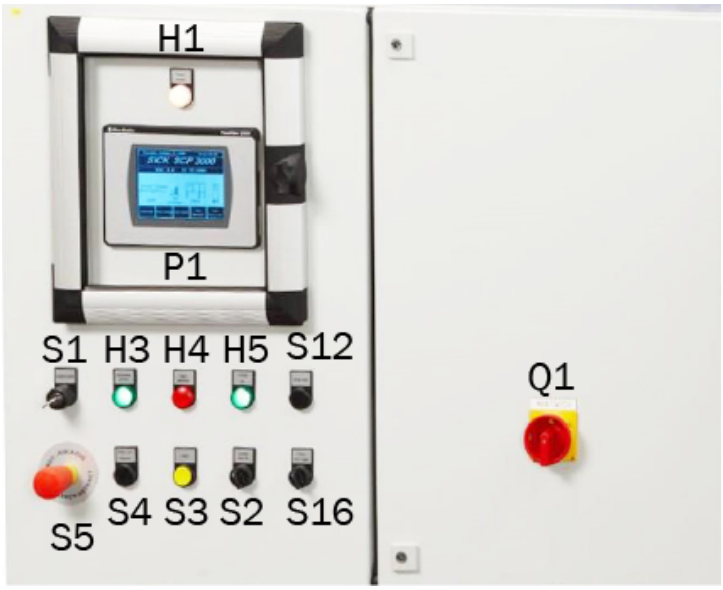


Fig. 44: Control cabinet - control and display elements

Legend	
H1	Power control
P1	Siemens KTP700 touchscreen
S1	Key selector switch local/automatic
H3	Automatic active
H4	General fault
H5	Cooling unit on
S12	Lamp test
S5	Emergency retract
S4	Blow out manual
S3	Acknowledgment
S2	Probe out/in
S16	Turn right/left
Q1	Power switch

6.2 Local Panel

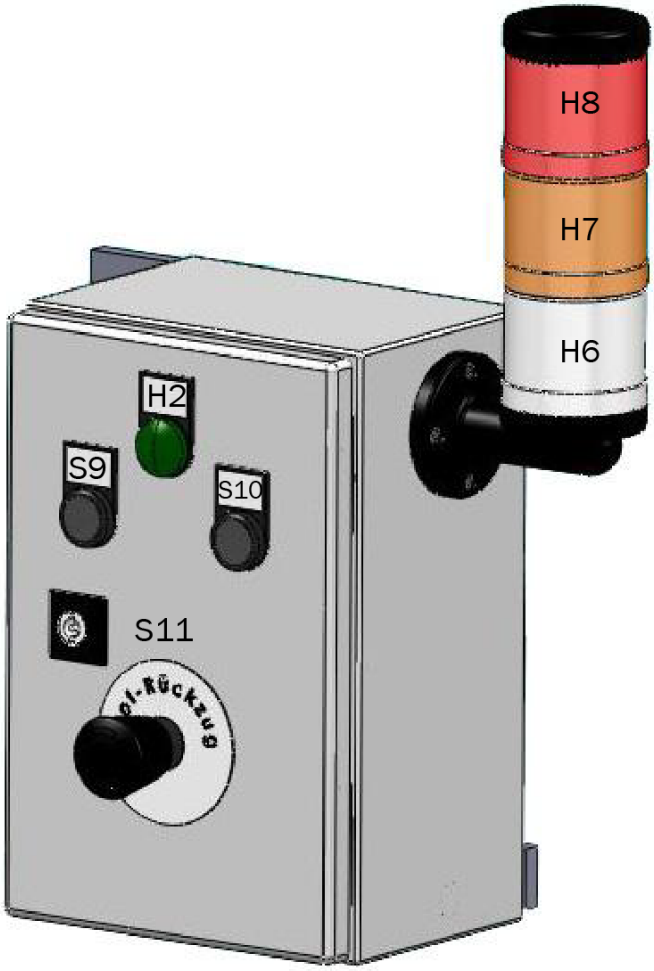


Fig. 45: Local panel - control and display elements

Legend	
H2	Local release
H6	Automatic mode active
H7	Maintenance mode active
H8	General fault
S9	Probe out/in
S10	Blow out manual

6.3 Operation Modes

6.3.1 Local Mode

- Use local mode to trigger operations on site or maintenance work.
- Control room no access on the device.
- Commands has to be issued only from the control cabinet or the local panel.
- Signal lamp H7 on local panels signals local mode active.

6.3.2 Automatic Mode

- Automatic mode is used for routine operation.
- When probe is in measuring position, automatic routine begins (cyclically).
- White signal lamp H6 on the local panel indicates automatic mode active.
- During automatic mode the system can be triggered from control room.

6.4 Operating the Retraction Device

⚠ The area in the immediate vicinity of the retraction device is dangerous when the probe is running in automatic mode.

The probe will be inserted, retracted and rotated in routine operation.

A yellow signal lamp (H7) on the local panel starts flashing to indicate the start of a dangerous process.

6.5 Emergency Retraction

To protect the probe from any damage, the probe is retracted from the kiln inlet chamber in case of any fault. The emergency retraction command has the highest priority. The alarms are indicated by the red lamp (H4) on the control cabinet, and a red flashing lamp (H8) on the local panel.

Emergency retraction is carried out in following situations:

- Cooling water failure
- Cooler malfunction
- Over-temperature
- Power failure
- Compressed air failure
- MCS300P error
- EMERGENCY RETRACT is activated

If an alarm appears:

▶ identify the reason.
▶ rectify the problem.
▶ acknowledge the alarm, press push button S3 on the control cabinet.

6.6 Back Flushing

Back flushing is a routine to clean the gas sampling line of the probe and also the dust filter. The back flushing routine will only do the shock-blow-cleaning when the probe is inside the kiln inlet chamber. In retracted position only the filter and the filter chamber cleaning will be possible.

Note

During the air blast (shock blow) gas and particles are blown out of the probe with high speed. Be aware and depressurize the SCP3000 during each service to the SCP and the kiln.

6.7 Anti-Stick Routine

The anti-stick routine is a cyclic routine to shake off any raw meal that may have accumulated to the probe in the kiln.

To make this happen the probe will retract about 10 cm and then rotate for 36° to the right. After a specific time the probe will rotate 45° back and then move forward approximately 10 cm.

The anti-stick routine increases the lifetime of the probe and does not interrupt the gas measurement process.

6.8 Dust Filter

The filter cleaning processes are controlled by the control cabinet. Because of that you do not have to intervene in the operation of the dust filter.

Only temperature settings need to be adjusted to the local conditions by using the thermostat.

Note

The installed thermostat can only be set in local mode and retracted probe to prevent the filter from rotating.

6.9 MCS300P

The MCS and the SCP3000 are working together in cyclic routine.

The signal exchange between the two components is realized by Modbus.
Without a working communication between MCS300P and SCP3000 the automatic mode cannot be started.

6.9.1 MCS300P Signals

- All measured values are monitored on the control panel.
- For monitoring actual values press the automatic button and use the arrow keys for moving to the right display space.

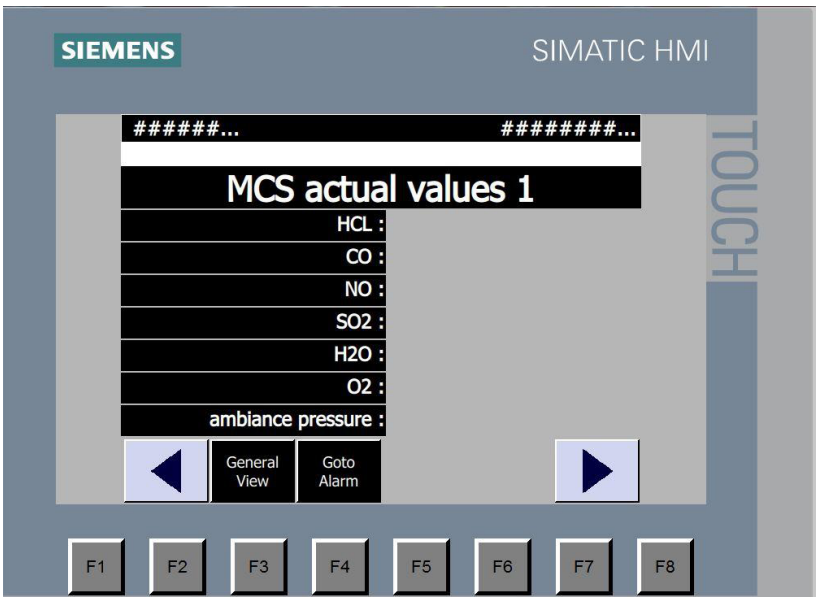


Fig. 46: Control panel - “actual values 1“

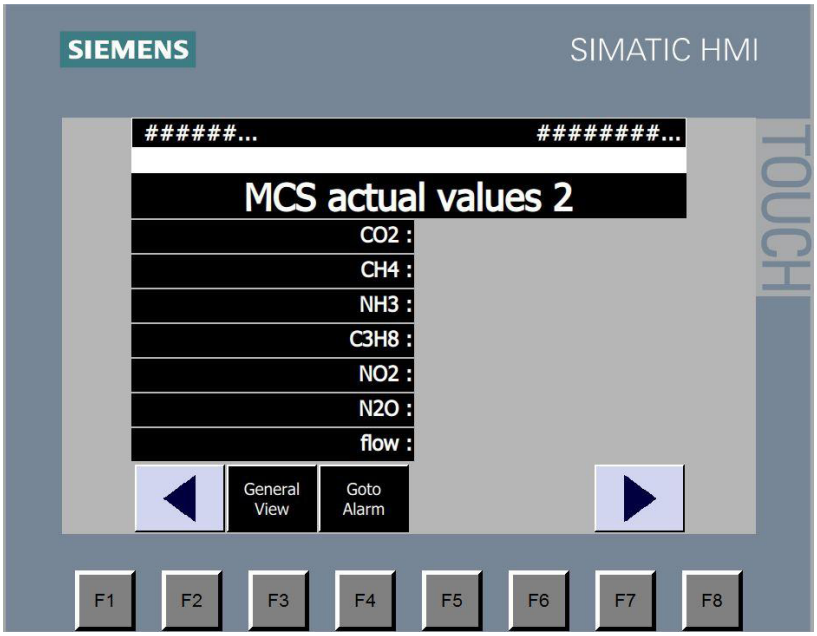


Fig. 47: Control panel - “actual values 2“

- Actual values signals 1 and 2 send from MCS to SCP.
- Only MCS error lead to retraction of the probe.
- When the gas flow falls below 80 l/h the MCS signals error
  Only this error cannot be acknowledged.
  The MCS must be restarted.
- When the gas flow falls below 150 l/h the MCS starts back flushing automatically.
  Probe remains inside the kiln inlet chamber.
- All MCS alarms appears temporary delayed after 1 minute.

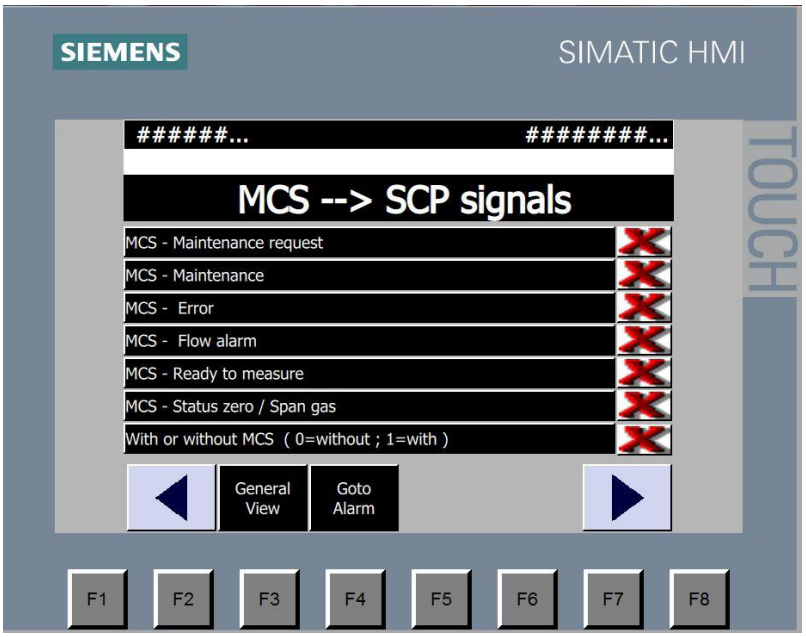


Fig. 48: Control panel „“MCS -> SCP signals

6.9.2 MCS300P Modes

The MCS uses two modes to ensure optimal measuring results:

Conditioning:

In conditioning mode, the pump of the MCS sucks infiltrated air out of the gas sampling line. The conditioning routine takes about 3 minutes and gets activated after each measuring routine.

Measuring:

The measuring process starts after the conditioning routine is finished. The Measuring routine takes 45 minutes (standard value).
The measuring routine running time can be adapted in the MCS settings.

7 Maintenance

Note

Only qualified personnel from the respective field are permitted to work on the system.

For questions and help regarding maintenance work contact SICK Service.

This chapter explains how to perform maintenance works to keep the SCPs3300 in good condition. The individual components should be checked regular to prevent malfunctions. The frequency of maintenance work depends on the local conditions and should be determined on an application-specific basis.

- Before starting maintenance or repair work the SCPS3300 must be in maintenance position.
- Maintenance work must be carried out in local mode.
- Safety equipment must be used.

This chapter explains how to perform maintenance works to keep the SCP3000 in good condition. The individual components should be checked regular to prevent malfunctions. The frequency of maintenance work depends on the local conditions and should regularly determined on an application-specific basis.

Components check

- Retraction device
- Dust filter
- Sealing box
- Cooling unit
- Probe and rotation device
- Control cabinet
- MCS300P

General

- Keep the system free of raw meal dust
- Clean all filters in regular intervals
- Check and fill up all liquids if necessary (oil, antifreeze)

For further information about maintenance of the SCP3000 and the MCS300P, refer to the respective SICK Operating Instructions.

7.1 Leak Test

This chapter explains how to perform a leak test for the SCP3000 in combination with a MCS300P including the heated sampling line.

There are three possible leak test variants. Two tests with negative pressure by using the MCS300P included pump and one test with positive pressure.

There is an optional leak test set available including a pressure gauge, a sealing clamp for the front opening of the sampling probe, and a test gas inlet bag.

7.1.1 Leak Test 1 - Complete System Check with Negative Pressure

- ▶ Bring the probe into maintenance position (move probe completely out).
- ▶ Wait for cool down of the probe.
- ▶ Switch the key selector on the control cabinet to position “0“

Fig. 49: Control cabinet - key switch selector

- ▶ Clean the tip of the probe by using a brush until there no deposits.
- ▶ Close the front opening of the probe with the sealing clamp.

Fig. 50: Sealing clamp closed

At the control cabinet on the Siemens KTP700 touchscreen a leak test is available at menu service 2.

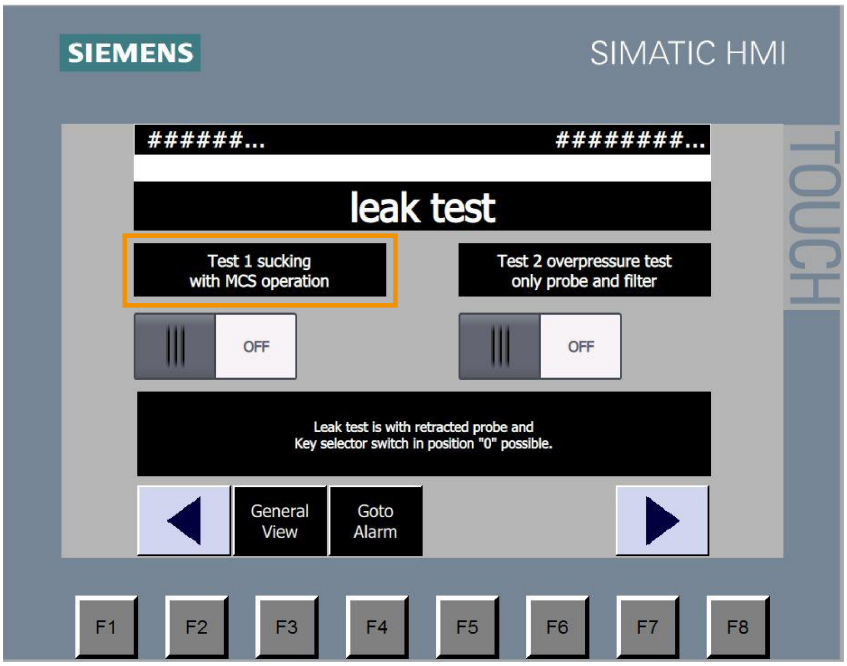


Fig. 51: Control panel KTP700 touchscreen “leak test“

- ▶ Push the button “Test1 sucking with MCS operation“.
  The MCS pump start working and produces negative pressure.

The gas flow at the MCS should decrease and reach a value of approx. 20 - 30 l/h after 5 minutes.

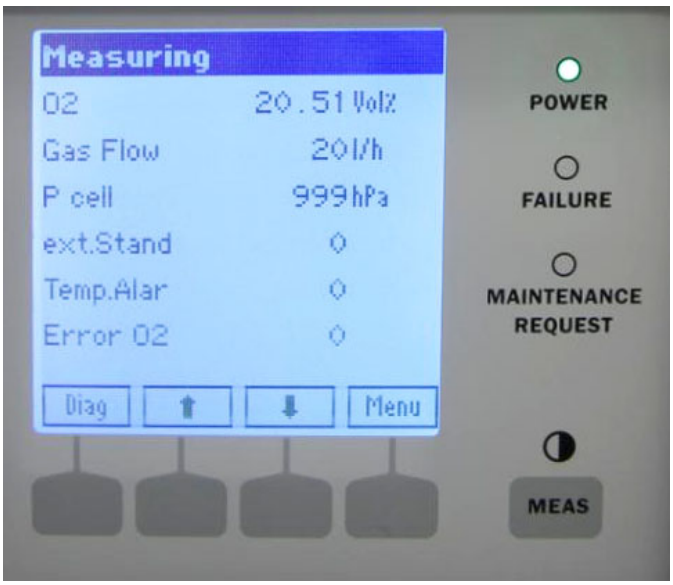


Fig. 52: MCS display with decreased “Gas Flow“

Note

The gas flow is measured/calculated by pressure. The precision of this measurement is not designed for this low gas flow rates.

The gas flow will not reach zero at this type of measurement.
A gas flow rate of 20 - 30 l/h is that high, that the test is passed okay.

Leak test finish:

- switch off the leak test.
- remove the components.
- set the system into operation.

7.1.2 Leak Test 2 - Complete System Check with Zero Gas

- Bring the probe into maintenance position (move probe completely out).
- Wait for cool down of the probe.
- Switch the key selector on the control cabinet to position “0“.
- Clean the tip of the probe by using a brush until there no deposits.
- Close the front opening of the probe with the sealing clamp in combination with the test gas inlet bag.

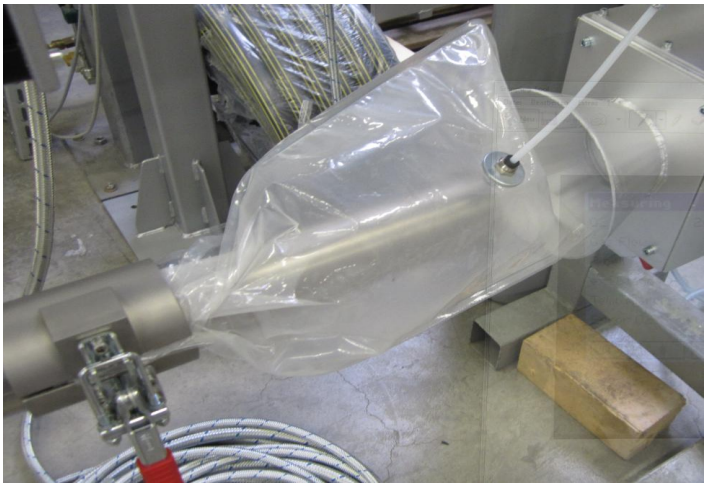


Fig. 53: Sealing clamp with test gas inlet bag.

- Connect a zero gas to the bag and fill the bag with gas. The bag has a small opening at the back side to prevent overpressure and a bursting of the bag.
- The flow rate into the bag shall be double of the flow rate of the MCS, e.g. flow rate of MCS 450 l/h, filling of the bag approx. 900 l/h.

The gas flow rate at the MCS should stay at standard value, e.g. 450 l/min, and the oxygen value should start to decrease down to 0,6 % O2 within the next 5 minutes.

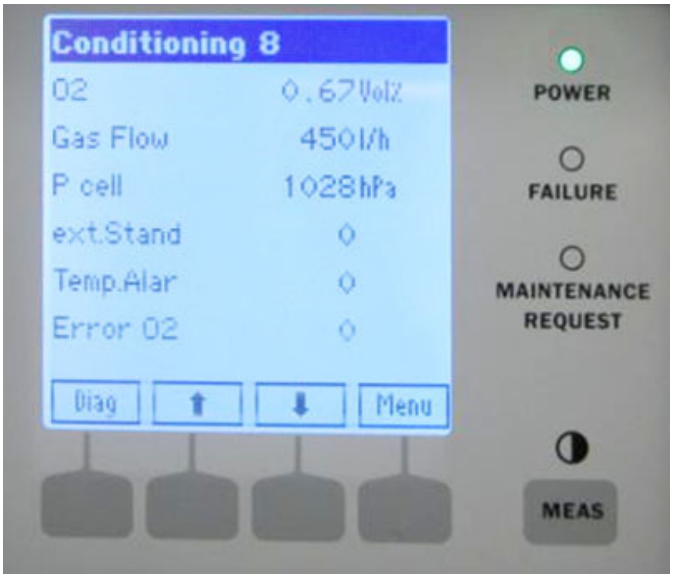


Fig. 54: MCS display with low O2

Leak test finish:

- ▶ switch off the leak test.
- ▶ remove the components.
- ▶ set the system into operation.

7.1.3 Leak Test 3 - Probe and Filter Check with Positive Pressure

For this test, the optional leak test set is necessary, including:

- the pressure gauge
- a leak test spray
- a sealing clamp

- ▶ Bring the probe into maintenance position (move probe completely out).
- ▶ Switch the key selector on the control cabinet to position “0“.
- ▶ Switch of the filter heating and shock blow heating in reference to the wiring diagram (standard fuse F3).
- ▶ Wait for cool down of the probe.
- ▶ Clean the tip of the probe by using a brush until there no deposits.
- ▶ Close the front opening of the probe with the sealing clamp.
- ▶ Disconnect the shock blow hose at the shock blow valve and install the pressure gauge.

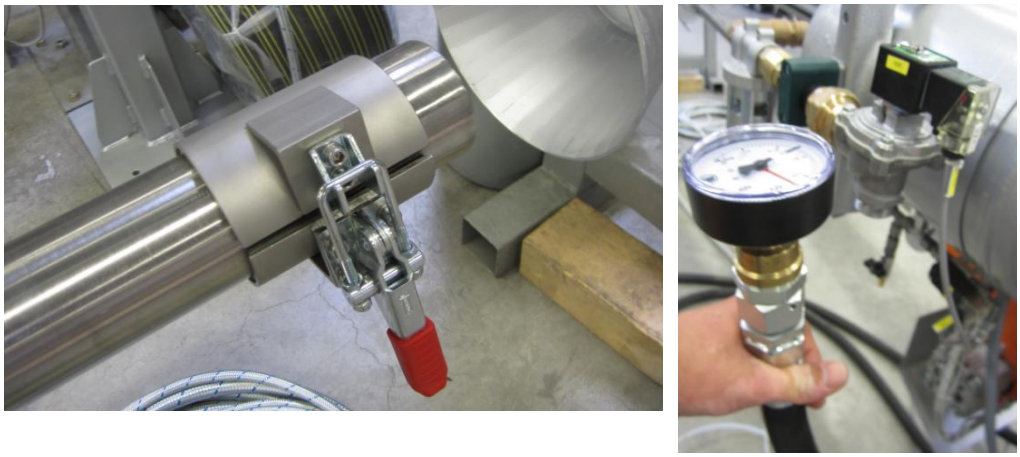


Fig. 55: Sealing clamp - pressure gauge

- ▶ Remove the heating sleeves to get access to the flanges.

Fig. 56: Heating sleeves

At the control cabinet on the Siemens KTP700 touchscreen a leak test is available at menu service 2.

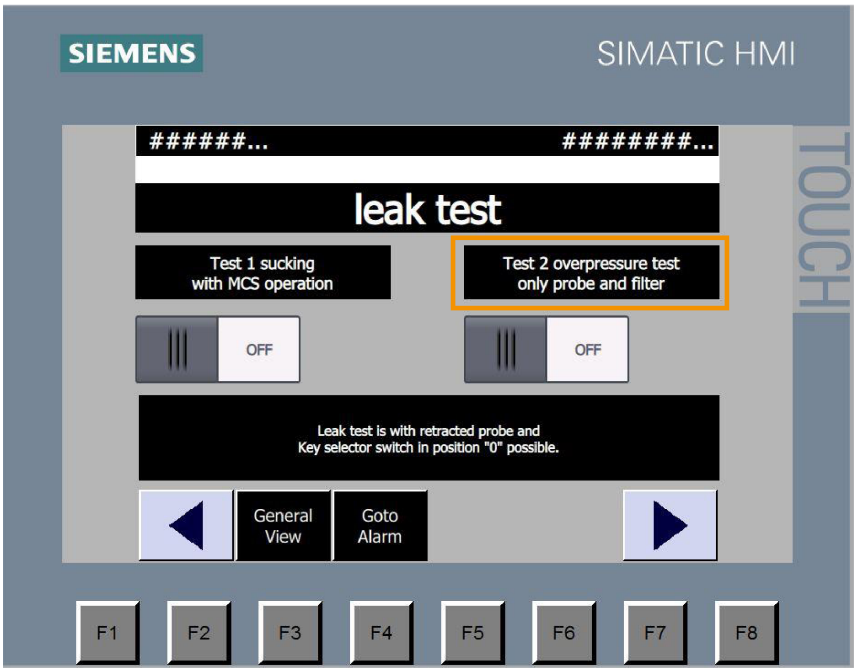


Fig. 57: Control panel KTP700 touchscreen “leak test“

- Push the button “Test 2 overpressure test only probe and filter“.
  The probe and the filter get filled now with 6 bar.
- Check all flanges and connectors with leak test spray.
- Push the OFF button for the leak test 2 an wait until the system has lost the pressure by monitoring the pressure gauge.
- To accelerate the pressure drop the screw joint at the pressure gauge can be released slightly to get a leak for pressure relief.
- After the complete pressure drop remove the pressure gauge and reinstall the shock blow hose and remove all other installed components.
- Dry the material if it is wet from the leak test spray.
- Place the heatings again into the correct position and switch on the filter heating.
- Set the system into operation.

8 Troubleshooting

Note

Only qualified personnel from the respective field are permitted to work on the system.

For questions and help regarding troubleshooting contact SICK Service.

8.1 Alarms

Actual alarms/failures of the SCP3000 are shown in the touchscreen KTP700 on the page “actual failures“.

Additionally new failures and still current failures are shown on in the top line of every page.

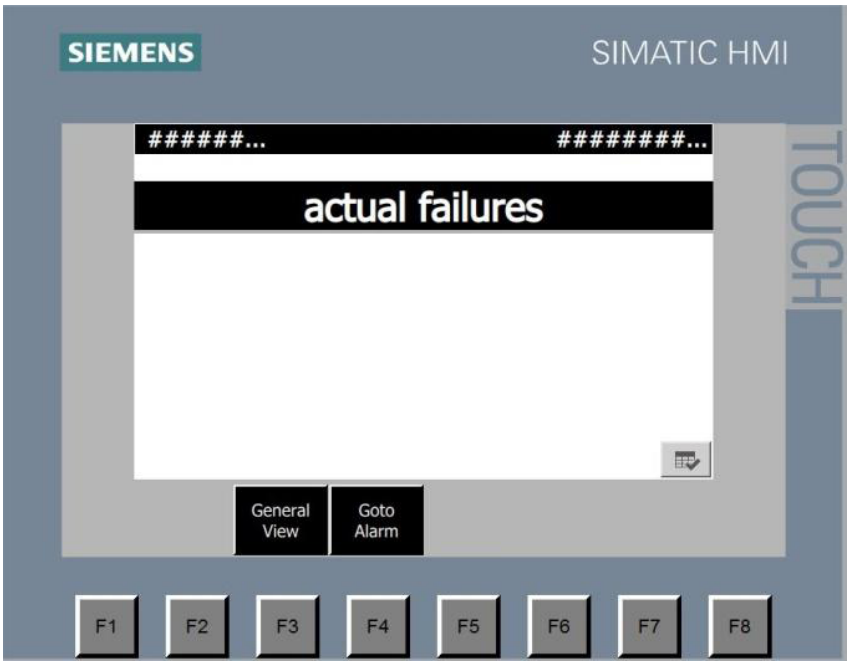


Fig. 58: Control panel KTP700 touchscreen “actual failures“

Actual alarms are also displayed on the control panel elements.

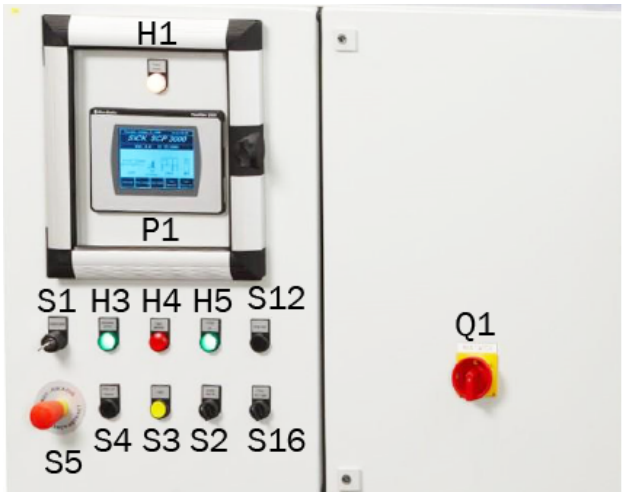


Fig. 59: Control panel - control and display elements

The alarm messages and the indicator lamps stay active, until the alarm has been cleared and the S3 button (acknowledgment) has been pushed.

Alarms are also indicated by the display elements on the local panel with the red light H8 at the column.

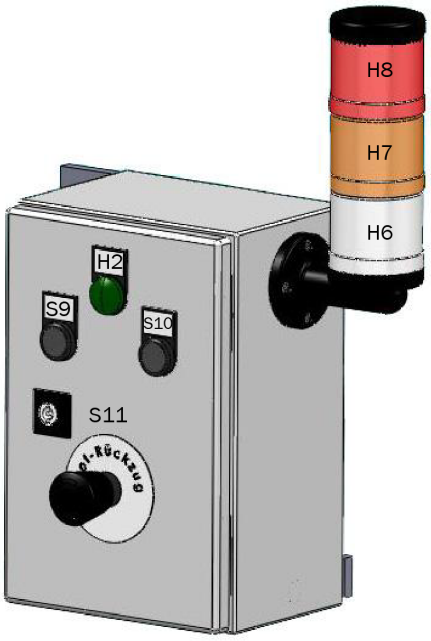


Fig. 60: Local panel - control and display elements

The “Alarm-Report“ shows all occurred alarms.

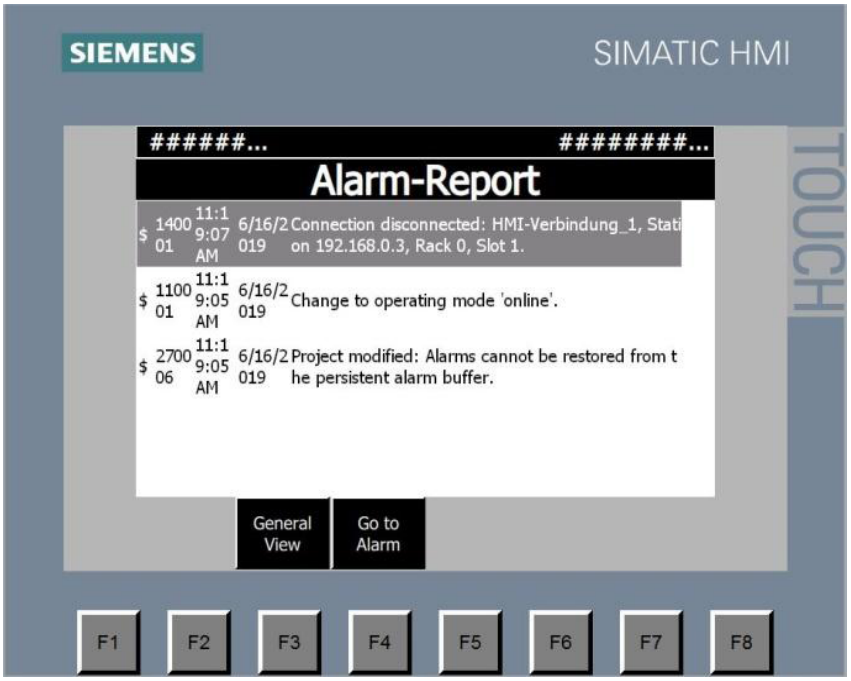


Fig. 61: Control panel KTP700 touchscreen “Alarm-Report“

8.2 Reset Alarms

- Before an alarm can be reseted, the error must first be corrected.
- The alarm can be reseted pushing the S3 button (acknowledgment).
- In standard configuration the reset can only by done locally pushing the S3 button. Optionally a remote reset using the bus connection is available upon request.

8.3 Action Table - SCPS3300

Error	Result	Possible causes	Action
Communication error between MCS an SCP	Analyzing values on SCP HMI are frozen	IP address at MCS misadjusted	Check MCS IP Adress check LED on the Siemens RS485 module in the control cabinet (only with Modbus RTU Communication, before 08/2018) check LED at Ethernetport, check Ethernet cable with a connection MCS to SCP (only with Modbus TCP Communication, after 08/2018)
		Cable broken	
		Error in communication processor	
MCS error on SCP HMI display	System is out of operation	Gas flow < 80 l/min = MCS error	Check filter and pump
Wrong measured values	typically O2 to high	System is not gas tight	Check tightness of the sample gas line
Probe does not move into kiln	No automatic mode	Kiln-in operation signal missing	Check available signals
		Move probe-in signal missing	
		Start button on HMI missing	
“Endless“ back flushing	SCP3000 is in continues back flushing	Gas filter is full of dust	Check filter
		Flow iin MCS reached first flow limit and triggers a back flushing	Check back flushing is sufficient Check shock blow works correct

9 Technical Data

System	
Power supply	3 x 400 V / 50 Hz + N + PE
Control voltage	24 V DC
Compressed air supply	6 bar (free of dust, oil, and water)

Gas sampling probe	
Length	3,000 / 3,500 / 4,000 mm (depending on insertion depth)
Diameter	76 mm
Process temperture	Max. 1,400 °C
Coolant connections	G 1“
Probe material	temperature resistant stainless steel (1.4841)

Rotation device	
Probe rotation angle	72°
Drive	Pneumatic piston drive; piston diameter: 50 mm
Bearings	2 deep-groove ball bearings
Valves	5/2-way solenoid valve; R1/4"; 12 V DC; with throttle valve
Dimensions (L x W x H)	360 x 325 x 435 mm

Dust filter	
Filter element	Metal mesh 1 µm
Filter heater	180 °C; adjustable on the control thermostat
Back purging	1 x through the filter element; 1 x above the filter element
Power supply	230 V / 50 Hz; 630 W
Degree of protection	IP 54 (terminal box)
Dimensions (L x W x H)	345 x 340 x 260 mm

Retraction device	
Travel length	2,500 / 3.000 / 3,500 mm
Drive	Spindle drive in cylinder housing
Electrical motor	Worm gear motor; 400 V / 50 Hz
Compressed air motor	Max. 7.0 bar; at 5.6 bar 1,500 rpm
Retraction force	app. 10,000 N
Degree protection	IP 54

Control and supply cabinet	
PLC	SIMATIC with control panel (standard); other PLCs on request
Control voltage	24 V DC
Power supply	3 x 400 V / 50 Hz + N + PE
Degree of protection	IP 54
Dimensions (W x H x D)	Control cabinet: 1000 x 760 x 260 mm

Australia
Phone +61 (3) 9457 0600
1800 33 48 02 – tollfree
E-Mail sales@sick.com.au

Austria
Phone +43 (0) 2236 62288-0
E-Mail office@sick.at

Belgium/Luxembourg
Phone +32 (0) 2 466 55 66
E-Mail info@sick.be

Brazil
Phone +55 11 3215-4900
E-Mail comercial@sick.com.br

Canada
Phone +1 905.771.1444
E-Mail cs.canada@sick.com

Czech Republic
Phone +420 2 57 91 18 50
E-Mail sick@sick.cz

Chile
Phone +56 (2) 2274 7430
E-Mail chile@sick.com

China
Phone +86 20 2882 3600
E-Mail info.china@sick.net.cn

Denmark
Phone +45 45 82 64 00
E-Mail sick@sick.dk

Finland
Phone +358-9-25 15 800
E-Mail sick@sick.fi

France
Phone +33 1 64 62 35 00
E-Mail info@sick.fr

Germany
Phone +49 (0) 2 11 53 01
E-Mail info@sick.de

Hong Kong
Phone +852 2153 6300
E-Mail ghk@sick.com.hk

Hungary
Phone +36 1 371 2680
E-Mail ertekesites@sick.hu

India
Phone +91-22-6119 8900
E-Mail info@sick-india.com

Israel
Phone +972-4-6881000
E-Mail info@sick-sensors.com

Italy
Phone +39 02 27 43 41
E-Mail info@sick.it

Japan
Phone +81 3 5309 2112
E-Mail support@sick.jp

Malaysia
Phone +603-8080 7425
E-Mail enquiry.my@sick.com

Mexico
Phone +52 (472) 748 9451
E-Mail mario.garcia@sick.com

Netherlands
Phone +31 (0) 30 229 25 44
E-Mail info@sick.nl

New Zealand
Phone +64 9 415 0459
0800 222 278 – tollfree
E-Mail sales@sick.co.nz

Norway
Phone +47 67 81 50 00
E-Mail sick@sick.no

Poland
Phone +48 22 539 41 00
E-Mail info@sick.pl

Romania
Phone +40 356-17 11 20
E-Mail office@sick.ro

Russia
Phone +7 495 283 09 90
E-Mail info@sick.ru

Singapore
Phone +65 6744 3732
E-Mail sales.gsg@sick.com

Slovakia
Phone +421 482 901 201
E-Mail mail@sick-sk.sk

Slovenia
Phone +386 591 78849
E-Mail office@sick.si

South Africa
Phone +27 (0)11 472 3733
E-Mail info@sickautomation.co.za

South Korea
Phone +82 2 786 6321
E-Mail info@sickkorea.net

Spain
Phone +34 93 480 31 00
E-Mail info@sick.es

Sweden
Phone +46 10 110 10 00
E-Mail info@sick.se

Switzerland
Phone +41 41 619 29 39
E-Mail contact@sick.ch

Taiwan
Phone +886-2-2375-6288
E-Mail sales@sick.com.tw

Thailand
Phone +66 2 645 0009
E-Mail marcom.th@sick.com

Turkey
Phone +90 (216) 528 50 00
E-Mail info@sick.com.tr

United Arab Emirates
Phone +971 (0) 4 88 65 878
E-Mail info@sick.ae

United Kingdom
Phone +44 (0)17278 31121
E-Mail info@sick.co.uk

USA
Phone +1 800.325.7425
E-Mail info@sick.com

Vietnam
Phone +65 6744 3732
E-Mail sales.gsg@sick.com

Further locations at **www.sick.com**

SICK
Sensor Intelligence.