OPERATING INSTRUCTIONS

PGK
Gas Cell

Installation
Operation
Maintenance

SICK
Sensor Intelligence.

Document Information

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Warning Symbols


Hazard (general)


Hazard by voltage

Hazard in potentially explosive atmospheres


Hazard by explosive substances/mixtures


Hazard by acidic substances


Hazard by toxic substances


Hazard by noxious substances


Hazard by high temperature or hot surfaces


Hazard for the environment/nature/organic life

Warning levels / Signal words

DANGER
Immediate danger for persons which *will* result in severe personal injury or death.

WARNING
Risk or hazardous situation which *could* result in severe personal injury or death.

CAUTION
Hazard or unsafe practice which *could* result in less severe or minor injuries *and/or* property damage.

Information Symbols


Information about the use in potentially explosive atmospheres


Important technical information for this device


Important information on electrical or electronic functions


Supplementary information


Link to information at another place

PGK

1 Important Information

Main hazards
Intended use
Own responsibility

1.1 Main hazards

WARNING: Hazards by ignitable or combustible gases

► Do not use the PGK to measure ignitable or combustible gases.

CAUTION: Noxious and irritating sample gases

When the sample gas contains noxious or irritant substances:

► Operate the PGK in a safe manner (→ p. 24, §4.1.1)

WARNING: Risk of explosions in potentially explosive atmospheres

► Do not use the PGK in potentially explosive atmospheres.

1.2 Intended use

1.2.1 Purpose of the cell

The PGK cell is part of a measuring system for analyzing gas mixtures.

1.2.2 Limitations

► Check whether the cell is suitable for the sample gas composition planned.
  – List with materials used in the cell: Refer to the Data Sheet delivered with the cell.
  – In case of doubt, contact your local SICK Sales Office.

1.3 Responsibility of user

Intended user

The PGK cell may only be installed by skilled persons who, based on their technical training and knowledge as well as knowledge of the relevant regulations, can assess the tasks given and recognize the dangers involved.

Correct use

- ► Use the cell only as described in these Operating Instructions.
  The manufacturer bears no responsibility for any other use.
- ► Have the prescribed maintenance work performed.
- ► Do not remove, add or modify any components in or on the cell. Otherwise:
  - – The cell can become dangerous.
  - – Any warranty by the manufacturer becomes void.

Special local conditions

- ► In addition to these Operating Instructions, observe all local laws, technical regulations and company-internal operating directives applicable at the installation location of the device.

Further documents

- ● Operating Instructions for the MCS300P (for assembling the cell on an MCS300P).

Keeping documents

These Operating Instructions:

- ► Must be available for reference.
- ► Must be passed on to new owners.

PGK

2 Product Description

Product identification
Functional principle

2.1 Product identification

Manufacturer:	SICK AG Erwin-Sick-Str. 1 · 79183 Waldkirch · Germany

Cell	Part No.
PGK10 (10 cm)[1]	2023312
PGK20 (20 cm)	2023313
PGK50 (50 cm)	2023314
PGK75 (75 cm)	2030789

[1] Optical path length

The type plate is located on the connection box (→ p. 13, Fig. 1).

2.2 Combustible sample gases

The cell is only suitable to a limited extent for the measurement of combustible gases
There is no ignition source present in the part of the cell with sample gas contact.

Conditions for feeding combustible sample gases

WARNING: Risk of explosions in potentially explosive atmospheres
► Do not use the PGK in potentially explosive atmospheres.

- Sample gas flow rate: Max. 100 l/h (3.5 cu.foot/h).
- Purge gas:
  - Use inert purge gas (e.g. nitrogen) (→ p. 20, §3.1.2).
  - Supply through appropriate return valve.
  - Purge gas disposal against atmospheric pressure.
  - The purge gas disposal lines require a greater diameter than all upstream purge gas lines.
  - Sample gas may only be fed into the cell when purge gas flow is available.
  - Monitor purge gas pressure and purge gas flow (specification → »Technical Data«).
  - Ensure disposal of purge gas - even in case of escaping sample gas.
- If appropriate, carry out an evaluation of the damage according to the operating conditions.

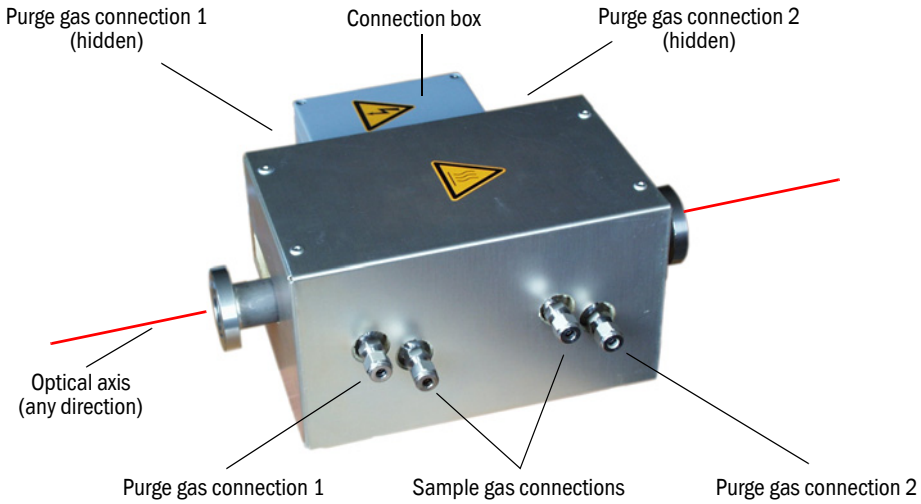
2.3 PGK cell description

The sample gas is channeled through a sample compartment limited by a window on the side.

The measuring beam of a connected analyzer travels lengthwise through the cell and through the sample compartment. The measuring beam is attenuated by sample gas, depending on the sample gas, and the analyzer evaluates this attenuation.

Protective windows between the sample compartment windows and the flanges to the analyzer form a purge gas compartment. This can be purged via purge gas connections. This allows, for example, flushing out gas from leaks in the cell window and detecting such leaks.

Fig. 1 PGK view



2.3.1 Materials used

Different materials are used for the windows and seals depending on the spectral range and application conditions.

- The cell can be used for reactive and corrosive gases depending on the materials used.
- The maximum operating pressure depends on the materials used.

► Refer to the Data Sheet delivered with the cell for the materials used.

2.3.2 Thermostatic control

The cell has integrated heating cartridges.

A Pt 100 sensor is fitted for temperature measurement (option: 2 Pt 100 sensors).

An external “temperature controller for Pt 100 sensors” controls the temperature (not part of the cell).

For thermal protection, the cell is equipped with a self-resetting temperature switch (→ p. 40, § 7.2→ »Technical Data«).

PGK

3 Installation

Installation
Initial start-up

3.1

Installation

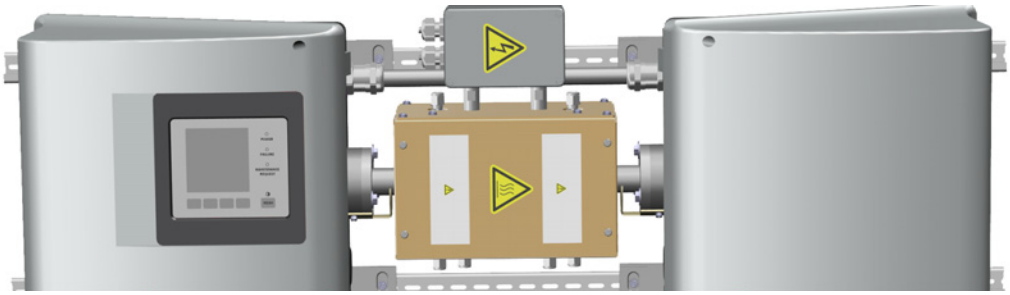
WARNING: Risk of explosions

► Do not use the PGK in potentially explosive atmospheres and do not use for measuring combustible gases.

The PGK is normally installed on a SICK MCS300P analyzer.

The location of the measuring beam inlet or outlet is arbitrary.

Fig. 2 PGK cell on MCS300P



If you have to install the cell yourself: → Operating Instructions of the MCS300P.

Final installation steps:

1 Connect sample gas → p. 17, §3.1.1.

2 Connect purge gas (option) → p. 20, §3.1.2.

3 Electrical installation → p. 21, §3.1.3.

3.1.1 Connecting sample gas

Gas connections may only be performed by skilled persons who, based on their technical training and knowledge:

- Are familiar with handling pipes and pipe connections.
- Are capable of performing suitable leak tests.

CAUTION: Damage through condensate

Condensate can form on the sample gas outlet when using wet and hot sample gas.

- ► Keep the line opening free from any blockages.
- ► Always lay the line so that it runs downwards and no condensate can occur.
- ► Protect the sample gas outlet from frost.
- ► If necessary, provide a suitable condensate collecting device and adequate ventilation.
  Check and empty the condensate collection container regularly.

CAUTION: Damage resulting from overpressure.

Blocked pipes can falsify measured values and possibly damage the cell.

- ► The sample gas outlet may not increase the working pressure.
- ► Only use pipes and screw connections suitable for the required pressure.
- ► Do not bend or crimp the pipes.

3.1.1.1 Preparation work

WARNING: Danger to life/health risk by noxious gases

If noxious gases are applied to the cell, emerging gas can damage health.

- ► Lay the outlets of the cell into the open or into a suitable collecting channel.
- ► Pay attention to the information from the equipment operator.

A leak in the gas path can create acute danger for persons.

- ► Take suitable safety measures.

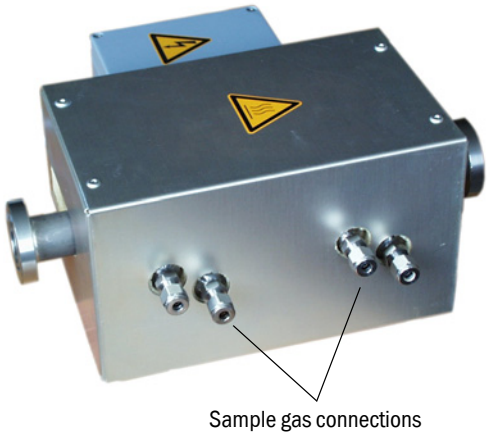
CAUTION: Possibly provide initial thermal stabilization for cold sample gas.

When cold sample gas is fed to a heated cell, it is possible that the measurement signal becomes unstable due to thermal turbulence.

- ► Plan suitable initial thermal stabilization when necessary.

3.1.1.2 Sample gas connection

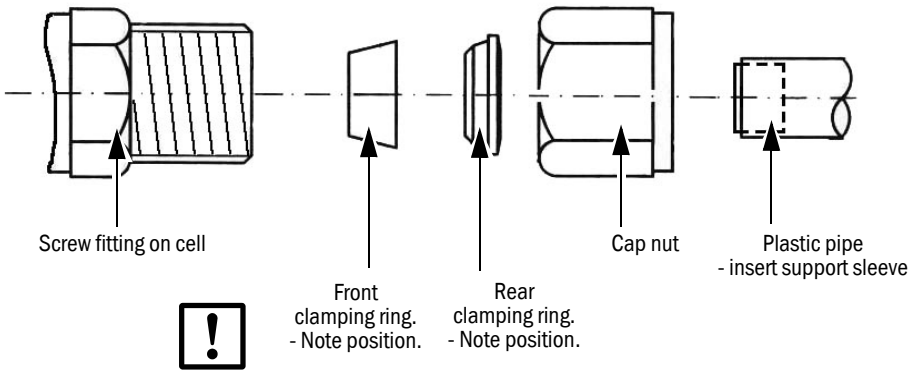
Fig. 3 Sample gas connections



► Connect sample gas pipes gas-tight.
- *Vertical assembly*: Sample gas inlet below, sample gas outlet above (recommended).
- *Horizontal assembly*: Sample gas inlet and sample gas outlet arbitrary.

Information: Only use suitable pipes for the sample gas, e.g. PTFE pipes.
Information on plastic pipes: Use support sleeves.

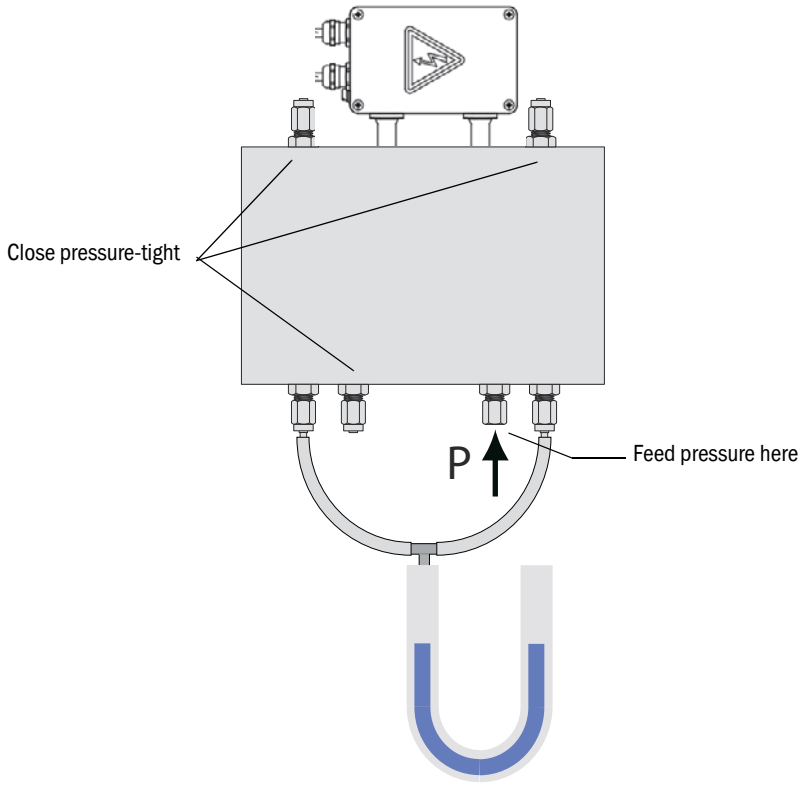
Fig. 4 Clamping ring screw connection



4 Carry out leak test.

3.1.1.3 Carrying out the leak test

Fig. 5 Leak test arrangement

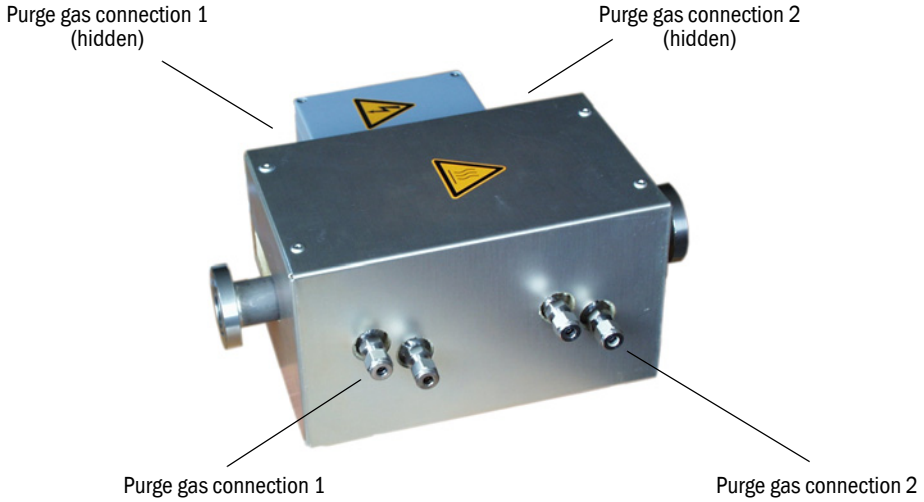


WARNING: Risk of bursting with high pressure
Glass splinters can escape from the pipes should a window break.
► Bring the cell to a safe place and cover the pipes.

1 Bring the cell up to operating temperature.
2 Slowly apply 1.5 times the operating pressure to the cell sample gas compartment.
3 Use a transparent plastic hose with 400 mm water column to monitor leak tightness.
1 mm water column corresponds to 0.1 mbar.
The water column must not change as the pressure is increased resp. within 1 minute.

3.1.2 Connecting purge gas

Fig. 6 Purge gas connections



- Feeding into the purge compartments must run via a return valve (provided by operator).
- Purge gas disposal must be made against atmospheric pressure and using lines with a larger cross-section than those for the purge gas pipes to the cell.
- The operator must ensure purge gas pressure and purge gas flow.
- Measuring medium may only be fed into the cell when purge gas flow is available.
- The operator must ensure safe disposal of the purge gas as well as any sample gas escaping after a malfunction.
- Purge gas conditions:
  - Flow: 2 .. 100 l/h (0.1 .. 35 cu.foot/h)
  - Primary pressure: Max. 3 bar (300 kPa)

Procedure

► Connect purge gas lines.

3.1.3 Electrical installation

Electrical installation is required only when the cell is to be heated.

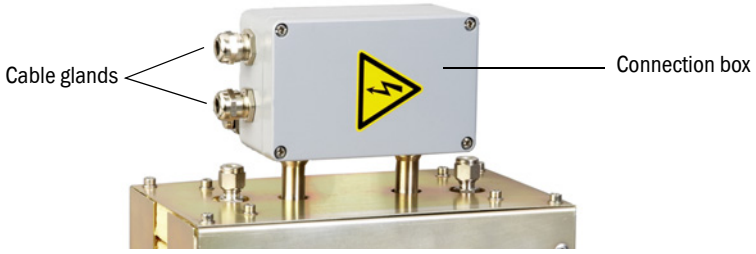
WARNING: Hazard by voltage
The PGK may only be installed by skilled persons who, based on their technical training and knowledge as well as knowledge of the relevant regulations, can assess the tasks given and recognize the dangers involved.

3.1.3.1 Preparation work

- Install a suitable mains disconnecting device to be able to disconnect from the mains and make all poles potential-free.
- Install a suitable mains fuse for the cell heater.
  - 4 A for PGK10/PGK20/PGK50 (with 115 V and 230 V)
  - 8 A for PGK75 (with 115 V and 230 V)
- Install a temperature controller for Pt 100 sensors and possibly a limiter.

3.1.3.2 Electrical connection

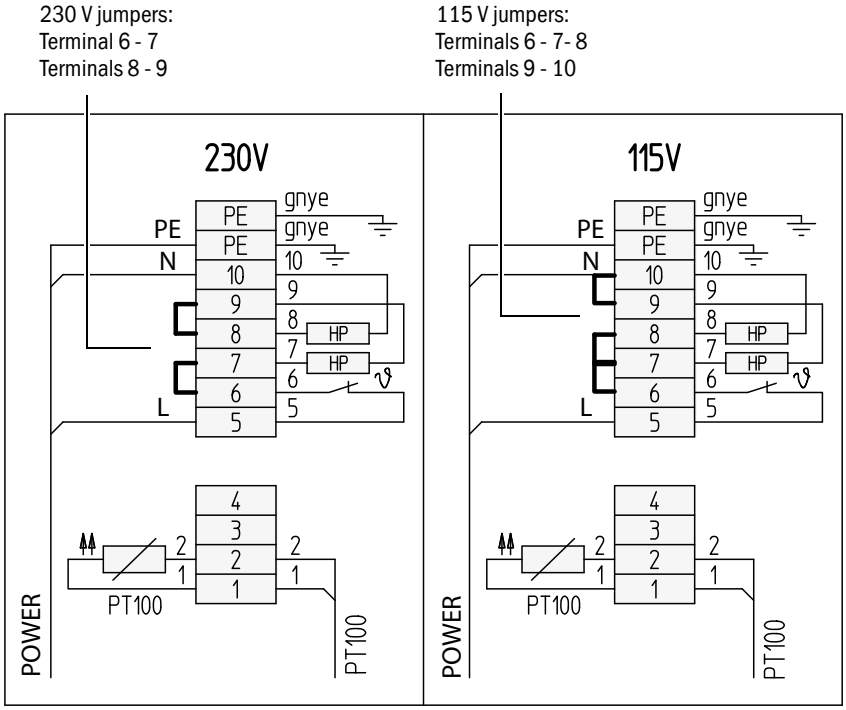
Fig. 7 Connection box



1 Loosen 4 screws on the connection box cover.
2 Take the cover off.

A wiring diagram is in the connection box cover.

Fig. 8 Connecting diagram



3 Check voltage setting on jumpers

> ***NOTICE:*Pay attention to jumpers**
> ► Jumpers depend on the mains voltage.

4 Lead connection lines for mains voltage and Pt 100 (specification → »Technical Data«) through the cable glands and connect in the connection box.
Pay attention to the cable glands (specification → »Technical Data«).

5 Tighten the cable glands.

6 Position the connection box cover and screw tight.

7 Connect the cell to the external temperature control.

PGK

4 Start-up / Operation

Start-up
Operation

4.1 Start-up

4.1.1 Safety information on start-up

WARNING: Hazards by explosive or combustible gases

► Do not use the PGK to measure combustible or ignitable gases.

WARNING: Mortal/health danger as a result of gas path leakage

When noxious gases are fed to the cell:
A leak in the gas path can create an acute danger for persons.

► When required, carry out a leak test (→ p. 19, § 3.1.1.3).

4.1.2 Start-up procedure

1 Check sample gas feed for:
- Damage
- Leak tightness
- Continuity
- Functional capability of sample gas filter
- Correct sample gas pressure setting
- When heated: Functional capability of heater

2 Let the cell heat up.

There is a risk of condensation in the cell when gas is fed to a cold cell.

► Let the cell heat up.

► Then feed sample gas.

a) When used under ambient temperature without heating:
- Allow the cell to adapt to the gas temperature for approx. 5 h.

b) When using the cell heating:
- Check the setting of the temperature controller.

Heating up time:
- From room temperature to approx. 50 °C (120 °F): Approx. 1 hour
- From room temperature to approx. 180 °C (360 °F): Approx. 4 hours

3 Set the purge gas flowrate.
- Flowrate: 2 .. 100 l/h (0.1 .. 35 cu.foot/h)

4 Feed sample gas.
- Max. sample gas temperature: 200 °C (400 °F).

When the cell is operated with pressure: Apply pressure slowly.
- Max. pressure: → Data Sheet

Set the sample gas flowrate:
- Recommended flowrate: 30 - 1000 l/h

4.2 Operation

WARNING: Risk of burns on hot surface
Cell and gas connections can be very hot.
► Do not touch the surface.

The cell operates automatically.

In regular intervals:

► Check the cell and connected pipes for:
  – Damage
  – Leak tightness
  – Continuity

► If a condensate container is fitted: Check fill level regularly.

PGK

5 Shutdown

Preparations
Switch-off procedure

5.1 Shutdown

WARNING: Hazard resulting from substances remaining in the cell

Depending on the sample gas composition, toxic or corrosive gases can remain in the cell and connected pipes when the gas supply is switched off. If necessary:

- ► Purge the cell and connected pipes for at least 1 h with inert gas (e.g.: N_2).
- ► Take suitable protective measures (e.g. work under a vent, wear suitable protective clothes).
- ► Decontaminate the cell.

1 Switch off the sample gas feed and ensure that no more gas can flow into the cell.

2 Depending on the sample gas composition, purge the cell and the connected pipes for at least 1 h with inert gas.

3 Ensure that there is no pressure.

4 Switch purge gas off when used.

5 If heating is connected: Switch the heating off and disconnect where necessary.

6 If the cell is to be put out of operation for a longer period: Close the gas inlets airtight.

WARNING: Risk of burns on hot surface

Cell and gas connections can be very hot.

- ► Allow the cell and gas connections to cool down before touching them.

WARNING: Danger when storing or dispatching

If the cell can contain deposits dangerous to health and the cell is to be stored or sent somewhere:

- ► Mark the cell *clearly*:
  - Which gases were in the cell.
  - Which hazards exist (e.g. when disassembling the cell).
  - How the cell was cleaned.

5.2 Disposal

- ► Observe local regulations.
- ► Dispose of electronic components (heating cartridges) as electronic waste.
- ► Dispose of metal parts as scrap metal.
- ► Dispose of windows and seals as residual waste.
- ► If the cell was used with toxic substances or substances harmful to the environment and there is a risk that deposits of these substances still cling to parts with media contact: Dispose of parts with media contact as hazardous waste.

PGK

6 Maintenance

Maintenance plan
Recommended spare parts

6.1 Maintenance plan

Maintenance interval	Maintenance work
1 year	► Disassemble and clean the cell. Recommendation: ► Renew O-rings with media contact. ► Renew cell window (can be severely damaged during disassembly).
2 years	► Additionally: Renew O-rings and protective window in purge gas flange.

***NOTICE:*Malfunction hazard**
Maintenance work on the PGK may only be carried out by skilled persons trained on the PGK.

6.2 Recommended spare parts for 2 years operation

WARNING: Risk of leaks and bursting when incorrect seal or window materials are used

The maximum operating pressure and therefore cell leak tightness depend on the window and seal materials used.

- ► Observe the maximum operating pressure: → p. 44, »Technical Data« or Data Sheet.
- ► Only use window and seal materials specified in the Data Sheet.

WARNING: Malfunction hazard

- ► Use original SICK spare parts only.

Assembly kits[1]	Quantity[2]	Y[3]	2Y[4]	Part No.
Cell-side windows and seals - Isolast				
1 set quartz windows 32 x 5 with Isolast O-ring, washer and thrust ring	2	x		2024087
1 set CaF2 windows 32 x 5 with Isolast O-ring, washer and thrust ring	2	x		2024089
1 set BaF2 windows 32 x 5 with Isolast O-ring, washer and thrust ring	2	x		2024088
1 set IG2 windows 32 x 5 with Isolast O-ring, washer and thrust ring	2	x		2024090
Cell-side windows and seals - Kalrez				
1 set quartz windows 32 x 5 with Kalrez O-ring, washer and thrust ring	2	x		2055958
1 set CaF2 windows 32 x 5 with Kalrez O-ring, washer and thrust ring	2	x		2055960
1 set BaF2 windows 32 x 5 with Kalrez O-ring, washer and thrust ring	2	x		2055959
1 set IG2 windows 32 x 5 with Kalrez O-ring, washer and thrust ring	2	x		2055961
Protective window and seals, purge flange				
1 set quartz protective windows 32 x 5 with Viton O-ring, washer and thrust ring	2		x	2023647
1 set CaF2 protective windows 32 x 5 with Viton O-ring, washer and thrust ring	2		x	2023649
1 set BaF2 protective windows 32 x 5 with Viton O-ring, washer and thrust ring	2		x	2023648
1 set IG2 protective windows 32 x 5 with Viton O-ring, washer and thrust ring	2		x	2023650

1 → p. 34, Fig. 12

2 Number of sets per maintenance

3 Recommendation: Renew yearly

4 Recommendation: Renew every 2 years

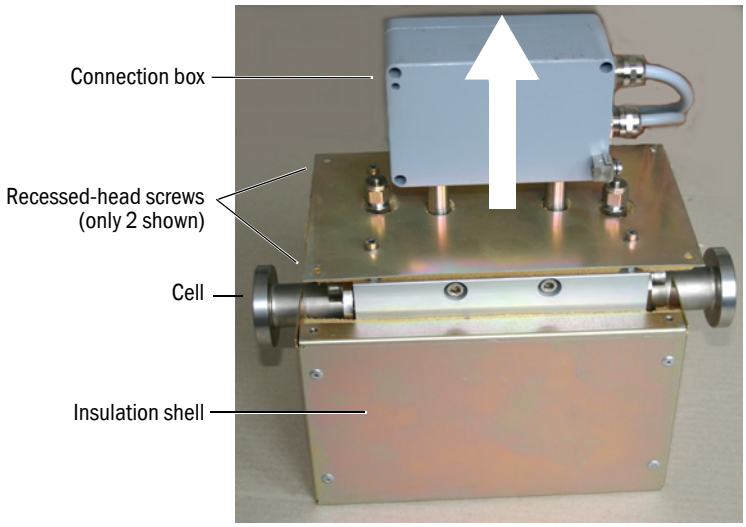
6.3 Removing the cell from the MCS300P

Cell disassembly from MCS300P → Operating Instructions of the MCS300P

6.4 Working on the Cell

6.4.1 Remove the cell from the insulating housing

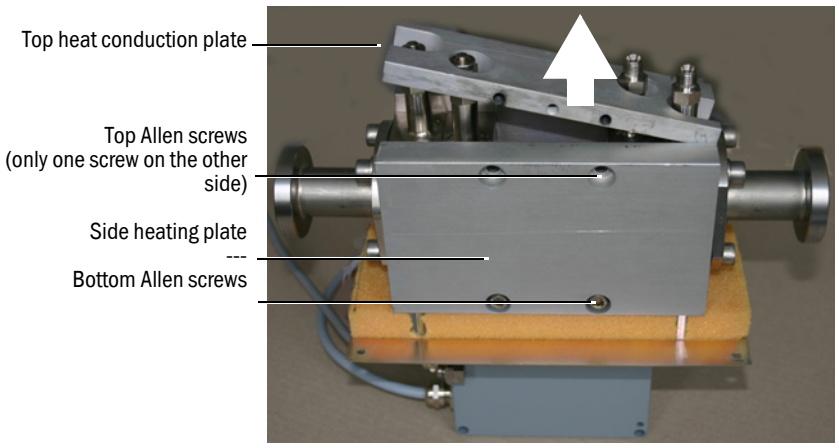
Fig. 9 Removing the cell from the insulating housing



1 Insert the cell so that the connection box points upwards.
2 Unscrew 4 recessed-head screws on the top side of the enclosure.
3 Lift the cell with connection box out of the insulation shell.

6.4.2 Removing the cell with cell heating

Fig. 10 Take off the top heat conduction plate

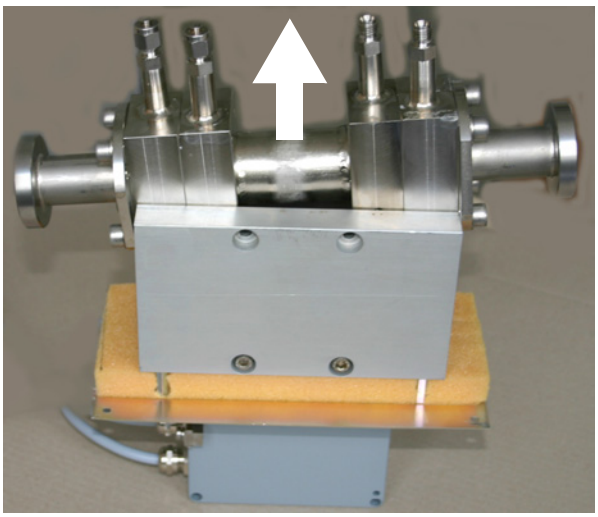


NOTICE:
Do not damage connection lines for heating cartridges.

Mark position of the plates to be unscrewed (e.g. with a pencil line).

1 Position the cell on the connection box.
2 On the side heating plates:
   – Loosen the *bottom* 6 mm Allen screws slightly (1/2 turn at the most).
   – Unscrew the top 6 mm Allen screw(s) from the cell.
3 Pull the top heat conduction plate out upwards.
4 Mark position of the cell (e.g. with a pencil line).
5 Pull the cell out.

Fig. 11 Removing the cell with heating plates



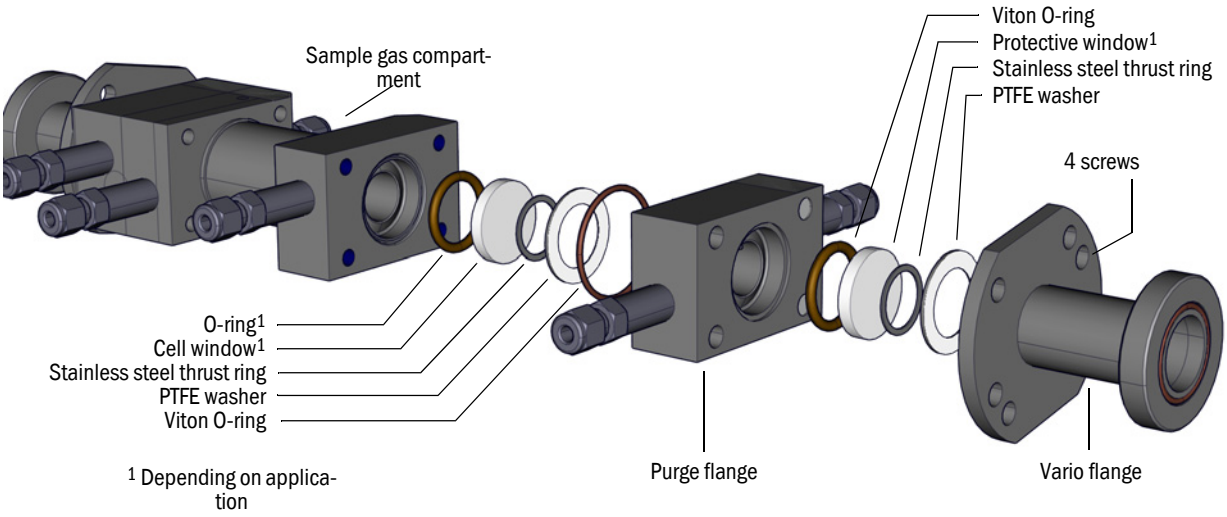
6.4.3 Working on the cell body

WARNING: Toxic and acidic deposits

Toxic, acidic or corrosive gases or deposits can be present in parts of the cell depending on the sample gas.

- ► Ensure adequate ventilation.
- ► As necessary, take suitable protective measures (e.g work under a vent, wear breathing protection, protective goggles or safety mask, protective gloves and acid-proof protective clothes).

Fig. 12 Exploded view of the cell body (technical drawing → Technical Data)



1 Depending on application

6.4.3.1 Removing the flanges

NOTICE:

- ► Make sure the cell window does not fall out during removal.
- ► Protect windows from contamination and damage.

1 Position the cell so that the flange to be disassembled points upwards.

2 Unscrew 4 screws (Allen screw M8) on the cell face side.

3 Remove the vario flange (seals can stick).
The protective window can now be accessed
(Exchanging the windows → both following Sections).

4 Take off the purge flange (seals can stick).
The cell window can now be accessed
(Exchanging the window → both following Sections).

6.4.3.2 Removing the protective and cell windows and seals

Removal of the protective and cell windows is identical.

1 Take off the PTFE seal.

2 Take off the stainless steel thrust ring.

> ***NOTICE:***
> ► Do not touch cell window with your fingers (wear gloves, if required) and do not contaminate the window.

3 Remove the window (e.g. using a suction cap).
Place the window in a clean and secure place.

4 Take out the O-ring (cell window-side, 2 O-rings).

6.4.3.3 Fitting the protective and cell windows and seals

Fitting the protective and cell windows is identical. Consider the additional O-ring for the cell window (→ Fig. 12).

1 Carefully clean the sealing surfaces.
- If necessary, use cotton swabs or wooden sticks for cleaning, and possibly acetone.
- Use new O-rings.
  Make sure O-rings are made of the correct material.
  Do not mix up the O-rings.

2 Insert O-rings carefully.

> **WARNING: Risk of bursting with scratched windows and high pressure**
> Windows can burst when scratched and with high operating pressure.
> ► Only use windows in perfect condition.

> ***NOTICE:* Make sure the cell is clean**
> Sample gas and purge gas compartments must be clean before assembly.
> Cleaning agent residues could affect measurement.
> The windows must be clean.
> ► Do not touch the windows with your fingers.

3 If necessary, clean the window carefully with a soft cloth.
Suitable cleaning agent (depending on the sample gas):
- Demineralized water
- Isopropanol
- Acetone

Do not use any other cleaning agents and no scouring cloths.

Carefully dry the window after cleaning (no marks should remain).

4 Check window for perfect condition and insert.

5 Lay PTFE sealing ring centered to opening.

6 Lay the stainless steel thrust ring in the PTFE sealing ring.

6.4.3.4 Installing the flanges

> ***NOTICE:***
> During flange assembly, make sure the windows do not fall out and get dirty.

1 Carefully clean the sealing surfaces.
2 Insert the cell window (→ p. 35, § 6.4.3.3).
3 Position the purge flange (according to markings made).
4 Insert the protective window (→ p. 35, § 6.4.3.3).
5 Position the Vario flange (according to markings made) on the purge flange (the flange is seated slightly tilted).
6 Tighten 4 screws slowly and evenly, then screw tight.
7 Perform a suitable leak test (→ p. 19, § 3.1.1.3).

6.4.4 Exchanging heating cartridges, Pt 100, safety temperature switch

6.4.4.1 Exchange the safety temperature switch

The safety temperature switch is located on the plate with the connection box.

1 Disconnect the flat plug.
2 Unscrew the safety temperature switch.
3 Screw the new safety temperature switch on.
4 Connect the flat plug.

6.4.4.2 Disassembly to exchange heating cartridges and Pt 100

> Mark position of unscrewed plates.

> ***NOTICE:***
> Do not damage electric lines.

1 Loosen leads of the heating cartridges resp, Pt 100 in the connection box.
2 Loosen cable clips.
3 Unscrew the heating plates on the 2 bottom screws completely (→ Fig. 10) and take apart.

Exchange the heating cartridges

- PGK10/PGK20/PGK50: 2 heating cartridges on 1 heating plate
- PGK75: 4 heating cartridges on 2 heating plates

1 Pull heating cartridges out.
2 Leads on the new heating cartridges:
   – Cut to length of old leads.
   – Strip.
   – Remove the marking rings from the connection lines of the old heating cartridges and push onto the corresponding connection lines of the new heating cartridges.
   – Crimp lead end sleeves on.
3 Insert new heating cartridges in heating plate to stop.

Exchange the Pt 100

One Pt 100 (optional 2 Pt 100) fitted in one heating plate.

1 Pull the Pt 100 out.
2 Leads of the new Pt 100:
   – Cut to length of old leads.
   – Strip.
   – Attach the marking rings according to the old marking.
   – Crimp lead end sleeves on.
3 Push the new Pt 100 into the heating plate to stop.

6.4.4.3 Assembly after exchanging the heating cartridges and Pt 100

1 Lay connection lines in the connection box according to the original state.
2 Screw connection lines tight with cable clips.
3 Screw heating plates together again loosely with the bottom 2 screws.
4 Reconnect leads according to numbering.

6.4.5 Inserting the cell in the cell heating

Use the markings made during assembly.

NOTICE:
► Do not damage connection lines for heating cartridges.

WARNING: Hazard through leaky cell
► Check the cell with a suitable leak test before assembling (→ p. 19, §3.1.1.3).

1 Push the cell with 2 gas connections down between the side heating plates (→ Fig. 11).
2 Insert the top heat conduction plate.
3 Screw all screws of the side plates tight again.

6.4.6 Install the cell in the insulating housing.

1 Fit the cell in the insulating housing (→ Fig. 10).
2 Screw the screws of the insulating housing tight.

6.5 Assembly of the cell on the MCS300P

The cell is normally operated on an MCS300P MCS300P Ex.
The location of the measuring beam inlet and outlets is arbitrary.
Recommendation: Fit the cell in the same direction as beforehand.

Assembling the cell on an MCS300P: → Operating Instructions of the MCS300P.

PGK

7 Clearing malfunctions

General malfunctions

7.1 Clearing malfunctions

Malfunction	Possible cause	Information
Gas flowrate inadequate.	Sample gas path blocked.	Clean.
Leak.	Sample gas path leaky.	Seal.
	Cell window leaky.	Clean or renew window (→ p. 32, § 6.4).
Safety temperature switch has triggered.	Temperature on temperature controller set too high.	Cell seals can be damaged (→ p. 32, § 6.4).
Temperature varies considerably.	Mains connection incorrect.	Provide mains connection.
	Temperature controller defective.	Have the temperature controller repaired or replaced.
Heating does not work.	No voltage supply.	Provide mains connection.
	Safety temperature switch defective	Safety temperature switch, renew (→ p. 32, § 6.4).
	Pt100 defective	Renew Pt100 (→ p. 32, § 6.4).
	Heating cartridge defective	Renew heating cartridge (→ p. 32, § 6.4).
Condensate in the cell.	Temperature below dew point.	Check cell and clean as necessary. Check thermostatic control. Heat sample gas feed. Dry sample gas (e.g. gas cooler).
Not enough energy at the analyzer detector.	Cell window or mirror soiled.	Clean cell (→ p. 32, § 6.4).
Unstable measurement signal.	Temperature difference between cell and sample gas very high.	Adjust temperature.
	Cell window or mirror soiled.	Check cell temperature. Clean cell (→ p. 32, § 6.4).
	Temperature controller hysteresis too large	Reduce hysteresis.
Measured values incorrect	For heated cell: Sample or purge gas flowrate too high so that cell cools down.	Adjust gas flowrate or preheat gas.
	After cleaning: Cleaner in sample gas or purge gas compartment.	Clean cell thoroughly

7.2 Safety temperature switch has triggered

Cutout temperature: Approx. 235 °C

The internal safety temperature switch switches on independently when the reset temperature is underflown (approx. 205 °C).

If the internal safety temperature switch switched the cell off, seals on the cell could have been damaged.

► Perform a leak test (→ p. 19, § 3.1.1.3).

PGK

8 Technical Specification

Declaration of conformity
Technical data

8.1 Compliance

The technical version of this device complies with the following EU directives and EN standards:

- EU Directive: LVD (Low Voltage Directive)
- EU Directive: EMC (Electromagnetic Compatibility)

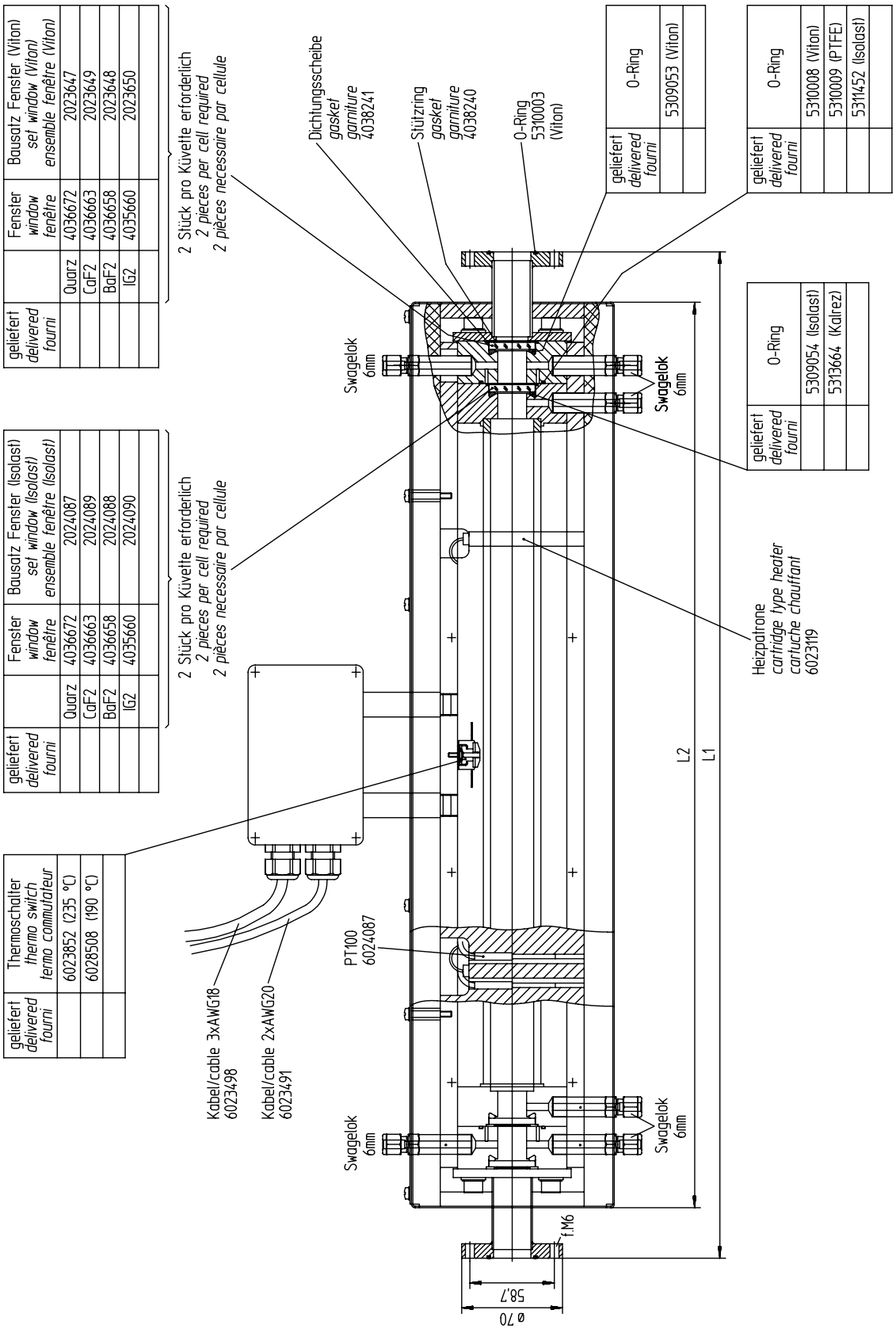
Applied EN standards:

- EN 61010-1, Safety requirements for electrical equipment for measurement, control and laboratory use
- EN 61326, Electrical equipment for measurement technology, control technology and laboratory use - EMC requirements

8.1.1 Electrical protection

- Insulation: Class of protection 1 in accordance with EN 61010-1
- Contamination: The device operates safely in an environment up to contamination level 2 in accordance with EN 61010-1 (usual, non-conductive contamination and temporary conductivity by occasional moisture condensation).

8.2 Technical drawing (example, 75 cm cell)



8.3 Technical Data

Refer to the Data Sheet delivered with the cell for the materials used.

Cell characteristics	
Optical path length	PGK10: 10 cm (3.94 in.) PGK20: 20 cm (7.87 in.) PGK50: 50 cm (19.7 in.) PGK75: 75 cm (29.5 in.)
Materials with media contact: - Cell body - Window - O-rings	 Stainless steel 1.4571 (SS316Ti) Quartz, CaF2, BaF2 Isolast, Option: Viton, Kalrez
Weight	PGK10: Approx. 8 kg PGK20: Approx. 10 kg PGK50: Approx. 15 kg PGK75: Approx. 20 kg
Sample gas volume	PGK10: Approx. 80 cm^3 (4.9 cu.in.) PGK20: Approx. 150 cm^3 (9.2 cu.in.) PGK50: Approx. 360 cm^3 (22 cu.in.) PGK75: Approx. 540 cm^3 (33 cu.in.)

Purge gas (expendable item)	
Consumption	2 .. 100 l/h (0.1 .. 35 cu.foot/h)
Primary pressure	Max. 3 bar (300 kPa)

Operating conditions	
Ambient temperature	+5 ... +40 °C (+40 ... +100°F)
Storage temperature	–20 ... +70°C (0 .... +160°F)
Relative humidity	Max. 80%
Degree of protection	IP 20
Heating temperature Temperature controller (external)	Adjustable to max. 200 °C (390 °F) Max. temperature for Isolast O-rings: 220 °C (428 °F) Temperature controller for Pt 100
Temperature sensor	1 * Pt 100, optional 2 * Pt100
Safety temperature switch (internal)	Switch-off temperature 235 °C, independent reset at approx. 205 °C Other temperatures optional (refer to the Data Sheet delivered with cell).
Heating up time	From room temperature to approx. +50 °C (+120 °F): Approx. 1 hour From room temperature to approx. +150 °C (+300 °F): Approx. 4 hours
Operating pressure, sample gas compartment	- Quartz, CaF_2: Max. 20 bar (2000 kPa) absolute - BaF_2: Max. 10 bar (1000 kPa) absolute (For T = +5 °C .. +150 °C (+40 .. +300 °F))
Operating pressure, purge gas compartment	Max. 3 bar (300 kPa)
Helium leak rate	10^{-8} mbar*L*sec^{-1}; 5 minutes at max. 90 °C (He leak test)

Mechanical installation	
Fitting position	Any
Pipes: - Sample gas input and output - Purge gas input and output	Screw fitting for pipe outer diameter: 6 mm 6 mm

Sample gas (requirements)	
Temperature	Thermostatically controlled to cell temperature Max. temperature: 200 °C (400 °F)
Flowrate	30 .. 1000 l/h (1 .. 35 cu.foot./h) With combustible sample gas: Max. 100 l/h (3.5 cu.foot/h)
Cleanness	Free from dust and condensed components

Electrical installation	
Supply voltage	115 or 230 V +10% / -15%; 50...60 Hz
Power input	PGK10/PGK20/PGK50: Max. 275 VA PGK75: Max. 550 VA
Mains fuse (external): - PGK10/PGK20/PGK50 - PGK75	Via temperature controller or external 4 A (for 115 V and 230 V) 8 A (for 115 V and 230 V)
Electrical connection lines: - Power supply - Pt100	 3 * AWG 18 2 or 4 * AWG 20

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