Embracing Challenge

Compact Gas Sample Probe Series SP®

SP180-H/MA, SP180-H/MA SS Maritime Application

TYPE APPROVED PRODUCT
DNV
DNV.COM/AF

Instruction Manual
Version 1.02.01

Dear customer,

Thank you for buying our product. In this instruction manual you will find all necessary information about this M&C product. The information in the instruction manual is fast and easy to find, so you can start using your M&C product right after you have read the manual.

If you have any question regarding the product or the application, please don't hesitate to contact M&C or your M&C authorized distributor. You will find all the addresses in the appendix of this manual.

For additional information about our products and our company, please go to M&C's website www.mc-techgroup.com. There you will find the data sheets and manuals of all our products in German and English.

With the release of this version all older manual versions will no longer be valid. The German instruction manual is the original instruction manual. In case of arbitration only the German wording shall be valid and binding.

Version: 1.02.01

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1 General information

The product described in this manual has been built and tested in our production facility.

All M&C products are packed to be shipped safely. To ensure the safe operation and to maintain the safe condition, all instructions and regulations stated in this manual need to be followed. This manual includes all information regarding proper transportation, storage, installation, operation and maintenance of this product by qualified personnel.

Please follow all instructions and warnings closely.

Please read this manual carefully before commissioning and operating the device. If you have any questions regarding the product or the application, please don't hesitate to contact M&C or your M&C authorized distributor.

2 Declaration of conformity

CE – Certification

The product described in this operating manual complies with the following EU directives:

EMV-Instruction

The requirements of the EU directive 2014/30/EU "Electromagnetic compatibility" are met.

Low Voltage Directive

The requirement of the EU directive 2014/35/EU "Low Voltage Directive" are met.
The compliance with this EU directive has been examined according to DIN EN 61010.

Declaration of conformity

The EU Declaration of conformity can be downloaded from the **M&C** homepage or directly requested from **M&C**.

3 Safety instructions

Please follow these safety directions and instructions regarding installation, commissioning and operation of the SP180-H/MA:

Read this manual before commissioning and operating the product. Please make sure to follow all safety instructions.

Installation and commissioning of electrical devices must be carried out only by qualified skilled personnel in compliance with the current regulations.

The installation and commissioning of the device must conform to the requirements of VDE 0100 (IEC 364) 'Regulations on the Installation of Power Circuits with Nominal Voltages below 1000 V' and must be in compliance with all relevant regulations and standards.

Before connecting the device, please make sure to compare the supply voltage with the specified voltage on the product label.

Protection against damage caused by high voltages:

Disconnect the power supply before opening the device for access. Make sure that all extern power supplies are disconnected.

Operate the device only in the permitted temperature and pressure ranges. For details please refer to the technical data sheet or manual.

Do NOT install the device on open deck.

This device is NOT certified to be installed or operated in explosive hazardous areas.

Installation, maintenance, inspections and any repairs of the devices must be carried out only by qualified skilled personnel in compliance with the current regulations.

3.1 Intended use

The SP180-H/MA and SP180-H/MA SS are intended for use in general purpose areas (non-hazardous environments). The gas sample probes can only be operated in compliance with the specifications given in chapter 7 Technical data. You must meet the requirements of the ambient temperature and pressure characteristics in particular.

Do not use this product for any other purpose. Improper use and handling can create hazards and cause damage. For more information, please refer to the safety information in this instruction manual.

4 Warranty

In case of a device failure, please contact immediately M&C or your M&C authorized distributor.

We have a warranty period of 12 months from the delivery date. The warranty covers only appropriately used products and does not cover the consumable parts. Please find the complete warranty conditions in our terms and conditions.

The warranty includes a free-of-charge repair in our production facility or the free replacement of the device. If you return a device to M&C, please be sure that it is properly packaged and shipped with protective packaging. The repaired or replaced device will be shipped free of delivery charges to the point of use.

5 Warning signs and definitions

Danger

The 'Danger' warning sign indicates that death, serious injury and/or significant material damage will be the consequence, if the appropriate precautions should not be taken.

Warning

The 'Warning' warning sign indicates that death, serious injury or damage to property may occur if the relevant precautionary measures are not observed.

Caution

The 'Caution' warning sign indicates that slight personal injury can occur if the appropriate safety precautions are not observed.

Toxic!
Acute toxicity (oral, dermal, inhalation)! Toxic when in contact with skin, swallowed or inhaled.

Corrosive!
These substances destroy living tissue and equipment upon contact.
Do not breathe vapors; avoid contact with skin and eyes.

Caution

'Caution' indicates that damage to property can occur if the appropriate safety precautions are not observed.

Note

'Note' indicates important information relating to the product or highlights parts of the documentation for special attention.

Qualified personnel

'Qualified personnel' are experts who are familiar with the installation, mounting, commissioning and operation of these types of products.

High voltages!
Protect yourself and others against damage which might be caused by high voltages.

Hot surface!
Contact may cause burn! Do not touch!

Wear protective gloves!
Working with chemicals, sharp objects or extremely high temperatures requires wearing protective gloves.

Wear safety glasses!
Protect your eyes while working with chemicals or sharp objects. Wear safety glasses to avoid getting something in your eyes.

Wear protective clothes!
Working with chemicals, sharp objects or extremely high temperatures requires wearing protective clothes.

Use foot protection

Use safety helmet and full protective goggles

6 Introduction

The SP180-H/MA is designed especially for applications aboard ships and vessels.

M&C gas sample probes provide direct insitu ultra-fine filtration during continuous gas sampling for analytic measurements. This means, that part of the necessary maintenance work of a system is concentrated at a single point. This filter technology ensures high efficiency separation of dust mixtures, consisting of ultra-fine and coarse dusts, from sample gas streams. Additionally it provides a minimum of maintenance work, which makes the SP180-H/MA particullary suitable for usage in a maritime environment.

Optimal adaptation of the sample probe to processing conditions and to measurement work is a necessary condition for a measurement system to work smoothly. Basically, the gas sample should be kept to a necessary minimum. This is made possible thanks to optimised downstream gas processing using M&C components. Only in this way it is possible to reduce maintenance to a minimum while ensuring maximum availability.

6.1 Serial numbers

The product label with the serial number is located inside the terminal box of the sample probe.

Please refer to this serial number if you have any questions about your sample probe or if you need to order spare parts or consumables.

6.2 Power supply

The probe can be operated on alternating current in the range of 110 V AC to 240 V AC.

7 Technical Data

Gas Sample Probe Series SP®	**SP180-H/MA**	**SP180-H/MA SS**
Part-No.	02S1860	02S1865
DNV Type Approval Certificate	TAA00002J3	
Insulation cap	Yes	
Mounting	Not for mounting on open decks	
Degree of protection	IP66, EN 60529	IP66, EN 60529
DNV: Location classes	Temperature D, Humidity B, Vibration B, EMC A, Enclosure B	
Ambient temperature	-25 to +60 °C [-13 to +140 °F]	
Vibration/Shock for sample tubes (optional)	4 g, classified according to GL (Germanischer Lloyd) (GL-2012 VI section 7, Tab 3.16, characteristic diagram 2a)	
Sample pressure	0.4 to 1.5 bar abs.	
Sample temperature	Max. 600 °C* [1112 °F*]	
Gas flow rate	Max. 500 Nl/h	
Dust load	Max. 1 g/m^3*	
Filter chamber volume	70 ml	
Filter element	Type **S-0,1GF**, filter porosity 0.1 µm, fiber (other filter elements on request)	
Probe heating temperature	+180 °C [+356 °F] self-regulating	
Ready for operation	After 2 hours	
Low temperature alarm contact, alarm point	< 160 °C [< 320 °F], NO	
Low temperature alarm, contact rating	250 V - 3 A AC, 30 V - 3 A DC	
Connection sample outlet	1/4"-NPT inside, with Swagelok tube connector for 6 mm tube (DN 4/6)	
Power supply	110 V up to 240 V 50/60 Hz	
Power consumption	Start up: 400 VA, during operation: 100 VA, fuse 6 A	
Terminal box	Aluminium	Stainless steel VA
Electrical connection terminals	Terminals max. 2.5 mm^2, cable glands 1 x M20 and 1 x M16	
Electrical equipment standard	EN 61010, EN 60335-1	
Flammability test protection cover	Needle-flame test method IEC 60695-11-5:2005 severity level: 30 s	
Mounting flange	DN 65 PN 6, B stainless steel 316Ti	
Material of sample contacting parts	SS 316/316Ti, FKM, glass fiber	
Dimensions (W x H x D)	Approx. 270 (with calibration gas connection) x 280 x 225 mm [≈ 10.6" x 11" x 8.9"]	
Weight	Approx. 7.5 kg [≈ 16.53 lbs]	

Sample tube options	
Part No.: 92S0040**	Hastelloy® sample tube, SP180 M/HC/400, connection G3/4"a, ø 27/20, length 400 mm [≈ 15.75"]
Part No.: 92S0060**	Hastelloy® sample tube, SP180 M/HC/600, connection G3/4"a, ø 27/20, length 600 mm [≈ 23.62"]
Part No.: 92S0080**	Hastelloy® sample tube, SP180 M/HC/800, connection G3/4"a, ø 27/20, length 800 mm [≈ 31.5"]

* Standard, other versions on request.
** Sample tubes classified according to GL (Germanischer Lloyd) GL-2012 VI section 7, Tab 3.16, characteristic diagram 2b)

Please note: Nl/h and Nl/min refer to the German standard DIN 1343 and are based on these standard conditions: 0 °C [32 °F], 1013 mbar.
Hastelloy® is the brand name of a nickel-based alloy from Haynes International.

8 Applications

The M&C gas sample probe version SP180-H/MA is suitable for continuous gas sampling in processes with dust densities of up to 1 g/m^3, operating pressure of up to max. 1.5 bar abs., temperatures of up to a maximum of 600 °C [1112 °F] or for high gas humidity. The compact design requires only limited space. The gas sample probe has a DNV Type Approval Certificate for special application aboard ships.

9 Description

The sample probe SP180-H/MA is designed for easy installation, reliable operation and trouble-free maintenance. Advantages are:

- Gas sampling with dust-laden processes;
- low volume, fast response time;
- filter elements can be changed without tools and without disconnecting the (heated) sample line;
- the filter chamber can be easily cleaned;
- the probe tube can be cleaned without dismantling the probe;
- self-regulated electrical heating with undertemperature alarm contact, and different probe tubes and pre-filters as option;
- with calibration gas connection as standard.

The 0.1 micron glass fiber filter sits in a heated stainless steel filter housing. Other filter element materials are available on request.

The gas sample probe is heated with special self-regulating heating elements to +180 °C in the range of 110V to 240 V mains voltage without the need for any switching.

An external temperature controller or temperature limiter is not required. A separate thermal switch (<160 °C, NO) is provided for undertemperature monitoring.

10 Probe design

The probe head with its new all-round enclosing heat insulating protection cover forms a complete unit with the filter housing, the standard mounting flange DN65 PN6 and the junction box which is attatched to the side.

The screw-in fitting for connecting a heated M&C sample line is located in the opening on the underside of the insulating cover. The heated sample line is attached to the gas sample probe using the mounting clamp below the insulating cover. Please contact us for more information on the selection of suitable heated M&C sampling lines.

The sample gas outlet at the probe is designed for a 6 mm (DN4/6) tube as standard.

The Hastelloy® sample tubes in 400 [≈ 15.75"], 600 [≈ 23.62"] or 800 mm [≈ 31.5"] length (Part. No. 92S0040, 92S0060, 92S0080) are optional. They can be screwed into the G 3/4" thread of the mounting flange. The maximum operating temperature of the stainless steel sampling tube is 600 °C [1112 °F].

The following cross-sectional drawing shows the probe SP180-H/MA.

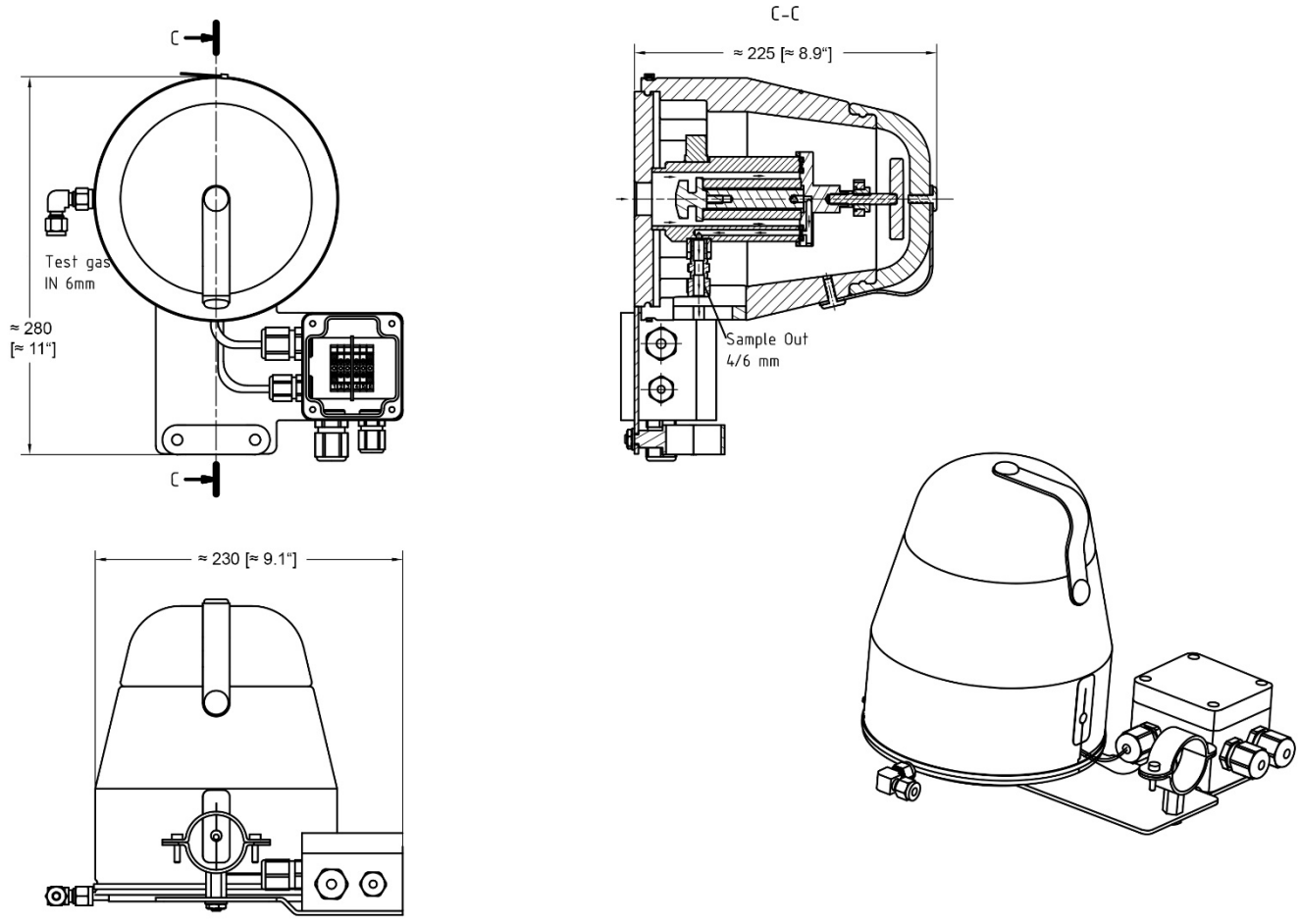


Figure 1 Dimensions and construction of the SP180-H/MA

11 Receiving the sample probe

The gas sample probe is usually delivered in one packaging unit:

- The gas sample probe with the required screws, nuts and flange sealing.

If you order a sample tube with gasket in addition to the gas sample probe, you will receive this in a separate packaging unit.

Please remove the gas sample probe carefully from the packaging. Check the scope of the delivery specified on the delivery note. Please make sure that you have received all items stated on the delivery note. Please check the unit for any transport damage after receipt and report any complaints to the transport company immediately.

12 Preparation for Installation

- Select the optimum sampling point in accordance to the generally applicable guidelines or by consulting the relevant person or department.
- Before choosing the sampling point location, please be sure that this location has adequate space for inserting and removing of the probe. Please consider the insertion length of the probe tube when you choose the location of the sampling point.
- The probe needs to be easily accessible for all necessary maintenance work.
- The temperature of the sample probe connections needs to be always above the acid dew point in order to avoid corrosion and problems with blockage.
- If the ambient temperature in the area of the connections is > 80 °C [> 176 °F] as a result of radiant heat, a reflector needs to be installed to protect the probe.
- The mounting flange connector of the sample probe should be in compliance with DN65 PN6.
- The probe needs to be fitted to the existing operating conditions before mounting.

The following existing operational parameters need to be checked prior to installing the sample probe:

Mounting location <u>not</u> on open deck	_____provided	_____needs to be installed	
Under / over pressure situation	mbar	bar	
Process temperature	°C, Min.	°C, Max.	
Dust loading	g/m³		
Dust composition - grain size	µm		
Gas composition	corrosive	toxic	explosive
Which parameters should be measured, e.g. O_2, CO, SO_2, NO_X,..,	vol%	mg/Nm³	ppm
Required amount of gas	l/hr, Min.	l/hr, Max.	
Necessary T_{90} time	sec.		

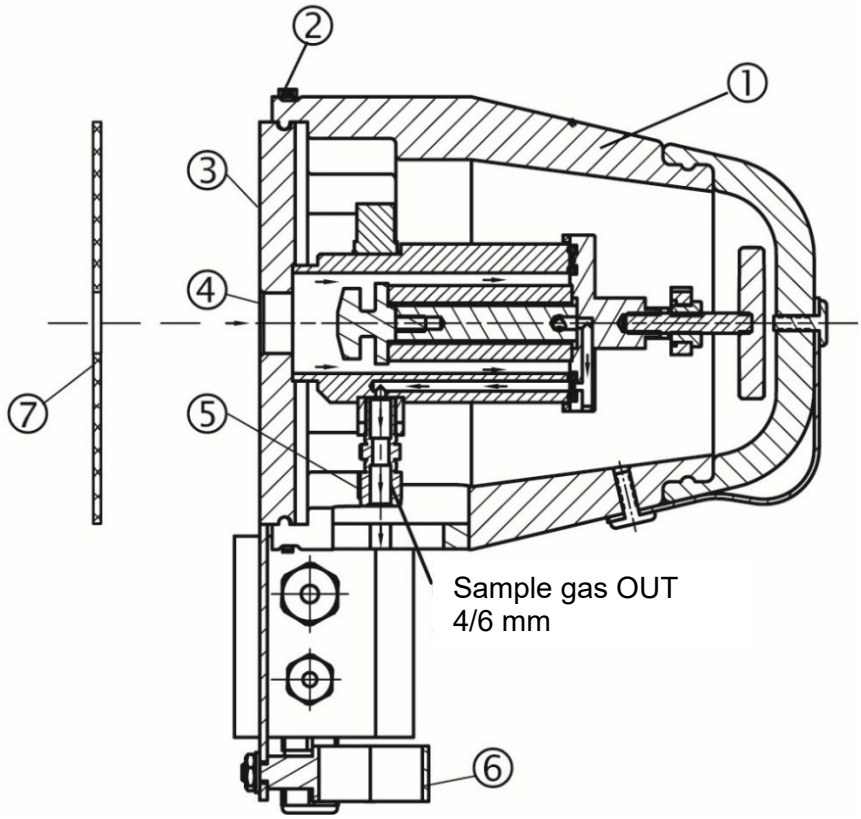
13 Installation

M&C SP180-H/MA probes are designed for stationary use. The professional choice of the right sample probe for the application and the professional installation garantees a long service life and minimum maintenance work. The ideal position for mounting the sample probe is horizontally with a tilt angle of 10° inclination towards the process. Please follow these installation steps and see details in Figure 2.

1. Screw the sample probe tube (not included in gas sample probe delivery) directly into the ¾" inner thread ④ of the probe flange and tighten it.
2. To mount the SP180-H/MA at the sampling flange, please loosen the metal clamp ② around the heat insulating protection cover and remove the cover ①.
3. Attach the flange seal ⑦ to the probe connection.
4. Insert sample probe with mounted probe tube into the connection piece and fasten the probe using the supplied bolts and nuts.
5. After mounting of the probe at the sampling flange put the heat insulating protection cover ① over the probe flange again and secure it with the metal clamp ②.

Note

For the preferred mounting position of the probe, the sample gas outlet is pointing downwards. This is just the preferred mounting position, it is not necessary for correct operation.



① Insulating cover
② Metal clamp
③ Sample probe flange
④ Thread inside flange
⑤ Sample gas OUT
⑥ Mounting clamp for sample line
⑦ Flange seal

Figure 2 Mounting of the SP180-H/MA

13.1 Connecting the heated sample line

To connect the sample line, a threaded tube connector ⑤ with Ø 6 x 1 mm is available – other diameters available on request.

1. Open mounting clamp for heated sample line ⑥.
2. Insert the tube connection piece into the threaded tube connector ⑤ and connect them.

If you use a PTFE tube as sample line, a metal tubing sleeve for pneumatic fittings needs to be inserted at the end of the tube to prevent it of being pressed together.

3. The temperature-resistant, stainless steel connector ⑤ from M&C has a double-blade ring system to ensure reliable sealing. First finger-tight the nut of this connector, then use a flat spanner to turn the nut exactly 1¼-turns. The nut is now correctly mounted.
4. Place the heated sample line into the open mounting clamp ⑥ and close the clamp.

Note

Make sure that the connection is leakproof!

13.2 Connecting the test gas line

- To connect the test gas line, a threaded tube connector with Ø 6 x 1 mm (DN4/6) is available (see Figure 1)
- If you use a PTFE tube as sample line, a metal tubing sleeve for pneumatic fittings needs to be inserted at the end of the tube to prevent it of being pressed together.

1. The temperature-resistant, stainless steel connector from M&C has a double-blade ring system to ensure reliable sealing. First finger-tight the nuts of these connectors, then use a flat spanner to turn the nuts exactly 1¼-turns. The nuts are now correctly mounted.

14 Electrical Connection

Warning

When connecting the equipment, please make sure that the supply voltage is identical with the information provided on the model type plate.

Setting up of electrical power installations must be conform to the requirements of IEC 364 (DIN VDE 0100) 'Regulations on the Installation of Power Circuits with Nominal Voltages below 1000V', and must be in compliance with all relevant regulations and standards.

Note

We recommend the use of temperature resistant cable! A main switch and matching fuse must be provided externally! The main circuit must be equipped with a fuse corresponding to the nominal current (over current protection); for electrical details see chapter 7 Technical Data. We recommend to use a low temperature alarm at all times. In case of an alarm the flow can be stopped and the components downstream of the probe will be protected.

The junction box is mounted on the side of the probe The wiring plan is inside the lid of the junction box. Two separate cable glands are available for the mains and the signal cable.

Please follow the following steps to connect the equipment:

1. Remove the lid of the junction box.
2. Insert the power cord through the cable gland M20. Connect the mains cable to the appropriate terminals as shown below.
3. Insert the signal cable through the other cable gland M16 and connect it to the appropriate terminals as shown in the wiring below.
4. Tighten both cable glands to secure the inserted cables and prevent cable pull out.
5. If you don't use a signal cable, the cable gland M16 needs to be closed with a hole plug (not included).
6. Screw lid back on.

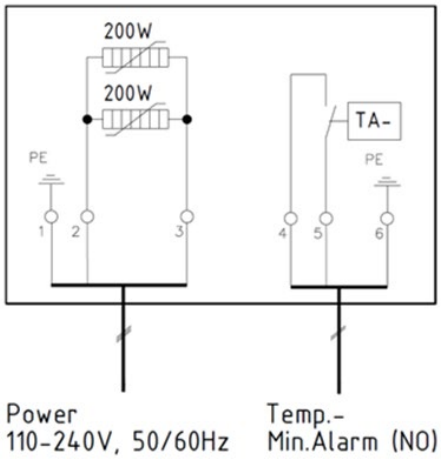


Figure 3 Electrical connection diagram

15 Preparations for commissioning

Before initial startup, all plant- and process-specific safety measures must be observed. It is mandatory for the operator to complete the enclosed risk assessment of the product.
The gas exposure risk must be assessed by the operator with regard to the hazards posed by process and calibration gas and the setup at the installation site (e.g. tubing, system cabinet/container/plant). If the risk assessment reveals increased exposure hazards, further measures are required.
A visible label must be attached to the installation site in accordance with the risk assessment provided by the operator.

16 Starting up

Before connecting the device, please make sure that the supply voltage matches the specified voltage on the product label of the probe.

- Switch on mains power supply. The total heating-up time is approximately 2 hours. After about 1 hour the temperature of the probe is already higher than the temperature failure alarm value (160 °C [320 °F]), but it still takes about another hour until operation temperature has been reached.
- After the minimum heating-up time of 2 hours, the gas sample probe can start to extract the sample gas.

17 Maintenance

Before starting any maintenance work, please make sure that any work done on the device is in compliance with all relevant regulations and standards.

Warning

Disconnect power supply before opening the device for access.

Make sure that all external power supplies are disconnected.

This also applies to any external alarm or control circuits which may be connected.

The intervals between servicing are dependent on the process and system conditions in your facility.

The facility QA/QC plan should address the frequency for maintenance and should be updated based on your operations.

An indication that maintenance work of the sample probe might be necessary, is a steady decrease of the amount of sample gas going out to your analysis system.

The routine maintenance work consists mainly of replacing filter elements and checking seals.

Warning

When working during operation: High surface temperatures!

Touching the device can cause severe burns!

Wear protective gloves! Secure the device against unauthorized access.

To start the maintenance work, please follow these steps:

1. Remove insulating cap ❶ by squeezing and lifting the cap (see Figure 4).

Caution

Don‘t use the green retaining strap to remove the insulating cap. The insulating cap will be damaged by using the retaining strap!

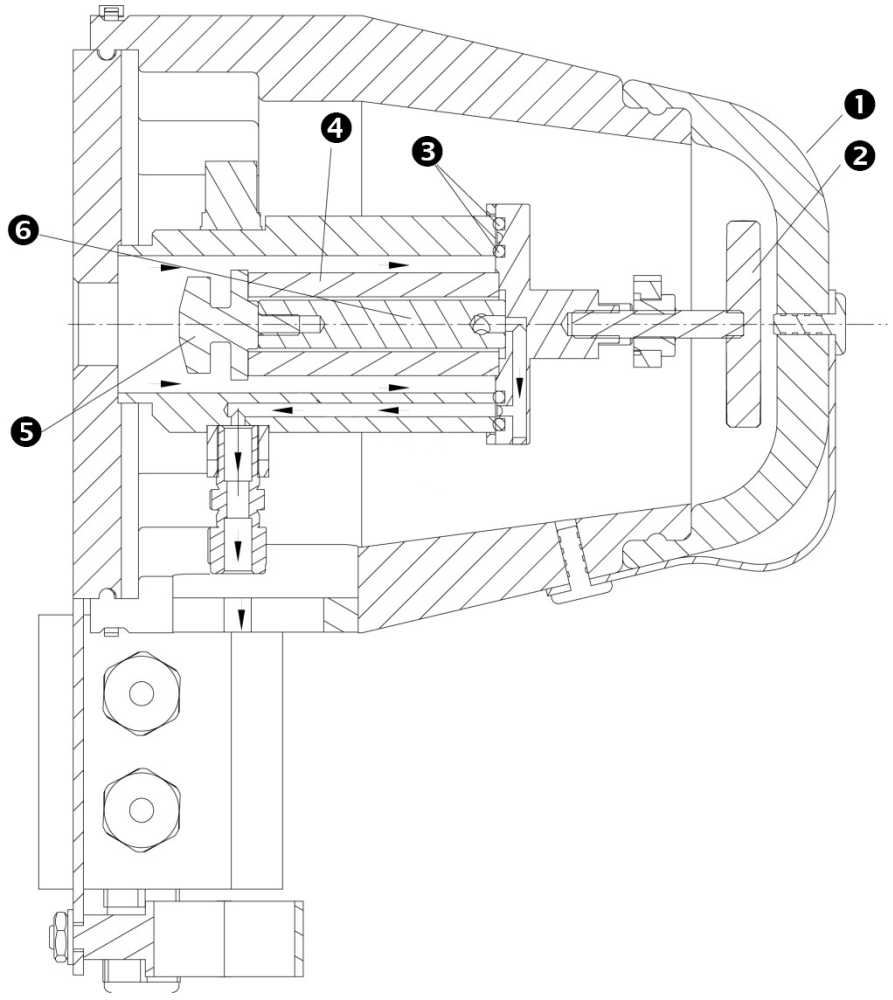
Figure 4 Opening of the insulating cap

2. Loosen filter lid by turning handle ❷ to the left. Then pull out the filter lid with o-rings ❸, filter element ❹ with filter element holder ❻ and filter retaining screw ❺.

Note

To remove the filter lid, please hold the filter lid clamp against the studs and turn the handle to the left until the filter lid loosens.

3. Unscrew the filter retaining screw ❺ of the filter and remove the filter element ❹.
4. Check o-rings of the filter lid ❸ and replace if necessary.
5. Place new filter element ❹ on the filter element holder ⑦.
6. Screw-on the filter retaining screw ❺ again.
7. Clean the filter chamber. Now, while the filter lid with the filter element is removed, you can clean the inside of the probe tube to remove residue.
8. To assemble the sample probe, please insert the filter lid with the new filter element back into the probe. To tighten the filter lid, put the filter lid clamp against the studs and turn the handle ❷ to the right.
9. Place insulating cap ❶ back on the sample probe.



❶ Insolating cap
❷ Handle of the filter lid
❸ Filter lid o-rings
❹ Filter element
❺ Filter retaining screw
❻ Filter element holder

Figure 5 Replacing the filter element

18 Decommisioning

Before decommissioning the gas sample probe (turning off the heating), the probe needs to be flushed with inert gas or air in order to avoid condensation of aggressive components of the process gas.

19 Proper disposal of the device

At the end of the service life of our products, it is important to take care of the appropriate disposal of obsolete electrical and non-electrical devices. To help protect our environment, follow the rules and regulations of your country regarding recycling and waste management.

20 Spare parts and consumables

The replacement interval for spare parts and consumables depends on the specific operating condition of the probe. The quantities recommended in the following table are based on experience. Your replacement intervals will be based on your operating conditions.

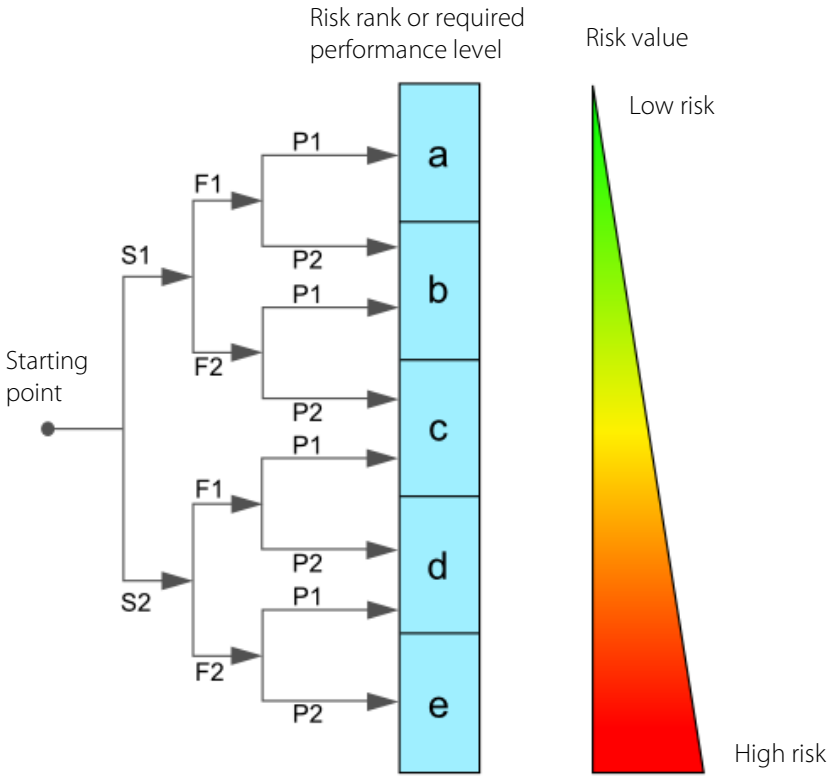
Gas sample probe SP180-H/MA					
(C) Consumable parts **(R) Recommended spare parts** **(S) Spare parts**					
		recommended amount based on number of years of operation [years]			
Part No.	**Description**	**C/R/S**	**1**	**2**	**3**
90S0017	Type **S-0,1GF**, filter porosity 0.1 µm, (see ❹ in Figure 5)	C	6	12	18
93S0020	O-ring lid sealing (39) Material: Viton® (see ❸ in Figure 5)	R	2	4	6
93S0025	O-ring lid sealing (55) Material: Viton® (see ❸ in Figure 5)	R	2	4	8
90S2077	Novapress® flange gasket DN65 PN6 (67 mm i.)	R	1	1	1
90S2075	Flange gasket set for DN65 PN6 B**,** consisting of Novapress® gasket (67 mm i.) and screws set M12	S	1	1	1
93S1805	Min. temperature contact < 160 °C [< 320 °F]	R	-	-	1
93S1810	Cartridge heater SP180 HLPSR, L = 100 mm [≈ 3.94"], 110 to 240 V AC 100 W	R	2	2	4

21 Risk assessment

The risk assessment provided in this chapter is intended for all work activities on the product. The hazards can occur in the work steps of assembly, commissioning, maintenance, disassembly and in the event of a product fault. During normal operation, the product is protected by a system cabinet or appropriate covers.
Only qualified personnel is permitted to perform the work. The following minimum knowledge is required for the work:

- Employee instruction provided in process engineering
- Employee instruction provided in electrical engineering
- Detailed knowledge of the instruction manual and the applicable safety regulations

The product complies with the current regulations according to state-of-the-art science and technology. Nevertheless, not all sources of danger can be eliminated while observing technical protective measures. Therefore, the following risk assessment and the description of exposure hazards refer to the work steps mentioned above.



Severity of injury:
S1 = 1 = minor (reversible injury)
S2 = 2 = serious (irreversible injury, death)

Frequency and duration:
F1 = 1 = infrequent or short exposure to hazard
F2 = 2 = frequent (more than once per hour/shift)

Possibility of preventing or limiting the damage
P1 = 1 = possible
P2 = 2 = hardly possible

Figure 6 Overview risk assessment

Aggressive condensate possible

Risk rank group A
Chemical burns due to aggressive media possible!
This applies to all liquids in vessels and in the product.
In general, for electrical and mechanical work on the product, wear personal protective equipment (PPE) in accordance with the risk assessment.

Caution hot surfaces

Risk rank group A
The temperature inside the product can be higher than > 180 °C.
The hot parts are shielded by mechanical devices. Before opening the products, they must be disconnected from the power supply and a cooling time of more than > 180 minutes must be observed. In general, for electrical and mechanical work on the product, wear personal protective equipment (PPE) in accordance with the risk assessment.

Caution electric shock

Risk rank group C
When installing high-power systems with nominal voltages of up to 1000 V, the requirements of VDE 0100 and their relevant standards and regulations must be observed!
This also applies to any connected alarm and control circuits. Before opening the products, they must always be disconnected from the power supply.

Gas hazard

Risk rank group A-B-C
The hazard potential mainly depends on the gas to be extracted.
If toxic gases, oxygen displacing or explosive gases are conveyed with the product, an additional risk assessment by the operator is mandatory.
In principle, the gas paths must be purged with inert gas or air before opening the gas-carrying parts.
The escape of potentially harmful gas from the open process connections must be prevented.
The relevant safety regulations must be observed for the media to be conveyed. If necessary, flush the gas-carrying parts with a suitable inert gas. In the event of a gas leakage, the product may only be opened with suitable PPE or with a monitoring system.
Furthermore, the work safety regulations of the operator must be observed.

Caution crushing hazard

Risk rank group A
The work must be performed by trained personnel only.
This applies to products weighing less than < 40 kg [≈ 88.2 lbs]:
The product can be transported by 1 to 2 person(s). The instructions for appropriate personal protective equipment (PPE) must be observed.
The weight specifications are contained in the technical data of this product.
Furthermore, the work safety regulations of the operator must be observed.

22 Appendix

- **DNV Type Approval Certificate**

Further product documentation is available on our home page:

http://www.mc-techgroup.com

DNV

TYPE APPROVAL CERTIFICATE

Certificate No:
TAA00002J3
Revision No:
1

This is to certify:

That the Gas Sample Probes

with type designation(s)
SP180-H/MA, SP180-H-MA SS, Sp180 M/HC/400, SP180 M/HC/600, SP180 M/HC/800

Issued to
M&C Techgroup Germany GmbH
Ratingen, Nordrhein-Westfalen, Germany

is found to comply with
DNV GL rules for classification – Ships, offshore units, and high speed and light craft

Application :

Temperature	**D**
Humidity	**B**
Vibration	**B**
EMC	**A**
Enclosure	**B**

Issued at **Hamburg** on **2021-08-06**
This Certificate is valid until **2026-08-05**.
DNV local station: **Essen**

Approval Engineer: **Marco Rinkel**

for **DNV**

Joannis Papanuskas
Head of Section

Job Id: **262.1-021044-2**
Certificate No: **TAA00002J3**
Revision No: **1**

Product description

Electrically heated sample probe with protection cover applicable for continuous gas sampling.

Power supply:	110 … 240V AC, 50/60Hz
Sample pressure:	0.4 … 1.5bar absolut
Probe heating:	+180°C, self-regulated
Low temperature contact,	Alarm active <160°C, NO

Environmental Category:

Cold test with	-25°C /2h
Dry heat test with	+60°C / 16h
Vibration test tube:	curve B up ti 300 Hz at a temperature of 180°C

Application/Limitation

The Type Approval covers hardware listed under Product description. When the hardware is used in applications to be classed by DNV GL, documentation for the actual application is to be submitted for approval by the manufacturer of the application system in each case. Reference is made to DNV GL Rules for Ships Pt.4 Ch.9 Control and Monitoring Systems.
Ex-certification is not covered by this certificate. Application in hazardous area to be approved in each case according to the Rules and Ex-Certification/ Special Condition for Safe Use listed in valid Ex- Certificates issued by a notified/recognized Certification Body.

Type Approval documentation

Tests carried out

Applicable tests according to Class Guidelines DNVGL-CG-0339, November 2019.

Marking of product

The products to be marked with:
- manufacturer name
- model name
- serial number

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the type are complied with, and that no alterations are made to the product design or choice of systems, software versions, components and/or materials.
The main elements of the assessment are:

- Ensure that type approved documentation is available
- Inspection of factory samples, selected at random from the production line (where practicable)
- Review of production and inspection routines, including test records from product sample tests and control routines
- Ensuring that systems, software versions, components and/or materials used comply with typeapproved documents and/or referenced system, software, component and material specifications
- Review of possible changes in design of systems, software versions, components, materials and/or performance, and make sure that such changes do not affect the type approval given
- Ensuring traceability between manufacturer's product type marking and the type approval certificate

Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

END OF CERTIFICATE