

Electrically Heated Sample Tube Series SP[®]

SP 34-H, SP34-H1.1 and SP34-H2

Instruction Manual
Version 1.01.00



Dear customer,

Thank you for buying our product. In this manual you will find all necessary information about this M&C product. The information in the 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 instruction manual.

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

This Instruction Manual does not claim completeness and may be subject to technical modifications.

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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: 1.01.00

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Head Office

M&C TechGroup Germany GmbH ♦ Rehhecke 79 ♦ 40885 Ratingen ♦ Germany

Telephone: 02102 / 935 - 0

E - mail: info@mc-techgroup.com

www.mc-techgroup.com

1 General Information

The product described in this instruction 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 instruction manual need to be followed. This instruction manual includes all information regarding proper transportation, storage, installation, operation and maintenance of this product by qualified personnel.

Follow all instructions and warnings closely.

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



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

EMC-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

Follow these basic safety precautions during installation, commissioning and operation of the device:

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

Work on electrical equipment is only to be carried out by trained specialists as per the regulations currently in force.

Attention must be paid to the requirements of **VDE 0100** when setting high-power electrical units with nominal voltages of up to 1000V, together with the associated standards and stipulations.

Check the details on the type plate to ensure that the equipment is connected up to the correct mains voltage.

Protection against touching dangerously high electrical voltages. Before opening the equipment, it must be switched and hold no voltages. This also applies to any external control circuits that are connected.

The equipment is only to be set within the permitted range of temperatures and pressures.

The device must not be used in hazardous areas.

Check that the location is weather-protected. It should not be subjected to either direct rain, sun or moisture.

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 SP34-H, SP34-H1.1 and SP34-H2 heated sample tubes are intended for use in general purpose areas (non-hazardous environments). It may only be operated in compliance with the information in chapter "9 Technical Data". Only use the device within the permitted temperature and pressure ranges.

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 Used Terms and Signal Indications



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.

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.



Electrical voltage!

Danger to life due to electric shock!

Keep a safe distance and avoid contact with the electrical system. It is MANDATORY to take suitable measures to reduce the risk and for personal protection.



Toxic!

Danger to life if swallowed, in contact with skin or inhaled!

Do not swallow toxic substances, avoid skin contact and do not inhale toxic vapors. It is MANDATORY to take appropriate measures to reduce the risk and for personal protection.



Corrosive!

Risk of severe skin burns and serious eye damage! Living tissue and many materials are destroyed on contact with this chemical.

Do not inhale vapors and avoid contact with skin, eyes and clothing!

It is MANDATORY to take appropriate measures to reduce the risk and for personal protection.



Hot surface!

Risk of burns from touching the surface!

Do not touch the surfaces which are marked with this warning sign. Allow the surfaces to cool down after operation. Use personal protective equipment (PPE).



Use protective gloves!

Risk of injury from corrosive, hot or sharp objects!

Use adequate hand protection when working with chemicals, sharp objects or extreme temperatures.



Wear safety goggles!

Risk of injury to the eyes from splashes or flying particles!

Use suitable safety goggles.



Wear protective clothing!

Risk of injury from corrosive, hot or sharp objects!

Wear adequate protective clothing when working with chemicals, sharp objects or extreme temperatures.



Use safety shoes!

Risk of injury from falling objects, slippery floors or sharp objects on the floor!

Wear safety shoes with a suitable safety class.



Use head protection and full safety goggles!

Risk of injury from falling objects and splashes or flying particles from all directions.

Wear a helmet and full safety goggles when working with heavy equipment and where there is a risk to the eyes from splashes or flying particles from all directions.

6 Application

The electrically heated **M&C** sample tube **SP34-H** is used in extracting portable sampling systems to avoid cooling and condensation of sample in the in-situ tube from the sample point to the heated sample probe **PSP4000-H**.

7 Description

The standard length of electrically heated **M&C** sample tube **SP34-H** is 1000 mm (other length on request). The sample tube has G 3/8" threads on both ends. With the outside thread it will be screwed into the inlet of the sample probe **PSP4000-H**. Into the inside thread at the other end, a non-heated sample tube or prefilter can be fixed. The electrical heater is inside of a double tube system, completely separated from the process.

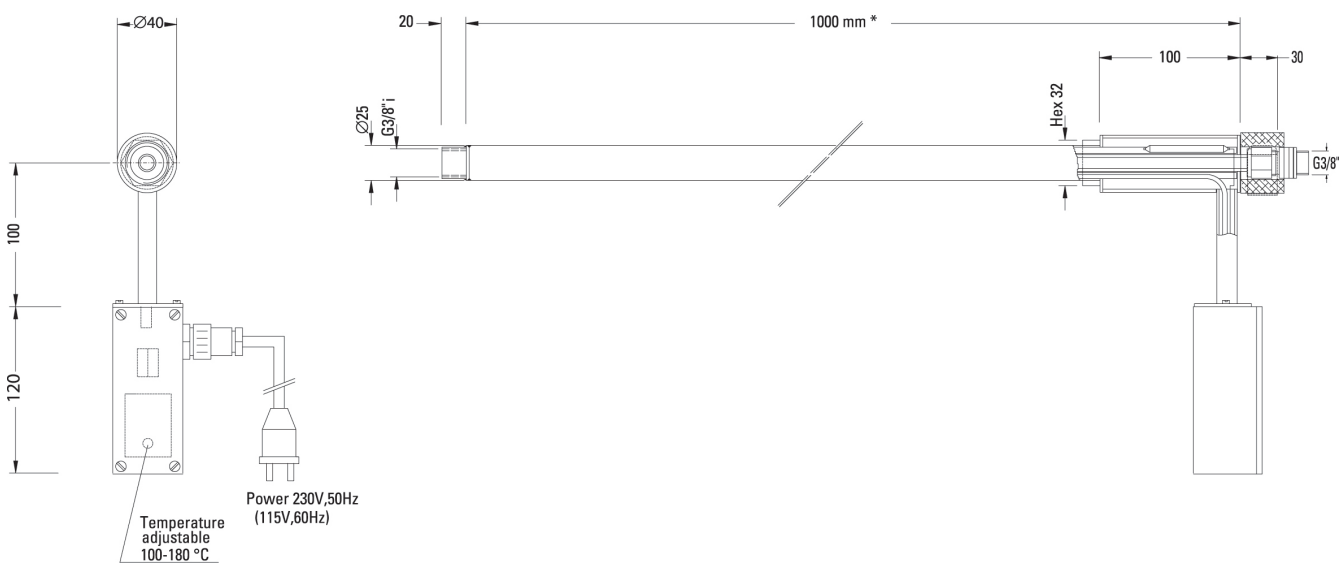


Figure 1: Dimensions SP34-H

8 Temperature Controller

For the standard version **SP34-H** the temperature is controlled by an integrated capillary thermostat, built in the terminal box. The temperature is adjustable in the range of 100-180 °C. An external temperature controller is not necessary.

For the version **SP34-H1.1** with thermocouple or **SP34-H2** with Pt100 in contrast an external temperature controller is necessary. The function and correctness of the temperature control is the responsibility of the installer and operator.

9 Technical Data

	SP 34-H, 230 V	SP 34-H, 115 V	SP 34-H1.1, 230 V	SP 34-H1.1, 115 V	SP 34-H2, 230 V	SP 34-H2, 115 V
Part No.	40S9115	40S9115A	40S9120	40S9120A	40S9125	40S9125A
Voltage	230 V	115 V	230 V	115 V	230 V	115 V
Frequency	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz
Temperature sensor	Capillary sensor		Fe-CuNi		Pt100	
Temperature controller	Capillary thermostat		Optional, external			
Power consumption	400 W					
Cable length	4 m [≈ 13.1 ft]					
Tube length	1 m [≈ 3.3 ft] standard					
Connections	Gas inlet: G 3/8" female thread, Gas outlet: G 3/8" male thread, DIN ISO 228/T					
Material	Stainless steel SS316Ti					
Operating temperature	Max. 180 °C [356 °F]					
Sample temperature	Max. 400 °C [752°F]					
Ambient temperature (controller)	-20°C to +60 °C [-4 to 140 °F]					
Degree of protection/ Electrical equipment standard	IP54 EN 60529/EN 61010, EN 60519-1					

10 Mounting

Screw in the heated sample tube with 3/8" sealing into the sample gas inlet of the portable gas sample probe **PSP4000-H**.

11 Electrical Connections



Warning

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

The heated sample tube SP34-H is connected to the power supply using the 4 m long power cable supplied. The cable is connected to the connection box of the heated sample tube using the 7-pin plug and connected to the mains using the IEC plug.

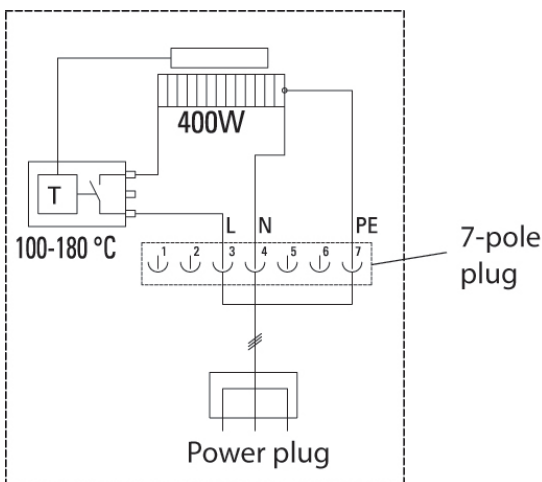


Figure 2: Electrical connection SP34-H

The SP34-H2 and SP34-H1.1 versions come with a 7-pin plug for electrical connection. The pin assignment is shown in Figure 3.

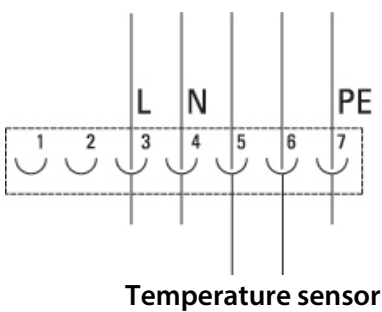


Figure 3: Pin assignment for electrical connection of SP34-H2 and SP34-H1.1

12 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.

13 Starting

Prior to starting the device, the system and process-specific safety measures must be observed. For the media to be supplied, the relevant safety requirements and measures must be taken into account.



Before starting up check whether the mains power supply voltage corresponds with the information stated on the nameplate.



Start up only the built-in heated probe tube because otherwise there is a risk of burning!

The following step-by-step procedure is recommended:

1. Check the temperature setpoint on the control thermostat or external controller. To do this, remove the cover of the junction box.
2. Switch on mains power supply.
3. The heated sample tubes are ready for operation after 2 hours heat-up time.

14 Decommissioning

For decommissioning no specific measures need to be taken.

Before switching off, i.e. switching off the heating, the heated sample tube needs to be flushed with inert gas or air in order to avoid condensation of aggressive components from the process gas.

15 Maintenance

Maintenance of the heated sample tube is limited to the cleaning of the surfaces.



Warning

The safety instructions specific to the plant and process are to be consulted prior to any maintenance work!



Warning



When working during operation:

High surface temperatures!

Touching the surfaces can result in burns. Wear protective gloves and protect against unauthorized access!



16 Cleaning



Note

In case of external contamination of the connection box clean it only with a cloth wetted with soapy water.

17 Proper Disposal of the Device

At the end of the life cycle 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, please follow the rules and regulations of your country regarding recycling and waste management.

18 Risk Assessment

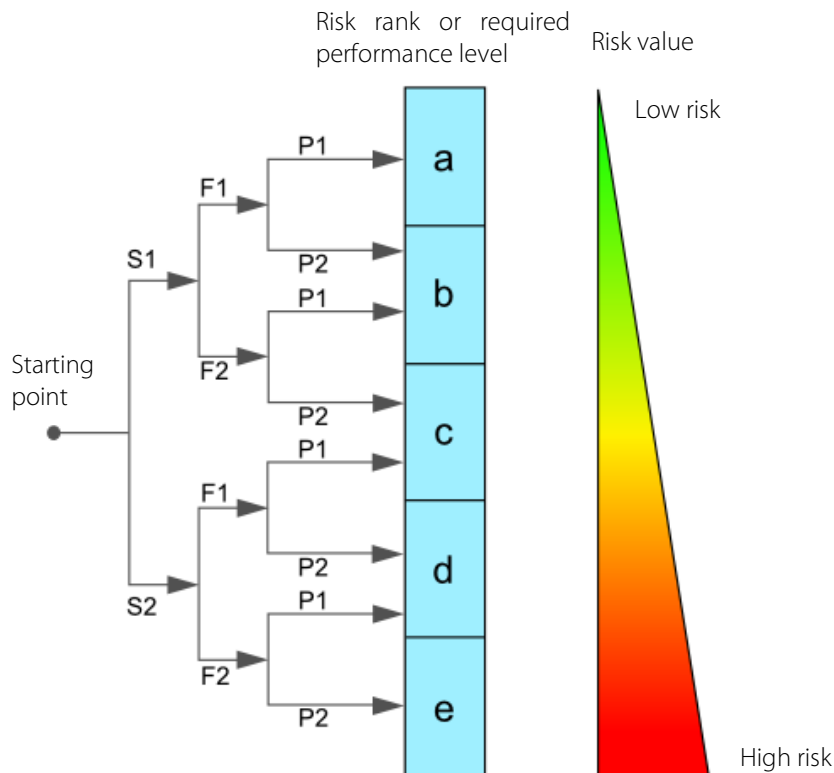
The risk assessment provided in this chapter is intended for all work activities on the product. The hazards can occur in the work steps of assembly, commissioning, maintenance, disassembly and in the event of a product fault. During normal operation, the product is protected by a system cabinet or appropriate 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 4: 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 $> 180^{\circ}\text{C}$.

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 $< 40\text{ kg}$ [$\approx 88.2\text{ lbs}$]:

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.

19 Appendix



More product documentation is available on our Internet catalogue:
www.mc-techgroup.com