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Instruction Manual

Portable Gas Treatment System
Type: MAXISYSTEM ST

☞ Read manual before use!

☞ Observe all safety information!

☞ Keep manual for future use!

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Contents

1 About this instruction manual

This instruction manual is part of the product.

- ▶ Read this manual before using the product.
- ▶ Keep this manual during the entire service life of the product and always have it readily available for reference.
- ▶ Always hand this manual over to future owners or users of the product.

1.1 Warning Terms

WARNING TERM The type and source of danger is shown here.

- ▶ Precautions to take in order to avoid the danger are shown here.

There are three different levels of warning:

Warning term	Meaning
DANGER	Imminent danger! Failure to observe the information will result in death or serious injuries.
WARNING	Possible imminent danger! Failure to observe the information may result in death or serious injuries.
CAUTION	Dangerous situation! Failure to observe the information may result in minor or serious injuries as well as damage to property.

2 Safety

2.1 Intended use

The portable gas treatment system MAXISYSTEM ST is exclusively suitable for:

- Professional settings and control measurements at all small combustion systems (low temperature and burner value boilers and thermal systems) for gas, oil and solid fuel systems.

Any use other than the application explicitly permitted in this instruction manual is not permitted.

2.2 Incorrect use

The portable gas treatment system MAXISYSTEM ST must never be used in the following cases:

- Hazardous area (Ex).
  If the device is operated in hazardous areas, sparks may cause deflagrations, fires or explosions.
- Use as a safety (alarm) unit or continuous measuring device.
- Ambient air monitoring.
- Use in humans and animals.

2.3 Safe handling

This product represents state-of-the-art technology and is made according to the pertinent safety regulations. Each device is subjected to a function and safety test prior to shipping.

- ▶ Operate this product when it is in perfect condition. Always observe the operating instructions, all pertinent local and national directives and guidelines as well as the applicable safety regulations and directives concerning the prevention of accidents.
- ▶ Perform an overall visual inspection of the measuring device (including any accessories) prior to each operation of the MAXISYSTEM ST in order to ensure proper operation of the device.
- ▶ Protect the product against impact.
- ▶ Use the product only indoor.
- ▶ Insulate the product from moisture.

Voltage supply

- ▶ Verify that the device is suitable for your mains. Make sure you have the correct mains voltage when connecting the device.

This is a device of safety class 1, i.e. it has an earth connection. Any interruption of the protective conductor inside or outside the device or disconnecting the protective conductor connection may cause hazards. Intentional interruptions of the protective conductor are prohibited.

The mains plug may only be plugged into an isolated earth power outlet. Do not disable the protection effect by using an extension cable without a protective conductor.

- ▶ Disconnect the device from all voltage sources before troubleshooting or repairing it or before replacing parts.

WARNING **Severe burns or death due to live parts.**

- ▶ Do not touch parts under voltage with the instrument or sensors.
- ▶ If work must be performed on the device while it is connected to voltage, such work may only be performed by a trained expert who is familiar with the associated hazards!

2.4 Qualification of personnel

The product may only be installed, commissioned, operated, maintained, shut down and disposed of by qualified, specially trained personnel.

Electrical work may only be carried out by qualified electricians in accordance with local and national regulations.

2.5 Calibration

The portable gas treatment system MAXISYSTEM ST have to be calibrated annually by a recognized, relevant authority.

2.6 Modifications to the product

Changes or modifications made to the product by unauthorised persons may lead to malfunctions and are prohibited for safety reasons.

2.7 Usage of spare parts and accessories

Usage of unsuitable spare parts and accessories may cause damage to the product.

- ▶ Use only the manufacturer's genuine spare parts and accessories of the manufacturer.

2.8 Liability information

The manufacturer shall not be liable in any direct or consequential damage resulting from failure to observe the technical instructions, guidelines and recommendations.

The manufacturer or the sales company shall not be liable for costs or damages incurred by the user or by third parties in the use or application of this device, in particular in case of improper use of the device, misuse or malfunction of the connection, malfunction of the device or of connected devices. The manufacturer or the sales company shall not be liable for damage resulting from any use other than the use explicitly stated in this instruction manual.

The manufacturer shall not be liable for misprints.

3 Product description

The portable gas treatment system MAXISYSTEM ST is designed for applications at changing sites requiring high-precision gas analyses and involving pollution and condensate in the flue gas.

The analysis of strongly water-soluble gases (NO_2 and SO_2) makes the use of a gas treatment system indispensable. The complete gas treatment system is contained in a small, sturdy case so that precise and reproducible analyses can be performed quickly and with high reliability. The MAXISYSTEM ST is designed to dock a MULTILYZER STx flue gas analyzer which perform the measurement using the gas treatment system of the MAXISYSTEM ST.

The gas cooler operates with an electronically controlled Peltier element which reduces the dew point to an optimum value of approx. 5 °C. The condensate is discharged via a hose pump. The gas treatment system indicates the operating states of the individual system components by means of status indicators. The gas treatment system is designed for quasi-continuous operation with an operating time of up to 12 hours. An LED status indicator provides information on the cooler temperature, the function of the Peltier element and the heating hose temperature.

3.1 Gas sampling system

Peltier gas cooler

The reduced dew point of the measured gas avoids the formation of condensate and dirt particles in the analyser and in other system components. At the same time, a stable output dew point prevents vapour cross sensitivity and volumetric errors.

The gas cooler operates with an electronically controlled Peltier element which ensures, together with the flow-optimised heat exchanger, an optimum dew point reduction to a value of approx. 5°C. The condensate is discharged via a hose pump.

The Peltier cooler indicates the operating states of the individual system components by means of status indicators.

The gas to be measured is drawn in via a gas sampling probe and a heated gas line and supplied to the Peltier cooler. The gas cooler cools down the gas to a dew point of 5 °C; the condensate is discharged via a hose pump.

Gas sampling probe and heated gas line

Heating the gas from the sampling point all the way to the Peltier gas cooler avoids accumulations of condensate in the gas supply system

and incorrect measurements of strongly water-soluble gases such as NO_2 and SO_2.

The electrically heated gas line with Pt100 temperature sensors is available in 3 m length. MAXISYSTEM ST controls the temperature and indicates the status LED of the heating hose. The controlled temperature of the heated hose is between 100 °C and 180 °C. If the reference temperature is higher or lower by 5 °C, the status LED lights red. The device is ready for operation when the status LED switches from red to white.

The following functions are monitored and indicated.

Gas cooler		
Gas cooler temperature	"COOLING SYSTEM"	5 °C, alarm at ± 3 °C
Heated hose		
Heating hose temperature	" HEATED LINE SYSTEM"	100 - 180 °C, alarm at ± 3 °C

Status indicators "Gas Cooler"

Status LED “COOLING SYSTEM” lights white: The gas cooler is ready for operation. The controlled cooler temperature is within the temperature tolerance range of 5 °C ± 3 °C.

Status LED “COOLING SYSTEM” lights solid red: The gas cooler is not ready for operation. The controlled cooler temperature is outside the temperature tolerance range of 5 °C ± 3 °C.
Possible reasons are:

The gas cooler has been switched on and is still starting up. The cooler should have reached the controlled temperature after approx. 10 minutes.

The cooling capacity is insufficient even though the Peltier element operates in continuous mode.

The Peltier element is defective. This is indicated by the solid red Active LED.

Status indicators "Heated Line System”

Status LED “HEATED LINE SYSTEM” lights white: The heated line is ready for operation. The controlled heated line temperature is within the temperature tolerance range of ± 3 °C.

Status LED “HEATED LINE SYSTEM” lights solid red: The heated line is not ready for operation. The set heated line temperature is

outside the temperature tolerance range of ± 3 °C.
Possible reasons are:

The device has been switched on and the heated line is still starting up. The heated line should have reached the controlled temperature after approx. 5 minutes.

The heating element of the gas line is defective.

3.2 Technical specifications

Parameter	Value
General Specifications	
Dimensions (H x W x D)	350 x 420 x 220 mm
Weight	Approx. 7.5 kg
Material Protective case	Polypropylen (PP)
Temperature range	
Ambient	5 °C to +40 °C
Medium	5 °C to +40 °C
Storage	-20 °C to +50 °C
Air pressure range	
Ambient	750 hPa to +1100 hPa
Humidity range	
Ambient	20 % rH to 80 % rH
Power supply	
Mains fuse	T 5A/250V (4 x 20 mm)
Power line	220 V - 240 V / 50 Hz -60 Hz
Electrical device standard	2014/35/EU (Low Voltage Directive)

4 Transportation and storage

CAUTION **Damage to the device due to improper transportation.**

- ▶ Do not throw or drop the device.
- ▶ Transporting the device only in the device-specific case.

CAUTION **Damage to the device due to improper storage.**

- ▶ Protect the device from shock when storing it.
- ▶ Store the device in a clean and dry environment.
- ▶ Only store the device within the permissible temperature range.
- ▶ Store the device away from paint, solvent and glue.

5 Commissioning

WARNING

- ▶ Before using the MAXISYSTEM ST you have to do a visual inspection of the entire measurement equipment (Device and accessories) for a correct operation of the device.

5.1 Connection diagram

1. Power Button
2. Power connection
3. Plug for pressure / draft measurement
4. Plug for flue gas hose (yellow)
5. Power connection for heated line
6. Flue gas temperature
7. Ambient air temperature
8. Fresh air entry
9. Condensate water outlet

5.2 Installation

For separation and discharge of the condensate in the cooler, MAXISYSTEM ST must be placed on an even, horizontal surface.

Use MAXISYSTEM ST only away from heat sources and when free ventilation is ensured to avoid heat accumulation in the device. The fan openings must not be covered.

5.3 Electrical connection

Mains supply is disconnected and cannot be switched back on by accident.

CAUTION **Destruction of the device caused by incorrect mains voltage.**

▶ Verify that you have the proper mains voltage (AC 110 - 230 V) before connecting the device.

The standard version of the gas treatment system comes with a 1.5 m low temperature cable. Connect the low temperature cable to the main socket on the front plate.

5.4 Flue gas analyzer

Connect the MULTILYZER STx flue gas analyser at the prepared docking station and plug in the USB cable in the MULTILYZER STx.

6 Operation

Switching on device:

Press the Power button to switch on the complete system. Briefly press the „ON/OFF“-button to switch on the flue gas analyzer. Follow the instructions of the MULTIYLZER STx manual.

After the gas treatment system is switched on, the connected components must first reach their operating temperatures. The heating phase may take up to 10 minutes until all system components are ready for operation. When the LEDs became white color, the device is ready for operation.

7 Maintenance

Take all system- and process-related safety measures before performing maintenance work.

Work such as replacing device components or making internal settings may only be performed by trained staff.

WARNING **Risk of burns due to high surface temperatures.**

- ▶ Wear protective gloves when dismounting the heated gas line- and sampling probe.

The connection pieces may heat up to 180 °C.

Gas treatment

- ▶ Empty the condensate trap completely after each operation. Water in the measuring device will destroy pumps and sensors.
- ▶ Check the fine filter for pollution and replace as necessary.
- ▶ If pump capacity is reduced, carefully replace the Teflon membrane filter. Damage to the filter membrane greatly decreases or eliminates the filter function and leads to the failure of expensive pumps and sensors.
- ▶ Make sure threaded parts are straight when positioned and tighten them moderately. Ensure sufficient sealing by means of O rings.
- ▶ Hard-to-move/plug parts (plug-type elements and flanges): Remove any gas residues and grease with Vaseline.
- ▶ Do not short-circuit connection terminals.

Replacing the mains fuse

A spare fuse is located in the fuse holder of the mains input socket.

The fuse can only be replaced when the mains cable is disconnected.

8 Troubleshooting

Repair work may only be performed by qualified, specially trained staff.

9 Shutting down and disposal

▶ To protect the environment, this device must **not** be disposed of together with the normal household waste. Dispose of the device according to the local conditions and directives.

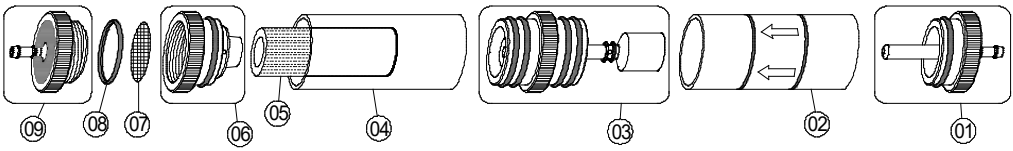
This device consists of materials that can be reused by recycling firms. The electronic inserts can be easily separated and the device consists of recyclable materials.

If you do not have the opportunity to dispose of the used device in accordance with environmental regulations, please contact us for possibilities to return it.

10 Spare parts and accessories

The gas treatment protect the flue gas analyzer against disturbing components like dust, carbon black and condensate.

The condensate filter cartridge in good condition is a protector for the flue gas analyzer against dirt and an important part of the measurement of exhaust gas.



Articles:	**Art.-Nr.**
Filter spare part package (5x 520921 and 5x 524735)	500216
O ring package for condensate filter cartridge	511002

Spare parts for condensate cartridge:	
(0**1**) Inlet piece	520594
(0**2**) Glass piston with arrow	520596
(0**3**) Centre piece with cylinder pieces	521990
(0**4**) Glass piston with logo	521778
(0**5**) Infiltec fine filter	524735
(0**6**) Intermediate piece	520592

Articles:	Art.-Nr.
(0**7**) Teflon membrane 23.5 mm	520921
(0**8**) O ring 18 x 3	520365
(0**9**) Outlet piece	520591

CAUTION

▶ Check the completeness and functionality of particle filter, filter disc, glass piston and O-rings. After the measurement disconnect the probe from the analyzer, empty the condensate and exchange used filters!

11 Warranty

The manufacturer's warranty for this product is 12 months after the date of purchase. This warranty shall be good in all countries in which this device is sold by the manufacturer or its authorised dealers.

12 Copyright

13 Customer satisfaction

Customer satisfaction is our prime objective. Please get in touch with us if you have any questions, suggestions or problems concerning your product.

14 Addresses

The addresses of our worldwide representations and offices can be found on the Internet at www.systronik.com

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