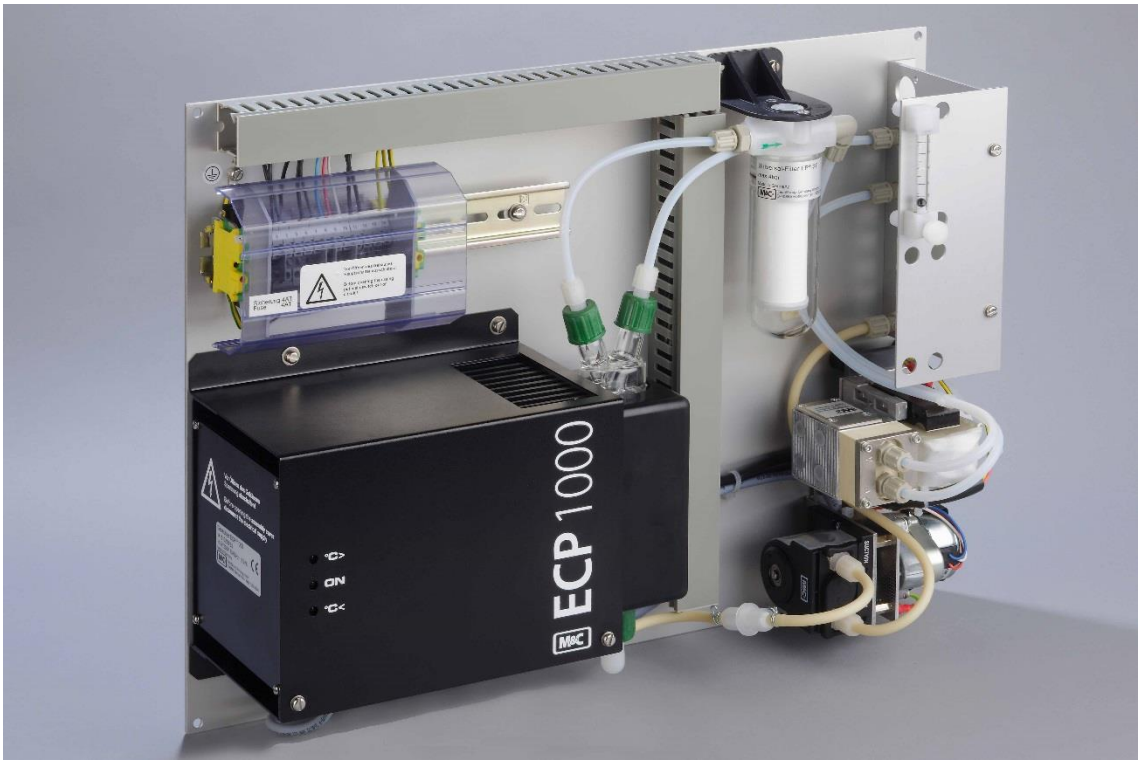
Embracing Challenge

Gas Conditioning Unit Series PSS®

SS-5, SS-5/3

Instruction Manual
Version 1.00.01



Dear customer,

we have made up this operating manual in such a way that all necessary information about the product can be found and understood quickly and easily.
Should you still have any question, please do not hesitate to contact **M&C** directly or go through your appointed dealer. Respective contact addresses are to be found in the annexe to this operating manual.
Please also contact our homepage **www.mc-techgroup.com** for further information about our products. There, you can read or download the data sheets and operating manuals of all **M&C** products as well as further information in German, English and French.

This Operating Manual does not claim completeness and may be subject to technical modifications.
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Version: 1.00.01

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1 GENERAL INFORMATION

The product described in this operating manual has been examined before delivery and left our works in perfect condition related to safety regulations. In order to keep this condition and to guarantee a safe operation, it is important to heed the notes and prescriptions made in this operating manual. Furthermore, attention must be paid to appropriate transportation, correct storage, as well as professional installation and maintenance work.
All necessary information a skilled staff will need for appropriate use of this product are given in this operating manual.

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 take care of the following basic safety procedures when mounting, starting up or operating this equipment:

Read this operating manual before starting up and use of the equipment. The information and warnings given in this operating manual must be heeded.

Any 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 (IEC 364) when setting high-power electrical units with nominal voltages of up to 1000 V, together with the associated standards and stipulations.

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

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

The device is only to be used within the permitted range of temperatures and pressures.

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

The gas conditioning systems SS-5 and SS-5/3 must not be used in hazardous areas.

Installation, maintenance, monitoring and any repairs may only be done by authorized personnel with respect to the relevant stipulations.

4 WARRANTY

If the equipment fails, please contact **M&C** directly or else go via your appointed **M&C** dealer.
We offer a one year warranty as of the day of delivery as per our normal terms and conditions of sale and assuming technically correct operation of the device. Consumables are hereby excluded. The terms of the warranty cover repair at the factory at no cost or the replacement at no cost of the equipment free ex user location. Reshipments must be sent in a sufficient and proper protective packaging.

5 USED TERMS AND SIGNAL INDICATIONS

DANGER!

This means that death, severe physical injuries and/or important material damages **will occur** in case the respective safety measures are not fulfilled.

WARNING!

This means that death, severe physical injuries and/or important material damages **may occur** in case the respective safety measures are not fulfilled.

CAUTION!

This means that minor physical injuries **may occur** in case the respective safety measures are not fulfilled.

CAUTION!

Without the warning triangle means that a material damage may **occur** in case the respective safety measures are not met.

ATTENTION

This means that an unintentional situation or an unintentional status **may occur** in case the respective note is not respected.

NOTE!

These are important information about the product or parts of the operating manual which require user's attention.

SKILLED STAFF

These are persons with necessary qualification who are familiar with installation, use and maintenance of the product.

6 INTRODUCTION

This unit, mounted on an aluminium plate, provides a completely pre-installed sample gas conditioning for continuous use that can be excellently integrated within gas analysis systems.
Its compact construction only takes up little space. The **SS-5..** units are ready for use in a few minutes. This makes time-consuming procurement of individual components and assembly superfluous.

7 APPLICATION

The gas conditioning and sampling system is ideally suited for both intermittent and continuous operation.

The components of the system **SS-5...** are intended for "standard use." We also provide a wide range of additional equipment and other components if special measurements are required.

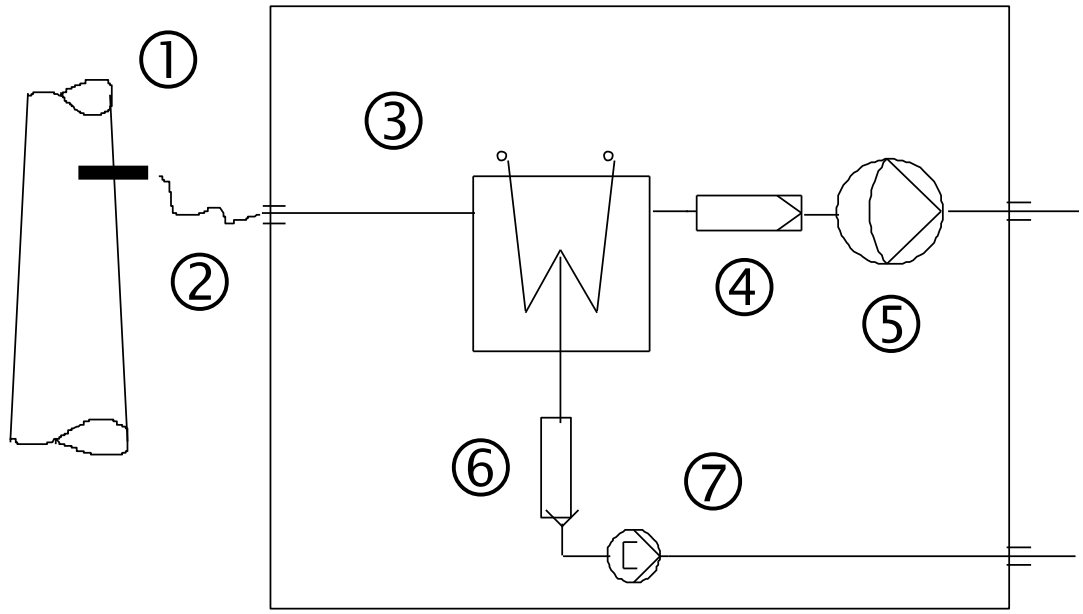

Figure 1 Flow sheet of the SS-5 and SS-5/3

① Gas sample probe, e.g. SP2000-H
② Gas sample line, e.g. heated
③ Gas cooler **ECP1000** or **ECP3000**
④ Fine filter **FP-2T,** filter element fineness 2 µm
⑤ Sample gas diaphragm pump **N3KPE** or **N9KPE**
⑥ Pre-filter **PF 2**
⑦ Peristaltic pump **SR25.1** for continuous removal of condensate

8 TECHNICAL DATA

Gas Conditioning Type	**SS-5**	**SS-5/3**
Part No. version 230V 50Hz Part No. version 115V 60Hz	03G5000 03G5000a	03G5500 03G5500a
Sample outlet dew point	range of adjustment: +2 °C … +15 °C, factory setting: +5 °C	
Dew point stability	at const. conditions: < ±0,1°C	
Sample inlet temperature	**max. 80°C* optional: **max. 180°C with stainless steel bulkhead union	
Sample inlet dew point	**max. +80°C	
Gas flow rate	**max. 150Nl/h	**max. 350Nl/h
Ambient temperature	**+5°C up to +40°C	
Storage temperature	-25°C up to +65°C	
Pressure	0,7bar up to 1,4bar abs.*	
Total cooling power	max. 50kJ/h	max. 90kJ/h
Number of gas inlets	1	
Number of gas outlets	1* optional: max. 4	
Medium connections	tube connections 4/6 mm	
Material of parts beeing in contact with the medium	stainless steel, glass, PPH, PVC, PVDF, PTFE, Novoprene® optional: Viton for gas sample line	
Ready for operation	approx. 10 min.	
Mains power supply	230V 50Hz ± 10% or 115V 60Hz ± 10%	
Power consumption	max. 240VA Option temperature controller and heated sample line: 230V max. 1620VA, 115V max. 930VA	
Fuse protection	4AT, 5mmx20mm with option temperature controller and heated sample line: 10AT, 5mmx20mm	
Electrical connection	Terminals 4mm^2	
Case protection	IP20 (EN 60529)	
Casing	portable aluminium case	
Casing dimensions (H x W x D)	385mm x 515mm x 190mm	
Weight	approx. 18,5kg	approx. 20,0kg
Electrical equipment standard	EN 61010	
Options		
Temperature controller:	range of control: 0°C-200°C Input : PT100 230V, max. 6A Part No. 01G9055 115V, max. 6A Part No. 01G9055a	
Flow meter FM40 (optionally), max. 4	7-70 l/h air, Part No. 01G9070 15-150 l/h air, Part No. 01G9075 25-250 l/h air, Part No. 01G9080 50-500 l/h air, Part No. 01G9085	
Liquid alarm	LA 1S/1.4 Part No. 01G9035	
5-way-ball valve	60750 Part No. 01G9045	

PPH=Polypropylene, PTFE=Polytetrafluoroethylene (Teflon®), PVC=Polyvinyl chloride, PVDF=Polyvinylidenfluoride

* Standard

** Maximum values in technical datas must be rated in consideration of total cooling capacity at 25 °C ambient temperature and an outlet dew point of 5 °C.

9 DESCRIPTION

1 = Sample gas IN

2 = Sample gas OUT

3 = Condensate OUT
(all connections DN4/6)

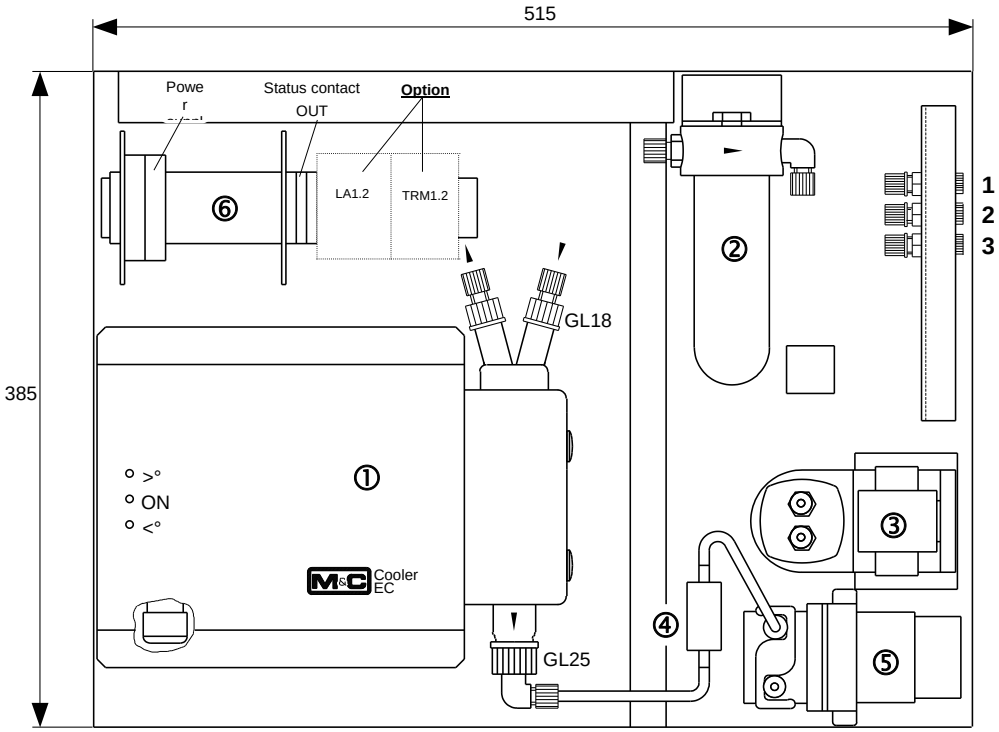

Figure 2 Design of the conditioning and sampling system SS-5 and SS-5/3

The installation of a gas cooler ① and an appropriate diaphragm gas pump ③ will be carried out according to the maximum flow of gas extracted (see instruction manual for individual components). The possible combinations are listed in the following table:

SS-5...	Type of cooler	max. gas flow [Nl/h]	Sample gas pump
SS-5	ECP1000	150	N 3 KPE
SS-5/3	ECP3000	350	N 9 KPE

The minimum amount of flow is determined by the sample gas pump (see 8.). Premature damage can be caused to the pump membrane if less than the minimal total amount of flow is extracted as a result of excess pressure.

All gas coolers are equipped with a Duran glass heat exchanger ①. Heat exchangers of PVDF or stainless steel are also available.

The preliminary filter **FP-2T** (2µm filter element fineness) ② installed in front of the gas measuring pump ensures that the correct amount of solid matter is precipitated.

The sample gas pump ③ is turned off and on automatically by means of an excess temperature contact on the cooler (+8°C).
The resulting condensation is continually lead off by means of the **SR25.1** ⑤ peristaltic pump.

A preliminary filter, **PF2** ④ has been fitted in the condensation hose in between the heat exchanger and peristaltic pump. This prevents particles in the condensate entering the pump.

The 4/6mm hose connections for the condensate and measuring leads (11) are located on the right-hand side of the case (see figure 2 and 3).

The ventilation grids located in the lid and the left-hand side of the case ensure that the equipment is sufficiently ventilated.

Options

The gas conditioning and sampling system **SS-5...** consists of a maximum of 4 gas-measuring outlet terminals. Additional flowmeters (**FM 40**), with needle valves, can be fitted to each of these terminals, whereby the adjustment of the terminals is carried out in accordance with the specified volume flow rate (see 3.). The assembly bore holes in the gas-measuring outlet terminals and the flowmeter which are not being used are sealed-off with caps.

In order to protect additionally connected analysers against fluid irruption, and increase the operational safety of the entire system, we recommend that a fluid alarm sensor **LA 1S** be installed. In such a case, the preliminary filter **FP-2T**, which is delivered with all models, will be replaced with the **FP-2T-D** preliminary filter by the manufacturer. The **LA1.4** electronic is located on the clamp mounting rail ⑥ in the upper part of the case. In the event of a fluid irruption, the LA electronics automatically turns off the sample gas pump. The alarm will be raised by means of a red LED. If the equipment is functioning properly, i.e. no alarm, a green LED will be on.

The **SS-5...** can also be equipped with an additional gas measuring inlet terminal (see figure 3, Article No. 01 G 9060) in order to connect a heated sample line. The existing antikink device is only to be used for heated sample lines in conjunction with the model "C" connection (Article No. 03 B 1012).

The heated sample line, Article No. 01 B 4035, can also be fitted in conjunction with the sample gas probe **PSP 4000**.

In the event that the heated line is ordered as additional equipment, the necessary temperature controller **701** (Article No. 01 G 9055) will be fitted to the clamp mounting rail ⑥ (figure 2) by the manufacturer.

A 3-way ball valve (01 G 9046) or 5-way ball valve (01 G 9055) can be fitted to the inlet terminal of the gas conditioning system in order to calibrate analyser(s) with check gas, or to switch from one sample gas measurement to another.

10 RECEIPT OF GOODS AND STORAGE

The gas conditioning and sampling system **SS-5...** is a completely pre-fitted unit.

- Please take the gas conditioning system and possible special accessories carefully out of the packaging material immediately after arrival, and compare the goods with the items listed on the delivery note;

- Check the goods for any damage caused during delivery and, if necessary, notify your transport insurance company without delay of any damage discovered.

NOTE!

The equipment should be stored in a protected, frost-free room!

11 INSTALLATION INSTRUCTIONS

NOTE!

The equipment is to be used in a vertical position only. The perfect functioning of the seperation and drainage procedures will only be guaranteed if the equipment is used in a vertical position.
The gas conditioning system should be installed in an area well away from any heat emitting sources in order to prevent demage caused by an accumulation of heat.
Pay attention to a non critical installation for individuals.

The compact gas conditioning system is preferably designed for mounting in a cabinet. When the cabinet is installed outside, ample protection against the effects of direct sunlight and dampness must be provided. In winter, the equipment must only be used in frost-free areas; Schutzart der Gasaufbereitung beachten.
For mounting of the compact gas conditioning system the supplied distance bolts (M5, 15mm) have to be used.

In order to guarantee the operational safety of the gas conditioning system and the additionally connected analysers, and to avoid false alarms, the gas conditioning system should not be used at temperatures other than those specified.

It is of great importance that the analysers which have been additionally connected be used at temperatures well above the specified gas outlet dew point of +5°C. This prevents the gas in the connector lines from condensing completely.

In the event of the unheated sample gas lines being connected to the gas conditioning system on a slope, it is not necessary to carry out a preliminary condensate removal.

12 SUPPLY CONNECTIONS

12.1 HOSE CONNECTIONS

NOTE!

Do not mix up the hose connections: they are clearly marked. After all the hoses have been connected, the tightness of such leads should be checked.

All hose connections are equipped with 4/6mm sealing ring threaded hose couplings made of polypropylene (PP) for gas input temperatures of up to a maximum of 80°C (see 3.). If heated sample lines are used, whereby the gas input temperatures are increased up to a maximum of 180°C, additional bulkhead unions made of stainless steel are recommended.

Connection hoses with dimensions DN 4/6mm are utilised for all models.

The sample gas hoses, and condensation hoses, are to be assembled as follows:

- Remove the union nut from the sealing ring couplings by turning it anti-clockwise. The nut should be removed from the thread with great care so as to ensure that the loose sealing ring in the nut is not lost.
- Place the union nut over the connecting hose.
- Place the sealing ring over the connecting hose with the thicker bead towards the nut.
- Place the hose over the nipple on the thread.

NOTE!

The tightness of the connections can only be guaranteed if the connecting hose has a straight rim (hose cutter).

- The union nut is to be screwed tight by hand.

The hose will no longer be able to slip off, and is now compression-proof.

The hoses are to be removed in the reverse order.

WARNING!

Aggressive condensate possible.
Wear protective glasses and proper protective clothing!

12.2 ELECTRICAL CONNECTIONS

WARNING!

False supply voltage can demage the equipment. When connecting the equipment, please ensure tha the supply voltage is identical with the information provided on the model type plate !

NOTE!

For the erection of power installations with rated voltages up to 1000V, the requirements of VDE 0100 and relevant standards and specifications must be observed!

The main circuit is equipped with a fuse corresponding to the nominal current (over current protection); for electrical details see technical data.

The **SS-5...** gas conditioning system is available with either 230V/50 Hz or with 115V/60Hz (for circuit diagram see Appendix). A 4A fuse is used on all models as fuse protection. The fuse is located on the clamp mounting rail (see figure 2). In the event that a temperature controller is used in conjunction with heated sample lines, the overload protection level is increased to 10A.

The electrical connection for the mains is carried out at the terminals 1, 2 and 3 of the mounting rail ⑥ (see Fig. 2).

X1

Connection 230V

	Casing/PE	1	PE	Power in **PE**
	X1/4	2	Si	Power in **L**
	X1/11	3		Power in **N**
	X1/2	4		E1/X1-1
	B1/1	5		M2/L
	B2/L1	6		X2/4
	B2/1 (43)	7		E1/X2-1
with option LA B1/24	E1/X2-3	8		M1/black
		9		M1/blue
		10		M1/orange
	X1/3	11		M1/white
		12		E1/X1-2
	B1/2	13		M2/N
	B2/N	14		X2/2
	B1/3	15	PE	E1/X1-3
	X2/PE	16	PE	M2/PE
		17	PE	M1/PE

X1

Connection 115V

	Casing/PE	1	PE	Power in **PE**
	X1/4	2	Si	Power in **L**
	X1/11	3		Power in **N**
	X1/2	4		E1/X1-1
	B1/1	5		M2/L
	B2/L1	6		X2/4
	B2/1 (43)	7		E1/X2-1
with option LA B1/24	E1/X2-3	8		M1/black
		9		M1/blue
		10		M1/orange
	X1/3	11		M1/white
		12		E1/X1-2
	B1/2	13		M2/N
	B2/N	14		X2/2
	B1/3	15	PE	E1/X1-3
	X2/PE	16	PE	M2/PE
		17	PE	M1/PE

Figure 3 Electrical connections for SS-5 and SS-5/3, 115V and 230V

Option temperature controller 701 for heated sample lines:

For the electrical supply and control of a heated sample line with PT-100 a 7-pin plug at the side is available. The connection power is max. 6A, 1380W for the 230V version resp. 6A, 690W for the 115V-version.

The maximum length of the heated sample line which can be used is calculated as follows:

$$L(m) = \frac{\text{max. connection power [W]}}{\text{power draw of heated sample line [W/m]}}$$

13 STARTING

Before starting the gas conditioning system please pay attention to the site-oriented and process-oriented precautions.

The following steps have to be done starting up the **SS-5...** for the first time:

- Connect the mains cable;
- Connect the mains cable to the mains;
- In case of option temperature controller **701** adjust the required temperature at the controller:

  The digital display shows the actual temperature value of the heated line after switching on the conditioning unit. The controller is adjusted to 0 °C by factory. To change the set temperature press key *P* . The display shows *S* and than it changes to the adjusted set temperature. Change the value with the arrow keys. After 60 seconds the display switches automatically to the actual value.

The gas measuring cooler will become operational after approximately 10 minutes. The excess temperature alarm contact located in the cooler switches the sample gas pump automatically on as soon as the temperature reaches +8°C.

WARNING! **Check the temperature at the temperature controller if the conditioning unit is run with a heated sample line!**

NOTE!

The following minimal gas flow rates have been determined on the basis of the requirements of the maximum pressure on both sides of the gas measuring pumps N3-KPE and N9-KPE:
N 3 KPE approximately 60NL/h air,
N 9 KPE approximately 200NL/h air

Premature damage can be caused to the pump membrane if less than the minimal total amount of flow is extracted as a result of excess pressure.

In the event that long-term measurements are carried out whereby the gas contains a high level of dust, it is necessary to utilise a suitable sample gas probe in order to protect the sample leads from clogging-up.

14 CLOSING DOWN

NOTE!

The area in which the equipment is situated when not in use must be kept free of frost at all times.

There are no special regulations to be observed if the gas conditioning and sampling system is to be closed down for a short period of time.
In the case of a long-term closing down, for example after a series of measurements has been completed, it is recommended to backflush the gas conditioning system with ambient air or inert gas. Under normal conditions, the equipment only needs to be backflushed for 3 to 5 minutes. Condensate residue should also be removed from the system.

WARNING!

Aggressive condensate is possible.
Wear protective glasses and proper protective clothing!

15 MAINTENANCE

Before the maintenance work is carried out, it is necessary that the specific safety procedures pertaining to the system and operational process be observed!

WARNING!

Dangerous voltage. It is necessary to take the equipment off the mains before any assembly, maintenance or repair work is carried out.

In order to do this the main switch should be turned to the position "O" and the mains plug should be removed from the mains plug socket!

The frequency of the maintenance work depends on the operational process and can therefore only be determined in each individual case. Maintenance instructions pertaining to individual components can be found in the instruction manual for individual components.

All parts which require maintenance work are housed in the gas conditioning system in such a way so that they are easily accessible. These are (see figure 2):

- The filter element of the preliminary filter **FP-2T**.

NOTE!

In order to protect the analysers which have been additionally connected, it is recommended that in the event of a condensation irruption the moist filter elements be replaced.

- The preliminary filter for the peristaltic pump **PF2**. If the condensate contains particle residue, the preliminary filter should be replaced at regular intervals. The 'one-way' filter is situated in the suction side of the pump hose (see figure 2) and can be easily replaced;

- Hoses of the Condensate pump **SR25.1**. These should be checked every six months and, if necessary, replaced;

- Diaphragm of the sample gas pump **N3KPE** or **N9KPE**. These should be checked every six months and, if necessary, replaced;

16 TROUBLE SHOOTING

The following table aims to point out possible operational problems and offer solutions to such problems (not applicable during the starting procedure).

Indication	Problem	Possible Cause	Check/Solution
	Interruption of gas flow;	No voltage;	Check supply voltage with model type plate; OK? Check whether the supply voltage plug is insert correctly and if the main switch is turned in position 'I' OK? Check the fine fuse on connector block ⑥ (fig. 2); OK?
Upper LED on cooler does not come on;		Cooler does not function. Cooler alarm registers 'excess temperature'. Cooler turns gas measuring pump of automatically.	Ambient temperature too high. OK? Free convection in case impaired ⇨ case temperature too high; OK? Cooler faulty (for check see manual ECP1000/3000, 3.1.1-ME). OK?
Middle LED on cooler is green;	Cooler in operation but gas flow interrupted;	Membrane pump faulty;	Check voltage on clamps X1/11 and X1/8 ; OK?
		Contamination of the membrane pump;	Remove the hoses at head of pump and check; OK? Clean pump if necessary; OK?
		Sample probe/hose clogged up or lead squashed;	Remove sample hose at gas inlet (see 9.); Gas flow? Clean contaminated lead or replace; No gas flow?
		Sample gas hose to analyser clogged up or squashed;	Remove sample gas hose on analyser side and check via hose thread if sample gas flows; No gas flow? Clean contaminated leads or replace; Gas flows?
Alarm LED on the LA electro-nics is red (see 4);		<u>Optional liquid alarm sensor:</u> Sensor turns measuring pump off automatically;	Momentary overloading of the cooler due to excessive amount of condensate; OK? Check hoses for condensate removal; OK? Check Pre-filter ⑩ and if necessary replace; OK? Check hoses of the peristaltic pump (see manual peristaltic pump SR25.1, 3-7.1-ME); OK? Check peristaltic pump **SR25.1** (see manual peristaltic pump SR25.1, 3-7.1-ME); OK? Check cooler according to instruction manual;
		<u>Optional flowmeter(s):</u> Needle valve closed.	Adjust needle valve(s) to the desired flow.

Indication	Problem	Possible Cause	Check/Solution
Middle LED on cooler is green;	Cooler and gas pump in operation; condensate in sample gas lead;	Pre-filter ⑩ clogged up;	Remove filter from condensate lead; Pump delivering? Change filter; Pump not delivering?
		Pump hose faulty;	Change pump hose (see manual peristaltic pump SR25.1, 3-7.1-ME); OK?
		Peristaltic pump **SR25.1** faulty;	Check peristaltic pump (see manual peristaltic pump SR25.1, 3-7.1-ME); OK?
		Unsufficient drying of sample gas;	Check cooler (see manual ECP1000/3000, 3.1.1-ME);
LED of the LA electronics is green (see 4).		<u>Optional liquid alarm sensor:</u> Sensor has not turned pump off.	Check the LA electronics and if necessary replace.

17 SPARE PARTS LIST

Wear, tear and replacement part requirements depend on specific operating conditions.
The recommended quantities are based on experience and are not binding.
For spare parts of components which are not presented in the following list please see the specific instruction manuals or leaflets added in the appendix.

Portable Sampling System Versions SS-5, SS-5/3

(C) consumable parts, (R) recommended spare parts, (S) spare parts

			recommended quantity **SS-5...** being in operation [years]		
		C/R/S	1	2	3
Fine filter FP-2T: ⑦ (see Fig. 2)					
90 F 0002	Filter element **F-2T**, PTFE, 2µm	C	6	12	20
90 F 0040	Viton O-ring, 26 for FP-	R	1	1	1
90 F 0056	PVDF filter element clamp **F-P**	S	-	-	1
90 F 0012	Filter body **F-120G** of glass	R	1	1	1
Fine filter FP-2T with Option LA1S:					
90 F 0015	Filter body **F-120G-D** of glass with GL25 condensate connection thread	R	1	1	1
90 F 0020	Union nut GL 25	R	1	1	1
90 F 0025	PTFE sealing ring GL 25-12mm Ø	R	1	1	1
Peristaltic pump SR25.1:					
90 P 1007	SR25 pump hose with PVDF tube connectors DN 4/6mm	C	1	2	4
Diaphragm pump type N3 KPE/KP18; N5 KPE/KP18					
90P2100	Square cap type D3, 1/8“i for N3/N5 KPE/KP18, Material: PVDF	S	-	-	1
90P2120	Diaphragm type S3, for N3/N5 KPE/KP18, Material: Viton, PTFE coated	C	1	2	3
90P2115	Sealing ring type O3, for N3/N5 KPE/KP18, 1 piece, Material: Viton (2 pc. required)	C	2	4	6
90P2110	Valve plate type V3, for N3/N5 KPE/KP18, 1 piece, Material: Viton (2 pc. required)	C	2	4	6
90P2105	Intermediate plate type Z3, for N3/N5 KPE/KP18, Material: PVDF	S	-	-	1
Diaphragm pump type N9 KPE/KP18					
90P2200	Square cap type D9, 1/8“i for N9 KPE/KP18, Material: PVDF	S	-	-	1
90P2220	Diaphragm type S9, for N9 KPE/KP18, Material: Viton, PTFE coated	C	1	2	3
90 P 2211	Valve plate with seal for N9 KPE, 1 pc., material: Viton. (2 pcs./pump)	C	2	4	6

Portable Sampling System Versions SS-5, SS-5/3

(C) consumable parts, (R) recommended spare parts, (S) spare parts

			recommended quantity **SS-5...** being in operation [years]		
		C/R/S	1	2	3
90P2205	Intermediate plate type Z9, for N9 KPE/KP18, Material: PVDF	S	-	-	1
Option flowmeter FM40:					
90 A 0015	Flowmeter glass for FM40 range **7-70 l/h** air	S	-	1	1
94 F 0010	Flowmeter glass for FM40 range **15-150 l/h** air	S	-	1	1
94 F 0015	Flowmeter glass for FM40 range **25-250 l/h** air	S	-	1	1
94 F 0020	Flowmeter glass for FM40 range **50-500 l/h** air	S	-	1	1
90 A 0018	Viton O-ring 9 for flowmeter glass FM40	R	2	4	6
Diverse:					
90 G 0006	Pre-filter **PF 2** ⑩ for condensate pump SR25.1	C	5	10	15
90 K 6030	Fine fuse 4A T, 5mmx20mm for **SS-5...**	R	5	5	5
90 G 0020	Fine fuse 10A T, 5mmx20mm for **SS-5...** **with option temp. controller and heated sample line**	R	5	5	5
Hose and hose fittings:					
05 V 3230	Bulkhead union SV-PP DN 4/6 **SS-5 standard PPH = Polypropylene**	R	2	2	2
05 V 3215	Bulkhead union SV-PVDF DN 4/6 **SS-5 optional PVDF = Polyvinylidenfluoride**	R	2	2	2
05 V 6500	Sealing ring 4/6 PP **see above**	R	5	10	10
05 V 6600	Sealing ring 4/6 PVDF **see above**	R	5	10	10
05 V 6505	Union nut M10-4/6 PP **see above**	R	5	10	10
05 V 6605	Union nut M10-4/6 PVDF **see above**	R	5	10	10
01 T 4000	Hose PVC DN 4/6 (meters)	S	3	6	9
01 T 1000	Hose Viton DN 4/6 (meters)	S	1	2	3
01 T 2000	Hose Novoprene DN 3,2/6,4 (meters)	S	1	2	3
02 B 1000	Hose PTFE DN 4/6 (meters)	S	1	2	3
10 T 1000	Hose cutter	S	1	1	1

18 APPENDIX

- Circuit diagram **SS-5** and **SS-5/3**

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

- Instruction manual electric gas cooler **ECP 1000**, **ECP3000**
  Document : **3.1.1-ME**

- Universal-Filters **FP, FT, FPK, FS, FSS**
  Document : **5-1.1**

- Instruction manual diaphragm pump **Series N**
  Document : **6-1.2.1-ME**

- Instruction manual peristaltic pump **SR25.1, SR25.1-G**,
  Document : **3-7.1-ME**

- Liquid alarm sensor **LA1S** and electronic controllers type **LA1.4**
  Document : **5-5.1.1-ME**

- Flow meter **FM40**
  Document : **5-6.1.10**

- Ball valves **L/PV-1**
  Document : **6-2.1.1**

- Temperature controller **701**
  Document : **2-5.1.2**

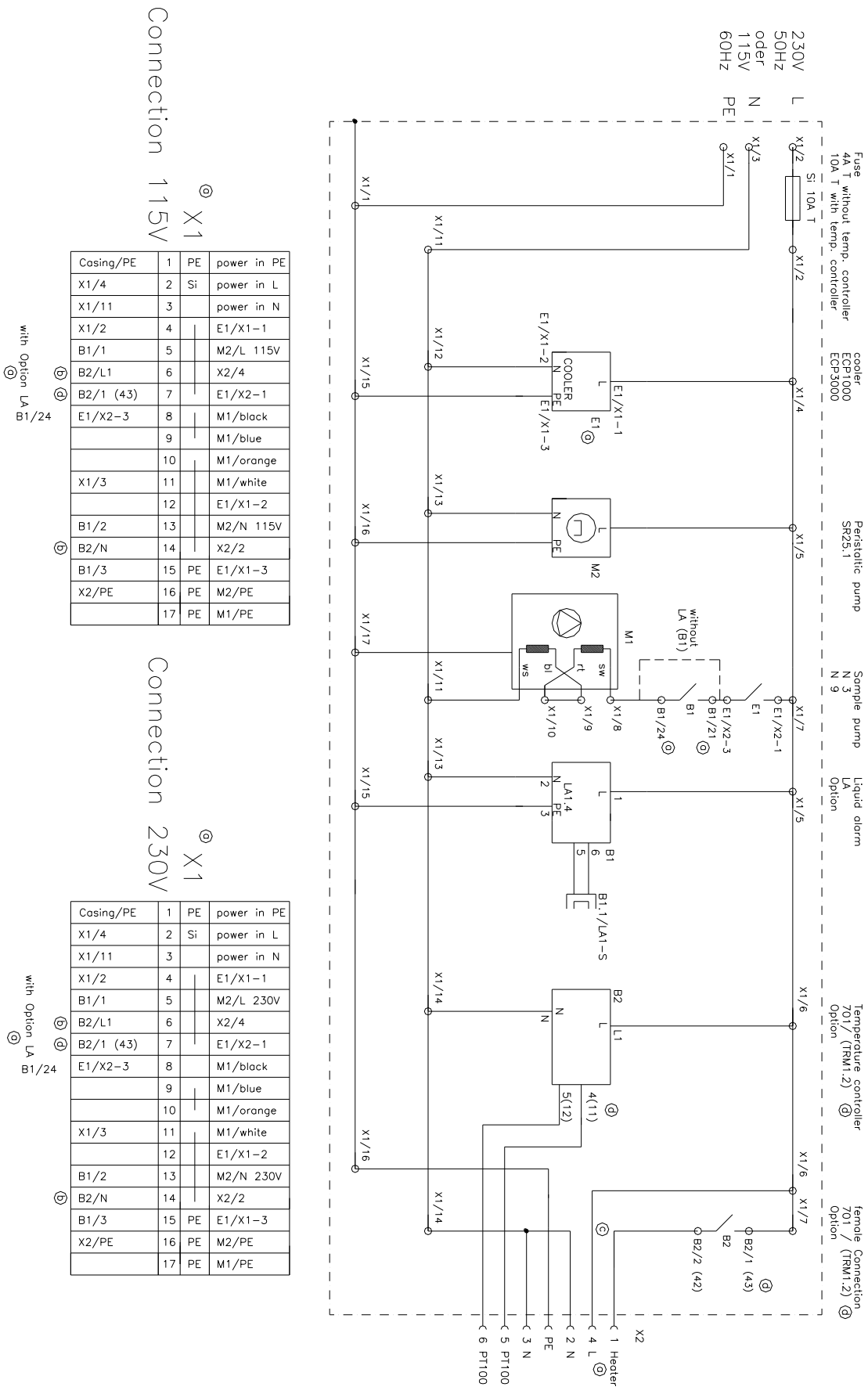

Figure 4 Circuit diagram SS-5 and SS-5/3, 115V and 230V