

# Portable Gas Conditioning Unit Series PSS®

## PSS-20

Instruction Manual  
Version 1.00.01





**Dear customer,**

We have carefully prepared this operation manual for you to quickly and easily find and understand all the necessary information about the product.

If you have any questions, please feel free to contact M&C directly or through your designated dealer. The corresponding contact address can be found in the appendix of this operation manual.

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

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**PSS®** is a registered trade mark.

Version: 1.00.01

## List of Contents

1	General information .....	5
2	Safety instructions .....	6
3	Warranty .....	6
4	Used terms and signal indications .....	7
5	Introduction .....	9
6	Application .....	9
7	Technical data .....	10
8	Design Specification .....	12
9	Receipt of goods and storage .....	16
10	Installation instructions .....	17
11	Supply connections .....	18
11.1	Tube connections .....	18
11.2	Electrical connections .....	20
12	Commissioning .....	22
13	Closing down .....	24
14	Maintenance .....	25
15	Trouble shooting .....	26
16	Spare parts list .....	28
17	Appendix .....	31

## List of Figures

Figure 1	PSS-20 gas flow diagram .....	9
Figure 2	Design of the conditioning unit PSS-20, internal components .....	12
Figure 3	Design of the conditioning unit PSS-20, front-view .....	13
Figure 4	Design of the conditioning unit PSS-20, back-view .....	14
Figure 5	Tube connections .....	18
Figure 6	Electrical connection and main switch ① .....	20
Figure 7	Circuit diagram of the 7pin socket ② .....	21
Figure 8	702 Temperature controller .....	22
Figure 9	PSS-20 wiring diagram .....	32
Figure 10	PSS-20 Electrical schematic diagram 230VAC .....	33



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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 SAFETY INSTRUCTIONS

**Follow these 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.

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 system PSS-20 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.

## 3 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 China**, 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.

## 4 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.

**Qualified Personnel**

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



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



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



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.



## 5 INTRODUCTION

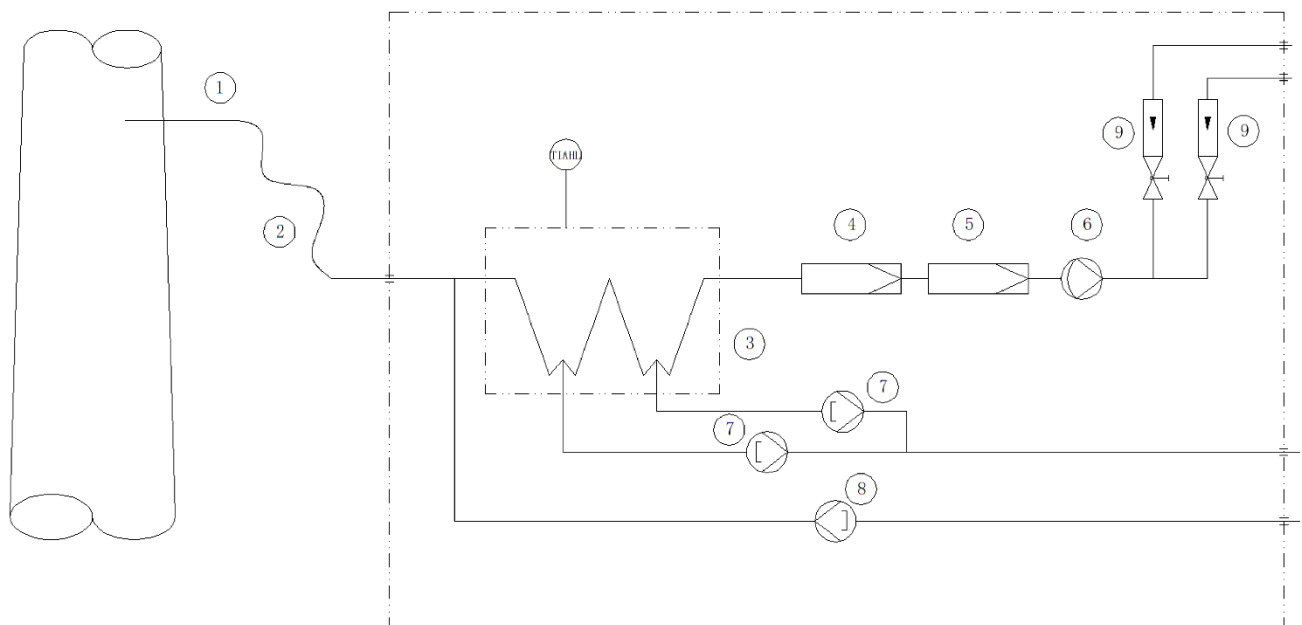
The portable gas conditioning system **PSS-20** has been especially designed, so that precise gas analysis can be carried out in any place and at any time.

The entire gas conditioning system is housed in a compact and robust metal framed protective case which ensures that the components can be removed easily, and gas analysis carried out quickly, safely and with a minimum amount of maintenance.

## 6 APPLICATION

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

The components of the **PSS-20** system are intended for "standard use." We also provide a wide range of additional equipment and other components if special measurements are required.



- ① Gas sample probe, stainless steel 316,  $\varnothing$  4/6 mm, length 0.5 m
- ② Gas sample line, PVC tubing,  $\varnothing$  4/6 mm, length 3 m [not heated]
- ③ Peltier gas cooler
- ④ Primary fine filter **FPF+**, filter element fineness 2  $\mu$ m, with LA3 humidity sensor
- ⑤ Secondary fine filter **FPF+**, filter element fineness 0.1  $\mu$ m
- ⑥ Sample gas diaphragm pump N5 KPE (PN: 02P3355)
- ⑦ Peristaltic pumps SR25.2 for continuous removal of condensate
- ⑧ Peristaltic pump **SR25.3** for acid dosing (optional)
- ⑨ Flow meters FM40 (15-150 NL/h & 25-250 NL/h)

Figure 1 PSS-20 gas flow diagram

## 7 TECHNICAL DATA

<b>Gas Conditioning Unit Series PSS®</b>	<b>PSS-20</b>
<b>Part No.</b>	<b>760-280200000</b>
Gas outlet dew point	Range of adjustment: +2 to +15 °C [35.6 to 59 °F], factory setting: +5 °C [41 °F]
Gas outlet dew point stability	At const. conditions: < ±0.1 °C [±0.18 °F]
Gas inlet temperature	*Max. 180 °C [356 °F] with stainless steel bulkhead union
Gas inlet water vapor saturation	*Max. +80 °C [176 °F]
Gas flow rate	*Max. 150 NL/h
Ambient temperature	+5 to +40 °C [41 to 104 °F]
Storage temperature	-25 °C to +65 °C [-4 to 149 °F]
Pressure	0.7 to 1.4 bar abs.
Total cooling capacity	*Max. 90 kJ/h
Number of gas inlets	1
Number of gas outlets	2 [bypass]
Medium connections	Tube connections DN 4/6 mm
Material of sample contacting parts	Stainless steel 316Ti, glass, PVDF, PTFE, Novoprene, FKM
Ready for operation	Approx. 5 min.
Mains power supply	230 V AC ±10 % 50/60 Hz
Power consumption	Max. 400 VA, with option temperature controller and heated sample line: 230 V max. 1380 VA
Liquid detection	Yes
Fuse protection	4 A, time-delay, 5 x 20 mm (with option temperature controller: 10 A, time-delay)
Electrical connection	2 m [≈ 6.6 ft] long universal power cord three-hole national standard plug
Housing	Impact-resistant case with handle
Case protection	IP20
Housing color	Black/white
Housing dimensions (H x W x D)	Approx. 245 x 341.5 x 411 mm [≈ 9.6" x 13.4" x 16.2"] without anti-collision angles
Weight	Approx. 12.5 kg [≈ 27.6 lbs]

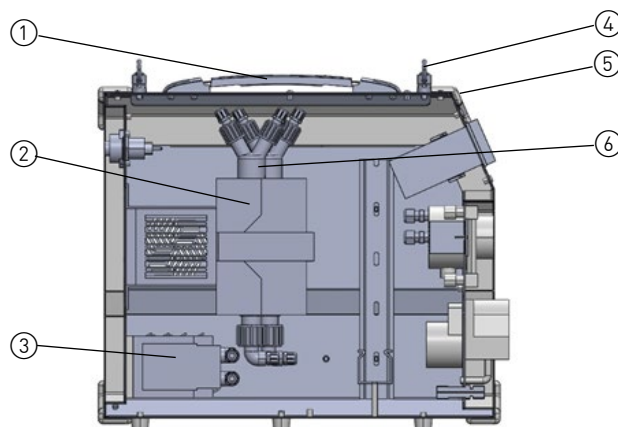
Options	Type	Part No.
Acid dosing package	Includes dosing peristaltic pump SR25.3, PVDF tees, PVDF through-plate connectors and installation and wiring services	760-280200001
702 Electronic temperature controller for max. (8 m [≈ 39.4 ft] (230 V) heated sample line 100 W/m	702 control range: 0 to 200 °C [32 to 392 °F], input PT100, power: 230 V AC 50/60 Hz, contact capacity: 250 V AC, max. 6 A, completely mounted and wiring services incl. 7-pin plug 10 A	760-280200002

\* Maximum values in technical data must be rated in consideration of total cooling capacity at 25 °C [77 °F] ambient temperature and 5 °C [41 °F] outlet dew point.

PTFE = Polytetrafluoroethylene (Teflon®), PVDF = Polyvinylidenfluoride, Teflon® is a registered trademark used by DuPont Performance Elastomers, USA.

Please note: NI/h and NI/min refer to the German standard DIN 1343 and are based on these standard conditions: 0 °C [32 °F], 1013 mbar.

## 8 DESIGN SPECIFICATION

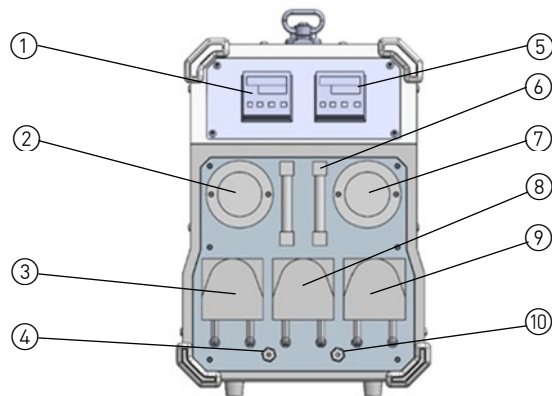


- ① Handle
- ② Peltier cooling unit
- ③ Diaphragm sample gas pump N5-KPE
- ④ Ring-pull
- ⑤ Top of the case
- ⑥ Heat exchanger

**Figure 2 Design of the conditioning unit PSS-20, internal components**

- All components of PSS-20 portable gas conditioning systems can be removed from the case. Open the top and left panel with an inner hexagon M4 screwdriver, according to the maximum gas flow rate discharged, install Peltier cooling unit Fig. 2/② and appropriate diaphragm pump Fig. 2/③ (Refer to the instruction manual of each component).
- The minimum amount of flow is determined by the sample gas pump Fig. 2/③. If the required minimum total flow rate is not reached, excessive overpressure can lead to premature destruction of the pump diaphragm.

The gas cooler is equipped with a Duran glass heat exchanger Fig. 2/⑥ as standard. Heat exchangers in PVDF or stainless steel are optionally available.

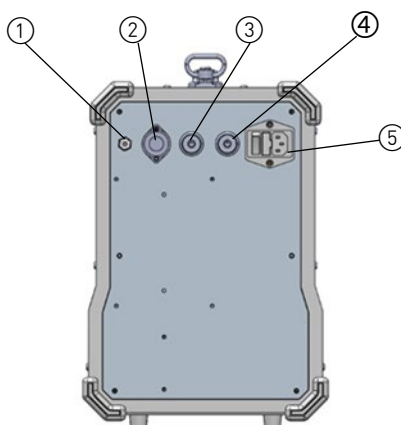


- ① Peltier temperature controller TC1
- ② Filter FPF+ with 2  $\mu\text{m}$  filter porosity (including: LA3 humidity sensor)
- ③ Peristaltic pump SR25.2 for condensate removal
- ④ Acid dosing Inlet (optional)
- ⑤ Gas sample line temperature controller TC2 (optional)
- ⑥ Flow meters 2 x FM40 with sample gas outlet (measuring range: 15 – 150 l/h & 25 – 250 l/h)
- ⑦ Filter FPF with 0.1  $\mu\text{m}$  filter porosity
- ⑧ Acid dosing peristaltic pump SR25.3 (optional)
- ⑨ Peristaltic pump SR25.2 for condensate removal
- ⑩ Condensate outlet

**Figure 3 Design of the conditioning unit PSS-20, front-view**

- In order to prevent the liquid from entering the downstream analytical instrument and improve the working safety of the entire system, the humidity sensor LA3 is installed in the FPF+ filter as standard component.

When the humidity sensor detects that the liquid enters the filter, the system will automatically turn off the sample gas pump. When the liquid is cleaned, the system will return to normal operation. Filter FPF+ Fig. 3/② and FPF Fig. 3/⑦ are installed in front of diaphragm pump Fig. 2/③ to ensure adequate particle separation.



- ① Sample gas Inlet
- ② Electrical connection for heated sample line
- ③ Sample gas pump switch
- ④ Acid dosing peristaltic pump switch (optional)
- ⑤ Main switch and cold appliance socket

**Figure 4 Design of the conditioning unit PSS-20, back-view**

- When the temperature of the Peltier cooler reaches the contact temperature (default + 8 °C) the diaphragm pump Fig. 2/③ can be started by pressing the pump switch Fig. 4/③.
- The condensate is continuously discharged through the SR25.2 peristaltic pump Fig. 3/⑥ (see instructions for separate assemblies), with the condensate outlet Fig. 3/④ under the front panel and connected through a DN4/6 mm condensate tube.
- In special measurement applications, press down the switch Fig. 4/④ of the peristaltic pump to start the acid dosing peristaltic pump SR25.3 Fig. 3/⑥. The acid dosing inlet Fig. 3/④ is at the lower part of the front panel and connected by a DN4/6 mm dosing tube.
- The gas conditioning and sampling system PSS-20 is equipped with two sample gas outlets as standard. By installing the flow meter FM40 Fig. 3/⑥, with needle valve, each sample gas outlet can be controlled according to the specified volume flow range. The flow meter is installed on the front panel, and the sample gas outlet is at the upper end of the flow meter. It can be selected from 15-150 Nl/h, 25-250 Nl/h.
- Through the up and down arrow keys on the TC1 panel of the Peltier temperature controller Fig 3/①, the temperature can be adjusted. The temperature range is +2 °C to +15 °C, and the factory setting is +5 °C.
- Gas sample line temperature controller TC2 Fig 3/⑤ can be adjusted up to 200 °C. The system default heating temperature is 180 °C.
- The size of the sample gas inlet Fig. 4/① connection is DN 4/6 mm. The connection is at the back-panel of the device. The maximum sampling temperature is 80 °C for PVDF and 180 °C for stainless steel.
- The electrical connection for the heated sample line Fig. 4/② is a standard 7-pin aviation plug.
- Main switch and cold appliance socket Fig. 4/⑤ use standard international 3-hole power cord. Voltage: 230 V AC; Fuse: 10 A

- PSS-20 portable gas conditioning systems is equipped with a pull ring Fig. 2/④ which can be equipped with a strap to facilitate the user's portable movement.
- When the heat exchanger tubing needs to be replaced, it is convenient to replace it by opening the top of the case Fig. 2/⑤. The grilles on the left and right-side panels ensure adequate ventilation and heat dissipation. The unused mounting holes are sealed with a blocking column.

#### Optional: Acid dosing package

Under ultra-low emission conditions, a portable flue gas analyzer is faced with a great challenge to monitor the flue gas with high humidity, low temperature, low SO<sub>2</sub> and low NO<sub>x</sub>. The main challenge is how to effectively remove water vapor in the flue gas without affecting the accurate analysis of a low SO<sub>2</sub> concentration.

For ultra-low emission monitoring, PSS-20 specially introduces portable acid-added condensation pretreatment, which can well solve the problem of SO<sub>2</sub> soluble in water and can completely meet the monitoring requirements of high humidity and low concentration SO<sub>2</sub> and NO<sub>x</sub> under ultra-low emission conditions.

It is recommended to add 5 % H<sub>3</sub>PO<sub>4</sub>.

When adding acid, first turn on the acid dosing peristaltic pump switch Fig. 4/ ④. The peristaltic pump will start conveying the acid. The acid will then enter the heat exchanger tubing together with the sample gas through the PSS-20 add dosing Inlet Fig. 3/ ④. The excess acid will be discharged through the SR25.2 peristaltic pump Fig. 3/ ③ with the condensate. When adding acid it is not needed to turn off the switch of the acid dosing peristaltic pump switch Fig. 4/ ④.



Warning

Aggressive condensate is possible.

Wear protective glasses and proper protective clothing!

## 9 RECEIPT OF GOODS AND STORAGE

The gas conditioning and sampling system **PSS-20** is completely pre-installed units.

- Immediately after arrival take the gas conditioning system and possible special accessories carefully out of the packaging material.
- 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 gas conditioning unit should be stored in a protected frost-free area!



## 10 INSTALLATION INSTRUCTIONS



Note

The gas conditioning device should be set up away from heat sources and freely ventilated so that no unwanted heat accumulation occurs.

The case should be placed on an even horizontal surface to ensure a secure and stable position.

The operating position is exclusively vertical. Only in this case is the proper condensate separation and discharge in the heat exchanger of the cooler guaranteed.

For outdoor installation, adequate protection against direct sunlight and moisture must be provided. In winter, the installation site must be frost-free; observe the protection class of the case.

To ensure the operational safety of the portable gas conditioning unit and the downstream analyzers and to avoid false alarms, the sample gas conditioning unit must not be used outside the specified temperature range.

Downstream analyzers must always be operated at temperatures well above the specified gas output dew point of +5 °C. The temperature range of the downstream analyzers must not be exceeded. This avoids any condensation of the gas in the connecting lines to the analyzers.

Unheated gas sample lines must be installed with a gradient down to the cooler. Condensate pre-separation is then not necessary.

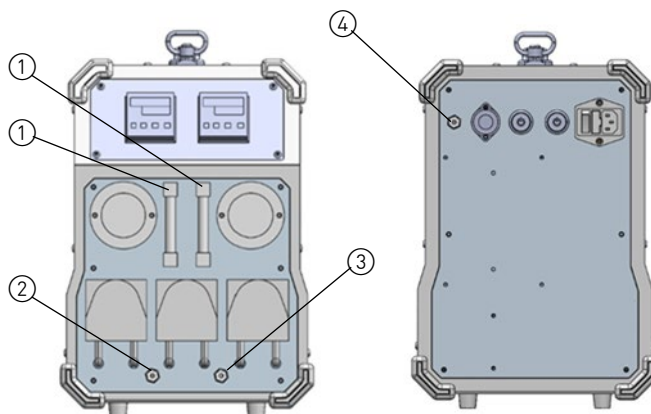
## 11 SUPPLY CONNECTIONS

### 11.1 TUBE CONNECTIONS



Note

Do not swap tube connections; connections are marked accordingly.  
After connecting all lines, the tightness must be checked.



- ① Sample gas outlets
- ② Sample gas Inlet
- ③ Acid dosing Inlet (Optional)
- ④ Condensate outlet

**Figure 5 Tube connections**

All tube connections are equipped with 4/6 mm sealing ring threaded hose couplings made of PVDF for gas input temperatures of up to a maximum of 80 °C [176 °F] (see chapter 0). If heated sample lines are used, whereby the gas input temperatures are increased up to a maximum of 180 °C [356 °F], additional bulkhead unions made of stainless steel are recommended.

Dimension 4/6 mm connecting tubes are used as standard.

The sample gas or condensation tubes, are to be assembled as follows:

1. 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 to ensure that the loose sealing ring in the nut is not lost.
2. Place the union nut over the connecting tube.
3. Place the sealing ring over the connecting tube with the thicker bead towards the nut.
4. Place the tube over the nipple on the thread.



Note

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

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

The tubes are to be removed in the reverse order.



Aggressive condensate is possible.



Wear protective glasses and proper protective clothing!



## 11.2 ELECTRICAL CONNECTIONS



Warning

False supply voltage can damage the equipment. When connecting the equipment, please ensure that 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 1000 V, 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 PSS-20 gas conditioning systems are available with either 230 V/50 Hz or with 115 V/60 Hz (for circuit diagram see appendix). A 4 A fuse is used on all models as fuse protection. The fuse is located on the clamp mounting rail (see Figure 2). When optionally using a temperature controller with heated gas sample line, the overload protection increases to 10 A.

The electrical connection is made via a cold appliance plug with 2 m cable on the left side of the case. The power socket is equipped with a two-pole main switch.

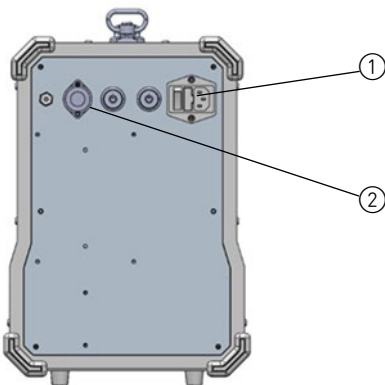


Figure 6 Electrical connection and main switch ①

### Option “ heated sample line”:

For the electrical supply of a heated sample line with PT-100 sensor and/or the connection of other heated components, e.g. heated sample gas probe or heated filter, a connection socket as shown in Figure 7 is available. The maximum connected load is 6 A, 1380 W for the 230 V sample gas conditioning or 6 A, 690 W for the 115 V version.

The maximum length of the usable heated sample line is calculated as follows:

$$L(\text{m}) = \frac{\text{Max. connected load [W]} - \text{Power consumption of heated components (e.g. sample probe) [W]}}{\text{Power consumption heated line per meter [W/m]}}$$

Be wired with the temperature controller according to the pin connection plan (see figure 7). This enables you to make a simple, easy servicing connection between the heated sample lines **3/4/5-N/M/H** or **PSP4M (-W)** by means of the multipolar coupler plug (standard equipment of the heated sample lines) with the temperature controller.

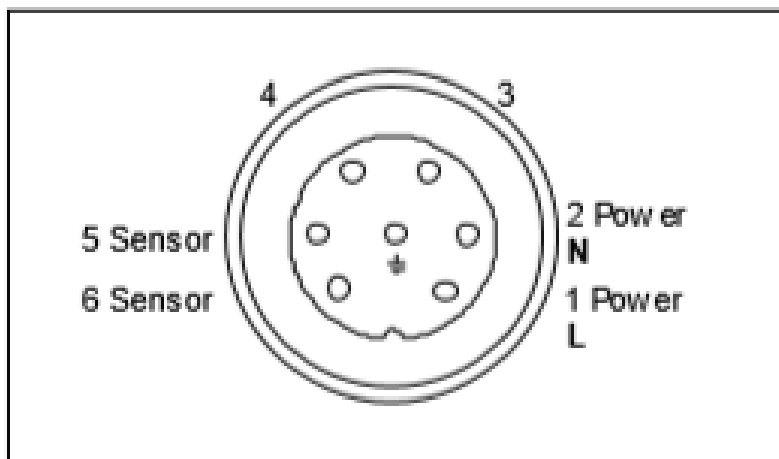


Figure 7 Circuit diagram of the 7-pin socket ②

## 12 COMMISSIONING

Before commissioning, the plant-specific and process-specific safety measures must be observed.



Note

**Before connecting the equipment to the supply voltage, the main switch must be in position “0”.**

The following steps must be carried out before initial commissioning:

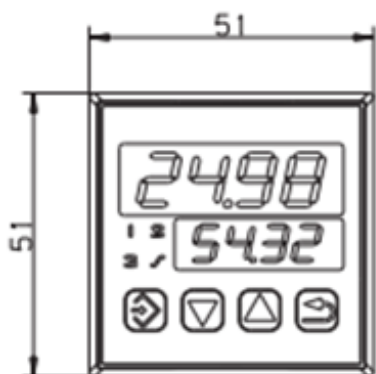
1. Plug the power plug of the supplied power cable into the power socket.
2. Connect the heated sample line (optional).



Warning

**When operating the sample gas conditioning system with a heated sample line, the temperature must be checked at the temperature controller.**

3. Connect the mains plug to the mains.
4. Switch the main switch to position 'I'.
5. Set the desired temperature on the temperature controller TC1,TC2 (optional).



**Figure 8 702 Temperature controller display**

The digital display of the Model 702 temperature controller shows the actual value of the temperature. Adjust the setting value by pressing the up and down arrow on the thermostat. After adjusting the desired setting value, press the input key on the far left to confirm, or wait 2-3 seconds for the thermostat to automatically enter and confirm.

The PSS-20 sample gas cooler is ready for operation after approx. 5 minutes. The overtemperature alarm contact of the cooler switches the sample gas pump automatically on when the cooler reaches the temperature of  $<+8^{\circ}\text{C}$  [ $46.4^{\circ}\text{F}$ ].



Note

The following minimum gas flow rates result from the requirement of the maximum pressure-side load of the sample gas pumps:

N 5 KPE approx. 100 l/h air.

If the required minimum total flow rate is not reached, excessive overpressure can lead to premature destruction of the pump diaphragm.

For long-term measurements with a high dust content in the sample gas, a suitable gas sample probe must be provided to protect the sample line from blockages.

## 13 CLOSING DOWN



Note

The installation site of the gas conditioning unit must remain frost-free even when the unit is switched off.

No special measures are to be taken in the event of short-term shutdowns of the gas conditioning system.

In the case of long-term shutdowns, for example after a completed series of measurements, it is recommended to purge the gas conditioning system with fresh air or inert gas. A flushing time of 3 to 5 minutes is sufficient under normal conditions. Condensate residues must also be removed from the system.



Warning

Aggressive condensate is possible.



Wear protective glasses and proper protective clothing!





## 14 MAINTENANCE

Before carrying out maintenance work, the plant-specific and process-specific safety measures must be observed!



**Dangerous voltage.**

**Before carrying out any work on the gas conditioning unit, move the main switch to position “0” and pull out the mains plug!**

The maintenance cycles depend on the process conditions and must therefore be determined for each specific application.

All parts to be serviced are easily accessible and installed in the sample gas conditioning case. These are (see Figure 3):

- The filter element of the preliminary filter **FPF+2 µm** Fig. 3/②.
- The filter element of the secondary filter **FPF-0.1 µm** Fig. 3/⑦.



**In order to protect downstream analyzers, the wet filter element must always be replaced after a condensate ingress.**

- Check the tubing of the **SR25.2** Fig. 3/⑨ condensate pump every six months and replace it if necessary (see operating instructions in the appendix);
- Check the diaphragm of the gas feed pump **N5 KPE** Fig. 3/⑧ every six months and replace if necessary.

## 15 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
The power light doesn't work	Device can not start	<ul style="list-style-type: none"> <li>➤ No voltage</li> <li>➤ Incorrect voltage</li> <li>➤ Fuse broken</li> </ul>	<ul style="list-style-type: none"> <li>➤ Check the power supply voltage against the model's name plate;</li> <li>➤ Check if the power plug is inserted correctly and that the main switch is in position "1".</li> <li>➤ Check the fuse in the power socket.</li> <li>➤ Replace the spare fuse;</li> </ul>
Temperature controller display error	Display 9999 or 1999	<ul style="list-style-type: none"> <li>➤ Bad contact of PT100 sensor signal wire;</li> <li>➤ PT100 sensor signal wiring error;</li> <li>➤ PT100 sensor is damaged;</li> </ul>	<ul style="list-style-type: none"> <li>➤ Open the top cover to check the thermostat PT100 sensor wiring.</li> <li>➤ Check if the wiring is correct.</li> <li>➤ Replace the PT100 sensor;</li> </ul>
Sample pump does not start	Peltier cooling unit worked normally, but there was no gas flow	<ul style="list-style-type: none"> <li>➤ Diaphragm pump failure;</li> <li>➤ Diaphragm pump contamination;</li> <li>➤ The gas sample probe/gas line is blocked or compressed;</li> <li>➤ The sample gas line connected to the analyzer is blocked or compressed;</li> <li>➤ The sample pump switch is not turned on;</li> <li>➤ Humidity sensor contact switch to close the sample pump;</li> </ul>	<ul style="list-style-type: none"> <li>➤ Remove the gas lines from the pump head and check it;</li> <li>➤ Clean the pump as needed.</li> <li>➤ Remove the gas tubing from the gas inlet;</li> <li>➤ Clean or change the gas way;</li> <li>➤ Take down the gas tubing on the analyzer side. If the sample gas is flowing, check the connection of the gas tubing.</li> <li>➤ Clean or change the gas way;</li> <li>➤ Open the sample gas pump switch.</li> <li>➤ Check the peristaltic pump discharge.</li> <li>➤ Check the condensate discharged from the tube.</li> <li>➤ Check the filter, if the inside is wet, replace the filter element in time, and dry the filter chamber.</li> <li>➤ Check the cooler according to the instruction manual.</li> <li>➤ Adjust the desired flow rate with a needle valve.</li> </ul>
Small outlet flow	Peltier cooling unit and pump are operating normally, but the outflow rate is very low	<ul style="list-style-type: none"> <li>➤ Filter clogging</li> <li>➤ Pump failure</li> </ul>	<ul style="list-style-type: none"> <li>➤ Clean the filter and replace the filter element.</li> <li>➤ Check the pump.</li> </ul>



<b>Indication</b>	<b>Problem</b>	<b>Possible Cause</b>	<b>Check/Solution</b>
The system works normally	Peltier cooling unit and pump are operating normally. There is condensate in the gas tubing.	<ul style="list-style-type: none"><li>➤ Peristaltic pump failure</li><li>➤ LA humidity sensor failure</li></ul>	<ul style="list-style-type: none"><li>➤ Replace the pump tubing.</li><li>➤ Check the peristaltic pump.</li><li>➤ (See manual SR25.2 manual for manual peristaltic pump)</li><li>➤ Check the LA humidity sensor</li></ul>

## 16 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 PSS-20					
(C) consumable parts, (R) recommended spare parts, (S) spare parts					
		C/R/S	PSS-20 recommended quantity being in operation [years]		
			1	2	3
<b>Fine filter FPF</b>					
90F0009	Filter element F-0,1GF50, material: glass fiber	C	6	12	20
90F0097	Filter element F-2GF50, material: glass fiber	C	6	12	20
90F0118	Filter glass FPF F-45	S	-	-	1
90F0044	O-Ring, Viton, 35.00 x 4.00 FPF	R	1	1	1
90F0095	Filter element clamp FPF	S	-	-	1
90F0098	Front ring aluminium for FPF filter	S	-	-	1
<b>Fine filter FPF+, including LA3</b>					
04F2100	Front panel-mounting filter FPF+	S	-	-	1
03E1300	Liquid alarm sensor type LA3, for conductive media. For mounting in FPF+, material: 1.4571, PTFE, FKM	R	1	1	1
90F0002	Filter element type F-2T. Length: 75 mm, material: PTFE, porosity: 2 µm	C	6	12	20
90F0006	Filter element type F-2K. Length: 75 mm, material: ceramic, porosity: 2 µm	C	6	12	20
90F0044	O-Ring, Viton®, 35,00x4,00 FPF	R	1	1	1
90F0098	Front ring aluminium for FPF filter	S	-	-	1

Portable Sampling System Versions PSS-20					
(C) consumable parts, (R) recommended spare parts, (S) spare parts					
			PSS-20 recommended quantity being in operation [years]		
		C/R/S	1	2	3
<b>Peristaltic pumps SR25.2 &amp; SR25.3</b>					
90P1007	SR25 tube set, connection DN4/6	C	4	8	12
90P1010	SR25 contact spring set (4 pcs.)	R	-	-	1
90P1020	SR25 driver, complete	R	-	-	1
90P1045	SR25 contact pulley	R	-	-	1
90P1050	SR25 conveying belt	R	-	-	1
90P1025	SR25 S-bolt	R	-	-	1
90P1031	SR25.2 pump head without tube set	R	-	-	1
<b>Diaphragm pump N5 KPE</b>					
90P2110	Disc V3, for N3/N5 KPE/KP18, 1 piece, material: Viton® (2 pieces, required)	C	2	4	8
90P2120	Diaphragm type S3, for N3/N5 KPE/KP18, material: Viton®, PTFE coated	C	1	2	3
90P2111	Valve reed type V3 with O-ring type O3, for N3-N5, 1 pc, material: Viton® (2 pieces required)	C	2	4	8
90P2125	N3-N5 KPE, motor, 115/230 V	S	-	-	1
90P2122	N3, eccentric/rod/ball-bearing	S	-	-	1
90P2100	Square cap type D3, 1/8" female for N3/N5 KPE/KP18 Material: PVDF	S	-	-	1
90P2105	Intermediate plate type Z3, for N3/N5 PE/KP18 Material: PVDF	S	-	-	1
<b>Flow meter FM40</b>					
09F4005	Flow meter 15-150 l/h air	S	-	1	1
09F4010	Flow meter 25-250 l/h air	S	-	1	1
94F0035	FM40 upper part, complete	S	-	2	2
09A0018	Viton® O-ring 9 for flow meter glass FM40	R	2	4	6



Portable Sampling System Versions PSS-20					
(C) consumable parts, (R) recommended spare parts, (S) spare parts					
		C/R/S	PSS-20 recommended quantity being in operation [years]		
			1	2	3
Tube and tube fittings					
05V1045	G 1/8" to DN 4/6 mm connector, material: PVDF	R	1	2	3
05V4045	G 1/8" to DN 4/6 mm 90° male elbow connector, material: PVDF	R	1	1	1
05V5015	Tee-connector DN 4/6 mm, material: PVDF	R	1	1	1
05V3215	Bulkhead connector DN 4/6 mm, material: PVDF	R	1	1	1
09V7015	Bulkhead connector DN 4/6 mm, material: stainless steel	R	1	1	1
02B1000	PTFE tube DN 4/6, price per meter	R	1	1	1
10T1000	Hose cutter	S	-	-	1
05V6035	GL elbow adapter, GL 25 - DN4/6, material: PVDF	R	2	4	8
09F9520	Straight GL adapter, GL 25 - DN4/6	R	1	2	4
09F1010	Sealing ring GL 18 - 6 mm	R	2	4	8
09F0025	Sealing ring GL 25 - 12 mm	R	1	2	4
01F1005	Spare union nut GL 18	R	2	4	8
90F0020	Union nut GL 25	R	1	2	4

## 17 APPENDIX

- PCB wiring diagram
- Electrical schematic diagram (220 V AC)



More product documentation is available in our Internet catalogue:  
[www.mc-techgroup.com](http://www.mc-techgroup.com)

- Filters **FPF & FPF+**
- Instruction manual diaphragm pump **Series N**
- Instruction manual peristaltic pump **SR25.2 & SR25.3**
- Data sheet: Liquid alarm sensor **LA3**
- Data sheet: Flow meter **FM40**

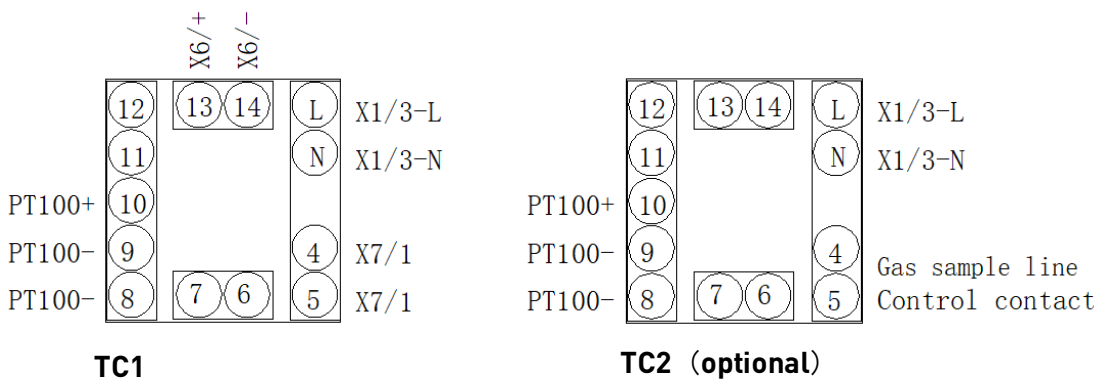
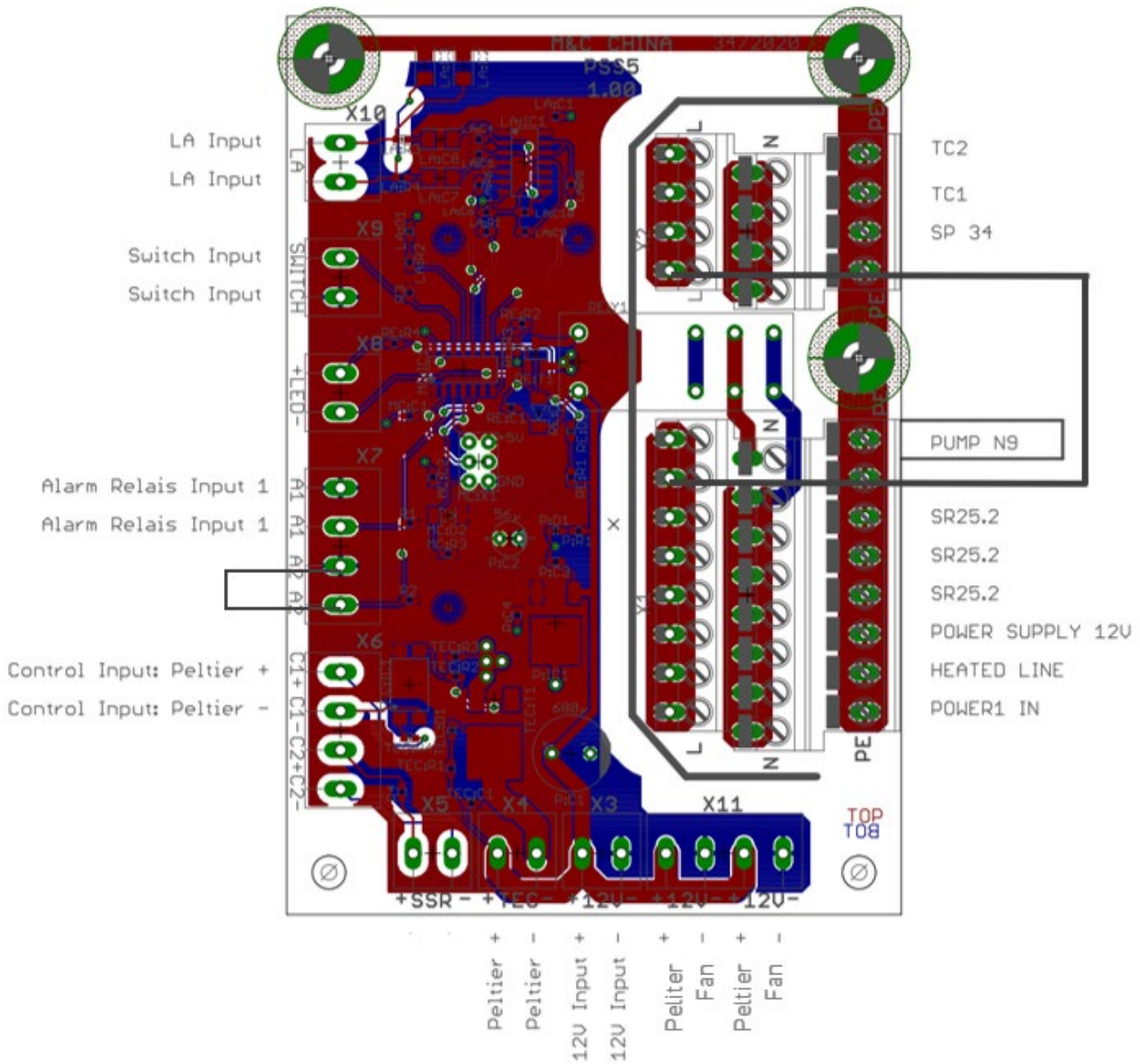


Figure 9 PSS-20 wiring diagram



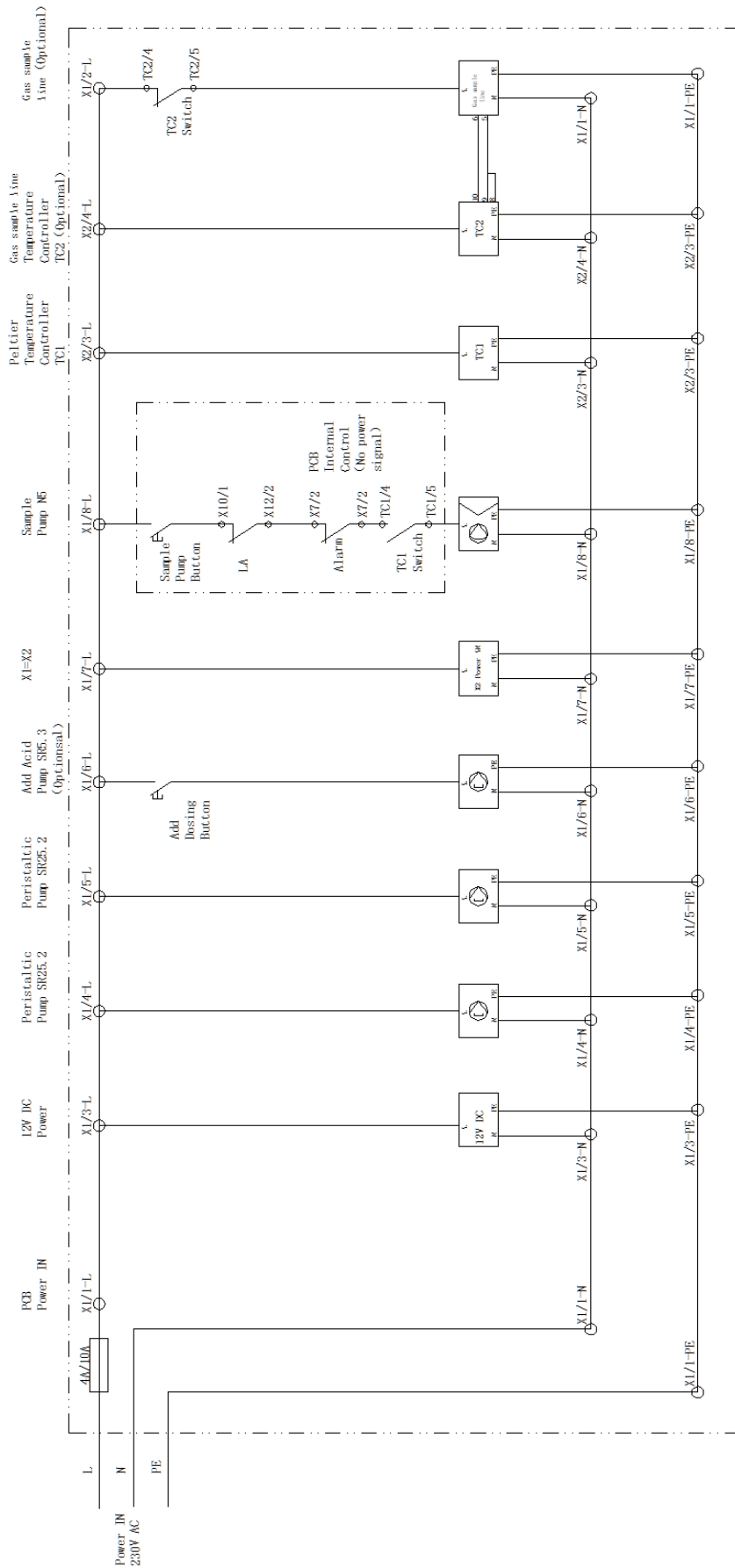


Figure 10 PSS-20 Electrical schematic diagram 230 V AC