

# 19" Sample Gas Conditioning System SCS



It is important to condition sample gases before feeding them into the analyzer. Components as chiller, gas pump, filter, condensate pump and flow meters are required. Further components e.g. the insert of calibration gases may be needed depending on the application.

All these components are compiled in the sample gas conditioning system SCS. The design concept emphasizes modularity to prevail easy and cost effective adaptation to different applications. The SCS may be controlled manually or externally. The system's status can be seen on the front panel and be read to external devices.

By adding a probe and an analyzer to the SCS a complete analyzing system can be built. Together with a PLC this analyzing system may be automated. All parts needing maintenance e.g. filter are easily accessible on the front.

In this data sheet you get a description of one variation of the SCS (the one you see on the larger photograph above). Other variations and options you can see in the attached SCS questionnaire.

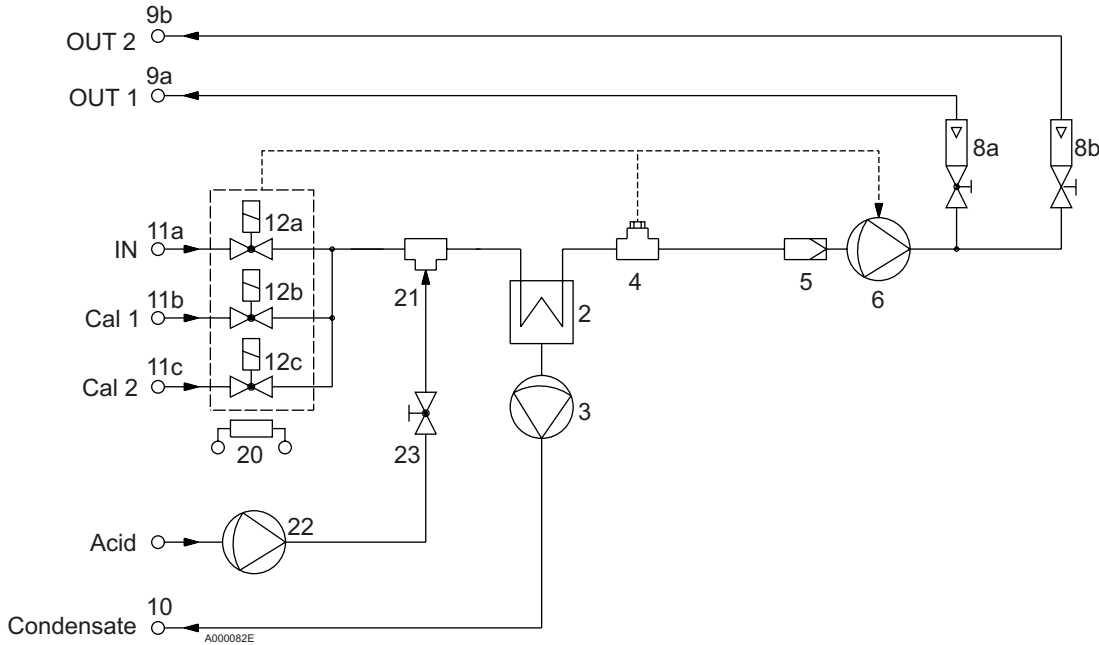
Don't hesitate to call our sales people for helping match the SCS to your application.

- **includes all necessary gas conditioning components**
- **modular design: very cost effective**
- **easily built in: completely mounted (plug and play)**
- **low maintenance cost due to smart design**
- **1 or 2 gas paths**
- **2 standard flow rates**
- **up to 5 calibration gases**
- **materials covered by gases available acid proof**
- **optional acidification**
- **manually or externally controlled**
- **self surveillance**
- **integrated calibration and blowback controller in development**
- **nearly every kind of terminals available**

## Description

Due to the modular design a lot of variations in flow and control are possible. Of course, not all can be described here. As an example the SCS 200 shown on the larger photograph on the first page will be described. Drawings of the views and dimensions are shown on the last page. Not all of the described modules are necessary with all applications (e.g. the acidification).

You may see the bunch of variations from the attached SCS questionnaire. Some impressions you may also get from the small photos.



The sample gas will be driven through the heated valve block (12) and the sample gas cooler PKE 19 (2) by the gas pump (6). The moisture condensates inside the cooler's heat exchanger. The condensate pump (3) takes it to the condensate outlet (10) on the backside. Upstream the cooler an acidification with phosphoric acid is done to reduce a wash out of sulfur dioxide with the moisture inside the heat exchanger (This is not a necessary extension in every system). The acid is added by a pump (22) regulated by a valve (23).

The temperature of the gas coolers cooling block is shown on a display on the front of the housing. In case of cooler overdrive and therefore leaving the acceptable temperature range of more than 3K (5F) around the preset outlet dew point an alarm is given. A LED in the display will flash and the gas pump will be immediately stopped to prevent damage of downstream devices.

A moisture detector (4) is added downstream the cooler raising an alarm even at small moisture contents. This will also shut down the gas pump (6) and be displayed.

The filter (5) on the front panel protects the downstream components and analyzer from being polluted by particles. The final parts in the stream are the flow meters (8) including needle valves (two in this application).

Two calibration gases may be switched to the input by the magnetic valves (12a,b). These are located on the heated valve block together with the input valve (12a). The temperature is surveilled by the SCS controller. Too low temperature will inhibit the pump.

Gas covered material used in this application are: stainless steel, viton, glass, novopren, and PVDF. The hosing is done in viton.

The manual control in this version is done by a simple rotary switch with the functions "external control", "measure", "calibration gas 1" and "calibration gas 2". The condensate pump can be switched off for easy change of the pump hose.

All the status and mode signals of the SCS are shown on the front panel and can be accessed on terminals on the back side. Another terminal is used to control the system mode from outside.

## Basic data of the 19" sample gas conditioning system SCS

| Possible cooler modules / no. of gas streams            | PKE 19 / 1 stream  | EGK 19 / 1 stream   | EGK 19 / 2 stream  |
|---|--|---|--|
| <b>Gas paths</b>  |  |   |  |
| Number of gas outs / calibration gases                  | depending on application   |   |  |
| Gas covered materials standard <sup>2)</sup>            | Viton, PTFE, stainless steel, Novopren, PVDF, PP <sup>2)</sup>   |   |  |
| Maximal pressure <sup>3)</sup>                          | depending on application and built in parts                      |   |  |
| Gas terminals (standard)                                | Hose fittings DN 4/6   |   |  |
| Standard flow rate free                                 | 300 l/h  | 550 l/h   | 2 x 300 l/h  |
| With -150mbar rel. at input and +120mbar rel. at output | 150 l/h  | 350 l/h   | 2 x 150 l/h  |
| Death volumina appr. (dep. on application)              | 85 cm <sup>3</sup><br>3 x 10 <sup>-3</sup> ft <sup>3</sup>       | 100 cm <sup>3</sup><br>3,5 x 10 <sup>-3</sup> ft <sup>3</sup> | Each 70 cm <sup>3</sup><br>Each 2,5 x 10 <sup>-3</sup> ft <sup>3</sup> |
| <b>Electrical data</b>                                  |  |   |  |
| Electrical control contacts                             | Driven by dry contacts or common ground                          |   |  |
| Electrical status and mode outputs max.                 | 230 VAC/150 VDC; 0,5 A; 50 VA, dry contacts                      |   |  |
| Power supply  | 115V / 60 Hz or 230 V / 50Hz                                     |   |  |
| Power consumption (dep. on application)                 | 200..350 VA  | 450..550 VA   | 500..600 VA  |
| <b>Gas cooler data</b>                                  |  |   |  |
| Cooling power at 25 °C (40°C) <sup>1)</sup>             | 70(30) kJ/h<br>66(28) btu/h                                      | 360(100) kJ/h<br>340(95) btu/h                                | 360(100) kJ/h<br>340(95) btu/h   |
| Max. flow rate <sup>1)</sup> (steel / glass)            | 300 l/h<br>10.5 ft <sup>3</sup> /h                               | 400 l/h<br>14.1 ft <sup>3</sup> /h                            | 2 x 200/125 l/h<br>2 x 7 / 4.4 ft <sup>3</sup> /h                      |
| Max. gas inlet temperature <sup>1)</sup>                | 180 °C / 355 °F  | 180 °C / 355 °F   | 180 °C / 355 °F  |
| Max. inlet dew point (1bar abs) <sup>1)</sup>           | 65 °C / 150 °F   | 80 °C / 175 °F  | 80 °C / 175 °F   |
| Ambient temperature <sup>1)</sup>                       | 50 °C / 120 °F   | 50 °C / 120 °F  | 50 °C / 120 °F   |
| Outlet dew point  | Standard 5°C ( 41°F);<br>factory presettable 3..15°C (37..60 °F) |   |  |
| Dew point stability static                              | 0,2K (0,4°F)   | 0,2K (0,4°F)  | 0,2 K (0,4°F)  |
| <b>General data</b>                                     |  |   |  |
| Dimensions  | See table next page  |   |  |
| Weight (depending on application)                       | 15..20 kg<br>33..44 lb   | 15-20 kg<br>33..44 lb   | 25-30 kg<br>55..66 lb  |
| Start up time max.                                      | 15 min   | 15 min  | 15 min   |

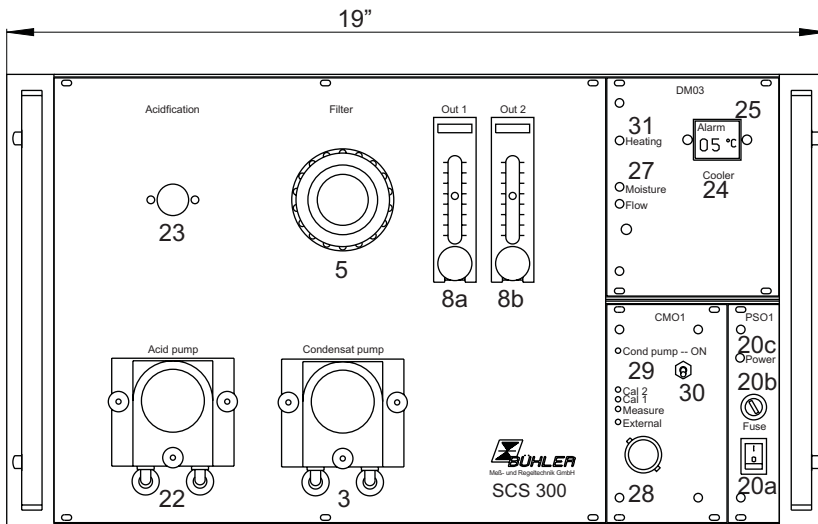
### Remarks:

1) The maximal values depend in a complicated manner on: the ambient temperature and therefore the available cooling power on the one hand; the used heat exchanger material and the gas parameters themselves. After you defined your application we will calculate the required cooler module.

If you want further information on this subject, look into the chapter "help" of our gas cooler calculation program.

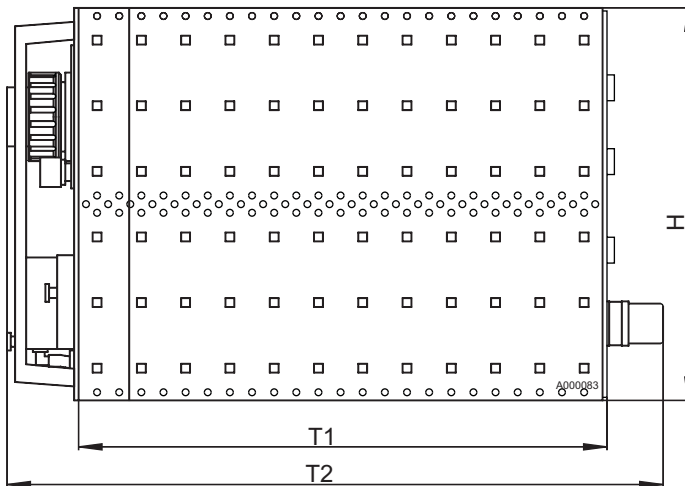
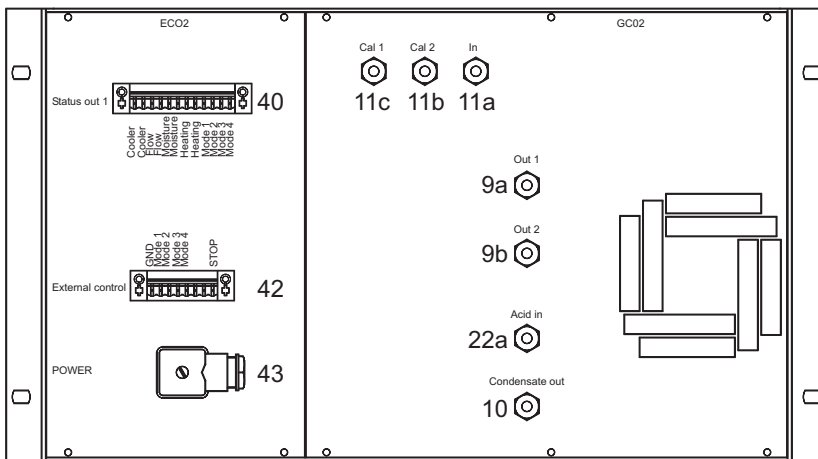
2) If required by your application the selection of materials may be reduced.

3) The pressure values depend on the selected components. Internal tubing for higher pressures may also be possible.



## Explanations

- 3 Condensate pump
- 5 Filter
- 8a,b Flow meters for output
- 9a,b Gas out terminals
- 10 Condensate out terminal
- 11a Sample gas inlet
- 11b,c Calibration gas inlets
- 20a Main power switch
- 20b,c Main fuse and LED
- 22,23 Acid pump and valve
- 22a Acid inlet terminal
- 24,25 Cooler display and alarm LED
- 27 Moisture alarm LED
- 28 Rotary switch for mode selection
- 29 LEDs showing system mode
- 30 Switch for condensate pump
- 31 LED valve block temperature
- 40 Status output terminals
- 42 External control inputs
- 43 Power terminal



## Dimensions

|          | with cooler type |                  |                  |
|----------|------------------|------------------|------------------|
|          | PKE 19           | EGK 19           | 2-stream         |
| H        | 6 HU             | 6 HU             | 9 HU             |
| T1       | 355 mm<br>14.98" | 475 mm<br>18.70" | 475 mm<br>18.70" |
| T2 appr. | 420 mm<br>16.5"  | 540 mm<br>21.3"  | 540 mm<br>21.3"  |

## Ordering hints

Please answer the attached questionnaire. Our sales people will help you if required. Based on your specification we select the matching modules and components.

In case of a SCS with 2 paths fill in one questionnaire for each path (unless identical). Please note that the possible extensions may be limited by the room given on the front panel.

Please use the second page for explanations and number them. Already existing specifications and drawings e.g. gas flow charts should be attached

## Spare parts recommended for maintenance

|  |                 |                       |
|--|-----------------|-----------------------|
| Filter elements: (according to built in filter): | FE-1 (5 pieces) | part no. 41 15 001    |
|  | FE-4            | part no. 41 15 104    |
| Hose for condensate pump                         |                 | part no. 91 24 030027 |
| Hose for acid pump                               |                 | part no.              |