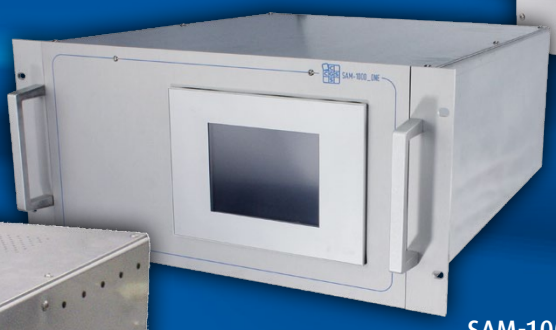
CGS
PROZESS-
ANALYTIK

Gas switching module SAM

- Compact design
- Low dead volume
- 19“ modular design
- High tightness
- Digitisation of total product measurement
- Selection of external analysers
  (not Profibus-capable; binary RS232, RS485)

Development and production of complex requirements in gas switching modules through single-source know-how from CGS.

SAM-3500_1/2“



SAM-1000_ONE

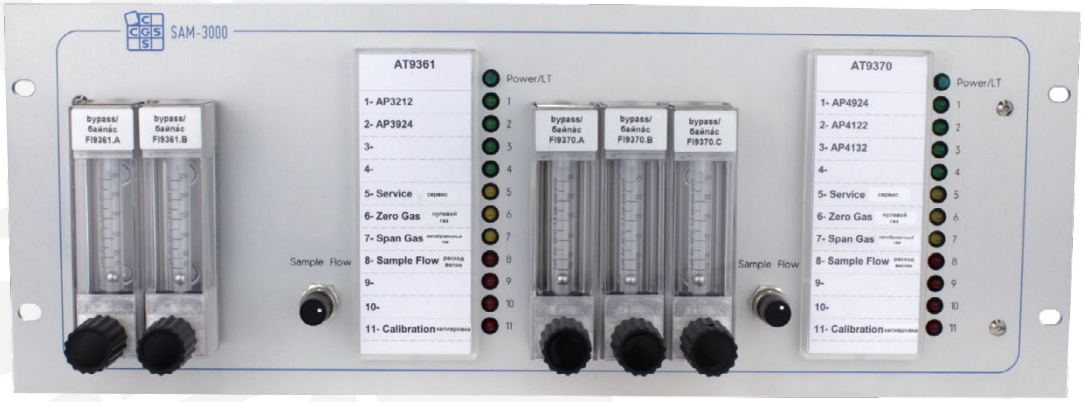
SAM-1000_DP

SAM-3000

Description

The cabinet switching module SAM-3000 is a 19“ rack unit with 4 RU. It can switch up to 4 measuring points and two test gases to the gas analyser. A measuring point could also be a manual analysis here. The connection is made here via a quick-release coupling element at the front plate. The module is designed for dry and clean gases where filtration via sintered metal frits is adequate. Different valve blocks are available so that flushing of the analyser or pre-flushing of a sample line is also possible. The low-dead volume valve blocks have a very compact design and are equipped with quick-acting 2/2-way (NC) and 3/2-way solenoid valves. For measurements in the trace area a flow capillary is used to obtain a flush-out. In addition to the standard valves, special versions are also available for application in oxygen and to measure humidity. Glass flow meters with maximal four ring initiators are used for flow rate measurement in the bypass and to the analyser. A broad range is available for pressure and flow settings: needle valves, mechanical flow controllers, pressure controllers, back pressure controllers and pressure transmitter.

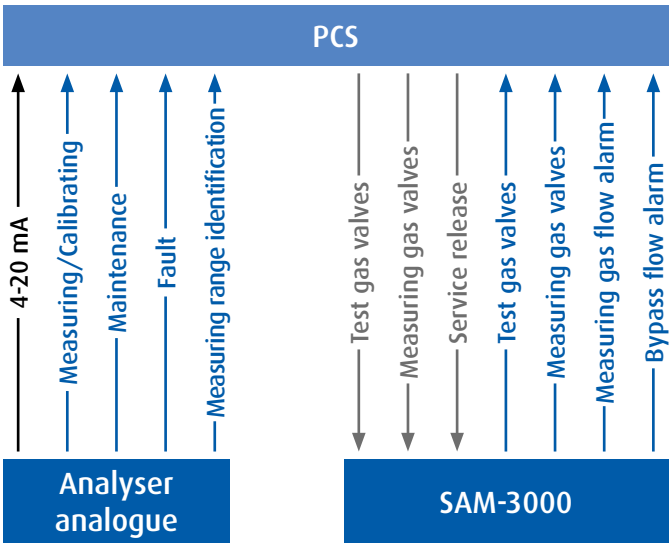
LEDs indicate the switching states of the measuring gas valves in green, the zero and test gas valve and the service status in green and the alarms, e.g., flow monitoring in red. As an alternative, the LEDs can also be designed as pushbuttons. This allows for a very quick change of measuring point without first requiring cumbersome operation via the user interface of the analyser. The valve is selected by pressing the respective pushbutton. Multiple activation is prevented since the pushbuttons and thus the valves are locked against each other. The connections of the individual measuring and calibration gases are made via flange adapters into which sintered metal filters are integrated. Thus, a very compact and modular cabinet switching module is available which can be quickly installed in a 19“ cabinet.



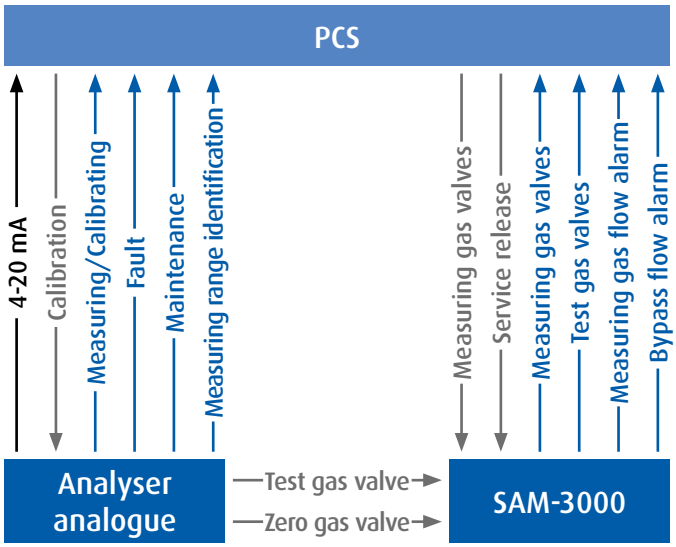
SAM-3000

SAM-3000 connection options

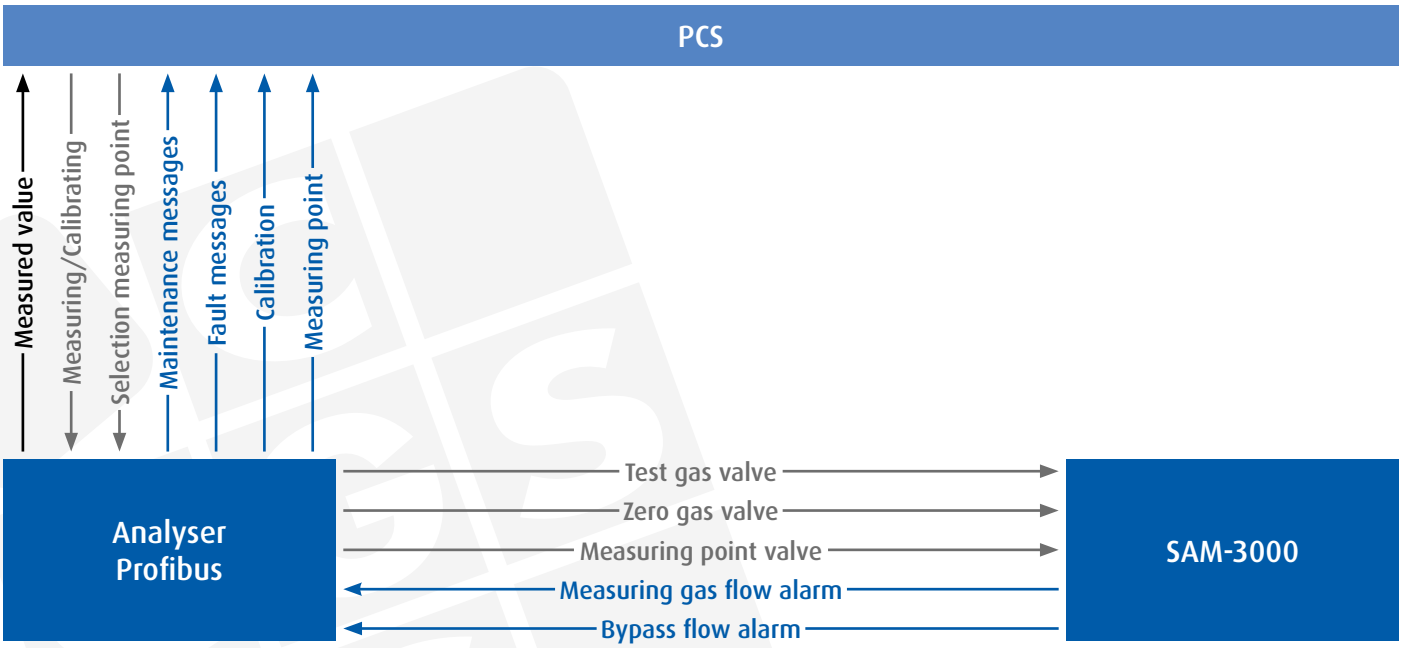
1. Analyser without control function



2. Analyser with Autocal function



3. Analyser with Profibus interface



Feedback
Controls
Measured value

SAM-3000

Technical Data of SAM-3000

Housing design	
Protection class	none
Weight	approx. 7 kg
Dimensions (W x H x D)	483 x 4HU x 270 mm
Electrical features	
Operating voltage	24 V DC / 0.4 A
Fuse protection	F 1.6 A
Operating front	
Version 1	
Pushbutton + light	1x green
Lights	4x green, 3x yellow, 4x red
Version 2	
Pushbutton + light	5x green, 2x yellow, 1x red
Lights	3x red, 1x yellow
Gas inlet requirements	
Measuring gas pressure	≤7.0 bar for NC valve and ≤3.5 bar for NO valve
Measuring gas temperature	0 to 60°C
Measuring gas humidity	< 90% relative humidity
Gas connections	
Measuring gas inlets incl. manual analysis	1...6
Measuring gas outlets	1
Connections	dual clamping ring 2 mm; 3 mm; 6 mm; 1/8"; ¼"
Manual analysis	quick-coupling plug RBE 03
Bypass	6 mm Push-In
Solenoid valves	
Number	6 (Optional)
Valve types	2/2-way solenoid valve NC 3/2-way solenoid valve
Special designs	Valve for application in oxygen Valve for application of humidity determination Valve for application in oxygen for humidity determination
Pressure control (optional)	
Pressure controller	0-3.0 bar
Back pressure controller	0-3.5 bar
Pressure transducer	0-0.6 bar; 0-1.0 bar

Flow control/monitoring (optional)	
Flow controllers	0...18l/h; 0...96l/h
Flow controllers	0.5...5l/h; 1.6...16l/h; 6...60l/h; 10...100l/h; 15...150l/h; 25...250l/h
Electrical inputs and outputs	
NAMUR ring initiators	
Version 1	4 inputs
Version 2	3 inputs
Interface	SUB-D 37-pin 11 digital inputs 10 digital outputs, potential-free
Interface	SUB-D 9-pin 1 analogue output 1 digital output, potential-free 1 24 Volt
Power supply	FRONT MSTB plug 3-pin
Climate requirements	
Permissible ambient temperature	0 to +50 °C in operation -10 to +60 °C during storage and transport
Permissible humidity	no dew point undercutting

NOTES

SAM-3500

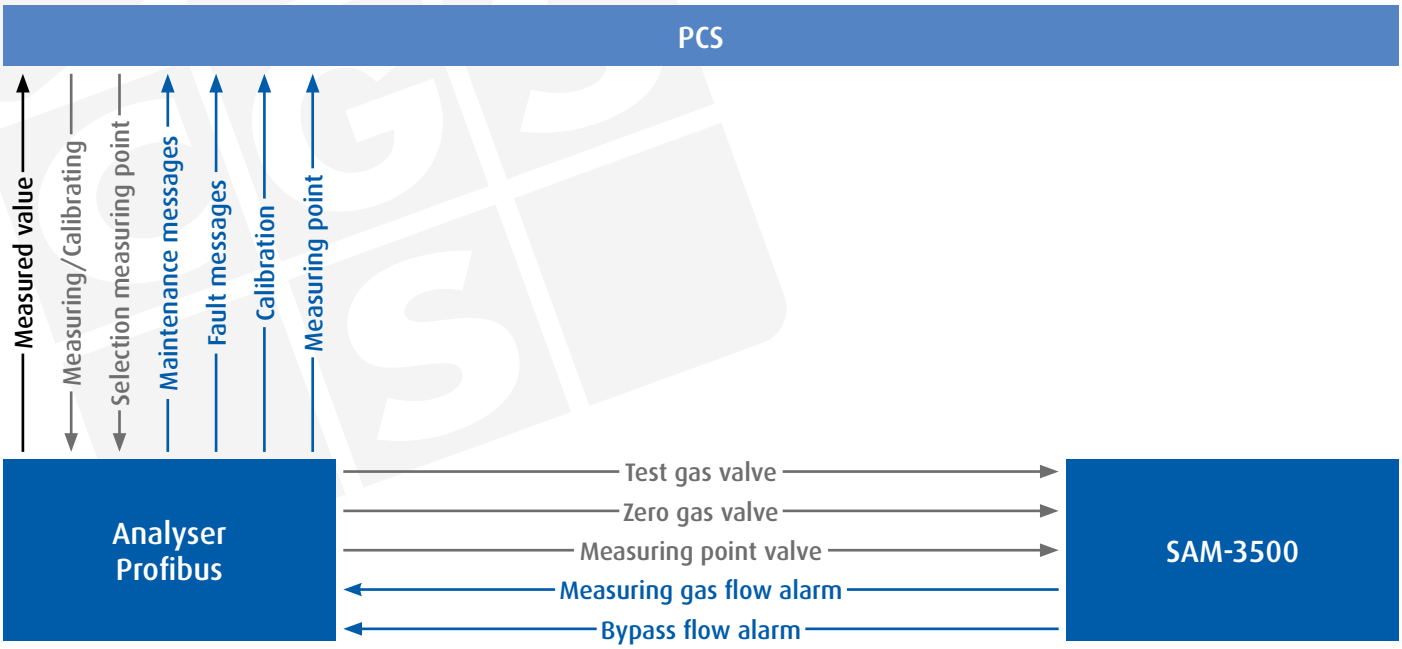
Description

The cabinet switching module SAM-3500 is a further development of the SAM-3000. It is a Profibus compatible module which can read measured values from non-Profibus analysers digitally or analogue and, in addition, is able to process signals from contact pressure gauges. With the analogue connection, the numeric mA value and the status messages *measuring range identification, service, calibration* and *fault* are transmitted to the control system. With serial coupling, it depends on the information the device manufacturer provides on the interface. In this case an integration module for the PCS can be programmed by our partner LEITEK Information- und Automatisierungstechnik GmbH.

Operation of the SAM-3500 is nearly identical with the SAM-3000 in terms of pushbutton version with the exception of the selection of the measuring and calibration gas valves. The valve must be deactivated via the reset pushbutton and the valves are activated again by pressing the respective pushbutton. Multiple activation is not possible since only one valve can be selected at a time.

SAM-3500 connection options

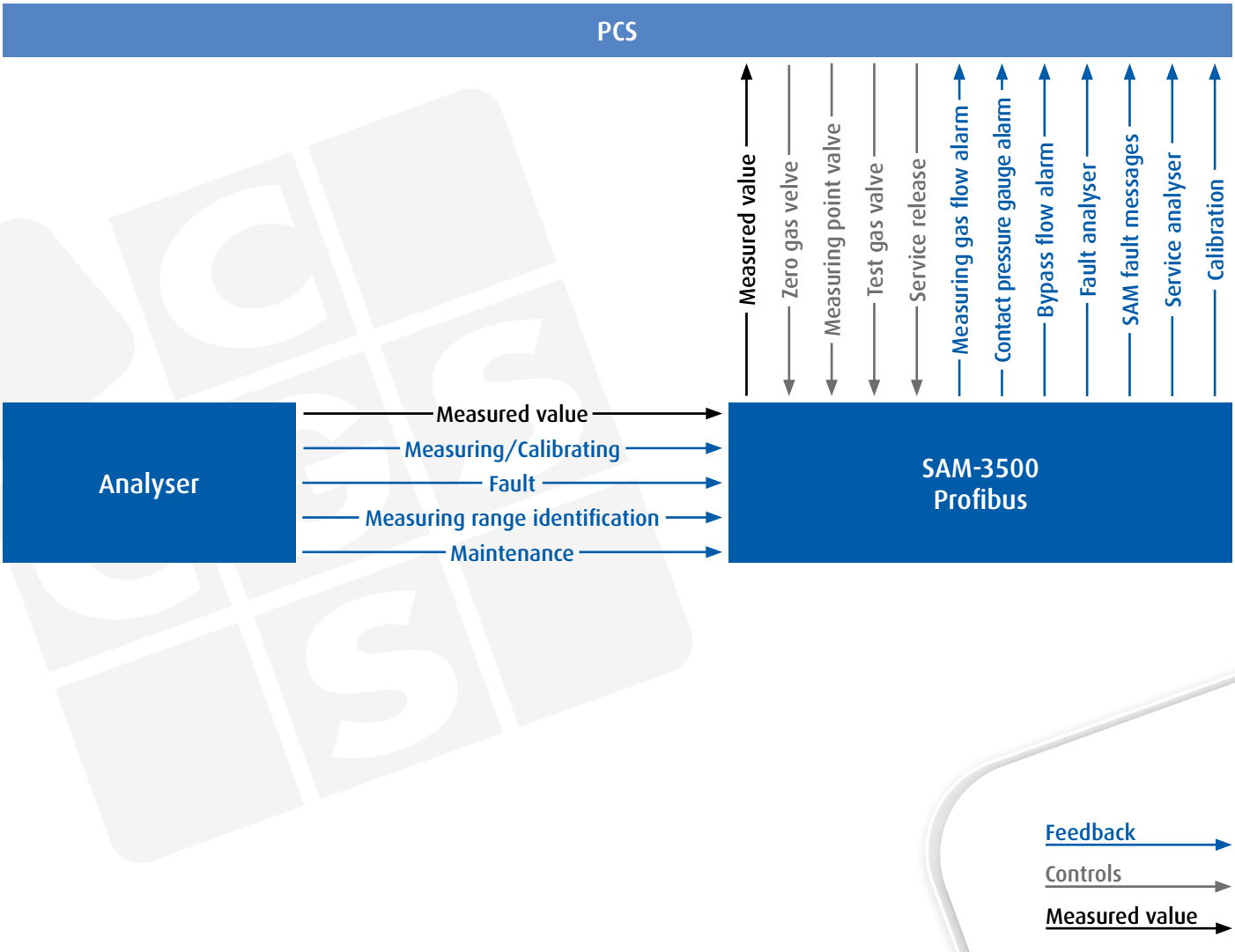
1. Analyser with Profibus interface



SAM-3500

2. Analyser and SAM with Profibus interface

3. Analyser without Profibus interface



SAM-3500

Technical Data of SAM-3500

Housing design	
Protection class	none
Weight	approx. 7 kg (single-SAM); approx. 14 kg (double-SAM); approx. 6 kg (½“ SAM)
Dimensions (W x H x D)	483 x 4HU x 270 mm
Electrical features	
Operating voltage	24 V DC / 0.4 A
Fuse protection	self-resetting fuse protection
Special functions	reverse polarity protection
Operating front	
Pushbutton + light	5x green, 3x yellow, 1x red
Lights	3x red
Gas inlet requirements	
Measuring gas pressure	≤7.0 bar for NC valve and ≤3.5 bar for NO valve
Measuring gas temperature	0 to 60°C
Measuring gas humidity	< 90% relative humidity
Gas connections	
Measuring gas inlets incl. manual analysis	1...6
Measuring gas outlets	1
Connections	dual clamping ring 2 mm; 3 mm; 6 mm; 1/8“; ¼“
Manual analysis	quick-coupling plug RBE 03
Bypass	6 mm Push-In
Solenoid valves	
Number	6 (Optional)
Valve types	2/2-way solenoid valve NC 3/2-way solenoid valve
Special designs	Valve for application in oxygen Valve for application of humidity determination Valve for application in oxygen for humidity determination
Druckregelung (optional)	
Pressure controller	0-3.0 bar
Back pressure controller	0-3.5 bar
Pressure transducer	0-0.6 bar

Flow control/monitoring (optional)	
Flow controllers	0...18l/h; 0...96l/h
Flow controllers	0.5...5 l/h; 1.6...16 l/h; 6...60 l/h; 10...100 l/h; 15...150 l/h; 25...250 l/h
Electrical inputs and outputs	
NAMUR ring initiators	3 inputs
Contact pressure gauge	3 inputs, potential-free
Analyser interface	SUB-D 25-pin 3 analogue inputs 10 digital inputs 7 digital outputs 1 digital output
Profibus DP	SUB-D 9-pin, female
Power supply	MINI COMBICON MC 3-pin
Climate requirements	
Permissible ambient temperature	0 to +50 °C in operation -10 to +60 °C during storage and transport
Permissible humidity	no dew point undercutting

NOTES

SAM-1000_DP

Description

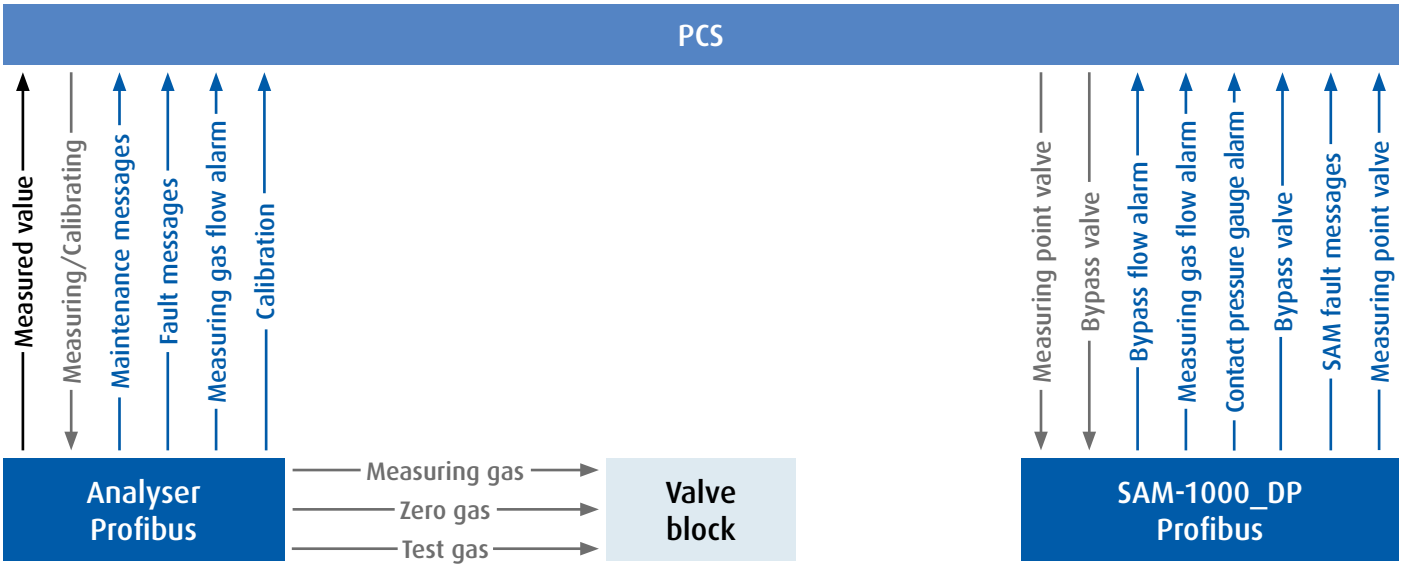
The cabinet switching module SAM-1000_DP is used for sample switchover for bottle filling plants and truck fuelling stations. The switching module can be individually equipped with up to 8 sample gas lines. Each inlet is equipped with a 50 µm sintered metal filter to protect downstream components from contamination or entry of foreign objects. Stream selection is performed via 24 VDC solenoid valves selected externally or by hand on the touch panel. Multiple activations of the streams is not possible since the valves are locked against each other in the control system. A permanent bypass has been installed for the continuous flushing of the analysis line which can be adjusted via flowmeter and needle valve. Additional quick-flushing valves are provided to reduce the response time. The bypass valves can also be switched via the touch panel, however, they are not locked against each other and multiple activation is therefore possible. With these valves, the bypass current is briefly increased prior to measurement ensuring a short response time at minimum consumption of measuring gas. Pre-flushing, taking place parallel to a measurement in progress, is visualised via a flowmeter and analysed per inductive switching contact. The solenoid valve block from the company's own production is marked by its compact design as well as the rather low dead volume and guarantees reliable measurement of the analysis system. The measuring gas pressure is kept constant in the analysis line via a mechanical back pressure controller and is monitored by a pressure sensor. The actual value can be read on the touch panel. Accordingly, a fault message can be activated if a target value is undercut. If the downstream analysers are not equipped with internal flow monitoring, up to 4 flowmeters with inductive contact can be provided by the SAM-1000_DP. These signals are displayed visually on the touch panel and as feedback in the control system.

The SAM-1000_DP features an integrated control; it has a Profibus interface and can connect up to 3 external analysers via IO signals. 1 analogue input, 6 digital inputs and 5 digital outputs are available per connection/ analyser. 5 additional digital inputs can be connected via another port, such as REED contacts from the calibration gas pressure gauges. The mA values or status signal can be verified or selected via the touch panel.

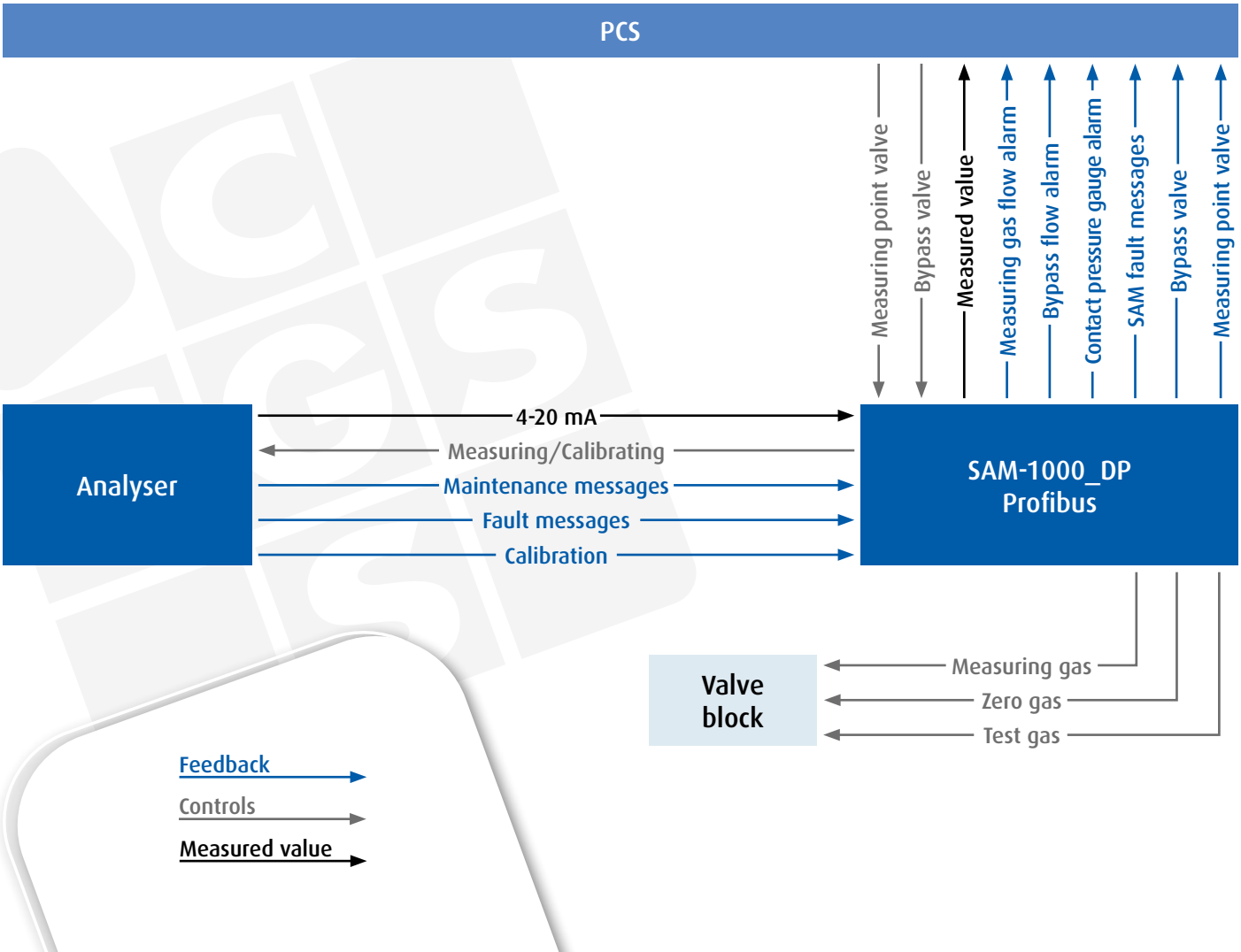
SAM-1000_DP

SAM-1000_DP connection options

1. Analyser with Profibus interface



2. Analyser without Profibus interface



SAM-1000_DP

Technical Data of SAM-1000_DP

Housing design	
Protection class	IP20
Weight	approx. 30 kg
Dimensions (W x H x D)	483 x 6HU x 510 mm
Electrical features	
Operating voltage	24 V DC / 2 A
Operating front	colour touch panel 4“
Gas inlet requirements	
Measuring gas pressure	≤7.0 bar for NC valve
Measuring gas temperature	0 to 60 °C
Measuring gas humidity	< 90% relative humidity
Gas connections	
Measuring gas inlets incl. manual analysis	1...8
Measurement gas outlets	1...7
Connections	dual clamping ring 2 mm; 3 mm; 6 mm; 1/8“; ¼“
Manual analysis	quick-coupling plug RBE 03
Bypass	12mm Push-In
Solenoid valves	
Number	2...16
Valve types	2/2-way solenoid valve NC
Special designs	Valve for application in oxygen Valve for application of humidity determination Valve for application in oxygen for humidity determination
Pressure control	
Back pressure controller	0-3.5 bar
Pressure transducer	measuring range 0.5-4.0 bar 4...20 mA
Flow monitoring (optional)	
Flow controllers	0.5...5l/h; 1.6...16l/h; 6...60l/h; 10...100l/h; 15...150l/h; 25...250l/h

Electrical inputs and outputs	
NAMUR ring initiators	4 inputs (one assigned internally for rapid flushing)
Analyser interfaces	4 x SUB-D 25-pin 3 analogue inputs 23 digital inputs (one assigned internally for MCB trip) 15 digital outputs
Pump selection	diode bush, 3-pin; 24 V / 0.5 A
Profibus DP	SUB-D 9-pin, female
Ethernet	RJ45
Power supply	Burndy plug 7-pin
Climate requirements	
Permissible ambient temperature	0 to +50 °C in operation -10 to +60 °C during storage and transport
Permissible humidity	no dew point undercutting

NOTES

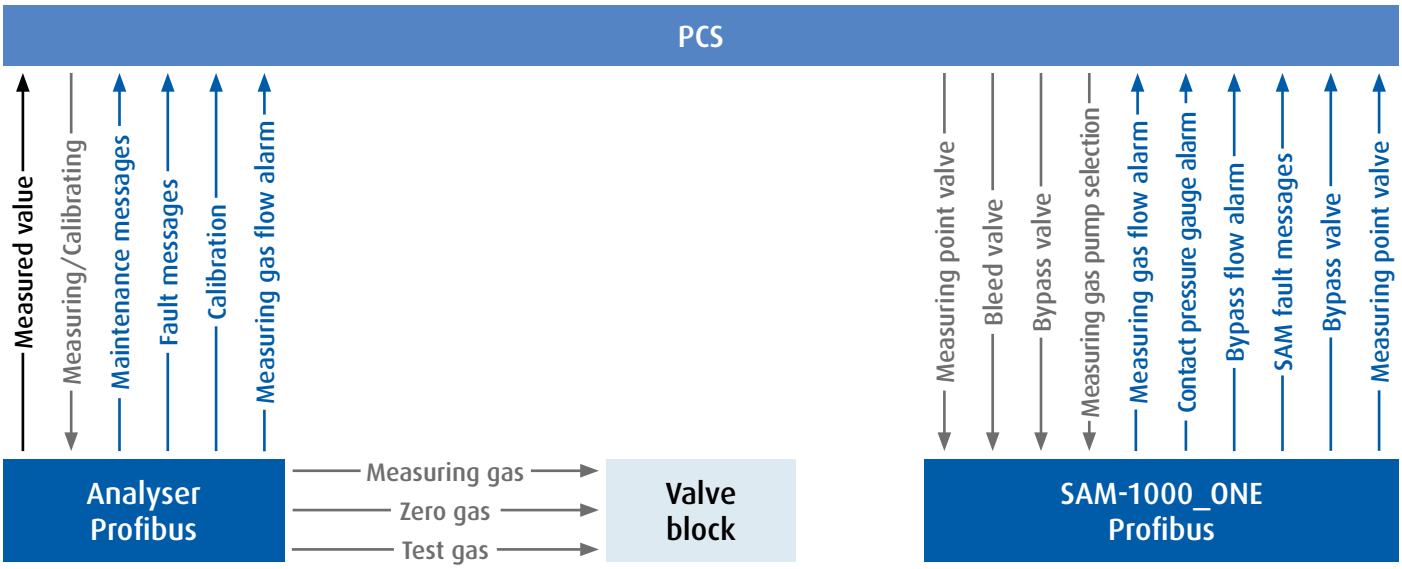
SAM-1000_ONE

Description

The cabinet switching module SAM-1000_ONE is used for sample switchover for bottle filling plants and truck fuelling stations. The switching module can be individually equipped with up to 8 sample gas lines. SAM-1000_ONE is a fully automated gas switchover module. The abbreviation ONE stands for **O**perate **N**avigate **E**lectronic. As the acronym already indicates, the module works fully electronically and can be completely operated and controlled via the touchscreen. Sample stream selection to the analysis system is made via the so-called block & bleed switch in the solenoid valve block. The sample gases are connected directly to the solenoid valve block at the rear of the gas switchover module. Each inlet is equipped with a 50 µm sintered metal filter to protect downstream components from contamination or entry of foreign objects. Stream selection is performed via two 24 VDC solenoid valves selected externally or individually by hand on the touch panel. Because of the large number of valves, they are not locked against each other. Multiple activation of the valves is therefore possible at any time. The two measuring gas valves are monitored by a third valve, the bleed valve. The bleed valve opens when the measuring point is deactivated. A high-resolution electronic flowmeter detects the gas flow occurring in the event of a malfunction or leak of the valves. The bleed valve is closed in measuring mode. A permanent bypass has been installed for the continuous flushing of the sample gas line which is analysed electronically via flowmeter and adjusted mechanically via needle valve. Additional quick-flushing valves are provided to reduce the response time. The bypass valves can also be switched via the touch panel. With these valves, the bypass current is briefly increased prior to measurement ensuring a short response time at minimum consumption of sample gas. Pre-flushing, which can be performed parallel to measurement in progress, is analysed with an electronic flowmeter and visualised on the touch panel. The solenoid valve block from the company's own production is marked by its compact design as well as the rather low dead volume and guarantees reliable measurement of the analysis system. The pressure in the analysis line is kept constant via an electronic back pressure controller. The actual value is displayed on the touch panel. Accordingly, a fault message can be activated if a target value is undercut.
The SAM-1000_ONE features an integrated control with a Profibus DP interface. 5 additional digital inputs can be connected via another port, such as REED contacts of the calibration gas pressure gauges. The status signals can be verified via the touch panel and the module can be accessed remotely via the Ethernet interface. If this remote access is accessible to CGS we can support you directly on site via this remote access.

SAM-1000_ONE

SAM-1000_ONE connection option



Technical Data of SAM-1000_ONE

Housing design	
Protection class	IP20
Weight	40 kg
Dimensions (W x H x D)	483 x 5HU x 485 mm
Electrical features	
Operating voltage	24 V DC / 2 A
Operating front	colour touch panel 5.7“
Gas inlet requirements	
Measuring gas pressure	≤7.0 bar for NC valve
Measuring gas temperature	0 to 60 °C
Measuring gas humidity	< 90% relative humidity
Gas connections	
Measurement gas inlets	1...8
Measuring gas outlet	1
Connections	double clamping ring ¼“
Bypass	½“ Push-In
Bypass BPR	1/4“ hose
Solenoid valves	
Number	10-40 (optional)
Valve types	2/2-way solenoid valve NC
Sonderausführungen	Valve for application in oxygen Valve for application of humidity determination Valve for application in oxygen for humidity determination

Flow monitoring (electr.)	
Continuous bypass	0-60 l/h (± 2.0%)
Rapid flushing	0-300 l/h (± 2,0%)
Bleed monitoring	0-50 l/h (± 0,2%)
Pressure control (electr.)	
Pre-pressure controller	0.5-4 bar
Electrical inputs and outputs	
Interfaces	1 x SUB-D 25-pin 1 digital input for fuse trip
Pump actuation	diode socket, 3-pin
Profibus DP	SUB-D 9-pin, female
Ethernet	RJ45
Power supply	Burndy plug 7-pin
Climate requirements	
Permissible ambient temperature	0 to +50 °C in operation -10 to +60 °C during storage and transport
Permissible humidity	no dew point undercutting

Feedback
Controls
Measured value

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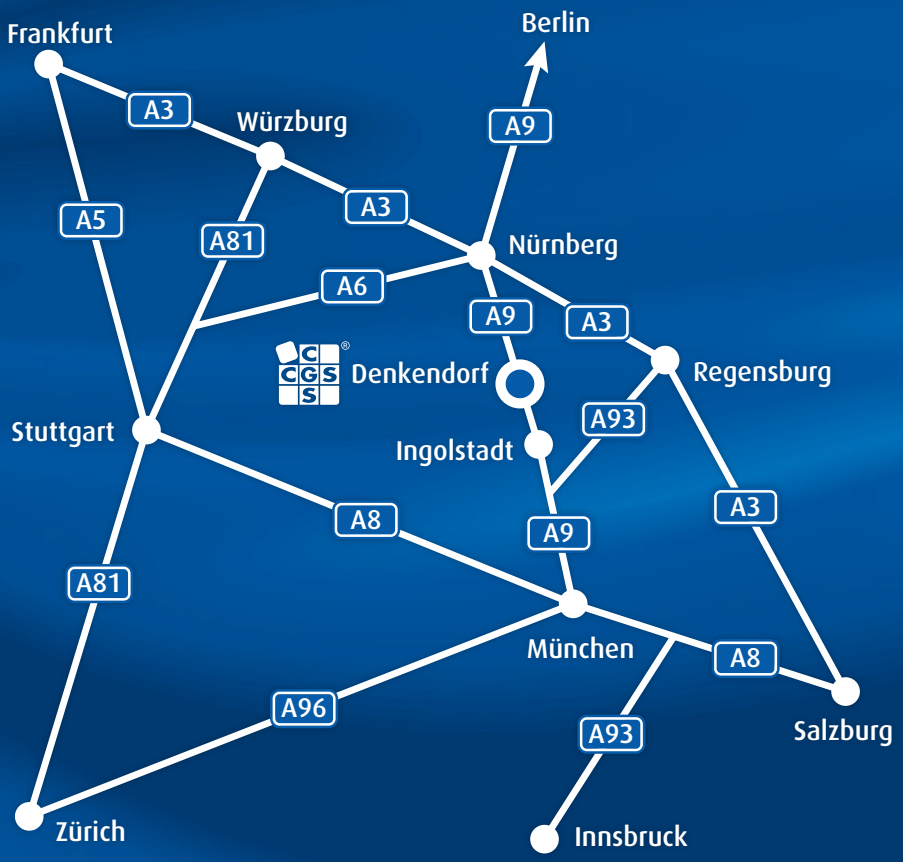

How to reach us:

- BAB A9 Nuremberg–Munich
- Exit at Denkendorf interchange (Exit 59)
- Turn right towards Beilngries
- At the roundabout (LIMES), take the third exit (Industrial area entrance 1)
- Take the first street on the left (Keltenstraße)

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