Peltier gas cooling unit

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Cooling unit for conditioning of measuring gas in gas analysis systems for protection of subsequent analysis device

APPLICATION

Safe process management depends on the prompt and precise determination of the respective operating parameters. Hence the gas analysis is an important precondition for the safe and efficient control of process flows, for protection of the environment as well as for quality assurance.

Many analysis techniques require the extraction of the measuring gas. However, this results in process-related impurity by particles or moisture and influences measuring results. Therefore the sampled measuring gas must be conditioned by a gas cooling unit before entry into the analysis device. This is, for example, applied at the monitoring of flue gas emissions in power plants.

YOUR BENEFITS AT A GLANCE

- compact design
- decreasing of water content in the measuring gas to a constant, lower dew-point → precipitation of water
- designed for the requirements in automated measuring systems (AMS) acc. to EN 15267-3
- pre-assembled → easy mounting
- short commissioning time
- display of current cooling block temperature
- nominal value of cooling block temperature and alarm limits adjustable
- low-noise operation
- low maintenance costs

PRECONDITIONS ON SITE

- ambient temperature: 5...50 °C
- gas inlet temperature max. 140 °C
- installation place indoors
- protection against wetness
- protection against percussions/vibrations

OPERATING UNIT

FUNCTION

The control of the cooling unit is made by a microprocessor. For operating the device possesses a graphic display with five operating keys. As a main display the current cooling block temperature is shown. Via the menu, amongst others, its nominal value as well as the alarm limits for over-/undershooting the nominal value can be adjusted. Messages are signalled via the status LEDs and the graphic display as well as they are output via the alarm output.

In the gas analysis system the alarm output can be used for example for controlling a measuring gas pump to enable a switch-on of the measuring gas not before reaching the admissible cooling range. The GCU 16 is equipped with two heat exchangers (optionally made of glass or PVDF) which are factory-set considered by the control.

TECHNICAL DATA

Housing:	stainless steel housing, IP20
Dimensions:	approx. 310 mm x 190 mm x 180 mm (w x h x d)
Weight:	approx. 7.5 kg
Display / Operating:	graphic display, 3 status LEDs, 5 operating keys; cooling block temperature as well as alarm limits adjustable via menu; temperature value output selectable in °C or °F
Cooling:	by Peltier effect; cooling power: 90 kJ/h at 25 °C ambient temperature
Ambient temperature:	operation: 5...50 °C; storage: -20 ... +60 °C
Dew-point stability:	0.1 K
Gas temperature:	inlet temperature: max. 140 °C ; outlet temperature: 2...20 °C (preset: 5 °C)
Flow rate:	max. 2 l/min (at 65 °C gas inlet temperature)
Differential pressure at 2 l/min:	19 mbar
Dead volume of heat exchanger:	glass: 19 ml (for each heat exchanger); PVDF: 18 ml (for each heat exchanger)
Pressure inside of heat exchanger:	glass: max. 3 bar; PVDF: max. 2 bar (max. permissible system operating pressure limited by possibly used peristaltic pumps and filters)
Connections of heat exchanger (metric):	glass: measuring gas inlet/outlet: GL14 (6 mm), condensate outlet: GL18 (8 mm); PVDF: measuring gas inlet/outlet: DN 4/6, condensate outlet: G1/4
Switching capacity of status contact:	potential-free output (alarm output), max. 250 V AC, 150 V DC, 2 A, 50 W
Power supply:	230 V AC / 50 Hz, max. 140 VA / 110 W
Electrical connections:	connector according to EN 175301-803 (power supply, alarm output)
Cable cross-section / tightening zone:	max. 1.5 mm² / 8...10 mm (adapted to rated current)
Mechanical load:	2...13.2 Hz, amplitude ± 1.0 mm, acceleration 13.2...100 Hz (tested according to DNVGL-CG-0339, table 6)
Optional:	• power supply 110 V AC, 60 Hz • material of heat exchanger: glass or PVDF

Special models are possible on request.

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