ECO FRIENDLY
NATURAL REFRIGERANT

ModbusRTU

Sample gas cooler RC 1.2+ Rack

Sample gas coolers are used in extractive gas analysis. The sample gas is taken from the process and may contain impurities such as particles or moisture that can damage the measuring cells or influence the measurement results. For this reason, the moist gas is cooled below the dew point in the sample gas cooler, causing the moisture to condense so it can be removed from the system.

The RC 1.2+ Rack features a new generation heat exchangers with a particularly low wash out effect of water-soluble components and are specifically suitable for measuring emissions. Most notably, the washout of SO_2 is low. These coolers can therefore be used for so-called automated measuring systems (AMS) per EN 15267-3.

The natural refrigerant R600a meets the requirements of EU Regulation (EU) 2024/573 and is a very environmentally friendly solution thanks to the reduction in CO_2 emissions. At the same time, it ensures the future-proof operation of your systems that comply with legal requirements in the long term.

- Optimised for gases with water-soluble substances (e.g. SO_2)
- Can be used for systems for continuous emission monitoring pursuant to EN 15267-3 due to low wash-out effects
- 19-inch housing as a slide-in unit for system cabinets or for wall mounting
- Corrosion-resistant heat exchanger made of DURAN glass or PVDF
- Efficient cooling with a nominal output of 320 kJ/h
- Ambient temperature from +5 °C to +50 °C
- Future-proof and climate-friendly: Use of natural refrigerants instead of HFC refrigerants
- Modular: Moisture detector, filter and condensate pump
- Option: Signal output 4 - 20 mA for function and temperature monitoring
- Option: Digital output (Modbus RTU) for device configuration and access to process and diagnostic data

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Overview

The RC 1.2+ Rack series was designed specifically for the requirements in automated measuring systems (AMS) according to EN 15267-3. The series connection of the heat exchangers will cool in two cycles to minimise wash-out effects.

The compressor coolers are distinguished by two types based on the cooling nests. This classification is reflected in the type designation. The exact item number of the model defined by you is determined by the model code in the ordering information category.

Application	Cooler model	Heat exchanger
Washout-optimised gas cooling	RC 1.2 Rack	2 heat exchangers in series

Additional components which every conditioning system should feature can optionally be integrated:

- Peristaltic pump for condensate separation,
- Filter,
- Moisture detector.

In addition, we offer a range of signal outputs:

- Status output,
- Analogue output, 4...20 mA, incl. status output,
- Modbus RTU digital output, incl. status output.

This allows for various configurations of the cooler and its options. Here the approach is to simplify the creation of a complete system in a cost-efficient way using pre-installed components with hoses connected. We also prioritised easy access to wear parts and consumables.

Gas cooler technical data

Gas Cooler Technical Data			
Rated cooling capacity (at 25 °C):	320 kJ/h		
Ambient temperature:	5 °C to 50 °C		
Ready for operation:	after max. 15 minutes		
Gas outlet dew point preset: adjustable:	 5 °C 3 °C to 20 °C		
Dew point fluctuations static: in the entire specification range:	 ± 0.1 K ± 1.5 K		
Temperature difference between heat exchangers:	< 0.5 K		
IP rating:	IP 20		
Installation:	19” rack mounting housing or wall mounting		
Housing:	Stainless steel		
Packaging dimensions:	approx. 550 x 420 x 340 mm		
Weight:	approx. 16 kg		
max. altitude:	Altitudes up to 2000 m		
Refrigerant:	R600a (26 g)		
Electrical connections:	Plug per DIN EN 175301-803 + 12-pin Plug connector		
Contamination level:	2		
Overvoltage category:	II		
Electrical data: *Available options may result in details that differ from these*		230 V	115 V
	Tolerance:	+/-10% at 50 Hz +/-10% at 60 Hz	- +/-10% at 60 Hz
	Typical power input:	322 VA	288 VA
	max. operating current:	1.4 A	2.5 A
	Starting current:	2.3 A	3.6 A
	Protection:	4 A (delayed action)	4 A (delayed action)
Status output switching capacity:	33 V AC/70 V DC 1A, potential-free		
Condensate outlet:	Hose nipple Ø5 mm or with screw connection (metric/US)		
Parts in contact with media Filter: Moisture detector: Heat exchanger: Peristaltic pump: Tubing:	 see "Technical Data - Options" see "Technical Data - Options" see table "Heat Exchanger Overview" see "Technical Data - Options" PTFE/FKM (Viton)		

Technical Data - Options

Analogue Output Technical Data

Signal:	4-20 mA or 2-10 V corresponds to -20 °C to +60 °C cooling block temperature
Connection:	M12x1 connector, DIN EN 61076-2-101

Technical Data, digital output

Signal:	Modbus RTU (RS-485)
Connection:	M12x1 connector, DIN EN 61076-2-101

Technical Data Cpsingle Condensate Pumps

Ambient temperature:	0 °C to 60 °C
Voltage tolerance:	± 5%
Flow rate:	0.3 L/h (50 Hz)/0.36 L/h (60 Hz) with standard hose
Inlet vacuum:	max. 0.8 bar
Inlet pressure:	max. 1 bar
Outlet pressure:	1 bar
Weight:	0.47 kg
Hose:	4 x 1.6 mm
Condensate outlet:	Hose nipple Ø5 mm Screw connection 4/6 (metric), 1/6”-1/4” (US)
IP rating:	IP 40
Materials	
Hose:	Tygon (Norprene)
Connections:	PVDF

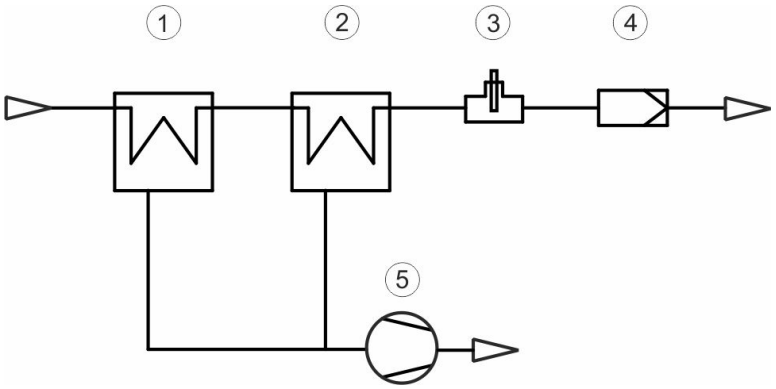
Technical Data FF-3-N Moisture Detector

Ambient temperature:	3 °C to 50 °C
max. operating pressure with FF-3-N:	2 bar
Weight:	0.04 kg (incl. cable)
Material:	PVDF, PTFE, epoxy resin, stainless steel 1.4571, 1.4576

Technical Data Filter AGF-FA-5

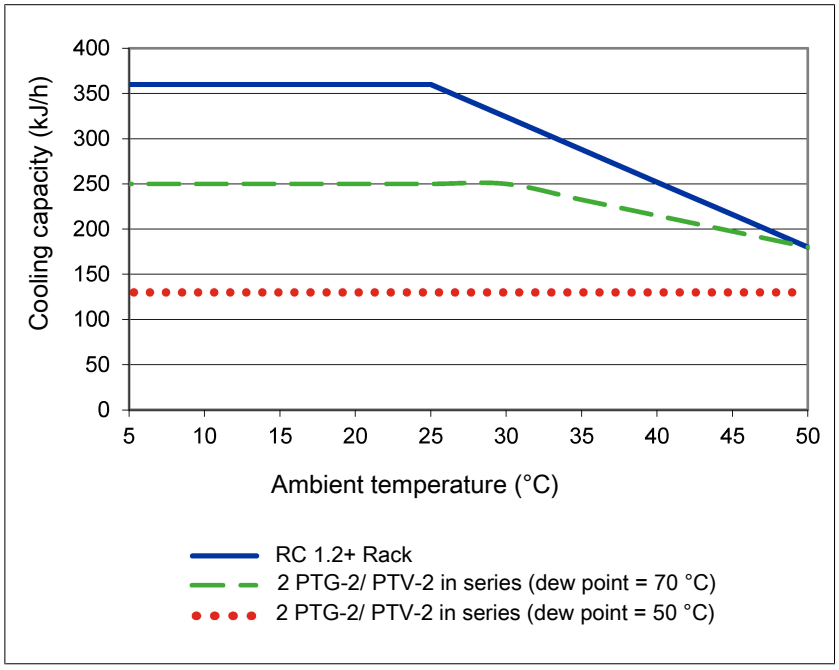
max. operating pressure with filter:	2 bar
Filter surface:	42 cm^2
Weight:	0.30 kg
Filter fineness:	2 µm
Dead volume:	28.5 ml
Materials	
Filter:	PTFE, PVDF, DURAN glass (parts in contact with media)
Seal:	FKM (Viton)
Filter element:	PTFE sintered

Typical installation arrangement (2 gas paths)



1	Cooler/cooling nest 1	4	Filter (optional)
2	Cooler/cooling nest 2	5	Condensate Pump
3	Moisture detector (optional)		

Performance data



Remark: The limit curves for the heat exchanger apply to a dew point of 70 °C under standard conditions per DIN EN 15267-3:2008-03 and to a dew point of 50 °C under operating conditions.

Heat exchanger description

The energy content of the sample gas and the required cooling capacity of the gas cooler is determined by three parameters: gas temperature ϑ_G, dew point τ_e (moisture content) and volume flow v. The outlet dew point rises with increasing energy content of the gas. The following limits for the maximum flow are specified for a standard operating point of τ_e = 40 °C and ϑ_G = 70 °C. The maximum flow v_{max} in Nl/h of cooled air indicated, so after moisture has condensed. Values may differ for other dew points and gas inlet temperatures. However, the physical facts are so vast we decided to omit the illustration. Please contact our experts for clarification or refer to our calculation programme.

Heat exchanger overview

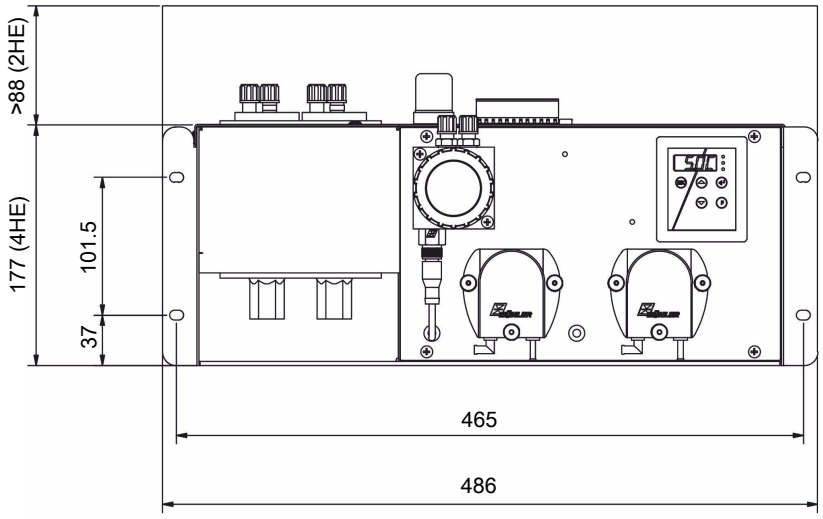
Heat exchanger	2 x PTG-2 2 x PTG-2-I [2]	2 x PTV-2 2 x PTV-2-I [2]
Materials in contact with media	DURAN Glas PTFE	PVDF
Weight	2 x 0.15 kg	2 x 0.15 kg
Flow rate v_{max} [1]	250 Nl/h	250 Nl/h
Inlet dew point $\tau_{e,max}$ [1]	70 °C	70 °C
Gas inlet temperature $\vartheta_{G,max}$ [1]	140 °C	140 °C
Max. Cooling capacity Q_{max}	230 kJ/h	215 kJ/h
Gas pressure p_{max}	3 bar	2 bar
Pressure drop Δp (v=150 L/h) total	20 mbar	20 mbar
Dead volume V_{dead} total	59 ml	115 ml
Gas connections (metric)	GL 14 (6 mm) [3]	DN 4/6
Gas connections (US)	GL 14 (1/4") [3]	1/4"-1/6"
Condensate out connection (metric)	GL 25 (12 mm) [3]	G3/8
Condensate out connection (US)	GL 25 (1/2") [3]	NPT 3/8"

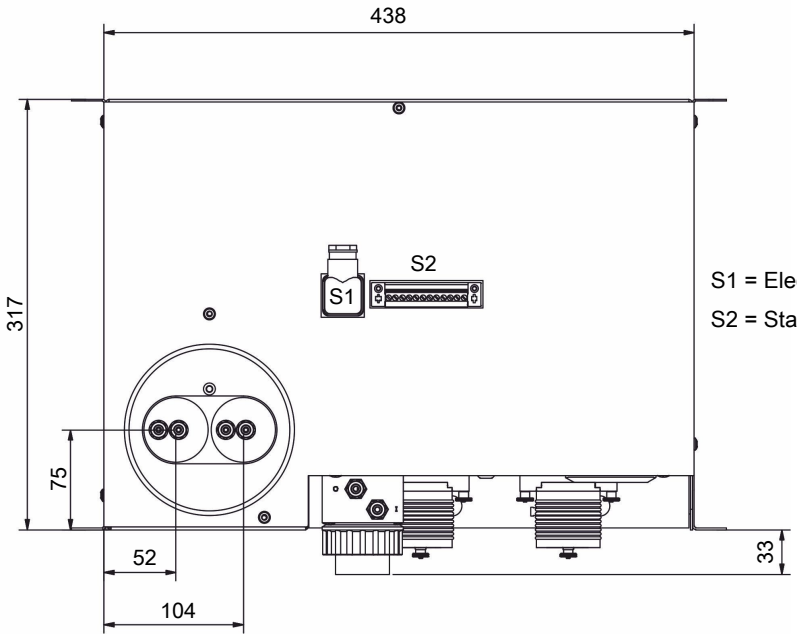
[1] Max. cooling capacity of the cooler must be considered.

[2] Models marked I have NPT threads or US tubes, respectively.

[3] Gasket inside diameter.

Dimensions





S1 = Electric supply

S2 = Status output, Analogue/digital output (optional)

Ordering instructions

Gas cooler with two heat exchangers in series

The item number is a code for the configuration of your unit. Please use the following model code:

4596	3	X	2	0	X	1	X	X	X	0	X	X	X	0	0	0	0	0	Product characteristic
																			Housing type
		4																	19” housing for wall mounting
		5																	19” rack mount housing
																			Power supply
					1														115 V AC, 60 Hz
					2														230 V AC, 50/60 Hz
																			Heat exchanger
						1	2	2											Duran glass, PTG-2, metric
						1	2	7											Duran glass, PTG-2-I, US
						1	3	2											PVDF, PTV-2, metric
						1	3	7											PVDF, PTV-2-I, US
																			Condensate drain
									0										without condensate drain
									2										2 CPsingle with hose nipple, angled
									4										2 CPsingle with hose nipple, straight
																			Filter and moisture detector
										0	0								without filter, without moisture detector
										5	0								1 filter, without moisture detector
										5	1								1 filter, 1 moisture detector
																			Signal outputs
												0							status output only
												1							Analogue output, 4..20 mA, incl. status output
												2							Modbus RTU digital output, incl. status output

Spare parts and accessories

Item no.	Description
41151050	Filter element FE-4; Unit 8 count
4101003	O-ring for filter AGF-FA-5, Unit 8 count, sintered PTFE
4410001	Automatic condensate drain 11 LD V 38
4410004	Automatic condensate drain AK 20, PVDF
4410005	Condensate trap GL 1; glass, 0.4 L
4410019	Condensate trap GL 2; glass, 1 L
see data sheet 410014	Fine mesh filter AGF-FA-5
see data sheet 450020	CPsingle, CPdouble peristaltic condensate pumps