

**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 is a compact 19-inch format compressor sample gas cooler, ideal for system cabinets. With the option of simultaneous cooling of two gas paths, the cooler offers a high degree of flexibility. Thanks to its modular design, the RC 1.2 Rack can be individually equipped with integrated humidity sensors, filters and condensate pumps to meet your specific requirements.

The natural refrigerant R600a meets the requirements of Regulation (EU) 2024/573 and is a very environmentally friendly solution thanks to the reduction in CO<sub>2</sub> emissions. At the same time, it ensures the future-proof operation of your systems that comply with legal requirements in the long term.

19-inch housing as a slide-in unit for system cabinets or for wall mounting

Simultaneous cooling of 2 gas paths possible

Efficient cooling with a nominal output of 341 Btu/h

Accurate setting of the gas outlet dew point in a range from 37 °F to 68 °F with a constant dew point stability of  $\pm 0.1$  K

Adjustable tolerance ranges (alarm thresholds) for the setpoint temperature of the measuring gas cooler

Ambient temperature from 41 °F to 122 °F

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



**Overview**

The compact system RC 1.2 Rack is a 19" rack with a sample gas cooler and condensate drain, particle filter and moisture detector for up to two gas paths.

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.

<b>Application</b>	<b>Cooler model</b>	<b>Heat exchanger</b>
Standard	RC 1.2 Rack	1 or 2 heat exchangers

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 77 °F):	341 Btu/h		
Ambient temperature:	41 °F to 122 °F		
Ready for operation:	after max. 15 minutes		
Gas outlet dew point preset:	41 °F		
adjustable:	37 °F to 68 °F		
Dew point fluctuations static:	± 0.1 K		
in the entire specification range:	± 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. 21.9 x 16.5 x 13.4 in		
Weight:	approx. 35 lb		
max. altitude:	Altitudes up to 3281 ft		
Refrigerant quantity [oz]:	R600a (0.92 oz)		
Electrical connection:	Plug per DIN EN 175301-803 + 12-pin Terminal block		
Contamination level:	2		
Overvoltage category:	II		
Electrical data: <i>Available options may result in details that differ from these</i>	Supply voltage:	230 V	115 V
	Tolerance:	+/-10%	+/-10%
	Frequency:	50 Hz / 60 Hz	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:	30 V AC/60 V DC 1A, potential-free		
Gas connections and condensate outlet:	For heat exchanger, see table "Heat exchanger overview" For condensate pump, see "Technical Data - Options"		
Parts in contact with media			
Filter:	see "Technical Data - Options"		
Moisture detector:	see "Technical Data - Options"		
Heat exchanger:	see table "Heat Exchanger Overview"		
Peristaltic pump:	see "Technical Data - Options"		
Tubing:	PTFE/FKM (Viton)		

## Technical Data - Options

### Analogue Output Technical Data

Signal:	4-20 mA or 2-10 V corresponds to -4 °F to 140 °F 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:	32 °F to 140 °F
Voltage tolerance:	± 5%
Flow rate:	0.3 L/h (50 Hz)/0.36 L/h (60 Hz) with standard hose
Inlet vacuum:	max. 11.6 psi
Inlet pressure:	max. 14.5 psi
Outlet pressure:	14.5 psi
Weight:	1 lb
Hose:	4 x 1.6 mm (0.06 in)
Condensate outlet:	Hose nipple Ø5 mm (0.24 in) Screw connection 4/6 (metric), 1/6"-1/4" (US)
IP rating:	IP 40
Materials	
Hose:	Tygon (Norprene)
Connections:	PVDF

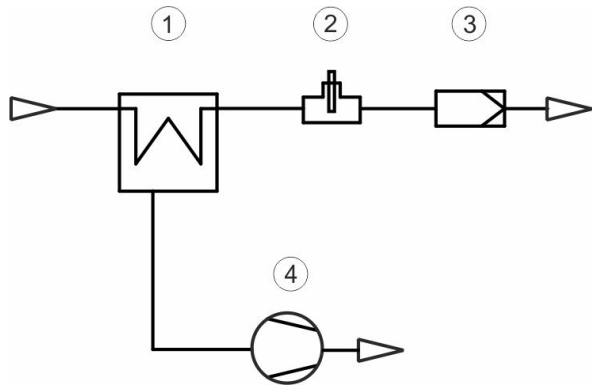
### Technical Data FF-3-N Moisture Detector

Ambient temperature:	37 °F to 122 °F
max. operating pressure with FF-3-N:	29 psi
Weight:	0.09 lb (incl. cable)
Material:	PVDF, PTFE, epoxy resin, stainless steel 1.4571, 1.4576

### Technical Data Filter AGF-FA-5

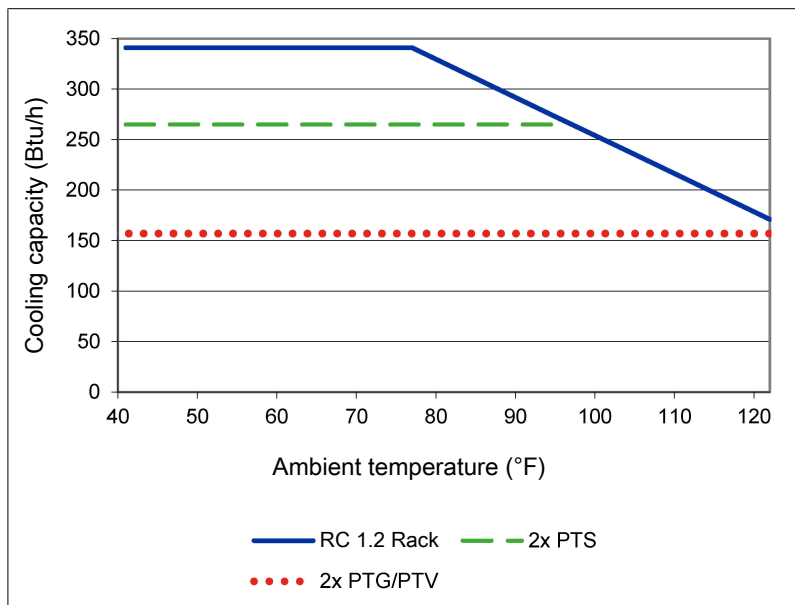
max. operating pressure with filter:	29 psi
Filter surface:	6.5 in <sup>2</sup>
Weight:	0.7 lb
Filter fineness:	2 µm
Dead volume:	1.74 cu. in.
Materials	
Filter:	PTFE, PVDF, DURAN glass (parts in contact with media)
Seal:	FKM (Viton)
Filter element:	PTFE sintered

Typical installation arrangement (1 gas path)



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

Performance data



Note: The limit curves for the heat exchangers exchanger apply to a dew point of 104 °F.

## 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  $\vartheta_G$ , dew point  $\tau_e$  (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  $T_e = 104\text{ °F}$  and  $\vartheta_c = 158\text{ °F}$ . The maximum flow  $v_{\max}$  in l/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 program.

## Heat exchanger overview

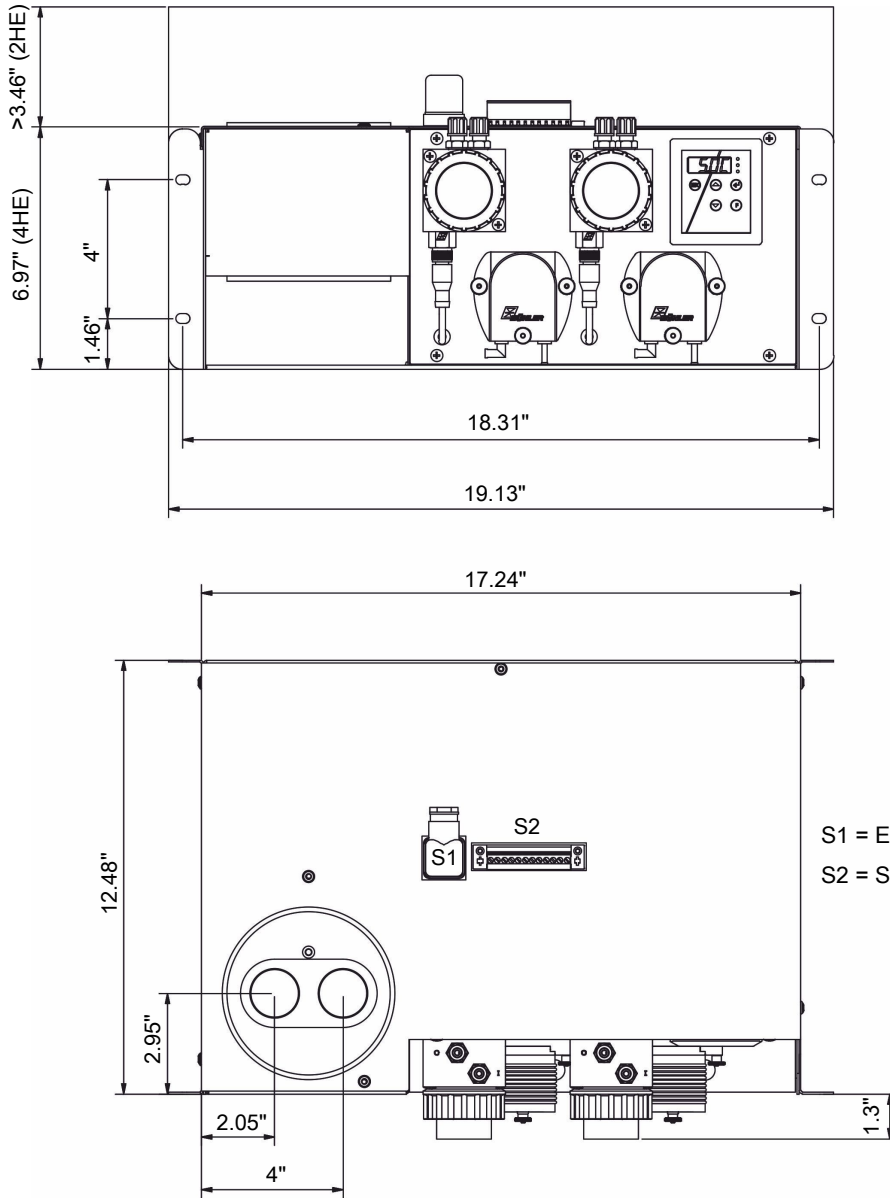
Heat exchanger	PTS PTS-I <sup>2)</sup>	PTG	PTV PTV-I <sup>2)</sup>
Materials in contact with media	Stainless steel	DURAN Glas PTFE	PVDF
Weight	1.1 lb	0.4 lb	0.3 lb
Flow rate $v_{\max}$ <sup>1)</sup>	8.3 lpm	4.7 lpm	4.7 lpm
Inlet dew point $\tau_{e,\max}$ <sup>1)</sup>	150 °F	150 °F	150 °F
Gas inlet temperature $\vartheta_{G,\max}$ <sup>1)</sup>	356 °F	284 °F	284 °F
Max. Cooling capacity $Q_{\max}$	142 Btu/h	85 Btu/h	85 Btu/h
Gas pressure $p_{\max}$	2320 psi	43 psi	43 psi
Pressure drop $\Delta p$ ( $v=2.5\text{ lpm}$ )	0.15 psi	0.15 psi	0.15 psi
Dead volume $V_{\text{dead}}$	1.8 cu. in.	1.8 cu. in.	3.5 cu. in.
Gas connections (metric)	6 mm	GL 14 (6 mm) <sup>3)</sup>	DN 4/6
Gas connections (US)	1/4"	GL 14 (1/4") <sup>3)</sup>	1/4"-1/6"
Condensate out connection (metric)	G3/8	GL 25 (12 mm) <sup>3)</sup>	G3/8
Condensate out connection (US)	NPT 3/8"	GL 25 (1/2") <sup>3)</sup>	NPT 3/8"

<sup>1)</sup> Max. cooling capacity of the cooler must be considered.

<sup>2)</sup> Models marked I have NPT threads or US tubes, respectively.

<sup>3)</sup> Gasket inside diameter.

Dimensions (inch)





## Spare parts and accessories

Item no.	Description
41151050	Filter element FE-4; Unit 8 count
4101003	O-ring for filter AGF-FA-5, sintered PTFE
9144050143	Modbus RTU connection cable 2 m (6.6 ft)
9144050144	Modbus RTU connection cable 5 m (16.4 ft)
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	Peristaltic condensate pumps CPsingle, CPdouble
see data sheet 400008	Tube and pipe fittings PVDF and PFA
see data sheet 400013	Tube and pipe fittings for glass connections
see data sheet 400014	Pipe fittings and plugs made of stainless steel