ECO FRIENDLY
NATURAL REFRIGERANT

ModbusRTU

Sample gas cooler RC 2.4 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 2.4 Rack is a compact 19-inch format compressor sample gas cooler, ideal for system cabinets. With the option of simultaneous cooling of four separate gas paths, the cooler offers a high degree of flexibility.

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_2 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
- Parallel cooling of up to 4 gas paths
- Application-specific selection of heat exchangers: Stainless steel, PVDF or DURAN glass
- High-power cooling with a nominal output of 815 Btu/h at 230 V and 682 Btu/h at 115 V
- Future-proof and climate-friendly: Use of natural refrigerants instead of HFC refrigerants
- Ambient temperature from 41 °F to 113 °F
- 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 2.4 Rack is a compressor sample gas cooler for up to 4 separate gas paths.

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
Standard	RC 2.4 Rack	1 to 4 heat exchangers

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

- Peristaltic pump for condensate separation.

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 further paid attention to easy access to wear parts and consumables.

Technical Data

Gas Cooler Technical Data			
Rated cooling capacity (at 77 °F):	815 Btu/h at 230 V 682 Btu/h at 115 V		
Ambient temperature:	41 °F to 113 °F		
Ready for operation:	after max. 15 minutes		
Gas outlet dew point preset: adjustable:	 41 °F 37 °F to 59 °F		
Dew point fluctuations static: in the entire specification range:	 ± 0.2 K ± 2 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. 21.7 x 16.5 x 13.4 in		
Weight:	approx. 57 lb		
max. altitude:	Altitudes up to 3281 ft		
Refrigerant, quantity [oz]:	R600a 115 V: 1.4 oz 230 V: 1.3 oz		
Electrical connection:	Plug per DIN EN 175301-803		
Contamination level:	2		
Overvoltage category:	II		
Electrical data: *Available options may result in details that differ from these*	Supply voltage:	230 V	115 V
	Tolerance:	+/-10%	+/-10%
	Frequency:	50 Hz	60 Hz
	Typical power input:	460 VA	414 VA
	max. operating current:	2 A	3.6 A
	Starting current:	3 A	4.5 A
	Protection (recommendation):	3.15 A (delayed action)	5 A (delayed action)
Status output switching capacity:	max. 250 V AC, 150 V DC 2 A, 50 VA, 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 Heat exchanger: Peristaltic pump: Tubing:	 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 -4 °F to 140 °F cooling block temperature
Connection:	M12x1 connector, DIN EN 61076-2-101

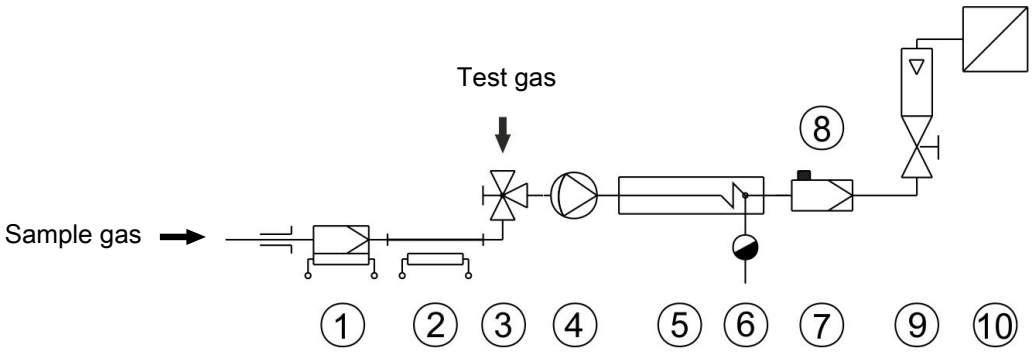
Technical Data, digital output

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

Technical Data CPsingle/CPdouble Condensate Pump

Ambient temperature:	0 °C to 55 °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:	CPsingle-SA: 0.7 kg CPdouble-SA: 0.74 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 44
Materials	
Hose:	Tygon (Norprene)
Connections:	PVDF

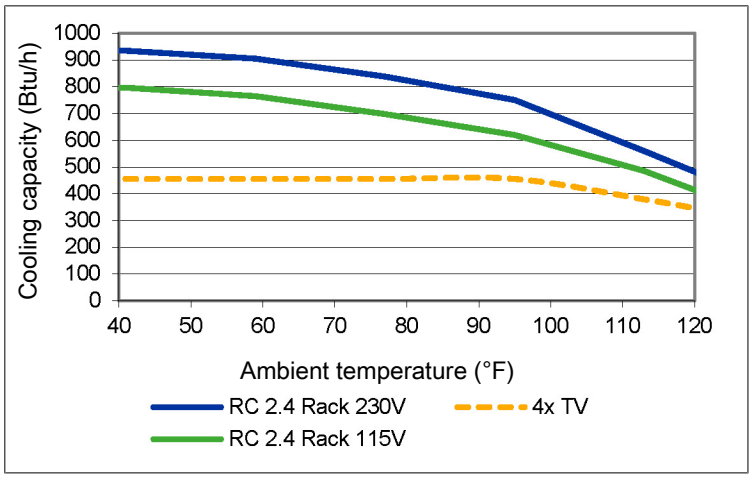
Diagram typical installation



1	Sample gas probe	2	Sample gas line
3	Reversing tap	4	Sample gas pump
5	Heat exchanger	6	Automatic condensate drain
7	Fine mesh filter	8	Moisture detector
9	Flow meter	10	Analyser

See data sheets for individual component models and data.

Performance Data



Note: The limit curves for the heat exchangers exchanger apply to a dew point of 149 °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 ϑ_G, (inlet) dew point τ_e (moisture content) and volume flow v. The outlet dew point rises with increasing energy content of the gas. The approved energy load from the gas is therefore determined by the tolerated rise in the dew point.

The following limits are specified for a normal standard operating point of τ_e = 149 °F and ϑ_G = 194 °F. The maximum volume flow v_{max} in Nl/h of cooled air is indicated, so after moisture has condensed.

If the values fall below τ_e and ϑ_G, the flow v_{max} may be increased. For example, on the TG heat exchanger the parameter triple τ_e = 149 °F, ϑ_G = 194 °F and v = 4.7 lpm may also be used in place of τ_e = 122 °F, ϑ_G = 176 °F and v = 6.3 lpm.

Please contact our experts for clarification or refer to our design program.

Heat exchanger overview

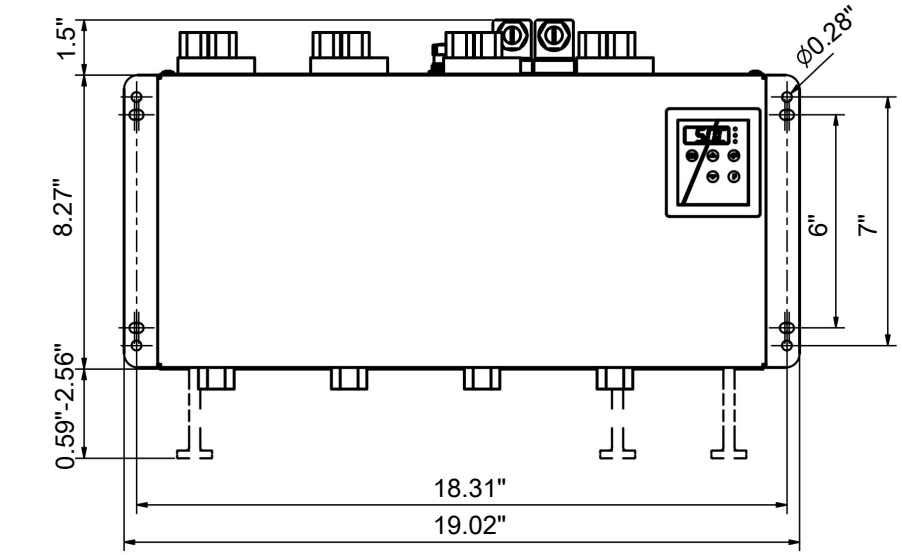
Heat exchanger	TS TS-I [2]	TG TG	TV TV-I [2]
Materials in contact with media	Stainless steel	DURAN Glas PTFE	PVDF
Weight	2 lb	0.9 lb	0.6 lb
Flow rate v_{max} [1]	8.9 lpm	4.7 lpm	2.6 lpm
Inlet dew point $\tau_{e,max}$ [1]	175 °F	175 °F	149 °F
Gas inlet temperature $\vartheta_{G,max}$ [1]	356 °F	284 °F	284 °F
Max. cooling capacity Q_{max}	427 Btu/h	218 Btu/h	114 Btu/h
Gas pressure p_{max}	2321 psi	44 psi	44 psi
Pressure drop Δp (v=2.5 lpm)	0.12 psi	0.12 psi	0.12 psi
Dead volume V_{tot}	4.2 cu. in.	2.9 cu. in.	7.9 cu. in.
Gas connections (metric)	G1/4	GL 14 (6 mm) [3]	DN 4/6
Gas connections (US)	NPT 1/4”	GL 14 (1/4") [3]	1/4"-1/6"
Condensate out connection (metric)	G3/8	GL 25 (12 mm) [3]	G3/8
Condensate out connection (US)	NPT 3/8”	GL 25 (1/2”) [3]	NPT 3/8”

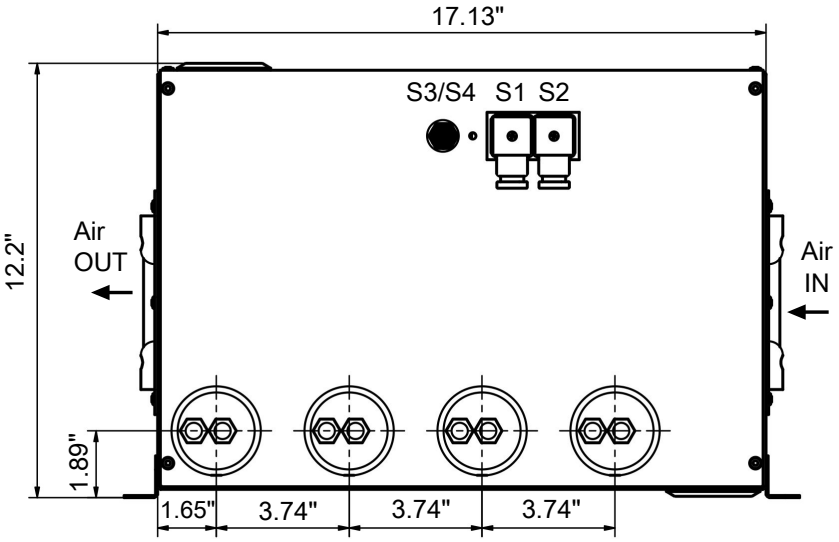
[1] Max. cooling capacity of the cooler must be considered.

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

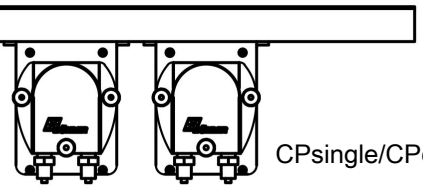
[3] Gasket inside diameter

Dimensions - 19“ rack

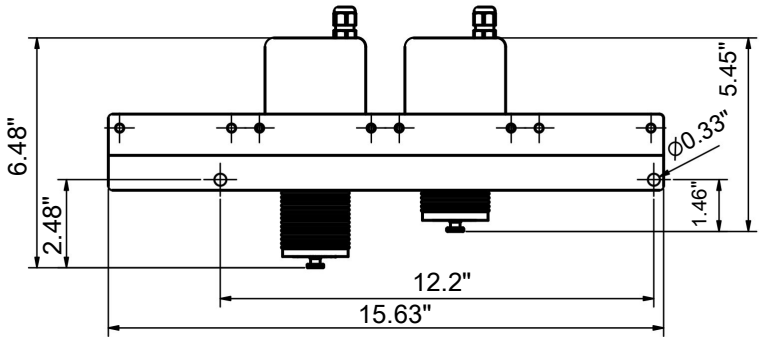




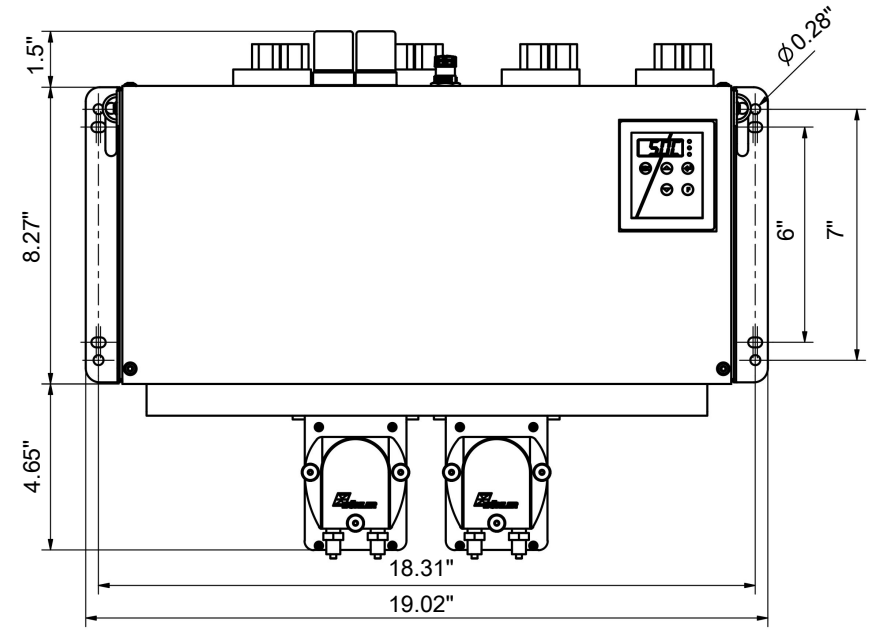
S1 = Electric supply
S2 = Status output
S3/S4 = Analog/digital output (optional)

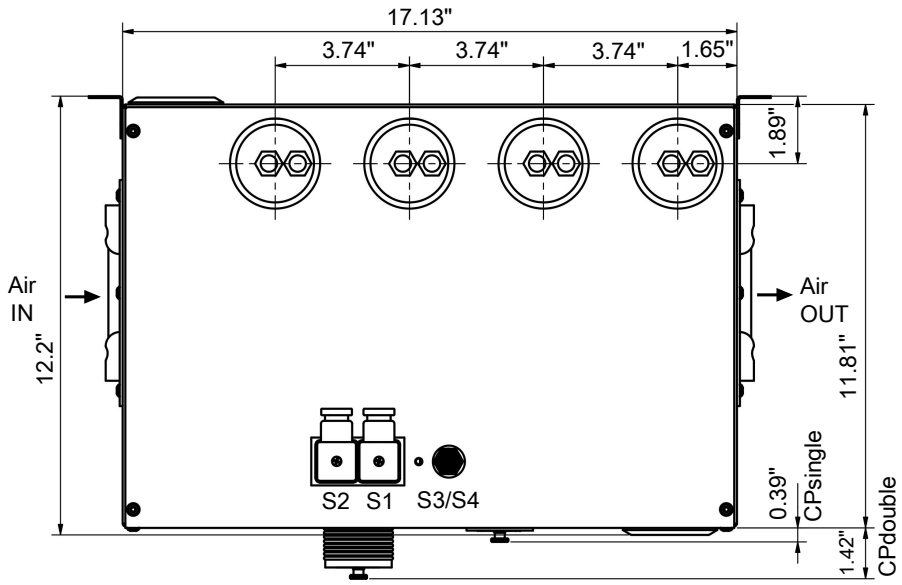


CPsingle/CPdouble (optional)



Dimensions - 19“ housing for wall mounting





S1 = Electric supply
S2 = Status output
S3/S4 = Analog/digital output (optional)

Ordering instructions

Gas cooler with one to four heat exchangers

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

4596	5	X	4	0	X	X	X	X	0	0	0	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, 60 Hz
					2													230 V, 50 Hz
																		Gas paths
						1												1 gas path
						2												2 gas paths
						3												3 gas paths
						4												4 gas paths
																		Heat exchanger
							1	0										Stainless steel, TS, metric
							1	5										Stainless steel, TS-I, US
							2	0										Duran glass, TG, metric
							2	5										Duran glass, TG, US
							3	0										PVDF, TV, metric
							3	5										PVDF, TV-I, US fittings
																		Condensate drain [1]
									0									without condensate drain
									1									Condensate pump, adapter [2]
									3									Condensate pump, screw-in connection [2]
																		Signal outputs
												0						status output only
												1						Analogue output, 4..20 mA, incl. status output
												2						Modbus RTU digital output, incl. status output

[1] metric/US depending on chosen heat exchanger.

[2] The number of condensate pumps corresponds to the number of gas paths: 1 gas path = CPsingle, 2 gas paths = CPdouble, 3 gas paths = CPdouble + CPsingle, 4 gas paths = 2x CPdouble. With 19” rack-mount housing, the condensate pumps can only be installed externally underneath the device. The required connection accessories are included.

Spare Parts and Accessories

Item no.	Description
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
4570008	Mounting angles for up to 4 peristaltic condensate pumps
see data sheet 450020	Peristaltic condensate pumps CPsingle, CPdouble