



ModbusRTU

Sample gas cooler RC 1.2+

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+ 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 SO₂ is low. RC 1.2+ 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 CO₂ 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. SO₂)

Can be used for systems for continuous emission monitoring pursuant to EN 15267-3 due to low wash-out effects

Efficient cooling with a nominal output of 390 kJ/h

Accurate setting of the gas outlet dew point in a range from +3 °C to 20 °C with a constant dew point stability of ± 0.1 K

Corrosion-resistant heat exchanger made of DURAN glass or PVDF

Ambient temperature from +5 °C to +50 °C

Future-proof and climate-friendly: Use of natural refrigerants instead of HFC refrigerants

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 RC 1.2+ series was designed specifically for the requirements in so-called 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+	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.

Technical Data

Gas Cooler Technical Data			
Rated cooling capacity (at 25 °C):	390 kJ/h		
Ambient temperature:	5 °C to 50 °C		
Ready for operation:	after max. 15 minutes		
Gas outlet dew point preset:	5 °C		
adjustable:	3 °C to 20 °C		
Dew point fluctuations static:	± 0.1 K		
in the entire specification range:	± 1.5 K		
IP rating:	IP 20		
Installation:	Table-top or wall mounting		
Housing:	Stainless steel		
Packaging dimensions:	approx. 530 x 400 x 400 mm		
Weight:	approx. 15 kg		
max. altitude:	Altitudes up to 2000 m		
Refrigerant:	R600a (28 g)		
Recommended minimum room: <i>Refrigerant quantity [g] / 8 g/m²</i>	3,5 m ²		
Electrical connection:	Plug per DIN EN 175301-803		
Contamination level:	2		
Overvoltage category:	II		
Electrical data: <i>Available options may result in details that differ from these</i>	Voltage:	230 V	115 V
	Tolerance:	+/-10% at 50 Hz +/-10% at 60 Hz	- +/-10% at 60 Hz
	Typical power input:	414 VA	345 VA
	max. operating current:	1.8 A	3.0 A
	Starting current:	2.3 A	3.6 A
	Protection:	4 A (delayed action)	4 A (delayed action)
Status output switching capacity:	max. 250 V AC, 150 V DC 2 A, 50 VA, potential-free		
Condensate outlet:	Hose nipple Ø5 mm or with screw connection (metric/US)		
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 -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 CPdouble Condensate Pumps

Ambient temperature:	0 °C to 60 °C
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:	0.51 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

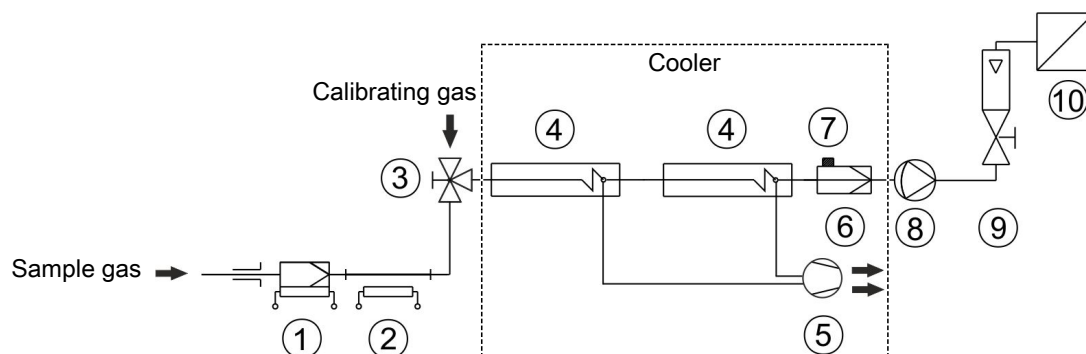
Technical Data FF-3-N Moisture Detector

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

AGF-PV-30-F2 Filter Technical Data

Ambient temperature:	3 °C to 100 °C
max. operating pressure with filter:	4 bar
Weight:	0.24 kg
Filter surface:	60 cm ²
Filter fineness:	2 µm
Dead volume:	57 ml
Materials	
Filter:	PVDF, DURAN glass (parts in contact with media)
Seal:	FKM (Viton)
Filter element:	sintered PTFE

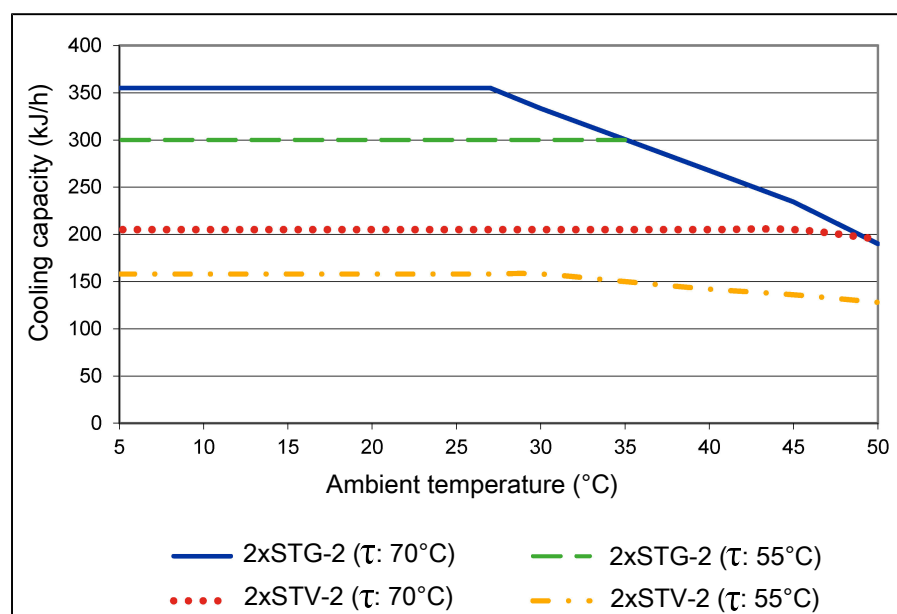
Diagram typical installation



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

See data sheets for individual component models and data.

Performance data



Note: The limit curves of the heat exchangers apply to different dew points (τ), see legend.

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 approved energy load from the gas is therefore determined by the tolerated rise in the dew point.

The following limits are specified for a standard operating point of $\tau_e = 70^\circ\text{C}$ and $\vartheta_G = 110^\circ\text{C}$. The maximum volume flow $v_{\max}$ in NI/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, with the STG heat exchanger in place of $\tau_e = 70^\circ\text{C}$, $\vartheta_G = 110^\circ\text{C}$ and $v = 320 \text{ NI/h}$ the parameter triple $\tau_e = 50^\circ\text{C}$, $\vartheta_G = 105^\circ\text{C}$ and $v = 420 \text{ NI/h}$ may also be used.

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

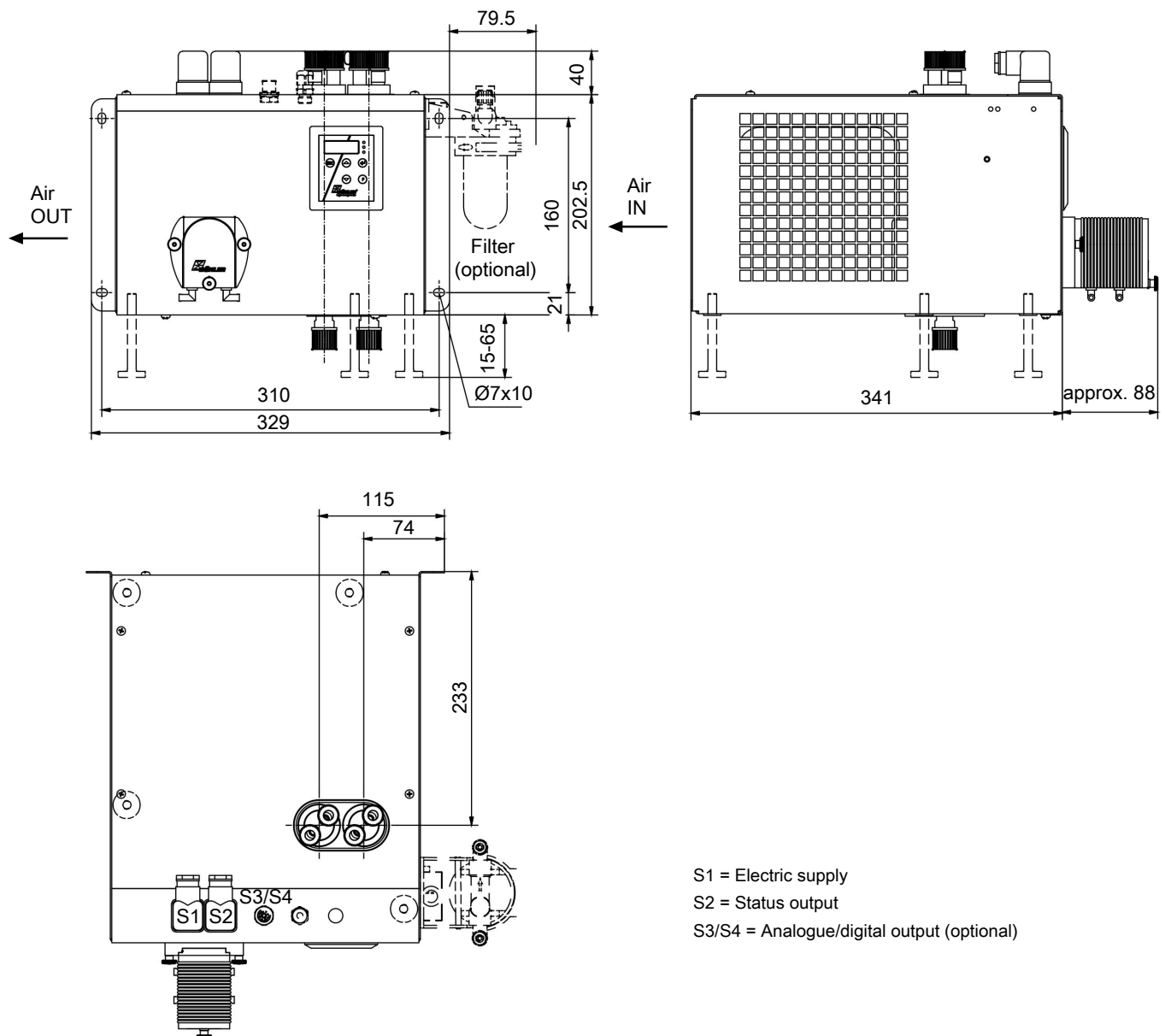
Heat exchanger overview

Heat exchanger	2 x STG-2	2 x STV-2
Materials in contact with media	DURAN Glas PTFE	PVDF
Weight	2 x 0.14 kg	2 x 0.11 kg
Flow rate $v_{\max}$ ¹⁾	320 L/h	300 L/h
Inlet dew point $\tau_{e,\max}$ ¹⁾	70 °C	70 °C
Gas inlet temperature $\vartheta_{G,\max}$ ¹⁾	140 °C	140 °C
Gas pressure $p_{\max}$	3 bar	3 bar
Pressure drop Δp ($v=150 \text{ L/h}$)	2.6 mbar	2.9 mbar
Max. Cooling capacity $Q_{\max}$	345 kJ/h	210 kJ/h
Dead volume V_{dead}	47 ml	41 ml
Gas connections (metric)	GL 14 (6 mm) ²⁾	DN 4/6
Gas connections (US)	GL 14 (1/4") ²⁾	1/4"-1/6"
Condensate out connection (metric)	GL 18 (10 mm) ²⁾	G1/4
Condensate out connection (US)	GL 18 (10 mm) ²⁾	NPT 1/4"

¹⁾ Max. cooling capacity of the cooler must be considered.

²⁾ Gasket inside diameter.

Dimensions



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	1	2	0	X	X	X	X	X	0	X	X	X	0	0	0	0	0	Product characteristic
																			Power supply
																			115 V AC, 60 Hz
																			230 V AC, 50/60 Hz
																			Heat exchanger
																			Duran glass, STG-2, metric
																			Duran glass, STG-2, US
																			PVDF, STV-2, metric
																			PVDF, STV-2, US
																			Condensate drain
																			without condensate drain
																			CPdouble with hose nipple, angled
																			CPdouble with screw connection, metric/US
																			Filter and moisture detector
																			without filter, without moisture detector
																			without filter, 1 moisture detector
																			1 filter, without moisture detector
																			1 filter, 1 moisture detector
																			Signal outputs
																			status output only
																			Analogue output, 4..20 mA, incl. status output
																			Modbus RTU digital output, incl. status output

Spare Parts and Accessories

Item no.	Description
41020050	Filter element F2-L; unit 2 count (for type RC 1.1)
41030050	Filter element F2; unit 5 count (for type RC 1.2+)
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
459600026	Adapter plate EGK 1/2 to RC 1.1 and RC 1.2+
see data sheet 410001	Fine mesh filter AGF-PV-30
see data sheet 450020	Peristaltic Condensate Pumps CPsingle, CPdouble