

# Peltier Gas Coolers ECP4X & ECP5X

High Cooling Capacity and Modular Design



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## Introduction

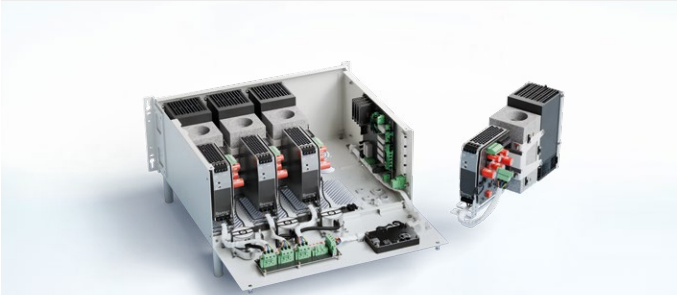
The ECP4X and ECP5X Peltier gas coolers are used in analytical technology to reliably lower the dew point of humid sample gases, thereby preventing condensation in downstream analytical devices. The precise control to a stable gas outlet dew point significantly reduces water vapor cross-sensitivities and volumetric measurement errors, whilst ensuring a high level of measurement accuracy.

The ECP4X and ECP5X gas coolers can be fitted with up to four cooling modules. The flexible, modular design allows for simple and cost-effective retrofitting in the field. As the cooling modules operate independently of one another, they can maintain their essential core functions even if the base unit fails. This ensures high system availability, maximum process reliability and dependable continuous operation.

## Modular Design in Two Versions

### ECP4X

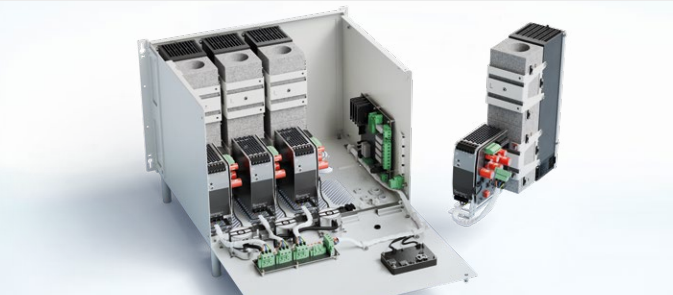
- ▶ Compact design
- ▶ An active cooling zone without an additional pre-cooling zone
- ▶ Two temperature sensors per cooling module for precise dew point regulation
- ▶ Optional thermocouple module for informative temperature measurement within the heat exchanger
- ▶ Easy retrofitting and quick replacement of cooling modules in the field thanks to the modular design
- ▶ Various heat exchanger materials available
- ▶ Speed-controlled fan for demand-based cooling capacity



Retrofitting a Cooling Module ECP4X

### ECP5X

- ▶ Particularly high cooling capacity
- ▶ Two independent, active cooling zones with a pre-cooling and main cooling section
- ▶ Three temperature sensors per cooling module for maximum control accuracy
- ▶ Optional thermocouple module for informative temperature measurement within the heat exchanger
- ▶ Easy retrofitting and quick replacement of cooling modules in the field thanks to the modular design
- ▶ Various heat exchanger materials available
- ▶ Speed-controlled fan for demand-based cooling capacity



Retrofitting a Cooling Module ECP5X

## High Performance at High Ambient Temperature

Both the operation of two ECP4X cooling modules connected in series and the patented design of the ECP5X cooling modules enable high cooling capacities at ambient temperatures of up to +50 °C [+122 °F]. This opens up new applications for process and emissions analyses at sites where, until now, only compressor coolers were a viable option. Thanks to the independently operated cooling modules,

each heat exchanger can utilize the full capacity even in multi-channel applications. While compressor coolers require their capacity to be distributed across several heat exchangers, the overall system performance of ECP4X and ECP5X Peltier coolers increases with each additional cooling module installed. This enables flexible scalability and future expansion without compromising cooling capacity.

### ECP4X per Cooling Module (up to 4 Cooling Channels are possible)

| Ambient Temperature (°C) | Flow Rate (NI/h) | Cooling Capacity (kJ/h) | Max. Inlet Dew Point TP <sub>IN</sub> (°C) |
|--------------------------|------------------|-------------------------|--------------------------------------------|
| 25                       | 50               | 160                     | 86                                         |
| 25                       | 150              | 100                     | 62                                         |
| 50                       | 50               | 20                      | 50                                         |
| 50                       | 150              | 20                      | 30                                         |

### ECP4X with 2 Cooling Modules Connected in Series\* (up to 2 Cooling Channels are possible)

| Ambient Temperature (°C) | Flow Rate (NI/h) | Cooling Capacity (kJ/h) | Max. Inlet Dew Point TP <sub>IN</sub> (°C) |
|--------------------------|------------------|-------------------------|--------------------------------------------|
| 25                       | 50               | 320                     | 92                                         |
| 25                       | 150              | 320                     | 82                                         |
| 50                       | 50               | 160                     | 86                                         |
| 50                       | 150              | 160                     | 70                                         |

### ECP5X per Cooling Module (up to 4 Cooling Channels are possible)

| Ambient Temperature (°C) | Flow Rate (NI/h) | Cooling Capacity (kJ/h) | Max. Inlet Dew Point TP <sub>IN</sub> (°C) |
|--------------------------|------------------|-------------------------|--------------------------------------------|
| 25                       | 50               | 450                     | 94                                         |
| 25                       | 250              | 140                     | 58                                         |
| 50                       | 50               | 160                     | 86                                         |
| 50                       | 250              | 70                      | 40                                         |

\*When connected in series with different setpoints.

▼ ECP4X versus ECP5X

ECP4X



|                                                                                            |
|--------------------------------------------------------------------------------------------|
| Low housing (W x H x D): 482 x 248 x 360 mm [≈ 19" x 9.8" x 14.2"]                         |
| Flow rate: max. 150 NI/h                                                                   |
| Gas inlet dew point*: max. +86 °C [+186.8 °F]                                              |
| Maximum total cooling capacity**: 4 x 160 kJ/h                                             |
| Power consumption: 120 VA per cooling module (max. 480 VA)                                 |
| No pre-cooling                                                                             |
| –                                                                                          |
| Weight: max. 18.7 kg [≈ 41.2 lbs] with 4 cooling modules, without HE(s) and without SR25.2 |

ECP5X



|                                                                                                             |
|-------------------------------------------------------------------------------------------------------------|
| High housing (W x H x D): 482 x 381 x 360 mm [≈ 19" x 15" x 14.2"]                                          |
| Flow rate: max. 250 NI/h                                                                                    |
| Gas inlet dew point*: max. +94 °C [+201.2 °F]                                                               |
| Maximum total cooling capacity**: 4 x 450 kJ/h                                                              |
| Power consumption: 240 VA per cooling module (max. 960 VA)                                                  |
| With pre-cooling zone                                                                                       |
| Setpoint temperatures for the cooling zone and the pre-cooling zone can be set independently of one another |
| Weight: max. 30.6 kg [≈ 67.5 lbs] with 4 cooling modules, without HE(s) and without SR25.2                  |

\* Maximum values in technical data must be rated in consideration of total cooling capacity at an ambient temperature of +25 °C [+77 °F] and a cooler temperature of +5 °C [+41 °F].  
 \*\*At an ambient temperature of +25 °C [+77 °F], flow rate: 50 NI/h.  
 NI/h and NI/min refer to the German standard DIN 1343 and are based on the following standard conditions: 0 °C, 1013 mbar.

▼ Options

SR25.2 Peristaltic Pump



Specially designed for continuous condensate drainage. The flow rate of 0.3 l/h ensures reliable removal.

Thermocouple Module



For informative temperature measurement in the heat exchanger. Consisting of a special glass heat exchanger, a thermocouple and a TC module.

Liquid Alarm Sensor



Connection of up to 4 liquid alarm sensors: LA1 or LA1S. Installation of the sensors in M&C universal filters with GL connections.

Analog Output



Up to 4 individually configurable analog outputs, which can either be set as mA outputs (0–20 or 4–20 mA) or as V outputs (0–1 or 0–10 V).

▼ Heat Exchangers

Duran® Glass Heat Exchanger



Stainless Steel Heat Exchanger



PVDF Heat Exchanger

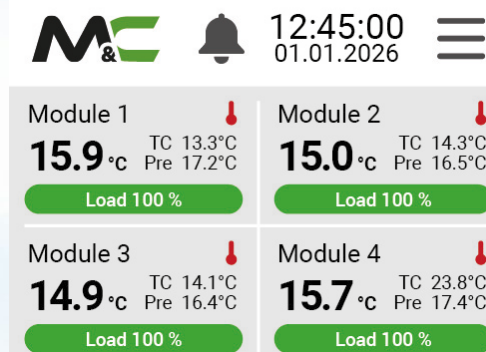


The heat exchangers in the ECP4X version are designed for flow rates of up to 150 NI/h, whilst those in the ECP5X version are for up to 250 NI/h. To meet a wide range of process requirements, the heat exchangers are available in Duran® glass, stainless steel (316Ti) and PVDF (polyvinylidene fluoride).

▼ Software

Start Screen

The HMI's intuitive user interface, comprising the User, Expert and Service sections, is used both to display key operating data and conveniently configure the cooler. The start screen displays the actual temperature of the main cooling zone, the pre-cooling temperature 'Pre' (ECP5X only) and the current Peltier 'Load' of the main cooling zone as a percentage. In addition, where available, the temperature of the thermocouple is displayed as 'TC'.



Event List

The event list clearly displays the messages from all cooling modules in operation. To enable a quick assessment of the system status, color-coded messages indicate the severity level of the event:  
 Red: Alarm  
 Yellow: Warning  
 Green: Back to normal  
 Blue: Information message

**Events**

|          |       |          |                                 |
|----------|-------|----------|---------------------------------|
| 26.06.26 | 15:03 | Module 1 | LA1 OK                          |
| 26.06.26 | 15:02 | Module 1 | LA1: Wire break                 |
| 26.06.26 | 14:58 | Module 1 | TC temperature warning OK 4.0°C |
| 01.01.24 | 04:47 | Module 1 | TC temperature warning 2.8°C    |
| 01.01.24 | 04:46 | Module 1 | Temperature warning OK 5.9°C    |

Service Request

For quick and efficient support, the M&C Service team simply needs a photo of the device-specific QR code. This contains all the relevant diagnostic information for the device. Based on this data, our M&C Service department can perform comprehensive remote diagnostics, eliminating the need for an on-site service assignment.

**Service Request**

In case of issues or questions, tap the QR code to enlarge it, photograph it as sharply as possible and send the photo to the MSA M&C service team:  
 service10@msasafety.com

Tap to enlarge

▼ USPs at a Glance

**High Cooling Capacity also under Demanding Conditions**  
 Reliable sample gas cooling even at high ambient temperatures.

**Intuitive HMI User Interface**  
 Clear operating structure with User, Expert and Service levels for easy configuration and monitoring.

**Efficient Remote Diagnostics**  
 Rapid fault analysis and M&C Service support without the need for an on-site assignment.

**Modular System Design**  
 Cooling modules can be easily and flexibly added by the customers themselves as required.

**Easy Integration into Existing Systems thanks to Numerous Interfaces**

- Configurable status relays
- CANopen
- Liquid alarm inputs
- Informative temperature measurement in the heat exchanger (optional)
- Analog outputs (optional)



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