

CIRRUS[®] PC500. Pre-condenser for complex VOC handling.



General During cryogenic condensation, freezing can occur inside the main cryogenic condenser. Depending on the specific VOC mixture, this can be caused by the high freezing temperature of certain VOCs or a high level of water vapour. This freezing impacts process efficiency as it lowers the operation time of the cryogenic condensation unit(s) and increases the time needed to defrost them. The PC500 pre-condenser is an upstream option for our CIRRUS[®] M500 VEC system portfolio and provides an extended operating window for the complete system. It eliminates high freezers and water and also reduces process temperatures to as low as -30°C (-22°F).

Advantages Plants that typically handle complex VOCs can look forward to the following benefits if they add the PC500 to their skid:

- Safe and uninterrupted operation of the whole setup.
- Potential to save money by increasing the runtime of the main units.
- Nitrogen recycling for other processes such as inerting and blanketing.
- Lower OPEX and CAPEX compared with alternative technologies.

Pressure vessel approval All CIRRUS systems comply with the Pressure Equipment Directive (PED) 97/23/EC.

Materials of construction All surfaces in contact with process gas and condensate are made of stainless steel 1.4404 or equivalent (corresponding to Type 316L) and PTFE. The condensers are mounted in a skid made from stainless steel 1.4301 (corresponding to Type 304). The condensers are insulated with CFC-free polyurethane foam and Armaflex[®].

Electrical safety The CIRRUS VEC system complies with the ATEX Directive 2014/34/EU and is thus approved for installation in an area classified as EX zone 1, IIC, T4. It achieves certification by using intrinsically safe signal loops (EEx ia) and explosion-protected junction boxes (EEx d and EEx e) for the power supply to the built-in defrost system. The instrument cabinet with operator panel should be installed in a non-classified area. The CIRRUS VEC system also complies with the Low Voltage Directive (LVD) 73/23/EEC and the Electromagnetic Compatibility Directive (EMC) 89/336/EEC.

Installation The unit can be installed outdoors, but the control cabinet needs to be protected against the elements and kept and in the temperature range from 0 to +50°C.

Documentation Each CIRRUS unit is delivered with complete documentation. This includes instructions for installation, maintenance, safety and operation. Component datasheets, electrical and sizing drawings and manufacturing control documentation, such as welding documents, material certificates and test protocols, are also available.

Technical data **Process data**

- Nominal flow rate: 1,000 Nm³/h
- Nominal cooling duty: 210 kW

Min./max. pressure

- Process gas side: -0.5/+0.5 bar (g)
- Nitrogen side: 0/16 bar (g)

Skid dimensions

- Width: 1,200 mm
- Depth: 1,600 mm
- Height: 5,778 mm
- Weight: 3,500 kg

Control system

- Operator panel: Siemens Simatic HMI TP1200

Connections

Process gas

- Inlet flange: DN 200 / PN 10, 8" – 150 LB-RF
- Outlet flange: DN 200 / PN 10, 8" – 150 LB-RF

Condensate

- Outlet flange: DN 80 / PN 10, 3" – 150 LB-RF

Liquid nitrogen

- Inlet flange: DN 25 / PN 16, 1" – 300 LB-RF

Gaseous nitrogen

- Inlet flange: DN 25 / PN 16, 1" – 300 LB-RF
- Outlet flange: DN 50 / PN 16, 2" – 300 LB-RF

Utilities

- Electricity (50/60 Hz), 400 V / 32 A / 3P +N
- Compressed air: Pressure 5–7 bar (g), dew point < -20°C

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