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ETC[®]-SV

Class 0 oil-free compressed air through catalysis



»»» The way to oil-free compressed air

The ETC® operating principle

Through the process of catalytic oxidation, ETC® converters actively transform the oil and hydrocarbons in compressed air into water and CO₂. ETC® Converter continuously supply Class 0 compressed air, in accordance with DIN ISO 8573-1, with a residual oil content of < 0.0025 mg/Nm³ as well as an oil-free condensate.

With its catalytic technology for the treatment of compressed air, ETC® provides a technical solution that has been successfully used for many years in the automotive and chemical industries.

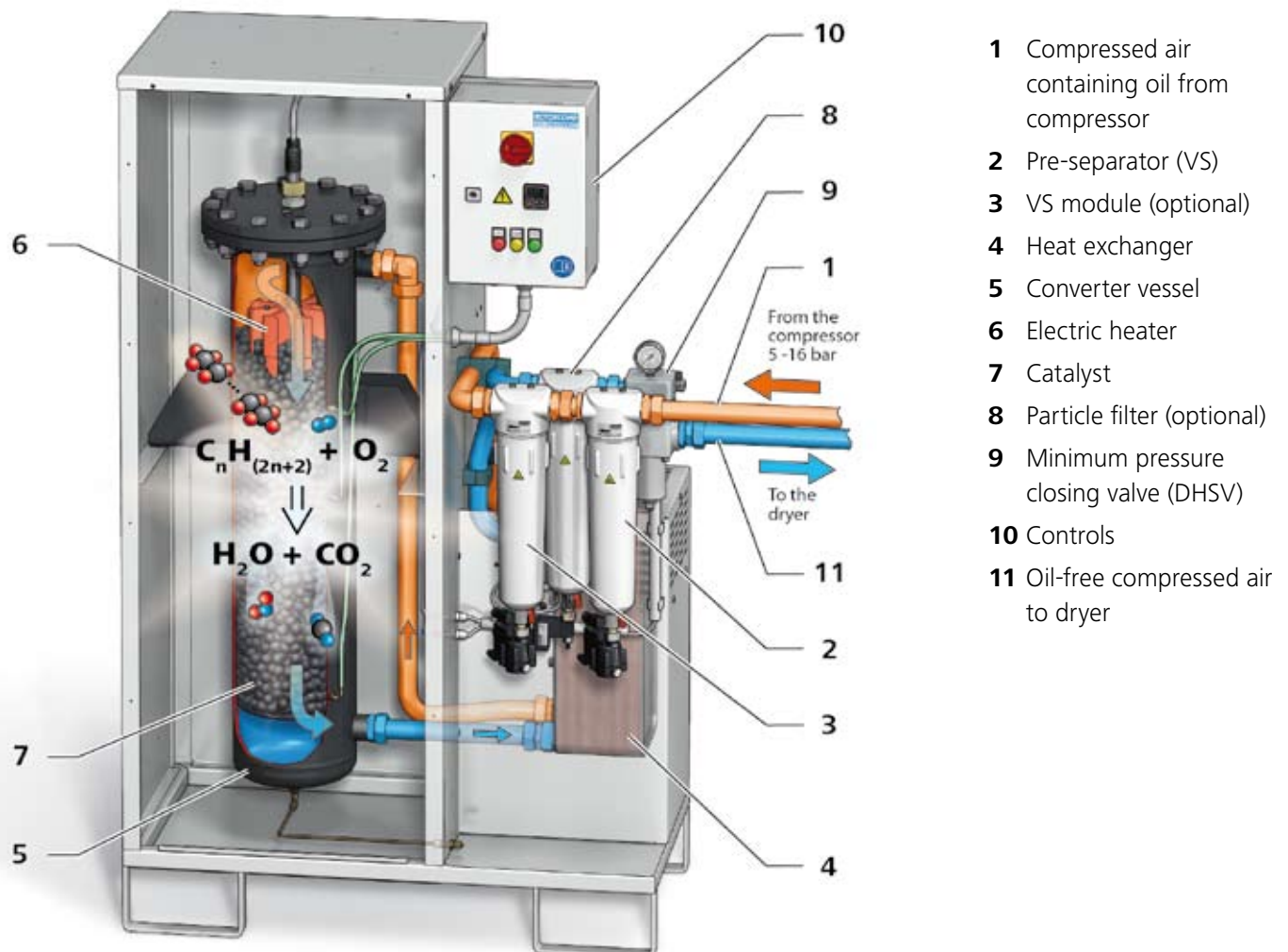
For compressed air upstream of a converter that has an oil content of max. 200 mg/Nm³, ROTORCOMP® guarantees oil-free Class 0 compressed air downstream of the converter.

In contrast to conventional filter systems (e.g., activated carbon), the air quality is constantly maintained over 20,000 hours of operation. Saturation and the risk of breakthrough by hydrocarbon compounds is avoided.

In contrast to oil-free compressors, the compressed air quality does not depend upon the hydrocarbon content of the ambient air.

The operation of the catalytic converter is independent of the temperature and humidity of the compressed air to be treated.

ETC®-SV layout



»» ETC®-SV – Catalytic air treatment

Features and product advantages

- › Guaranteed oil-free compressed air in accordance with DIN ISO 8573-1 Class 0 (residual oil content ≤ 0.0025 mg/Nm³), confirmed by independent TÜV measurements
- › Absolutely secure system since a protective shutdown unit prevents oil-containing compressed air from entering into the network in the event of a malfunction
- › Guarantee on the operation of the catalyst for 20,000 operating hours, max. 30 months, for hydrocarbon concentrations at the ETC® inlet of up to 200 mg/Nm³
- › Improved insulation of converter and housing reduces energy consumption to a max. of 0.01 kWh/m³
- › Pressure drop over ETC®-SV system approx. 0.4 bar at design point at 7 barg
- › Minimizes the bacteria, fungus and microbial content in the compressed air
- › Collected in a dryer downstream of the ETC®, a clean and neutral condensate is produced that has a hydrocarbon content < 2 mg/liter and a pH value between 6 and 7 and can thus, according to regulations, be discharged indirectly without further treatment
- › In the converter, silicone monomers are adsorbed and converted to silicates
- › Partial load capacity of 20 to 110 % of the nominal flow rate when using the optional VS module
- › Increased service life for downstream adsorption dryer

The ETC® is integrated into the compressed air network downstream of the compressor. The compressed air (1) containing oil that is flowing from the compressor is conducted over a pre-separation unit (2) and a VS module (3) into a plate heat exchanger (4). The pre-separation unit protects the ETC® against liquid oil and water. The optional VS module extends the max. working range by 20 to 110 % of the nominal flow. The compressed air is pre-heated in the plate

heat exchanger and subsequently flows into the converter vessel (5) containing the catalyst (7). By using an electric heater (6), the catalyst is held at a temperature that is necessary for the catalytic reactions to take place. The oil-free compressed air leaves the converter and is cooled down again in a counter flow in the plate heat exchanger and is conducted through an optional particle filtration unit (8) and the minimum pressure closing valve (9) to a dryer.

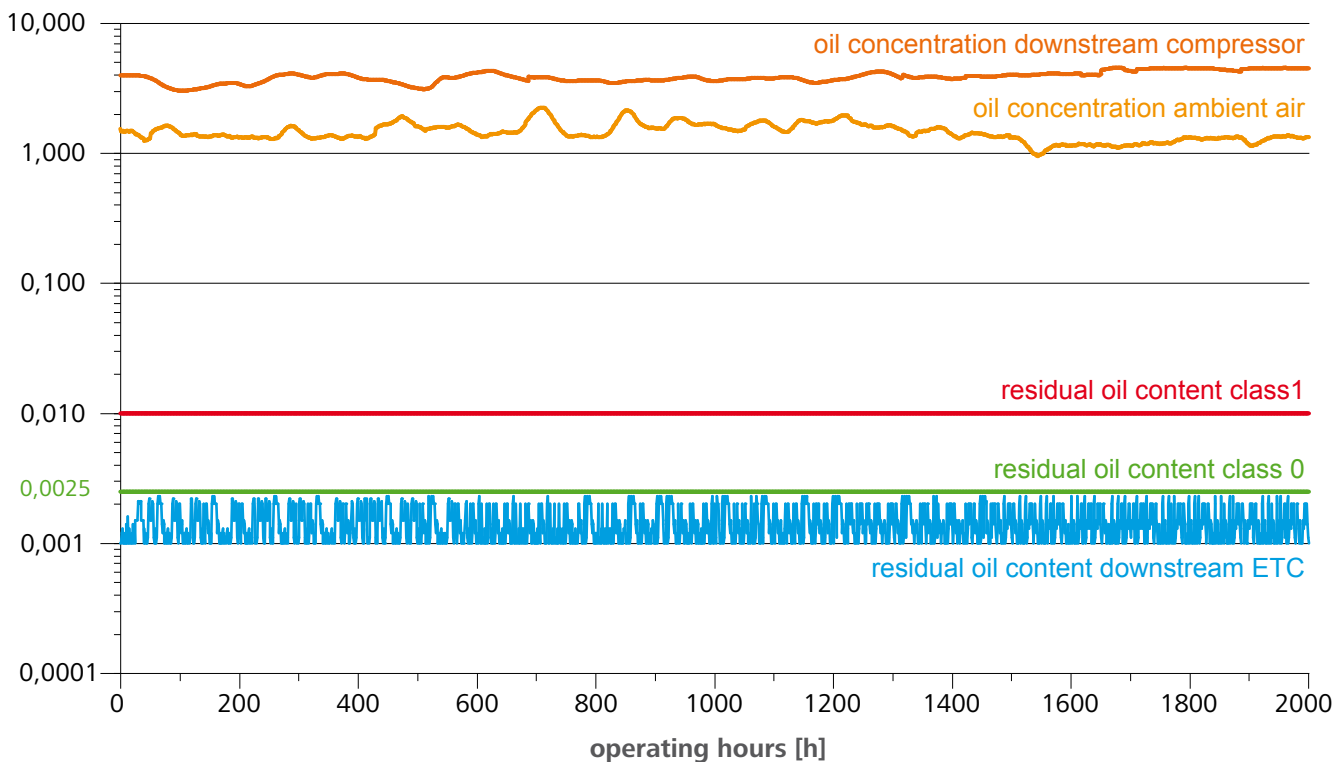
ETC®-SV

Class 0 oil-free compressed air and clean condensate

Hydrocarbon concentration measurements in air and compressed air



oil concentration [mg/Nm³]



Over a period of 2,000 hours, hydrocarbon concentrations

- › in the ambient air
- › downstream of an oil-injected screw compressor
- › after an ETC-SV5

were measured in accordance with ISO 8573-2, -5 and -6. For this a ROTORCOMP® on-line-measurement instrument type RCS NMHC/CH₄ NDIR was used, which is based on the measuring of NMHC (non-methane hydrocarbons) – values.

TÜV test report: oil content measurements

TÜV SÜD Industrie Service GmbH
 Messstelle nach §§ 26/28 BImSchG
 Befristung der Bekannngabe bis 22.05.2011
 Westendstraße 199
 80688 München

Industrie Service

Mehr Sicherheit.
Mehr Wert.

Report

on the measurement of oil content (aerosol and filter-passing) in the exhaust air of a compressor downstream of a converter for oil-free compressed air

System: **Compressor with downstream converter for oil-free compressed air**

Owner/Operator: **ROTORCOMP VERDICHTER GmbH
Industriestr. 9
82110 Germering**

Location: **Industriestr. 9
82110 Germering**

Date of order: **5 October 2009**

Date of measurement: **13 April 2010**

Date of report: **6 May 2010**

Ordered by: **Dr. Peitzker**

Project No.: **1396241**

Terms of reference: **Measurement of oil content (aerosol and filter-passing) in compressed air as per ISO 8573-1**

Date: 6 May 2010
 Our reference: IS-051-MUC-001
 Report No.: 1396241

This document consists of 17 pages
 Page 1 of 17

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The test results refer exclusively to the unit under test.

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 Referenznummer der Preparation: IS-051-MUC-001 / 16.05.2010
 Report No.: 1396241
 Rotorcomp Verdichter GmbH, Ölschichtmessung, 2010

Summary

Oil content in compressed air downstream of catalytic converter

| Component measured | Unit | Mean | Maximum | Measurement uncertainty |
|---|-------------------------|--------------|--------------|-------------------------|
| Oil (aerosol) | mg/m ³ | 0.0005 | 0.0006 | 0.0005 |
| Filter-passing oils (gaseous and vaporous hydrocarbon compounds > C6) | mg/m ³ | 0.0014 | 0.0017 | 0.0005 |
| Total oil content | mg/m³ | 0.002 | 0.002 | 0.001 |

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Technical data

| Model | Nominal flow at 7 barg | Max. over-pressure | Pipe diameter* | Weight** | Width** | Depth** | Height** | Power supply | Specific energy consumption during operation | Energy consumption at nominal flow | Installed power |
|----------|------------------------|--------------------|----------------|----------|---------|---------|----------|--------------|--|------------------------------------|-----------------|
| | [Nm ³ /min] | [bar] | | [kg] | [mm] | [mm] | [mm] | [V] | [kWh/Nm ³] | [kWh] | [kW] |
| ETC-SV04 | 0.4 | 16 | 15 x 1.5mm | 60 | 700 | 340 | 1400 | 230 | 0.009 | 0.2 | 1 |
| ETC-SV1 | 1 | 16 | 18 x 1.5mm | 140 | 860 | 455 | 1455 | 230 | 0.009 | 0.5 | 1.2 |
| ETC-SV2 | 2 | 16 | 28 x 2 mm | 160 | 860 | 455 | 1655 | 230 | 0.009 | 1.1 | 2.5 |
| ETC-SV5 | 5 | 16 | 35 x 2 mm | 360 | 1175 | 620 | 1890 | 400 | 0.007 | 2.1 | 5 |
| ETC-SV7 | 7 | 16 | 42 x 2 mm | 410 | 1175 | 620 | 1890 | 400 | 0.006 | 2.5 | 5 |
| ETC-SV10 | 10 | 16 | 42 x 2 mm | 590 | 1630 | 815 | 2100 | 400 | 0.005 | 3.0 | 10 |
| ETC-SV15 | 15 | 16 | DN 50 | 770 | 1630 | 880 | 2100 | 400 | 0.005 | 4.5 | 10 |
| ETC-SV20 | 20 | 16 | DN 65 | 900 | 1900 | 1140 | 2150 | 400 | 0.005 | 6.0 | 15 |
| ETC-SV30 | 30 | 16 | DN 65 | 1100 | 1900 | 1140 | 2150 | 400 | 0.005 | 9.0 | 21 |
| ETC-S40 | 40 | 16 | DN 80 | 1500 | 2200 | 900 | 2240 | 400 | 0.005 | 12.0 | 28 |
| ETC-S50 | 50 | 16 | DN 100 | 1700 | 2250 | 900 | 2240 | 400 | 0.005 | 15.0 | 28 |

* Connection dependent on options (see installation drawing)
 ** Weight and dimensions without pre-separator, VS module and particle filter

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ETC®-SV 03.11 | Technical modifications and errors excepted.