Aluventa Heat Exchanger specification

Type: C-251

Product description

The Aluventa Microchannel Heat Exchanger is an all-Aluminium brazed product that can be used as a condenser, gas cooler or de-superheater in HVAC applications.

ISO 9001

Aluventa A/S is an ISO 9001 certified company (DS/EN ISO 9001:2015).

Alloys

The Heat Exchanger is an all-aluminium product made of brazable alloys from the EN/AW 3000 series.

Copper connections are Cu-pipes according to EN 12735 (Copper and copper alloys - Seamless, round copper tubes for air conditioning and refrigeration).

PED 2014/68/EU

The heat exchangers comply with the PED 2014/68/EU for use with group 1 and group 2 fluids with the following limitations:

PS = 30 bar, Burst pressure > 90 bar, Test pressure = 33 bar = (1.1 x PS), Pmin = -1 bar, TS min/max = -30 - 120 °C

Specifically the Heat Exchangers are covered by article 4 section 3 in the Pressure Equipment Directive 2014/68/EU.

Refrigerants

The heat exchangers are PED approved for type 1 and type 2 refrigerants up to PS = 30bar(g). Refrigerants R410a, R717, R22, R134a, R290, R407c, R744, R404a, R507 can be used. Use with propane and ammonia is possible but recommended only with coated Heat Exchangers.

Drawings and tolerances

A technical drawing and a thermal performance calculation exists for each Heat Exchanger. The drawing is approved by the customer before the order is processed. The drawing contains the dimensions and tolerances of specific areas of the Heat Exchanger. The thermal performance calculation is based on fluid data from EES (Engineering equation Solver) on a clean Heat Exchanger in vertical orientation and uniform horizontal air flow. The calculation has a tolerance of ± 9%. The calculation does not include the effects of the header manifold, connections, side plates or coating.

Aluventa standard

Natural cosmetic marks from the manufacturing process can be found on the finished Heat Exchanger. That is: 1) Crystalline flux residues from the brazing process especially on the header surface. In the first fin convolutions closest to the headers brazing material may be present. Brazing material and flux residues can be found on the flame brazed Al/Al and Cu/Al connections and is a natural result of the brazing process. 2) If the Heat Exchanger is designed as a 2- or 3-pass Heat Exchanger the position of the baffle (separator by-pass) can be seen as a circular dent along the header perimeter. 3) Shades in the gloss/shine of the aluminium surface in the form of straight lines reaching from side-frame to side-frame can be seen on all heat exchangers. 4) The light reflection from the heat exchanger varies depending from which angle it is viewed. 5) The heat exchanger is not rectangular but has an hourglass shape with parallel header manifolds. 6) The baffle inside the header manifold does not necessarily provide a tight seal to the header wall and may allow refrigerant to pass internally.

The visual appearance of an Aluventa Heat Exchanger is very homogeneous however cosmetic and aesthetic variation may occur. These do not influence the Heat Exchanger performance and are not considered to be quality errors/faults: 1) The fin may extends a few mm out of the Heat Exchanger plane in limited areas. 2) The fin may be stretched or clotted leaving the FPI different in limited areas. 3) In limited areas the edge of the fin may be slightly bend. 4) At the location where the side plate is cut the fin may be slightly bend.

Strength

The heat exchanger is designed for operation at 30 bar with burst pressure above 90 bar as a single unit. The Heat Exchanger is not designed to hold different internal pressures at the same time. If the Heat Exchanger is designed as two or more separate volumes the inlet pressures must always be identical in all volumes at all times. The heat exchanger must be used, handled, installed and mounted according to the installation manual.

Pressure and leakage tests

Aluventa pressure and leakage testing is based on Helium mass spec. technology. All heat exchangers are pressure and leakage tested at 33 bar as part of the quality control.

A Heat Exchanger can be delivered sealed with a pressurised protective gas. The pressure of the protective gas is not constant and cannot be used to evaluate the leakage rate of the Heat Exchanger.

Connections

The Cu/Al connection joint is established using a soldering process with special soldering wire.

The Cu/Al joint is protected against galvanic corrosion by heat shrinkable tubing embracing the joint.

Installation, maintenance and repair

For information regarding installation, maintenance and repair see the Installation Manual.

Coated Heat Exchangers

Heat Exchangers are coated to protect the Heat Exchanger against a corrosive environment.

Electrofin® e-coating Specification

Electrofin coating consists of an electro-coating (E-coating) and a UV-protection. The technical performance of the coating is: Dry Film Thickness: 15-30 micron (ASTM D7091-05), Pencil Hardness: 2H minimum (ASTM D3363-00), Cross Hatch Adhesion: 4B-5B (ASTM D3359-97), Impact Resistance: 160 in./lbs. Direct (ASTM D2794-93), Heat transfer reduction: <1% (ARI 410), pH Range: 3-12, Temperature limits: -40 – 163°C.