

Operating and service instructions

General

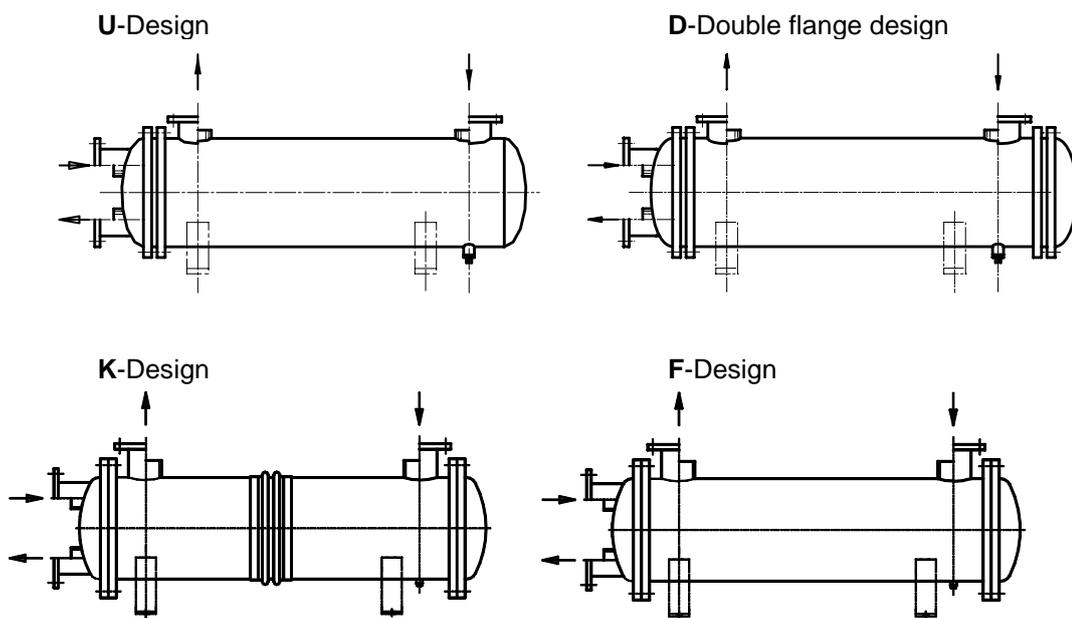
The Series G heat exchangers are primarily suited for heat transfer between various liquids and gases with or without phase change. Excellent results have been obtained using water, thermal oil, wet steam etc. to warm or cool liquids and gases. The standard series consists of 6 sizes with heat transfer surfaces ranging from 0.5 to 500 m².

Type Designation Key

Designation	G	25	-	160	/	1	/	2	-	14	-	V
Smooth tube heat exchanger **												
Diameter of casing (nominal) in cm												
Length of tube bundle (in cm)												
Tubeturns casing side												
Tube turns tube side												
Tube diameter												
Vertical position												

- | | |
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GK: Tube bundle condenser
GV: Tube bundle evaporator
GD: Steam generation plant | GA: Exhaust gas heat exchanger
GS: Safety heat exchanger
GE: Electric heater |
|---|---|

Design Variations



Design and Function

The heat exchangers consist basically of housing and tube bundles. The housing is a welded construction and includes all connecting, joining and fastening elements. The standard smooth tube bundle to be installed has a tow-way model. The exchanger design variation with U-tubes (U-design) resp. the variation with the floating tube base (D-design) or with a fix compensator (K-design), all allow for large changes in length between the casing and the tube bundle due to heat expansion. With low thermic stress a fix bundle (F-design) can be used.

Electric heaters are equipped with a electric heating inset with u-shaped heating rods instead of the tube bundle.

Materials

The following material combinations are possible:

Casing tube:	Steel St 37-2, St 37-2 galvanized, stainless steel V2A/V4A
Lid:	Steel St 37-2, St 37-2 coated with RILSAN [®] , stainless steel V2A/V4A
Cooling tubes:	SF-Cu, CuZn20Al, CuNi10Fe, CuNi30Fe, stainless steel V2A/V4A

With regard to design, assembly and material requirements, the heat exchangers can be delivered with a certificate of approval form various testing organisations, especially the TÜV and SVTI.

Nominal Pressure

The standard heat exchangers are designed for a nominal pressure of 16 bar and a testing pressure of 20 bar on the casing and tube. Deviating nominal pressures are indicated on the type label.

Operating Temperature

The units are suited for a maximum operating temperature of 180°C when flat packings of graphite are in use. The maximum operation temperatures can be seen on the type plate and depending on the application they can considerably vary.

Installation

It is important to pay attention to the installation position. Specially with evaporating or condensating media, the wrong position can lead to damages. It is also important to ensure that ventilation and drainage can take place automatically if necessary.

Initiation

The heat exchangers are delivered in a ready for work performance. Installation and initiation have to be done by a recognized specialist. Additionally all local directions have to be observed. After filling and complete deaeration of tube and shell side the installed adjusting and safety components have to be checked on their function. Additionally all connections have to be checked on their tightness and the flow direction of the media must be checked. After the first initiation and the operation of the heat exchanger on operation temperature all screws and flange connections have to be tightened when cold and without pressure.

Down time / frost

On longer operation stops or on danger of frost the heat exchanger must be drained. In order to avoid downtime damages a preservation (e.g. filling with nitrogen) can be made.

Maintenance

Although the heat exchangers generally can be considered maintenance-free, the units can be disassembled in just a few steps. When the screws on the lid flange are loosened, the medium chamber can be opened for cleaning the tube bundle inside the chamber. If the units are operated with heavily soiled media, we recommend preventive treatment. The used cooling water is either e. g. chemically treated or, in case of particle deposits, the water side can be pumped periodically at high speed through the cooler. In addition the tube side can be rinsed at regular intervals with a decalcifying agent. It is then necessary to neutralize and rinse the decalcified surface. Previously the consistency and the suitability of the cleaning agent with the used materials has to be checked.

ATTENTION: For every manipulation at the electrical control system or over all the unit the current entry must be disconnected.

CAUTION: Never loosen any flange connection as long as the unit is under pressure. This concerns also ventilation- and drainingdevice. All service works may only be done by approved specialized staff.