

SPIRAL TYPES

Type I

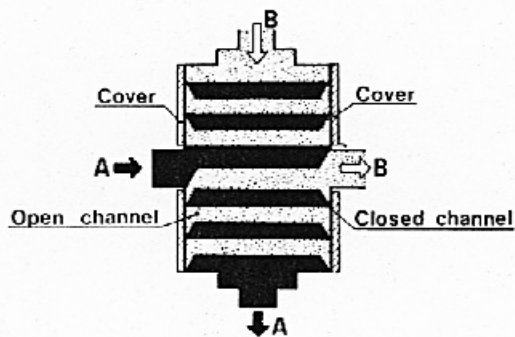
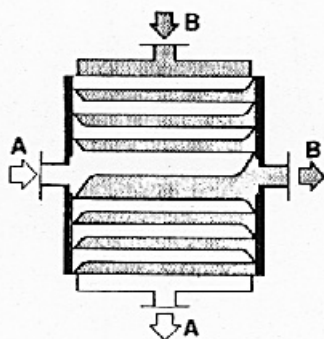
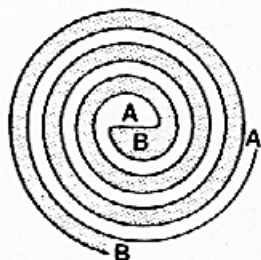
Normally intended for liquid/liquid services, the horizontally mounted Type IH spiral has alternate channels welded, i.e. one channel sealed at one face of the spiral body and the other channel sealed at the other face. Flat covers on each face.

Channel A is thus accessible from the left hand face of the body, channel B from the right hand face.

For gas phase or two phase gas/liquid services, the Type I spiral is mounted vertically—Type IV—for improved venting or phase separation.

For some duties, one channel may be completely welded and the other completely open. The closed channel is not accessible for inspection or mechanical cleaning, but the open channel is accessible from both faces. This construction is therefore used when one of the fluids is very dirty, or when one of the fluids presents severe gasketing problems.

Flows are normally counter-current. If fluid A enters at the periphery and exists at the central cover connection, fluid B enters the other central cover connection and exits at the periphery. Co-current operation is sometimes used, here both fluids enter at the periphery or at the central cover connections.

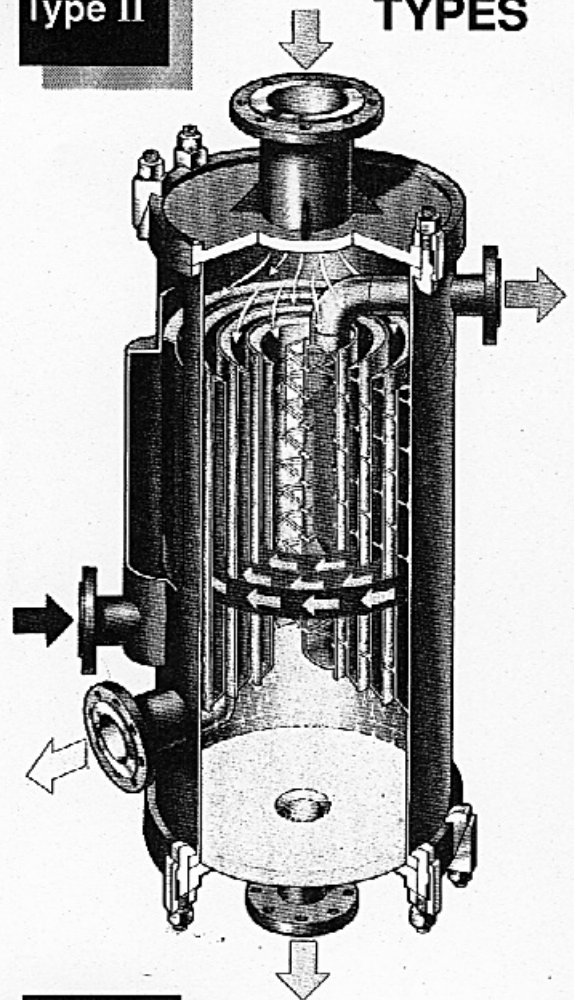


The Type II SHE operates in cross flow, one fluid passing from face to face of the body. The channel for this cross-flow fluid must therefore be open at both faces.

The other fluid is in spiral flow and the channel is welded at both faces. The central entry or exit for the spiral flow fluid is taken through an extension of the outer "shell" of the body, which incorporates the connections for the cross-flow fluid.

The Type II spiral is normally used for condensation or vaporization duties, where a channel of larger cross-section than in a Type I can be obtained. Additional connections (e.g. vent or drain connections) can be provided in the top and the bottom covers on the cross flow side. The central core of a Type II is normally closed to prevent bypassing of the cross flow fluid. In vaporizers operating with internal recirculation or in overhead condensers the central core may be open.

Type II



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The Type III is a combination of Types I and II usually used as a condenser which can combine both subcooling of condensate and desuperheating of non-condensables.

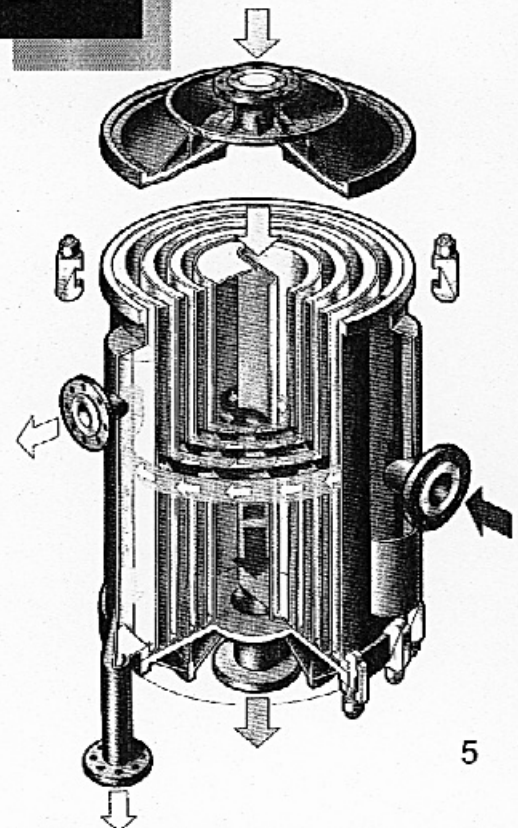
The top cover feeds the vapor in cross-flow to the main part of the spiral body. At the periphery, channels are closed over the outer turns of the spiral body, forcing the vapor into spiral flow in the outer turns.

The cooling water enters at the periphery of the body and leaves via a central pipe exiting through the periphery.

Condensate flows in the lower part of the channel from center to periphery and is removed via a header which also incorporates a connection for noncondensables.

The channels in a Type III are normally alternately welded. In certain cases, the cooling medium channel is totally welded.

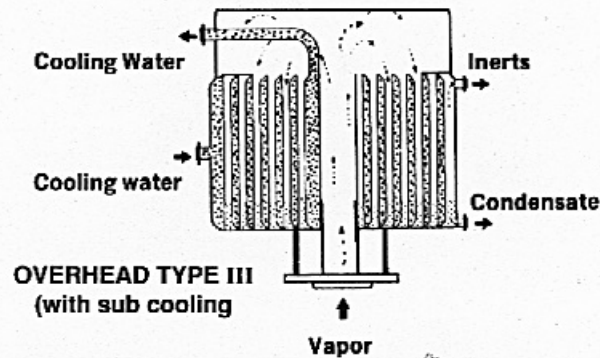
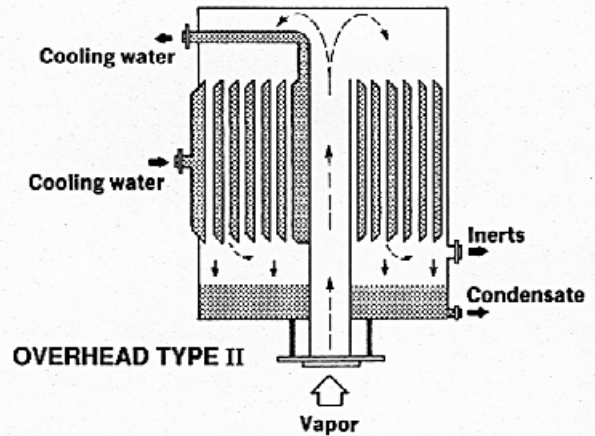
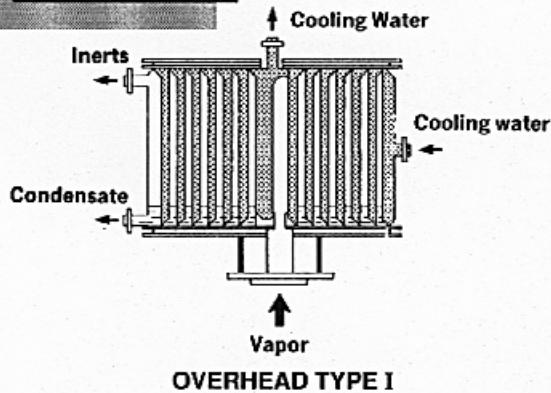
Type III



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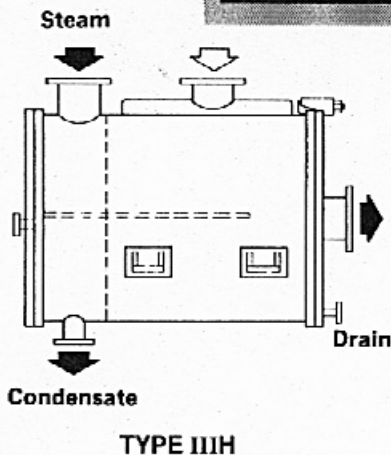
Overhead Condensers

These are variants of the basic Types I, II and III. The construction is such that vapor is admitted to the SHE directly via the bottom cover, thus eliminating vapor pipework when the units are used as condensers on distillation columns or reactors.



Horizontal Type III

Certain applications, for instance those involving fluids containing considerable solids, require an SHE with horizontal axis in order to reduce the risks for blockage. When heating such fluids, with steam, a special design is used (Type IIIH).



The steam cover is provided with a baffle which extends about 2/3 of the way into the SHE body. Steam is thus caused to flow in the upper half of the body. The fluid being heated enters at the periphery and exits via the central connection on the flat cover at the opposite face.

Channels are alternately welded.