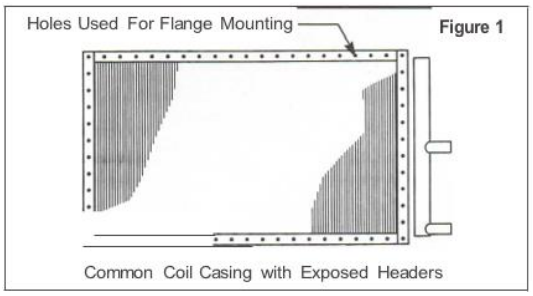
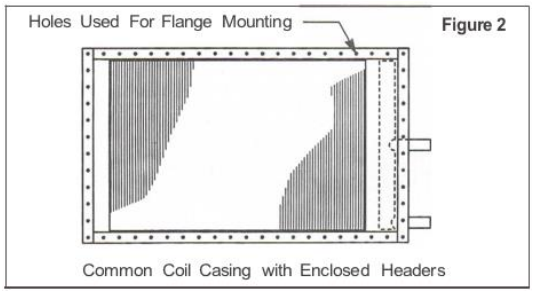
Tech Brief | Coil Case Designs



Common Coil Casing with Exposed Headers

Choosing the proper coil case design can greatly simplify the coil installation and improve the system's overall performance. Careful consideration of the coil case design can reduce the installation price of a coil by reducing expensive field labor.

In this tech brief we have outlined some of the most common coil case designs in use today

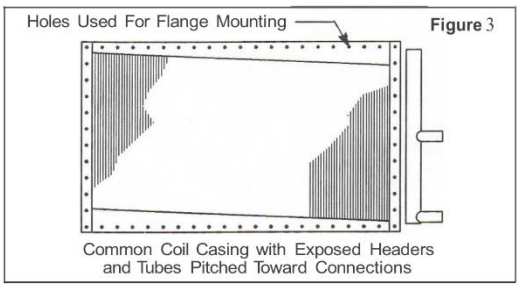


Common Coil Casing with Enclosed Headers

COMMON COIL CASINGS

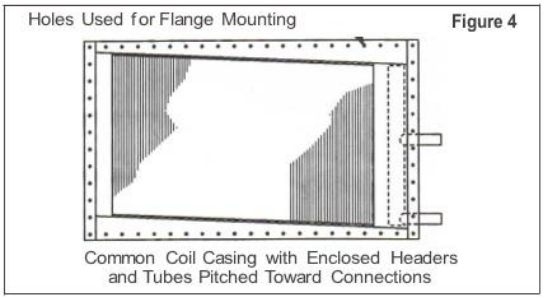
Most coil manufacturers market case de- signs that can be used for both FLANGE MOUNTED and TRACK MOUNTED installations.

- Flange mounted coils are designed to be attached (usually bolted) directly to a duct or piece of equipment that has a flanged opening.
- Track mounted coils are designed to slide into a track or channel which holds the coil in place.



Common Coil Casing with Exposed Headers and Tubes Pitched Toward Connections

From a coil casing standpoint, the only difference between these designs is that the flange mounted coil requires holes around the perimeter of the case flange. To simplify matters, many coil manufacturers provide holes on all coil casings. The headers on these case designs may be exposed or enclosed depending on the manufacturer and, to some extent, the coil type (see Figures 1 & 2). Water or circulating fluid coils are almost always supplied with the headers (and return bends) exposed. Steam coils, on the other hand, may or may not have the headers ex- posed.



Common Coil Casing with Enclosed Headers and Tubes Pitched Toward Connections

Exposed header designs deliver two advantages:

1) They permit complete access to the headers and return bends, and **2)** they have a larger coil face area for a given overall flange perimeter.

Enclosed headers have the advantage of simpler installation in some applications, since the headers don't have to be baffled off.

Both flange and track mounted steam coils, and drainable type water coils can be sup- plied with "pitched" casings to facilitate condensate removal or drainage. A pitched casing is constructed such that the coil core is sloped toward the condensate or drain connection (see Figures 3 & 4).

GASTIGHT CASE DESIGNS

In some applications it is desirable for the coil casing to be "gas tight". This means that the gas stream passing through the fins is contained within the outer perimeter of the case flange. In these situations, the degree of containment must always be defined. Sometimes, the intent is merely to avoid major leakage of the internal gas flow. In other cases, however, it is critical that there be absolutely no cross-contamination between the internal and external environments.

To obtain a zero-leakage condition, the outer casing must be welded airtight and tested at a pressure no less than 11/2 times the maximum operation pressure. Generally, casings are not designed for pressures much above

2 PSIG, but higher pressures are possible with special designs.

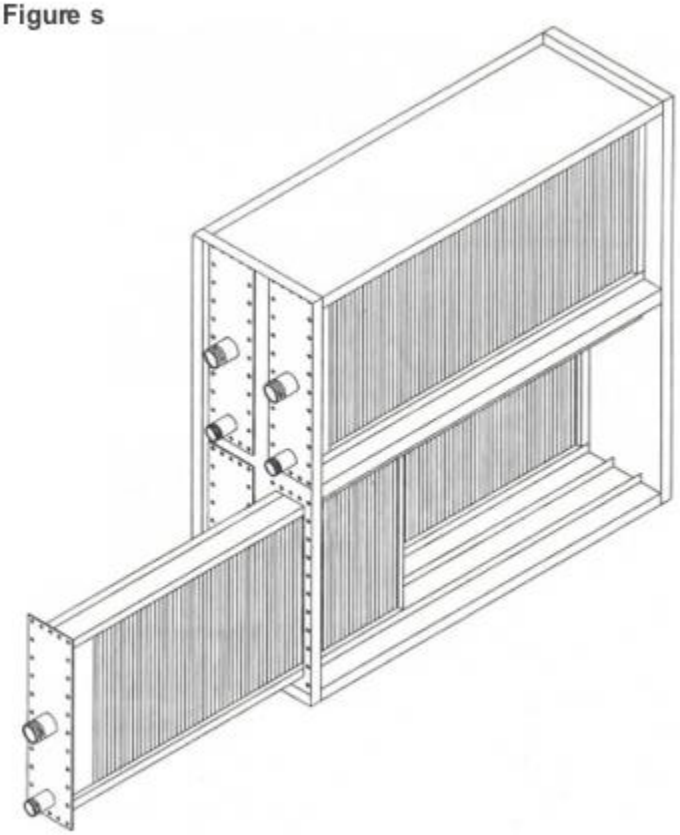
Normally a gastight case design includes enclosed headers (Figures 2 & 4), because these eliminate the need to weld each tube where it passes through the tube sheet.

All types of coils (i.e.: water, refrigerant, steam) in virtually any size can be built with a gastight case design.

REMOVABLE CORE CASE DESIGNS

This case design is very useful in applications where a coil needs to be cleaned or maintained on a periodic basis. Although there are variations in the marketplace, most coil manufacturers who offer this case design provide an outer housing into which a coil section (or core) slides (see Figure 5). A sealing plate is attached to one end of the coil. This plate is supplied with holes around the perimeter which mate to holes in the housing. When installed, the coil seal plate is gasketed and bolted to the housing and is, to some degree, air tight.

Figure s



Removable Core Case Design with Extraction On Connection End (After Piping Has Been Cleared Away).

The housing and coil assembly can be designed so the coils can be extracted from either the connection or opposite end of the coil. Although removal from the connection end is simplest in terms of the housing design (and therefore less expensive), it also means that all piping to the coil must be cleared away before the coil can be extracted.

Consequently, when frequent coil removal is anticipated, it may be more desirable to have the coils remove from the end opposite the connections.

Varying degrees of gastight case designs are available with a removable core design. The same conditions and criteria discussed earlier in the GASTIGHT CASE DESIGNS section also apply to the outer housing on removable core designs.

Depending on the manufacturer, single or multiple cores can be provided in the same housing. The housing can be designed to accommodate multiple coils across the face and/or multiple coils in depth. The coils and housing can be orientated for horizontal or vertical air flows.

Again, depending on the manufacturer the housing can also include removable 'filter sections, drain pans, moisture eliminator actions, spray systems for cleaning, inspection ports and access panels.

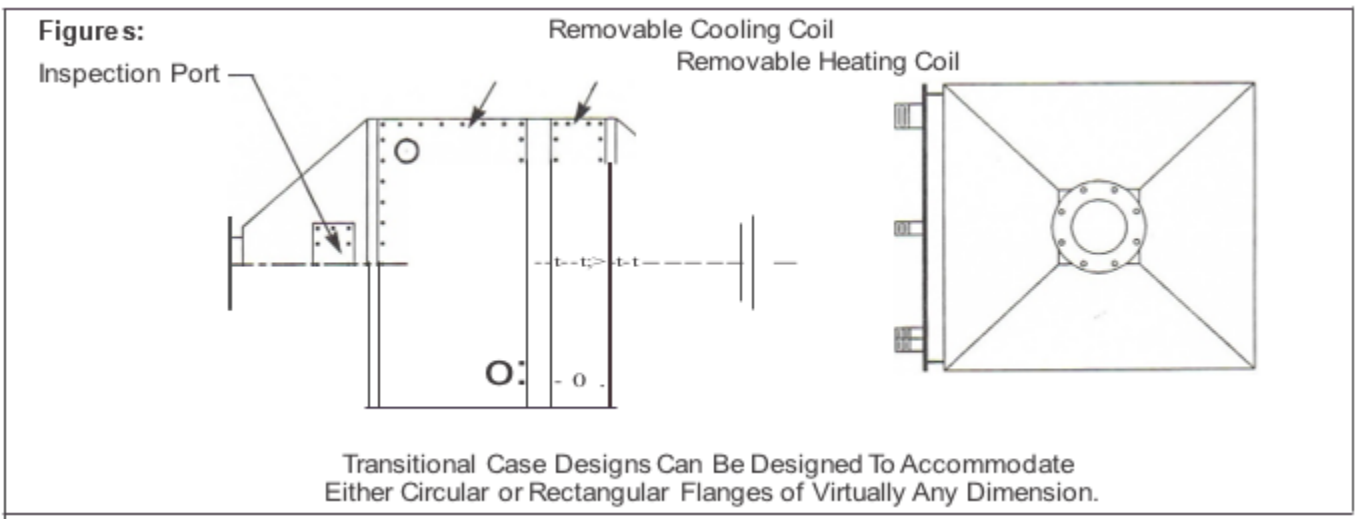
TRANSITIONAL CASE DESIGNS

A transitional case (See Figure 6) is useful in applications where a coil will be attached directly to a duct or other apparatus where the air or other gas is moving at velocities which are impractical for the coil.

Most often, transitional cases consist of an outer housing with a removable coil core much like that discussed earlier in the REMOVABLE CORE CASE DESIGN section. As you would expect, transitional case designs can be gastight to specified pressures and can be provided with auxiliary components like drain pans, filter sections, inspection ports, access panels and spray systems.

MATERIALS

Common coil casings are normally made with either 18, 16, or 14-gauge galvanized steel. Stainless steel is usually available as an option. Other case designs such as the airtight, removable core or transitional styles usually require heavier gauge materials due to the gas side pressure requirements and overall equipment structure. Often 3/16 or 1/4-inch-thick material is required to meet the application requirements of the project.



Transitional Case Designs Can Be Designed To Accommodate Either Circular or Rectangular Flanges of Virtually Any Dimension.