Dry All®

Full Range of HVAC&R Line Products

Coil-in-shell Heat Exchangers

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What is a Coil-in-Shell Heat Exchanger?

A coil-in-shell heat exchanger, also known as a coil-in-shell condenser or a helical coil heat exchanger, is a type of heat exchanger that consists of a coiled tube or coil placed inside a shell. It is commonly used in various industrial and commercial applications for heat transfer between two fluids.

The coil, which is typically made of metal such as copper or stainless steel, is designed in a helical shape to maximize the surface area available for heat transfer. The shell, on the other hand, is a larger cylindrical vessel that surrounds the coil. The shell is usually made of a sturdy material like steel and is equipped with inlet and outlet connections for the two fluids involved in the heat exchange process.

Introduction

Introducing the Dry All Coil-in-Shell Heat Exchangers, engineered to excel in the toughest applications. Their compact size, with respect to the heat exchange area, sets them apart from standard solutions, delivering superior performance that HVAC&R system engineers and designers truly value. These exchangers offer robust and enduring solutions for system designers, ensuring long-lasting performance. With their adaptable design, they seamlessly integrate into various heat transfer systems.

Our Dry All Coil-In-Shell Heat Exchangers are meticulously crafted to optimize heat transfer efficiency and elevate overall performance. Their design and construction are specifically tailored to deliver exceptional results even in the harshest environments. Despite their compact form, these exchangers boast an impressive heat exchange area, guarantees utmost efficiency and effectiveness. Ideal for heating and cooling applications, they effortlessly provide outstanding performance. Dry All Coil-in-Shell Heat Exchangers strived to be the preferred choice, will rise to the challenge and surpass expectations.

Key Features

a. **Construction:** Dry All Coil-in-shell heat exchangers consist of a shell that encloses a bundle of coiled tubes. The shell is typically made of a durable material such as stainless steel, while the coiled tubes are made of finned copper. The coil design allows for a compact and efficient heat transfer process.

b. **Design Advantage:** The coil-in-shell design offers several advantages. Firstly, it provides a large surface area for heat transfer, resulting in enhanced efficiency. Secondly, the coiled tubes promote turbulent flow, which further improves heat transfer rates. Lastly, the compact design makes it suitable for space-limited applications.

c. **Safety:** Dry All Coil-in-shell heat exchangers are designed with safety in mind. The construction materials, such as stainless steel, provide resistance against corrosion and high temperatures, ensuring long-term reliability. Additionally, the compact design minimizes the risk of leakage, and the tubes are typically equipped with appropriate safety measures, such as pressure relief valves, to prevent over-pressure situations. Overall, these features contribute to the safety and durability of the heat exchanger.

Advantages

1. Space Saving: Coil-in- Shell having compact dimensions and vertical installation reduces the space required for installation.
2. High Efficiency: Higher heat transfer coefficient – finned copper tubes promote flow turbulence and thus intensify heat exchange.
3. Low Maintenance Costs: Finned tubes make the exchangers more resistant to fouling.
4. Wide Application: Wide range of temperature and pressure, flow velocity, and media makes it suitable for wide application.

Applications

1. Pool Heating and Cooling
2. Heat Pumps
3. Food Processing Plants
4. Ice Machines
5. Domestic Hot Water
6. Heat recovery Discharge
7. Liquid Chilling Evaporators for Fresh Water
8. Brine Chilling Applications

Working of Coil in Shell Heat Exchangers

Points to Remember

For Condenser

Refrigerant vapour will enter from top of the Heat Exchanger, will condense down and will exit from bottom, while the Secondary fluid will enter from bottom of the Heat Exchanger & exit from top.

For Evaporator

Refrigerant vapour will enter from the bottom of the Heat Exchanger, will evaporate up and will leave from top, while the Secondary fluid will enter from top of the Heat Exchanger & exit from bottom.

Basic Working

- Water enters the upper tube, while refrigerant liquid enters via the lower refrigerant tube and is forced to follow a long spiral flow path.
- The tight tolerance between the finned copper tubing and steel side walls creates a spiral flow path that is highly efficient in releasing heat from the water side.
- The coils in the shell are made of a finned copper tube. The enhanced surface of the finned copper tubing becomes highly efficient which eventually leads to rapid evaporation of the refrigerant at very low-pressure drop on the refrigerant side with no oil trapping
- As the liquid refrigerant absorbs heat from the water it begins to boil off exiting the heat exchangers as a vapour
- The water tubes cross over at the midpoint of the heat exchanger. The outside tube becomes the inside tube and the inside tube becomes the outside tube. This results in two tubes of exactly the same length with equal pressure drop and equal heat exchange
- The cooled water exits the two lower water tubes, ready for use in your application.

Models Available with Capacity

S/N	Model No	Capacity as Condenser		Capacity as Evaporator	
		TR	kW	TR	kW
1	DA-COSH-010	1	3.5	0.71	2.5
2	DA-COSH-015	1.5	5.3	1.08	3.8
3	DA-COSH-020	2	7.0	1.42	5.0
4	DA-COSH-030	3	10.5	2.14	7.5
5	DA-COSH-050	5	17.6	3.56	12.5

Above Models are rated for below working conditions

Particulars	As Condenser	As Evaporator
Refrigerant	R410A	R410A
Condensing Temperature (if Condenser)	40°C	-
Evaporating Temperature (if Evaporator)	-	2°C
Water In Temperature	30°C	12°C
Water Out Temperature	35°C	7°C
Water Flow rate	0.172 m^3/kW	0.172 m^3/kW

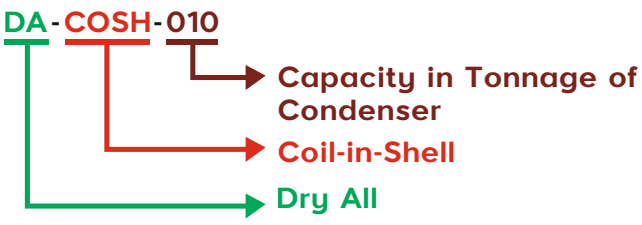
Maximum Working Pressure

1. Refrigerant Side: 42 Bar
2. Water Side: 15 Bar

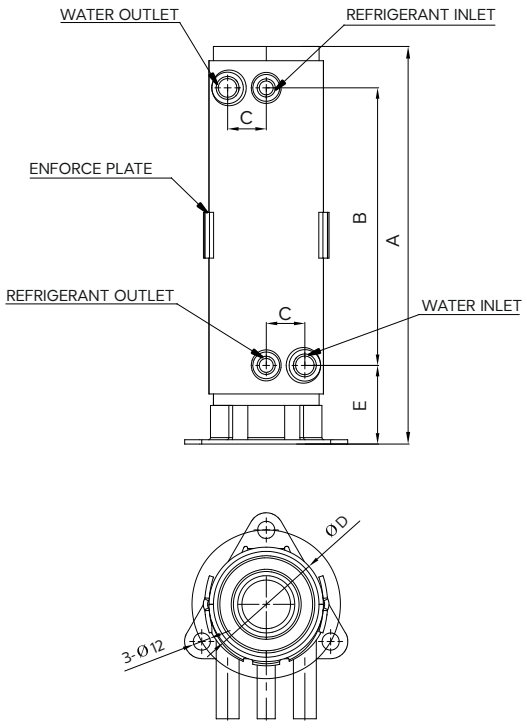
Working Temperature Range

1. Refrigerant Side: -10°C to + 100°C
2. Water Side: -10°C to + 120°C

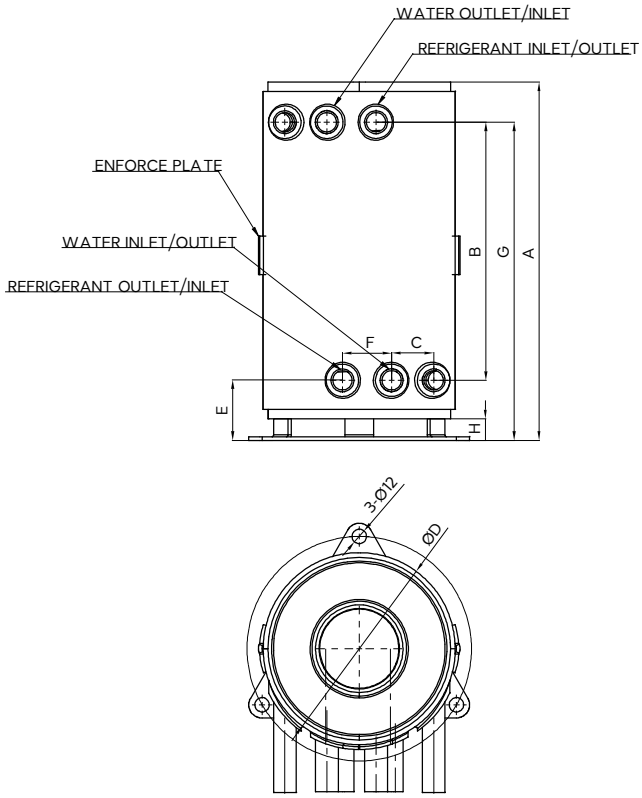
Nomenclature:-



Drawing



Drawing 1



Drawing 2

Connection & Dimensional Table

S/N	Model No	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	Figure
1	DA-COSH-010	278	194	27	80	55	-	-	-	Drawing 1
2	DA-COSH-015	308	225	27	80	55	-	-	-	
3	DA-COSH-020	363	280	27	80	55	-	-	-	
4	DA-COSH-030	328	250	33	120	50	-	-	-	
5	DA-COSH-050	298.5	215	35	160	50	41	265	18	Drawing 2

S/N	Model No	Water Side		Refrigerant Side	
		Inlet (mm)	Outlet (mm)	Inlet (mm)	Outlet (mm)
1	DA-COSH-010	16	16	12.7	12.7
2	DA-COSH-015	16	16	12.7	12.7
3	DA-COSH-020	16	16	12.7	12.7
4	DA-COSH-030	19.05	19.05	16	16
5	DA-COSH-050	2 X 19.05	2 X 19.05	19.05	19.05

“Dry All” Coil-in-Shell Heat Exchangers are designed to deliver exceptional performance and efficiency, with a spiral flow path that maximizes heat transfer and a robust construction that ensures long-lasting durability.

Marketed by:

Dry All®

Full Range of HVAC&R Line Products

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