

Plate Heat Exchangers

Type EC 59

multichannel



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EC59 Manual

Installation – Manual

Introduction

Multichannel Brazed Plate Heat Exchangers EC-59 are available in 14 up to 120 plates. The plates are made of stainless steel. Copper 99,9% is used as soldering material. The EC-59 is a combined Evaporator and Condenser. It contains 4 different channels; Condenser- (refrigerant), Evaporator- (refrigerant), Water (condenser), and Brine/Water (evaporator), in one and the same unit. The EC-59 is patterned (U.S.Patent.No 6,564,862 B1) As an option to all models there's a diffusion proof insulation. This insulation is made out of a NBR-based 10/20 mm closed cell foam with adhesive tape. Therefore the assembly should only take a few minutes. Agents being aggressive to copper or stainless steel must not be used in the heat exchanger, e.g. ammonium hydrate and water mixtures based on sodium chlorides.

Manufacturer's label

Gives the following information:

Model description: (EC59-30)

EC= Kind of pattern Design temperature TS in °C min -195, max 145

59= Size Design pressure PS in bar. Side 1/2/3/4

30= Number of plates Test pressure PT in bar. Side 1/2/3/4

Manufacturing number Volume in l, Side 1/2/3/4

Fluid group 1, 2

Side 1. cond.ref./ Side 2 evap. Ref./ Side 3 water cond./ Side 4 water evap.

Table 1 **PED Ps/Ts**

Side	Temp	-195	-50	0	20	50	100	145	PT (bar)
1&2	Ps bar /-1	47	47	47	47	43,8	38,6	35,7	70.5
3&4	Ps bar /-1	25	25	25	25	23,3	20,5	19,0	37.5

VARNING :

Vacuum should not occur at the same time as Ps

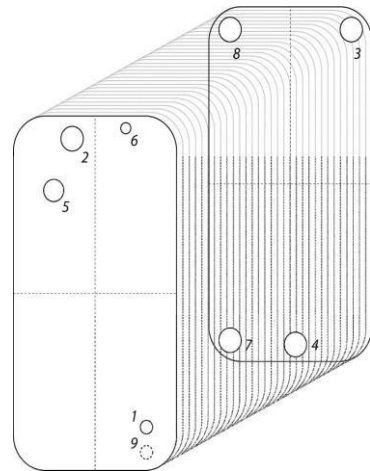
Plate Heat Exchangers

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Installation

The plate heat exchanger should be installed in a upright, vertical position.(check drawing)
The pipes should be connected as follows:

1. Inlet evaporator. First add the Ejector (see next page) before expansionvalve.
2. Outlet evaporator (refrigerant)
3. Inlet brine (evaporator side)
4. Outlet brine (evaporator side)
5. Inlet condenser (refrigerant)
6. Outlet condenser (refrigerant)
7. Inlet water (condenser side)
8. Outlet water (condenser side)
9. Recirculation, (to be connected with a copper-pipe into the ejector at connection 1.)



Below you have a rough estimation of the amount of refrigerant needed for each EC-59 model.

EC-59 NP	Refrigerant in Kg
14	1,0 Kg
20	1,3 Kg
24	1,5 Kg
30	2,0 Kg
40	2,4 Kg
50	2.8 Kg
60	3,2 Kg
70	3,6 Kg
80	4,0 Kg
100	4,8 Kg
120	5,6 Kg

Plate Heat Exchangers

Type EC 59

Injector assembly.

Multichannel plate heat exchangers EC59-xx need an injector install after the expansion valve to recycling the oil from the bottom of the evaporator.

The installation of the injector need to be correctly for a good function. There is also important to use the right size of injector for the number of plates is used.

EC59- 14, 20, 24 and 30 plate = Injector with inside hole 4 mm
EC59- 40 and 50 plate = Injector with inside hole 5 mm
EC59- 60 and 70 plate = Injector with inside hole 6 mm
EC59- 80, 90, 100 and 120 plate = Injector with inside hole 8 mm

Liquid line connections for injector are 5/8" inlet and outlet.
Circulation line (from the bottom of the heat exchanger) is 1/4"

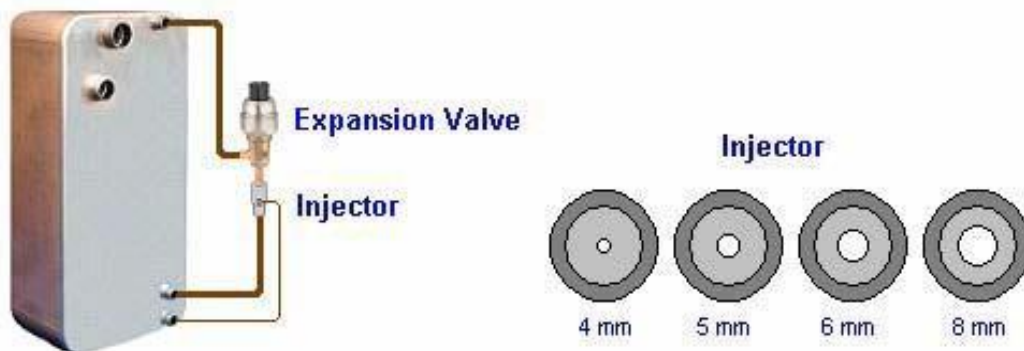
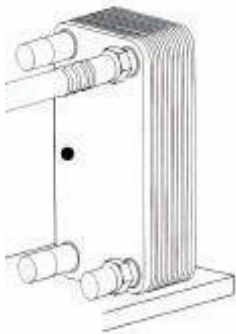


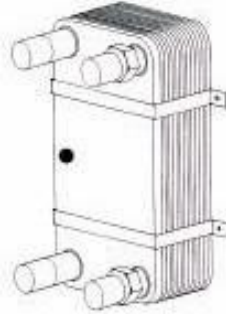
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Type EC 59

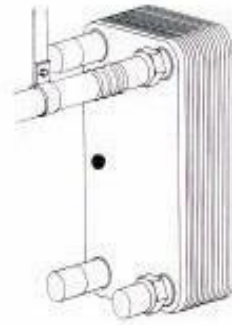
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2



3



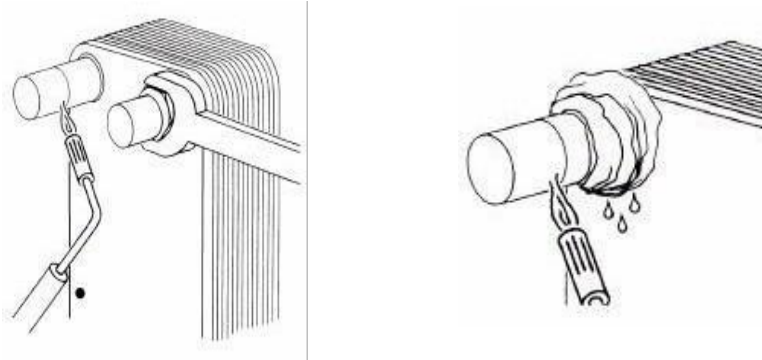
Mounting/Assembly

Always install the plate heat exchanger vertically.

EC-59 should be mounted on a foundation (1), attached by binding clips (2) or attached by bolts, if included. Always use flexible hoses or compensators (3) if there is a risk for vibrations, shock waves or mechanical strains.

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Connections

Use nitrogen in case of soldering. Carefully clean the surfaces that should be soldered. Push the pipe into the connection and solder with a 40-55% silver at a maximum of 700°C. Do not point the flame against the top plate of the exchanger (1). Tie a wet rag around the connection to protect the exchanger against too intense heat (2). Threaded connections are mounted after the exchanger has been fastened/fixated. Then connect the pipe system with female unions.

Do not exceed maximum allowable loads

Model	Mounting	
	Torque	Bending
EC59	150 Nm	60 Nm

WARNING:

Heat exchangers shall not be exposed to external loads during operation.

Cleaning

Protect the exchanger from getting clogged by installing a filter before the heat exchanger. When the performance is decreasing, it is time to clean the exchanger. When the deposit contains fat, the exchanger should be cleaned with a cleaning liquid and water. When the deposit is stronger, use a detergent which is not aggressive to copper, 5% phosphoric acid or 5% oxalic acid. For optimal cleaning, the cleaning solution flow rate should be 1,5 times the normal flow. Always rinse the exchanger afterwards, with clean water.

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