



EC59 Manual



Plate Heat Exchangers

Type EC 59

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 W 1.4401, 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

59= Size

30= Number of plates

Manufacturing number

Design temperature TS in °C min -160, max -204

Design pressure PS in bar. Side1/2/3/4

Test pressure PT in bar. Side1/2/3/4

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.

Model EC-59

TS °C	PS, bar				PT bar			
	Side 1	Side 2	Side 3	Side 4	Side 1	Side 2	Side 3	Side 4
-160/204	31	31	20	20	52	52	34	34

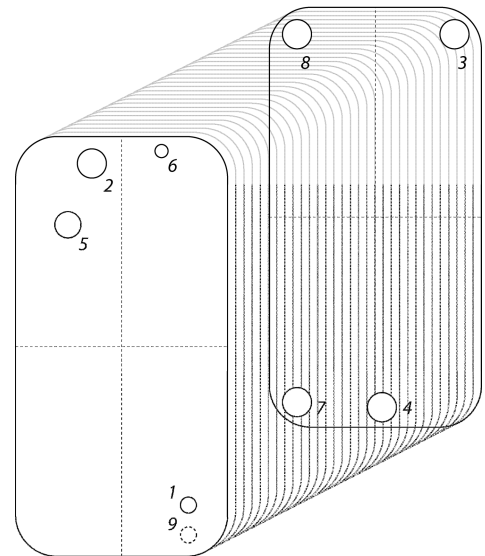
Installation

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

How to install the ejector.

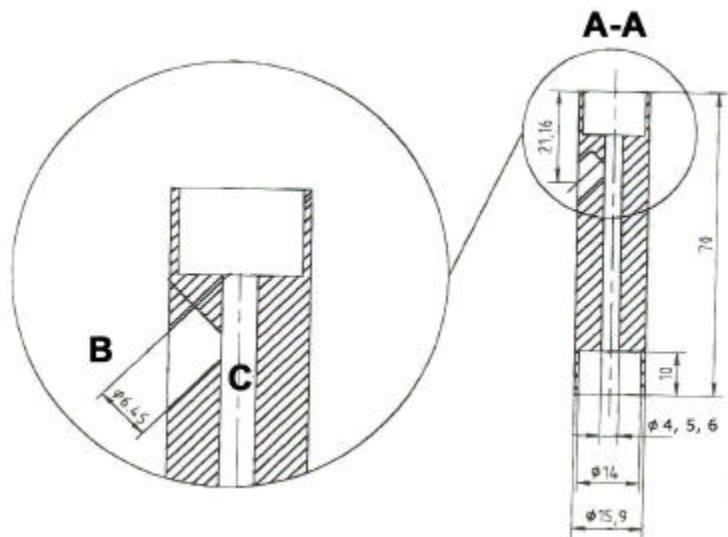
Start to put the copper-pipe into the ejector **(B)**

Make sure the you can see a part of the copper-pipe through the centre-hole in the ejector **(C)**. Then solder the copper-pipe together with the ejector.

The ejector should be placed with the **A-A-end** into the connection 1. Then solder the ejector into the connection 1, the copper-pipe should be down. Put together the ejector and your expansionvalve.

The copper-pipe you assemble on the ejector should be soldered into connection 9.

If you want you can install a sight-glass on that pipe.



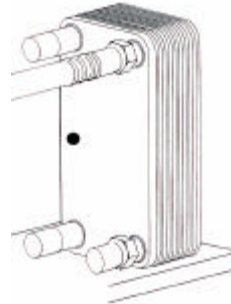
EC-59 plates	Ejector size Ø-centerhole (C)	Copper pipe (B)	Connection no. 9 Recirculation inner Ø mm	Connection no. 1 for the ejector inner Ø mm
14-30	4 mm	1/4 "	6.45	16
40-50	5 mm	1/4 "	6.45/16	16
60-70	6 mm	1/4 "	16	16
80-120	8 mm	1/4 "	16	16

Mounting/Assembly

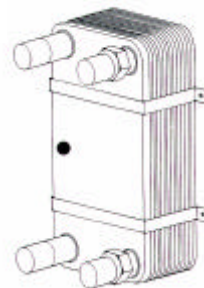
Always install the plate heat exchanger vertically.

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.

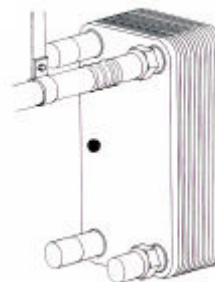
1.



2.



3.

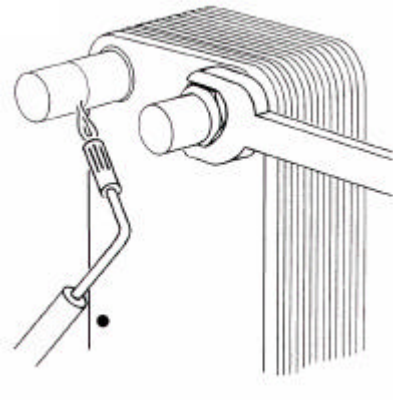


Connections

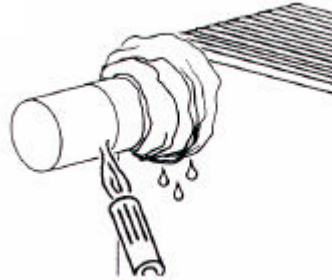
Use nitrogen in case of soldering. Carefully clean the surfaces that should be soldered. Push the pipe into the connection and solder with a 40-55% silver at a maximum of 700°C. Do not point the flame against the top plate of the exchanger (1). Tie a wet rags around the connection to protect the exchanger against too intense heat (2).

Threaded connections are mounted after the exchanger has been fastened/fixed. Then connect the pipe system with female unions.

1.



2.



Do not exceed maximum allowable loads

Model	Mounting	
	Torque	Bending
EC-59	150 Nm	60 Nm

Model	Operation	
	Torque	Bending
EC-59	90 Nm	40 Nm

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.

