

**Simple Brazed plate heat exchangers for  
use with heat pumps for DHW use.**

## **Installation, Commissioning and Maintenance instructions**

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DHW Brazed plate heat exchanger Installation Instructions	English	V1	18-Jun-25	S Addis

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## 1.0 INTRODUCTION

The Lochinvar ranges of brazed heat exchangers are designed to provide DHW alongside a heat pump. The plates have been designed at the required flow rates on the primary side to achieve the required kW rating. The pressure drops on both sides of the plate have been designed to be as low as possible allowing suitably sized pumps to be used to achieve the required flow rates.



**Read the Individual data sheets available for all brazed plate heat exchangers before proceeding with the installation.**

## 2.0 SAFETY GUIDELINES



### READ AND UNDERSTAND THE INSTRUCTIONS

**Read and fully understand all instructions before attempting to operate maintain or install the unit.**

Keep these instructions near the water heater for quick reference.

This equipment must be installed by a competent person.

Commissioning, maintenance and repair must be done by a skilled installer/engineer, according to all applicable standards and regulations.

### 2.1 GENERAL DESCRIPTION OF SAFETY SYMBOLS USED



#### BANNED

A black symbol inside a red circle with a red diagonal indicates an action that should not be performed



#### WARNING

A black symbol added to a yellow triangle with black edges indicates danger



#### ACTION REQUIRED

A white symbol inserted in a blue circle indicates an action that must be taken to avoid risk



#### HOT SURFACES

The symbol indicates those components with a high surface temperature that could create a risk.



**This symbol shows essential information which is not safety related**

### 3.0 CONNECTION DESIGNATION AND USE:

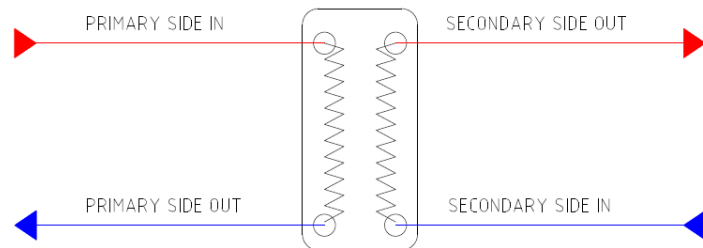
The plate will be supplied with a data plate attached, the data plate information is as shown below.

Serial Number Example: 12009242000892

01	20	09	24	2	000892	Serial number
						Number in series
						Number of circuits
						Date In Month, i.e.g 24 of Sept.
						Month 09, i.e. September
						Year 20, i.e. 2020
						Production entity

### 3.1 CONNECTION DETAILS

Connecting to the PHE are generally as per the schematic below, it is important to cross reference this with the actual plate on site which will have a badge showing inlet and outlet connections as per example below.



#### Caution

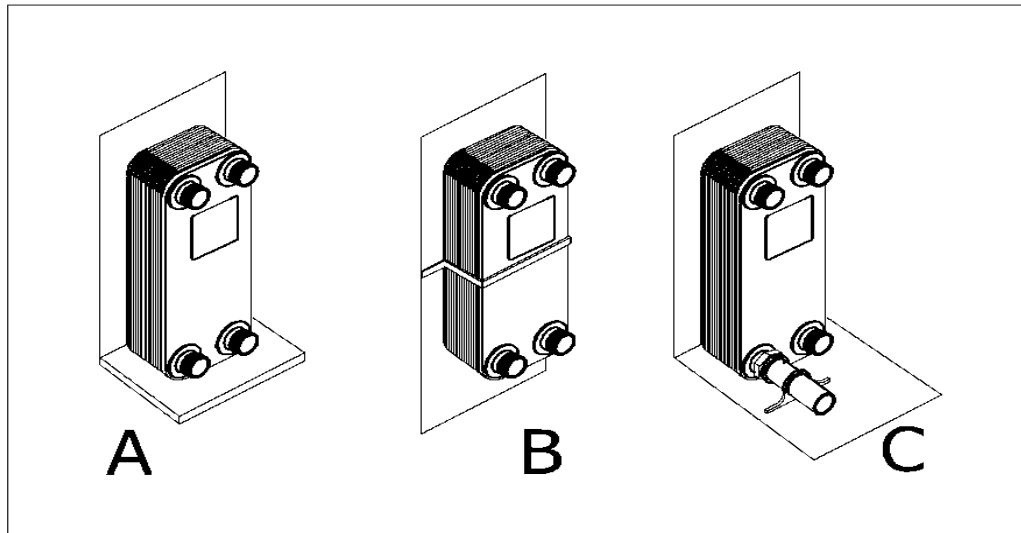
It is important to cross reference with the actual plate on site before proceeding with the installation as the connections may differ from the drawing above. If in doubt **DO NOT** proceed with the installation before contacting Lochinvar technical support.

## 4.0 INSTALLATION - GENERAL POINTS

### 4.1 SUPPORTING THE PLATE:

The plate must be suitably supported to avoid damage to nearby pipework.

- A) Place on a suitable shelf.
- B) By brackets.
- C) By using the pipe work (providing weight of unit taken by another support).



**Warning:**  
Do not drill through any part of the heat exchanger.



**Caution:**  
It is essential that the exchanger, as with all pressure containers, is protected from the effects of any over pressurisation should a fault in the operation of the system arise. Provision of suitable pressure relief devices such as relief valves or bursting disks should be considered and installed in the pipes close to the plate.

### 4.2 PIPE WORK MUST COMPLY WITH THE FOLLOWING:

- The pipe work is fully supported to avoid weight/forces acting upon the unit.
- The fitting of flexible couplings if the pipe work is subject to vibration.
- The fitting of flexible couplings if operating over 80 Deg. C. (to absorb expansion).
- The pipe work is completely flushed before attaching to exchanger.
- The fitting of suitable vents & drains.
- The fitting of isolating valves / by-pass valves to facilitate easier inspections and cleaning if required.

### 4.3 FITTINGS:

The use of thermometers and pressure gauges to record temperatures and pressures in the inlet and outlet pipes of both circuits of the PHE is recommended. Periodic checking of these devices shall allow the performance of the exchanger to be monitored, plus, give a visual warning that the internal passages are becoming fouled up through service.



**Warning:**  
**No Welding - either onto, or near the exchanger.**



**Caution:**  
**A filter must be fitted on the system side of the system to protect the plate from water borne particles above 0.5mm diameter. Failure to install a filter will invalidate the warranty.**

#### **4.4 CONNECTIONS:**

The threads are BSPP Although the best method is to seal using an O-ring, or a ring gasket located at the end of the connection, the threads can be sealed by a suitable tape / paste.



**Warning:**  
**Avoid over tightening onto the threaded connections.**

#### **4.5 SOLDERING NEAR THE PLATE:**

Ensure connection and pipe work are thoroughly cleaned  
Apply flux to protect from oxidising & to help cool the temperature PHE to be horizontal  
Fill the other circuit with water (ensure open to atmosphere).  
Wrap a wet towel around the base of the connection to be soldered.  
Use solder containing no less than 45% silver.

## **5.0 SCHEMATICS**

Domestic Hot Water systems tend to be bespoke in design; as such it is difficult to show schematics to cover every design. More detailed schematics are available within the relevant product literature that a plate is to be used for contact Lochinvar technical support for help.



**Note:**  
**Lochinvar limited may provide technical advice and guidance to assist with best practice, optimisation and installation of Lochinvar products; however, we will not be liable for any duties as designers under construction (design and management regulations 2015). In all cases where information is provided, the customer must assess and manage risks associated with the technical information and advice provided.**

## 6.0 COMMISSIONING



### Caution:

It is essential that the exchanger is not subjected to thermal or mechanical shock as this could lead to premature failure which will not be covered by the product warranty.

### 6.1 START UP:

- Fully vent pipe work system and the PHE.
- Close isolation valves between pump & exchanger.
- Fully open valve fitted into return line from the exchanger.
- Start the circulation pump (coldest circuit first).
- **Gradually** open closed valve fitted to inlet line of exchanger.
- Vent circuit again if necessary – special consideration must be given to discharge of hot fluids.
- Repeat for the other circuit.

### 6.2 CHECKS:

- Check for pressure pulses in system caused by the pumps or control valves. If found, stop operation, and rectify. Continuous pressure pulses will result in fatigue failure of the plates.
- Check that all pump vents are closed to prevent air being sucked into system.

## 7.0 SHUTTING DOWN THE EXCHANGER



### Caution:

Water hammer & thermal shock can damage the exchanger resulting in loss of fluid from one, or more, of the liquid circuits.

**Water hammer** occurs when a flowing liquid is suddenly halted. Pressure waves then travel along the pipes creating a hammering effect as they bounce off any restrictions within the pathway.

**Thermal shock** occurs when the bulk temperature of the exchanger is suddenly raised or lowered. The resulting expansion or contraction of the unit can result in damage to the plate pack.

Both water hammer & thermal shock can be avoided by not using fast acting control valves, therefore, sufficient consideration should be given to protecting the heat exchanger when designing the associated control systems.

### 7.1 SHUT DOWN PROCEDURE:

SLOWLY close the control valve on the “hot” circuit whilst maintaining the full flow on the “cold” circuit.



### Caution:

Shut down cold side first if “hot side” liable to freeze.

- Switch off hot circuit pump.
- SLOWLY close the control valve on the cold circuit.
- Switch off the cold circuit pump and close all isolating valves.



## **7.2 STORAGE:**

If the unit is to be taken offline for an extended period, then the following procedure can be followed:  
Allow unit to cool and then drain both circuits after the release of any pressure.  
Flush through with clean water, drain and then seal the connections (if pipes removed).

## **7.3 CLEANING OF THE EXCHANGER**

A reduction in the performance of the exchanger – especially combined with an increase in the pressure drop across either circuit indicates that the heat transfer surfaces have become fouled.

The chemicals selected are the choice of the operator of the plant and shall depend on the type of deposit – we recommend that the services of a cleaning specialist company be employed for further advice. This type of organisation shall be able to determine the nature of the deposit to be removed, and shall furnish the correct solvents, and equipment, plus comply with all Health & Safety regulations.

Suggested cleaning fluid: 5% phosphoric acid, or 5% oxalic acid circulated at ambient temperature, followed by large amounts of fresh water to flush.



**Warning:**  
Wear gloves & eye goggles when using cleaning detergents.



**Caution:**  
After using any type of cleaning agent, always rinse thoroughly with fresh water. Circulate fresh water for at least 10 mins.



**Warning:**  
**HOT SURFACES**  
The plate and associated pipework may still be hot

## 8.0 TROUBLE SHOOTING

Symptom	Possible cause	Remedy
Liquid flows higher than design	Plates blocked	Flush or replace plate
	Liquid flows higher than design	Check and adjust
	Inaccurate measurements	Check accuracy of gauges
	Low primary flow temperature	Check primary flow temperatures and adjust to design parameters of plate
	Liquid used not as per design	Has Glycol been added this will affect the plate design?
Leak from plate	Contamination	Check filters ect and replace plate
	Working pressure too high	Rectify and replace plate
Decrease in performance	Unit incorrectly installed	Check and re-pipe plate
	Plates partially blocked	Flush or replace plate
	Primary pumps not giving the correct flow	Check and reset pump flow or replace faulty pump
	Low primary flow temperature	Check primary flow temperatures and adjust to design parameters of plate
	Primary heat source undersized or faulty	Investigate and repair/upgrade as required
	Secondary flow is higher than design	Investigate and rectify
Damage/distortion to plate	Overpressure on system	Rectify and replace plate

[illegible]



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