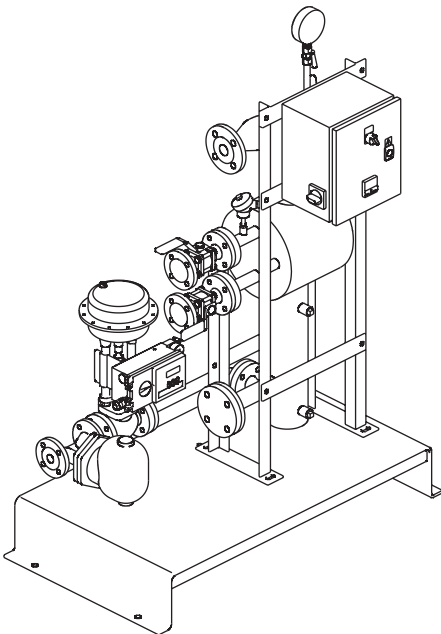


QuickHeat™

Packaged Heat Exchanger Solutions

Installation and Maintenance Instructions




QuickHeat™
(QH_C condensate control version) shown

1. Safety information
2. General product information
3. Installation
4. Commissioning
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1. Safety information

Pressure equipment not bearing the  mark is classified 'Sound Engineering Practice' in accordance with Article 3, Paragraph 3 of the European Pressure Equipment Directive 2014/68/EU.

It is the responsibility of the user to ensure that the product is installed and operated safely. Detailed product information including installation, operation and maintenance instructions can be obtained from www.SpiraxSarco.com or by contacting your local Spirax Sarco sales office.

Note: By law, SEP products cannot be marked with the  symbol.

Note

This document refers only to the mechanical installation and commissioning of the unit and should be used in conjunction with the IMI's and supplementary safety information for all the relevant system components.

Warning

Your attention is drawn to Safety in accordance with any National or Regional regulations.

This product is designed and constructed to withstand the forces encountered during normal use. Use of the product for any purpose other than its intended use could cause damage to the product and may cause injury or fatality to personnel.

Before any installation or maintenance procedure, always ensure that all primary steam and condensate return lines and secondary water lines are isolated.

Ensure any residual internal pressure in the system or connecting pipework is carefully relieved. Allow hot parts to cool before commencing work, to avoid the risk of burns.

Always wear appropriate safety clothing before carrying out any installation or maintenance work.

1.1 Intended use

- i) Check that the product is suitable for use with the intended fluid.
- ii) Check material suitability, pressure and temperature and their maximum and minimum values. If the maximum operating limits of the product are lower than those of the system in which it is being fitted, or if malfunction of the product could result in a dangerous overpressure or overtemperature occurrence, ensure a safety device is included in the system to prevent such over-limit situations.
- iii) Determine the correct installation situation and direction of fluid flow.
- iv) Spirax Sarco products are not intended to withstand external stresses that may be induced by any system to which they are fitted. It is the responsibility of the installer to consider these stresses and take adequate precautions to minimise them.
- v) Remove protection covers from all connections before installation.

Safe operation of these products can only be guaranteed if they are properly installed, commissioned, used and maintained by qualified personnel (see Section 1.11) in compliance with the operating instructions. General installation and safety instructions for pipeline and plant construction, as well as the proper use of tools and safety equipment must also be complied with.

1.2 Access

Ensure safe access and if necessary a safe working platform (suitably guarded) before attempting to work on the product. Arrange suitable lifting gear if required.

1.3 Lighting

Ensure adequate lighting, particularly where detailed or intricate work is required.

1.4 Hazardous liquids or gases in the pipeline

Consider what is in the pipeline or what may have been in the pipeline at some previous time. Consider: flammable materials, substances hazardous to health, extremes of temperature.

1.5 Hazardous environment around the product

Consider: explosion risk areas, lack of oxygen (e.g. tanks, pits), dangerous gases, extremes of temperature, hot surfaces, fire hazard (e.g. during welding), excessive noise, moving machinery.

1.6 The system

Consider the effect on the complete system of the work proposed. Will any proposed action (e.g. closing isolation valves, electrical isolation) put any other part of the system or any personnel at risk?

Dangers might include isolation of vents or protective devices or the rendering ineffective of controls or alarms. Ensure isolation valves are turned on and off in a gradual way to avoid system shocks.

1.7 Pressure systems

Ensure that any pressure is isolated and safely vented to atmospheric pressure. Consider double isolation (double block and bleed) and the locking or labelling of closed valves. Do not assume that the system has depressurised even when the pressure gauge indicates zero.

1.8 Temperature

Allow time for temperature to normalise after isolation to avoid danger of burns.

1.9 Tools and consumables

Before starting work ensure that you have suitable tools and/or consumables available. Use only genuine Spirax Sarco replacement parts.

1.10 Protective clothing

Consider whether you and/or others in the vicinity require any protective clothing to protect against the hazards of, for example, chemicals, high/low temperature, radiation, noise, falling objects, and dangers to eyes and face.

1.11 Permits to work

All work must be carried out or be supervised by a suitably competent person.

Installation and operating personnel should be trained in the correct use of the product according to the Installation and Maintenance Instructions.

Where a formal 'permit to work' system is in force it must be complied with. Where there is no such system, it is recommended that a responsible person should know what work is going on and, where necessary, arrange to have an assistant whose primary responsibility is safety.

Post 'warning notices' if necessary.

1.12 Handling

Manual handling of large and/or heavy products may present a risk of injury. Lifting, pushing, pulling, carrying or supporting a load by bodily force can cause injury particularly to the back. You are advised to assess the risks taking into account the task, the individual, the load and the working environment and use the appropriate handling method depending on the circumstances of the work being done.

Lifting

The QuickHeat™ unit should be lifted by a suitable forklift truck, from the base, placed in position and securely bolted to the floor.

Note:

- On no account is the unit to be lifted by any other part, other than the base.
- Sufficient space should be provided in its location to allow access for maintenance.
- The unit occupies a maximum of 4.1 m³ space.

The maximum footprint is 2205 x 2200 x 840 mm.

1.13 Residual hazards

In normal use the external surface of the product may be very hot.

Many products are not self-draining. Take due care when dismantling or removing the product from an installation.

1.14 Freezing

Provision must be made to protect products which are not self-draining against frost damage in environments where they may be exposed to temperatures below freezing point.

1.15 Disposal

Unless otherwise stated in the Installation and Maintenance Instructions, this product is recyclable and no ecological hazard is anticipated with its disposal providing due care is taken.

Please visit the Spirax Sarco product compliance web pages

<https://www.spiraxsarco.com/product-compliance>

for up to date information on any substances of concern that may be contained within this product. Where no additional information is provided on the Spirax Sarco product compliance web page, this product may be safely recycled and/or disposed providing due care is taken. Always check your local recycling and disposal regulations.

1.16 Returning products

Customers and stockists are reminded that under EC Health, Safety and Environment Law, when returning products to Spirax Sarco they must provide information on any hazards and the precautions to be taken due to contamination residues or mechanical damage which may present a health, safety or environmental risk. This information must be provided in writing including Health and Safety data sheets relating to any substances identified as hazardous or potentially hazardous.

2. General product information

2.1 Product nomenclature

Condensate control valve version

QuickHeat™	QH = Packaged heat exchanger system	QH
Heat load	2C = 50 to 300 kW	2C
	3C = 300 to 1 300 kW	
	4C = 1 300 to 3 300 kW	
	5C = 3 300 to 5 000 kW	
Piping configuration	S = Standard	S
Valve actuation	PN = Pneumatic	PN
	EL = Electric	

Selection example

A QuickHeat™ unit with a pneumatically actuated condensate control valve. The nomenclature for the above selection would be displayed as follows:

QH2C - S - PN

Steam control valve version

QuickHeat™	QH = Packaged heat exchanger system	QH
Heat load	2S = 100 to 400 kW	2S
	3S = 400 to 1000 kW	
	4S = 1 000 to 4 000 kW	
	5S = 4 000 to 10 000 kW	
Piping configuration	S = Standard	S
	FR = Fast response	
Valve actuation	PN = Pneumatic	PN
	EL = Electric	
Condensate removal	APT = Automatic pump trap	APT
	FT = Float and thermostatic steam trap	

Selection example

A QuickHeat™ unit with a fast response piping arrangement, having a primary pneumatically actuated steam control valve and an automatic pump-trap.

The nomenclature for the above selection would be displayed as follows:

QH2S - S - PN - APT

2.2 General information

QuickHeat™ systems are available in two main versions:

1. Supplied with a condensate control valve.
2. Supplied with a primary steam control valve.

Both versions use steam as the primary energy source, and provide accurate control of low temperature hot water for heating purposes, domestic hot water or hot water for processes. Systems can be sized for any heating duty from 50 kW to approximately 10 MW and are supplied fully assembled and tested ready for installation.

The QuickHeat™ unit consists of the following items (refer to Figures 1 and 2):

- Fully welded Plate & Shell® heat exchanger.
- Pneumatic or electrically actuated control valve and positioner.
- Controller and sensor.
- Condensate removal solution (either a float trap or an automatic pump-trap).
- Ancillaries.
- Secondary circuit isolation valves.
- Internal recirculation pump on fast response units.
- Internal injection valve on fast response units.

Note: For additional information about any particular product used in the construction of this unit see the relevant Technical Information Sheet.

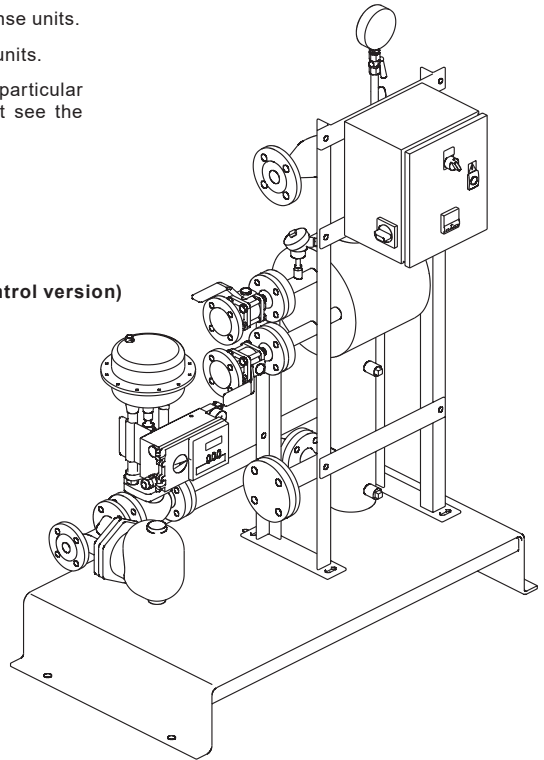
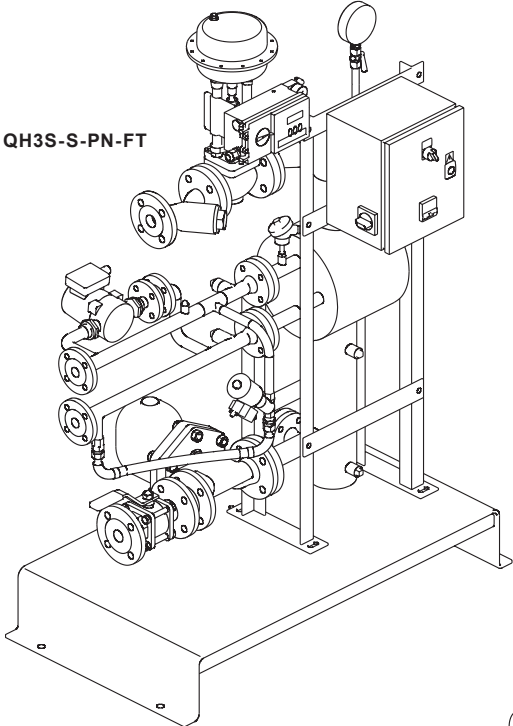
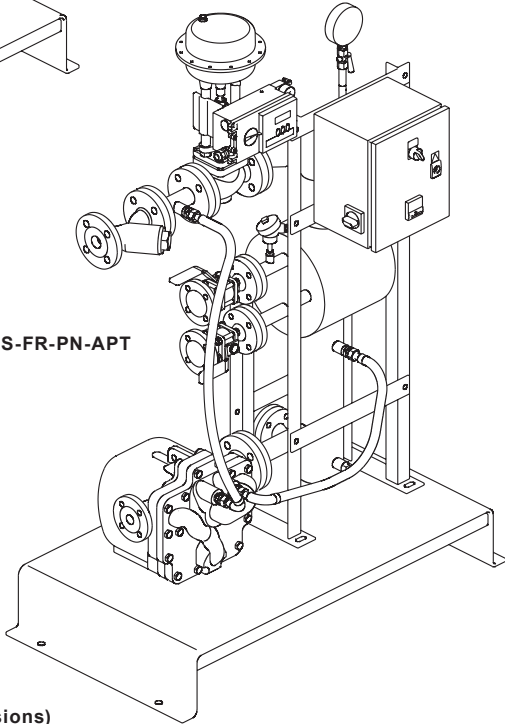


Fig. 1 QuickHeat™ (QH_C condensate control version)



QH3S-S-PN-FT



QH3S-FR-PN-APT

Fig. 2 QuickHeat™ (QH_S steam control versions)

3. Installation

Warning:

Before proceeding with any installation or maintenance work read Section 1, Safety information.

3.1 Steam and condensate connections

It is paramount that the required amount of dry clean steam is supplied to the QuickHeat™, in accordance with good steam engineering practice. In some instances, dry steam may be achieved by careful construction of the steam supply pipework and the proper positioning of the correct type of steam trap; in others, it may necessitate the installation of a steam separator (Spirax Sarco can advise). It should also be ensured that all connecting pipework is stress free and adequately supported. QuickHeat™ must not operate above the maximum steam pressure and temperature indicated on the name-plate attached to the unit.

QuickHeat™ contains all of the carefully matched components necessary to ensure its performance meets expectations. Spirax Sarco can advise on and provide complementary products or systems to ensure the QuickHeat™ system always operates safely and at the peak of its capability. We especially recommend that an independent high limit safety shut-off system be considered when heating water for personal use, or in process applications where overheating could be dangerous or create a costly shutdown, and that it should always be fitted where local regulations require it. It is recommended that the high limit safety system should isolate the steam supply to the QuickHeat™ in the event of either an overtemperature or loss of hydraulic pressure in the secondary water system. Care should be taken to ensure that a differential exists between the normal operating set point and the high limit set point, to avoid superfluous high limit shut-off.

In most cases, because of the high maximum operating pressure and temperature limits of QuickHeat™ components, extra pressure reducing valve stations and safety valves are not required to maintain integrity.

Spirax Sarco offers a complete solution to users of QuickHeat™, including initial evaluation, correct sizing and selection, and installation and commissioning.

3.2 Air supply

If a pneumatic control system is installed, connect a compressed air supply to the pressure regulator mounted on the control valve positioner.

Air supply	4.5 to 8 bar g (65 to 116 psi g)
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3.3 Electrical supply

All electrical wiring and connections should be carried out in accordance with National regulations and Standards.

Electrical supply	Power supply: 230 Vac / 50 Hz
	Supply fuse: 5A (T)
Actuators	24 Vac
Bypass solenoid valve (FR type only)	20 Vac / 50 Hz
Bypass pump (FR type only)	230 Vac / 50 Hz

4. Commissioning

We recommend the service and support of a Spirax Sarco Commissioning Engineer. Details of this service can be found by contacting Spirax Sarco.

Note: It is usual, in new piping installations, for dirt and foreign bodies to collect in the steam line during construction. It is essential to flush out new steam lines prior to apparatus being connected, and check and clean all relevant pipeline strainers prior to commissioning.

4.1 Commissioning procedure:

- **Ensure** the steam inlet valve upstream of the QuickHeat™ remains **shut**, thus isolating the steam supply.
- **Check all** electrical connections are secure and as per installation drawing.
- **Dry commissioning valve stroke check** - An initial valve stroke check should be carried out before the steam supply is turned on, to ensure free movement of the valve stem.
- **Open** all condensate drain valves.
- **Switch off** electrical power.
- **Open secondary** isolating valves downstream of the QuickHeat™.
- **Start** the main secondary water circulating pump(s).
- **Check to ensure** the secondary water is circulating through the QuickHeat™.
- **If** the secondary circulation is okay, and after ensuring that the voltage and frequency are correct, switch on the power to the unit via the local switch fuse.
- **Switch on** the QuickHeat™ main switch, (switch adjacent to the controller).
Note: Ensure the controller temperature setting is suitable for the application. If this needs to be altered, refer to the 'Controller Manual'.
- **Slowly open** the primary steam isolating valve to the QuickHeat™, to allow the supply steam pressure to increase slowly to the required value. When the required pressure is reached and no abnormalities are observed, open the valve fully.
- **Check** that the QuickHeat™ secondary outlet temperature is within the acceptable limits of the set point..
- **If necessary adjust PID settings**, (see DB-S27-08, 'Selecting PID settings'). **Spirax Sarco strongly recommends that only a suitably trained controls engineer adjust these parameters.**
- **Check** operation of steam traps / condensate pump to ensure that condensate is being removed from the heat exchanger throughout the complete heat load cycle, from full load to minimum load.
- **Check** for leaks.

The QuickHeat™ unit is now ready for service.

5. Operation

5.1 QuickHeat™ with condensate control valve

The condensate control valve automatically modulates the available heating area within the Plate & Shell® heat exchanger to match the required heat demand. The control valve is either pneumatically or electrically actuated and the system uses a Pt100 temperature sensor and temperature controller for precise control. This version requires a constant pressure steam supply to maintain a constant steam temperature in the heat exchanger. The steam pressure in the heat exchanger must be higher than the condensate backpressure at all times, and the water pressure in the secondary circulation system must be higher than the highest operating steam pressure.

This version gives accurate temperature control when used for heating and process hot water with slow changes in heat load.

5.2 QuickHeat™ with steam control valve

The steam flowrate is automatically modulated to match the heat demand by the steam control valve. The control valve is either pneumatically or electrically actuated and the system uses a Pt100 temperature sensor and temperature controller for precise control. The pumping trap version can operate at low or even sub-atmospheric steam pressure, in areas where there is a risk of scaling of the heat exchanger in open circuit installations such as a domestic hot water application.

This version can be used for domestic hot water, heating and process hot water. Accurate temperature control is provided whatever the requirements for fast or slow changes in heat load.

6. Maintenance

6.1 General

For maintenance of the individual components of the system, please see the relevant IMI's for the products concerned.

6.2 Scale formulation

Within open systems, such as domestic hot water systems supplying hot water to basins, baths and showers, and where there is continual make-up water, there is a risk of scale formation as the make-up water is unlikely to be chemically treated. The extent of the scale will depend largely upon the water quality, which varies greatly upon the geographical area and the site parameters. **A thorough test conducted by a water treatment specialist is recommended**; to determine and consider water quality and the condensing temperature, and whether scaling problems are foreseen which will subsequently require attention prior to the QuickHeat™ being specified or ordered.

After extended service - If scale becomes a persistent problem, regular chemical cleaning should be considered. ¼" ports are available on the secondary inlet and outlet piping to allow easy connection for 'Clean in Place' apparatus. It should be noted that raising the steam pressure could result in an increase of scaling.

6.3 High limit testing device

The purpose of this test is to ensure the QuickHeat™ safety system operates satisfactorily when required to do so.

Method

1. High limit temperature set point test

The temperature set point of the high limit controller should be lowered, to simulate an overtemperature on the system. The responsible or competent person should ensure the high limit device operates in a satisfactory manner.

2. Low limit secondary pressure test (if fitted)

The static water pressure in the secondary circulation system should be reduced to test the high limit control valve. (It is recommended that the secondary water circulation pumps be turned off for this test).

3. Electrical power failure test

The QuickHeat™ should be turned off at the controller to simulate an electrical power failure. An examination should be made to ensure that the high limit system has switched to its fail-safe mode, thus isolating the steam supply.

Frequency

It is essential that a responsible or competent person tests the high limit device on a regular and frequent basis. Intervals between tests should not exceed a six month period.

Spirax Sarco does not recommend the installation of a self-acting high limit system to QuickHeat™.

