

Spirax EasiHeat™
DHW Potable and Process Water Heating
Compact Heat Transfer Solution
Installation and Maintenance Instructions



1. Safety information
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1. Safety information

Safe operation of this product can only be guaranteed if it is 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.

Note: This document refers only to the mechanical installation and commissioning of the Spirax Sarco EasiHeat™ DHW packaged heat exchange system and should be used in conjunction with the relevant IMIs for the other system components and supplementary safety information for all the system components.

Warning - Lifting

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

On no account is the Spirax Sarco EasiHeat™ unit to be lifted by any other part, other than the base.

Note: Sufficient space should be provided around the systems location to allow access for maintenance.

Warnings - General:

1. This product is designed and constructed to withstand the forces encountered during normal use.
2. 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.
3. Before any installation or maintenance procedure, always ensure that all primary steam and condensate return lines and secondary water lines are isolated.
4. Ensure any residual internal pressure in the system or connecting pipework is carefully relieved.
5. Allow hot parts to cool before commencing work, to avoid the risk of burns.
6. Always wear appropriate safety clothing before carrying out any installation or maintenance work.

Warning - Anti-legionella cycle:

The temperature set-point during the anti-legionella cycle will exceed normal operating temperatures and could cause scalding if water is used during the cycle.

The cycle should only be initiated when it is safe to do so.

There must also be water drained from the circuit at the end of the cycle to assist in reducing the water temperature.

1.1 Intended use

Referring to the Installation and Maintenance Instructions, name-plate and Technical Information Sheet, check that the product is suitable for the intended use/application. The Spirax Sarco EasiHeat™ DHW potable and process water heating compact heat transfer unit complies with the requirements of the Pressure Equipment Directive (PED) - For any product specific PED categorisation that is required for this unit or products used in the make-up of the unit please contact Spirax Sarco directly.

- i) The product has been specifically designed for use on steam or water/condensate which are in Group 2 of the above mentioned Pressure Equipment Directive (PED). The products' use on other fluids may be possible but, if this is contemplated, Spirax Sarco should be contacted to confirm the suitability of the product for the application being considered.
- 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 and protective film from all name-plates, where appropriate, before installation on steam or other high temperature applications.

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 the danger of burns.

Warning: The temperature set-point during the anti-legionella cycle will exceed normal operating temperatures and could cause scalding if water is used during the cycle. The cycle should only be initiated when it is safe to do so.

The water must also be drawn from the system at the end of the cycle to assist in reducing the water temperature trapped within the system.

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.

Please note that if lifting straps are required we would recommend that they be fitted around the baffle plate legs to prevent damage to the unit.

2. General product information

2.1 General information

The Spirax Sarco EasiHeat™ DHW system uses steam to provide accurate heating of potable hot water or hot water for processes. Systems can be sized for any heating duty from 50 kW to approximately 1.1 MW and are supplied fully assembled and pressure tested ready for installation.

The standard Spirax Sarco EasiHeat™ DHW system is expandable by the inclusion of additional items such as steam pressure reduction, safety valve and safety high limit shut-off should be selected separately.

The base unit of the Spirax Sarco EasiHeat™ DHW provides the core of the system, while options (see Sections 2.2) provide additional features such as: high limit package, stop valve package and energy monitoring.

The Spirax Sarco EasiHeat™ DHW unit consists of the following core items (refer to Figure 1):

A - Plate heat exchanger.

B - Pneumatic or electrically actuated control valve and positioner.

C - PLC controller.

D - Pipeline ancillaries.

E - Lockable isolator

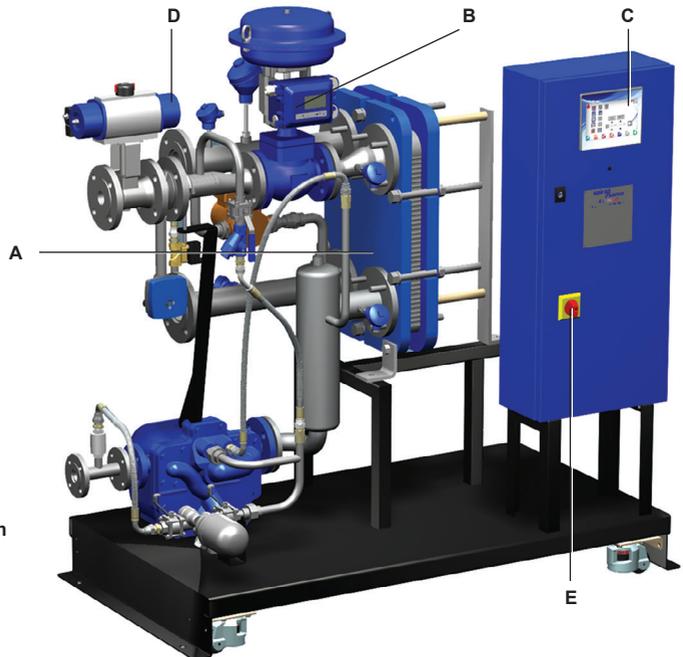


Fig. 1
Spirax Sarco EasiHeat™
DHW heat transfer solution

Notes:

1. For additional information about any particular product used in the construction of this unit see the relevant product specific Technical Information (TI) sheet.
2. For further technical information regarding the Spirax Sarco EasiHeat™ DHW see the Technical Information sheet TI-P481-02.

2.2 Spirax Sarco EasiHeat™ DHW nomenclature

The product nomenclature is a reflection of the core items and unit options that have been ordered and supplied – See the table below:

Spirax Sarco EasiHeat™ DHW nomenclature example:

EHD	2	P	EL	ST	-	HL	C	V2	G1	W	S	-	E	R2	C2
Compulsory selection	Domestic hot water		EHD = Spirax Sarco EasiHeat™ DHW										EHD		
			1 = DN20												
			2 = DN25												
	CV size		3 = DN32												
			4 = DN40												
			5 = DN50												
			6 = DN65												
	Pressure vessel code		P = PED												
	Actuation		EL = Electric												
			PN = Pneumatic												
		ST = Steam trap													
Condensate removal		PT = Pump trap													
		PTHC = Pump trap high capacity													
High limit		HL = Integrated high limit													
		IHL = Independent high limit													
High limit actuation (EL only)		B = Battery back-p													
		C = Super capacitor													
Isolation		V1 = Ball valve													
		V2 = BSA													
		V3 = DBB3													
Gasket material		G1 = EPDMPC													
		G2 = Heatseal													
Extras		W = Wheels													
		S = EN 12828 safety option													
Energy monitoring		E = With energy monitoring													
		R1 = Level 1 – SMS and E-mail													
Remote access		R2 = Level 2 – Full web access													
		R3 = Level 3 – SMS + Remote													
Communications		C1 = Modbus RTU													
		C2 = BACnet													
		C3 = LonTalk (LonWorks)													
		C4 = DeviceNet													
		C5 = CANopen													
		C6 = Profinet													
		C7 = Profibus													

3. Installation

3.1 Steam and condensate connections

It is important that the steam supply (and compressed air if pneumatic actuation is selected) to the Spirax Sarco EasiHeat™ DHW unit is supplied as dry and as clean as possible, in accordance with good steam engineering practice.

It should also be ensured that all connecting pipework is stress free and adequately supported.

The steam supply should always be maintained at the specified design pressure and temperature for the unit. The Spirax Sarco EasiHeat™ DHW must not operate above the maximum steam pressure and temperature indicated on the name-plate attached to the plate heat exchanger.

The installation of an appropriately sized safety valve, to protect any lower pressured equipment on either the hot or cold side of the plate heat exchanger, is strongly recommended.

Spirax Sarco supplies a range of traps, strainers, separators, safety valves and pressure reducing equipment.

3.2 Air supply

If a pneumatic control system is installed, connect a compressed air supply (4.5 to 8 bar g (65 to 116 psi g)) to the pressure regulator mounted on the control valve.

3.3 Electrical supply

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

A lockable isolator/switch disconnect should be fitted adjacent to the unit.

Mains supply is directly connected to the primary side of the incoming control panel isolator (shown with the IP2X cover removed) and main earth terminal as shown in Figure 2.

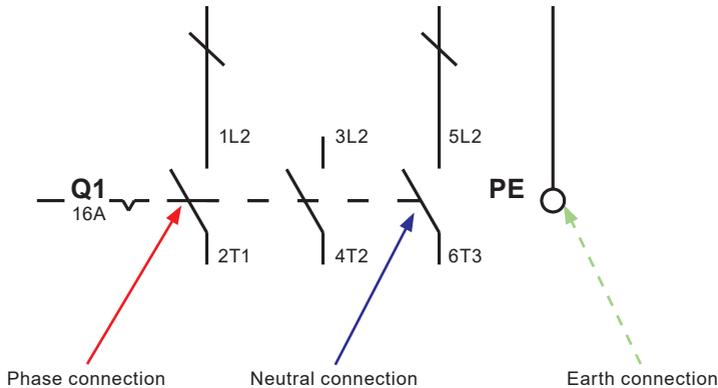


Fig. 2

3.4 Electrical specifications

Electrical supply: Refer to the name-plate on the unit

Control panel supply voltage	110 Vac/60 Hz
	240 Vac/50 Hz
Control panel load requirements	Internally fused at 5 amps
Electrical control actuator	24 Vac
	4 - 20 mA control
Pneumatic control actuator	-
	4 - 20 mA control
High Limit isolation valve (optional)	24 Vac
Steam flowmeter TVA (optional)	4 - 20 mA control
PT100 temperature sensors	3 wire

Note:
Power supply 10 - 16 A

3.5 Electrical connections

The following are available for customer connection to the Spirax Sarco EasiHeat™ system if required:

	Terminal designation	Description	Type
Volt free contacts	X14	Enabled/running signal	1 x N/O contact
			1 x N/C contact
	X15	High Limit alarm	1 x N/O contact
			1 x N/C contact
	X16	Band Alarm	1 x N/O contact
			1 x N/C contact

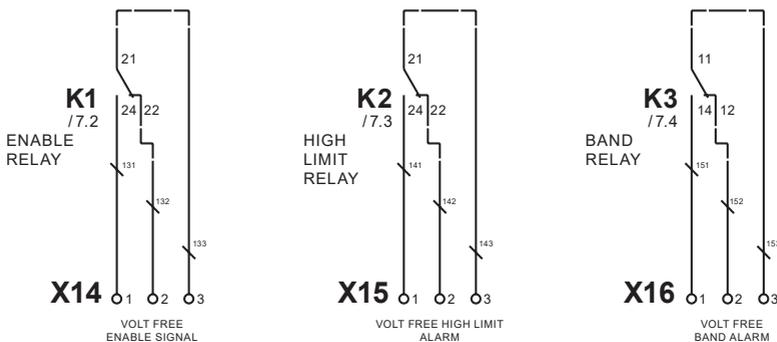


Fig. 3

Remote operation and retransmission connections

Terminal designation	Description	Type
X7	Remote set point	4-20 mA input
X17	Remote enable	24 Vdc signal
X9	Retransmission value	4-20 mA output

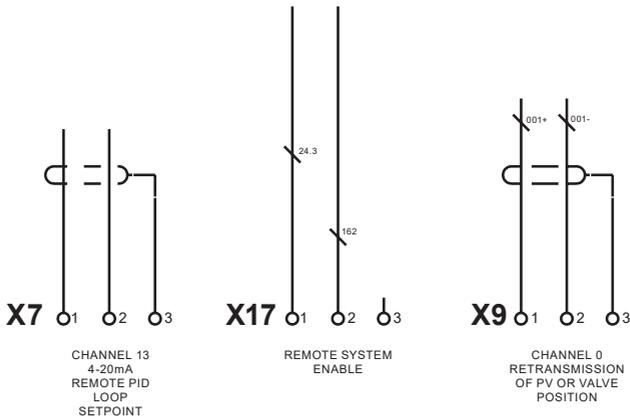


Fig. 4

Terminal layout overview

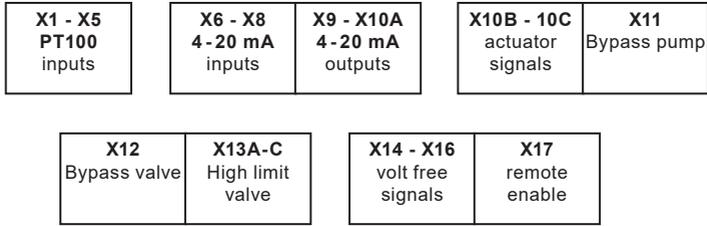


Fig. 5

Terminal layout detailed

Note: for detailed wiring schematic options please refer to the 'Operations manual'.

1. Basic

- 2. Independent high limit
- 3. Independent high limit with safety
- 4. American standard

- X1** - Water temperature IN
- X2** - Water temperature OUT
- X3** - Steam temperature
- X4** - Condensate temperature
- X5** - High limit temperature

Group X6 to X10A

- X6** - Linear actuator feedback
- X7** - Remote PID loop set point (requires 4-20mA input)
- X8** - Steam flow
- X9** - Retransmission value
- X10A** - Linear actuator control position

Group X10B to X11

- X10B** - Linear actuator closed signal
- X10C** - Linear actuator supply voltage (Electric actuator only)
- X11** - Bypass pump
- X12** - Bypass valve
- X13** - High limit valve
- X13A** - High limit valve control output signal
- X13B** - High limit valve supply voltage (electric actuator only)
- X13C** - High limit valve battery signal

Group X14 to X17

- X14** - Volt free signal for enabled
- X15** - Volt free high limit
- X16** - Volt free band alarm
- X17** - Remote enable signal

4. Commissioning

We recommend that you use the service and support of a Spirax Sarco commissioning engineer. Details of this service can be found by contacting Spirax Sarco.

Note: Pre commissioning requirements:

- In most new installations, dirt collects in the steam pipeline during construction of the system. It is essential to flush this out prior to commissioning.
- Ensure the secondary (cold side) of the system is charged and all air is bled from the system.
- Ensure that all main isolation valves for both steam and water are isolated.
- Ensure that the electrical supply to the Spirax Sarco EasiHeat™ is isolated.
- Double check that all steam, condensate and water connections are correctly connected to the Spirax Sarco EasiHeat™.
- Check all flange bolts are tight.

Fig. 6

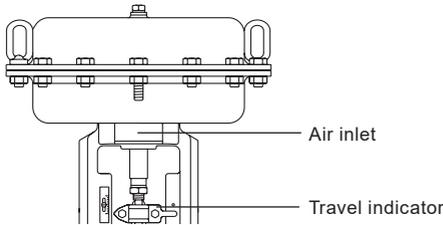
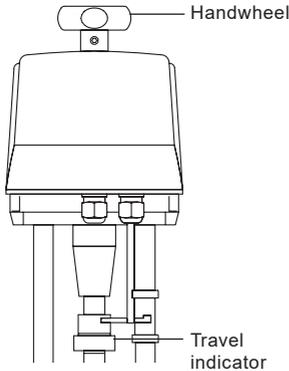


Fig. 7

4.1 Mechanical commissioning procedure:

- Check that all of the electrical connections are secure and as per the wiring diagram (Section 3.3, Figure 2).
- Dry commissioning valve stroke check - An initial valve stroke check should be carried out to ensure free movement of the valve stem.
 1. For the electric actuated control valve, use the manual override on top of the actuator to raise and lower the actuator spindle between the two travel indicators located on the side of the pillar (Figure 6).
 2. For the pneumatic actuated control valve, remove the existing air supply and connect an independent air supply to the actuator (pressure not to exceed 6 bar g [87 psi g]), allow the valve to fully open, remove the air supply from the actuator allowing the valve to close. Reconnect the original pipework (Figure 7).
- Open the secondary (cold side) isolating valves downstream of the Spirax Sarco EasiHeat™.
- Start the main secondary water circulating pump(s) if fitted.
- Check and confirm there is secondary water circulation through the Spirax Sarco EasiHeat™.
- If the circulation is okay, switch on the main power to the control panel (local isolator).
- Turn the control panel isolation switch to 'ON'.
- Follow the quick start-up guide (Section 4.4) before opening the steam isolations valves.

4.2 TVA quick commissioning:

The TVA flowmeter is factory set to display data in metric units (changeable to imperial if required by following the flow chart, Figure 10, or the individual product Installation and Maintenance Instructions (IMI)).

All commissioning of the TVA is through the arrow buttons located on the front display see Figure 8.

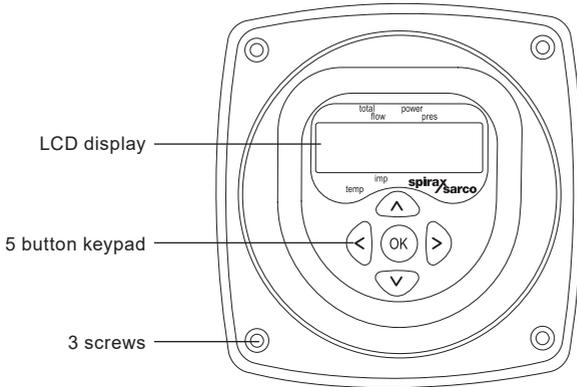


Fig. 8

Press and hold down the 'OK' button and hold for 3 seconds, then enter the default pass code.

Use the up and down arrows to set the number then press OK to confirm your selection, repeat until all numbers are entered.

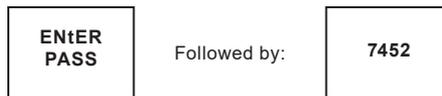
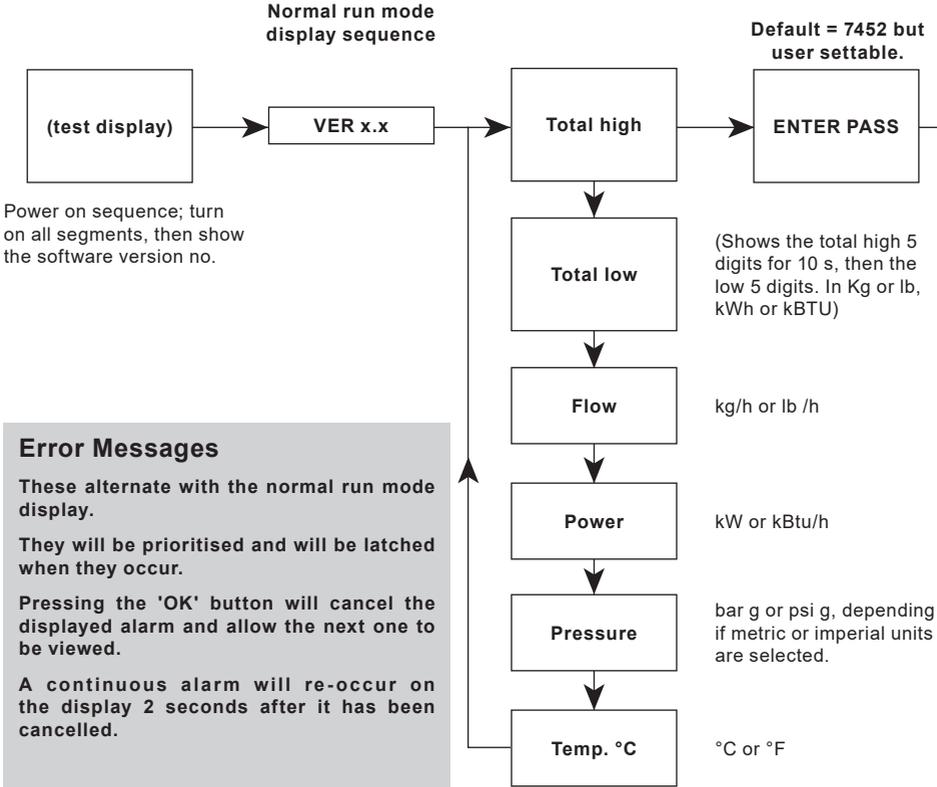


Fig. 9

4.3 TVA flowmeter commissioning chart

To navigate around the first level menu use the up and down arrows, to enter any sub menu use the right arrow.

Fig. 10 TVA configuration displays



Error Messages

These alternate with the normal run mode display.

They will be prioritised and will be latched when they occur.

Pressing the 'OK' button will cancel the displayed alarm and allow the next one to be viewed.

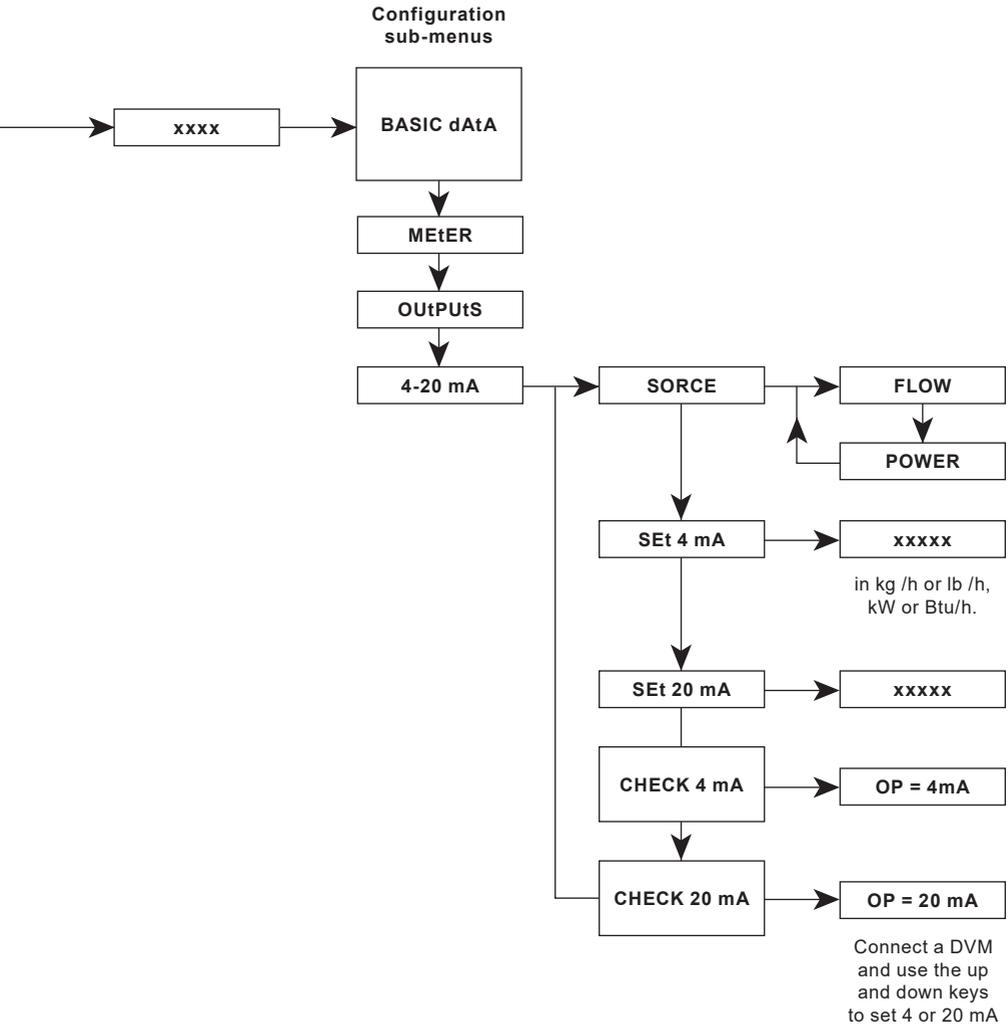
A continuous alarm will re-occur on the display 2 seconds after it has been cancelled.

Power interrupted **POWER OUT**

No signal from sensor **NO SIGNL** The 4-20 mA alarm can also be activated

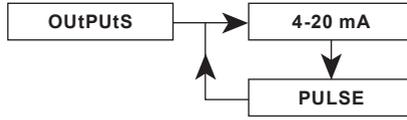
Signal from sensor constant **SENSR CONST** The 4-20 mA alarm can also be activated

Flow above maximum **HIGH FLOW** Shows when flow i/p exceeds MAX A



From the Basic dAtA menu navigate to OutPUtS and press the right arrow to enter the sub menu of 4 - 20 mA.

Fig. 11

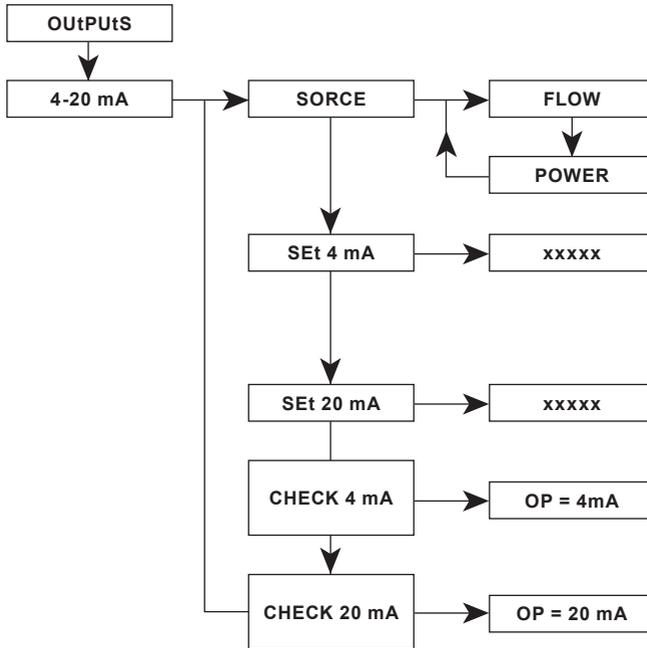


The next menu Sorce will need FLOW to be selected.

Obtain the correct flow data from the Spirax Sarco EasiHeat™ specification sheet supplied for accuracy, thereafter navigate down the menu and input:

Minimum flow = 4 mA
 Maximum flow = 20 mA

Fig. 12



After this data has been input, continually press the left arrow button to take you back to the run mode.

This completes the basic requirement for scaling of the TVA flowmeter suitable for integration with the HMI.

4.4 HMI quick start commissioning procedure:

The HMI display is a 7" touch screen, and the following procedures detail a basic set-up of the control system from initial power up.

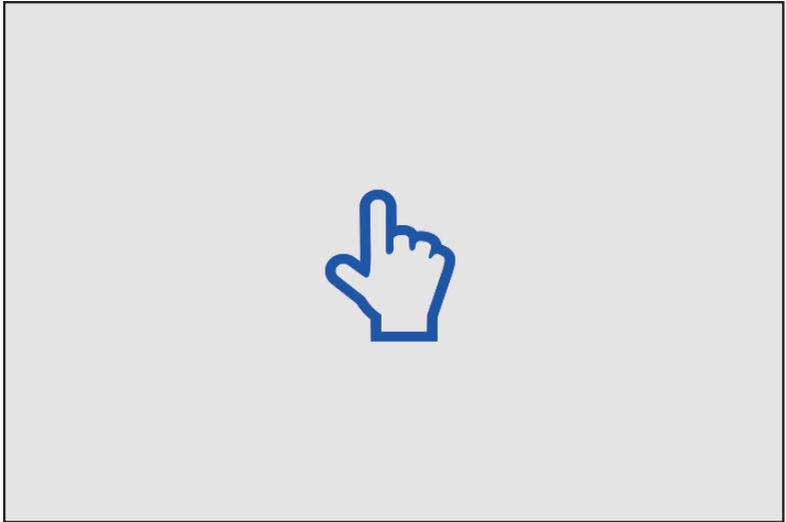


Fig. 13

When ready the above screen will appear, touch the screen. If the unit has not been configured for previous use following page will appear.

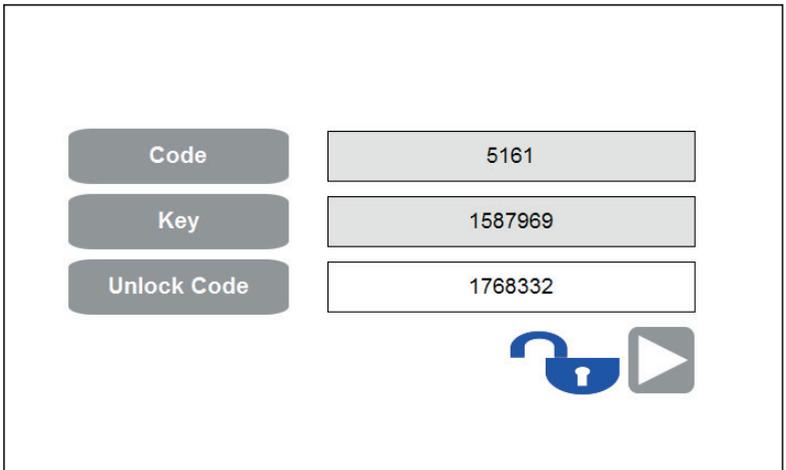


Fig. 14

To be able to move to next page the unlock code is essential, after entering the proper code (found on the software authentication document), the lock and the continue button will appear which will transfer you to the time/date setting page.

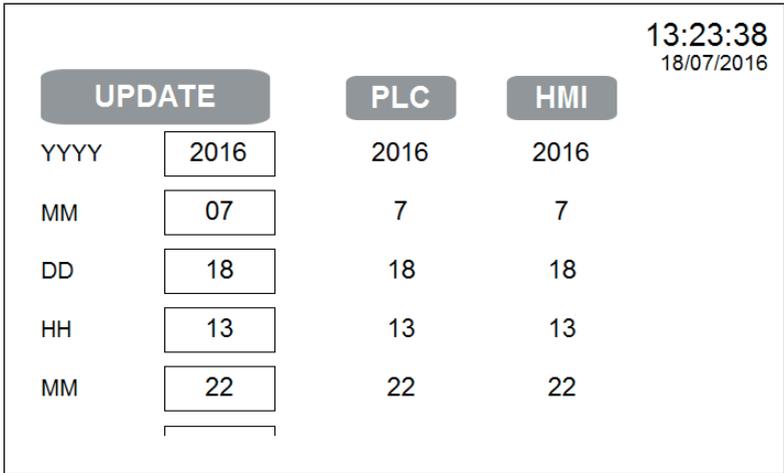


Fig. 15

After unlocking the system (by using the unlock code) and setting the time and date or if the unit has been returned to factory default one of the following four pages will appear (pre-configured for designated region):



Fig. 16



Fig. 17



Fig. 18



Fig. 19

By choosing the relevant flag for your Country the common default engineering units and language will automatically be selected for that region. These values can be changed after the initial commissioning set-up procedure has been completed (see Section 4.5.3).

The system will advance automatically to allow the selection of the relevant Spirax Sarco EasiHeat™ unit - The type of Spirax Sarco EasiHeat™ unit that is available is dependent on the flag selection.

The next screen (Figure 20) requires confirmation of the system to be configured.

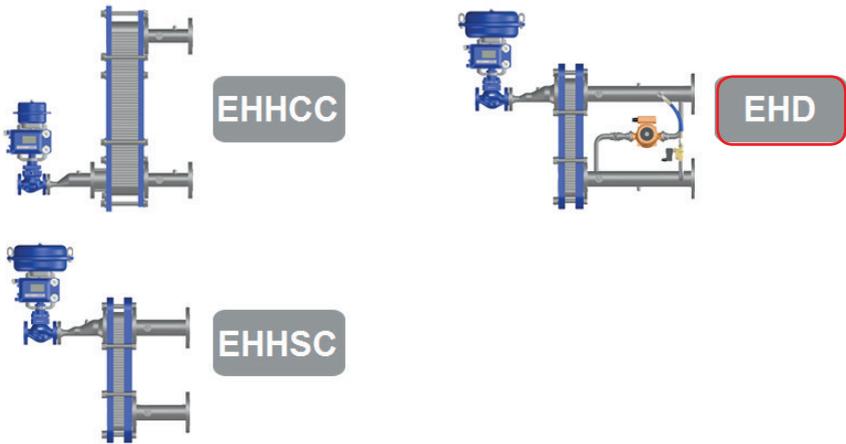


Fig. 20

The selection shall be confirmed by the icon becoming highlighted with a red surround and a continue button shall be revealed.

Press the continue button to advance to the system configuration menu.

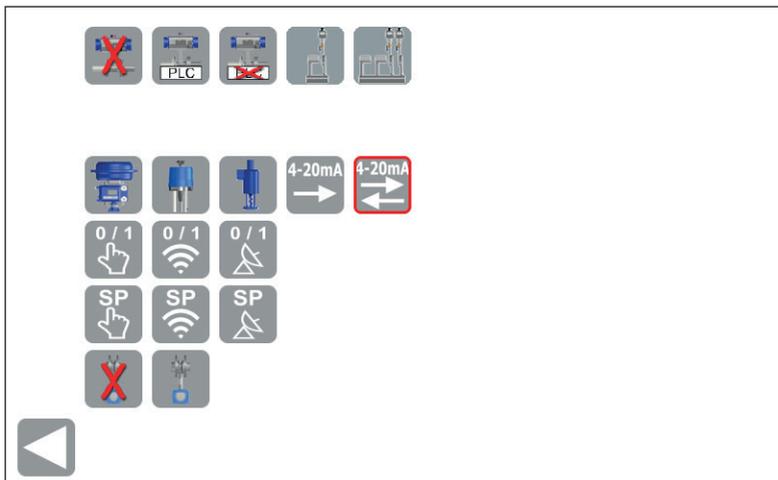


Fig. 21

The system configuration is now required to be entered on this page; again a selection is highlighted by a blue surround around the icon.

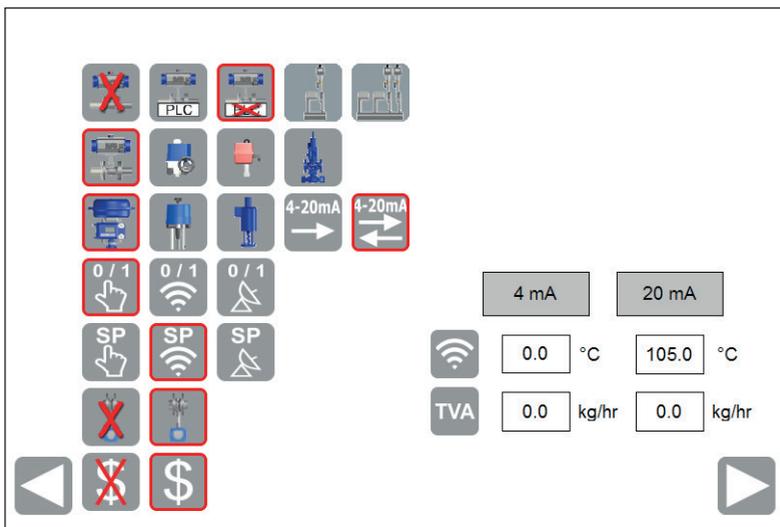


Fig. 22

System configuration should match the mechanical configuration of the Spirax Sarco EasiHeat™ and control system of the plant, proper configuration will show or hide options available after configuration. Some of the screens may contain additional options which with specified configuration may be hidden; all the options are described in this document.

Spirax Sarco EasiHeat™ mechanical and control system configuration options are detailed as follows:

Fig. 23
High-limit selection



Not installed



PLC controlled



Independently controlled



Single safety interlock



Double safety interlock

Fig. 24
¼ turn actuator selection



BVA



PSA



Valves



DP27E

Fig. 25
Linear actuator selection



Electrical



Pneumatic

Fig. 26
Linear actuator control signals



No position feedback



Position feedback

Fig. 27
Enable control selection



Local



Remote



Communications

Fig. 28 PID set point selection



Local



Remote



Communications

Fig. 29 TVA flowmeter selection



Not installed



Installed

Fig. 30 Cost calculation



Disabled



Enabled

TVA not installed and local set point selected

If the Spirax Sarco EasiHeat™ unit is not fitted with a TVA flowmeter then the system configuration is now complete and the continue navigation button at the right-base of the screen can be used to navigate to next page which is the Start Page (Figure 13, page 16 - Blue hand).

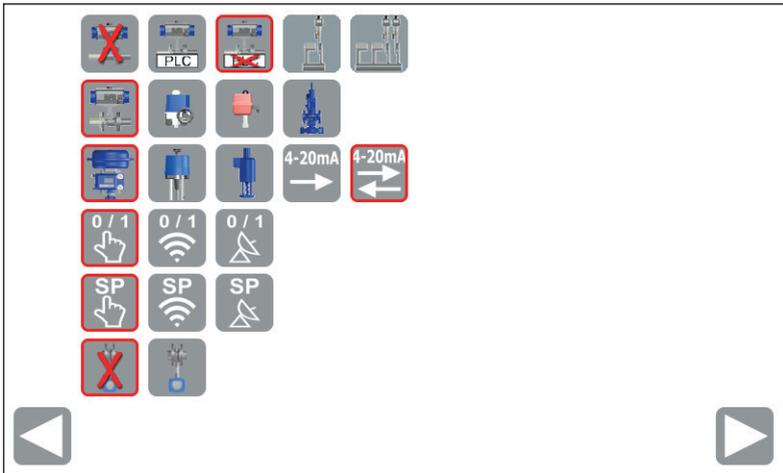


Fig. 31

TVA installed and remote set point selected

On TVA flowmeter selection a data entry point shall be displayed in order for effective scaling of the flowmeter (full engineering range for the 4-20 mA signal input to the Spirax Sarco EasiHeat™ system). The full range values entered at this point should match exactly those that are programmed in the TVA flowmeter parameters (Refer to Sections 4.2 and 4.2.1 for TVA commissioning data) as well as remote set point.

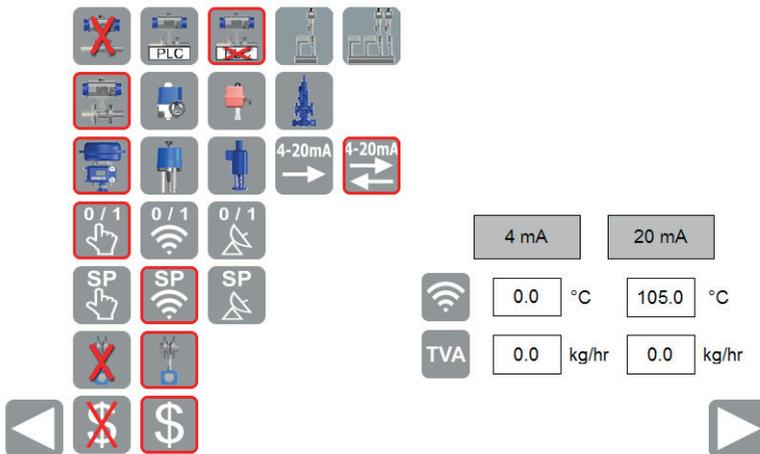


Fig. 32

A continue button will appear after system configuration which will navigate to the logged energy data for the Spirax Sarco EasiHeat™ system.

Press the continue button to navigate to the energy set up page.

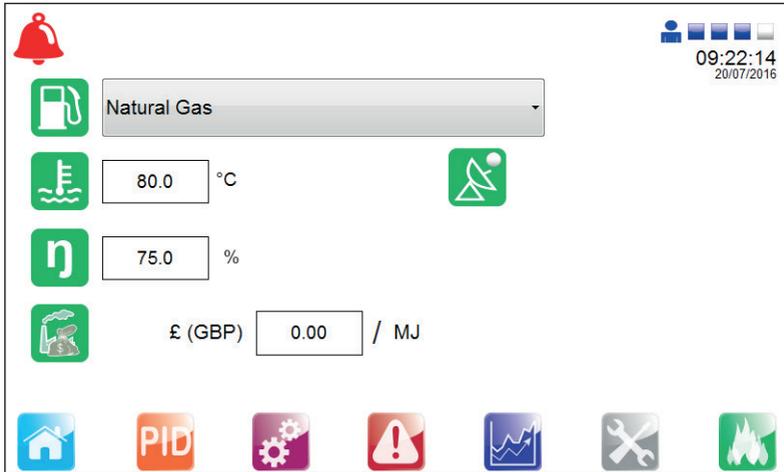


Fig. 33

Accurately enter specific energy data to ensure valid energy data can be calculated.



Boiler fuel properties - Selected via the drop down menu



Boiler feedwater temperature



Boiler efficiency



Cost per unit of fuel



Override energy set points with BACnet set points

In addition enter the custom fuel set points by selecting the custom fuel type.

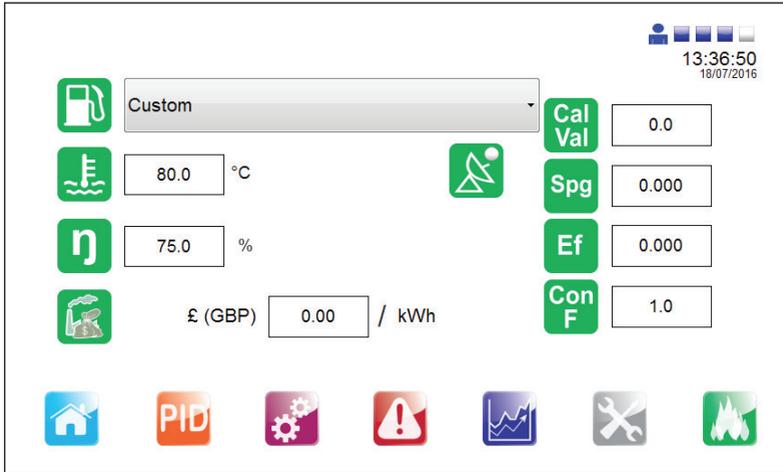


Fig. 34

Custom fuel parameters to be set:



Fuel calorific value



Fuel specific gravity



Fuel emission factor



Fuel conversion heat factor

Energy setting will not affect control process, to obtain correct values of the calculated energy, the accurate data settings are essential.

4.5 Global navigation buttons



Home mimic



PID set points



Settings menu



Alarms menu



Historical trends



Service menu



Energy logging



4.5.1 Home mimic

This button will always navigate you back to the overview of the Spirax Sarco EasiHeat™ system that has been selected and configured.

From this home screen the overall status and control of the Spirax Sarco EasiHeat™ systems operation can be performed, depending on the security level access.

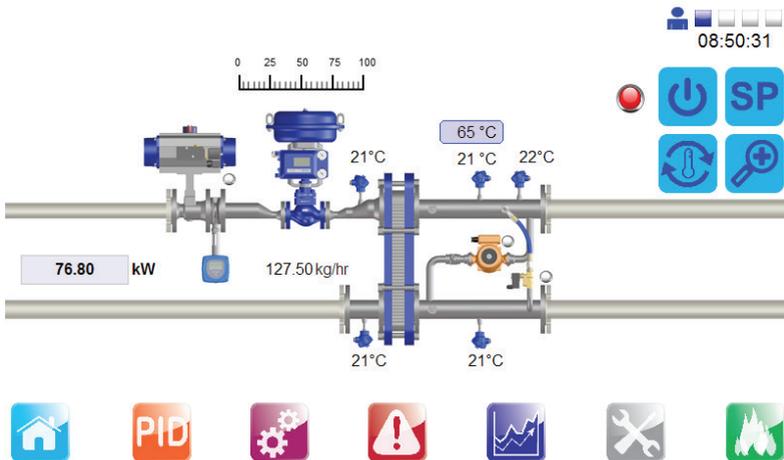


Fig. 35

Images shown below are dialogue pages that are only available for engineers access, which allow control over the valves, it is possible to enter those dialogs by pressing the screen surface at one of the unit devices (valves). This will allow the setting of the operation mode AUTO or MANUAL in which we are able to open/close the valves.

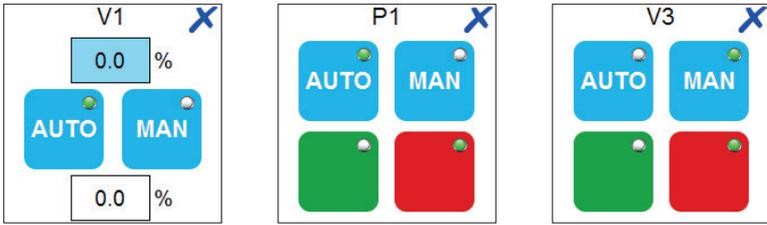


Fig. 36

V1 dialog page contains two value fields, the top one show the actual valve position, and the bottom one can be used to move the valve to requested position in manual mode.

- 
Automatic mode
- 
Manual mode
- 
Open/Start
- 
Close/Stop

The light indicator shows what mode is selected.



PID set point

This pop-up menu depending on the communications, allows users to either set the local temperature set point or view the remote or BACnet temperature set point and enter the Spirax Sarco EasiHeat™ system PID associated ramp up and ramp down time bases. If the configuration were set to BACnet, it is possible to override the configuration and change it to local enable.

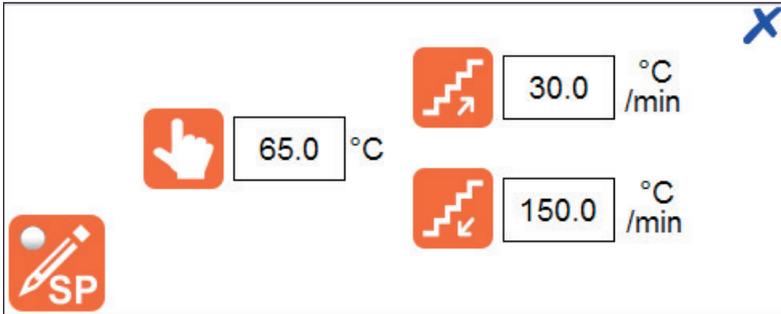


Fig. 37



Local temperature set point



Remote temperature set point



BACnet temperature set point (remote)



Ramp-up temperature set point



Ramp-down temperature set point



BACnet temperature set point override with local temperature set point



Enable control

This pop-up menu depending on the configuration, allows the user to select one of three control modes for the Spirax Sarco EasiHeat™ or view the remote or communications enable status. If the configuration were set to BACnet, it is possible to override the configuration and change it to local enable configuration.



Fig. 38



Spirax Sarco EasiHeat™ OFF mode



Spirax Sarco EasiHeat™ ON mode



Remote or communications enable



Communications enable override with local Spirax Sarco EasiHeat™



Zoom

The zoom pop-up provides a more detailed view of the key process parameters.

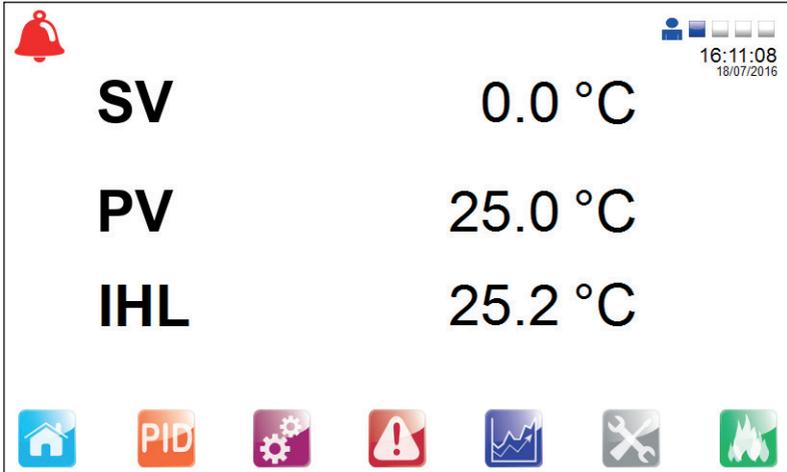


Fig. 39



Anti-legionella

To minimise the growth of legionella bacteria from growing in the water pipeline a routine has been programmed into the EasiHeat™ control system. The anti-legionella control and set-point page is accessible from a button located on the main screen.

There are two modes of operation for the anti-legionella cycle that are selectable from the HMI pop up screen, these are:

- Manual
- Automatic (timed)

Warning: The temperature set-point during this cycle will exceed normal operating temperatures and could cause scalding if water is used during the cycle. The cycle should only be initiated when it is safe to do so. There must also be water drained from the circuit at the end of the cycle to assist in reducing the water temperature.

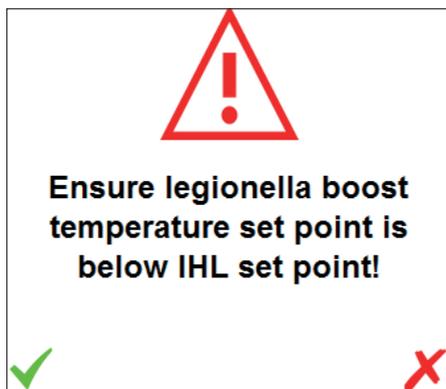


Fig. 40

When the anti-legionella button is pressed a confirmation screen will appear, only if Independent High Limit is fitted (IHL). Ensure the boost cycle temperature is below the high limit set-point.

Manual mode

The default mode of operation is Manual. In order to operate the anti-legionella cycle in manual mode press MAN. This is confirmed by the Manual set point entry fields being available, and confirmed by the LED on the HMI (Figure 42).

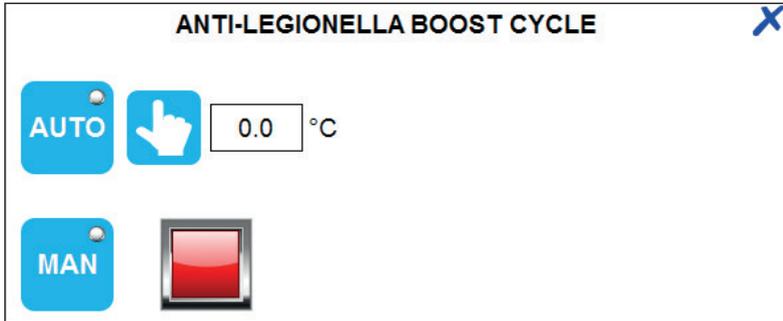


Fig. 41

The next step is to set the anti-legionella boost temperature that the EasiHeat™ must achieve during a cycle. **Note** that the temperature setting must not exceed that of the Independent High Limit (IHL) if fitted.

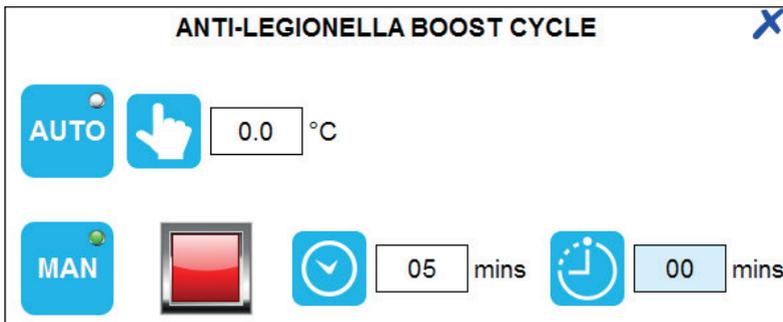
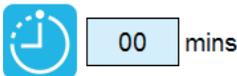


Fig. 42



This is the time, set-point, for the manual cycle boost in which the cycle will be performed. During this time the process temperature request will be overridden by the temperature entered in the anti-legionella boost cycle setting window.



Cycle time counter, displays the amount of time (minutes) has passed since start cycle.



Enable/Disable request button.

Finally the unit must be manually enabled from the enable request pushbutton located on the HMI, the user can stop the anti-legionella boost cycle at any time by pressing the same button.



Fig. 43

Automatic mode

In order to operate the anti-legionella cycle in the automatic or timed mode, select AUTO. This is confirmed by the Automatic set-point entry fields being available and confirmed by the LED on the HMI. The next step is to set the anti-legionella boost temperature that the EasiHeat™ must achieve during the cycle. Then there must be a period of automatic operation set into the start and finish time. **Note:** If the time is between the two time parameters then the unit shall be enabled and operate.

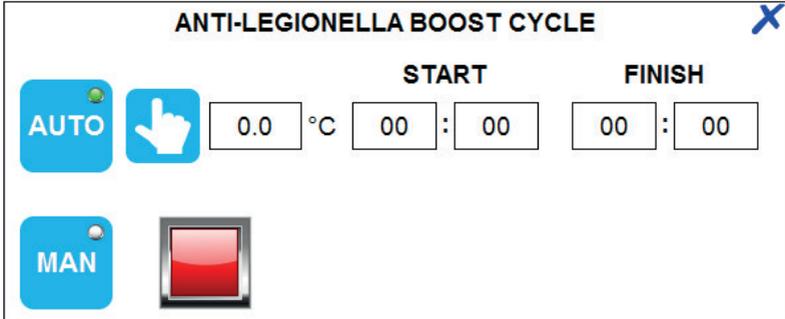


Fig. 44

The automatic/timed cycle cannot be started by pressing the button on HMI interface, however the button can be used to shut the cycle down early if required by pressing the Enable/Disable button (as per the manual operation).

Note: When enabled (in either mode of control) the process set-point temperature used to control the PID loop and proportional valve is overridden by the anti-legionella temperature set-point. The anti-legionella set-point is still governed by the same ramp-up and ramp-down rates as the original set-point to ensure a smooth transition in the process between set-point changes.

In addition the high limit alarm temperature set-point is raised by 5° to avoid high limit alarm conditions only when the PLC controlled High Limit is selected.

If there is an Independent High Limit fitted a confirmation warning will appear requesting confirmation that the cycle temperature is lower than the high limit, if so continue by pressing accept.



4.5.2 PID set points

This page allows you to set the PID control factors (entries available only for engineers).

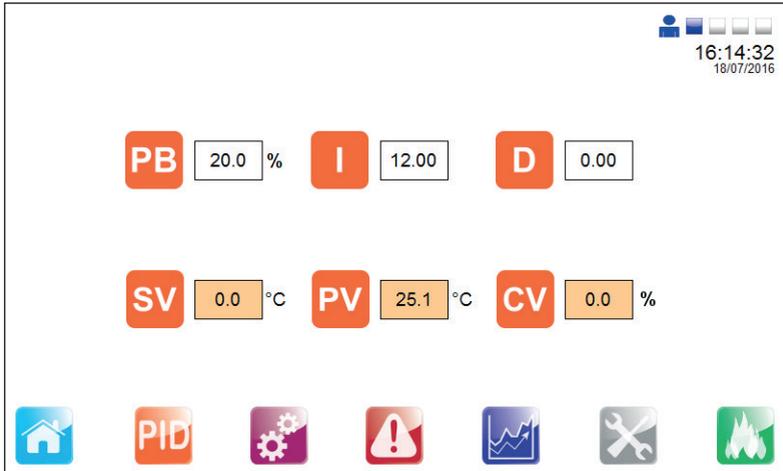


Fig. 45



Proportional band (P factor of the PID control)



Proportional gain (P factor of the PID control)



Integral factor (I factor of the PID control)



Derivative factor (D factor of the PID control)



Desired value (local, remote or communications set point)



Current value of the controlled variable (T2 temperature)



Manipulated value (valve position request)



PID real time trend page
(Allows to configure the PID set points with view of the actual signals)

The following screen is accessible from above PID Loop Set Points page (available only for engineers). We are able to switch between proportional band and proportional gain. Trend shows us PID loop real time responses. The SV, PV and CV values at PID Real Time Trend are scaled to percent.

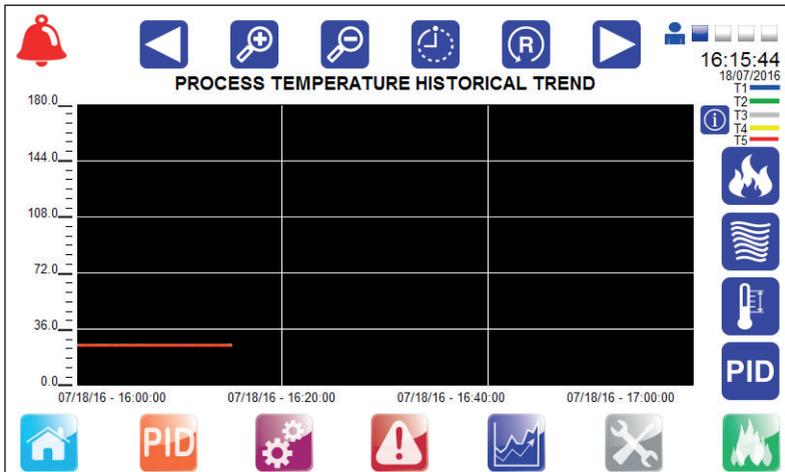


Fig. 46



4.5.3 Settings menu

The settings displayed (with blue surround) are default settings after the country flag has been selected, changes can be made if required.

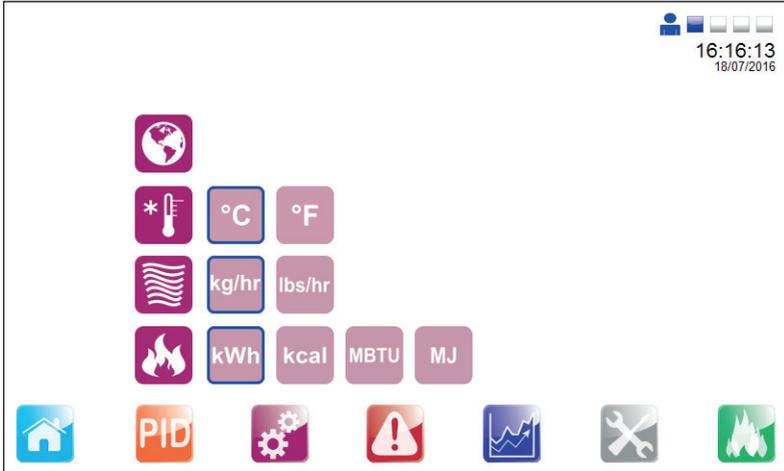


Fig. 47



Time/date configuration page



Language selection page



Temperature units selection



Flowmeter units selection (Energy monitoring only)



Energy units selection (Energy monitoring only)

There is also the possibility of changing the language (from the pre-configured options) by using the following selection menu without affecting the engineering units:



Fig. 48

In addition, engineers are able to set or change the actual time and date for PLC and HMI.

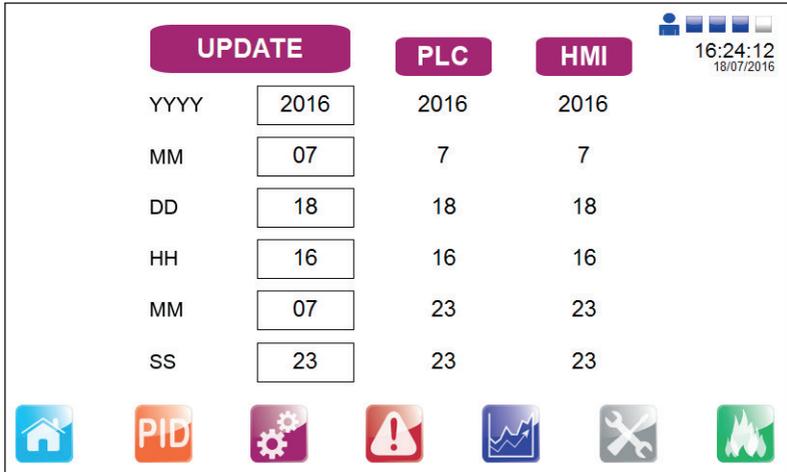


Fig. 49



4.5.4 Alarms menu

The following page shows all active alarms, an active alarm is indicated on all the mimic screens via the alarm bell in the top left hand corner of the screen.

State	Description	Date	Time
Triggered	V1 Position 4 - 20mA Under Range	18/07/2016	13:32:19
Triggered	Remote PID / Outside Weather 4 - 20mA Under Range	18/07/2016	13:34:56
Triggered	Steam Flow meter 4 - 20mA UnderRange	18/07/2016	13:34:53
Triggered	TSI Independent High Limit Alarm	18/07/2016	13:31:43
Triggered	CPU Battery Fault	13/07/2016	13:23:37
Triggered	CPU Warning Active	13/07/2016	13:23:37

Fig. 50

There are also navigations to further alarm set point pages as well as the historical alarm list, located on the right of the display. Press each of them to view or alter.



High-limit alarm set point (PLC controlled only)

95.0 °C

1 secs

High-limit temperature set point

High-limit temperature mask time



Band alarm

 °C

 secs

 secs

Band alarm temperature set point

Band alarm delay time set point

Band alarm reset time set point



Deviation alarm

 °C

Deviation alarm set point



Rate of change alarm (DHW only)

A screenshot of a configuration screen for a rate of change alarm. It features three rows of settings, each with a red icon on the left and a text input field on the right. The first row has a waveform icon and the value '10.0 °C'. The second row has a clock icon and the value '2 secs'. The third row has a circular arrow icon and the value '5 secs'. A blue 'X' icon is in the top right corner of the screen.

Temperature rate of change alarm set point

Process set point reduction set point

Alarm reset time set point



Reset high-limit alarm latch (PLC controlled high-limit only)



Historical alarm page

The following page provides access to historical alarm list. This allows the user to view previously triggered alarms.

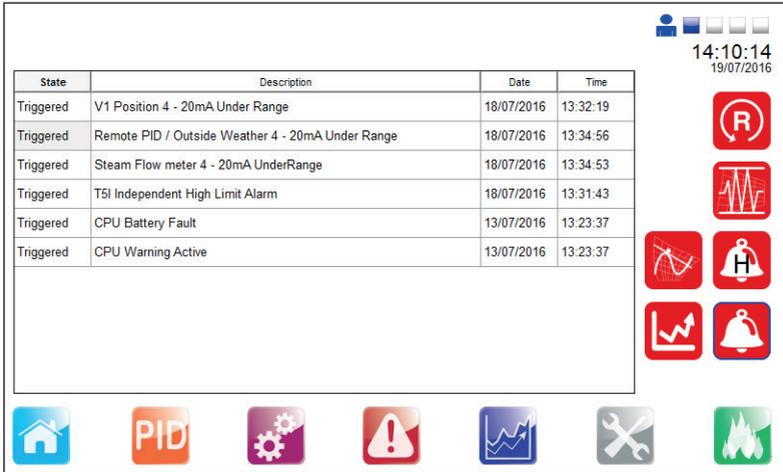


Fig. 51



Alarms indication icon



Caution - high-limit setting



Manual alarm indication icon

- If fitted, the high-limit controller should be set at a suitable level to protect plant, process and personnel.
- Care should be taken to ensure sufficient difference between the process set point and the high-limit set point, to avoid any unwanted high limit tripping.
- Check temperature rises to set value and controls satisfactorily.
- If necessary adjust PID settings. We would strongly recommend that only a suitably trained controls engineer adjust these parameters.
- Check operation of steam traps/condensate pump.



4.5.5 Trend menu

This menu provides historical trend monitoring of the process values, useful for analysing the historical reactions of the Spirax Sarco EasiHeat™ system to process conditions.

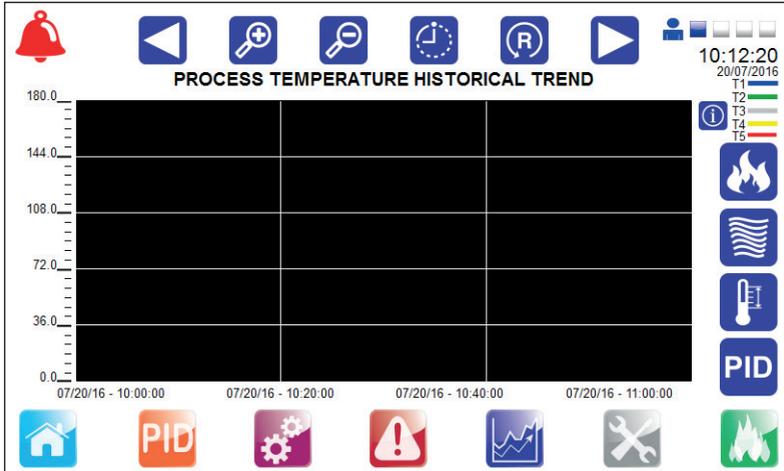


Fig. 52



Energy trend page button (energy monitoring only)



Flow trend page button (energy monitoring only)



Temperature trend page button



PID process trend page button



Scroll trend left



Zoom in
trend



Zoom out
trend



Move trend to
actual position



Refresh trend



Scroll trend
right



4.5.6 Service menu

The following page provides service information and allows engineering level users to navigate to pages containing process information.

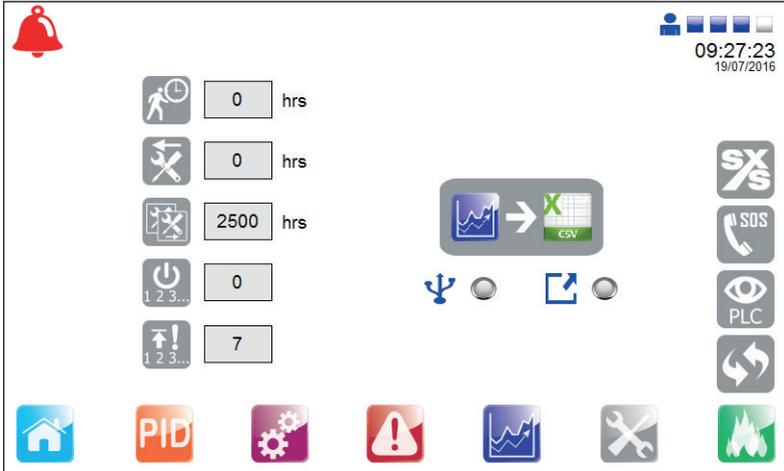


Fig. 53



Save trends to USB memory stick



This LED if green confirms that the memory stick is connected and the data format is correct (FAT32 only allowed)



This LED is switched on only during the trend dump, do not remove the memory stick before it is switched off or data may be lost



Total unit runtime



Last service due at number of hours



Next service due at number of hours



Process enable event count



High-limit event count



Local Spirax Sarco engineer contact details dialog page



Hardware monitoring pages (input/output overview)



Restore commissioned set points (access level 2)



4.5.7 Hardware monitoring

The following pages provide only an overview of the input and outputs; it is not possible to set any set points.



Fig. 54

Figures 55, 56, 57 and 58 display the analogue input and output values.



Fig. 55 CPU



Fig. 56
Digital input

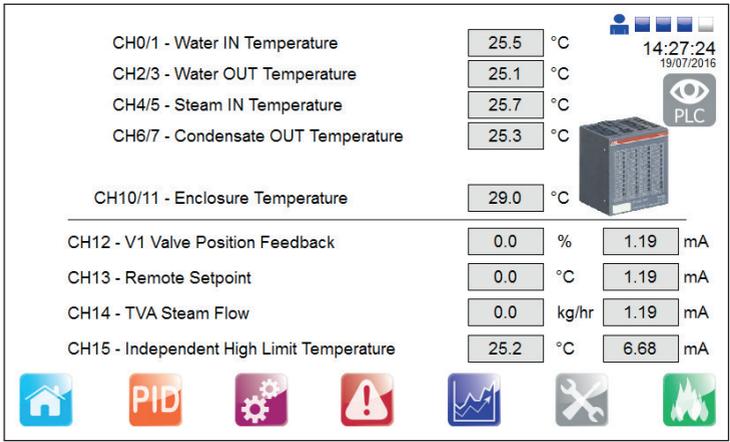


Fig. 57
Analogue inputs

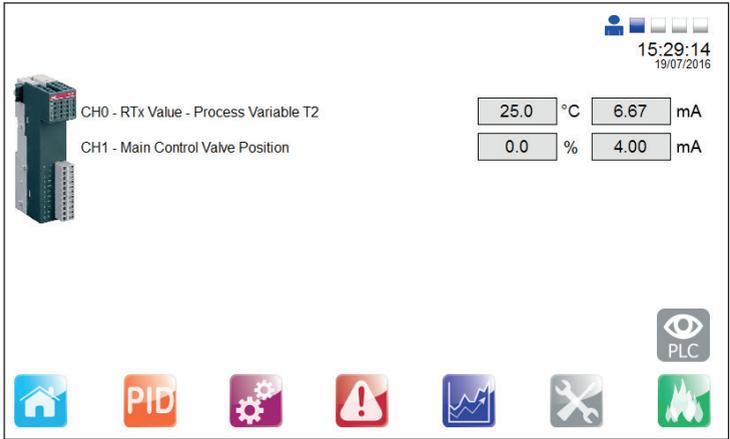


Fig. 58 Analogue retransmission outputs



Local Spirax Sarco engineer contact details dialog page

Please Contact your local Spirax Sarco Agent, this can be found at www.spiraxsarco.com

Agent Name:

Telephone:

Fig. 59



4.5.8 Energy pages

Energy monitoring pages provide the user access to view the total value of the power and carbon use, total of CO₂ emission and calculated total cost of energy that has been used. By pressing the green field underneath the 'Total Between Two Dates' allows two dates to be set for the total to be calculated between.

	Power	Carbon	CO ₂	Cost
24 Hour Total			0.000	MJ
7 Day Total			0.000	MJ
30 Day Total			0.00	MJ
Total Between Two Dates			0.00	MJ

Fig. 60



Energy monitoring set points page

At engineer level it is possible to access the energy page to make changes by pressing the energy monitoring set point. This will go to the energy page.

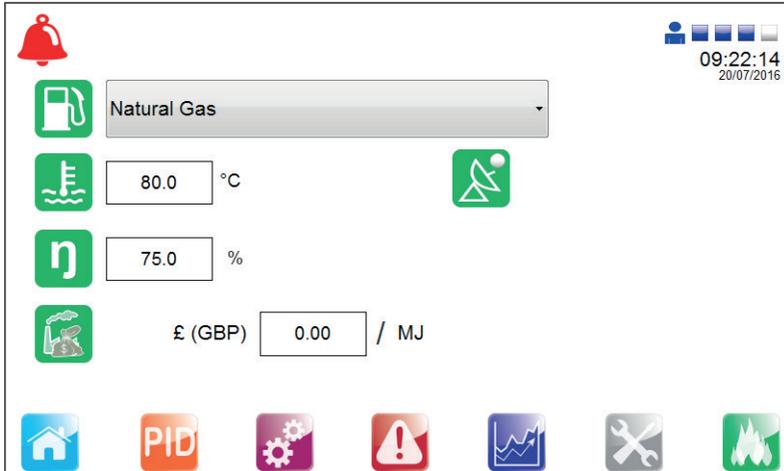


Fig. 61

To finalise the mechanical commissioning of the system:

- Open all condensate drain valves.
- Slowly open the steam inlet valve.
- Monitor the process temperature to ensure that it is within the acceptable limits.

The Spirax Sarco EasiHeat™ unit is now ready for service.

5. Fault finding

Fault	Possible cause	Remidial action
Unit does not power up	Loss of incoming supply	Check incoming supply
	Internal fuse blown	Check all mains fuses F1 - F4 and Control fuses AF1, CF1 - CF7
Loss of 24 Vdc supply	Internal fuse blown	Check all mains fuses F1 - F3 and Control fuses CF1 - CF7
	Field wiring fault	Sequentially disconnect the field wiring for all 24 Vdc supplies to see if supply is restored
Loss of 24 Vac supply	Internal fuse blown	Check all mains fuses F1 and F2 and Control fuses AF1
PT100 signal not reading correctly (T1 - T5)	Field wiring fault	Check termination of 3 wire PT100 terminats (X1 - X5) and PT100 head
	Faulty PT100	Check compensated resistance
Bypass pump does not operate	Field wiring fault	Check wiring of pump to terminals X11
	Internal fuse blown	Check mains fuse F4
Bypass valve does not operate	Field wiring fault	Check wiring of bypass valve to terminals X12
	Check setting of deviation alarm on HMI	Ensure not to set 0, the setting should be 2C
Remote set point is not showing correctly	Scaling value incorrect	Ensure that the minimum and maximum engineering units from the remote set point match those on the HMI (this data is found on the Spirax Sarco engineers 4-20 mA page)
	Polarity of 4-20 mA incorrect	Reverse polarity and wire as per electrical drawings

Fault	Possible cause	Remidial action
TVA flowmeter does not power up	Field wiring fault	Check wiring of TVA to terminal X8
	Loss of loop power	Check control fuse CF3
TVA input is not showing correctly	Scaling value incorrect	Ensure that the minimum and maximum engineering units from the TVA commissoining match those on the HMI (this data is found on the Spirax Sarco engineers 4-20 mA page)
	Polarity of 4-20 mA incorrect	Reverse polarity and wire as per electrical drawings

6. Maintenance

Note: Before actioning any maintenance observe the 'Safety information' in Section 1.

6.1 General

For maintenance of the individual components that make up the system, please see the relevant product specific IMI's for the components concerned.

6.2 High limit device testing

The purpose of the test is to ensure that the system operates satisfactorily when required to do so.

Method:

1. High limit set point test - The set point of the high limit controller should be lowered, to simulate a high temperature situation. Test personnel should ensure the high limit device operates in a satisfactory manner.

2. Electrical power failure test - The unit should be turned off at the PLC controller switch to simulate power failure. Examination should be made to ensure the high limit system has switched to its fail-safe mode, isolating the primary steam supply.

Frequency

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

We do not recommend the installation of a self-acting high limit control to the Spirax Easiheat™ system.

6.3 Scale formulation

Within open systems, where there is continual make-up water, there is a risk of scale formation. The extent of the scale will depend largely upon the water quality, which varies greatly from area to area. A test, conducted by a water treatment specialist, is recommended to determine the local water quality and whether problems are foreseen.

After extended service, the plate heat exchanger can be easily dismantled for cleaning. If scale becomes a persistent problem, regular chemical cleaning should be considered.

¾" ports are available on the secondary inlet and outlet piping to allow easy connection for CIP 'Clean in Place' apparatus. It should be noted that raising the steam pressure could result in an increase of scaling.

6.4 Local isolator

When the control panel is switched off from mains power a padlock or similar device can be used to lock the isolator switch by lifting the center section of red isolator to expose a locking hole.