EasiHeat-S

Installation and Maintenance Instructions

EasiHeat-S Steam Control System

Contents

1. Safety information

In addition to putting your personnel at risk of death or serious harm, failure to comply with the instructions, recommendations and guidance set out in this document may jeopardise your warranty rights. Further, use of the product(s) otherwise than in accordance with this document will be undertaken entirely at your own risk. To the fullest extent legally permitted, Spirax Sarco excludes all responsibility and liability for any and all loss or damage caused in the event that the practices and procedures detailed in this document have not been followed.

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

General safety notes

This document refers only to the mechanical installation and commissioning of the EasiHeat-S system should be used in conjunction with the relevant IMIs for the other system components and supplementary safety information for all the system components.

Lifting

The EasiHeat-S system should be lifted by a suitable forklift truck, from the base, placed in position and securely bolted to the floor when required.
The customer is responsible for the safe lifting of the EasiHeat-S system.

 **Caution or Warning**	Do not lift the EasiHeat-S system by any other part except from the base. Note: always leave sufficient space around the system for future maintenance operations.

Warnings

1. The unit is designed and constructed to withstand the intensity of work in ordinary use.
2. Use of the product for any other purpose, or failure to install the product in compliance with these Installation and Maintenance Instructions, may damage the product and also cause serious injuries to operating personnel.
3. Before carrying out any installation and maintenance procedure, always check that all primary steam, condensate and water return lines on the secondary have been isolated.
4. Make sure that residual pressure in the system and in pipework has been vented to atmospheric level.
5. To avoid the risk of burns, allow parts to cool before carrying out any type of operation.
6. Always wear suitable protective clothing before carrying out any installation or maintenance activity.

1.1 Intended use

Referring to the installation and maintenance instructions and the nameplate of the unit and the Technical Specifications, check that the product is suitable for intended use/application.
EMEA - The EasiHeat-S heating system complies with the requirements of the EU Pressure Equipment Directive/UK Pressure Equipment (Safety) Regulations and is CE marked. For any product specific PED catagorisation 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 and water belonging to Group 2 of the mentioned Pressure Equipment Directive ie European Pressure Equipment Directive 2014/68/EU.**

ii) **Check suitability of material, pressure and temperature and related maximum and minimum values. If the maximum operating limits of the product are lower than those of the system in which it to be inserted, or if malfunction of the product could generate dangerous overpressure or overtemperature, always insert a safety device in the system to prevent exceeding of such limits.**

iii) **Determine the correct installation position and direction of flow of fluids.**

iv) **The product is not designed to withstand external stresses induced by the system in which it is fitted. The installer is responsible for taking into account such stresses and for adopting adequate precautions to reduce these to a minimum.**

v) **Prior to installation, remove protective covers from all connections and also protective film and packaging elements.**

1.2 EU Pressure Equipment Directive

The EasiHeat-S series are classified as assembly according the EU Pressure Equipment Directive/UK Pressure Equipment (Safety) Regulations:

Product	Fluid Group	Category
EasiHeat-S DHW and HTG	2	I
EasiHeat-S DHW and HTG (T10 HEX with 46+ plates)	2	II

For the category of bespoke units, refer to the "EC Declaration of Conformity" supplied with the product.
Other component parts of the assembly comply with the relevant European Directives, where necessary. Please refer to specific component literature for further details.

1.3 Access

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

1.4 Lighting

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

1.5 Hazardous liquids or gases in the pipeline

Take into account what is currently in the pipeline or what may have been in the pipeline at some previous time. Consider: flammable materials, substances hazardous to health, extreme temperatures.

1.6 Hazardous environment around the product

Consider: areas with a risk of explosion, lack of oxygen (e.g. tanks, pits), dangerous gases, extreme temperatures, hot surfaces, fire hazards (e.g. during welding), excessive noise, moving machinery.
The place of installation of the assembly must be equipped with the fire-prevention devices required by current regulations.

1.7 The system

Consider the effect of the work to be carried out on the entire system. Consider whether the action proposed (e.g. closing of isolating valves, electrical isolation) may put any other part of the system or personnel at risk.
Hazards may include isolation of vents or protective devices or the rendering ineffective of controls or alarms. Ensure isolating valves are opened and closed gradually to avoid shocks to the system.

1.8 Pressure systems

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

1.9 Temperature

Allow time for temperature to normalise after isolation to avoid the risk of burns and consider whether protective clothing (including safety glasses) is required.
If there is a possibility of heated water coming directly/indirectly in contact with personnel, a high limit must be fitted to mitigate the risk of scalding and appropriate risk assessment conducted

1.10 Hard water

The EasiHeat-S Package will utilise a high efficiency heat exchanger and as such it is important that the unit is supplied with water of reasonable quality to prevent adverse scaling/corrosion – recommended factors are:
pH 6 – 8.
Chlorides < 10 ppm
Total hardness < 200 ppm

1.11 Protective bonding

The EasiHeat-S system and nearby metallic items within 2.5m meters should be all connected to the same common earth.

1.12 Electrical Hazard

The EasiHeat-S system's panel contains hazardous voltages. Some maintenance operations may require the panel being energized and open. These maintenance actions may only be undertaken by a suitably qualified and competent person.

1.13 Legionella

Legionella bacteria presents a risk in any hot water system, appropriate measures should be taken in line with national guidance to manage this risk.

1.14 Tools and consumables

Before starting work, make sure you have suitable tools and/or consumables on hand. Use only genuine Spirax Sarco replacement parts.

1.15 Protective clothing

Consider whether you and/or others require protective clothing to protect against hazards, such as chemicals, high/low temperatures, radiation, noise, falling objects and danger to eyes and face.

1.16 Permits to work

All work must be carried out or supervised by a suitably competent person. Installation and operating personnel should be trained in correct use of the product according to the Installation and Maintenance Instructions. Any formal work permit system adopted must be complied with. Where no such system is applied, a person responsible should be informed of progress of the work and, where necessary, an assistant with primary responsibility for safety should be appointed. Post "warning signs" if necessary.

1.17 Handling

Manual handling of large and /or heavy products may involve a risk of injury. Lifting, pushing, pulling, carrying or supporting a load by bodily force may 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 appropriate handling methods according to the circumstances of the work to be carried out.
Note: if it is necessary to use slings for lifting, it is good practice to fit these around the plate of the base unit to avoid damage to the unit.

1.18 Storage

Note: If the EasiHeat-S cannot be installed and put into operation immediately upon receipt at the jobsite, certain precautions are necessary to prevent deterioration during storage.
Responsibility for integrity of the heat exchangers must be assumed by the user. Spirax Sarco will not be responsible for damage, corrosion or other deterioration of heat exchanger equipment during transit and storage.
The following suggested practices are provided solely as a convenience to the user, who shall make their own decision on whether to use all or any of them.

- **On receipt of the EasiHeat-S, inspect for shipping damage to all protective covers. If damage is evident, inspect for possible contamination and replace protective covers as required. If damage is extensive, notify the carrier immediately and Spirax Sarco.**
- **If the EasiHeat-S is not to be placed in immediate service, take precautions to prevent rusting or contamination.**
- **Store under cover in a heated area, if possible. The ideal storage environment for EasiHeat-S and accessories is indoors, above grade, in a dry, low humidity atmosphere which is sealed to prevent entry of blowing dust, rain or snow. Maintain temperatures between 0 °C and 50 °C (32 °F and 122 °F) and humidity at 40% relative humidity or lower.**

Note: Ambient temperature of the place where the unit will be installed must be above 0 °C (32 °F) and below 40 °C (122 °F).

1.19 Freezing

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

1.20 Disposal

As the product may contain PTFE and Viton, particular precautions must be adopted to avoid potential risks for health caused by decomposition or combustion of such materials. Unless otherwise indicated in the installation and maintenance instructions with regard to the materials of the seals, this product can be recycled and it is considered that no environmental risk exists deriving from disposal thereof provided that suitable precautions are adopted. However, its components can be checked to verify the possibility of safe disposal.

PTFE:

- **This material can be disposed of only using approved systems and never in incinerators.**
- **PTFE waste to be disposed of must be stocked in separate containers, must never be mixed with other waste and must be sent directly to a landfill.**

Viton:

- **VITON waste can be sent directly to landfills when permitted and accepted by local and national regulations.**
- **VITON components may also be incinerated but a scrubber must be used to remove the hydrogen fluoride developed by the product, carrying out this procedure in accordance with local and national regulations.**
  The components are insoluble in aquatic media.

Electrical:

Unless otherwise stated, the electrical components within this product are recyclable and no ecological hazard is anticipated with its disposal providing due care is taken. The product should be recycled in line with local legislation.
An overview of the structure of the control panel is availible in the supplied wiring diagram.

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.

1.21 Return of products

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

Notes: For additional information about any particular product used in the construction of this unit see the relevent product specific Technical Information (TI-P565-15) sheet.

2. General product information

2.1 Description

EasiHeat-S-S systems use steam to provide accurate heating of low temperature hot water (HTG), domestic hot water (DHW) or hot water for processes. Systems can be sized for any heating duty from 70 kW to approximately 3.5 MW and are supplied fully assembled and pressure tested, ready for installation.

The EasiHeat-S is a Steam Controlled heat exchanger system. Additional options are available for the core configuration, such as high limit and isolation valves. These options are detailed in section 7 (P&ID) and or TI-P565-15.

The EasiHeat-S unit consists of the following core items (refer to Fig. 1):

A	Steam plate heat exchanger, type TS6-M, T8-M, or T10-M
B	Pneumatically or Electrically actuated steam control valve and positioner
C	Process Controller and sensors
D	Condensate removal solution
E	Pipeline ancillaries
F	Lockable Isolator

For a detailed list of equipment and specifications, refer to the P&ID and documentation provided.
For additional information about any particular product used in the construction of these units see the relevent product specific Technical Information (TI) sheet.
For further technical information regarding the EasiHeat-S system please refer to TI-P565-15.

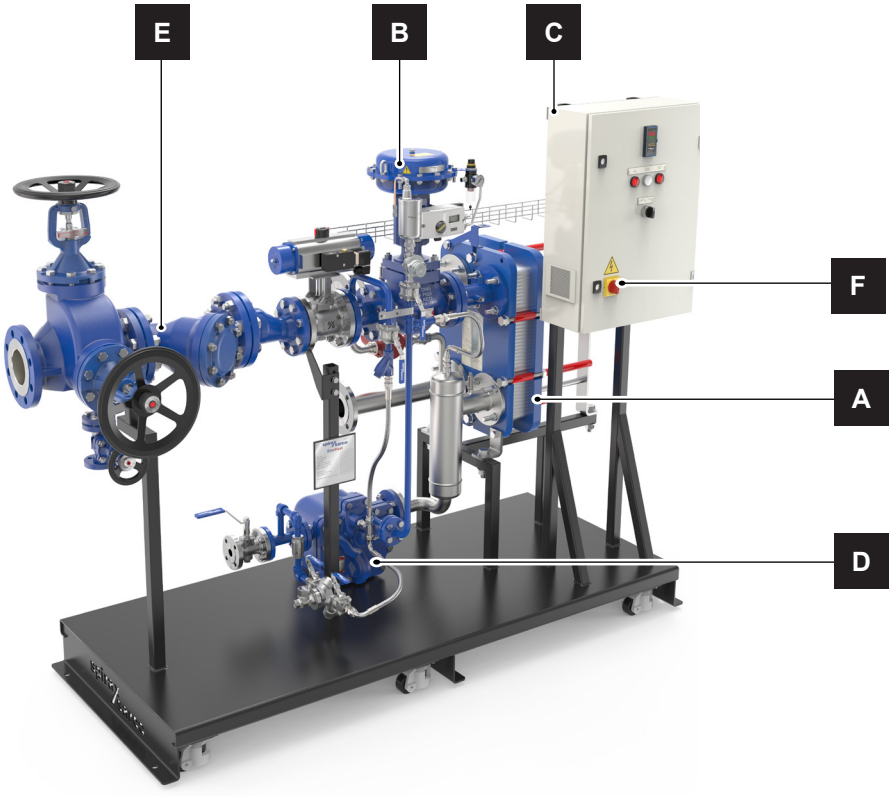
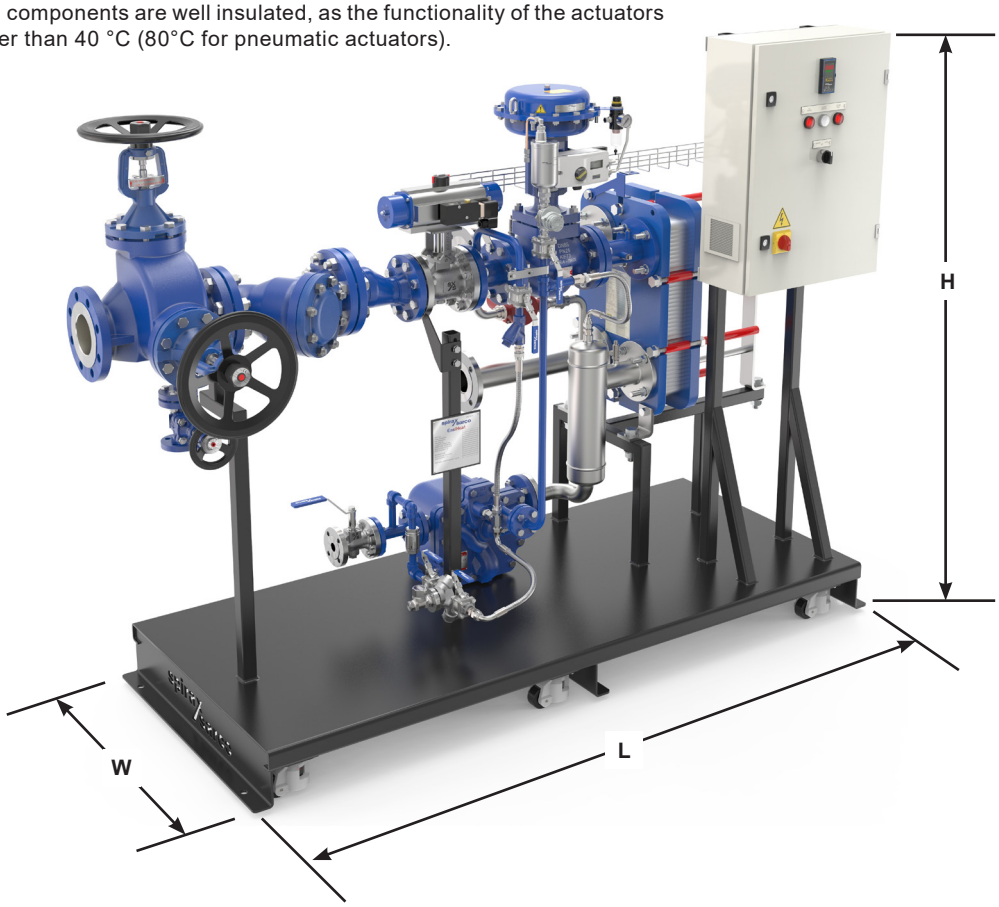


Fig. 1 EasiHeat-S-S Steam Control System

3. Installation

3.1 Dimensions approximate in mm (inches)

Note : It is recommended to thermally insulate the EasiHeat-S-S to reduce heat losses and for protection against personal injury from contact with hot surfaces. If the package contains electrical actuation, please ensure all hot pipework and components are well insulated, as the functionality of the actuators are impeded at temperatures higher than 40 °C (80°C for pneumatic actuators).



Metric	Maximum dimensions (mm)			Largest piping connections*		
Plate Type	H	L	W	Steam	Water	Condensate
TS6-M	1995	2488	850	DN125	DN65	DN40
T8-M			850	DN150	DN80	DN50
T10-M		2932	904	DN200	DN100	DN50

Imperial	Maximum dimensions (inches)			Largest piping connections*		
Plate Type	H	L	W	Steam	Water	Condensate
TS6-M	78.5	98.0	34	5"	2.5"	1.5"
T8-M			34	6"	3.15"	2"
T10-M		115	35.5	8"	4"	2"

* Piping connections sized to order and will depend on the load and heat exchanger size.

Options selected may impact overall dimensions.

3.2 Steam and condensate connections

It is important that the steam supply (and compressed air if pneumatic actuation is selected) to the EasiHeat-S unit is supplied as dry and as clean as possible, using a suitable line steam trap upstream to ensure that the line is free of condensate when isolated/off-line. Also ensure 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 EasiHeat-S 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 the pressure equipment on either the hot or cold side of the plate heat exchanger, should be fitted if required. If isolation valves are installed on the flow and return of the secondary side, then it is recommended that a suitable relief valve is fitted to mitigate gasket damage caused by water being hydraulically locked in the heat exchanger.
Spirax Sarco supplies a range of traps, strainers, separators, safety valves and pressure reducing equipment.

3.3 Positioning and fastening

The unit must be positioned on a completely flat, horizontal surface able to support its entire weight at full load.

For access to the unit, provide at least one metre of clearance from the plate heat exchanger fixings in order to safely disassemble.

3.4 Air supply

If a pneumatic control system is installed, connect a compressed air supply 2 to 6 bar g (29 psi g to 87 psi g) to the pressure regulator mounted on the control valve.

Actuator	CV inlet	Supply pressure
PN9123E	DN32, DN40, DN50	5 - 6 bar
PN9233E	DN65, DN80	5 - 6 bar
PN9320E	DN100	2 - 3 bar

Please refer to documentation for the pneumatic control valve when lifting.

During lifting, take into account the high centre of gravity of the unit and adopt all the necessary precautions to avoid accidental tipping over of the unit.

3.5 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 Fig. 3

3.6 Panel details

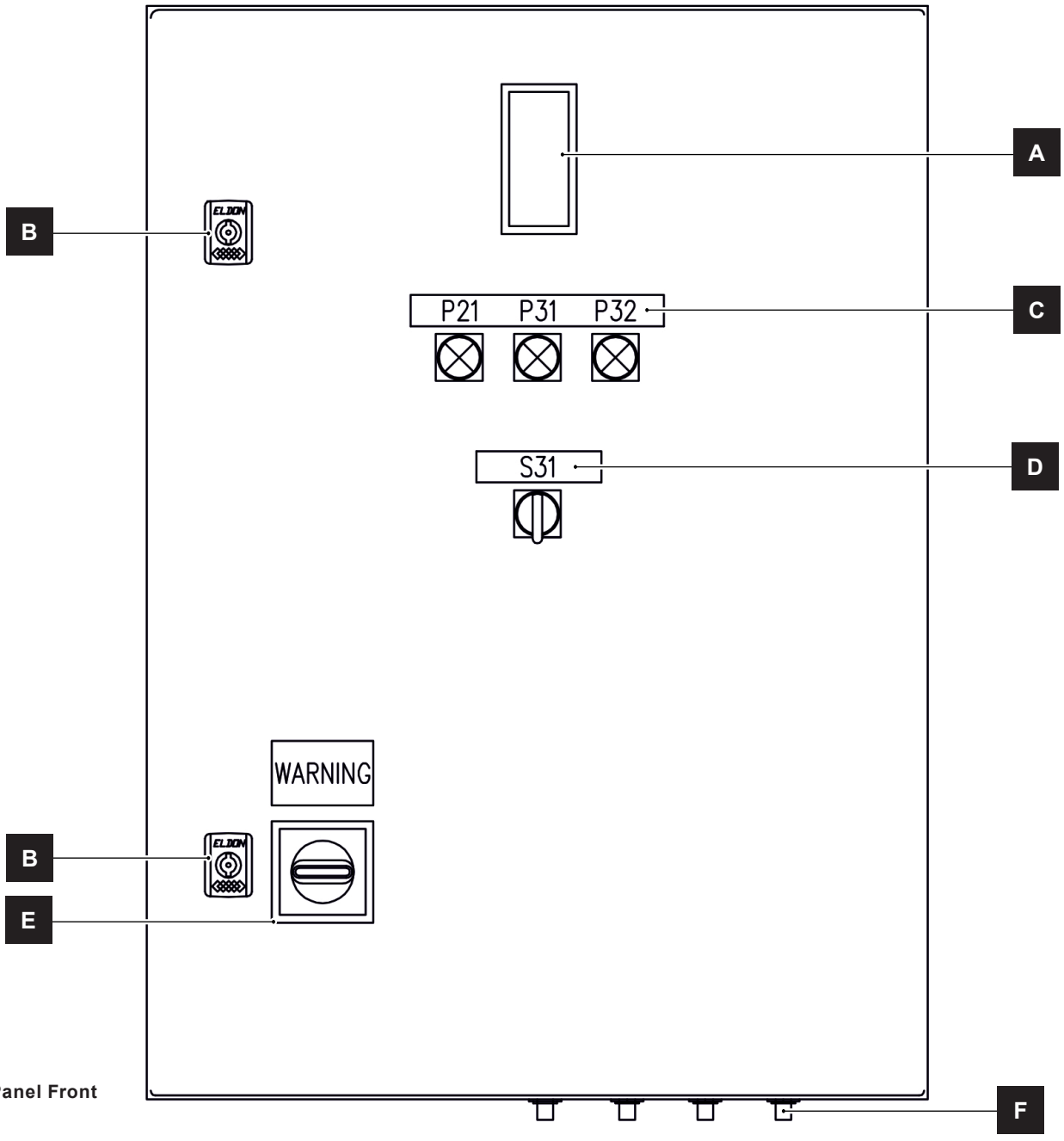


Fig. 2
Control Panel Front

A	GS-X2 Process Controller			
B	Control Panel Locks			
C	Indicators	**P21** - IHL Tripped	**P31** - System Enabled	**P32** - System Fault
D	Control Switch - S31	**Position 1** - Remote Start	**Position 2** - top	**Position 3** - Local Start
E	Isolator/Emergency Stop			
F	M12 Connectors			

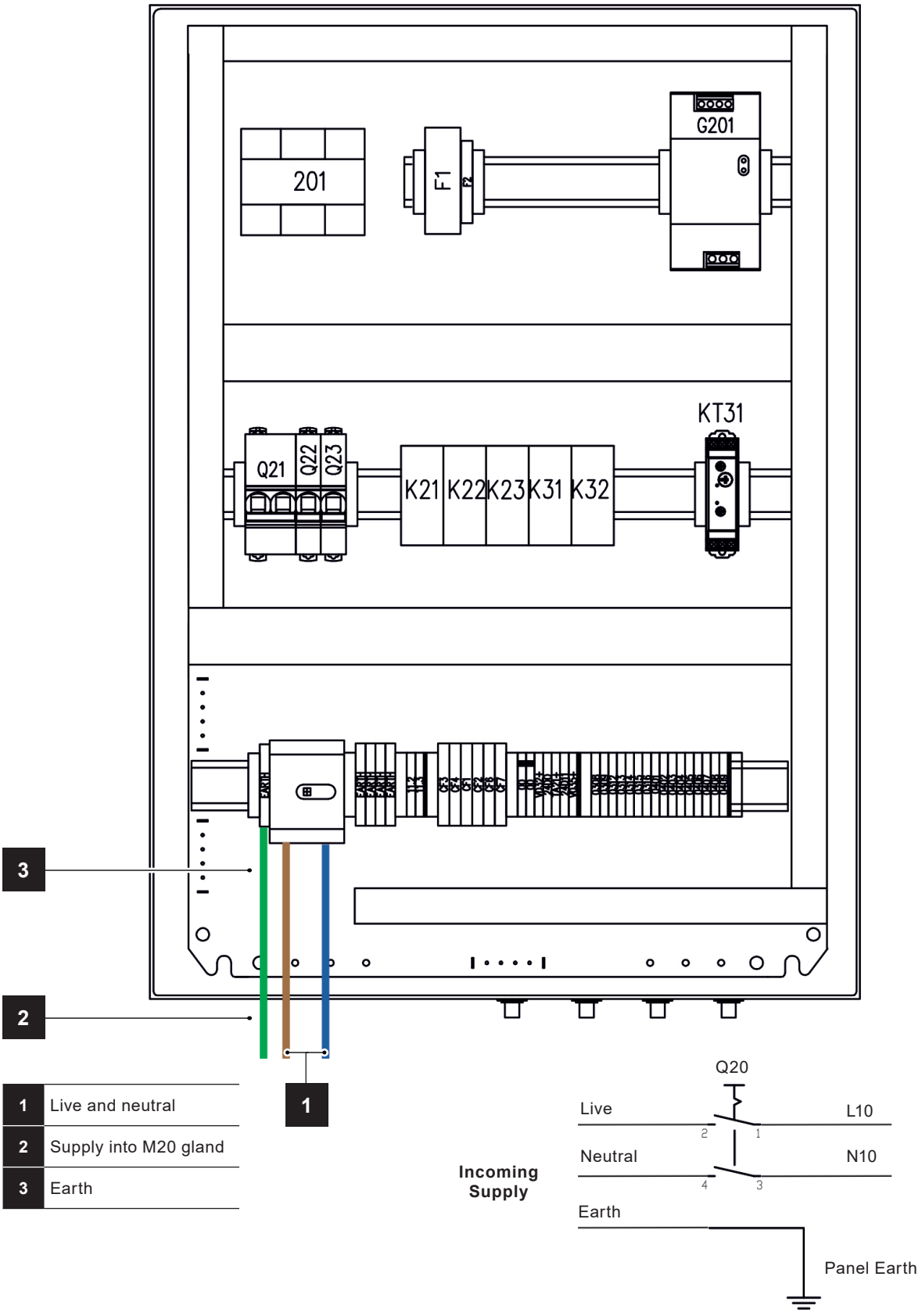


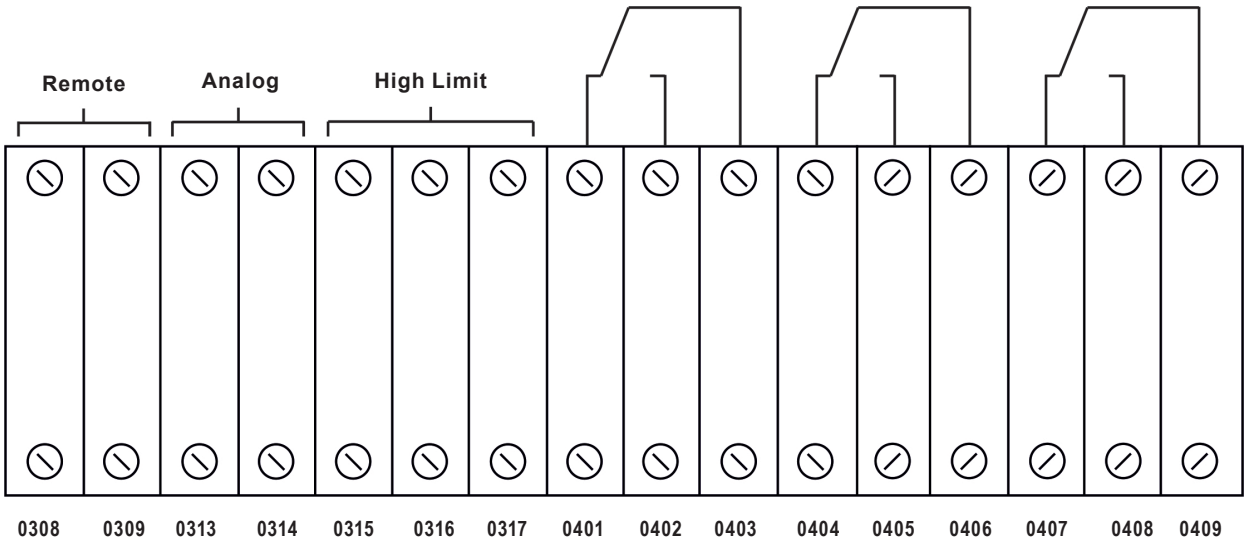
Fig. 3 Control panel inside

3.7 Electrical specifications

Power supply

Electrical supply requirements			230 Vac/50Hz
Power consumption			690W Nominal 1610W Max
Maximum supply conductor dimensions			16 mm^2
Maximum current draw			1.6A
			Size
Fuses	**Power supply DC +ve side (F1)**	10A (Normal blow)	5 x 20mm cartridge fuse
	GS-X2 Controller (F2)	500mA (Normal blow)	5 x 20mm cartridge fuse
	(CF1)	5A (Quick acting F HBC)	5 x 20mm fuse
	(CF2)	500mA (Quick blow F HBC)	5 x 20mm Ceramic fuse
	(CF3)	1A (Anti surge T HBC)	5 x 20mm Ceramic fuse
	(CF4)	5A (Quick acting F HBC)	5 x 20mm fuse
	(CF6)	500mA (Quick blow F HBC)	5 x 20mm Ceramic fuse
	(CF7)	500mA (Quick blow F HBC)	5 x 20mm Ceramic fuse

3.8 Customer connections

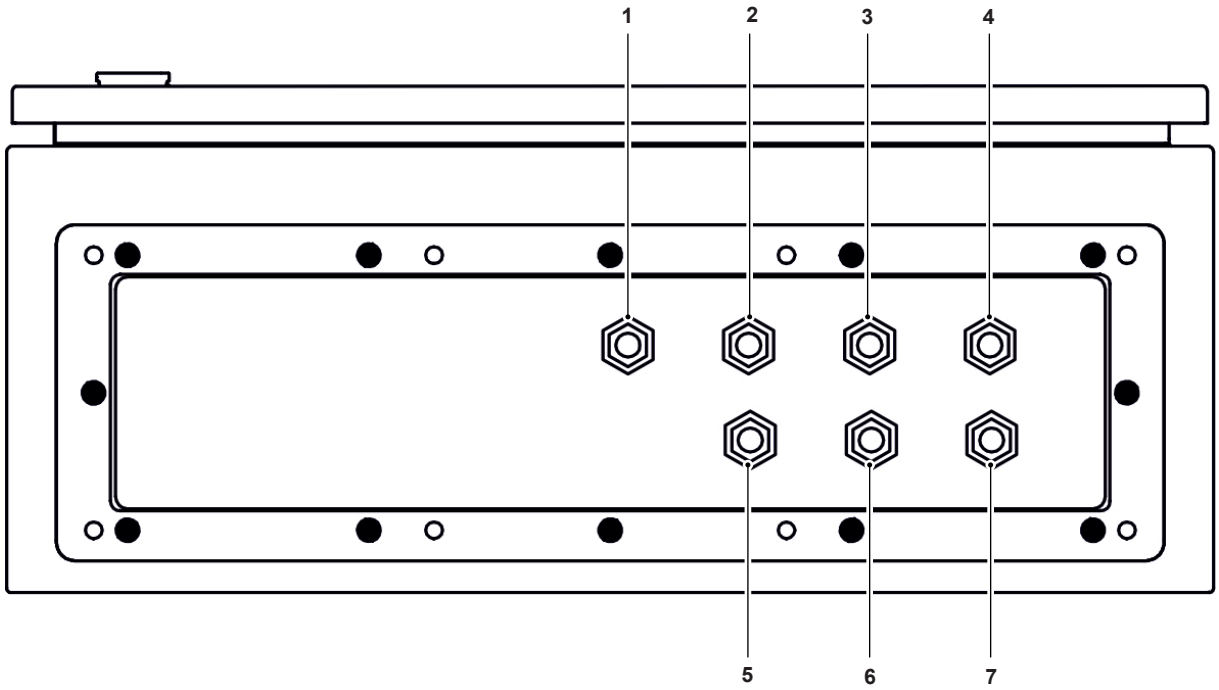


Remote operation and retransmission connections

Description	Terminal number	Type	
Remote Enable	**0308**	Close to Enable	24VDC
	0309		
Analog Output	**0313**	+ve	4-20mA Temperature Retransmission (as default)
	0314	-ve	
Analog Input	**0315**	+ve	0-10 Vdc Remote Setpoint (as default)
	0316	SI	
	0317	-ve	
High Limit Status	**0401**	Normally Closed	VFC (Volt-free contact/dry contact)
	0402	Normally Open	
	0403	Common	
System Enabled	**0404**	Normally Closed	VFC (Volt-free contact/dry contact)
	0405	Normally Open	
	0406	Common	
System Fault	**0407**	Normally Closed	VFC (Volt-free contact/dry contact)
	0408	Normally Open	
	0409	Common	

Fig. 4 - Customer Connections

M12 Sensor/Component connector layout



M12 Connections

Terminal designation	Description	Type
1	SP7	Control valve Solenoid (if fitted)
2	VB31	Control Valve Power & Control signal
3	LSB1/AEL7T	High Limit Valve Power
4	TA21	Temperature Transmitter
5	Valve SW	Control Valve Feedback Switch
6	LSB1/AE7T	High Limit Valve Feedback Switch
7	HL STAT	High Limit Reset

Fig. 5 - M12 Connectors

For full customer connection details refer to EasiHeat-S wiring diagram

4. Commissioning

For correct commissioning, we recommend the service and support of a Spirax Sarco engineer. Please contact your local Spirax Sarco representative for more details.

4.1 Pre-commissioning inspection (initial start-up)

- Ensure all bolts and fasteners have been correctly tightened before commissioning.
- Most of the new installations during the construction of pipelines and the installation of the system may inadvertently collect dirt particles inside the pipes. It is essential to carefully remove any residual impurities and dirt in them before starting the commissioning.
- Check that all the manual isolating valves (on primary steam, on condensate removal, on water side are closed).
- Clean the filters upstream of the regulation valves.
- Check that the steam and water design conditions do not exceed the rated values of the unit.
- Check that the supply steam line is properly pressurised and has been drained/ vented.
- Verify that all connections to steam, condensate and water lines have been made correctly.
- Check the air supply of the filters/reducers of the valves (actuated pneumatically where established) and that it complies with the system requirements.

4.2 Commissioning procedure

1. Complete Pre-Start-up checks by ensuring steam and condensate are isolated. Services, such as air (if applicable) and electric, are now available.
2. Ensure all electrical connections are made between the panel and the EasiHeat-S, and that air (if required) is available to the system.
3. Dry commissioning valve stroke check - An initial valve stroke check should be carried out to ensure free movement of the valve stem. Use manual mode on GS-X, refer to Auto/Manual Mode page 73 in IM-P794-03 (GS-X Controllers IMI) to change mode.
    - For the electric actuated control valve, please see IM-P714-02.
    - For the pneumatic actuated control valve, please see IM-P706-02
4. Turn dial on the thermostat to set the high limit (IHL), where applicable. It is recommended to have the High Limit 10°C above the Setpoint (SP).
5. Fill the secondary (cold side) of the EasiHeat-S and bleed the air out of the system.
6. Start the main secondary water circulating pump(s), if fitted.
7. Check and confirm there is secondary water circulation through the EasiHeat-S.
8. If the circulation is okay, remove any power isolations and switch on the main power to the control panel.
9. Ensure remote/stop /local switch is set to stop. Turn the control panel isolation switch to 'ON'. Controller will turn on, displaying scrolling message “Off”.
10. Start the system by turning the switch to Local (advised to run system locally before enabling remotely). System enabled light will come on and process controller will ramp to setpoint..
11. The system should begin by opening the plant steam isolation valve.
12. Close and lock the panel
13. To finalise the mechanical commissioning of the EasiHeat-S system:
    - Open all condensate drain valves
    - Slowly open steam inlet valve
    - Monitor the process temperature to ensure that it is within the acceptable limits

4.3 Process controller operation

Ensure that section 4.2 has been completed before continuing.

Shows ambient temperature

Shows 0.0%, then setpoint in local

Note :
This stage will have been completed from factory default settings.
The description below shows how to navigate and edit parameters via the GS-X2 screen, for comprehensive detail on all of the menus and configurable settings please refer to IM-P794-03 (GS-X Controllers IMI).

1. The controller will arrive pre-configured. Initially, it will turn on in Level 1 mode and the home screen will show the display as shown on the left.

For further information on start-up, refer to IM-P794-03 Start Up - New Configured Controller, page 69.

For a general description of the front panel displays and operator buttons, see General Description of Front Panel Displays refer to IM-P794-03 GS-X2 page 60 and General Description of Operator Buttons page 62,63.

For more information on operator levels, see Operator levels, pages 71-90.

2. To change the Setpoint (SP):

In Level 1 (deafult mode):

Press ^ to increase the active setpoint.

Press v to decrease the active setpoint.

For more detail, see Operator level 1 refer to IM-P794-03 page 72.

In Level 1 or 2 (see PID step 5 for how to enter):

Press ↵ till SP1.

Use ^ and v to adjust.

Alternatively in Level 3/Config mode, to view configurable setpoints refer to Loop List (LOOP) IM-P794-03 page 107 for navigation and setpoint sub-list table page 112 for parameters.

Note: The GS-X2 is supplied with a default setpoint of 65 °C.

4. To change the language:

Enter config mode. To do this:

1. Press and hold  until “GOTO” is shown and LEu3 is visible.

2. Press  to choose CONF.

3. Press  to enter.

4. The default password for config is "0004".

5. Press  to move to the next digit.

6. Press  or  to enter the correct digit value.

7. When CONF List is displayed, you have entered Config mode. For more information, refer to table To select configuration level IM-P794-03 page 89

From CONF List press  +  to navigate to INST
Refer to IM-P794-03 Instrument List (INSt) page 191 for navigation and Information Sub-List (INFO) table page 192 for parameters.

LANG (language) can only be viewed and edited in config mode. For more info on read/write access, see Parameter Navigation IM-P794-03 page 92.

Note: Default is English.

5. To edit alarms

Enter Level 3. To do this:

1. Press and hold until “GOTO” is shown and LEu3 is visible.

2. Press to enter.

3. The default password for level 3 is "0003".

4. Press to move to the next digit.

5. Press or to enter the correct digit value.

6. When Level 3 Pass is displayed you have now entered the mode. For more information, refer to table To enter level 3 IM-P794-03 page 81.

From home screen press until ALm.

Refer to Alarms List (ALm) page 135 for navigation and tables pages 136-138 for parameters.

Note:

+ is Alarm Acknowledge by default.

The GS-X2 is supplied with default alarms

- Alarm 1 is high temperature alarm at 90°C
- Alarm 2 is deviation high alarm of 1°C

If alarms are triggered, System Fault light will come on

Note: Alarm Type can only be changed in config mode.

6. PID Settings:

1. Press and hold ☰ until “GOTO” is shown and Leu1 is visible.

2. Press ∧ to choose Leu2.

3. Press ↵ to enter.

4. The default password for level 2 is "0002".

5. Press ↵ to move to the next digit

6. Press ∧ or ∨ to enter the correct digit value.

7. When Level 2 Pass is displayed you have now entered the mode. For more information, refer to table To select operator level 2 IM-P794-03 page 76.

Press ↵ till PB.H, TI or TD. Use ∧ and ∨ to adjust.

See Level 2 Operator parameters IM-P794-03 pages 76-78 for comprehensive list of parameters.

Alternatively in Level 3/Config mode, refer to Loop List (LOOP) IM-P794-03 page 107 for navigation and PID Sub-list table page 121-124 for parameters.

7. To edit Analog inputs:

Enter config mode (see changing language for how to enter).

From CONF List, press  until AI.

Refer to Analog Input List (a1 a2) IM-P794-03 page 93 for navigation and tables pages 94-95 for parameters.

Inst 1 is Temperature Transmitter.
Inst 2 is Remote Setpoint.

Type of input can be configured i.e. mV, V, mA.

MV HI and MV LO (InputHigh and InputLow) can only be viewed and edited in config mode.

4.4 Start-up procedure

1. Ensure that steam supply is available to the system at the required pressure and that condensate is free to flow from the system.
2. Ensure water flows.
3. Turn isolation switch to ON and Remote Remote Start/Stop/Local Start switch to Local.
4. Monitor any alarms.
5. Change setpoint or PID control as required.

4.5 Shutdown

1. Turn Remote Start/Stop/Local Start switch to OFF position.
2. Wait for system to ramp down (allow valves to close and water to dissipate heat).
3. Turn off isolation switch.
4. If pump fitted, recirculation pump will stay on for length of time as set on the pump delay timer (KT31).

4.6 GS-X2 Replacement

In the event of power loss, the process controller will restart with the same configured settings. However, if the power loss causes controller failure, it will need to be replaced.

1. Ensure panel is isolated.
2. Open panel
3. Remove all wiring connections from the rear of the GS-X2.
4. Remove controller from panel door.
5. Insert the new controller into the gap and refit wiring.
6. Turn on power to the panel.

4.7 How to reset the thermostat

1. Unscrew cap on top
2. Press button firmly

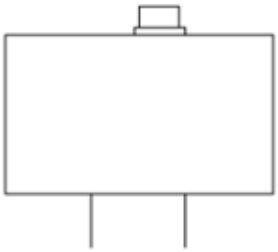


Fig. 6 Thermostat (TD21)

5. Fault finding

Fault	Possible cause	Remedial action
Inability to accurately control temperature and or repeated tripping of high limit	Pump is blocked, worn or experiencing loss of power	Maintain pump or replace completely
	PID Tuning being incorrect for installation	Retune the EasiHeat-S system
	Unstable flow on the water/secondary side	Investigate hot water system to ensure flowrate is within specified operating conditions for the installation
	Scaling of the temperature sensor	Descale temperature sensor
	Failure/Wear of steam side control components	Check the correct operation of control valve(s)/ trap(s)/pump trap
	Wiring fault(s) relating to control equipment	Check function and integrity of control equipment
Inability to reach set-point temperature/rated kW output EasiHeat-S system	Steam side strainer has become blocked	Maintain strainer as per products IMI
	Heat Exchanger, heat from steam to water not transferred effectively	Treat steam and water supply, maintain heat exchanger
	Valve position calibration drifted/incorrect	Recalibrate/Re-stroke the actuator
	Failure/Wear of steam side control components	Check the correct operation of control valve(s)/ trap(s)/pump trap
	High limit activated	Reset button on thermostat (TD21)
Control valves not shutting off tightly	Corrosion, wear and tear	If pneumatic, filter media may be damaged and/or or saturated filter
		Service valve internals
	Valve position calibration drifted/incorrect.	Recalibrate/Re-stroke the actuator
Valve position not being representitive of the % displayed on the controller	Lack of air supply	Check incoming supply
	Loss of electrical supply	Check incoming electrical supply.to valve.
	Valve being incorrectly calibrated by Autostroke feature/not calibrated.	Re-run the Autostroke/Calibration operation on the valve.
	Valve feedback connected to wrong M12 connector.	Check valve feedback cables match M12 connectors on panel.
Steam/Pump trap leaking steam /Excessive live steam in condensate return	Worn internal components/failed open	Maintain or replace product as per associated IMI's
Manual isolation valve has become stuck open or shut – Package can not be isolated	Wear	Maintain valve as per product IMI or replace completely

Continued on next page

Fault	Possible cause	Remedial action
Bypass pump does not operate	Field wiring fault	Check wiring of pump to terminals ME11.2 and ME11.3
	Internal circuit breaker tripped.	Check circuit breaker Q21
Temperature measurement signal not reading correctly (TA21)	PT100 connected to wrong M12 socket.	Check the M12 cable label and socket match.
	Faulty sensor	Check compensated resistance
Remote set point is not displayed correctly on GSX process controller	Scaling value incorrect	Ensure that the minimum and maximum engineering units from the remote set point match those on the screen, refer to setpoint settings (Controller Operation) for more detail.
	Polarity of 4-20 mA incorrect	Rewire as per electrical drawings.
Loss of 24 Vdc supply	Internal circuit breaker trip	Check breaker Q22.
	Internal cartridge fuse blown	Check fuses F1, F2, CF1, CF2
Loss of 24 Vac supply	Internal cartridge fuse blown	Check fuse CF3, CF4.
	Internal circuit breaker trip	Check breaker Q23.

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.

To open the panel of the EasiHeat-S system you require the standard panel key supplied with the unit.

For a system specific service and maintenance plan that encompasses routine preventative maintenance actions please contact your local Spirax Sarco sales office.

6.2 Scale formation

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.
'Clean in Place' apparatus. It should be noted that raising the steam pressure could result in an increase of scaling.

6.3 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.

6.4 Functional test of safety components

To test the functionality of the safety components on the EasiHeat-S system please do the following;

1. High limit test – For Spirax high limit and EN14597 high limit, undo the cover retaining screws and remove the cover, adjust the dial on the temperature sensor until setpoint is below current water temp and ensure high limit valve closes. For INAIL high limit, disconnect connection to the sensor and ensure high limit valve closes and the system stops running (Note, this does not test the high limit temp sensor itself – to do this, the sensor must be heated to a temperature over the trip temperature).

2. Isolation/Electrical power failure test – The system should be turned off using the panel isolator switch to simulate power failure. Examination should be made to ensure the high limit valve has closed, isolating the primary steam supply. Process controller turns off

3. 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 EasiHeat system.

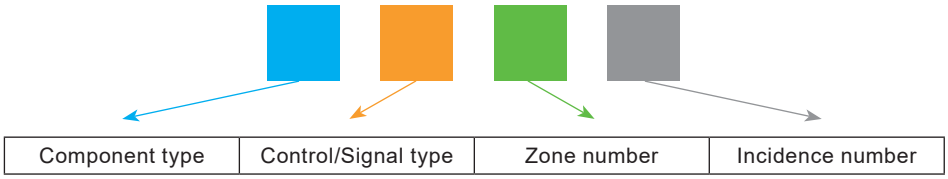
Note: At the end of each functional safety test the Alarm should be acknowledged and the system should not automatically restart.

7. Component map

7.1 Component naming convention

The naming convention for the system map do not correlate to the specific parts and part numbers. The tag names are specific to the EasiHeat-S system and are not tied to specific component models. To identify a particular component, reference the component tag number to the Bill Of Materials for the specific model of EasiHeat-S.

The tag numbers can be deciphered to aid identification and location of the component on the EasiHeat-S.



7.1.1 Component types

Below is a table of currently identified component types.

Letter	Component type
H	Heat exchanger (preheater, sample cooler, etc)
M	Motor (pump, expander, generator, etc)
P	Pressure sensor
Q	Trap (steam, air eliminator, etc)
T	Temperature sensor
V	Valve (globe, ball, check, Vacuum breaker, butterfly, etc)
Y	Strainer

7.1.2 Control/signal type

Below is a table of currently identified Control and Signal types. The direction of signals is always reference in relation to the PLC or process controller.

Letter	Control/Signal type
A	Analogue input (signal)
B	Analogue output (control)
D	Digital input
E	Digital output
I	Indicator (non-electrical, dial, etc)
M	Manual control
U	Un-controlled (check valve, strainer, separator, etc)

7.1.3 Area allocation
Areas are used to segregate areas of the package into sub-areas based around state changes of the process of the package.

Numbering of the Areas begins with the inlet flow of the process fluid at Area 0. When the process fluid undergoes a change or state change, the Area number increases until it leaves the EasiHeat-S.

The inlet of the control fluid begins with the next available Area number. At each state change of the control fluid, increase the Area number until the control fluid leaves the package.

7.1.4 Incidence number
Where multiples of similar devices and parts occur in the same Area, incidence numbers are used to distinguish between them.

Starting points for incidence numbers always start from the component closest the entry of the Area area.
e.g. On a condensate line, if 2 manual valves are identified in Area 5, the first of the manual valves to come into contact with the condensate as it passes through Area 5 will be given the Incidence number 1.

7.2 Component definitions
- Area 1 for return water connection to main heat exchanger connection.
- Area 2 for heated water from main heat exchanger to water outlet.
- Area 3 for plant steam from steam inlet to connection to main heat exchanger.
- Area 4 for condensate from connection to main heat exchanger to trap.
- Area 5 for condensate removal.

7.2.2 Area 1 Return water
- HU11 Main heat exchanger.
- ME11 Recirculation pump.

7.2.3 Area 2 Heated water
- TA21 Outlet water temperature analogue input.
- TD21 Outlet water temperature high limit switch (option 2).

7.2.4 Area 3 Plant steam
- VB31 Plant steam control valve analogue output (low flow).
    - VA31 Plant steam control valve feedback analogue input.
    - VD35 Plant steam control valve fully closed digital input.
- VM31 Steam inlet manual isolation [option 1].
- YU31 Steam inlet strainer [option 1].
- VE31 Plant steam digital isolation valve (open signal output) [option 2].
    - VD31 Plant steam isolation valve fully open digital input.
    - VD32 Plant steam isolation valve fully closed digital input.
- PI31 Pressure Gauge [option 3].

7.2.5 Area 4 Condensate
- QU41 Steam trap/APT

7.2.5 Area 5 Condensate Removal
- VU51 Condensate check valve.
- VM51 Condensate outlet manual isolation valve [option 1].

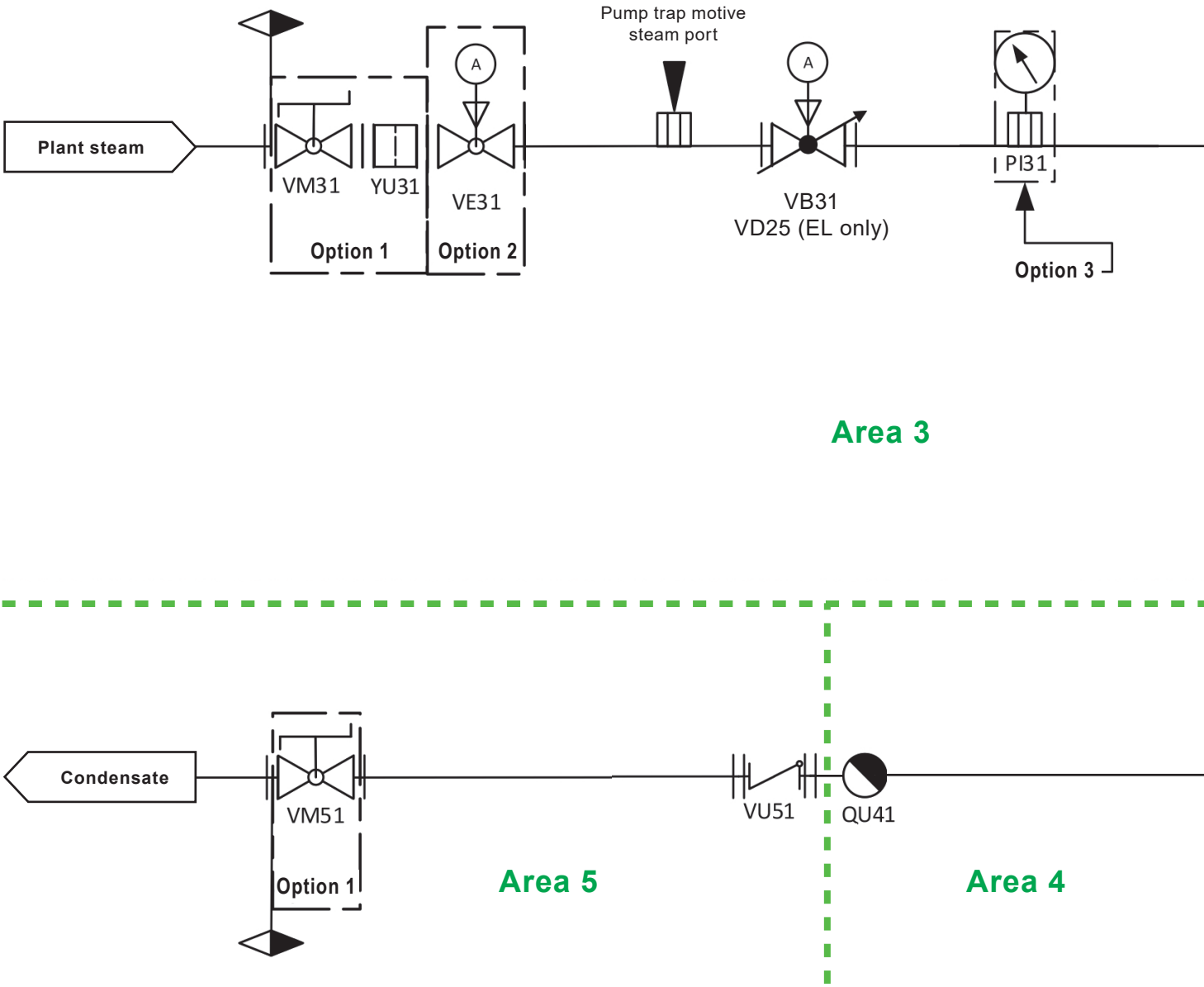
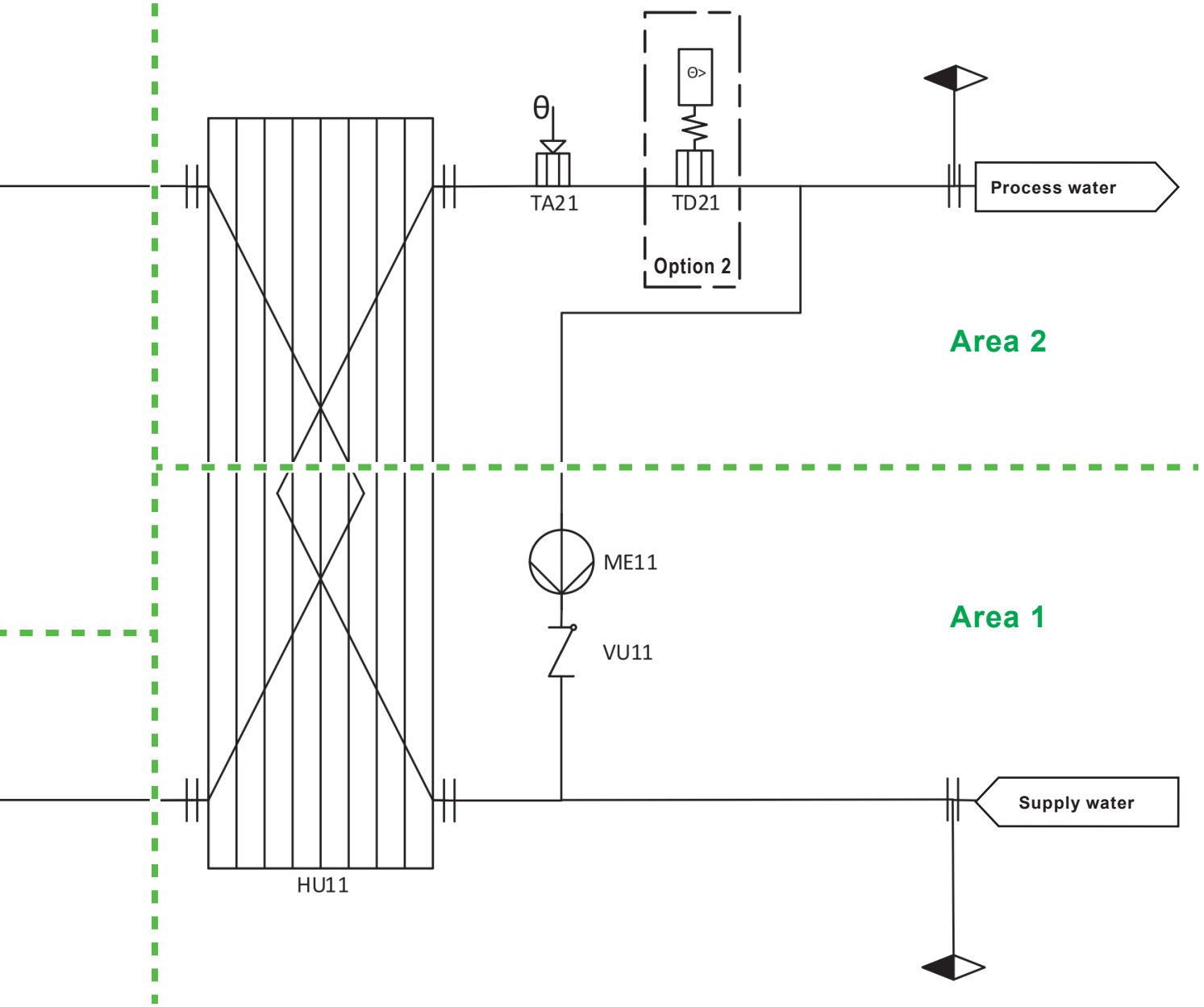


Fig. 7 - EasiHeat-S Schematic



Service
For technical assistance contact our nearest Office or Agency.

Warranty
Ascertained partial or complete non-compliance with these regulations will result in forfeiture of the related warranty.

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