

## Process Controller Panel Kits for Pressure and Temperature Control

### Installation and Maintenance Instructions

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DHW panel shown

1. Safety information
2. General product information
3. Installation
4. Commissioning
5. Fault finding
6. Maintenance

# 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 electrical connection and operation of the control system within the Universal Lite control panel. Please refer to the relevant IMIs for the systems components and supplementary safety information.

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

## 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.

- i) The product has been specifically designed for use on steam or water/condensate. 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.

## 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.

## 1.13 Transport

Transportation and storage temperatures within a range of  $-25\text{ }^{\circ}\text{C}$  to  $+55\text{ }^{\circ}\text{C}$  and for short periods not exceeding 24 h at up to  $+70\text{ }^{\circ}\text{C}$ . Suitable means shall be provided to prevent damage from humidity, vibration, and shock.

## 2. General product information

### 2.1 Description

The Spirax Sarco Process Controller Panel Kits are designed and built for multiple industry applications including Heating (HTG), Domestic Hot Water (DHW), Pressure, or Level control applications utilizing a variety of different modulating control valves and input sensors.

Standard configurations and field adjustable outputs provide a wide range of applications for use with various heat exchanger technologies with (2) modulating control outputs and relay outputs for high limit or alarm status.

The Spirax Package below is fitted with a plate and frame heat exchanger as an example (refer to the figure below):

- A Plate heat Exchanger
- B Pneumatic or Electrically actuated control valve and positioner
- C SX90 Process Controller Panel
- D Pipeline ancillaries

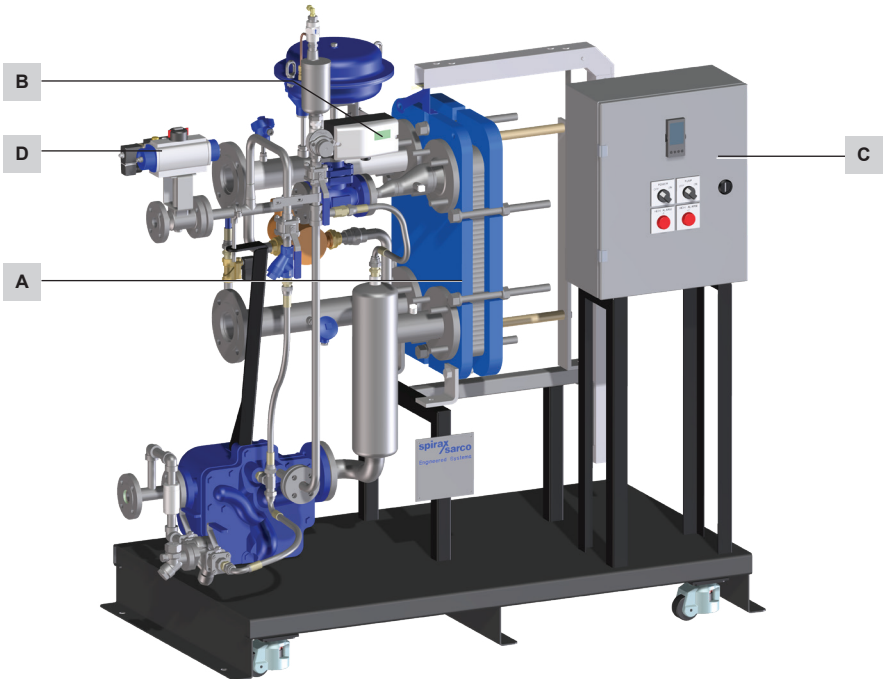


Fig. 1 DHW heat transfer solution

#### Notes:

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

# 3. Installation

## 3.1 Electrical Supply

All electrical wiring and connections should be carried out in accordance with National Electrical Code and any relevant local electrical code requirements.

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

Supply power is directly connected to terminal block connections including the main power supply earthing connection.

## 3.2 Electrical Specification

<b>Control Panel Supply Voltage</b>	110-120 Vac @ 50-60Hz
	Inlet Voltage Breaker – 10A
<b>Control Panel Circuit Breakers</b>	120 V Power Breaker – 5A
	Controller Breaker – 5A
	24 V Power Breaker – 3A
<b>Electric Actuator Power</b>	24 Vac or 120 Vac
<b>Modulating Output(s)</b>	(2) 4-20 mA control
<b>Operating Ambient Temperature</b>	32 °F to 131 °F and RH: 5 to 85% non-condensing
<b>Enclosure Rating</b>	NEMA 4
<b>Controller</b>	See SX90 Technical Information Sheet TI-P323-30-US

## 3.3 Electrical Connection

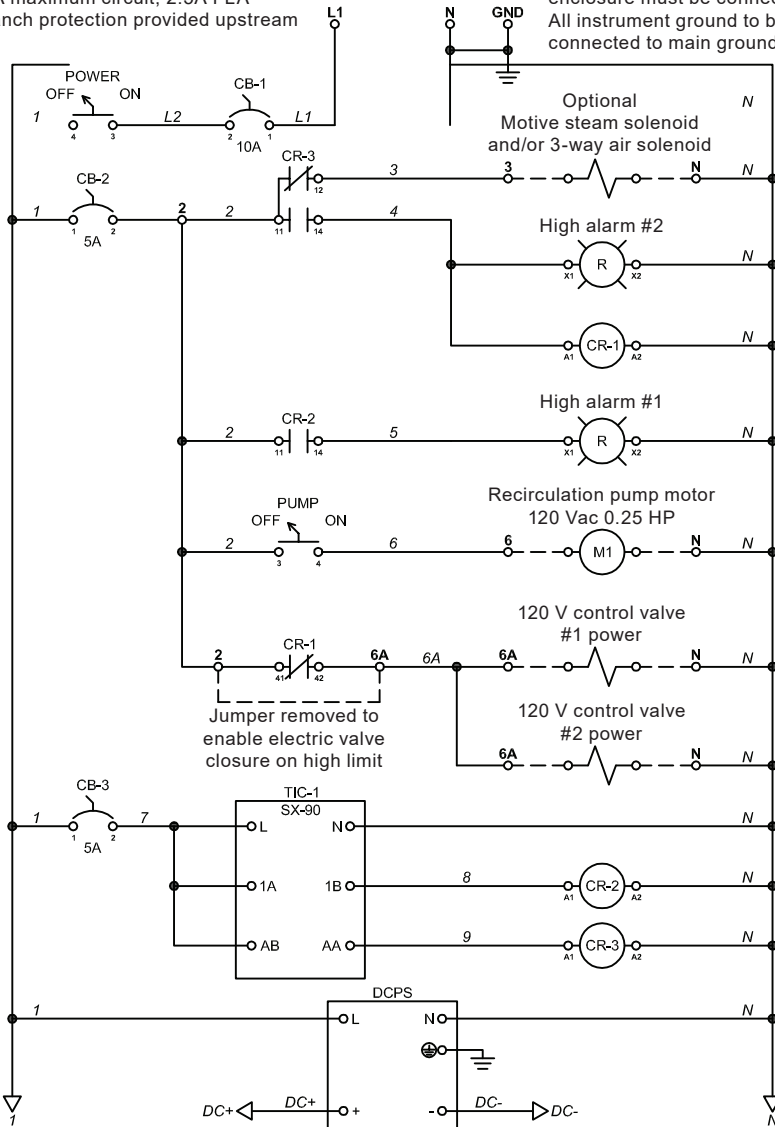
The following are available for customer connection to the SX90 Process Control Panel if required:

<b>High Limit Alarm #1</b>	Terminals 100, 101, and 102
<b>High Limit Alarm #2</b>	Terminals 103, 104, and 105
<b>Secondary Setpoint</b>	Terminals 307 and 309
<b>Output Shutdown</b>	Terminals 308 and 309

### 3.4 Terminal Layout Overview - Domestic Hot Water (DHW)

120 Vac from plant distribution  
 10A maximum circuit, 2.5A FLA  
 Branch protection provided upstream

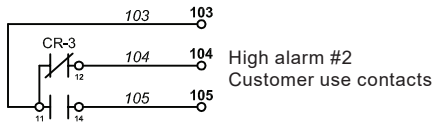
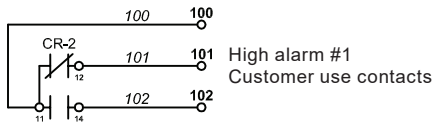
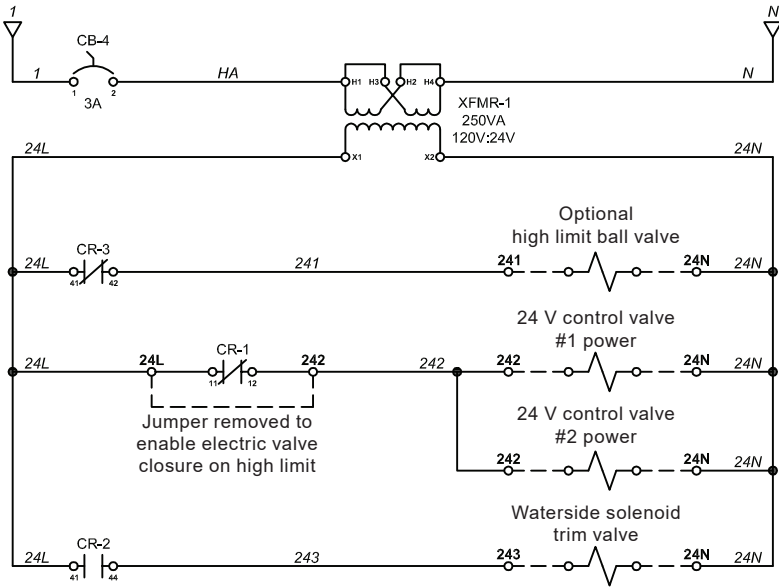
Ground strap to door and main enclosure must be connected.  
 All instrument ground to be star connected to main ground bus.



Terminal Layout Overview - Domestic Hot Water (DHW) continued on next page

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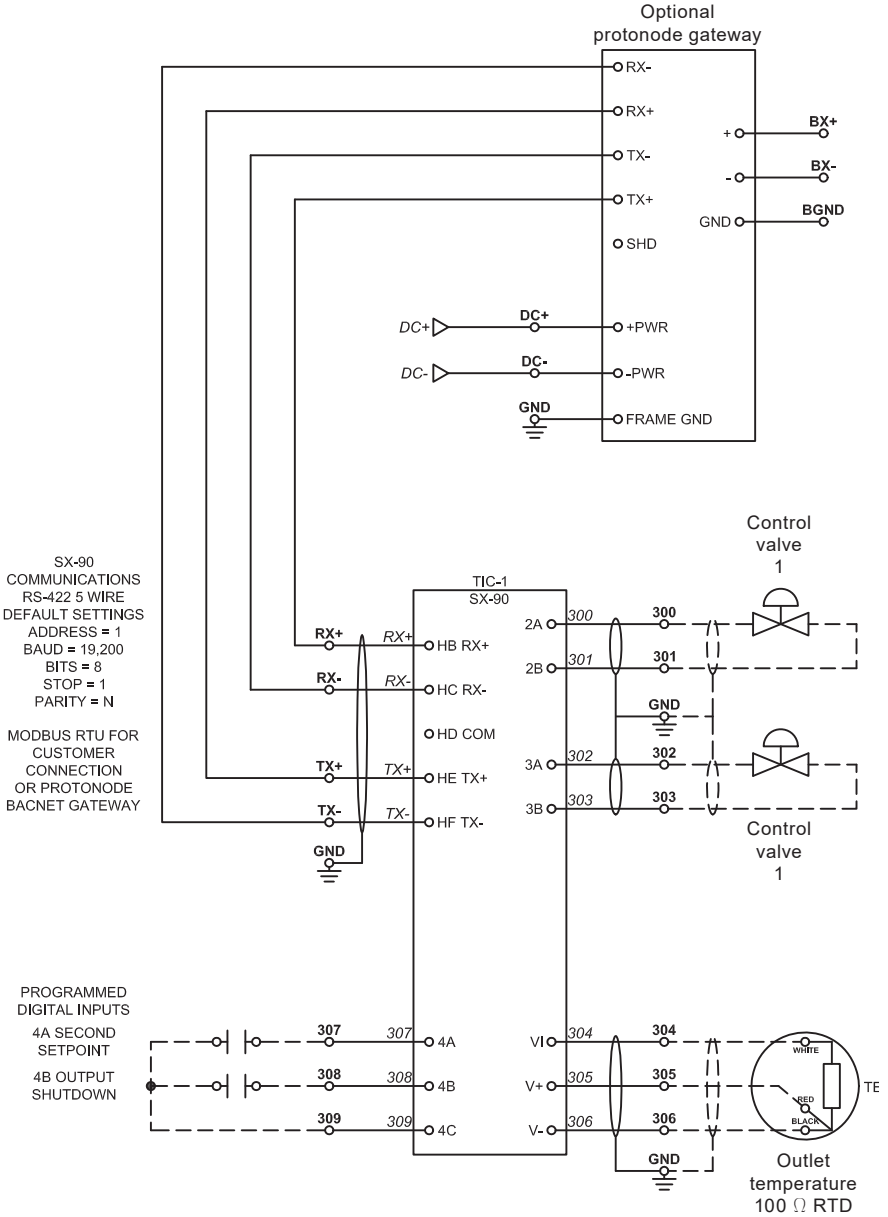
### 3.4 Terminal Layout Overview - Domestic Hot Water (DHW) (continued)



Terminal Layout Overview - Domestic Hot Water (DHW) continued on next page



### 3.4 Terminal Layout Overview - Domestic Hot Water (DHW) (continued)

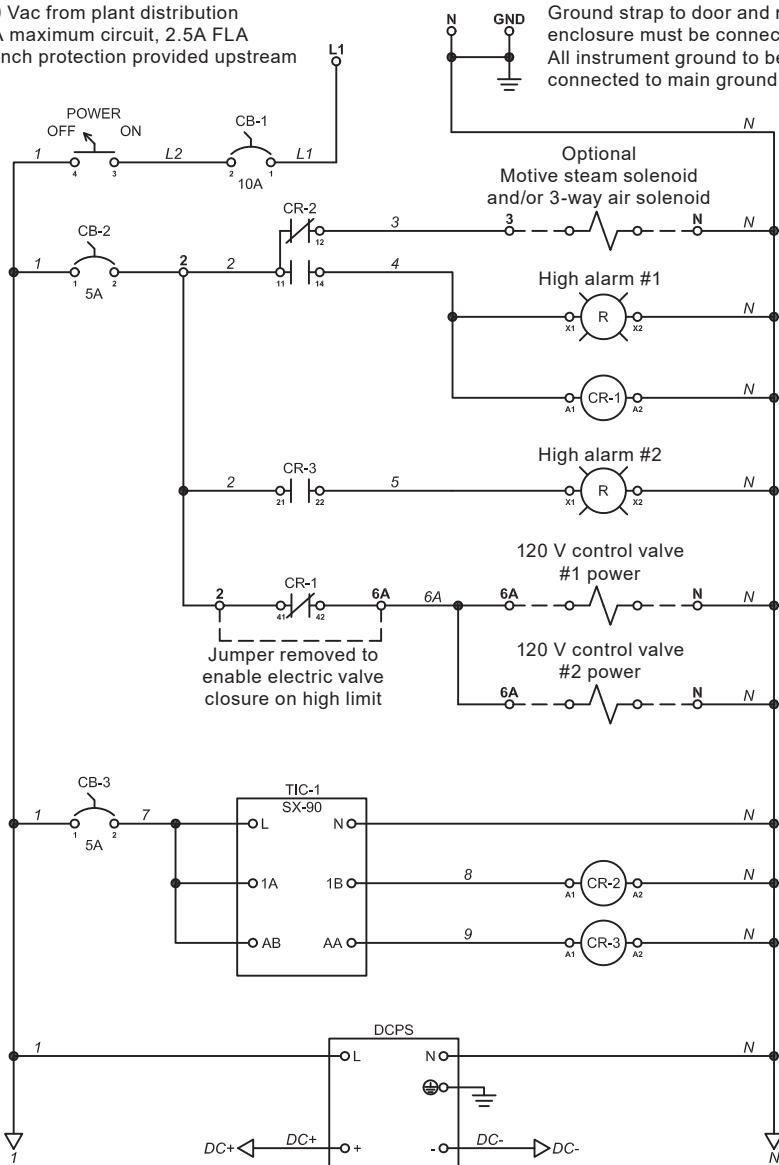


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### 3.5 Terminal Layout Overview - Heating (HTG)

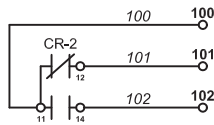
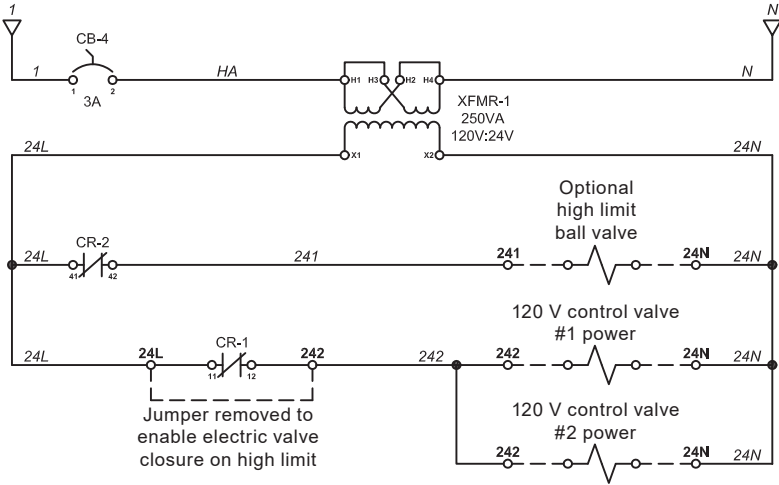
120 Vac from plant distribution  
 10A maximum circuit, 2.5A FLA  
 Branch protection provided upstream

Ground strap to door and main enclosure must be connected.  
 All instrument ground to be star connected to main ground bus.

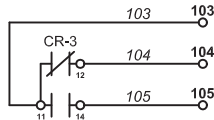


Terminal Layout Overview - Heating (HTG) continued on next page

### 3.5 Terminal Layout Overview - Heating (HTG) (continued)



High alarm #1  
Customer use contacts

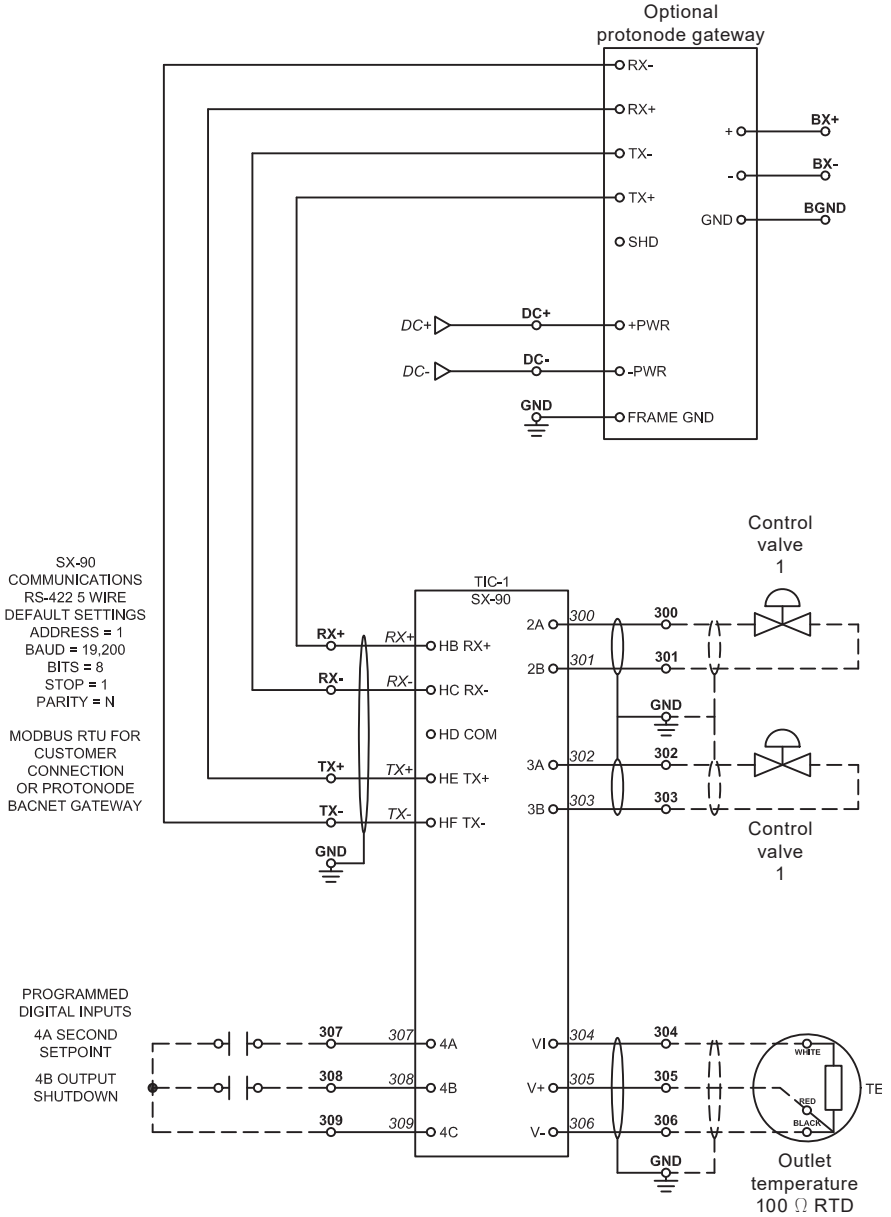


High alarm #2  
Customer use contacts

Terminal Layout Overview - Heating (HTG) continued on next page

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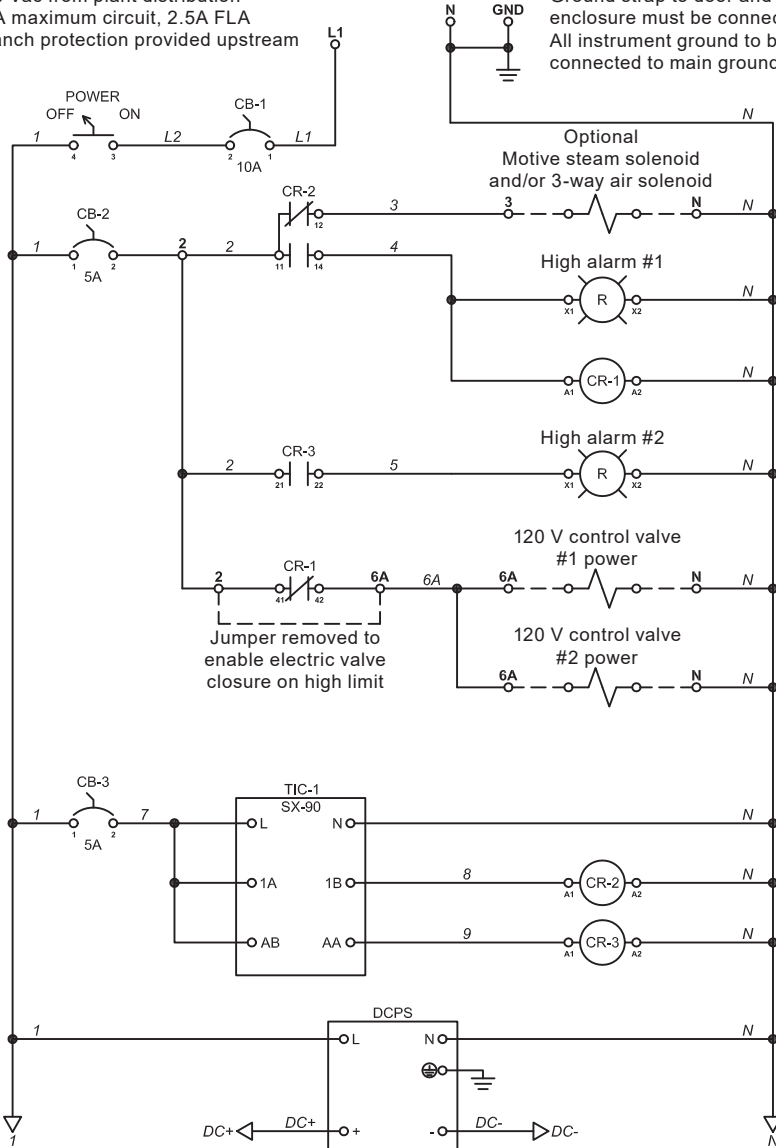
### 3.5 Terminal Layout Overview - Heating (HTG) (continued)



### 3.6 Terminal Layout Overview - Pressure

120 Vac from plant distribution  
 10A maximum circuit, 2.5A FLA  
 Branch protection provided upstream

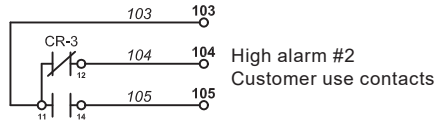
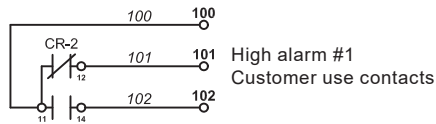
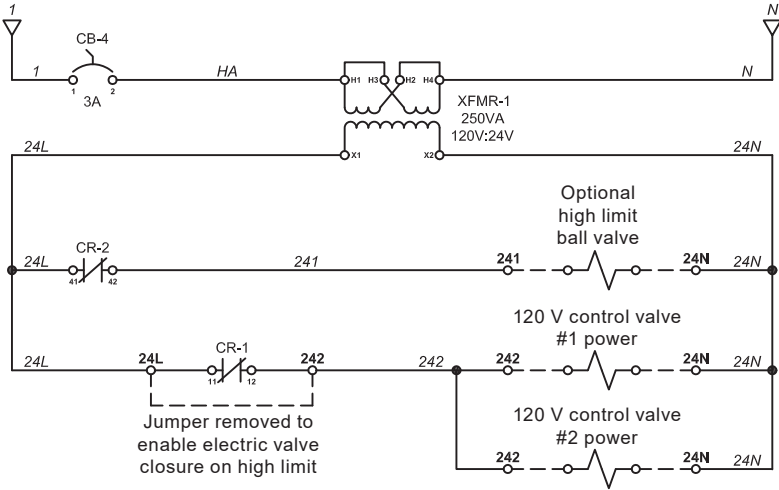
Ground strap to door and main enclosure must be connected.  
 All instrument ground to be star connected to main ground bus.



Terminal Layout Overview - Pressure continued on next page

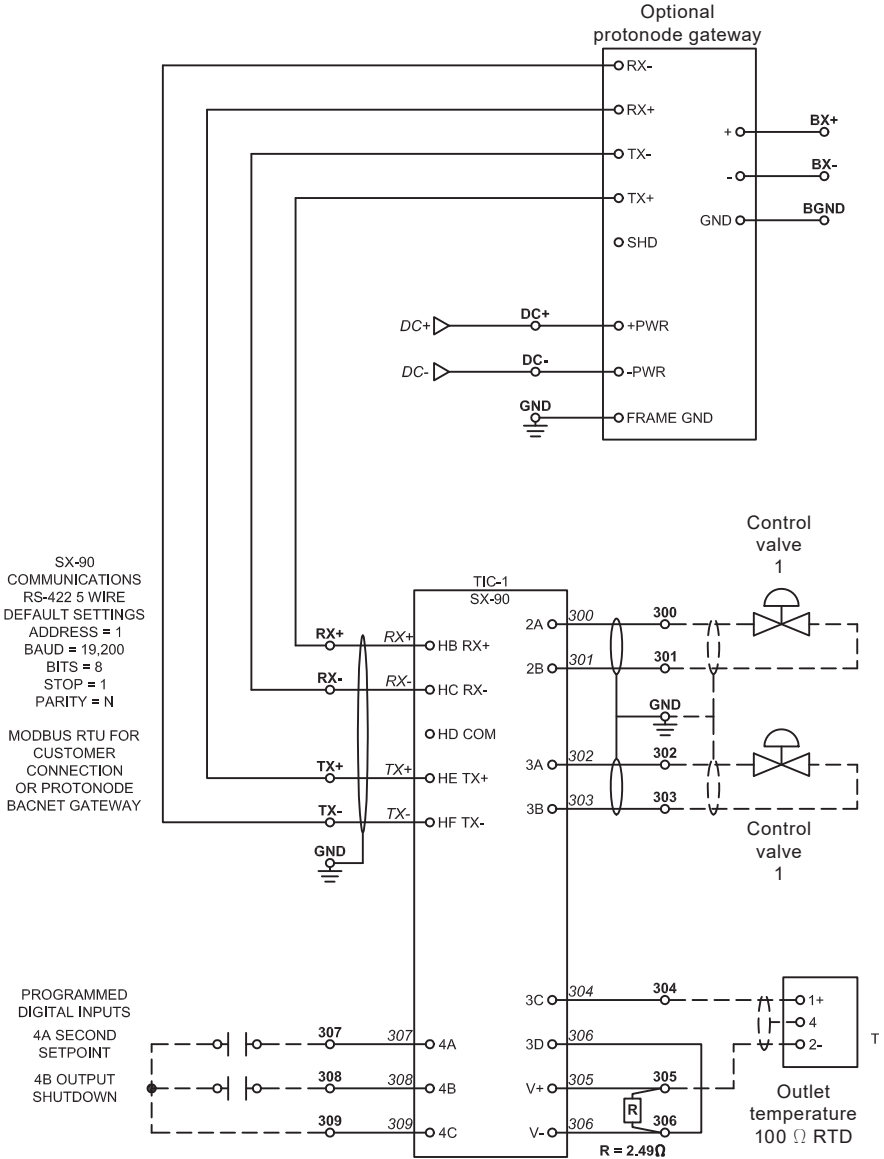
Process Controller Panel Kits for Pressure and Temperature Control

### 3.6 Terminal Layout Overview - Pressure (continued)



Terminal Layout Overview - Pressure continued on next page

### 3.6 Terminal Layout Overview - Pressure (continued)



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# 4. Commissioning

We recommend using the service and support of a Spirax Sarco commissioning engineer for commissioning new panel installations. 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 for any commissioning with live steam.
- Ensure that all main isolation valve for both steam and water are isolated.
- Ensure that the electrical supply to the Spirax Control Panel is Isolated.
- Double check that all steam, condensate, and water connections are correctly connected to the Spirax Thermal Energy Package.
- Check all flange bolts are tight.

### 4.1 Quick Start Commissioning procedure:

The Process Control Panel will ship pre-loaded with the appropriate control program (HTG, DHW, or Pressure Control) and can be adapted or overwritten locally for special applications.

### 4.2 Front panel layout

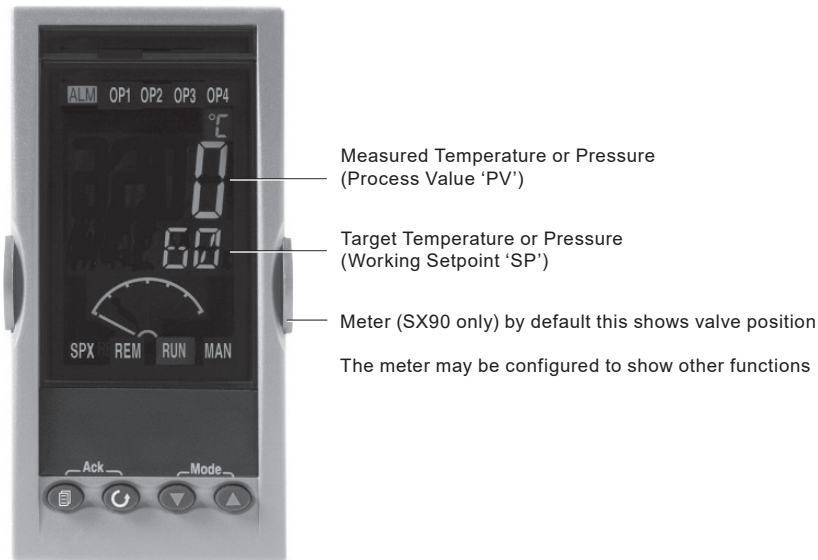


Fig. 2



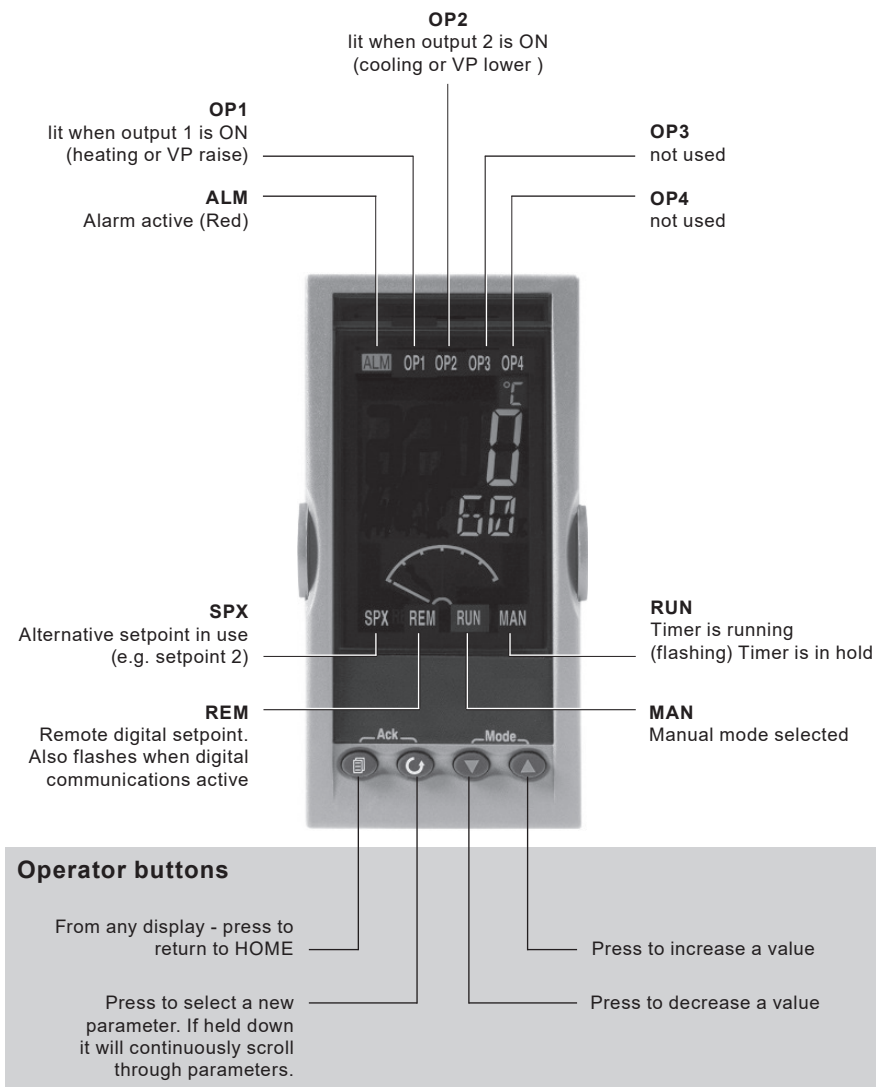


Fig. 3

Instructions for Quickstart can be found in the SX80 and SX90 Quickstart Guide (IM-P323-32)

## 5. Fault finding

Fault	Possible Cause	Remedial Action
<b>Unit does not power up</b>	Loss of incoming supply power	Check incoming supply
	Internal Circuit Breaker Trip	Check all circuit breakers to confirm continuity
<b>Sbr – Sensor Break Error</b>	Incorrect field wiring of sensor	Check wiring of sensor to terminals per wiring diagram
	Sensor out of range	Confirm range of installed sensor against site conditions
	Incorrect Sensor Type Selected	Verify correct sensor type is selected in Input menu
<b>Incorrect Set Point/Alarms</b>	Incorrect setup of controller/ wrong profile loaded	Consult SX90 IM (IM-P323-35) for corrective action
<b>E.ConF, E.CaL, E2.Er, EE.Er, E.LI n, Emod, or E.CPU</b>	Various diagnostic alarms for SX90 Module	
<b>Valves operating opposite of expected control</b>	Analog outputs configured incorrectly	Consult SX90 IM (IM-P323-35) for corrective action to change direct/reverse acting

## 6. Maintenance

Spirax Control Panel kits are non-maintainable systems and do not require regular preventative maintenance.

For maintenance instructions related to the heat exchanger or process control system serviced by the control panel, please refer to the relevant Instruction and Maintenance Manual (IM).

