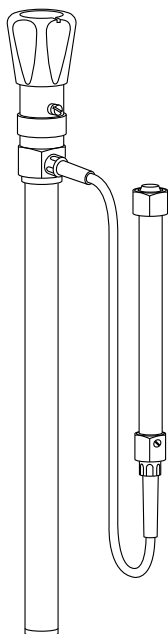


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**SA121, SA122, SA123, SA128 and SA1219**  
**Self-acting Temperature Control Systems**  
**(Knob Adjustment)**  
**Installation and Maintenance Instructions**

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- 1. Safety information*
- 2. Use*
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# *1. Safety information*

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

These product are designed and constructed to withstand the force encountered in normal use. Use of these products for any purpose other than as temperature controllers could cause injury or fatality to personnel.

## **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 products comply with the requirements of the European Pressure Equipment Directive 97/23/EC and fall within category 'SEP'. It should be noted that products within this category are required by the directive not to carry the CE mark.

- i) The products have been specifically designed for use on steam, water, compressed air and other non-hazardous fluids which are in Group 2 of the above mentioned Pressure Equipment Directive. 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.

**WARNING:** The sensor must not be subjected to mercury or ammonium salts.

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## **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.

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### 1.13 Residual hazards

In normal use the external surface of the product may be very hot. If used at the maximum permitted operating conditions the surface temperature of some products may reach temperatures of 215°C (419°F).

Many products are not self-draining. Take due care when dismantling or removing the product from an installation (refer to 'Maintenance instructions').

**WARNING:** This product contains kerosene which is highly inflammable.

### 1.14 Freezing

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

### 1.15 Disposal

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

### 1.16 Returning products

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

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## 2. Use

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It is important that these self-acting temperature control systems are only used with Spirax Sarco control valves as indicated in Table 1:

**Table 1**

Self-acting temperature control system	Control valve size	Control valve type
SA121, SA123	All	2-port
	¾" to 2"	TW
SA128, SA122	½" to 1"	2-port
	¾" and 1"	TW
SA1219	3" and 4"	TW

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## 3. Installation

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These product are designed and constructed to withstand the force encountered in normal use. Use of these products for any purpose other than as temperature controllers could cause injury or fatality to personnel.

**WARNING:** The sensor must not be subjected to mercury or ammonium salts.

Check that the control system supplied is of the temperature range required. It is important that the whole of the temperature sensing area of the sensor is fully immersed in the fluid being controlled, see Figure 1.

The sensors can be held in a screwed nipple by means of a compression ring. Screw the nipple into the boss provided on the plant, thread the union nut and compression ring over the sensor. Insert the sensor fully into the nipple and tighten up the nut and compression ring. Do not overtighten.

Where the sensors are used in conjunction with a pocket, either to allow easy withdrawal or as a protection against corrosion, the separate screwed nipple is dispensed with and the union nut and compression ring attached directly to the top of the pocket. Therefore insert the pocket in place of the screwed nipple.

When using a special long pocket with the SA122 or SA123 sensor, the screwed nipple, compression ring and nut are dispensed with and a rubber sealing bung provided, which is fitted over the capillary and slid into place to secure the sensor into the pocket. Screw the pocket into place, then feed the sensor bulb to the bottom of the pocket, using the rubber bung to seal the top.

When using a pocket it is advisable to fill the gap between the pocket and the sensor with a heat conducting medium such as oil, but when using a special long pocket in conjunction with the SA122 or SA123 sensors it should not be filled above the top of the sensor.

The adjustment mechanism should not be subjected to an ambient temperature above 50°C (122°F) or below -35°C (-31°F). The capillary tube between the sensor and the valve must be run and supported in such a way that it will not become damaged. Avoid all sharp bends. See Sections 5 and 6 'Display adjustment' and 'Commissioning'.

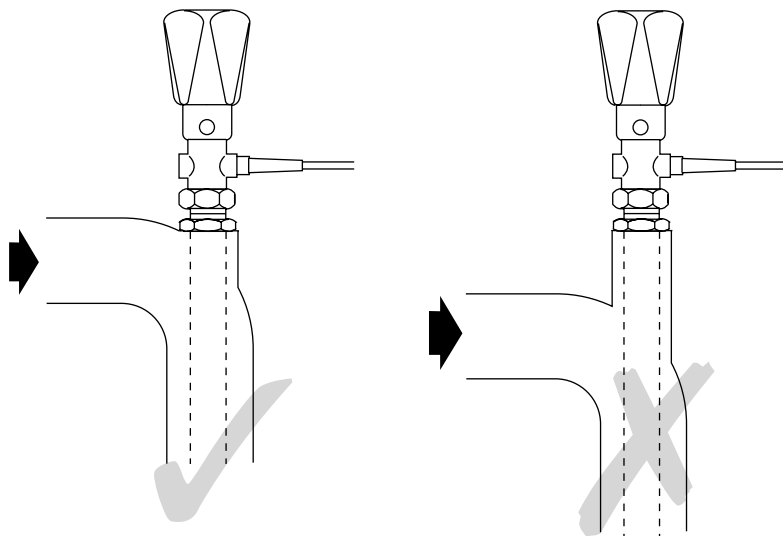


Fig. 1

Correct installation

Incorrect installation

## 4. Pre-commissioning checks

These temperature control systems have been designed and manufactured to the highest industrial standards. In order that they function correctly, please observe the following points and then proceed with the 'Display adjustment' in Section 5 for adjusting to the desired set temperature.

### Factory temperature setting

In order to avoid accidental damage due to exposure of extreme temperatures, the unit is factory adjusted to its highest set temperature. This value will vary according to the data shown in Table 2.

### Overtemperature protection

In the event that the overtemperature protection is exceeded by the values shown, serious damage will occur and the warranty will be invalidated. Before commissioning this unit, please ensure that the system temperature cannot exceed the overtemperature protection value.

**Table 2**

#### Metric

Self-acting temperature control system	Range no.	Temperature adjustment range (°C)	Factory setting	Overtemperature protection
SA121, SA1219 and SA123	1	-15 to +50	50°C	55°C over set value to 190°C maximum (215°C maximum for the SA123)
	2	+40 to +105	105°C	
	3	+95 to +160	160°C	
SA122	1	-20 to +120	120°C	
	2	+40 to +170	170°C	
SA128	1	-20 to +110	110°C	
	2	+40 to +170	170°C	

#### Imperial

Self-acting temperature control system	Range no.	Temperature adjustment range (°F)	Factory setting	Overtemperature protection
SA121, SA1219 and SA123	1	+5 to +125	125°F	130°F over set value to 374°F maximum (420°F maximum for the SA123)
	2	+105 to +225	225°F	
	3	+205 to +325	325°F	
SA122	1	-5 to +240	240°F	
	2	+106 to +340	340°F	
SA128	1	-5 to +230	230°F	
	2	+106 to +340	340°F	

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## 5. Display adjustment

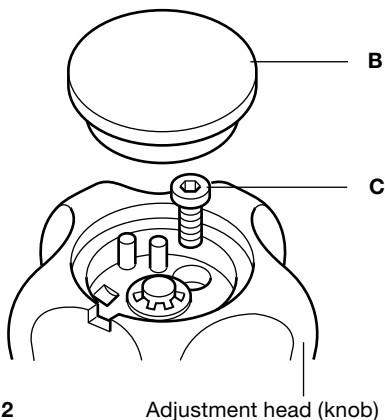
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The adjustment head provided (Figure 2), enables the set temperature to be raised or lowered, once the drive screw 'C' has been engaged.

To make any adjustment the blue knob is turned clockwise to lower the temperature, and anticlockwise to increase it.

After setting, if desired, the drive screw can be disengaged by prising out the black plastic cap 'B' with a small flat bladed screw driver, via the slot provided, remove the 3 mm A/F allen headed drive screw 'C' and stow in the knob, then replace the black cap.

The adjustment knob will now spin freely without changing the temperature setting.



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## 6. Commissioning

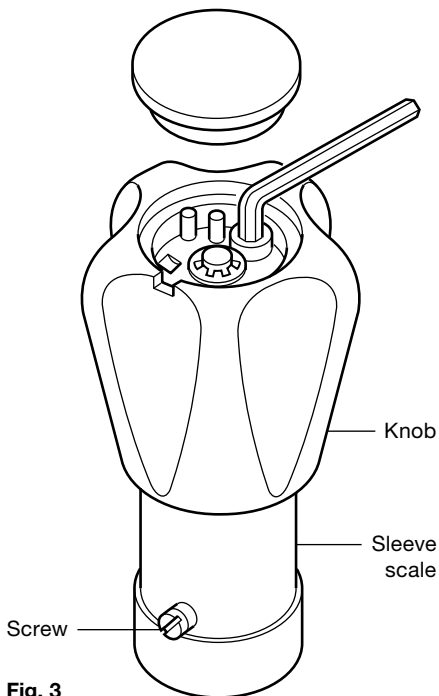
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Reference Figure 3, opposite, for the following instructions:-

Adjust to the desired setting by turning the knob clockwise to lower the temperature and anticlockwise to increase it.

After setting the plant to work, compare the thermometer reading with the scale reading on the temperature control reading. This may be found to differ by a few degrees. If precise indication is required it can be adjusted by resetting the scale as follows:-

1. Loosen the screw holding the sleeve scale in place and adjust the sleeve by rotating it until the scale reading matches the actual temperature.
2. Tighten the screw until it holds the scale firmly in place without over tightening (it only needs a light touch as it is for location only).



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## *7. Decommissioning*

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As a safety precaution, if the unit is to be decommissioned, it is important to reset the unit to its maximum (factory) setting before reinstalling.

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## *8. Maintenance and spare parts*

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There are no serviceable parts.