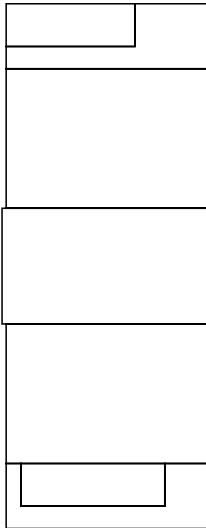


**Frost Protection Liquid Expansion Trap**  
**Installation and Maintenance Instructions**

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- 1. *General safety information*
- 2. *General product information*
- 3. *Installation*
- 4. *Commissioning*
- 5. *Operation*
- 6. *Maintenance*
- 7. *Spare parts*
- 8. *Fault finding*

# — 1. *General safety information* —

Safe operation of these units can only be guaranteed if they are properly installed, commissioned and maintained by a qualified person (see Section 11 of the attached Supplementary Safety Information) 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.

## **Isolation**

Consider whether closing isolating valves will put any other part of the system or personnel at risk. Dangers might include; isolation of vents and protective devices or alarms. Ensure isolation valves are turned off in a gradual way to avoid system shocks.

## **Pressure**

Before attempting any maintenance consider what is or may have been in the pipeline. Ensure that any pressure is isolated and safely vented to atmospheric pressure before attempting to maintain the product, this is easily achieved by fitting Spirax Sarco depressurisation valves type DV (see separate literature for details). Do not assume that the system is depressurised even when a pressure gauge indicates zero.

## **Temperature**

Allow time for temperature to normalise after isolation to avoid the danger of burns and consider whether protective clothing (including safety glasses) is required.

## **Disposal**

The product is recyclable. No ecological hazard is anticipated with the disposal of this product providing due care is taken.

## — 2. General product information —

### 2.1 General description

The Spirax Sarco bydrain frost protection liquid expansion trap is made of stainless steel. It has been specifically designed for protecting water systems from frost damage. This fixed temperature discharge trap continuously monitors the water temperature in the pipes; the trap is firmly closed at 7°C (45°F), but as the temperature of the water cools to 2°C (36°F) the trap opens, discharging any water in the pipe.

#### Standards

This product fully complies with the requirements of the European Pressure Equipment Directive 97/23/EC.

#### Certification

This product is available with certification to EN 10204 3.1.B. **Note:** All certification/inspection requirements must be stated at the time of order placement.

#### Note:

For additional information see Technical Information Sheet TI-P670-02.

### 2.2 Sizes and pipe connections

½" and ¾" screwed BSP or NPT

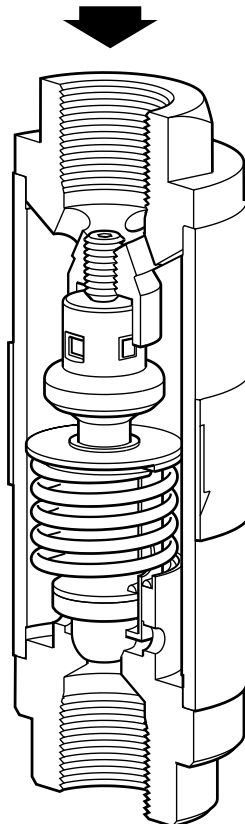


Fig. 1

## 2.3 Limiting conditions

Body design conditions	PN50, Class 300 to ANSI B 16.34	
PMA - Maximum allowable pressure	41.4 bar g	(600.3 psi g)
TMA - Maximum allowable temperature	450°C	(842°F)
PMO - Maximum operating pressure	10 bar g	(145 psi g)
TMO - Maximum operating temperature	70°C	(158°F)
Minimum operating pressure for satisfactory operation	0.1 bar g	(1.5 psi g)
ΔPMX - The backpressure for correct operation must not exceed 90% of the upstream pressure.		
Designed for a maximum cold hydraulic test pressure of:	62 bar g	(899 psi g)

**Note:** The trap seat is completely open at a water circuit temperature of 2°C (36°F) and closed at 7°C (45°F).

## 2.4 Dimensions / weights (approximate) in mm and kg

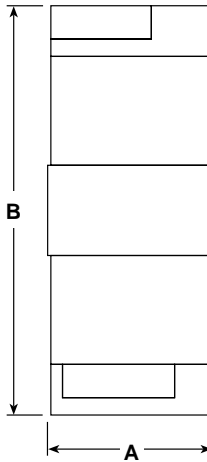


Fig. 2

Size	Connections	A	B	Weight
½"	BSP, NPT	42.4	110	0.65
¾"	BSP, NPT	42.4	115	0.70

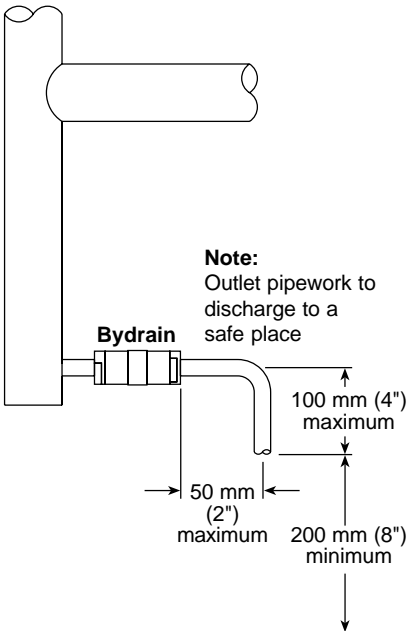
# 3. Installation

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

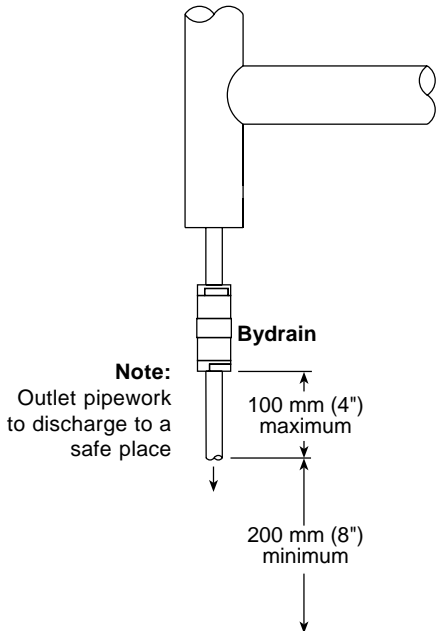
Referring to the Installation and Maintenance Instructions, name-plate and Technical Information Sheet, check that the product is suitable for the intended installation:

- 3.1** Check materials, pressure and temperature and their maximum values. If the maximum operating limit of the product is lower than that of the system in which it is being fitted, ensure that a safety device is included in the system to prevent overpressurisation.
- 3.2** Determine the correct installation situation and the correct direction of fluid flow.
- 3.3** Remove protective covers from all connections.
- 3.4** Install the bydrain downstream of the equipment to be drained, ensuring that it is easily accessible for inspection and maintenance.
- 3.5** The bydrain is generally placed at the end of pipes, at low points in installations or in any area in which liquid may temporarily be stationary and thus susceptible to freezing. The bydrain may be installed in any position, except where discharge is flowing vertically upward.
- 3.6** Before installing the trap, ensure all connecting pipework is clean and free of debris.
- 3.7** The bydrain is factory set. It is non-adjustable and non-maintainable.

**Note:** If the bydrain is to discharge to atmosphere ensure it is to a safe place. To avoid any risk of ice downstream of the trap, it is advisable not to fit any pipe connection at the outlet, apart from a small length of tube angled towards the ground. See installation diagrams below.



**Fig. 3** Horizontal mounting



**Fig. 4** Vertical mounting

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## 4. Commissioning

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After installation or maintenance ensure that the system is fully functioning. Carry out tests on any alarms or protective devices.

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## 5. Operation

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The Spirax Sarco bydrain is a thermostatically controlled frost protection trap. It is designed to protect liquid installations from ice. The bydrain reacts to any drop in temperature and allows the liquid to flow faster the colder it is, then close as soon as the liquid temperature rises above 7°C (45°F).

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## 6. Maintenance

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### **Note:**

**Before actioning any maintenance programme observe the 'Safety information' in Section 1.**

### **Safety note:**

**These traps are installed in pressurised lines. Personnel doing the adjustment work should wear heavy gloves, long sleeve shirt, and other safety equipment designed to protect the wearer (goggles, face shield, etc.) in the event of a leak.**

**The equipment needed to proceed with any maintenance programme is listed in Table 1.**

Once installed the bydrain does not require any maintenance.

The bydrains operation may deteriorate if it becomes clogged, consequently it is recommended that the bydrain valve is removed once a year, before the winter period, in order to clean the pipework and flush the valve through, if necessary.

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## 7. Spare parts

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There are no spare parts available for this product.

### How to order a new product

**Example:** 1 off Spirax Sarco ½" bydrain frost protection liquid expansion steam trap with screwed BSP end connections.

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## 8. Fault finding

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<b>Trap fails to pass water</b>	1. Make sure upstream and downstream valves are open.
	2. Check external strainers for clogging; blowdown or dismantle and clean.
	3. Back pressure too high. Downstream system must be corrected. Backpressure will also lower the discharge temperature.
	4. Valve port clogged with dirt. Flush through with cold water below 7°C (45°F).
<b>Trap fails to close</b>	1. Dirt on seating surface. Flush through with cold water below 7°C (45°F).
	2. Liquid expansion element failed due to exposure above 70°C (158°F). Remove and replace trap.
	3. Worn valve seat. Remove and replace trap.

