
**Single and Double Window Sight Glasses
and Sight Check**
Installation and Maintenance Instructions



**Single window
sight glass**



**Double window
sight glass**



**SG13
sight glass**



**SG253
sight glass**



Sight check

- 1. General
safety information*
- 2. General
product information*
- 3. Installation*
- 4. Commissioning*
- 5. Operation*
- 6. Maintenance and
Spare parts*

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.

Warning

The gaskets used in these units (with exception to the SG13) contain thin stainless steel support rings which may cause physical injury if not handled and disposed of carefully.

Under certain conditions corrosive elements in condensate can affect the inside face of the sight tube/window, particularly where caustic alkali and hydrofluoric acid are present. It is recommended that the sight glass/sight check is periodically checked for thinning of the sight tube/window. If there is evidence of thinning or erosion damage then the sight tube/window should be replaced immediately. Always wear eye protection when viewing the contents of the sight glass/sight check.

Reasonable steps should be taken to protect personnel from injury in the unlikely event that the sight tube/window breaks.

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.

PTFE (SG13 - sight tube gasket):

If parts made from PTFE have been subjected to a temperature approaching 260°C (500°F) or higher, they will give off toxic fumes, which if inhaled are likely to cause temporary discomfort. It is essential for a no smoking rule to be enforced in all areas where PTFE is stored, handled or processed as persons inhaling the fumes from burning tobacco contaminated with PTFE particles can develop 'polymer fume fever'.

Disposal

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

PTFE (SG13 - sight tube gasket):

- Waste parts can only be disposed of by approved methods, not incineration.
- Keep PTFE waste in a separate container, do not mix it with other rubbish, and consign it to a landfill site.

— 2. General product information —

2.1 Single window and double window sight glasses

General description

A range of single and double window sight glasses having screwed connections available in either brass or bronze depending on size.

Note: For additional information see the following Technical Information Sheet TI-P022-05.



Fig. 1
Single window sight glass



Fig. 2
Double window sight glass

Sizes and pipe connections

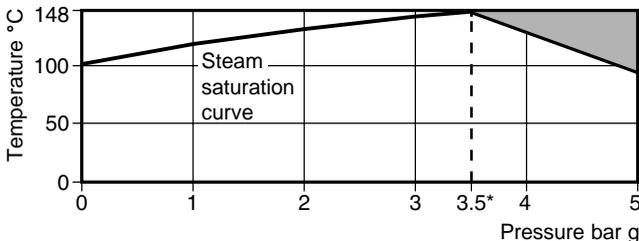
Single window $\frac{3}{8}$ " , $\frac{1}{2}$ " , $\frac{3}{4}$ " and 1" screwed BSP or NPT

Double window $\frac{1}{2}$ " , $\frac{3}{4}$ " , 1" 1½" and 2" screwed BSP or NPT

Limiting conditions

Body design conditions	PN5	
PMA - Maximum allowable pressure	5 bar g	(72.5 psi g)
TMA - Maximum allowable temperature	148°C	(298.4°F)
PMO - Maximum operating pressure	3.5 bar g	(50.75 psi g)
TMO - Maximum operating temperature	148°C	(298.4°F)
Minimum operating temperature	-29°C	(-20.2°F)
Designed for a maximum cold hydraulic test pressure of:	7 bar g	(101.5 psi g)

Operating range



The product must not be used in this region.

* PMO Maximum operating pressure recommended for saturated steam is 3.5 bar g (50.75 psi g).

2.2 SG13 sight glass

General description

The SG13 is a maintainable brass multi-window sight glass with a cylindrical viewing area and screwed connections. The sight glass monitors the discharge downstream of steam traps in pressurised condensate return lines. It is screwed directly into the steam trap providing a modular monitoring system, thus eliminating the need for a connecting nipple, minimising joints and potential leak paths.

The sight glass can also be installed in process lines to provide a visual indication of flow.

Note: For additional information see the following Technical Information Sheet TI-P130-11.



Fig. 3
SG13 sight glass

Sizes and pipe connections

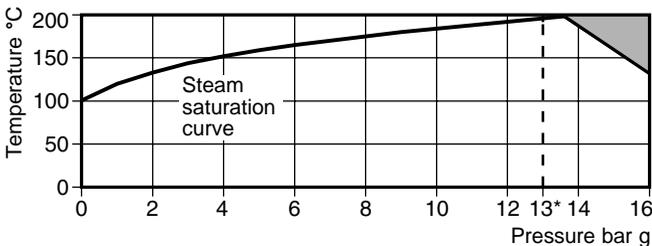
½", ¾" and 1" screwed BSP male taper/female parallel to BS 21 or

½", ¾" and 1" screwed NPT male/female to ANSI B 1.20.1.

Limiting conditions

Body design conditions	PN16	
PMA - Maximum allowable pressure	16 bar g	(232 psi g)
TMA - Maximum allowable temperature	200°C	(392°F)
PMO - Maximum operating pressure	13 bar g	(188.5 psi g)
TMO - Maximum operating temperature	200°C	(392°F)
Minimum operating temperature	-20°C	(-4°F)
Designed for a maximum cold hydraulic test pressure of:	24 bar g	(348 psi g)

Operating range



 The product should not be used in this region.

* PMO Maximum operating pressure recommended for saturated steam is 13 bar g (188.5 psi g).

2.3 SG253 sight glass

General description

The SG253 is an SG iron double window sight glass with flanged connections.

Note: For additional information see the following Technical Information Sheet TI-P130-01.



Fig. 4
SG253 sight glass

Sizes and pipe connections

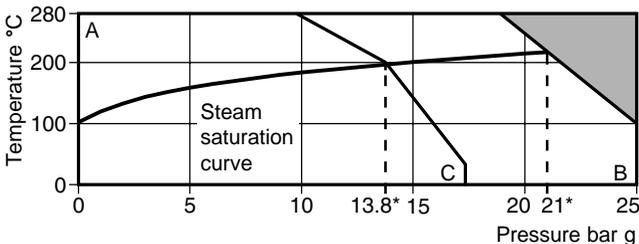
DN15, 20, 25, 32, 40 and 50.

Flanged BS 4504 (DIN) PN25 and BS 1560 (ANSI) Class 150.

Limiting conditions

Body design conditions	PN25 and ANSI 150	
PMA - Maximum allowable pressure	PN25	25 bar g (362.5 psi g)
	Class 150	17.2 bar g (249.5 psi g)
TMA - Maximum allowable temperature	280°C (536°F)	
PMO - Maximum operating pressure	PN25	21 bar g (304.5 psi g)
	Class 150	13.8 bar g (200.1 psi g)
TMO - Maximum operating temperature	280°C (536°F)	
Minimum operating temperature	-10°C (14°F)	
Designed for a maximum cold hydraulic test pressure of:	PN25	38 bar g (551 psi g)
	Class 150	30 bar g (435 psi g)

Operating range



 The product must not be used in this region.

*PMO Maximum operating pressure recommended for saturated steam.

A - B Flanged BS 4504 (DIN) PN25.

A - C Flanged BS 1560 (ANSI) Class 150.

2.4 Sight check

General description

A sight check is a combined sight glass and check valve. It is used to observe discharges from steam traps. The position of the ball check indicates whether or not condensate is flowing. Where condensate rises after the trap it eliminates the need for a separate check valve thus simplifying installation.

It is particularly useful for commissioning steam traps fitted with a steam lock release (SLR) unit. It can also be used on other liquid lines for which the materials of construction are compatible.

Note: For additional information see the following Technical Information Sheet TI-P022-01.



Fig. 5
Sight check

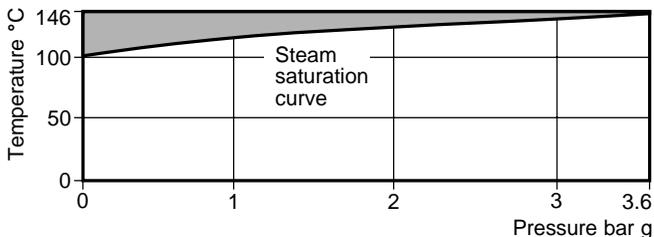
Sizes and pipe connections

½", ¾" and 1" screwed BSP or NPT.

Limiting conditions

Body design conditions	PN3.6	
PMA - Maximum operating pressure	3.6 bar g	(52.2 psi g)
TMA - Maximum operating temperature	146°C	(294.8°F)
PMO - Maximum operating pressure	3.6 bar g	(52.2 psi g)
TMO - Maximum operating temperature	146°C	(294.8°F)
Minimum operating temperature	-10°C	(14°F)
Designed for a maximum cold hydraulic test pressure of:	7 bar g	(101.5 psi g)

Operating range



 The product must not be used in this region.

3. *Installation*

Note:

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

Warning

Under certain conditions corrosive elements in condensate can affect the inside face of the sight tube/window, particularly where caustic alkali and hydrofluoric acid are present. It is recommended that the sight glass/sight check is periodically checked for thinning of the sight tube/window. If there is evidence of thinning or erosion damage then the sight tube/window should be replaced immediately. Always wear eye protection when viewing the contents of the sight glass/sight check.

Reasonable steps should be taken to protect personnel from injury in the unlikely event that the sight tube/window breaks.

Sight glasses and sight checks can be fitted in either a horizontal or vertical line on the outlet side of a steam trap. Where the trap is a blast discharge type e.g. thermodynamic, the sight glass and sight check must be fitted at least 1 m (3 ft) from the trap. This is to ensure that the glass is not subjected to thermal shock or pressure. Reasonable steps should be taken to protect personnel from injury in the unlikely event that the glass breaks.

Ensure access is available for maintenance purposes

4. *Commissioning*

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

5. *Operation*

5.1 Sight glasses

The sight glass has a smooth concentric reduction in the inlet connection which promotes turbulence in the sight glass when the fluid is passing through it. The turbulent flow inside the sight glass permits any fluid to be detected.

Sight glasses can be used to detect blocked valves, strainers, steam traps and other pipeline equipment. Sight glasses can also be used for inspection purposes, i.e. to compare the colour of the fluid at different stages of the process, enabling adjustments to be made quickly and effectively.

The SG13 cylinder view can be screwed directly into the steam trap it is monitoring to form a modular steam trap arrangement.

5.2 Sight checks

The sight check is a sight glass and check valve combination in one unit. A ball in the top of the flow tube is lifted off its seat by the fluid as it flows through the cylindrical window to the outlet connection. The ball movement makes the flow easy to see yet provides shut-off on reverse flow.

— 6. Maintenance and Spare parts —

6.1 Single window and double window sight glasses

Note:

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

Warning

The gaskets used in the single and double window sight glasses contain thin stainless steel support rings which may cause physical injury if not handled and disposed of carefully.

Under certain conditions corrosive elements in condensate can affect the inside face of the window, particularly where caustic alkali and hydrofluoric acid are present. It is recommended that the sight glass is periodically checked for thinning of the window. If there is evidence of thinning or erosion damage then the window should be replaced immediately. Always wear eye protection when viewing the contents of the sight glass.

Reasonable steps should be taken to protect personnel from injury in the unlikely event that the window breaks.

All work must be carried out by a suitably competent person. Before starting work ensure that suitable tools are available and the 'Safety information' is being complied with. Use only Spirax Sarco replacement parts.

How to renew the window(s) and gaskets:

- Isolate the sight glass and allow the pressure and temperature to reduce to ambient conditions.
- After isolation unscrew the bezel(s) (2) and remove old gaskets (4 and 5) and windows (3).
- Carefully clean the recess.
- Refit new gaskets and windows, ensuring that the thick bottom gasket (5) is fitted under the glass window (3) and the thin gasket (4) on top.
- Replace the bezel(s) and tighten to the recommended torque (see Table 1).
- After maintenance has been completed, isolation valves should be opened slowly to allow pressure and temperature to build up in a controlled manner.
- Check for leaks.

6.2 Spare parts (for the single window and double window sight glasses)

The spare parts available are shown in heavy outline. Parts drawn in broken line are not supplied as spares.

Available spares

Set of windows and gaskets	3, 4, 5
Set of gaskets	4, 5

How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size and type of sight glass.

Example: 1 - Set of windows and gaskets for a 1" Spirax Sarco double window sight glass.

Fig. 6
Single window
sight glass

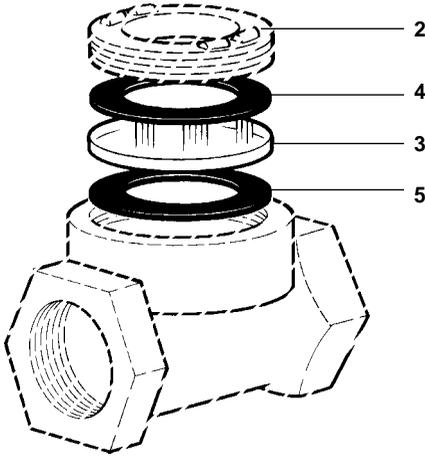


Fig. 7
Double window
sight glass

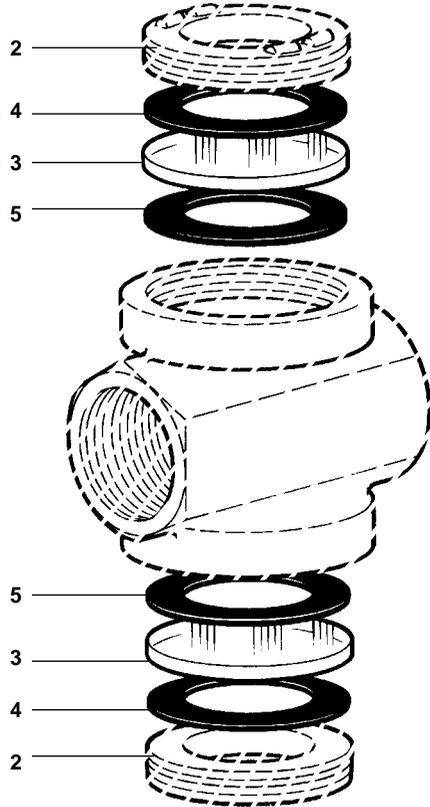


Table 1 Recommended tightening torque

Item No.	Part	 or  mm	N m	(lbf ft)
2	Bezel		60 - 65	(43 - 47)

6.3 SG253 sight glass

Note:

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

Warning

The gaskets used in the SG253 contain thin stainless steel support rings which may cause physical injury if not handled and disposed of carefully.

Under certain conditions corrosive elements in condensate can affect the inside face of the window, particularly where caustic alkali and hydrofluoric acid are present. It is recommended that the sight glass is periodically checked for thinning of the window. If there is evidence of thinning or erosion damage then the window should be replaced immediately. Always wear eye protection when viewing the contents of the sight glass.

Reasonable steps should be taken to protect personnel from injury in the unlikely event that the window breaks.

All work must be carried out by a suitably competent person. Before starting work ensure that suitable tools are available and the 'Safety information' is being complied with. Use only Spirax Sarco replacement parts.

How to renew the windows and gaskets:

- Isolate the sight glass and allow the pressure and temperature to reduce to ambient conditions.
- After isolation unscrew the cover nuts (6) and remove the old gaskets (4 and 5) and windows (3).
- Carefully clean the recess.
- Refit new gaskets and windows, ensuring that the thick bottom gasket (5) is fitted under the glass window (3) and the thin gasket (4) on top.
- Replace the covers (2) and cover nuts (6) and tighten to the recommended torque (see Table 2).
- After maintenance has been completed, isolation valves should be opened slowly to allow pressure and temperature to build up in a controlled manner.
- Check for leaks.

6.4 Spare parts (for the SG253 sight glass)

The spare parts available are shown in heavy outline. Parts drawn in broken line are not supplied as spares.

Available spares

Set of windows and gaskets	3, 4, 5
Set of gaskets	4, 5

How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size and type of the sight glass.

Example: 1 - Set of windows and gaskets for a DN15 Spirax Sarco SG253 sight glass.

Fig. 8
SG253 sight glass

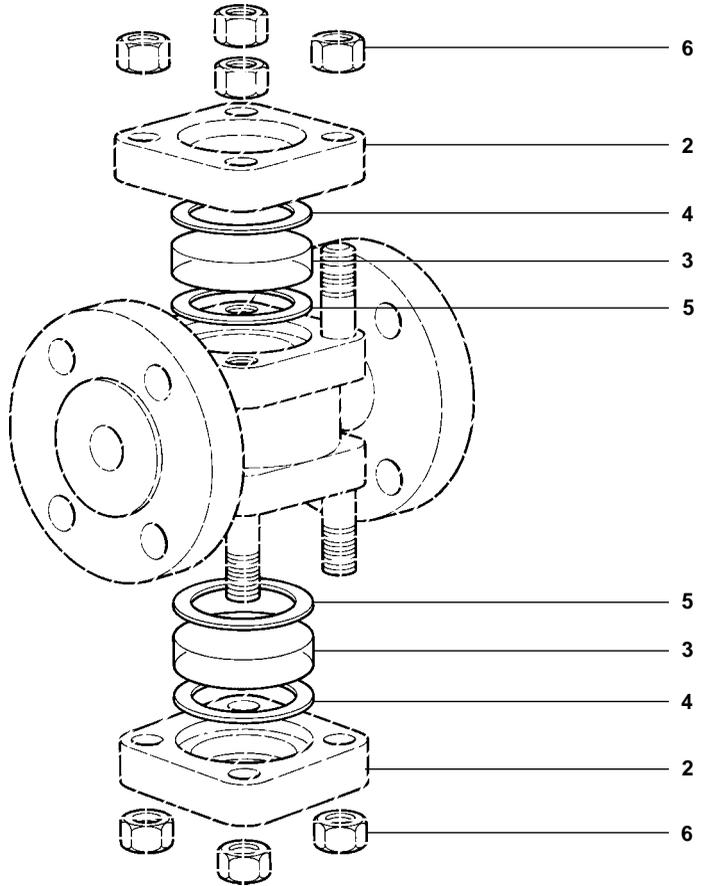


Table 2 Recommended tightening torque

Item No.	Size	 or mm		N m	(lbf ft)
6	DN15-20	17 A/F	M10 x 30	12	(8.6)
	DN25-32	17 A/F	M10 x 35	24	(17.2)
	DN40-50	17 A/F	M10 x 40	40	(29.0)

6.5 SG13 sight glass

Note:

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

Warning

Under certain conditions corrosive elements in condensate can affect the inside face of the sight tube, particularly where caustic alkali and hydrofluoric acid are present. It is recommended that the sight glass is periodically checked for thinning of the sight tube. If there is evidence of thinning or erosion damage then the sight tube should be replaced immediately. Always wear eye protection when viewing the contents of the sight glass.

Reasonable steps should be taken to protect personnel from injury in the unlikely event that the sight tube breaks.

All work must be carried out by a suitably competent person. Before starting work ensure that suitable tools are available and the 'Safety information' is being complied with. Use only Spirax Sarco replacement parts.

How to renew the sight tube and gaskets:

- Isolate the sight glass and allow the pressure and temperature to reduce to ambient conditions.
- After isolation remove the SG13 sight glass from the pipeline.
- Unscrew the end connection from the body and remove the sight tube (4).
- Take out the old gaskets (3) taking care not to damage the seating face and carefully clean out the recesses.
- Fit the new gaskets (3) supplied with sight tube (4) (see Section 6.6, Spare parts).
- Ensure the sight tube (4) is aligned correctly within the body. Then tighten the end connection (2) to the recommended torque (see Table 3). **Note:** Misalignment of the sight tube (4) within the body may cause the edge of the glass to fracture.
- Refit the sight glass into the pipeline.
- After maintenance has been completed, isolation valves should be opened slowly to allow pressure and temperature to build up in a controlled manner.
- Check for leaks.

6.6 Spare parts (for the SG13 sight glass)

The spare parts available are shown in heavy outline. Parts drawn in broken line are not supplied as spares.

Available spare

Sight glass assembly	3 (2 off), 4
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How to order spares

Always order spares by using the description given in the column headed 'Available spare'. Since the sight glass assembly is the same for all three sizes, it will always be :-

Example: 1 - Sight glass assembly for Spirax Sarco SG13 sight glass.

Fig. 9
SG13 sight glass

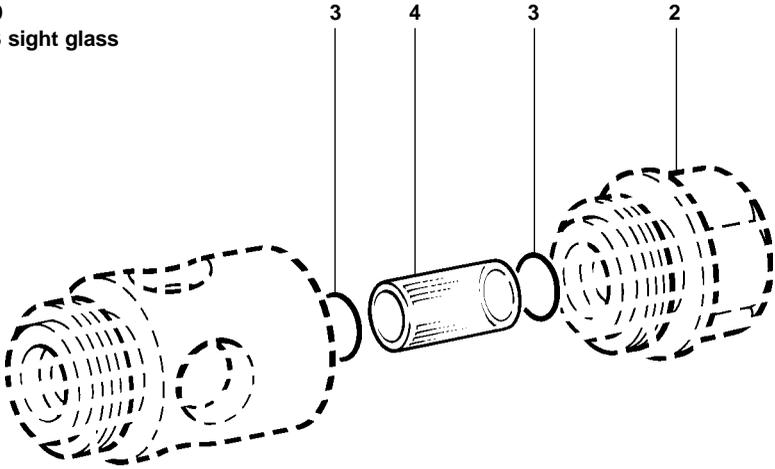


Table 3 Recommended tightening torques

Item No.	Size	 or mm 	N m	(lbf ft)
2	1/2" - DN15	32 A/F	35 - 40	(25 - 29)
	3/4" - DN20	36 A/F	35 - 40	(25 - 29)
	1" - DN25	46 A/F	35 - 40	(25 - 29)

6.7 Sight check

Note:

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

Warning

The gaskets used in the sight check contain thin stainless steel support rings which may cause physical injury if not handled and disposed of carefully.

Under certain conditions corrosive elements in condensate can affect the inside face of the sight tube, particularly where caustic alkali and hydrofluoric acid are present. It is recommended that the sight check is periodically checked for thinning of the sight tube. If there is evidence of thinning or erosion damage then the sight tube should be replaced immediately. Always wear eye protection when viewing the contents of the sight check.

Reasonable steps should be taken to protect personnel from injury in the unlikely event that the sight tube breaks.

All work must be carried out by a suitably competent person. Before starting work ensure that suitable tools are available and the 'Safety information' is being complied with. Use only Spirax Sarco replacement parts.

How to renew the sight tube:

- Isolate the sight check and allow the pressure and temperature to reduce to ambient conditions.
- After isolation remove the bolt and washers (7 and 8).
- Remove the cover (6).
- Take out the old gaskets (2) and the sight tube (3) and carefully clean out the recesses.
- Fit the new gaskets (2) supplied with sight tube (3) and reassemble, tightening the bolts evenly to the recommended torque (see Table 4).
- It is advisable to do up the bolts little more than finger tight, retightening as necessary after a period of use to the recommended tightening torque (see Table 4).
- After maintenance has been completed, isolation valves should be opened slowly to allow pressure and temperature to build up in a controlled manner.
- Check for leaks.

How to renew the discharge tube:

- Remove the cover (6) and the sight tube (3) the same way as 'To renew sight tube' above, and lift out the ball check (5).
- Using the notches, carefully unscrew the old discharge tube (4) and fit a new one.
- Renew the gaskets (2), fit a new ball check (5) and reassemble, tightening the bolts evenly to the recommended torque (see Table 4).
- After maintenance has been completed, isolation valves should be opened slowly to allow pressure and temperature to build up in a controlled manner.
- Check for leaks.

Warning

In some applications condensate can act as a solvent for glass. It is recommended that the sight tube is periodically checked for thinning. If there is any evidence of thinning then the sight tube should be replaced immediately.

6.8 Spare parts (for the sight check)

The spare parts available are shown in heavy outline. Parts drawn in broken line are not supplied as spares.

Available spares

Sight tube assembly		2 (2 off), 3 (1 off)
Discharge tube assembly (set of 2)		4, 5
Set of bolts and washers (set of 4*)		7, 8
Gasket set (packet of 6†)		2

Available spares are common to ½" and ¾" sizes, but not 1".

Note:

* Earlier models used studs, nuts and washers and these are contained in the set of bolts pack.

† Earlier models used ethylene propylene gaskets which were considerably thicker than graphite laminate.

How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size of the sight check.

Example: 1 - Sight tube assembly for a ½" Spirax Sarco sight check.

Fig. 10
Sight check

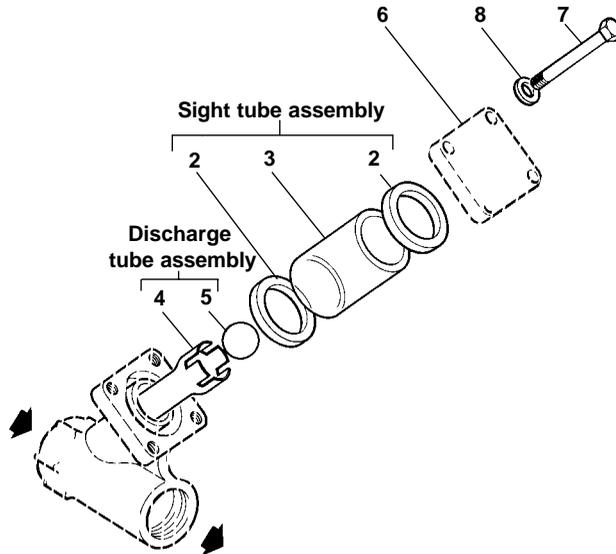


Table 4 Recommended tightening torques

Item No.	Size	 or 	mm	N m	(lbf ft)
7	½" and ¾"	10 A/F	M6 x 65	1.6 - 2.3	(1.2 - 1.7)
	1"	10 A/F	M6 x 65	1.8 - 2.5	(1.3 - 1.8)
4	½" and ¾"		9/16" x 26 BSW	5 - 6	(3.6 - 4.3)
	1"		7/8" x 20 UNF	5 - 6	(3.6 - 4.3)

