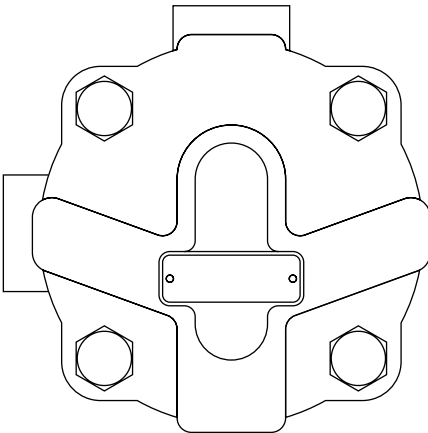


spirax /sarco

CA10S, CA14 and CA14S

Air and Gas Traps

Installation and Maintenance Instructions



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 cover gasket and the main valve assembly gasket on the CA14S contains a thin stainless steel support ring which may cause physical injury if not handled and disposed of carefully.

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.

Viton - CA14 main valve cone:

If the main valve cone (made of Viton) has been subjected to a temperature approaching 315°C (599°F) or higher it may have decomposed and formed hydrofluoric acid. Avoid skin contact and inhalation of any fumes as the acid will cause deep skin burns and damage the respiratory system.

Disposal

These products are recyclable. No ecological hazard is anticipated with the disposal of these products providing due care is taken, EXCEPT;

Viton - CA14 main valve cone:

- Waste parts can be landfilled, when in compliance with National and Local regulations.
- Waste parts can be incinerated, but a scrubber must be used to remove Hydrogen Fluoride, which is evolved from the product and with compliance to National and Local regulations.
- Parts are insoluble in aquatic media.

— 2. General product information —

2.1 General description

CA10S

($\frac{3}{4}$ " screwed)

The CA10S is a float type automatic liquid drain trap for air and gas systems. It has a cast iron body and cover with stainless steel valve head for use on high temperature or where corrosive condensate would adversely affect a rubber valve.

CA14 and CA14S

($\frac{1}{2}$ " and $\frac{3}{4}$ " screwed and DN15, DN20 and DN25 flanged)

The CA14 is a range of float type automatic liquid drainers for air systems. The body and cover are of SG iron and the complete unit is readily maintainable.

The standard version has a Viton valve cone, designated CA14.

A stainless steel valve cone version is also available, designated CA14S.

(DN15, DN20 and DN25 flanged only)

The cover will be drilled and tapped $\frac{1}{2}$ " BSP or NPT for the purpose of fitting a balance line.

Both flanged versions are available with horizontal flanged connections with flow from right to left CA14 (R-L) or from left to right CA14 (L-R).

CA14S

(DN40 and 50 flanged)

The CA14S is a cast iron ball float air and gas trap. It is available with a stainless steel valve cone given designation CA14S having horizontal flanged connections. The cover will be drilled and tapped $\frac{1}{2}$ " BSP or NPT for the purpose of fitting a balance line.

Optional on all units

Drain cock tapping: The cover can be drilled and tapped $\frac{3}{8}$ " BSP or NPT to enable a drain cock to be fitted.

Note:

For additional information see the following Technical Information Sheets:

Product		Connection	Material	Section	TI reference
CA10S	$\frac{3}{4}$ "	Screwed	Cast iron	Section 2.2	TI-P148-15
CA14	$\frac{1}{2}$ " and $\frac{3}{4}$ "	Screwed	SG iron	Section 2.3	TI-P148-36
CA14S	$\frac{1}{2}$ " and $\frac{3}{4}$ "	Screwed	SG iron	Section 2.3	TI-P148-36
CA14	DN15, DN20 and DN25	Flanged	SG iron	Section 2.4	TI-P148-12
CA14S	DN15, DN20 and DN25	Flanged	SG iron	Section 2.4	TI-P148-12
CA14S	DN40 and DN50	Flanged	Cast iron	Section 2.5	TI-P148-35

2.2 CA10S - Cast iron

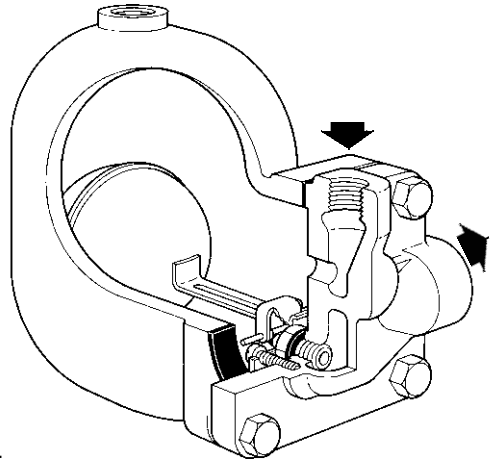
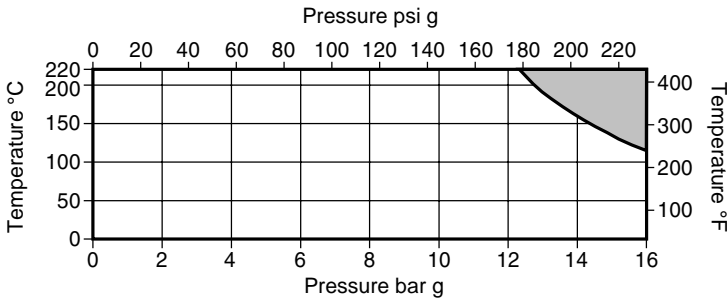



Fig. 1 3/4" screwed BSP

Sizes and pipe connections

3/4" screwed BSP (BS 21 parallel) or NPT.
A 1/2" tapping is provided for a balance pipe.

Pressure/temperature limits

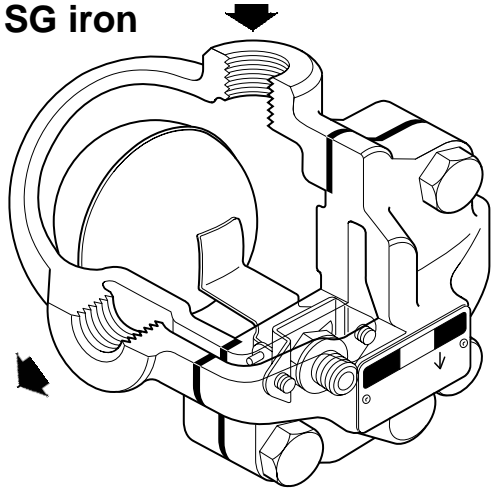


 The product must not be used in this region.

Body design conditions	PN16				
PMA Maximum allowable pressure @ 120°C (248°F)	16 bar g (232 psi g)				
TMA Maximum allowable temperature	250°C (482°F)				
Minimum allowable temperature	0°C (32°F)				
PMO Maximum operating pressure @ 120°C (248°F)	16 bar g (232 psi g)				
TMO Maximum operating temperature @ 12.1 bar g (174 psi g)	220°C (428°F)				
Minimum operating temperature	0°C (32°F)				
ΔPMX Maximum differential pressure bar, depending on the specific gravity of the liquid being drained:					
Specific gravity	1.0	0.9	0.8	0.7	Min. 0.6
ΔPMX bar	14.0	13.8	11.7	8.6	5.0
ΔPMN Minimum differential pressure	0.1 bar				
Designed for a maximum cold hydraulic test pressure of	24 bar g (348 psi g)				

2.3 CA14 and CA14S - SG iron

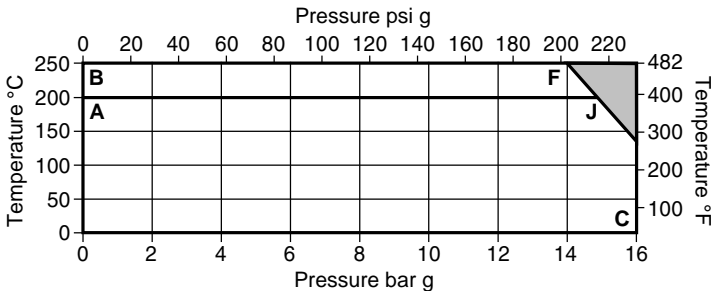
Fig. 2 1/2" screwed BSP




Sizes and pipe connections

1/2" and 3/4" screwed BSP or NPT.

Pressure/temperature limits



 The product must not be used in this region.

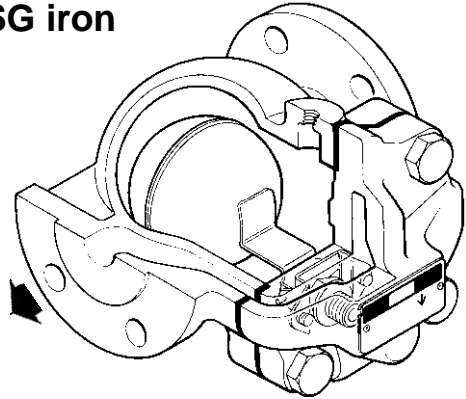
A - J - C CA14 screwed BSP or NPT.

B - F - C CA14S screwed BSP or NPT.

Body design conditions		PN16				
PMA	Maximum allowable pressure @ 120°C (248°F)	16 bar g (232 psi g)				
TMA	Maximum allowable temperature	250°C (482°F)				
Minimum allowable temperature		0°C (32°F)				
PMO	Maximum operating pressure @ 120°C (248°F)	16 bar g (232 psi g)				
TMO	Maximum operating temperature: CA14 @ 14.7 bar g (213.15 psi g)	200°C (392°F)				
	CA14S @ 13.9 bar g (201.6 psi g)	250°C (482°F)				
Minimum operating temperature		0°C (32°F)				
ΔPMX	Maximum differential pressure bar, depending on the specific gravity of the liquid being drained:					
	Specific gravity	1.0	0.9	0.8	0.7	Min. 0.6
	ΔPMX bar	14.0	14.0	14.0	9.0	5.0
ΔPMN	Minimum differential pressure	0.1 bar				
Designed for a maximum cold hydraulic test pressure of:		24 bar g (348 psi g)				

2.4 CA14 and CA14S - SG iron

Fig. 3 DN20 flanged



Sizes and pipe connections

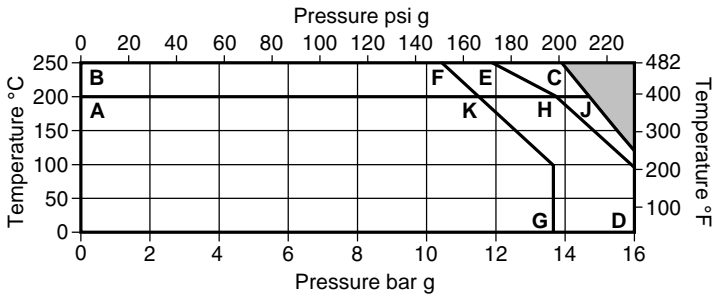
DN15, DN20 and DN25


Standard flange EN 1092 PN16,

ANSI 150 and JIS/KS 10.

A 1/2" tapping is provided for a balance pipe.

Pressure/temperature limits



 The product must not be used in this region.

A - J - D CA14 flanged PN16

A - K - G CA14 flanged JIS/KS 10

A - H - D CA14 flanged ANSI 150

B - C - D CA14S flanged PN16

B - F - G CA14S flanged JIS/KS 10

B - E - D CA14S flanged ANSI 150

Body design conditions		PN16				
PMA	Maximum allowable pressure @ 120°C (248°F)	16 bar g (232 psi g)				
TMA	Maximum allowable temperature	250°C (482°F)				
Minimum allowable temperature		0°C (32°F)				
PMO	Maximum operating pressure @ 120°C (248°F)	16 bar g (232 psi g)				
TMO	Maximum operating temperature:	CA14 @ 14.7 bar g (213.15 psi g)		200°C (392°F)		
		CA14S @ 13.9 bar g (201.6 psi g)		250°C (482°F)		
Minimum operating temperature		0°C (32°F)				
ΔPMX	Maximum differential pressure bar, depending on the specific gravity of the liquid being drained:					
	Specific gravity	1.0	0.9	0.8	0.7	Min. 0.6
	ΔPMX bar	14.0	14.0	14.0	9.0	5.0
ΔPMN	Minimum differential pressure	0.1 bar				
Designed for a maximum cold hydraulic test pressure of:		24 bar g (348 psi g)				

2.5 CA14S

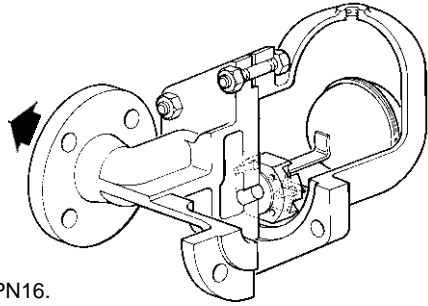


Fig. 4 DN40 flanged

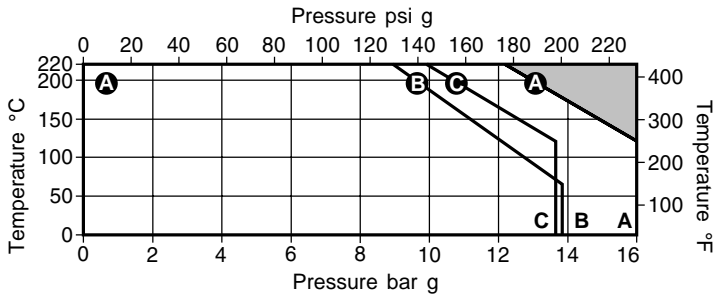
Sizes and pipe connections

DN40 and DN50. Standard flanges are EN 1092 PN16.

On request ANSI B 16.1/ BS 1560 Class 125 and JIS/KS 10 flanges

can be provided with drilled and tapped bolt holes. A 1/2" tapping is provided for a balance pipe. PN flanges will be provided with BSP balance line and ANSI, JIS/KS with NPT balance pipe.

Pressure/temperature limits



The product must not be used in this region.

A - A - A Flanged EN 1092 PN16

A - B - B Flanged ANSI B 16.1/BS 1560 Class 125 having flat faces

A - C - C Flanged JIS/KS 10

Body design conditions		PN16				
PMA	Maximum allowable pressure @ 120°C (248°F)	16 bar g (232 psi g)				
TMA	Maximum allowable temperature	220°C (482°F)				
Minimum allowable temperature		0°C (32°F)				
PMO	Maximum operating pressure @ 120°C (248°F)	16 bar g (232 psi g)				
TMO	Maximum operating temperature @ 12.2 bar g (176.9 psi g)	220°C (392°F)				
Minimum operating temperature		0°C (32°F)				
ΔPMX	Maximum differential pressure bar, depending on the specific gravity of the liquid being drained:					
	Specific gravity	1.0	0.9	0.8	0.7	Min. 0.6
	CA14S-4.5	4.5	4.5	4.5	3.4	2.0
ΔPMX	CA14S-10	10.0	9.5	6.8	5.5	3.4
	CA14S-14	14.0	14.0	11.0	8.0	5.0
ΔPMN	Minimum differential pressure	0.1 bar				
Designed for a maximum cold hydraulic test pressure of:		24 bar g (348 psi g)				

3. Installation

Note:

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

Warning

The cover gasket and the main valve assembly gasket on the CA14S contains a thin stainless steel support ring which may cause physical injury if not handled and disposed of carefully.

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 direction of fluid flow.
- 3.3 Remove protective covers from all connections.

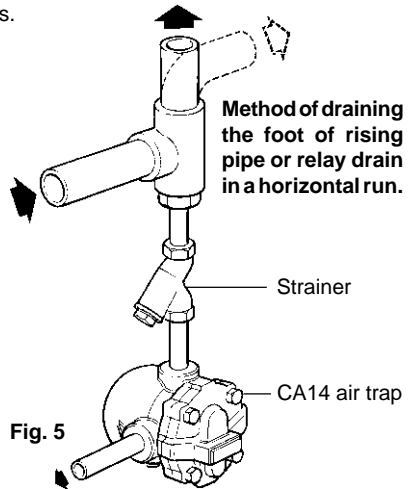
3.4 CA10S, CA14 and CA14S (1/2" and 3/4" screwed)

The trap should be fitted in the horizontal plane with the inlet at the top so that the float mechanism is free to rise and fall in a vertical plane. Some typical installations are displayed in Figures 5, 6 and 7.

CA14 and CA14S (DN15, DN20, DN40 and DN50 flanged)

The trap should be fitted in the horizontal plane so that the float mechanism is free to rise and fall in a vertical plane. In this orientation the flow will be either left-to-right or right-to-left.

Note: Figure 5 shows an installation without balance line arrangement.



- 3.5 The trap must be fitted below what it is draining. Point the arrow on the name-plate downwards. One of the advantages of the float trap for draining air systems is that no air bleed is required for satisfactory operation. However, because the trap has no air bleed it could under some circumstances become air locked.

If the load is low, i.e. mains drainage applications, then the air in the body can be displaced as water passes into it.

However, if the load is high, i.e. after cooler or receiver drainage applications, then the air in the body cannot be displaced through the inlet pipe and a separate balance line is needed. It should be noted that the balance line is piped back to the upstream side. The need for a balance line to prevent the trap from air locking can only be decided by trial and error.

If in any doubt it is preferable to use the balance line arrangement.

Note: If the trap is to discharge to atmosphere ensure it is to a safe place, the discharging fluid may be at a temperature of 100°C (212°F).

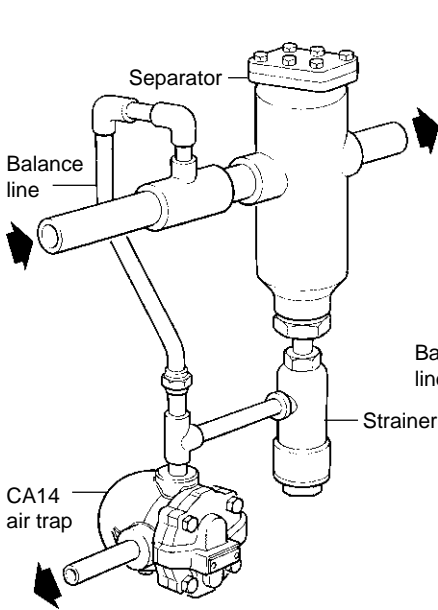


Fig. 6
Air trap draining a separator
on a compressed air main

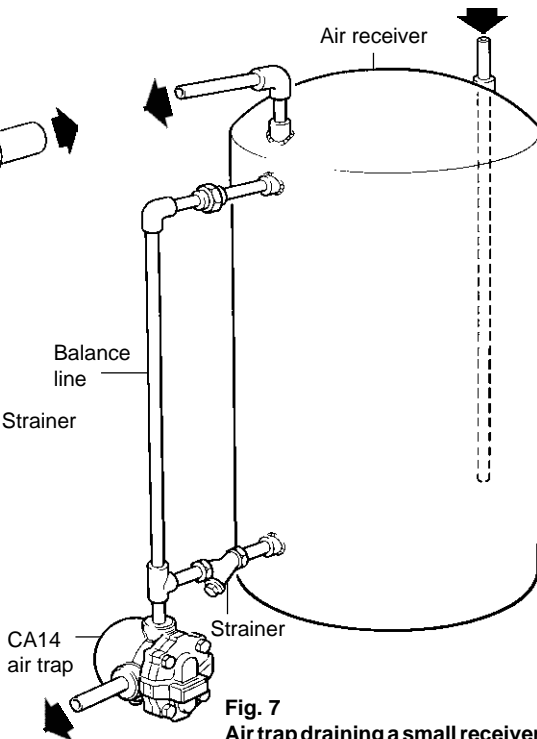


Fig. 7
Air trap draining a small receiver

Figs. 6 and 7 Installations with balance line arrangement

4. Commissioning

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

5. Operation

The CA10 and CA14 float trap is a continuous discharge trap, removing liquid from air and gas systems. As soon as liquid enters the main chamber of the trap, the float rises and the lever mechanism attached to it opens the main valve - keeping the system drained of liquid at all times. When air or gas arrives, the float drops and shuts the main valve tightly against the seat. The balance line is necessary to prevent the trap from becoming air locked. Float type traps are renowned for their instantaneous load handling capability, clean tight shut-off and resistance to waterhammer and vibration.

— 6. Maintenance and Spare parts —

6.1 CA10S (¾" screwed)

Note:

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

Warning

The cover gasket contains a thin stainless steel support ring which may cause physical injury if not handled and disposed of carefully.



Servicing:

- With suitable isolation, repairs can be carried out with the trap in the pipeline.
- When reassembling, make sure that all joint faces are clean and the dowel locates in the cover.

How to fit the main valve assembly:

- Isolate, undo cover bolts (2), remove existing mechanism (5, 6, 7, 8 + 12, 9, 10, 11).
- Using a little jointing paste on the thread and gasket (6), fit the new valve seat to the body (5) and tighten to the recommended torque (see Table 1).
- Attach the support frame (10), and pivot frame (11) to the body with assembly set screws (7), but do not tighten.
- Fit the float arm (8 + 12) to the pivot frame (11) using the pin (9) and by moving the complete assembly centre the valve head onto the seat orifice. Hold the assembly firmly in place and tighten up set screws (7) to the recommended tightening torque (see Table 1).
- Check operation by raising and lowering the float several times making sure that the valve head is centring properly on the seat.
- Make sure all joint faces are clean, apply a thin coating of an anti-seize compound to the cover bolt threads (2).
- Refit the cover (4) using a new cover gasket (3)
- Tighten cover bolts (2) uniformly to the recommended tightening torque (see Table 1). Open up the isolating valve slowly until full system pressure is achieved.
- Check for leaks.

Table 1 Recommended tightening torques

Item	 or mm		N m	(lbf ft)
2 Cover bolt	17 A/F	M10 x 30	29 - 32	(19 - 23)
5 Valve seat	17 A/F	M12 x 8	50 - 55	(37 - 40)
7 Pivot frame assembly set screws	Cheesehead	M5 x 20	2.5 - 2.8	(1.8 - 2.1)

Spare parts

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

Available spares

Main valve assembly with float	5, 6, 7, 8+12, 9, 14, 15, 16
Gasket set (packet of 3 sets)	3, 6

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 trap.

Example: 1 - Main valve assembly for a Spirax Sarco ¾" CA10S air and gas trap.

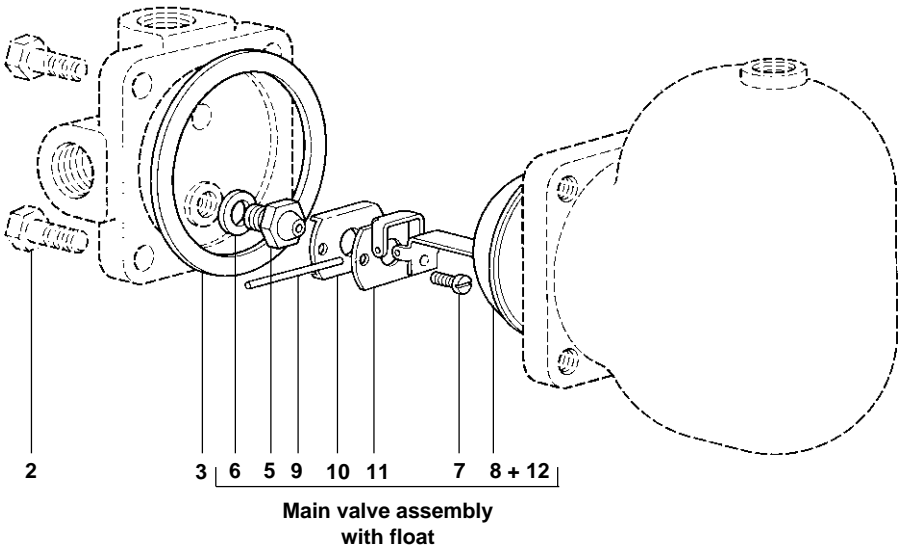


Fig. 8

6.2 CA14 and CA14S (1/2" and 3/4" screwed)

Note:

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

Warning

The cover gasket contains a thin stainless steel support ring which may cause physical injury if not handled and disposed of carefully.

Servicing:

- With suitable isolation, repairs can be carried out with the trap in the pipeline.
- When reassembling, make sure that all joint faces are clean.



How to fit the main valve CA14:

- Undo the cover bolts (2) and lift off the cover (4), withdraw the pivot pin (11) to release the float and lever (9) from the pivot frame (10).
- Push out the main valve cone (5) and replace with a new one.
- Reassemble and refit the cover (4) using a new gasket (3).
- Tighten cover bolts (2) uniformly to the recommended tightening torque (see Table 2). Open up the isolating valve slowly until full system pressure is achieved.
- Check for leaks.

How to replace the main valve assembly CA14 and CA14S:

- Undo the cover bolts (2) and lift off the cover (4).
- Remove the complete float assembly (9, 10, 11 and 5) by undoing the two screws (8).
- Remove the main valve seat (6) and replace with a new one supplied with new gasket (7).
- Fit a complete new float assembly (9, 10, 11 and 5) by tightening the assembly set screws (8) to the recommended torque (see Table 2).
- Refit the cover using a new gasket (3).
- Tighten cover bolts (2) uniformly to the recommended tightening torque (see Table 2). Open up the isolating valve slowly until full system pressure is achieved.
- Check for leaks.

Table 2 Recommended tightening torques

Item	or		N m	(lbf ft)
	 mm			
2 Cover bolt	17 A/F	M10 x 30	47 - 50	(35 - 37)
6 Valve seat	17 A/F	M12	50 - 55	(36 - 40)
8 Pivot frame assembly set screws	Pozidrive	M4 x 6	2.5 - 3.0	(1.8 - 2.2)

Spare parts

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

Available spares

Maintenance kit	CA14	3, 5, 6, 7, 8 (2 off), 9, 10, 11
	CA14S	3, 6, 7, 8 (2 off), 9 + 5, 10, 11
Seal kit	CA14	3, 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 trap.

Example: 1 - Maintenance kit for a Spirax Sarco ½" CA14 air trap.

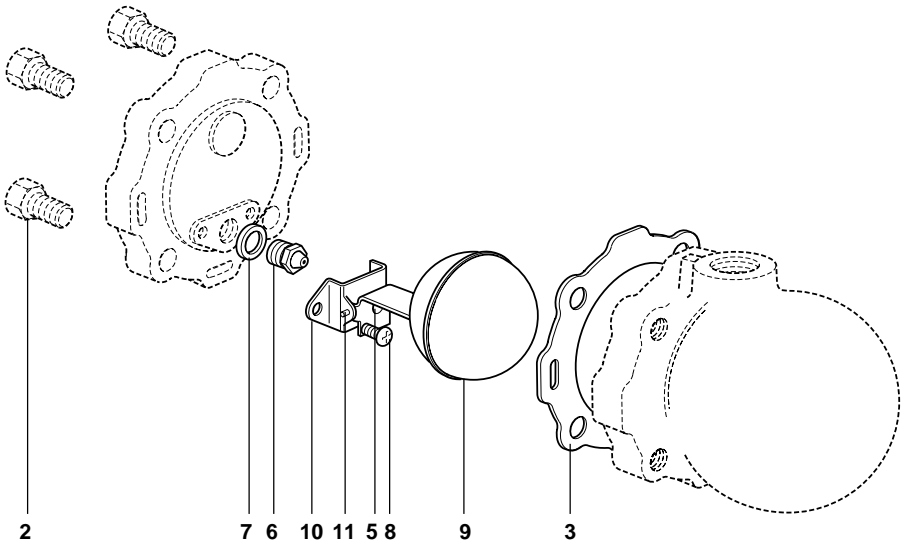


Fig. 9

6.3 CA14 and CA14S (DN15, 20 and 25 flanged)

Note:

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

Warning

The cover gasket contains a thin stainless steel support ring which may cause physical injury if not handled and disposed of carefully.

Servicing:

- With suitable isolation, repairs can be carried out with the trap in the pipeline.
- When reassembling, make sure that all joint faces are clean.



How to fit the main valve - CA14:

- Undo the cover bolts (2) and lift off the cover (4), withdraw the pivot pin (11) to release the float and lever (9) from the pivot frame (10).
- Push out the main valve cone (5) and replace with a new one.
- Reassemble and refit the cover using a new gasket (3).
- Tighten cover bolts (2) uniformly to the recommended tightening torque (see Table 3). Open up the isolating valve slowly until full system pressure is achieved.
- Check for leaks.

How to fit the main valve assembly - CA14 and CA14S:

- Undo the cover bolts (2) and lift off the cover (4).
- Remove the complete float assembly (5, 9, 10, 11 and 13 DN25 only) by undoing the two screws (8).
- Remove the main valve seat (6) and replace with a new one supplied with new gasket (7).
- Fit complete new float assembly by tightening the assembly set screws (8) to the recommended torque (see Table 3).
- Refit the cover (4) using a new gasket (3).
- Tighten cover bolts (2) uniformly to the recommended tightening torque (see Table 3). Open up the isolating valve slowly until full system pressure is achieved.
- Check for leaks.

Table 3 Recommended tightening torques

Item		or		N m	(lbf ft)
	mm				
2 Cover bolts	17 A/F		M10 x 30	47 - 50	(35 - 37)
6 Valve seat	17 A/F		M12 x 12	50 - 55	(36 - 40)
8 Pivot frame assembly set screws	Pozidrive		M4 x 6	2.5 - 3.0	(1.8 - 2.2)

Spare parts

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

Available spares

Maintenance kit	CA14S	3, 6, 7, 8 (2 off), 5 + 9, 10, 11, 13 (DN25 only)
	CA14	3, 6, 7, 8 (2 off), 5 + 9, 10, 11
Seal kit	CA14	3, 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 trap.

Example: 1 - Maintenance kit for a Spirax Sarco DN15 CA14 air and gas trap.

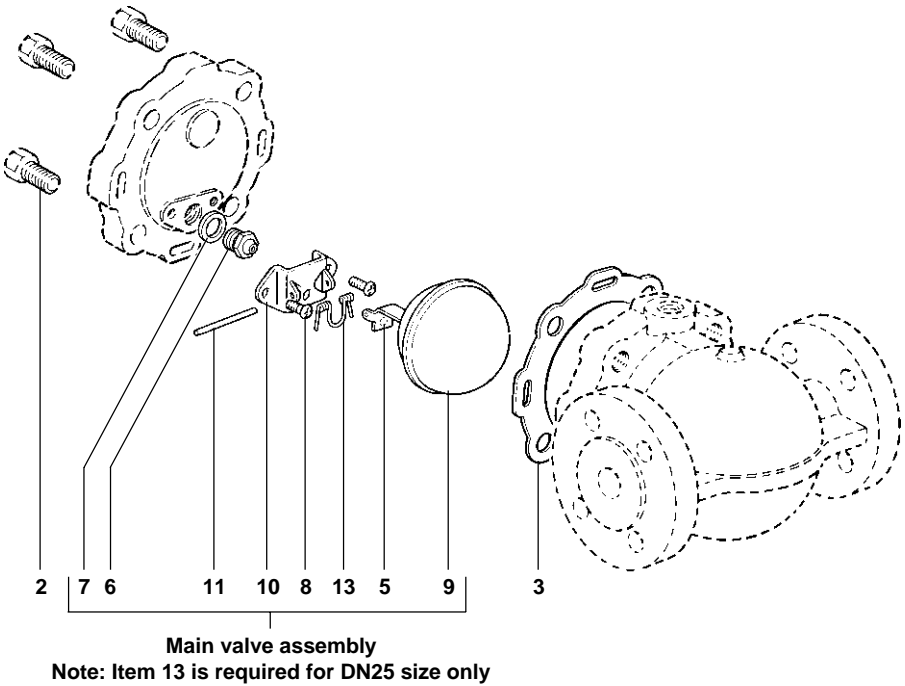


Fig. 10

6.4 CA14S (DN40 and 50 flanged)

Note:

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

Warning

The cover gasket and main valve assembly gasket, contains a thin stainless steel support ring which may cause physical injury if not handled and disposed of carefully.



Servicing:

- With suitable isolation, repairs can be carried out with the trap in the pipeline.
- When reassembling, make sure that all joint faces are clean and the dowel locates in the cover.

How to fit the main valve assembly:

- Undo the cover bolts (2) and lift off the cover.
- Remove the complete float assembly (7, 8, 9, 10 and 11) by undoing the two screws (6).
- Remove the main valve seat (5) and replace with a new one supplied with new gasket (14). Tighten to the recommended tightening torques (see Table 4).
- Attach the support frame (9) and pivot frame (10) to the body with the assembly set screws (6), but do not tighten.
- Fit the float arm (7 and 8) to the pivot frame (10) using the pin (11) and by moving the complete assembly centre the valve head onto the seat orifice. Hold the assembly firmly in place and tighten up the set screws (6) to the recommended tightening torque (see Table 4).
- Check operation by raising and lowering the float (7) several times making sure that the valve head is centering properly on the seat (5).
- Make sure that all joint faces are clean and apply a thin coating of an anti-seize compound to the cover bolts (2).
- Tighten cover bolts (2) uniformly to the recommended tightening torque (see Table 4). Open up the isolating valve slowly until full system pressure is achieved.
- Check for leaks.

Table 4 Recommended tightening torques

Item	Size	Qty	 or  mm	N m (lbf ft)
2 Cover studs and nuts	DN40	6	19 A/F	60 - 66 (44 - 48)
	DN50	6	24 A/F	80 - 88 (58 - 65)
5 Valve seat	DN40, DN50	1	17 A/F	50 - 55 (37 - 40)
6 Pivot frame assembly bolts	DN40, DN50	2	Cheesehead	M5 x 20 25 - 28 (18 - 20)
13 Mounting plate fastening bolts	DN40	4	10 A/F	M6 10 - 12 (7 - 9)
	DN50	4	13 A/F	M8 20 - 24 (15 - 17)

Spare parts

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

Available spares

Main valve assembly with float*	5, 6, 7+8, 9, 10, 11, 14
(* The erosion deflector is pressed into the body during manufacture and not available as a spare.)	
Complete set of gaskets (packet of 3 sets)	3, 14

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 trap.

Example: 1 - Main valve assembly with float for a Spirax Sarco DN40 CA14S-14 air and gas trap.

