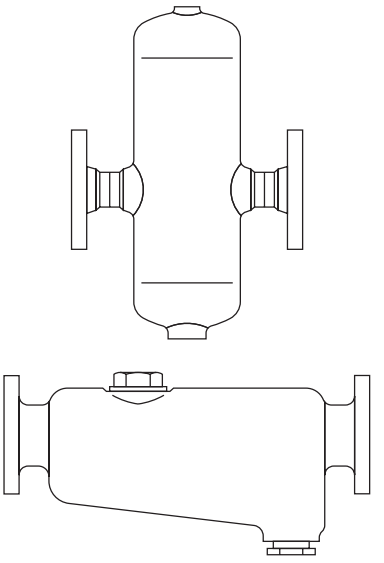
spirax sarco

S1, S2, S3, S5, S6, S7, S8, S12 and S13 Separators

Installation and Maintenance Instructions



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 inspection cap gasket on the S2, S3, S12, S13 and the bottom cover gasket on the S5 and S6 separators contain 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, 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 safety 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

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

2. General product information

2.1 General description

The products detailed are all baffle type separators used for the removal of entrained liquids in steam, compressed air and gas systems. We recommend the fitting of insulating jackets to improve the performance of the separator.

Note: For additional information see the following Technical Information Sheets.

Type	Material	Pressure rating	Sizes	Connections	TI reference
S1	SG iron	PN16	½", ¾" and 1"	Screwed	TI-P023-02
S2	Cast iron	PN16	1¼", 1½" and 2"	Screwed	TI-P023-07
S3	Cast iron	PN16	DN40 - 200	Flanged	TI-P023-24
S5	Carbon steel	PN50/ANSI 300	DN15 - 80	Screwed and Flanged	TI-P023-11
S6	Austenitic stainless steel 316L	PN50/ANSI 300	DN15 - 80	Screwed and Flanged	TI-P023-12
* **S7**	Carbon steel	PN16 and PN40	DN65 - 150	Flanged	TI-P138-03
			DN200 - 350	Flanged	TI-P138-04
* **S8**	Austenitic stainless steel 316L	PN16 and PN40	DN65 - 150	Flanged	TI-P138-10
			DN200 - 350	Flanged	TI-P138-11
S12	SG iron	PN25	1¼", 1½" and 2"	Screwed	TI-P023-25
S13	SG iron	PN25	DN40 - 200	Flanged	TI-P023-26

* **Note:** The S7 and S8 separators are designed and manufactured to BS 5500 Category 3.

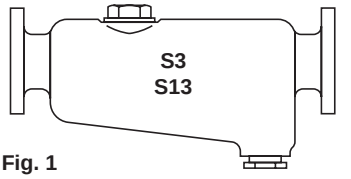


Fig. 1

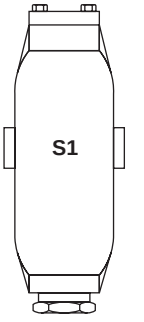


Fig. 2

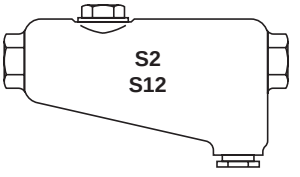


Fig. 3

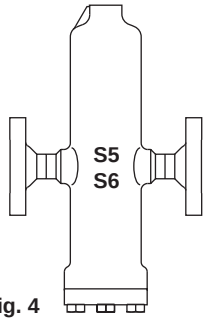


Fig. 4

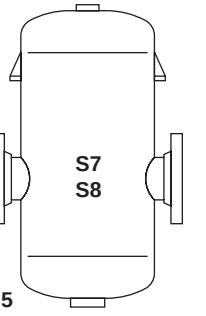


Fig. 5

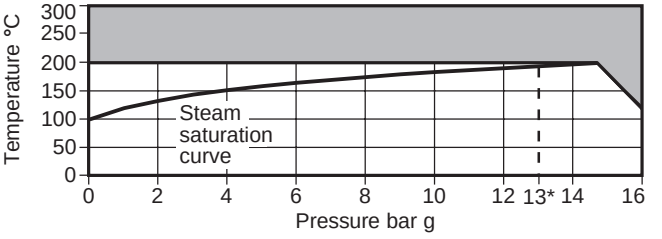
2.2 Limiting conditions for cast separators (ISO 6552)

Type	Maximum body design conditions exceeds	PMA - Maximum allowable pressure bar g	(psi g)	TMA - Maximum allowable temperature °C	(°F)		Designed for a max. cold hydraulic test pressure of: bar g	(psi g)
S1	PN16	16	(232)	300	(572)		24.0	(348.0)
S2	PN16	16	(232)	184	(363)		24.0	(348.0)
S3	PN16	16	(232)	184	(363)		24.0	(348.0)
S5 and S6	ANSI 300/ PN50	50	(725)	425	(767)	JIS/KS 10K	20.6	(299.0)
						ANSI 150	30.0	(435.0)
						JIS/KS 20K	50.0	(725.0)
						DIN PN40	60.0	(870.0)
						ANSI 300	76.6	(1 111.0)
						Screwed, Socket weld, Butt weld	76.6	(1 111.0)
S12	PN25	25	(362)	350	(662)		37.5	(544.0)
S13	PN25	25	(362)	350	(662)	JIS/KS 10K	20.4	(296.0)
						PN16	24.0	(348.0)
						PN25	37.5	(544.0)
						JIS/KS 20K	37.5	(544.0)

Note: Flanged separators may be supplied with a lower pressure rating than that cast into the body. Reference should be made to the appropriate operating chart to determine the actual product limitations.

2.3 Operating ranges for cast separators

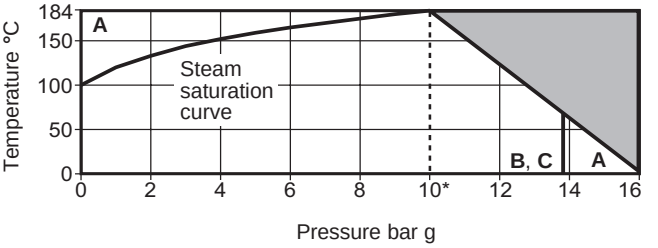
S1



The product must not be used in this region.

***PMO** Maximum operating pressure when used for steam service.

S2 and S3

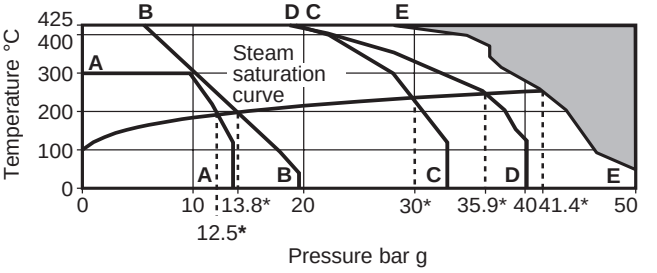


The product must not be used in this region.

***PMO** Maximum operating pressure when used for steam service.

A - A PN16/Table F/ Scrd BSP/NPT
A - B JIS/KS 10
A - C ANSI 125

S5

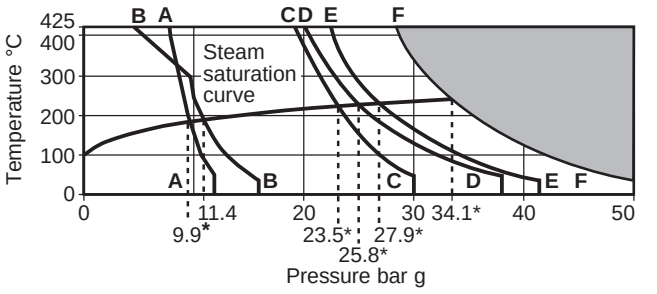


The product must not be used in this region.

***PMO** Maximum operating pressure when used for steam service.

A - A JIS/KS 10K
B - B ANSI Class 150
C - C JIS/KS 20K
D - D DIN PN40
E - E ANSI Class 300, Scrd BSP, NPT, SW and BW

S6

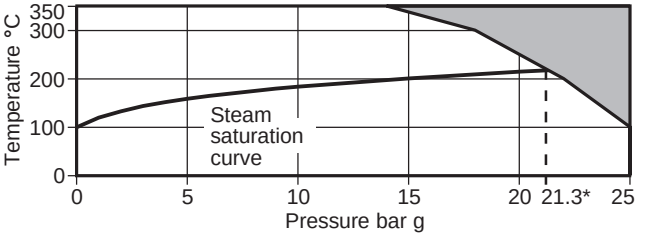


The product must not be used in this region.

***PMO** Maximum operating pressure when used for steam service.

A - A JIS/KS 10K
B - B ANSI Class 150
C - C JIS/KS 20K
D - D DIN PN40
E - E ANSI Class 300
F - F Scrd BSP, NPT, SW and BW

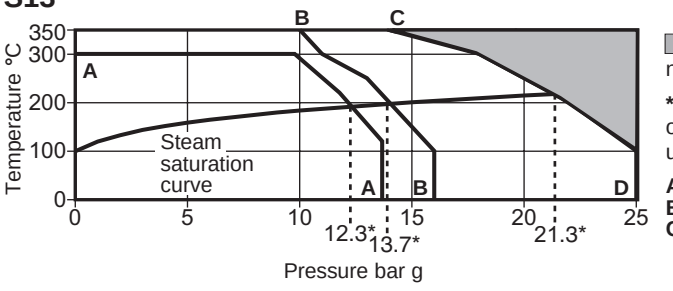
S12



The product must not be used in this region.

***PMO** Maximum operating pressure when used for steam service.

S13



The product must not be used in this region.

***PMO** Maximum operating pressure when used for steam service.

A - A JIS/KS 10K
B - B PN16
C - D PN25 and JIS/KS 20K

2.4 Limiting conditions for fabricated separators

Type S7

Size	Flange standard	Design pressure bar g	(psi g)	Design temperature °C	°F	Designed for a maximum cold hydraulic test pressure of: Shop bar g	(psi g)	Site bar g	(psi g)
DN65	Class 150 PN16	14	(203)	198	(388)	26.2 24.0	(380) (348)	23.0 23.0	(333) (333)
	Class 300 PN40	25	(362)	227	(441)	49.1	(712)	43.1	(625)
DN80	Class 150 PN16	14	(203)	198	(388)	25.7 24.0	(373) (348)	23.0 23.0	(333) (333)
	Class 300 PN40	20	(290)	213	(415)	38.0	(550)	33.9	(491)
DN100	Class 150 PN16	14	(203)	198	(388)	25.7 24.0	(373) (348)	23.0 23.0	(333) (333)
	Class 300 PN40	20	(290)	213	(415)	37.9	(549)	33.9	(491)
DN125	Class 150 PN16	14	(203)	198	(388)	25.7 24.0	(373) (348)	23.0 23.0	(333) (333)
	Class 300 PN40	30	(435)	236	(457)	58.3	(845)	53.1	(770)
DN150	Class 150 PN16	14	(203)	198	(388)	25.7 24.0	(373) (348)	23.0 23.0	(333) (333)
	Class 300 PN40	30	(435)	236	(457)	59.3	(860)	53.1	(770)
DN200	Class 150 PN16	6	(87)	165	(329)	10.7	(155)	9.0	(130)
	Class 150 PN16	14	(203)	198	(388)	23.4	(339)	21.0	(304)
	Class 300 PN40	30	(435)	236	(457)	52.7	(764)	47.4	(687)
DN250	Class 150 PN16	6	(87)	165	(329)	10.7	(155)	9.0	(130)
	Class 150 PN16	14	(203)	198	(388)	22.7	(329)	21.0	(304)
	Class 300 PN40	30	(435)	236	(457)	51.8	(751)	47.4	(687)
DN300	Class 150 PN16	6	(87)	165	(329)	10.3	(149)	9.0	(130)
	Class 150 PN16	14	(203)	198	(388)	22.7	(329)	21.0	(304)
	Class 300 PN40	30	(435)	236	(457)	51.8	(751)	47.4	(687)
DN350	Class 150 PN16	6	(87)	165	(329)	10.3	(149)	9.0	(130)
	Class 150 PN16	14	(203)	198	(388)	22.7	(329)	21.0	(304)
	Class 300 PN40	30	(435)	236	(457)	50.6	(734)	47.4	(657)

For pressures and temperatures that exceed these operating conditions please contact Spirax Sarco for a bespoke product.

Type S8

Size	Flange standard	Design pressure bar g	(psi g)	Design temperature °C	(°F)	Designed for a maximum cold hydraulic test pressure of: bar g	(psi g)
DN65	Class 150	11	(159)	198	(388)	19.5	(283)
	PN16	10	(145)	198	(388)	17.7	(257)
	Class 300	27	(391)	236	(457)	50.2	(728)
	PN40	25	(362)	236	(457)	46.5	(674)
DN80, DN100, DN125, DN150	Class 150	11	(159)	198	(388)	18.8	(273)
	PN16	10	(145)	198	(388)	17.1	(248)
	Class 300	27	(391)	236	(457)	48.5	(703)
	PN40	25	(362)	236	(457)	44.9	(651)
DN200, DN250, DN300, DN350	Class 150	6	(87)	165	(329)	9.7	(141)
	PN16	6	(87)	165	(329)	9.7	(141)
	Class 150	11	(156)	198	(388)	18.8	(273)
	PN16	10	(145)	198	(388)	17.1	(248)
	Class 300	27	(391)	236	(457)	48.5	(703)
	PN40	25	(362)	236	(457)	44.9	(651)

For pressures and temperatures that exceed these operating conditions please contact Spirax Sarco for a bespoke product.

3. Installation

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

Referring to the Installation and Maintenance Instructions, body markings, name-plate (if fitted) 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 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 The separators may be lagged if required.

Important installation note
for the S1, S2, S3, S12 & S13 separators:

Install in a horizontal pipeline with the drain directly below. To ensure that any separated liquid is drained away quickly, a suitable liquid drainer or steam trap must be connected to the drain.

3.5 Installation for the S5 and S6

Install in a horizontal pipeline with the drain directly below.
To ensure that any separated liquid is drained quickly, a suitable liquid drainer or steam trap must be connected to the drain connection. A float type trap is recommended.
For those steam systems where air can be present, air can collect in the upper portion of the separator. In this situation a suitable air vent should be connected to the air vent connection.
If an air vent is not being fitted then the connection must have the plastic transit protection plug removed and must have a carbon steel class 3000 lb plug fitted.

3.6 Installation for the S7 and S8

Install in a horizontal pipeline with the drain directly below. All sizes are fitted with support brackets which can be used to minimise piping loads. Each bracket has two drilled holes.
To ensure that any separated liquid is drained quickly, a suitable liquid drainer or steam trap must always be connected to the drain connection. A float type trap is recommended.
For those steam systems where air can be present, air can collect in the upper portion of the separator. In this situation a suitable air vent should be connected to the air vent connection.
If an air vent is not being fitted then the connection must have the plastic transit protection plug removed and a carbon steel class 3000 lb plug fitted.

4. Commissioning

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

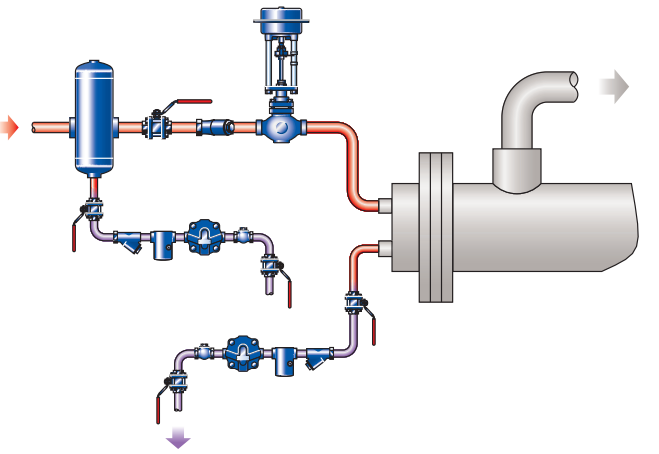


Fig. 6 Heat transfer processes and valve protection

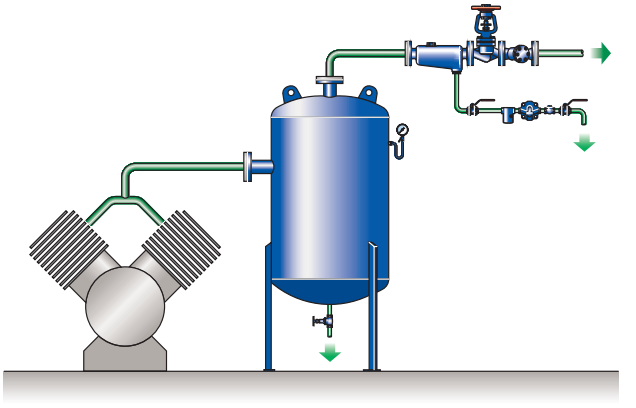


Fig. 7 Compressed air distribution

5. Operation

Separators are designed to gather together small droplets of entrained liquids and then separate them from the gas/vapour flow. The relatively heavy droplets impinge on the internal baffles and are then directed to the separator drain connection and removed from the system using a steam trap, or when used on air or gas distribution system, a liquid drainer.

6. Maintenance

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

Warning

There are no internal components that require maintenance.

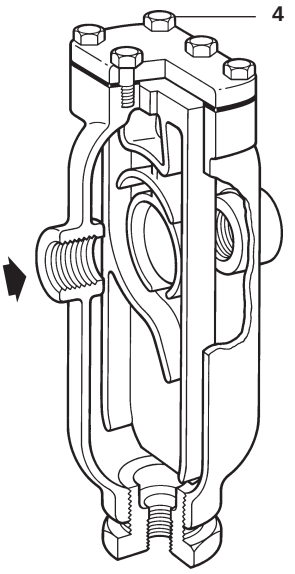


Fig. 8 S1

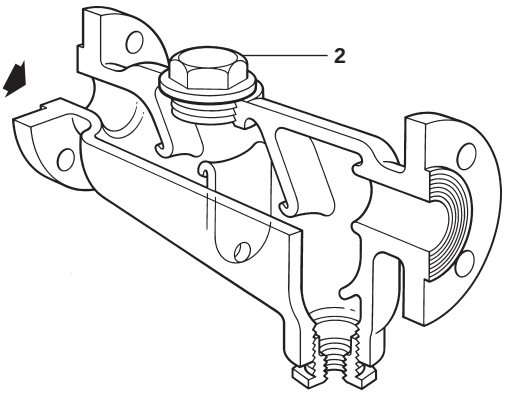


Fig. 9 S2, S3, S12 and S13

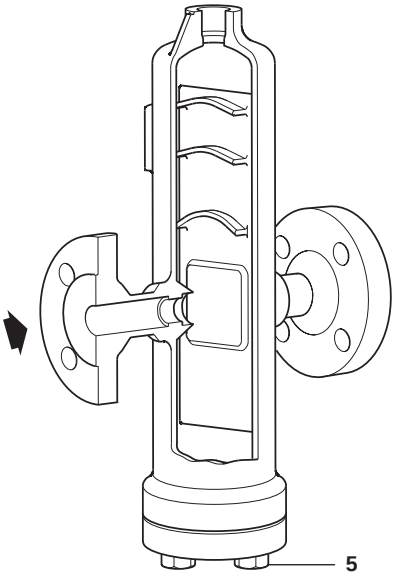


Fig. 10 S5 and S6

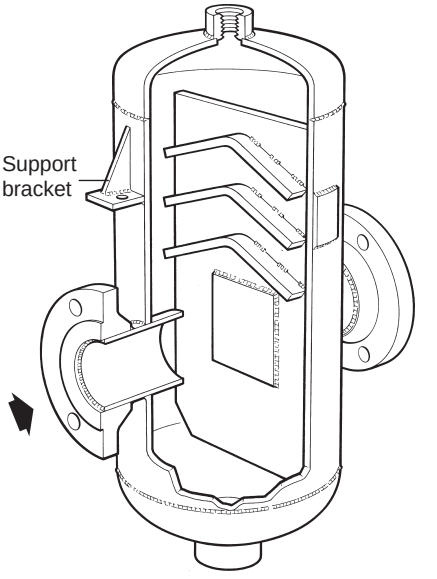


Fig. 11 S7 and S8

Table 1 Recommended tightening torques

Separator	Item	Size		or mm 	N m	(lbf ft)
S1	4	½"	7/16"	¼" UNF x ¾"	12 - 14	(9 - 10)
		¾"	½"	5/16" UNF x ¾"	28 - 32	(21 - 24)
		1"	9/16"	3/8" UNF x ¾"	40 - 50	(30 - 37)
S2	2	2"	60 A/F	M72	190 - 210	(140 - 155)
S3	2	DN40	46 A/F	M56	150 - 165	(110 - 121)
		DN50	60 A/F	M72	190 - 210	(140 - 155)
		DN65	46 A/F	M56	150 - 165	(110 - 121)
		DN80	60 A/F	M72	190 - 210	(140 - 155)
		DN100	60 A/F	M72	190 - 210	(140 - 155)
		DN125	60 A/F	M72	190 - 210	(140 - 155)
		DN150	60 A/F	M72	190 - 210	(140 - 155)
		DN200	60 A/F	M72	190 - 210	(140 - 155)
S5	5	DN15-80	19 A/F	M12 x 35	40 - 45	(30 - 37)
S6	5	DN15-80	19 A/F	M12 x 35	40 - 45	(30 - 37)
S12	2	2"	46 A/F	M56	150 - 165	(110 - 121)
S13	2	DN40	46 A/F	M56	150 - 165	(110 - 121)
		DN50	46 A/F	M56	150 - 165	(110 - 121)
		DN65	46 A/F	M56	150 - 165	(110 - 121)
		DN80	60 A/F	M72	190 - 210	(140 - 155)
		DN100	60 A/F	M72	190 - 210	(140 - 155)
		DN125	60 A/F	M72	190 - 210	(140 - 155)
		DN150	60 A/F	M72	190 - 210	(140 - 155)
		DN200	60 A/F	M72	190 - 210	(140 - 155)

7. Spare parts

There are no spare parts required or available for these components.