

FIG.12, FIG.13, FIG.14, FIG.16, FIG.34, FIG.36, CI, CSX and CSSX

Installation and Maintenance Instructions



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1. Term of guarantee

Spirax Sarco guarantees, subject to the conditions described below, to repair and replace free of charge, including labour, any components that fail within 1 year of delivery of the product to the end customer. Such a failure must have occurred as a result of a material or manufacturing defect, and not as a result of the product not being used in accordance with the instructions in this manual.

This guarantee does not apply to products that require repair or replacement as a result of normal wear and tear or products that are subject to accidents, misuse or improper maintenance.

Spirax Sarco's sole obligation under the Warranty Term is to repair or replace any product that we deem to be defective. Spirax Sarco reserves the right to inspect the product at the end customer's premises or request the return of the product freight prepaid by the buyer.

Spirax Sarco may replace with new equipment or upgrade any parts judged to be defective without further liability. Any repairs or services carried out by Spirax Sarco that are not covered by this warranty will be charged in accordance with the current Spirax Sarco price list.

THIS IS SPIRAX SARCO'S SOLE TERM OF WARRANTY AND SPIRAX SARCO HEREBY EXPRESSES AND BUYER HEREBY WAIVES ALL OTHER WARRANTIES, IMPLIED BY LAW, INCLUDING ANY WARRANTY OF MERCHANTABILITY FOR A PARTICULAR PURPOSE.



2. Safety information

2.1 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.

2.2 Lighting

Ensure adequate lighting, particularly where detailed or intricate work is required.

2.3 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.

2.4 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.

2.5 The System

Consider, for example, whether closing shut-off valves or depressurising would put another part of the system or a person at risk. When opening and closing the shut-off valves, do so gradually to avoid shocks to the system.

2.6 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.

2.7 Temperature

Allow time for temperature to normalise after isolation to avoid danger of burns.

2.8 Tools and consumables

Before starting work ensure that you have suitable tools and/or consumables available. Use only genuine Spirax Sarco replacement parts.

2.9 Protective Equipment

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.

2.10 Permits to work

All work must be carried out or be supervised by a suitably competent person. Attach warnings where necessary.



2.11 Electrical work

Before starting work, study the wiring diagram and wiring instructions and check any special requirements. Consider in particular: main source and phase voltage, local insulation of main systems, fuse requirements, earthing, special cables, cable entries, electrical selection.

2.12 Commissioning

After installation or maintenance, make sure the system is working properly. Carry out tests on all alarms and protective devices.

2.13 Disposition

Equipment and materials must be stored in a safe place.

2.14 Product disposal

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

2.15 Additional Information

Additional information and help is available worldwide at any Spirax Sarco service centre.



3. General product information

3.1 General description

The products detailed are Y-type strainers with screwed or flanged connections. The filter covers are screwed or flanged, depending on the filter model. They are used to protect other pipeline items from damage due to debris and dirt in the system.

The filters are supplied in a wide variety of materials and sizes, with filter elements generally made of stainless steel and various perforations.

Products	Body material	Pressure class	Connections	Cap type	Strainer size	Technical information sheet
FIG.12	Bronze	PN25	Screwed	Screwed	³∕8" - 2"	TI-D233-01
FIG.13	Cast iron	PN16	Screwed	Screwed	³∕8" - 2"	TI-D234-01
FIG.14	Carbon Steel	600#	Screwed SW	Screwed	³⁄8" - 2"	TI-D235-01
FIG.16	Stainless Steel	600#	Screwed SW	Screwed	³⁄8" - 2"	TI-D236-01
FIG.34	Carbon Steel	150# 300#	Flanged	Screwed	1⁄2" - 2"	TI-D241-01
FIG.36	Stainless Steel	150# 300#	Flanged	Screwed	1⁄2" - 2"	TI-D242-01
CI	Cast iron	125# 250#	Flanged	Flanged	2" - 16"	TI-D245-01
CSX	Carbon Steel	150# 300#	Flanged	Flanged	2" - 12"	TI-D248-01
CSSX	Stainless Steel	150# 300#	Flanged	Flanged	2" - 12"	TI-D249-01

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

FIG.12, FIG.13, FIG.14, FIG.16, FIG.34, FIG.36, CI, CSX and CSSX

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3.2 Available filter elements

Perforations (mm)

0.8*; 1.2**; 1.6***; 2.0; 3.2

Mesh

40, 60, 80, 100, 200, 325

(*) Standard perforation for filters from $\frac{3}{2}$ " to 2" (**) Standard perforation for filters from $\frac{2}{2}$ " to 8" (***) Standard perforation for 10" to 16" filters





3.3 Pressure and temperature limits

FIG. 12

Body design conditions		PN25
PMO Maximum operating pressure @ 120 °C		25 bar g
тмо	Maximum operating temperature @ 19.0 bar g	210 °C
Minimum operating temperature		0 °C
Hydros	static test pressure	38 bar g



FIG. 13

Body design conditions		PN16
РМО	Maximum operating pressure @ 120 °C	16 bar g
тмо	Maximum operating temperature @ 11.7 bar g	232 °C
Minimum operating temperature		0 °C
Hydros	static test pressure	25 bar g





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FIG. 14

Body design conditions		600#
PMO Maximum operating pressure @ 38 °C		102 bar g
тмо	Maximum operating temperature @ 57.0 bar g	425 °C
Minimum operating temperature		-29 °C
Hydro	static test pressure	154 bar g



FIG. 16

Body design conditions		600#
РМО	Maximum operating pressure @ 38 °C	99 bar g
тмо	Maximum operating temperature @ 57.0 bar g	538 °C
Minimum operating temperature		-29 °C
Hydrostatic test pressure		153 bar g



The product **must not** be used in this region.



FIG. 34 and CSX

Body design conditions -		150#	150#
		300#	300#
DMO	Maximum aparating processing @ 20.00	150#	196 bar g
PMO	maximum operating pressure @ 38 °C	300#	51,1 bar g
тмо	Maximum operating temperature	150#	425 °C @ 6.6 bar g
		300#	425 °C @ 28.8 bar g
Minimum operating temperature			-29 °C
Hydrostatic test pressure		150#	33 bar g
		300#	82 bar g



The product **must not** be used in this region.

- A A Flanged ASME 150#
- B B Flanged ASME 300#

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FIG. 36 and CSSX

Body design conditions -		150#	150#
		300#	300#
	Mauimun an antina an anna 2000	150#	19.0 bar g
PMO	Maximum operating pressure @ 38 °C	300#	49.6 bar g
тмо	Maximum operating temperature	150#	425 °C @ 1.4 bar g
		300#	425 °C @ 25.2 bar g
Minimum operating temperature			-29 °C
Hydrostatic test pressure		150#	31 bar g
		300#	80 bar q



The product **must not** be used in this region.

- A A Flanged ASME 150#
- B B Flanged ASME 300#



•••			
		125#	150#
воау	aesign conditions	250#	300#
	Maximum anasating processing @ 20.00	125#	13,8 bar g
PMO	Maximum operating pressure @ 38 °C	250#	34,0 bar g
тмо	Maximum operating temperature	125#	232 °C @ 10.2 bar g
		250#	232 °C @ 19.3 bar g
Minim	um operating temperature		0 °C
Hydrostatic test pressure		125#	20 bar g
		250#	52 bar g



The product **must not** be used in this region.

- A A Flanged ASME 150#
- B B Flanged ASME 300#

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4. Installation

Note: Before actioning any installation observe the 'Safety information in Section 2.

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

- **4.1** Check the materials, pressure and temperature conditions, and their maximum operating 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 over-pressurisation.
- **4.2** Determine the correct installation situation and flow direction.
- **4.3** Remove protective covers from all connections.
- **4.4** Strainers can be fitted on liquid or steam/gas systems in either horizontal pipework or vertical pipework where the flow is downward. In a horizontal line on steam/gases the strainer pocket should be in the horizontal plane as this reduces the possibility of water-hammer. On liquid systems the strainer pocket should point downwards.

Strainer installed on steam or gas line



Strainer installed on liquid line







5. Commissioning

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

FIG.12, FIG.13, FIG.14, FIG.16, FIG.34, FIG.36, CI, CSX and CSSX

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6. Operation

Strainers are passive items and will prevent the onward movement of dirt and debris, which is larger than the holes in the screen. The pressure drop across the strainer will increase as the screen becomes blocked. Regular cleaning/blowdown is recommended to keep the screen clean.

7. Maintenance

Note: Before actioning any maintenance observe the 'Safety information 'in Section 2.

Warning

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

7.1 General Information

Before undertaking any maintenance of the strainer it must be isolated from both the supply line and return line and any pressure allowed to safely normalise to atmosphere. The trap should then be allowed to cool. When reassembling, ensure that all joint faces are clean.

7.2 How to clean or replace the strainer screen:

Check section 8 ("Spare Parts") to identify the filter components.

- Remove the strainer cap
- On most sizes the cap is simply unscrewed
- However the cap on the 2½" and 3" Fig 12SG strainer is retained by four bolts. The number of screws
 will depend on the filter diameter, construction material or pressure class;
- Once the cap is removed the strainer screen can be taken out;
- Clean the filter element with a brush or dip in solvents or cleaning solutions, or replace the element with a new one;
- Reassemble the screen into the cap by pushing the end into the recess;
- Make sure that the welded joint of the filter element is facing the inlet nozzle of the filter, to avoid possible blows to the weld area.
- Always fit a new strainer cap gasket ensuring the jointing faces are clean;
- Refit the strainer cap and tighten to the recommended torque. Apply compounds such as Teflon to the
 threads to ensure a good seal;
- In the case of flanged covers, ensure that the nuts are tightened equally before final torque is applied.
- Check for leaks.



	Item	Diameter	N m
		3⁄8" and 1⁄2"	50 ±10
	2	3/"	60 ±10
FIG. 12		1"	110 ± 10
		1¼" and 1½"	160 ± 20
		2"	200 ± 20
	Item	Diameter	N m
		3∕₃", and ½"	50 ±10
EIC 12		3/4"	60 ±10
FIG. 13	2	1"	100 ± 10
		1¼" and 1½"	160 ± 20
		2"	200 ± 20
	Item	Diameter	N m
	2	3⁄8", and 1⁄2"	50 ±10
		3/4"	60 ±10
FIG. 14		1"	210 ± 20
		1¼" and 1½"	220 ± 20
		2"	220 ± 20
	Item	Diameter	N m
		3⁄8", and 1⁄2"	50 ±10
		3/4"	60 ±10
FIG. 16	2	1"	210 ± 20
		1¼" and 1½"	220 ± 20
		2"	220 ± 20
	Item	Diameter	N m
		1/2"	50 ±10
		3/4"	60 ±10
FIG. 34	2	1"	210 ± 20
		1¼" and 1½"	220 ± 20
		2"	220 ± 20

Recommended tightening torques

Recommended tightening torques continued on next page

FIG.12, FIG.13, FIG.14, FIG.16, FIG.34, FIG.36, CI, CSX and CSSX

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	ltem	Diameter	N m	-
		1/2"	50 ±10	_
		3/4"	60 ±10	_
FIG. 30	2	1"	210 ± 20	_
		1¼" and 1½"	220 ± 20	_
		2"	220 ± 20	_
	ltem	Diameter	N m	_
		2"	30 ± 5	_
IC	F	21⁄2" a 4"	60 ± 10	_
	5	6"	80 ± 10	_
		8" a 16"	200 ± 20	_
	ltem	Diameter	Class	N m
		2" to 4"	150#	15 ± 2
		2" to 4"	300#	65 ±10
		6"	150#	80 ± 10
	5	6"	300#	25 ± 5
CSX		8"	150#	60 ± 10
		8"	300#	240 ± 20
		10"	150#	115 ± 15
		10"	300#	250 ± 20
		12"	150#	160 ± 20
		12"	300#	340 ± 25
	Item	Diameter	Class	N m
		2" to 4"	150#	15 ± 2
		2" to 4"	300#	65 ±10
		6"	150#	25 ± 5
		6"	300#	60 ± 10
CSSX	E	8"	150#	± 10 5
	5	8"	300#	200 ± 20
		10"	150#	115 ± 15
		10"	300#	250 ± 20
		12"	150#	160 ± 20
		12"	300#	340 ± 25

Recommended tightening torques (continued)

8. Spare parts

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

Screen + Gasket Set (always state material, size of perforation/mesh and size of strainer)

3 and 4



How to order spare parts Always order spare parts using the description given in the column of the spare parts table and inform the size and type of the filter and the perforation of the selected screen.

Example: 1 off strainer screen in stainless steel with 100 mesh to suit Spirax Sarco Fig. 13 1".

FIG.12, FIG.13, FIG.14, FIG.16, FIG.34, FIG.36, CI, CSX and CSSX

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9. Troubleshooting

Symptoms	Possible causes	Solution
	Blocked element	Clean or replace the element
No flow through the filter	The system is isolated	Check upstream and downstream shut-off valves
Increased pressure drop in the filter	Saturated element	Clean or replace the element

10. Further information

To assist steam system users throughout Brazil, Spirax Sarco offers a variety of technical support services. These services are designed to definitively eliminate energy losses in the industry.

Reduction of Steam Losses (RSL)

This service involves a technical assessment of installations, identifying leakage points, evaluating and registering steam traps, and quantifying losses with a payback calculation. - consists of a technical survey of the installations, locating leakage points, evaluating and registering steam traps and quantifying losses with a payback calculation.

Maintenance Contracts (MC)

These contracts enable effective reduction in the overall average of energy losses. They make it possible to achieve an effective reduction in overall average energy losses. There are four types: Emergency Maintenance Plan (PME); Predictive Maintenance Contract (CMD); Preventive Maintenance Contract (CMR); and Corrective Maintenance Contract (CMC).

Maintenance

Contracts cost less than the most common losses in these systems. Additionally, Spirax Sarco offers other tools to optimize steam lines. Furthermore, its network of authorized distributors includes more than 40 partners with standard service coverage across the entire country. The company is the only one to offer this level of expertise in steam system maintenance.

Returns

All equipment that has been contaminated with, or exposed to, bodily fluids, chemicals, toxic substances, or any other hazardous material must be decontaminated before being returned to Spirax Sarco or its distributor. Returns will not be accepted without prior authorisation.



FIG.12, FIG.13, FIG.14, FIG.16, FIG.34, FIG.36, CI, CSX and CSSX

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