



APT14, APT14HC and APT14SHC Automatic Pump Traps

Description

The Spirax Sarco APT14, APT14HC and APT14SHC automatic pump traps are flanged or screwed displacement receivers pressure rated to PN16. The units are capable of automatically trapping or pumping, depending on pipeline conditions. The unit is operated by steam (saturated or superheated) and is used to remove condensate from process plant under all operating conditions including vacuum. For optional extras see 'How to order' on page 6.

Definition of Motive Steam

For clarity throughout this document, it is important to note that the term 'motive steam' is used to describe both saturated steam and superheated steam.

Design compliance

The shell of the product has been designed in accordance with A.D. Merkblatter/ASME VIII.

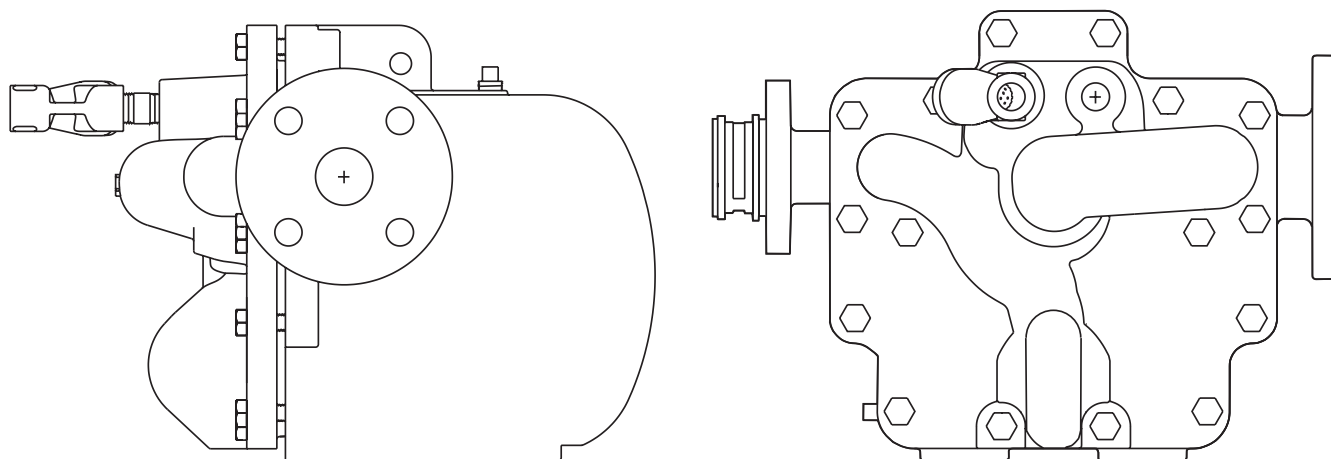
Standards

These products fully comply with the requirements of the European Pressure Equipment Directive 2014/68/EU, ATEX Directive and carry the  and  marks when so required.

Certification

These products are available with certification to EN 10204 3.1.

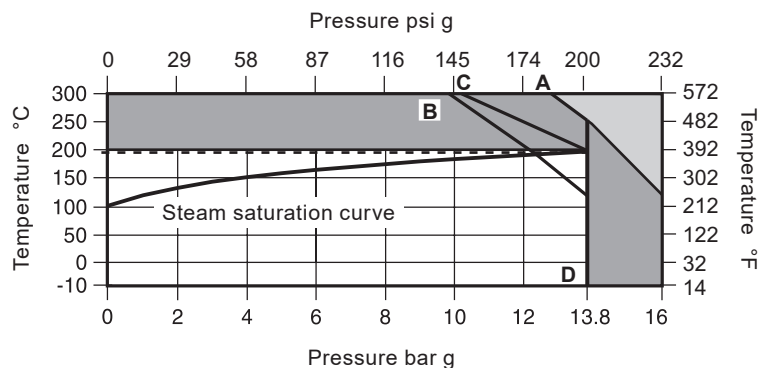
Note: All certification/inspection requirements must be stated at the time of order placement.



Sizes and pipe connections

Model and body material	Inlet and outlet sizes and pipe connections	Connections					
		Motive /exhaust		Sight glass		Drain	
APT14 SG iron	Flanged DN40 inlet x DN25 outlet	EN 1092 PN16	BSP T Rp (ISO 7-1) or NPT	DN15 (½")	DN15 (½")	BSP T Rp (ISO 7-1)	DN10 (⅜")
		ASME B 16.5 150	NPT			NPT	
		JIS 10 (JIS B 2210)	BSP T Rp (ISO 7-1)			BSP T Rp (ISO 7-1)	
		KS 10 (KS B 1511)	BSP T Rp (ISO 7-1)			BSP T Rp (ISO 7-1)	
	Screwed 1½" inlet x 1" outlet	BSP T Rp (ISO 7-1)	BSP T Rp (ISO 7-1)			BSP T Rp (ISO 7-1)	
		NPT	NPT			NPT	
APT14HC SG iron	Flanged DN50 inlet x DN40 outlet	EN 1092 PN16	BSP T Rp (ISO 7-1)	DN15 (½")	DN15 (½")	BSP T Rp (ISO 7-1)	DN10 (⅜")
		ASME B 16.5 150	NPT			NPT	
		JIS 10 (JIS B 2210)	BSP T Rp (ISO 7-1)			BSP T Rp (ISO 7-1)	
		KS 10 (KS B 1511)	BSP T Rp (ISO 7-1)			BSP T Rp (ISO 7-1)	
APT14SHC Carbon steel							

Pressure/temperature limits - APT14 and APT14HC (SG iron)



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

The product should not be used in this region or beyond its operating range as damage to the internals may occur.

----- Superheated steam should not exceed the following parameters: 13.8 bar g @ 198 °C (200 psi g @ 388 °F)

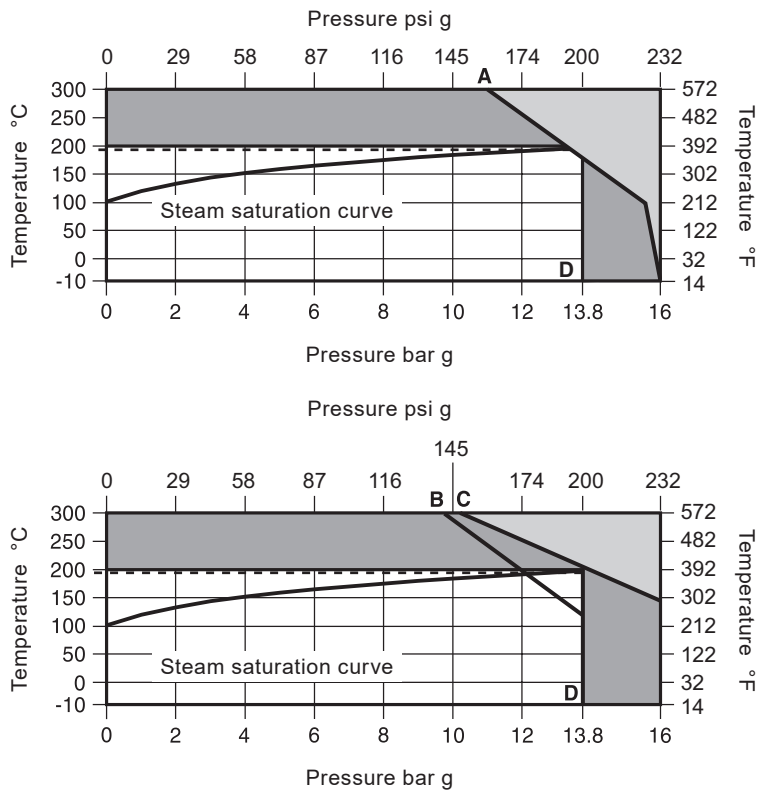
A - D Flanged PN16.

B - D Flanged JIS/KS 10.

C - D Flanged ASME 150.

Body design conditions		PN16
Maximum motive inlet pressure	13.8 bar g	200 psi g
PMA Maximum allowable pressure	16 bar g @ 120 °C	232 psi g @ 248 °F
TMA Maximum allowable temperature	300 °C @ 12.8 bar g	572 °F @ 186 psi g
Minimum allowable temperature	-10 °C	14 °F
Note: For lower temperatures consult Spirax Sarco.		
PMO Maximum operating pressure for saturated and superheated steam service	13.8 bar g @ 198 °C	200 psi g @ 388 °F
Maximum backpressure for standard pumps (for higher backpressures contact Spirax Sarco)	5 bar g	73 psi g
TMO Maximum operating temperature for saturated and superheated steam service	198 °C @ 13.8 bar g	388 °F @ 200 psi g
Temperature limits (Ambient Ξ_x)	-10 °C to 200 °C	14 °F to 392 °F
Product is safe for use under full vacuum conditions		
Designed for a maximum cold hydraulic test pressure of:		24 bar g 348 psi g
Filling/ Installation	Recommended filling head above the pump (from the base of the receiver / process)	0.3 m 1 ft
	Maximum recommended installation (from the base of the pump) for higher installation heads refer to Spirax Sarco	1 m 3.2 ft
	Minimum installation head required (from the base of the pump)	0.2 m 0.7 ft

Pressure/temperature limits - APT14SHC (carbon steel)



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Warning 1
Consideration of Condensate Temperature Increase

In situations where the temperature of the motive steam is considerably higher than that of the condensate, it is important that the design of the system located downstream of the pump adequately addresses this temperature difference.



Warning 2
Control of Motive Pressure and Risk Assessment

It is essential to implement reliable and effective control of the motive pressure supplied to the pump. This control is necessary to ensure that the temperatures within the system do not exceed the maximum allowable temperature limits specified for the equipment.



Warning 3
Steam Backflow Risk and Upstream Device Rating

There is a risk of steam backflow through the balance line in systems utilising the APT14 pump. To mitigate this risk, it is strongly advised that the device situated upstream of the pump is specified to withstand the temperature of the steam employed as motive steam. This precaution is particularly crucial in installations where a second steam line—be it superheated or saturated steam—is introduced to the system.

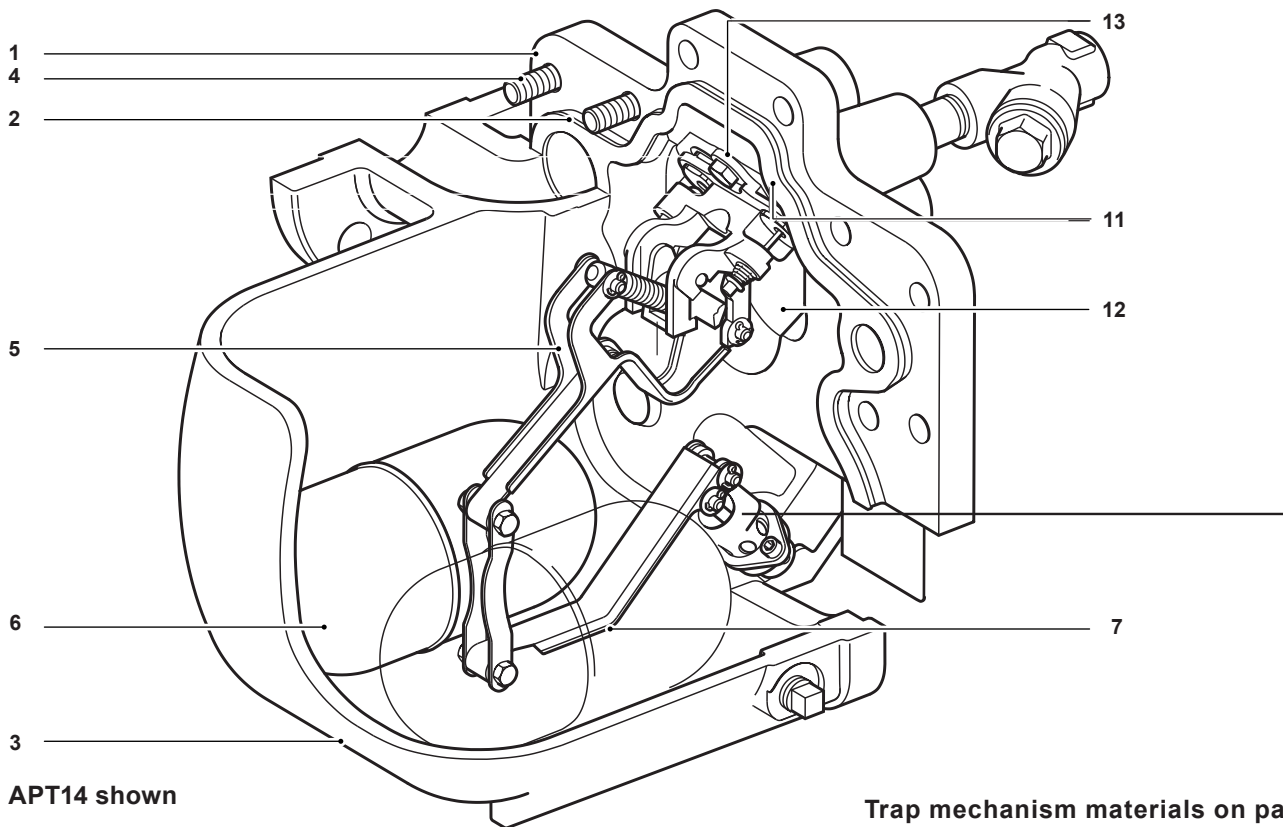


Warning 4
Specification of Sight Glass

When specifying a sight glass for the system, it is imperative that the component is capable of withstanding the maximum temperature gradient that the pump may encounter during operation. This temperature gradient is defined as the difference between the highest possible steam temperature and the temperature of the coldest condensate present in the system.

It is the responsibility of the user to conduct an appropriate level of risk assessment for the application. This assessment should ensure that all necessary precautions are in place and that the system operates within safe parameters at all times.

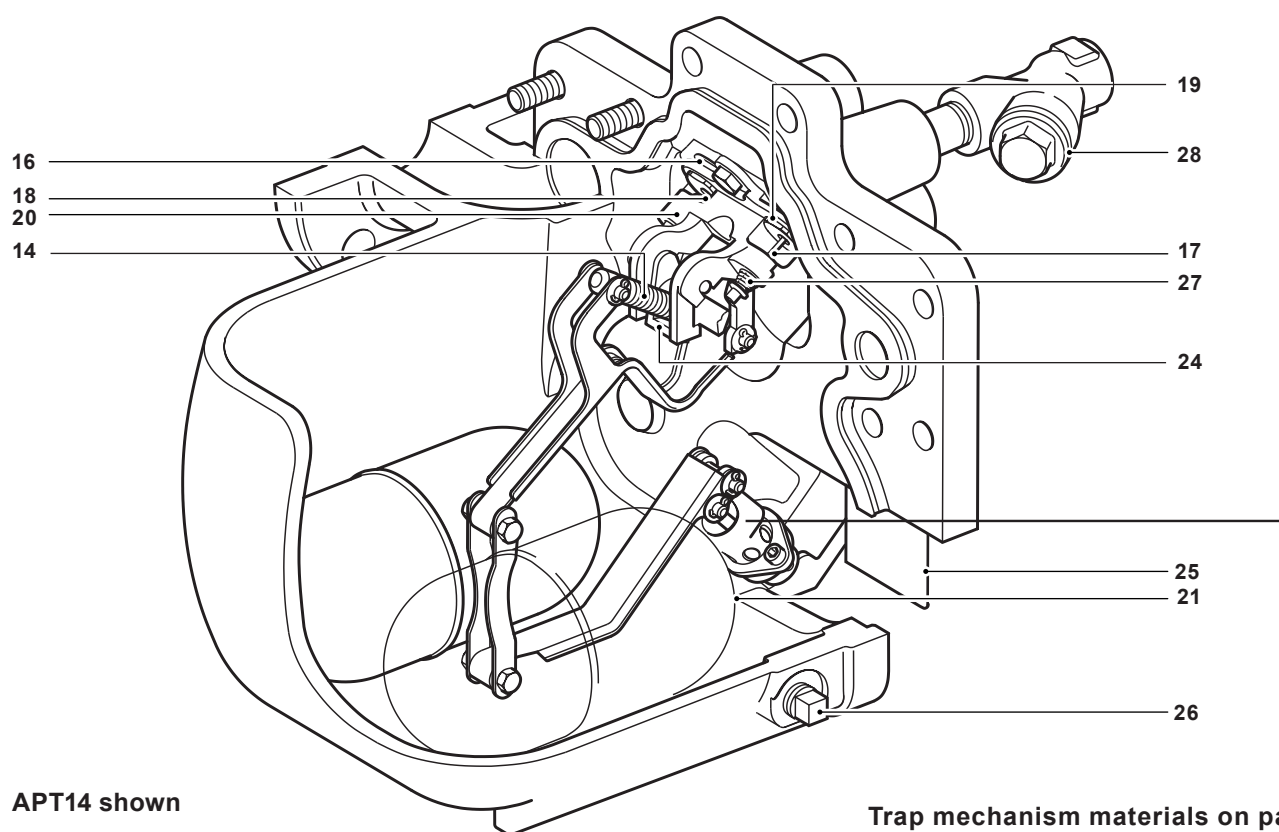
Materials



No.	Part	Material
1	Cover	APT14 SG iron EN JS 1025 or ASTM A395
		APT14HC SG iron EN JS 1025 or ASTM A395
		APT14SHC Carbon steel EN 1.0619+N or ASTM A216 WCB
2	Cover gasket	APT14 Graphite laminated with stainless steel insert
		APT14HC Graphite laminated with stainless steel insert
		APT14SHC Novapit SSTC expanded graphite laminated with stainless steel insert
3	Body	APT14 SG iron EN JS 1025 or ASTM A395
		APT14HC SG iron EN JS 1025 or ASTM A395
		APT14SHC Carbon steel EN 1.0619+N or ASTM A216 WCB
4	Cover bolts	Stainless steel ISO 3506 Gr. A2 70
	Location pins	APT14SHC only Stainless steel 304
5	Pump lever	Stainless steel BS 1449 304 S15
6	Float	Stainless steel BS 1449 304 S15
7	Trap lever	Stainless steel BS 1449 304 S15
11	Seat (inlet check valve)	Stainless steel AISI 420
12	Flap (inlet check valve)	Stainless steel BS 3146 ANC 4B
13	Pump mechanism bracket	Stainless steel BS 3146 ANC 4B

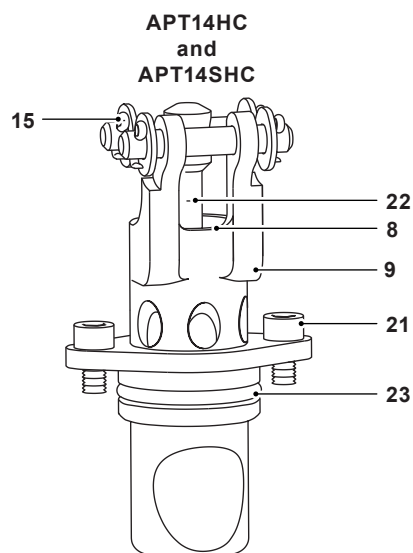
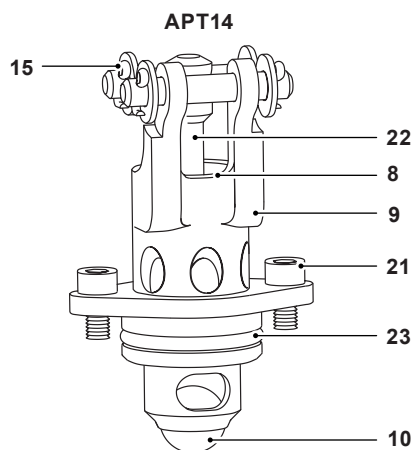
Materials continued on next page

Materials (continued)



No.	Part	Material	
14	Spring (pump)	Stainless steel	BS 2056 302 S26 Gr. 2
16	Exhaust seat	Stainless steel	BS 970 431 S29 or ASTM A276 431
17	Inlet valve and seat assembly	Stainless steel	
18	Exhaust valve	Stainless steel	BS 3146 ANC 2
19	Valve seat gasket	Stainless steel	BS 1449 409 S19
20	Pump mechanism bolt	Stainless steel	ISO 3506 Gr. A2 70
24	Actuator arm	Stainless steel	BS 3146 ANC 2
25	Name-plate	Stainless steel	BS 1449 304 S16
26	Drain plug	Steel	DIN 17440 1.4571
27	Inlet valve spring	Stainless steel	
28	Motive strainer	APT14	SG iron
		APT14HC	SG iron
		APT14SHC	Carbon steel
29	DCV10 (APT14HC and APT14SHC)		
		Stainless steel (not shown)	

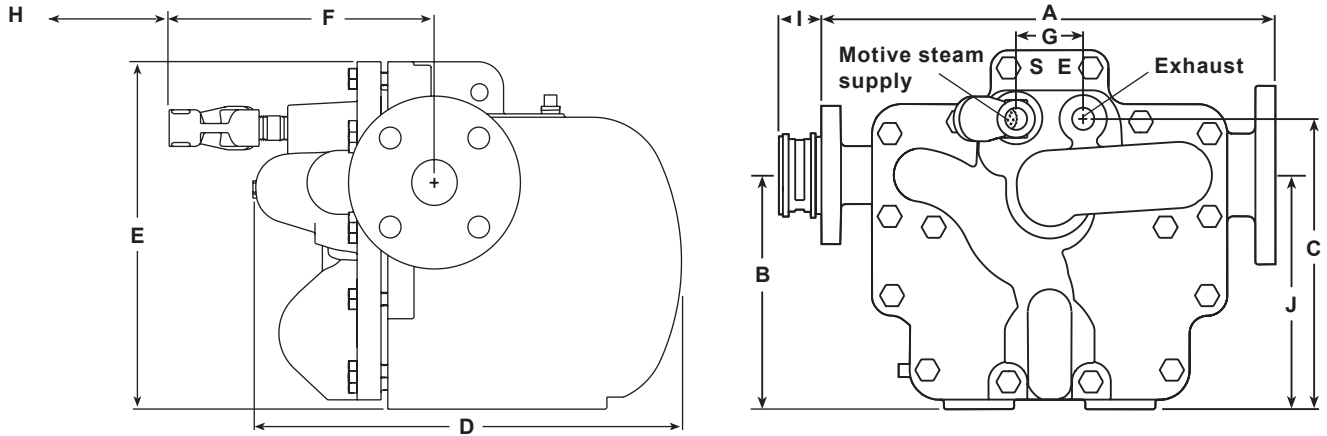
Materials for the trap mechanism



No.	Part	Material	
8	Trap 2 nd stage valve	Stainless steel	ASTM A276 440 B
9	Trap housing	Stainless steel	BS 3146 ANC 2
10	Ball (APT14 only)	Stainless steel	ASTM A276 440 B
15	Split pin	Stainless steel	BS 1574
21	Trap housing bolt	Stainless steel	BS 6105 A4 80
22	Trap 1 st stage valve	Stainless steel	BS 970 431 S29 or ASTM A276 431
23	'O' ring	EPDM	

Dimensions/weightS (approximate) in mm (inches) and kg (lbs)

Withdrawal distance



Model	Connection	A				B	C	D	E	F	G
		BSP T Rp (ISO 7-1)/NPT	PN16	JIS/KS10	ASME						
APT14	Screwed	350 (13.8)	389 (15.3)	385 (15.1)	386.5 (15.2)	198 (7.7)	246 (9.68)	385 (15.1)	304 (11.9)	258 (10.1)	57 (2.24)
APT14HC	Flanged		512 (20.1)	506 (19.9)	524 (20.6)		270 (10.6)	400 (15.7)	335 (13.1)	261 (10.2)	
APT14SHC	Flanged		552 (21.7)	546 (21.4)	544 (21.1)		206 (8.11)	278 (10.9)	407 (16)		

Model	Connection	H	I				J	Weight
			Screwed BSP T Rp (ISO 7-1)/NPT	PN16	Flanged JIS/KS10	ASME		
APT14	Screwed	250 9.8					198 (7.8)	45 (99)
APT14HC	Flanged	275 10.8		31.5 (1.2)	31.5 (1.2)	45 (1.8)		65 (143)
APT14SHC	Flanged						206 (8.11)	105 (232)

Nominal capacities

For full capacity details for a specific application consult Spirax Sarco. To accurately size the pump trap, the following data is required.

1. Installation head available, from the base of the pump trap to the centre line of the heat exchanger/process condensate outlet (m).
If the outlet is mounted vertically, then this should be from the base of the pump to the face of the outlet.
2. Motive steam pressure available to power the pump trap (bar g).
3. Total backpressure in the condensate return system (bar g).
4. Heat exchanger full-load operating pressure (bar g).
5. Heat exchanger maximum steam load (kg/h).
6. Minimum temperature of secondary fluid (°C).
7. Maximum controlled temperature of secondary fluid (°C).

Model	APT14	APT14HC and APT14SHC
Pump discharge/cycle	5 litres (1.3 gallons)	8 litres (2.1 gallons)

Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-P612-04) supplied with the product.

How to specify

APT14 and APT14HC

The pump trap shall be a Spirax Sarco automatic pump trap type APT14 operated by steam to 13.8 bar g (200 psi g). No electrical energy shall be required. Body construction from SG iron (EN JS 1025 dual certified with ASTM A395) with a swing type inlet check valve (APT14 and APT14HC) and ball type outlet check valve (APT14 only). The internal trap mechanism shall contain dual stainless steel floats connected with a two stage trap, while the internal pump mechanism shall be a stainless steel single tension spring snap-action device with no external seals or glands.

APT14SHC

The pump trap shall be a Spirax Sarco automatic pump trap type APT14SHC operated by steam to 13.8 bar g. No electrical energy shall be required. Body construction from carbon steel (EN 1.0619 dual certified with ASTM A216 WCB) with a swing type inlet check valve. The internal trap mechanism shall contain dual stainless steel floats connected with a two stage trap, while the internal pump mechanism shall be a stainless steel single tension spring snap-action device with no external seals or glands.

How to order

Example: 1 off Spirax Sarco automatic pump trap, type APT14, DN40 x DN25, flanged EN 1092 PN16 with BSP T Rp (ISO 7-1) motive fluid connections.

Optional extras

Both the APT14 and APT14HC are available with the **body and cover coated with electroless nickel plate (ENP)**. This option, when required, will be denoted as **APT14 ENP** and **APT14HC ENP** respectively and must be stated at the time of order placement.

The APT14, APT14HC and APT14SHC are available with the body drilled, tapped and plugged to accept sight level gauges. **Note:** Sight level gauges can not be fitted retrospectively to the standard APT14, APT14HC or APT14SHC.

Spare parts

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

Available spares

A	Cover assembly (A - G inclusive)	1, 2, 5-25
B	Cover gasket	2
C	Inlet check valve	2, 12
D	Spring and actuator arm	2, 14, 24
E	Floats	2, 5, 6, 7
F	Trap and outlet check valve mechanism	2, 8, 9, 10 (APT14 only), 21, 22, 23
G	Inlet/exhaust valve and seat kit	2, 16, 17, 18, 19, 27
H	See separate literature: For the APT14 or APT14HC see TI-P163-01 and for the APT14SHC see TI-P063-02	28
DCV10 outlet check valve (APT14HC and APT14SHC only). See separate literature TI-P601-32		29

Please note:

For customer convenience, spares are supplied in kits to ensure all the appropriate replacement parts are available e.g. when an inlet/exhaust valve and seat assembly is ordered, all replacement split pins, washers and gaskets will be provided in addition to the key components listed.

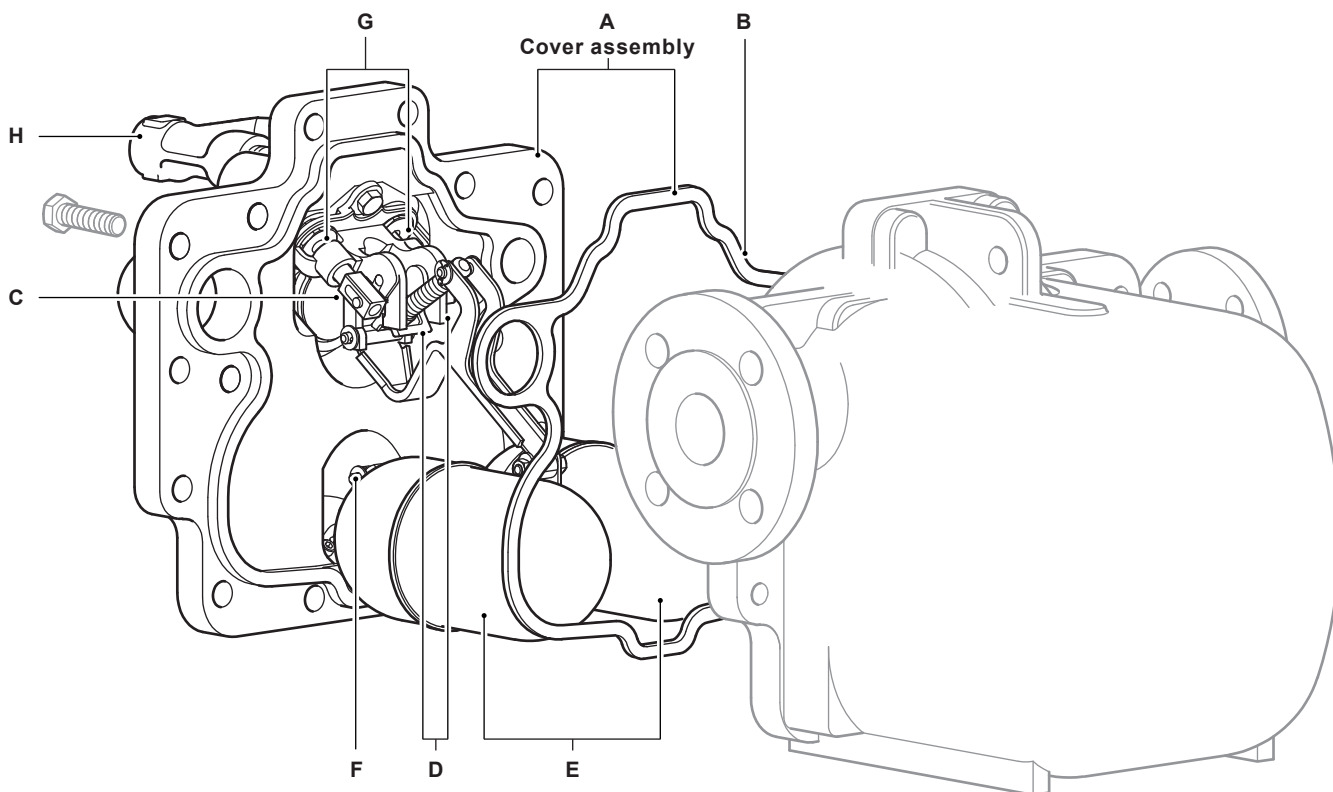
How to order spares

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

Example: 1 off Inlet/exhaust valve and seat kit for a Spirax Sarco DN40 x DN25 APT14 automatic pump trap.

A

Cover assembly (APT14 shown)

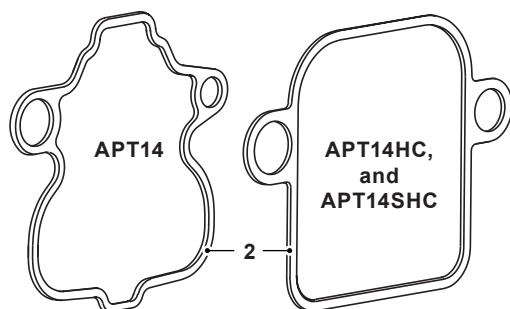


Available spares continued on next page

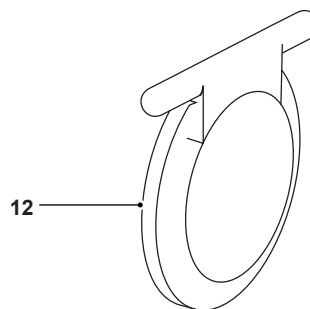
Available spares (continued)

A	Cover assembly (A - G inclusive)	1, 2, 5-25
B	Cover gasket	2
C	Inlet check valve	2, 12
D	Spring and actuator arm	2, 14, 24
E	Floats	2, 5, 6, 7

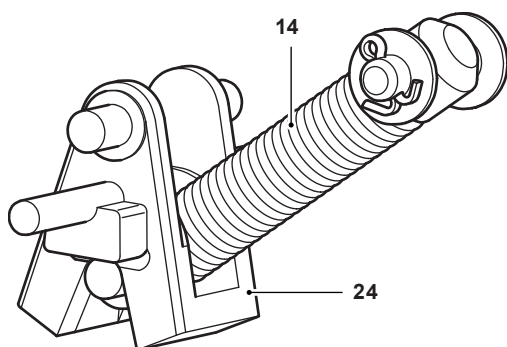
B
Cover gasket



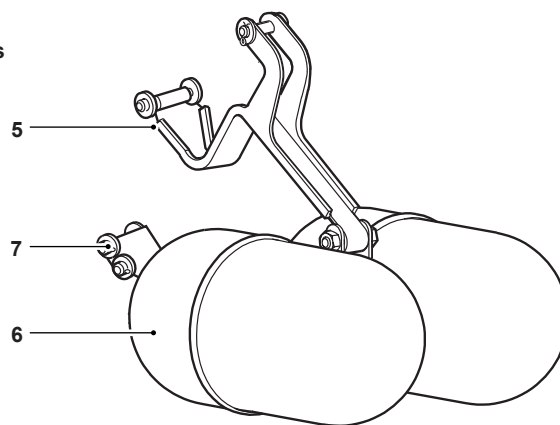
C
Inlet check valve



D
Spring and actuator arm



E
Floats



Available spares continued on next page

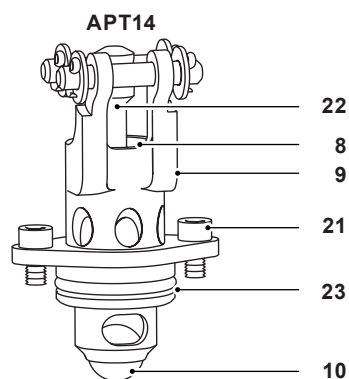
Available spares (continued)

F	Trap and outlet check valve mechanism	2, 8, 9, 10 (APT14 only), 21, 22, 23
G	Inlet/exhaust valve and seat kit	2, 16, 17, 18, 19, 27

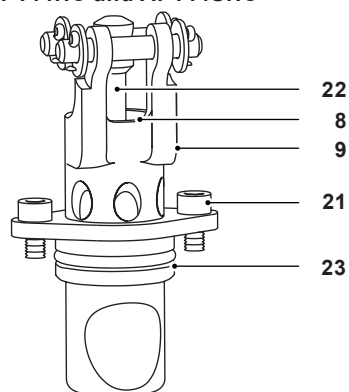
F

Trap and outlet check valve mechanism

Note: Item 10 is not included for the APT14HC and APT14SHC

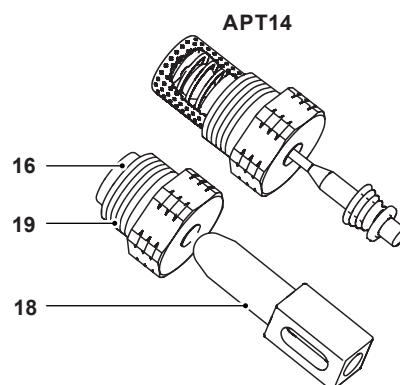


APT14HC and APT14SHC



G

Inlet/exhaust valve and seat kit



APT14HC and APT14SHC

