MFP14-PPU (Vented) Automatic Pump Packaged Units

Description

The Spirax Sarco MFP14-PPU vented automatic pump packaged units are plug-in systems specifically designed to collect and pump hot condensate; commonly returned for use as boiler feedwater.
The MFP14-PPU is available with either single, duplex or triplex pumps, mounted on a single base plate, that can be used for duty only or duty / stand-by applications.
Operated by steam, the MFP14-PPU can be tailored to suit a wide range of condensate handling applications.
The standard pump is manufactured from SG iron, although cast steel and stainless steel versions are available on request.

Please note: Versions suitable for use with compressed air as the motive power and or other combinations are available as bespoke items. For further details contact your local Spirax Sarco office or representative.

Standards

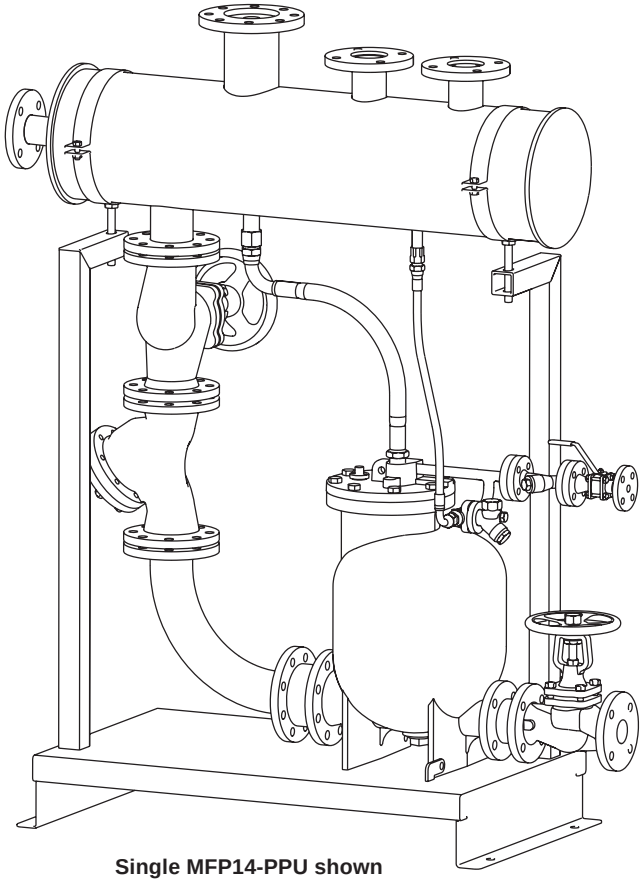
The MFP14-PPU fully complies with the requirements of PED, the European Pressure Equipment Directive 97 / 23 / EC.
Please note that all the welding is in accordance with the requirements of PED.

Certification

This product is available with a declaration of conformity. For other certification requirements contact Spirax Sarco.
Note: All certification / inspection requirements must be stated at the time of order placement. Retrospective certification / inspection may not be possible.

Pressure / temperature limits

Body design condition			PN16
Maximum receiver operating pressure			0.5 bar g
Maximum motive inlet pressure (steam air or gas)		MFP14	13.8 bar g
		MFP14S	13.8 bar g
		MFP14SS	10.96 bar g
PMA	Maximum allowable pressure	MFP14	16 bar g @ 120°C
		MFP14S	16 bar g @ 120°C
		MFP14SS	16 bar g @ 93°C
TMA	Maximum allowable temperature	MFP14	300°C @ 12.8 bar g
		MFP14S	300°C @ 10.8 bar g
		MFP14SS	300°C @ 9.3 bar g
Minimum allowable temperature			0°C
PMO	Maximum operating pressure	MFP14	13.8 bar g @ 198°C
		MFP14S	13.8 bar g @ 198°C
		MFP14SS	10.96 bar g @ 188°C
TMO	Maximum operating temperature	MFP14	198°C @ 13.8 bar g
		MFP14S	198°C @ 13.8 bar g
		MFP14SS	188°C @ 10.96 bar g
Minimum operating temperature			0°C
Note: For lower operating temperatures consult Spirax Sarco			
Designed for a maximum cold hydraulic test pressure of 24 bar g			



Single MFP14-PPU shown

Approximate capacities

For full sizing details see pages 8 and 9

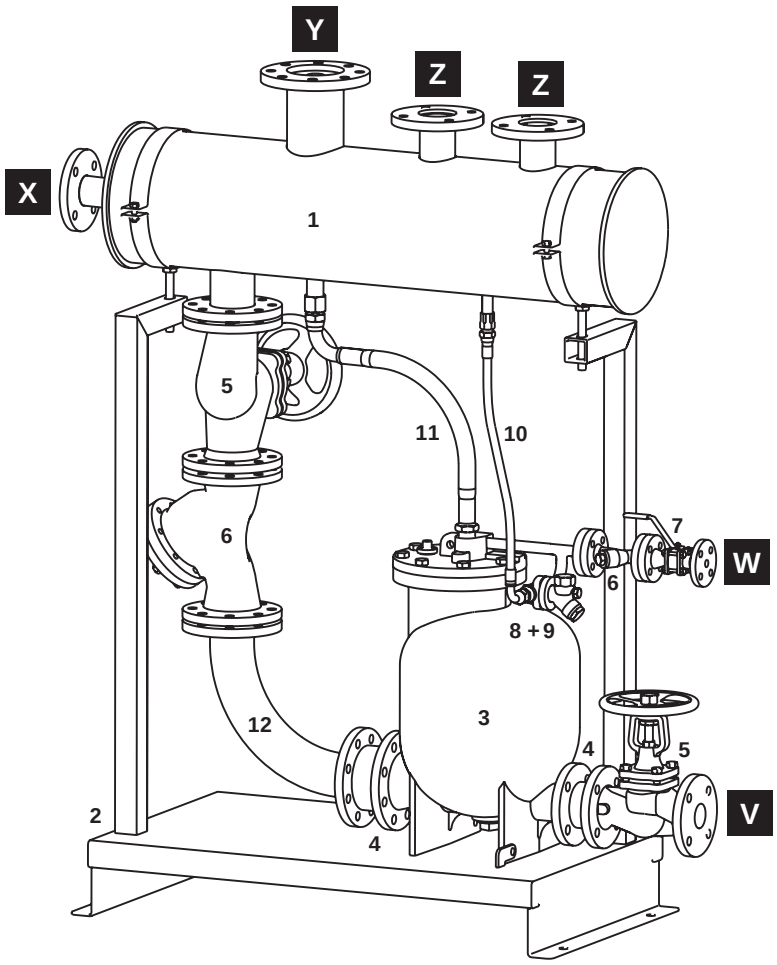
Unit size	Approximate maximum capacities (with 4 m lift) kg/h		
	Single MFP14-PPU	Duplex MFP14-PPU	Triplex MFP14-PPU
DN25 (1")	1300		
DN40 (1½")	2000	4000	
DN50 (2")	4000	8000	
DN80 x DN50 (3" x 2")	6000	12000	18000

For Single MFP14-PPU, see pages 2 and 3
For Duplex MFP14-PPU, see pages 4 and 5
For Triplex MFP14-PPU, see pages 6 and 7

Single MFP14-PPU

Sizes and pipe connections

Unit size	Pipe connection	V (Condensate out)	W (Motive)	X (Overflow)	Y (Vent)	Z (Inlet)
DN25 (1")	PN16	DN25	DN15	DN50 PN16	DN80	DN40
	ASME 150	1" ASME 150	½" ASME 150	2" ASME 150	3" ASME 150	1½" ASME 150
DN40 (1½")	PN16	DN40	DN15	DN50 PN16	DN100	DN40
	ASME 150	1½" ASME 150	½" ASME 150	2" ASME 150	4" ASME 150	1½" ASME 150
DN50 (2")	PN16	DN50	DN15	DN50 PN16	DN150	DN65
	ASME 150	2" ASME 150	½" ASME 150	2" ASME 150	6" ASME 150	2½" ASME 150
DN80 x DN50 (3" x 2")	PN16	DN50	DN15	DN50 PN16	DN150	DN65
	ASME 150	2" ASME 150	½" ASME 150	2" ASME 150	6" ASME 150	2½" ASME 150



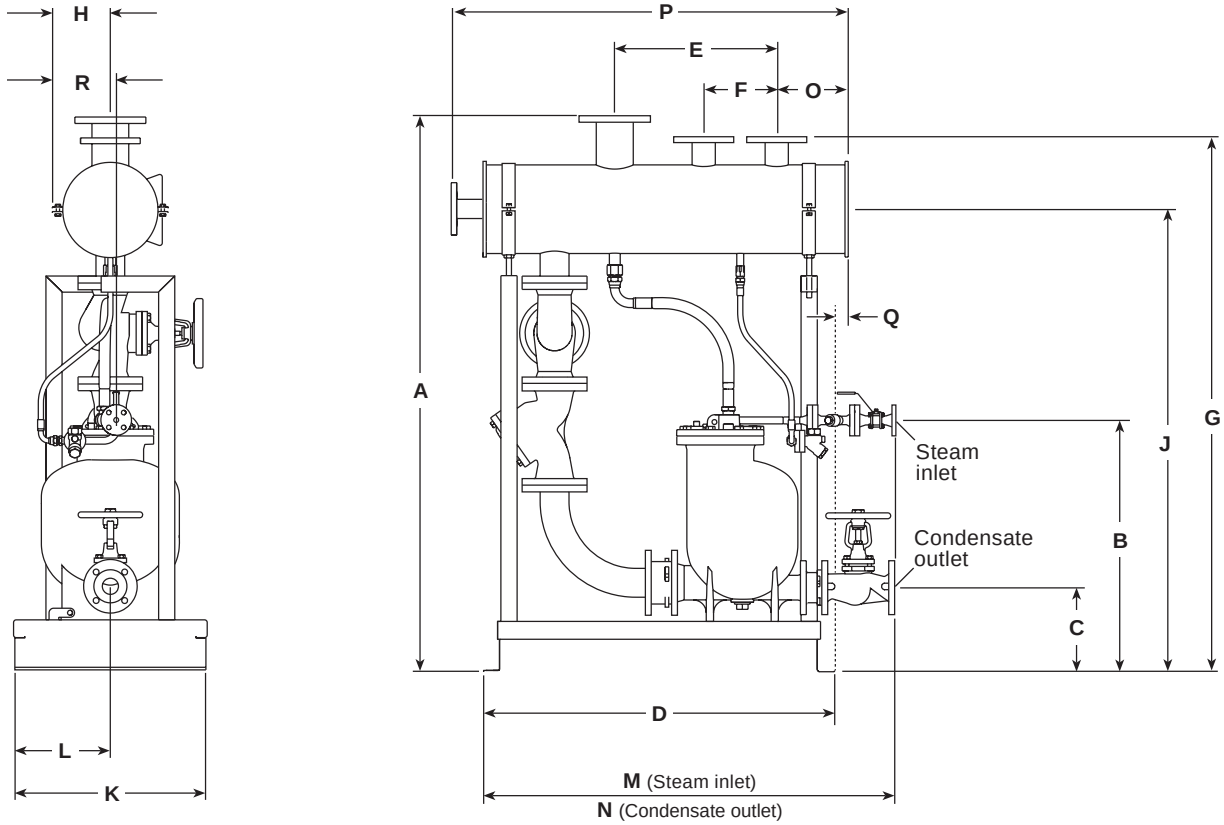
Materials

No	Part	Material
1	Receiver	Mild steel
2	Base plate and frame	Mild steel
3	MFP14 pump	SG iron
4	DCV10 check valve	Stainless steel
5	BSA2T isolation valve	SG iron
6	Fig 37 strainer	SG iron
7	M10S2 RB ball valve straight handle	Carbon steel
8	PC10 Quick-fit connector	Stainless steel
9	UTD30L thermodynamic steam trap	Stainless steel
10	Steam inlet drain trap flexible hose	Mild steel / stainless steel
11	Exhaust flexible hose	Mild steel / stainless steel
12	Pipework	Mild steel

Single MFP14-PPU

Dimensions (approximate) in mm

Unit size	Dimensions (mm)																	
	A	B	C	D	E	F	G	H	J	K	L	M		N		O	P	Q	R
												PN16	ASME 150	PN16	ASME 150				
DN25 (1")	1380	645	223	1081	499	225	1316	300	1119	600	300	1158	1138	987	965	220	1240	42	318
DN40 (1½")	1401	665	235	1081	499	225	1337	300	1139	600	300	1158	1139	1036	1015	220	1240	42	318
DN50 (2")	1606	775	259	1081	499	225	1541	300	1316	600	300	1274	1254	1270	1257	220	1240	42	318
DN80 x DN50 (3" x 2")	1716	775	259	1081	499	225	1650	300	1425	600	300	1274	1255	1269	1261	220	1240	42	318

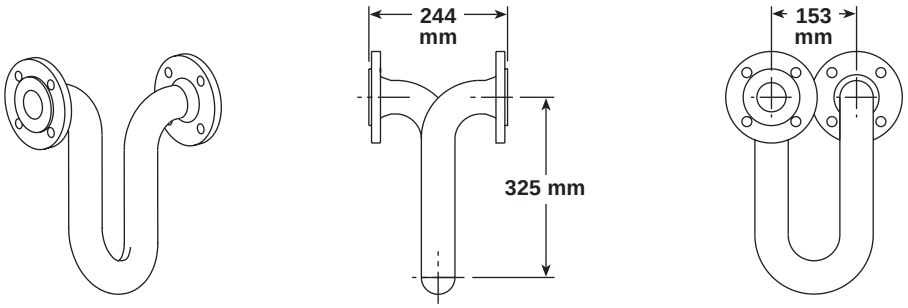


Weight (approximate) in kg

DN25 (1")	DN40 (1½")	DN50 (2")	DN80 x DN50 (3" x 2")
230	255	285	325

Optional loop seal

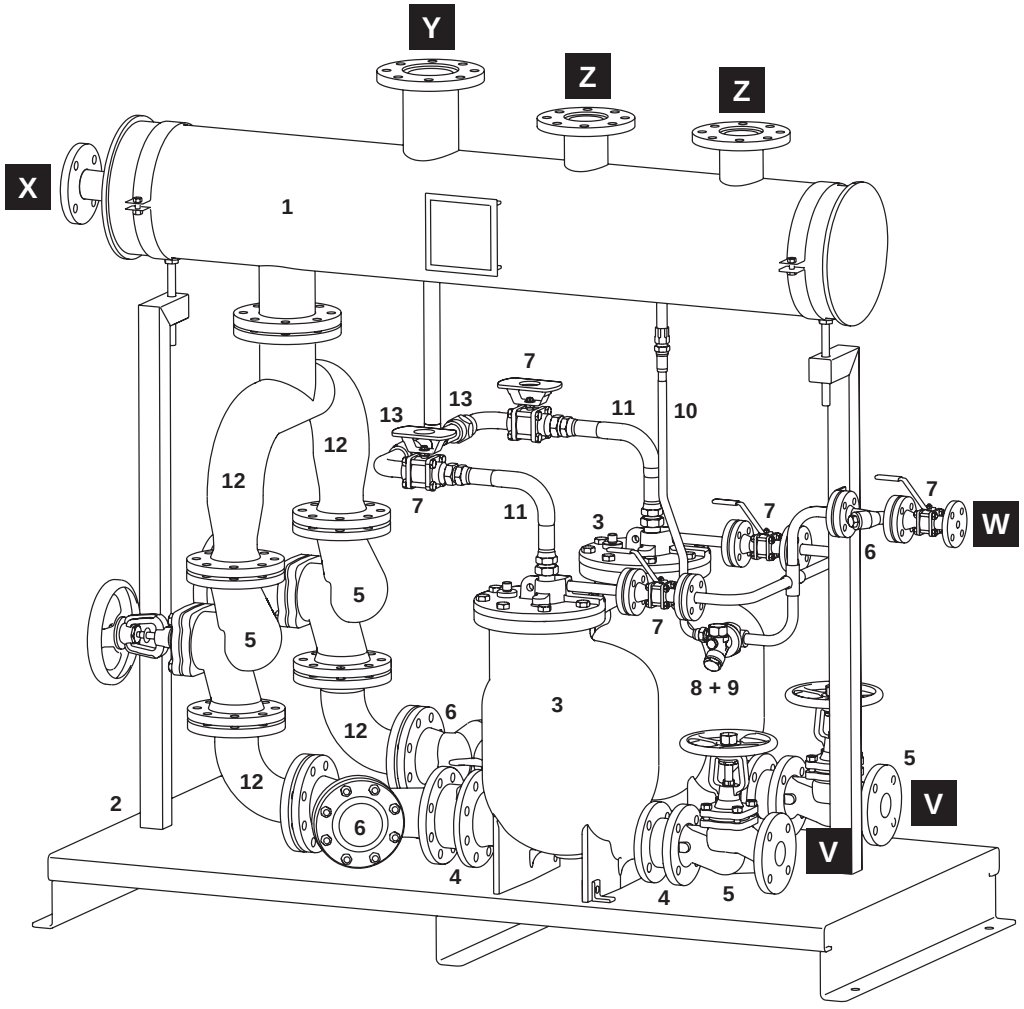
A loop seal must be be fitted to the overflow of the receiver. This can be purchased as an optional extra and must be specified at the time of order placement. Alternatively a loop seal can be created by the fitter at the point of installation.



Duplex MFP14-PPU

Sizes and pipe connections

Unit size	Pipe connection	V (Condensate out)	W (Motive)	X (Overflow)	Y (Vent)	Z (Inlet)
DN40 (1½")	PN16	DN40	DN15	DN50	DN100	DN50
	ASME 150	1½" ASME 150	½" ASME 150	2" ASME 150	6" ASME 150	2" ASME 150
DN50 (2")	PN16	DN50	DN15	DN50	DN200	DN65
	ASME 150	2" ASME 150	½" ASME 150	2" ASME 150	8" ASME 150	2½" ASME 150
DN80 x DN50 (3" x 2")	PN16	DN50	DN15	DN50	DN200	DN80
	ASME 150	2" ASME 150	½" ASME 150	2" ASME 150	8" ASME 150	3" ASME 150



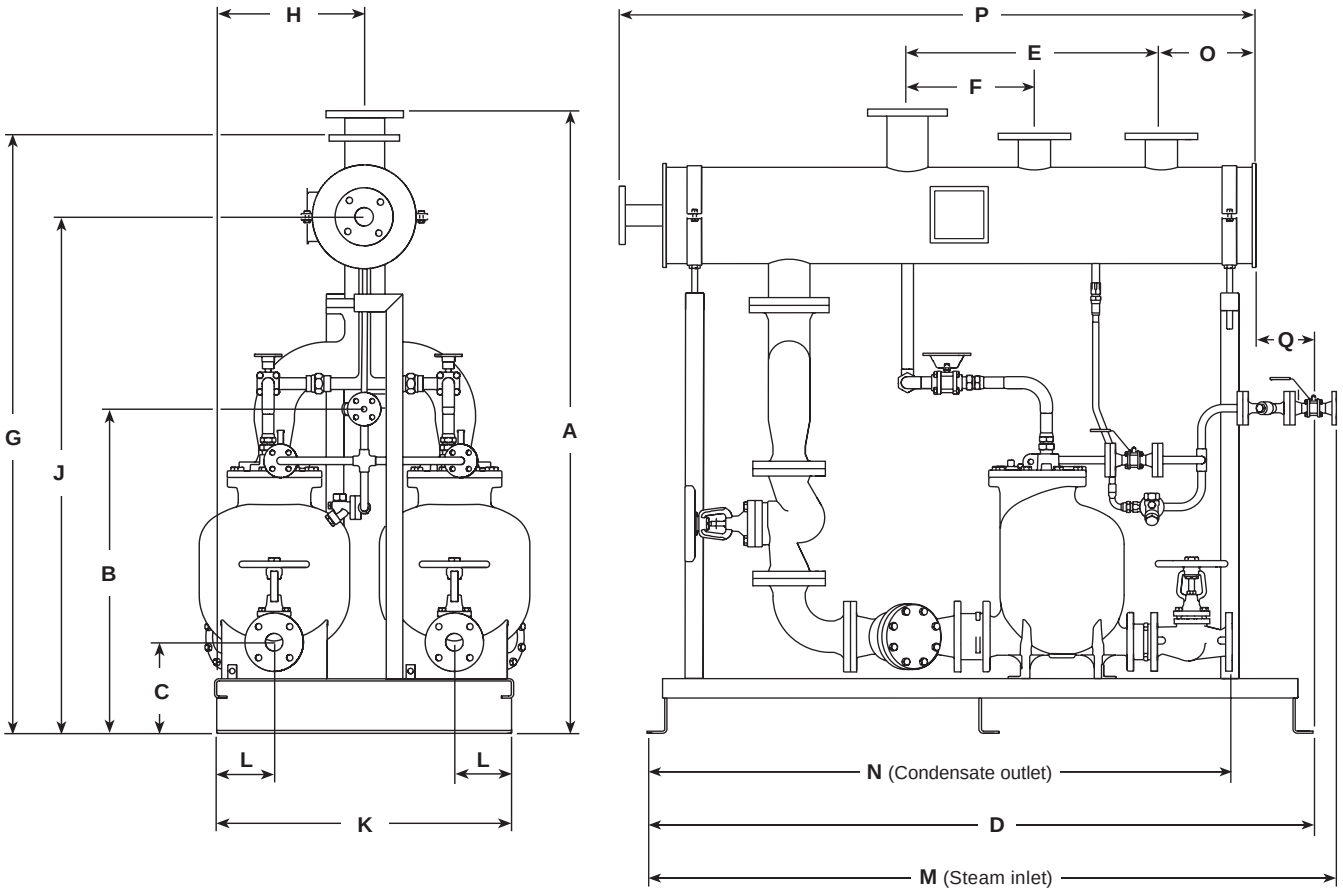
Materials

No	Part	Material
1	Receiver	Mild steel
2	Base plate and frame	Mild steel
3	MFP14 pump	SG iron
4	DCV10 check valve	Stainless steel
5	BSA2T Isolation valve	SG iron
6	Fig 37 strainer	SG iron
7	M10S2 RB ball valve with either oval or straight handle	Carbon steel
8	PC10 Quick-fit connector	Stainless steel
9	UTD30L thermodynamic steam trap	Stainless steel
10	Steam inlet flexible hose	Mild steel/stainless steel
11	Exhaust flexible hose	Mild steel/stainless steel
12	Pipework	Mild steel
13	DCV41 check valve	Stainless steel

Duplex MFP14-PPU

Dimensions (approximate) in mm

Unit size	Dimensions (mm)																	
	A	B	C	D	E	F	G	H	J	K	L	M		N		O	P	Q
												PN16	ASME 150	PN16	ASME 150			
DN40 (1½")	1504	820	236	1836	700	350	1454	425	425	850	191	1766	1766	1366	1352	285	1496	270
DN50 (2")	1654	921	258	1836	700	350	1582	425	425	850	172	1850	1850	1564	1552	287	1667	183
DN80 x DN50 (3" x 2")	1822	921	259	1836	700	350	1760	425	425	850	167	1895	1938	1606	1640	282	1751	144

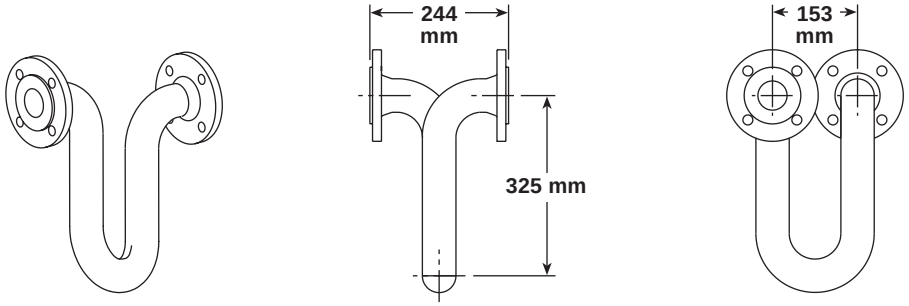


Weight (approximate) in kg

DN40 (1½")	DN50 (2")	DN80 x DN50 (3" x 2")
470	510	650

Optional loop seal

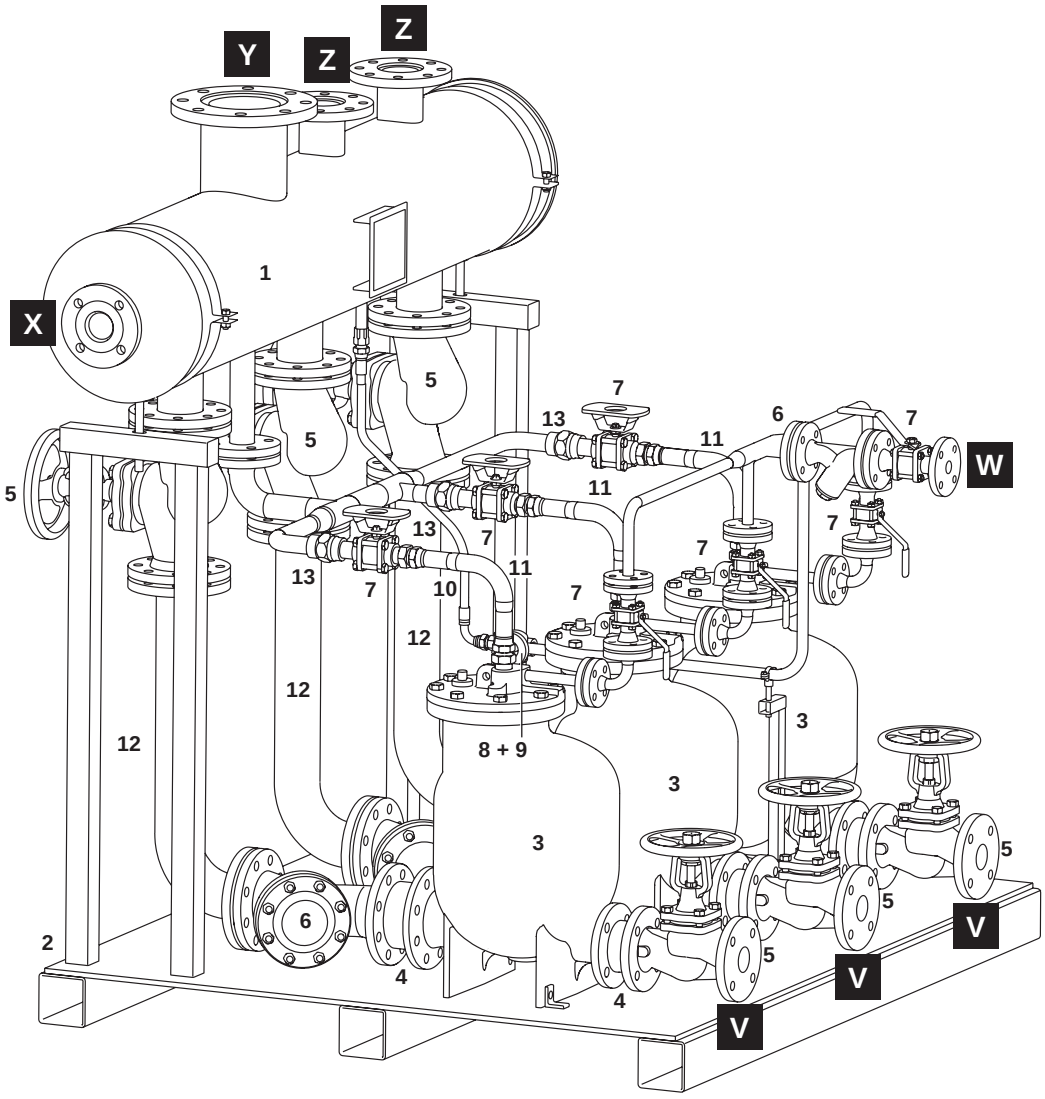
A loop seal must be be fitted to the overflow of the receiver. This can be purchased as an optional extra and must be specified at the time of order placement. Alternatively a loop seal can be created by the fitter at the point of installation.



Triplex MFP14-PPU

Sizes and pipe connections

Unit size	Pipe connection	V (Condensate out)	W (Motive)	X (Overflow)	Y (Vent)	Z (Inlet)
DN80 x DN50 (3" x 2")	PN16	DN50	DN25	DN80	DN300	DN100
	ASME 150	2" ASME 150	1" ASME 150	3" ASME 150	12" ASME 150	4" ASME 150



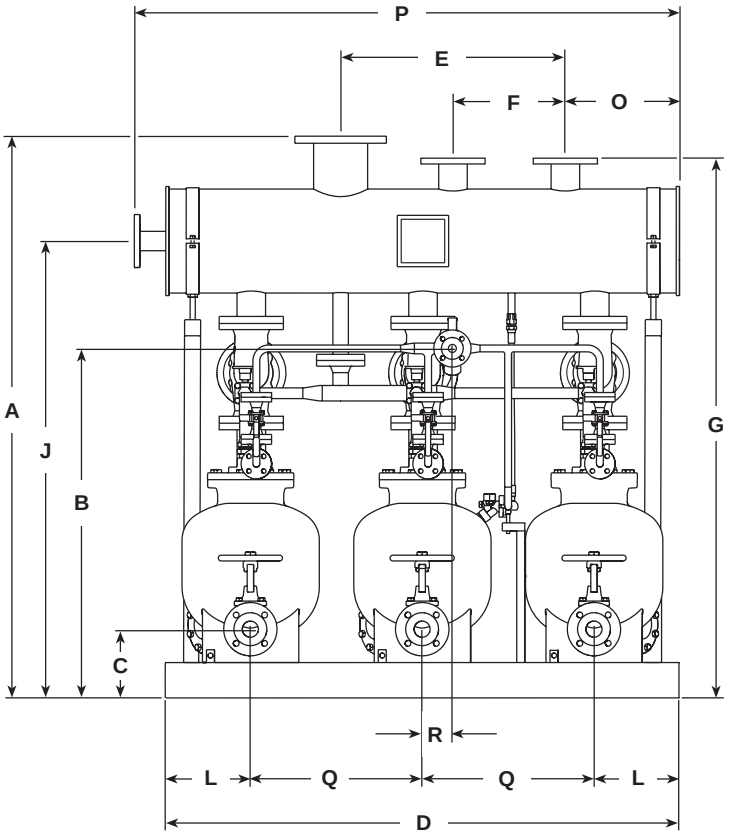
Materials

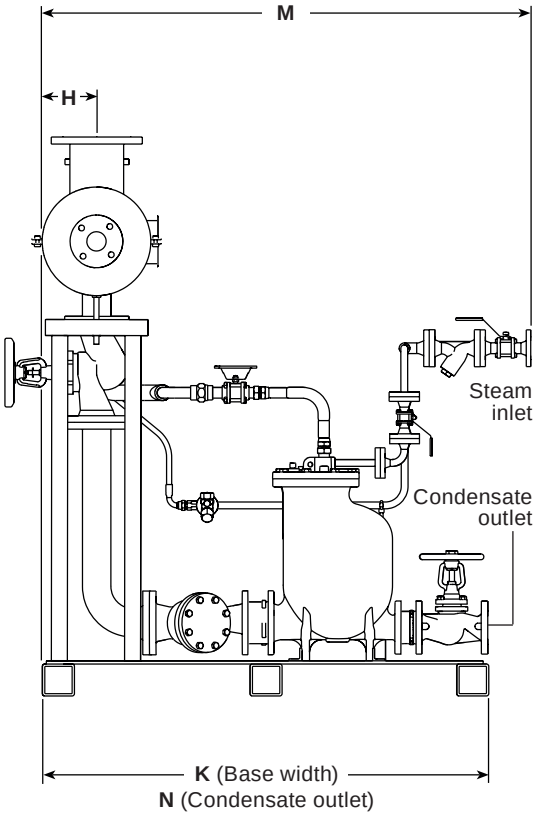
No	Part	Material
1	Receiver	Mild steel
2	Base plate and frame	Mild steel
3	MFP14 pump	SG iron
4	DCV10 check valve	Stainless steel
5	BSA2T isolation valve	SG iron
6	Fig 37 strainer	SG iron
7	M10S2 RB ball valve with either oval or straight handle	Carbon steel
8	PC10 quick-fit connector	Stainless steel
9	UTD30L thermodynamic steam trap	Stainless steel
10	Steam Inlet flexible hose	Mild steel/stainless steel
11	Exhaust flexible hose	Mild steel/stainless steel
12	Pipework	Mild steel
13	DCV41 check valve	Stainless steel

Triplex MFP14-PPU

Dimensions (approximate) in mm

Unit size	Dimensions (mm)																	
	A	B	C	D	E	F	G	H	J	K	L	M		N		O	P	Q	R
												PN16	ASME 150	PN16	ASME 150				
DN80 x DN50 (3" x 2")	1836	1088	214	1635	760	350	1767	244	1464	1465	267	1586	1602	1465	1501	355	1704	535	97



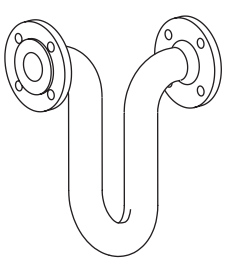


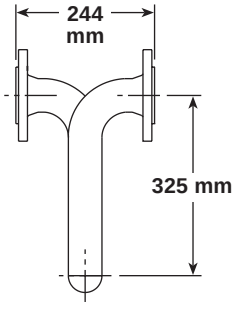
Weight (approximate) in kg

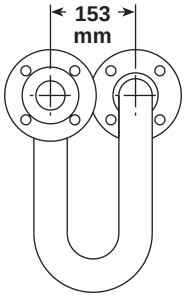
1 050

Optional loop seal

A loop seal must be be fitted to the overflow of the receiver. This can be purchased as an optional extra and must be specified at the time of order placement. Alternatively a loop seal can be created by the fitter at the point of installation.

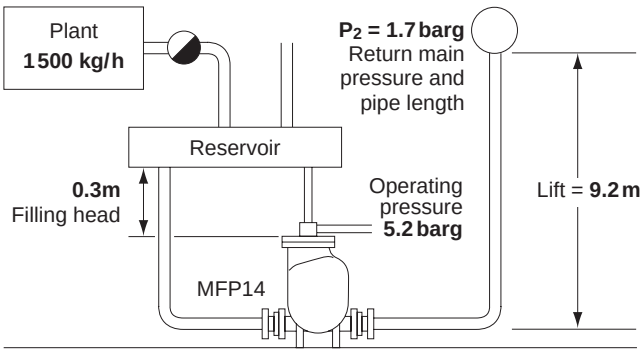






How to size and select

Considering the inlet pressure, backpressure and filling head conditions, select the pump size which meets the capacity requirements of the application.

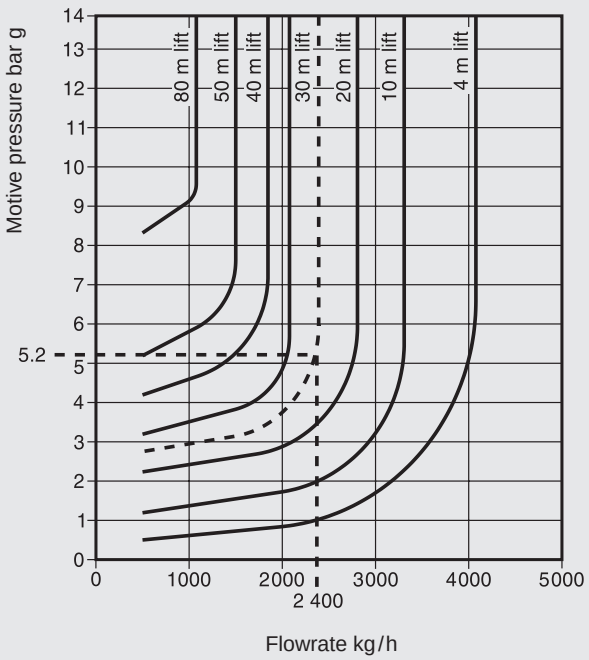


The known data

Condensate load	**1500 kg/h**
Steam pressure available for operating pump	**5.2 bar g**
Vertical lift from pump to the return piping	**9.2 m**
Pressure in the return piping (piping friction negligible)	**1.7 bar g**
Filling head on the pump available	**0.3 m**

Note: It is strongly recommended that the maximum motive/backpressure differential is between 2-4 bar g.

How to use the sizing chart



Example
DN50 pump capacities

Selection example

Firstly calculate the total effective lift against which condensate must be pumped.
Total effective lift is calculated by adding **vertical lift from the pump to return piping (9.2 m)** to the **pressure in the return piping (1.7 bar g).**
To convert pressure in the return pipe into pressure head, divide it by the conversion factor of 0.0981:-
P_2 = 1.7 bar g ÷ 0.098 1 = 17.3 m Pressure head (lift)
The total effective lift then becomes calculable :-

9.2 m + 17.3 m

The total effective lift is 26.5 m

Now that the total effective lift has been calculated, a pump can be selected by plotting the known data onto the graphs on page 9.

1. Plot a horizontal line from 5.2 bar g (Motive pressure).

2. Plot a line indicating 26.5 m lift.

3. From the point where the motive pressure line crosses the m lift line, drop a vertical line to the X axis.

4. Read the corresponding capacity (2400 kg/h).

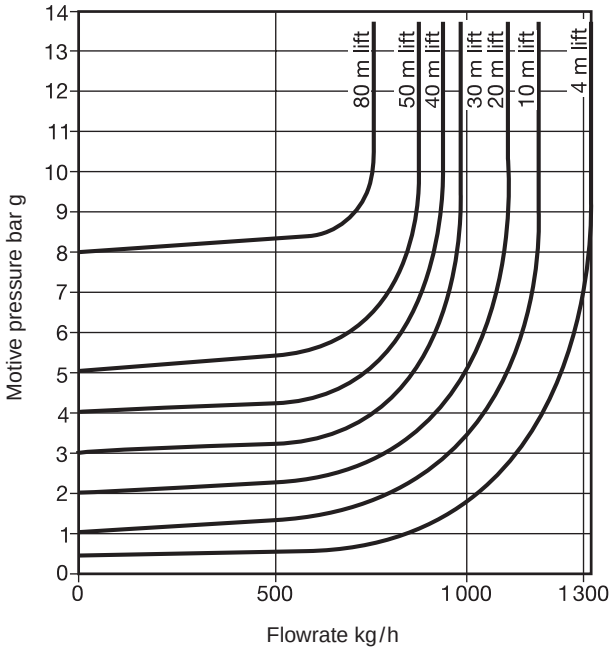
The capacity charts shown are for single pumps. The capacities should be doubled or tripled to give the capacities of the duplex or triplex pumped packages.

Note: The MFP14-PPU packages are not supplied with a connecting condensate return manifold. Ideally each pump should have its own dedicated return line to a vented receiver or holding tank. If the duplex pump returns are to be joined together to create a collective return line, care should be taken to ensure that it is adequately sized to accommodate the instantaneous discharge rate of all pumps discharging at the same time. Failure to do this may result in reduced capacity of the packaged pump unit.

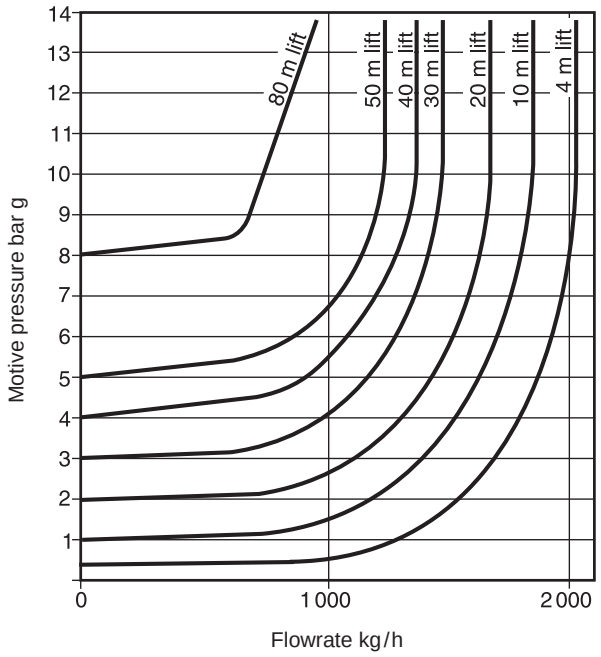
Capacities

The capacity charts are based on a filling head of 0.3 m. The lift lines represent the net effective lift (i.e. lift plus frictional resistance).

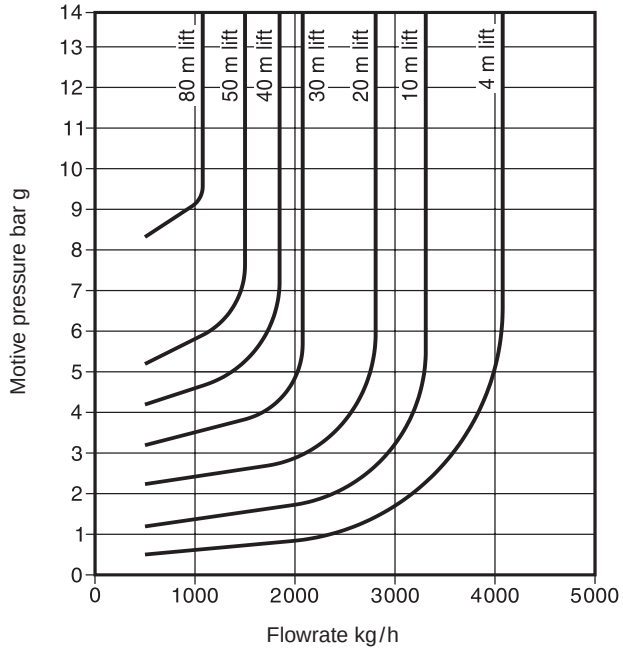
DN25 pump capacities



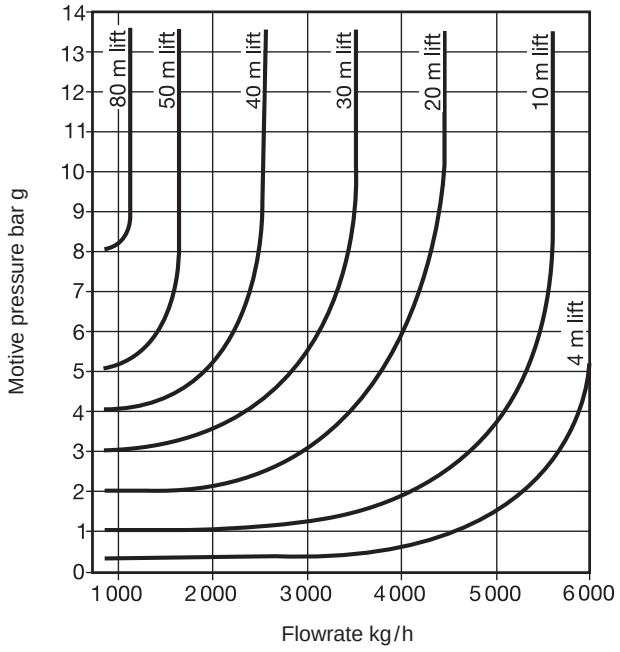
DN40 pump capacities



DN50 pump capacities



DN80 x DN50 pump capacities



Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions supplied with the unit.

Installation points to consider

As well as the returning condensate lines to and from the MFP14-PPU, consideration should be taken to ensure that the receiver vent and overflow pipes can be fitted to the recommended guidelines. Details are shown within the installation and maintenance instructions IM-P681-02.

Spare parts

For availability of spare parts refer to the individual product TI sheets that comprise the unit.

How to specify

Spirax Sarco MFP14-PPU vented automatic pump packaged unit operated by steam to 13.8 bar g. The complete system shall be supplied with a receiver designed to be compliant with the PED (97 / 23 / EC), and all welding in accordance with EN 287 / 288 BS EN Part 1 – 2004 and BS EN ISO 15614 Part 1 2004. The whole system shall be supplied ready to fit with a base plate.

How to order - Please state on the order if you require the optional loop seal.

Example: 1 off Spirax Sarco DN80 X DN50 MFP14-PPU (vented) automatic pump packaged unit with flanged PN16 external connections.