PPPPU-C

Compact Pressure Powered Pump Package Unit with IJ and CRM485R

Description

The Forbes Marshall Compact Pressure Powered Pump Package Unit, PPPPU-C, is a positive displacement pump unit operated by steam, compressed air or pressurised gas. The compact pump has an in-built receiver for condensate, which eliminates the need for a separate storage tank. The size enables this pump to be used with individual equipment also. The pump is specifically designed to pump hot condensate.

Size and Pipe Connections

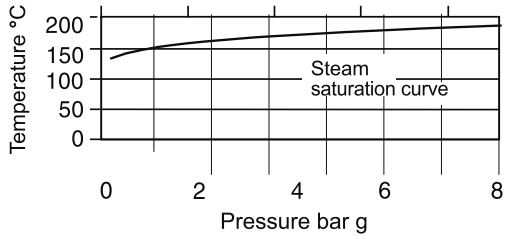
Pump Size (DN)	Condensate Inlet connection (DN)	Condensate Outlet connection (DN)	Vent Conn. (DN) Class 150	Empty Wt. (kg)
20	20 Class 150	25 Class 150	50	110
25	25 Class 150	40 Class 150	80	135

Limiting Conditions

PMO Maximum operating pressure	8.7 bar g
TMO Maximum operating temperature	220°C
Operating inlet motive pressure	Steam / Compressed Air / Pressurised gas 3 to 7 bar g (max)
Pump discharge per cycle	30 kg
Steam consumption	3 Kg of steam per 1000 Kg condensate pumped
Air consumption	22 SCF per 1000 Kg condensate pumped
Minimum operating temperature	0°C

Note: Receiver not to be pressurised .

Operating Range



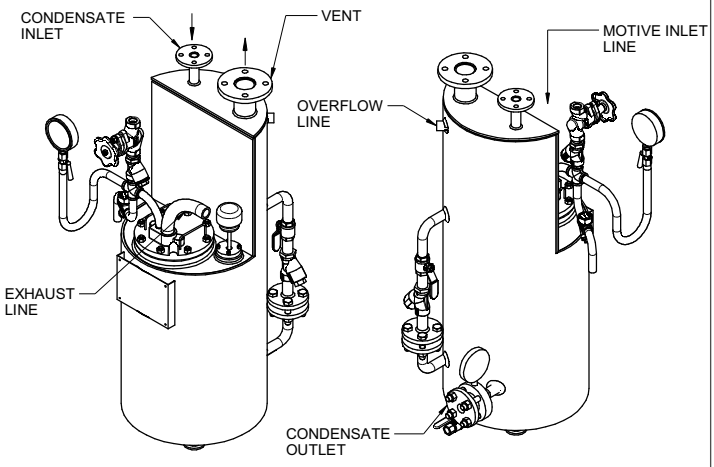
How to Order

Example : DN 20 Compact Pressure Powered Pump Package Unit PPPPU-C

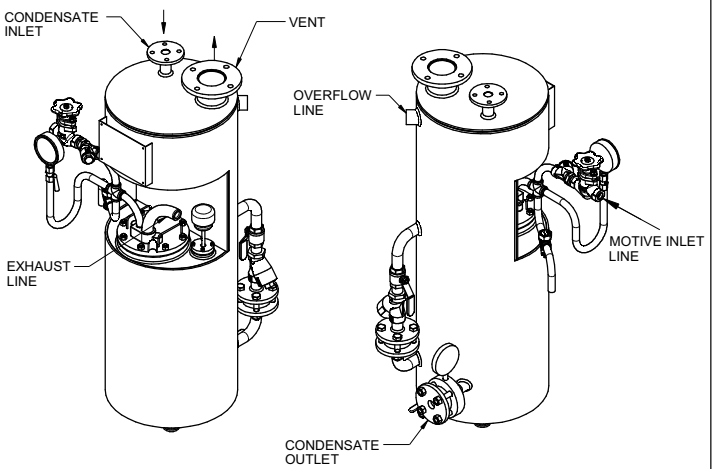
Standard Accessories

- Condensate recovery meter - 485 (CRM485R)
- Insulation jacket

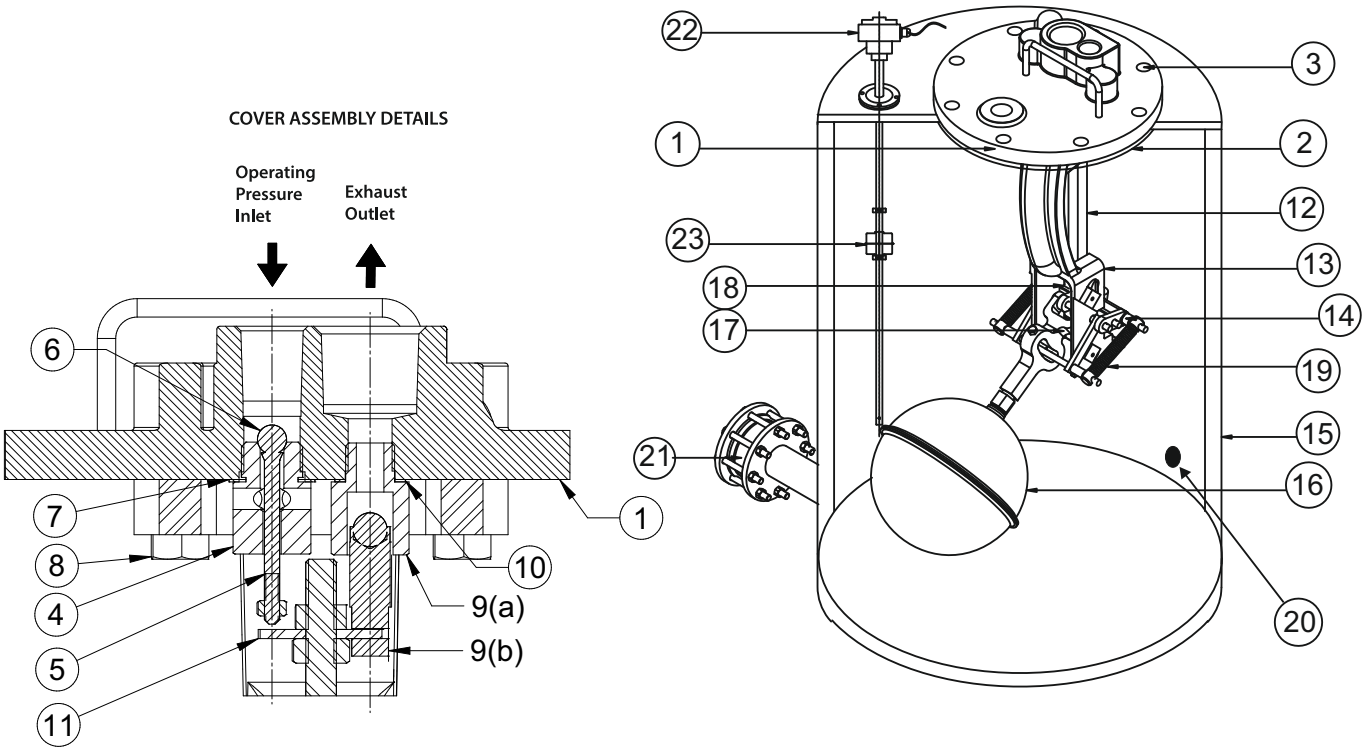
Note: Condensate Outlet - Use Flange provided with the Pump



DN20 PPPPU-C



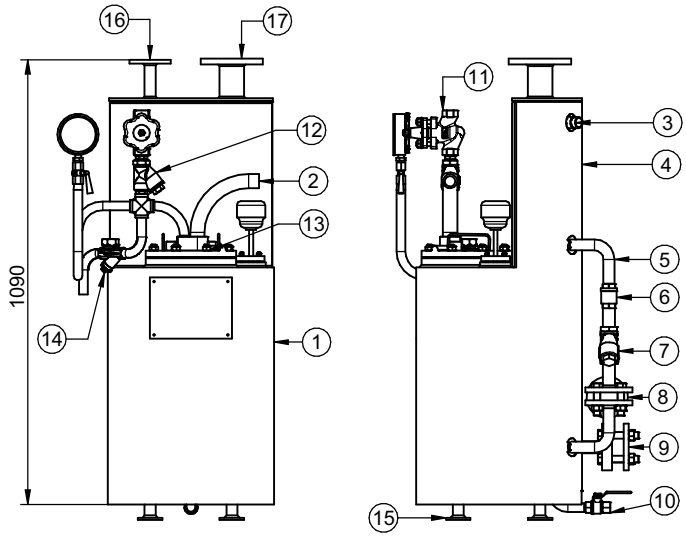
DN25 PPPPU-C



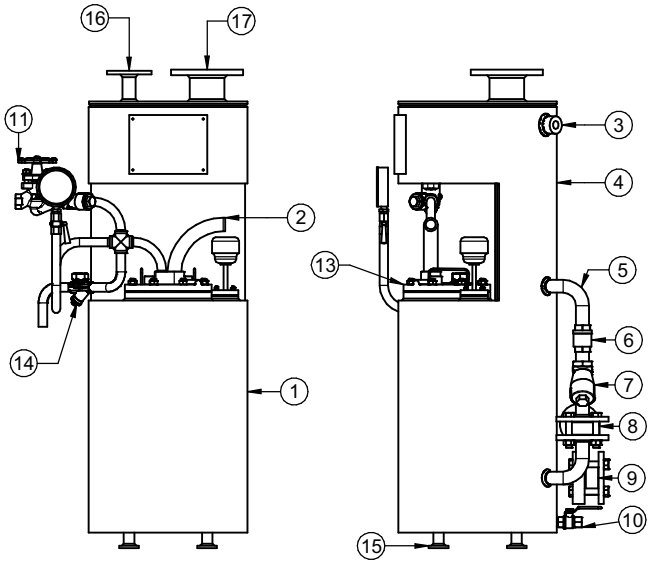
Material

Sr. No.	Description	Material	Standard
1	Cover	Cast Iron	IS 210 Gr FG 260
2	Cover Gasket	Synthetic Fibre	AF154
3	Stud and Nut M - 12	Carbon Steel	-
4	Inlet Valve Seat	Stainless Steel	ASTM A276 SS 304
5	Inlet Valve Stem	Stainless Steel	ASTM A276 Type 304
6	Inlet Valve Head	Stainless Steel	AISI 440 C
7	Inlet Seat Gasket	Copper	-
8	Exhaust Valve	Stainless Steel	ASTM A276 SS 304
9(a)	Exhaust Valve	Stainless Steel	ASTM A276 SS 304
9(b)	Exhaust Valve Head	Stainless Steel	ASTM A276 SS304
10	Exhaust Seat Gasket	Copper	-
11	Valve Actuator Disc	Stainless Steel	ASTM A276 SS 304

Sr. No.	Description	Material	Standard
12	Push Rod	Stainless Steel	ASTM A240 SS 304
13	Mechanism	Cast Iron	IS 210 FG 260
14	Mechanism Actuator	Stainless Steel	SS304
15	Body	Carbon Steel	IS 3589
16	Float	Stainless Steel	ASTM A240 SS 304
17	Linkage Mechanism	Stainless Steel	ASTM A351 CF 8
18	Push Rod Actuator	Stainless Steel	ASTM A351 CF 8
19	Spring	Inconel	-
20	Plug 1/2"BSPT	Forged Steel	ASTM A105
21	Check Valve	Stainless Steel	-
22	Flow-temp Sensor	Stainless Steel	-
23	Sensor Float	Stainless Steel	ASTM A240 SS 304



DN20 PPPPU-C



DN25 PPPPU-C

All Dimensions shown above in 'mm'

Sr.no.	Description	Material
1	PPPPU-C Shell	MS ERW Pipe
2	Exhaust Elbow	MS
3	Overflow Socket	MS
4	Reciever Shell	MS ERW Pipe
5	Condensate Inlet Line	MS
6	Ball Valve For Condensate Inlet	Carbon Steel
7	DN20 Strainer	C.I.
8	DN25 Check valve for condensate inlet	S.S.
9	DN25 Check valve for condensate outlet	S.S.
10	DN15 Drain	MS
11	Dn15 Piston Valve For Steam Inlet Connection	Forged Carbon Steel
12	DN15 Strainer Steam Inlet	CI
13	Cover Plate Assembly	CI
14	DN15 MLT21 Trap	SS
15	Leg Support	MS
16	Condensate Inlet Conn. DN20 Flanged to BS 10 TAB 'E'	CS
17	Vent Connection DN50 Flanged to ANSI # 150	CS

How to Select and Size

From the inlet pressure (motive pressure) and back pressure conditions given below, select the pump size which meets the capacity requirement of the application. Select optional extras, as required. Back pressure is the lift height (H) in mtr x 0.1 plus bar (g) in return line plus downstream piping friction pressure drop in bar (g) at the lesser of six times the actual flow rate or 340 lit/min.

Available Spares

• Set of internals	• Gasket kit (pkt. of 5)
• Valve kit	• Exhaust valve kit
• Float assembly	• Spring assembly (pkt. of 2)

How to Order Spares

Always order spares giving description and P.C. No. given in 'User Manual' under the heading "Available Spares".

Capacity kg/hr

For liquid specific gravity (0.9 to 1)

No.	INLET Pr. (M.P.) bar g	TOTAL Lift or Back Pr. bar g	Condensate Flow Rate (Kg/hr)	
			DN 20 CRS 600 kg/hr	DN 25 CRS 1000 kg/hr
1	8.7	1	600	1020
2	8.7	2	514	900
3	8.7	3	482	800
4	8.7	4	470	780
5	7	1	590	900
6	7	2	550	900
7	7	3	475	800
8	7	4	390	780
9	6	1	580	900
10	6	2	520	900
11	6	3	425	800
12	6	4	300	690
13	5	1	550	900
14	5	2	430	840
15	5	3	320	720
16	4	1	440	840
17	4	2	340	720
18	3	1	325	660

Example

Condensate load = 450 kg/hr
Steam / air pressure available for Operating pump = 7 bar g
Vertical lift from pump to the return piping = 9 m
Pressure in return piping (piping friction negligible) = 1.72 bar g

Solution

1. Calculate "H", the total lift or back pressure against which the condensate must be pumped
   = (9m x 0.1) + 1.72 = 2.62
2. From capacity table : 7 bar g operating inlet pressure and 3 bar g back pressure pump has a capacity of 475 kg/hr.

Note from capacity factor charts

Pump capacity using compressed air

(% BP / MP = 3/7) = 42% = 1.1 X 475 = 522 kg/hr

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