MV55-PPPPU-HP (Patent Applied)

Multi Valve Pressure Powered Pump Package Unit- High Pressure With Insulation Jacket and Condensate Recovery Meter

Description

The Forbes Marshall Multi Valve Pressure Powered Pump Package Unit - High Pressure (MV55-PPPPU-HP) is a steam operated positive displacement pump designed to pump hot condensate against high back pressures using high motive steam pressures specifically for the oil and petrochemical industry. The MV55-PPPPU-HP utilizes multiple inlet and exhaust valves in a mechanism assembled in a compact shell to deliver high condensate discharge capacities.

Sizes and Pipe Connections

Size (DN)	Condensate inlet conn. (A) (DN)	Condensate outlet conn. (B) (DN)	Vent conn. (C) (DN)	Motive inlet (DN)	Empty weight (kg)
80	80	80	150	25BSPT	550

Size : DN80 Multi Valve Pressure Powered Pump Package Unit - High Pressure

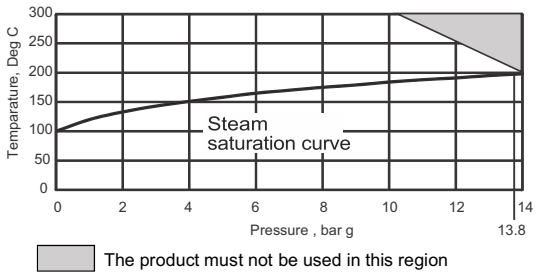
Condensate inlet and vent flanged to ASME B16.5 Class 150

Note: Use the flange provided with the pump for the condensate outlet

Limiting Conditions

Design Standard	ASME Section VIII Div.1
PMA Maximum design pressure	13.8 bar g
TMA Maximum design temperature	200°C
Operating inlet motive pressure	Steam, 3 to 13.8 bar g (Max)
Pump discharge per cycle	55 kg
Steam consumption	3.5 kg of steam per 1000 kg of condensate pumped
Minimum operating temperature	0°C
Max. Allowable back Pressure	8.5 bar g
Pump Shell Hydrotest Pressure	21 bar g
Note : Receiver not to be pressurized	

Operating Range



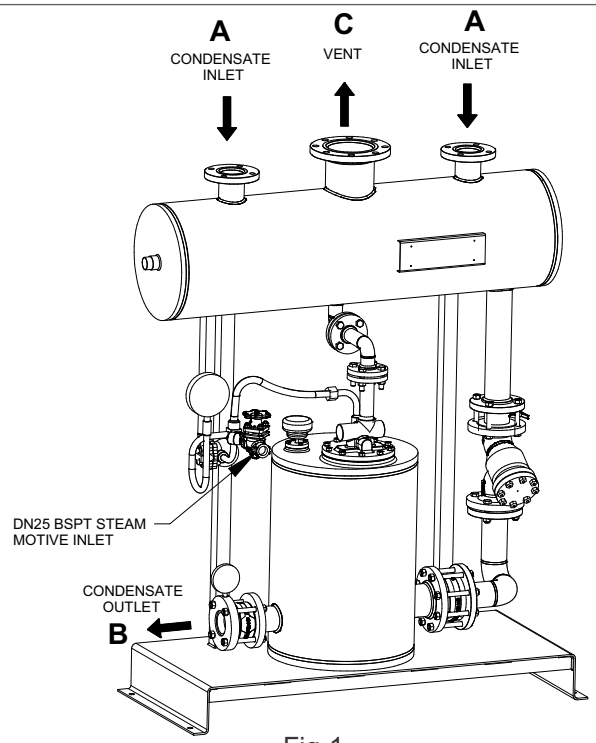


Fig-1

Standard Accessories

Condensate Recovery Meter - (CRM485R) and Insulation Jacket

Note : Refer separate TIS for CRM485R .

How to Order

Example: DN80 Multi Valve Pressure Powered Pump Package Unit- High Pressure MV55-PPPPU - HP with Insulation Jacket.

Available Spares

Mechanism Assembly Kit
Gasket Kit
Inlet Valve Kit (Set of 2)
Exhaust Valve Kit (Set of 2)
Float Assembly
Spring Assembly (Set 0f 2)

How to Order Spares

Always order spares by using the description given in the column headed “Available Spares” of the user manual for this product.

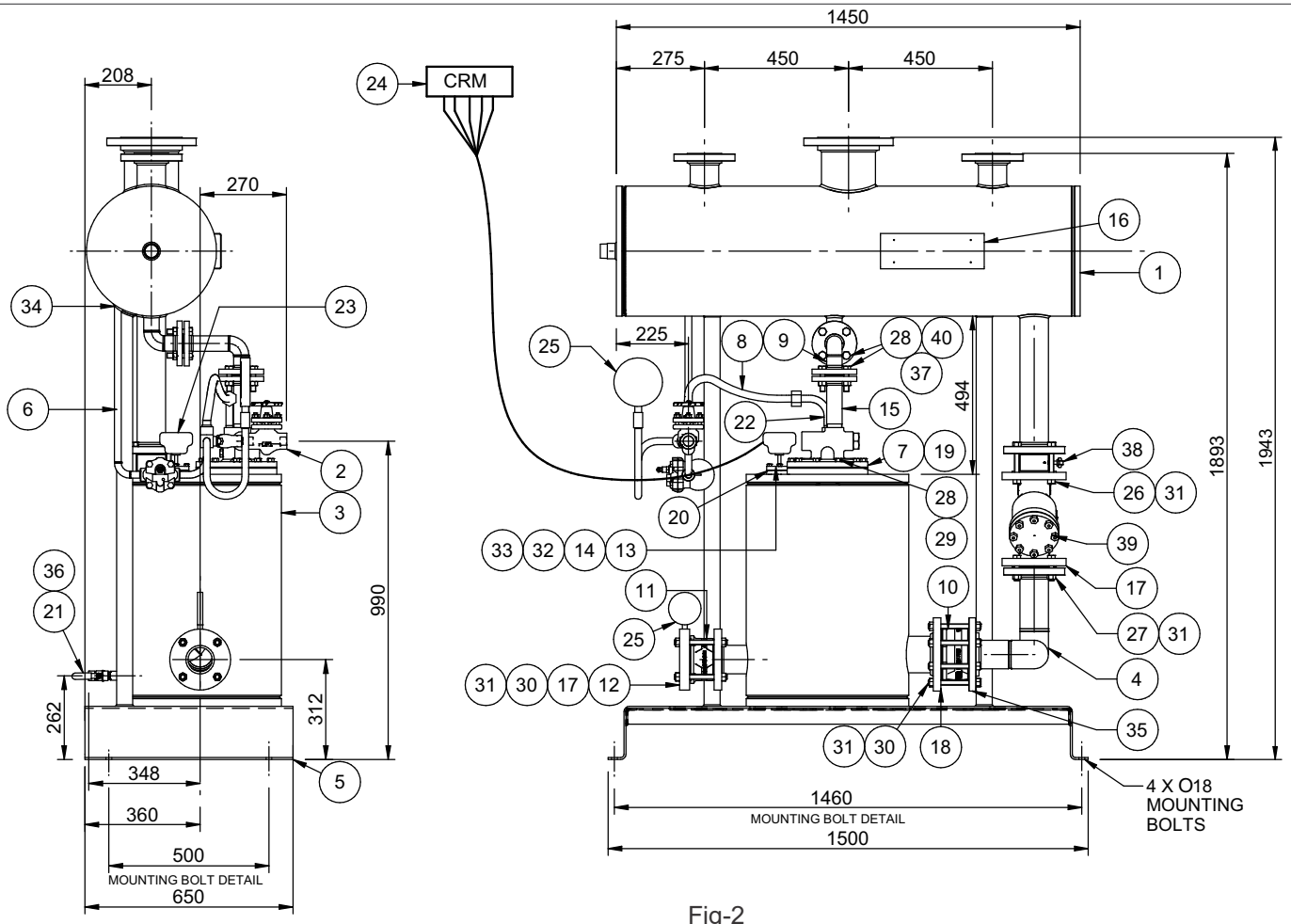


Fig-2

All dimensions are in mm

Material : Refer Fig.-2

Sr. No.	Descrption	Material	Sr. No.	Descrption	Material
1	Reciever Assembly	Carbon Steel, ASTM A516 Gr. 70	21	DN15 BSPT Drain Valve	Stainless Steel, ASTM A351 Gr.
2	Steam Motive Inlet Assembly	Carbon Steel	22	DN15 BSPT Pipe Bend	Carbon Steel, ASTM A106 Gr. B
3	Shell Assembly	Carbon Steel, ASTM A516 Gr. 70	23	Reed Sensor Assembly	Stainless Steel
4	Condensate Inlet Assembly	Cast Iron Strainer / Carbon Steel	24	Condensate Recovery Meter (CRM485)	-
5	Frame Assembly	Carbon Steel	25	Steam Motive Inlet / Condensate Outlet Pressure Gauge	Stainless Steel
6	Support Assembly	Carbon Steel	26	Valve Hex Head M16 Bolt	ASTM A193 Gr. B7
7	Mechanism Actuator Assembly	Stainless Steel	27	Strainer Hex Head M16 Bolt	ASTM A193 Gr. B7
8	DN15 Steam Inlet Hose	Stainless Steel, SS304	28	Mechanism Actuator Mounting M12 Nut	ASTM A194 Gr. 2H
9	Exhaust Spool Assembly	Carbon Steel	29	Mechanism Actuator Mounting M12 Stud	ASTM A193 Gr. B7
10	DN100 FMDCVANSI Check Valve	Stainless Steel, ASTM A351 Gr. CF8	30	Check Valve Hex Head M16 Bolt	ASTM A193 Gr. B7
11	DN80 FMDCVANSI Check Valve	Stainless Steel, ASTM A351 Gr. CF8	31	M16 Hex Nut	ASTM A194 Gr. 2H
12	DN80 ASME B16.5 Class 150 Special Flange	Carbon Steel, ASTM A516 Gr. 70	32	Reed Flange Mounting M8 Stud	ASTM A193 Gr. B7
13	Reed Sensor Flange	Carbon Steel, ASTM A516 Gr. 70	33	M8 Hex Nut	ASTM A194 Gr. 2H
14	Sensor Mounting Flange	Carbon Steel, ASTM A516 Gr. 70	34	Support Pad	Carbon Steel, ASTM A516 Gr. 70
15	Mechanism Exhaust Pipe Assembly	Carbon Steel	35	DN100 BTS DN80NB ASME B16.5 Class 150 Flange	Carbon Steel, ASTM A516 Gr. 70
16	Name Plate	Stainless Steel, ASTM A240 Gr. 304	36	DN15 BSPT Male Hex Nipple	Carbon Steel, ASTM A105
17	DN80 ASME B16.5 Class 150 Gasket	SS304 Exfoliated Graphite	37	40NB ASME B16.5 Class 150 Gasket	SS304 Exfoliated Graphite
18	DN100 ASME B16.5 Class 150 Gasket	SS304 Exfoliated Graphite	38	DN80 Butterfly Valve	ASTM A216 Gr. WCB
19	Mechanism Flange Gasket	Synthetic Fibre	39	DN80 FMSTR34 Strainer	Cast Iron, IS210 FG260
20	Reed Gasket	Synthetic Fibre	40	M12 Hex Head Bolt	ASTM A193 Gr. B7

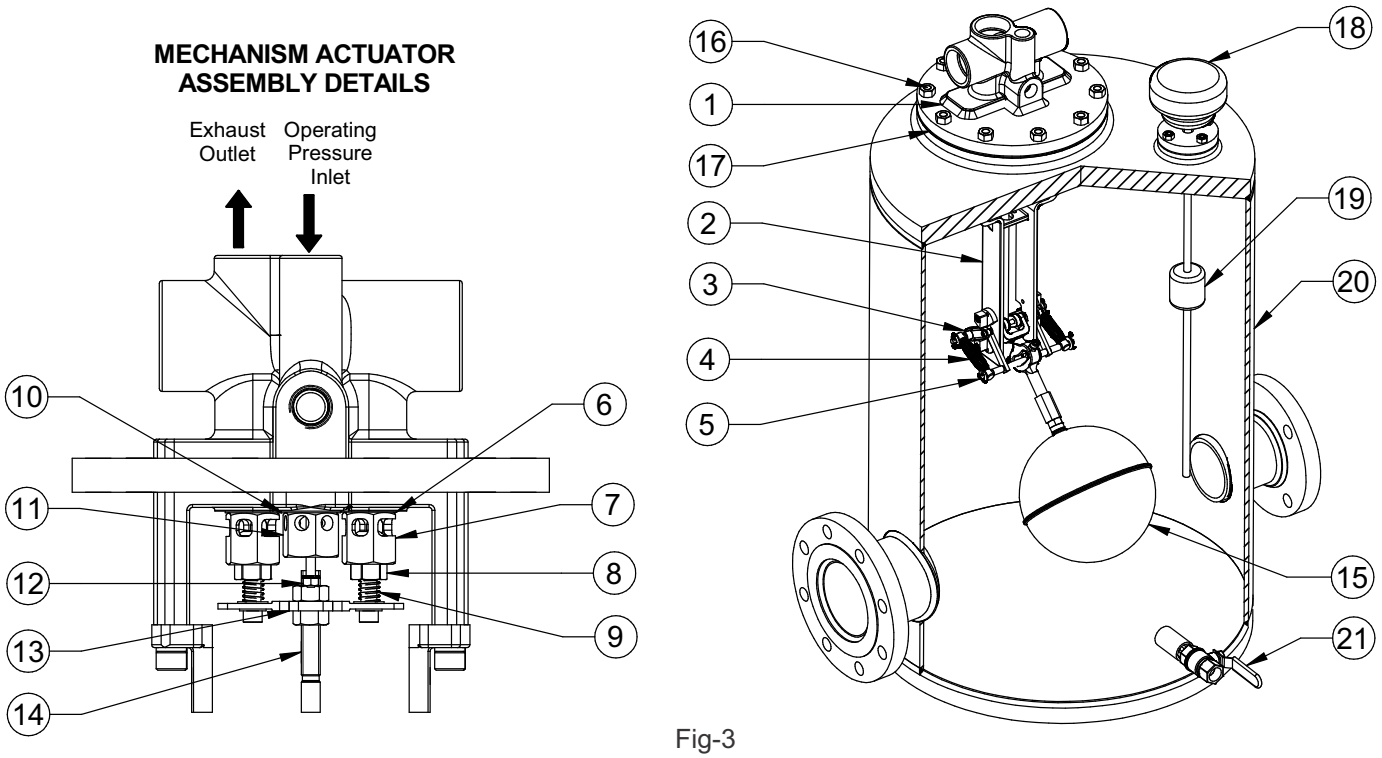


Fig-3

Material : Refer Fig.-3

Sr. No.	Descrption	Material	Standard
1	Mechanism Actuator Cover	Carbon Steel	ASTM A516 Gr. 70 / ASTM A351 Gr. CF8
2	Mechanism Support Bracket	Stainless Steel	ASTM A351 Gr. CF8
3	Push Rod Actuator	Stainless Steel	ASTM A351 Gr. CF8
4	Spring	Inconel	-
5	Linkage Mechanism	Stainless Steel	ASTM A351 Gr. CF8 / ASTM A276 Gr. 304
6	Exhaust Seat Gasket	Copper	-
7	Exhaust Valve Seat	Stainless Steel	ASTM A276 Gr. 431
8	Exhaust Valve Head	Stainless Steel	ASTM A276 Gr. 431
9	Exhaust Spring	Stainless Steel	SS316
10	Inlet Seat Gasket	Copper	-
11	Inlet Valve Seat	Stainless Steel	ASTM A276 Gr. 304
12	Inlet Valve Stem	Stainless Steel	ASTM A276 Gr. 304
13	Valve Actuator Disc	Stainless Steel	ASTM A240 Gr. 304
14	Push Rod	Stainless Steel	ASTM A276 Gr. 304
15	Float	Stainless Steel	ASTM A240 Gr. 304
16	Stud and Nut	Carbon Steel	ASTM A193 Gr. B7 / A194 Gr. 2H
17	Mechanism Flange Gasket	Synthetic Fibre	-
18	Reed Sensor	Stainless Steel	-
19	Sensor Float	Stainless Steel	ASTM A240 Gr. 304
20	Body Shell	Carbon Steel	ASTM A516 Gr. 70
21	Drain Valve	Carbon Steel	ASTM A105

Capacity kg/hr.

When installed with recommended filling head above top of pump = 494mm. For liquid specific gravity (0.9 to 1)

MV55-PPPPU-HP Capacities (kg/hr)					
Motive Pr. (bar g)	Back Pr. (bar g)	Capacity (kg/hr)	Motive Pr. (bar g)	Back Pr. (bar g)	Capacity (kg/hr)
3	0.5	6953	9	0.5	10382
3	1	5707	9	1	9881
3	2	4228	9	2	8481
4	0.5	8292	9	3	6949
4	1	7305	9	4	5477
4	2	5470	9	5	5086
4	3	3512	9	6	4296
4	2	5470	9	7	3357
4	3	3512	9	8	2523
5	0.5	8116	10	0.5	11209
5	1	8180	10	1	9649
5	2	6331	10	2	8762
5	3	4424	10	3	7982
5	4	2998	10	4	6009
5	4	2998	10	5	5792
6	0.5	9419	10	6	4549
6	1	9126	10	7	4167
6	2	7281	10	8	3614
6	3	5379	10	8.5	3101
6	4	4563	11	0.5	11417
6	5	2536	11	1	10800
7	0.5	9878	11	2	9726
7	1	10057	11	3	7914
7	2	7667	11	4	6595
7	3	6300	11	5	6169
7	4	5076	11	6	5347
7	5	3812	11	7	4695
7	6	2961	11	8	4056
8	0.5	9946	11	8.5	3716
8	1	9997	12	0.5	11828
8	2	8572	12	1	11228
8	3	6945	12	2	9935
8	4	5996	12	3	8524
8	5	5017	12	4	6336
8	6	4368	12	5	5930
8	7	2563	12	6	5483

MV55-PPPPU-HP Capacities (kg/hr)					
Motive Pr. (bar g)	Back Pr. (bar g)	Capacity (kg/hr)	Motive Pr. (bar g)	Back Pr. (bar g)	Capacity (kg/hr)
12	7	4978	13	8.5	4218
12	8	4334	13.8	0.5	11442
12	8.5	4211	13.8	1	11354
13	0.5	11613	13.8	2	10128
13	1	10791	13.8	3	9158
13	2	10088	13.8	4	7815
13	3	8795	13.8	5	7114
13	4	7021	13.8	6	6524
13	5	6161	13.8	7	6027
13	6	5643	13.8	8	5045
13	7	5087	13.8	8.5	4518
13	8	4612			

How to Select and Size

Verify the pump capacity according to the required capacity of the application from the inlet, back pressure and filling head conditions given in the table above.

Back pressure (h) = [H X 0.1] + FP + LP

Where H=height to which condensate is to be lifted (meters)
FP= Frictional pressure drop of discharge (bar g)
LP=Line Pressure (bar g)

Example

Steam pressure available for operating pump	5.0 bar g
Vertical lift from pump to 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.
= (9mx 0.1) + 1.72 = 2.62 bar g

2 From capacity table with 5.0 bar g operating inlet pressure and 3.0 bar g back pressure MV55-PPPPU-HP has a capacity of 4424 kg/hr.

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