

TLV[®]

PowerTrap[®]

MODEL GP10F CAST STEEL CARBON STEEL

MECHANICAL PUMP WITH RETROFITTABLE MECHANISM FOR CONDENSATE REMOVAL AND RECOVERY

Features

Pump for a wide range of applications. Ideal for condensate removal from vented receivers and sump drainage.

1. Handles high-temperature condensate without cavitation.
2. No electric power or additional level controls required, hence **INTRINSICALLY SAFE**.
3. Pump will operate with a low filling head.
4. Durable nickel-based alloy compression coil spring.
5. All internal parts are suspended from the trap cover and can be removed upward in one piece.
6. High quality stainless steel internals and hardened working surfaces ensure reliability.
7. Optional built-in steam trap available for drainage of steam supply line.



Patented

Specifications

Model		GP10F
Connection	Pumped Medium Inlet & Outlet	Flanged DIN 2501 PN 40*
	Motive Medium & Pump Exhaust	Screwed BSP DIN 2999*
Size	Pumped Medium Inlet / Outlet	DN 80 / DN 50
	Motive Medium Inlet	3/4"
	Pump Exhaust Outlet	1"
Maximum Operating Pressure (barg)	PMO	10.5
Maximum Operating Temperature (°C)	TMO	220
Motive Medium Pressure Range (barg)		0.3 – 10.5
Maximum Allowable Back Pressure		0.5 bar less than motive medium pressure used
Volume of Each Discharge Cycle (ℓ)		approximately 30
Motive Medium**		Steam, compressed air or nitrogene
Pumped Medium***		Steam condensate or water

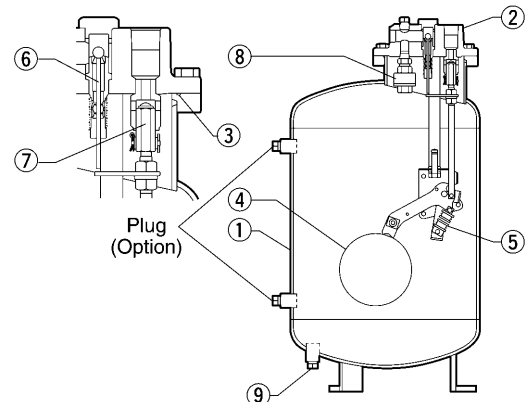
* Other standards available ** Do not use with toxic, flammable or otherwise hazardous fluids. ***Do not use for fluids with specific gravities under 0.85 or over 1, or with toxic, flammable or otherwise hazardous fluids. 1 bar = 0.1 MPa

PRESSURE SHELL DESIGN CONDITIONS (NOT OPERATING CONDITIONS): Maximum Allowable Pressure (barg) PMA: 10.5
Maximum Allowable Temperature (°C) TMA: 220



To avoid abnormal operation, accidents or serious injury, DO NOT use this product outside of the specification range. Local regulations may restrict the use of this product to below the conditions quoted.

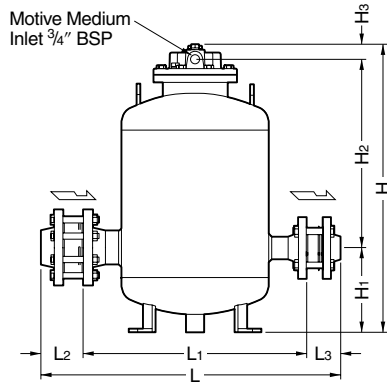
No.	Description	Material	DIN ¹⁾	ASTM/AISI ¹⁾
①	Body	Carbon Steel H11 ²⁾	1.0425	A415 Gr.60
②	Cover	Cast Steel A216 Gr.WCB ²⁾	1.1811	—
③	Cover Gasket	Fluorine Resin PTFE	PTFE	PTFE
④	Float	Stainless Steel SUS316L/SUS304	1.4404/ 1.4301	AISI316L/ AISI304
⑤	Snap-action Unit	Stainless Steel	—	—
⑥	Motive Medium Intake Valve Unit	Intake Valve	1.4125/ 1.4305	AISI440C/ AISI303
		Valve Seat	1.4125	AISI440C
⑦	Exhaust Valve Unit	Exhaust Valve	1.4125/ 1.4305	AISI440C/ AISI303/
		Valve Seat	1.4028	AISI420F
⑧	Steam Trap ³⁾	Stainless Steel	—	—
⑨	Drain Plug	Carbon Steel S25C	1.1158	AISI1025
⑩	Flange Assembly ^{4) 5)}	Carbon Steel C22.8	1.0460	A105
⑪	Check Valve ⁵⁾	CKF3MG	1.4312	—



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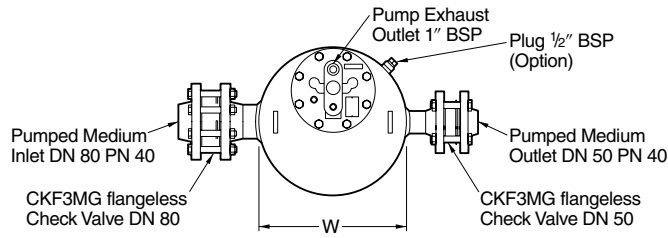
¹⁾ Equivalent materials ²⁾ Optionally available in stainless steel ³⁾ Option (if steam is used as motive medium) ⁴⁾ Consisting of bolts, nuts, butt-weld flange, gaskets
⁵⁾ Shown overleaf

Dimensions



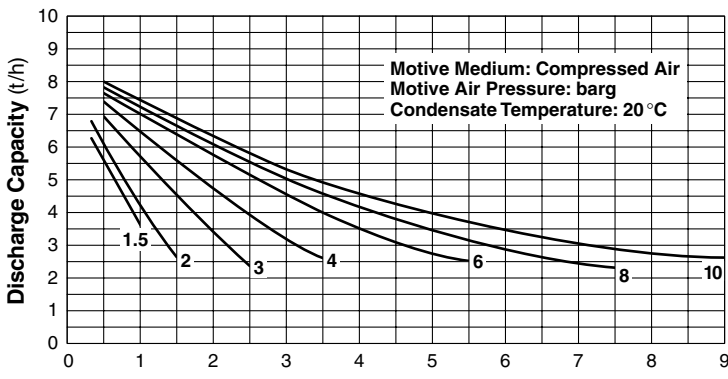
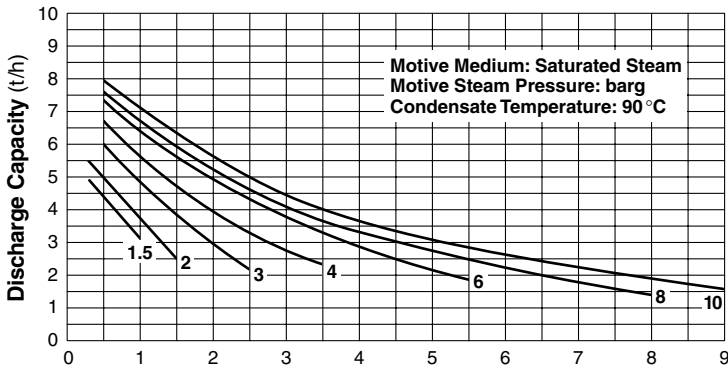
GP10F Flanged*										(mm)
L	H	H ₁	H ₂	H ₃	L ₁	L ₂	L ₃	φW	Weight (kg)	
810	782	230	512	40	600	115	95	400	82	

* DIN 2501 PN 40, threaded connections: DIN 2999 female, other standards available



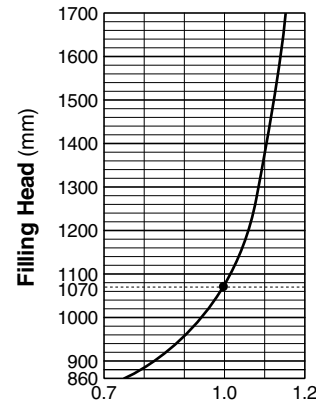
Discharge Capacity

CKF3MG DN 80 check valve at inlet, DN 50 at outlet, filling head 1070 mm

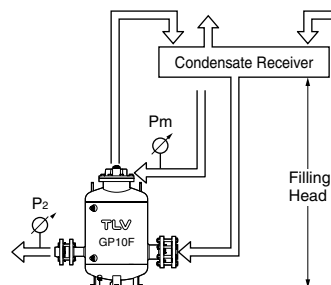


• Correction Factor

For GP10F with check valve CKF3MG, installed with filling head other than 1070 mm (minimum filling head: 860 mm)



• Illustration of Filling Head and Pressures



NOTE:

- To achieve the above capacities with the standard GP10F configuration, TLV CKF3MG check valves (supplied with the GP10F) must be used at the pumped medium inlet and outlet.
- Motive medium pressure minus back pressure must be greater than 0.5 bar.
- In closed system applications, the motive medium must be compatible with the liquid being pumped. If a non-condensable gas such as air or nitrogen is used as the motive medium, consult TLV for assistance.
- A strainer must be installed at the motive medium and pumped medium inlets.

- The flow rate is determined by the motive medium, motive medium pressure (P_m) and back pressure (P_2). Make sure that: flow rate \times correction factor $>$ required flow rate.

Size of Receiver/Reservoir

The receiver/reservoir must have a capacity sufficient to store the condensate produced during the **PowerTrap** operation and discharge. A receiver will generally be larger than a reservoir because it must handle the condensate both as a liquid and as flash steam, and separate one from the other so that only condensate is sent to the **PowerTrap**.

① **Size of Receiver** (flash steam is involved)
(Length: 1 m)

Flash steam up to kg/h	Receiver diameter mm	Vent pipe diameter mm
25	80	25
50	100	50
75	125	50
100	150	80
150	200	80
200	200	100
300	250	125
400	300	125
500	350	150
700	400	200
800	450	200
1000	500	200
1100	500	250
1400	550	250
1500	600	250

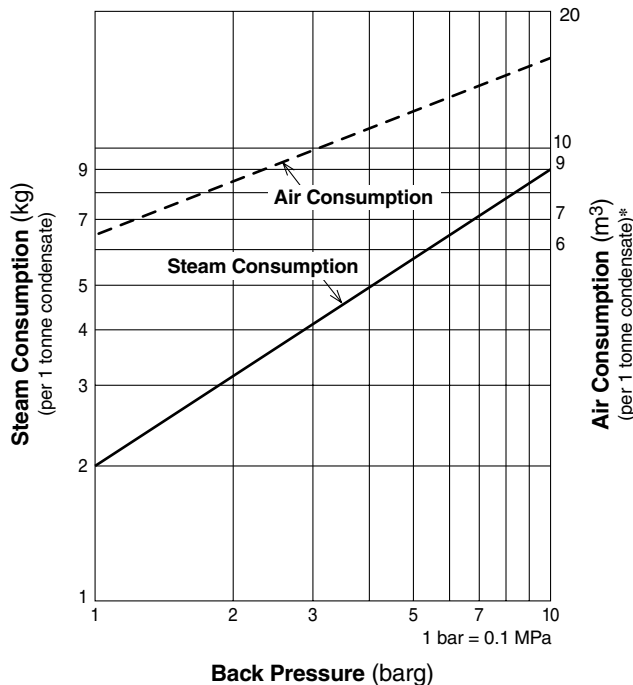
② **Size of Reservoir** (flash steam is not involved)

Amount of condensate kg/h	Reservoir diameter (mm) and length (m)						
	40	50	80	100	150	200	250
300	1.2 m	0.7					
400	1.5	1.0					
500	2.0	1.2	0.5				
600		1.5	0.6				
800		2.0	0.8	0.5			
1000			1.0	0.7			
1500			1.5	1.0			
2000			2.0	1.3	0.6		
3000					0.9	0.5	
4000					1.2	0.7	
5000					1.4	0.8	0.5
6000					1.7	1.0	0.6
7000					2.0	1.2	0.7
8000						1.3	0.8
9000						1.5	0.9
10000						1.7	1.0

③ If flash steam is condensed before it enters the receiver/reservoir, compare tables ① and ② and choose the larger of the two sizes.

Reservoir length can be reduced by 50% when the motive pressure (P_m) divided by the back pressure (P_2) equals 2 or greater (when $P_m \div P_2 \geq 2$).

Steam or Air Consumption (Motive Medium)



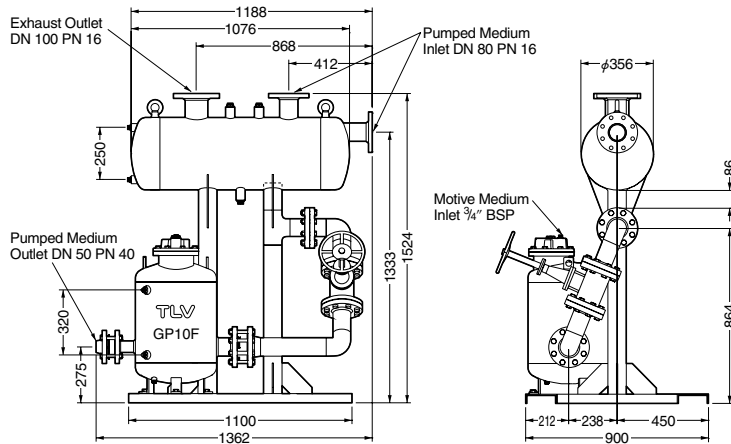
* Equivalent consumption of standard air (Air at 20 °C under atmospheric pressure)

System Packages (Open Systems)

Single System Package

Type M1

Discharge Capacity: see discharge capacity graph (no correction factor required)
 Maximum Allowable Flash Steam: 500 kg/h
 Tank Size: 100 ℓ

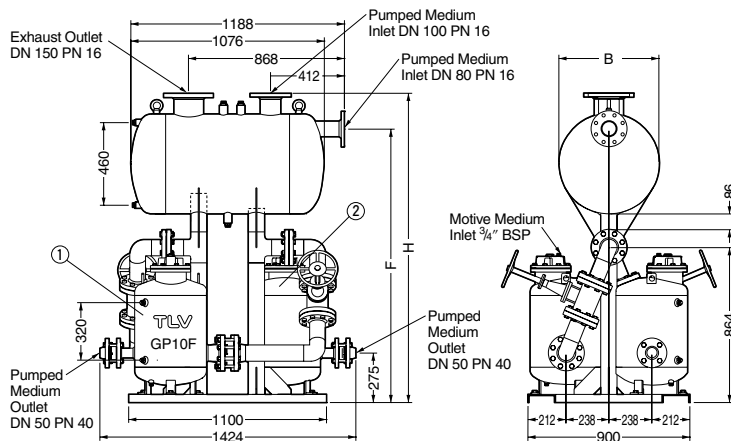


Twin System Package

With small condensate loads, **PowerTrap** ① operates alone.
 As condensate loads increase, **PowerTraps** ① and ② operate together.

Type L2

Discharge Capacity: double discharge capacity in graph (no correction factor required)
 Maximum Allowable Flash Steam: 1000 kg/h
 Tank Size: 230 ℓ



Type E2

Discharge Capacity: double discharge capacity in graph (no correction factor required)
 Maximum Allowable Flash Steam: 1500 kg/h
 Tank Size: 330 ℓ

Standards:

Flanged connections: DIN 2501
 Screwed connections: DIN 2999
 Other standards available

Units: mm

Dimensions

Type	H	F	φ B
L2	1724	1524	560
E2	1823	1623	660

Manufacturer

ISO 9001/ISO 14001

TLV CO., LTD.
 Kakogawa, Japan

is approved by LRQA Ltd. to ISO 9001/14001

