



# PowerTrap®

## MODEL GP10 CAST IRON CAST STEEL

### MECHANICAL PUMP 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. Easy, inline access to internal parts simplifies cleaning and reduces maintenance costs.
6. High-quality stainless steel internals ensure reliability.
7. Compact design permits installation in a limited space.



#### Specifications

Model		GP10		
Body Material		Cast Iron	Cast Steel	
Connection	Pumped Medium Inlet & Outlet	Screwed	Screwed	Flanged
	Motive Medium & Pump Exhaust	Screwed	Screwed	Flanged
Size (mm)	Pumped Medium Inlet / Outlet	3" / 2"		DN 50 / 50, 80 / 50
	Motive Medium Inlet	1"		DN 25
	Pump Exhaust Outlet	1"		DN 25
Maximum Operating Pressure (barg)	PMO	10.5		
Maximum Operating Temperature (°C)	TMO	185		
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 33		
Motive Medium		Steam, compressed air, nitrogen or other non-flammable, non-toxic gasses		
Pumped Medium		Steam condensate, water or other non-flammable, non-toxic fluids with specific gravities 0.85 – 1		

**PRESSURE SHELL DESIGN CONDITIONS (NOT OPERATING CONDITIONS):**

Maximum Allowable Pressure (barg) PMA: 13 (Cast Iron), 16 (Cast Steel)

Maximum Allowable Temperature (°C) TMA: 200 (Cast Iron) 220 (Cast Steel)

1 bar = 0.1 MPa

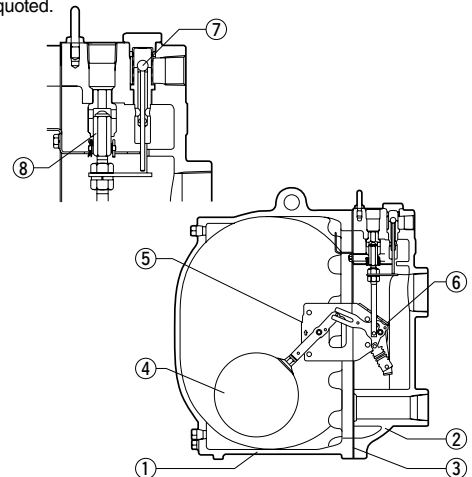


To avoid abnormal operation, accidents or serious injury, **DO NOT** use this product outside of the specification range. Local regulations may restrict the use of this product to below the conditions quoted.

No.	Description	Material	DIN*	ASTM/AISI*	
①	Body	Cast Iron FC250	0.6025	A126 Cl. B	
		Cast Steel SCPH2**	1.0619	A216 Gr. WCB	
②	Cover	Cast Iron FC250	0.6025	A126 Cl. B	
		Cast Steel SCPH2**	1.0619	A216 Gr. WCB	
③	Cover Gasket	Graphite Compound	—	—	
④	Float	Stainless Steel SUS316L/303	1.4404/1.4305	AISI316L/303	
⑤	Lever Unit	Stainless Steel	—	—	
⑥	Snap-action Unit	Stainless Steel	—	—	
⑦	Motive Medium Intake Valve Unit	Intake Valve	Stainless Steel SUS303/440C	1.4305/1.4125	AISI303/440C
		Valve Seat	Cast Stainless Steel/ Stainless Steel SCS13A/SUS440C	1.4312/1.4125	A351 Gr. CF8/ AISI440C
⑧	Exhaust Valve Unit	Exhaust Valve	Stainless Steel SUS303/440C	1.4305/1.4125	AISI303/440C
		Valve Seat	Stainless Steel SUS420F	1.4028	AISI420F
⑨	Check Valve***	CK3MG	Cast Stainless Steel SCS13A	1.4312	A351 Gr. CF8
		CKF3MG	Cast Stainless Steel SCS13A	1.4312	A351 Gr. CF8

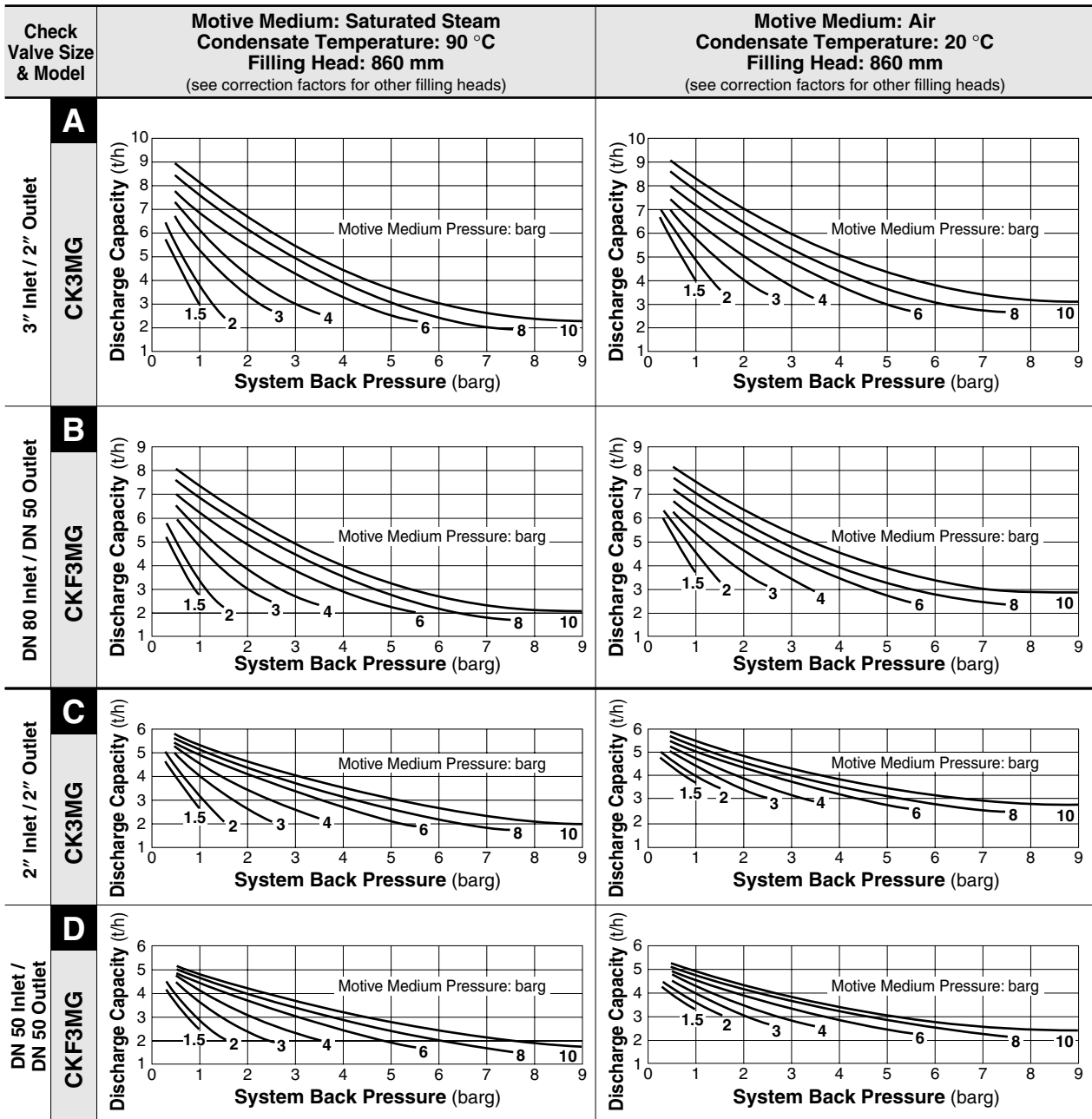
\* Equivalent materials \*\* Option: Cast Stainless Steel

\*\*\* Not shown, model depends on GP10 connection; CK3MG for screwed, CKF3MG for flanged



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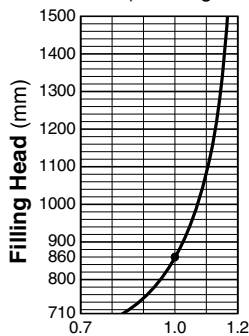
### Discharge Capacity



• **Correction Factors** (for filling heads other than 860 mm)

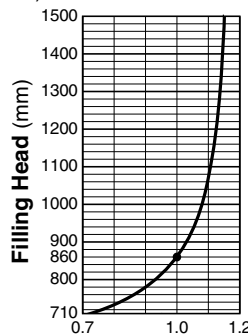
For Discharge Capacity Graphs **A & B**

(minimum filling head: 710mm)



For Discharge Capacity Graphs **C & D**

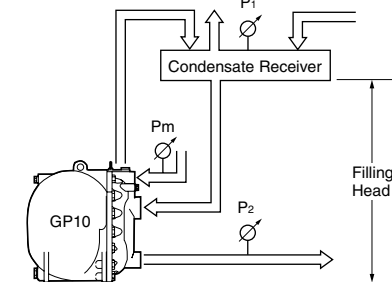
(minimum filling head: 710mm)



**NOTE:**

- A check valve must be installed at both the pumped medium inlet and outlet. To achieve the above capacities with the standard GP10 configuration, TLV CK3MG or CKF3MG check valves must be used.
- 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.

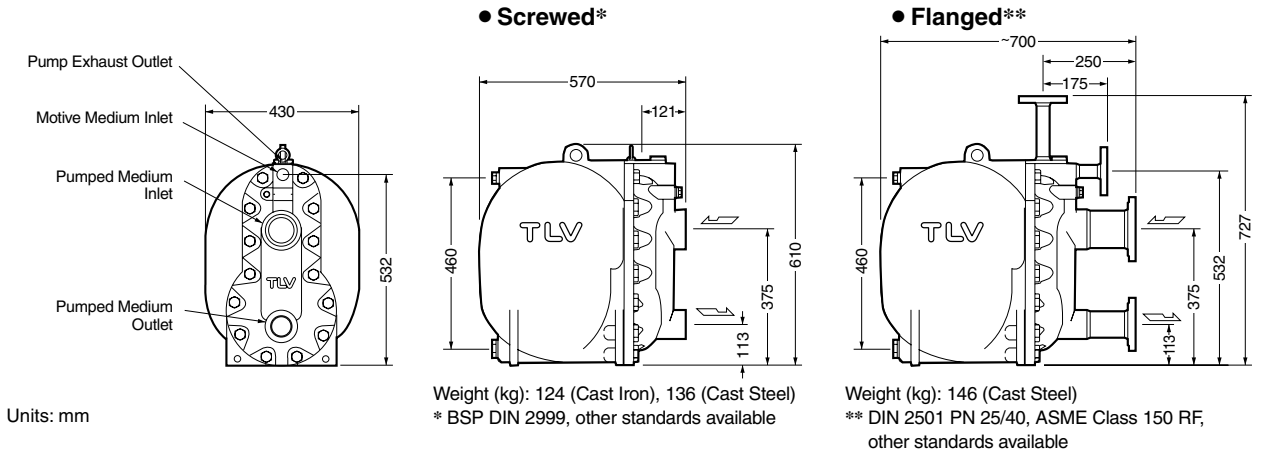
• **Illustration of Filling Head and Pressures**



The flow rate is determined by the motive medium, motive medium pressure (Pm) and back pressure (P2).  
Make sure that:

$$\text{Flow Rate} \times \text{Correction Factor} > \text{Required Flow Rate}$$

**Dimensions**



**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
1 000	500	200
1 100	500	250
1 400	550	250
1 500	600	250

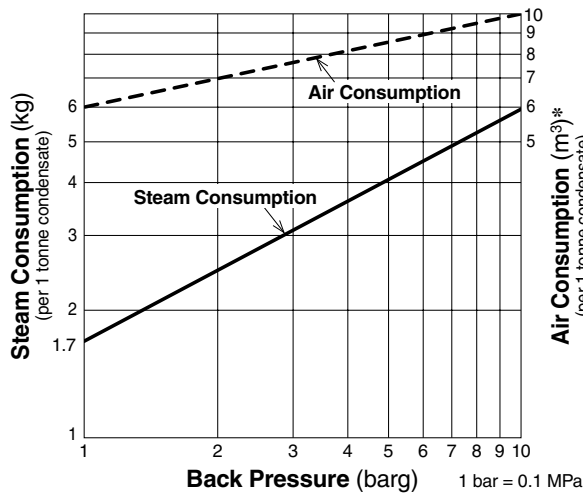
② **Size of Reservoir** (flash steam is not involved)

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			
1 000			1.0	0.7			
1 500			1.5	1.0			
2 000			2.0	1.3	0.6		
3 000				2.0	0.9	0.5	
4 000					1.2	0.7	
5 000					1.4	0.8	0.5
6 000					1.7	1.0	0.6
7 000					2.0	1.2	0.7
8 000						1.3	0.8
9 000						1.5	0.9
10 000						1.7	1.0

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

Reservoir length can be reduced by 50% when the motive medium pressure (Pm) divided by back pressure (P2) equals 2 or greater (when  $P_m \div P_2 \geq 2$ ).

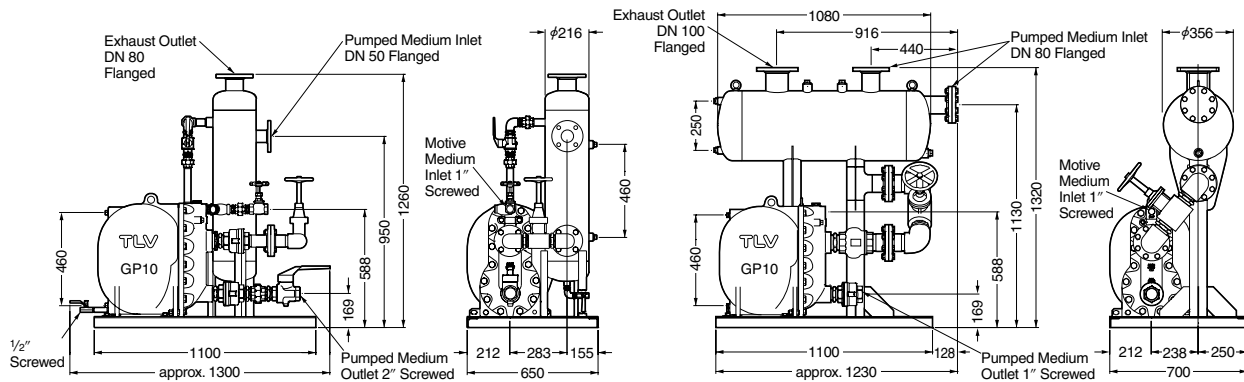
**Steam or Air Consumption (Motive Medium)**



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

System Packages (Open Systems)

Single System Package



Type S1

Discharge Capacity: see discharge capacity graph **C**  
 (no correction factor required, maximum capacity 2 t/h)  
 Maximum Allowable Flash Steam: 200 kg/h  
 Tank Size: 30 ℓ  
 Weight: 300 kg

Type M1

Discharge Capacity: see discharge capacity graph **A**  
 (no correction factor required)  
 Maximum Allowable Flash Steam: 500 kg/h  
 Tank Size: 100 ℓ  
 Weight: 340 kg

Twin System Package

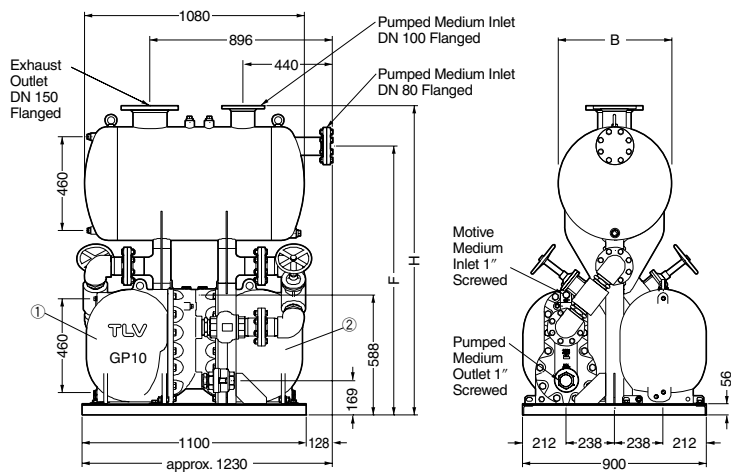
With small condensate loads, **PowerTrap** ① operates alone.  
 As condensate loads increase, **PowerTraps** ① and ② operate together.

Type L2

Discharge Capacity: double the discharge capacity found in graph **A** (no correction factor required)  
 Maximum Allowable Flash Steam: 1000 kg/h  
 Tank Size: 230 ℓ  
 Weight: 570 kg

Type E2

Discharge Capacity: double the discharge capacity found in graph **A** (no correction factor required)  
 Maximum Allowable Flash Steam: 1500 kg/h  
 Tank Size: 330 ℓ  
 Weight: 580 kg



Standards:

Screwed Connections: BSP DIN 2999  
 Flanged Connections: DIN 2501 PN 25/40  
 Other standards available,  
 but weights and dimensions may differ

Units: mm

Dimensions

Type	H	F	φ B
L2	1520	1320	560
E2	1620	1420	660

Manufacturer

ISO 9001/ISO 14001

**TLV**® CO., LTD.  
 Kakogawa, Japan

is approved by LRQA Ltd. to ISO 9001/14001

