



# PowerTrap®

## MODEL GP21F 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. Cycle Counter installable as option.



#### Specifications

Model		GP21F
Connection	Pumped Medium Inlet & Outlet	Flanged DIN 2501 PN 40*
	Motive Medium & Pump Exhaust	Screwed BSP DIN 2999*
Size	Pumped Medium Inlet x Outlet	DN 80 x DN 80
	Motive Medium Inlet	3/4"
	Pump Exhaust Outlet	1"
Maximum Operating Pressure (barg)	PMO	21
Maximum Operating Temperature (°C)	TMO	220
Motive Medium Pressure Range (barg)		0.5 – 21
Maximum Allowable Back Pressure		0.5 bar less than motive medium pressure used
Volume of Each Discharge Cycle (ℓ)		approximately 40
Motive Medium**		Saturated Steam
Pumped Medium***		Steam Condensate, Water

\* Other standards available \*\* Do not use with toxic, flammable or otherwise hazardous fluids.

1 bar = 0.1 MPa

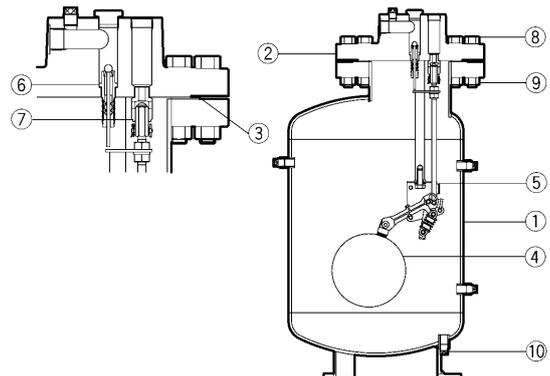
\*\*\* Do not use for fluids with specific gravities under 0.85 or over 1, or for toxic, flammable or otherwise hazardous fluids.

PRESSURE SHELL DESIGN CONDITIONS (**NOT** OPERATING CONDITIONS): Maximum Allowable Pressure (barg) PMA: 21  
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*	ASTM/AISI*	
①	Body	Carbon Steel H11	1.0425	A415 Gr.60	
②	Cover	Cast Steel A216 Gr. WCB	1.0619	—	
③	Cover Gasket	Graphite/ Stainless Steel SUS316L	—/ 1.4404	—/ AISI316L	
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	Stainless Steel SUS440C/ SUS303	1.4125/ 1.4305	AISI440C/ AISI303
		Valve Seat	Stainless Steel SUS440C	1.4125	AISI440C
⑦	Exhaust Valve Unit	Exhaust Valve	Stainless Steel SUS440C/ SUS303	1.4125/ 1.4305	AISI440C/ AISI303
		Valve Seat	Stainless Steel SUS420F	1.4028	AISI420F
⑧	Bolt	Steel (DIN 931 Class 5.6)	—	—	
⑨	Nut	Steel (DIN 934 Class 5.6)	—	—	
⑩	Drain Plug	Carbon Steel S25C	1.1158	AISI1025	
⑪	Flange Assembly***,***	Carbon Steel C22.8	1.0460	A105	
⑫	Check Valve***	CKF3MG Cast Stainless Steel A351Gr.CF8	1.4312	—	

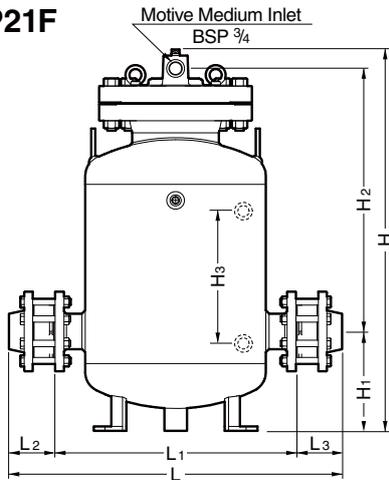


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\* Equivalent materials \*\* Consisting of bolts, nuts, butt-weld flange, gaskets  
\*\*\* Shown overleaf

**Dimensions**

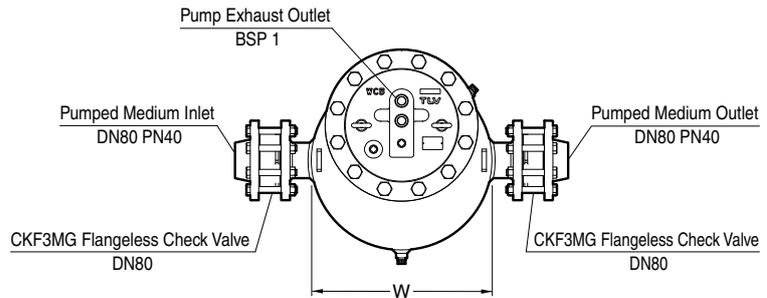
● **GP21F**



**GP21F Flanged\***

										(mm)
L	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	H	H <sub>1</sub>	H <sub>2</sub>	H <sub>3</sub>	φW	Weight (kg)	
830	600	115	115	960	250	660	320	450	200	

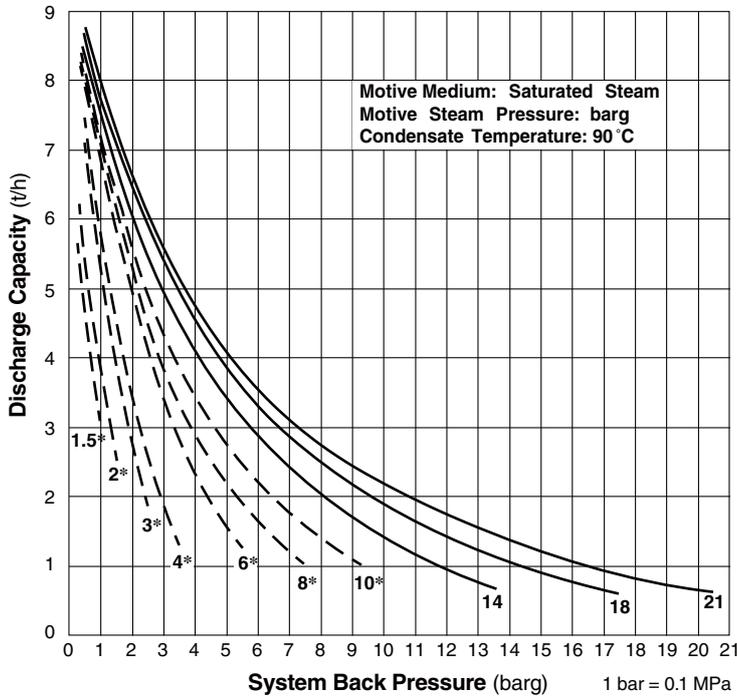
\*DIN 2501 PN 40, threaded connections: DIN 2999 female, other standards available but weight and length may vary.



Note: All plug holes BSP 1/2

**Discharge Capacity**

Connection:	Flanged
Inlet size:	DN 80
Outlet size:	DN 80
Check Valve:	CKF3MG
Inlet	DN 80
Outlet	DN 80
Filling Head:	1070 mm



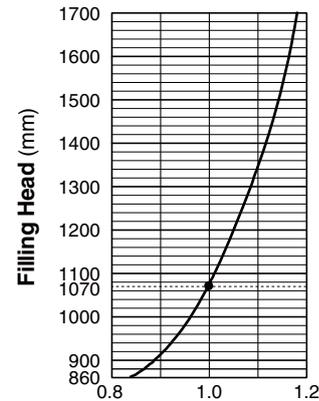
\* GP10F is recommended for use with motive pressures of 10 barg or less.

**NOTE:**

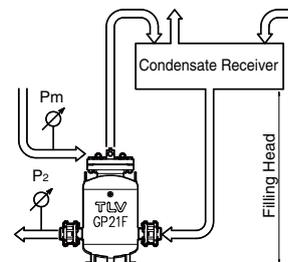
- To achieve the above capacities with the standard GP21F configuration, TLV CKF3MG check valves (supplied with the GP21F) must be used at the pumped medium inlet and outlet.
- Motive medium pressure minus back pressure must be greater than 0.5 bar.
- In closed system applications, the motive medium must be compatible with the liquid being pumped.
- A strainer must be installed at the motive medium and pumped medium inlets.

● **Correction Factor**

For GP21F with check valve CKF3MG, installed with filling head other than 1070 mm (minimum filling head: 860 mm)



● **Illustration of Filling Head and Pressures**



- The discharge capacity is determined by the motive medium, motive medium pressure ( $P_m$ ) and back pressure ( $P_2$ ).

Make sure that:  
 Discharge Capacity × 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)

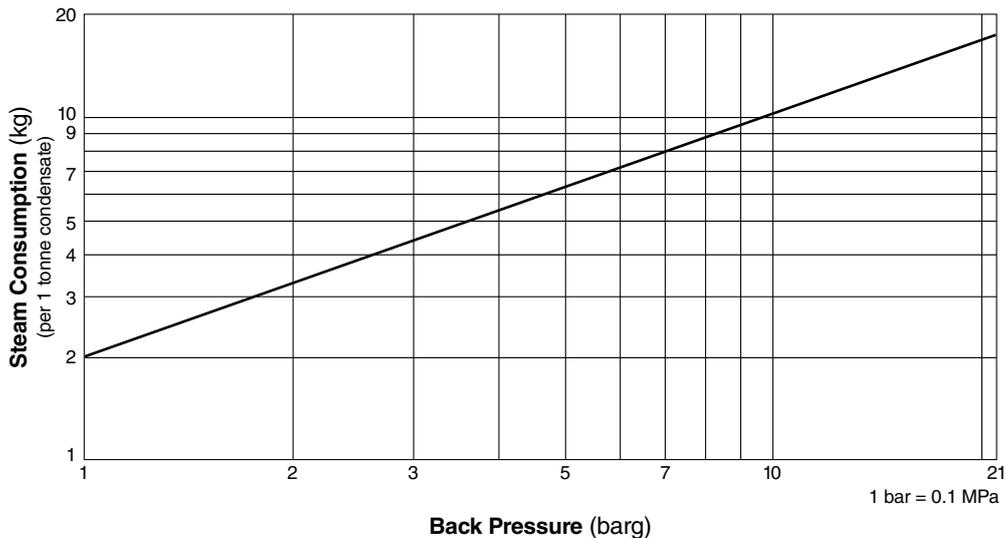
Flash steam up to kg/h	Receiver diameter mm	Vent pipe diameter mm
300	350	125
400	400	125
500	400	150
700	450	200
800	500	200
1000	550	200
1100	550	250
1400	600	250
1500	600	250

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

Amount of condensate kg/h	Reservoir diameter (mm) and length (m)							
	50	80	100	150	200	250	300	350
300 or less	1.9 m	0.9						
400		1.1	0.7					
500		1.4	0.8					
600		1.7	1.0					
800			1.3	0.6				
1000			1.6	0.8				
1500				1.1	0.7			
2000				1.5	0.9	0.6		
3000					1.3	0.9	0.6	
4000					1.7	1.1	0.8	0.7
5000						1.4	1.0	0.8
6000						1.7	1.2	1.0
7000						2.0	1.4	1.1
8000							1.6	1.3
9000							1.8	1.4
10000							1.9	1.6

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

## Steam Consumption (Motive Medium)

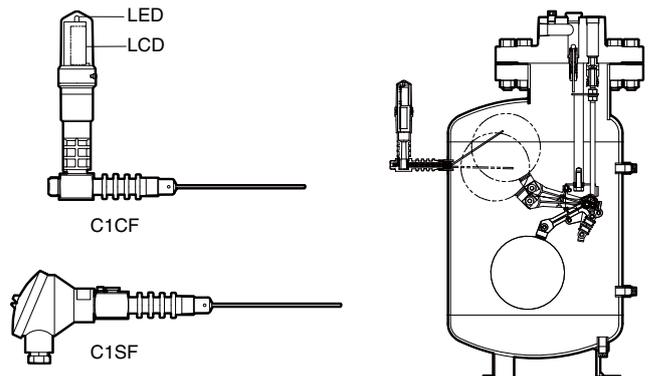


## Cycle Counter (option)

Two types of counter can be installed on the GP21F to monitor the number of pumping cycles and help to determine the timing of maintenance, or estimate the volume of pumped condensate.

- C1CF – (Counter Unit Type) : Self-contained standalone unit. Includes an LCD counter display and an operation indicator LED.
- C1SF – (Terminal Box Type) : Designed for use with remote monitoring equipment and systems.

Intrinsically safe models are also available. See the Cycle Counter SDS for further details.



Memo:

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Manufacturer

ISO 9001/ISO 14001

**TLV**® CO., LTD.  
Kakogawa, Japan

is approved by LRQA Ltd. to ISO 9001/14001

