

# TLV®

# PowerTrap®

## MODEL GP10F

### STEEL SECONDARY PRESSURE DRAINERS FOR PUMPING APPLICATIONS

#### Benefits

**Technologically advanced system for pumping high temperature condensate or process liquids from vented receivers and sumps.**

1. No cavitation or seal leakage.
2. Non-electric, compression spring design.
3. Externally removable motive medium intake valve, protected by an internal screen provides excellent serviceability.
4. Durable nickel-based alloy compression coil spring.
5. Inlet and exhaust valve heads are both Rockwell 65C with 45C seats for maximum durability.
6. All internal parts are suspended from the trap cover and can be removed upward in one piece, for simple maintenance and repair.
7. Two year snap-action mechanism and lifetime spring warranty.\*
8. Float resists shock to 1500 psig.
9. Low profile design operates with low filling head and permits installation in a limited space.
10. Optional internal thermostatic steam trap available for drainage of motive medium inlet pipeline.
11. Mechanism retrofits some other makers' pumps.\*
12. Cycle Counter installable as option.

\* Contact TLV for details



#### Specifications

Model		GP10F
Connection	Pumped Medium Inlet & Outlet	<b>Screwed*</b>
	Motive Medium & Pump Exhaust	<b>Screwed*</b>
Size (in)	Pumped Medium: Inlet × Outlet	<b>3 × 2</b>
	Motive Medium Inlet	<b>¾</b>
	Pump Exhaust Outlet	<b>1</b>
Maximum Operating Pressure (psig)	PMO	150
Maximum Operating Temperature (°F)	TMO	428
Maximum Allowable Pressure (psig)	PMA	150
Maximum Allowable Temperature (°F)	TMA	650
Motive Medium Pressure Range (psi)		5 – 150
Maximum Allowable Back Pressure		7 psi less than motive medium pressure used
Volume of Each Discharge Cycle (gal)		Approximately 8
Motive Medium**		Saturated Steam, Compressed Air or Nitrogen
Pumped Medium***		Steam Condensate, Water

\* Other connections available, but discharge capacity may be reduced.

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

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

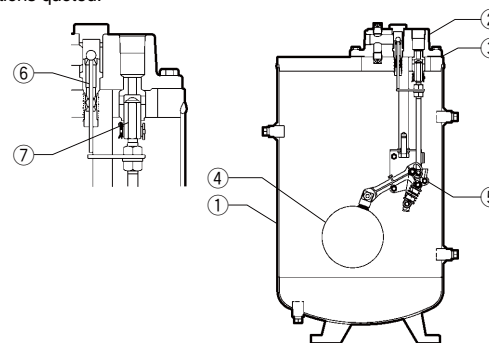
**Connections and sizes in bold are standard**



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	ASTM/AISI*	JIS
①	Body	Carbon Steel**	SA414 Gr.G	—
②	Cover	Cast Steel**	A216 Gr.WCB	—
③	Cover Gasket	Graphite	—	—
④	Float	Stainless Steel	AISI316L/ AISI304	SUS316L/ SUS304
⑤	Snap-action Unit	Stainless Steel	—	—
⑥	Motive Medium Intake Valve Unit	Intake Valve	AISI440C/ AISI303	SUS440C/ SUS303
		Valve Seat	AISI440C/ AISI303	SUS440C/ SUS303
⑦	Exhaust Valve Unit	Exhaust Valve	AISI440C/ AISI303	SUS440C/ SUS303
		Valve Seat	AISI420F	SUS420F
⑧	TLV CK3MG Check Valve***	Cast Stainless Steel	A351 Gr.CF8	—

\* Equivalent \*\* Option: Stainless steel \*\*\* Not shown



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## Receiver/Reservoir Sizing Tables

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.

If NO flash steam is present, use dimensions given in table 2. If flash steam is present, compare tables 1 & 2 and choose the larger resultant size. For all open systems, use table 1 to select a suitable vent pipe diameter.

### 1. Receiver Dimensions (Length: 3.5 ft)

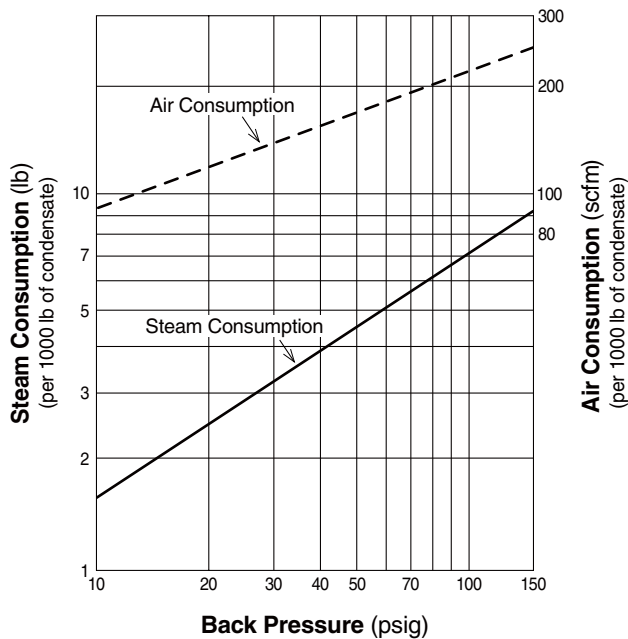
Flash Steam up to (lb/h)	Receiver Diameter (in)	Vent Pipe Diameter (in)
50	3	1
75	4	1½
100	4	2
200	6	2½
300	8	3
400	8	4
600	10	4
800	12	6
1,000	14	6
1,400	16	8
1,600	18	8
2,000	20	8

### 2. Reservoir Dimensions

Amount of condensate lb/h	Reservoir diameter (in) and length (ft)						
	1½	2	3	4	6	8	10
500 or less	3.0 ft	2.0					
700	4.0	2.5	1.0				
1,000	5.5	3.5	1.5				
1,200		4.5	2.0	1.0			
1,500			2.5	1.5			
2,000			3.5	2.0			
3,000			4.5	3.0			
4,000			6.5	4.0	1.5		
5,000				5.0	2.5		
6,000				5.5	2.5	1.5	
7,000				6.5	3.0	1.5	
8,000					3.5	2.0	
9,000					4.0	2.5	1.5
10,000					4.5	2.5	1.5
12,000					5.0	3.0	2.0
14,000					6.0	3.5	2.5
16,000					6.5	4.0	2.5
18,000						4.5	3.0
20,000						5.0	3.5

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

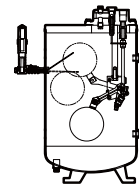
## Steam or Air Consumption (Motive Medium)



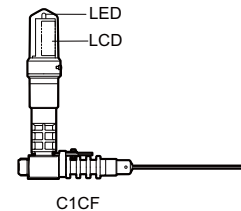
\* Equivalent consumption of air at 68 °F under atmospheric pressure

## Cycle Counter (option)

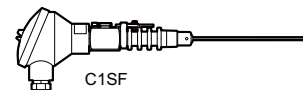
Two types of counter can be installed on the GP10F to monitor the number of pumping cycles and help to determine the timing of maintenance, or estimate the volume of pumped condensate.



- C1CF - (Counter Unit Type) : Self-contained standalone unit. Includes an LCD counter display and an operation indicator LED.



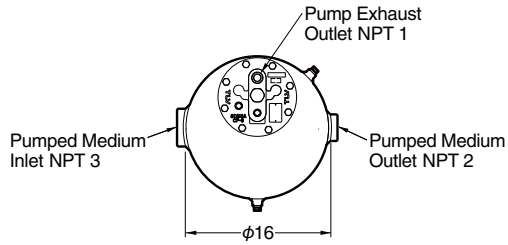
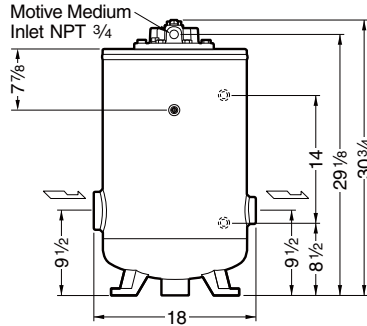
- C1SF - (Terminal Box Type) : Designed for use with remote monitoring equipment and systems.



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

## Dimensions

Units: in



Note: All Plug Holes NPT 1/2

Weight: 154 lb

## Discharge Capacity

Filling Head: 42" from Grade

Inlet Pipe Size		A	1"	B	1 1/2"	C	2"	D	3"
Inlet Check Valve		1" CK3MG		1 1/2" CK3MG		2" CK3MG		3" CK3MG	
Outlet Check Valve		1" CK3MG		1 1/2" CK3MG		2" CK3MG		2" CK3MG	
Motive Medium		Air		Steam		Air		Steam	
Operating Inlet Press. (Pm) (psig)	Total Lift or Back Press. (P2) (psig)	(lb/h)	(lb/h)	(lb/h)	(lb/h)	(lb/h)	(lb/h)	(lb/h)	(lb/h)
		150	15	4200	4100	8300	8100	14600	14200
	25	4000	4000	8000	7700	13400	13000	16800	16500
	40	3900	3700	7500	7000	11700	11400	13900	13700
	60	3800	3500	6800	6200	10000	9400	11200	11000
	80	3500	3200	6100	5600	8800	7800	9400	8900
	100	3300	3000	5400	4800	7900	6400	8300	7300
125	15	4000	3900	8200	7700	14100	13600	17800	17500
	25	3900	3800	7800	7200	12700	12100	15800	15400
	40	3800	3500	7200	6400	11000	10100	13200	12500
	60	3600	3300	6500	5700	9500	8000	10700	10400
	80	3400	3100	5800	5200	8300	6400	9000	8400
	100	3200	2800	5100	4300	7400	5500	7800	6900
100	15	3900	3700	7900	7300	13600	13200	17000	16700
	25	3800	3500	7500	6800	12300	11400	15100	14200
	40	3600	3300	7000	6000	10500	9200	12500	11300
	60	3500	3100	6300	5200	8900	7300	10100	8600
	80	3300	2900	5600	4200	7800	6100	8500	7000
75	15	3800	3500	7800	6900	13100	12500	15600	15000
	25	3700	3300	7300	6300	11700	11000	13500	12300
	40	3500	3000	6600	5500	10000	8700	11500	9800
	60	3300	2600	5800	4600	8500	6700	9200	7200
50	10	3800	3400	7900	6800	12500	11500	15300	14800
	15	3700	3300	7600	6400	11800	9800	14200	13200
	25	3600	3000	7000	5700	10400	7700	12400	10000
	40	3300	2500	6300	4600	8300	6000	10200	6300
25	5	3800	3400	7800	6400	12400	11300	15200	13500
	10	3600	3100	7400	5800	11500	8700	14000	11000
	15	3500	2900	7100	5300	10600	6800	12900	9300

**NOTE:**

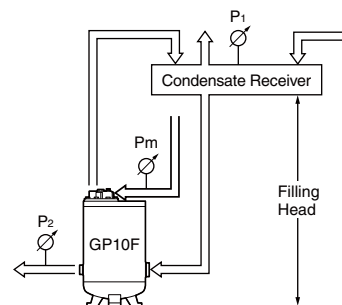
- A check valve must be installed at both the pumped medium inlet and outlet. To achieve the above capacities with the standard GP10F configuration, TLV CK3MG check valves must be used.
- Motive medium pressure minus back pressure must be greater than 7 psi.
- In closed system applications, the motive 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.

• **Correction Factors**

For GP10F installed with filling head other than 42" (minimum filling head 33")

Filling Head from Grade	Inlet Pipe/Check Valve Size			
	1"	1 1/2"	2"	3"
33"	0.76	0.83	0.83	0.85
36"	0.85	0.89	0.88	0.90
42"	1.00	1.00	1.00	1.00
48"	1.10	1.07	1.04	1.03
54"	1.18	1.14	1.09	1.08
60"	1.22	1.17	1.12	1.09
66"	1.29	1.20	1.15	1.11

• **Illustration of Filling Head and Pressures**

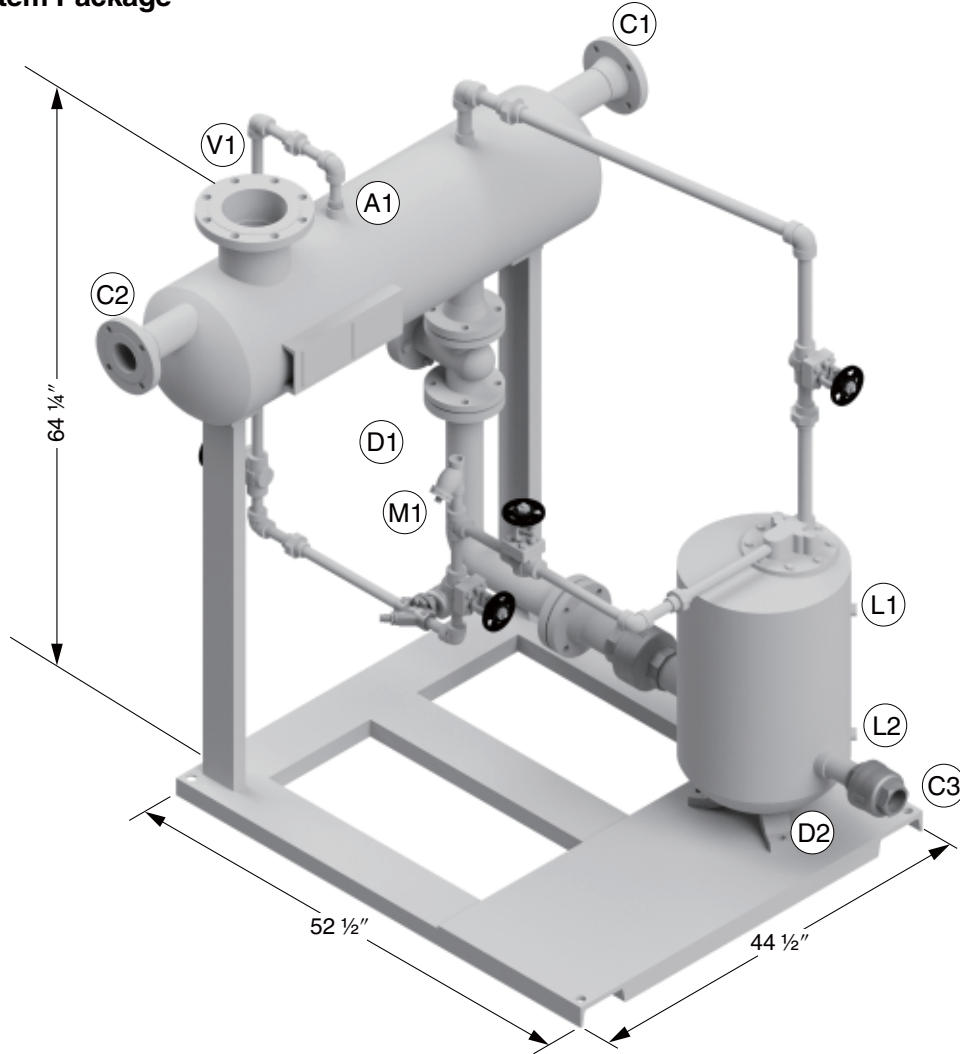


- The discharge capacity is determined by the motive medium, motive medium pressure (Pm) and back pressure (P2).

Make sure that:  
 Discharge Capacity × correction factor  
 > required flow rate

## System Package Configuration

### Single System Package<sup>1)</sup>



## Available Standard System Package Configurations

### Single GP10F: 29 Gallon Tank

Weight: approx. 940 lb  
Max. Allowable Flash Steam: 1800 lb/h

Tag	Qty.	Size (in)	Process
A1	1	½	Auxiliary Connection
C1	1	3	Condensate Inlet/Overflow Connection
C2	1	3	Condensate Inlet/Overflow Connection
C3	1	2	Pumped Condensate Outlet Connection
D1	1	½	Tank Drain Connection
D2	1	½	PowerTrap Drain Connection
L1	1	½	PowerTrap Level Gauge Connection
L2	1	½	PowerTrap Level Gauge Connection
M1	1	1	Motive Steam Inlet Connection
V1	1	6	System Vent Connection

Discharge Capacity: see discharge capacity graph column **D**

### Twin GP10F: 50 Gallon Tank

Weight: approx. 1500 lb  
Max. Allowable Flash Steam: 3200 lb/h

Tag	Qty.	Size (in)	Process
A1	1	½	Auxiliary Connection
C1	1	4	Condensate Inlet/Overflow Connection
C2	1	4	Condensate Inlet/Overflow Connection
C3	2	2	Pumped Condensate Outlet Connection
D1	1	½	Tank Drain Connection
D2	2	½	PowerTrap Drain Connection
L1	2	½	PowerTrap Level Gauge Connection
L2	2	½	PowerTrap Level Gauge Connection
M1	1	1	Motive Steam Inlet Connection
V1	1	8	System Vent Connection

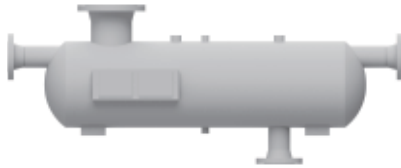
Discharge Capacity: double the discharge capacity found in column **D**

**NOTES:**

1) Single Industrial System Package shown. See System Package Specifications table for details and alternative configuration. See next page for Standard Tank/Piping specifications. Other non-standard specifications available to meet site requirements.

## System Package Specifications





**Tank**



ASME U-stamped pressure vessel built in accordance with the latest edition of ASME Section VIII Div. 1  
 Rated to 200 psig @ 395 °F

Connections 2" and greater:  
 Connections 1 1/2" and smaller:  
 Corrosion Allowance:

ASME 150RFWN flanged fittings  
 300# socket weld fittings  
 1/32"

Standard Design Option:	Industrial	Power & Refining
<b>PowerTrap</b>		
Body Material	Cast Iron	Cast Steel
PowerTrap Connections incl. Inlet, Outlet, Motive & Exhaust Connections	NPT	150RFWN flanged (connections are NPT & seal welded)
PowerTrap Connections incl. Drain & Sight Glass Connections	NPT	NPT
<b>Check Valves</b>		
PowerTrap Check Valves	NPT (CK3MG)	Flangeless 150RF (CKF3MG)
<b>Isolation Valves</b>		
Inlet/Outlet Valves	150RF Cast Steel Flanged Gate Valve with #8 Trim	150RF Cast Steel Flanged Gate Valve with #8 Trim
Motive/Balance Line Valves	800# NPT Cast Steel Gate Valve with #8 Trim	800# Socket Weld Cast Steel Gate Valve with #8 Trim
<b>Piping</b>		
PowerTrap Inlet/Outlet Piping	Schedule 40 A106 SMLS	Schedule 80 A106 SMLS
Motive/Balance Line Piping	Schedule 40 A106 SMLS	Schedule 80 A106 SMLS
Motive/Balance Line Fittings	3000# Forged Steel Threaded	3000# Forged Steel Socket Weld
Piping Code	ASME B31.3 "Category D" fluid service With no testing documentation	ASME B31.3 specification code With full testing and documentation as indicated in the ASME B31.3 code
<b>Y-strainer Installation Location</b>		
Location	On Motive Line	
<b>Gaskets</b>		
Type	Stainless Steel Flexible Graphite Spiral Wound	
<b>Paint</b>		
Pre-paint	Near White Metal Blast	White Metal Blast
Pre-Top Coat	None	
Top Coat	Sherwin Williams Heat-Flex Hi-Temp Pure Aluminium Finish, Surface Temp. 500 °F	

Memo:

**TLV CORPORATION**

13901 South Lakes Drive, Charlotte, NC 28273-6790  
Tel: 704-597-9070 Fax: 704-583-1610  
E-mail: [tlv@tlvengineering.com](mailto:tlv@tlvengineering.com) <https://www.tlv.com>  
For Technical Service 1-800 "TLV TRAP"



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