



# PowerTrap®

## MODEL GP10L

### SECONDARY PRESSURE DRAINER FOR PUMPING APPLICATION

#### Benefits

**Pump for a wide range of applications.  
Ideal for low flow condensate removal from receivers  
situated at low level.**

1. No cavitation or seal leakage.
2. Non-electric design with durable nickel-based alloy compression spring for reliable performance.
3. Pump will operate with a low filling head (min 12").
4. Easy, inline access to internal parts simplifies cleaning and reduces maintenance costs.
5. Intake/exhaust valve heads are both Rockwell 65C with 45C seats for maximum durability.
6. High quality stainless steel internals ensure reliability.
7. Compact design permits installation in a limited space.
8. Float resists hydraulic shock to 1500 psig.
9. Two year warranty for snap-action mechanism.\*
10. Cycle Counter installable as option.

\* Contact TLV for details



#### Specifications

Model		GP10L	
Connection	Pumped Medium Inlet & Outlet	<b>Screwed and Flanged*</b>	
	Motive Medium & Pump Exhaust	Screwed	
Size (in)	Pumped Medium: Inlet × Outlet	<b>1 × 1</b>	<b>1½ × 1</b>
	Motive Medium Inlet		½
	Pump Exhaust Outlet		½
Maximum Operating Pressure (psig)	PMO	150	
Maximum Operating Temperature (°F)	TMO	365	
Maximum Allowable Pressure (psig)	PMA	Cast Iron: 230 Cast Steel: 300	
Maximum Allowable Temperature (°F)	TMA	428	
Motive Medium Pressure Range (psig)		5 – 150	
Maximum Allowable Back Pressure		7 psi less than motive medium pressure used	
Volume of Each Discharge Cycle (gal)		approximately 1.6	
Motive Medium**		Saturated Steam, Compressed Air, Nitrogen	
Pumped Medium***		Steam Condensate, Water	

\* For details of flange connection, see picture at bottom right.

\*\* 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 for toxic, flammable or otherwise hazardous fluids.

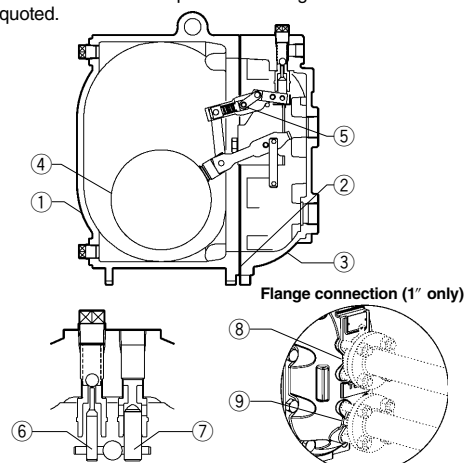
**Connections and sizes in bold are standard**



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	Cast Iron	A126 Cl.B	FC250
		Cast Steel**	A216 Gr.WCB	—
②	Cover	Cast Iron	A126 Cl.B	FC250
		Cast Steel**	A216 Gr.WCB	—
③	Cover Gasket	Graphite Compound	—	—
④	Float	Stainless Steel	AISI316L	SUS316L
⑤	Snap-action Unit	Stainless Steel	—	—
⑥	Motive Medium Intake Valve Unit	Intake Valve	AISI440C	SUS440C
		Valve Seat	AISI420F	SUS420F
⑦	Exhaust Valve Unit	Exhaust Valve	AISI440C	SUS440C
		Valve Seat	AISI420F	SUS420F
⑧	Inlet Check Valve	Screwed CK3MG***	Cast Stainless Steel A351 Gr.CF8	—
		Flanged CKF5M	Stainless Steel AISI304	SUS304
⑨	Outlet Check Valve	Screwed CK3MG***	Cast Stainless Steel A351 Gr.CF8	—
		Flanged CKF3M	Cast Stainless Steel A351 Gr.CF8	—

\* Equivalent \*\* Option: Cast Stainless Steel \*\*\* Not shown



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## Discharge Capacity

Filling Head: 25" from Grade

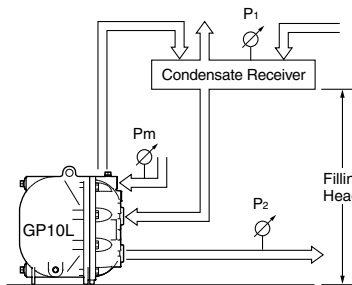
Inlet Pipe Size		A		1½"		B		1"		C		1"	
Inlet Check Valve		1½" CK3MG				1" CK3MG				1" CKF5M			
Outlet Check Valve		1" CK3MG				1" CK3MG				1" CKF3M			
Motive Medium		Air		Steam		Air		Steam		Air		Steam	
Motive Medium Inlet Pressure (P <sub>m</sub> ) (psig)	Total Lift or Back Press. (P <sub>2</sub> ) psig	(lb/h)	(lb/h)	(lb/h)	(lb/h)	(lb/h)	(lb/h)	(lb/h)	(lb/h)	(lb/h)	(lb/h)	(lb/h)	(lb/h)
150	15	3,640	3,310	2,650	2,490	2,710	2,330						
	25	3,550	3,060	2,620	2,270	2,680	2,050						
	40	3,400	2,710	2,570	2,000	2,520	1,870						
	60	3,220	2,320	2,500	1,680	2,430	1,410						
	80	3,040	1,960	2,430	1,390	2,330	1,120						
	100	2,820	1,630	2,370	1,200	2,250	870						
125	15	3,570	3,110	2,630	2,430	2,660	2,270						
	25	3,480	2,870	2,590	2,160	2,610	1,960						
	40	3,330	2,540	2,530	1,870	2,520	1,780						
	60	3,150	2,160	2,460	1,540	2,420	1,260						
	80	2,950	1,830	2,390	1,270	2,310	1,020						
	100	2,690	1,460	2,320	1,100	2,160	740						
100	15	3,510	2,950	2,610	2,330	2,600	2,200						
	25	3,420	2,670	2,560	2,070	2,530	1,900						
	40	3,260	2,230	2,490	1,730	2,410	1,660						
	60	3,060	1,760	2,410	1,370	2,280	1,100						
	80	2,870	1,320	2,330	1,100	2,110	820						
75	15	3,440	2,800	2,590	2,250	2,520	2,050						
	25	3,330	2,490	2,530	1,890	2,430	1,800						
	40	3,130	2,010	2,440	1,560	2,320	1,410						
	60	2,870	1,460	2,340	1,190	2,070	890						
50	10	3,400	2,820	2,590	2,270	2,460	2,050						
	15	3,310	2,600	2,550	2,080	2,420	1,850						
	25	3,130	2,120	2,460	1,730	2,330	1,690						
	40	2,870	1,490	2,330	1,280	2,160	1,050						
25	5	3,370	2,870	2,580	2,240	2,450	2,140						
	10	3,150	2,540	2,520	1,980	2,340	1,770						
	15	2,950	2,210	2,450	1,720	2,270	1,480						
10	2	3,310	2,820	2,540	2,190	2,500	2,150						

### • Correction Factors

For GP10L installed with filling head other than 25" (minimum filling head: CK3MG: 18", CKF5M: 12")

Filling Head from Grade	Inlet Pipe & Check Valve Size		
	1½" CK3MG	1" CK3MG	1" CKF5M
55"	1.30	1.50	1.37
43"	1.27	1.35	1.28
37"	1.23	1.25	1.21
31"	1.15	1.15	1.12
25"	1.00	1.00	1.00
22"	0.90	0.85	0.93
18"	0.60	0.60	0.81
12"	—	—	0.59

### • Illustration of Filling Head and Pressures



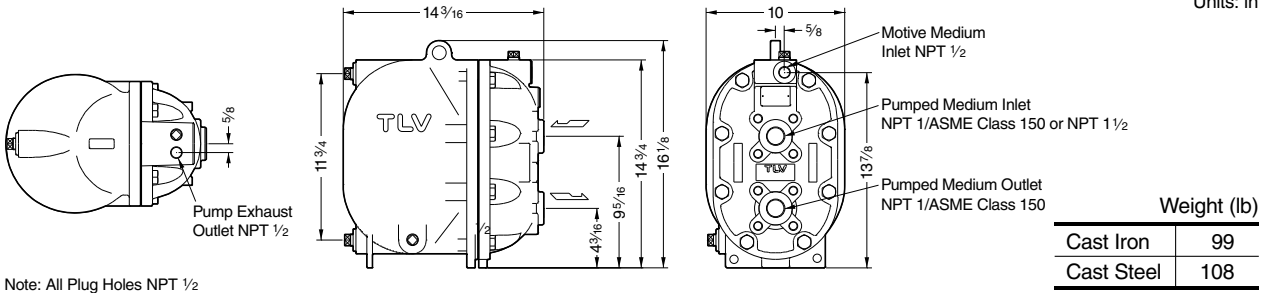
The discharge capacity is determined by the motive medium, motive medium pressure (P<sub>m</sub>) and back pressure (P<sub>2</sub>).

Make sure that:  
 Discharge Capacity × Correction Factor > Required Flow Rate

### NOTE:

- A check valve must be installed at both the pumped medium inlet and outlet. To achieve the above capacities with the standard GP10L configuration, either TLV check valves CK3MG (inlet & outlet), or CKF5M (inlet) and CKF3M (outlet) must be used, depending on connection type.
- 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.

## Dimensions



## 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)

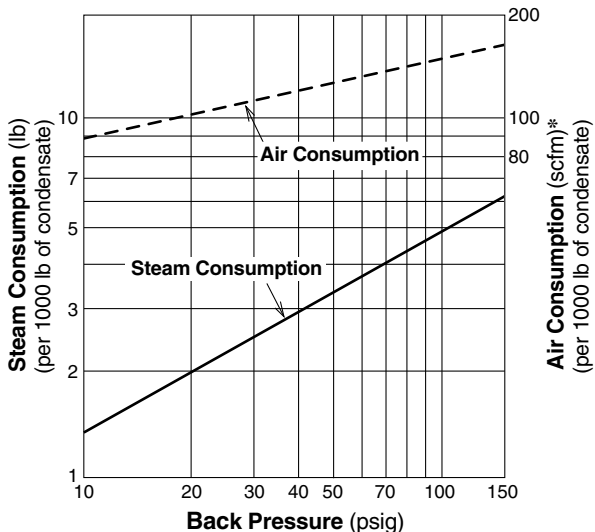
Flash Steam up to (lb/h)	Receiver Diameter (in)	Vent Pipe Diameter (in)
50	3	1
75	4	1 1/2
100	4	2
200	6	2 1/2
300	8	3
400	8	4
600	10	4
800	12	6
1,000	14	6
1,400	16	8
1,600	18	8
2,000	20	8

### 2. Reservoir Dimensions

Amount of condensate lb/h	Reservoir diameter (in) and length (ft)						
	1 1/2	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

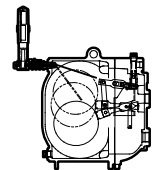
Reservoir length can be reduced by 50% when the motive pressure (Pm) divided by the back pressure (P2) equals 2 or greater (when  $P_m \div P_2 \geq 2$ ).

## Steam/Air Consumption (Motive Medium)

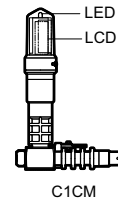


## Cycle Counter (option)

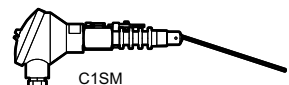
Two types of counter can be installed on the GP10L to monitor the number of pumping cycles and help to determine the timing of maintenance, or estimate the volume of pumped condensate.



- C1CM - (Counter Unit Type) : Self-contained standalone unit. Includes an LCD counter display and an operation indicator LED.



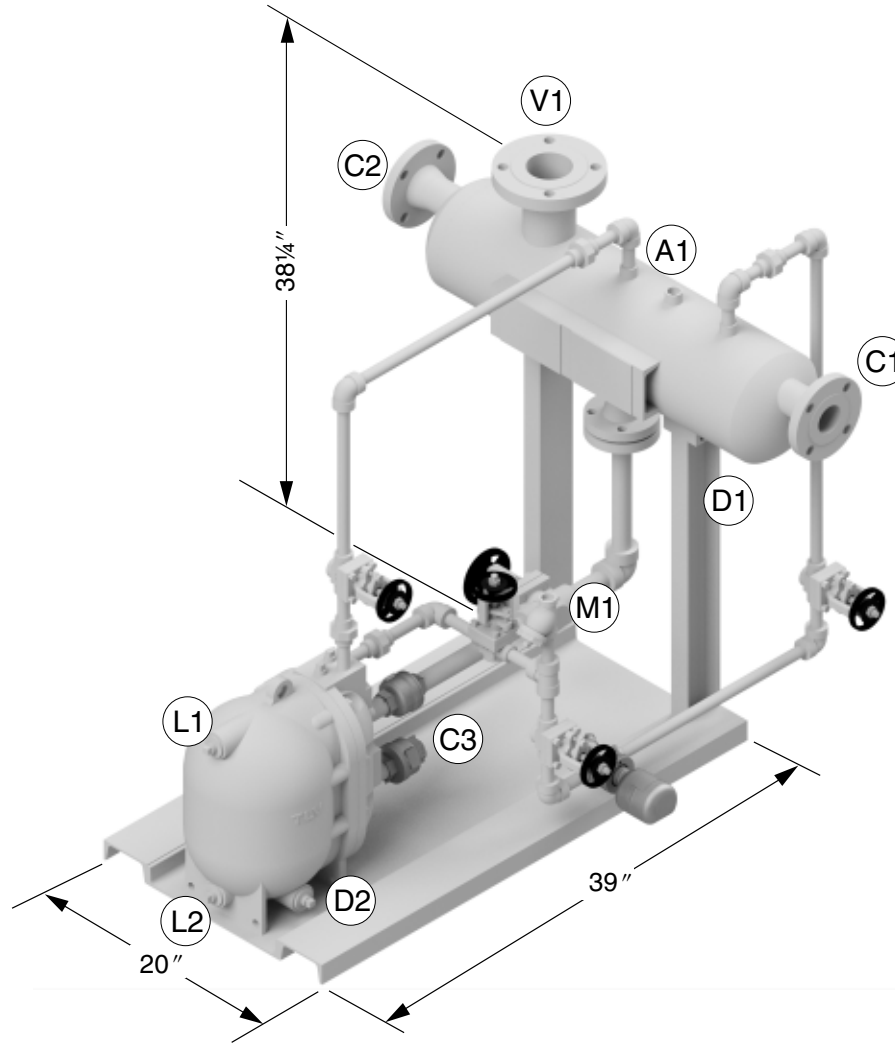
- C1SM - (Terminal Box Type) : Designed for use with remote monitoring equipment and systems.



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

## System Package Configuration

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



## Standard System Package Configuration

### Single GP10L: 6 Gallon Tank

Weight: approx. 370 lb

Max. Allowable Flash Steam: 400 lb/h

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

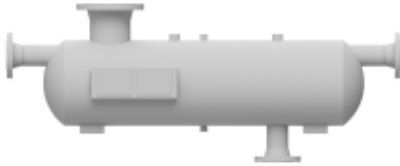
Discharge Capacity: see discharge capacity graph column **B**

**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**

**PowerTrap**



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

**Check Valves**



PowerTrap Check Valves

NPT (CK3MG)

Flangeless 150RF (CKF3MG)

**Isolation Valves**

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

**Piping**

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

**Y-strainer Installation Location**

Location

On Motive Line

**Gaskets**

Type

Stainless Steel Flexible Graphite Spiral Wound

**Paint**

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**

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Manufacturer  
**TLV** CO., LTD.  
Kakogawa, Japan  
is approved by LRQA Ltd. to ISO 9001/14001

