



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	Screwed and Flanged*	
	Motive Medium & Pump Exhaust	Screwed	
Size (in)	Pumped Medium: Inlet × Outlet	1 × 1	1½ × 1
	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.

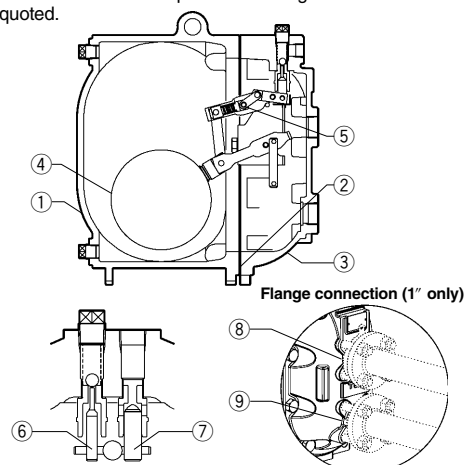
Connections and sizes in bold are standard



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
		Flanged	CKF5M	Stainless Steel
⑨	Outlet Check Valve	Screwed	CK3MG***	Cast Stainless Steel
		Flanged	CKF3M	Cast Stainless Steel

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



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Discharge Capacity

Filling Head: 25" from Grade

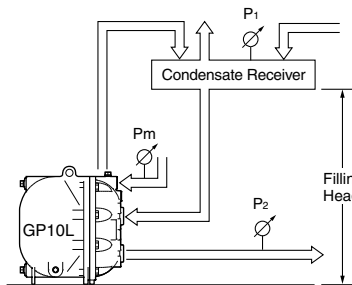
Inlet Pipe Size		A	1½"		B	1"		C	1"				
Inlet Check Valve		1½" CK3MG			1" CK3MG			1" CKF5M					
Outlet Check Valve		1" CK3MG			1" CK3MG			1" CKF3M					
Motive Medium		Air		Steam		Air		Steam		Air		Steam	
Motive Medium Inlet Pressure (P _m) (psig)	Total Lift or Back Press. (P ₂) psig	(lb/h)	(lb/h)	(lb/h)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



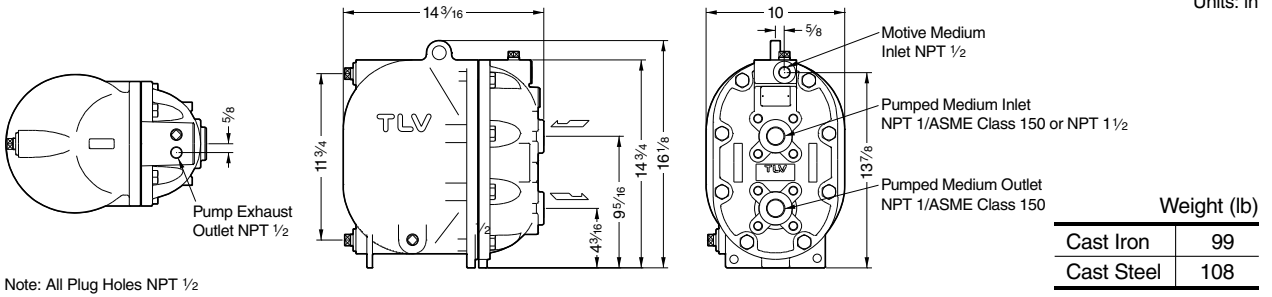
The discharge capacity is determined by the motive medium, motive medium pressure (P_m) and back pressure (P₂).

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)

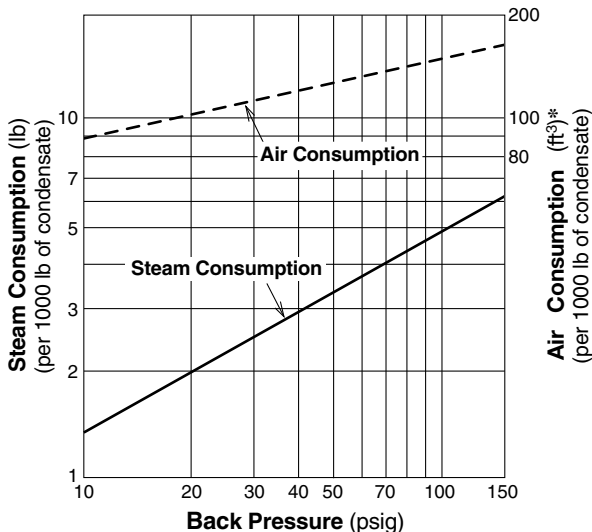
Flash Steam up to (lb/h)	Receiver Diameter (in)	Vent Pipe Diameter (in)
50	3	1
75	4	1 1/2
100	4	2
200	6	2 1/2
300	8	3
400	8	4
600	10	4
800	12	6
1,000	14	6
1,400	16	8
1,600	18	8
2,000	20	8

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 $P_m \div P_2 \geq 2$).

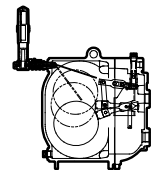
Steam/Air Consumption (Motive Medium)



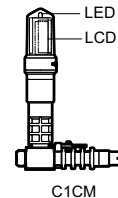
* Equivalent consumption of air at 68 °F under atmospheric pressure

Cycle Counter (option)

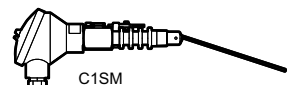
Two types of counter can be installed on the GP10L to monitor the number of pumping cycles and help to determine the timing of maintenance, or estimate the volume of pumped condensate.



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



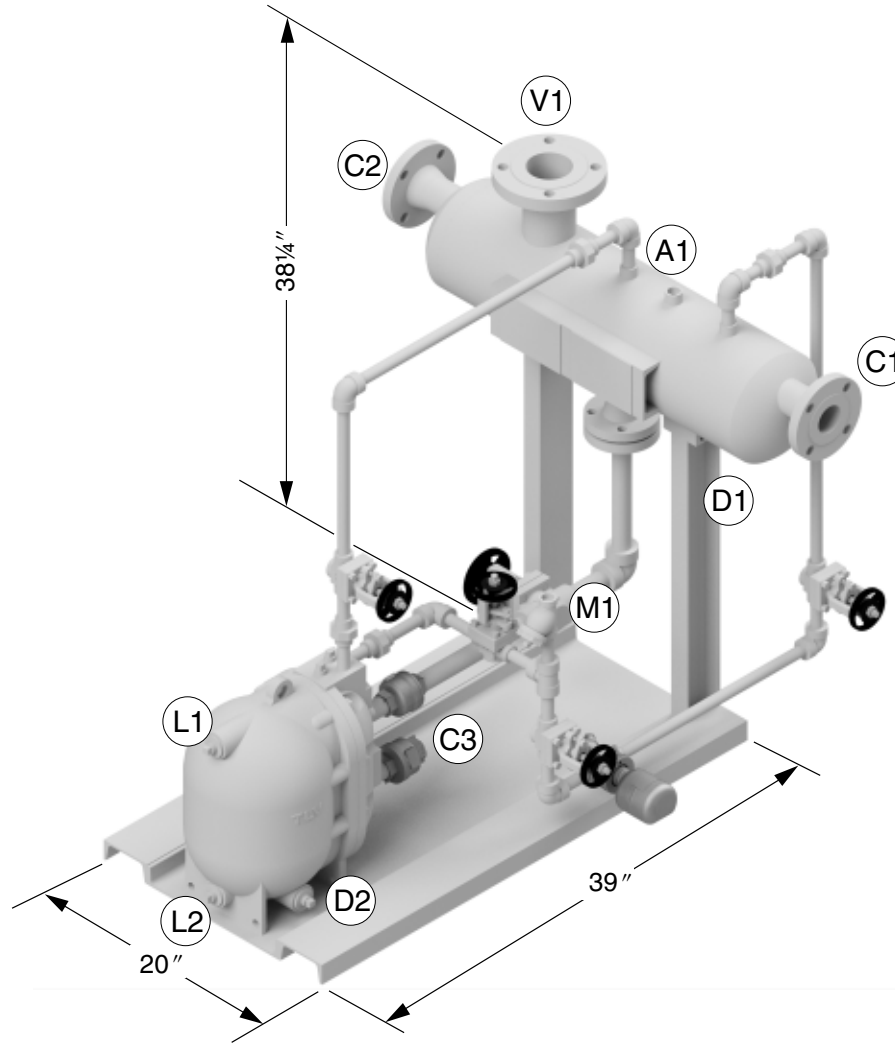
- C1SM - (Terminal Box Type) : Designed for use with remote monitoring equipment and systems.



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

System Package Configuration

Single System Package¹⁾



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	½	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	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	3	System Vent Connection

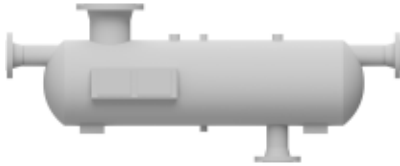
Discharge Capacity: see discharge capacity graph column **B**

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:

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

ISO 9001
ISO 14001