PowerTrap®

MODEL GP10/GP14

SECONDARY PRESSURE DRAINER 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 design with durable nickel-based alloy compression spring for reliable performance.
3. Externally removable motive medium intake valve protected by an internal screen provides excellent serviceability.
4. Inlet and exhaust valve heads are both Rockwell 65C with 55C/45C seats for maximum durability.
5. High quality stainless steel internals ensure reliability.
6. Two year mechanism and lifetime spring warranty.*
7. Float resists shock to 1340 psig.
8. Cycle Counter installable as option.

* Contact TLV for details

Specifications

Model		GP10			GP14		
Body Material		Cast Iron	Cast Steel		Cast Iron	Cast Steel	
Connection	Pumped Medium Inlet & Outlet	**Screwed**	**Screwed**	**Flanged**	**Screwed**	**Screwed**	**Flanged**
	Motive Medium & Pump Exhaust	Screwed	Screwed	Flanged	Screwed	Screwed	Flanged
Size (in)	Pumped Medium: Inlet × Outlet	**3×2**		**2×2, 3×2**	**3×2**		**2×2, 3×2**
	Motive Medium Inlet	1			1		
	Pump Exhaust Outlet	1			1		
Maximum Operating Pressure (psig) PMO		150			200		
Maximum Operating Temperature (°F) TMO		365			392		
Maximum Allowable Pressure (psig) PMA		200	230		200	230	
Maximum Allowable Temperature (°F) TMA		428			428		
Motive Medium Pressure Range (psig)		5 – 150			100 – 200		
Maximum Allowable Back Pressure		7 psi less than motive medium pressure used			7 psi less than motive medium pressure used, but not to exceed 150 psig		
Volume of Each Discharge Cycle (gal)		approximately 8					
Motive Medium*		Saturated Steam, Compressed Air, Nitrogen					
Pumped Medium**		Steam Condensate, Water					

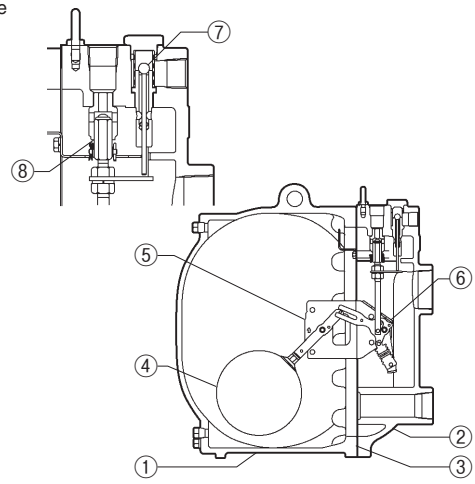
* Do not use with toxic, flammable or otherwise hazardous fluids. ** Do not use for fluids with specific gravities under 0.85 or over 1, or for toxic, flammable or otherwise hazardous fluids.

Connections and sizes in bold are standard

⚠ CAUTION 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 (GP10)		Graphite Compound	—	—
	Cover Gasket (GP14)		Graphite/Stainless Steel	– / AISI316L	– / SUS316L
④	Float		Stainless Steel	AISI316L/303	SUS316L/303
⑤	Lever Unit		Stainless Steel	—	—
⑥	Snap-action Unit		Stainless Steel	—	—
⑦	Motive Medium Intake Valve Unit	Intake Valve	Stainless Steel	AISI303/440C	SUS303/440C
		Valve Seat	Cast Stainless Steel/ Stainless Steel	A351 Gr.CF8/ AISI440C	– / SUS440C
⑧	Exhaust Valve Unit	Exhaust Valve	Stainless Steel	AISI303/440C	SUS303/440C
		Valve Seat	Stainless Steel	AISI420F	SUS420F
⑨	Check Valve***	CK3MG	Cast Stainless Steel	A351 Gr.CF8	—
		CKF3MG	Cast Stainless Steel	A351 Gr.CF8	—

* Equivalent ** Option: Cast Stainless Steel
*** Not shown, model depends on connection; CK3MG for screwed, CKF3MG for flanged



Discharge Capacity

● GP10 (Filling Head: 36″ from Grade)

Inlet Pipe Size		A 2″		B 2″		C 2″		D 3″		E 2″		F 3″	
Inlet Check Valve		1″ CK3MG		1½″ CK3MG		2″ CK3MG		3″ CK3MG		2″ CKF3MG		3″ CKF3MG	
Outlet Check Valve		1″ CK3MG		1½″ CK3MG		2″ CK3MG		2″ CK3MG		2″ CKF3MG		2″ CKF3MG	
Motive Medium		Air	Steam	Air	Steam	Air	Steam	Air	Steam	Air	Steam	Air	Steam
Motive Medium Inlet Pressure (P_m) (psig)	Total Lift or Back Pressure (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	3,600	3,400	7,800	7,500	12,100	11,900	18,600	18,400	10,900	10,700	16,700	16,600
	25	3,500	3,300	7,400	6,900	11,200	11,000	16,400	15,800	10,100	9,900	14,800	14,200
	40	3,300	3,100	6,800	6,300	9,800	9,300	13,400	12,500	8,800	8,400	12,100	11,300
	60	3,000	2,900	6,200	5,400	8,300	7,800	10,400	9,500	7,500	7,000	9,400	8,600
	80	2,900	2,700	5,600	4,600	7,000	6,500	8,000	7,300	6,300	5,900	7,200	6,600
	100	2,600	2,500	5,100	3,900	6,400	5,400	7,000	6,100	5,800	4,900	6,300	5,500
125	15	3,400	3,200	7,600	7,200	11,800	11,600	17,500	17,300	10,600	10,400	15,800	15,600
	25	3,300	3,100	7,200	6,700	10,600	10,400	15,300	14,900	9,500	9,400	13,800	13,400
	40	3,100	2,900	6,600	6,000	9,300	8,900	12,600	11,600	8,400	8,000	11,300	10,400
	60	2,900	2,800	5,900	5,100	8,000	7,000	10,000	8,900	7,200	6,300	9,000	8,000
	80	2,600	2,500	5,100	4,300	6,800	5,800	7,700	6,800	6,100	5,200	6,900	6,100
	100	2,400	2,200	4,600	3,500	6,100	5,000	6,800	5,600	5,500	4,500	6,100	5,000
100	15	3,300	3,100	7,500	7,000	11,500	11,200	16,900	16,100	10,400	10,100	15,200	14,500
	25	3,100	3,000	7,000	6,600	10,000	9,800	15,000	13,600	9,000	8,800	13,500	12,200
	40	2,900	2,800	6,200	5,700	8,800	8,200	11,900	10,700	7,900	7,400	10,700	9,600
	60	2,700	2,600	5,400	4,800	7,600	6,600	9,600	7,900	6,800	5,900	8,600	7,100
	80	2,400	2,300	4,700	3,900	6,400	5,000	7,400	5,900	5,800	4,500	6,700	5,300
75	15	3,100	3,000	7,400	6,700	11,100	10,900	15,500	14,600	10,000	9,800	14,000	13,100
	25	3,000	2,900	6,700	6,200	9,400	9,200	13,300	12,100	8,500	8,300	12,000	10,900
	40	2,800	2,700	5,800	5,300	8,100	7,700	10,600	8,800	7,300	6,900	9,500	7,900
	60	2,500	2,400	4,700	4,300	6,500	5,600	7,600	6,600	5,900	5,000	6,800	5,900
50	10	3,100	2,900	7,500	6,600	11,000	10,800	15,100	14,600	9,900	9,700	13,600	13,100
	15	3,000	2,800	7,100	6,200	9,800	9,300	13,900	13,000	8,800	8,400	12,500	11,700
	25	2,900	2,700	6,300	5,400	8,500	7,200	11,900	9,900	7,700	6,500	10,700	8,900
	40	2,600	2,500	5,000	4,200	6,600	5,500	8,000	6,100	5,900	5,000	7,200	5,500
25	5	3,000	2,900	7,200	6,300	10,500	10,300	14,800	12,900	9,500	9,300	13,300	11,600
	10	2,900	2,800	6,700	5,700	9,500	8,200	12,400	9,700	8,600	7,400	11,200	8,700
	15	2,800	2,600	6,200	5,100	8,500	6,400	9,500	7,300	7,700	5,800	8,600	6,600

● GP14 (Filling Head: 36″ from Grade)

Inlet Pipe Size		G 2″		H 3″		I 2″		J 3″	
Inlet Check Valve		2″ CK3MG		3″ CK3MG		2″ CKF3MG		3″ CKF3MG	
Outlet Check Valve		2″ CK3MG		2″ CK3MG		2″ CKF3MG		2″ CKF3MG	
Motive Medium		Air	Steam	Air	Steam	Air	Steam	Air	Steam
Motive Medium Inlet Pressure (P_m) (psig)	Total Lift or Back Pressure (P_2) (psig)	(lb/h)	(lb/h)	(lb/h)	(lb/h)	(lb/h)	(lb/h)	(lb/h)	(lb/h)
150 – 200	15	11,100	9,700	13,800	13,300	9,900	8,700	13,400	12,700
	25	10,300	8,600	12,600	11,700	9,200	7,800	12,200	11,100
	40	9,200	7,100	10,800	9,400	8,100	6,500	10,500	8,900
	60	8,000	5,600	9,000	7,200	7,100	5,300	8,900	6,700
	80	7,000	4,400	7,500	5,400	6,200	4,300	7,500	5,000
	100	6,200	3,600	6,600	4,200	5,500	3,600	6,500	3,900
	120	5,700	3,200	6,000	3,600	5,100	3,200	6,000	3,400
125	15	11,100	9,000	13,800	11,900	9,900	7,900	13,400	11,400
	25	10,300	7,900	12,600	10,300	9,200	7,000	12,200	9,800
	40	9,200	6,400	10,800	8,100	8,100	5,800	10,500	7,600
	60	7,900	4,900	9,000	6,000	7,100	4,600	8,400	5,500
	80	6,700	3,700	7,500	4,300	6,000	3,500	6,800	3,900
	100	6,000	2,900	6,600	3,300	5,400	2,700	6,100	2,900
100	15	10,300	8,300	12,900	10,800	9,100	7,200	12,600	9,800
	25	9,500	7,200	11,600	9,100	8,300	6,300	11,300	8,300
	40	8,400	5,700	9,700	6,900	7,300	5,000	9,600	6,200
	60	7,200	4,200	7,900	4,800	6,300	3,700	7,800	4,300
	80	6,100	3,000	6,400	3,200	5,500	2,600	6,100	2,900

● Correction Factors

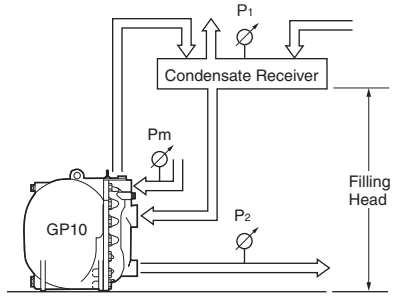
(For GP10 and GP14 with filling heads other than 36″)

Filling Head from Grade	Inlet Pipe / Check Valve Size (in)			
	GP10			GP14
	1	1½, 2	3	2, 3
60″	1.34	1.27	1.14	1.14
54″	1.29	1.24	1.12	1.12
48″	1.22	1.18	1.09	1.09
42″	1.13	1.11	1.05	1.05
36″	1.0	1.0	1.0	1.0
30″	0.71	0.75	0.88	0.88

NOTE:

- A check valve must be installed at both the pumped medium inlet and outlet. To achieve the above capacities with the standard GP10 or GP14 configuration, TLV CK3MG or CKF3MG 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.

● Illustration of Filling Head and Pressures

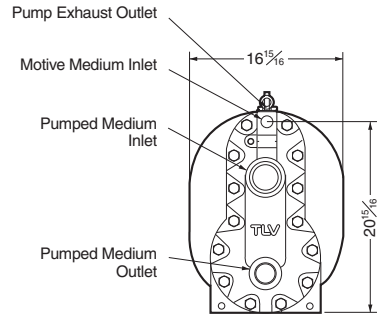


The discharge capacity is determined by the motive medium, motive medium pressure (Pm) and back pressure (P_2).

Make sure that:

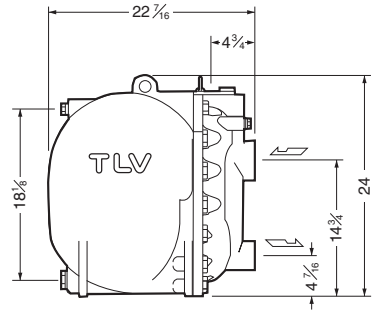
Discharge capacity × Correction Factor > Required Flow Rate

Dimensions



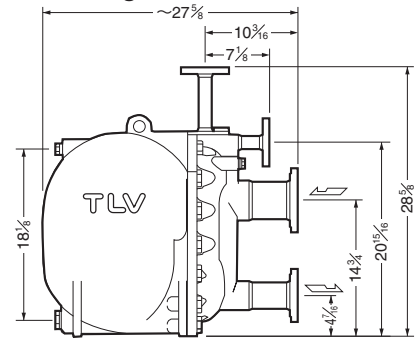
Units: in

● **Screwed***



Weight (lb): 273 (Cast Iron), 300 (Cast Steel)
* NPT, other standards available

● **Flanged****



Weight (lb): 322 (Cast Steel)
** ASME Class 150 RF (GP10, option for GP14), Class 300 RF (GP14), other standards available

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)

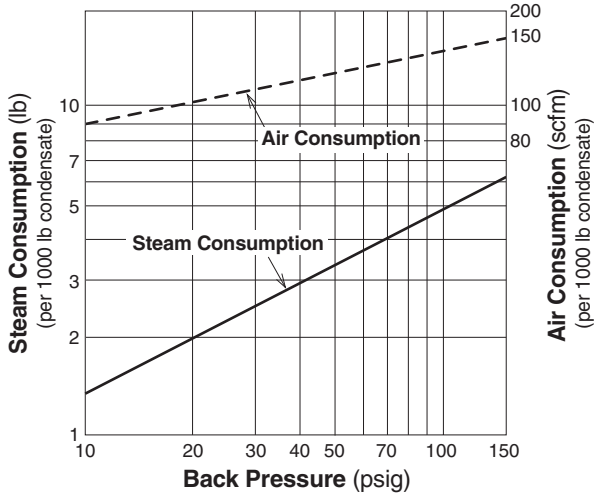
Flash Steam up to (lb/h)	Receiver Diameter (in)	Vent Pipe Diameter (in)
50	3	1
75	4	1½
100	4	2
200	6	2½
300	8	3
400	8	4
600	10	4
800	12	6
1,000	14	6
1,400	16	8
1,600	18	8
2,000	20	8

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 (P_2) equals 2 or greater (when $Pm \div P_2 \geqq 2$).

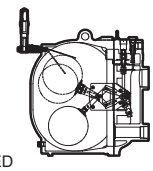
Steam or Air Consumption (Motive Medium)



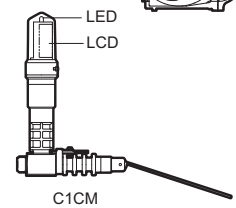
* Equivalent consumption of air at 68 °F under atmospheric pressure

Cycle Counter (option)

Two types of counter can be installed on the GP10/GP14 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.

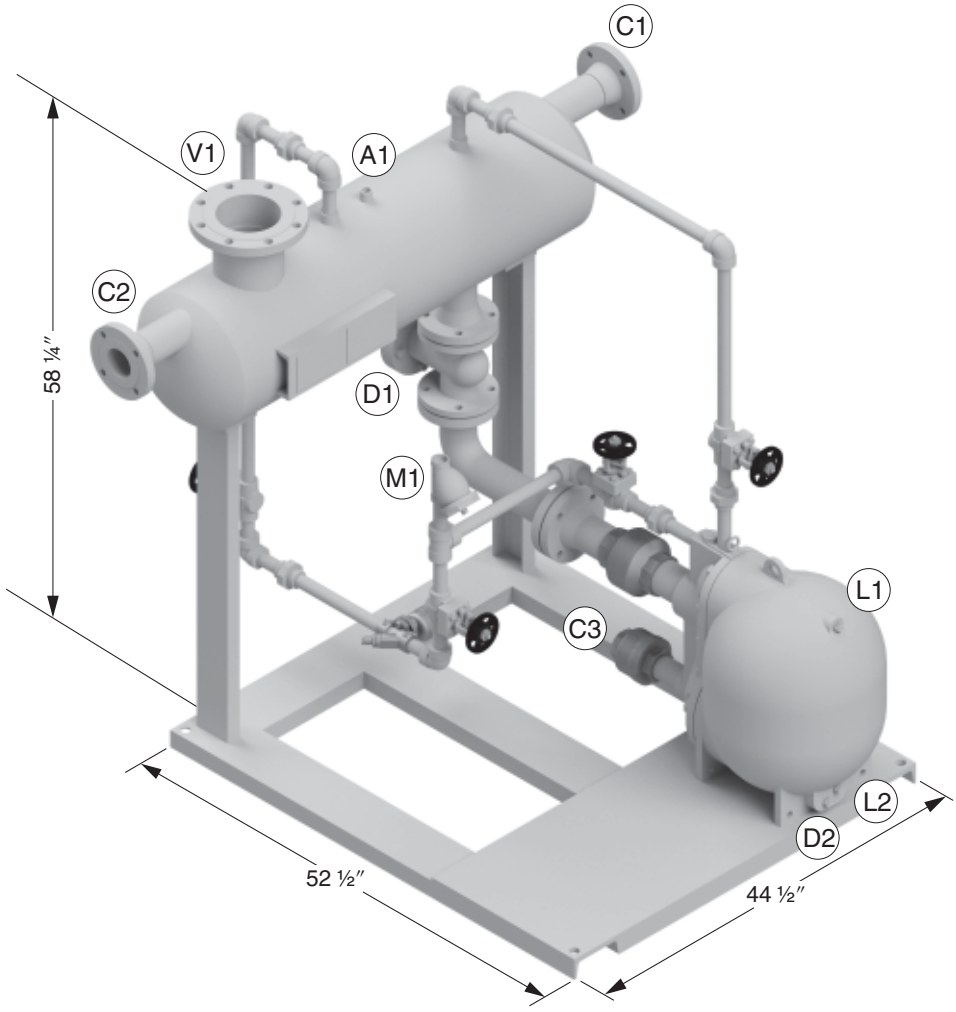


- C1SM - (Terminal Box Type) : Designed for use with remote monitoring equipment and systems.

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

System Package Configuration

Single System Package[1)]



Available Standard System Package Configurations

Single GP10/GP14: 29 Gallon Tank

Weight: approx. 1060 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** for GP10, column **H** for GP14.

Twin GP10/GP14: 50 Gallon Tank

Weight: approx. 1740 lb
Max. Allowable Flash Steam: 3200 lb/h

Tag	Qty.	Size (in)	Process
A1	1	½	Air Vent Connection
C1	1	4	Condensate Inlet Connection
C2	1	4	Auxiliary 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 ½	Motive Steam Inlet Connection
V1	1	6	Max. Flash Steam Capacity

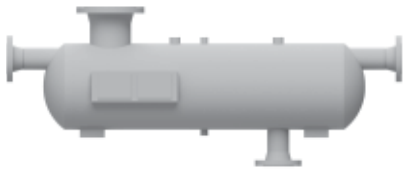
Discharge Capacity: double the discharge capacity found in column **D** for GP10, column **H** for GP14.

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:	ASME 150RFWN flanged fittings
Connections 1 ½″ and smaller:	300# socket weld fittings
Corrosion Allowance:	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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Member of FCI Fluid Controls Institute, Inc. Technical Resources for Instrumentation and Fluid Control

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

ISO 9001
ISO 14001
CERTIFIED ISO 9001 · ISO 14001

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Products for intended use only.
Specifications subject to change without notice.