

**INSTALLATION, OPERATION and  
MAINTENANCE MANUAL**

**Inverted Bucket Steam Trap  
MODEL: ER 25 SERIES**



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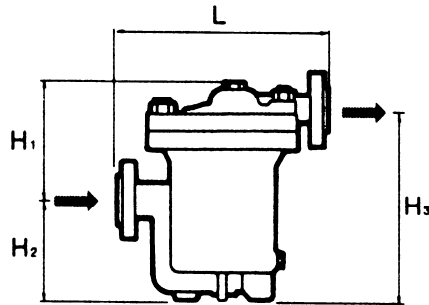
## SAFETY INSTRUCTION

Prior to using the ER 25 series, read this manual thoroughly to understand the correct handling and operating procedure.

The manual should be used by experienced personnel as a guide to the installation and maintenance of the Steam Traps.

We ask you to contact MIYAWAKI or its local representative if further information is required.

## 1. Dimensions and Technical Specification



Model	Connections	Size	Max. Oper. Press.		Max. Oper. Temp.		Dimensions (mm)				Dimensions (inch)				Weight	
			MPa	psig	°C	°F	L	H <sub>1</sub>	H <sub>2</sub>	H <sub>3</sub>	L	H <sub>1</sub>	H <sub>2</sub>	H <sub>3</sub>	kg	lb
ER 25 – 45	flanged	½" – 2"	2,5	360	425	800	Ref. Table 1	210	180	345	Ref. Table 1	8.3	7.1	13.6	½"-1"	105.6
			4,4	640											48	
			6,4	925											1 ¼"-2"	
ER25W-45	socket weld	½" – 2"	2,5	360	425	800	½"-1½"	210	180	345	½"-1½"	8.3	7.1	13.6	45	99
			4,4	640			340				13.4					
			6,4	925			2"				15.0					

### Face – to – face dimensions of ER 25

Size	Flange standard		L (mm)	L (inch)
½" – 1"	JIS 20-40K	ANSI 150/300 lb RF	340	13.4
	ANSI 600 lb RF	ANSI 150-600 lb RJ	345	13.6
	JIS 63K	ANSI 900 lb RF/RJ	380	15.0
1¼" – 2"	JIS 20-40K	ANSI 150-600 lb RF/RJ	380	15.0
	JIS 63K	ANSI 900 lb RF/RJ	400	15.8

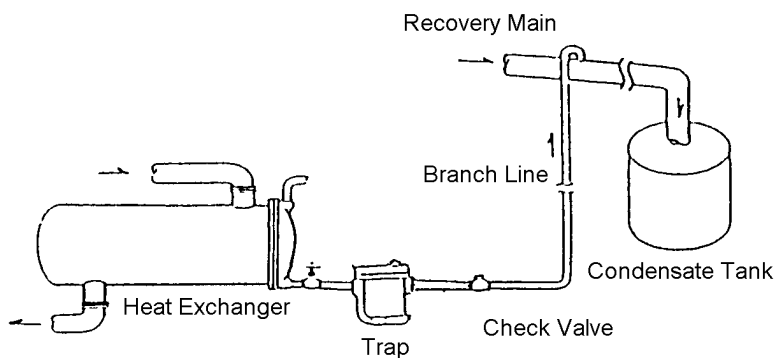
Body Material: Cast Steel SCPH 2

## 2. Installation

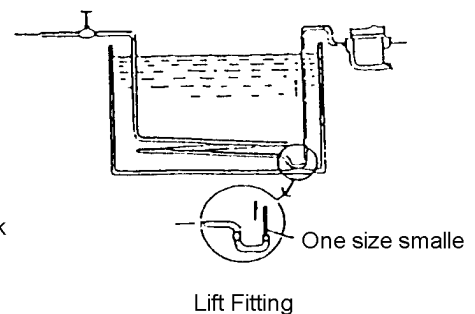
<b>CAUTION</b>	Before installing the trap, always blow down the piping that leads to the trap's inlet.
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<b>CAUTION</b>	The inverted bucket steam trap Model ER 25 can only be installed horizontally.
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- A. Install the trap according to the direction of the arrow on the body.
- B. Install the trap at the lowest point of the steam using equipment to be drained.
- C. Install the trap so that the condensate will flow naturally into the trap.
- D. When recovering the condensate, the outlet branch line should be piped from the steam trap as shown in drawing A.  
It is recommended to install a check valve on the downstream side of the trap.
- E. If the trap is installed higher than the steam using equipment, use a lift fitting as shown in drawing B for better performance.
- F. If the trap is used for draining a cylinder dryer, please, install it lower than the lowest point of the cylinder and minimize the horizontal piping.  
Do not insulate the piping.
- G. The trap should be installed for easy maintenance.
- H. Upon start up inspect the following:
  1. Eventual leakage from the sealing of the Body (1) and the Cover (2) - If the trap is leaking retighten the cover bolts and nuts (33) evenly crosswise.
  2. Eventual leakage from the Plugs (3), (29) or (36) -If the trap is leaking retighten the plugs.



Drawing A



Drawing B

### **3. Trouble-shooting**

The steam trap should be checked for proper operation at least once a year.

The inverted bucket steam trap is operating intermittently, i.e. it will discharge the condensate and close at certain cycles.

Improper operations will be:

- No discharge
- Continuous discharge of condensate or steam.

<b>Problem</b>	<b>Reason</b>
The trap is not discharging. The trap is cold.	<p>A. The inlet valve is closed. Open it.</p> <p>B. The operating pressure is too high. Check the operating conditions of the trap. If necessary reduce the inlet pressure or change the valve (No. 6) and the valve seat (No. 7) according to the higher operating pressure.</p> <p>C. The strainer is plugged. Remove the Body Plug (No.36) and clean the strainer (28).</p> <p>D. The air vent (hole in the bucket) is plugged. Open the trap and clean the hole.</p> <p>E. The valve seat is plugged. Open the trap and clean the seat.</p>
The trap is not discharging. The trap is hot.	<p>A. No condensate is flowing to the trap.</p> <ul style="list-style-type: none"> <li>- The by-pass valve or flanges upstream are leaking.</li> <li>- In case of cylinder dryers the syphon tube is damaged or broken.</li> <li>- A vacuum had been created at the upstream piping. Install a vacuum breaker upstream.</li> </ul>
The Trap is discharging continuously condensate.	<p>A. The capacity of the trap is too low.</p>
The trap is blowing through steam.	<p>A. Loss of prime The ER model requires a minimum condensate flow of about 50 kg/h for normal operation. If the specification is lower, please, change to another model. Close the upstream valve for a few minutes and open the valve then gradually to rebuild the prime.</p> <p>B. Scale is lodged between the valve and the valve seat.</p> <p>C. The valve or the valve seat are damaged.</p>
The trap is discharging normally (intermittently), but the steam using equipment is not obtaining enough heat.	<p>A. Eventually steam locking at the heat exchanger.</p> <p>B. Maybe, on trap is installed to several lines (short circuiting).</p>

## **4. Maintenance, Disassembling and Assembling**

<b>WARNING</b>	Before disassembling a steam trap be sure to close the valves in both supply and discharge lines, reduce the pressure inside the trap to atmospheric pressure, and allow the trap to cool before opening it.
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For cleaning purposes or for changing parts perform the following steps:

### **A. Replacing the valve unit (super discharger)**

- 1) Unscrew the cover plug (3) and disassemble the valve seat (4) with a “T” wrench.
- 2) Remove the cover bolts and nuts (33). Take off the cover (2) together with all internal parts ( valve unit and bucket unit)
- 3) Take off the split pin from the eyebolt pin (19) and dismantle the eyebolt pin. The bucket will come part along with the eyebolt (17) and the u-nut (18). The connector (12) and the lever B (21) will be disconnected. Unscrew the bolt (25). The lever A (20) and lever B (21) will be disconnected from the valve unit.
- 4) Unscrew the cylinder (10) from the bonnet (8). The complete valve unit will be dismantled. The bonnet (8) is welded to the cover.
- 5) Clean the contact surface of the bonnet (8). Screw the new valve unit to the bonnet.
- 6) Loosen the bolt (26) and move the swivel ring (27) to a position where the lever B (21) should be parallel or perpendicular to the outlet flange. Screw the bolt (26) to firm the swivel ring. Just turn the bolt only ½ turn after the bolt (26) touched the surface of the cylinder (10).
- 7) Connect the lever B (21) and the bucket unit by placing the eyebolt pin (19) through the eyebolt (17) and the hole of the lever B. Place the split pin into the hole of the eyebolt pin.
- 8) Replace the cover gasket (34) and assemble the cover to the body.
- 9) Clean the contact surfaces of the bonnet (8) and the valve seat (4). Screw the valve seat into the bonnet.  
Screw in the plug (3).

### **B. Cleaning of the valve unit (super discharger)**

- 1) Disassemble the cover (2).
- 2) Take off the split pin from the pin (23), dismantle the pin (23). The connector (12) and the lever B (21) will be disconnected.
- 3) Unscrew the gland (11) from the cylinder (10) and take off the internal parts separately. Clean all parts and replace worn ones.
- 4) Assemble the main valve unit (5, 9, 13), then the pilot valve unit (6, 12, 15). Screw the gland (11) to the cylinder (10). Connect the lever B (21) and the connector (12) with the pin (23) and firm it with the split pin.
- 5) Assemble the cover.

### C. Cleaning or replacing the strainer

- 1) Remove the plug (36) and take out the screen (28). Check and clean it.
- 2) Install the screen (28) and assemble the plug. Don't forget to replace the plug gasket (37) by a new one.

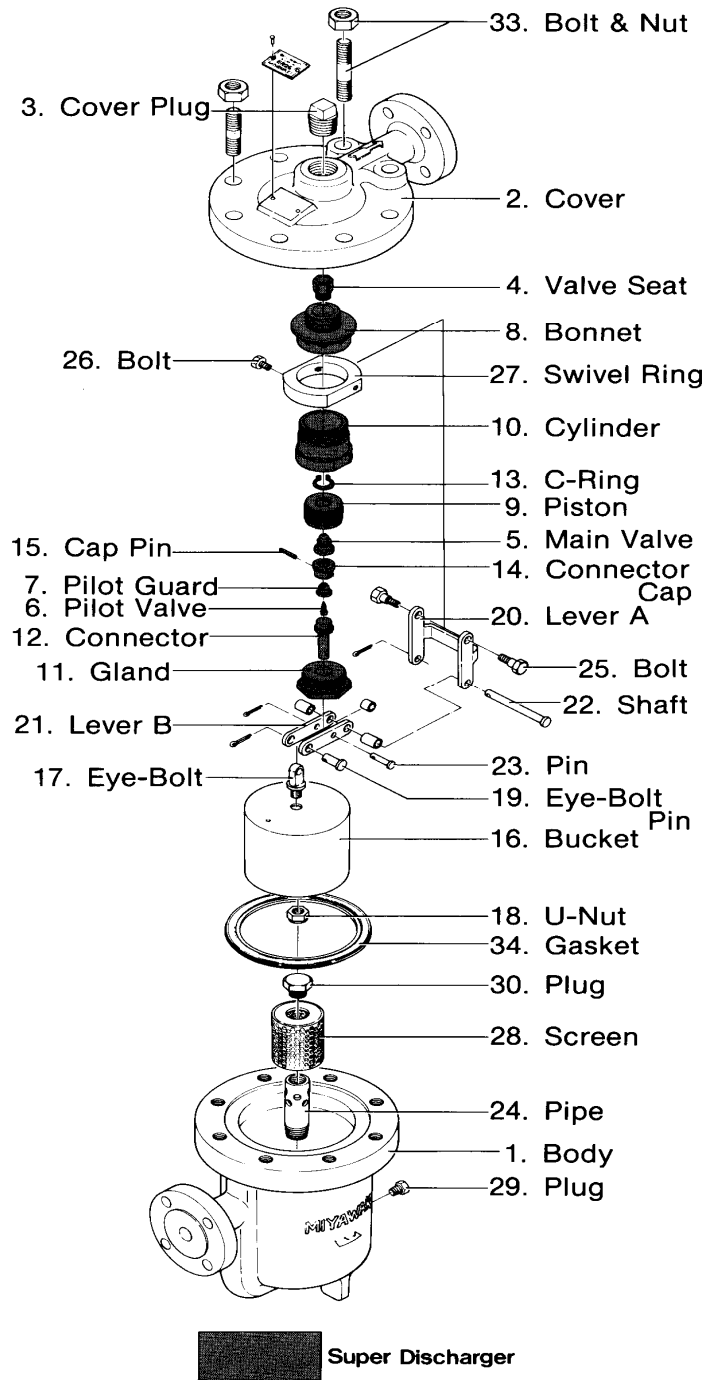
<b>CAUTION</b>	When reassembling the body always replace the Cover Gasket (34) by a new one.
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<b>CAUTION</b>	Tighten the Cover Bolts (34) evenly crosswise.
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### Wrench Sizes and Torques

Parts Number	Parts Name	Wrench Size (mm)	Torque (Nm)
4	Valve seat	17	80
10	Cylinder	42	200
11	Gland	38	200
18	U-nut	19	50
25	Bolt	12	10
30	Plug	29	100
33	Cover Bolt and nut	30	300

## 5. Details and Spare Parts List



### SPARE PARTS LIST

No.	Parts / Unit Name
4	Valve seat
5-7, 9-15	Super discharger
16	Bucket
34	Cover Gasket
28 & 37	Screen & Plug gasket