

OPERATING MANUAL
FOR
INVERTED BUCKET STEAM TRAP
MODEL:ER116



SAFETY

The following warnings and cautions are shown at appropriate places in this manual.



WARNING

Failure to observe this type of precaution may lead to serious injury or death.

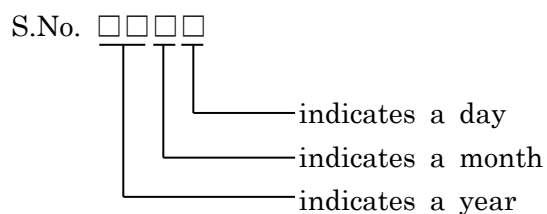


CAUTION

Failure to follow this type of precaution can lead to injury or damage to equipment and property.

S No. on the name plate of our product indicates a manufacturing date.

Indicating method of S No.



Example of indicating a year

03 → 2003 13 → 2013

Method of indicating a month

Mark	Month	Mark	Month	Mark	Month	Mark	Month
1	January	4	April	7	July	X	October
2	February	5	May	8	August	Y	November
3	March	6	June	9	September	Z	December

Method of indicating a day

Mark	Day	Mark	Day	Mark	Day	Mark	Day
1	1	9	9	H	17	Q	25
2	2	A	10	J	18	R	26
3	3	B	11	K	19	S	27
4	4	C	12	L	20	T	28
5	5	D	13	M	21	U	29
6	6	E	14	N	22	V	30
7	7	F	15	O	23	W	31
8	8	G	16	P	24		

(Example)

In case that S.No. is 0316, the manufacturing date is January 6, 2003

In case that S.No. is 13XM, the manufacturing date is October 21, 2013

CONTENTS

1. Introduction·····	P.1
2. Dimensions and Specifications·····	P.1
3. Installations·····	P.2
4. Trouble Shooting·····	P.3
5. Maintenance, Disassembling and Assembling·····	P.4
6. Construction·····	P.6
7. Warranty·····	P.7
★ Guidance for reading special product name·····	P.8

1. Introduction

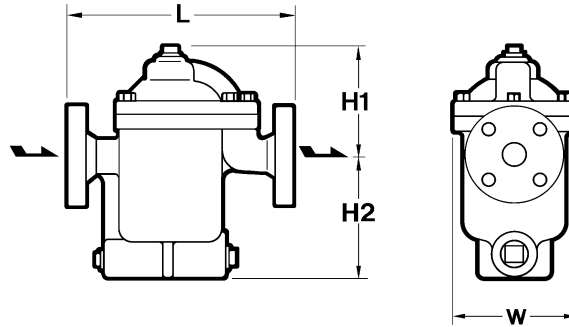
Inverted Bucket steam trap, inverted bucket Model ER Series is for multipurpose steam traps.

Especially for medium and large capacities.

This manual contains Installation, Trouble Shooting and Maintenance etc..


Never fail to read them to the end before using.

2. Dimensions and Specifications



Model No.	Connections	Size mm (inch)	Operating Pressure (MPa)	Maximum Temperature °C (°F)	Material of Body	Dimensions (mm)				Weight (kg)
						L	H1	H2	W	
ER116-7	Flanged	15(1/2)	0.05 to 0.7	350 (662)	Ductile Cast Iron (FCD450)	300	220	131	190	19
		20(3/4)								
		25(1)								
		32(1_1/4)					180	167	190	23
		40(1_1/2)								
		50(2)								
ER116-16	Flanged	15(1/2)	0.05 to 1.6	350 (662)	Ductile Cast Iron (FCD450)	300	220	131	190	19
		20(3/4)								
		25(1)								
		32(1_1/4)					180	167	190	23
		40(1_1/2)								
		50(2)								
ER116-16L	Flanged	15(1/2)	0.05 to 1.6	350 (662)	Ductile Cast Iron (FCD450)	300	220	131	190	19
		20(3/4)								
		25(1)								
		32(1_1/4)					180	167	190	23
		40(1_1/2)								
		50(2)								

3. Installations

 CAUTIONS	<ul style="list-style-type: none">• Before installing the trap always blow off the sludge, scales, etc. from the piping.• This trap can be installed horizontally.
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1) Install trap according to the direction of the arrow on the body.

2) Pipe the outlet condensate recovery piping at the lowest point of the steam using equipment.

The trap should be installed that condensate will flow naturally into the trap.

3) When recovering the condensate outlet branch line should be piped from the steam trap as the drawing A below.

Install a check valve on the downstream side on the trap.

4) If the trap is installed higher than the steam using machinery please install lift fitting as drawing B below for better performance.

5) If installed on cylinder dryer please install lower than the lowest point of the cylinder and minimize the horizontal piping.

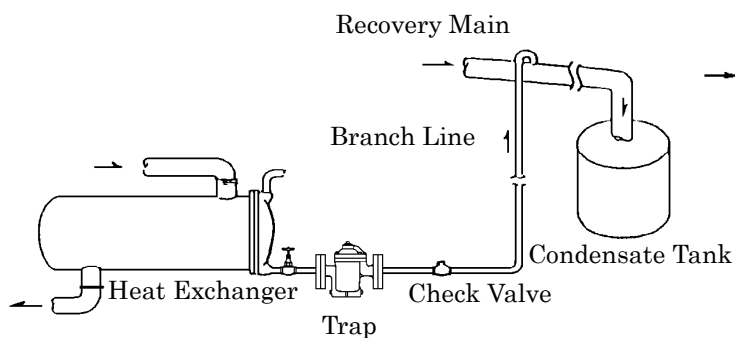
Also do not insulate the piping.

6) The trap should be installed for easy maintenance. 150mm clearance is necessary for disassembling the cover.

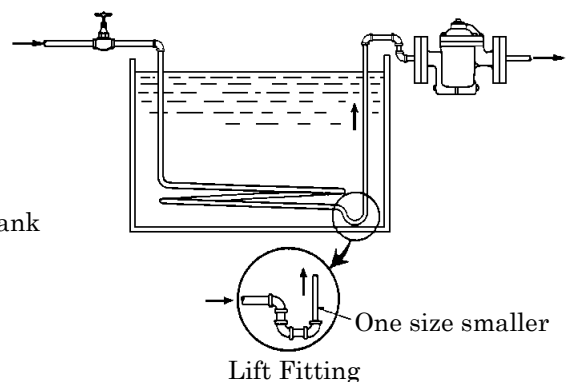
7) Upon start up inspect the followings.

a) Leak from the sealing of Body(1) and Cover(2) if leaking retighten the Cover Bolt(40) evenly.

b) Leak from the Plug(3),(4),(28),(30).
Re-tighten them.



Drawing A



Drawing B

4. Trouble Shooting

Problem	Reason
The Trap is not discharging. The Trap is cold.	The inlet valve closed.
	The operating pressure is too high. Check the operating conditions of the trap. If necessary reduce the inlet pressure or change the Valve(6) and the Valve Seat(7) according to the higher operating pressure.
	The strainer is plugged. Remove the Body Plug(3) and clean the Screen(17).
	The air vent (hole in the Bucket(9)) is plugged.
	The Valve Seat(5) is plugged.
The Trap is not discharging. The trap is hot.	No condensate is flowing to the trap. The by-pass valve or flange upstream are leaking. In case of cylinder dryers the syphon tube is damaged or broken. A vacuum had been created at the upstream piping. Install a vacuum breaker upstream.
The trap is discharging continuously condensate.	The capacity of the trap is too low.
	The Bucket(9) is out of place with the valve closed.
The trap is blowing through steam.	Loss of prime. The Series ES has a self-priming effect. If a normal amount of condensate is flowing into the trap, it will self-prime.
	Scales is lodged between the Valve(6) and the Valve Seat(5).
	The Valve(6) or the Valve Seat(5) are damaged.
	The Bucket(9) is out of place with the valve opened.

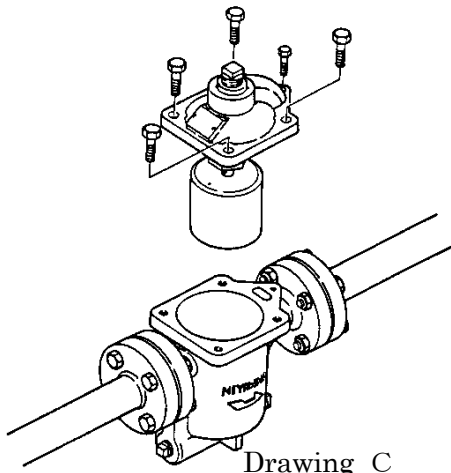
5.Maintenance, Disassembling and Assembling



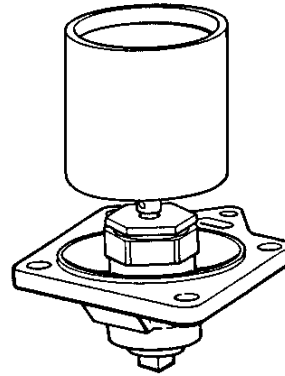
WARNING

When disassembling a hot trap, be sure to release the pressure inside to atmospheric pressure, and cool the trap before the work.

1. Disassemble Body Plug(3) take out the Screen(29) check and clean.
2. Disassemble Cover Bolt(40) and Bolt(39) take off the Cover(2), the internals (Valve Seat(5), Piston Valve(6), Pilot Valve(7), Pilot Guard(8), Bonnet(9), Cylinder Liner(11), Gland(12), Connector(13), Connector Cap(15), Cap Pin(16), Bucket(17), Eyebolt(18), U-Nut(19), Eyebolt Pin(20)) will come together as the drawing C.



Drawing C



Drawing D

3. Unscrew the Nut(19), the Bucket(27) will come off. Take off the Spilt Pin and Eyebolt Pin(20) the Eyebolt(18) will come off.
4. Firm the Cover(2) with a vise and with a box wrench disassemble the Bonnet(9).
5. Firm the Bonnet(9) disassemble the Gland(12) with a wrench,then the Pilot Valve Mechanism (Pilot Valve(7),Pilot Guard(8),Connector Cap(15), Cap Pin(16)) will come apart with the Connector(13), Piston Valve(6), Cylinder Liner(11) will also come apart. Also disassemble the Valve Seat(5) with a wrench.
6. Clean and check the parts accordingly if all the parts are in normal condition install in the opposite of disassembling. If parts are worn or defected please replace.

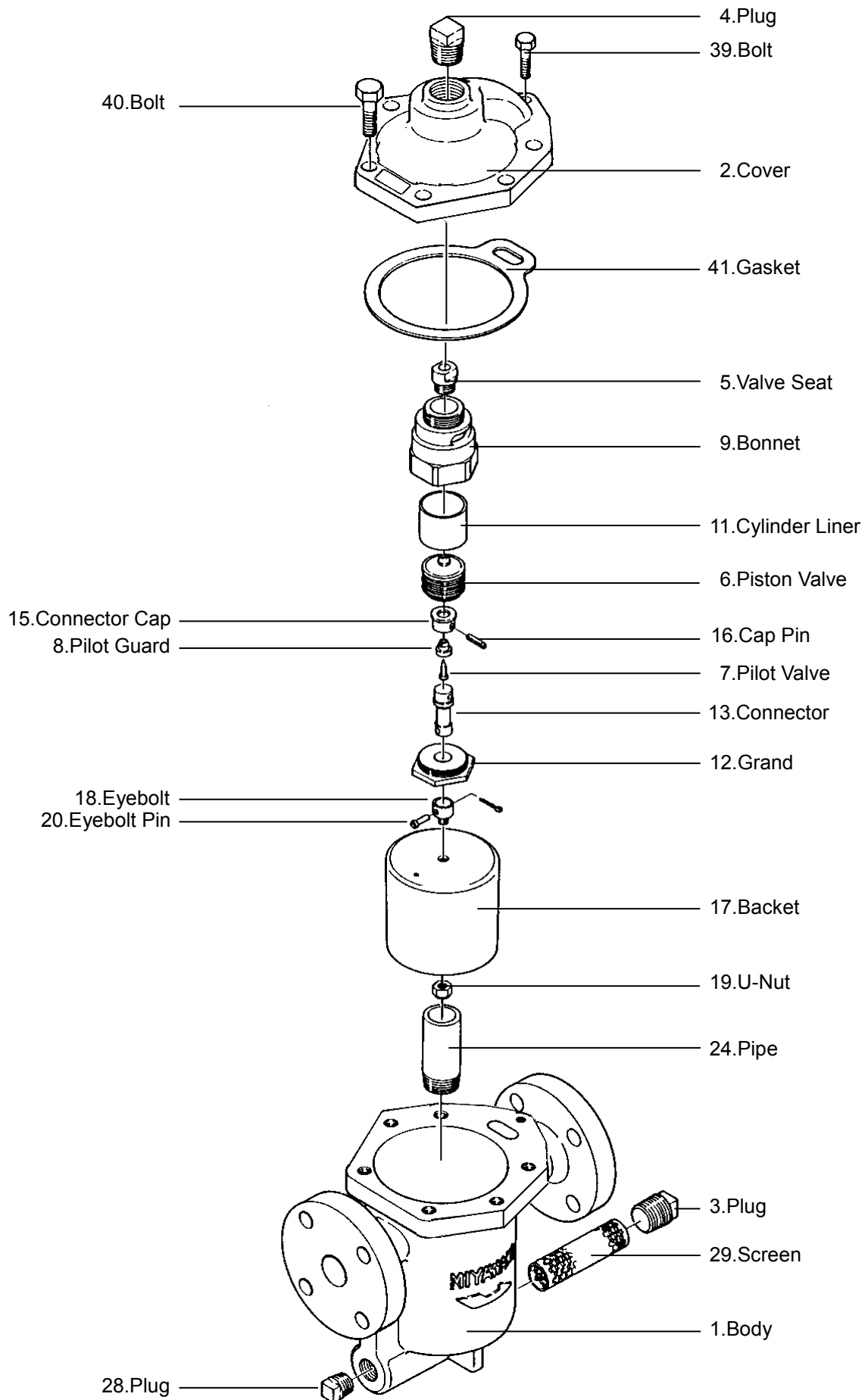
Especially the Pilot Valve(7), Piston Valve(6) and Valve Seat(5) should be checked thoroughly.



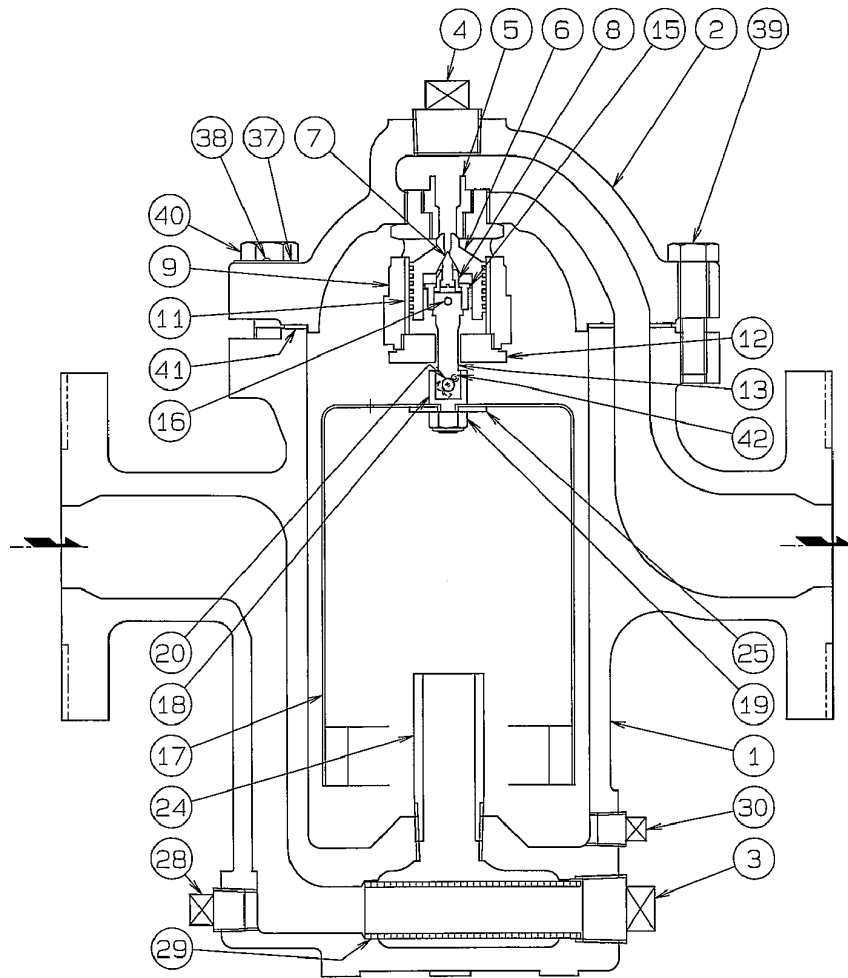
CAUTIONS

- When reassembling always replace the Cover Gasket(41) to new one.
- Gasket (41) is fragile, so please handle it with care.
- Also Bolt(39), (40) should be tightened evenly.

No.	Parts	Size	Shape	Clamp Torque	Tools
39	Bolt	17mm	Haxagon	30N·m (300kgf·cm)	Wrench
40	Bolt	19mm	Haxagon	79N·m (800kgf·cm)	Wrench



6.Construction



- | | |
|--------------------|-----------------|
| 1. Body | 17. Bucket |
| 2. Cover | 18. Eyebolt |
| 3. Plug | 19. U-Nut |
| 4. Plug | 20. Eyebolt Pin |
| 5. Valve Seat | 24. Pipe |
| 6. Piston Valve | 25. Washer |
| 7. Pilot Valve | 28. Plug |
| 8. Pilot Guard | 29. Screen |
| 9. Bonnet | 30. Plug |
| 11. Cylinder Liner | 37. Name Plate |
| 12. Gland | 38. Rivet |
| 13. Connector | 39. Bolt |
| 15. Connector Cap | 40. Bolt |
| 16. Cap Pin | 41. Gasket |

7 Warranty

7.1 Warranty period

The warranty period is 18 months after shipment or 12 months after installation, whichever occurs first.

7.2 Details of the warranty

If the product stops working correctly within the warranty period, we will repair or replace the product free of charge if the cause of the trouble is not one of the following items.

- 1) The precautions described in this manual were not observed
- 2) User's errors or mistakes such as an inappropriate installation or incorrect handling, or an excessively large impact caused by dropping
- 3) Problems caused by devices or equipment other than ours, or a disallowed use environment
- 4) When a repair or modification has been performed by anyone other than us or people who are authorized to make such repairs
- 5) Intrusion of salt or other substances that promote significant rust or corrosion or problems from fluids that contain the same substances
- 6) Consumable parts such as Packing, Gasket, O-ring, Diaphragm, etc
- 7) Attachment or accumulation of foreign matter in the pipe, such as dust and scale
- 8) Problems from fires, natural disasters, or other force majeure which is not our responsibility

7.3 Warranty limitation

The remedy available under the warranty shall not exceed the sales price of the products delivered, for any cause whatsoever.

★ Guidance for reading special product name

○○○-○○-□

**Special symbol: symbol apply only to special product
(Please refer to table 1 for details)**

1 suffix English letter after “-”.

Model symbol: Product model number

Table 1 Symbol description

Suffix	Special contents
A	Approved high-pressure gas trap
C	Blow valve attached & countermeasure against scale
K	Change of gasket
L	Special face to face dimension
M	Change of parts material
P	Change of operating pressure
R	Change of screen mesh or countermeasure against scale
T	Parts are standards, and the specification (operating temp, press. etc.) is changed
V	Change of air vent
X	Other than mentioned above or complex of special contents above

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- For any questions about the product that you purchased or about the details in this user's manual, please contact the following.
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 - Some special specifications of the product you have, may found to be different from the ones in the user's manual. If you have any question, please contact MIYAWAKI, our local authorized agent, or the place where you purchased.
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