

STEAM •

Continuous Condensate drain

For Energy and Fuel cost saving



Best Solution to **Cost Saving**
and Reduction of CO2



Simple is the Best



• **Engineering Co.,Ltd.**

Z Engineering Co,. Ltd. manufacturer profile

Name Z Engineering CO,. LTD

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Tokyo, Japan 133—0057

Directors
Chairman : Mr. Hiroki HIGASHINO

President : Mr. Tetsuya ISHII

Established October 6, 1984

Capital 50,000,000 yen

Product brand Steam Z

Do you have problem with Traditional steam trap losses ?

100%
Fuel
input

55% Useful
heat output

2% Blowdown losses
2% Pipe leakages
3% Standing losses
5% Pipework insulation losses
5% Condensate losses/flash
10% Steam trap losses
18% Stack losses



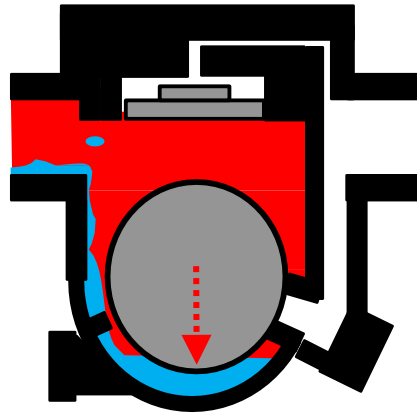
**Tired of
failing
traps?**

The structure of a traditional steam trap

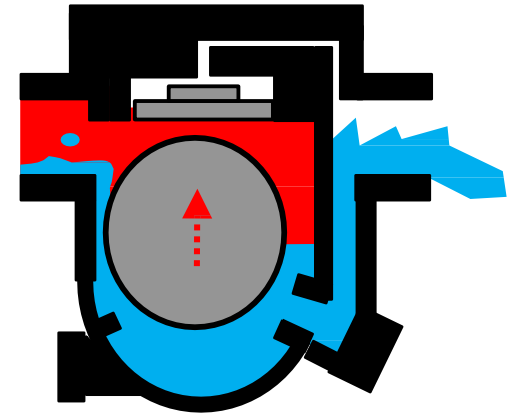
A traditional steam trap is a kind of device which automatically drains **by opening and closing of movable valve**. There are some kinds of steam trap such as 'disk type', 'floating type', 'bucket type', 'temperature regulating type' according to the structure of valve.



Floating Type



When Closing



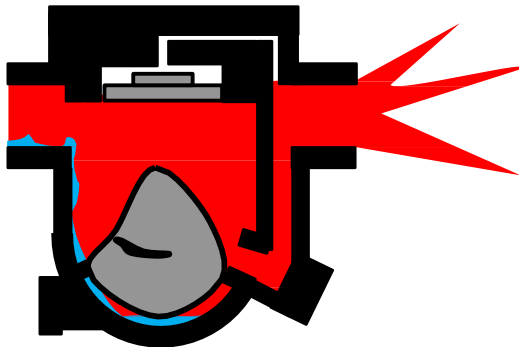
When Opening

Traditional steam trap

Traditional Steam Trap problem

Fuel Cost Increase due to the degrading

- A traditional steam trap is generally degraded in a few years and comes to leak much steam.
- Boiler would be operated more than before to make up the steam leaked, fuel cost would rapidly increase.

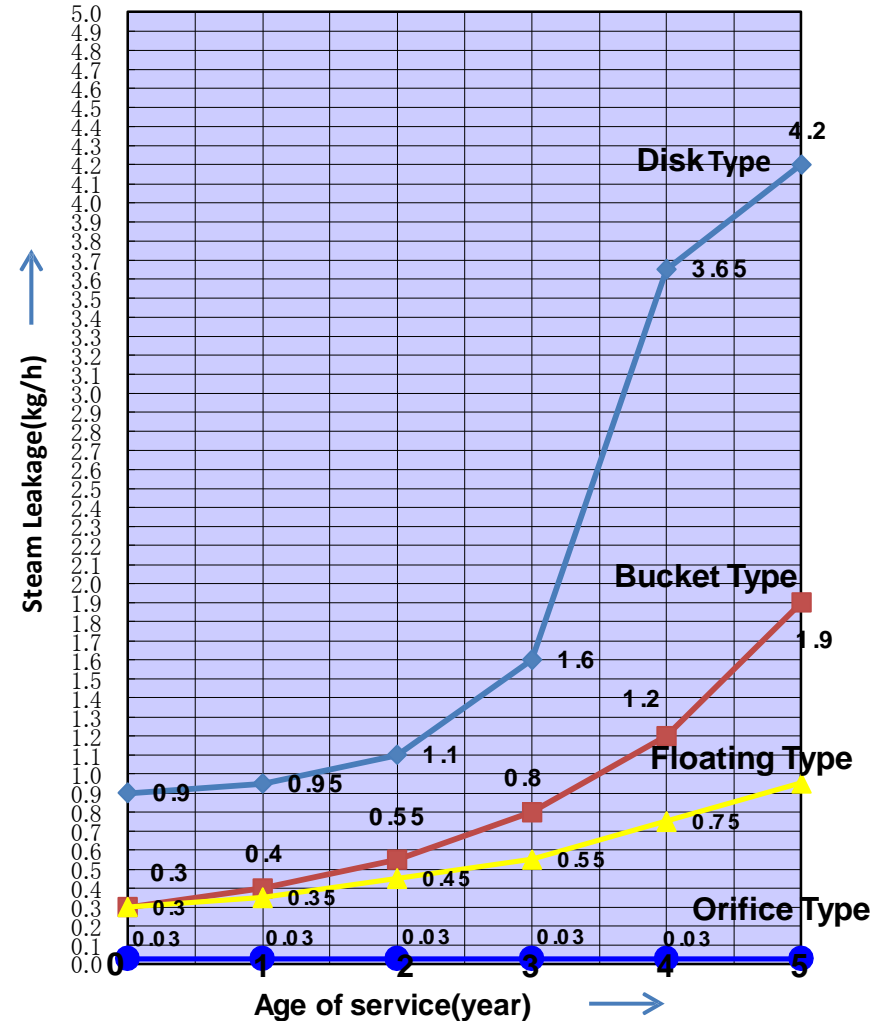


Mechanism of Degrading

- Steel ball repeats opening and closing so many times, it soon comes to degrading.
- Makes steam leakage without draining condensate.

Precondition:

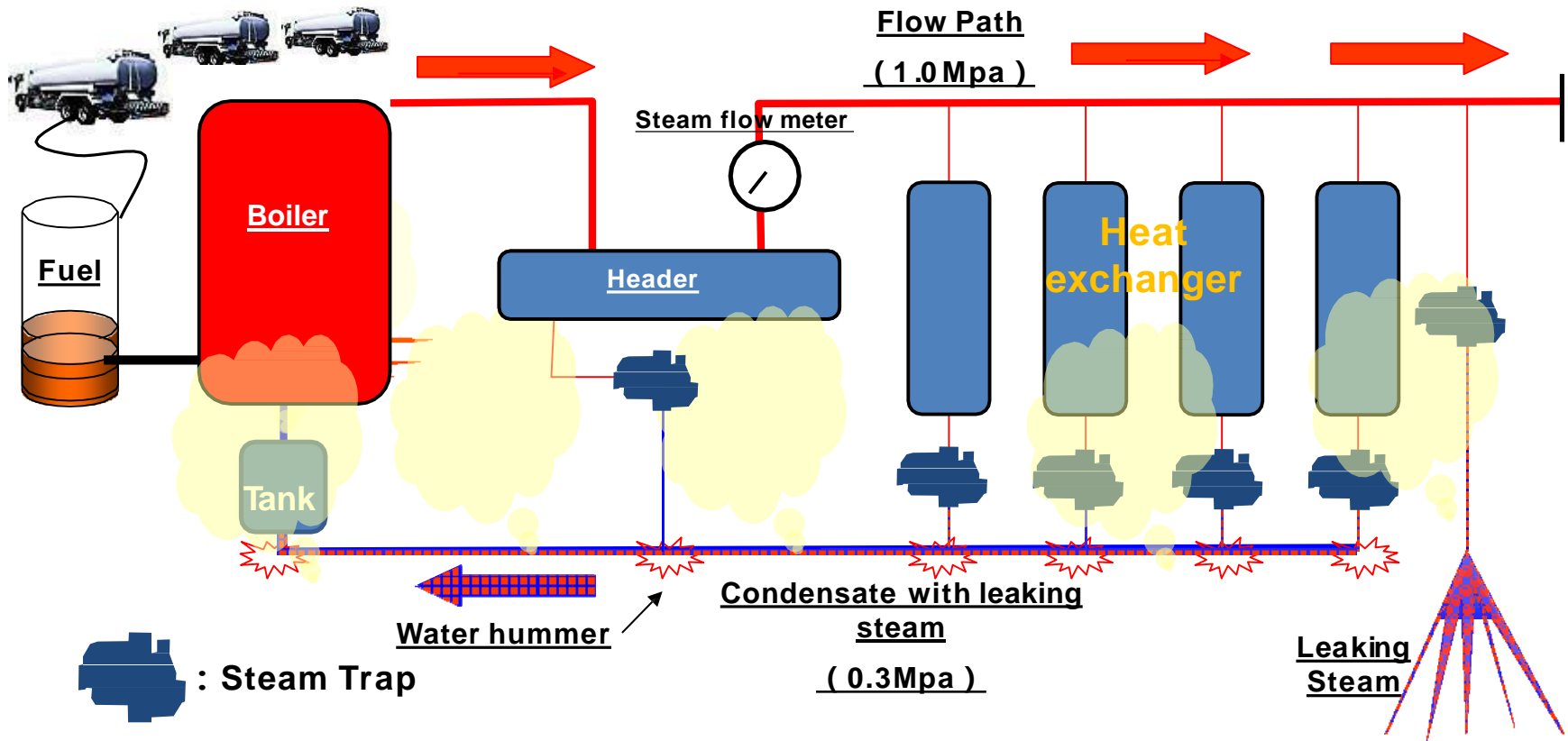
- Steam Pressure 1.0 Mpa · G
- Condensate 10kg/h



Correlation between
Age of service & steam leakage

Traditional Steam Trap problem

Condensate cannot be recovered due to the degrading

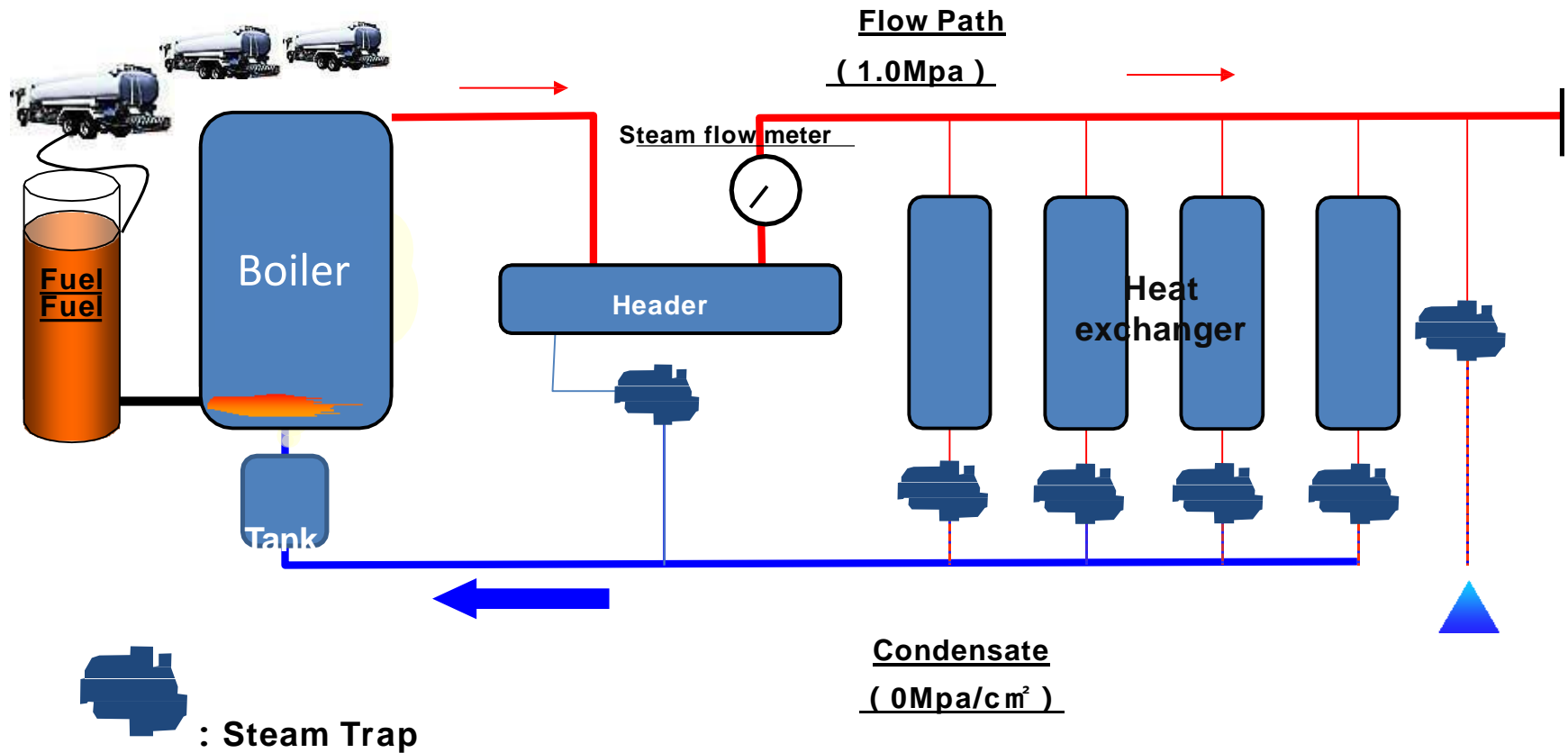


- Steam is exhausted with condensate when the steam trap is degraded.
- Fuel consumption increases to make up the leaked steam
- The piping trouble such as the water hammers happens frequently.
- Condensate cannot be recovered but steam leaks.

STEAM.



The Best Solution without degrading

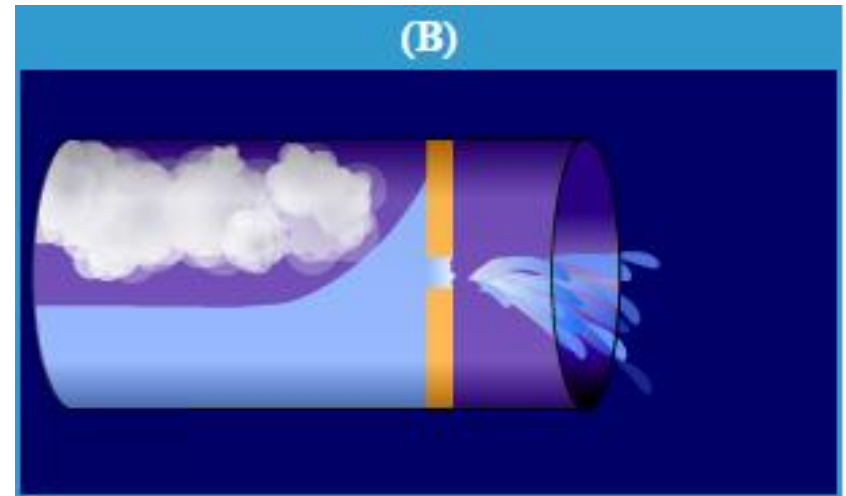
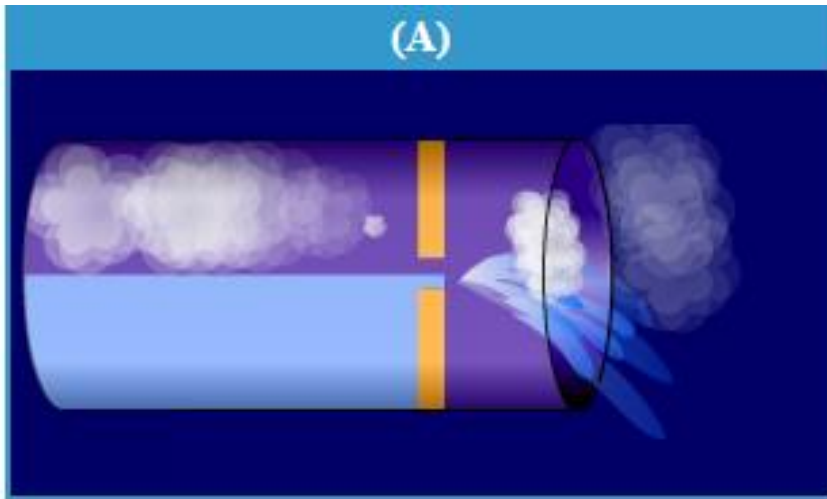


- ✓ It has been released from the maintenance work.
- ✓ Fuel cost has been rapidly reduced and condensate can be recovered without steam leakage.
- ✓ Water hammering has not been happened.

Steam Z - Concept of Condensate drain design (B)

The condensate occupies half of the pipe. If condensate and steam were to flow at the same speed, there would be no friction between the condensate and the steam. So, there would always be steam leakage through the orifice. (A)

As the steam flows more than 30 times faster than the condensate, the speed differential between the steam and the condensate produces waves, and these waves seal the orifice at more than 99 % of the time, allowing almost no steam to go through. (B)

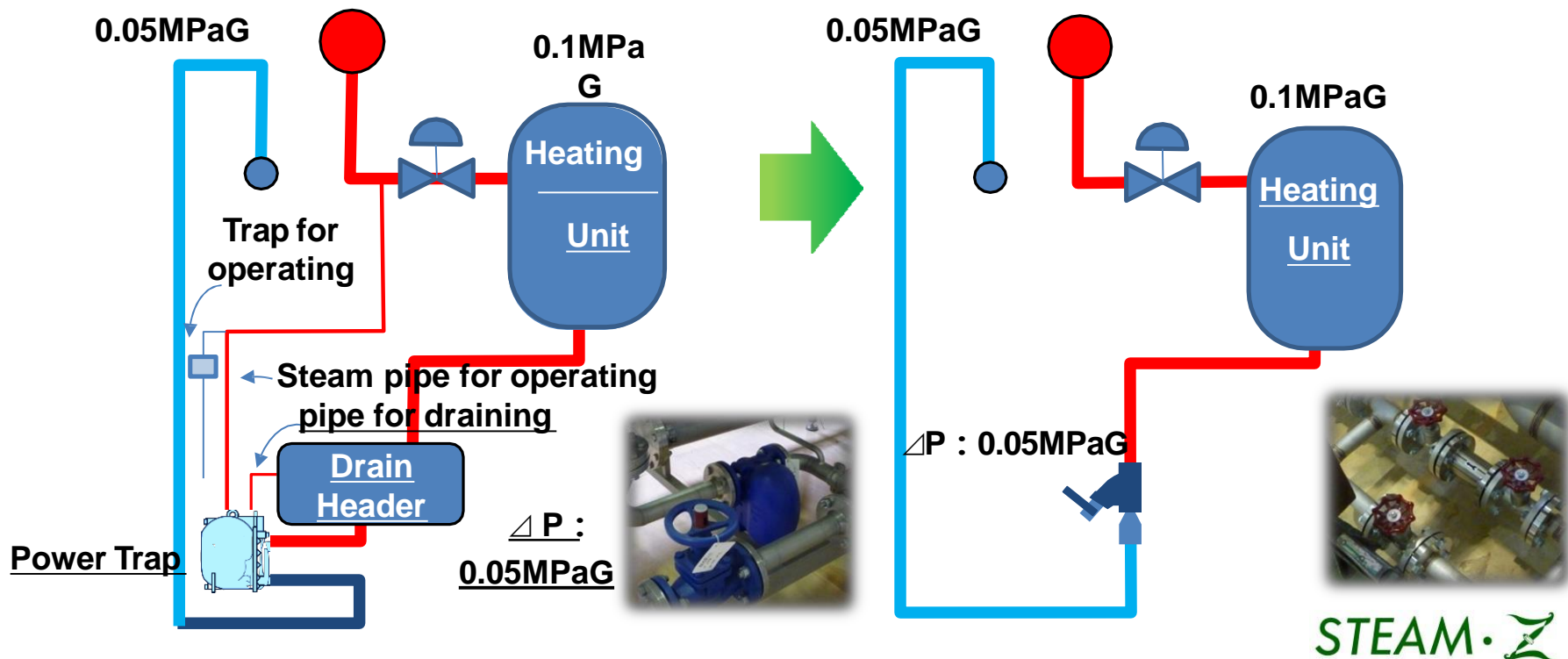


However, in reality, the things are NOT like this.

The best solution by STEAM·Z

Condensate drainage in the case of very low pressure difference

- STEAM · Z with no movable valves can drain more than 10 tons of condensate even if it was in the location of very low pressure (under 0.05 MPa).
- STEAM · Z can stop using of some devices which is required to drain condensate by compulsion and of the laying of the pipes
- Large amount of Energy cost and maintenance cost can be saved.

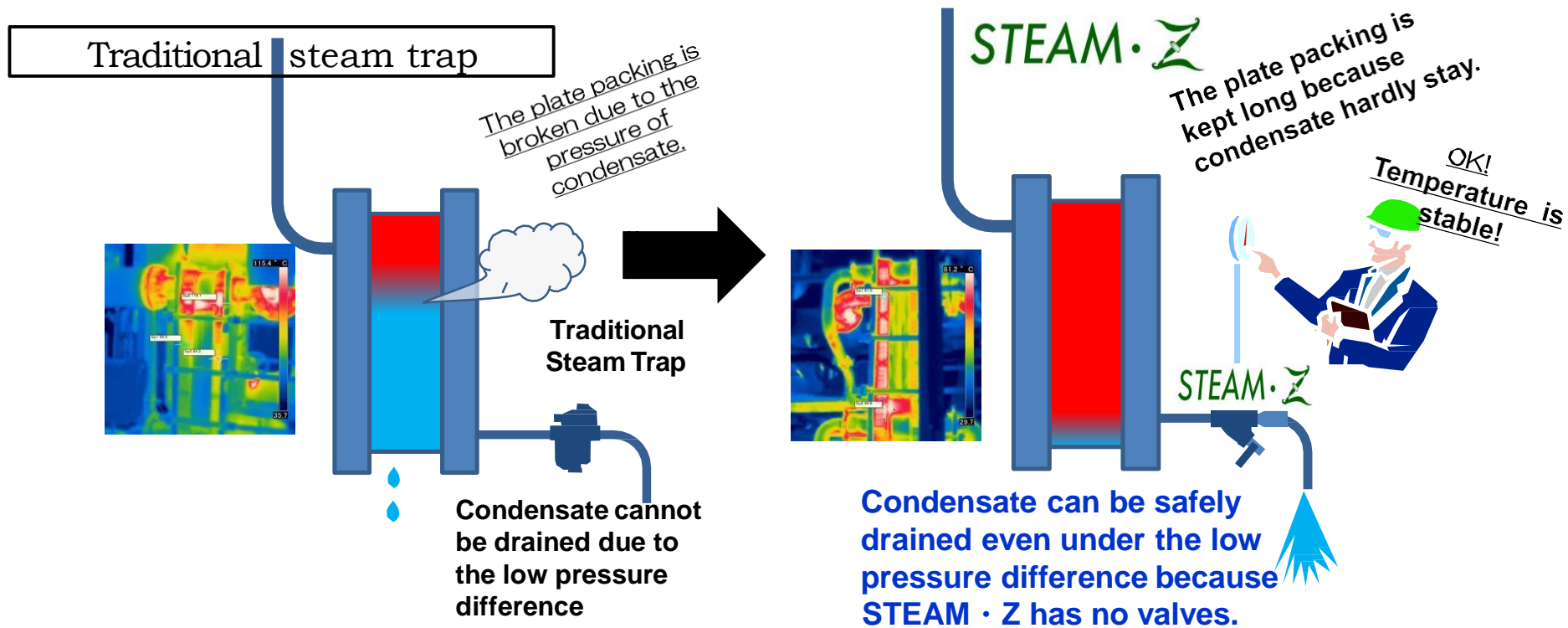


STEAM·Z

The best solution by STEAM · Z

Quality control by “Stabilization of the condensate drainage”

- Because a traditional steam trap in the plate-type heat exchanger which is being driven by low pressure steam hardly able to open the valve, so condensate is stayed in the plate and that makes a big heat stress in the part, consequently makes troubles such as breaks plate packing.
- STEAM · Z with no movable valves includes a designed drainage hole so that consumption steam = condensate may be drained by the regulation pressure, and even low pressure steam
- Drains condensate in stable way. As a result, accumulation of condensate is minimized, trouble of packing is reduced.

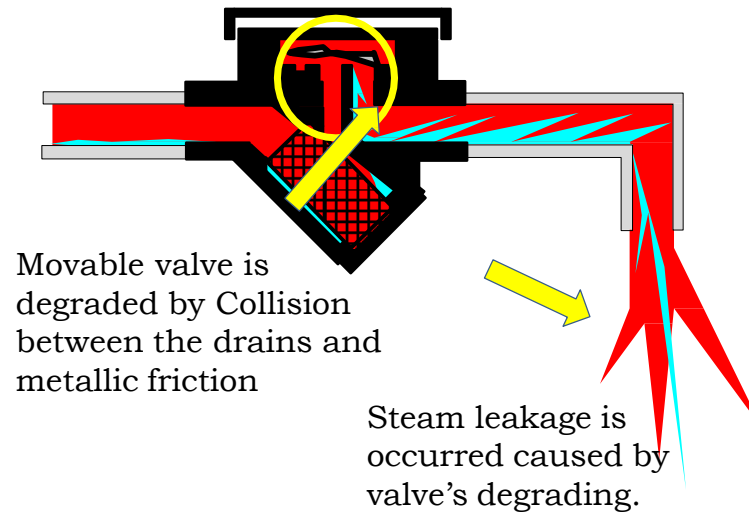
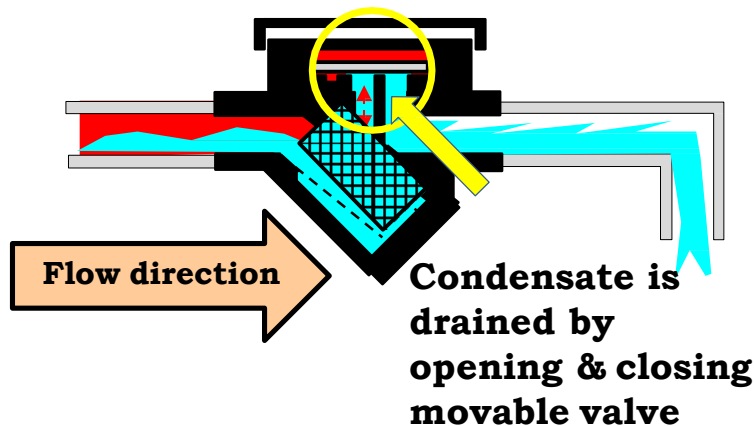


Mechanism of STEAM · Z

Steam · Z has no movable valve which means degraded parts.

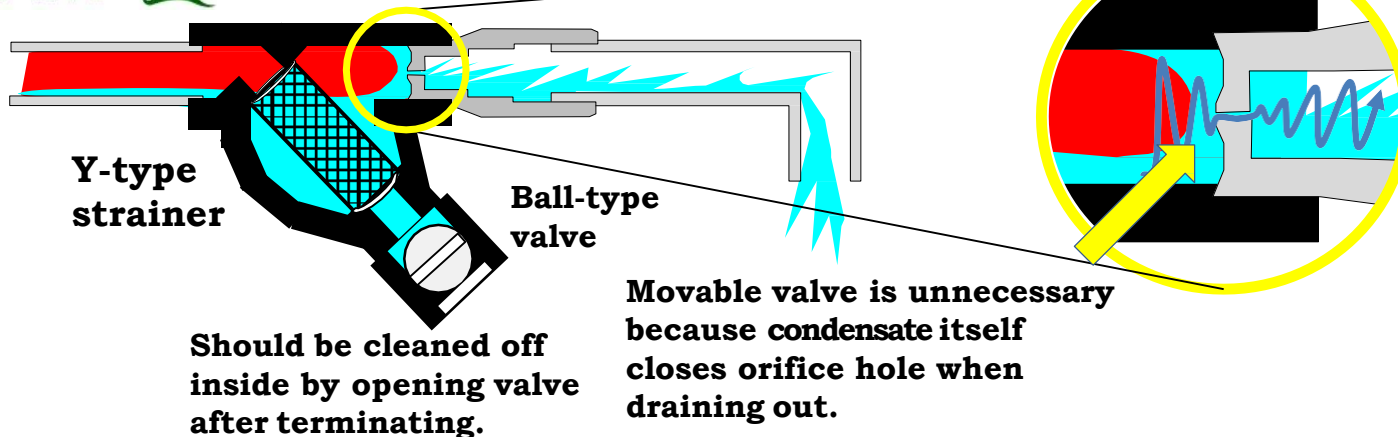
Steam · Z drains just only condensate with no any movable valve by using fixed drainage holes (**Orifice hole**) which is properly designed.

Traditional steam trap



A traditional steam trap should be replaced with a new one because it is degraded in a few years.

STEAM · Z

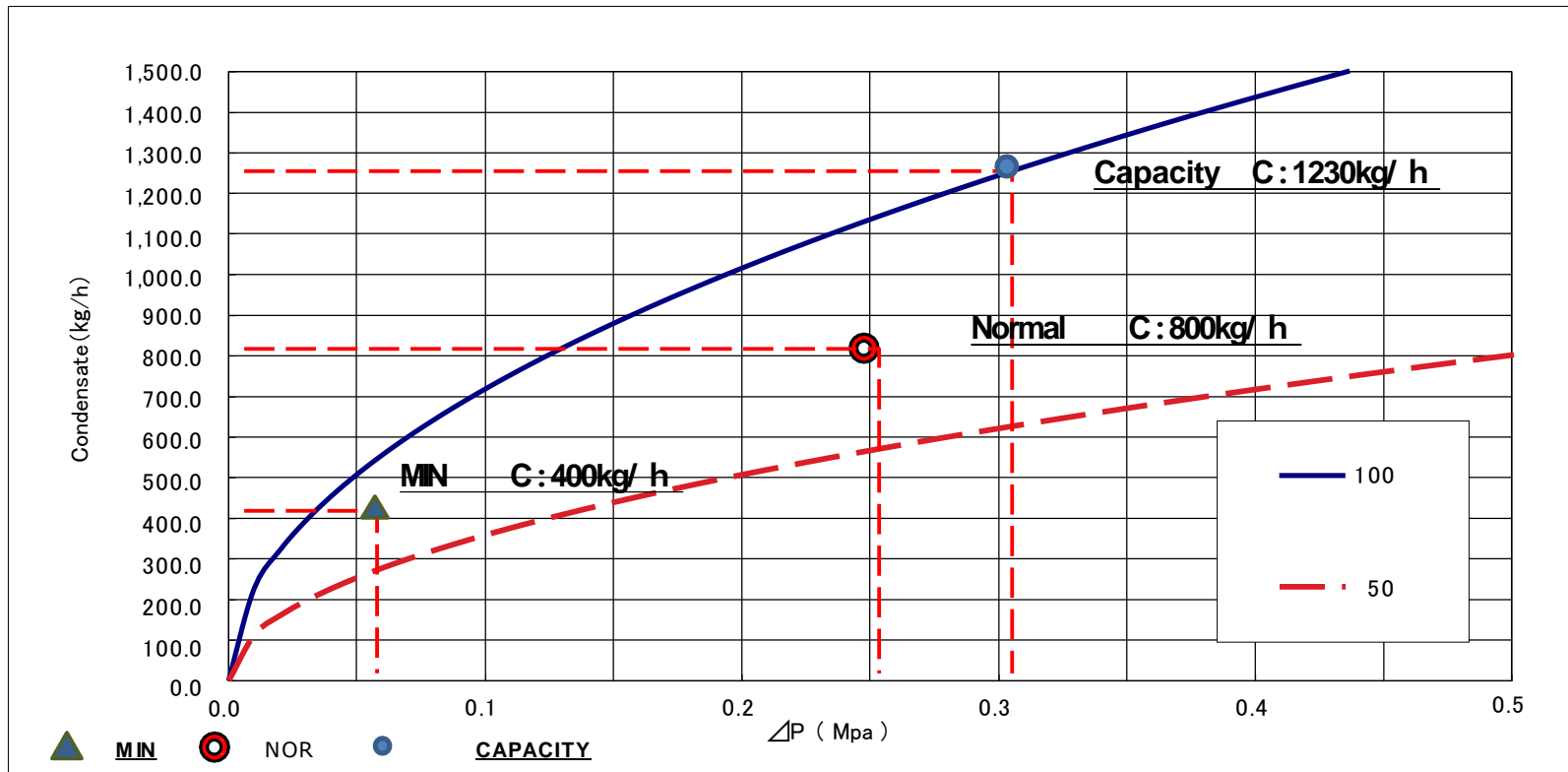


No maintenance is required because no steam leakage is occurred caused by valve's degrading.

Mechanism of STEAM.

The diameter of orifice hole is designed based on the volume of maximum condensate and Pressure Difference

Relation between Pressure Difference & Maximum Condensate

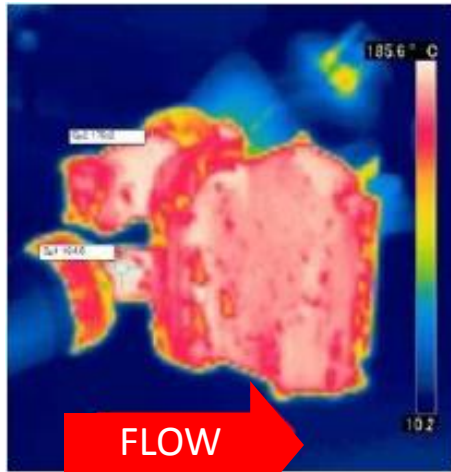


When condensate is reduced (it means that the temperature of the material to be heated increases . So CV is throttled), pressure difference will be decreased and the load factor can be kept constantly.

BEFORE

Conventional Steam Trap

ปีที่ติดตั้ง : 2005



Recheck ปี 2015

Inlet temp : 184.8 °C

Outlet temp : 179.2 °C

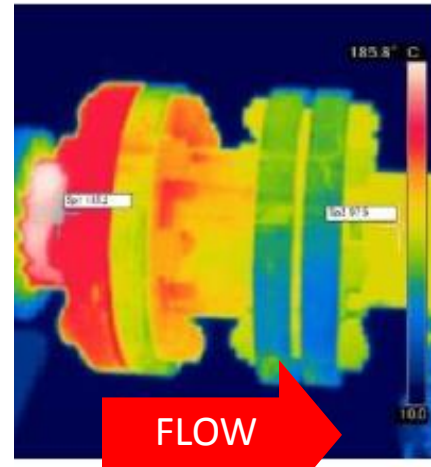
10 ปีหลังการติดตั้ง :::> ไอน้ำรั่วอย่างมาก !!!

Conditions 10 years later :::> Huge Steam Leak !!

AFTER

Installation of Steam Z

ปีที่ติดตั้ง : 1998



Recheck ปี 2015

Inlet temp : 185.2 °C

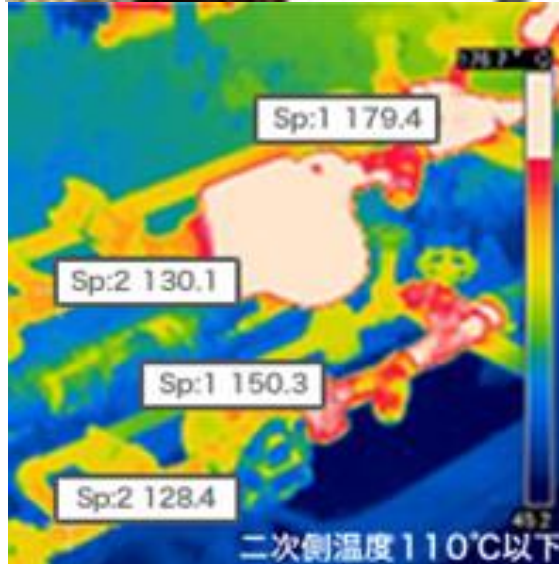
Outlet temp : 97.5 °C

17 ปีหลังการติดตั้ง :::> ไม่มีไอน้ำรั่ว

Conditions 17 years later :::> No Steam Leak

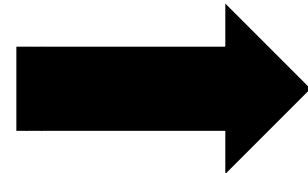
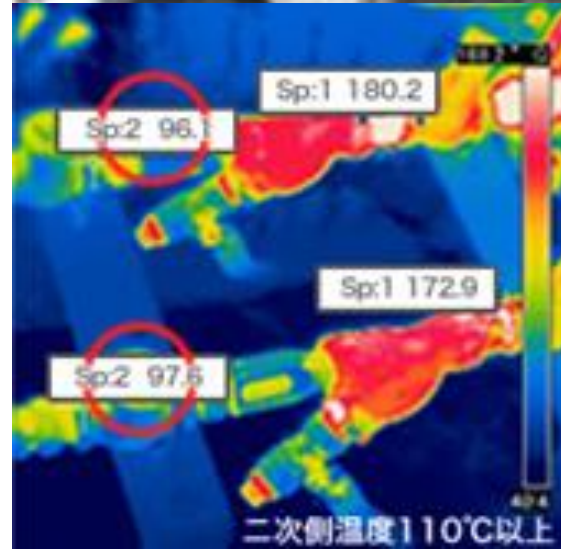
BEFORE

Conventional Strap... Leakage



AFTER

Replacement with **Steam Z...** no leak



BEFORE

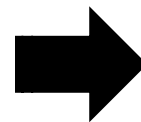
Conventional Steam Trap



ΔP : 1.5 MPaG

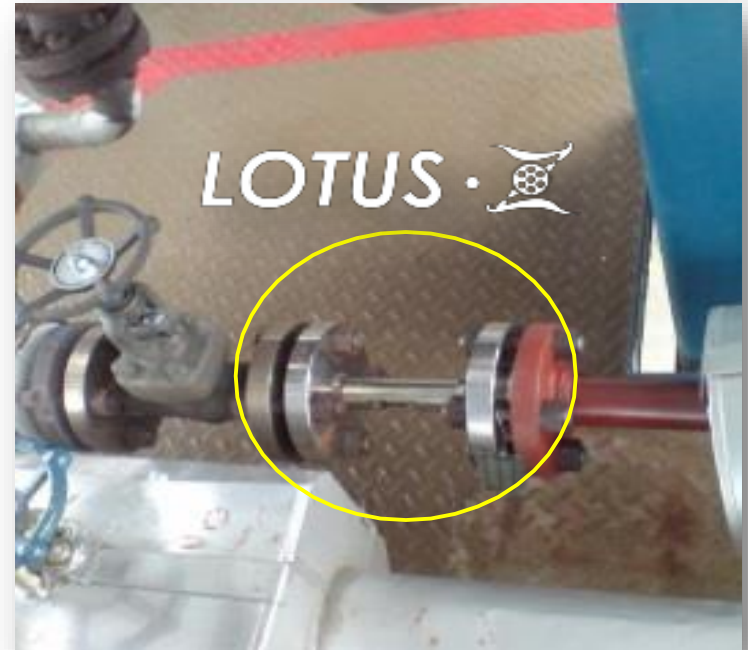
อัตราการใช้น้ำโดยเฉลี่ย : 2,500 kg/h

Average Steam volume : 2,500 kg/h



AFTER

Installation of Steam Z




ΔP : 1.5 MPaG

อัตราการใช้น้ำโดยเฉลี่ย : 1,800 kg/h

Average Steam volume : 1,800 kg/h

*** ลด Lost 700 kg/h

*** Reducing : 700 kg/h

LOTUS ·  The ultimate solution to
Cost saving and **quality control of products**

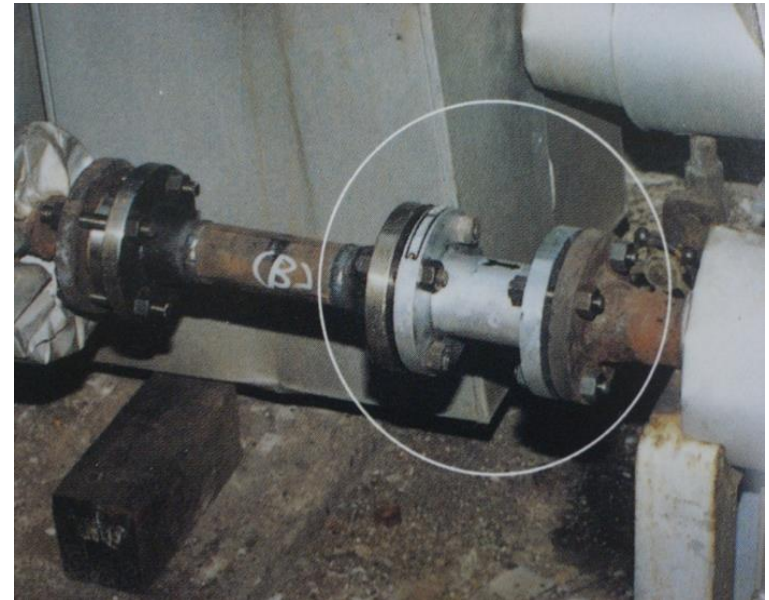
BEFORE

Traditional Trap



AFTER

STEAM · Z (LOTUS · Z)



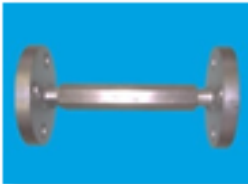
NO Steam Leak design

Steam Z Products models



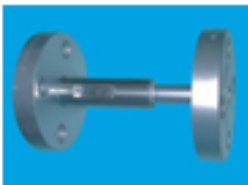
Steam Z : Standard type

Maximum pressure	Maximum capacity
1.0Mpa	7,500kg/h



Steam Z : type P

Maximum pressure	Maximum capacity
2.0Mpa	50kg/h



Steam Z : type LP (for high pressure)

Maximum pressure	Maximum capacity
20.0Mpa	1,000kg/h



Steam Z : type F

Maximum pressure	Maximum capacity
20.0Mpa	28,000kg/h



LOTUS Z (for high capacity)

Maximum pressure	Maximum capacity
20.0Mpa	No limitation

- **Standard Model 15A type**

Max Pressure 1.0 Mpa · G , Max Drainage Capacity 670 kg/hr

15A type is relatively small and the ϕ 3.0 mm of orifice diameter is at a maximum, this type is being sold by set with an exclusive Y strainer and ball valve in order to prevent clogging.



Model No.

Z-45/46/47/48/49/410

Z-56/57/58/59/510

Y strainer and ball valve SET



• **Standard Model 20A type**

Max Pressure 1.0 Mpa · G , Max Drainage Capacity 3,750 kg/hr

20A type is designed by the orifice diameter ϕ 3.2 ~ ϕ 6.5 mm. Recommend to use that sets the Y strainer and ball valves, but we also sell only in the body by customers' requirement.



Model No.

Z-2A/5A/8A/0B/5B

Z-7B/0C/5C/0D/5D

• **Standard Model 25A type**

Max Pressure 1.0 Mpa · G , Max Drainage Capacity 7,510 kg/hr

25A type orifice diameter is designed so large as ϕ 7.0 ~ ϕ 10 mm. , so we recommend the sale of the body only because we have never experienced clogging so far.



Model No.

Z-0E/5E/0F/5F

Z-0G/5G/0H

• Model P type

Max Pressure 2.0 Mpa · G , Max Drainage Capacity 50 kg/hr

P type is often used in the steam pipe of pressure 1.0 Mpa · G ~ 2.0Mpa · G which standard model can not cope. the drainage capacity is adapted by adjusting the size of diameter of orifice or the number of stages of the interior of the orifice. This type sold with the strainer internal organs , possible to deliver with flange.



Model No.

P-45/46/47/48/49/410

P-412/415/418/420/425

P-430/330/230/130

• Model LP type

Max Pressure 20.0 Mpa · G , Max Drainage Capacity 1,000 kg/hr)

LP type is a product for use in a high pressure environment than the P type. To cope with the high pressure, the inlet side is lap flange joints. Internal structure is the same as the P-type, it is popular in **high-pressure steam pipe or in the resin pellets extruder.**



Model No.

LP-45/46/47/48/49/410

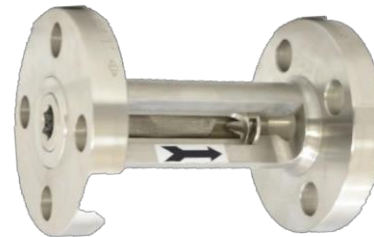
LP-412/415/418/420/425

LP-430/330/230/130

• Model F type

Max Pressure 20.0 Mpa · G , Max Drainage Capacity 28,000 kg/hr

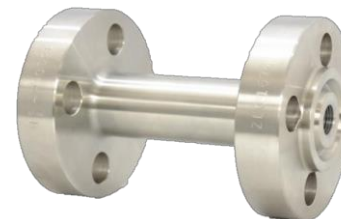
F type is a product which possibly correspond to condensate drainage amount 1.0 - 28.0 t / hr in **the high pressure region** of 1.0Mpa · G ~ 20.0Mpa · G. Integrally machined from SUS 304 round bar, there is no weld.



• Model HP type

Max Pressure 20.0 Mpa · G , Max Drainage Capacity 50 kg/hr

HP type is the best product to place like the condensate amount is minimum at high pressure. Because this product is also integral cutting from a round bar, weld is not. It is popular in the **thermal power plants** and the like.



• LOTUS · Z type

Max Pressure 20.0 Mpa · G , From Low to High Pressure, Ultrahigh Capacity

Lotus · Z can process unlimited condensate volume by single and is compatible to a large capacity of the heat devices from low pressure to high pressure such as **Heat exchanger, Reboiler, Air heater**. Face-to-face minimum L : 150 mm and small, lightweight , so the piping cost will be significantly reduced.



• ZETRON IV type

Max Pressure 0.7 Mpa · G , (For Steam Presser)

Zetron IV has been developed for the **steam iron** used in **the laundry** where condensate amount is relatively small.



Major customer (overseas)

Achilles	Sapporo Beer	Nakagoshi Pulp	Nihon Gosei	Mitsubishi Chemical
Asahi Kasei	Showa Cabot	Chuo Paper	Nihon Shokubai	Mitsubishi Rayon
Asahi Denka	Showa Denko	Nicchu Coca Cola	Nihon Seishi	Meiji
Asahi Beer	Johnson&Johnson	Chugoku Power	Nihon Zeon	Morinaga
Idemitsu	JFE	Chubu	Nihon Petrol	Yuki Gosei
Ibaragi Kasei	JSR	Chiyoda	Nihon Cardboard	Yokohama Rubber
Energy Advance	Shinkoshi Chemical	Teijin	Nihon Delmonte	Yotsuba
Oji Paper	Shin-nissen	Toa Chemical	Nihon Yushi	Self-defense force
Oji Hanshi	Shin-nihon air conditioning	Tokyo Gas	Nihon Yunika	Rengo
Oji Rubber	Shin-nihon refining	Tokyo Power	Nihon Manufact.	Wako Chemical
Okinawa Refining	Sumitomo Chemicals	Toshiba	Nisso Metal	
Konahama Refining	Sumitomo metal	Tonen Chemical	Hitachi	
Kabaya Industry	Sumitomo Pharmaceuticals	Tonen General	Fujisawa Pharmaceuticals	
Kikkoman	Seibu Gas	Toho Chemicals	Fuji Heavy Industries	
Kibun Food	Daikin	Toyo Rubber	Fuji Petrol	
Kyushu Power	Daisel Chemical	Toso	Fuji Yunibansu	
Kyoto Univ. Hospital	Daido Special Steel	Toray	Bridgestone	
Kyowa Hakko	Taisho Paper	Toyoda Synthetic	Fresh Diner	
Kyowa Oil	Taisho Pharmaceuticals	Toyota Motors	Hokuren	
Kirin Beer	Dai Nihon Ink	Nichiban	Honda	
Kurare	Daihatsu	Nikka Wiskey	Matsushita	
Konoha Kagaku	Takasago Parfums	Nissan Motors	Matsushita Batteries	
Koito Manufact.	Takasago Heat	Nisseki Hospital	Maruzen Petrochemical	
Kobe Steel	Takeda Pharmaceuticals	Nihon Glass	Matsuda	
National Cancer Inst.	Chisso	Nihon Moshoku	Mitsui Chemical	



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Let's start
Saving Energy!!

