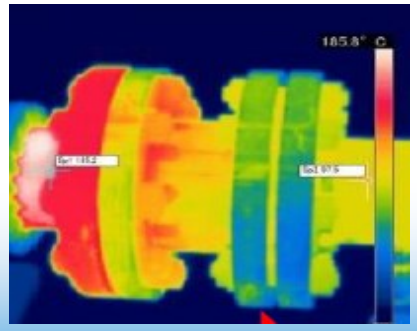
NOTICE
O TRAP

Orifice Type Steam-Trap

O-TRAP

Case Study



Heat efficiency increased	❖ Steam Heating Plant
Product quality increased by stabilizing condensate drainage	❖ Jacket Heating Cooker ❖ Plate Type Heat Exchanger ❖ Hot Air Dryer ❖ Cylinder Type of Dryer
Reduction of maintenance & installation cost	❖ Condensate Drainage Under Minimum Differential Pressure ❖ Drainage of Ultra Large Amount of Condensate
Suppression of steam hammering	❖ Steam Hammering inside the keep warm tank ❖ Steam Hammering inside the Steam Pipe

Steam Heating Plant

Traditional steam trap : drain condensate by opening & closing of moving valve. It is usually deteriorated or broken down in a few years. And there will be much of steam leakage in such degraded steam-traps, it will be the cause of heat efficiency down.

O-TRAP : there is little steam leakage due to the deterioration or breakdown because of no moving valve.

It will reduce steam leakage and improve heat efficiency.

Before installation of O-TRAP

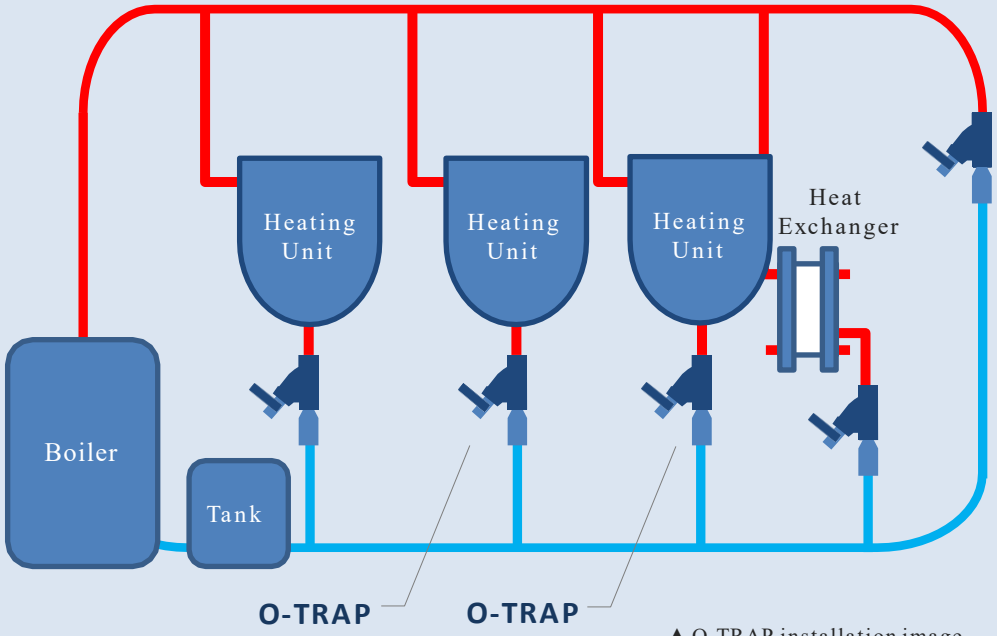
Repeated operation and stop

Steam leaking from recovery Tank

After installation of O-TRAP

Improvement of Boiler's performance

Stop of steam leaking



▲ O-TRAP installation image

Jacket Heating Cooker

Traditional steam trap can't transmit temperature to the product uniformly because of fluctuation of steam pressure in side the jacket. And sometimes the upper part of Jacket will be burned because condensate is stagnated in the jacket. *(stall phenomenon)*

O-TRAP of orifice type is designed to drain condensate automatically and stabilize the internal temperature of Jacket heating Cooker under pressure fluctuation.

※ stall phenomenon …It is phenomenon that the pressure difference between inlet and outlet of trap has been made very low, condensate becomes difficult to drain.

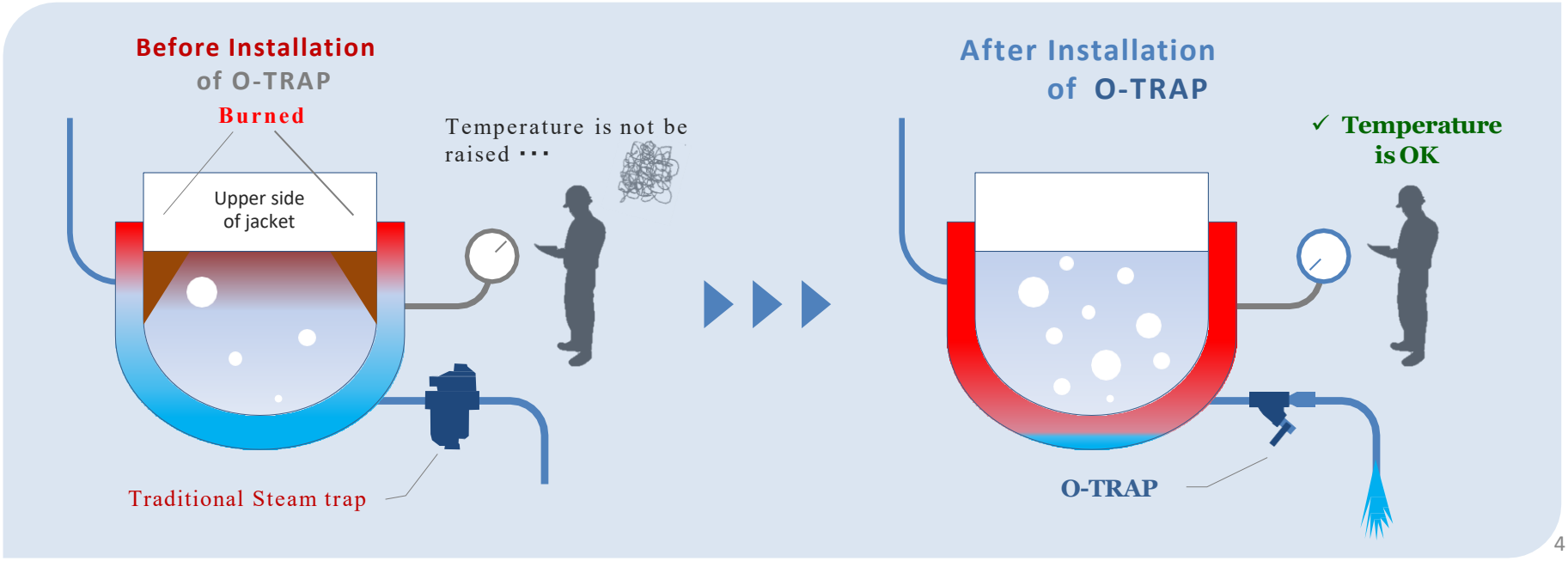
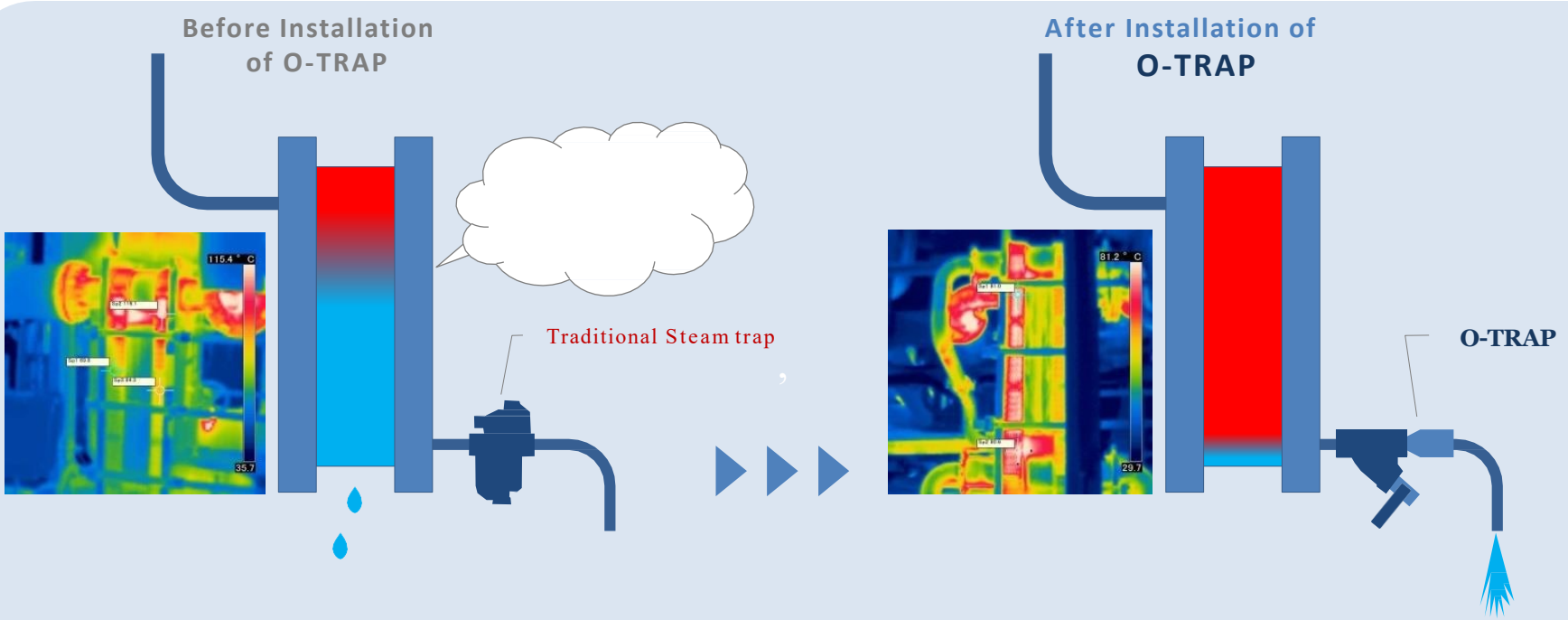


Plate Type of Heat Exchanger

Traditional Steam Trap : Plate Type Heat Exchanger operate under very low pressure, the moving valve of a Traditional steam trap hardly able to open the valve. Therefore, condensate is stayed in the plate that generated big heat stress in the part. It may cause troubles like breaking plate packing.

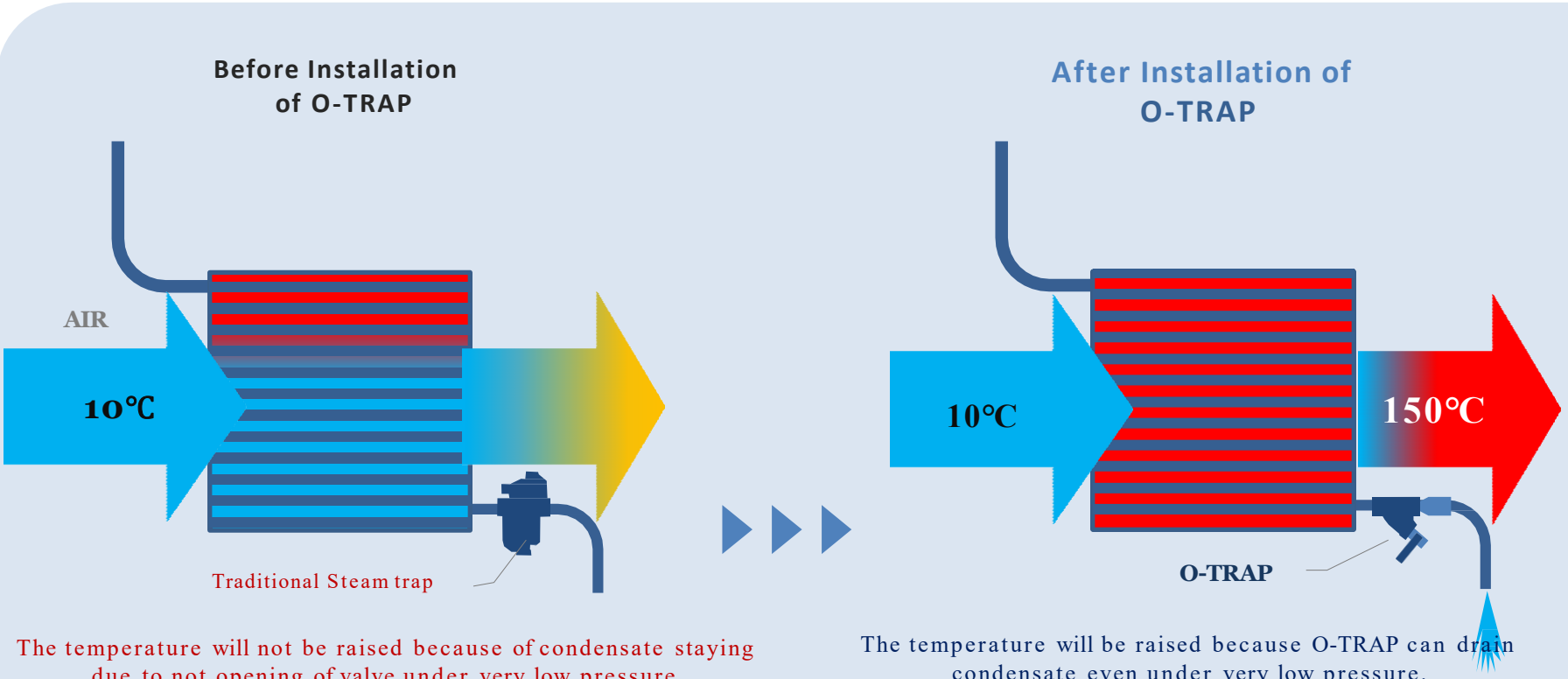
O-TRAP : Orifice type without movable valves included a designed to drain condensate under prescribed pressure. So O-TRAP makes it possible to drain condensate in stable way under even very low pressure. Consequently, accumulation of condensate is minimized, trouble of packing is reduced.



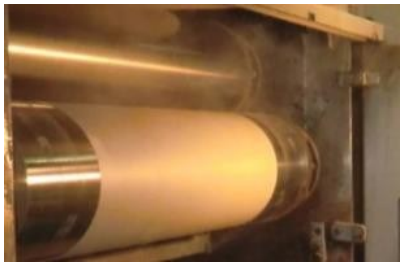
Hot Air Dryer

Traditional Steam Trap : The temperature of Hot Air Dryer won't be raised because of condensate staying when differential pressure doesn't reach itself enough to open the valve.

O-TRAP of orifice type is designed to drain condensate under prescribed pressure. **O-TRAP** can be used for drain condensate automatically and stabilize the temperature of Hot Air Dryer.



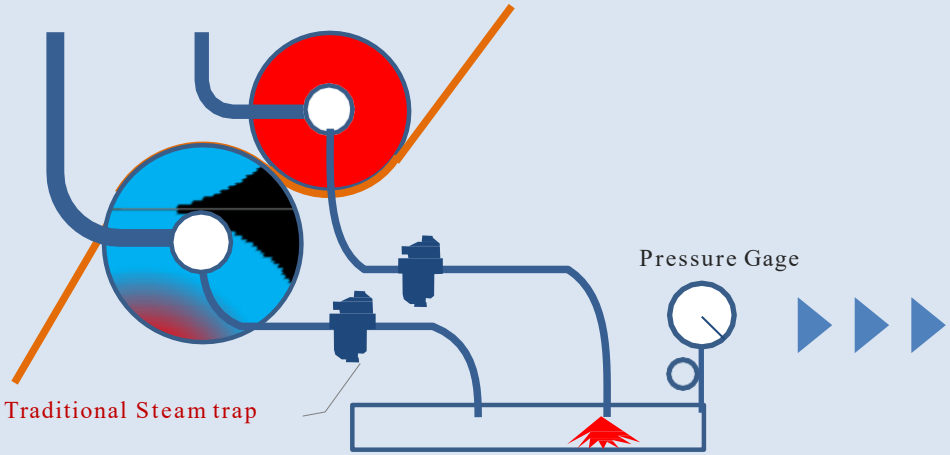
Cylinder Type of Dryer



Traditional Steam Trap : Intermittent drainage of condensate or steam leakage cause the pressure variation of recovery pipe and disturb the drainage of condensate. Insufficient drainage of condensate makes the surface temperature of the dryer unstable and also it causes the degradation of products.

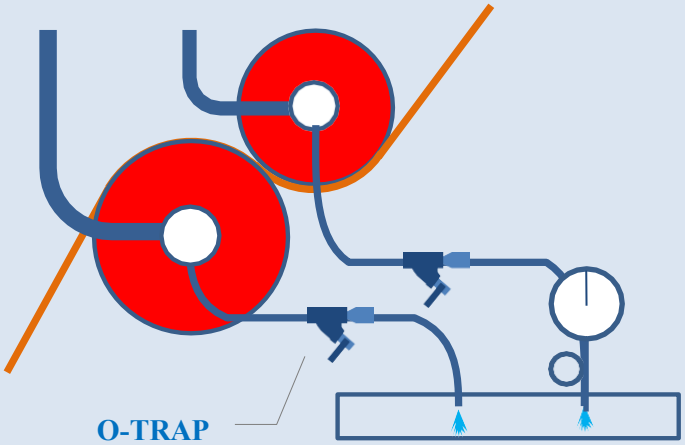
O-TRAP : there is little steam leakage due to the deterioration or breakdown because of no moving valve And also continuous drainage of condensate makes the pressure inside recovery pipe stable and keeps the surface temperature constant, consequently realize the product quality stable.

Before Installation of O-TRAP



Because the pressure inside the recovery pipe repeats up and down due to intermittent drainage of condensate, the surface temperature becomes unstable

After Installation of O-TRAP



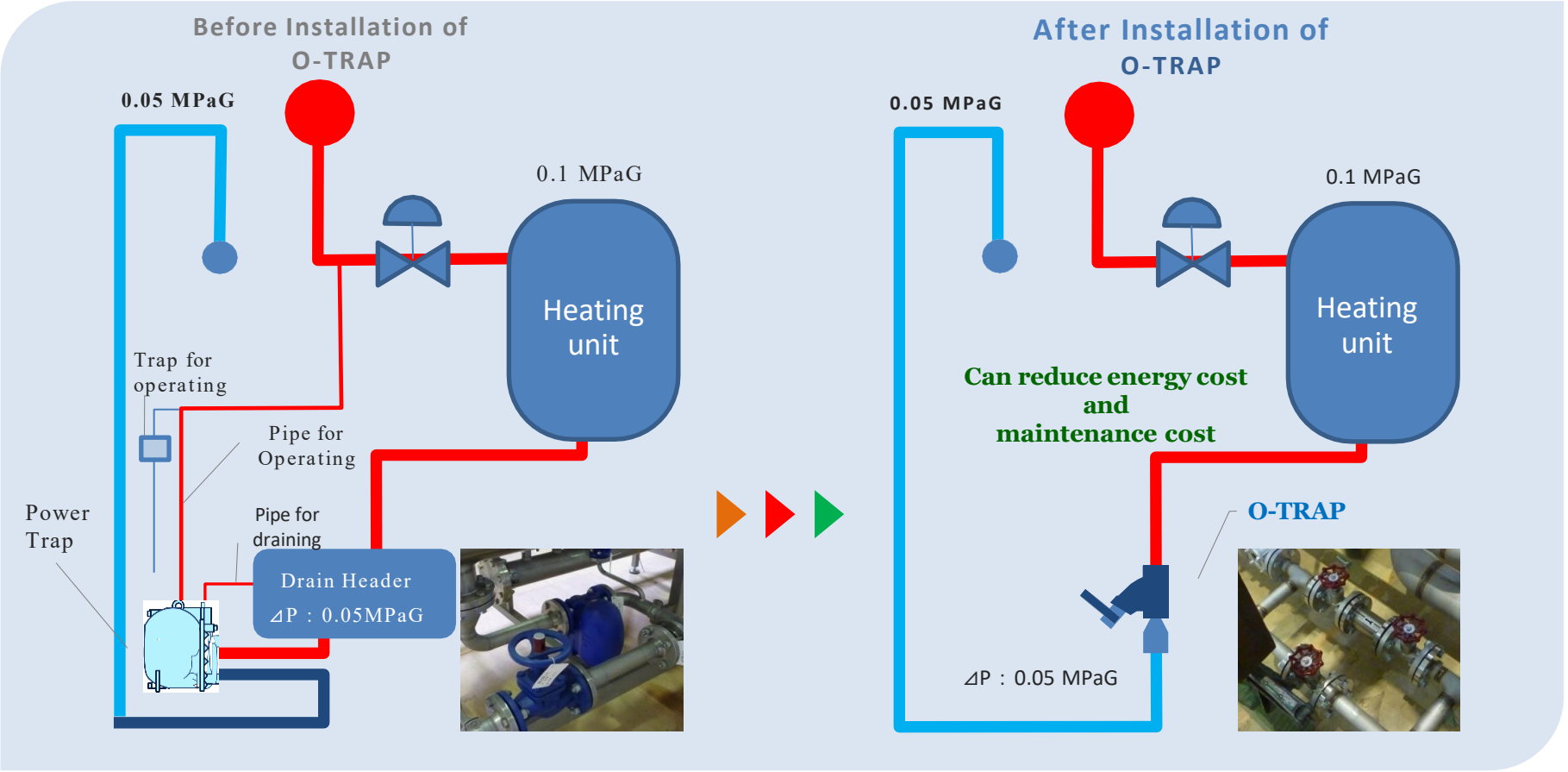
Because the pressure inside the recovery pipe is stable due to continuous drainage of condensate, The surface temperature of dryer becomes stable.

Condensate Drainage under very low differential pressure

~Reduction of running cost by removing of powertrap

O-TRAP with no movable valves is designed according to the maximum condensate drainage.
It can smoothly drain condensate more than 10 tons even in the location of very low differential pressure (0.05MPa).

Therefore, **O-TRAP** can save a lot of Energy cost and maintenance cost by stopping using of Power Trap and connecting pipes.

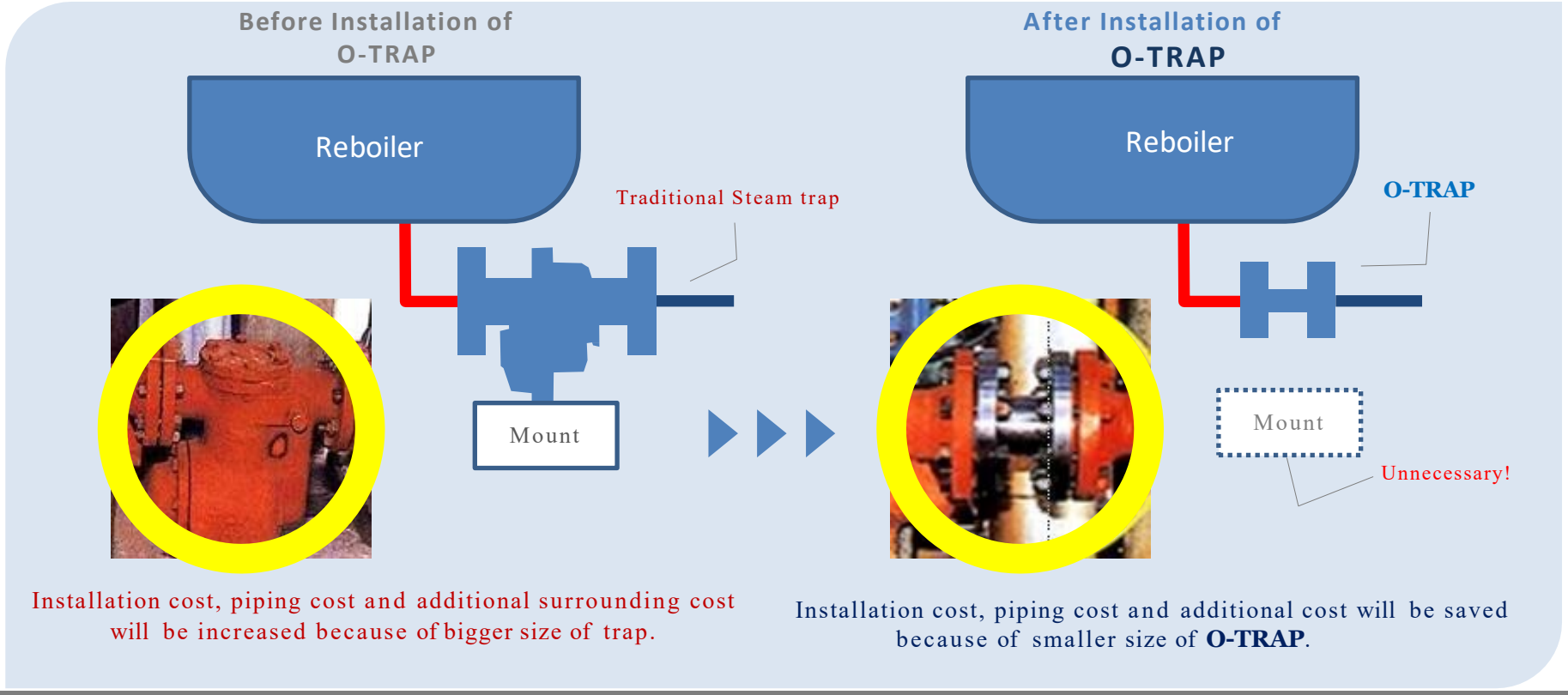


Drainage of a large amount condensate

~Reduction of installation cost by removing of large steam traps

Traditional Steam Trap : is mostly proportional its size or weight to the capability of heat exchanger, the bigger trap size, the higher trap installation cost or modification cost is.
And further, the cost for connection valve will be higher because of its size also become bigger.

O-TRAP : Orifice type has no moving valve, light weight with simple structure and compact designed like a steam pipe. O-TRAP can make it possible to miniaturize connection valve to reduce installation & maintenance cost all together.



Installation cost, piping cost and additional surrounding cost will be increased because of bigger size of trap.

Installation cost, piping cost and additional cost will be saved because of smaller size of **O-TRAP**.

Suppression for Steam Hammering in Keep Warm Tank

Traditional Steam Trap : intermittently drains condensate.
It causes a big steam hammering in the Keep Warm Tank because the pressure inside the steam pipe is always varied or unstable.

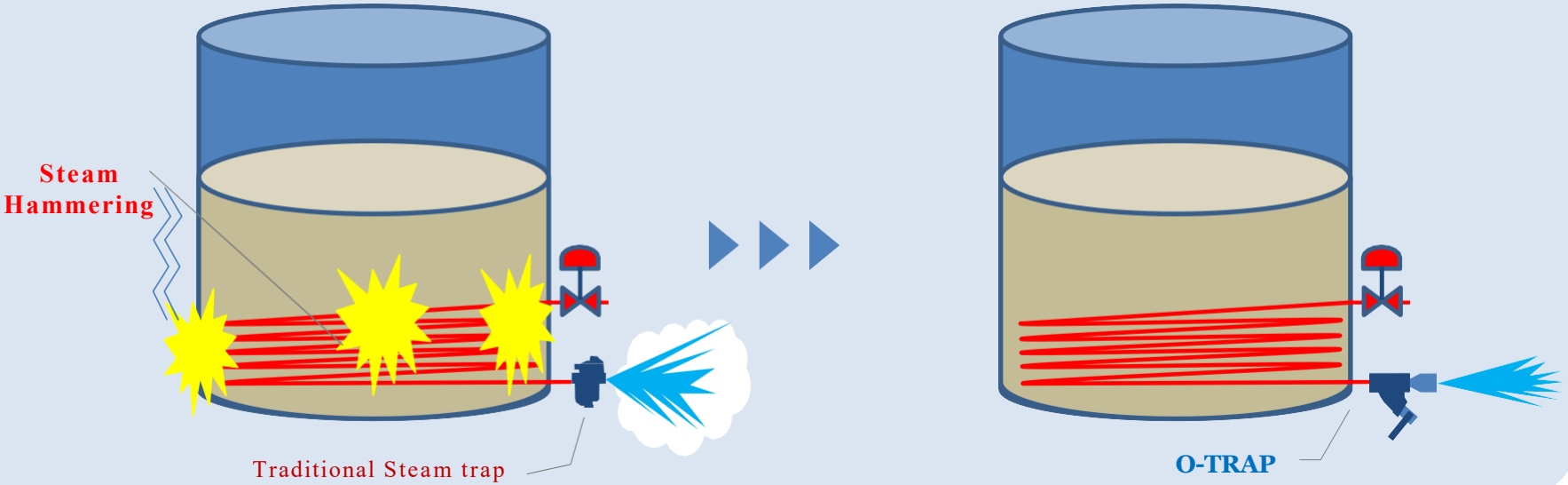
O-TRAP : of orifice type drains condensate automatically and continuously. So, It's does not pulsate the pressure and suppress steam hammering without making pressure variance.

Before Installation of O-TRAP

Pressure variance
↓
Steam Hammering is easy to occur

After Installation of O-TRAP

No Pressure Variance
↓
Steam Hammering will be suppressed



Suppression for Steam Hammering in Steam Pipe

Traditional Steam Trap : Steam Hammering inside steam pipe sometimes occurs when using a traditional steam trap because 2-phase which consists of steam and condensate due to steam leakage or condensate staying.

O-TRAP : of orifice type was designed to continuously discharge the condensate from the orifice. So it doesn't make such a 2-phase inside the steam pipe and suppress steam hammering.

Before Installation of O-TRAP

Two flows which consists of steam and condensate occurs

↓

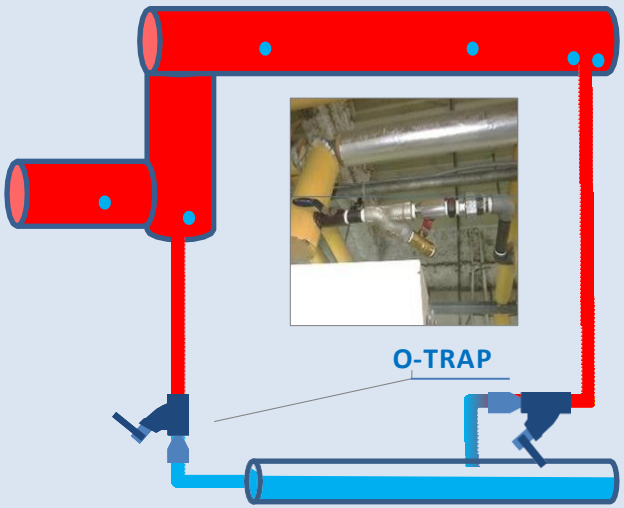
Generate Steam Hammering

After Installation of O-TRAP

No two flows occur

↓

Suppress Steam Hammering

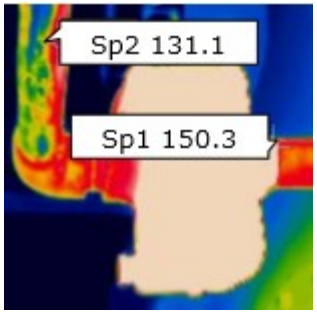


Thermography

If the 2nd side was connected to the recovery pipe, it is hard to judge that steam trap is fairly operated or not, steam is leaked or not.

It will be possible to judge the current conditions of steam trap by measuring the temperature of the 2nd side with Thermography.

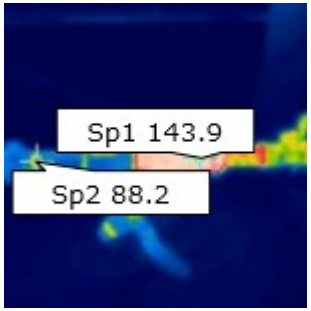
Abnormal condition



outlet : 131.1℃

Traditional Steam Trap

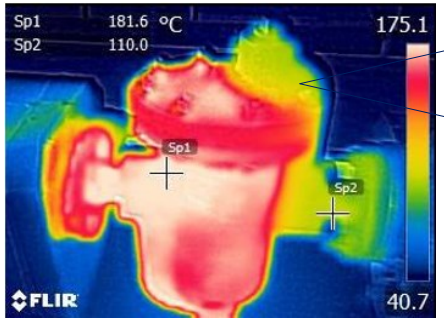
Normal condition



Normal
outlet : 88.2℃

O-TRAP

Measured Photo	Measured Date	2017/6/29
	Steam Pressure	0.70MPaG
	Sp1temperature	181.6℃
	Sp2 temperature	110.0℃
	Back Pressure	ATM.
	Judged	✕ Steam Leakage(L)



- The 2nd side temp. exceeds saturated temp. of the pressure of the discharge environment > 10 °C .
- A large amount of steam leakage (around 20%) may be generated.
- The valve disc possibly does not work by deterioration.