引进固定孔式O-疏水阀 后提高效率的案例集

CASE STUDY OF FIXED ORIFICE TYPE STEAM TRAP IMPLEMENTATION



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夹套加热锅 Implementation to steam jacket boiler 因凝结水稳定排放而提高品质的案例-1

"Stabilization of the condensate drainage-1"

传统疏水阀的开合,引起夹套内部的压力发生变化,造成对产品的传热不均匀。而且传统疏水阀的间歇性工作会使凝结水在夹套内滞留, 在夹套上部出现焦糊。排放固定孔式 O-**疏水**阀。因排放孔设计成凝结水按规定压力排放。夹套内的凝结水可稳定排放。因此夹套的温度可 以维持稳定,从而使产品品质稳定。

A pressure change occurs by the opening and closing of the steam trap in the jacket inside, and temperature is not handed down to a product uniformly. Also the steam trap makes a stall phenomenon X occur, so condensate stays in a jacket, and consequently the product of the boiler highest points sometimes is burnt. Fixed Orifice Type Steam Trap with no movable valves includes a designed drainage hole so that consumption steam = condensate may be drained by the regulation pressure, and drain condensate from a jacket in stable way. By this it's possible to make the quality of the product become stable because it's possible to keep the temperature in the jacket uniformly.





以0.2MPaG以下的低压运行的平板式热交换机,因为疏水阀阀门不容易启动,凝结水会滞留,在热应力的作用下,会使平板衬垫碎裂。 而固定孔式 0-疏水阀 是固定排放孔,排放孔根据费蒸汽=凝结水在规定压力下的排放而设计,在低压条件下也能稳定排放凝结水,因此没有凝 结水滞留的问题,减少了平板衬垫碎裂的问题。

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. Fixed Orifice Type Steam Trap 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.



热风干燥机 Implementation to hot air drying machine 因凝结水稳定排放而提高品质的案例!-3 "Stabilization of the condensate drainage-3"

热风干燥机上的传统疏水阀,是根据疏水阀前后的压差运行的,如压差达不到运行要求,凝结水会滞留, 滞留的凝结水会使热交机内的空气温度无法充分上升。而固定孔式疏水器**〇-疏水阀**,没有阀门开关,消费的蒸气=凝结水, 按规定的压差,按设计好的排放孔排放,无论何时,都会稳定地排放凝结水,因此获得的空气温度也稳定。

In the hot air drying machine, condensate sometimes stays because the difference pressure around the steam trap can't reach one required to operate the valve. In this case, the temperature of the air sometimes doesn't rise sufficiently due to condensate stayed in the heating changer. Fixed Orifice Type Trap with no movable valves includes a designed drainage hole so that consumption steam = condensate may be drained by the regulation pressure, so it always drains condensate in stable way and which makes the temperature of the air stable.





"Stabilization of the condensate drainage-4"

O-疏水阀

活动阀门式疏水阀,因凝结水间歇性排放,使凝结水回收管的压力产生上下变化。热交换量少或压差小的疏水阀,凝结水的排放会被不畅。因凝结水的排放不充分,干燥机的表面温度不均匀、不稳定,从而影响产品的品质。 排放固定孔式 O-疏水阀,因凝结水连续排放,凝结水回收管道的压力没有变化。因此能维持干燥机表面的稳定温度,从而提高产品品质。

Because a traditional steam trap drains condensate intermittently, the pressure inside the laying of the pipes rises and falls , and that sometimes make prevent condensate from draining in the part of a little amount of heat exchanging or the trap of low pressure difference. When condensate drains insufficiently, the surface of the temperature of dryer becomes unstable and it causes the quality of products to be degraded, but the implementation of Fixed Orifice Type Steam Trap has made the surface temperature of dryer stable because of its continuous drainage and consequently, it has brought the product to the equalization and quality-up.





压力差极小时的凝结水排放

O-疏水阀

Condensate drainage of very low pressure difference

• 因放弃使用POWER TRAP(强力疏水阀), 降低维修管理费的案例! "Reduction of running cost by removing of power trap"

没有活动阀门的排放固定孔式 **O-疏水阀**, 在没有压力差的(0.05MPa以下)场所, 只要把排放孔径按最大凝结水排放量 设计, 就能自如排放10吨以上的凝结水。 放弃使用强制排放凝结水的装置(强力疏水阀), 用 0-TRAP 更换后, 可以降低维护强力疏水阀的各项费用。

Fixed Orifice Type Steam Trap with no movable valves can drain more than 10tons of condensate even if it was in the location of very low pressure(under 0.05MPa) if you have only to design drainage hole according to the maximum condensate drainage. Fixed Orifice Type Steam Trap can stop using of some devices which is required to drain condensate by compulsion and of the laying of the pipes, and as a result of that, a large amount of energy cost and maintenance cost can be saved.



因放弃使用大容量的大型输水阀,节约施工费用的案例! "Reduction of implementation cost by removing of large trap for large volume" 活动阀门式疏水阀,热交换机的产能越大,疏水阀也要相应大型化,重量重,连接口规格也大,安装维修时,施工费用也会相应增加。 排放固定孔式O-疏水阀,因没有活动阀门,O-疏水阀机身不用和管道大小匹配,节省安装空间,连接口也小,安装、使用、维修费用都得到节约。

Having light weight and simple structure, Fixed Orifice Type Steam Trap makes it possible to minimize the designing even in a large plant generating a great quantity of condensate. Fixed Orifice Type Steam Trap contributes to not only shortening work periods but also saving cost such as installation cost because it can minimize steam pipe lines or surrounding valves. It has been a big troubles for a large plant to make a huge steam loss when happening troubles in a traditional steam trap, but Fixed Orifice Type Steam Trap has resolved that big issue, because it has no any mechanical troubles once it has been installed, so Fixed Orifice Type Steam Trap has contributed to saving maintenance cost also.





保温罐内发生的水锤现象是根据压力的脉动发生活动阀门式疏水阀因间歇式排放凝结水.管道内的压力经常产生脉动. 导致储藏罐内发生重大水锤现象。 排放固定孔式 O-疏水阀, 因连续排放凝结水, 管道内部压力稳定, 不发生脉动, 消除水锤现象。

The steam hammering which occurs in the keep warm coil and the keep warm tank depends on pulsation of the pressure. Because a traditional steam trap always makes the pressure inside the laying of the pipes pulse by draining condensate intermittently, and makes a large-scale steam hammering occur for a product storage tank.

Fixed Orifice Type Steam Trap with no movable valves doesn't make the pressure inside the laying of the pipes pulse by draining condensate continuously, and doesn't make steam hammering occur.





管道内发生水锤现象的原因很多。活动阀门式疏水阀,凝结水滞留或蒸汽泄露使凝结水及蒸汽产生2相流,引发水锤现象。

排放固定孔式O-疏水阀,按设计好的排放孔连续排放凝结水,管道内不发生2相流,没有水锤现象。

There are some reasons why steam hammering arises inside the laying of the pipes, but it also occurs in the case when 2 flows consists of condensate and steam are made due to the staying of condensate or leakage of steam by a traditional trap. Fixed Orifice Type Steam Trap with no movable valves doesn't make the 2 flows inside the laying of the pipes occur by draining condensate continuously from designed drainage hole, and doesn't make steam hammering occur.





了解掌握蒸汽泄漏 - 1 Confirmation of steam leakage-1

红外线热成像照相机(热像仪)确认蒸汽泄漏的事例-1

"Confirmation of steam leakage by thermography -1"

因疏水阀的凝结水进口处/凝结水出口处(2次側)都与管道相连,无法知道疏水阀是否正常工作或是否有蒸汽泄漏。 用红外热像仪(温度测温计)照在管道表面,管道表面的温度分布会被测定,由此可以测定蒸汽泄漏的异常温度。

When the secondary side of a traditional steam trap is connected to the laying of the pipes, it's hard to find out that it's normally running or the steam leakage is occurring.

By taking the temperature distribution in the surface of the pipe by thermography, it's possible to find out abnormal temperature by steam leakage in the secondary side of a traditional steam trap.



Confirmation of steam leakage-2

根据收集测试,确认蒸汽泄漏案例-2

"Confirmation of steam leakage by extracting test -2"

测定疏水阀排放的凝结水中有多少蒸汽混入,要收集凝结水测定热量。这样才能了解改善疏水阀的必要性。

It assess how much steam is mixed in the condensate discharged from a traditional steam trap by measuring the amount of heat of condensate which is actually collected. As a result, it is possible to accurately grasp the benefits of improving the steam trap.

收集水量

(35°C x 10.4L) − (22°C x 10.0 L)

(10.4L - 10.0L) = 386 kcal/L

确认蒸汽泄漏-2

- 凝结水,每1L的热量,减去使用蒸汽的显热就是凝结水的潜热。 386 kcal/L – 160 kcal/L = 226 kcal/L
- 凝结水的潜热,除以使用蒸汽的潜热,就是泄漏蒸汽. 226 kcal/L ÷ 498 kcal/L = 0.45kg/min (27.2kg/h)

泄漏的蒸汽量乘以蒸汽单价,就是损失金额, 27.2 kg/h x ¥ 0.35 元/kg = ¥9.52 元/h

年运行340日(8,160h)时, 一年发生大概 RMB¥77,683 元的蒸汽泄漏。 27.2kg/h x ¥ 0.35/kg= ¥ 9.52/h x 8,160h ≒ ¥ 77,683 元/年



Assuming that the steam of 0.5MPaG was collected for one minute Total heat at the end —Total initial heat Amount of discharging Total amount of condensate heat per L(condensate)

(35℃ × 10.4L) – (22℃ × 10.0 L)

- = 386 kcal/L

(10.4L - 10.0L)

Sensible heat remains when subtracting the sensible heat of use steam from the discharge quantity per drain 1 liter 386 kcal/L - 160 kcal/L = 226 kcal/L

Leaked steam amount comes out when the remaining sensible heat divided by the sensible heat of use steam 226 kcal/L \div 498 kcal/L = 0.45kg/min (27.2kg/h) Los amount comes out in the relevant section when multiplying leaked steam amount by the steam unit price 27.2kg/h x ¥ 0.35/kg= ¥9.52/h x 8,160h = ¥77,683 π /year Steam leakage corresponds to RMB¥ 77,683 π /year



O-疏水阀





Fixed Orifice Type Steam Trap





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