

GESTRA Steam Systems

GESTRA Information A 1.6

Ball-Float Traps

Drainage of Compressed-Air Plants

Air contains humidity in the form of water vapour.

The saturation limit depends on the temperature and on the pressure of the air. If the limit is exceeded because of a temperature drop or air compression, part of the water condenses and condensate is formed. The presence of condensate in compressed air-lines may lead to problems in the plant.

It is therefore essential to drain aftercoolers downstream of compressors, but also pipelines and vessels if the air is cooled further and not dried in refrigeration, absorption or adsorption driers. If practically dry air is required by the air consumer without air drying equipment being available, a water separator should be installed in the airline upstream of the consumer. Horizontal pipelines should be drained

at regular distances and also at least at low points and upstream of risers.

Coolers and separators should be drained continuously by a float trap. Pipelines and vessels may be drained intermittently with manual or automatic valves, continuous drainage by float traps is, however, preferable.

In outside installations subject to freezing water pockets have to be avoided. This can be achieved either by drying the air or by heating pipelines and equipment.

Ball-float traps used for continuous drainage are level-controlled proportional controllers. As soon as condensate is formed – which must be free to fall towards the trap – the level in the trap body rises, the float is lifted and opens the closing unit. There is always a water seal upstream of the closing unit that prevents air from escaping. It is recommended to fill the trap with water when commissioning plants so that the water seal is provided on start-up.

Contrary to float-operated steam traps, air traps must not be equipped with a thermic element and we recommend our traps with Simplex control. To ensure, however, perfect drainage the air trapped in the trap body should be able to escape so that it cannot obstruct condensate flow. The safest method to obtain this is to provide a direct connection between trap body and air equipment to be drained through an air-balance pipe. The water flowing into the trap pushes the air out of the trap body back into the plant. The air-balance pipe only requires a very small diameter, e.g. DN 10 mm (3/8") or 15 mm (1/2"). Unnecessary flow resistance in the balance pipe that might prevent correct balancing should be avoided.

An air-balance pipe is not required if the air trap is installed directly underneath the equipment to be drained. In this case, ensure that the pipeline leading to the air trap is adequately sized so that the air can escape by bubbling through the condensate.

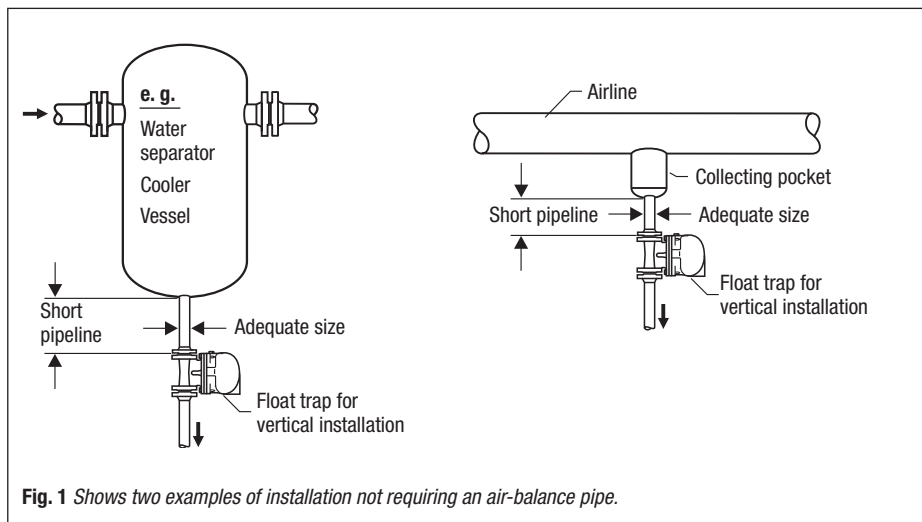


Fig. 1 Shows two examples of installation not requiring an air-balance pipe.

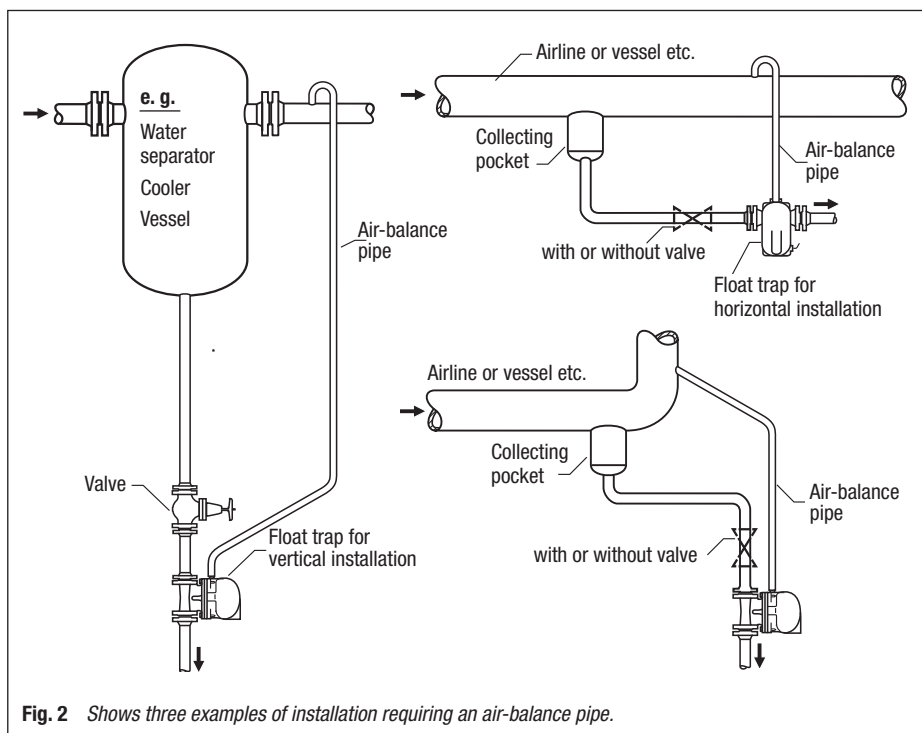


Fig. 2 Shows three examples of installation requiring an air-balance pipe.

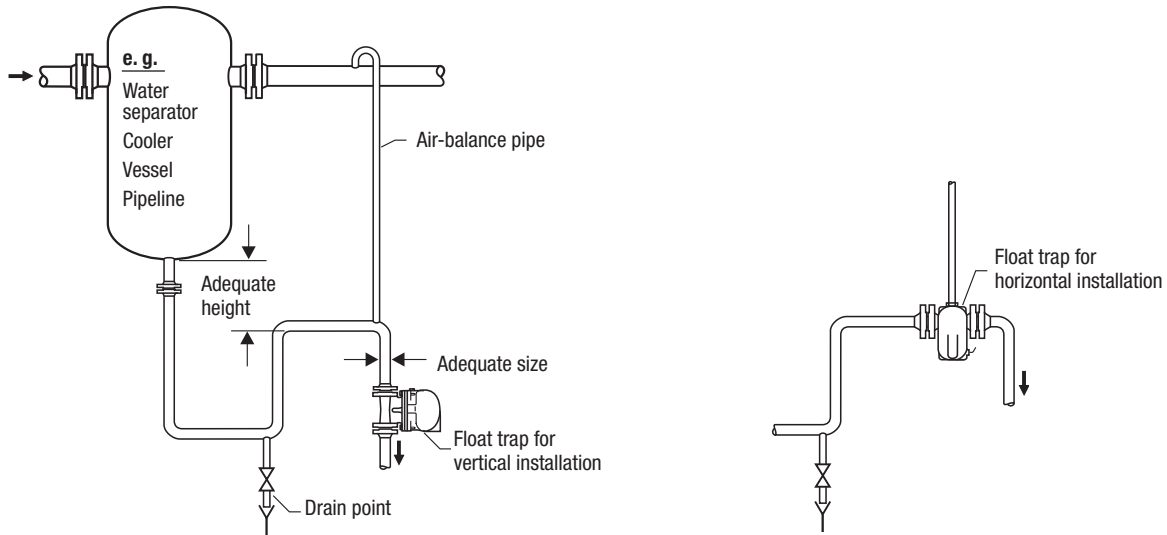


Fig. 3 Shows an example of installation requiring an air-balance pipe fitted at the highest point of the condensate line.

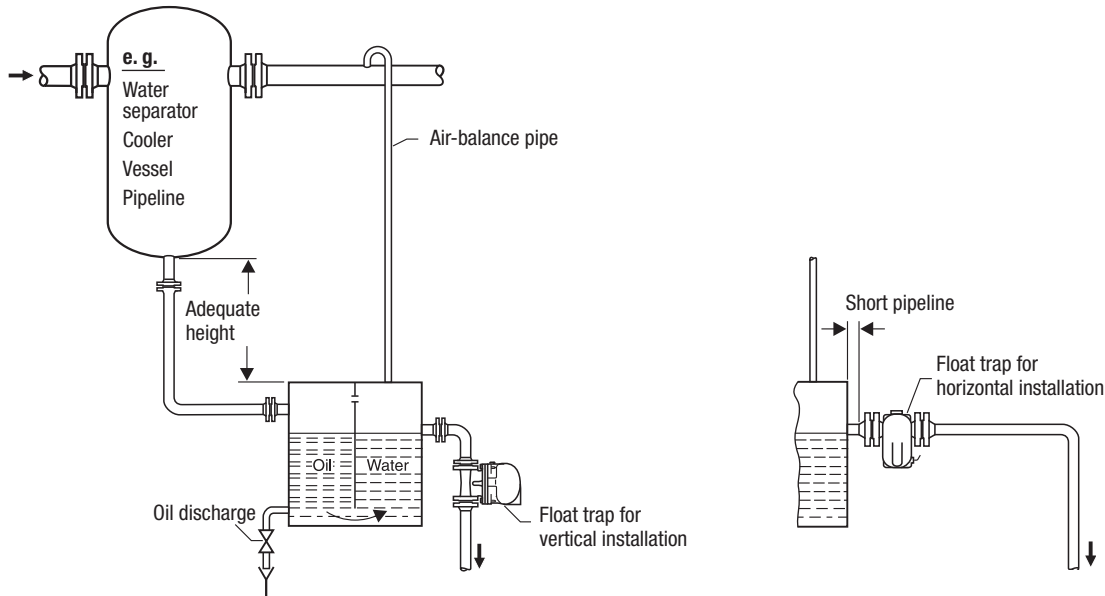


Fig. 4 Shows a system with an oil separator.

GESTRA air trap type UNA 14 P is equipped with a plug permitting the connection of an air-balance pipe. The trap is provided with a rolling ball valve closing mechanism. To ensure better tightness the ball valve is made of Perbunan for temperatures up to 40 °C. The trap is provided with a

manual purging device. Purging may for instance become necessary if the air or the condensate contains a slight amount of oil from oil-lubricated compressors.

If the oil contamination of the condensate is rather heavy it is recommended to install an oil separator upstream of the air trap to prevent the latter from being clogged. Besides GESTRA air traps our product range also includes water and oil separators.

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