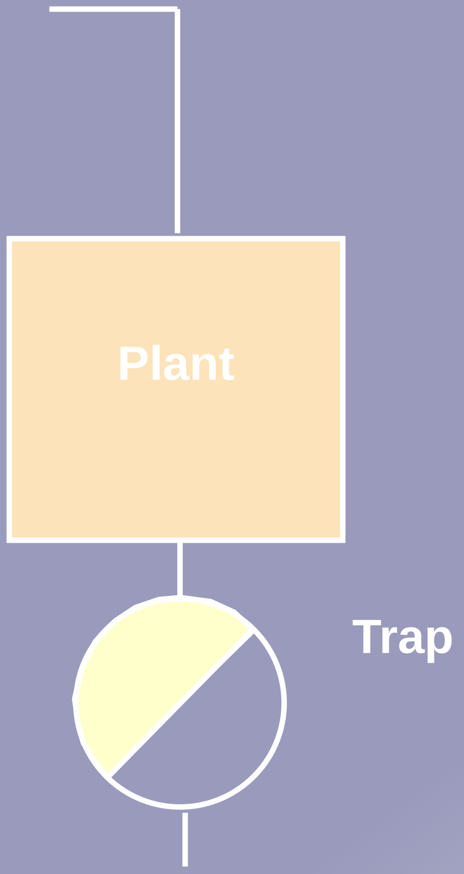
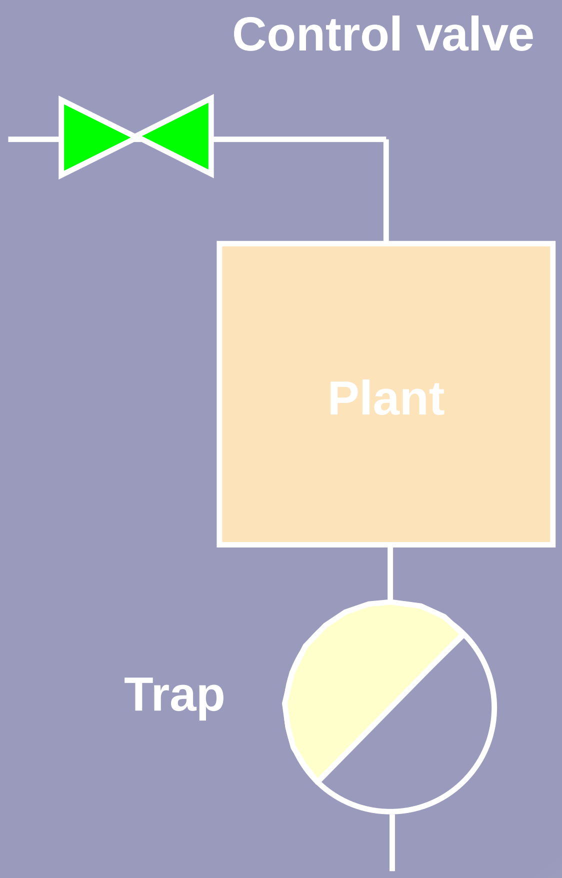
پمپ های مکانیکی

Condensate Removal No 1



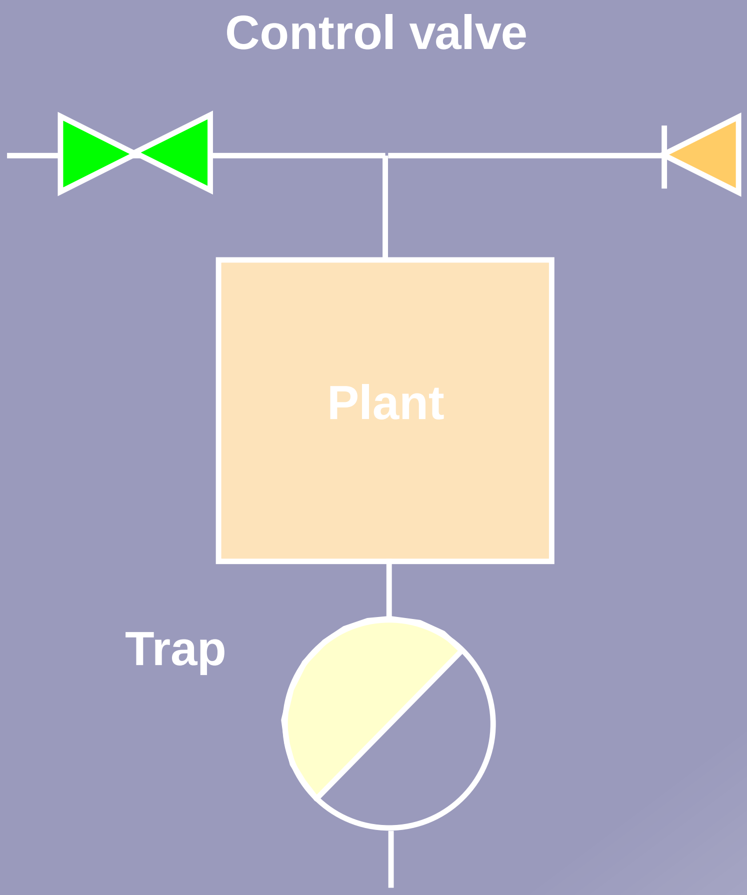
- No control valve, no lift, no problems, assuming:
- Condensate can drain to atmospheric pressure.
- The equipment is not shut down.

Condensate Removal No 2



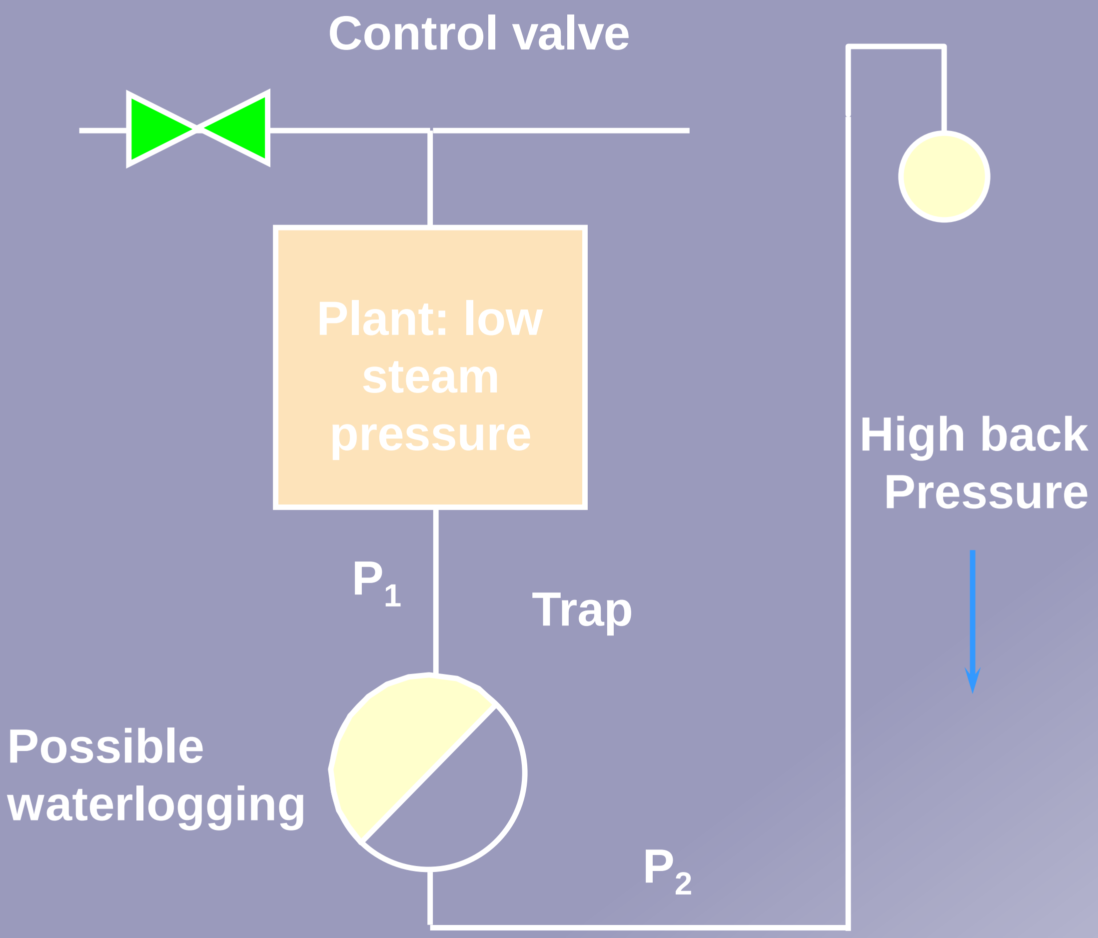
- Control valve added = possible problems with vacuum under low loads, assuming:
- Condensate can drain to atmospheric pressure.
- The equipment is not shut down.

Condensate Removal No 3



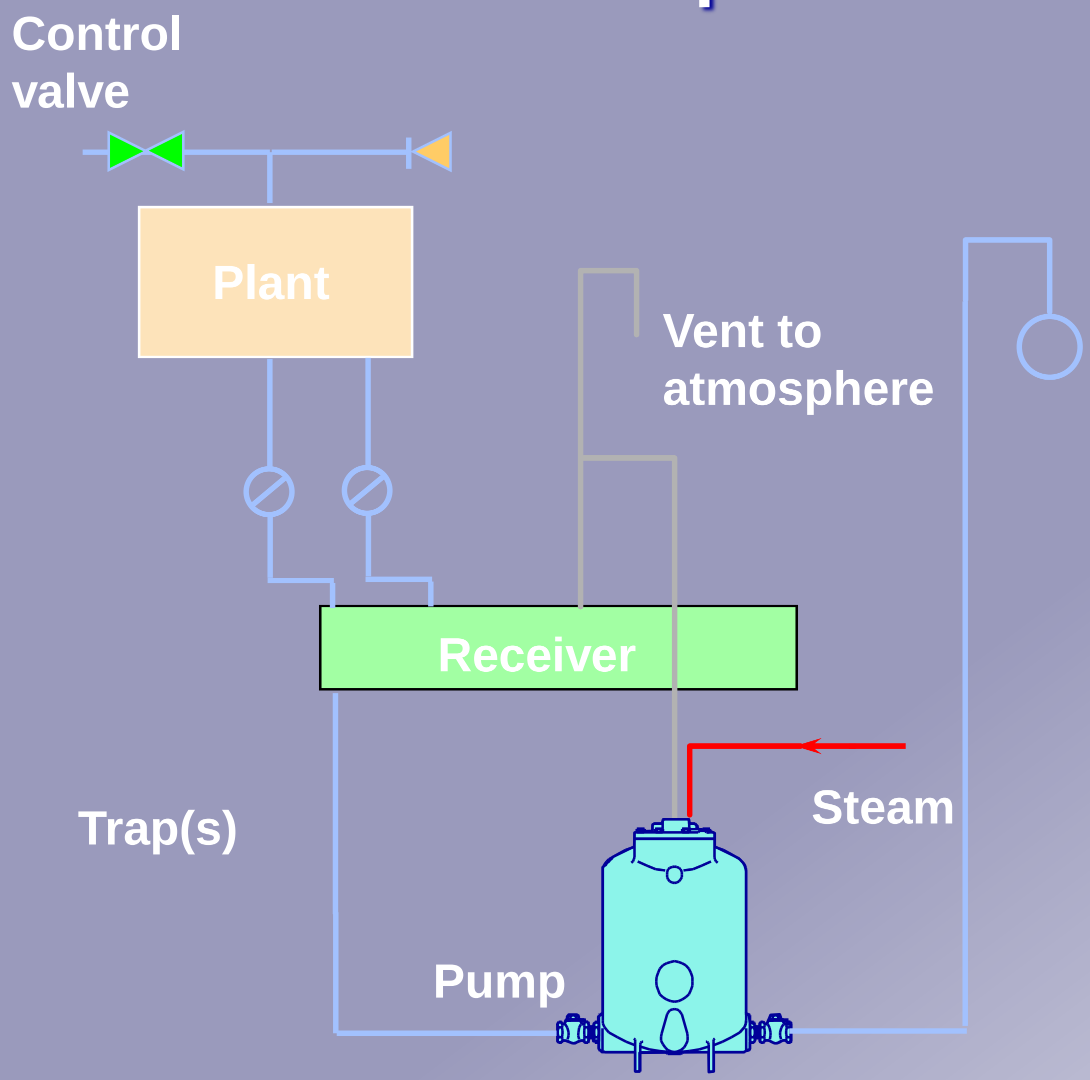
- With a vacuum breaker added, there is still a problem because the trap needs:
- Positive head for flow.
- To drain to atmospheric pressure.

Condensate Removal No 4



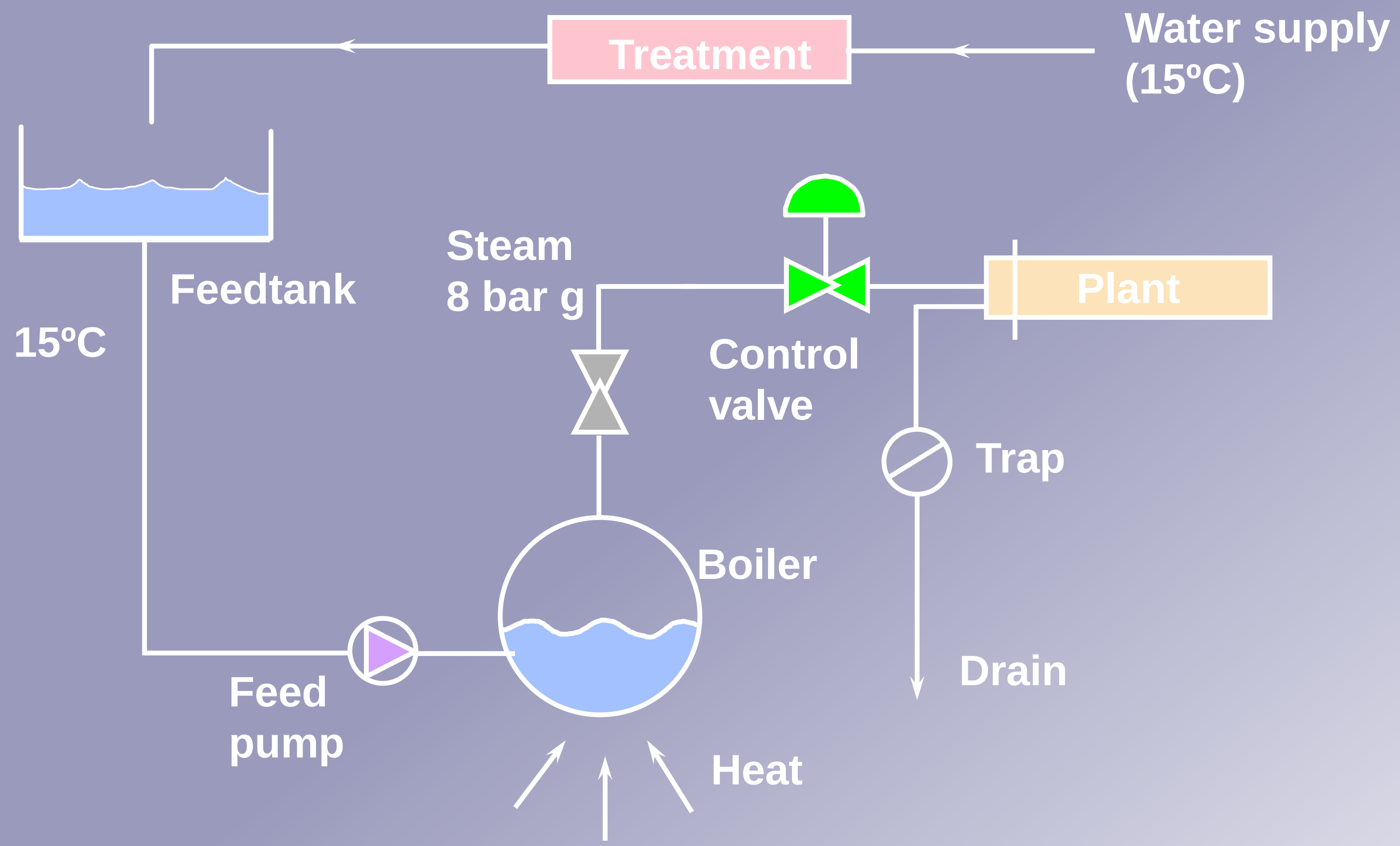
- If condensate lifts after the trap, the system may STALL.
- Stall will occur at any time when P2 is greater than P1

Condensate Recovery at Atmospheric Pressure

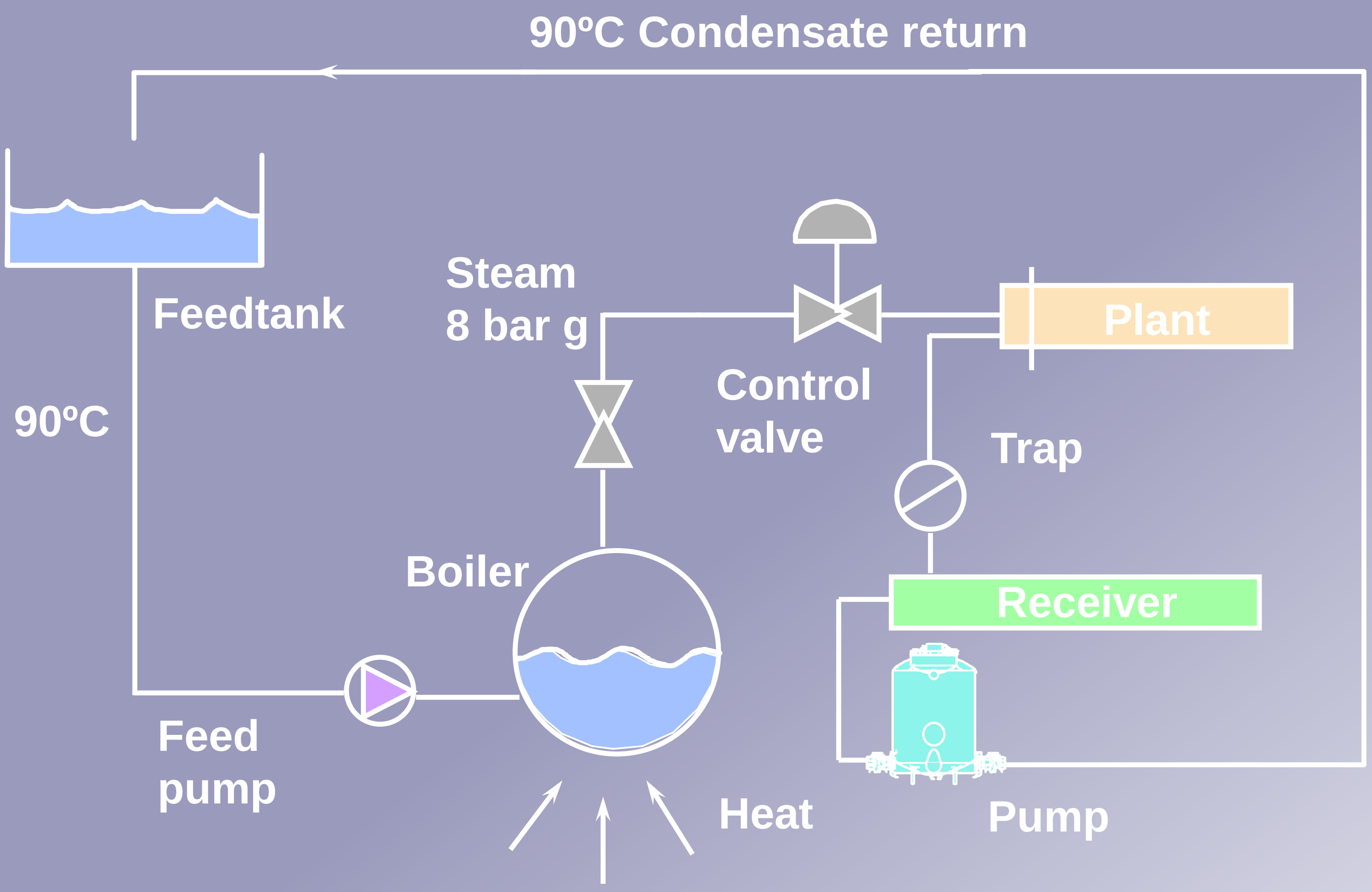


- Pump overcomes back pressure but heat exchanger outlet must be well above the receiver to provide gravity drainage.

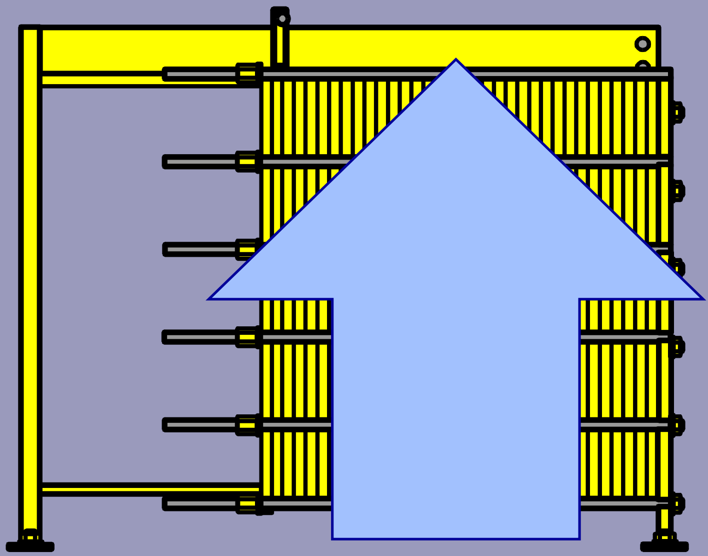
Simple Steam System without Condensate Return



Simple Steam System with Condensate Return



Exchanger Waterlogging



- Exchanger waterlogging causes:
- Reduced heat output
- Control valve hunting
- Product quality problems
- Corrosion
- Waterhammer
- Freezing and thermal stresses of plant and piping.

MFP14 Automatic Pumps

Effective Condensate Management

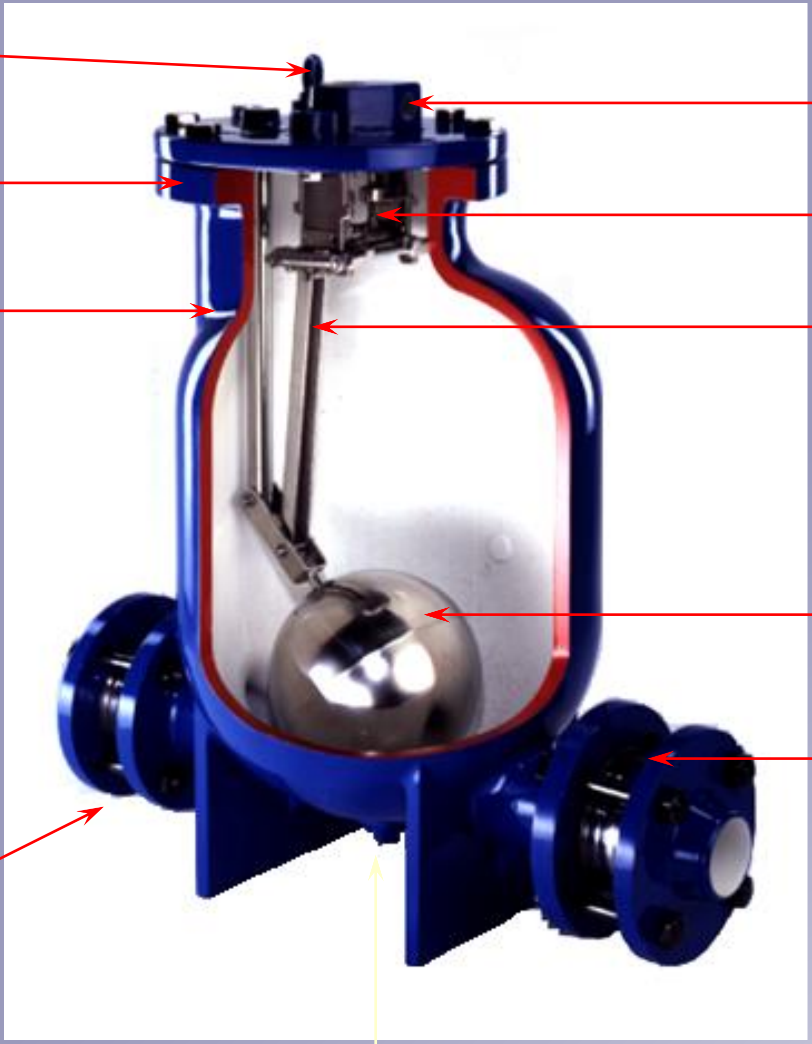
Lifting eye

Stainless steel cover bolts. High integrity trapped cover gasket

SG Iron or Cast steel body and cover 3.1B certifiable. Available with TUV approval.

Pump cycle counter available

Available with DIN PN16, ANSI 150, JIS/KS10 or screwed boss flanges



Available with screwed BSP NPT or socket weld motive fluid connections

Replaceable valves and seats

Stainless steel internal mechanism

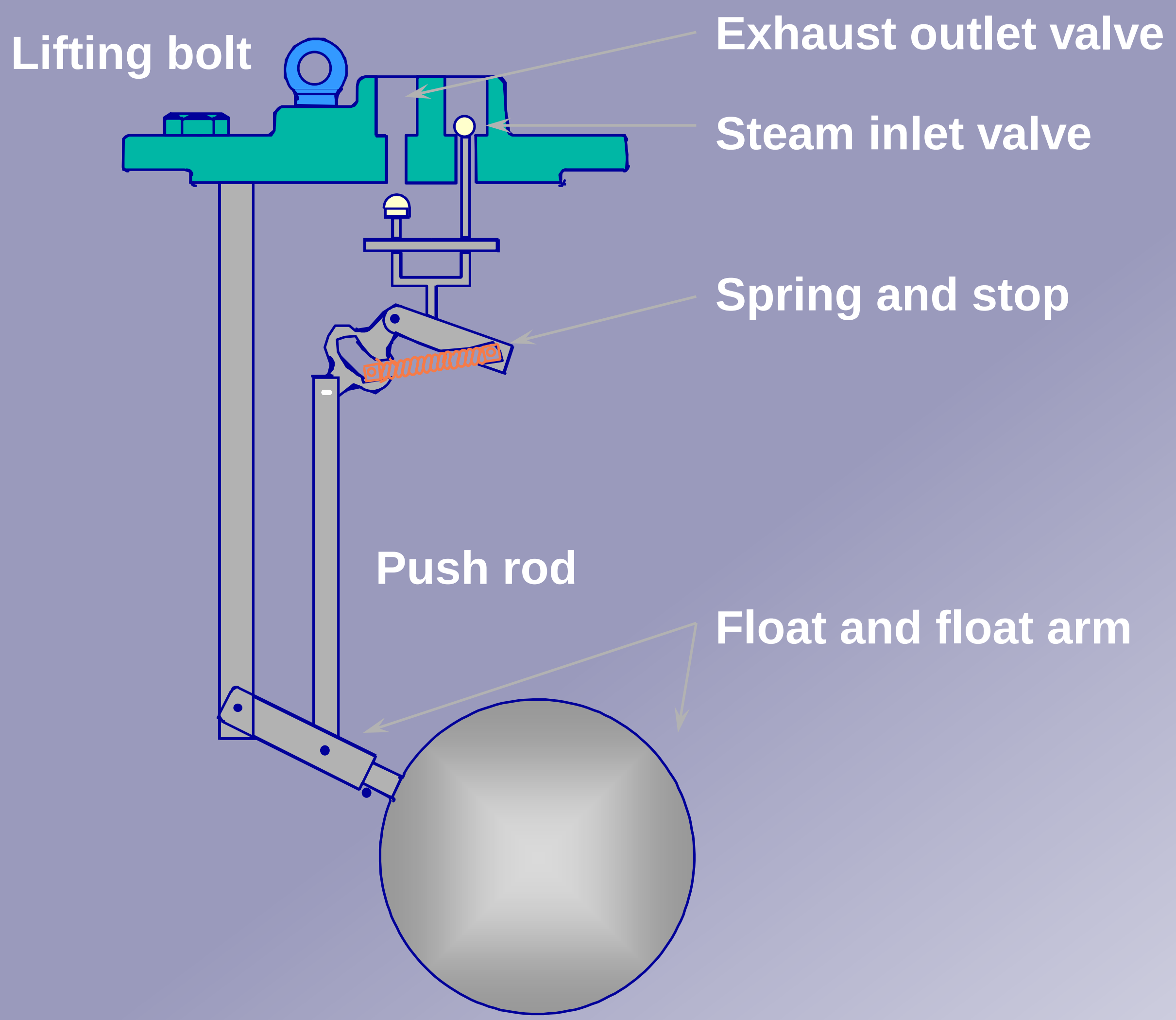
Custom insulation jacket available

Robust stainless steel float

Stainless steel high capacity inlet and outlet check valves

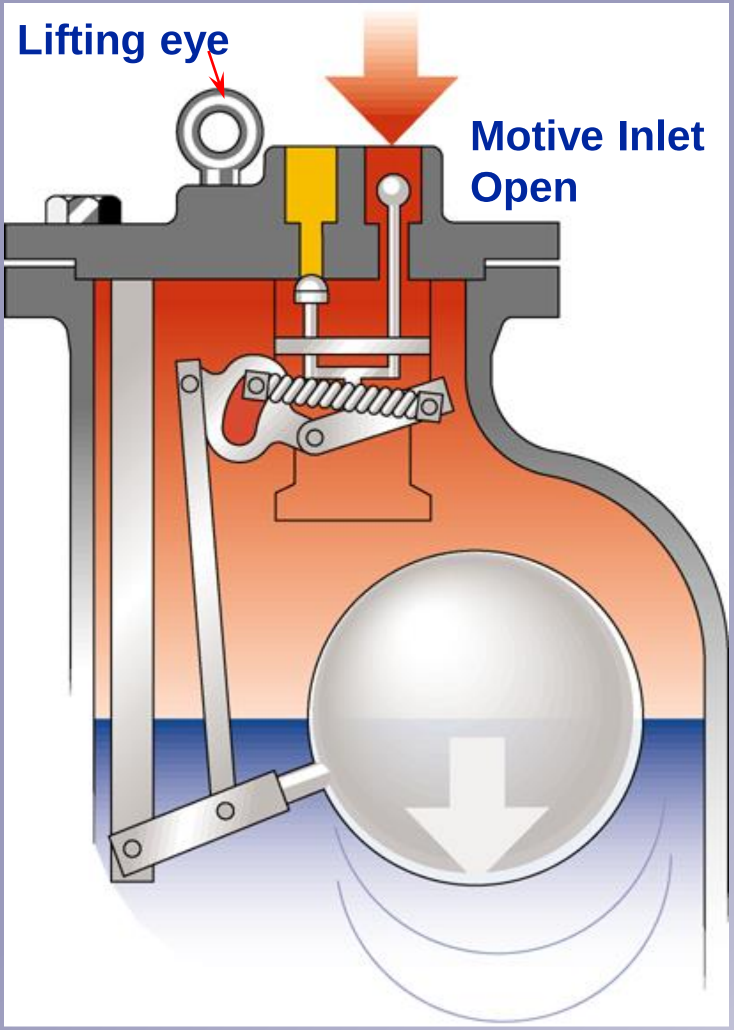
Low level drain point

Pump Mechanism - MFP14 Range

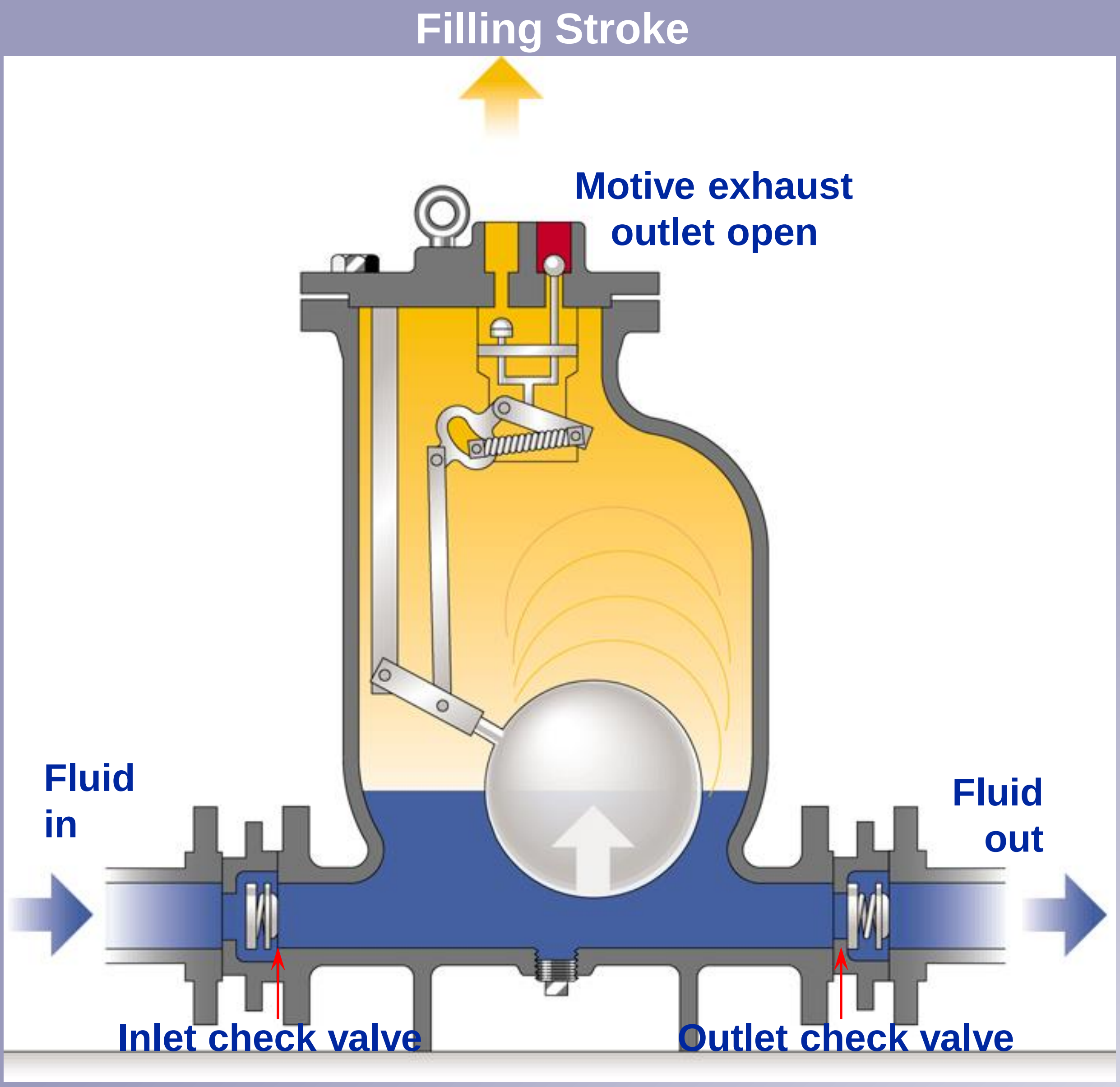


How The MFP14 Works

Discharge Stroke



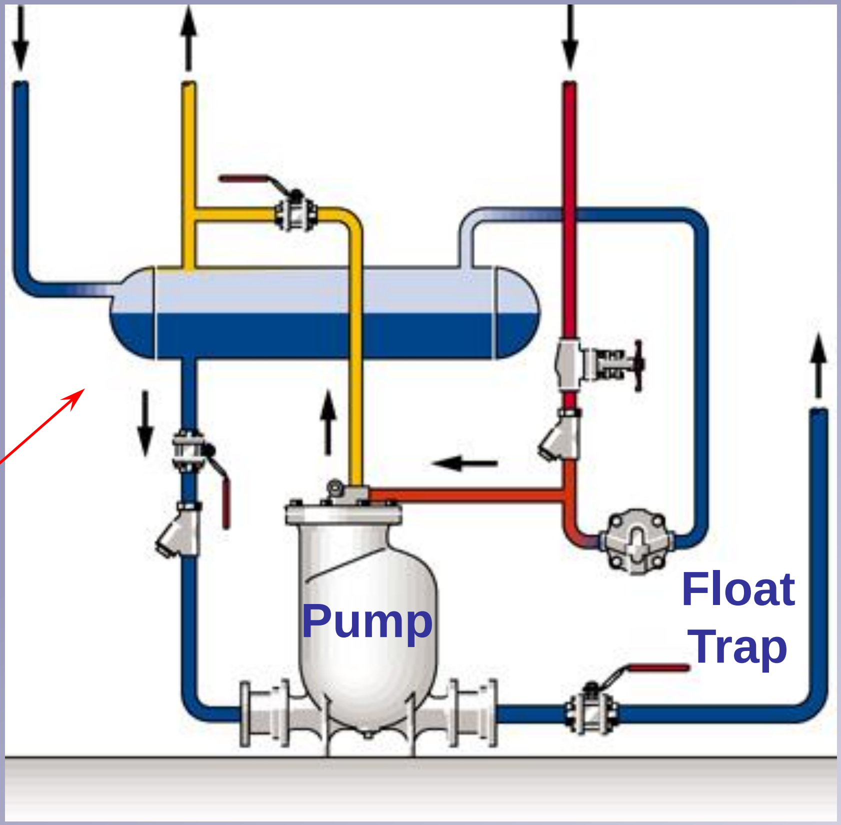
How The MFP14 Works



Typical Applications

- Condensate recovery (open system)
- Pumping high temperature condensate without cavitation or mechanical seal problems.
- Provides maximum heat recovery.

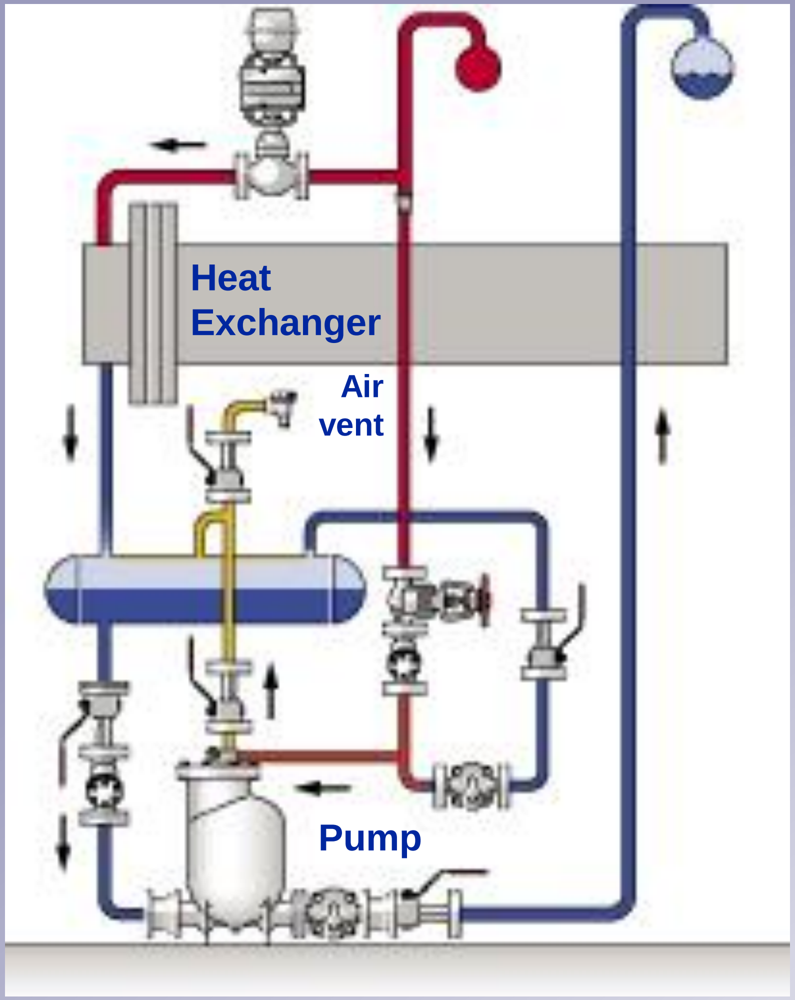
Condensate collecting receiver



Typical Applications

- Condensate removal from process vessels and heat exchangers (pump/trap combination, closed system)
- Removal of condensate under all pressure conditions ensures stable temperatures prevents corrosion, waterhammer and freezing

Condensate collecting receiver



Back Pressure on Traps

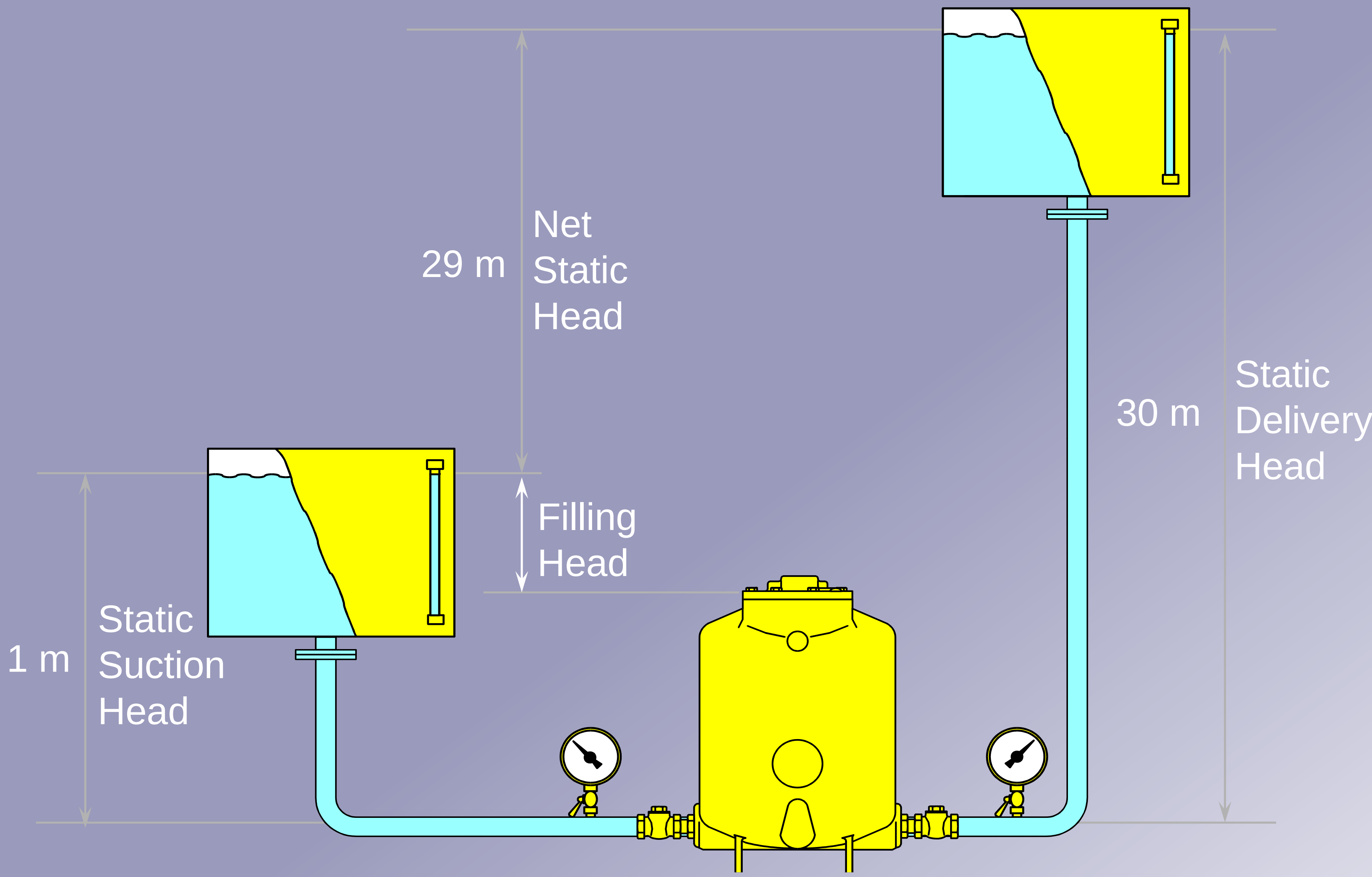
- Pressure at end of return line is equal to:

  Hydrostatic head

  \+ Frictional resistance to flow

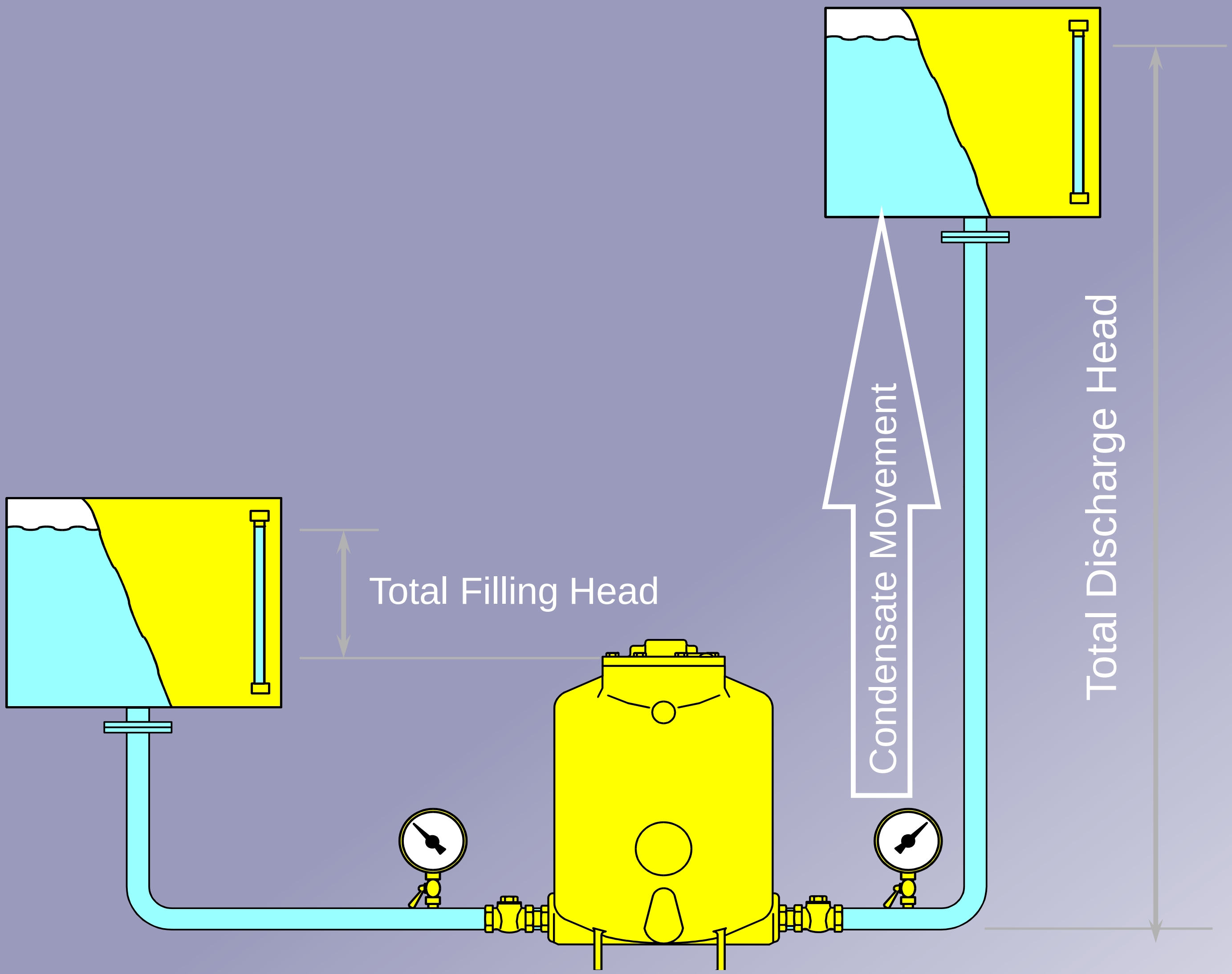
  = BACK PRESSURE

Static Head

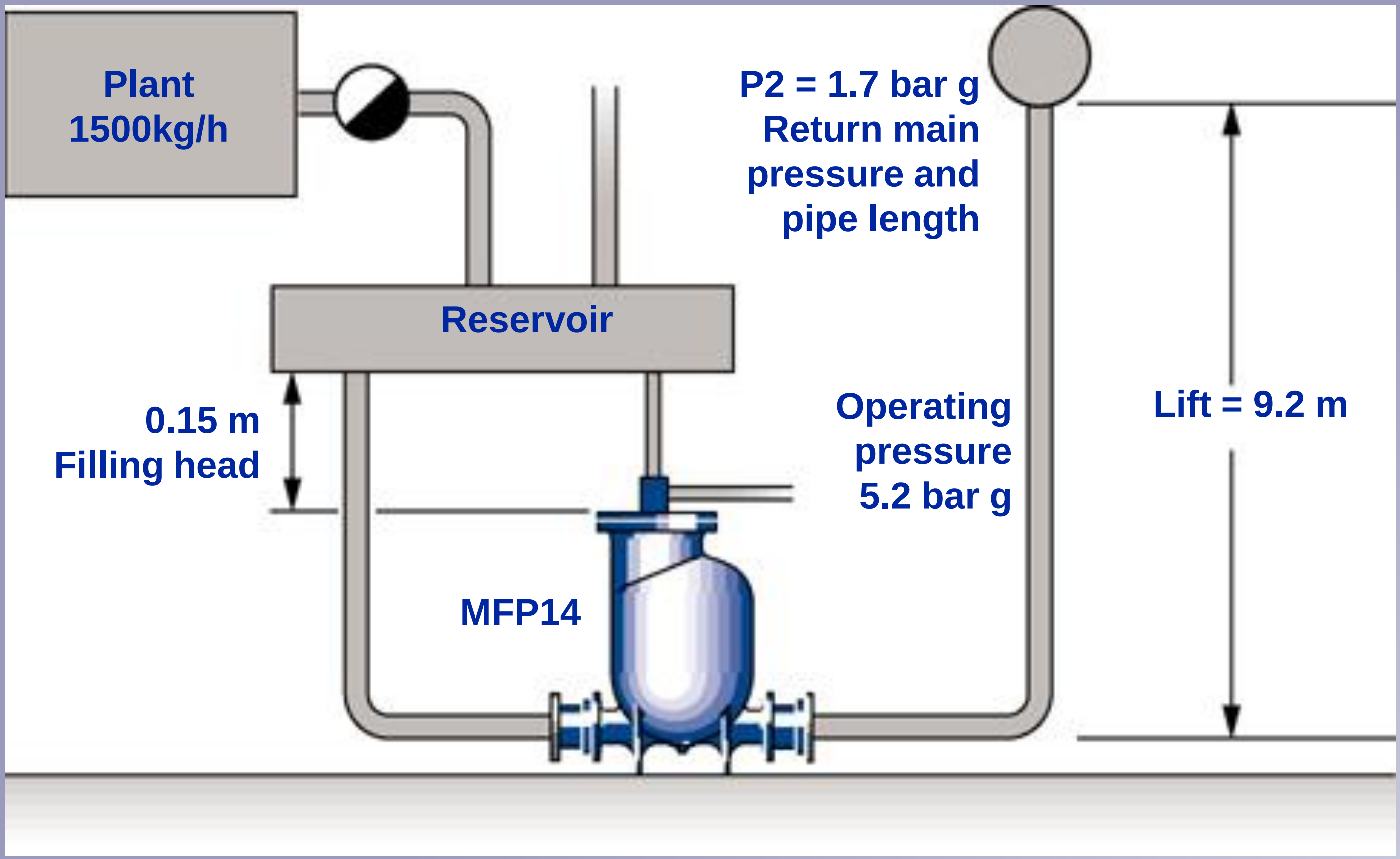


29 m
Net Static Head
30 m
Static Delivery Head
Filling Head
1 m
Static Suction Head

Total Discharge Head



How to Size and Select the MFP14



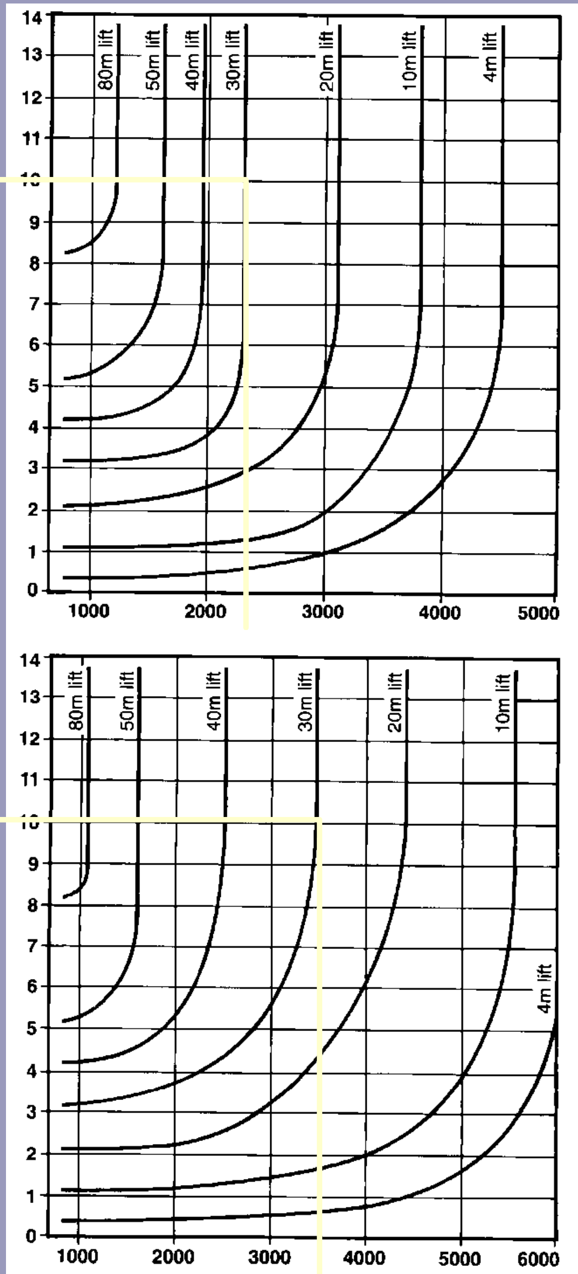
Sizing an MFP

More advanced case considering the effects of pressure in the discharge pipework

MFP14

50 mm

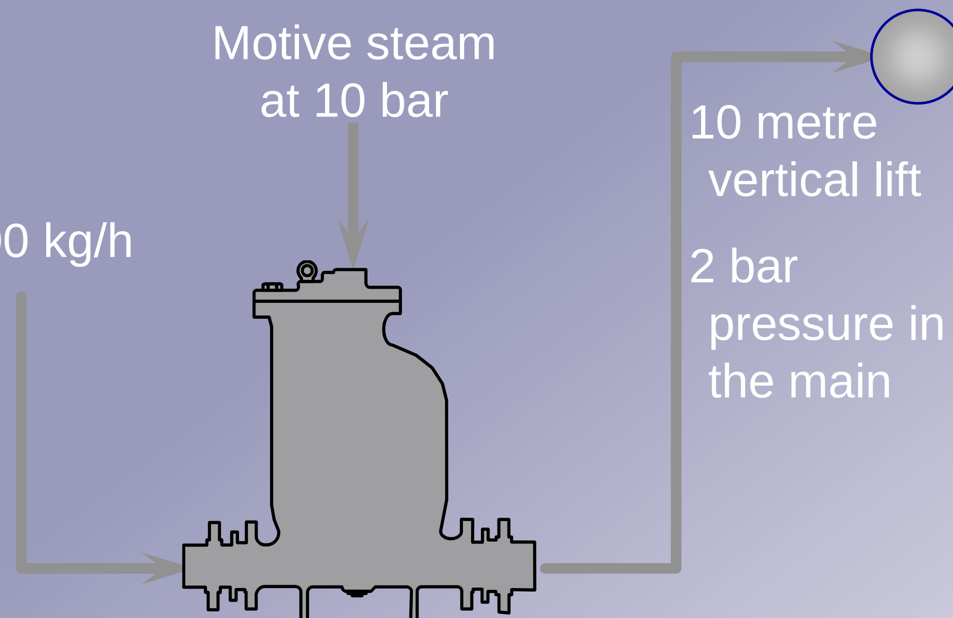
Motive Pressure (bar g)



MFP14

80 x 50 mm

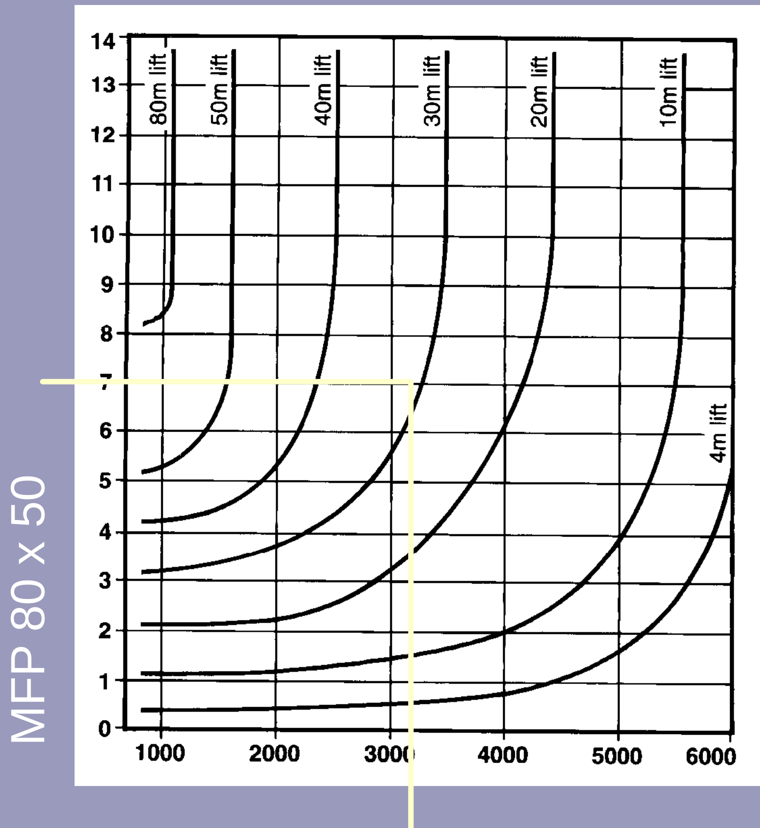
Capacity (kg/h)

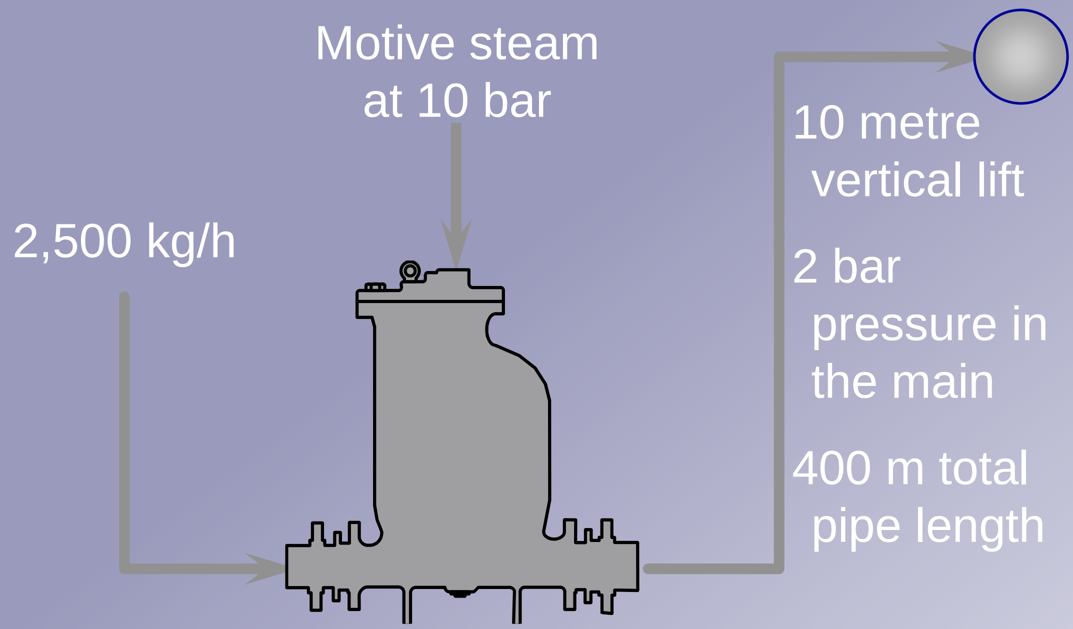


- MFP14 50 mm is too small
- Select MFP14 80 x 50 mm

Sizing an MFP

Complex Case Considering the Effects of Pipe Size and Length

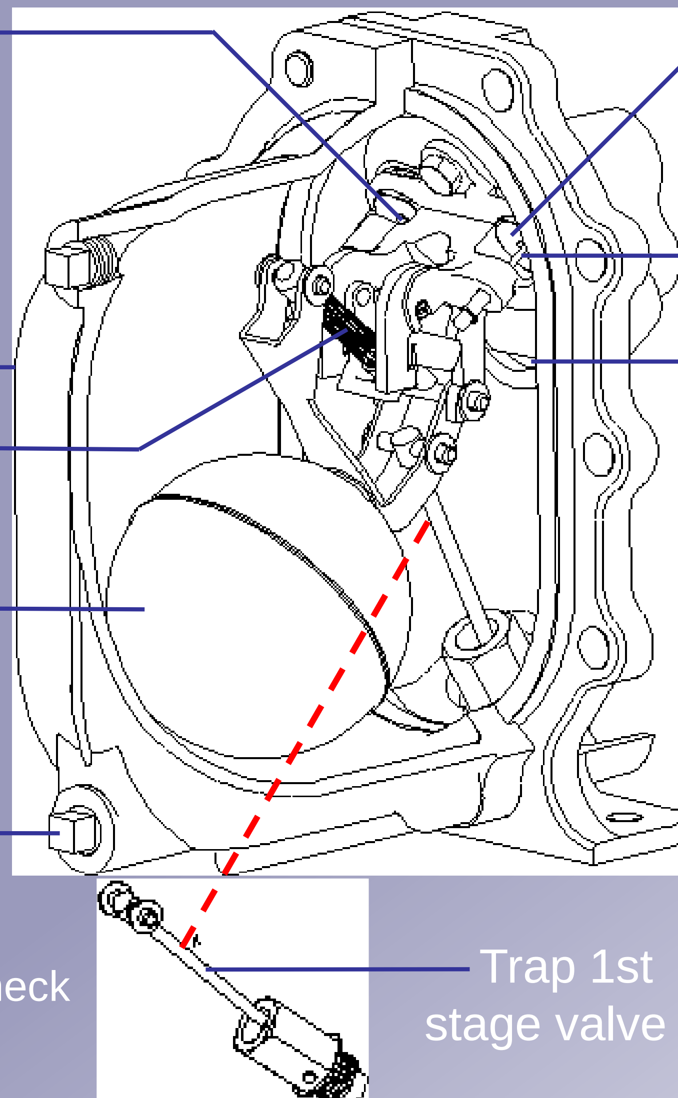




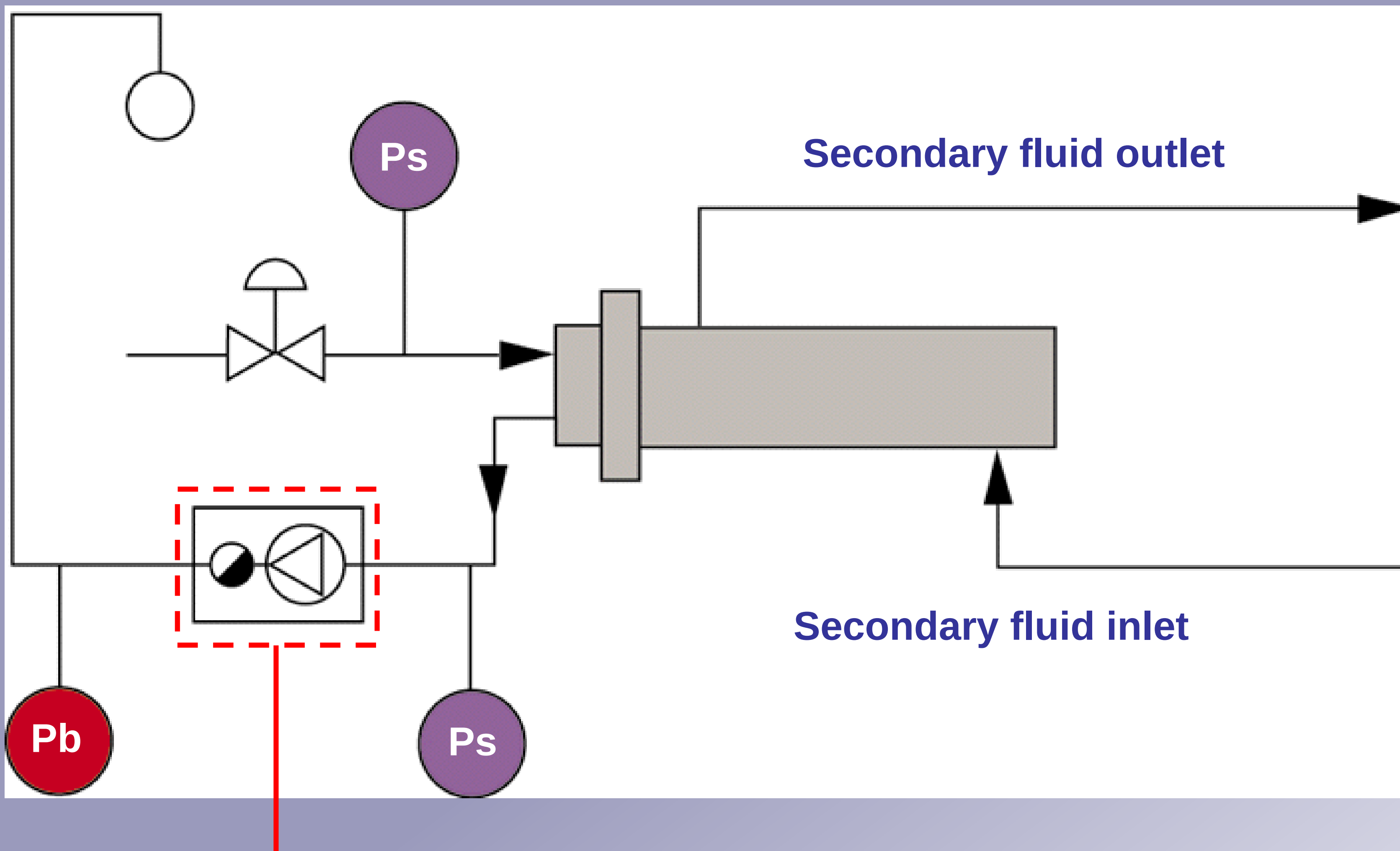
APT Automatic Pump Trap

APT10 with cut section

APT10 Automatic Pump Trap



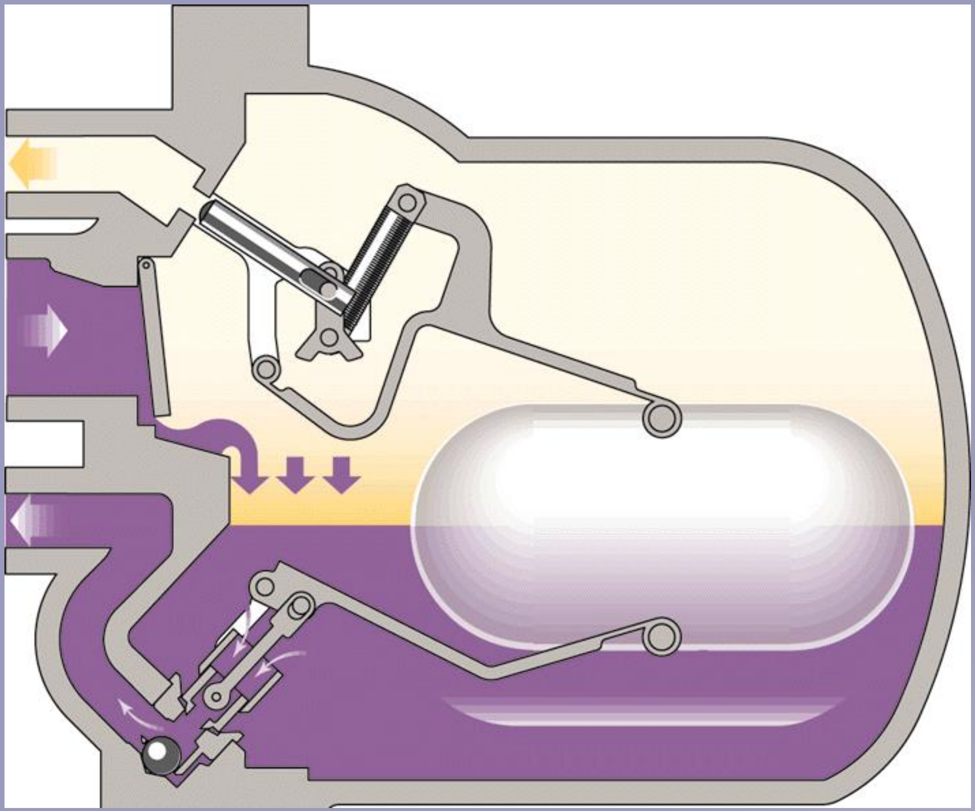
How the APT is connected in the system



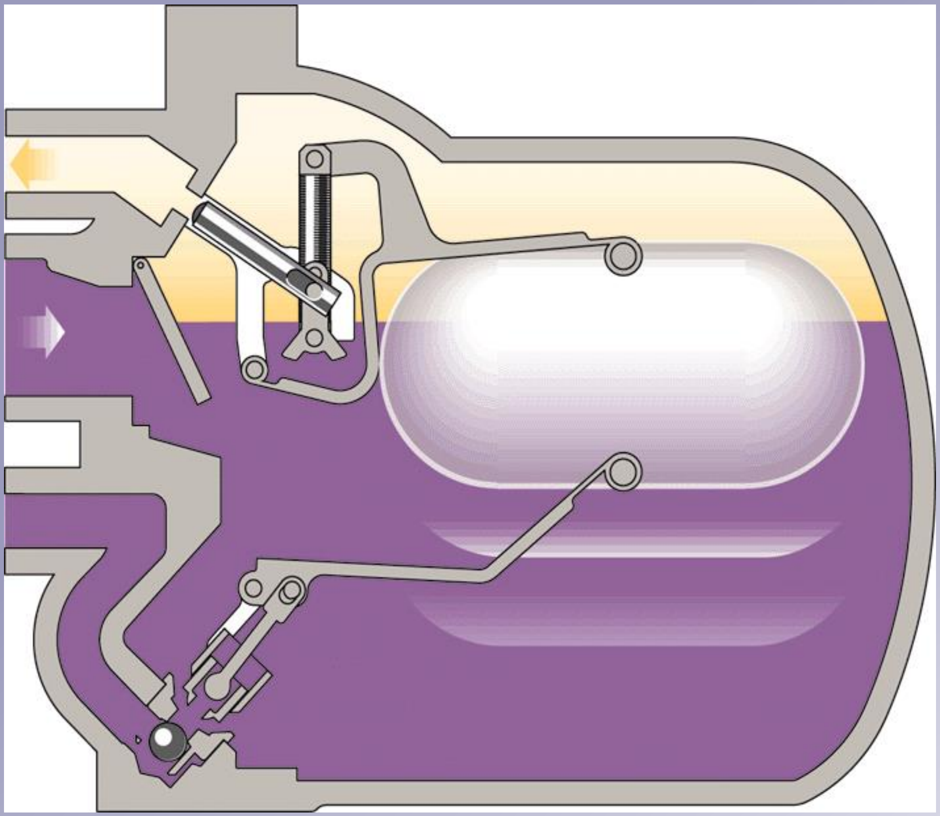
This is the symbol Spirax Sarco use for an automatic pump trap

How the APT operates

1st

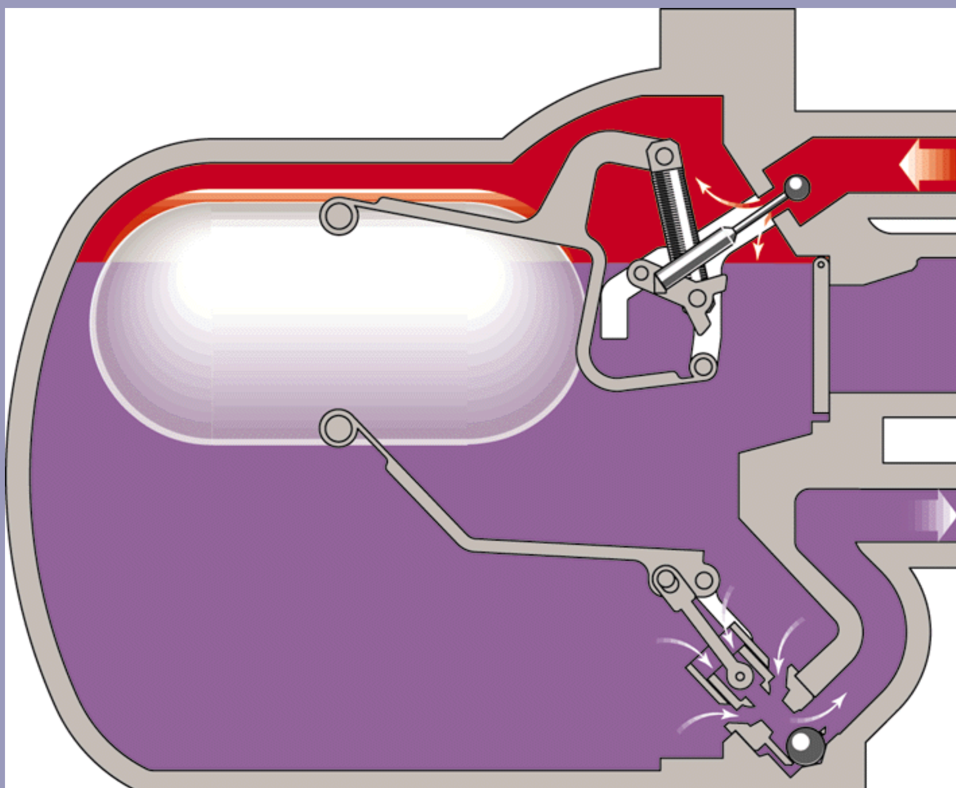


2nd

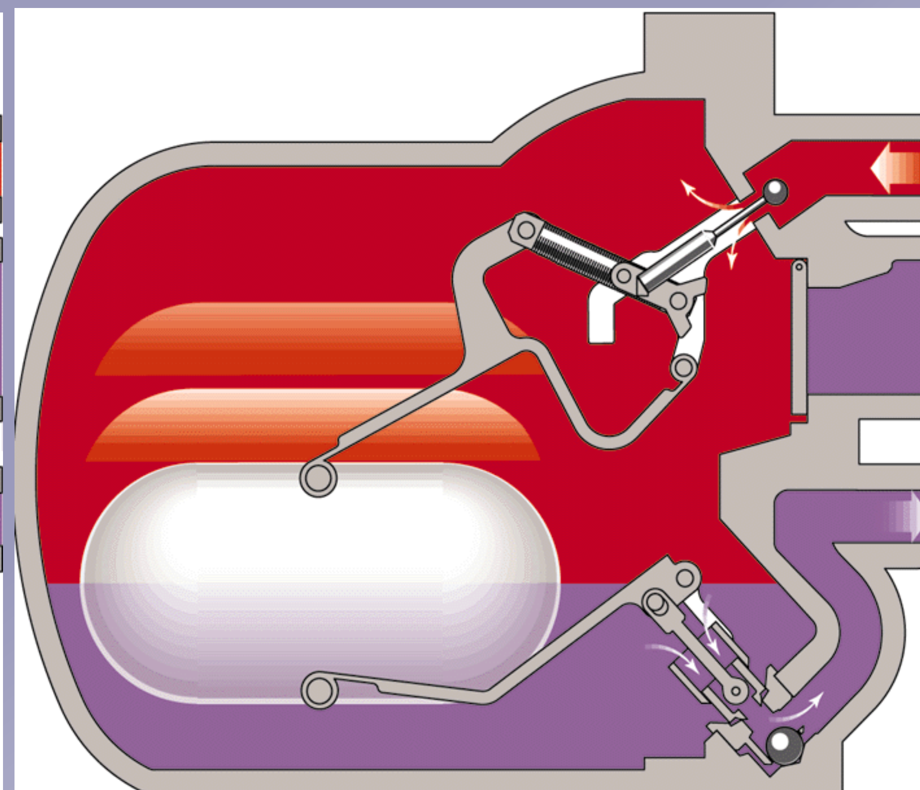


How the APT operates

3rd

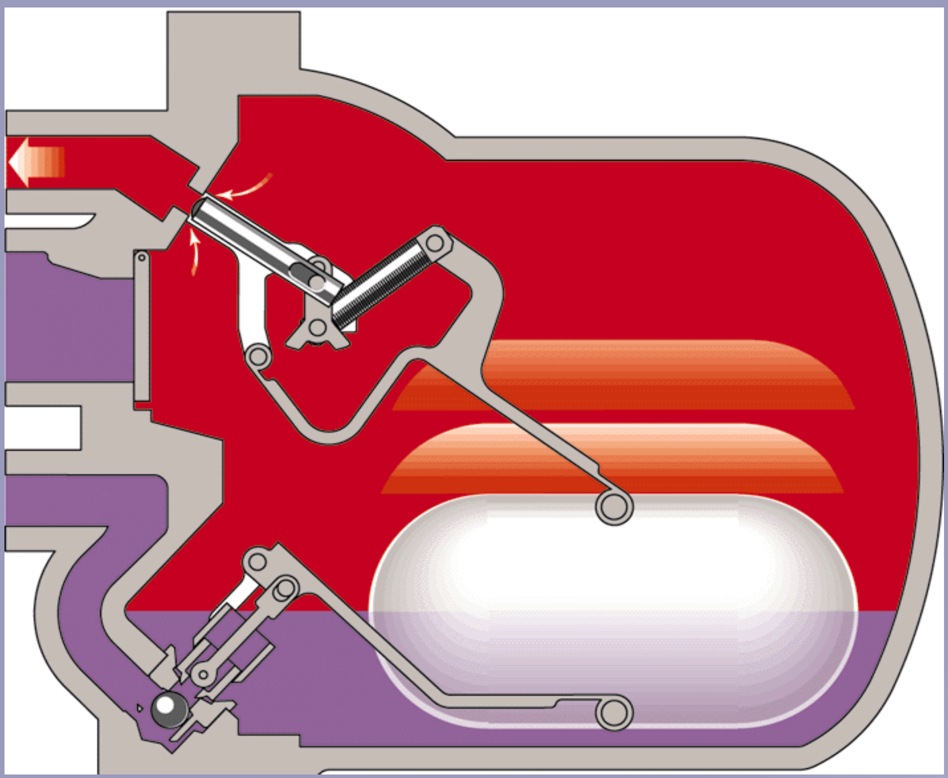


4th

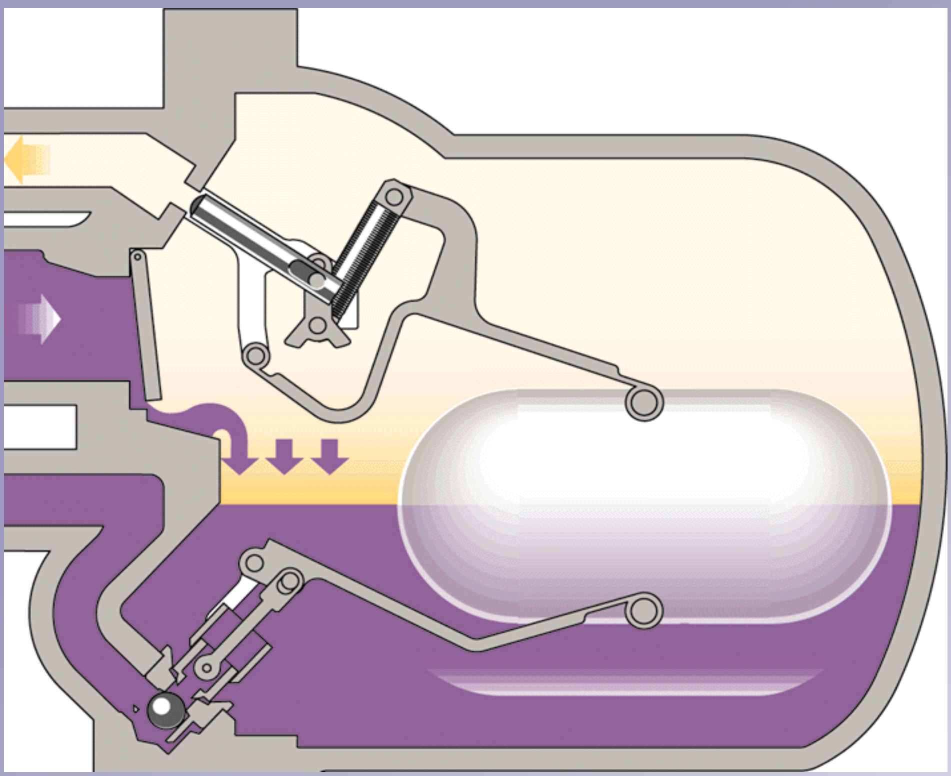


How the APT operates

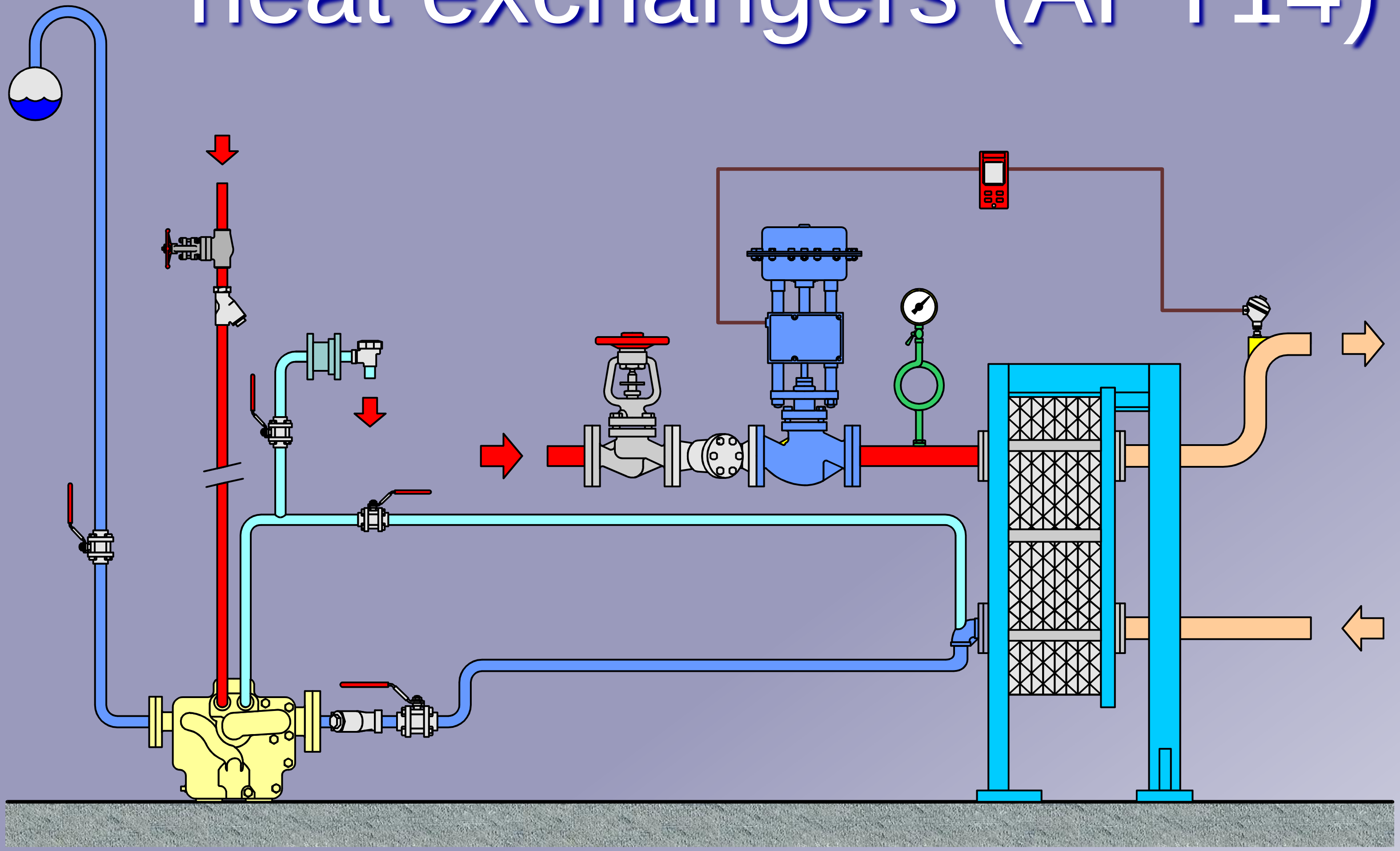
5th



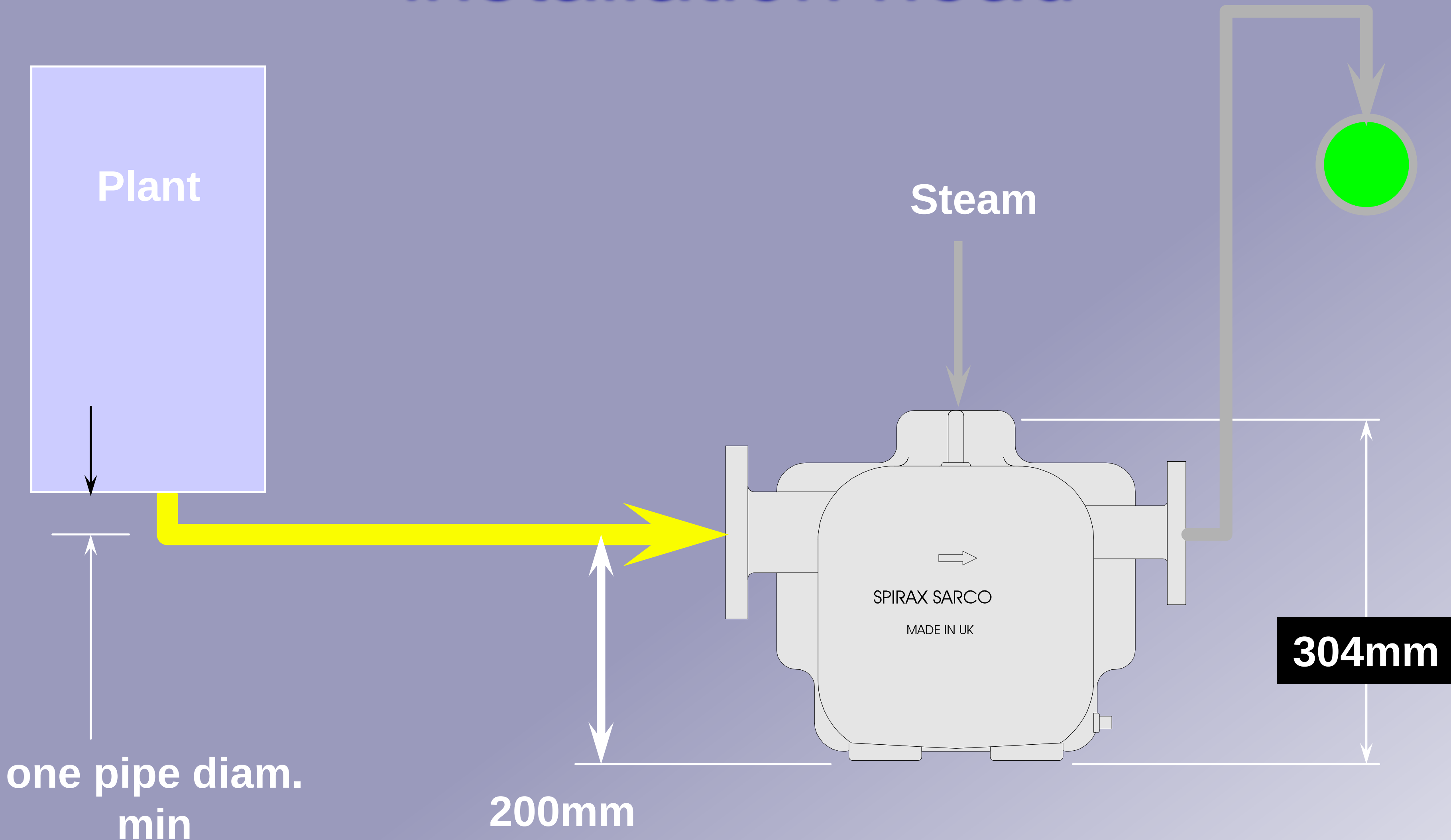
6th



Condensate removal from plate heat exchangers (APT14)

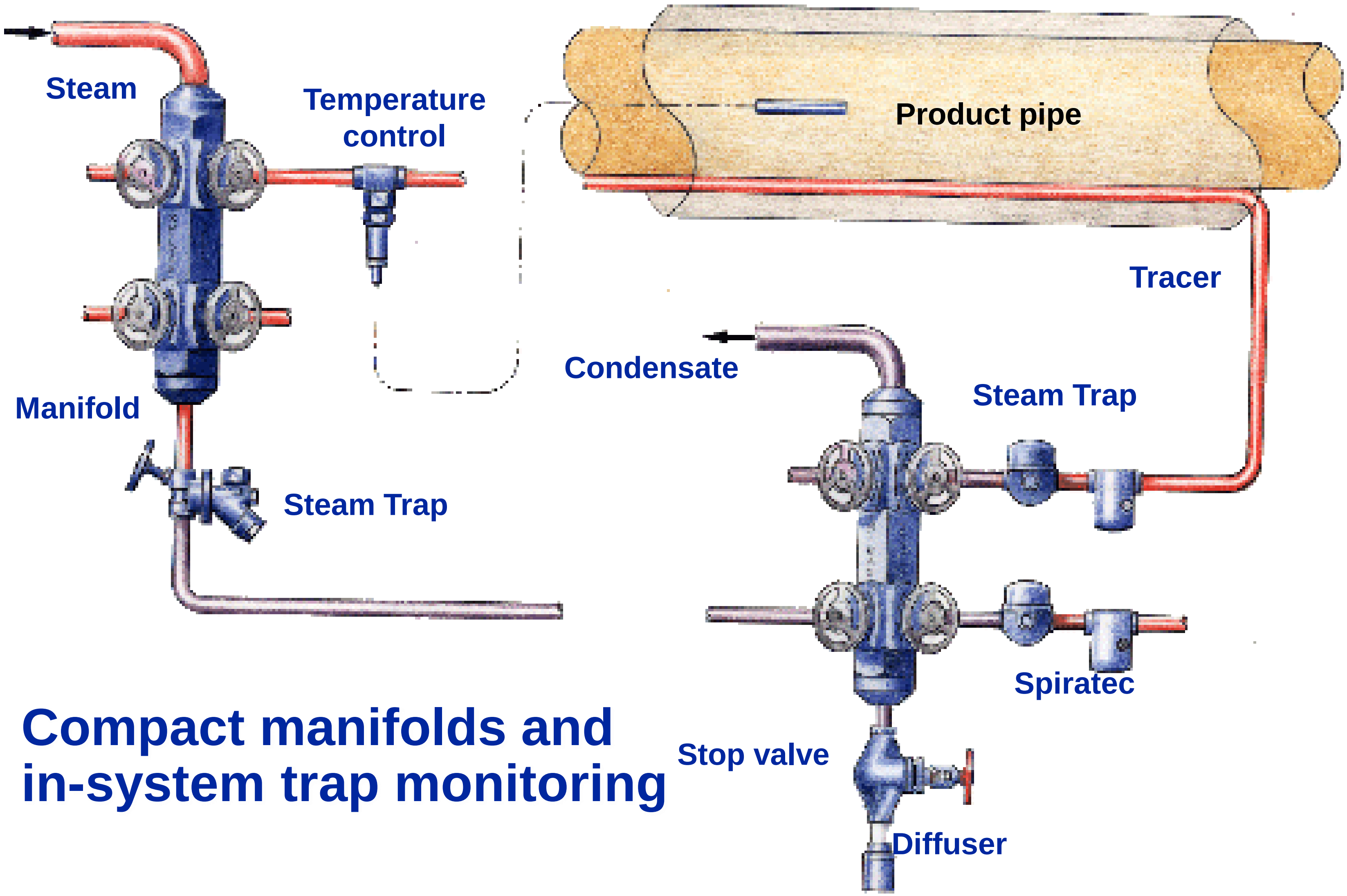


APT 14 height and installation head



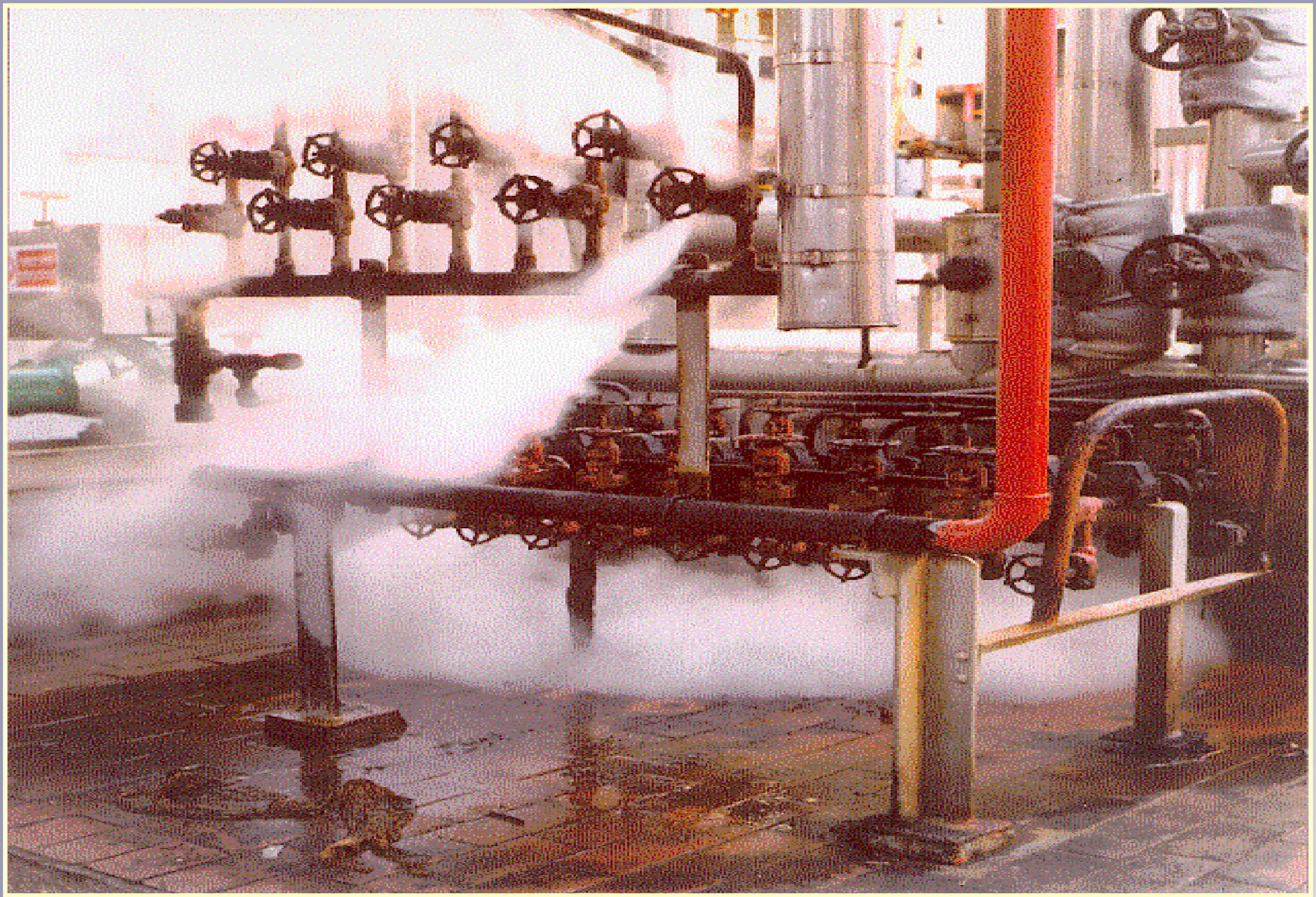
Compact Manifolds
&
Compact Steam Trap Stations

Critical Tracing

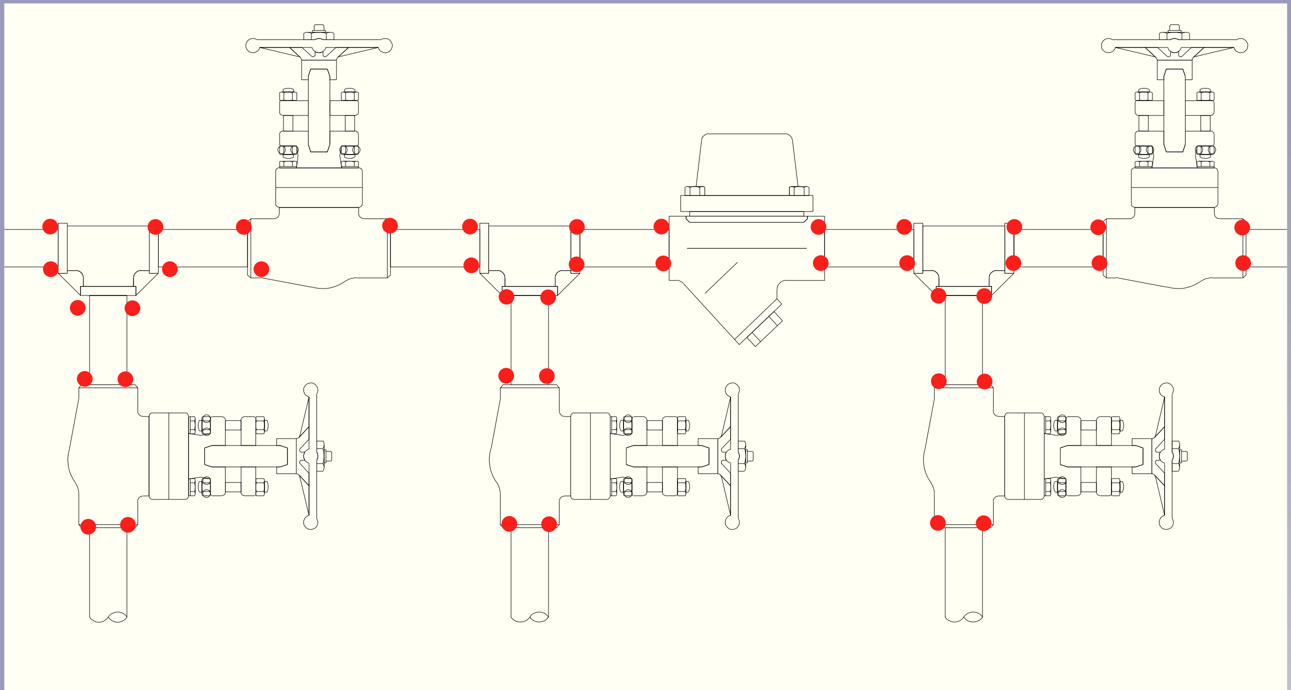


Compact manifolds and in-system trap monitoring

Old style fabricated condensate collection manifold



Traditional trapping layout



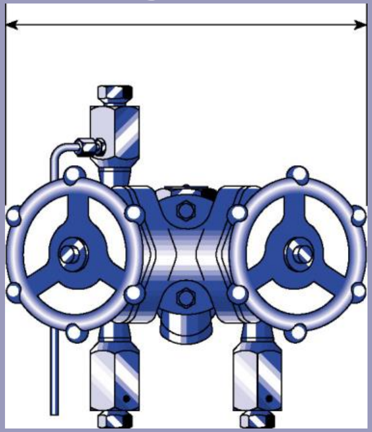
21 Welds

17 Components

Comparison compact and conventional steam trap station

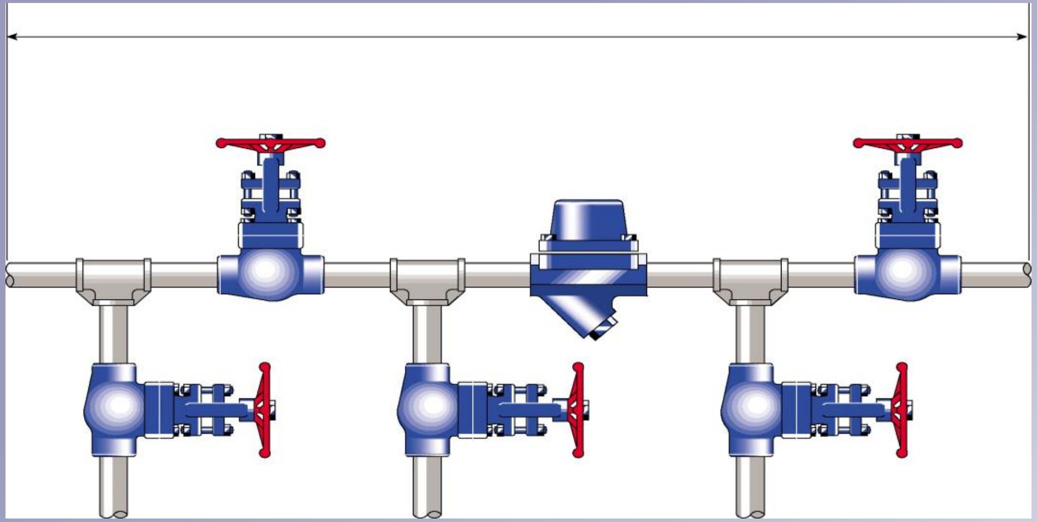
PC4-compact steam trapping station

125 mm



600 mm

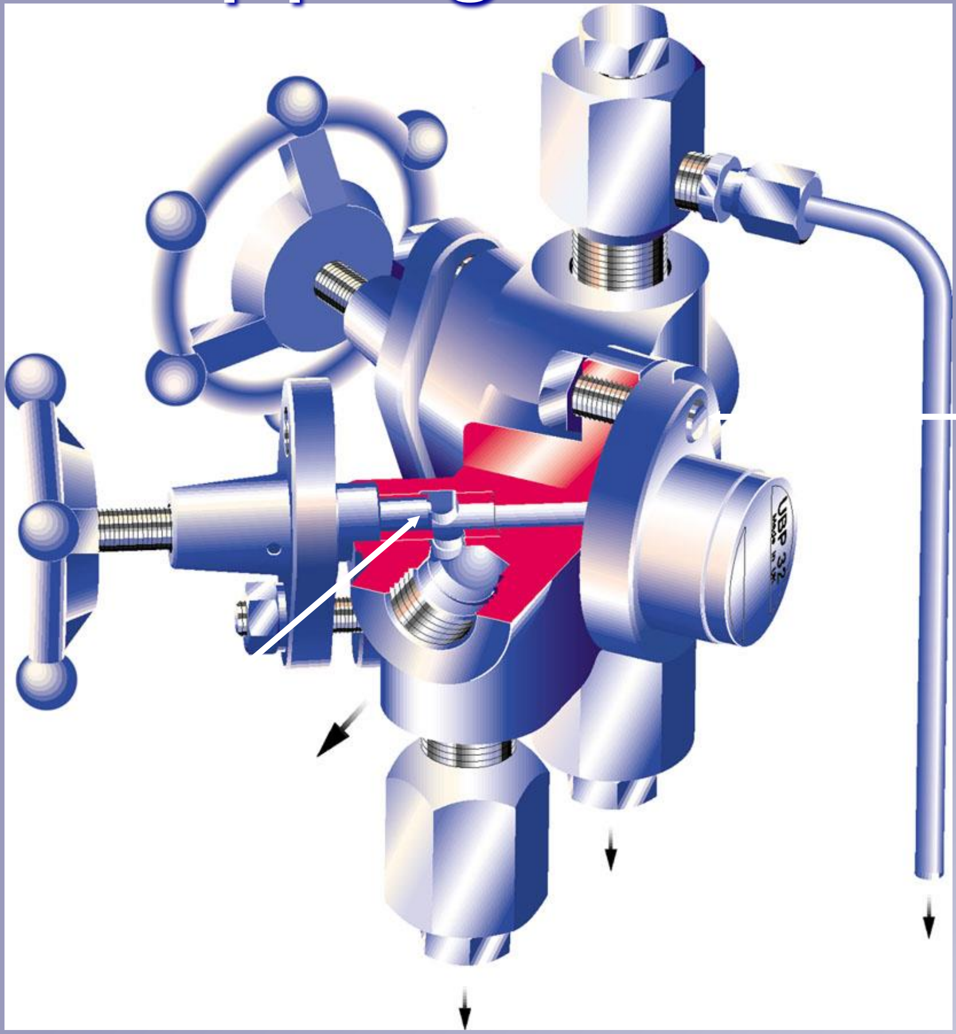
Traditional steam trapping Station



Spirax Sarco compact steam trapping station

All stainless steel construction

Piston valve technology



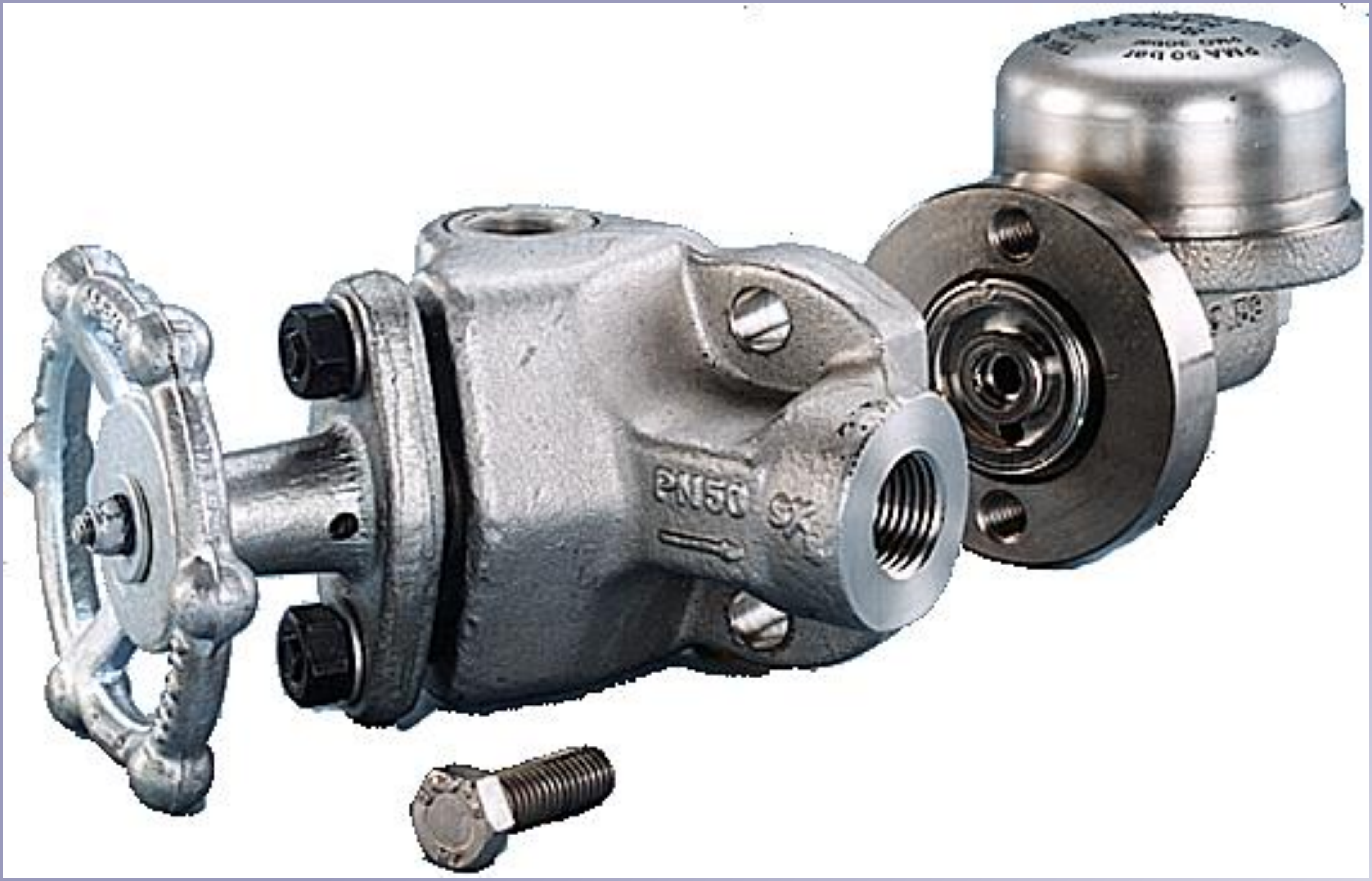
Optional upstream depressurisation valve

2 bolt connections

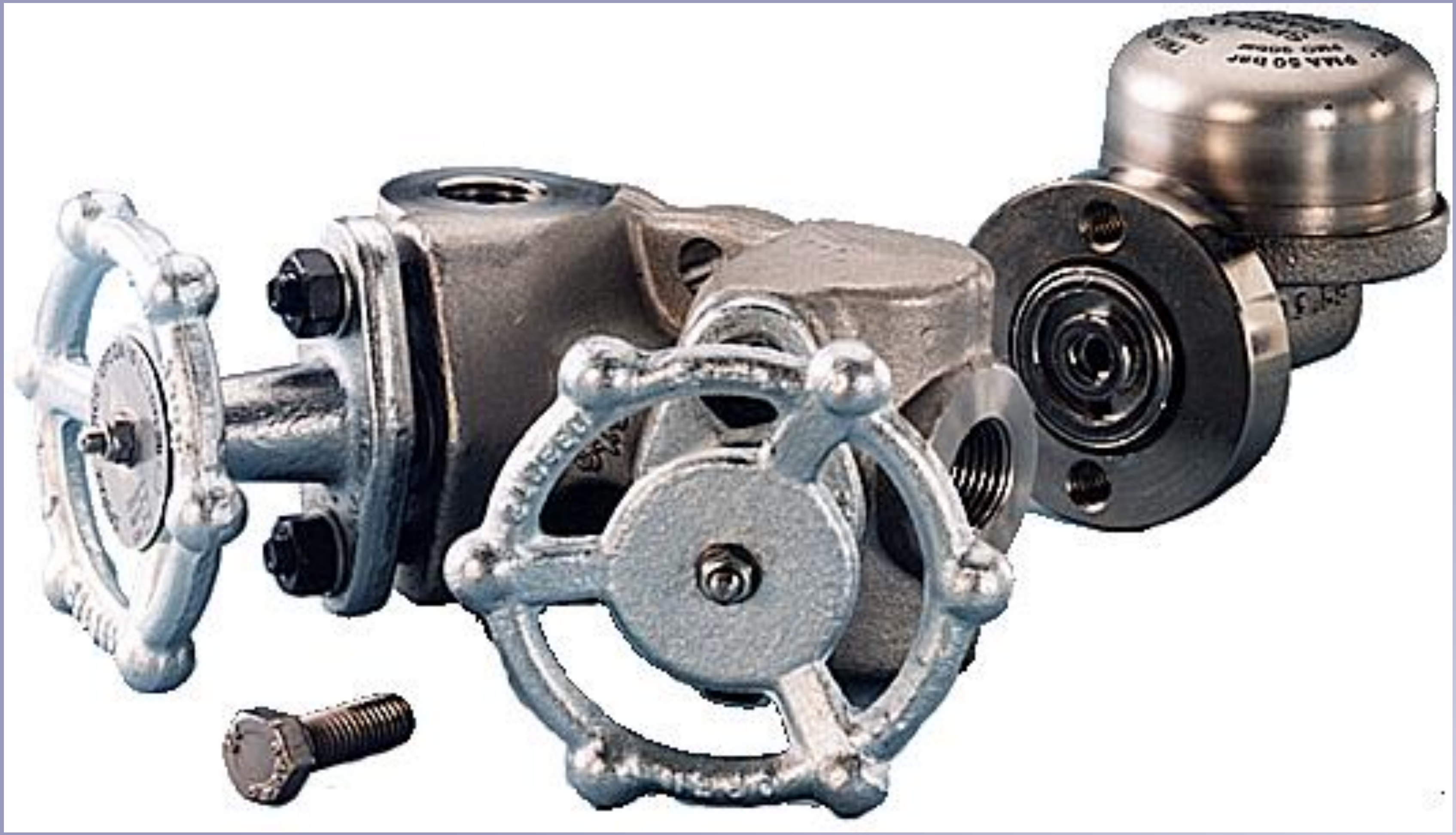
Optional upstream line drain

Optional downstream depressurisation valve

PC30 Universal Connector



PC40 Universal Connector



PC10 Universal Connector

- **All stainless steel**
- **Screwed or socket weld**
- **DN15/20/25**
- **Swivel type connection**

UBP21 Balanced Pressure Universal Trap

- Universal Connection
- Stainless Steel Body
- Rated to 21 Barg
- Variable Thermostatic Capsules
- Utilises sensible heat from condensate
- Changed out in 2 minutes

UTDM42L Thermodynamic Trap

- **Universal Connection**
- **Stainless Steel Body**
- **Thermodynamic Disc Operation**
- **Discharges condensate immediately**
- **Changed out in 2 minutes**

Pipeline Connector Technology