



SAM Engineering & Trade Co.

Condensate Recovery

Condensate recovery

- Why condensate should be recovered?
- What makes an efficient return system?
- Condensate pumps and diagnostics?

Why return condensate?

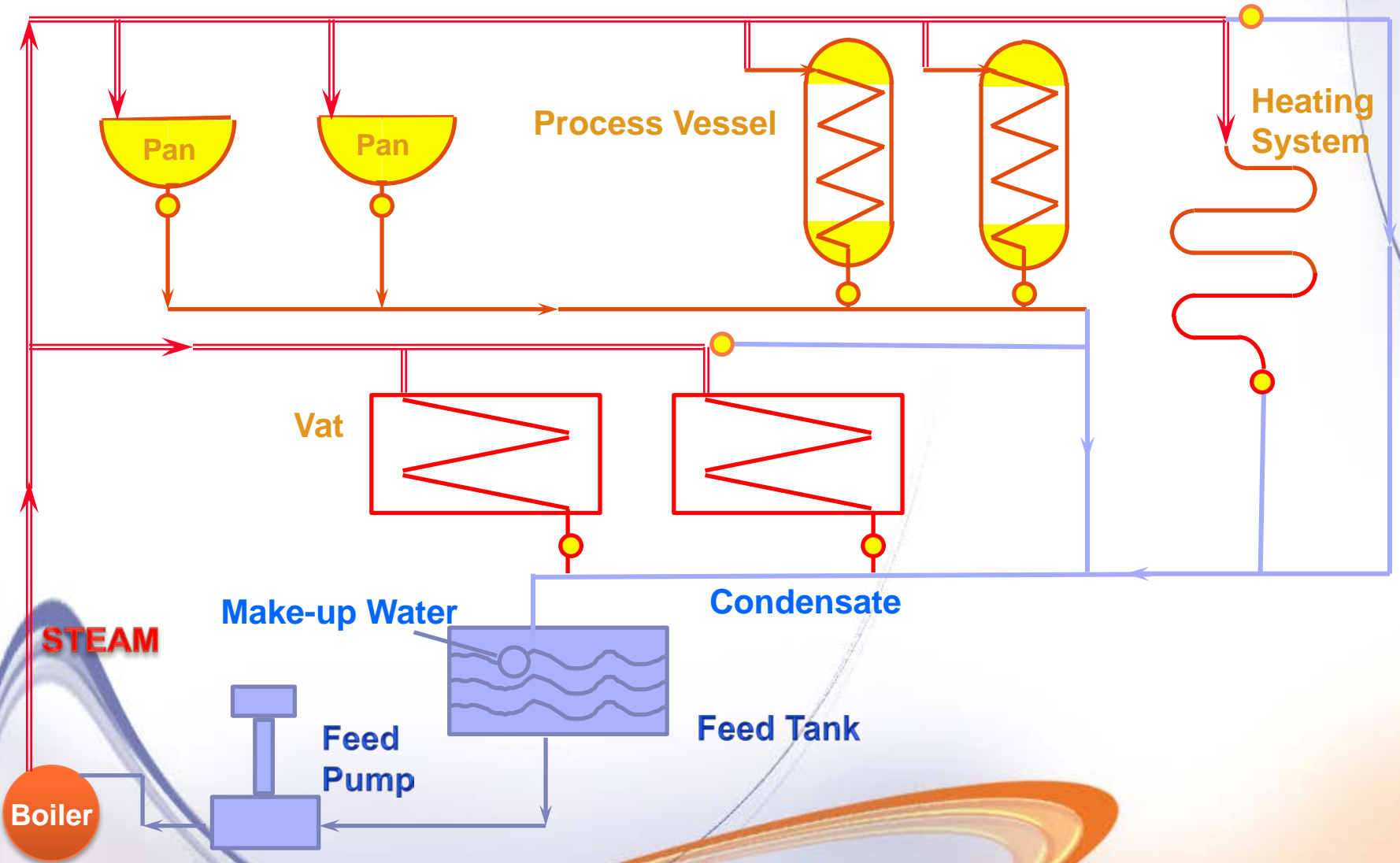
- **Saves water**
- **Saves fuel**
- **Saves Boiler Chemicals**
- **Reduces Oxygen**
- **Reduces Corrosion and wear**
- **Increases Boiler Feedtank water temperature**
- **SAVES MONEY!**

Efficiency

Pressure (bar)	cond. lost flash lost	cond. Returned flash lost	con. returned flash recovered
10	72.5	86.5	100
7	75.0	89.1	100
3.5	78.3	92.4	100
0	85.6	100	100

(Assumed : water at 7 deg C and flash used at 0 bar)

Typical Steam Circuit



Cost effective condensate return

Fuel Saving:

Condensate recovered

$$= 1,000 \text{ kg / h}$$

Hours per year (10 x 5 x 48)

$$= 2,400 \text{ h}$$

Total condensate recovered = 1,000 x 2,400

$$= 2,400,000 \text{ kg}$$

Assume condensate 85 deg C, cold make up 15 deg C,

Heat saved = 2,400,000 x 4.186 x (85 - 15) kJ / year

Calorific value of diesel = 44,000 kJ/Kg

Boiler efficiency , say 80 %

$$\text{Fuel saved} = \frac{2,400,000 \times 4.186 \times 70 \times 100}{44,000 \times 80} = 19,978 \text{ Kg} = 23,505 \text{ L}$$

Fuel cost (Assuming the Price of 1 L of diesel=0.68 JD)

Annual saving in fuel

$$= 15,983 \text{ JD / Year}$$

Cost effective condensate return

Water

Water cost = 1.3 JD / m³

Water saved = 2,400,000 kg = 2400 m³

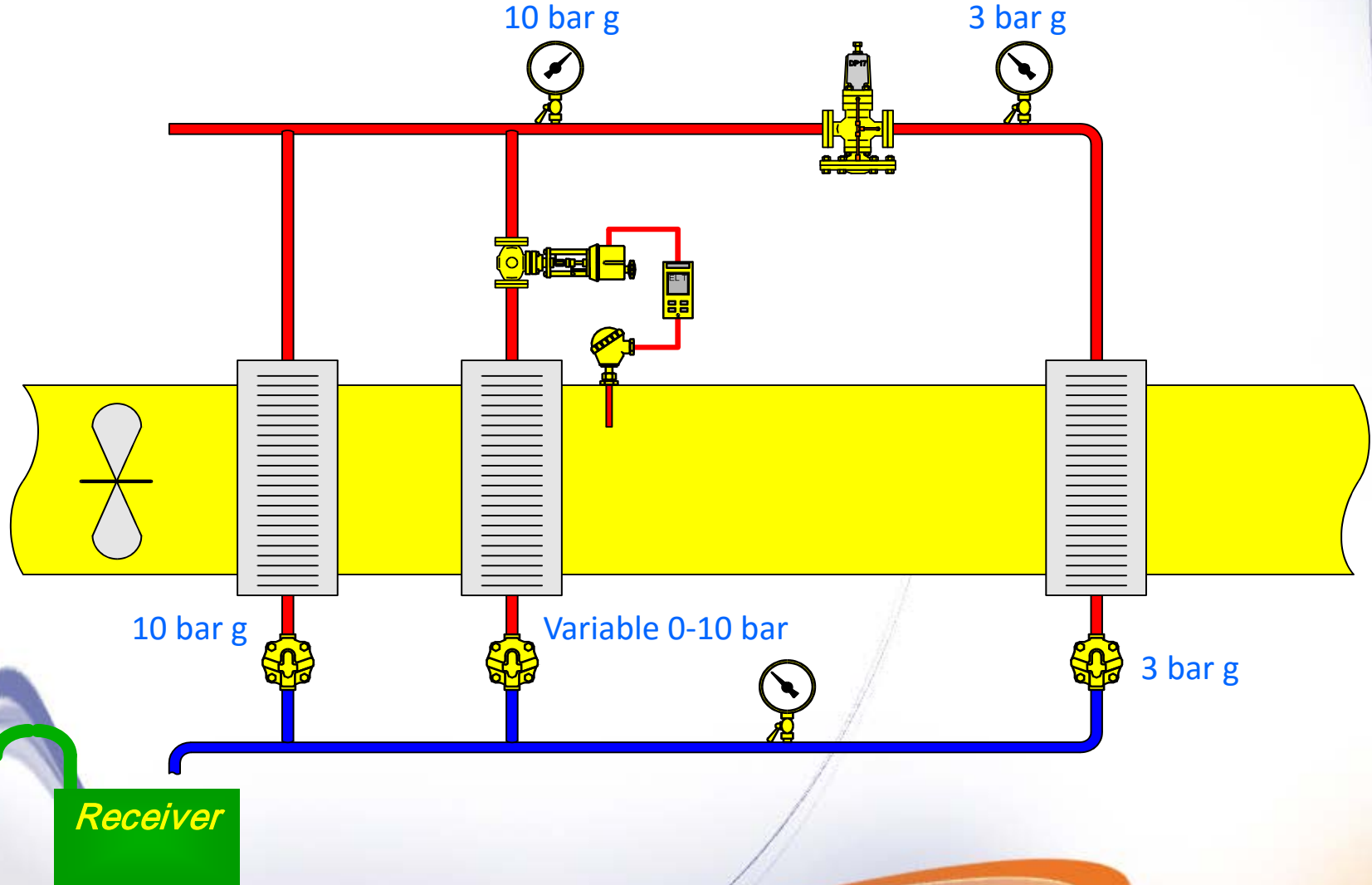
Annual cost saving = 2400 x 1.3 JD = 3,120 JD

Total savings (for 1000 l/h) = 15,983 + 3120 = 5455 JD

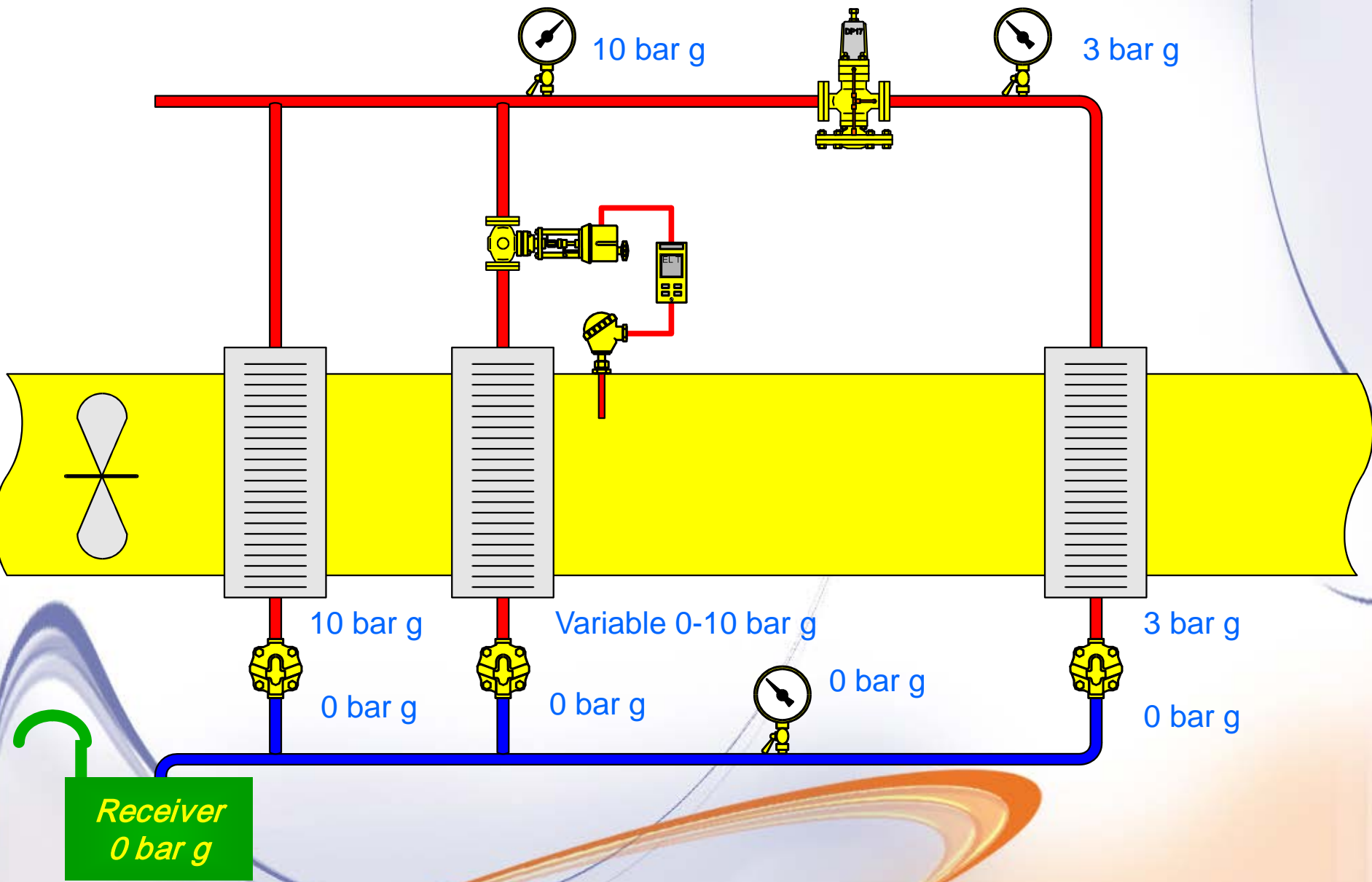
PLUS cost of treatment and increased boiler blowdown !!



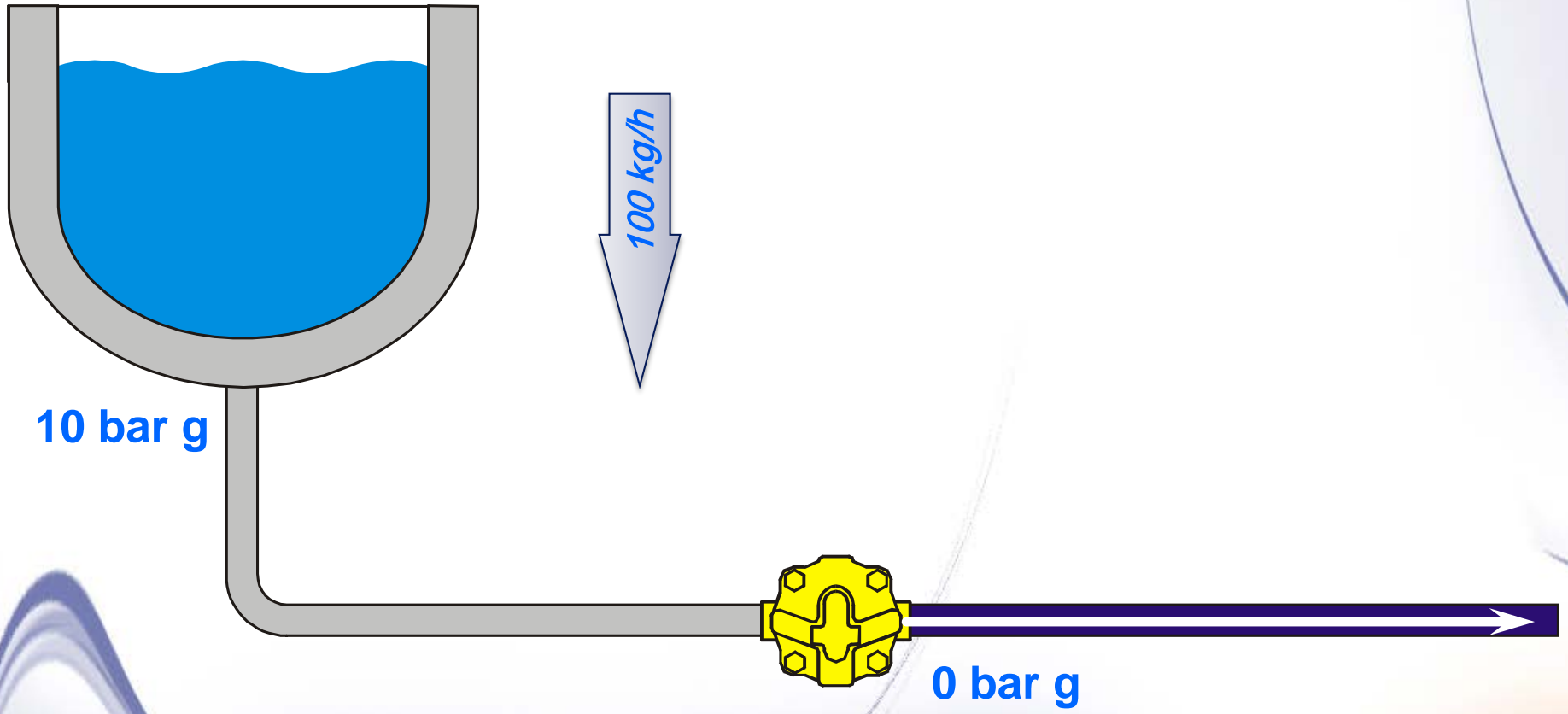
Traps Operating at Different Pressures



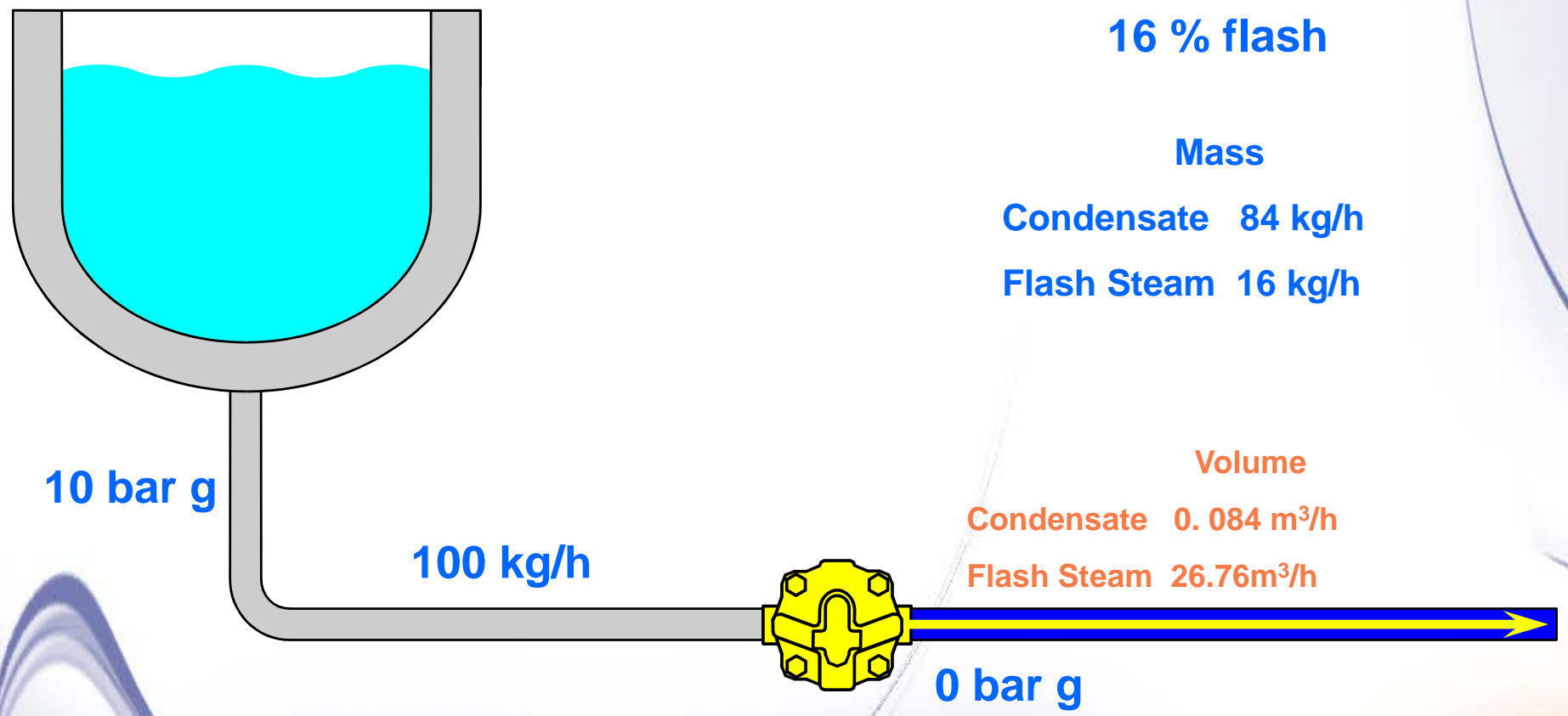
Traps Operating at Different Pressures



What does a condensate pipe carry?



What does a condensate pipe carry?



Quantity of Flash Steam in Line

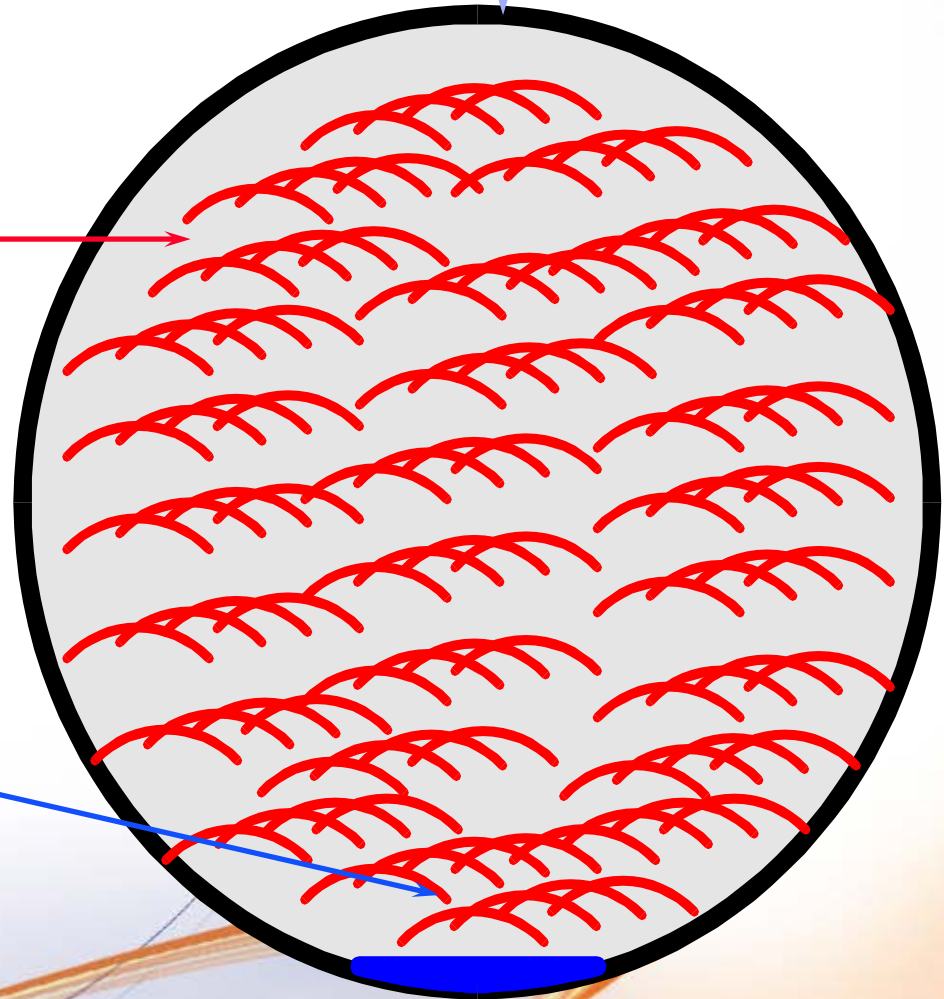
Condensate
100 kg /h
10 bar



16 % flash

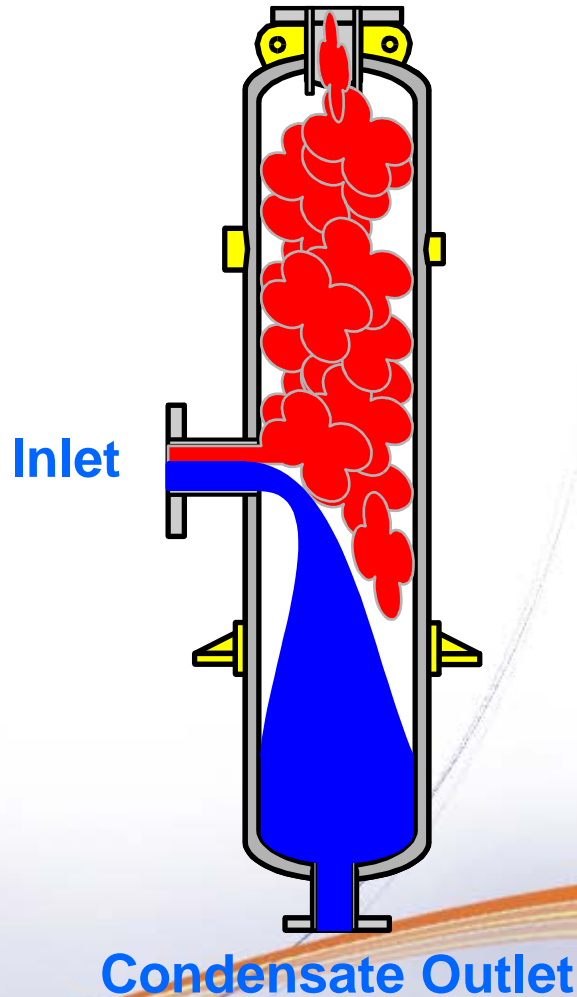
16 kg Flash Steam
99.68% of Total Volume

84 kg Condensate
0.32 % of Total Volume



Flash Steam Recovery

Flash Steam Outlet



Flash Steam Application

