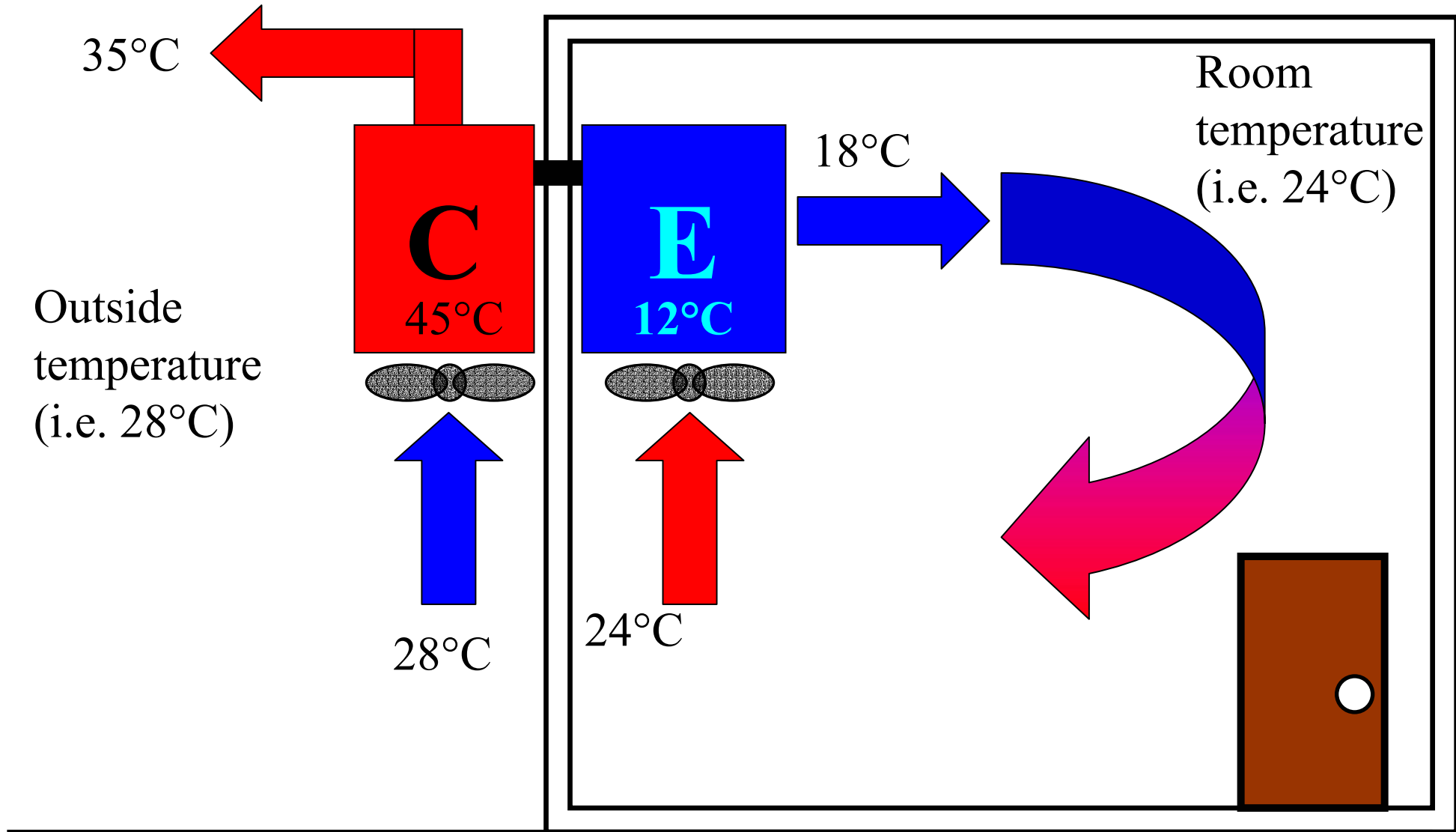
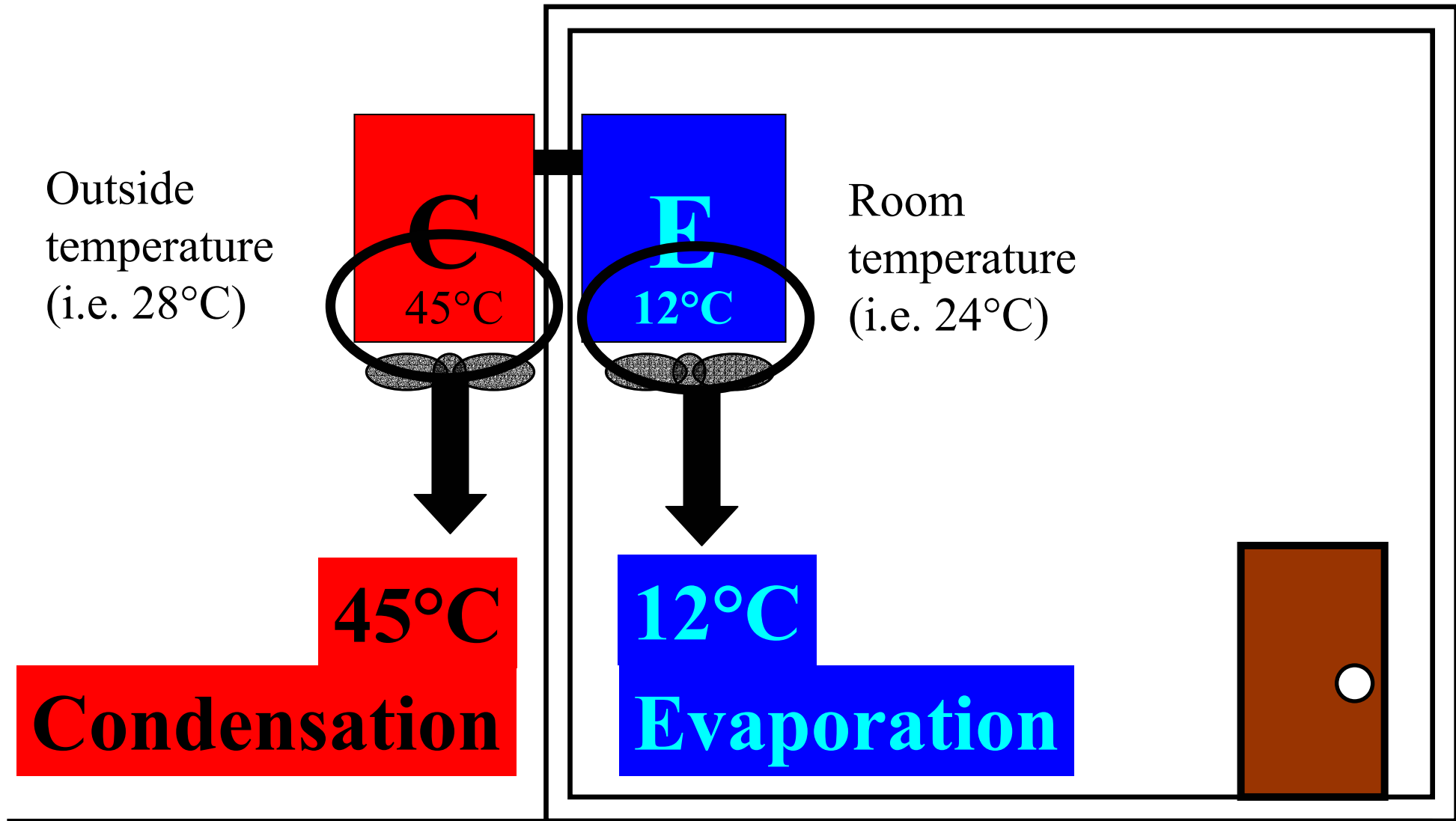


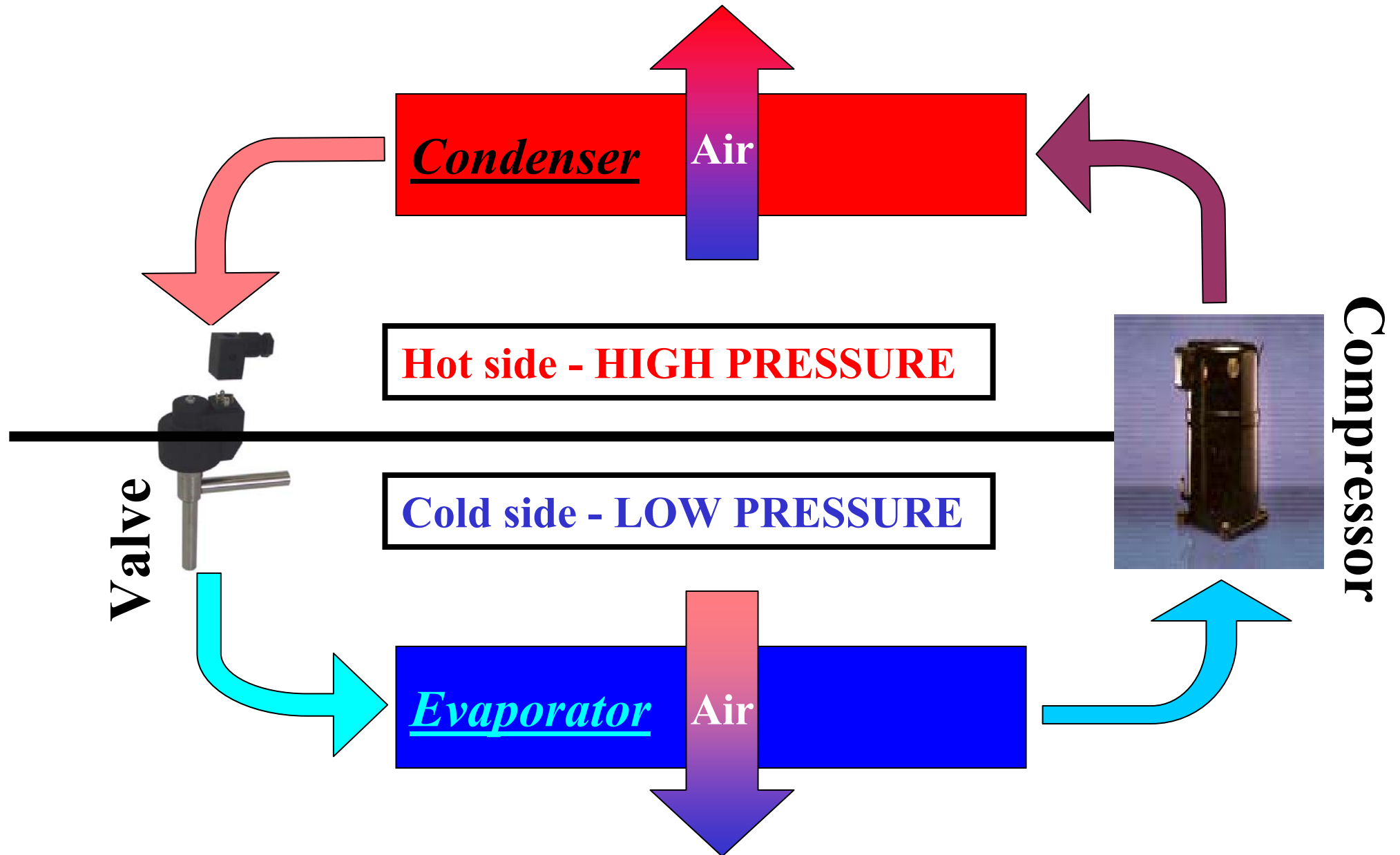
# Refrigeration ambients



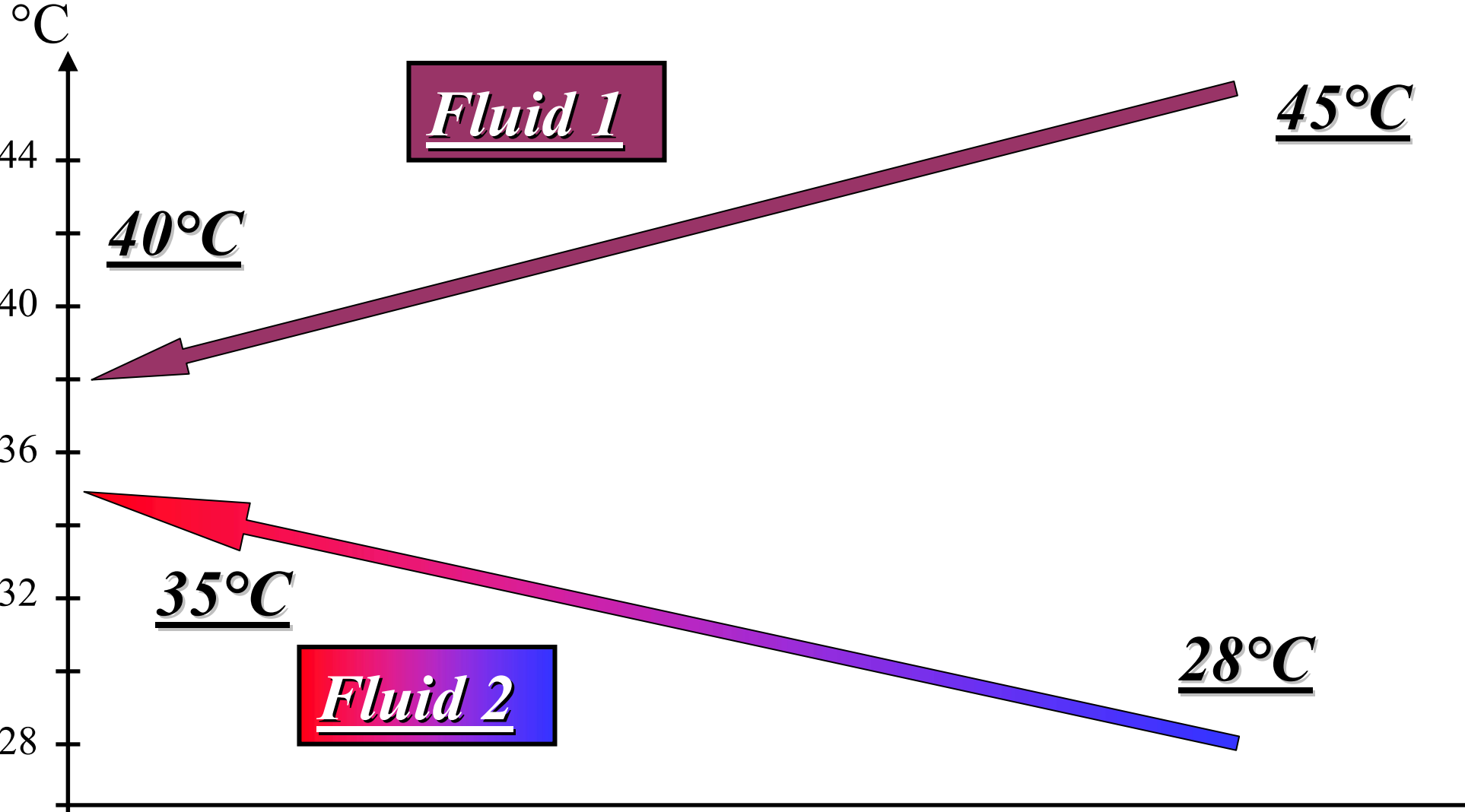
# Refrigeration ambients



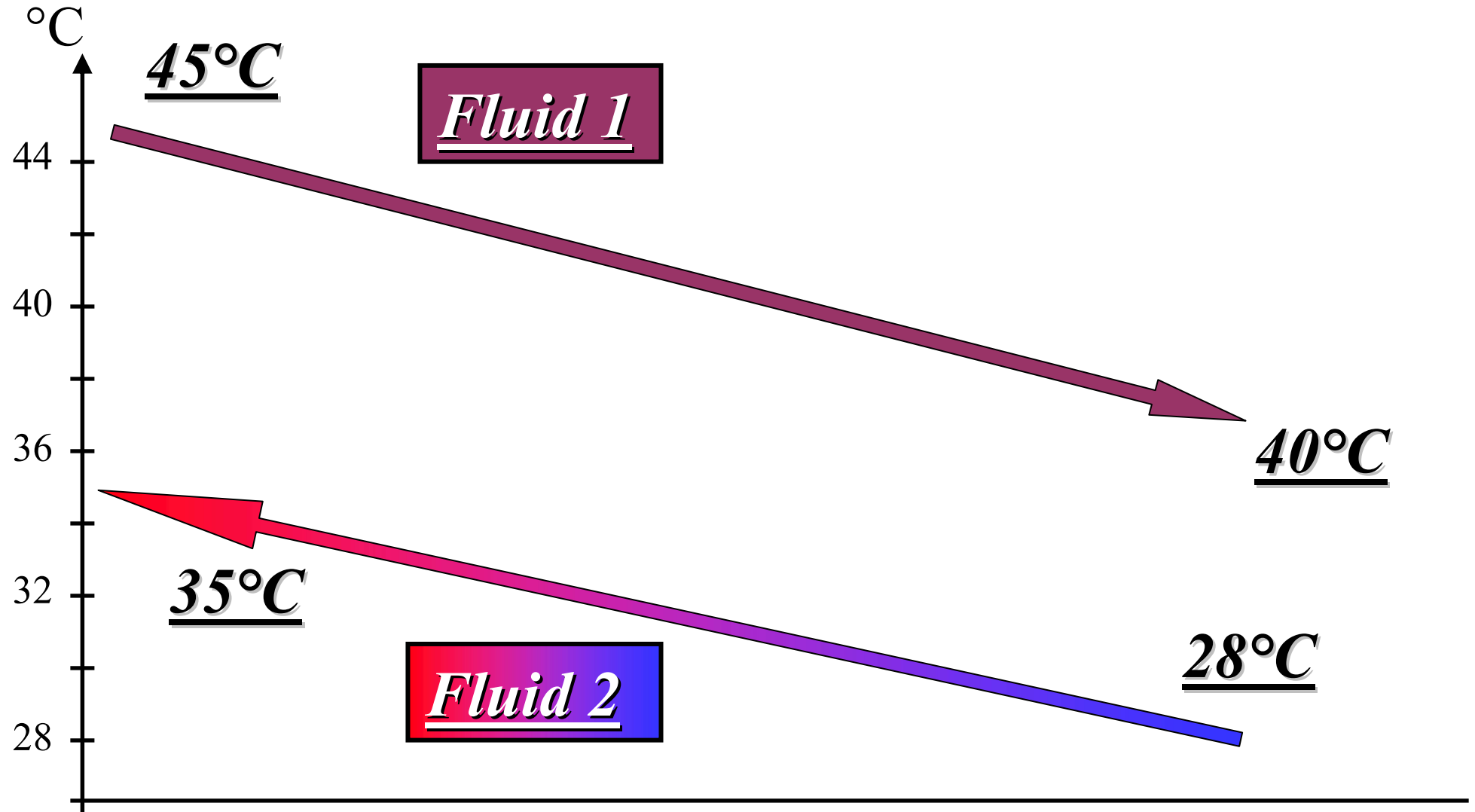
# Refrigeration Circuit



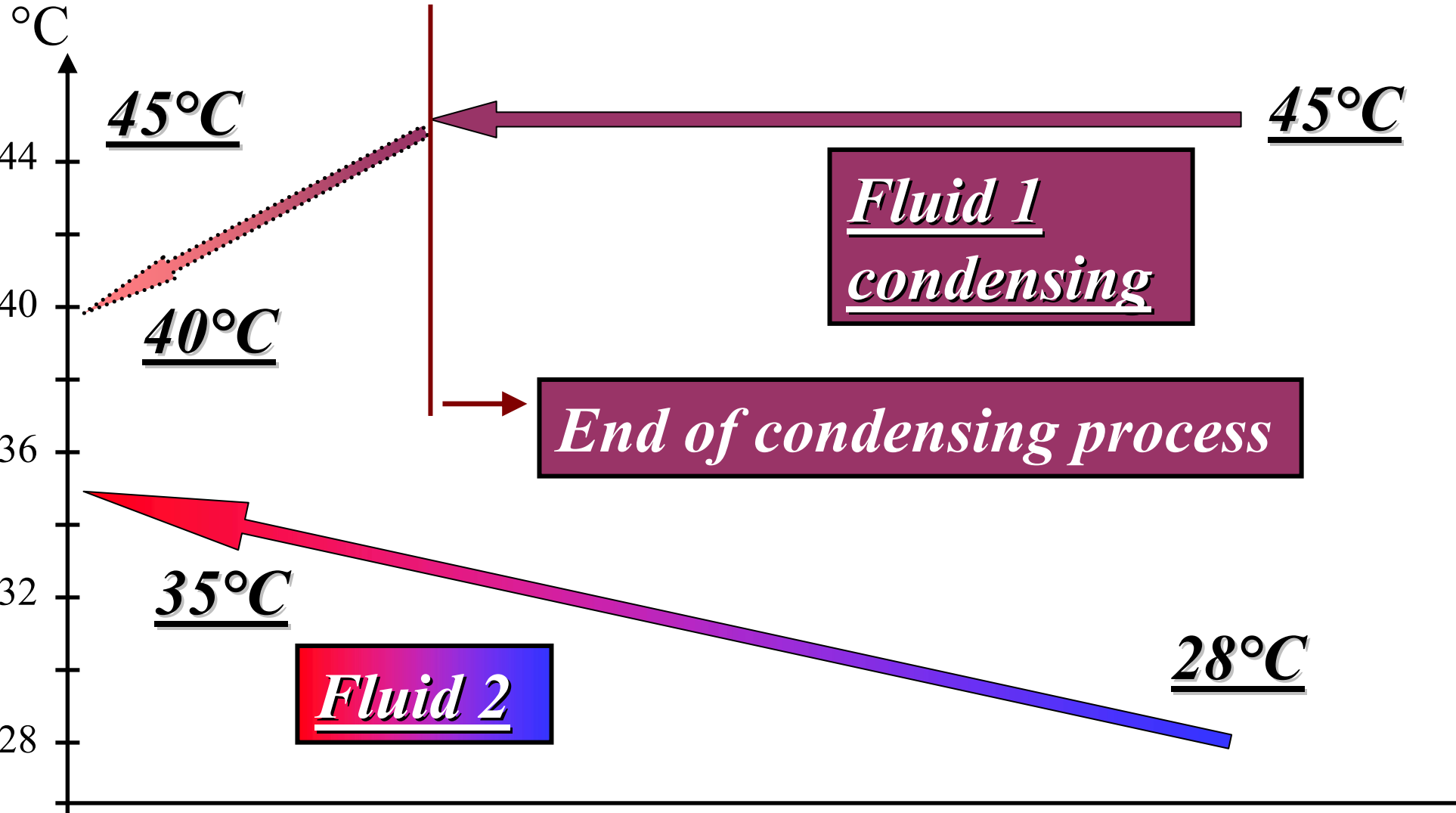
# Heat exchange - EQUICORRENT flow



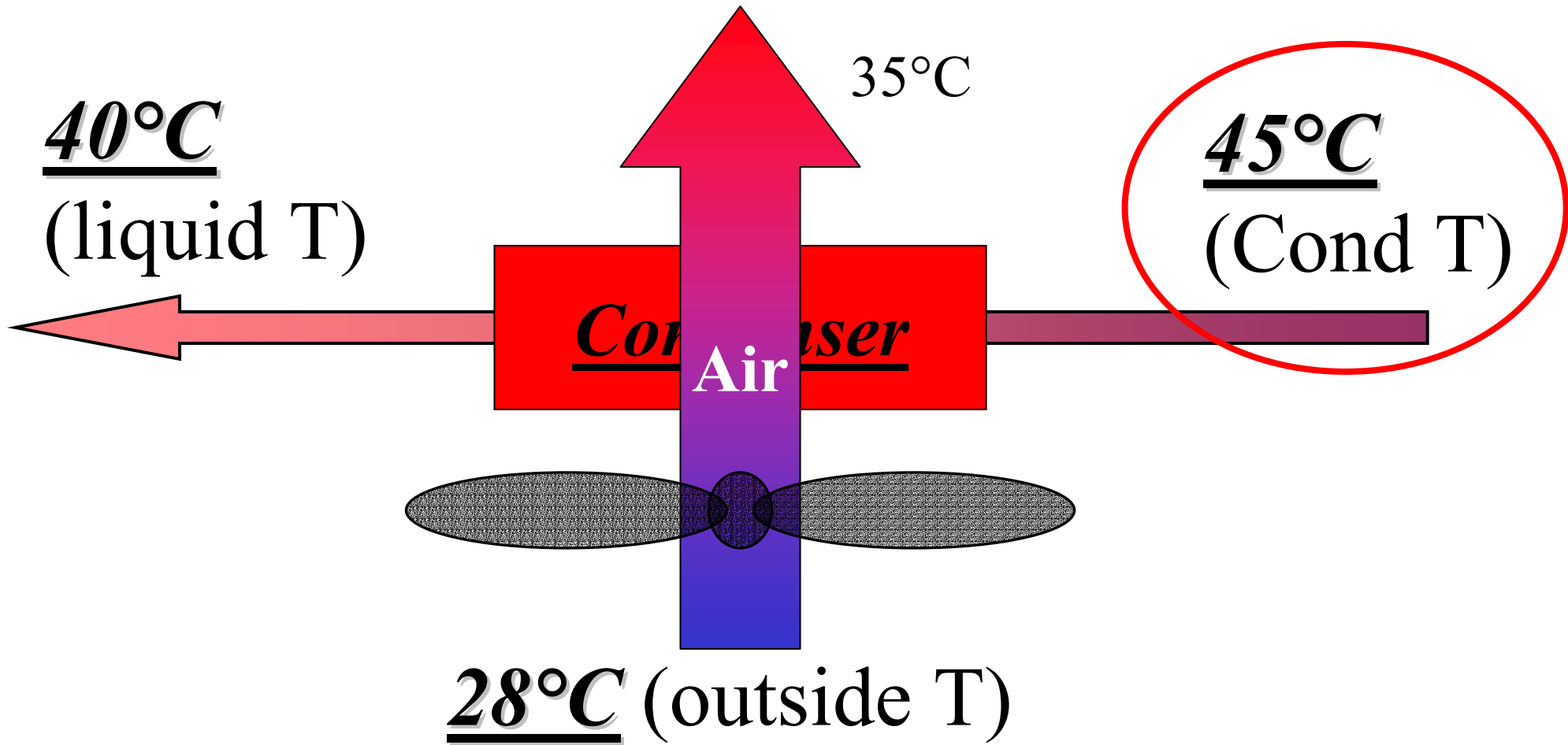
# Heat exchange - COUNTERFLOW



# Heat exchange - EQUICORRENT flow

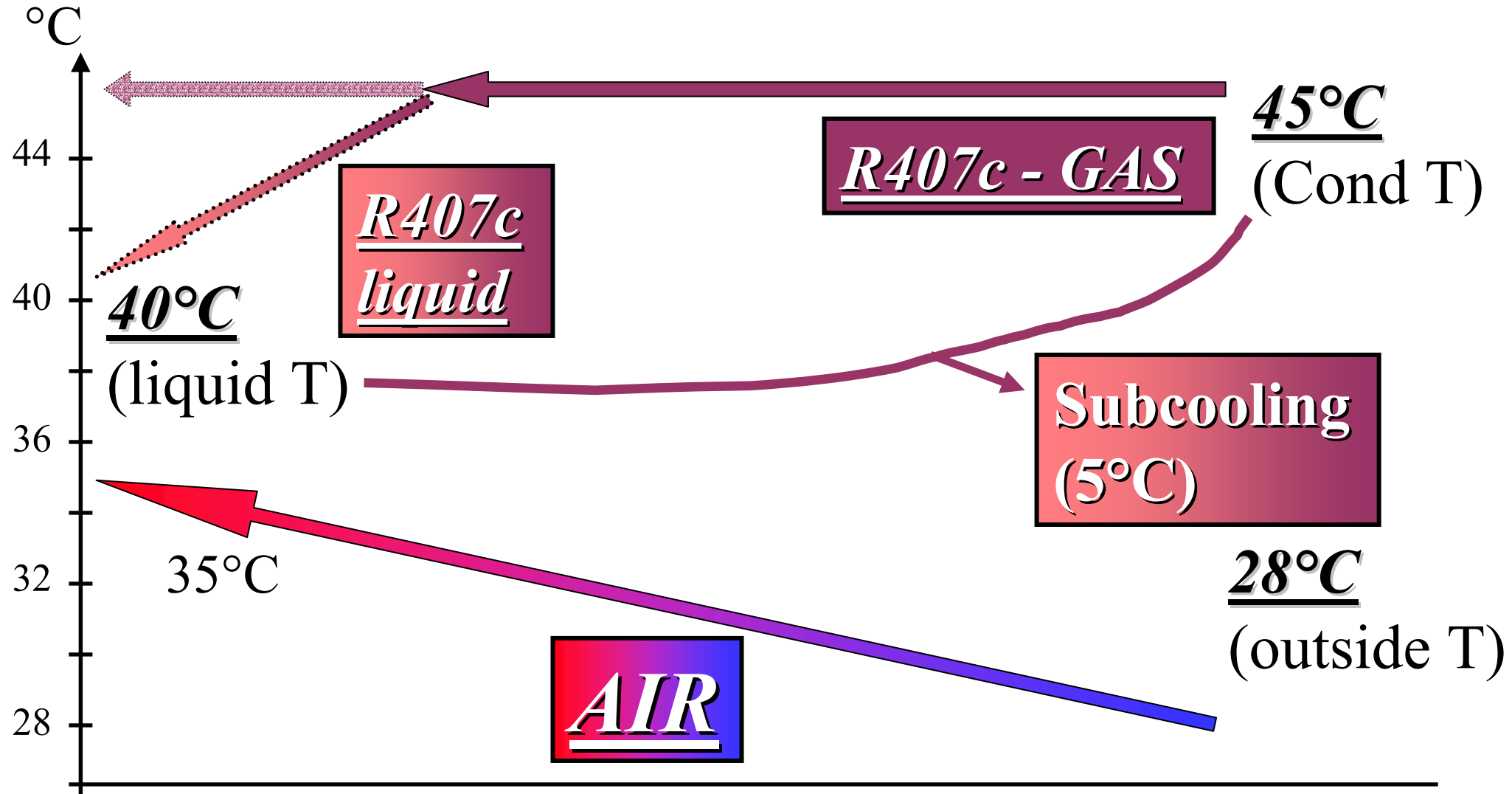


# Refrigeration Circuit - HOT side



**Hot side - HIGH PRESSURE**

# Refrigeration Circuit - HOT side





# Refrigeration Circuit - HOT side

*R407c (refrigerant)*

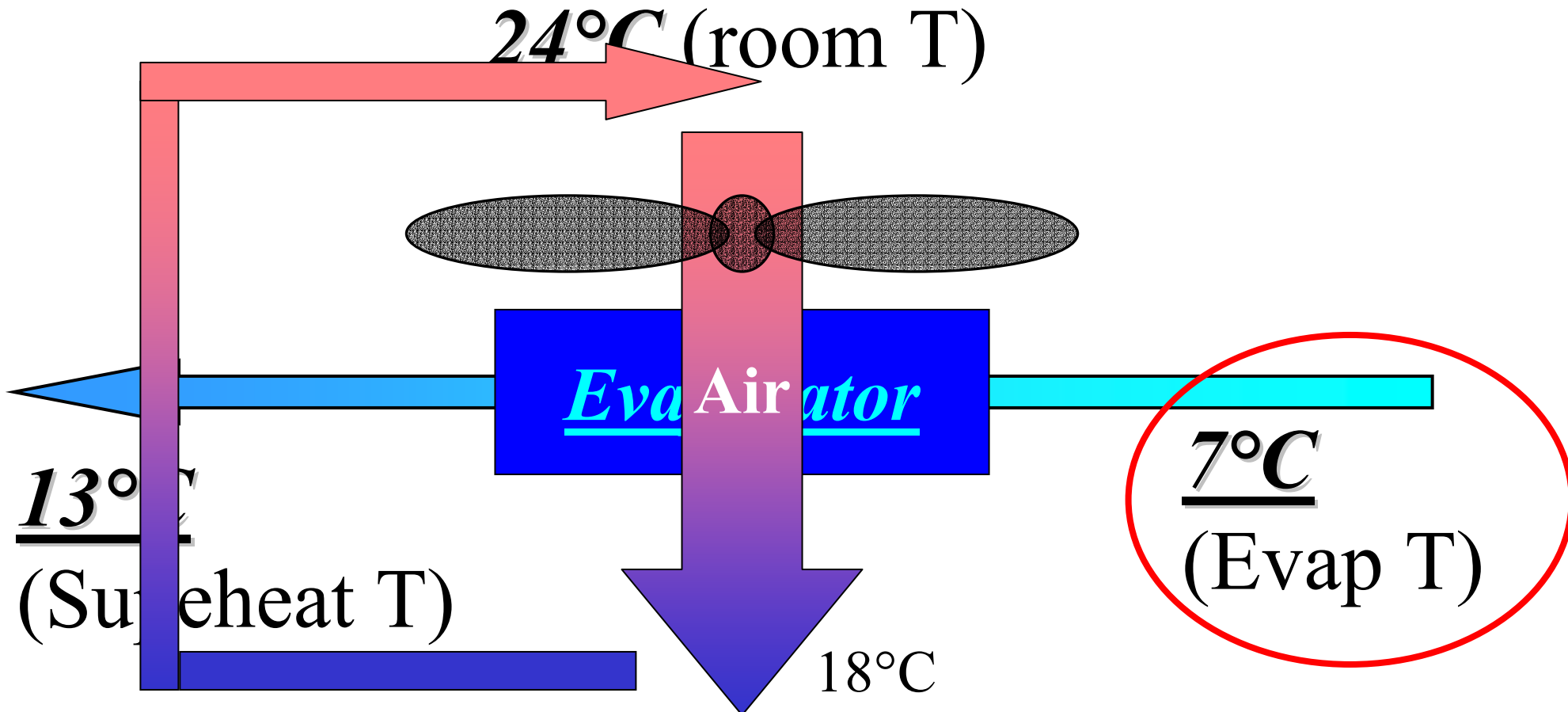
*AIR*

- *Condensing temperature*
- *Liquid temperature*
- *Subcooling*

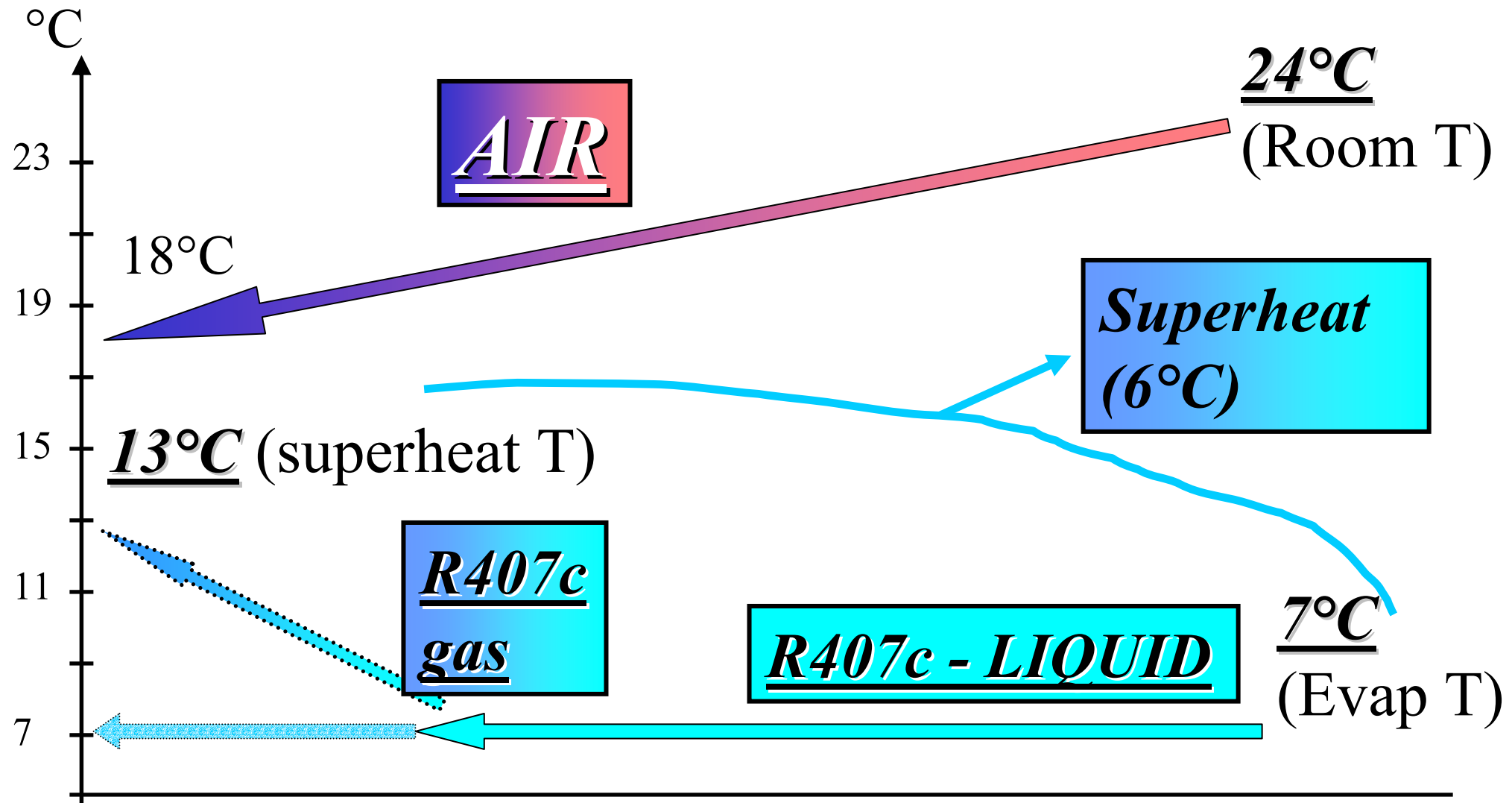
- *Outside temperature*

# Refrigeration Circuit - COLD side

Cold side - LOW PRESSURE



# Refrigeration Circuit - COLD side



# Refrigeration Circuit - COLD side

*R407c (refrigerant)*

*AIR*

- *Evaporating temperature*
- *Supereheat temperature*
- *Superheat*

- *Room temperature*

# Refrigeration Circuit - Compressor

80°C (Discharge T)

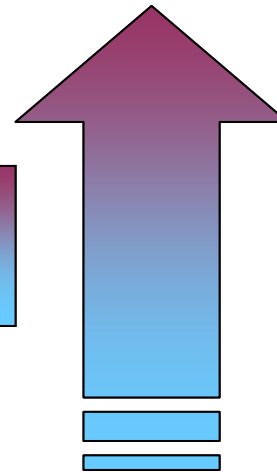


R407c gas

15.5bar (Cond P)

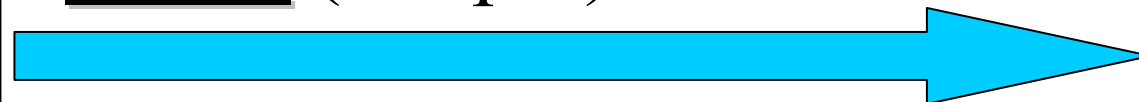
Pressure  
DROP

PRESSURE



4.8bar (Evap P)

R407c gas



13°C (Superheat T)

Superheat! (6°C)

# Refrigeration Circuit - Compressor

**Inlet**

**Outlet**

- *Evaporating PRESSURE*
- *Superheat  $\neq 0^{\circ}\text{C}$  !*
- *Superheat (suction) temperature*

- *Condensing PRESSURE*
- *Discharge temperature*

# Refrigeration Circuit - Valve

Subcooling! ( $5^{\circ}\text{C}$ )

$40^{\circ}\text{C}$  (Liquid T)

*R407c liquid*

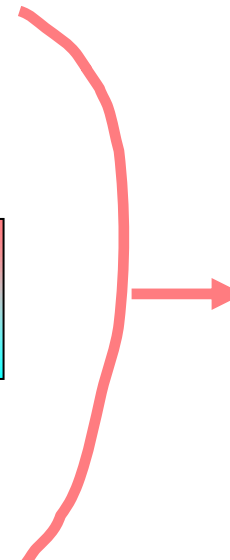
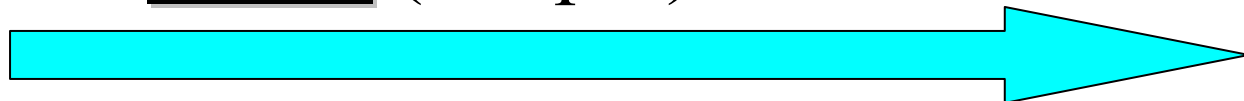
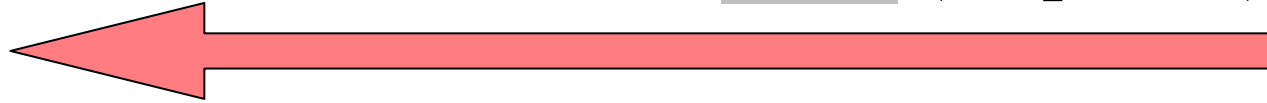
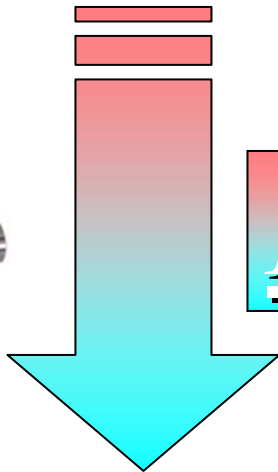
$15.5\text{bar}$  (Cond P)

*PRESSURE*

*Pressure  
DROP*

$4.8\text{bar}$  (Evap P)

*R407c MIX*



# Refrigeration Circuit - Compressor

**Inlet**

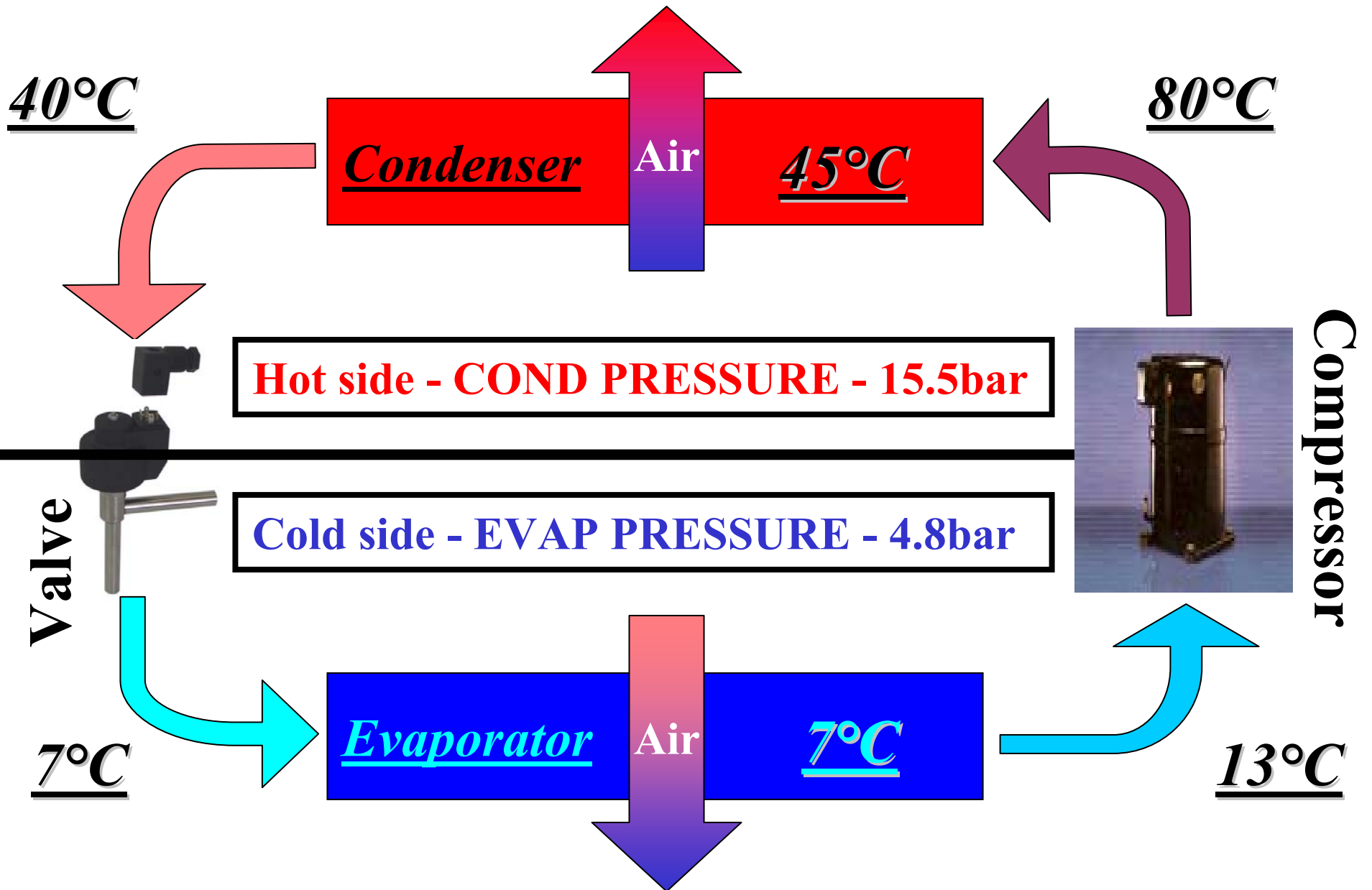
**Outlet**

- ***Condensing PRESSURE***
- ***Subcooling  $\neq 0^{\circ}\text{C}$  !***
- ***Liquid temperature***

- ***Evaporating PRESSURE***



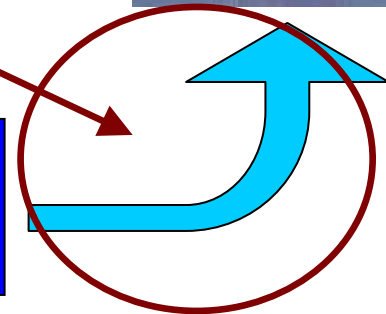
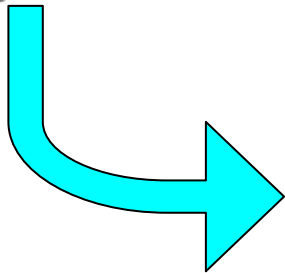
# Refrigeration Circuit



# Valve



- *Supereheat*  $> 0^{\circ}\text{C}$  (to protect compressor)
- *LOW superheat* (to fill the evaporator)



*Supereheat* = *LIQUID*

# Valve



- ***VALVE OPENS:*** increases refrigerant speed, the superheat goes ***DOWN***
- ***VALVE CLOSES:*** decreases refrigerant speed, the superheat goes ***UP***

***IDEAL theoretical value of Superheat = 1°C***

# Valve capacity

- *Type of refrigerant*
- *Valve orifice size*
- *Valve position*

- *Pressure difference  
(between inlet and outlet)*
- *Subcooling*

