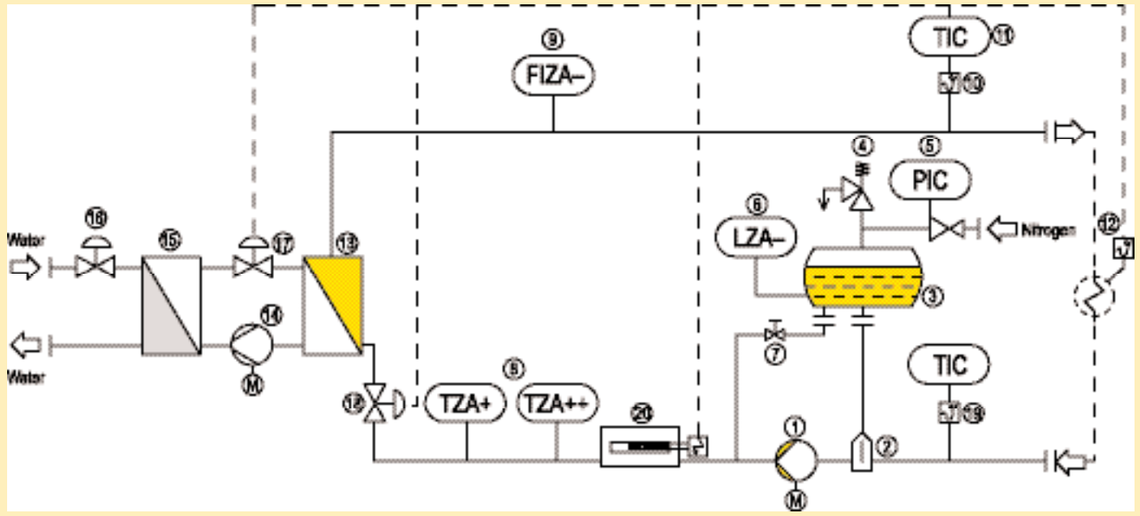
Process cooling units use an active refrigeration system, i.e. refrigeration is produced via an electrical drive motor driving a compression refrigeration process. Depending on the working temperature range these cooling units can be operated with most heat transfer fluids. If heating is also required, the high vapour pressure of water based heat transfer fluids has to be taken into consideration. Synthetic or silicone based thermal fluids are recommended when working in a wide temperature range.

Only refrigerants which are non-toxic, free from chlorine, ozone-friendly and comply with the Montreal protocol are used. Chlorine-free H-CFC refrigerant substitutes, like for instance R 404A, R 410 etc., have been proved to be good and LAUDA use them with much success.

There is still a demand on research and development and therefore LAUDA regularly test and evaluate new refrigerants including natural ones as and when they become available.

Process cooling units
Operating temperatures from -100 up to 150 °C

LAUDA heating and cooling systems from the SUK family consist of the modules compressor, pump, expansion tank, evaporator and condenser. For units series DV pump module and expansion tank are removed. Depending on the lowest operating temperature LAUDA use one-stage (down to -35 °C) or two-stage compressors (down to -50 °C), cascade switching of two refrigeration systems down to -100 °C for very low temperatures.The condensing of the refrigerant takes place via cooling water or air (-W or -L) with energy conservation being controlled by the infinitely variable and precise cooling water injection valve or variable speed fan control in air cooled applications. If there are several compressors, a sequencing system ensures energy saving, equal-wear, partial load operation.
With an electric heater or steam heat exchanger added, the SUK line can be expanded to make a compact, ready-for-connection heating and cooling system for temperatures between -100 and 150 °C. Additional precooling via in-house brine or air can easily be put into practice with the help of the modular system, and as far as energy is concerned, this often implies economic advantages compared to conventional systems. Some very exothermic processes require the additional cold storage buffer tanks that again are easily incorporated into the LAUDA modular approach.



1 Circulating pump
2 Air/Gas separator
3 Expansion tank
4 Safety valve
5 Pressure controller
6 Level indication
7 Vent-off valve
8 Temperature indication
9 Flow indication
10 Temperature probe “Outflow”
11 Temperature controller
12 Temperature probe “Consumer”
13 Evaporator
14 Compressor
15 Condenser
16 Valve “Cooling”
17 Control valve “Cooling”
18 Valve “Cooling”
19 Temperature probe “Return”
20 Electric heater

Process cooling unit with water-cooled condenser for installation in hazardous area to control the temperature within a temperature range from -30 up to 150 °C.
Cooling capacity 300 kW/0 °C
Additional heating steam 500 kW
Type SUK 600 W Ex

Process cooling unit with water-cooled condenser to control the temperature within a temperature range from -70 up to 150 °C.
Cooling capacity 2 kW/-70 °C
Additional electric heating 12 kW
Type SUK 350 W II

Technical data Standard Modules (standard see page 12 and 13)

Series	SUK 150 W/L	SUK 250 W/L	SUK 350 W/L	SUK 400 W/L	SUK 600 W/L
Heat transfer fluid			Water/Glycol/Thermal oil/Special fluids		
Operating temperature [°C]	-40…150	-50…150	-70…150	-100…150	-100…150
Pump capacity [m³/h]	0,5…2	2…6	2…20	4…30	5…50
Electric heating [kW]	up to 9	up to 18	up to 50	up to 60	up to 120
One-stage compressor					
Cooling capacity [kW] at 20 °C	up to 10	up to 20	up to 50	up to 150	up to 300
Cooling capacity [kW] at 0 °C	up to 5	up to 15	up to 35	up to 120	up to 240
Cooling capacity [kW] at -20 °C	up to 3	up to 6	up to 18	up to 60	up to 120
Cooling capacity [kW] at -40 °C	up to 1	up to 2	up to 7	up to 45	up to 90
Two-stage compressor					
Cooling capacity [kW] at -50 °C		up to 1	up to 4	up to 35	up to 70
Two-cascade switching					
Cooling capacity [kW] at -60 °C			up to 3	up to 25	up to 50
Cooling capacity [kW] at -70 °C			up to 2	up to 10	up to 20
Cooling capacity [kW] at -80 °C			up to 0,5	up to 5	up to 10
Overall dimensions W x D x H [mm]	400x800x1000	500x1000x1500	800x1700x1500	1000x1500x1900	1500x2200x2000
	500x1000x1500	600x1500x1500	1000x1500x1900	1300x1900x2000	2000x2500x2000

Explosion-proof types available for all units.