

Operating Instructions

LAUDA Circulating Cooling Units
UKT 3000, UKT 3000 W
UKT 6000, UKT 6000 W

From Series P30
03/93
YAWED013

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


Accessories

Circuit and pipe diagram

1. Brief operating instructions

Even if you find these short instructions sufficient please read and observe the following sections, especially Section 4: "Safety features and notes".

- 1.1 Check circulating cooling unit and accessories during unpacking for any transport damage and if necessary inform the carrier so that the damage can be inspected.
- 1.2 Assemble the unit according to Section 6 and add extra items as appropriate.
- 1.3 Water-cooled units (indicated by a "W" in the type designation) must be connected to the mains water supply with the hoses supplied. See Section 6. On air-cooled units the distance between the grills and any object which might obstruct the free air flow must be at least 0.5 m.
- 1.4 Pump nozzles open, fill the bath up to the upper marking of the level indicator. In order to do so open the flap in the cover; the filler lid is located underneath. Check that the drain cock behind the right-hand side panel is closed (spanner 12 a/f).
- 1.5 Fitting the tubing to the pump connections:

Make tubing connections to the external system. Secure tubing connections with clips against slipping off.
Use tubing suitable for heating liquid and for at least 8 bar operating pressure only.
- 1.6 Check the supply voltage against the details on the label. Insert the mains plug.
- 1.7 On water-cooled units turn on the water tap.
- 1.8 Check that the tubing connections have been made in accordance with Section 1.5! Switch on the main switch (I). The temperature indication on the controller shows the actual bath temperature.
- 1.9 Press key  for pressure indication. A positive pressure must be indicated when the pump is running. If a negative pressure is indicated, immediately switch off the unit with the main switch (see Section 8.3).
- 1.10 The selected operating temperature setpoint is indicated by pressing the key . Selection is made with potentiometer . Unlock the locking device first.
- 1.11  indicates whether the compressor is running, i.e. whether the unit is cooling or not.
- 1.12  indicates insufficient level, overload of the pump motor, or the compressor's switching off via the pressure switch of the refrigerating circuit.

LAUDA Circulating Cooling Units
 UKT 3000, UKT 3000 W, UKT 6000, UKT 6000 W

2. Table of technical data

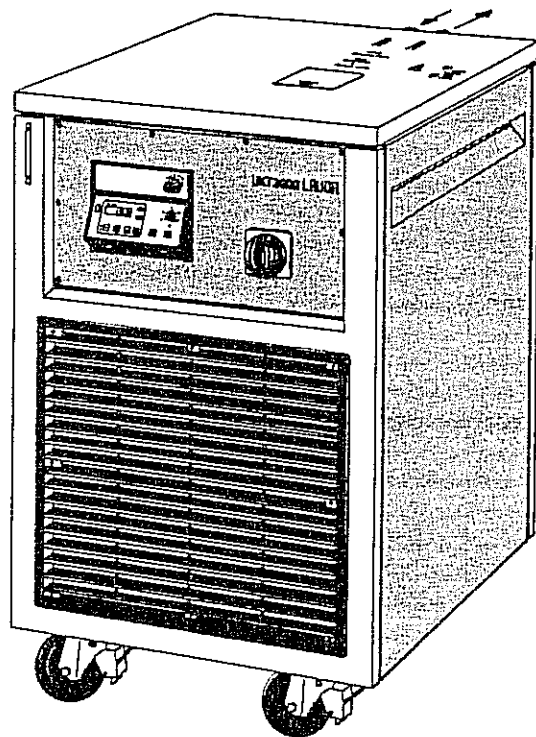
	UKT 3000	UKT 3000 W	UKT 6000	UKT 6000 W
Operating temperature range (°C)	-25 to 40			
Condenser cooling	air (controlled fan speed)/ water (controlled flow rate)			
Ambient temperature range (°C)	0 to 40			
Temperature measurement (outflow)/ resolution/accuracy	Pt 500, green digital 7-segment-LED-display / 0.1°C / Class A to DIN IEC 751 ± 0.2°C in operating temperature range			
Temperature setting/ resolution	10-turn potentiometer with digital indication / 0.1°C; can be locked manually			
Temperature control (±°C)	better than 1.0			
Control	compressor on-off, with stop time control			
Cooling capacity (effective, with ethanol at 20°C ambient temperature) (kW)				
at 20°C	3.4	4.2	6.5	8.0
0°C	2.5	2.6	3.2	4.0
-25°C	0.5	0.5	0.6	0.7
Safety features	level indication, level sensor against pump running dry. Adjustable alarm contact against overtemperature and low temperature with LED indication and neutral contact (24 V; 0,2 A)			
Flow rate at pressure head 0 (l/min)	42			
Max. discharge pressure (bar)	6			
Pump connections	3/4" pipe		15 mm int. dia.	
Pressure indication range/resolution (bar)	digital 0 - 7 / 0.1			
Capacity (l)	28 to 43		60 to 90	

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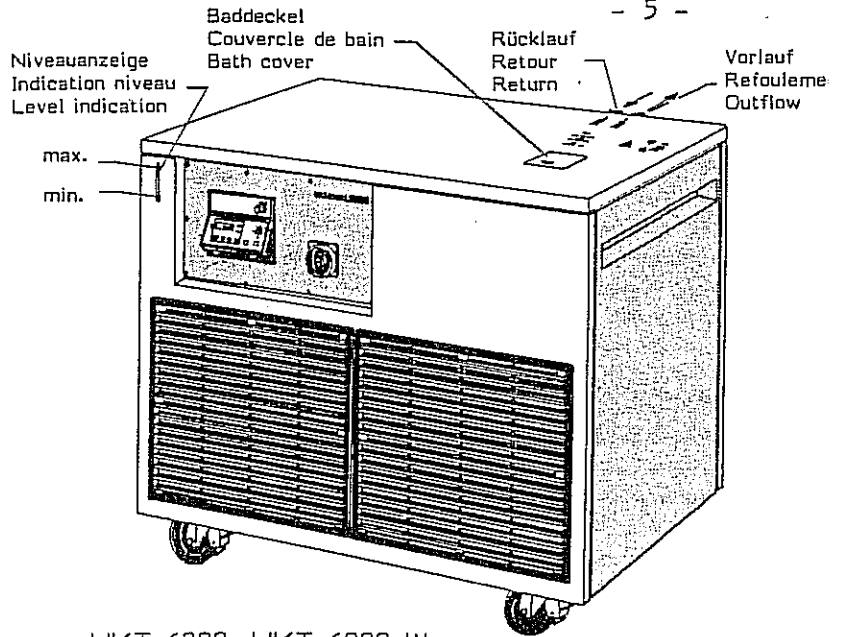
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		UKT 3000	UKT 3000 W	UKT 6000	UKT 6000 W
Overall dimensions					
Floor area (WxD) x height	(mm)	550 x 735 x 900		1000 x 735 x 900	
Weight	(kg)	150		240	
Protection to DIN 40050		IP 54			
Power supply	(V; Hz)	220/380 V; 3-phase		50 Hz	
Total power consumption	(kW)	2.5/2.4		4.2/4.0	
Interference suppression		suppressed to VDE 0875			
Ref. No.		LWG 218	LWG 219	LWG 224	LWG 225
Extra functions:					
Standard:		RT, MF, DR			
Options:		FB			
Details of extra functions:		RT = Return flow temperature measurement, Pt 500 mounted inside the unit. MF = Multifunction output on terminal DR = Digital discharge pressure indication FB = Remote operation. Control unit including supply ON/OFF in separate housing remote from unit.			

LAUDA Circulating Cooling Units
 UKT 3000, UKT 3000 W, UKT 6000, UKT 6000 W



UKT 3000, UKT 3000 W



UKT 6000, UKT 6000 W

Druckanzeige
Affichage digital de la pression
Pressure indication

Anzeige "Kühlen"
Affichage "Refroidissement"
Display "Cooling"

Digitalanzeige
Affichage digital
Digital display

Vorlauftemperatur/Sollwert
Température de refoulement/
Valeur de consigne
Outflow temperature/
Setpoint

Blindstopfen für Multi-funktionsausgang
Bouchon pour connecteur d'entrées-sorties
Plug for multi-function outlet

Rücklauftemperaturanzeige
Affichage de la température de retour
Temperature indication of return

Sollwerteneinstellung
Ajustage de la valeur de consigne
Setpoint adjustment

Arretierung
Arrêtage
Locking device

Meldekontakteneinstellung
Ajustage de l'interrupteur d'alarme
Alarm contact adjustment

Meldekontaktsignalleuchte
Lampe témoin de l'interrupteur d'alarme
Alarm contact pilot lamp

Blindstopfen für EIN/AUS-Fernbedienung
Bouchon pour commande à distance MARCHE/ARRET
Plug for Remote Control ON/OFF

Signalleuchte "Störung"
Lampe témoin "Perturbation"
Pilot lamp "Fault"

Hauptschalter
Interrupteur général
Main switch

Labels on the unit:
UKT3000 LAUDA
max.
min.

Baddeckel
Couverture de bain
Bath cover

Niveauanzeige
Indication niveau
Level indication

Rücklauf
Retour
Return

Vorlauf
Refoulement
Outflow

3. General construction and technical description

3.1 Type selection

The circulating cooling units Class UKT are compact floor-standing cooling units. The models UKT 3000 and UKT 6000 operate on 3-phase supply and differ in their cooling rates and size. Both models are available as air-cooled or water-cooled units (indicated by a "W" after the type designation).

3.2 Construction

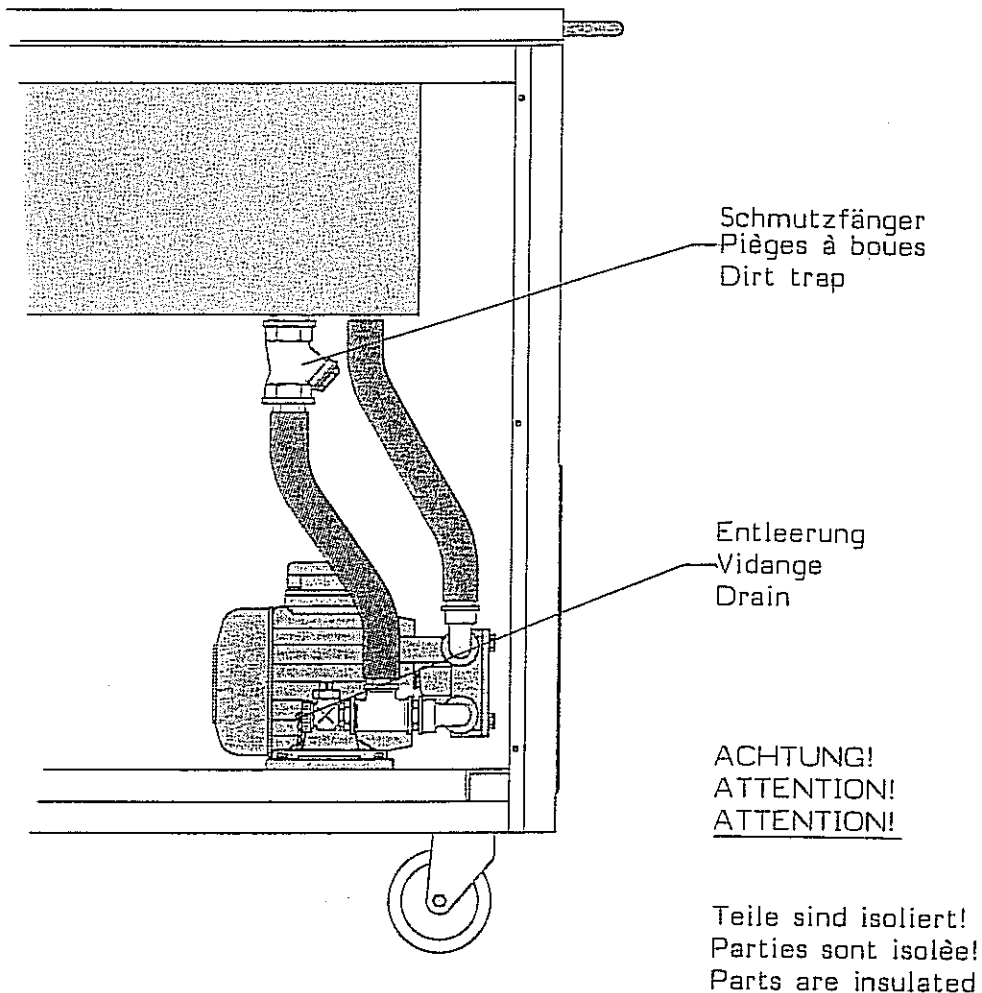
The refrigeration system and the pump are mounted inside the lower part of the unit. The liquid tank is mounted on top.

A frame of steel sections forms the support and is covered with 4 panels. The unit is mounted on 4 castors of which the front ones can be locked. The front and back panels are fitted with large ventilation grills which provide heat dissipation especially on the air-cooled units. The sides have recesses which allow the units to be placed side-by-side. The electronics for the indication of temperature and pump output with the controller and the control contactors are located in a control box behind the front panel. Most of the indications and controls are arranged on this front panel.

3.3 Thermostatic bath

The bath tank of high-grade stainless steel is insulated with polyurethane foam in accordance with the operating temperature range. All parts in contact with the bath liquid are made of high-grade stainless steel, copper or plastic (PVC) which can withstand the operating temperature range or fibre-reinforced rubber. The bath drain cock is accessible behind the right-hand side panel.

A dirt trap is fitted at the tank outlet (towards the pump suction) whose screen can be removed for cleaning.



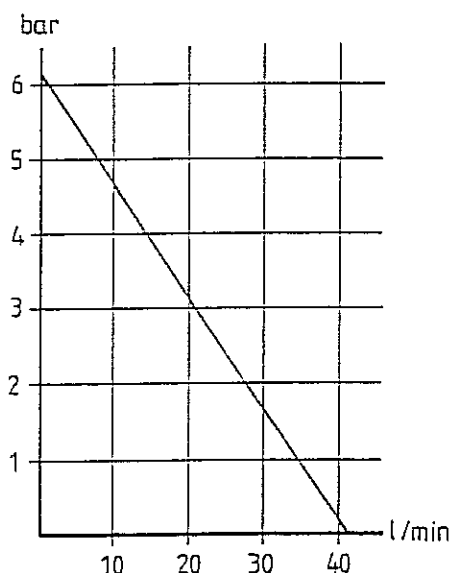
3.4 Circulating pump

The units are fitted with a free-standing side channel pump with sliding ring seal. This pumps the bath liquid through the outflow connection on the back of the unit through the pressure-tight external system. The return flow connection leads back into the bath.

Caution:

With a restricted or closed circuit it is possible for pressures up to 7 bar to build up (glass!).

Performance diagrams



3.5 Refrigeration system

3.5.1 The refrigeration system removes heat from the bath liquid through the evaporator mounted in the bath. The units operate with compressor cooling.

The refrigeration circuits are charged ready for operation with partly halogenated safety refrigerant R 22 and special low-temperature oil and require no maintenance. The compressors are hermetically sealed models.

3.5.2 The heat of condensation and the heat losses of the motor are removed through a finned condenser cooled by a powerful fan. The fan speed is electronically controlled in accordance with the loading of the cooling circuit in order to reduce noise. Fresh air is drawn in at the front of the unit and discharged at the back. The air flow must never be restricted; the distance between the ventilation grills and any obstructing objects, e.g. walls, must therefore be at least 0.5 m. The units should also not be operated close to sources of heat (such as heating radiators etc.).

The ratings specified in the technical data are based on 20°C ambient temperature. Higher temperatures result in reduced performance. Above 40°C the refrigerator can switch off automatically because of overload. The heat dissipated to the air includes both the heat removed from the bath and the power supplied through the mains supply.


3.5.3 Water-cooled version

The heat of condensation and the heat losses of the motor are removed through a water-cooled countercurrent heat exchanger. The connections for inlet (from water tap) and outlet (drain) are located on the back of the unit underneath the back panel. Viewed from the back side of the unit, the inlet is located on the left side and the outlet to the drain on the right side. The cooling water rate is matched to the requirement via the condensation pressure, between 50 and 350 l/h (50 to 600 l/h on UKT 6000). The water temperature should not exceed 25°C. The cooling water pressure must be at least 3 bar.

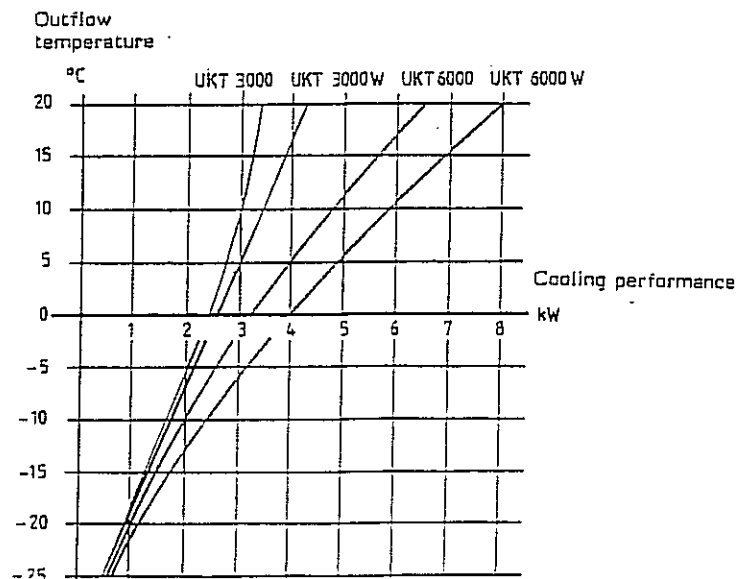
3.5.4 Safety devices of the refrigeration system

3.5.4.1 Every compressor is fitted with 3 temperature cut-outs which sense the temperature of the windings.

3.5.4.2 Every cooling circuit is protected against excessive condensation pressures by a pressure switch. When a fault condition arises, a red fault LED on the control panel is activated and lights up. Usually this fault condition is caused by insufficient or lacking cooling water supply, or that on air-cooled units the finned condenser is contaminated.

The green lamp  in the control panel lights up when the refrigeration compressor is running.

Cooling performance diagrams



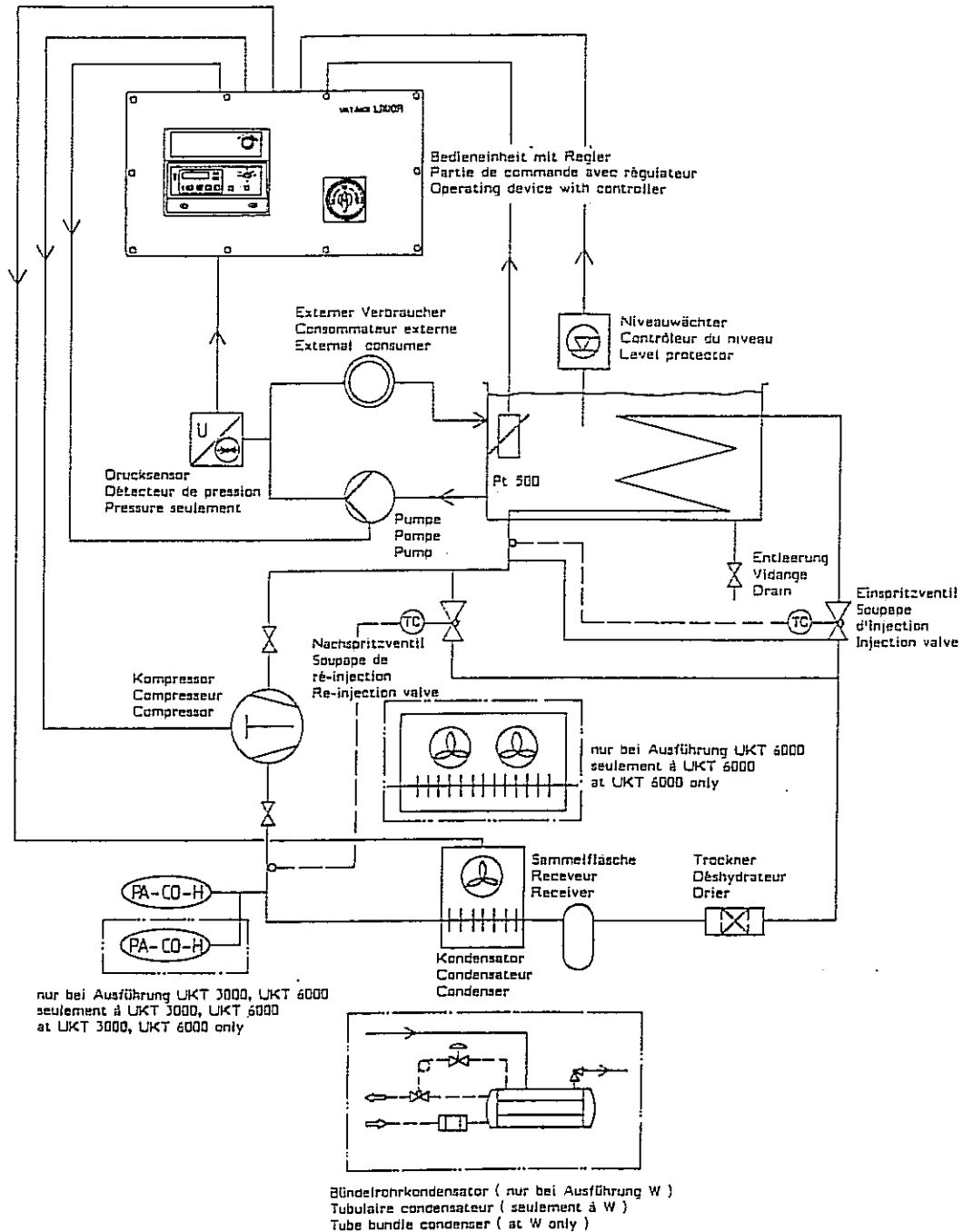
LAUDA Circulating Cooling Units
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
Important: Empty the condenser on water-cooled units if there is danger of frost (e.g. transport in winter)! Heat the bath liquid to approx. 20°C. Remove water hose from the mains supply. Set the setpoint for example to -20°C and blow compressed air into the water inlet hose (on the left seen from the back) as soon as the compressor starts up.

Arrange the outflow hose as low as possible so that the unit can be emptied completely. Then switch off the unit immediately.

Cooling and temperature control circuit diagram




3.6 Control

The units operate with a Pt 500 conforming to 5 x DIN IEC 751 to sense the bath temperature. The bath temperature is indicated digitally with a resolution of 0.1°C. The setpoint is selected on a precision 10-turn-potentiometer with locking device. In order to indicate the setpoint the key  must be pressed at the same time. The value from the programmer input (setpoint, see description of multifunction output) is added to the selected setpoint. The sum can be displayed by operating the key  .

The comparison between setpoint and actual value is followed by an on-off controller which switches the compressor through a triac coupler. A stop monitoring circuit ensures a minimum stopping period of approx. 2 min.

3.7 Pressure measurement

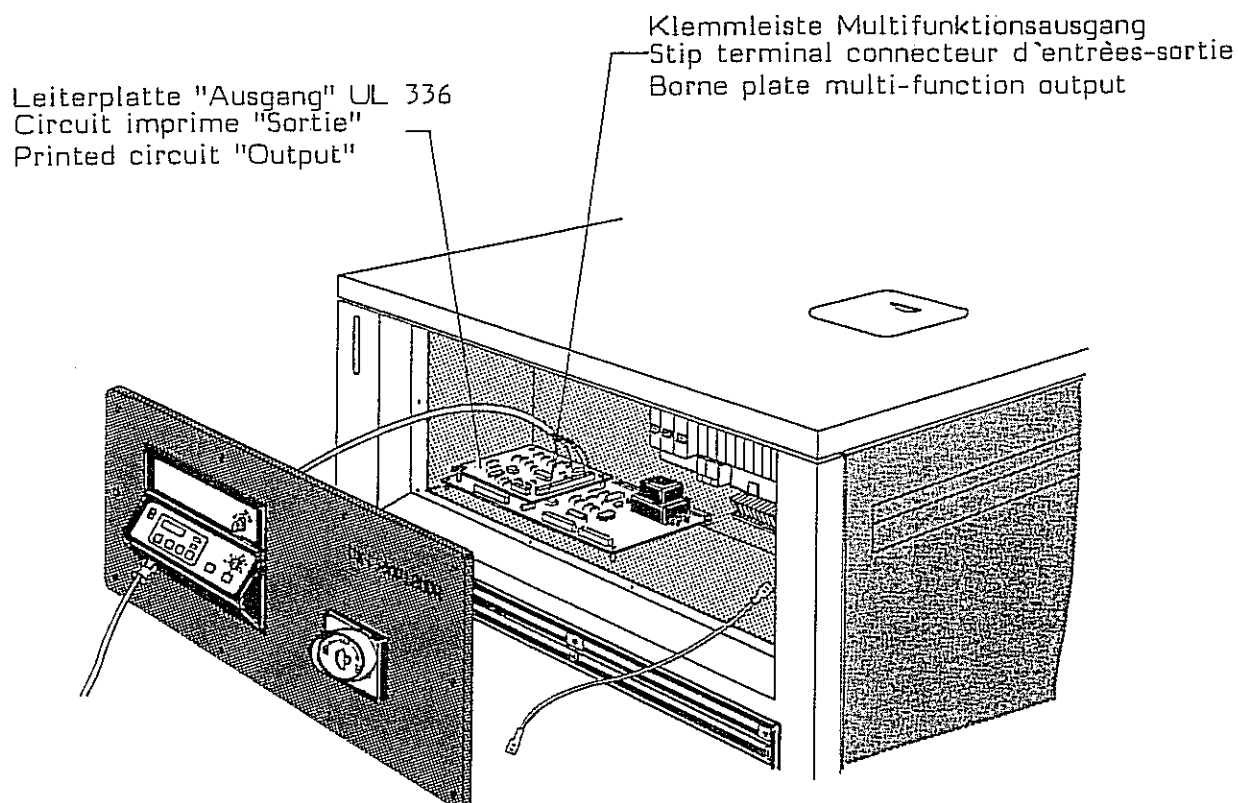
A pressure sensor is connected to the pump outlet which senses the pressure built up in the remaining thermostating circuit. It is indicated in bar by operating the key  .

The pressure measurement provides information on the liquid flow rate (see pump characteristic 3.4) and shows changes in the external thermostating circuit.






3.8 Multifunction output

As the unit described is designed to Protection Grade IP 54 the multifunction output is arranged on terminals in the control box. The external connections must therefore be made through appropriate cable glands.


NOTE: Connections in the control unit must only be made with the mains plug removed and only by a qualified electrician.



- Terminal 1: Control deviation 100 mV/°C approx. for service purposes only (0 V terminal 5)
- Terminal 2: spare
- Terminal 3: Setpoint output 10 mV/°C, $R_i \approx 100 \text{ Ohm}$ approx.; load resistance $\geq 10 \text{ kOhm}$ min. (0 V terminal 5)
- Terminal 4: -12 V supply, max. additional load 20 mA (0 V terminal 7)
- Terminal 5: 0 V reference potential for measurement signals
- Terminal 6: +12 V supply, max. additional load 20 mA
- Terminal 7: 0 V load reference potential
- Terminal 8: Reference output 10 V + 0.1 V; $R_i = 1 \text{ kOhm}$; load resistance $\geq 10 \text{ kOhm}$ min. (0 V terminal 5)
- Terminal 9: +18 V un stabilised, additional load 20 mA max.

- Terminal 10: Recorder connection for (int.) outflow temperature, correct sign 10 mV/°C; $R_i = 100 \text{ Ohm}$; internal recorder resistance $\geq 1 \text{ MOhm min.}$ (0 V terminal 5)
- Terminal 11: Recorder connection for return flow temperature (), correct sign 10 mV/°C; $R_i \approx 100 \text{ Ohm}$, internal recorder resistance $\geq 1 \text{ MOhm min.}$ (0 V terminal 5).
- Terminal 12: 12 V when red LED  alight; $R_i \approx 10 \text{ kOhm}$; $i \text{ max } 1 \text{ mA}$ (0 V terminal 7)
- Terminal 13/14: Neutral contact closed when red LED  alight; 24 V max. 0.2 A (SELV)
- Terminal 15: Recorder connection for outflow pressure signal (), correct sign 10 mV/bar; $R_i \approx 10 \text{ Ohm}$; internal recorder resistance $\geq 1 \text{ MOhm min.}$ (0 V terminal 5)
- Terminal 16: Programmer or external setpoint input 10 mV/°C; added to setpoint selected internally. Sum is displayed with key  ; $R_i = 24 \text{ kOhm}$ (0 V terminal 5)


3.9 Return flow temperature measurement RT

The units are fitted with return flow temperature measurement. In that case a Pt 500 resistance thermometer is fitted at the bath inlet. After operating the key  the return flow temperature is indicated on the display. See also 3.8, terminal 11.

3.10 Remote operation FB (option)

On versions with remote operation the control unit is arranged outside the main unit in a separate bench housing which also includes a mains switch for the remote operation of the unit. The mains switch remains on the unit itself. The connection between unit and remote control is performed with two separate cables for mains voltage and low voltage.

4. Safety features and notes

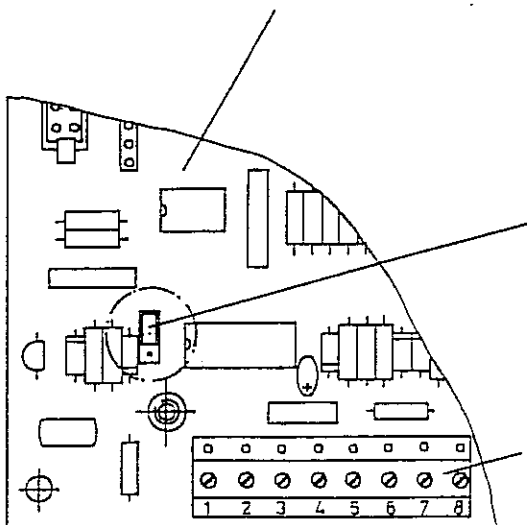
4.1 The red LED  (see 3.8, terminal 13/14) lights up in case of the following fault conditions.

4.1.1 The units are fitted with a level cut-out. When the liquid level drops below the minimum level the refrigeration compressor and the pump are switched off.

- 4.1.2 An overcurrent cut-out is connected in series with the circulation pump which switches off compressor and pump in case of a pump overload. It can only be reset manually by a qualified electrician after the front panel of the control unit has been removed.
- 4.1.3 The overpressure cut-out of the refrigeration system only switches off the refrigeration compressor.
- 4.2 The complete unit is protected by 3 coupled, electromagnetic K-type safety cut-outs which are accessible after the front panel of the control unit has been removed by a qualified electrician.
- 4.3 A signal contact which can be adjusted with a screwdriver within the operating temperature range, indicates via the yellow LED if the selected temperature has been exceeded. At the same time the neutral contact (signal contact 24 V; 0,2 A SELV) is closed. This contact is located in the control unit on the main circuit board A 2 connector X 3 contact 1/2.

The direction of the signal contact function can be reversed by setting the plug encoder near the contacts to the other position - LED is alight and the neutral contact closes when the temperature falls below the set limit.

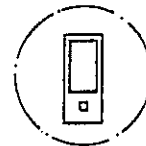
Leiterplatte "Netz/Regelung" UL 335
 Circuit imprimé "Secteur/Réglage"
 Printed circuit "Mains/Control"



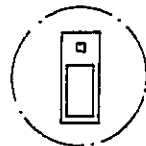
Kodierstecker
 Prise de codage
 Plug encoder

Klemmleiste X 3
 Strip terminal X 3
 Borne plate X 3

Übertemperaturmeldung
 Indication pour surtempérature
 Overtemperature indication



Untertemperaturmeldung
 Indication pour
 température insuffisante
 Undertemperature indication



4.4 The control unit is designed to Protection Class IP 54. In order to safeguard this class, the cables must be introduced into the unit through appropriate cable glands.

4.5 Important!

Any work in the control unit must only be performed by a qualified electrician and after the main switch has been switched off!

5. Bath liquids and tubing connections

The operating ranges of the bath liquids and tubing represent general data and may be limited by the operating range of the unit.

5. Bath liquids

Operating range 5-90°C:

Use decalcified water. Make up losses through evaporation at elevated temperatures.

Temperatures close to zero and below:

Use water-monoethylene glycol mixture, preferably Glycoshell P 300, in the ratio 1:1.

Operating range	-30 to 100°C	<u>Ultra-Therm G 100</u>
Boiling point	110°C	
Viscosity at 20°C	4 mm ² /sec	Ref. No. LZB 009

Prolonged operation at elevated temperatures results in a decreasing proportion of water in the mixture which gradually approaches the properties of pure glycol and thus becomes flammable (flashpoint 128°C). The mixture ratio must therefore be checked from time to time against the original mixture, e.g. with a hydrometer.

For special applications we offer silicone oils.

5.2 Tubing (continuous lengths)

Rubber tubing with fabric reinforcement

3/4", uninsulated

Ref. No. RKJ 032

-40 to 100°C. For water, water-glycol mixture, alcohols and silicone oils

Operating pressure 10 bar max.

Insulation tubing

Ref. No. RKJ 013

(28 mm int. dia; 9 mm thick)

in length of 2 m for insulating 3/4" rubber tubing

Secure tubing with clips to prevent it from slipping off!

For further information on thermostatic liquids and tubing please refer to our special Information Bulletin.

6. Unpacking, assembly and setting up

- 6.1 Goods are packed carefully to prevent transport damage. If, however, the unit should arrive damaged, the carrier, the post office, or the railway authorities have to be informed so that it can be inspected.

Standard accessories:

1 Bath cover for filler opening	EZU 070
2 Connectors 3/4"	EOA 004
2 Cable glands PG 11 with reinforcement	EKV 042
1 Square spanner	EZ 127
2 water hoses, 1/2", each 5 m long, with quick-release coupling (only with water-cooled units)	
Operating Instructions	

- 6.2 The units are best set up so that the control unit faces the front and the air flow to the refrigerator (grills in the lower part) is not obstructed. With air-cooled units keep a minimum distance of 0.5 m between ventilation grills and any obstructing objects, e.g. walls (see 3.5.2).

With water-cooled units (indicated by a "W" in the type designation) make the tube connections to water tap and drain (see 3.5.3)

Secure tubing with clips to prevent it from slipping off!

Check that the drain cock behind the right side panel is closed (spanner 12 a/f).

7. Filling and connection of external systems

- 7.1. Fill the unit with bath liquid depending on the operating temperature according to Section 5. For venting the pump during initial filling the pump nozzle must be open, otherwise the pump may be damaged. Filler opening located underneath flap in the cover.

For initial start-up fill the bath up to the upper marking of the level indicator if possible. Top up, if required, after charging an external system.

- 7.2 Link the pump connections on the back of the unit to the external system. Only pressure-tight systems may be connected.

Attention: Pressures of up to 7 bar may occur on units Type P if the return flow is accidentally closed.







Apparatus made of glass normally only withstand very much lower pressures! (see accessories: "Overflow valve").

For suitable tubing material please refer to Section 5. With a high-level external system, entry of air into the thermostatic circuit while the pump is stopped may cause the external volume to drain down even with a closed circuit, resulting in flooding of the thermostatic bath! Overflow see Section 3.3.


Always ensure maximum flow area in the external circulation (olives, tubing, external system). This produces a larger flow rate and thereby improves the thermostating action.

Secure the tubing with clips to prevent it from slipping off!

8. Starting up

- 8.1 The unit must only be connected to a grounded line supply.
On air-cooled units check the direction of rotation in accordance with Section 8.2.
Check the line voltage and frequency against the data on the unit!
On water-cooled units open the water tap !
- 8.2 Switch on the main switch on the right of the control panel (I). The green digital display indicates the actual outflow temperature.
Check the pump's direction of rotation; on air-cooled units also the direction of rotation of the fan. In order to do so, switch on the pressure indication by pressing key  . A positive pressure value must be indicated. Simultaneously, on air-cooled units, the fan at the front of the unit must suck in air and discharge it at the back.
If a negative pressure value is indicated and, at the same time, the fan rotates in the wrong direction, a qualified electrician must reverse the direction of the 3-phase current by interchanging two phases in the mains connection.
- 8.3 If there is no flow of bath liquid despite sufficient liquid level the pump cannot fill with liquid due to a build-up of air. Venting the external system at its highest point will rectify this fault condition!
- 8.4 Unlock the locking device of the setpoint selector  (by turning it anticlockwise to the top). The setpoint is indicated by pressing the key  . Keep this key pressed for setting the setpoint. Turn the knob  for selecting the setpoint. Then release the key and tighten the locking device by turning it in clockwise direction. Depending on the temperature selected the compressor starts up (possibly after a delay). The cooling lamp  at the control unit then lights up. The unit now controls the selected temperature by switching the compressor on and off.
- 8.5 On units type "P" the pressure which builds up at the external system can be indicated by pressing the key  (see Section 3.7 and 3.8).

8.6 Operation with programmer

A programmer Type PM 351 or an external setpoint selector can be connected to the terminals of the multifunction output (see Section 3.8) so that the setpoint of the circulating cooling unit can be varied according to a preset program. This requires that the energy balance (heating, cooling, load) of the circulating cooling unit matches the requirements of the program (heating rate, cooling rate, operating temperatures). The programmer output or setpoint selector output is set to 0 Volt. Adjust the unit setpoint to the lowest temperature of the program; this value is entered as value A when programming the programmer. Do not change the unit setpoint any more. Operation of the key  indicates on the digital display the current setpoint which is provided by the programmer and according which the unit is operating. For further details refer to the Operating Instructions for the PM 351.

8.7. Operation with Interface RS 232 (V24) R 61/2 (MF necessary)

If a computer can be connected to the Interface RS 232 C (V24) R 61 with A/D-converter and D/A-converter, it is possible to transfer 3 signals of 10mV-scale from the multifunction output of the circulating cooler to the computer and to transmit one value as setpoint value from the computer to the circulating cooler. Error signal can also be determined.

Depending on type and kind of equipment of the circulating cooler the below mentioned actual value signals are available (see multifunction output 3.8):

1. Setpoint output (terminal 3)
2. Outflow temperature (terminal 10)
3. Return flow temperature (terminal 11)
4. Outflow pressure (terminal 15)
5. External temperature (terminal 2)

If required, the R 61-inputs IN 1 (brown), IN 2 (red) and IN 3 (white) can be connected to 3 signals of those 5 ones mentioned above.

Programming and automatic processing of ramp segments as well as programmable relay contacts possible.

9. Maintenance

- 9.1 LAUDA circulating cooling units operate largely without maintenance. Contaminated bath liquid should be drained through the drain cock and replaced by fresh liquid.

The refrigerating system operates largely without maintenance. On air-cooled units the finned condenser of the refrigerator must be cleaned in regular time intervals, e.g. every 6 months, depending on the amount of dust. In order to do so, the ventilation grill mounted at the front may have to be unscrewed. Then remove the dust on the finned condenser located behind it via an appropriate method, e.g. blow compressed air or nitrogen into the ventilation grill for several minutes.

- 9.2 In case of reduced pump output the dirt trap (see Section 3.3) can be unscrewed and cleaned after removing the right side panel and the insulation.

- 9.3 On water-cooled units a dirt trap is located in the cooling water inlet which must be cleaned in case of faults in the system.

- 9.4 The outside of the units can be cleaned using a damp cloth, wetted with water and some drops of a tenside (wash-up liquid).

9.5 Safety notes in case of repair

Always unplug mains supply before performing any maintenance procedures or repairs. Repairs on the unit must only be performed by a qualified electrician!

9.6 Notes on Repair and Disposal

The refrigerating circuit is filled with partly halogenated refrigerant R 22. Repair on the circuit as well as disposal of the R 22 by qualified technician only.

9.7 Order of spare parts

When ordering spare parts, please always state the type designation and unit number as indicated on the unit label. We rely on your cooperation as this prevents unnecessary delays due to further inquiries or wrong deliveries.

We shall always be happy to deal with queries, suggestions and complaints.

LAUDA Circulating Cooling Units
 UKT 3000, UKT 3000 W, UKT 6000, UKT 6000 W

Accessories for LAUDA Circulating Coolers

Type	Ref.No.
<u>LAUDA Temperature Programmer PM 351-1</u>	LRP 012
<p>Microprocessor-controlled programmer with up to 50 . different temperature/time coordinates and a program range of 350°C for unrestricted individual programming of temperature courses. Programmable control of permissible variation. External controllable start, stop and reset function.</p>	
<p><u>Connecting cable to the strip terminal</u> multifunction output to PM 351-1</p>	UK 178
<p><u>Step programmer PS 2</u> Using a timer with 7-day-program one can automatically switch between two different temperatures within the operating temperature range of the circulating cooler.</p>	LRP 111
<p><u>RS 232 C Interface R 61/2</u> If a computer can be connected to the Interface RS 232C (V 24) with A/D and D/A converter, it is possible to transfer signals from the multifunction output of the circulating cooler to the computer and to transmit one value as setpoint from the computer to the circulating cooler. Error signal can also be determined. Programming and automatic processing of ramp segments as well as programmable relay contacts possible.</p>	LRT 013
<p><u>Connecting cable to strip terminal</u> of the multifunction output of the circulating cooler suitable for PS 2 and R 61.</p>	UK 179
<p><u>Four-way receiver and distributor for return and outlet</u> connection of pump, can be operated separately.</p>	
<p>G 3/4 / 3/4" tube</p>	LWZ 010
<p><u>Overflow valve for pressure limitation and improved</u> circulation in the circulating cooler in consumers with high flow resistance. Break pressure for bypass adjustable.</p>	
<p>Adjustment range 1.5 - 2.5 bar</p>	LWZ 012
<p>Adjustment range 1.0 - 1.5 bar</p>	LWZ 013

BESTÄTIGUNG / CONFIRMATION / CONFIRMATION**LAUDA****An / To / A:**

LAUDA Dr. R. Wobser

LAUDA Service Center

•Fax +49 (0) 9343 - 503-222

Von / From / De :

Firma / Company / Entreprise: _____

Straße / Street / Rue: _____

Ort / City / Ville: _____

Tel.: _____

Fax: _____

Betreiber / Responsible person / Personne responsable: _____

Hiermit bestätigen wir, daß nachfolgend aufgeführtes LAUDA-Gerät (Daten vom Typenschild):

We herewith confirm that the following LAUDA-equipment (see label):

Par la présente nous confirmons que l'appareil LAUDA (voir plaque signalétique):

Typ / Type / Type :	Serien-Nr. / Serial no. / No. de série:

mit folgendem Medium betrieben wurde

was used with the below mentioned media

a été utilisé avec le liquide suivant

Darüber hinaus bestätigen wir, daß das oben aufgeführte Gerät sorgfältig gereinigt wurde, die Anschlüsse verschlossen sind, und sich weder giftige, aggressive, radioaktive noch andere gefährliche Medien in dem Gerät befinden.

Additionally we confirm that the above mentioned equipment has been cleaned, that all connectors are closed and that there are no poisonous, aggressive, radioactive or other dangerous media inside the equipment.

D'autre part, nous confirmons que l'appareil mentionné ci-dessus a été nettoyé correctement, que les tubulures sont fermées et qu'il n'y a aucun produit toxique, agressif, radioactif ou autre produit nocif ou dangeureux dans la cuve.

Stempel Seal / Cachet.	Datum Date / Date	Betreiber Responsible person / Personne responsable

Formblatt / Form / Formulaire:

Unbedenk.doc

LAUDA DR. R. WOBSEr GmbH & Co. KG

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30.10.1998

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