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## Operating instructions

### LAUDA Immersion coolers

ETK 30, ETK 50

YAFE0002  
English

Read the instructions prior to performing any task!  
release 06/2018 c  
replaces release 08/2016 b2; a2 07/03  
Translation of the original operating instructions

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## Prefixed safety notes



Before operating the equipment please read carefully all the instructions and safety notes. If you have any questions please phone us!

Follow the instructions on setting up, operation etc. This is the only way to avoid incorrect operation of the equipment and to ensure full warranty protection.




- Transport the equipment with care!  
Cooling devices may NEVER be overturned nor put upside down!
- Equipment and its internal parts can be damaged:
  - by dropping,
  - by shock.
- Equipment must be operated only by technically qualified personnel!
- Never operate the equipment without a proper heat transfer liquid!
- Never operate the equipment without sufficient heat transfer liquid level!
- Do not start up the equipment, if:
  - it is damaged or leaking,
  - the supply cable is damaged.
- Switch off the equipment and pull out the mains plug for:
  - servicing or repair,
  - before moving the equipment!
- It is prohibited to make any technical modifications to the device.
- Have the equipment serviced or repaired by properly qualified personnel only!

The Operating Instructions include additional safety notes which are identified by a triangle with an exclamation mark. Carefully read the instructions and follow them accurately! Disregarding the instructions may have serious consequences, such as damage to the equipment, damage to property or injury to personnel.

*Product specifications are subject to change without notice!*

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Explanation of symbols		
	Caution:	This sign is used where there may be injury to personnel if a recommendation is not followed accurately or is disregarded.
	Note:	Here special attention is drawn to some aspect. May include reference to danger.
	Reference:	Refers to other information in different sections.

## 1 Safety notes

An immersion cooler is intended for cooling liquids according to the needs of the user. This leads to hazards by low temperatures and the general hazards due to the application of electrical energy.

The user is largely protected through the application of the appropriate standard specifications.

Further hazard sources may arise from the type of material being thermostated, for example by exceeding or undercutting certain temperature thresholds or by the fracture of the container.

It is not possible to cover all possibilities; they remain largely within the responsibility and the judgement of the operator.

The unit must only be used as intended and as described in these Operating Instructions. This includes operation by suitably instructed qualified personnel.

Check the device carefully for shipping damage before putting into operation. Never start a damaged device!

Connect the unit only to grounded mains power (PE).

Depending on the heat transfer liquid used and the mode of operation it is possible for irritating vapours to be produced. Ensure appropriate ventilation!

Always pull out the mains plug before cleaning, maintenance or moving the ETK!

Repairs on the device must be carried out by properly qualified personnel only

The units are not designed for use under medical conditions according to DIN EN 60601-1 or IEC 601-1!

Classification in accordance with EMC requirements			
Unit	Immunity	Emissions class	Customer power supply
Immersion coolers ETK 30, ETK 50	Type 2 in accordance with DIN EN 61326-1	Emissions Class B in accordance with CISPR 11	Worldwide No limitation

### **Valid for the USA:**

Instructions for Class A digital devices

"This equipment has been tested and found to comply with the limits for Class A digital device, pursuant to Part 15 of the FCC (Federal Communication Commission) Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense."

"This device complies with Part 15 of the FCC (Federal Communication Commission) Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation."

### **Valid for Canada:**

"This Class A digital apparatus complies with Canadian ICES-003" (ICES = Interference Causing Equipment Standards).

«Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada».

### **EU conformity**

The device complies with the basic health and safety requirements outline in the Directives listed below.



- Machinery Directive 2006/42/EC
- EMC Directive 2014/30/EU

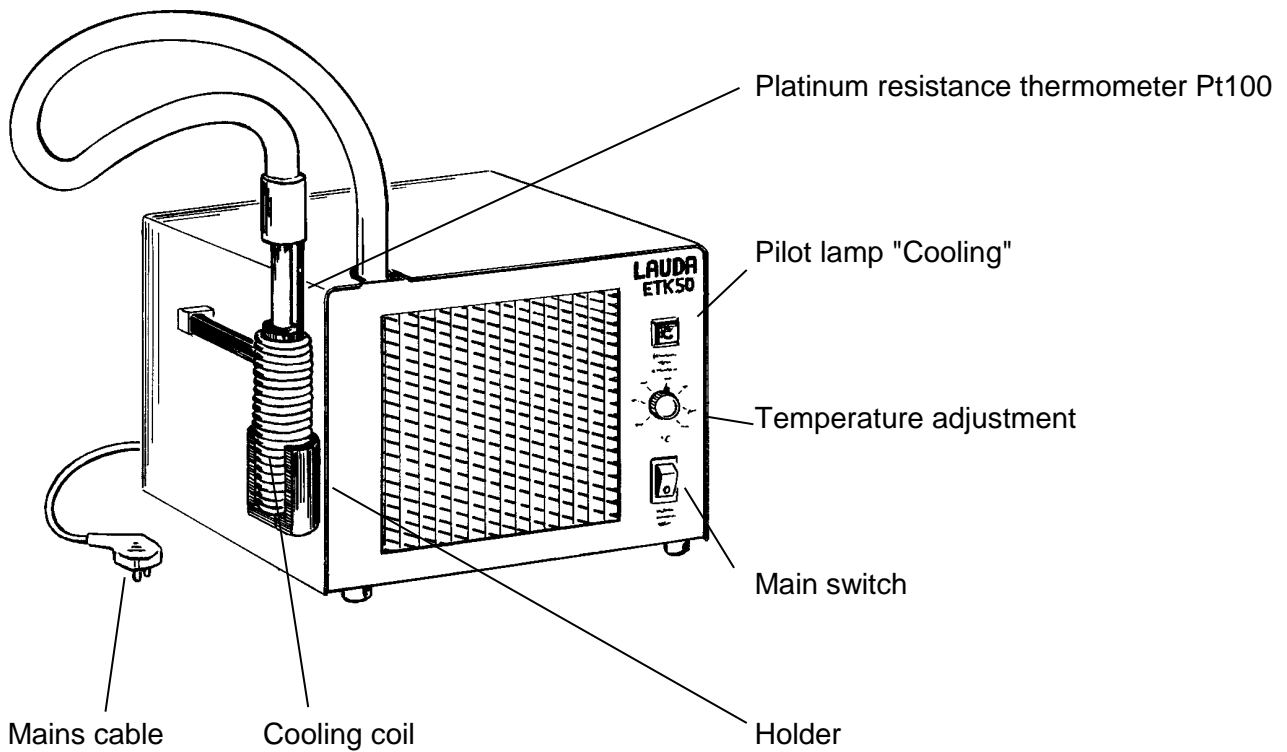
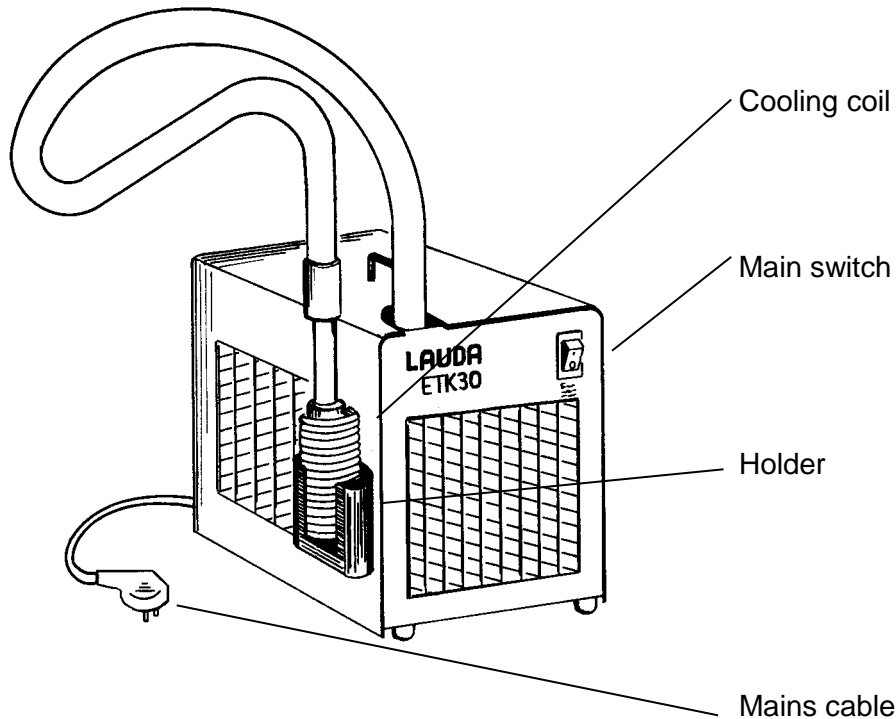
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The device does not fall under Pressure Equipment Directive 2014/68/EU because the device is only classified as high as Category 1 and is covered by the Machinery Directive.



## 2 Operating elements



## 3 General design

The immersion coolers **ETK 30** und **ETK 50** have air-cooled fully hermetical encased condensing units which are completely maintenance-free.

The cooling coil made from stainless steel is connected with the condensing unit by an insulated flexible metal tube of 1.5 m length. The electronic temperature controller of immersion cooler *ETK 50* controls a solenoid valve in the cooling circuit. The temperature probe (Pt100) is mounted in the cooling coil.

ETK 30 has no temperature control.

## 4 Unpacking and Set-up

### 4.1 Unpacking

The careful packing largely protects from damages during transit. If, however, the immersion cooler is damaged inform the forwarding agent or the post office.

Check if the immersion cooler has sustained damage. Never start a damaged device!

The unit may NEVER be overturned nor put upside down!

#### Standard accessories:

Operating instructions

Catalogue number: YAFE0002

### 4.2 Set-up

The condenser of the cooling unit is air-cooled. Fresh air is sucked at the front of the instrument and the warmed air is removed at the back. In order to guarantee good air circulation the venting slots must be free. Take care that no extremely warm air is sucked. Do not place the instrument near a heater.

Increased ambient temperature results in reduced capacity. In case of an excessive overloading of the compressor, caused by too high refrigerant pressure or too high ambient temperature, the instrument is switched off automatically by a bimetal switch (KLIXON). It is switched on automatically as soon as the compressor has cooled down.

## 5 Cooling of consumers

By simple suspending of the cooling coil any bath contents can be cooled. In this way heating thermostats or other baths to be tempered can be operated also below ambient temperature. It is possible to obtain operating temperatures to  $-30\text{ }^{\circ}\text{C}$  (*ETK 30*) and  $-50\text{ }^{\circ}\text{C}$  (*ETK 50*) depending on size and insulation of the baths concerned.

## 6 Starting up

Connect the instrument only at an earthed wall socket. Compare the voltage and the frequency mentioned on the rating label with your network. Put in the power supply plug.



**Note for electric installation on site:**

The devices must be protected with a 16 ampere circuit breaker fitted during installation.

Exception: Devices with 13 ampere UK plugs.

Suspend the cooling coil made from high-grade stainless steel into the consumer to be cooled. Note that the maximum cooling capacity is only obtained with completely immersed cooling coil. Clamp the cooling coil at a laboratory stand.

The temperatures at the surface of the cooling coil are clearly lower than in the bath directly especially if the baths are not circulated. If the surface temperature is lower than the freezing point of the heat transfer liquid, ice will be formed which results in a reduced cooling capacity. Use heat transfer liquid with a lower freezing point (see leaflet "LAUDA Heat transfer liquids").

The bending radius of the flexible tube must not be smaller than 150 mm. Otherwise the tube might break.

ETK 50: Adjust the desired temperature.

ETK 30: Without temperature control.

Switch on the device at the mains switch  
⇒ the green lamp lights.

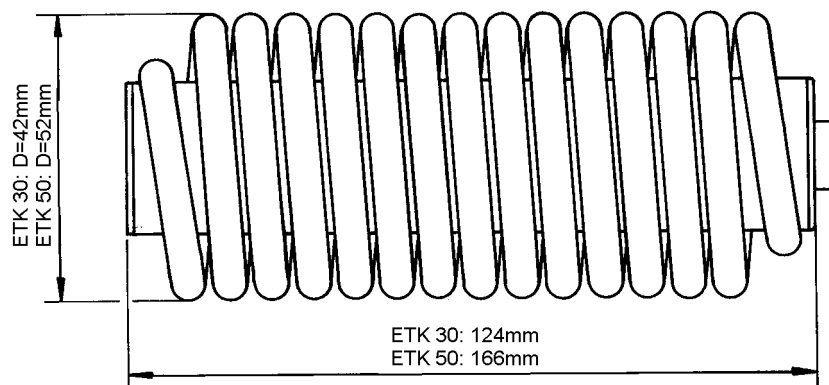
However the cooling only starts with delay of 3 – 5 minutes.

*ETK 50:* If the heat transfer liquid has obtained the desired value the control device operates. The pilot lamp "Cooling" goes on and out.

*ETK 30:* Cools down to its lowest temperature always.

*ETK 50:* The indicated temperature stability of  $\pm 0.5$  °C can be obtained only at slight stirring in the bath. In stagnant liquid there is a thermal stratification.

If the cooling coil is no longer required put in into the holder.



## 7 Cooling circuit (Design and Maintenance)

Page 17 shows you schemes of the cooling circuit.

The cooling unit operates largely maintenance free. If the ambient of the immersion coolers is dust-laden we recommend to clean the condenser of the cooling unit every 4 to 6 months. For this reason blow compressed air into the venting slots for some minutes.

The motor of the compressor is secured against overloading by a double acting bimetal switch (KLIXON). This switch responds to the temperature of the casing and additionally to the current consumption of the compressor motor. If ventilation is insufficient temperature of the housing increases and then the condensation pressure. Both results in an excessive overloading of the motor switch is now switched off. It is switched on again automatically as soon as the housing has cooled down. For quick cooling the cooling unit can also be started at temperatures around 100 °C. However it is possible that at higher temperatures the KLIXON switches of the compressor several times.

LAUDA immersion coolers are designed for continuous operation and do not require maintenance routine.

## 8 Disposal information



The following applies to Europe: The disposal of the device is regulated by EU Directive 2012/19/EU (WEEE Waste of Electrical and Electronic Equipment).

### 8.1 Disposal of refrigerant

The type and filling quantity of the refrigerant can be read on the unit or on the rating plate. Repair and disposal only through a qualified refrigeration engineer!

The refrigerant must be disposed of in accordance with regulation 2015/2067/EU in combination with regulation 517/2014/EU.

### 8.2 Disposal of packaging

The packaging must be disposed of in accordance with EU Directive 94/62/EC.

## 9 Ordering spare parts

When ordering spares please quote instrument type and serial number from the rating label. This avoids queries and supply of incorrect items.

Your contact for service and support:

**LAUDA Service Constant Temperature Equipment**  
**Telephone: +49 (0)9343 503 350 (English and German)**  
Fax: +49 (0)9343 503 283  
E-Mail [service@lauda.de](mailto:service@lauda.de)

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

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## 10 Technical Data

Type		ETK 30	ETK 50
Operating temperature range (without external heating)	°C	-30 – 20	-50 – 20
Operating temperature range (with external heating)	°C	-30 – 100	-50 – 100
Temperature probe		---	Pt100
Control behaviour		---	2-point action
Temperature stability (at –10 °C)	K	---	±0.5
Cooling capacity at 20 °C	kW	0.15	0.25
-10 °C	kW	0.13	0.25
-30 °C	kW	0.04	0.20
-40 °C	kW	---	0.10
-50 °C	kW	---	0.04
Cooling unit		Air-cooled, fully hermetical	
Base (W x D x H)	mm	250 x 360 x 285	460 x 410 x 270
Weight	kg	17	33
Safety class		1/NFL* according to DIN 12876	
<b>Catalogue number</b>		<b>Power consumption</b>	
230 V; 50/60 Hz	kW	0.2	---
230 V; 50 Hz	kW	---	0.3
230 V; 60 Hz	kW	---	0.3
100 V; 50 Hz/115 V; 60 Hz	kW	0.2	---

\*NFL non-flammable liquids

We reserve the right to make technical alterations!

### Refrigerant and filling quantity

The cooling thermostat contains fluorinated greenhouse gases.

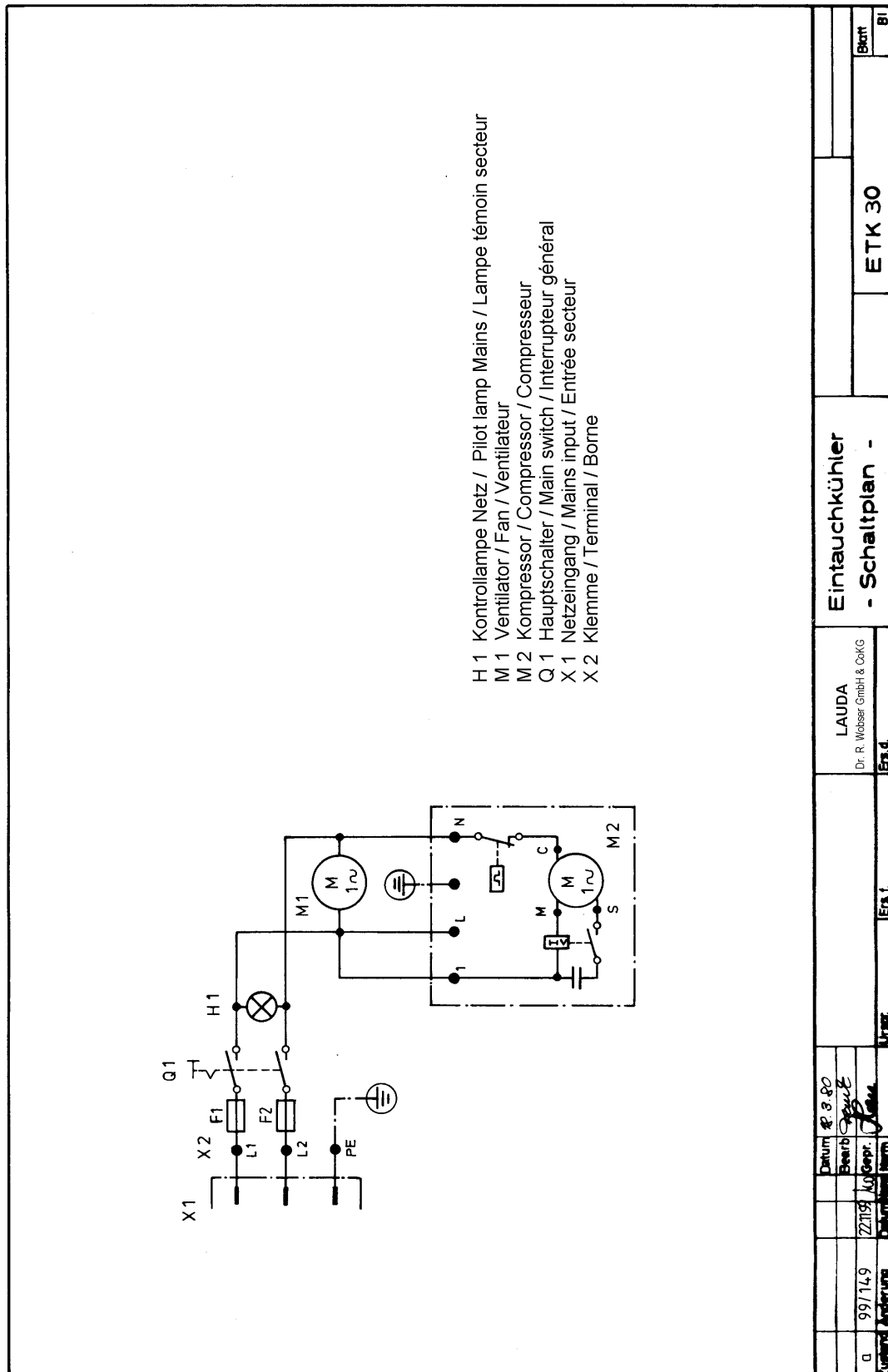
	Units	ETK 30	ETK 50
Refrigerant	---	R-134a	R-404A
maximum filling quantity	kg	0.06	0.175
GWP <sub>(100a)</sub> *	---	1430	3922
CO <sub>2</sub> equivalent	t	0.1	0.7



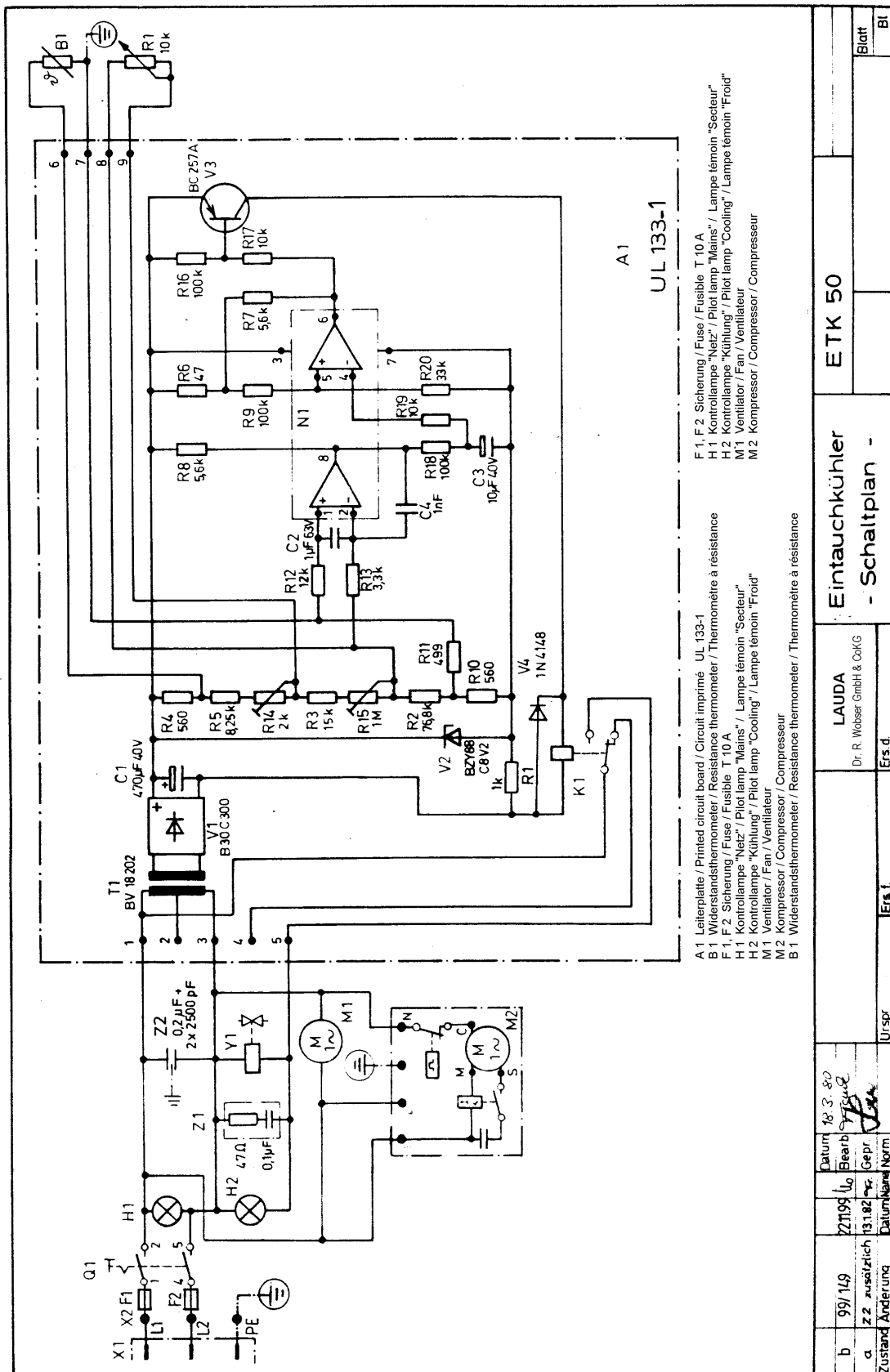
Global Warming Potential (GWP),  
Comparison CO<sub>2</sub> = 1,0

\* Time span 100 years - according to IPCC IV

## 11 Circuit diagram

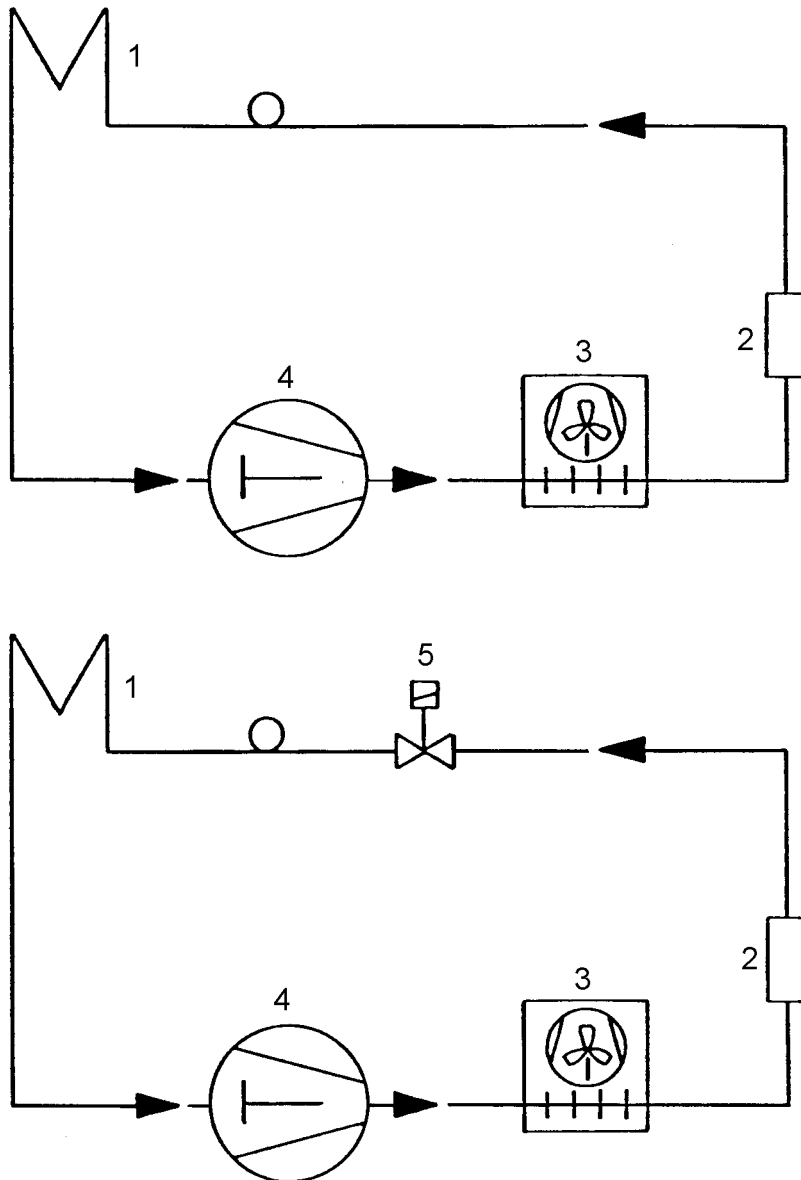








## 12 Pipe plan



<u>No.</u>	<u>Teil / Part / Pièce</u>
1	Kühlspirale / Cooling coil / Serpentin refroidissement
2	Filtertrockner / Filter drier / Déshydrateur-filtre
3	Verflüssiger / Condenser / Condenseur
4	Verdichter / Compressor / Compresseur
5	Magnetventil / Solenoid valve / Vanne solénoïde



**An / To / A:**

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**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 dangereux dans la cuve.**

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





