



KONVEKTA

Technical leadership starts with ideas.

Operating instructions for KONVEKTA air conditioning units

**KL20 Bus / Cabin
KL20E / KDE**

**KL20 facelift Bus / Cabin
KL20E / KL20KDE facelift**

**R134a
24 Volt**

**ID#: BBA-KL2E0102A
Version: A04**

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Appendix optional:

- Maintenance Schedule cabin [WP07050621](#)
- Maintenance Schedule bus [WP07050618](#)

Introduction

These operating instructions have been written for drivers, operators and the maintenance staff of your air conditioning unit.

In this context, we refer implicitly to the compliance with our general installation guidelines. These can be obtained from the KONVEKTA technical after sales service:

TKD@konvekta.com.

Please observe our valid safety instructions, available under www.konvekta.de/asv.html. In case of order placement or any other conclusion of contract the safety instructions get integral part of the contract.

These operating instructions have to be read carefully and made use of before the first start-up and after that regularly by each person who is involved in handling the machine:

- Operation including troubleshooting and waste disposal of fuels and auxiliary agents.
- Servicing, inspection, repair
- Transport

This facilitates the handling and avoids trouble caused by improper operation. Working in compliance with these operating instructions increases operation reliability and service life of the air conditioning unit and reduces life cycle costs.

Please complete these instructions by adding the national provisions for prevention of accidents and environmental protection.

These instructions are part of the air conditioning unit. Always have a copy at hand in the driver's cabin.

You will certainly understand that we will not recognize any warranty claims due to improper handling, inadequate maintenance, applications that do not correspond with the determined use, utilization of non-admitted fuels or the non-observance of safety provisions.

KONVEKTA will annul without notice all obligations concerning guarantee, service contracts etc. regardless if granted by KONVEKTA or its distributors in case other than original KONVEKTA spare parts or parts bought from KONVEKTA AG have been used for maintenance and repair. These operating instructions contain all necessary information to operate your air conditioning unit. In case you need more explanations please contact the next KONVEKTA service station.

^① On our website www.konvekta.com in category >service< you will find a survey of contact details of all our service partners close to your location.

Information on the operating instructions

These instructions are valid for the air conditioning unit's type:

- | | | |
|------------------------|---------------------|------------------|
| ➤ KL20 | ➤ KL20E | ➤ KL20KDE |
| ➤ KL20 facelift Kabine | ➤ KL20 facelift Bus | ➤ KL20E facelift |
| ➤ KL20KDE facelift | | |

☞ When taking the unit into operation we recommend adding the following data. This will also be important for your orders of spare parts, and in case of warranty.

Serial number of the unit:

Order No.:

Year of construction:/ (MM/JJ)

Date of first operation:// (TT/MM/JJ)

The machine is in accordance with the EC machinery directive 2006/42/EC.

The unit contains or needs fluorinated greenhouse gas for operation and is subject to identification requirements in accordance with F-Gas Regulation 517/2014.

Due to the fact that scope of supply depends on the order, equipment of your product may differ in some parts of description.

In case your product is equipped with details not shown or described in the operating instruction, your KONVEKTA -Service-Station will always be at disposal for informing you about correct operation.

In the course of further developments we reserve the right to technical modifications without notice. Guarantee and liability conditions of KONVEKTA AG's general business conditions are not enlarged by the above notes.

Indications and photos should neither be copied and circulated nor used for competitor's purposes. All rights according to the copyright remain expressly reserved.

Manufacturer: KONVEKTA AG, Postfach 2280, D-34607 Schwalmstadt

1. Directives for Installation, Connection and Use

Please read carefully the following instructions before installing, connecting and operating the device. We assume no liability for incorrect handling and usage.



WARNING

MAKE THE CORRECT CONNECTIONS.

Failure to make the proper connections may result in fire or product damage.

USE ONLY SUITABLE VOLTAGE.

The usage with a not suitable voltage may result in fire. Furthermore a not suitable voltage may result in failure or product damage.

TAKE CARE THAT WIRES NOT CARRY CURRENT WHILE CONNECTING.

Connecting wires which carry current may result in electrical shorts or product damage.

ONLY USE WIRES WITH SUFFICIENT LARGE CROSS SECTIONS.

Using wires with not sufficient large cross sections will exceed the current carrying capacity of the wires and result in fire or electric shock.

DO NOT DISASSEMBLE OR ALTER.

Doing so may result in an accident, fire or electric shock.

DO NOT INSTALL IN LOCATIONS WHICH MIGHT HINDER VEHICLE OPERATIONS.

Doing so may obstruct forward vision or hamper movement and result in serious accident.

DO NOT BLOCK VENTS OR RADIATOR PANELS.

Doing so may cause heat to build up inside and may result fire.

USE THE CORRECT AMPERE RATING WHEN REPLACING FUSES.

Failure to do so may result in fire or electric shock.

DO NOT PLACE HANDS, FINGERS OR FOREIGN OBJECTS IN INSERTION SLOTS OR GAPS.

Doing so may result in personal injury or damage to the product.

AVOID HIGH FORCE EFFECTS.

Do not expose the device high force effects or strokes. Doing so may result in product damage.

RANGE OF THESE DIRECTIVES.

These directives apply for all devices, on which this directives-sheet is added. One directives-sheet is sufficient per box.



CAUTION

HAVE THE WIRING AND INSTALLATION DONE BY EXPERTS.

The wiring and installation of this device requires special technical skill and experience and have to be done by experts.

ARRANGE THE WIRING SO IT IS NOT CRIMPED OR PINCHED BY A SHARP METAL EDGE.

Arrange the wiring so it will not be damaged.

DO NOT INSTALL IN LOCATIONS WITH HIGH MOISTURE OR DUST.

Avoid installing the device in locations with high incidence of moisture or dust. Moisture or dust that penetrates into this device may result in product failure or damage.

USE SPECIFIED ACCESSORY PARTS AND INSTALL THEM SECURELY.

Be sure to use the specified accessory parts. Use of other than designated parts may damage this device internally or may not securely install the device in place.

HALT USE IMMEDIATELY IF A PROBLEM APPEARS.

Failure to do so may cause personal injury or damage to the product. Return it to your authorized customer service.

TEMPERATURE.

Be sure the environment-temperature is in the allowed range before turning the device on.

USE DEVICE ONLY FOR SPECIFIED APPLICATION AREA.

Using the device for another purpose or in another application area than the intended one, may result failure, product damage or injury.

PRODUCT CLEANING.

Use a soft dry cloth for cleaning the device. For more severe dirt, please dampen the cloth with water only. Anything else has the chance of damage the product.

TRANSPORT TERMS

Handle the unit with care at any time. During transport make sure that the unit is stored safely and cannot be damaged. If more than one unit are transported, every unit has to be packed singly to avoid that the units damage one another.

The forwarder is liable for all damages during transport.

2. Technical data

Type		KL20-Bus	KL20-Cabin	KL20E	KL20KDE
Refrigerant		R 134a	R 134a	R 134a	R 134a
GWP		1.430	1.430	1.430	1.430
Refrigerant quantity approx.	kg	*	*	1,3	1,5
Co2 equivalent	to	-	-	18,59	21,45
Operating voltage	Volt DC	12 24	12 24	24	24
Cooling capacity	Watt	6.200	6.200	4.300	8.000
Air volume	m ³ /h	700	700	700	2.900
Current consumption	V / A	12V/28 24V/16	12V/28 24V/16	- 24V/69	- 24V/53
Measurements:					
- length	mm	967	794	1315	1315
- width	mm	780	780	802	802
- height	mm	166	168	181	181
- weight	kg	-	-	53	48

Type		KL20 facelift ABS-hood	KL20 facelift Sheet metal hood	KL20E facelift ABS-hood	KL20KDE facelift
Refrigerant		R 134a	R 134a	R 134a	R 134a
GWP		1.430	1.430	1.430	1.430
Refrigerant quantity rescri.	kg	*	*	0,7	0,8
Co2 equivalent	to	-	-	10,01	11,44
Operating voltage	Volt DC	12 24	12 24	24	24
Cooling capacity	Watt	6.200	6.200	4.300	8.000
Air volume	m ³ /h	700	700	700	2.700
Current consumption	V / A	12V/28 24V/16	12V/28 24V/16	- 24V/69	- 24V/53
Measurements:					
- length	mm	932	724	1300	931
- width	mm	788	750	791	787
- height	mm	211	168	206	209
- weight	kg	23	23	52	31

¹⁾) Depending on outside temperature

* **Note:** At KL20 (bus and cabin) and KL20KDE / facelift the quantity of refrigerant is depending on the vehicle and can only be determined during filling of the a/c unit.

2.1. Pressure switch combination

The pressure switch combination is fitted to the dryer-collector-sight glass –unit.

Konvekta code no.: H11-001-378

Low pressure	BAR	2,0 ± 0,2 off	2,1 ± 0,3 on
Excess pressure	BAR	28,0 ± 2,0 off	21,0 ± 3,0 on

2.2. Compressor (only for KL20E / KL20KDE)

Konvekta code: H13-002-209

Type	SD5H09 / HB / ø 125 mm / 5PV
Oil brand / quantity	PAG / corresponding to version ➤ <i>List is attached to compressor (Instruction no: TD00031A)</i>
Connection pressure side standard	3/4" UNF – O-Ring
Connection suction side standard	7/8" UNF – O-Ring
Capacity intake	rescri. 50 Watt
Number of revolutions	400 to max. 6.000 U/min.
Installation location	from vertical position max. 90° pivoting to both sides
Weight	rescri. 7,5 kg

Note: At KL20 / facelift (bus and cabin) the layout of the compressor is depending on the vehicle.



Important:

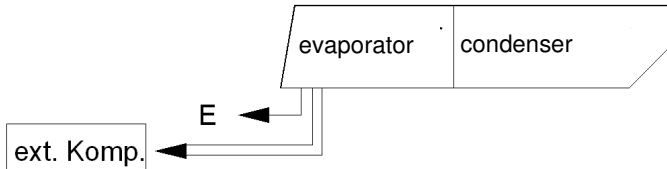
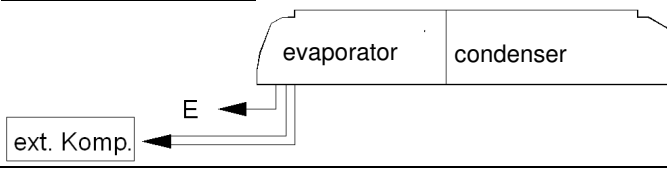
To avoid leakages at the shaft seal of the compressor:

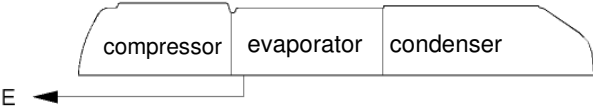
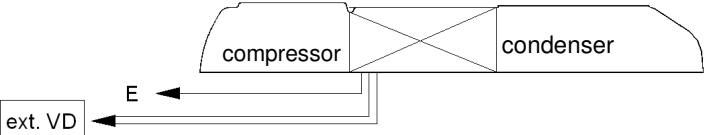
The compressor should be started every 4 weeks for rescri. 15 minutes!

This also applies when the vehicle is not into operation for a longer period or when the air conditioning unit is not used!

3. General description

- At the units KL20 and KL20E the optimum air quantity is adjustable via the fan switch in three levels.
- At the unit KL20 the refrigerant pipes have to be passed from the a/c unit to the compressor.
- The unit KL20E is pre-filled by the manufacturer with refrigerant R134a and electrically wired. Passing of refrigerant pipes to the engine is not necessary.
- At unit type KL20KDE the refrigerant pipes have to be passed from the unit to the evaporator.

Type of unit:	Connection to the vehicle:
<u>KL20 facelift (cabin)</u> 	<u>E</u> : connection electric <u>ext. comp.</u>: Connection to the vehicle engine or ext. compressor
<u>KL20 facelift (bus)</u> 	<u>E</u> : connection electric <u>ext. comp.</u>: Connection to the vehicle engine or ext. compressor

Type of unit:	Connection to the vehicle:
KL20 E / facelift 	– E : connection electric <i>Completely filled with refrigerant</i>
KL20 KDE / facelift 	– E : connection electric – ext. VD. : connection to front box or separate evaporator

4. Intended use

The **KONVEKTA** air conditioning unit is an air conditioning system that works with the ozone friendly refrigerant R 134a and which creates a pleasant and individually adjustable room temperature by means of forced convection. The determined use includes also the observance of the **operating instructions** as well as the proof of regular inspections.

4.1. Generally information for a/c unit

 **Attention in case of roof top a/c units: Never switch on the a/c unit during car-wash!**

-  *The air conditioning unit is operational with running engine only.*
- *At cooling operation the humidity inside the vehicle is decreased, which avoids steamed-up windows.*
- *The air conditioning unit works most effectively with windows and doors shut. If, however, the interior of the standing vehicle has been heated up severely by exposure to sunlight, short-time opening of windows/doors may accelerate the cooling down process.*
- *At high outside temperature and humidity, condensate might drip off the evaporator and make a puddle under the vehicle. This is quite normal and no sign for a leakage.*
- *If you think that the air conditioning unit has been damaged switch it off immediately in order to avoid further damage. **The air conditioning unit may be taken into operation again only after it has been checked at a KONVEKTA Service Station.***

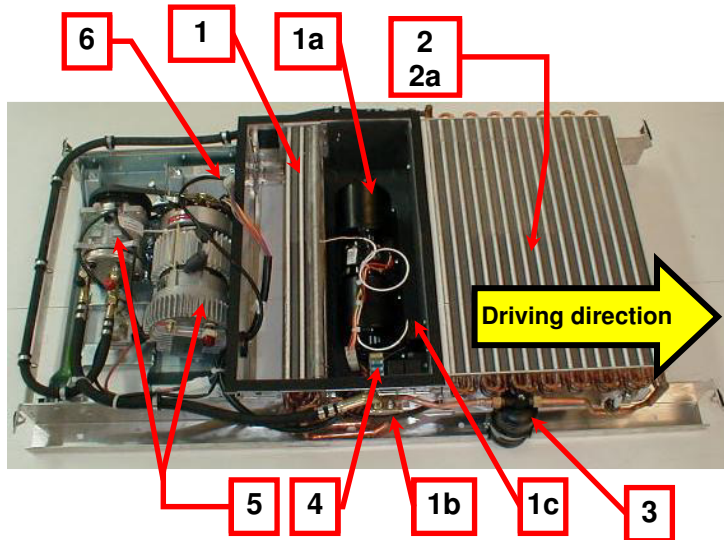
4.2. Operating Conditions

NOTE: KONVEKTA uses components made of copper and aluminium, which last a whole unit lifetime under normal environmental conditions. Should the units be operated under aggressive environmental conditions, i.e. air containing salt-, phosphate- or ammoniac extremely, a corrosion of the copper- and aluminium components can not be ruled out. The copper- and aluminium components of the KONVEKTA systems are not suitable for such extreme application conditions. We indicate emphatically, that corrosion is not subject to warranties for defects. KONVEKTA does not take over any warranties for defect, neither for corrosion nor for consequential damage resulting there from, nor for damages caused by cleaning the systems with highly compressed or corrosion advancing substances.

^① On our website www.konvekta.com in category >service< you will find a survey of contact details of all our service partners close to your location.

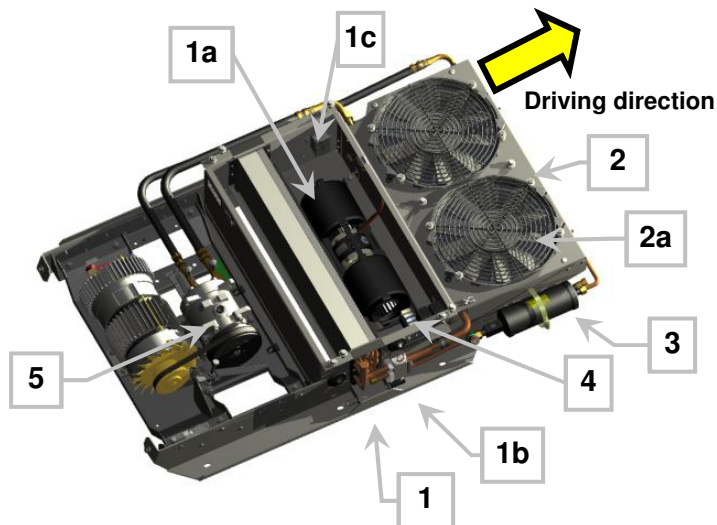
5. Positioning of the air conditioning components

5.1. KL20-/ Bus/ Kabine/ E/ KDE



- 1 Evaporator coil → not to apply with KL20KDE
- 1a Radial blower → not to apply with KL20KDE
- 1b Expansion valve
- 1c Thermostat
- 2 Condenser coil
- 2a Axial blower (condenser blower)
- 3 Dryer-collector-sight glass- unit with combined pressure switch
- 4 Electric
- 5 Driving unit complete with compressor SD5H09 → not to apply with KL20
- 6. Blower switch

5.2. KL20-/ Bus/ Kabine/ E/ KDE facelift



- 1. Evaporator coil
- 1a. Double fan
- 1b. Expansion valve
- 1c. Thermostat
- 2. Condenser coil
- 2a. Axial blower (condenser blower)
- 3. Dryer-collector-sight glass- unit with combined pressure switch
- 4. Electric
- 5. Driving unit complete with compressor SD5H09 → not to apply with KL20

6. Operation

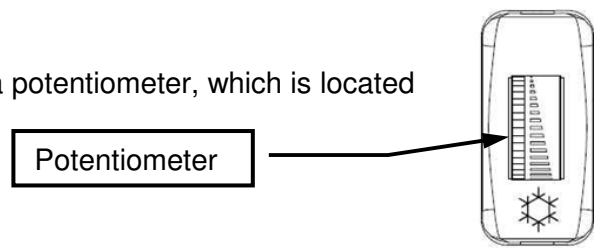
The blower switch to activate the blower is situated in the interior of the vehicle.

- Start motor of the vehicle (see original instruction manual of the vehicle)
- Regulate air capacity through blower switch
 - position 0 - OFF
 - position 1 - minimum air volume
 - position 2 - medium air volume
 - position 3 - maximum air volume



Optional possible with Thermotronik!

The desired room temperature can be adjusted via potentiometer, which is located in the dashboard.



7. Maintenance and Service

Please arrange regular dates for maintenance works and services with a KONVEKTA service station, as indicated in maintenance schedule no.: WP07050621. On our website www.konvekta.com in category >service< you will find a survey of contact details of all our service partners close to your location.

- Only qualified staff is allowed to carry out these works! -

–or general instructions on repair – and maintenance works please contact via email:

TKD@konvekta.com



Danger of accidents!

Qualified staff in charge of installation and maintenance have to be trained in accordance with EN 378-Part 4 and (EC) No.307/2008 and must strictly follow the legal provisions. Any works or modifications at the air conditioner which are carried out improperly can lead to malfunction and so endanger operational reliability. We recommend having all works and modifications carried out at an authorized KONVEKTA Service Station. Before carrying out any maintenance works at your air conditioning unit, carefully read the KONVEKTA safety provisions (TD00052A) in order to avoid any dangers and accidents!

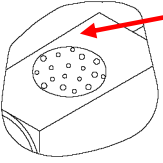
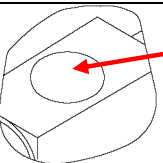
- ⇒ When the air conditioning system is being opened during maintenance resp. reparation works, the dryer-collector-sight glass has to be exchanged!
- ⇒ The connexions have to be resctted with PAG oil before the installation of respires.

7.1. Check refrigerant level

Check the refrigerant level at the sight glass of the dryer-collector unit:

KL20-/ bus/ cabin/ E/ KDE	KL20-/ bus/ cabin/ E/ KDE facelift
Sight glass View with protection caps	Safety valve Protective cap Sight glass Locking screw Protective cap

1. Switch a/c unit on.
2. The set temperature must be **lower** than the actual inside temperature, so that compressor is engaged.

Sight glass:	Cause	Remedy
	Forming of bubbles in the sight glass. ☞ Lack of refrigerant!!	Attention! In case there is too little refrigerant in the system, an increase in bubble formation can be observed in the sight glass. In this case it is necessary to switch off the system immediately in order to avoid damages at the compressor. Contact KONVEKTA Service Station®! - refill refrigerant - check a/c unit for leakages
	Free of bubbles.	Amount of refrigerant is o.k.

7.2. Condenser coil

After taking into operation the condenser, a regular cleaning is necessary. Always keep condenser coil fins clean. Severe soiling causes excess pressure within the a/c-unit system and it automatically stops working.

Attention: The condenser coil fins have to be cleaned with compressed air at least twice a year, in case of severe soiling more often. The fins of the condenser battery must not be deformed. Deformed fins have to be erected with a fin comb.

Picture:
erecting fins



7.3. Troubleshooting



Only qualified staff is allowed to carry out these works!

Trouble	Cause	Repair <i>By authorized Service Station only</i> ①
a/c is not running	electric connections disconnected	- check electric connections
	defective fuse	- check fuse, replace if necessary
	Blower switch defective	- check blower switch, V-belt if necessary
	excess pressure	- clean condenser coil
	low pressure, dry er clogged	- replace dry er ①
	low pressure, screen of expansion valve clogged	- clean screen; re place dry er ①
	leak age in a/c unit, lack of refrigerant	- check a/c unit for leak ages - re fill refrigerant and replace dry er ! ①
a/c runs, switch- es off	excess pressure caused by high outside temperature	- run unit, until pressure has stabilized ①
Loud noise at compressor	defective bearing at compressor	- replace either bearing or entire compressor
	magnetic clutch defective	- check connections at magnetic clutch ①
Loud noise at V-belt	worn V-belt slack V-belt	- replace V-belt ① - retighten V-belt ①

① On our website www.konvekta.com in category >service< you will find a survey of contact details of all our service partners close to your location.

② Source of supply: KONVEKTA AG, P.O. Box 2280, D-34607 Schwalmstadt

8. Warranty Conditions

The current „General Warranty Conditions“ KONVEKTA AG“ will apply. A copy will be furnished by the warranty department. Please contact: GWL@konvekta.com.

9. Waste disposal in accordance with legal provisions

After the phase of use the last proprietor is responsible for the adequate waste management. The environmental regulations in the exporting country must be observed.

The following list contains the most important regulating literature, valid for the *Federal Rep. of Germany*:

- Resolution for dangerous substances
- Law for waste circulation (KRW/AfgG)
- Resolution for the proofs of utilization and removal
- Criminal Code (StGB) 28th section „criminal acts against the environment“ §326 – Environment jeopardizing waste management
- Resolution for used oil
- Law of water balance
- Resolution for the waste management of old cars and the adaptation of road prescriptions
- Resolution (EC) No. 2037/2000 of the European Parliament and of the Council for materials that affect the ozone layer
- Resolution to prohibit certain ozone destroying halogen hydrocarbons
- Law of chemicals § 27 – penal prescriptions

The used refrigerant endangers the environment. When dealing with refrigerants the existing prescriptions and regulations are to be followed. **Only qualified staff is allowed to carry out these works!**

Water endangering substances – acc. To §§19g-19l – are solid, liquid, and gaseous substances. E.g.: mineral and tar oils (cooling oils), halogen containing organic combinations (refrigerants).

® Bezugsquellen:

- Bundesanzeiger
- Beuth Verlag
- dtv (Deutscher Taschenbuch Verlag)

10. History of modification

Version	Date	Name	Remark	File
A00	18.11.2014	B. Keßler	Source file	BAKL2E0102A
A01	08.12.2014	B. Keßler	Added facelift units	BAKL2E0102A
A02	19.01.2015	B. Keßler	Technical data: quantity of refrigerant at KL20KDE / facelift corrected	BAKL2E0102A
A03	12.09.2016	B. Keßler	Added item 6 Thermotronik ; updated item 9 and technical data	BAKL2E0102A
A04	22.02.2017	B. Keßler	Information on the operating instructions and technical data expanded with F-gas-regulation	BAKL2E0102A