KONVEKTA

Technical leadership starts with ideas.

Operating Instruction

for KONVEKTA

Air Conditioning unit

KL40T / KL45T / KL46T / KL46S

with Wabco ATC-CAN control

Versions:

- **24 Volt DC**
- **Fresh Air / Heating**

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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.

Please observe our valid safety instructions. 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.

✆ *On our website 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 operating instructions are valid for the a/c-units type:

- **KL40T/24V**
- **KL45T/24V**
- **KL46T/24V**
- **KL46S/24V**

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 prenotice. Guarantee and liability conditions of **KONVEKTA AG**'s general business conditions are not enlarged by the above notes.

Manufacturer: **KONVEKTA AG, P.O. Box 2280, D-34607 Schwalmstadt**

1. Technical data air conditioning unit

Type:		**KL40T**	**KL45T**	**KL46T / S**
Refrigerant		R134a		
GWP		1.430		
- quantity *with front box*	[kgs] *approx.*	2,5 3,3		
Operating voltage	[Volt DC]	24		
Current consumption (stageless) at 26V	[Ampere]	53		
Cooling capacity with KVX40/390 KVX40/560 KVX40/655K KVX30 oderTM31 TM65	[Watt]	18.000 - - 15.000 -	18.000 - - 15.000 -	- 22.000 22.000 - 22.000
Heating capacity Q= 100	[Watt]	25.000		
Evaporator – Air volume*, *free-blowing*	[m^3/h] stageless	4.400		
Measurements:				
- length	[mm]	1.956	1.980	1.970
- width	[mm]	1.367	1.836	1.836
- **hight,** - **depending on roof radius**	[mm]	216 193	225 201	227 185
Weight of unit, Version:				
- **Heating + Fresh Air**	[kgs] *approx.*	69	82	83 / 92

* With standard fans and/or blowers

Important!
In vehicles that are equipped with an a/c unit with heating function the heating medium has to consist of water/glycol – antifreeze protection (conform the mixing ratio to manufacturers` instructions). This is absolutely necessary to prevent the heaters from frost damage!
(The prevalent antifreeze filling of the vehicle manufacturers goes down to -40°C)

1.1. Compressors

Important:
To avoid leakages at the shaft seal of the compressor: The compressor should be started every 4 weeks for approx. 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!

Kompressor Type	TM 65	HDC 33	KVX40/655K
Weight (kgs) approx.	18,8	15,5	35
Oil brand - quantity (kgs)	ZXL 100PG 1,5	ZXL 100PG 0,5	Esteröl SE55 2,0
Magnetic clutch [1)] - Weight (kgs)	24V 1,382	12 / 24V DC	24V DC

Kompressor Type	KVX40/390	KVX40/560	KVX30/325
Weight (kgs) approx.	33	33	24,5
Oil brand - quantity (kgs)	Esteröl SE55 2	Esteröl SE55 2	Esteröl SE55 2
Magnetic clutch [1)] - Weight (kgs)	12 / 24V DC 12	24V 13,2	12 / 24V DC 7,6

[1)] ø depending on vehicle type

2. Determined use

The ***KONVEKTA*** air conditioner represents 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 instruction and the proof of regular inspections as well.

3. General information a/c unit

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

- The a/c unit is operational with running engine only.
- At cooling operation the humidity inside the vehicle is decreased, which avoids steamed up windows. The a/c 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 and 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.
- The filter in the return air grid (optional) retains pollution. If the external air is contaminated with gas switch over to return air operation. The filter should be cleaned or replaced respectively on a regular basis so that the capacity of the a/c unit is not affected.
- **If you think that the a/c unit is damaged, switch it off immediately.** To avoid further damage have it check at a KONVEKTA Service Station[①]. Only after that you can take unit into operation.

3.1. 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 cupper- and aluminium components can not be ruled out. The cupper- 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.

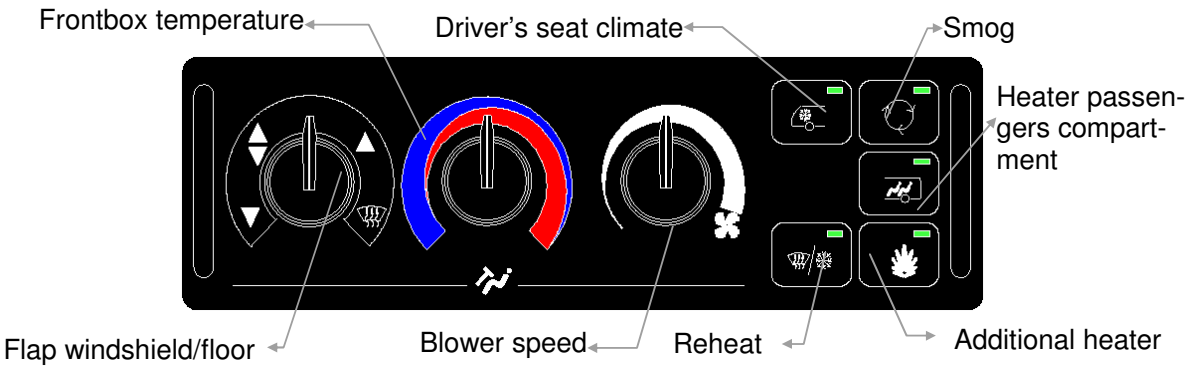
4. Operation

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

- Focussing your attention on the road traffic is of top priority
- Only operate your air conditioning unit when the traffic situation allows it.
- Make sure you can clearly recognize and read all operation- and display-elements at any time
- Protect all displays against irritating sun glare and any other optical disturbances
- Please note that the control panel keys have not been designed for heavy stressing
- **Excessive or fast pressing of the keys for adjusting the set temperature does not accelerate the cooling down process. It possibly damages the control panel and so affects the general performance of the air conditioning unit**

4.1. Control unit

You operate the air conditioning unit via the original WABCO – control unit *(see original WABCO- operation instructions „ATC-CAN„)*



For operation the driver can use 3 rotary potentiometer and maximal 5 keys. Depending on the serial-model modification of the bus different control desks are used.

In order to release the driver from extensive adjustments for the passengers compartment he is able to switch off the complete control for this area. All other functions on the control desk serve for the individual adjustments of the driver's cabin.

4.2. Flap for windshield/floor

The flap for windshield respectively floor are controlled according to the symbolism.

Arrow down:	**Flap for floor**	The whole air is lead to the floor
Arrow down/up:	**Mid-position**	Air circulation is split up between floor and windshield.
Arrow up	**Flap for windshield**	The whole air is lead to the windshield.
Symbol windshield	**Defrost**	Water valve completely opened; air to windshield; maximal blower speed.

The conversion is realized via characteristic curves which also facilitate intermediate positions.

4.3. Desired value of front box temperature

The blowout temperature of the front box can be set between 14 and 60º C.

4.4. Blower speed

The potentiometer serves for setting speed of the front box. The air velocity is increased by turning the potentiometer clockwise.

4.5. Smog

With the smog key you can stop supply of fresh air for the whole bus. If smog function is activated the key is illuminated. If this function is activated, the openings in the roof as well as the fresh air flaps are closed for a certain time prescribed by the manufacturer.

4.6. Heater passenger's compartment

The driver doesn't have the possibility to intervene in the fully automatic control of the passengers compartment. This control is merely turned off during routes without passengers (e.g. transportation of bus). If automatic function is activated the key is illuminated.

4.7. Additional heater

Normally the additional heater is turned on manually. If additional heater is activated, the key is illuminated.

4.8. Reheat

With the key Dry / Reheat the air conditioning unit is put into operation. The air is dried by cooling down and re-heating.

4.9. Driver's seat air conditioning

This function activates the refrigerant magnetic valve respectively the compressor magnetic clutch. Key is illuminated if a/c system is activated.

4.10. General

Roof ventilator: Roof ventilators are activated from a certain minimum speed of the roof evaporator blowers. In circulated air operation the roof ventilators are switched off.

5. Maintenance / Service

Please arrange regular dates for maintenance works and services with a KONVEKTA service station, as indicated in maintenance schedule bus no.: **WP07050618.**

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

For general instructions on repair – and maintenance works please contact via emai.

⚠ **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 Station①.
Before carrying out any maintenance works at your air conditioning unit, carefully read the KONVKETA safety provisions (TD00052A②) in order to avoid any dangers and accidents!

① *On our website 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*

5.1. Oil change Compressor type KVX

Make first oil change at the first maintenance of the vehicle, then approx. every 3 years. At every oil change the oil suction strainer has to be cleaned. Observe the oil quantity according to the compressor type (see chapter: “Technical data compressor”).

5.2. Return air grid

Clean the return air grid in the passenger area monthly, in case of enormous dirt weekly.

5.3. Condenser coil

Always keep condenser coil fins clean. Severe soiling cause’s 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 once a year, in case of severe soiling more often.

5.4. Troubleshooting

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

Trouble	**Cause**	**Repair** *by authorized Service Station only*
a/c is not running	magnetic clutch / compressor is not switched on	– check inside temperature,,adjust new if necessary ① – check connections at magnetic clutch
	electric connection disconnected	– check electric connections at switch-board
	relay defective	– check relay, replace if necessary
	defrost thermostat has switched off	– check evaporator blower, replace if nec-essary
	outside temperature too low (possible icing of evaporator)	– switch on „ventilation“ only
	evaporator coil dirty	– clean evaporator coil with compressed air
	compressor does not compress	– check high and low pressure, replace compressor if necessary
	magnetic clutch	– check connections at magnetic clutch
	compressor does not compress	– check high and low pressure, replace compressor if necessary
	excess pressure (pressure too high)	– check axial fans – check fuses at switchboard – clean condenser coil with compressed air
	excess pressure caused by high out-side temperature	– run unit until pressure has stabilized ①
	leakage in a/c unit, lack of refrigerant	– check a/c unit for leakages – refill refrigerant
	low pressure, dryer clogged	– replace dryer
Loud noise at compressor	defective bearing at compressor	– replace either bearing or entire com-pressor
	slack V-belt	– check V-belt at compressor drive

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 *By user*

6. Warranty Conditions

The current „General Warranty Conditions KONVEKTA AG“ will apply. A copy will be furnished by the warranty department.

7. 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
- Law of chemicals § 27 - penal prescriptions
- 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.

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).

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[3] Source of supply:
- Bundesanzeiger
- Beuth Verlag
- dtv (Deutscher Taschenbuch Verlag

8. History of modification

Version	Date	Name	Remark	File
A00	11.07.2007	B. Keßler	source file	BAKL40T12AF
A01	21.11.2007	B. Keßler	Added item 1 and item 1.1 updated	BAKL40T12AF
A02	21.04.2009	B. Keßler	Point 1.2 updated; TM31 replaced by HDC 33	BAKL40T12AF
A03	29.06.2016	B. Keßler	Added KL46T and technical data updated	BAKL40T12AF
A04	01.03.2017	B. Keßler	Information on the operating instructions and technical data expanded with F-gas-regulation	BAKL40T12AF
A05	30.11.2017	B. Keßler	Added KL46S and technical data updated	BAKL40T12AF
A06	20.03.2018	B. Keßler	Point 1.1 HGX34e/315 deleted, added KVX40/655K	BAKL40T12AF