



KONVEKTA

Technical leadership starts with ideas.

Operating Instruction

for KONVEKTA air conditioning unit

KL47T / KL48T / KL49T

- Single bus and articulated bus



with control KS601-CAN

Version:

- 24 Volt DC
- Fresh air (-optional)
- Fresh air / Heating (-optional)

ID#: BBA-KL480102A
Version: A01

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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:
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:

It contains:

- Operating instructions
- Safety information 
- Service information

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 unadmitted fuels or the non-observance of safety provisions.

KONVEKTA will annul without prenotice 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.

^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 operating instructions are valid for the a/c-units type:

- **KL47T**
- **KL48T**
- **KL49T**

with control KS601-CAN

☞ 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.

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

1. Technical data air conditioning unit



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)

Type:		KL47T	KL48T	KL49T
Refrigerant:		R134a		
Fan quantity depends on the variant:		4	6	6
Refrigerant quantity:	[kg] approx.	4,5	4,5	4,8
GWP		1.430		
Operating voltage:	[Volt DC]	26		
Current consumption:	single bus articulated bus	[Ampere]	72-84 144-168	89-115 178-230
Cooling capacity with K VX40:	[W]	28.000	30.000	32.000
Heating capacity:	[W]	29.000	32.000 oder	35.000
Evaporator – Air volume, free blowing	[m ³ /h]	4.000- 4.720	6.000- 7.080	6.000- 7.080
Measurements:				
- length:	[mm]	2.300	2.300	2.300
- width:	[mm]	1.852	1.852	1.852
- height:	[mm]	240	240	240
- height A/C after installation of the roof:		200-240	200-240	200-240
Weight of unit - Version:*				
- fresh air	[kg] approx.	100	105	107
- fresh air / heating	[kg] approx.	102	107	108
- CAN fresh air / heating	[kg] approx.	103	108	109

*Weight specifications included aluminum condenser. Versions with copper variants approx.. +5kg

1.1. Compressor



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!

Compressor Type:	-single bus -articulated bus	K VX40 / 560 N/K K VX40 / 655 N/K
Weight approx.	[kg]	34
Oil brand / quantity (liter)		Esteröl SE55 / (2 liter)
Magnetic clutch ¹⁾ / weight approx.	[kg]	12 / 24V DC / (11 kg)

¹⁾ ø depending on vehicle type

2. 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 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. **Only after that you can take unit into operation.**

1.2. Intended use

The **KONVEKTA** air conditioner represents an air conditioning system that works with the ozone friendly refrigerant R134a 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.

1.3. 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 cannot 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.

3. Operation



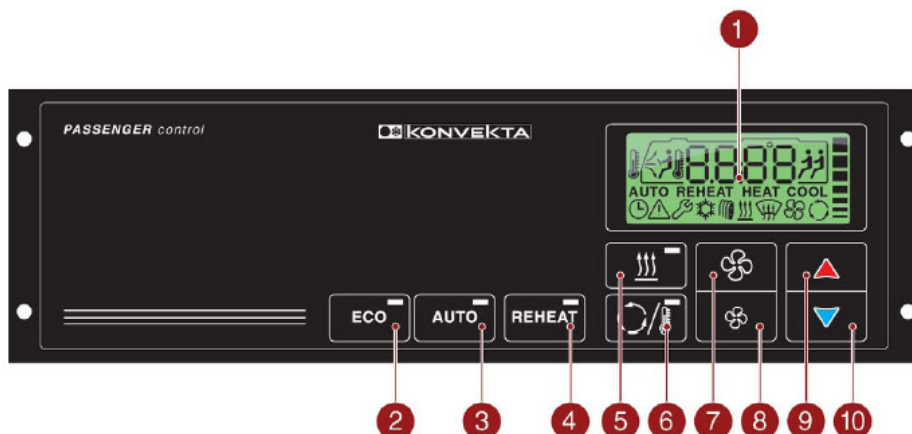
Attention in case of roof top a/c units: Never switch on the a/c unit during car-wash!

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
- **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**

1.4. Operation panel / function of the keys

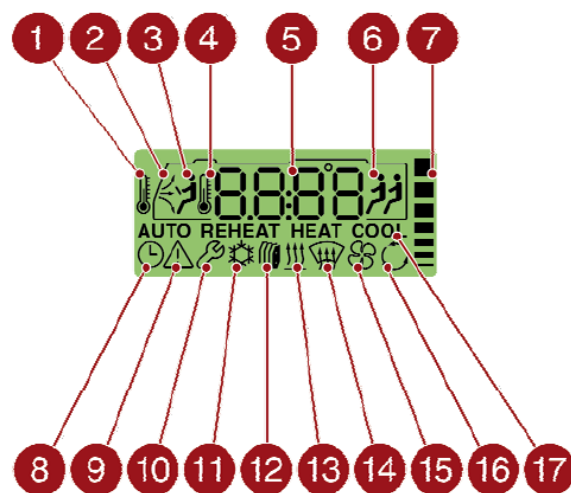
The KS601 control unit is designed upon customers request to control a climate system easily and clearly. The climate control for the passenger area is fully automatic and can be controlled via the AUTO button. The additional heating system that heats up the interior via convectors can be programmed for the next day.



Number	Key	Symbol	Function
1			- LCD display for driver's place and passenger area
2	S1		- ECO ON/OFF (compressor lock in AUTO mode).
3	S2		- Automatic climate control ON/OFF.
4	S3		- REHEAT mode, switches automatically back to AUTO mode after 20 min. - "LO" appears on the LCD at temperatures below 2°C as Reheat is blocked by outside temperature.
5	S4		- Switches on the additional heater and convectors are on standby.
6	S5		- Recirculation mode roof AC, switches automatically back to AUTO mode after 20 min. - Double click, switch between outside- /room temperature and time setting.
7	S6		- Increase evaporator blower speed.
8	S7		- Decrease evaporator blower speed.
9	S8		- Increase set temperature passenger area.
10	S9		- Decrease set temperature passenger area.

1.1. Short description of LCD display

Symbol	Function
1	Outside temperature
2	Air distribution
3	Driver seat
4	Room temperature
5	LCD display for temperature / error code.
6	Passenger compartment
7	Manual blower speed 1-7
8	Nc.
9	Nc.
10	Error in the system
11	Compressor is ON
12	Convactor heater on standby
13	Auxiliary heating
14	Defrost driver seat
15	Manual evaporator blower stage 1-7 ON
16	Fresh air flap – recirculation mode
17	Current operating mode AUTO/ RE-HEAT/ COOL



1.2. Short description of the keys

Key S1



Keypress	Functional description
Short press	ECO ON / OFF (compressor locked in AUTO mode).
Long press	---
Double-click	---
Key combination	---

Key S2



Keypress	Functional description
Short press	Automatic temperature control ON / OFF
Long press	Switch between AUTO / HEAT and COOL
Double-click	---
Key combination	 +  You get into the service area. Ignition OFF:  +  Querying of error message.  +  Setting time of the system.

Key S3



Keypress	Functional description
Short press	- Switch ON REHEAT mode for max. 20 min. - "Lo" appears on the LCD at temperatures below 2°C, as Reheat is blocked by outside temperature
Long press	---
Double-click	---
Key combination	---

Key S4 	Keypress	Functional description
	Short press	Switches the auxiliary heater ON.
	Long press	---
	Double-click	---
	Key combination	Ignition OFF:  +  Set start time auxiliary heater

Key S5 	Keypress	Functional description
	Short press	Switch ON Recirculation mode for max. 10 min.
	Long press	---
	Double-click	---
	Key combination	---

Key S6 	Keypress	Functional description
	Short press	Decrease blowers speed in seven steps.
	Long press	---
	Double-click	---
	Key combination	---

Key S7 	Keypress	Functional description
	Short press	Increase blower speed in seven steps.
	Long press	---
	Double-click	---
	Key combination	 +  You get into the service area. Ignition OFF:  +  Querying the error message.

With this key the blower speed can be adjusted manually in 7 steps. The manual setting always has priority over AUTO setting

Taste S8 	Keypress	Functional description
	Short press	Increase set temperature passenger area. When reaching the min. temperature press the key six times for MAX HEAT.
	Long press	---
	Double-click	---
	Key combination	Ignition OFF:  +  Set time system.  +  Set start time auxiliary heater.

The set temperature can be adjusted from 12° to 28°C. The basic value shown in the display is the room set temperature.

Taste S9 	Keypress	Functional description
	Short press	Decrease set temperature passenger area. When reaching the min. temperature press the key six times for MAX COOL.
	Long press	---
	Double-click	---
	Key combination	---

Switch display: 2 x 

Switch between different displayed values from time to room temperature to outside temperature.

Check air duct temperature: 5sec. + 

Switch the display for 5 seconds to air duct temperature.

1.3. Settings of KS601

1.3.1. Time setting

 +  The time can only be set, when ignition is off.

By simultaneously pressing of  +  the time flashes. (e.g. „12:00“). With key  or  the time can be set.

By pressing the  key once more, a switchover is made to the day (e.g. “day 1“).

The corresponding day can be set using the  or  keys:

1=Monday 2=Tuesday 3=Wednesday 4=Thursday 5=Friday 6=Saturday 7=Sunday

Note: if the auxiliary heating should not be required to start-up on a particular day, there is no need for a setting to be made for the day in question!

After programming the time, the display automatically switches back after 5 seconds to normal display!

1.3.2. Setting the start time of the auxiliary heating

 +  The start time of the auxiliary heating can only be set when ignition is OFF. By simultaneously pressing of  +  the time flashes. (e.g. „12:00“). With key  or  the start time can be set.

A switch-over to the day can be made by pressing the  key once more (e.g. day 1“).

The corresponding day can be set using the  or  keys:

1=Monday 2=Tuesday 3=Wednesday 4=Thursday 5=Friday 6=Saturday 7=Sunday

A= every day

Note: if the auxiliary heating is required to start-up every day, then “day A” should be set.

With key  the start of the auxiliary heating will be activated automatically and symbol  will be shown on the display. After programming the start time, the display automatically switches back after 5 seconds to normal display and („PrEH“) will be displayed.

The currently programmed day is displayed in the 7 blower bars. If the auxiliary heater starts via time, the display shows (AH:59). There is a time count down in minutes. When 0 minutes are reached the auxiliary heater switches off.

1.3.3. Queries fault indication

 +  The queries of the error messages can only be set when ignition is OFF. By simultaneously pressing of  +  the current error will be display [„E020“]. With key  error can be cleared.

A switch to the next error can be made via the  or  keys.
 If there is no error, [„ --- „] is displayed.

4. Maintenance

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

For 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!

1.4. Compressor type K VX

Make the 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: [1.1](#)).

1.5. Return air grid

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

1.6. 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.

1.7. Troubleshooting



Only qualified staff is allowed to carry out these works!

Trouble	Cause	Repair <i>only by refrigeration expert</i>^①
a/c is not running	magnetic clutch does not switch on	– check inside temperature ^②
	electric connections disconnected	– check connections at magnetic clutch
	relay defective	– check electric connections at switchboard
	defrost thermostat has switched off	– check relay, replace if necessary
	outside temperature too low (possible icing of evaporator)	– check evaporator blower, replace if necessary
	evaporator coil dirty	– switch on "ventilation" only
	compressor does not compress	– clean evaporator coil with compressed air
	excess pressure (pressure too high)	– check pressure at suction and discharge side, replace compressor if necessary
	excess pressure caused by high outside temperature	– check axial fans
	leakage in a/c unit, lack of refrigerant	– check fuses at switchboard
	low pressure, dryer clogged	– clean condenser coil with compressed air
	screen of expansion valve clogged	– run unit until pressure has stabilized ^②
Loud noise at compressor	defective bearing at compressor	– check a/c unit for leakages
	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

5. 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.

6. 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).

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

7. History of modification

Version	Date	Name	Remark	File
A00	10.08.2016	B. Keßler	Source file	BAKL481602A
A01	28.02.2017	B. Keßler	Information on the operating instructions and technical data expanded with F-gas-regulation	