



KONVEKTA

Technical leadership starts with ideas.

Operating Instruction

for KONVEKTA air conditioning unit

KL47T / KL48T / KL49T

- single bus and articulated bus



with control KS55-Basic

Version:

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

ID#: BBA-KL480502A
Version: A07

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Contents

Page:

• Introduction.....	3
• Information on the operating instructions	4
1. Technical data.....	4
1.1. Air conditioning unit.....	4
1.2. Compressor	5
2. Generally information for a/c unit.....	5
2.1. Determined use	5
2.2. Operating conditions	5
3. Introduction control KS55-Basic	6
4. Operation.....	6
4.1. Key function KS55-Basic	7
4.2. Description of the display (LCD symbols).....	8
4.3. Fault messages	8
5. Maintenance / Service	9
5.1. Compressor type K VX	9
5.2. Return air grid	9
5.3. Condenser coil.....	9
5.4. Troubleshooting	10
6. Warranty Conditions.....	10
7. Waste disposal in accordance with legal provisions	11
8. History of modification.....	11

Appendix:

- 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 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**

 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:	
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Order No:	
------------------	-------

Year of construction:	/..... (MM/JJ)
------------------------------	---------------------

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

1.1. 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		
GWP:		1.430		
Fan quantity depends on the variant:		4	6	6
Refrigerant quantity :	[kg] approx.	4,5	4,5	4,8
Operating voltage:	[Volt DC]	26	26	26
Current consumption:	single bus articulated bus	72-84 144-168	89-115 178-230	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	[m³/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:				
- recirculated air:	[kg] ca.	99	104	106
- fresh air:	[kg] ca.	100	105	107
- fresh air / heating:	[kg] ca.	102	107	108

1.2. 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		KVX40 / 560 N/K KVX40 / 655 N/K	TM31 -	TM43 -
Weight approx.	[kg]	34	10,7	12,5 (ohne Öl)
Oil brand / quantity (liter)		Esteröl SE55 / 2 liter	ZXL 100PG / 0,5 liter	ZXL 100PG / 0,8 liter
Magnetic clutch ¹⁾ / weight approx	[kg]	12 / 24V DC / 11kg	24V DC / 4,8kg	24V DC / 7kg

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.**

2.1. Determined use

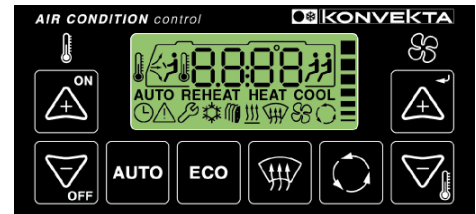
The **KONVEKTA** air conditioner represents an air conditioning system that works with the ozone friendly refrigerant R134a and which creates a pleasant and individually adjustable room temperature by means of forced convection. The determined use includes also the observance of the Operating instruction and the proof of regular inspections as well.

2.2. 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.

3. Introduction control KS55-Basic

The **KS55-Basic** is a climate controller for air conditioning systems in modern vehicles. Due to its compact design the controller can be mounted easily in the dash board of the vehicle. The clear arrangement of the symbols and the easy handling relieve the driver and meet all demands of optimal air conditioning control.



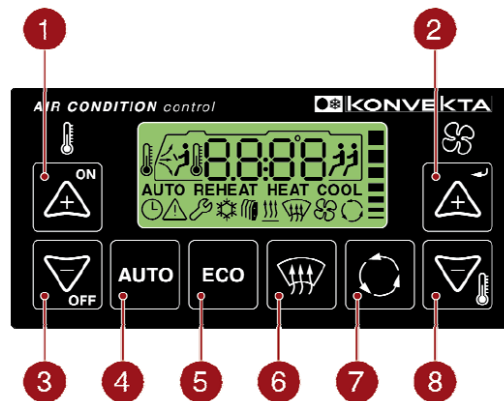
4. Operation



Danger of accidents!

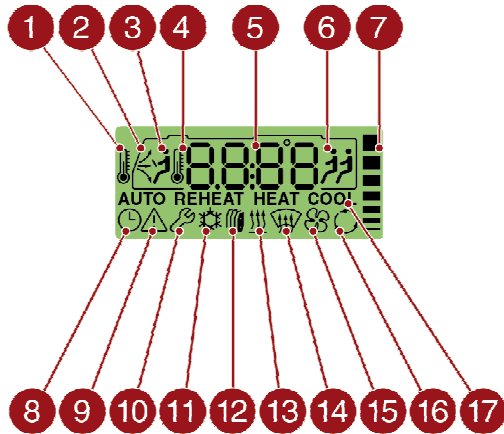
- Focussing your attention on the road traffic is of top priority
- Only operate your air conditioning unit when the traffic situation allows it
- Make sure you can clearly recognize and read all operation- and display-elements at any time
- Protect all displays against irritating sun glare and any other 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. Key function KS55-Basic



Taste	Symbol	Alternator OFF	Alternator ON
S1		---	- increases temperature up to 30°C max. - witches device ON - over 30°C, press 5 x , MAX heating
S2		---	- increases evaporator speed manually - programming key as <i>hot key</i>
S3		---	- decreases temperature down to 12°C min. - <i>long pressing</i> switches device OFF - under 12°C, press 5 x , MAX cooling
S4		---	- AUTO ON/OFF - By pressing the button, the target room temperature will be set up by default at 22° C
S5		---	- switches ECO on, thus the compressor is locked
S6		---	- switches to REHEAT mode - switches automatically back to AUTO mode after 20min.
S7		---	- switches a/c manually to recirculated air mode - switches automatically back to AUTO mode after 20min
S8		---	- decreases evaporator speed manually - <i>long pressing</i> starts automatically temperature inquiry room – ambient ACTUAL temperature

4.2. Description of the display (LCD symbols)



Symbol	Function
1	Ambient-temperature display
2	nc.
3	nc.
4	Room-temperature display
5	4-digit display for temperature / trouble-code etc.
6	Passenger compartment
7	Manual blower positions 1-7
8	nc.
9	nc.
10	Error in system
11	Compressor is ON
12	nc.
13	nc.
14	nc.
15	Evaporator blowers are ON
16	Recirculated air flap in recirculated air mode
17	Actual operation mode AUTO / REHEAT / HEAT / COOL

4.3. Fault messages

Diverse fault messages are recognized by the controller and substitute values are applied accordingly. If a fault is recorded, icon  is displayed.

If engine OFF, the fault messages can be displayed with the keys  + .

With key  or  a fault message can be selected.

With key  the selected fault message is deleted. If there is no fault message --- is displayed.

Number	Type of fault	Designation
E01	Short-circuit	Outside sensor
E02	Cable breakdown	Outside sensor
E03	Short-circuit	Room sensor
E04	Cable breakdown	Room sensor
E09	Short-circuit	Air duct sensor
E10	Cable breakdown	Air duct sensor
E40	Feedback	Compressor HP/LP
E100	Short-circuit	Evaporator step 1
E101	Short-circuit	Evaporator step 2
E102	Short-circuit	Evaporator step 3
E103	Short-circuit	Compressor
E105	Short-circuit	Condenser
E108	Short-circuit	Water pump
E109	Short-circuit	Circulation flap A
E110	Short-circuit	Circulation flap B
E113	Short-circuit	Roof valve A
E114	Short-circuit	Roof valve B

In case of a sensor fault the following substitute temperature values are applied:

Number	Type of fault	1. Substitute value	2. Substitute value
E01+E02	fault outside sensor	15 °C	15 °C
E03+E04	fault room sensor	air duct sensor	22 °C
E09+E10	fault air duct sensor	room sensor	22 °C

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 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 (EG) 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^①.

Before carrying out any maintenance works at your air conditioning unit, carefully read the KONVEKTA safety provisions (TD00052A^②) in order to avoid any dangers and accidents!

^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

5.1. 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: [1.2](#))

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 <i>only by refrigeration expert</i> ^①
a/c is not running	magnetic clutch does not switch on	• check inside temperature ^② • check connections at magnetic clutch
	electric connections disconnected	• check electric connections at switch-board
	relay defective	• check relay, replace if necessary
	defrost thermostat has switched off	• check evaporator blower, replace if necessary
	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 pressure at suction and discharge side, 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 outside temperature	• run unit until pressure has stabilized ^②
	leakage in a/c unit, lack of refrigerant	• check a/c unit for leakages • refill refrigerant
	low pressure, dryer clogged	• replace dryer
	screen of expansion valve clogged	• clean screen; replace dryer
Loud noise at compressor	defective bearing at compressor	• replace either bearing or entire compressor
	slack V-belt	• check V-belt at compressor drive

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^② By user

6. 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.

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).

8. History of modification

Version	Date	Name	Remark	File
A00	27.02.2014	B. Keßler	Source file	BAKL480502A
A01	05.05.2015	B. Keßler	1.2 pressure switches deleted; KS55 updated	BAKL480502A
A02	09.03.2016	B. Keßler	Item 7 updated	BAKL480502A
A03	18.05.2016	B. Keßler	Item 1.1 / TM31 and TM43 added	BAKL480502A
A04	01.06.2016	B. Keßler	Page 2 wiring diagrams deleted	BAKL480502A
A05	13.07.2016	B. Keßler	Added KL47T and KL49T	BAKL480502A
A06	22.02.2017	B. Keßler	Information on the operating instructions and technical data expanded with F-gas-regulation	BAKL480502A
A07	28.08.2017	B. Keßler	Item 4.3 Keys corrected	BAKL480502A