



KONVEKTA

Technical leadership starts with ideas.

Operating Instruction

for KONVEKTA air conditioning unit

KL47T / KL48T / KL49T

- single bus and articulated bus



with control Wabco ATC-CAN

Version:

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

ID#: BBA-KL480302A
Version: A03

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Contents

Page:

• Introduction	3
• Information on the operating instructions	4
1. Technical data air conditioning unit	4
1.1. Compressor	4
2. Generally information for a/c unit	5
2.1. Determined use	5
2.2. Operating conditions	5
3. Operation	5
3.1. Operation / Key function	6
3.1.1. Flap for windshield / floor	6
3.1.2. Desired value of front box temperature	6
3.1.3. Blower speed	6
3.1.4. Smog	7
3.1.5. Heater passenger's compartment	7
3.1.6. Additional heater	7
3.1.7. Reheat	7
3.1.8. Driver's seat air conditioning	7
3.1.9. General	7
4. Maintenance / Service	7
4.1. Compressor type K VX	8
4.2. Return air grid	8
4.3. Condenser coil	8
4.4. Troubleshooting	8
5. Warranty Conditions	9
7. History of modification	9

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:

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		
GWP		1.430		
Fan quantity depends on the variant:		4	6	6
Refrigerant quantity:	[kg] approx.	4,5	4,5	4,8
(optional) with Frontbox		5,0	5,0	5,3
Operating voltage:	[Volt DC]	26		
Current consumption:	[Ampere]	72-84	89-115	89-115
single bus		144-168	178-230	178-230
articulated bus				
Cooling capacity with KVX40:	[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:*				
- recirculated air	[kg] approx.	99	104	106
- 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		KVX40 / 560 N/K KVX40 / 655 N/K	TM65	TM55
Weight approx.	[kg]	34	28,1	28,1
Oil brand / quantity (liter)		Esteröl SE55 / (2)	SE55 / (1,5)	SE55 / (1,5)
Magnetic clutch ¹⁾ / weight approx.	[kg]	12 / 24V DC / (11)	24V DC / (9,3)	24V DC / (9,3)

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!
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- 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. Operation

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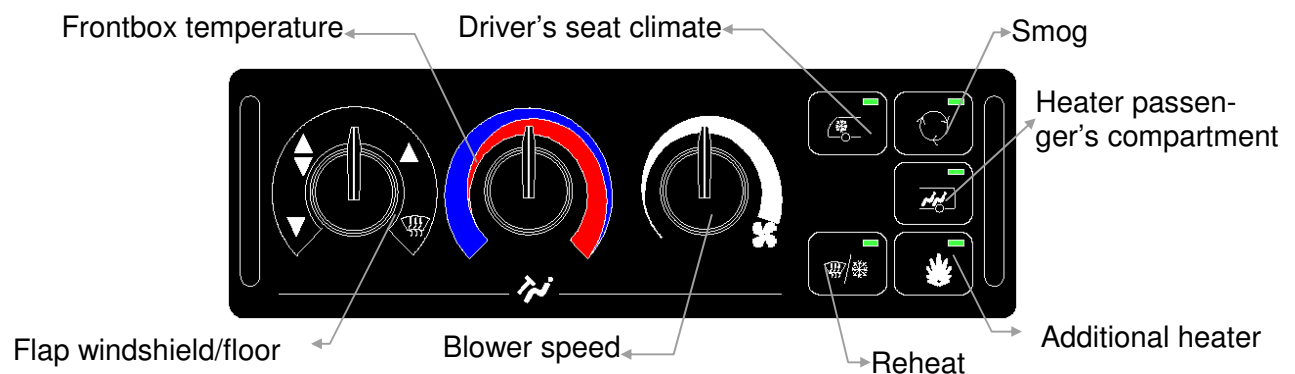


Danger of accidents!

- 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**

3.1. Operation / Key function

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 passenger's 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.

3.1.1. 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.

3.1.2. Desired value of front box temperature

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

3.1.3. Blower speed

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

3.1.4. 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.

3.1.5. Heater passenger's compartment

The driver doesn't have the possibility to intervene in the fully automatic control of the passenger's 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.

3.1.6. Additional heater

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

3.1.7. Reheat

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

3.1.8. 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.

3.1.9. 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.

4. 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

4.1. 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: 1.1)

4.2. Return air grid

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

4.3. 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.

4.4. 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 switchboard
	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

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	26.02.2014	B. Keßler	Source file	BAKL480302A
A01	12.07.2016	B. Keßler	Added KL47T and KL48T; file complete updated	BAKL480302A
A02	01.03.2017	B. Keßler	Information on the operating instructions and technical data expanded with F-gas-regulation	BAKL480302A
A03	06.03.2018	B. Keßler	Point 1.1, added TM65 and TM55	BAKL480302A