



KONVEKTA

Thermo Systems

Operating Instructions

For KONVEKTA

Air Conditioning units

UL500 / UL700 / UL800



With control KS60

R134a
24 Volt DC

ID#: BBA-KL6U022AB
Version: A00

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- 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.

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.

Information on the operating instructions

These operating instructions are valid for the air conditioners type:

➤ UL500	➤ UL700
➤ UL800	

With control KS60.

☞ ☞ 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/YY)

Date of first operation: (DD/MM/YY)

The machine corresponds to the security prescriptions of the EC # 89/392/EWG i.d.F. 91/368/EWG and 93/44/EWG.

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, P.O.Box 2280, D-34607 Schwalmstadt

I. Technical data

I.1. Air conditioner

Type		UL 500	UL 700	UL 800
Refrigerant		R 134a	R 134a	R 134a
Refrigerant quantity ca.	kg	8,5	9,5	10,5
Operating voltage	Volt DC	26	26	26
Power consumption	A	72	104	136
Cooling capacity	W	24.000	33.000	39.000
Evaporator – air volume	m ³ /h	4.320	6.480	8.640

I.2. Pressure Switches

Low pressure switch	BAR	0,3 bar (+/-0,1) off	2,1 bar (+/-0,2) on
High pressure switch	BAR	25 bar (+0,0/-0,5) off	18 bar (+0,5/-0,5) on

I.3. Compressors



Important:

To avoid leakage a the shaft seals of the compressor:

The compressor must be switched on every 4 weeks for about 15 minutes!

Even if the vehicles or the air conditioner has not been used for a longer period of time!

⇒ Compressor is dependent on delivery, see nameplate on the compressor.

2. Intended Use

The KONVEKTA air conditioning unit is 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 instructions as well as the proof of regular inspections.

2.1. 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 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. Control unit KS60

The air conditioning control **KS60** is a control and regulation device for air conditioners in modern buses. The bus driver is relieved from all questions of an optimum air conditioning in the passengers' compartment by a simple and clear handling. All functions of the a/c unit are adjustable by different key-buttons. Every button has an indicating lamp, called LED used as a control function of the buttons or in case of operating. LED is shining red if button is pressed or if unit is in operation. Control board KS60 is connected onto the original dash board lightning of the vehicle. This means that in case of running vehicle lamp, night lightning of control board (LED green) is also activated.

Note:

We recommend driving with automatic mechanism (*Key S5, see 4.1*). Additionally to the automatic the following functions can be activated:

- a) **SMOG**-flap manually, in order to prevent the entrance of exhaust fumes (in tunnels)
- b) **REHEAT**-function to dehydrate the steamed up wind shield

3.1.1. Auto-test

If voltage supply to unit is interrupted, unit starts a self test immediately after reset. Here all entrances and exits are controlled:

Process of auto test will be show at the display:

- 1. Indication of all LED's and display indication -88
- 2. Indication Software version: 03
- 3. Indication Configuration (DIP-Code, for example:) 08
- 4. Indication of auto-test code 01, 02... etc.

- After self-test, actual temperature can be read on display.

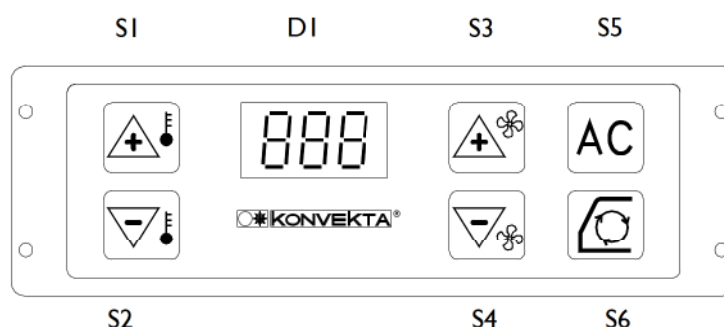
4. Operation



Danger of accident

- 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. Operation panel / function of the keys



Short.	Function
DI	3-figure display
S1	required room temperature can be adjusted (increase) 16 to 28°C
S2	required room temperature can be adjusted (decrease) 16 to 28°C
S3	required air volume can be adjusted (increase), step 1 or 2 (resp. stepless adjustment)
S4	required air volume can be adjusted (decrease), step 1 or 2 (resp. stepless adjustment)
S5	A/C automatic (A/C ON/OFF)
S6	Recirculated Air operation Close resp. Open. Recirculated air flap; in case of closed recirculated air flap , LED inside key button is indicating.

4.2. Operation of a/c system

- Start vehicle engine (refer to orig. operating instruction of the vehicle).
- The air conditioner is activated by means of key  „a/c automatic“, LED inside key button is indicated. Pressing key **S5** again, air conditioner switched off. The blowers are regulated automatically.
- With key  or  the required air volume can be adjusted manual.



ATTENTION:

In case of trouble, in the a/c cooling circuit, the LED-display (key  (s. **Fehler! Verweisquelle konnte nicht gefunden werden.**) is lighting up. Operation of the a/c system only after verification by qualified a **KONVEKTA-Service- Station**“

4.3. Adjustment of temperature

If a/c-unit is operating, vehicle inside temperature can be adjust with key  or  , in a range of 16°C up to 28°C. In case of operating key (+) or (-), temperature can be increased or reduced. The actual temperature can be read on display.

4.4. Recirculated Air operation => only in case of a/c units with Rec. air flaps option

In case of recirculated air operation (key S6 activated), the income of fresh air is interrupted and the air inside the vehicle is going to be circulated which avoids that outside air, possibly dirty because of exhaust fumes (tunnel driving) has a chance to penetrate into interior room of the vehicle.

Starting of the recirculated air operation, press key S6, the LED-display will light up. This position should not be adjusted very long. If windows are misting up, return air operation should be switched off:

If key S6 is pressed again the return air flap will be **reactivated** and fresh air operation restarted. The LED-display will **go out**.

Automatic In case of a temperature difference of more than 5°C between the set temperature (adjusted value) to the existing temperature the return air flaps switch to recirculated air operation

Manual If the button S6 is pressed, the recirculated air function of the return air flaps will be maintained independently from a temperature difference

4.5. REHEAT activate / stop

=> Only for units with heating option

Switching on of the air-conditioning system via button S5 afterwards the key S5 will be pressed shortly twice (double click). **REHEAT** will be activated for a period of 20 minutes, the **LED-display will light up at the same time**.

⇒ Operation of the blowers at the highest speed level by key S3 (increase of the air flow output)

⇒ Recirculated air operation must be switched off.

The premature termination of the **REHEAT** is possible by double-pressing the key S5.

4.6. Display of air duct temperature

=> Only for units with heating option

While pressing buttons S1  and S6  actual air duct temperature is displayed for 2 seconds.

4.7. Indicate outside temperature => only in case of a/c units with heating option

=> Standard for units with heating, optional for units without heating starting software version 3

While pressing buttons S1  and S4  actual outside temperature is displayed for 2 seconds

5. Maintenance / Service

Please arrange regular dates for maintenance works and services with a KONVEKTA service station, as indicated in maintenance schedule bus no. [WVP07050618](#).

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 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^①) in order to avoid any dangers and accidents!

^① Source of supply: KONVEKTA AG, P.O. Box 2280, D-34607 Schwalmstadt

5.1. Troubleshooting



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

Trouble	Cause	Repair by authorized Service Station only
a/c is not running LED  flashes up	thermostat open	check inside temperature ^① re-adjust thermostat ^①
	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
	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 outside 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
	low pressure, screen of expansion valve clogged	clean screen; replace dryer
	Loud noise at compressor	replace either bearing or entire compressor
	slack V-belt	check V-belt at compressor drive

^① By operator

6. Warranty Conditions

The current „General Warranty Conditions KONVEKTA AG“ will apply. A copy will be furnished by the warranty department. Please contact: BenjaminSchiepek@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	Resolution for used oil
Law for waste circulation (KRW/AfgG))	Law of water balance
Resolution for the proofs of utilization and removal	Resolution for the waste management of old cars and the adaptation of road prescriptions
Criminal Code (StGB) 28th section „criminal acts against the environment“ §326 - Environment jeopardizing waste management	Resolution (EWC) No.3093/94 for materials that affect the ozone layer
Law of chemicals § 27 - penal prescriptions	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 skilled personnel are 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	01.06.2010	B. Keßler	Source file	BAKL6U022AB.doc

		Wartungsplan		WP 07 05 06 18 Seite 1 von 2	
Titel:		Wartungsplan Bus – HLK-Gesamtsystem		Datum: 11.11.2009	
Geltungsbereich:		Wartungspersonal		Ablage: WP07050618-R02 Wartung Bus deutsch	

Pos.	Wartungs- und Instandsetzungsmerkmale	Prüf- / Einstellwerte	Bemerkungen	Wartungstyp				
				A	B	C	D	E
WK								
1.	Füllstand des Klimasystems überprüfen (Schauglas)				X	X	X	X
2.	Ölstand des Kompressors überprüfen (Schauglas)		nach 10 Min. Laufzeit muss Ölspiegel in einem Schauglas sichtbar sein		X	X	X	X
3.	Hochdruckschalter auf Funktion prüfen.	Aus: 25,0 (+/-0,5) bar / Ein: 18,0 (+0,5/-0,5) bar Aus: 25,0 (+0/-1,2) bar / Ein: 20,0 (+0,6/-0,6) bar	nur EvoBus mit Wabco-Steuerung				X	X
4.	Niederdruckschalter auf Funktion prüfen	Aus: 0,3 (+/-0,1) bar / Ein: 2,1 (+/-0,2) bar Aus: 0,2 (+0,1/-0,2) bar / Ein: 0,4 bar	nur EvoBus mit Wabco-Steuerung				X	X
5.	Filtertrockner erneuern		auch nach jedem Eingriff in den Kältekreislauf				X	X
6.	Kondensatorbatterie und Verdampferbatterie auf Verschmutzung prüfen, ggf. reinigen	nur mit Druckluft, nicht mit dem Hochdruckreiniger!				X	X	X
7.	Kältemittelsammler überprüfen	Sichtprüfung	bei Korrosion und mechanischer Beschädigung austauschen				X	X
8.	Alle Luftfilter auf Verschmutzung prüfen, ggf. erneuern			X	X	X	X	X
9.	Alle Luftklappen auf Funktion prüfen						X	X
10.	Kondensatorlüfter auf Funktion prüfen				X	X	X	X
11.	Verdampfergebläse auf Funktion prüfen				X	X	X	X
12.	Alle Kondenswasserabläufe überprüfen		Lippenventile sollten vorhanden sein				X	X
13.	Alle Klimaleitungen auf Dichtheit und Sitz prüfen	bei Systemdruck von 15 bar	keine Kontrastmittel verwenden				X	X
14.	Alle Heizungsleitungen auf Dichtheit und Sitz prüfen						X	X
15.	Alle Wasserventile auf Funktion und Dichtheit prüfen						X	X

Pos.	Wartungs- und Instandsetzungsmerkmale	Prüf- / Einstellwerte	Bemerkungen	Wartungstyp				
WK				A	B	C	D	E
16.	Ölfüllung des Kompressors erneuern	Öltyp: Triton SE 55	Ölmenge: KV4-KV6: 2,5 l KVX40. 2.0 l / KVX50. 2,6 l					X
17.	Schraubverbindungen an Kompressor und Halter auf Festsitz prüfen				X	X	X	X
18.	Keilriemen am Kompressor auf Zustand prüfen				X	X	X	X
19.	Keilriemen am Kompressor auf Spannung prüfen				X	X	X	X
20.	Alle Temperaturfühler auf Funktion und Sitz prüfen.						X	X
21.	Elektrische Steckverbindungen und Sicherungen prüfen					X	X	X
22.	Heizungsleistung überprüfen	Max. Heizen					X	X
23.	Klimaleistung überprüfen	Max. Kühlen						X
	Wartungsintervall für Länder mit gemäßigttem Klima	Wartungsintervall Heißland (Länder mit überwiegend Temperaturen >40°C)	Wartungsintervall für Tropische Länder mit überwiegend hoher Luftfeuchtigkeit					
A	Monatliche Wartungsarbeiten	Wartungsarbeiten alle zwei Wochen	Monatliche Wartungsarbeiten					
B	-----	Wartungsarbeiten alle drei Monate	Wartungsarbeiten alle drei Monate					
C	Wartungsarbeiten alle sechs Monate	Wartungsarbeiten alle sechs Monate	Wartungsarbeiten alle sechs Monate					
D	Jährliche Wartungsarbeiten	Jährliche Wartungsarbeiten	Jährliche Wartungsarbeiten					
E	Wartungsarbeiten alle drei Jahre	Alle drei Jahre oder 5000 Betriebsstunden	Alle drei Jahre oder 5000 Betriebsstunden					

Erstellt: T. Vierheilig (TKD)	Geprüft P. Petersen-Ross (PM3)	Freigegeben B. Kern (TKD)	Revisionsstand: R02
Datum, Unterschrift	Datum, Unterschrift	Datum, Unterschrift	Ersetzt Version: R01 Vom: 01.06.2006