



KONVEKTA

Thermo Systems

Operating Instruction

for KONVEKTA air conditioning unit

KL60



Version:

- 12 Volt DC
- 2-circuit
- Recirculated Air / Fresh Air
- Heating

with control KS60/12V

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Append.:

- Maintenance Schedule [WP07050618](#)
- Wirung diagram no. BK1-70T-128
- KONVEKTA Service Stations

Introduction

These operating instructions are for driver, user and maintenance staff of a/c-unit.

It contents:

- Operating instructions
- Safety information 
- Maintenance Schedule

Each person who is involved in handling the a/c-unit has to read and make use of these operating instructions, before first start-up and after that regularly, e.g.:

- Operation including troubleshooting, maintenance and disposal of fuels and auxiliaries agency.
- Servicing (maintenance, inspection, repair)
- Transport

This makes the user's training easier and troubles by improper handling will be avoided. Compliance with the operating instruction by the maintenance personnel increases the reliability during operation, increases the life time and reduces expenses for repair and loss of time.

- **Add national orders to this operating instruction for accident prevention and environment protection.**
- **The Operating instruction is a part of your a/c-unit.**
- **Always have a copy at hand in.**

You will certainly understand that we will not recognize any warranty claims due to improper handling, inadequate maintenance, applications that do not correspond to the determined use, utilization of not admitted fuels, or the non-observance of security prescriptions.

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.**

This Operating instruction contains all necessary information to operate your air conditioner. In case you need more explanations please contact the next **KONVEKTA** service station^①.

^① see hand book: „KONVEKTA Service Stations“

Notes to the operating instruction

This Operating instruction is valid for the air conditioners type:

- KL60 / 12V

When taking the unit into operation we recommend to add the following data.
This will also be important for your orders of spare parts, and in case of warranty.

Serial number of the a/c unit:.....

Order No.:

Year of construction: (MM/JJ)

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

**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 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



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. Air conditioning unit

		
Type		KL60
Refrigerant		R134a
- quantity approx.	lbs [kg]	22.1 [10]
Operating voltage	Volt DC	12
Current consumption	Ampere	129
Cooling capacity	BTU/h [Watt]	88090 [25800]
Air volume @ 0 static pressure	[CFM] [m³/h]	2825 4800
Measurements:		
- length	inch [mm]	144.7 [3675]
- width	inch [mm]	53.2 [1352]
- height	inch [mm]	9.1 [230]
- weight	lbs [kg]	374.8 [170]

Type of switch	Part no	Switch-off pressure	Switch-on pressure
Low pressure	H11-001-357	0.3 ± 0.1 bar off	2.1 ± 0.2 bar on
Excess pressure	H11-001-358	25.5 ± 0.5 bar off	18.0 ± 0.5 bar on

2. Intended use

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

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 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.

^① see hand book: "KONVEKTA Service Stations"

4. Operation with control KS60

4.1. General information

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 to drive with automatic mechanism (*Key S5, see 0*). Additionally to the automatic the following functions can be activated:

- a) **Recirculated – Fresh Air operation** – close flap manually, in order to prevent the entrance of exhaust fumes (in tunnels)
- b) **REHEAT**-function to dehydrate the steamed up wind shield

Auto-test

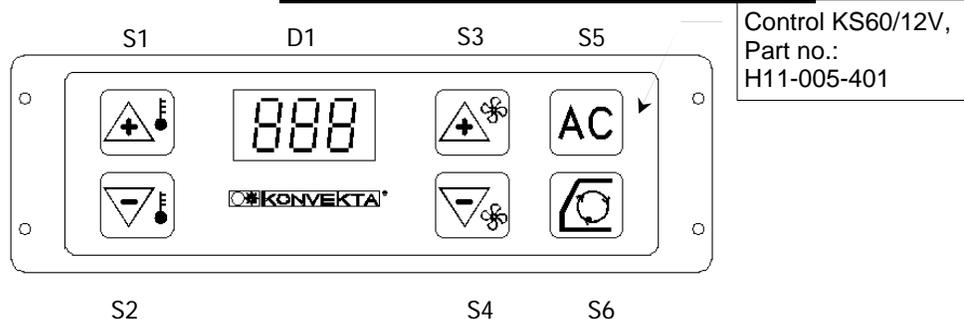
If voltage supply to unit is interrupted, unit starts a self test immediately after reset. All in- and outlets are checked. After self-test, actual temperature can be read on display (if ignition is ON), or... if ignition is OFF an LED flashes on display.



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 sunglare 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 airconditioning unit.

4.2. Operation panel / function of the keys



	Short.	Function
	D1	3-figure display
	S1	required room temperature can be adjusted (increase) 59 to 82.4°F
	S2	required room temperature can be adjusted (decrease) 59 to 82.4°F
	S3	required air volume can be adjusted (increase), step 1 or 2 -manually
	S4	required air volume can be adjusted (decrease), step 1 or 2 -manually
	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 .

4.3. Storing of functions

If **ignition is turned off**, the following data will be stored always:

- AUTO – function
- Desired temperature

4.4. 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 **S5**  „a/c automatic“, LED inside key button is indicated. Pressing key **S5**  again, air conditioner switched off. The blowers are regulated automatically.
- With key **S3**  or **S4**  the required air volume can be adjusted manual.



ATTENTION:

In case of trouble in the a/c cooling circuit the LED-display (key **S5** , see 5.3) is lighting up. Operation of the a/c system only after verification by qualified a **KONVEKTA-Service-Station**^①.

^① see hand book:“KONVEKTA Service Stations“

4.5. Adjustment of temperature

If a/c-unit is operating, vehicle inside temperature can be adjust with key **S1**  or **S2** , in a range of 59°F up to 82.4°F. In case of operating key (+) or (-), temperature can be increased or reduced. The actual temperature can be read on display.

4.6. Recirc. Air operation

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

4.7. REHEAT activate / stop

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** .

4.8. Display of air duct temperature

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

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

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

5. Maintenance / Servicing

Service and maintenance works have to be executed on basis of "Maintenance Schedule, no: WP07050618.

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

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



Danger of accident!

The experts in charge of installation and maintenance works should at least be trained in accordance with the EN 378 - part 4 and strictly obey the legal regulations.

All works or modifications at the air conditioner which are improperly executed can lead to function troubles and can jeopardize the operation safety. We recommend having works and modifications only executed in a KONVEKTA service station^① Also the prescribed regular maintenance works should be executed in an authorized KONVEKTA service station^①.

Before having the maintenance executed please read carefully the KONVEKTA safety prescriptions (TD00052A^②), in order to avoid dangers and accidents!

^① see hand book „KONVEKTA Service Stations

^② source of supply: KONVEKTA AG, P.O. Box 2280, D-34607 Schwalmstadt

5.1. Return air grid

Reference to Maintenance Schedule Bus No. WP 07 05 06 18 Item WK13:

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

Important:

- If the filter is soiled, the cooling performance of the air conditioner will decrease.
In case the a/c unit will be operated continuously with dirty filter, the evaporator blowers and cooling compressor will be damaged
- **It is not allowed to operate the air conditioner without filter.**
- **If filter is defective, filter must replace!**

5.2. Condenser coil

Reference to Maintenance Schedule Bus No. WP 07 05 06 18 Item WK03:

Always keep condenser coil fins clean. Severe soiling causes 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.

5.3. 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	thermostat open	<ul style="list-style-type: none"> check inside temperature re-adjust thermostat 	② ②
	electric connections disconnected	<ul style="list-style-type: none"> check electric connections at switchboard 	①
	relay defective	<ul style="list-style-type: none"> check relay, replace if necessary 	①
	defrost thermostat has switched off	<ul style="list-style-type: none"> check evaporator blower, replace if necessary 	①
	outside temperature too low (possible icing of evaporator)	<ul style="list-style-type: none"> switch on "ventilation" only 	②
	evaporator coil dirty	<ul style="list-style-type: none"> clean evaporator coil with compressed air 	①
	excess pressure (pressure too high)	<ul style="list-style-type: none"> check axial fans check fuses at switchboard clean condenser coil with compressed air 	① ① ①
LED  flashes up	excess pressure caused by high outside temperature	<ul style="list-style-type: none"> run unit until pressure has stabilized 	②
	leakage in a/c unit, lack of refrigerant	<ul style="list-style-type: none"> check a/c unit for leakages, re fill refrigerant 	①
	low pressure, dryer clogged	<ul style="list-style-type: none"> replace dryer 	①
	low pressure, screen of expansion valve clogged	<ul style="list-style-type: none"> clean screen; replace dryer 	①
	magnetic clutch	<ul style="list-style-type: none"> check connections at magnetic clutch 	①
	compressor does not compress	<ul style="list-style-type: none"> check high and low pressure, replace compressor if necessary 	①
	Loud noise at compressor	defective bearing at compressor	<ul style="list-style-type: none"> replace either bearing or entire compressor
slack V-belt		<ul style="list-style-type: none"> check V-belt at compressor drive 	①

① = see hand book, **KONVEKTA** Service Stations

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. Adequate waste management

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 (EWC) No.3093/94 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 skilled personnel is allowed to execute 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	16.09.08	Pfluger	source file	BAKL60222AB