



# KONVEKTA

Thermo Systems

## Operating Instruction

for KONVEKTA Air Conditioning  
unit

### KL40T



with control KS10

Versions:

- 24 Volt DC
- Recirculated Air

**ID#: BBA-KL40T I2AG**  
**Version: A00**

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- Maintenance Schedule Bus [WP07050618](#)
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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](mailto:TKD@konvekta.com).

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 in your area (contact details below: [www.konvekta.com](http://www.konvekta.com)) or our Customer Service Tel. +0049 6691/76-124 or mail to: [TKD@konvekta.com](mailto:TKD@konvekta.com)

## Information on the operating instructions

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

- **KL40T**

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 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

## I. 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:                                                |                     | <b>KL40T</b>               |
| Refrigerant                                          |                     | R134a                      |
| • quantity<br>with front box                         | [kgs] approx.       | 2,5<br>3,3                 |
| Operating voltage                                    | [Volt DC]           | 24                         |
| Current consumption<br>(two/three-stage) at 26V:     | [Ampere]            | 44                         |
| Cooling capacity with KVX40<br>KVX30 or TM3I<br>TM2I | [Watt]              | 18.000<br>15.000<br>12.000 |
| Heating capacity Q= 80                               | [Watt]              | 15.000                     |
| Evaporator – Air volume*, free-blowing               | [m <sup>3</sup> /h] | 4.000                      |
| Measurements:                                        |                     |                            |
| - length                                             | [mm]                | 1.966                      |
| - width                                              | [mm]                | 1.368                      |
| - height,<br>- depending on roof radius              | [mm]                | 221<br>183 – 221           |
| Weight of unit, Version:                             |                     |                            |
| - Recirculated Air                                   | [kgs ] approx.      | 65,5                       |
| - Fresh Air                                          | [kgs ] approx.      | 66,5                       |
| - Heating                                            | [kgs ] approx.      | 69                         |

\* With standard fans and/or blowers

### I.1. Pressure Switches

|                           | Bar OFF       | Bar ON    |
|---------------------------|---------------|-----------|
| Low pressure switch (LP)  | 0,3 ± 0,1     | 2,1 ± 0,2 |
| High pressure switch (HP) | 25 +0,0/ -0,5 | 18 ± 0,5  |

## 1.2. Compressor

**Compressor type depending on scope of delivery, see identification plate at 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!

| Kompressor Typ                | KVX40/390    | KVX30/325    | HDC 33      | TM2I        |
|-------------------------------|--------------|--------------|-------------|-------------|
| Weight (kgs) approx.          | 33           | 24,5         | 15,5        | 9,7         |
| Oil brand                     | Esteröl SE55 | Esteröl SE55 | ZXL 100PG   | ZXL 100PG   |
| - quantity (kgs)              | 2            | 2            | 0,5         | 0,18        |
| Magnetic clutch <sup>1)</sup> | 12 / 24V DC  | 12 / 24V DC  | 12 / 24V DC | 12 / 24V DC |
| - Weight (kgs)                | 12           | 7,6          |             |             |

<sup>1)</sup> ø depending on vehicle type

## 2. Determined use

The **KONVEKTA** air conditioner represents 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 instruction and the proof of regular inspections as well.

## 3. 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<sup>①</sup>. Only after that you can take unit into operation.

<sup>①</sup> See [www.KONVEKTA.com/Service](http://www.KONVEKTA.com/Service)

### 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.

## 4. Operation



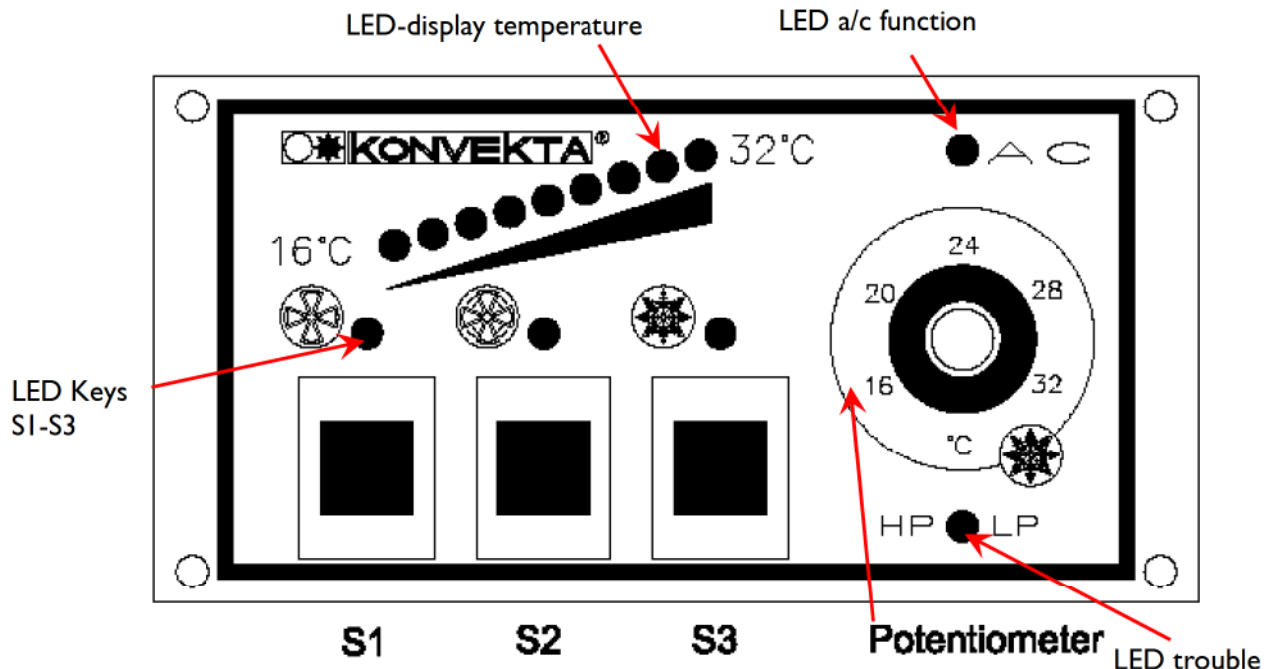
**Attention in case of roof top a/c units: Never switch on the a/c unit during car-wash!**

**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
- 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. Operating elements

Operating elements are placed on dashboard. Different functions are switched on/off by activating rotary switch (Potentiometer) or by switching on/off requested keys.



LEDs placed above switches and lights up immediately after starting its function.

- S1:** key ventilation slow
- S2:** key ventilation fast
- S3:** key switch A/C – unit ON/OFF

The **LED AC** lights up during a/c function is activated (the compressor ist running). If the adjusted temperature is reached, a/c function stopps and the LED disappears.

#### **LED HP/LP:**

If trouble is in the cooling system, the LED lights up, in this case, see chapter [“Trouble shooting”](#)

#### 4.2. Operation of a/c system

- Start vehicle engine (refer to orig. operating instruction of the vehicle).
- The air conditioner is switched on by means of switch S3 „A/C“ (compressor operation), unit works with half air performance.
- By actuating switch S2 „ventilation fast“ the air conditioner is operated with the maximum air volume.

#### 4.3. Adjustment of temperature

If air conditioning unit is operating, vehicle inside temperature can be adjusted with a Potentiometer in a range of 16°C up to 32°C. In case of turning the switch of the Potentiometer to the left side (-) or to the right side (+), temperature can be increased or reduced. The actual temperature can be read on LED-beam display.

## 5. Maintenance / Servicing

Maintenance and service works have to be done in accordance with the *"Maintenance Schedule, no: WP05070618"*.

On our homepage ([www.konvekta.com](http://www.konvekta.com)) you can find under the heading > service< the service station in your area.

 - 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](mailto:TKD@konvekta.com)



### **Danger of accident!**

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. The same applies to the regular maintenance works as prescribed and specified in the maintenance certificate.

Before carrying out any maintenance works at your air conditioning unit, carefully read the KONVEKTA safety provisions (TD00052A<sup>①</sup>) in order to avoid any dangers and accidents!

<sup>①</sup> Source of supply: KONVEKTA AG, P.O. Box 2280, D-34607 Schwalmstadt

### 5.1. Oil change Compressor type K VX

#### **Reference to maintenance Schedule Bus No.: WP07050618**

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: "Technical data compressor").

### 5.2. Return air grid

#### **Reference to Maintenance Schedule Bus No.: WP07050618:**

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.
- It is not allowed to operate the air conditioner without filter.
- If filter is defective, filter must replace!
- In case the a/c unit will be operated continuously with dirty filter, the evaporator blowers will be damaged
- Due to a reduction of the evaporator air flow, the a/c function „defrosting“ will be activated more often resulting in a decrease of the cooling capacity and damage of the cooling compressor!

### 5.3. Condenser coil

#### **Reference to Maintenance Schedule Bus No.: WP07050618:**

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 twice a year, in case of severe soiling more often.

### 5.4. Trouble shooting

| Trouble             | Cause                                                      | Repair<br>by authorized Service Station <sup>①</sup> only                                  |
|---------------------|------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| a/c is not running  | thermostat open                                            | check inside temperature <sup>②</sup><br>re-adjust Potentiometer <sup>②</sup>              |
|                     | 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                                                  |
| LED HP/LP lights up | excess pressure caused by high outside temperature         | run unit until pressure has stabilized <sup>②</sup>                                        |
|                     | leakage in a/c unit, lack of refrigerant                   | check a/c unit for leakages, refill refrigerant                                            |
|                     | excess pressure (pressure too high)                        | check axial fans<br>check fuses at switchboard<br>clean condenser coil with compressed air |
|                     | low pressure, dryer clogged                                | replace dryer                                                                              |
|                     | low pressure, screen of expansion valve clogged            | clean screen; replace dryer                                                                |
|                     | magnetic clutch                                            | check connections at magnetic clutch                                                       |

<sup>①</sup> [www.KONVEKTA.com/Service](http://www.KONVEKTA.com/Service)

<sup>②</sup> 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](mailto: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                                                                                        | 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).

## 8. History of modification

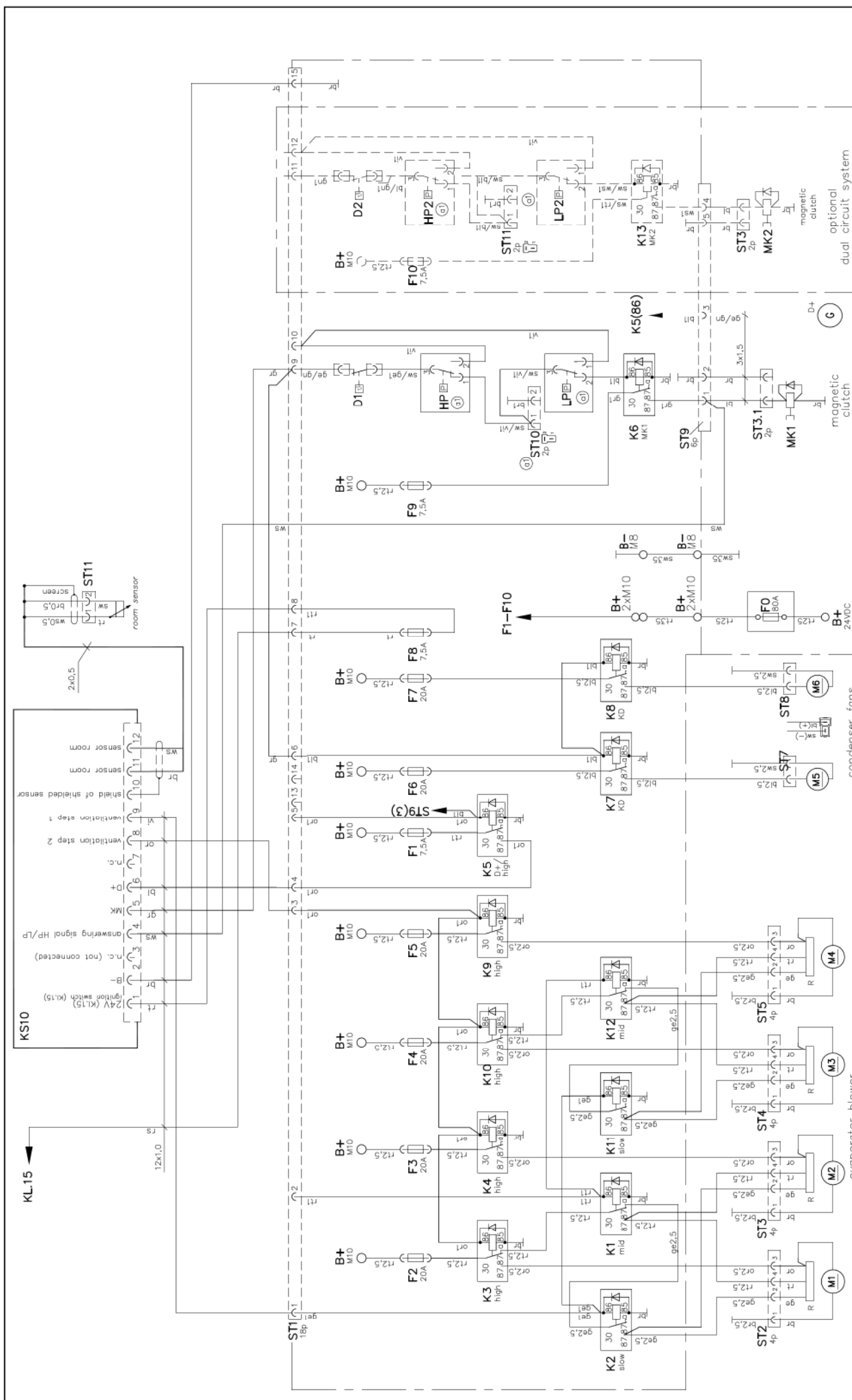
| version | date       | name    | remark      | file        |
|---------|------------|---------|-------------|-------------|
| A00     | 12.01.2010 | Pfluger | source file | BAKL40T12AG |

|                                                                                     |                                                           |                                                     |                                      |                                           |
|-------------------------------------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------|--------------------------------------|-------------------------------------------|
|  | <h1 style="text-align: center;">Maintenance Schedule</h1> |                                                     | <b>WP 07 05 06 18</b><br>Page 1 of 2 |                                           |
| Title:                                                                              |                                                           | <b>Maintenance Schedule Bus – HLK- total system</b> |                                      | Date: 11.11.2009                          |
| Valid for:                                                                          |                                                           | <b>Maintenance staff</b>                            |                                      | file: WPO7050618-R02 Wartung Bus englisch |

| Item: | Maintenance- / Repair Features                                               | Test parameter / settings                                                                               | Comments                                                                      | Maintenance Intervals |   |   |   |   |
|-------|------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|-----------------------|---|---|---|---|
| WK    |                                                                              |                                                                                                         |                                                                               | A                     | B | C | D | E |
| 1.    | Check refrigerant status of the conditioning system (at sight glass)         |                                                                                                         |                                                                               |                       | X | X | X | X |
| 2.    | Check oil filling of compressor (at sight glass)                             |                                                                                                         | After 10 min. running time the oil level should be visible in the sight glass |                       | X | X | X | X |
| 3.    | Check function of high pressure switch (HP)                                  | OFF: 25,0 bar (+/-0,5) / ON: 18,0 bar (+0,5/-0,5)<br>OFF: 25,0 bar (+0/-1,2) / ON: 20,0 bar (+0,6/-0,6) | Only for EvoBus with Wabco-control                                            |                       |   |   | X | X |
| 4.    | Check function of low pressure switch (LP)                                   | OFF: 0,3 bar (+/-0,1) / ON: 2,1 bar (+/-0,2)<br>OFF: 0,2 bar (+0,1/-0,2) / ON: 0,4 bar                  | Only for EvoBus with Wabco-control                                            |                       |   |   | X | X |
| 5.    | Exchange filter drier                                                        |                                                                                                         | And after every intervention in the refrigeration circuit                     |                       |   |   | X | X |
| 6.    | Check if condenser and evaporator battery are dirty, if necessary clean them | With compressed air only, not with high-pressure cleaner!                                               |                                                                               |                       |   | X | X | X |
| 7.    | Check refrigerant receiver                                                   | Visual inspection                                                                                       | Exchange in case of corrosion and mechanical damage                           |                       |   |   | X | X |
| 8.    | Check all air filters for fouling, if necessary renew them                   |                                                                                                         |                                                                               | X                     | X | X | X | X |
| 9.    | Check function of air flaps                                                  |                                                                                                         |                                                                               |                       |   |   | X | X |
| 10.   | Check function of all condenser fans                                         |                                                                                                         |                                                                               |                       |   | X | X | X |
| 11.   | Check function of all evaporator blowers                                     |                                                                                                         |                                                                               |                       | X | X | X | X |
| 12.   | Check all condensate drains                                                  |                                                                                                         | Lip valves should be in stock                                                 |                       |   |   | X | X |
| 13.   | Check all air-conditioning conduits for fit and impermeability               | system pressure of 15 bar                                                                               | Do not use any contrast medium                                                |                       |   |   | X | X |
| 14.   | Check all heating conduits for fit and impermeability                        |                                                                                                         |                                                                               |                       |   |   | X | X |
| 15.   | Check all water valves for function and impermeability                       |                                                                                                         |                                                                               |                       |   |   | X | X |

| Item:    | Maintenance- / Repair Features                                     | Test parameter / settings                                                                                          | Comments                                                                      | Maintenance Intervals |   |   |   |   |
|----------|--------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|-----------------------|---|---|---|---|
| WK       |                                                                    |                                                                                                                    |                                                                               | A                     | B | C | D | E |
| 16.      | Exchange oil filling of compressor                                 | Oil type: Triton SE 55                                                                                             | Amount: KV4-KV6: 2,5 liters<br>KVX40: 2,0 l / KVX50: 2,6 liters               |                       |   |   |   | X |
| 17.      | Check screwed connections at compressor and bracket on tight fit   |                                                                                                                    |                                                                               |                       | X | X | X | X |
| 18.      | Check condition of v-belt at compressor                            |                                                                                                                    |                                                                               |                       | X | X | X | X |
| 19.      | Check tension of v-belt at compressor                              |                                                                                                                    |                                                                               |                       | X | X | X | X |
| 20.      | Check all temperature sensors for function and fit                 |                                                                                                                    |                                                                               |                       |   |   | X | X |
| 21.      | Check electrical connections and the fuses                         |                                                                                                                    |                                                                               |                       |   | X | X | X |
| 22.      | Check Heating capacity                                             | max. heat                                                                                                          |                                                                               |                       |   |   | X | X |
| 23.      | Check Cooling capacity                                             | max. cooling                                                                                                       |                                                                               |                       |   |   | X | X |
|          | <b>Maintenance Intervals for countries with a moderate climate</b> | <b>Maintenance Intervals for countries with a hot climate (countries with temperatures predominantly &gt;40°C)</b> | Maintenance Intervals for tropical countries with predominantly high humidity |                       |   |   |   |   |
| <b>A</b> | Monthly maintenance works                                          | maintenance works every two weeks                                                                                  | Monthly maintenance works                                                     |                       |   |   |   |   |
| <b>B</b> | -----                                                              | maintenance works every three months                                                                               | maintenance works every three months                                          |                       |   |   |   |   |
| <b>C</b> | Half-yearly maintenance works                                      | Half-yearly maintenance works                                                                                      | Half-yearly maintenance works                                                 |                       |   |   |   |   |
| <b>D</b> | Yearly maintenance works                                           | Yearly maintenance works                                                                                           | Yearly maintenance works                                                      |                       |   |   |   |   |
| <b>E</b> | maintenance works every 3 years                                    | every 3 years or every 5000 hours of operation                                                                     | every 3 years or every 5000 hours of operation                                |                       |   |   |   |   |

|                     |                        |                 |                                         |
|---------------------|------------------------|-----------------|-----------------------------------------|
| Edited:             | Checked:               | Released:       | Revision Status:                        |
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| Date, Signature     | Date, Signature        | Date, Signature | Replaces Version: R01<br>of: 01.06.2006 |



**KONVEKTA® KÜHL- & KLIMANLAGEN D-34607 SCHWALMSTADT**

**SCHALTPLAN**  
KL40T 24V

Typ: KL40T

Blatt 1

Zeichnungs-Nr. K1-400-084

Gez. 11.01.10 S. Pflüger

Gepr. 05.10.11 S. Pflüger

Tag NAME KS10 , VD 2-stufig, KD 1st, Umluft

Nr. Änderungs-Mitteilung Tag Name

Diese Zeichnung verbleibt unser Eigentum. Vervielfältigung, Verwertung oder Mitteilung an dritte Personen hat zivil- und strafrechtliche Folgen. (Urheberrechtsgesetz. Gesetz gegen den unlauteren Wettbewerb BGB.)

Durch Weiterentwicklung entstehen konstruktive und technische Änderungen behalten wir uns vor !

Originale dürfen ohne Änderungsantrag nicht verändert werden.

**KONVEKTA AG 34607 Schwalmsstadt**