

# Control system for elevators

## **EKM 64**

Description  
part 1

**Version 01**  
**PRELIMINARY**

### **REKOBA**

Relais- und  
Fernmeldetechnik GmbH

Ederstr. 6  
D-12059 Berlin  
Tel. + 49 30 - 68998 • 0  
Fax + 49 30 - 68998 • 13

Version 01 / 0043    09.01.98

Description (part 1) <b>EKM64</b> Elevator control	<b>REKOBA</b>	<b>Page 1</b>  of 1
--	---------------	---------------------------

1.2 The modular system EKM 64	5
<b>2 Base configuration EKM64 (command unit)</b>	<b>7</b>
2.1 Assemblies of command unit	7
2.1.1 Assembly of base-board	7
2.1.2 Service-module 6402	9
2.2 In- and outputs	10
2.2.1 Parametritition-facilities of in- and outputs	10
2.2.2 Technichal datas of control in- and outputs	10
2.2.3 Principle wiring to security-chain and control of drives	13
2.2.4 The power supply of system EKM64	15
2.2.5 Utilization of standard parameter files (EKM16-standard also)	15
2.3 Base functions of command unit	16
2.3.1 Shaft-copying	16
2.3.1.1 Shaft-copying with influence switches	16
2.3.1.2 Digital shaft-copying with pulse-generator	17
2.3.2 Drive-control	14
2.3.3 Door operation	22
2.3.4 Calls	25
2.3.5 Indications: position, aim, next travel direction, gong	27
2.3.6 Inspection and re-levelling	29
2.3.7 Special travels	30
2.3.7.1 Firemens ride	30
2.3.7.2 Parking travel	30
2.3.7.3 Shut-off / Out of operation	31
2.3.7.4 Evacuation travel and travel-lock	31
2.3.7.5 Lowering travel	32
2.3.7.6 Warm-up travel	32
2.3.7.7 Light barrier stop	32
2.3.7.8 Orientation travel	32
2.3.7.9 Travel for position-correktion	32
2.3.8 Special call control (also for load-meassuring)	33
2.3.9 Thermic surveyance of drive	34
<b>3 Decentral components</b>	<b>35</b>
3.1 Universal in-/output module 6408	35
3.2 Floor module 6406	36
3.3 Relay module 6416	37
3.4 Intelligent terminals	38
3.5 Shaft-wiring	38
3.6 Serial cabin-wiring	39
<b>4 Group operation</b>	<b>41</b>
4.1 Hall call organisation	41
4.2 Group-logics	42

Description (part 1) <b>EKM64</b> Elevator control	<b>REKOBÄ</b>	<b>Page 2</b>  of 2
--	---------------	---------------------------

Description (part 1) <i>EKM64</i> Elevator control	<b>REKOB</b>	<b>Page 3</b>  of 3
--	--------------	---------------------------

<b>5 Operation indications and diagnosis</b>	<b>44</b>
5.1 Operation indications	44
5.2 Diagnosis	41
5.2.1 Fault diagnosis at service module	42
 <b>Contents of functions in EKM64:</b>	 <b>48</b>
 <b><u>Part 2:</u></b>	
<b>6 Parametritition</b>	<b>52</b>
6.1 Parametritition of functions	54
6.2 Parametritition of in- and outputs	58
6.3 Parametritition of DSE64	61
<b>7 Standard sets of parametritition</b>	<b>68</b>
7.1 Set of parameters for inputs E1-E16	68
7.2 Set of parameters for terminals 21-48	71
7.3 Set of parameters for relay-outputs A1-A9	73
<b>8 Diagrams on shaft-pulses</b>	<b>74-75</b>

Description (part 1) <b>EKM64</b> Elevator control	<b>REKOB A</b>	<b>Page 4</b>  of 4
--	----------------	---------------------------

# 1 The system EKM64

## 1.1 General

**Control-system EKM 64** for elevators is built-up modular and consists of few functional devices which communicate with each other serial on two-lines BUS-system.

**Base-board EKM 64 (command unit)** serves for central data-storing and -operation and distributes interfaces serial connection of **intelligent „In-/Output-(I/O)-modules“**. This causes diversion of total control into parts of process and a decentral placing within lift installation to the point where operations are to be done.

Expenses on wiring with all its known fault-sources are reduced by this, the **mounting of controller** is simplified and offers more survey. The system allows **shorter times for mounting**.

The **serial two-wire BUS-system** accords **CAN-Standard** and prepares the system EKM 64 for set-ups and enlargings in future. That means the total conception of this control enables a flexible system, easy to handle and easy for maintenance which serves to each type of elevator control.

The base-board is designed in that way that for conventional wirings without additions the assembly of a control is possible for an average elevator without I/O-modules. Therefore the base-unit has economic advantages even for small lifts and supplies also an **optional facility in extension for single lifts or elevator groups with any demands**.

Decentral placed I/O-modules enable the extension of floors up to **64 stops in selective-collective mode** and **communication with cabin and operation-/display-panels** in floors **with saving wires**.

Shaft-copying could be realized by **conventional induction switches** or by **integrated digital shaft-copying** for incremental pulse generator.

For **serial connection of voltage- and frequency-regulators** an interface is supplied. Conventional wiring via terminals is possible also.

In **group-mode** controls of each lift are to connect by a CAN-BUS-two-line wire but could be switched by input-signal into **single lift also**.

For group-mode EKM 64 serves with dynamic travel-control for optimizing load-facility by perception of travels with flexible parking feature, emphasis- and tendency-travel.

Yet the base-configuration enables a **comfortable diagnosis**. This is menu-controlled and is to be operated by **service-module EKM6402**. By **computer-diagnosis-system TESIM** a **high approved fine diagnosis** at face and **remote** is offered as well as **long time diagnosis**.

The **free parametrization feature of in-/output-modules** enables assignment of functions to available in-/outputs

and therefore an optimal using of hardware components.

All parametrizations are to be made with service-module or computer, menu-guided.

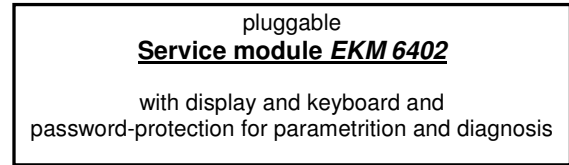
**I/O-modules** on cabin, in floors and in controller are connected serial via CAN-bus system with EKM64 base-board. That means a two-wire communication between these components, which **reduces terminals, wires and time for mounting**.

A multiple **password-system** protects the control against grip by thirds.

Description (part 1) <b>EKM64</b> Elevator control	<b>REKOBÄ</b>	Page 5 of 5
--	---------------	----------------

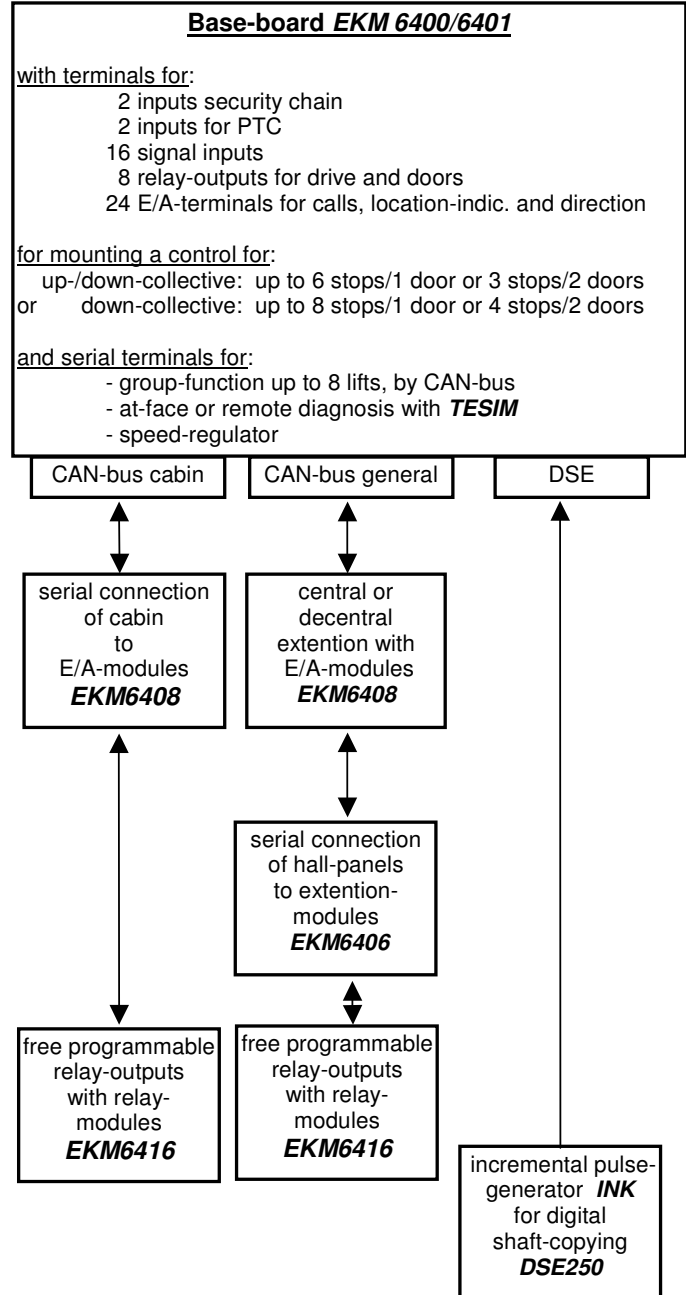
## 1.2 The modular system EKM 64

Moveable service-module **EKM 6402** with keyboard and display is a mobile test-tool to the mechanician for parametritions and checks. It could also remain at control as a fixed part.



The **base-configuration EKM64** consists of **base-board EKM 6400** which is firmly connected in sandwich construction with the upper **cover-board EKM 6401**.

The base-board supplies wiring terminals, while serial interfaces for CAN-bus, speed-regulator and digital shaft-copying are placed onto covering-board.



The in-/output-module **EKM 6408** serve in central installation to stops- and functional extentions for integrating the modules into controller as intelligent terminals. Connection to base-board is done via CAN-bus in 2-line- traffic. In decentral installations one or more **EKM6408** as cabin-moduls are mounted onto cabin and communicate by CAN-bus with base-board in machine room.

The floor-module **EKM 6406** serves to serial connection of hall-panels; operating in 2-line-traffic with base-board.

Relay-module **EKM6416** has 8 potential-free outputs contacts for greater consumptions at cabin- or hall-CAN bus. It communicates with base-board via CAN-bus also. Further there are 8 inputs, useable as coder.

Wiring of incremental pulse generator **INK** to EKM64 requests the pluggable **DSE**-controller on base-board.

Description (part 1) <b>EKM64</b> Elevator control	<b>REKOBÄ</b>	Page 6  of 6
--	---------------	--------------------

## 2 Base configuration EKM64 (command unit)

### 2.1 Assemblies of command unit

The command unit consists of 2 boards which are plugged as a sandwich by wire.

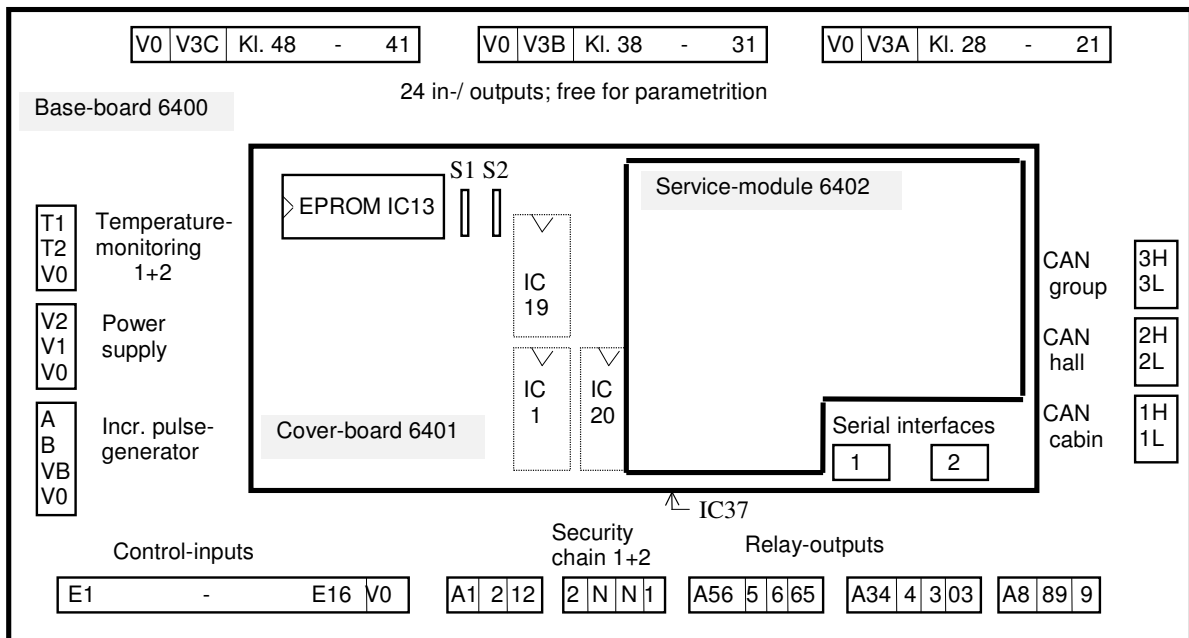
On base-board 6400 all terminals are placed. The smaller covering-board 6401 carries the terminals for service-modul 6402 and 2 serial interfaces. The 3 CAN interfaces on base-board are booked as follows (according CAN-controller are fixed acc. requirement):

- 1: K- cabin-CAN (IC1) for serial cabin-connection (up to max.127 modules)
- 2: A- hall-CAN (IC19) for any in-/output enlargement (up to max.127 modules)
- 3: G- group-CAN (IC20) for set of lift-groups up to 8 elevators

The in- and outputs of base- and extention-moduled could be parametered free with few exceptions. That means that the use as in- or output and its function could be set-up according requirement by service-module or by computer, menu-controlled. Onto modules at CAN-bus the adresses are set by DIP-switches to allow concrete adjoining.

If digital shaft-copying is used a DSE-controller (IC37) is plugged onto base-board.

#### 2.1.1 Assembly of base-board



measures: 250x180x100mm

Serial interfaces: 1 (X6): TESIM  
2 (X7): Parametrition / serial regulator

Switches and junper on cover-board: (\*= for manufacturer only;[ operation state] )

- \*S1: Watchdog [closed]
- S2: Write-protection of EPROM: [closed] opened while parametrition
- \*X3: Mode of serial EEPROM: [closed]
- \*X4: Mode fo serial EEPROM: [open]
- \*X8: EPROM-type [at a]
- \*X9: EKM-RESET[open]

on base-board:

Description (part 1) <b>EKM64</b> Elevator control	<b>REKOB</b>	Page 7 of 7
--	--------------	----------------

\*X85/86: End of bus CAN1/2: [closed]  
X87: End of group-bus CAN: [closed at 1. and last lift; all others open]

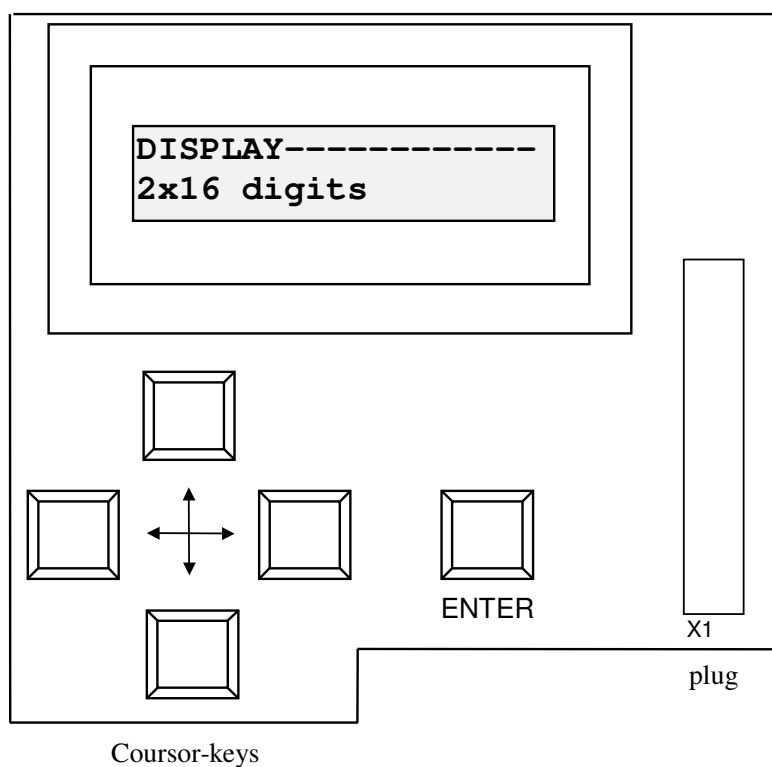
Description (part 1) <b>EKM64</b> Elevator control	<b>REKOBA</b>	<b>Page 8</b>  of 8
--	---------------	---------------------------

### 2.1.2 Service-module 6402

The service-module 6402 consists of a printed-circuit board with display and 5 operation buttons. It is furnished with plugs to insert onto command unit. The service-module could be screwed firmly with command unit or could serve as equipment of lift technician and be plugged if required only. For operation of control this module is not necessary. Plug-in and remove of service-module must be made while power of lift is switched off. The module is used for:

- indication of operating states of lift
- operation indication of digital shaft-copying
- displaying of fault-states
- fault-diagnosis
- entrance by password
- parametrization of command unit
- parametrization of in-/output-modules
- parametrization of digital shaft-copying device

The operation is told in according items of description.



measures: 110x100x15 mm

Description (part 1) <b>EKM64</b> Elevator control	<b>REKOB</b>	Page 9 of 9
--	--------------	----------------

## 2.2 In-and outputs

### 2.2.1 Parametritron-facilities of in- and outputs

In- and outputs of command unit and of I/O-modules could be parametered free. This means adjoin of I/O-terminals to requested functions. Names of functions are offered at display for selection while parametritron. Functions are booked internally with a four-bit „function code“ which is useable as short term.

The functions can require following terminal-characteristics:

**I** nput                      **O** utput                      **U** niversal (in- and output)

Functions, function-code and terminal-characteristics are named in further description as follows (examples):

**Close-door button** (0202) **I**  
**open door T1** (B000) **O**  
**Car-call T1-H01**(with acknowledgement, door 1, stop 01) (0B21) **U**

Terminals of characteristics I and O could be booked with functions of same characteristics only.  
Terminals of characteristics U could be booked with functions of characters I, O or U.

Same functions could also be booked multiple at terminals (same in- resp. outputs at different locations).  
Acknowledgements (for calls) are operated in parallel, independant of input-location.

### 2.2.2 Technical datas of control in- and outputs

#### Inputs with fixed special function:

- Temperature-monitoring: T1: thermally controlled resistor no 1 (see item 2.3.9.)  
T2: thermally controlled resistor no 2
- Incremental pulse-generator: terminal for pulse-generator (see item 2.3.1.2.)
- Security-chain tappings: 220V AC (see item 2.2.3.)

#### Terminals for free parametritron:

- terminals E1- E16 : (character **I**)                      input voltage: > 13V DC against terminal V0/E  
typical: 24V DC  
max: 40V (peak voltage)
- terminals 21-28 | 31-38 | 45-48: (character **U**)                      input voltage: > 13V DC against V0/A,B,C  
Block : A                      B                      C  
typical: 24V DC  
GND : V0A                      V0B                      V0C  
max: 40V (peak voltage)  
V3 : V3A                      V3B                      V3C

The supply voltage V3 of block also is

output voltage: V3/A,B,C against V0/A,B,C  
typical : 24V DC (pulsing)  
Imax.: 300mA  
(short-circuit proof for short time)

- terminals 41-44: (character **O** only)                      output voltage: as terminals 45-48

Description (part 1) <b>EKM64</b> Elevator control	<b>REKOB A</b>	Page10 of 10
--	----------------	-----------------

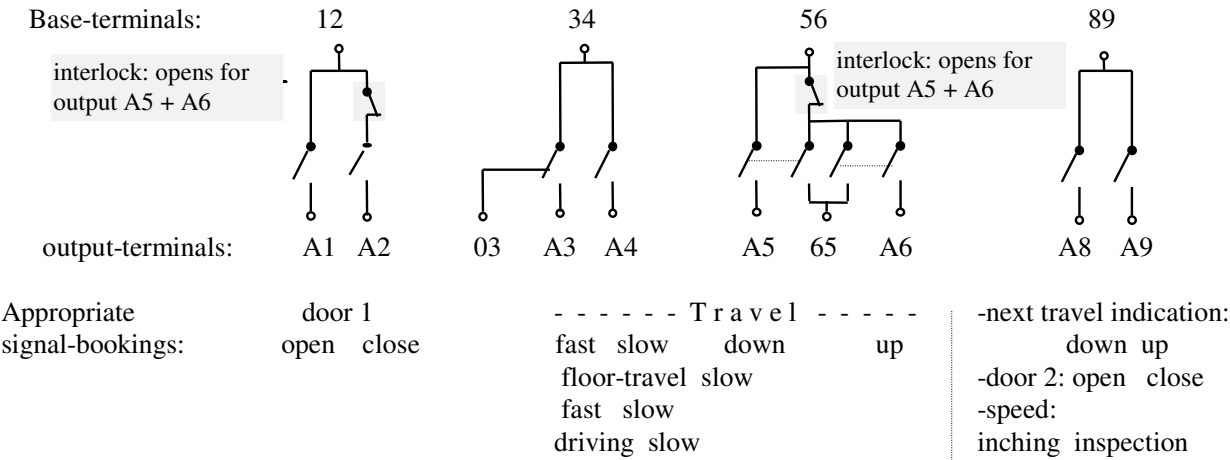
Power supply, adjoined to in- and outputs per block (V3x) could be served by V3 via fuses or any other supply, 24Vdc (unsmoothed) or max. 30Vdc (smoothed). The matched basis V0x (ground= GND) for taps is available at terminals (see item 2.2.4).

Description (part 1) <b>EKM64</b> Elevator control	<b>REKOBA</b>	<b>Page11</b>  of 11
--	---------------	----------------------------

**Output-terminals for standard use:**

- terminals A1- A.. : (charakter **O**) relay-outputs Umax: 220Vac  
Imax: 4A ac

Adjoin of functions for relay-outputs are to set-up. In many cases a standard use is appropriate (see drice-control also).

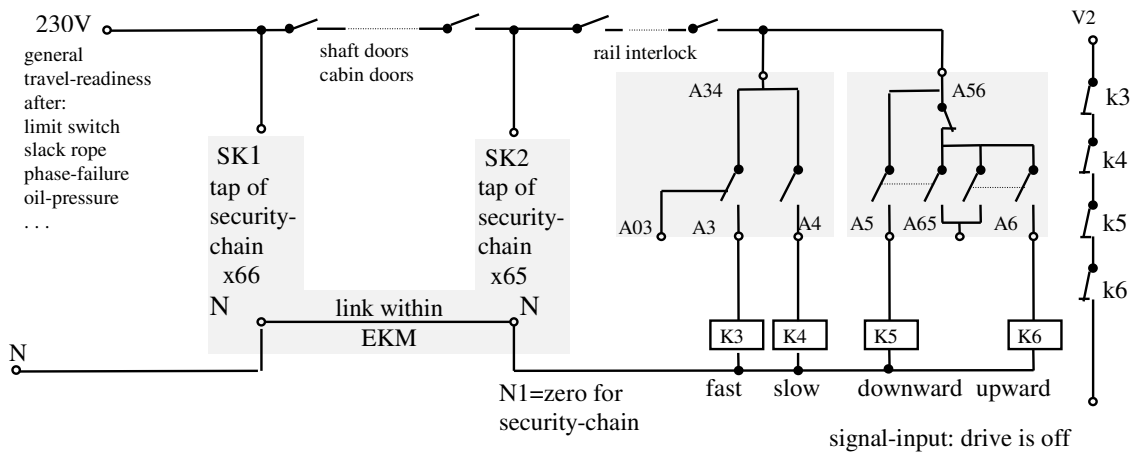


Above signal-bookings where combined in parameter-files (see item 7.3.).

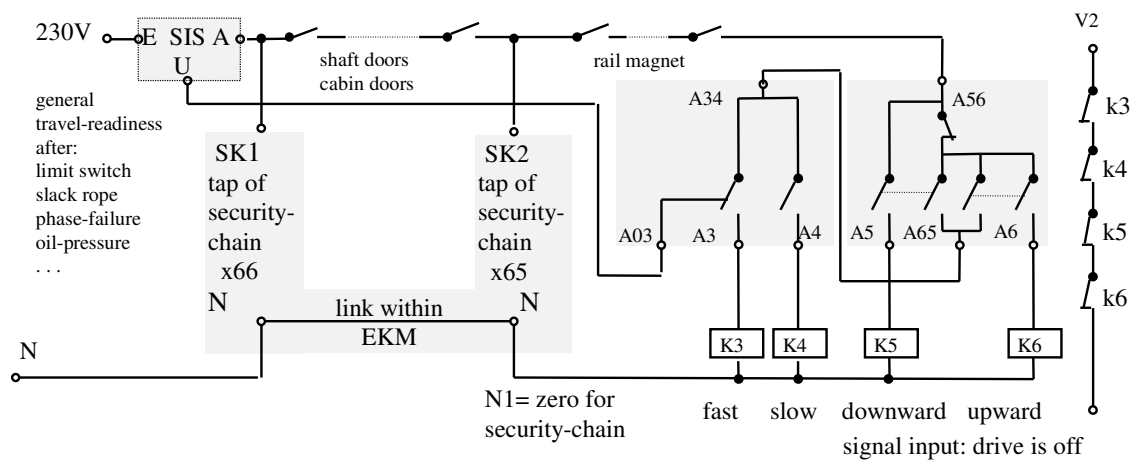
Terminals 03 and Kl.65 are useable for door-zone bridging (security-circuit).

### 2.2.3 Principle wiring to security-chain and control of drives

- **for elevators without security-circuit** (closed inching and no pre-opening doors)



- **for elevators with security-circuit** (open inching or pre-opening doors)



The security-circuit (SIS) supervises the door-zone and organizes the voltage of chain for travel-outputs. Output U offers within door-zone the voltage for by-passing security-chain with controlled security. In case of reported fault voltage for the drive, feed at E is totally blocked. SIS is to realize by external circuits or with **REKOB**A-device **SIS4797**.

Security-chain taps SK1 and SK2 control this chain and have following causes:

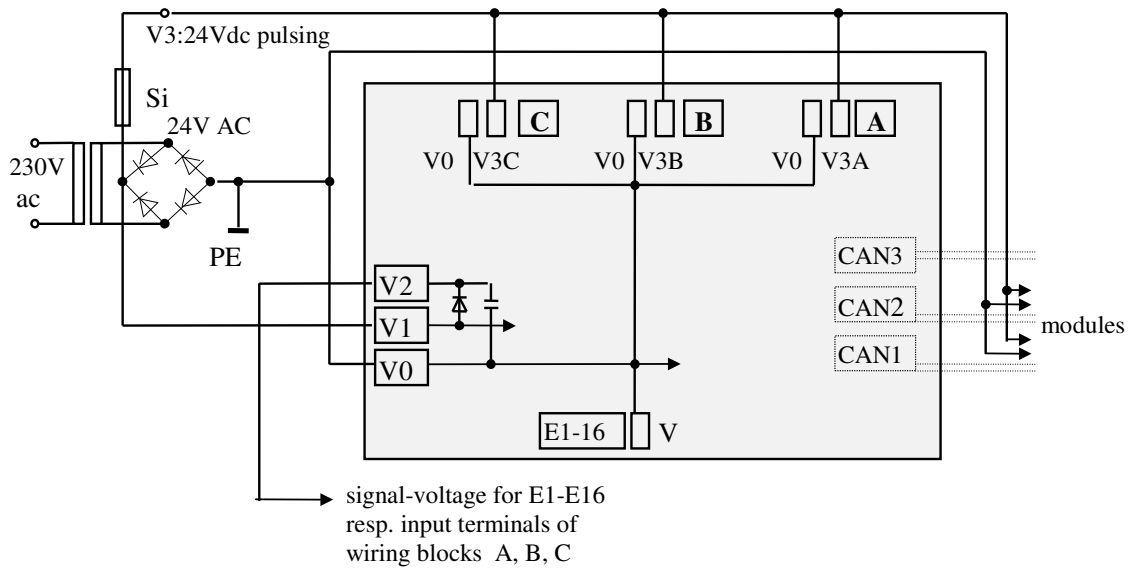
- SK1:** Control of general travel-condition including security-circuit for door-zone surveillance.  
 Missing voltage causes decrease of travel-relays and cancel of travel-outputs.  
 If the signal will further be not stable, no travel-output is made for careful treatment of drives.  
 On display fault message „security-chain 1“ appears.  
 If the lift is now within door-zone the command unit tries to open the doors. This could be effective if the door control is done at an earlier point of security-chain only.
- SK2:** Control of door closing: the signal is evaluated as „doors closed“. Missing voltage of security-chain causes tries of closing the door according parametrization (see door control). Control of selective doors with „no loading through“ is done by this input also.  
 SK2 is not permitted to receive a signal from door-zone bridging without travel-output (see example of circuit).

Description (part 1) <b>EKM64</b> Elevator control	<b>REKOB</b> A	Page13 of 13
--	----------------	-----------------

Connections of zero-lines (see drawing) is directed for security reasons.

Description (part 1) <b>EKM64</b> Elevator control	<b>REKOB A</b>	<b>Page14</b>  of 14
--	----------------	----------------------------

#### 2.2.4 The power supply of system EKM64



Variants of power supply:

- separated supplies: The operation-voltages of wiring blocks A, B, C and CAN1 and 2 could be supplied separate from other supplies (example stabilated dc-voltage) according requirement of consumptions also (note limits of in-/outputs).
- stabilated dc-supply: The power supply of command unit and of modules is possible in common by stabilated dc-voltage. Decentral components should get a separated fuse. This voltage is useable also as signal-voltage for inputs (note limits of in-/outputs).
- for lift groups: By low-impedance connection of V0=PE from each elevator a common base-potential is to set. Hints on power supply for hall-calls: see item group mode.

### 2.2.5 Utilization of standard parameter files (EKM16-standard also)

Free parametrization feature of in- and outputs of system EKM64 allows to each user the assemblation of control according manufacturers- and installation-requirement. For normal installations the „standard parameter file“ was set which could be selected for simple parametrization.

There are also standard parameter files available which create in-/outputs-characters of EKM16. This means that customers of EKM16 could use these standards further. The command unit even has the known namings of terminals which means a wide compatibility.

Description (part 1) <b>EKM64</b> Elevator control	<b>REKOB4</b>	<b>Page15</b>  of 15
--	---------------	----------------------------

## 2.3 Base functions of command unit

### 2.3.1 Shaft-copying

Shaft-copying is possible by conventional influence switch or by digital position-evaluation with incremental pulse-generator. For „digital shaft-copying“ a „DSE-controller“ is plugged onto base-board if required. Inputs according installation are done via computer and service-module.

#### 2.3.1.1 Shaft-copying with influence switches

For shaft-copying bistable influence switches are to use.

According operation several copying-standards are available which require different amounts of switches and magnets (see drawing of pulse-diagrams in appendix 1).

Standard: 1: retardation way < half floor-distances  
2: retardation way > half floor-distance

The requirement of specific pulses depends on type of inching also.

- ON= without inching
- NE= simple inching
- ND= dynamic inching - description 1)

Depending on standard and type of inching following functions are to determine to terminals:

	standard 1			standard 2			function-code
	ON	NE	ND	ON	NE	ND	
<b>Pulse</b>	x	x	x	4)	4)	4)	(0100) I
<b>Pulse-UP</b>				x	x	x	(0101) I
<b>Pulse-DOWN</b>				x	x	x	(0102) I
<b>Flush</b>	x			x			(0106) I
<b>Lower flush</b>		x	x		x	x	(0107) I
<b>Upper flush</b>		x	x		x	x	(0108) I
<b>Correction</b>	x	x					(0103) I
<b>Lower correction</b>				x	x	x	(0104) I
<b>Upper correction</b>				x	x	x	(0105) I
<b>Electrical stop 1)</b>			x			x	(0109) I
<b>Door-zone</b>	3)			3)			(010A) I

*Door-zone (external for SIS)* 3) 2) 2) 3) 2) 2)

- to 1) For arrival in floor the electrical stop of regulator must start 5-10cm before flush. For exact positioning while inching a smaller flush-zone is necessary after stopping which causes a smaller inching area.
- to 2) For „pre-opening doors“ or „inching with open door“ two door-zone supervisions independent of each other with security-circuit (SIS) are required according TRA.  
Not operated in EKM is the „door-zone (external for SIS)“, provided by a separate influence switch (independence). This door-zone is to compare with the door-zone „upper flush“ and „lower flush“, which is provided by SIS. For one door-signal only of two is booked to circuit the influence of only one of 2 criterias for SIS door-zone is possible. A de-coupling of signals by relays is not required according TRA.
- to 3) For special condition „ON with pre-opening doors“ the rule of TRA as said in item 2) is valid also. That means an additional signal „door-zone“ from separate influence switch is required (de-coupling by relay as said in item 2).

Description (part 1) <b>EKM64</b> Elevator control	<b>REKOB A</b>	<b>Page16</b>  of 16
--	----------------	----------------------------

to 4) Standard 2 is possible to drive (as for EKM16) too with „pulse“+interpole via direction.

### 2.3.1.2 Digital shaft-copying with pulse-generator

After plugging DSE-controller onto base-board and according parametrion terminals X57-X60 are prepared for connection of incremental pulse-generator.

X57 (A) : pulse A  
X58 (B) : pulse B (distorted for 90° to pulse A 0 for evaluation of torsion-direction)  
X59 (VB) : supply for pulse-generator (10Vdc, smoothed; proof against short-circuit)  
X60 (V0) : GND (0V)

The maximal pulse-frequency for inputs A and B is 1000 pulses per second.

To transmit movement of cabin onto pulse-generator following systems are proposed:

	pulse-generator – <u>pulses per turn</u>
a) tooth-belt with pulse-generator at diverting-pulley (d=8 or 15cm):	125
b) pulse-generator at rope-pulley of speed-limiter (d= approx. 30cm):	250

Caused resolutions by this and max. lift-speeds are:

pulse-generator pulses/turn	Ø pulley: 8cm		15cm		30cm	
	resolution mm	Vmax m/s	resolution mm	Vmax m/s	resolution mm	Vmax m/s
250	0,24	1,0	0,45	1,8	0,9	3,6
150	0,4	1,6	0,75	3,0	1,5	6,0
125	0,5	1,9	0,9	3,6	1,8	7,2
100	0,6	2,4	1,13	4,5	2,3	9,0

DSE-controller provides signals as listed in item 2.3.1.1. to EKM64 internally.

Using DSE, following inputs are booked firmly for reset-function:

- E4 HKU lower hard-correction: (010D) **I**  
bistabile influence switch, closed downward
- E16 HKO upper hard-correction: (010E) **I**  
bistabile influence switch, closed upward
- E3 HKI correction pulse – floor: (010F) **I**  
bistabile influence switch
  - for permanent correction in lifts with tolerances at mecanical transmission-system (example incremental pulse generator at speed-limiter)
  - allows more simplified set-up (learning-travels).

According rules of TRA 200 two independant door-zone controls for „pre-opening doors or inching with open door“ must be made. One of them is made by DSE, the second has to be realized with influence switches at door-zone and security circuit (SIS).

Parametrition and set-up is described in item „parametrition of DSE64“.

Description (part 1) <b>EKM64</b> Elevator control	<b>REKOB A</b>	<b>Page17</b>  of 17
--	----------------	----------------------------

## 2.3.2 Drive-control

### General notes on drive-control:

Following „general notes on drive-control“ are used for rope-traction- (regulated also) and hydraulic-drives and serve to common demands. The special notes for high-feature, regulated rope-traction-drives are listed after that.

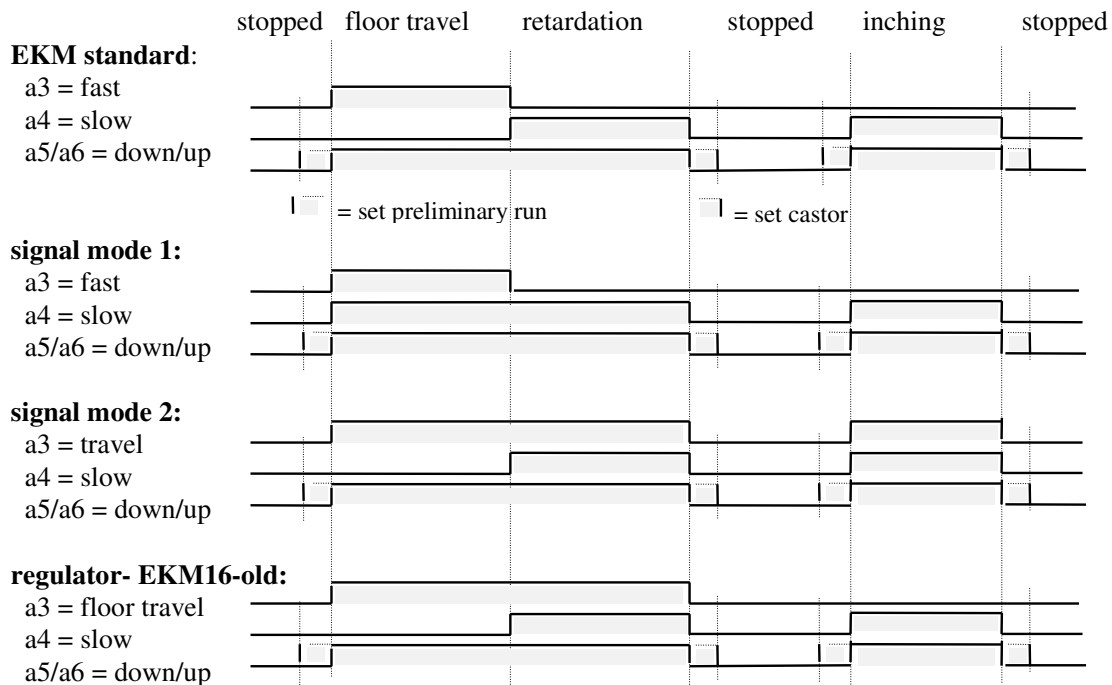
#### Main-outputs (direction)

• <b>Up</b>	direction upward	preliminary/castor_up [s]	(8000) <b>O</b>
• <b>Down</b>	direction downward	preliminary/castor_down [s]	(8001) <b>O</b>
• <b>Main</b>	direction up or down (incl. preliminary + castor)		(8002) <b>O</b>

#### Speeds

• <b>Floor travel</b>	fast or slow (not inching)	(8003) <b>O</b>
• <b>Travelling</b>	fast or slow or inching	(8004) <b>O</b>
• <b>Fast</b>	travel speed -fast	(8005) <b>O</b>
• <b>Slow</b>	travel speed -slow (inching or approaching)	(8006) <b>O</b>
• <b>Approaching</b>	travel speed while approaching (retardation)	(8007) <b>O</b>
• <b>Inching</b>	travel speed while inching	(8008) <b>O</b>

### former control-variants:



Preliminary-/castor-parametriton: If required, both directiond „up“ and „down“ could be given with preliminary

run and/or inching time.

Parametriton: in steps of 0.1s up to max. 5 sec. preliminary run resp. 8 sec. castor.

If no preliminary run/castor is desired, parameter must be set = „0“ [s].

Description (part 1) <b>EKM64</b> Elevator control	<b>REKOBÄ</b>	<b>Page18</b> of 18
--	---------------	------------------------

Parametrition of preliminary run / castor enables optimized control for example following requires:

- hydraulic lifts:
    - for star-triangle switching:
 

preliminary run UP:	0,3 - 1 sec.
preliminary run DOWN:	0
    - for motor-retardation:
 

castor UP:	0,3 to 0.5 sec.
castor DOWN:	0
  - rope-traction lifts:
    - in regulators for electrical breaking
 

castor UP:	2 to 3 sec.
castor DOWN:	2 to 3 sec.
- The real stop is signalized by regulator-output (usual signal „RELAYS“) synchronous by EKM64 input "drive stopped".

#### Drive-supervision (start-stop-information)

##### Parametrition:

- **Drive stopped** travel time (5, 10,...,40 sec) (0500) I

This input supervises travel-time of lift until stop (stop-signal). For this the signal voltage is to wire to this input in series to normally closed contacts of all direction- and speed-relays. First attraction of one of these relays starts travel-time supervision.

In case of overstepping the set maximal travel-time all relays as listed above and door-outputs will be released and the calls be cancelled.

If the cabin stops, „drive stopped“ resets all still existing inching-times (see above).

For power-start and after each travel a function-test of input „drive stopped“ is made.

Without this signal the message „drive-fault“ is shown and no new travel is given.

For parametrition of standard-files for input this input is booked to terminal E8.

#### Start-tries

After erasure of time for magnetic door-lock the drive will be operated. For a correct starting of drive the input „dive stopped“ must be without voltage then within 3 sec. (monitore of main relays).

If not, further tries of starting are made according parametrition:

( 1, 2, 3,..., 10 ).

In case these tries are without success also a door uncompletely closed is proposed and the command unit tries to erase this fault by a new try of door-close (see parameters of door).

#### Parametrition for „inching“

Inching means the adjustment of cabin to flush-level if this point was left unintentional (changings of load, lowering for hydraulic, arrival-fault). Inching requires acc. item 2.3.1.1 referring shaft pulses for shaft-copying and in case of inching with open door“ a security-circuit (also see item 2.2.3).

Parameters for „inching“ are:

- Inching: no, open (open door) , close (closes door before inching)
- Inching-force: yes, no  
(In case of force iching has preference before starting to an other stop.  
This has advantages for goods lifts, but causes time-waste for passenger lifts.)

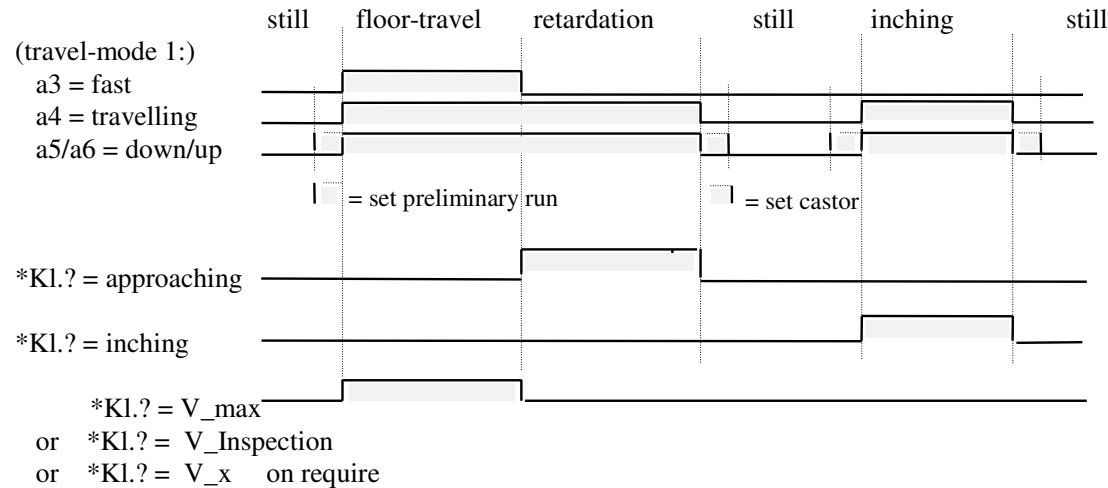
Description (part 1) <b>EKM64</b> Elevator control	<b>REKOB A</b>	<b>Page19</b>  of 19
--	----------------	----------------------------

Special outputs for regulators

These 6 signals distinguish several "fast" speeds for the floor-travel.

- **V\_MAX** maximal speed (8009) **O**
- **V\_Inspection** reduced speed for inspection-travel (800A) **O**
- **V\_1** short-floor-travel 1 (lowest) (800B) **O**
- **V\_2** short-floor-travel 2 (800C) **O**
- **V\_3** short-floor-travel 3 (800D) **O**
- **V\_4** short-floor-travel 4 (800E) **O**

Recommended relay-booking for regulated rope-tractions correspond to travel-mode 1:



- \*) - Output signals are to set according require and comfort of characteristics A or U at terminals on base-board.  
- For mode „serial regulator“ these outputs are not required for the regulator is controlled by serial interface (asynchronous report).  
- For speed regulators with inching the signal "inching" is additionally used (extra output; see above).

Serial regulator control:

Via serial interface 2 ( X7 ) a suitable regulator with serial report with nominal values could be operated.  
For this there is a parameter: serial regulator : yes, no

Description (part 1) <b>EKM64</b> Elevator control	<b>REKOB A</b>	Page20 of 20
--	----------------	-----------------

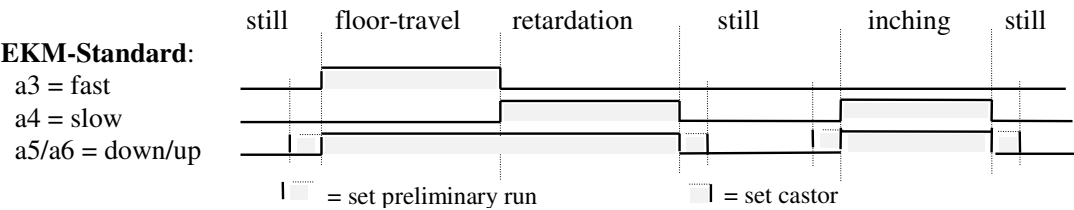
Drive-outputs free for parametrition

By „general outputs for drive-control“ including preliminary and castor the usual drive-controls are operated. For very individual control-problems there could be advantages if additional outputs with special switch-behaviour are available. Therefore it is possible to make free parametrition of those signal-outputs referring to times of switch-on and switch-off slope. Referring basis for such a „free-parametered drive-signal“ is one of „general drive-outputs“.

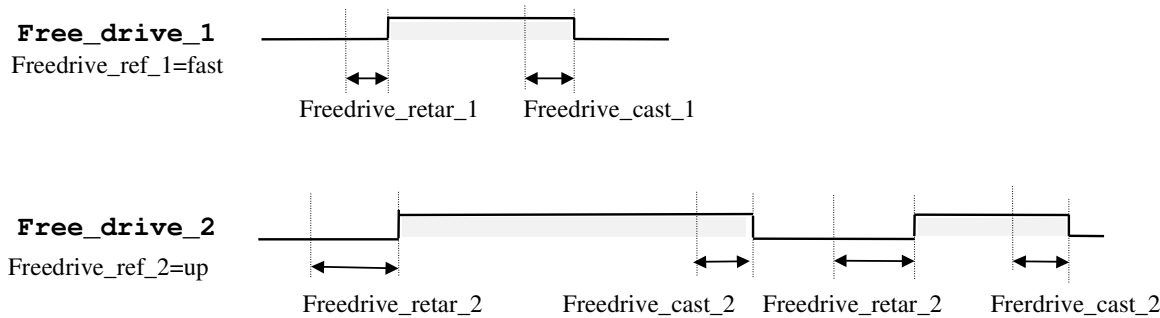
Parametrition

- **Free\_drive\_n**                      Freedrive\_ref\_n,                      (8010-8013) **O**  
   Freedrive\_retar\_n (0 to x sec)  
   Freedrive\_cast\_n (0 to x sec)  
n= (1 to 4) continuous no. of free parametered drive signal  
(automatical set Vergabe while parametrition (0 = no free drive-signal).

Example:            As output-basis travel-mode 2 with preliminary run and castor for „down“ and „up“ was choosen.



Following free drive-outputs are possible for example:



NOTE:            Retardation starts with beginning of referring signal, while castor\_n starts at castor-beginning of referring signal.

These drive-outputs are to set to terminals of characteristics O or U on base-board while parametrition of in- and outputs.

### 2.3.3 Door operation

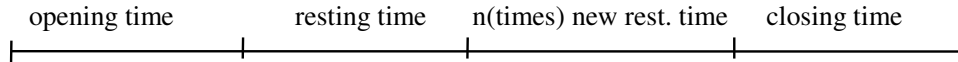
Door operation is set by „general door-parameters“ and using of in-/output-functions of door. It is designed on 2-door operation and could be set separately per door. The doors are operated selectively which means call- and door-open-functions refer to one door each. Input „close“ only operates on both doors.

#### General parameters on doors

Parameters marked with „\* “ are offered in input-level „insider “ only . Without „insider-parametrition“ the underlined standard values are important.

- |                           |   |                               |
|---------------------------|---|-------------------------------|
|                           |   | <u>Choose</u>                 |
| • <b>Amount of doors</b>  |   | (1, 2)                        |
| • <b>Load through</b>     | (for 2 doors)   |                               |
| yes:                      | Doors could open together for opening command.  |                               |
| no, level 1:              | Doors are opened one after the other. There are no limit switches requested. Closing is evaluated at security circuit. For faulty door the second door will open after <u>half</u> of set closing attempts, independant of succesful closing that door. Also new attempts of closing both doors will be done alternating eachother. |                               |
| no, level 2:              | As level 1, but after complete amount of set closing tries.   |                               |
| no, neither:              | Doors should never open together at same time. For this separate limit switches are requested for each door. In case of fault at limit switches the lift could block with „door fault“.   |                               |
| • <b>Door opening</b>     | Opening area of door after travel:  |                               |
|                           | in door zone   - (pre-opening door   - SIS necessary)   |                               |
|                           | in flush       - (normal case       - ! problems for regulators)  |                               |
|                           | if stopped     - (for electrical brake in regulated drives)   |                               |
| * <b>Opening retard.</b>  | if condition for opening of doors is given, waiting of set time will be done.   | (sec.: 0 , <u>0,2</u> ,...,5) |
| • <b>Interlock time</b>   | operation of interlock before output of travel-command or additional unchattering for secur. chain  | (sec.: 0 , <u>0,2</u> ,...,5) |
| • <b>Unlock time</b>      | time after switching off the interlock until output of „open door“  | (sec.: 0 , <u>0,2</u> ,...,5) |
| * <b>Closing attempts</b> | max. amount of closing attempts until „door-fault“  | (2,..., <u>6</u> ,...)        |
| • <b>Thronging</b>        | Closing against permanent light barrier after seconds ...   | ( <u>no</u> , 10, 20,...,60)  |
| • <b>Forced closing</b>   | max. amount of closing attempts before forced closing   | ( <u>no</u> , 3,5,7,10)       |

Door operation devides in following phases per door:



- |                             |   |                 |
|-----------------------------|---|-----------------|
| • <b>Opening time</b>       | control time for opening of door  | (sec; 1,2,...)  |
| • <b>Resting time</b>       | time for open door, inputs (like car calls) are awaited. Button „close door“ breaks resting time          | (sec; 1,2,...)  |
| • <b>New resting time</b>   | Renewed minimal resting time after light barrier or button „open door“                                    | (sec; 1,2,...)  |
| • <b>D.-move time close</b> | Control time for closing door   | (sec; 1,2,...)  |
| • <b>Reversing pause</b>    | reversing pause between „close door“ and „open door“ (example: for signal of light barrier while closing) | (sec;0, 0,2, 5) |

Description (part 1) <b>EKM64</b> Elevator control	<b>REKOB A</b>	<b>Page22</b>  of 22
--	----------------	----------------------------

**Door-existence:**

Per floor it is generally to set-up if doors are existing or not.

While parametrition it is to choose between:

booth doors , no door, 1.door, 2.door

Non existing stops are to set-up as no doors.

**Parking position of doors:**

In normal operation mode without calls a lift features the parking position of doors.

For other modes own door-positions are valid.

Position of door is to set-up global or per floor.

While parametrition it is to choose between:

closed, open, last open, 1.door open, 2.door open

**Door fault:** This fault is evaluated from security-chain grip „SK2“.

A door fault is recognized if set-up amount of „close attempts“ is reached once.

Door fault causes:

- temporary shut-down with open doors
- in groups: forwarding of hall calls
- fault-storage and external signalisation
- less attempts of fault-erasure by single closing attempts

4 tries each 2 min

8 „ 5 „

4 „ 15 „

permanent 30 „

First evaluation of „SK2“ and „Inspection/re-levelling“ will reset the door fault completely.

Important special travels (like „firemens ride“) ignore door fault.

**Inputs of door fault:**

- **Light bar. T1** light barrier of door 1 (0200) **I**
- **Light bar. T2** light barrier of door 2 (0201) **I**

A closed door will open and closing door reversed. Door remains open for new resting time after each signal. While travel and firemens ride this signal is without operation. For set „forced closing“ the door closed after set-up amounts of closing attempts (forced closing) or set-up time (throngle limit) and ignores the light barrier.

- **Close-door button** button for closing the doors (0202) **I**  
This button operates on both doors; if open: door will close;  
if opening it will close after total opening.

- **Close-door button hard** button for immediate closing the door (0203) **I**  
as close-door button but while opening an immediate closing is done  
after „reversing pause“ (door parameters).

- **Limit switch T1** limit switch for door 1 is closed (0204) **I**
- **Limit switch T2** limit switch for door 2 is closed (0205) **I**

These switches are to install for „load through“ with „no, neither“.

- **Open-door but. T1** button for opening of door 1 (0206) **I**
- **Open-door but. T2** button for opening of door 2 (0207) **I**

Button-inputs cause same reactions of door s as inputs for light barriers.

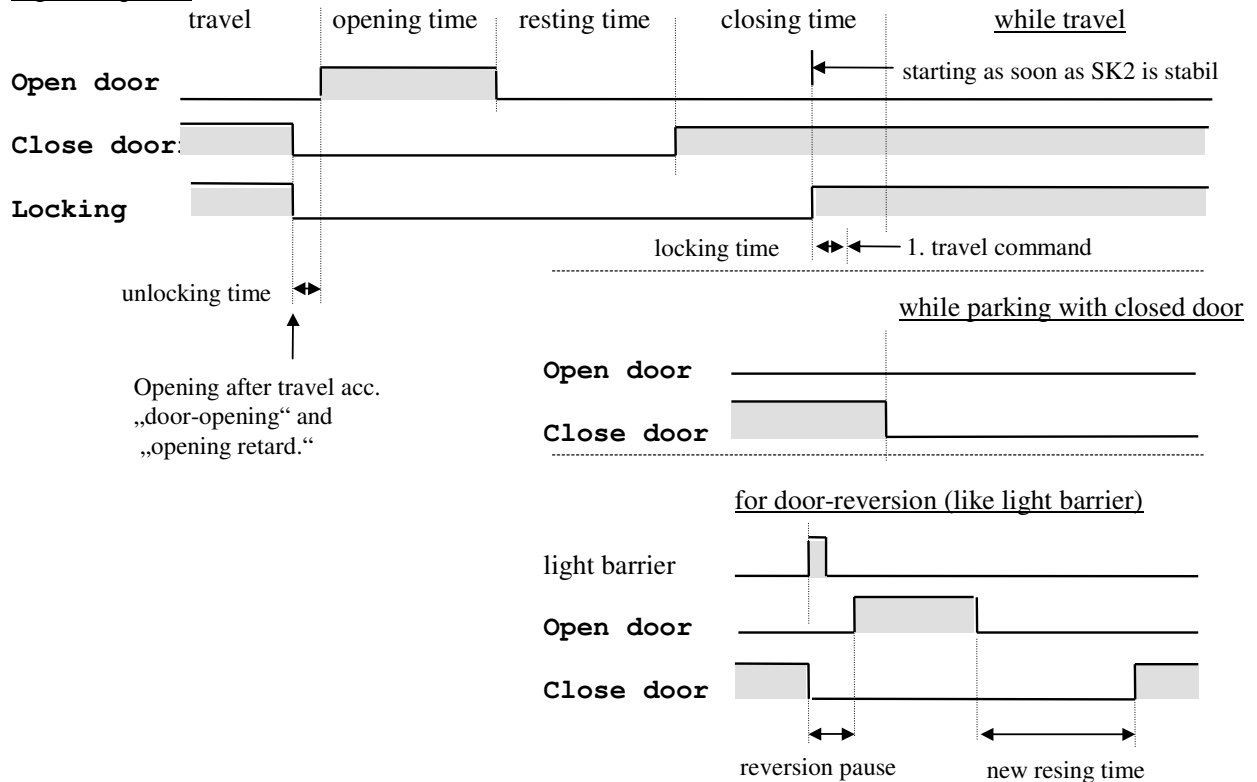
Additionally they operate for „forced closing“ and „firemens ride“ also.

Description (part 1) <b>EKM64</b> Elevator control	<b>REKOB A</b>	<b>Page23</b>  of 23
--	----------------	----------------------------

## Outputs for door control

- **Door-open T1** open door 1 (B000) **O**
- **Door-open T2** open door 2 (B100) **O**
  
- **Door-close T1** close door 1 (B001) **O**
- **Door-close T2** close door 2 (B101) **O**

### Signal-sequence:



- **Thronging T1** thronging of door 1 (B002) **O**
- **Thronging T2** thronging of door 2 (B102) **O**

This signal is given additionally to „close door“ for forced closing resp. thronging feature. It serves for controlling a slow closing of automatic doors (as example for a feasonable door-controlling device).

- **Looking** locking doors (B003) **O**  
This signal controls the interlock-magnet(s). Using this signal ensures controlling main relays without chattering and abration for travel command is made after a set-up „loocking time“. For arrival the „locking time“ prevents an opening of door against incomplete unlocking of doors.
  
- **Perm. open door T1** as „open door T1“, but also if the door is open (B004) **O**
- **Perm. open door T2** as „open door T2“, but also if the door is open (B104) **O**
  
- **Perm.close door T1** as „close door T1“, but also for closed parking (B003) **O**
- **Perm.close door T2** as „close door T2“, but during unlocking time (B103) **O**

Description (part 1) <b>EKM64</b> Elevator control	<b>REKOB A</b>	Page24 of 24
--	----------------	-----------------

### 2.3.4 Calls

During parametrization call functions are assigned to terminals. They include collection-characters, location of call

(door 1 or 2, car or hall) and number of floor.

The number of floor (01,02,03...- top floor) is shown in followings as xx. In groups the floors of all elevators are numbered continuously from bottom to top, independent of a lift could approach this floor.

Call functions include acknowledgement and request terminal-character U niversal (in- and output). Each call function could be set only once per elevator. Wiring in parallel of several call buttons is possible while regarding

the maximal tension for acknowledgment.

Collection-character of a call input influences serving the call (stopping with opening of door and call erasure). Each lift tries to continue in last travel direction and collect calls (serve them).

Collection is done:      - independent of direction for:      car calls, free-collectioning  
                                  - dependant of direction for:      downward-, upward- collection

A call will be served if travel direction meets collection character resp. it is the last in actual travel direction (direction-reversion). Aim of lift will be decided new at each stop after ending the resting time only. This serves

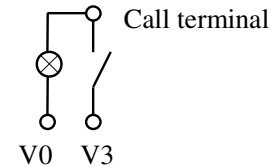
to calls of approached peoples.

Elevators of groups operate additionally to a special assignment of hall calls.

Collecting character could be assigned separately to each call button which permits an individual design of calls.

Call terminal reacts as input while pressing button and as output for acknowledgement.

Circuit:



Following call-functions exist:

#### Standardrufe:

<b>Car-call-T1-Hxx</b>	Cabin call for door 1 and stop xx	(40xx) U
<b>Car-call-T2-Hxx</b>	Cabin call for door 2 and stop xx	(50xx) U
<b>Hall-call-T1-Hxx</b>	Hall call non-collective for door 1 and stop xx	(41xx) U
<b>Hall-call-T2-Hxx</b>	Hall call non-collective for door 2 and stop xx	(51xx) U
<b>Call-up -T1-Hxx</b>	Hall call upward-collective for door 1 and stop xx	(42xx) U
<b>Call-up -T2-Hxx</b>	Hall call upward-collective for door 2 and stop xx	(52xx) U
<b>Call-down -T1-Hxx</b>	Hall call down-collective for door 1 and stop xx	(43xx) U
<b>Call-down -T2-Hxx</b>	Hall call down-collective for door 2 and stop xx	(53xx) U

Description (part 1) <b>EKM64</b> Elevator control	<b>REKOB A</b>	Page25 of 25
--	----------------	-----------------

### **Preference calls:**

**Call-PrefE-T1-Hxx**      Preference call SINGLE for door 1 and stop xx      (44xx) U  
**Call-PrefE-T2-Hxx**      Preference call SINGLE for door 2 and stop xx      (54xx) U  
Preference call will be operated by adjoined lift independant of group-inclusion. Car calls will be cancelled; hall calls will be erased for single elevator and forwarded in groups.

**Call-prefG-T1-Hxx**      Preference call GROUPE for door 1 and stop xx      (45xx) U  
**Call-prefG-T2-Hxx**      Preference call GROUPE for door 2 and stop xx      (55xx) U  
Preference call will be operated by most suitable elevator of group.  
Car calls will be erased; hall calls forwarded.

Preference call control: Preference lift travels to calling floor directly. For travel in opposite direction the lift stops with closed door and changes travel direction.  
For approaching the pref. call floor the door opens and one car call is expected within set-up „time for preference“ : ( 5,...,120 sec.; set-up see item 6.1.: special functions).  
Preference call priority could be kept on by a key in cabin for statical switch-on of „hall call lock“ (see item 2.3.8).

Preference calls are stored like standard calls and confirmed, so that an acknowledgement indication could be wired.

### **Zone calls (in lift groups only)**

Zone calls are hall calls independant of direction in elevator groups. Their lifts will operate different upper and lower zones. Concerning area call will be operated only by lift suitable for this zone, independant of direction.

**Call-max -T1-Hxx**      call for group-zone at top, door 1 and stop xx      (46xx) U  
**Call-max -T2-Hxx**      call for group-zone at top, door 2 and stop xx      (56xx) U  
upward-collective for the elevator which could reach to highest floor

**Call-min -T1-Hxx**      call for lowest group-zone, door 1 and stop xx      (47xx) U  
**Call-min -T2-Hxx**      call for lowest group-zone, door 2 and stop xx      (57xx) U  
upward-collecting for the lift which could reach lowest floor

**Special call control** (for call-lock or load-meassurings) see item 2.3.8

Description (part 1) <b>EKM64</b> Elevator control	<b>REKOB A</b>	<b>Page26</b>  of 26
--	----------------	----------------------------

### 2.3.5 Indications: position, aim, next travel direction, gong

Indications are split as follows:

- **position indication** : permanent indication of floor in which the elevator is located.  
(changing to a new position is done during travel while approaching the retardation signal to this floor.)
- **Aim indication** : permanent indication of aim-floor  
(example: pre-indication for groups)

Output of position and aim are possible in following variants:

1to1: each terminal offers one floor (like lightened digits or segment-displays with 1 to 1-control).  
With „xx“ the stop (01,02,...) for the output while approachign is set.

Cray: output is done in Cray-code ( control of displays with saving wires )  
( usual for scrolling displays )  
necessary terminals (pin=0p): 01 + 02 + 03 + 04 + 05 + 06  
up to max. 2 3 7 15 31 63 stop

BCD: output is done in BCD-code (control of displays with saving wires )  
necessary terminals (pin=0p): 01 + 02 + 03 + 04 + 05 + 06 + 07  
up to max. 2 3 7 9 19 39 79 stop

BIN: output is done in binary-code (control of displays with saving wires )  
necessary terminals (pin=0p): 01 + 02 + 03 + 04 + 05 + 06 + 07  
up to max. 2 3 7 15 31 63 stop

...free: output is done in any coding for free controlling (more on request).

For blocking outputs for position and aim following functions are available:

- **No position** position is not known
- **No aim** no aim exists

Following output-functions generate above said indications:

<b>Posit. 1to1 Hxx</b>	position indication	(90xx) <b>O</b>
<b>Posit. BCD P0p</b>		(910p) <b>O</b>
<b>Posit. GRAY P0p</b>		(920p) <b>O</b>
<b>Posit. BIN P0p</b>		(930p) <b>O</b>
<b>Posit. FREE P0p</b>		(940p) <b>O</b>
<b>No position</b>		(9500) <b>O</b>
<b>Aim 1to1 Hxx</b>	indication of aim	(A0xx) <b>O</b>
<b>Aim BCD P0p</b>		(A10p) <b>O</b>
<b>Aim GRAY P0p</b>		(A20p) <b>O</b>
<b>Aim BIN P0p</b>		(A30p) <b>O</b>
<b>Aim FREE P0p</b>		(A40p) <b>O</b>
<b>No aim</b>		(A500) <b>O</b>

Attention: - For groups the counting of stops is done referring to group independant of single lift would approach the stop.  
- Aim indications depend in groups generally to changings in aim of lifts. That means that using these indications the group-function „Aim-beware“ should be set-up.

Description (part 1) <b>EKM64</b> Elevator control	<b>REKOB A</b>	<b>Page27</b> of 27
--	----------------	------------------------

- **Next travel direction:** indication of next travel direction (arrows) independant of floor.

For indication following variants are possible:

		Indication during	
A)		x approach - resting -	start
B)		x approach - resting - waiting time -	start
C)		travel x approach - resting	start
D)	(always)	travel x approach - resting - waiting time -	start
		( x = retardation point )	

Next travel indication offers -dependant on direction- followings:

-while travel „fast“ : direction of travel  
 -since retardation : preferenced next direction at this time  
 -since resting : eventually a new decided direction or both directions while waiting time

<b>Next dir.-A-up</b>	Next travel direction	indication type: A	(A600) <b>O</b>
<b>Next dir.-A-down</b>			(A601) <b>O</b>
<b>Next dir.-B-up</b>		indication type: B	(A602) <b>O</b>
<b>Next dir.-B-down</b>			(A603) <b>O</b>
<b>Next dir.-C-up</b>		indication type: C	(A604) <b>O</b>
<b>Next dir.-C-down</b>			(A605) <b>O</b>
<b>Next dir.-D-up</b>		indication type: D	(A606) <b>O</b>
<b>Next dir.-D-down</b>			(A607) <b>O</b>

- **Next travel direction-floor indic. :** Indication of direction depending on floor (arrows)  
 Indication from retardation while approaching this floor until end of resting time resp. until starting for a new aim.

<b>Next dir.up-Hxx</b>	Indic. next travel direction UP at stop xx (01,02,...)	(07xx) <b>O</b>
<b>Next dir.down-Hxx</b>	Indic. next travel direction DOWN at stop xx (01,02,...)	(08xx) <b>O</b>

- **Floor gong** : for arrival-indication at retardation point (gong per floor)  
**Floor gong-Hxx** Arrival gong at stop xx (01,02, ) (09xx) **O**

**Cabin gong** : for arrival-indication (gong on cabin)  
 The signal could be made short after retardation point for better acoustical distinction by parametritition.

<b>Cabin gong</b>	Arrival gong on cabin	gong-retardation (0,0.5,...,5sec.)	<u>Parametritition</u> (0608)
<b>O</b>			

Description (part 1) <b>EKM64</b> Elevator control	<b>REKOB A</b>	Page28 of 28
--	----------------	-----------------

### 2.3.6 Inspection and re-levelling

Inspection and re-levelling are special travel-modes for manual control by service-technicians.

In inspection mode the travels „UP“ and „DOWN“ are possible in normal travel area only (between lowest and highest floor).

For re-levelling the lift is moveable out of this zone also with slow speed.

In both cases the normal operation mode is interrupted, cabin-doors will be closed and set calls cancelled.

Two control-variancies are possible for this:

- 1.variant: with 6 input signals  
Inspection-signal (from inspection box on cabin-roof) blockes all re-levelling signals (from controller).  
That means that there would be no danger to inspectors for any operation at controller. For there is separated UP/DOWN for inspection and re-levelling, no external blockings are necessary.
- 2.variant: with 4 input signals  
Signals „insp., re-levelling UP/DOWN“ are used as well for inspections as for re-levelling.  
It is to ensure that for common operation of inspection + re-levelling the signals „insp., re-levelling UP/DOWN“ are feed by inspection only.

#### inputs

		use for variants:		1	2
• inspection-IN		x		x	(0300) I
• inspection-UP		x			(0301) I
• inspection-DOWN		x			(0302) I
• re-levelling-IN		x	x		(0303) I
• re-levelling-UP		x			(0304) I
• re-levelling-DOWN		x			(0305) I
• insp.re-level-UP				x	(0306) I
• insp.re-level-DOWN				x	(0307) I
• i/r-slow	i/r-slow-travel (if requested)	(x)	(x)		(0308) I

Between last floors inspection travel is done „fast“(V\_inspection).

In area of last floor it will be reduced automatically to slow, referring to regulator.

Release of „UP“ or „DOWN“ causes always a „immediate stop“ for security reasons, as a „dead man-control“.

Common set of „UP“ and „DOWN“ are allowed and act as non of them.

For fast elevators the additional input i/r-slow is proposed. If this is set (even as pulse), a reduction to slow is done. This causes relative fast inspection with smooth stopping.

Description (part 1) <b>EKM64</b> Elevator control	<b>REKOB A</b>	Page <b>29</b>  of 29
--	----------------	-----------------------------

## 2.3.7 Special travels

### 2.3.7.1 Firemens ride

Depending on specific demands in countries three variants of firemens ride are realized. During parametrition it is to decide between:

firemens ride: non, standard, mode 1, mode 2

For firemens rides special buttons (key-switches) are placed which operate to following inputs:

- |                        |  |  |
|------------------------|--|--|
| • <b>firem.-hall-n</b> | (cont. no. of firemens call: 1-4 in order to aim-stop) | <u>Parametrition</u><br>(0B00-03) <b>I</b> |
|                        | (firemens_availability: 10sec., ... 2min.)             |  |
| • <b>firem.-car</b>    |  | (0B04) <b>I</b>                            |

Fir signal „firem.-hall-n“ the lift travels to set-up stop. For this already begun travels will be stopped, all calls erased and light barrier ignored (forced closing). Door-open button remains in function. For firemens calls at same time no.1 has highest priority.

Further behaviour:

Standard: In aim floor lift opens the doors and awaits the signal „firem.-car“.

Set-up firemens-availability serves for entering. firemens car-key has highest priority (against hall). The lift reacts for firemens car-key on car calls only; each switch side of key erases all car calls and light barrier will be ignored. Door-open button incl. characters for door-opening remain set-up normal function.

Alternatively to signal „firem.-car“ the signal „hall call lock“ could be set with same causes. Preferred signal „firem.-hall“ than has to be switched off before. Light barrier remains in function.

Mode 1: Calling of lift is done as in „standard“. For firemens ride with car-control the doors at aim-stop won't be opened automatically resp. closed. This is done for permanent operation of door-open- resp. door-close button. With release of button before end of opening-/ closing-time a reversion of door is made. After each arrival all calls will be erased.

Mode 2: After calling (as standard) an automatic reversion onto car call control is done (without firemens key in car). Key remain plugged at calling station (permanent signal firem.-hall-n).

### 2.3.7.2 Parking travel

A parking travel is caused in case of missing call after set-up park time (5-60sec.).

By parametrition following variancies are selectable:

Parking travel: non, simple, dynamic, several aims, TESIM-parking clock

simple: Set-up parking floor will moved always.

dynamic: Parking floor, set per lift, will be changed in group-mode between the lifts (see special group-functions).

several aims: Parking floors (max 4) depend on input signals.

- |                           |  |  |
|---------------------------|--|--|
| • <b>Parking travel-n</b> | (cont. no. parking floor: 1-4 with adaption of p.-aim) | <u>Parametrition</u><br>(0B05-08) <b>I</b> |
|---------------------------|--|--|

TESIM-parking clock: By TESIM-inputs any of max. 4 time-zones could be adapted to different parking aims. The dynamic exchange of actual parking aims in group-mode is chooseable.

In all parking modes a „park-tolerancy“: 0, 1, ... max. 5 is to set-up. This distinguishes the distance (amount of stops) which will not cause a parking travel (saving energy).

In case of calls a parking travel will be breaked.

Description (part 1) <b>EKM64</b> Elevator control	<b>REKOB A</b>	Page <b>30</b>  of 30
--	----------------	-----------------------------

2.3.7.3 Shut-off / Out of operation

In case of shut-off an elevator this one erases the calls, closes the door, travels to set-up floor, opens the door to discharge cabine (resting time of door) and than closes the door. Door-OPEN-button or each car call will cause temporary opening of door. The output „out of order“ is active for closed door and could be used for controlling of concerning indicator and for example thecabin-light.

While parametrition it is to select: shut-off: - no  
- standard

Shut-off in standard is done by a static signal at one of inputs to set-up:

- **Shut-off** shut-off stop
- parametrition  
(0B09) **I**

For output signal „out of order“ an output is to set-up on request:

- **Out of order**
- (8400) **O**

2.3.7.4 Evacuation-travel and travel-lock

Evacuation-travel serves in case of main power problems to a shut-off of lifts one after eachother and if requested to operation of an emergency elevator. It is useable for elevator groups but also for one or more single lifts. While parametrition it is to select:

Evacuation : no  
to fix aim (by input of an evacuation floor)  
to next stop

To this following signals serve:

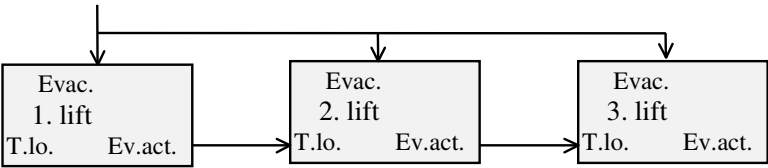
- **Evacuation**
  - **Evacuat. activ**
  - **Travel-lock**
- (for mode 1: evacuation floor)  
parametrition  
(0B0A) **I**  
(8401) **O**  
(0B0B) **I**

Function: By signal „evacuation“ lifts go to evacuation-feature, calls will be erased and output signals „evacuat. activ“ are switches on. This causes a travel-lock besides emergency lift or first lift (stopping with slow). The emergency or first lift will feature first an emergency-travel and waits with open door. It switches-off „evacuat.-activ“ and starts second lift in that chain for emergency-travel. After evacuation of last lift the emergency elevator will restart automatically the operation. Variants „with“ or „without“ emergency lift are caused by following circuits

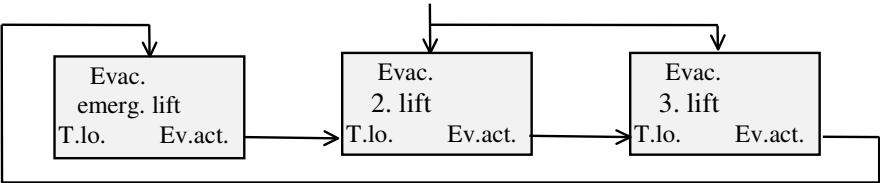
only:

Wiring principle:

without emerg. lift



with emerg. lift



Input „travel lock“ could be used out of evacuation-feature also.

Description (part 1) <b>EKM64</b> Elevator control	<b>REKOB</b>	Page <b>31</b>  of 31
--	--------------	-----------------------------

### 2.3.7.5 Lowering travel

For set-up lowering travel a travel to lowest stop will be done in case that within set-up time there is no travel for call. The lift remains in lowest floor with parking position of door according parametrization. Lowering travel is broken in case of a call.

Parametrization: lowering travel no, yes (1-16min)

### 2.3.7.6 Warm-up travel

For set warm-up travel the elevator makes a travel according warm-up cycle to highest stop and back in case this mode is active by an input signal (used for hydraulic lifts during winter).

#### Parametrization

- **Warm-up operation** warm-up travel: no, yes (0B0C) I  
warm-up cycle: up to max.120 min.)

### 2.3.7.7 Light barrier stop

For elevators without cabin-door light barriers are demanded. For the light barrier an input function is available:

- **Light barrier stop** (0B0D) I

This input is operating while travel only. In case of signal input the lift stops and all calls are erased (hall calls will be forwarded in groups).

Special travels lowering, parking, warm-up and position-correction become ineffective.

New travel is done by new car call or privileged travels (firemens, inspection, re-levelling) only.

### 2.3.7.8 Orientation travel

By this travel the control receives the position of cabin. The command unit starts orientation travel for following states:

- After lost of „position“-information (display indication: posit. =?? ;external pos. indications are off)
- After a test of system in case that position could not be realized.

Orientation travel is done as set-up (see parametrization of drives)

RESET-mode: - standard (orientation travel downward)  
- to top (orientation travel upward )

During resting within correction areas the orientation could also be done to a stop in the middle.

### 2.3.7.9 Travel for position-correction

In case of lift rests between floors because of a fault (security chain, thermic stop) or after ending of inspection/re-levelling the display resp. position indicators show neighbouring floors alternating.

If the cause is clarified the lift will do automatically a travel to next floor with display-indication

„=pos.-correct.“ off, in case of no other activity (like a call) is done.

This travel is also done even if there is no door in that floor.

Description (part 1) <b>EKM64</b> Elevator control	<b>REKOB A</b>	Page32 of 32
--	----------------	-----------------

### 2.3.8 Special call control (also for load-measuring)

Full load: For input signal „full load“ the hall calls will be ignored but not erased.  
New hall calls will be accepted even though.  
The lift will serve on car calls only until this signal is switched off.  
Independent of set-up parking position the door is open while parking.  
This signal could also be used as „non erasing hall call lock“.

- **Full load** (0400) **I**

Overload: For input signal „overload“ the lift remains in floor with open door and erased all car calls.  
Hall calls will be ignored but not erased.  
In case of „overload“ appears during travel (load-shocks) the lift stops at next floor with open door.

- **Overload** (0401) **I**

Hall call lock: This input signal locks hall calls statical (erasure for single lifts, forwarding in groups) and car calls in each switching-flank also. Parking position of door becomes „open“.  
Travelling is possible by car calls.

- **Hall call lock** (0402) **I**

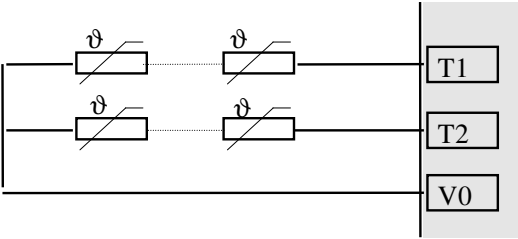
Call lock: This input signal locks all calls (erasing car calls, erasing hall calls for single lifts and forwarding in groups) statical and blocks registration of call.  
Parking position of door becomes „open“.

- **Call lock** (0403) **I**

Description (part 1) <b>EKM64</b> Elevator control	<b>REKOB A</b>	Page <b>33</b>  of 33
--	----------------	-----------------------------

2.3.9 Thermic surveyance of drive

There are 2 inputs independant of eachother for thermic surveillance of drives. They are designed for motor-protection sensor acc. DIN 44081/ DIN 44082. To each input up to 6 PTC-resistors could be wired in a row.



Inputs T1 or T2 cause a temporary shut-off of lift for set-up time while reaching the point „warm“, until state „cold“ is get.

		<u>LED-indication</u>	<u>hysteresis</u>
Input-states are:	operation (cold)	ON	1,5 to 2,3KΩ
	shut-off (warm)	OFF	2,5 to 3,6KΩ

Lift tries to reach within shut-off time the next stop (thermal stop travel) and remains there with open doors.  
All calls will be erased.  
If the operation-hysteresis is received again the lift will restart operation.  
Thermical surveyance operates during inspection and re-levelling also.  
In case of a thermic input is not booked the „thermic surveyance“ is to set-up with „no“.

The shut-off times (see item 6.1. special functions)  
are: Thermal shut-off 1: no, at once, after 5, 10, 20, 30 sec.  
Thermal shut-off 2: no, at once, after 5, 10, 20, 30 sec.

On display is shown while shut-off travel: ! Thermic travel !  
during shut-off: ! Thermic stop 1! resp. ! Thermic stop 2 !

This shut-off function could be caused by external contacts (normally closed) for other usings.

If next floor isn't reached within shut-up time a shut-off at once is done.

### 3 Decentral components

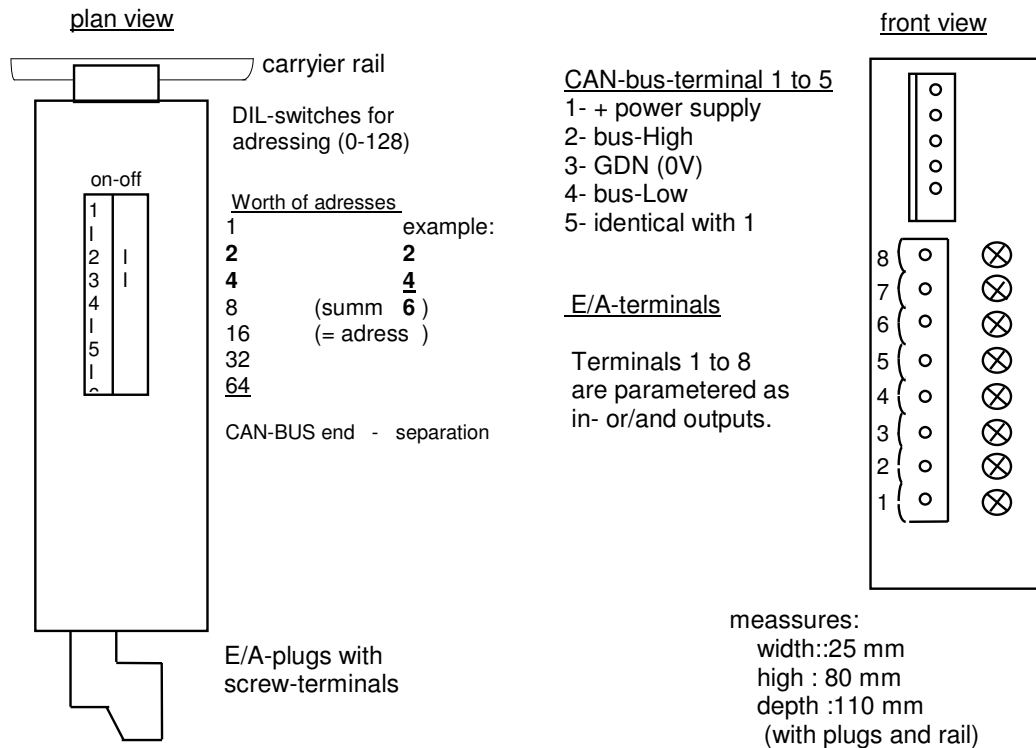
#### 3.1 Universal in-/output module 6408

The universal in-/output module (6408) in housing of plastics has

- 8 universal in-outputs for free parametriton (terminal characteristics „U“) with LED-indicator
- CAN-bus terminal incl. power supply
- DIP-switch (8-bit) for set of adresses
- clamp for carrier-rail

The I/O-module is designed for following uses:

- Extention-device to command unit EKM64  
Via CAN-bus up to 128 I/O-modules for extention of command unit are wirable.  
The I/O-modules are mounted onto carrier-rail as an intelligent terminal into controller and ensure a minimal internal wiring (CAN-bus) and have pluggable terminals.
- Cabin module  
Cabin I/O-signals are wired decentral onto I/O-modules and via CAN-bus transmitted in trail-cable.  
The I/O-modules could be snapped-in onto carriers in inspection-box.
- Decentral in- and outputs (like larger position indicators)carr



Power supply: at V3 (24Vdc unsmoothed) or other voltage 12V-24Vdc (unsmoothed).  
against V0 ( GDN 0V)

inputs: max 24Vdc (unsmoothed) or max.40Vdc (smoothed)

outputs: as main supply max.300mA; protected against temporary short-circuit.

Description (part 1) <b>EKM64</b> Elevator control	<b>REKOB</b>	Page35 of 35
--	--------------	-----------------

3.2
Floor module 6406

This module serves for wiring the floor signals and their transmission via CAN-BUS.  
 The module is a printed circuit board and could be mounted within shaft into given housing or into a housing of plastics which would be delivered.

- Floor module (6406) has
 

5 universal in-/outputs, free for parametrition
 

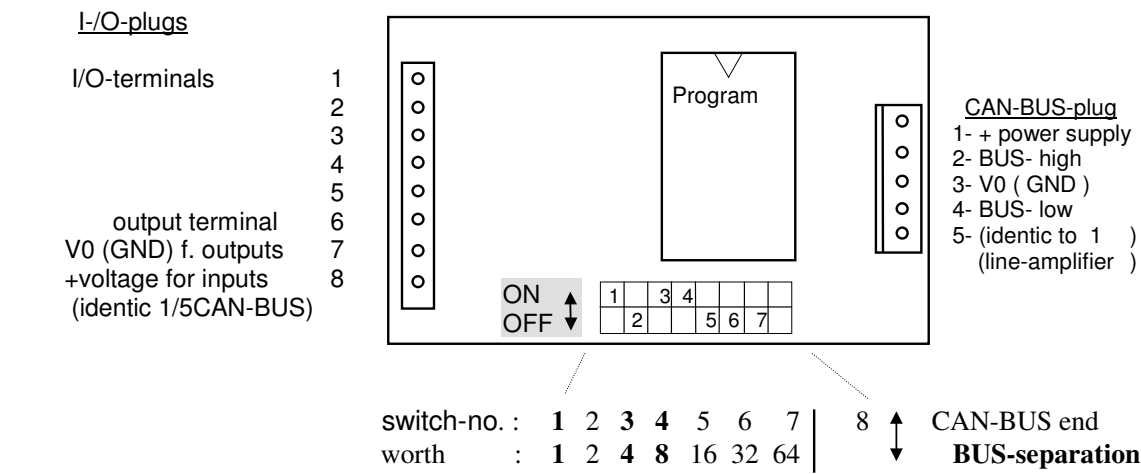
)
 plugs with screw-terminals

1 free useable output terminal
 

)

CAN-BUS plug, 5-polar with insulation displacement technics

DIP-switch (8-polar) for adress-setting and marking „CAN-BUS end“



Adresses of CAN-BUS user are set by DIL-switches 1-7. They accord to sum of switched-on worthes and could therefor add between 0 and 125.  
 Above picture shows summ of worth „13“ which refers to adress at CAN-BUS.  
 By switch 8 it is to set-up if CAN-user is placed at a separation or at end of BUS-line.

measures:	without housing	in housing for mounting onto wall
widthe :	80 mm (plus wiring-spaces)	120mm, plus 30mm for mounting
high :	55 mm	65 mm
depth :	approx. 35mm (incl. plug)	40 mm
power supply :	By CAN-BUS plug supply voltage V3: + 24Vdc (unsmoothed) against V0 (GND) is attracted. ( V3 is feeded by V1 via fuse. A separate plus-voltage could also be used, ) ( referring to V0 for floor module. ) Voltage of CAN-BUS plug is also available at terminal 8 of I/O-plug for supply of signal generators.	

Maximal length of in-/output lines is 5 meter.  
 Function-parametrition of terminals 1-7 is done by service module.

### 3.3 Relay module 6416

This module realises potential-free output of signals for transmission via CAN-BUS by 8 normally open contacts. This enables control of powerful or 230V consumers in addition to I/O-module. The relay module could be operated as code-transfer-circuit also.

Following types of relay modules are available:

- 6416 standard : with 8 relay-outputs and control via CAN-Bus
- 6416 code-transfer : with 8 relay-outputs, controlled via 8 inputs and code-transfer-circuit.

This module is manufactured as printed circuit board and is delivered with base-housing of plastics for snap-in onto carrier-rails.

Relay module 6416 has:

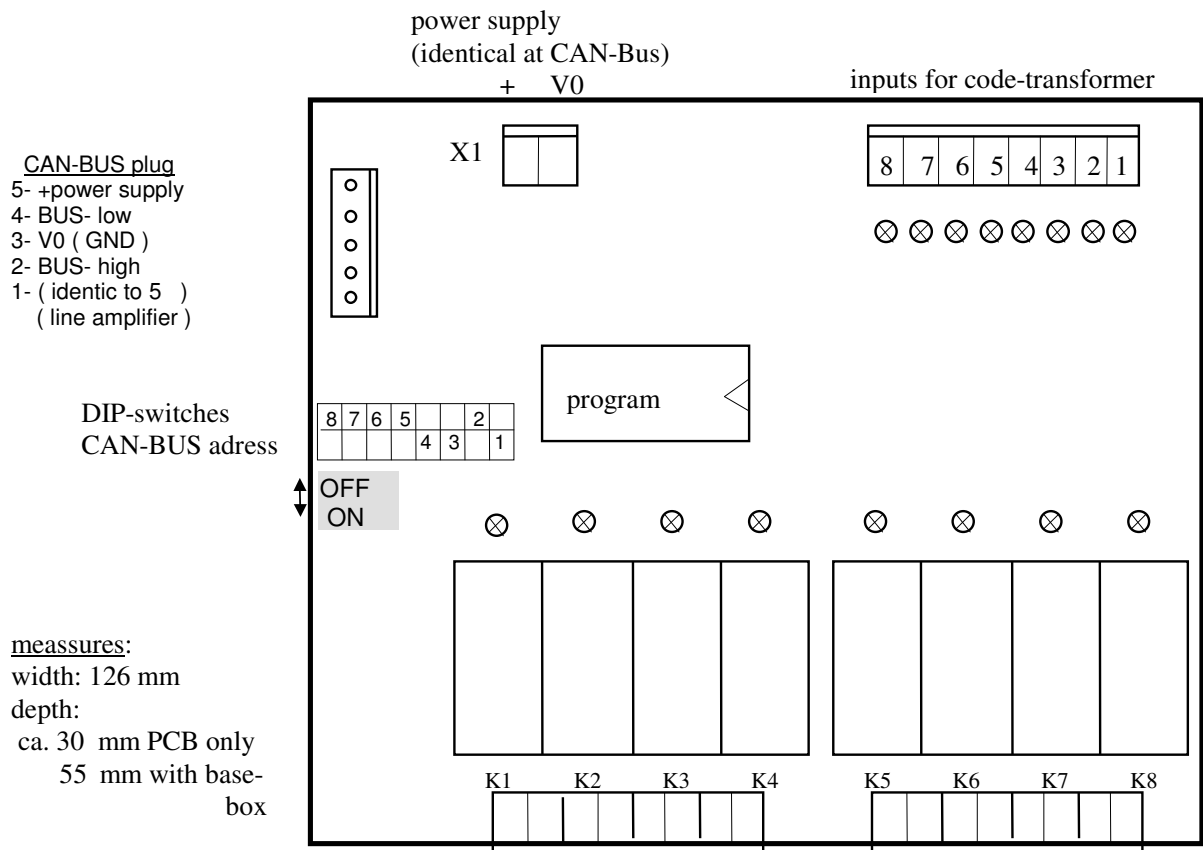
8 output-relays (1 norm. open contact each at plug-terminals and LED-indication)

CAN-BUS plug, 5-polar for insulation displacement technics

8 inputs with LED-indication for type „code-transfer-circuit“

DIP-switches (8-polar) for set-up addresses and end of CAN-BUS

(Addresses for CAN-BUS are to set-up analogue to floor module -item 3.2.)



8 relay-outputs (potential-free, norm. open contacts)

I<sub>max</sub>: 4A U<sub>max</sub>: 230V AC

Power supply:

Via CAN-BUS plug the supply voltage for module V3: + 24Vdc unsmoothed against V0 (GND) is attracted.

(V3 is feed by V1 via fuse. A special +voltage with base to V0 for relays module is possible also.)

Supply voltage could be feed via plug-terminal X1 also.

Functions for relay-outputs are to set-up for „standard“.

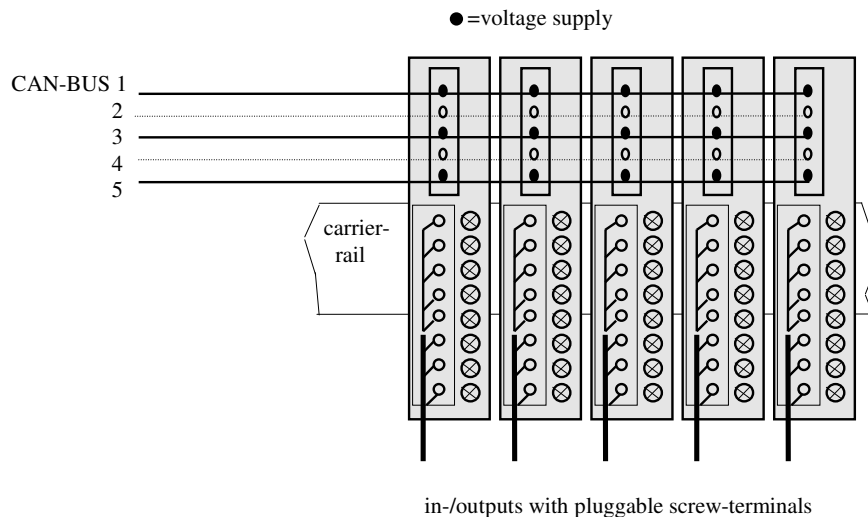
Description (part 1) <b>EKM64</b> Elevator control	<b>REKOB A</b>	<b>Page37</b>  of 37
--	----------------	----------------------------

### 3.4 Intelligent terminals

Universal in-/output-modules 6408 serve also for any extension of in- and outputs of command unit. They could be placed decentral or within control panel. The modules are designed for unbroken lining onto carrier rail. For installation within control panel an „intelligent terminal“ with LED-indication of signals at terminals is received. Modules are connected together by 5-polar wire, starting at „hall CAN-Bus“. At modules in-/outputs are also given pluggable for essential reduction of internal wiring in control panel.

CAN-BUS system consists of five lines:

1. + voltage supply
2. CAN- high
3. - voltage supply (V0 = GND)
4. CAN- low
5. (identical to 1. –diameter-extension)



### 3.5 Shaft-wiring

System EKM64 enables both: single-wiring of all signals for central elevator control as well as using a serial CAN-BUS. For CAN-BUS all signals which are not relevant for security (calls, indications, gong and others) are transmitted between floor modules 6406 and command unit via pluggable CAN-BUS lines. In special installations several floor modules, I/O modules 6408 or relay modules 6416 are useable also.

For layout of wires 1/5 and 3 (see 3.4.) the maximal tension load is relevant.

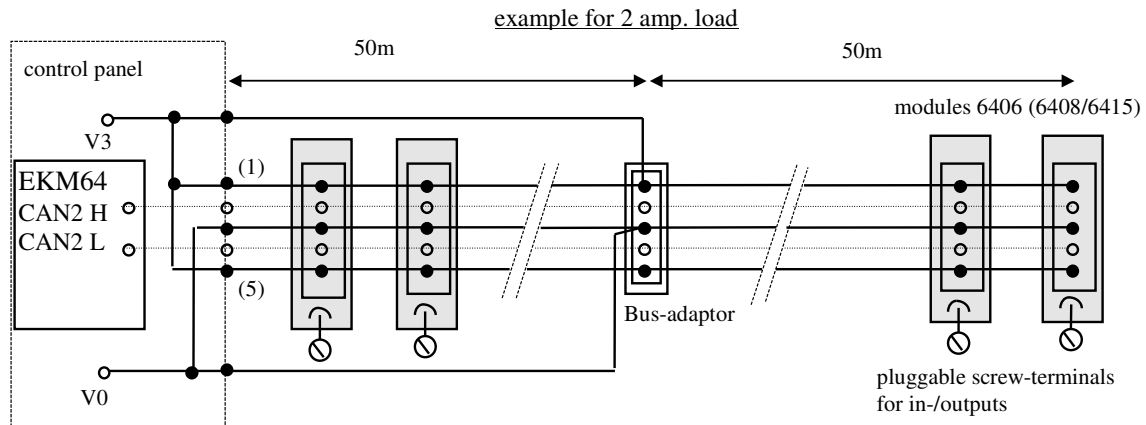
For a diameter of 1mm<sup>2</sup> more than 100m with 1 ampere is allowed.

In case of higher loadings at BUS the supply-wires are to extend by additional feeds as follows.

- |           |                   |
|-----------|-------------------|
| up to 2A: | approx. every 50m |
| up to 3A: | approx. every 30m |
| up to 4A: | approx. every 25m |

Description (part 1) <b>EKM64</b> Elevator control	<b>REKOBÄ</b>	Page38 of 38
--	---------------	-----------------

The 5-polar cable within shaft is designed with separation-plugs in insulation displacement technics at face or in pre-mounting. These plugs are plugged directly onto modules or BUS-adaptor for voltage supply.



Within CAN-BUS following lines (signals) couldn't be transmitted:

- 230V lines: like shaft light
- security-relevant signals: like (security chain) emerg. limit switch, door-limit switches, interlocks, etc.
- signals of other voltages

### 3.6 Serial cabin-wiring

Universal in- and output modules 6408 are used for serial signal transmission between cabin and control panel also. For this the command unit has a „cabin-CAN-BUS terminal“. I/O-modules could be snapped-in onto carrier rails within inspection box as „intelligent terminal“. The 5-polar CAN-BUS wire connects the modules (see item 3.4.). In special installations the relay module 6416 is wirable also. In-/outputs are booked by plugs from cabin panels, indications and others. Function of terminal accords parametrization at command unit. For this the relevant adress is to set-up at each module. Signal-state is perceptable by LED. „Cabin CAN-BUS“ is mounted within trail-cable besides other wires.

For necessary diameter of V0/V3-wires in trail-cable the maximal tension-load for outputs and length of cable (machine room + trail-cable) is important analogue item 3.5.

Diameter results as follows:

$$\text{diameter [mm}^2\text{]} = \frac{\text{max. output load [A]} \times \text{cable-length [m]}}{100}$$

Within cabin CAN-BUS following usual lines (signals) are not possible:

- 230V lines : like cabin light
- security relevant signals : like (security chain) limit switch of door, interlocks etc.
- special voltages : emerg. power supply, alarm button
- analogue signals : lines for emergency intercom

Description (part 1) <b>EKM64</b> Elevator control	<b>REKOB</b>	<b>Page39</b>  of 39
--	--------------	----------------------------

CAN-BUS driver 6403

For operation under strong influences a special interface for trail-cables was designed which enlarges the surely high influence-security of CAN-BUS further. It could be added to un-shielded trail-cables later if required. The CAN-BUS driver is available as printed circuit board or with housing of plastics for snap-in onto carrier-rail.

V3/V0: power supply (24Vdc)  
for CAN-BUS driver and -consumers

CL/CH: CAN-BUS wires (low, high)

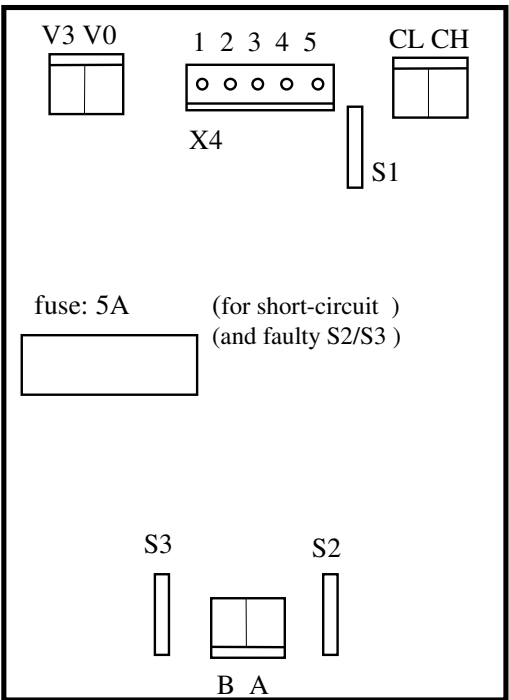
A/B: serial REKOBA -bus (two-line)

S1: switch for ennd of bus  
(to close for both drivers)

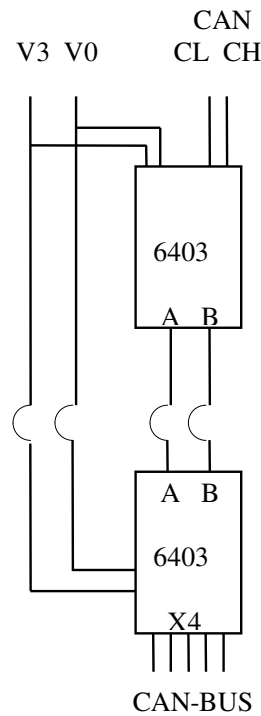
S2/S3 circuit of power supply:  
towards control: closed  
towards cabin: open

X4 CAN-BUS plug (electrical identic)

1- +power supply	terminal : V3
2- BUS- high	" : CH
3- V0 ( GND )	" : V0
4- BUS- low	" : CL
5- ( identic to 1 )	" : V3
( line amplifier )	



Circuit:



Controller  
S1=closed  
S2/S3= closed

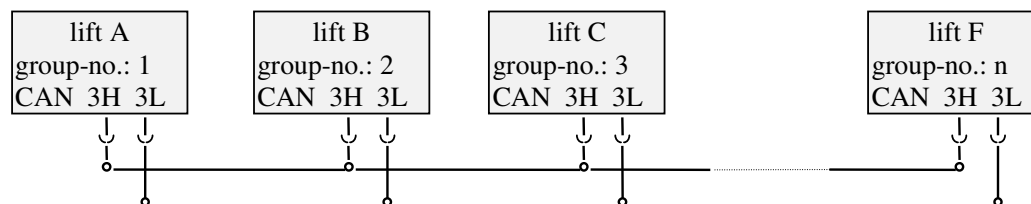
Cabin  
S1= closed  
S2/S3=open

measures:  
width: 74 mm  
high: 108 mm

Description (part 1) <b>EKM64</b> Elevator control	<b>REKOBA</b>	Page <b>40</b>  of 40
--	---------------	-----------------------------

## 4. Group operation

System EKM 64 enables to create a group of up to 8 lifts. Connection of single lifts is done by a 2-line group CAN-BUS with pluggable screw-terminals according following drawing:



Onto base-board a switch X87 is booked to group CAN-BUS (end of BUS).  
This switch must be closed for first and last lift, otherwise open.

For basic-parametrittion of each elevator following dates are asked:

amount of lifts (in group): (1 to 8; for >1 more dates)  
lowest stop: ) see item „calls“  
highest stop: ) “  
highest group-stop: ) “  
group-no.: continued number (1-8) identical to arrangement of connection

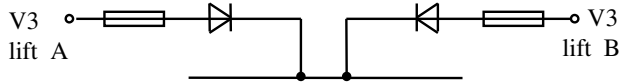
### 4.1 Hall call organisation

For booking of hall call buttons several variants are possible:

- 1. Each lift has necessary call inputs of its operation as single elevator:  
That means that several lifts haven identical call inputs for separated calls without connection (same function). These functions are organized by software and a common confrmance is done independant of indeed operated button.  
Advantage: optimal operation conditions; each lift is also fully useable as single lift.  
Disadvantage: larger amount of buttons and call inputs, for central call booking more efforts in wiring.
- 2. One or more call buttons with same function are wired together onto terminals of several lifts.  
Here maximal tension-load of call terminals for confrmance is to note. Supply voltages for calls should be wired with fuse and without feedback to a common hall call voltage.  
Advantage: less efforts, for shut-off one lift the calls remain in function.  
Disadvantage: critical for hall call wiring in case of short-circuits.  
Operation as single lift+group is not possible.
- 3. Calls are split, example: 1. lift is booked with upward calls and 2. lift with downward calls.  
Calls in final stops have to be wired acc. drawing 3 (below) onto both lifts for ensuring operation as single lift for both in final stops.  
Advantage: less efforts, for shut-off or failure other lift(s) this one is useable  
Disadvantage: in partial operation a collection-limitation exists on actual call demands.

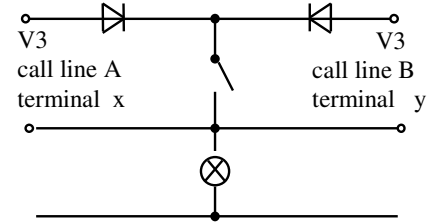
Description (part 1) <b>EKM64</b> Elevator control	<b>REKOB</b>	Page <b>41</b>  of 41
--	--------------	-----------------------------

Wiring-principle: item 2. common hall call voltage



For common hall call voltage the supply V3 of each lift must be able to feed total line load.

item 3.. final stop call button



V0 = connected for group elevators

Using a group lift as single elevator:

A group lift could be switched to „single lift“ by input signal. This operation requires separated hall call organisation (variant 1).

#### • **Single lift**

(0404) I

Same operation is received by release of plug at group-CAN-terminal (eventually switching of BUS-ending X87 is necessary).

## 4.2 Group-logics

Hall calls are distributed between group lifts.

Calls which are not to distribute: car calls, preference calls -single, (parts of) area calls.

Moreover distribution will be limited by not existing doors, depending on floors.

During following operation states a lift becomes „non group-feasonable“ and is impossible for hall call distribution:

#### Disturbances

thermic shut-off  
trip-time overstepping  
sicurity chain (SK1)  
door fault (SK2)  
drive fault  
permanent light barrier

#### Special travels

inspection/re-levelling  
firemens ride  
learn-travel  
pref. call single

#### Shut-offs

evacuation  
travel-locking  
(single lift)

#### Call-lockings

full load  
overload  
hall call lock

Remaining lifts devide hall calls themselves with main state „distance“ to call by regarding direction of collection. For each stopped lift the next floor is evaluated at end of resting time for regarding car calls of just entered persons.

Moreover states of lifts are evaluated with following aims:

Granting minimal times for wait  
Minimizing of empty travels  
Effective collection of several calls.

For this the opposite aims „quick service“ and „minimal energy-expense“ are optimized mathematically.

Base for optimization are parameters which will be provided with valents. There is possibility in parametritron (item 6.1. special functions) to select one of below offered preference group functions or to set parameter with „variable“ (last should be done after analysis of operation-feature, voting with REKOBA).

Group function	Z1	Z2	B1	B2
standard	20	10	20	10
saving energy	10	4	20	11
remaining aim	20	10	50	20
variable aim	20	10	5	4
variable	4 worthes to set by man. input			

effect of parameters:

Z1/Z2: avoiding of overloading a lift  
with aims (1/2 aims)  
B1/B2: calming for aim-changing  
(1./2. aim)

Description (part 1) <b>EKM64</b> Elevator control	<b>REKOBA</b>	Page42 of 42
--	---------------	-----------------

### 4.3 Special group functions

#### Dynamic parking

By parametrization of one parking floor and a uniform tolerancy of parking for each elevator (see item 2.3.7.2) causes for each lift a park-zone. For dynamic parking these zones are exchanged between lifts regarding the principle „avoiding of empty travels and quick service“.

If a lift is not called during set parking time it travels into central stop of next free park-zone. A received call could interrupt the travel for parking, depending on suit of lift.

#### Centre-service (convenient for selective-collection only)

In case of new hall calls in a floor just after service, a centre is notified. Each floor is evaluated in control and will cause importance depending on requests.

For reaching a border of centre this stop becomes centre for preferenced service.

Now the lifts collect calls away from this centre only. Opposite calls will be ignored. After service in one direction the lift directly to centre-floor.

Importances of floors are actualized permanent (enlarging or reducing).

With „centre-parameters S1 to S6“ their influence of importance could be varied. By this the centre-behaviour could be adapted to specific traffic-conditions of installation.

(Varies of standards as listed below should be done after discussion with REKOBÄ only.)

S1=4 (evaluation of terms for re-calling)

S2=4 (term reduction without re-calling)

S3=4 (border for recognizing centre)

S4=20 (max. pause [sec.] for a hall call at centre-floor until erasure the centre)

S5=2 (stopping time for re-calling: 2 floor-travel or advanced stop in floor)

S6=3 (enlarged stopping time for re-calling at active centre: 3. floor-travel or advanced stop in floor)

#### Tendency service

A partial traffic to a certain floor (tendency) will be reduced for usual service slow only. For recognizing a car call-peak a tendency service is done. That means that hall calls not into direction of tendency floor will get no service for quick reducing tendency. Elevators will collect in this case from most distanced hall calls to tendency floor.

With „tendency parameters T1 to T6“ the service on tendency could be influenced.

(Varies of standards as listed below should be done after discussion with REKOBÄ only.)

T1=20 (pause time [sec.] for reset of tendency)

T2=3 (term reduction for other aims)

T3=35 (border of saturation)

T4=21 (border of recognition tendency)

T5=7 (term evaluation for approaching)

T6=3 (tendency defeat in case of 3 get car call aims -temporary ignoring of tendency)

#### Exception time

The set-up exception time (standard= 2min) ensures serving of other traffics by one lift of group after this time in case of recognition centre or tendency service.

Description (part 1) <b>EKM64</b> Elevator control	<b>REKOBÄ</b>	Page <b>43</b>  of 43
--	---------------	-----------------------------

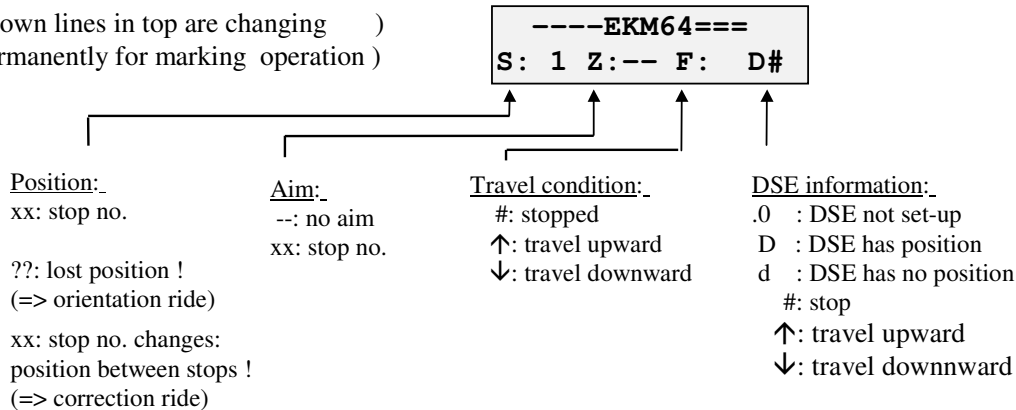
## 5. Operation indications and diagnosis

### 5.1 Operation indications

During operation of lift important states are indicated at command unit as follows:

- Signal states of in- and output terminals with adjoined LED.
- Display of service module shows in base-state (without button-operation) following:

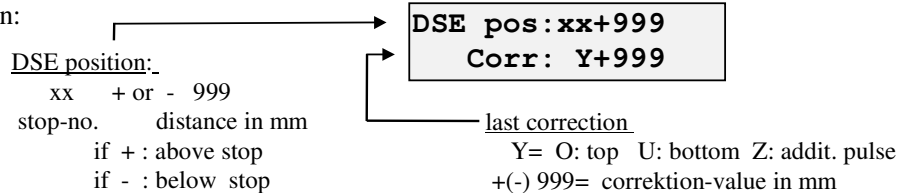
( Shown lines in top are changing )  
( permanently for marking operation )



- Following states –varying to normal call operation– will be shown on display in first line alternating to „---EKM64===“:

<u>Normal mode</u>	<u>reduced mode with call lockings</u>	<u>for faults or useage-locking</u>
=Position corr.=	!=Pref. travel !=	!=Travel locking !=
==Lowering trav.==	!Light barr. stop	Trip-time fault
==Parking ride==	!= Door fault !=	!= Inspection !=
==Warm-up ride==	!= Evacuation !=	!= Re-levelling !=
	!=Learn travel!=	Security chain
	!= Shut-off !=	!=Thermostop1 !=
	!Firemens ride!	!=Thermostop2 !=
	!Thermostop ride	!=Drive fault !=

- For operating DSE and pressing the key ⇄ (permanent regarding also) following DSE informations are shown:



#### Start- and RESET-behaviour of control

Command unit features complete reset with displaying „System-test“ for following events:

- Main power starting
- Operating RESET - jumper (X9)
- Leaving parametrition (closing write-protection switch S2)
- Fault-appearance for magnetic influences

Command unit features an orientation-travel for following events (item 2.3.7.8):

- After loosing „position“ -informations (in display: position =??: external pos. indicators are off)

Description (part 1) <b>EKM64</b> Elevator control	<b>REKOB</b>	<b>Page44</b>  of 44
--	--------------	----------------------------

- After system-test in case of position-information is not recognized clearly.

Description (part 1) <b>EKM64</b> Elevator control	<b>REKOBÄ</b>	<b>Page45</b>  of 45
--	---------------	----------------------------

## 5.2 Diagnosis

Diagnosis includes possibilities for fault-analysis and for service-support of lift-technician. For diagnosis of elevator control three possibilities are given:

- **Diagnosis at display** of EKM64-service module.

Technician can use following functions at face of control.

- Fault-memory: evaluation of indications and erasure
- Elevator clock: showing and sett-up
- Survey: graphical displaying of lift-behaviour (position, aims, calls, doors)
- Group mode: mode-informations of group-behaviour
- Set of calls: incl. selection of floors, door- and type of call
- Module-test: indicating and setting signals at module terminals
- Modes: indication of travel-, group- or parking-states

- **Diagnosis by Laptop** (see TESIM description)

EKM64 parametritition: (see item 6.1, special functions): TESIM-mode = standard 9600)

TESIM-number= (without effect)

Lift-technician could make diagnosis at face of control. Laptop is plugged to serial interface 1 (X6).

Diagnosis system TESIM offers a high comfort for operation and display. Functions of service module are offered with easy to survey presentations. Following enlarged resp. additional features are to point out:

- Survey: graphical presentation of lift within shaft in real-time mode (with position, aims, doors, calls etc.). Possibility for setting of calls.
- Fault-memory: Total presentation with variants of display-depth, hints for search of faults and possibility for copying of fault-memory (disk) and prints for external analysis.
- Fine diagnosis: In- and output signals of EKM64 are displayable in real-time mode with special set of calls. A comfortable integrated logic-analyser allows recording and displaying of 32 I/O signals in parallel. During this a permanent recording or disk-/printer-output is possible.
- Parametritition: Regarding parameter-datas in easy to survey textual presentation including recording onto disk or printer. (Parametritition is done by EKM64-service module only.)
- Service: Travel-counter, counter for operation-hours and test-travels could be activated.
- Elevator clock: (ingredient of EKM64) could be shown and set.

- **Remote diagnosis** via standard-modem or TransAlarm (see TESIM description)

Remote diagnosis offers same possibilities as diagnosis by Laptop. Additionally received is a more comfortable presentation because of color screen, larger line-resolution and enlarged offer of signs. Also remote-surveillance of total lift-groups is possible.

EKM64 parametritition: (see item 6.1. special functions):

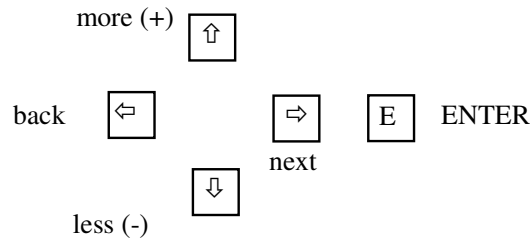
TESIM mode: modem 2400 (for standard-modem) ; standard 9600 (for TransAlarm modem)

TESIM number: 1, ... to 8 (differing for all command units at information-channels, to set similarly only, AWM gets own number also, in elevator groups the TESIM sequence must be identical to group-number.)



Description (part 1) <b>EKM64</b> Elevator control	<b>REKOB</b>	Page <b>46</b>  of 46
--	--------------	-----------------------------



### 5.2.1 Fault diagnosis at service module


Operation keys of service module have following meanings:




ENTER key is to press for confirmation of critical inputs (setting calls, set of clock) only.

Keys  and  together cause break (ESCAPE) and return to main menu.

Keys  and  are used for selection of menu functions or for setting counters.



Key  confirms selection in menu.

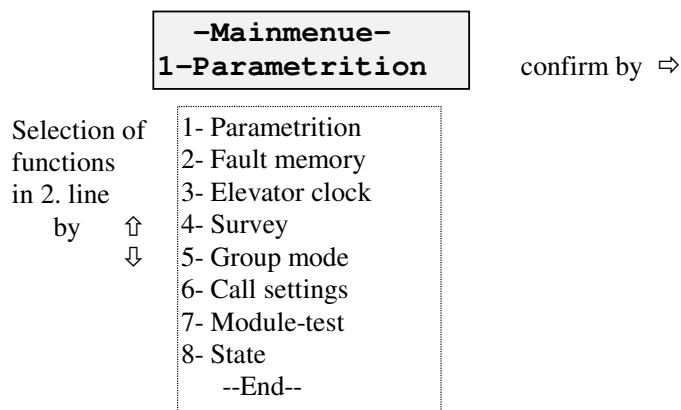
Key  will return to previous step in menu.

For all 4 cursor-keys an operation-repetition for permanent pressing was made.

If there is no cursor operation within 4 minutes a return to base-state is done after an additional minute and warning.



To step-in into diagnosis following entrance code against unallowed operation is to type-in:

3 times , 2 times , ET (than diagnosis main-menu appears).



#### 1-Parametrition:

This function shows set parametrition.

By operating keys  (next) and  (back) moving within parameters is possible.

Permanent operation causes more comfortable moving.

Break is done –as in all functions– by ESCAPE (both keys together).

Description (part 1) <b>EKM64</b> Elevator control	<b>REKOB</b>	Page <b>47</b>  of 47
--	--------------	-----------------------------

## 2-Fault memory:

This function shows fault memory of elevator. If called following display is shown:

reported amount → 

<b>015 Entries</b>
<b>Fault memory</b>

For pressing button ⇐ first entry is shown  
⇒ last entry is shown.

Each fault will be displayed first as follows: (date/time - see elevator clock also)

<b>F001</b>	<b>03.09.96</b>
<b>-13-</b>	<b>12:32:40</b>

By keys ⇐ and ⇒ chronological movement back resp. forward through fault memory is possible.  
Empty places will be stepped over.

Further informations to each fault are perceptable by keys ↑ and ↓.  
Display of fault-number (upper left corner) remains for orientation.

### Example

1. operation of key ↑ :

<b>F001 Start supp.</b>
-------------------------

(as code) reported fault  
in textual form

2. operation of key ↑ :

<b>F001 at stop: 0</b>
<b>aim-stop: 0</b>

position and aim while  
reporting of fault

For permanent pressing keys ⇒ resp. ⇐ a quick moving through memory is done.

Uncorrect entries are reported as disturbed and shown as follows:

<b>F209 Entry</b>
<b>was disturbed</b>

## 3-Elevator clock:

By this function the internal clock of control is shown and able for set-up.  
Calling this function the display shows::

<b>Date:</b>	<b>03.06.96</b>
<b>Time:</b>	<b>13:54:07</b>

For operation of key >ET< input-mode is activated.  
First digit flashes to show waiting on input.

Continuing of digit-input: keys ⇐ and ⇒  
+ and - counting of digits: keys ↑ and ↓  
take-over set time and date: ET  
Break of input-mode without changes of clock: keys ⇐ and ⇒ together.

Elevator clock and RAM fault memory are stored maintenance-free by special condensator in case of missing main supply.

Description (part 1) <b>EKM64</b> Elevator control	<b>REKOB A</b>	Page <b>48</b>  of 48
--	----------------	-----------------------------

#### 4-Survey:

This function shows as graphic the total behaviour of elevator, including:


- Position and aim
  - Received calls
  - Door-position
  - Lift-geometry (arrangement of doors)
  - Call-disposition
- within an area of 10 stops.



- \* Stops appear horizontal, increasing from left to right.
- \* For lifts with more than 10 stops the screen is moveable by keys ⇌ and ⇐ (max. 64 floors).
- \* For lifts with two doors line 2 shows all elements belonging to second door.
- \* Aim-floor is marked by flashing.
- \* Calls which are covered by cabin will flash alternating to cabin.
- \* By keys ⇑ and ⇓ switching into special mode for elevator groups is done which displays assigned calls only.

Example 1

Example 2

▼ Aim-floor flashes ▼

**Floor: --● ^--**   
**1-10 :**

**Floor: +**  **++●+++**  
**1-10 : +**  **✓**

- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>- Lift with: 8 stops</li> <li>- Position: 7. stop</li> <li>- Aim: 3. stop               <ul style="list-style-type: none"> <li>- at 3. stop: car call</li> <li>- at 4. stop: hall call UP</li> <li>- one door (now open)</li> <li>- standard mode</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>- at 9 stops (group lift)</li> <li>- 2. stop</li> <li>- 5. stop</li> <li>- 5. stop: car call, door 1</li> <li>- hall call UP, door 1</li> <li>- hall call DOWN, door 2</li> <li>- 2 doors (now: door 1 open / door2 close)</li> <li>- shaft door-2 at stops 1, 3 and 5 only</li> <li>- special mode (assigned calls only; see above)</li> </ul> |
|---|--|

#### 5-Group mode:

This function includes three statements on group behaviour which are switched by keys ⇌ and ⇐.

1.

2.

3. survey on group

**Set-up:**  
**Group (2of4)**

**Operation as:**  
**temp. single**

**total:1234**  
**#+#+-**

Variants:

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>- Single lift</li> <li>- Group (_of_)               <ul style="list-style-type: none"> <li>▲ - calls only</li> <li>Position in group</li> <li>Rest of group</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>- Single lift</li> <li>- Group complete</li> </ul> |
|---|---|

lifts 1+3: ready for operation.  
 lift 2: group lift but not ready for group-call (preference, fault etc.)  
 lift 4: failed or single lift mode now

For set-up single lifts non valid states 2. and 3. are blocked.

Description (part 1) <b>EKM64</b> Elevator control	<b>REKOB</b>	<b>Page49</b>  of 49
--	--------------	----------------------------

## 6-Call settings:

This service could be called from normal operation mode (without diagnosis-switching) by pressing the ENTER-key.

Select floor by: ↓ ↑    Offered type of call is to select per door by ↓ and ↑  
from following possibilities:

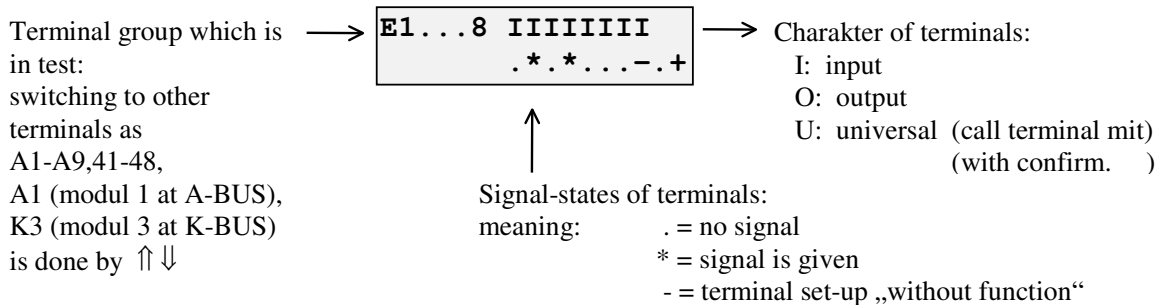
"Cabin"  
"hall-savage"  
"hall-up"  
"hall-down"  
"pref. single"  
"pref.-group" )  
"hall-max"    ) for groups  
"hall-min"    )

By operation  
call is set;  
other keys will  
lead to main menu.

## 7-Module-test:

This test enables signal-indication of in-/outputs of command unit and decentral modules. Terminals could be booked as „in-“ or „off-“ signals from central control also to monitor effects central.

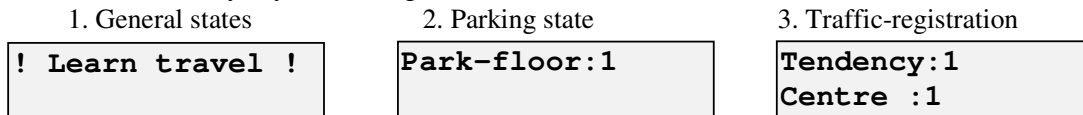
For operating „Module-test“ by ⇒ following screen appearst in main menu of diagnosis:



Flashing position is actually working, selection by keys ⇒ or ⇐.  
Signal is booked onto terminals by keys **[E]** and ↑ (in) or ↓ (out) together.  
Back to main menu with keys ⇒ ⇐ (together).

## 8-State:

Control-states are shown in three levels which are changed by key ⇒.  
Back to main menu by keys ⇒ ⇐ (together).



In level „General states“ the conditions acc. item 5.1 could be controlled while diagnosis-state.

Description (part 1) <b>EKM64</b> Elevator control	<b>REKOB A</b>	Page50 of 50
--	----------------	-----------------

9.-Travel command by UP/DOWN:

<b>Travel comm. UP/DOWN</b> <b>DSE-pos xx+YYYY</b>
---

stop + position in mm

In 2. line is shown:

with DSE-operation: (as shown on left)

none DSE-operation: position xx (stop)

for inspect./re-level: blocked (Insp/re-lev.)

**In this service-function keys ↓ (downward) and ↑(upward) allow travels similar to function re-levelling with „slow“-speed even into area of limit switches. This enables for example „test of limit switches“.**

Description (part 1) <b>EKM64</b> Elevator control	<b>REKOBA</b>	<b>Page51</b>  of 51
--	---------------	----------------------------

## Contents of functions in EKM64:

(I= inputs , O=outputs, U=universal)

<u>Shaft-copying: (item 2.3.1.1) I</u>				(digital item 2.3.1.2)
pulse	flush	correction	electrical stop	HKU
pulse-up	upper flush	upper correktion	door area	HKO
pulse-down	lower flush	lower correktion		HKI

<u>Drive control: (item 2.3.2) O</u>		<u>esp. for regulators</u>	<u>outputs free for param. I</u>	
up	floor travel	V_MAX	Free-drive-n	drive is still
down	driving	V_inspection		
main	fast	V_1		
	slow	V_2		
	approach	V_3		
	inching	V_4		

<u>Door control: (item 2.3.3) O</u>			<u>I</u>	
door open T1	perm. open door T1	throng T1	light barr. T1	door-close key
door open T2	perm. open door T2	throng T2	light barr. T2	door-close key hard
door close T1	perm. close door T1	locking	door-open key T1	limit switch T1
door close T2	perm. close door T2		door-open key T2	limit switch T2

<u>Calls: (item 2.3.4) U</u>			
car call T1	call up T1	call pref. E-T1-Hxx	call-max-T1-Hxx
car call T2	call up T2	call pref. E-T2-Hxx	call-max-T2-Hxx
call savage T1	call down T1	call pref. G-T1-Hxx	call-min-T1-Hxx
call savage T2	call down T2	call pref. G-T2-Hxx	call-min-T2-Hxx

<u>Indications: (position, aim, next travel direction, gong) (item 2.3.5) O</u>			
posit. 1to1 Hxx	aim 1to1 Hxx	next dir.-A-up	next dir.-up-Hxx
posit. BCD P0p	aim BCD P0p	next dir.-A-down	next dir.-down- Hxx
posit. GRAY P0p	aim GRAY P0p	next dir.-B-up	
posit. BIN P0p	aim BIN P0p	next dir.-B-down	floor gong-Hxx
posit. FREE P0p	aim FREI P0p	next dir.-C-auf	cabin gong
no position	no aim	next dir.-C-ab	
		next dir.-D-auf	
		next dir.-D-ab	

<u>Inspection and re-levelling: (item 2.3.6) I</u>			
inspection-IN	re-levelling-IN	insp.re-lev.-UP	I/R-slow
inspection-UP	re-levelling-UP	insp.re-lev.-DOWN	
inspection-DOWN	re-levelling-DOWN		

<u>Special travels: (item 2.3.7)</u>			
firem.-hall-n	I (2.3.7.1)	evacuation	I (2.3.7.4)
firem.-car	I (2.3.7.1)	evacuat.-activ	O (2.3.7.4)
park-trav.-n	I (2.3.7.2)	travel-lock	I (2.3.7.4)
shut-off	I (2.3.7.3)	warm-up trav.	I (2.3.7.6)
out of operat.	O (2.3.7.3)	light barr.stop	I (2.3.7.8)

<u>Special call control (item 2.3.8) I</u>			
full load	hall call lock	single lift	I (item 4.2 group logics)
overload	call locking		

Description (part 1) <b>EKM64</b> Elevator control	<b>REKOB A</b>	Page52 of 52
--	----------------	-----------------

Description (part 1) <b>EKM64</b> Elevator control	<b>REKOBA</b>	<b>Page53</b>  of 53
--	---------------	----------------------------

**Part 2:**

(items 6.- 8. are included in description, part 2)

**6. Parametrition****6.1. Parametrition of functions****6.2. Parametrition of in- and outputs****6.3. Parametrition of DSE64****7. Standard sets of parametritions****7.1. Parametritions for inputs E1-E16**

- I-set: EKM16
- I-set: EKM64-1
- I-set: EKM64-2
- I-set: EKM64-3
- I-set: EKM64-4
- I-set: EKM64-5

**7.2. Parametritions for terminals 21-48**

- C-set: 1 (calls/location for single lift -6 stops, one door, selective collective)
- C-set: 2 (calls/location for single lift -8 stops, one door, down- or non-collective)
- C-set: 3 (calls/location for single lift -4 stops, two doors, down- or non-collective)
- C-set: G1 (calls/location for group lift -8 stops, one door, selective collective)
- C-set: G2 (calls/location for group lift -4 stops, two doors, selective collective)

**7.3. Parametritions for relay outputs A1-A9**

- O-set: standard-1door
- O-set: standard-2 door
- O-set: FSM1-1 door (FSM= mode of travel-signals)
- O-set: FSM1-2 door
- O-set: FSM2-1 door
- O-set: FSM2-2 door
- O-set: regul. EKM16-1door
- O-set: regul. EKM16-2door

**8. Diagrams on shaft-pulses:**

- standard-1 (way of retardation < half floor-distance)
- standard-2 (way of retardation > half floor-distance)

Description (part 1) <b>EKM64</b> Elevator control	<b>REKOB</b> A	<b>Page54</b>  of 54
--	----------------	----------------------------