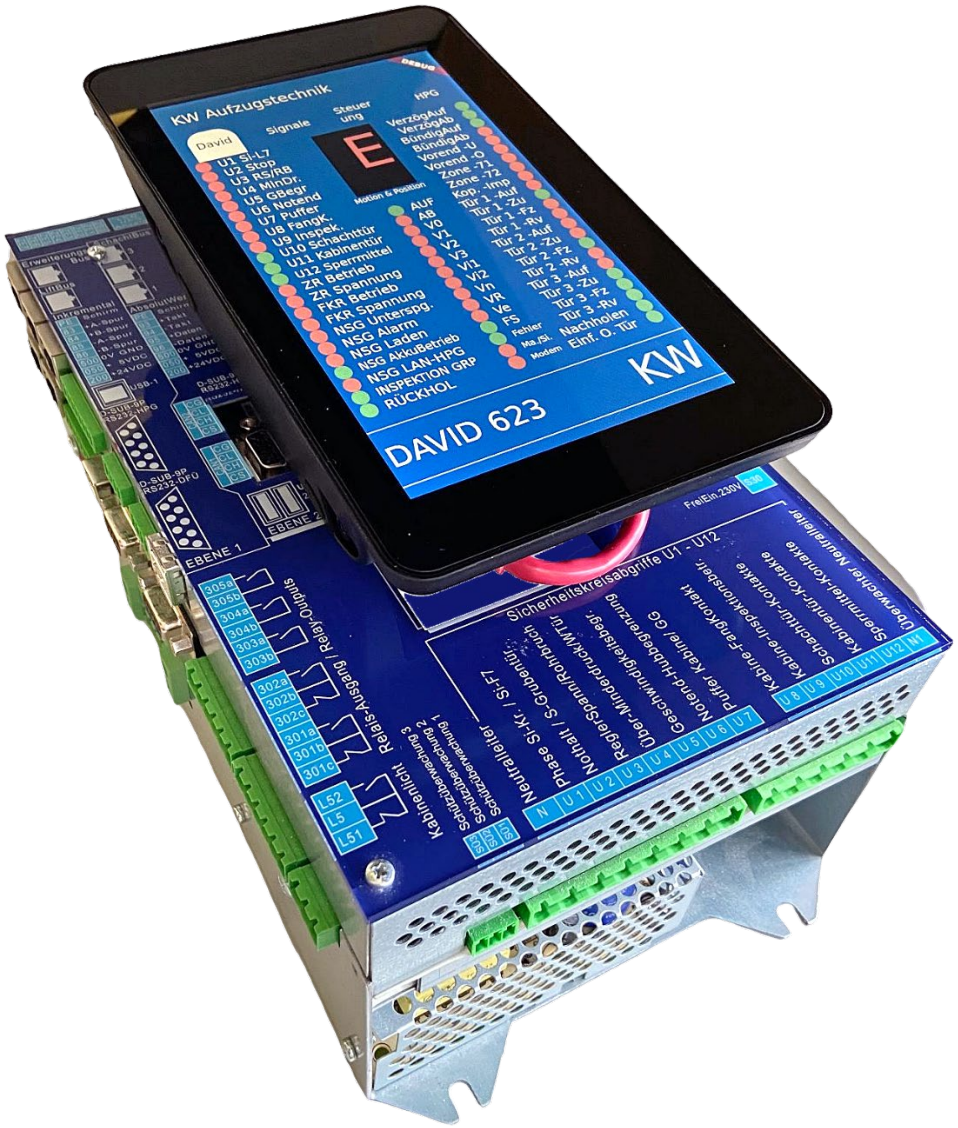
# OPERATING MANUAL

## MONITORING OF THE BRAKING ELEMENTS
## DAVID-606-613-623-2005

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**Self-Monitoring of the braking elements as a part of the protection against unintended car movement**

EN81-20/50
Konform

# KW Aufzugstechnik GmbH Monitoring of the braking elements DAVID-606-613-623-2005 Version V1.05 E



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# 1.0 System description

## 1.1 Product liability and guarantee

All work on these controller systems DAVID 606/ 613/ 623/ 2005 may be made only by qualified technical personnel (Electrical specialist or electrotechnically instructed person). Please consider the safety references in this quidance.
This manual is for elevator technicians, which installs and commissions the control as well as at controller constructor, which inserts the controller into the switchgear and makes necessary wiring.
We guarantee for the accuracy of the product in the sense of the product informations published by us and this manual. It does not become warranty, legal responsibility, still any adhesion for economy or error free function for another purpose, than in chapter 1.2 defined granted.

Terms of guarantee

On the function of the equipment in accordance with this manual a warranty is granted by 24 months. A condition for the free repair are the proven attention of the manual with storage, transport, installation, start-up and enterprise. The general trading conditions of the company KW Aufzugstechnik GmbH are valid.

## 1.2 Intended use

The controller systems DAVID 606/ 613/ 623/ 2005 are intended for the employment in lifts. Other application type are be coordinated with the company KW Aufzugstechnik GmbH. The following legal agreements are to be considered with the installation and enterprise:

- Low-voltage guideline 73/23/EG
- EN 81 -20 Ziffer 5.6.6.2 and 5.6.7.3
- TRA 264.2
- Guideline 2014/33/EU
- EN 81-20: 2020-06 and EN 81-50: 2020-06

## 1.3 Safety references

The manual of the controller systems DAVID 606/ 613/ 623/ 2005 must be freely accessible for the service personnel. It must be ensured that the operating personnel read the manual and in the handing of the safety assembly group is familier.
A condition is the intended enterprise of the controller systems DAVID 606/ 613/ 623/ 2005 according to chapter 1.2.
In the case of ignoring this regulation the danger exists of heavy damages to property and person. All work on the controller systems DAVID 606/ 613/ 623/ 2005 may be accomplished only by qualified technical personnel. The following safety regulations are to be considered:

DIN VDE0100, DIN VDE0110, IEC-364, IEC-664 and VBG 4.
Qualified technical personnel in the sence of this operating instructions are persons with

- Assemby
- Start up
- Maintenance
- Attention of the national rules for the prevention of accidents

are trusts and can show appropriate vocational qualifications.

### Never work under mains voltage – Danger of life!

Before you begin work on the controller systems DAVID 606/ 613/ 623/ 2005, **interrupt voltage supply** by main switches and the appropriate safety devices and secure you against **erroneous restarting**!
Survey the supply lines for **tension free**!
Neighbouring clamps and components, which could be energized must be covered!

## 1.4 EU DECLARATION OF CONFORMITY

FOR COMPONENTS FOR LIFTS

To Lifts Directive 2014/33/EU

| | |
|---|---|
| **Manufacturer:** | KW Aufzugstechnik GmbH<br>Zimmersmühlenweg 69<br>61440 Oberursel |
| **Authorized Person:** | Dipl.-Ing. (TU) Hans-Werner Walbert - CEO |
| **Type:** | DAVID-606-613-623-2005 |
| **Description safety:** | **Self-Monitoring of the braking elements as part of the protection against intended car movement and/or ascending car overspeed means** |
| **Year of manufactoring:** | 2003 |
| **Application scope:** | Lifts Directive 2014/33/EU |
| **Standard(s) used :** | **DIN EN 81-20: 2020-06**<br>**DIN EN 81-50: 2020-06**<br>Safety rules for the construction and installation of lifts. |
| **EN 12015** | Electromagnetic compatibility<br>Product family standard Elevators, escalators and moving walks - Emission of interference |
| **EN 12016** | Electromagnetic compatibility<br>Product family standard Elevators, escalators and moving walks - Immunity to interference |
| **Notified body for the EU type examtionation (Annex V.A)** | Liftinstituut B.V.<br>Buikslotermeerplein 381<br>1025 XE Amsterdam, Netherlands<br>NB no.: 0400 |
| **EU type examination certificate no.:** | NL17-400-1002-170-01 rev.2 |
| **Notified body for the random checks (Annex XI)** | Liftinstituut B.V.<br>Buikslotermeerplein 381<br>1025 XE Amsterdam, Netherlands<br>NB no.: 0400 |

Hereby we explain the component assembly DAVID 606-613-623-2005 due to conceiving and construction mentioned above which to general protection requirements corresponds to the EU Lift Directive 2014/33/EU. The manual is attached to the devices. The safety references are to be exactly read before employment of the equipment. Through with us this explanation their validity loses not coordinated changes.

Oberursel, den 19.09.2022

Hans-Werner Walbert
CEO

# 2.0 Function description

## 2.1 Function description Monitoring of the Braking Elements

### In General

In gearless drives the service brakes have been used as a protective device for the car moving against overspeed. The braking devices are therefore redundant and are monitored by a micro-switch / proximity switch per circuit. These switches are used to monitor the braking elements for protection against inadvertent movement of the car.
With traction elevator systems to EN81-1 with certified braking devices to the new standard EN 81-1:1998 + A3: 2009, like e.g. the types MAYER, Warner, ..., as a operating brake on the drives of the companies Wittur-SAD, Thyssenkrupp-Liftequipe, Ziehl-Abegg, Tornado, Sassi,..., or with A3 Certification brake control unit on the driving wheel, like the types of MAYER, Warner, ..., on the drives of Thyssenkrupp-Liftequipe-NBS, Sassi,...., the monitoring is done by independent input channels of brake control elements monitoring of the regulation unit.
At hydraulic lifts of the company ALGI and the types AZRS and AZFR , according to the new standard EN 81-2:1998 + A3: 2009, the Down Travel is initiatet with two series-connected hydraulic valves, which have a monitoring of the open and closed position. The monitoring is done by independent input channels of brake control elements monitoring of the regulation unit. The following description is part of the manual.

### Function steps

#### A) Before Starting - Motor and Controller are in standby state

In the standby state is expected that the brake element is not active and the brake switch elements have the following signal levels:

| Brake element monitoring input | Expected status |
|---|---|
| Configured as Closer (NO) | 0V Signal level at the monitoring input |
| Configured as Opener (NC) | +24V Signal level at the monitoring input |

Is no expected signal levels at the control DAVID-606/613/623/2005, it lock with the error messages "**F51 brake element function**" or "**F54 brake element synchronization**".
Only by **RESET in menu C0** or a reset pulse at an input to the programmed input function can control DAVID E506-606/613/623/2005 will be unlocked.

#### B) Start – Braking elements are opening

With activation of the braking element is "open brake element monitoring" period started. Within this time window, it is expected that the braking element is activated and the signal change is performed on the brake element monitoring switches:

| Brake element monitoring input | Expected status |
|---|---|
| Configured as Closer (NO) | 0V Signal level at the monitoring input |
| Configured as Opener (NC) | +24V Signal level at the monitoring input |

If the signal change within the time frame, or the synchronization of input channels is not guaranteed, the control DAVID-606/613/623/2005 lock with the error message "**F51 brake element function**" or "**F54 brake element synchronization**". Only by **RESET in menu C0,** the controller DAVID-606/613/623/2005 will be unlocked.

Solely through the on / off switching of the controller, the controller is not unlocked, i.e. If the error message F51 or F54 is applied and the system shuts off and then switched on again, the control with the appropriate error message locked.

**C) End of Travel - Braking elements are closing**

With drop in braking element, the monitoring time "Close monitoring braking element" starts. Within this time window, it is expected that the braking element is deactivated and the signal exchange is performed on the brake element monitoring switches:

| Brake element monitoring input | Expected status |
|---|---|
| Configured as Closer (NO) | 0V Signal level at the monitoring input |
| Configured as Opener (NC) | +24V Signal level at the monitoring input |

If the signal change within the time frame, or the synchronization of input channels is not guaranteed, the control DAVID-606/613/623/2005 lock with the error message "**F51 brake element function**" or "**F54 brake element synchronization**". Only by **RESET in menu C0,** the controller DAVID-606/613/623/2005 will be unlocked.

Solely through the on / off switching of the controller, the controller is not unlocked, ie If the error message F51 or F54 is applied and the system shuts off and then switched on again, the control with the appropriate error message locked.

## 2.2 Digital Inputs

All these channels can be Inputs-, but also Output-channels. The channels are potentialfree about optocouplers and designed for +24V DC. The inputs can used with the +24V DC Voltage of the inverter or the +24V DC Voltage of the lift controller ( pay attention to the GND connetion to the lift controller !).

The inputs and outputs are freely programmable. The desired input function can be found in the **menu B72 assignment inputs. For the brake elements are monitoring up to 3 input functions, ie It can monitor up to 3 braking circuits.**

## 2.3 Programming of the Digital Inputs

When the brake release up to 3 independent brake coils can be monitored. The choice of inputs is free, should the appropriate input functions to be occupied (E25, E438-E439 menu B72).

### Assignment of the inputs menu B72

All inputs can be used in principle, and are assigned to the features listed below. Assign menu B72 just as many input channels with features as you have brake circuits.

| No. | Display-Layout | Function |
|---|---|---|
| E25 | E25 - Brake Monitoring Coil-1 | Input function for Brake Monitoring Coil 1 |
| E438 | E438- Brake Monitoring Coil -2 | Input function for Brake Monitoring Coil 2 |
| E439 | E439- Brake Monitoring Coil -3 | Input function for Brake Monitoring Coil 3 |

## 2.4 Teach in of the Monitoring Times

**In the Menu B600 monitoring** the brake members shall be activated. In addition, the switch type (NO or NC) are defined. With the help of monitoring times, the behavior of the respective braking element type to be adapted.

| | |
|---|---|
| **Brake Monitoring** | |
| | At the Brake monitoring you can look over three brake coils |
| **Brake Monitoring Input** | |
| | Here you can put the switch-behaviour.There are two possibilities, like **NC-Normally Closed** and **NO-Normally Open**. Standart value is NC**.** |
| **Brake Monitoring Opening** | |
| | The time needed for the operation of the brake opening a window of up to 2000 ms can be clamped. |
| **Brake Monitoring Closing** | |
| | The time needed for the process of dropping the maximum brake a time window of 2000 ms are clamped. |
| **Brake Monitoring Synchronization** | |
| | The brake elements are monitored for synchronization. The default value for this tolerance time is 500ms. |

## 2.5 Fault clearance and Reset

Depending on the number of connected brake circuits may appear in the event of an error of up to 4 errors. In the Menu C3 all error messages are marked present.

| | | |
|---|---|---|
| **ERROR 51** | **Brake element monitor** | There is no expected signal levels at the monitoring braking inputs of the control DAVID-606/613/623/2005. |
| **ERROR 54** | **Brake element synchronization** | The monitoring of the braking elements has been activated. One of the monitor inputs is out of order or it is slower than the other (s) channel. Please check it. |

After remedying the lack of the brake elements / or the external wiring, the drive can be **unlocked by selecting the error menu C0 RESET memory**.

| | | |
|---|---|---|
| **E506** | **E506 RESET Brake Element** | Possibility of the external reset for brake monitoring elements |

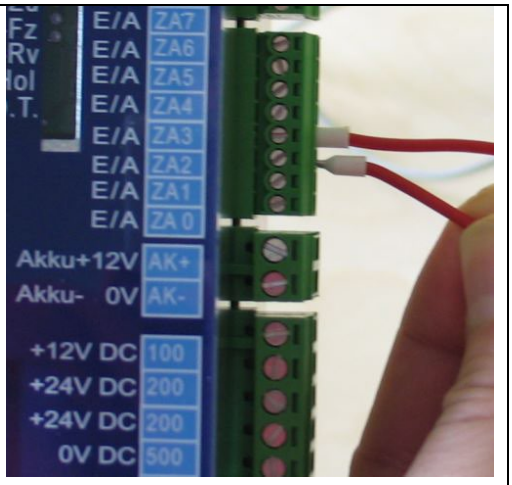
It is also possible to program a free entrance to the input function E506. By connecting a bowl button it is possible to unlock the system via a pulse on this input.

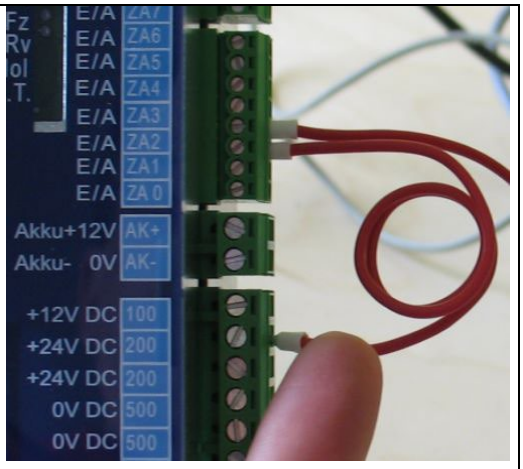
Solely through the on / off of the controller, the control is not unlocked, ie If the error message F51 or F54 is applied and the system shuts off and then switched on again, the control with the appropriate error message locked.

## 3.0 Function test

## 3.1 Function test – Self-Monitoring of the Braking Elements after EN81-20 clause 5.6.6.2 and 5.6.7.3

**Generally**
Due to the development of the software, the function of the brake elements in-plant monitoring at KW Aufzugstechnik GmbH in the testing, as well as in the on-site commissioning of the lift system must be examined. The description of the functional test is part of the manual.

| **Test cable break - Monitoring Input 1** | |
|---|---|
| 1.) Switch off the Signal line at the monitoring input channel 1.<br>2.) Return Motion Drive UP or DOWN<br>3.) The Controller DAVID 606/613/623/2005 gives the error Message "F54 – Brake Element Synchronization" and Locks.<br>More trips are not possible!<br>4.) Switch on the Signal line at the monitoring input channel 1.<br>5.) With the Return-Drive to try to take a ride. A drive may be not possible!<br>6.) In the menu C0 the Controller DAVID 606/613/623/2005 can be unlocked in the fault memory by selecting the error. The elevator system is ready to start again. |  <br>Removing the monitoring channel 1 |

| **Test cable bridge - Monitoring Input 1** | |
|---|---|
| 1.) Switch off the Signal line at the monitoring input channel 1 and put in a jumper between terminal 200 (+24 V DC) and channel 1.<br>2.) Return Motion Drive UP or DOWN<br>3.) The Controller DAVID 606/613/623/2005 gives the error message "F51 – Brake Element Function" and locks.<br>More trips are not possible!<br>4.) Put off the jumper between the terminal 200 and channel 1. Switch on the Signal line at the monitoring input channel 1.<br>5.) With the Return-Drive to try to take a ride. A drive may be not possible!<br>6.) In the menu C0 the Controller DAVID 606/613/623/2005 can be unlocked in the fault memory by selecting the error. The elevator system is ready to start again. |  <br>Setting the jumper between 20o and Channel 1 |

**Repeat the test steps**
After the two test steps were carried out for the monitoring braking element 1, then for all other brake circuits have now equivalent to the test steps are carried out!

## **4.0** EU-Declaration of Conformity

liftinstituut
SINCE 1933

# TYPE EXAMINATION CERTIFICATE

## FOR LIFTCOMPONENTS

Issued by Liftinstituut B.V.

| | | |
|---|---|---|
| Certificate no. | : NL12-400-1002-170-01 | Revision no.: 2 |
| Description of the product | : Self-Monitoring of the braking elements as part of the protection against unintended car movement and/or ascending car overspeed means | |
| Trademark | : KW Aufzugstechnik | |
| Type no. | : DAVID-606/613/623/2005 | |
| Name and address of the manufacturer | : KW Aufzugstechnik GmbH<br>Zimmersmühlenweg 69<br>D-61440 Oberursel, Germany | |
| Name and address of the certificate holder | : KW Aufzugstechnik GmbH<br>Zimmersmühlenweg 69<br>D-61440 Oberursel, Germany | |
| Certificate issued on the following requirements | : Lifts Directive 2014/33/EU | |
| Certificate based on the following standard | : EN 81-20:2020 clauses 5.6.6.2 and 5.6.7.3 | |
| Test laboratory | : None | |
| Date and number of the laboratory report | : None | |
| Date of type examination | : September 2022 | |
| Additional document with this certificate | : Report belonging to the type examination certificate no.: NL12-400-1002-170-01 rev.2 | |
| Additional remarks | : This revision replaces certificate NL12-400-1002-170-01 rev. 1 of 05-07-2017 | |
| Conclusion | : The product meets the requirements referred to in this certificate taking into account any additional remarks mentioned above. | |

Amsterdam

Date : 19-09-2022
Valid until : 19-09-2027

ing A.J. van Ommen
International Business Manager

Certification decision by