OPERATING MANUAL

MONITORING OF THE BRAKING ELEMENTS
GOLIATH-90/921

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 GOLIATH-90/-921 Version V1.04 E

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1.0 System description

1.1 Product liability and guarantee

All work on this frequency inverter GOLIATH-90/ 921 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 frequency inverter GOLIATH-90/ 921 is 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:

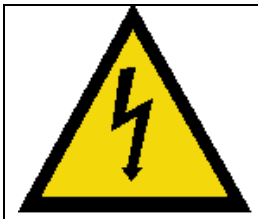
- Low-voltage guideline 73/23/EG
- EN 81 Part 1 and Part 2 Number 14.1.2.3.2
- TRA 264.2
- Guideline 95/16/EG Article 1 Par. 1, Article 8 Par. 1
- EN81-1: 2010-06 und EN81-2: 2010-08
- EN81-20: 2020-06 und EN81-50: 2020-06

1.3 Safety references

The manual of the frequency inverter GOLIATH-90/ 921 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 frequency inverter GOLIATH-90/ 921 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 frequency inverter GOLIATH-90/ 921 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 frequency inverter GOLIATH-90/ 921, **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 Zimmersmühlenweg 69 61440 Oberursel
Authorized Person:	Dipl.-Ing. (TU) Hans-Werner Walbert - CEO
Type:	GOLIATH-90/921
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** **DIN EN 81-50: 2020-06** Safety rules for the construction and installation of lifts.
EN 12015	Electromagnetic compatibility Product family standard Elevators, escalators and moving walks - Emission of interference
EN 12016	Electromagnetic compatibility Product family standard Elevators, escalators and moving walks - Immunity to interference
Notified body for the EU type examtionation (Annex V.A)	Liftinstituut B.V. Buikslotermeerplein 381 1025 XE Amsterdam, Netherlands NB no.: 0400
EU type examination certificate no.:	NL17-400-1002-170-02 rev.2
Notified body for the random checks (Annex XI)	Liftinstituut B.V. Buikslotermeerplein 381 1025 XE Amsterdam, Netherlands NB no.: 0400

Hereby we explain the component assembly GOLIATH-90-921 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 inverter unit GOLIATH-90/ 921 blocks with the error message "F30 brake element 1" to "F33 brake element 4"
Only by selection of the error in the C2 error menu memory or a reset pulse to an input of the programmed input function E31, the inverter device GOLIATH-90/ 921 is unlocked.
Solely through the on / off of the controller, the inverter is not unlocked, ie If the error message F30 to F33 is applied and the system shuts off and then switched on again, the control with the appropriate error message locked.

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 does not change within the time window, or the synchronization of input channels is not guaranteed, the controller GOLIATH-90/ 921 blocks with the error message "F30" to "F33". Only by selection of the error in the C2 error menu memory or a reset pulse to an input of the programmed input function E31, the inverter device GOLIATH-90/ 921 is unlocked.
Solely through the on / off of the controller, the inverter is not unlocked, ie If the error message F30 to F33 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 does not change within the time window, or the synchronization of input channels is not guaranteed, the controller GOLIATH-90/ 921 blocks with the error message "F30" to "F33". Only by selection of the error in the C2 error menu memory or a reset pulse to an input of the programmed input function E31, the inverter device GOLIATH-90/ 921 is unlocked.
Solely through the on / off of the controller, the inverter is not unlocked, ie If the error message F30 to F33 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 !). If you use the channels as outputs, they are limited in the current (200 mA for every output).
The In- and outputs are free programmable. There is a pool of 50 In- and output function. Setting of Output functions is controlled in the **Menu B2 IN/ Outputs / B21 Outputs**. If you wish a input-function you can visit the **Menu B2 IN/ Outputs / B22 Inputs.**
For checking of the function-setting, you can use the menu **C-DIAGNOSIS / C1 In-/ Outputsignals**.
The technical hardware connection happend about the 10-pole Terminal.

2.3 Programming of the Digital Inputs EA1 to EA4

When the brake release up to 4 independent brake coils can be monitored.The first four channels, EA1 to EA4 are spezial types, because you can switch them to a behaviour of **„0V-switching**“. So you can make a Brakeopen-Monitor directly on a NPN-Base. In the monitoring of the Braking elements the zero volt switching are (NPN), as Thyssen winds TW, DAF, SC ... menu B23 pullup resistors must select the control 0V switching (NPN).

A) Assignment of the inputs menu B22

The inputs EA1 to EA4 on Goliath-90/ 921 inverter can be potentially subject to the features below. Assign menu B22 just as many inputs with features as you have brake circuits.

No.	Display-Layout	Function
E17	E17- Brake Monitoring Coil-1	Input function for Brake Monitoring Coil 1
E18	E18- Brake Monitoring Coil -2	Input function for Brake Monitoring Coil 2
E19	E19- Brake Monitoring Coil -3	Input function for Brake Monitoring Coil 3
E20	E20- Brake Monitoring Coil -4	Input function for Brake Monitoring Coil 4

B) Setting the Input menu behavior in the menu B23

The inputs EA1 to EA4 have the possibility, to work with 0V DC switching levels. In this case there will be switched on Pullup-resistors to the inputs. It is possible to choose between **„+24V DC PNP**“ and „**0V DC NPN**“ switching.
Thyssen DAF Gearless with NPN-Signal break release evaluation can be monitored by inverter.

2.4 Teach in of the Monitoring Times

In the Menu B5 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 four brake coils. After activation you should program the inputs EA1 to Eax with the right input-functions (**E17-E20 Menu B22**). If you need a brake monitoring, which recognize a null-voltage level (NPN), like situation at Thyssen gearbox and gearless machines TW,DAF, SC... you must choose in the **menu B23 PullUp Resistors** value **0V-DC (NPN).**
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 C2 all error messages are marked present.

ERROR 30	**Monitor Brake-1:** - Brake-circuit-1 do not open / close during the travel -> Are the settings OK? Do you have opener or closer-contacts? 0V (NPN-Thyssen) or+24V (z.B. Ziehl-Abegg,..) - Do have connected the brakewires rightly? - Do you have observed, if the brakes open ? -> Brakewires ? - Are the brake-contacts OK ? -> If you have any douts, make a measurement !
ERROR 31	**Monitor Brake-2:** - Brake-circuit-2 do not open / close during the travel -> Are the settings OK? Do you have opener or closer-contacts? 0V (NPN-Thyssen) or+24V (z.B. Ziehl-Abegg,..) - Do have connected the brakewires rightly? - Do you have observed, if the brakes open ? -> Brakewires ? - Are the brake-contacts OK ? -> If you have any douts, make a measurement !
ERROR 32	**Monitor Brake-3:** - Brake-circuit-3 do not open / close during the travel -> Are the settings OK? Do you have opener or closer-contacts? 0V (NPN-Thyssen) or+24V (z.B. Ziehl-Abegg,..) - Do have connected the brakewires rightly? - Do you have observed, if the brakes open ? -> Brakewires ? - Are the brake-contacts OK ? -> If you have any douts, make a measurement !
ERROR 33	**Monitor Brake-4:** - Brake-circuit-4 do not open / close during the travel -> Are the settings OK? Do you have opener or closer-contacts? 0V (NPN-Thyssen) or+24V (z.B. Ziehl-Abegg,..) - Do have connected the brakewires rightly? - Do you have observed, if the brakes open ? -> Brakewires ? - Are the brake-contacts OK ? -> If you have any douts, make a measurement !

After remedying the lack of the brake elements / or the external wiring, the drive can be **unlocked by selecting the error menu C2 error memory**.

E31	**E31 RESET Braking Element**	Possibility of the external reset for brake monitoring elements

It is also possible to program a free entrance to the input function E31. 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 F30 to F33 is applied and the system shuts off and then switched on again, the control with the appropriate error message locked.

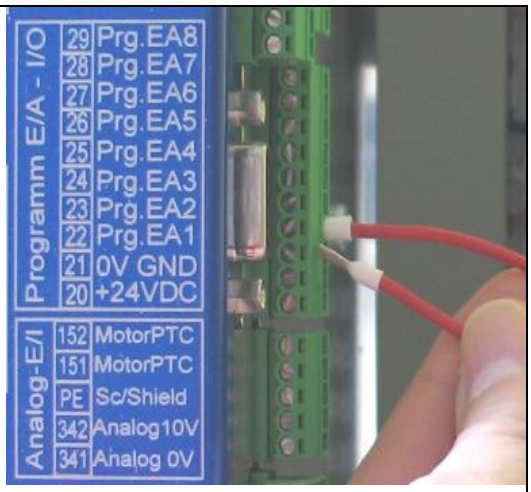
3.0 Function test

3.1 Function test – Self-Monitoring of the Braking Elements according EN81-20 Letter 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

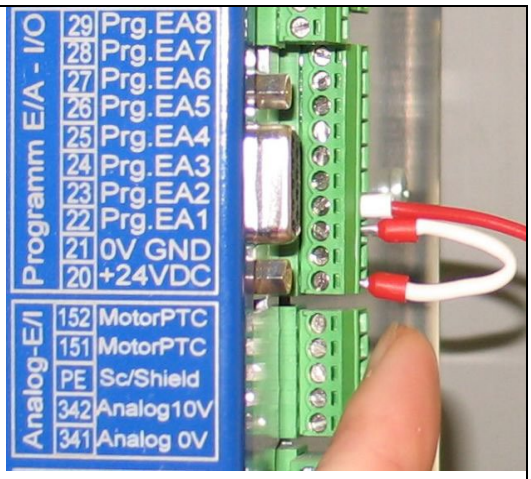
1.) Switch off the Signal line at the monitoring input EA1.
2.) Return Motion Drive UP or DOWN
3.) The GOLIATH-90/ 921 gives the error message "F30 - Brake control elements 1" and locks. More trips are not possible!
4.) Switch on the Signal line at the monitoring input EA1.
5.) With the Return-Drive to try to take a ride. A drive may be not possible!
6.) In the menu C2 the GOLIATH-90/ 921 can be unlocked in the fault memory by selecting the error. The elevator system is ready to start again.



Removing the monitoring channel EA1

Test cable bridge - Monitoring Input 1

1.) Switch off the Signal line at the monitoring input EA1 and put in a jumper between terminal 20 (+24 V DC) and EA1.
2.) Return Motion Drive UP or DOWN
3.) The GOLIATH-90/ 921 gives the error message "F30 – Brake control elements 1" and locks. More trips are not possible!
4.) Put off the jumper between the terminal 20 and EA1. Switch on the Signal line at the monitoring input EA1.
5.) With the Return-Drive to try to take a ride. A drive may be not possible!
6.) In the menu C2 the GOLIATH-90/ 921 can be unlocked in the fault memory by selecting the error. The elevator system is ready to start again.



Setting the jumper between 20 and EA1

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 EG-Declaration of Conformity

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SINCE 1933

TYPE EXAMINATION CERTIFICATE

FOR LIFTCOMPONENTS

Issued by Liftinstituut B.V.

Certificate no.	: NL12-400-1002-170-02	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.	: GOLIATH-90/921	
Name and address of the manufacturer	: KW Aufzugstechnik GmbH Zimmersmühlenweg 69 D-61440 Oberursel, Germany	
Name and address of the certificate holder	: KW Aufzugstechnik GmbH Zimmersmühlenweg 69 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.: NL12-400-1002-170-02 rev.2	
Additional remarks	: This revision replaces certificate NL12-400-1002-170-02 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

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· Registered at the KvK under number 34157363 ·

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