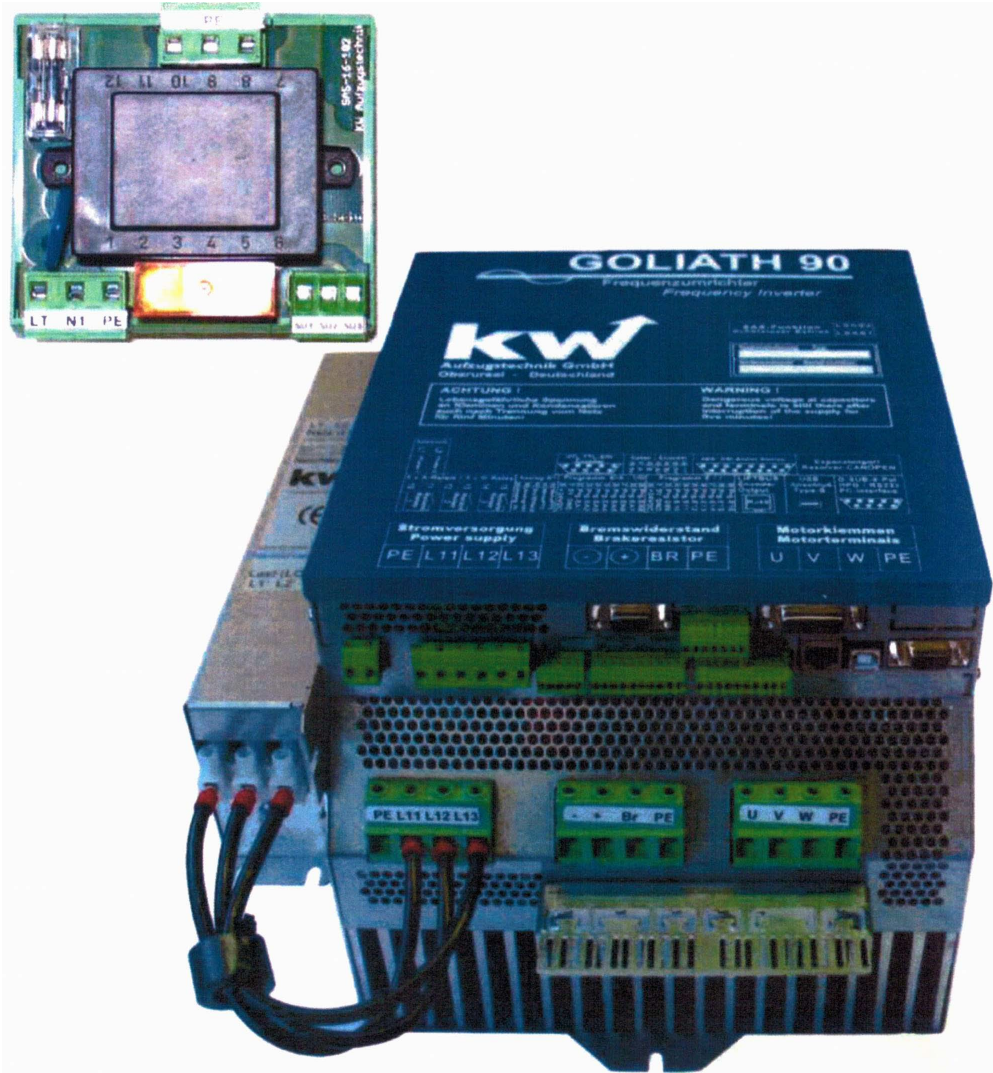


# OPERATING INSTRUCTIONS

## Safe Exit Lock SAS16-102



For use without contactors at GOLIATH-90  
Frequency Inverter

EN81-20/50  
Konform



## **KW Aufzugstechnik GmbH Safe Exit Lock SAS16-102 Version V1.09 E – 04.01.2023**

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## 1.0 System description

### 1.1 Product liability and guarantee

All work on this protection circuit may be made only by qualified technical personnel (Electrical specialist or electrotechnically instructed person). Please consider the safety references in this guidance. 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 protection circuit SAS16-102 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**
- **DIN EN 81-1: 1998+A3:2009**
- **DIN EN 81-2: 1998+A3:2009**
- **DIN EN 81-20: 2020**
- **DIN EN 81-50: 2020**
- **Lift guideline 2014/33/EU**

### 1.3 Safety references

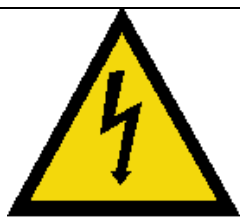
The manual of the protection circuit SAS16-102 must be freely accessible for the service personnel. It must be ensured that the operating personnel read the manual and in the handing of the safety assembly group is familier.

A condition is the intended enterprise of the protection circuit SIS16-101 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 protection circuit SAS16-102 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

- Assembly
  - 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 protection circuit SIS16-101, **interrupt voltage supply** by main switches and the appropriate safety devices and secure you against **erroneous restarting!**

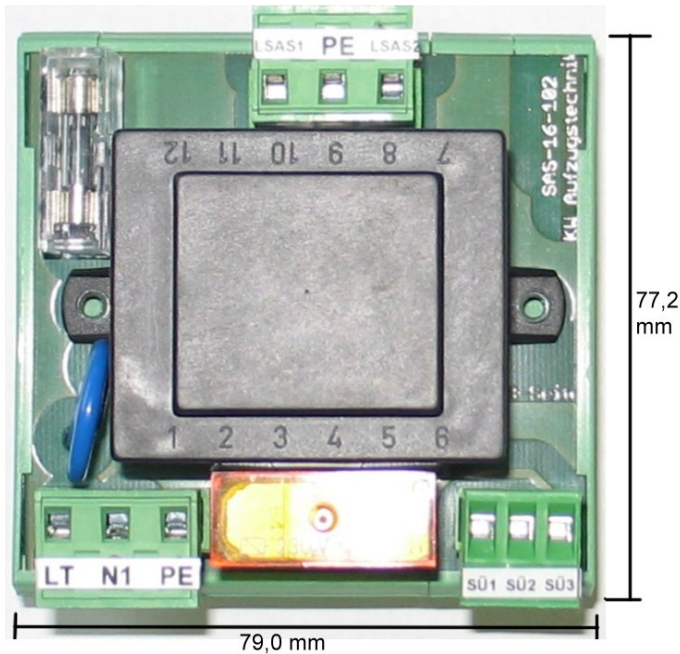
Survey the supply lines for **tension free!**

Neighbouring clamps and components, which could be energized must be covered!

✖

### 1.4 Technical data and measures

The component assembly SAS16-102 is equipped with transformer and belt relay. Insertion Terminals are located at top and bottom of the component assembly. SAS16-102 is preparatory for the DIN rail assembly.



<b>Relay elements:</b>	K6 = report relay
<b>Dimensions ( with basin):</b>	(L x B x H) 79,0 mm x 77,2 mm x 60,0 mm
<b>Weight:</b>	Approx . 700 Gram
<b>Voltage Supply:</b>	Terminals LT - 250V AC / 4A Terminals N1 - 0V AC monitoring neutral wire Terminals PE - Ground Terminals LSAS1 - 400V AC / 0,2A Terminals LSAS2 - 400V AC / 0,2A Terminals PE - Ground Terminals SÜ1 - +24V DC / 50mA Terminals SÜ2 - +24V DC / 50mA Terminals SÜ3 - +24V DC / 50mA
<b>Switching Cycles:</b>	Ca. 1.000.000 Switching cycles
<b>Protective Class</b>	IP 43
<b>Ambient Temperature:</b>	0°C to +65 °C

### 1.5 Function description

With help of SAS function (safe exit lock) for frequency inverter GOLIATH90 can be abandon drive contactors, which are needed for interruption the energy flow between frequency inverter and motor.

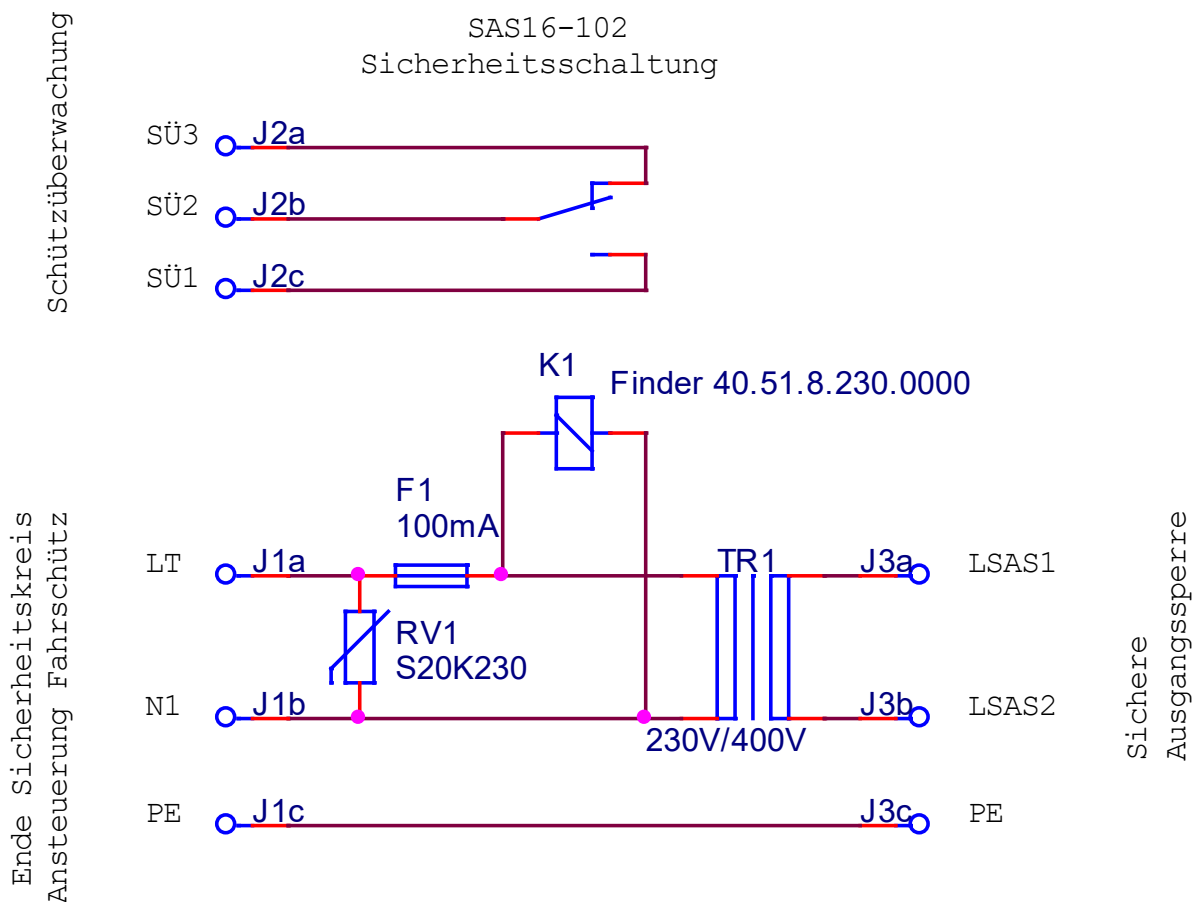
The protection circuit SAS16-102 replaces the driving contactor at the end of the safety circuit. If the safety circuit is opened, there are no apply voltage at primary coil of the transformer TRs (J1a, J1b).

Thereby no tension can be produced at the secondary winding of tehe TRs. (Terminal J3a, J3b ).

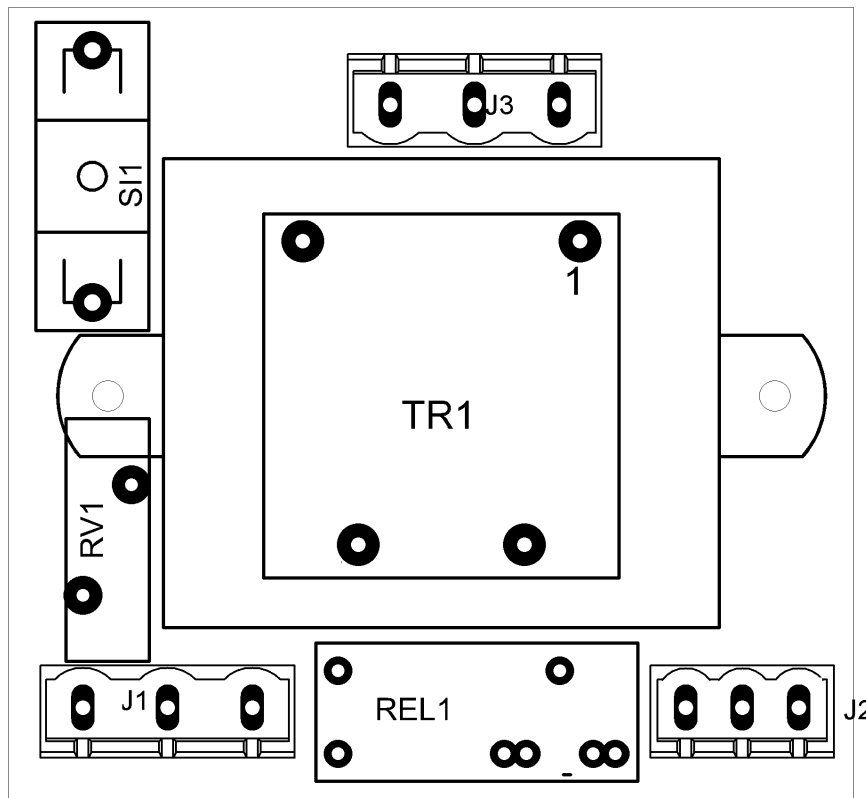
To head for the electrically isolated heading for stage with that alternating voltage of 400VAC at the clamps necessarily around the drivers of the IGBTs. From there it is ensured that voltage supply is switched off and cannot be headed for T1 / T2 / T3.

Thus no torque–producing alternating current can arrive the engine. The circuit consists only of a transformer, which transforms tension to tension of 400VAC at the end of the safety circuit. With the help of this high-transformed tension is the control circuit supplied with energy in the frequence inverter.

If the safety circuit is closed and if the release relay for the driving contactor is headed for by the elevator control , so terminals J1a and J2b have a tension of 230VAC. In consequence the terminals J3a and J3b have the tension of 400VAC. With this tension teh IGBT drives are supplied. If the safety circuit is opened, there ist no voltage on the terminals J1b and J1b. In consequence its cannot be a voltage at terminals J3a and J3b.



## 1.6 Component diagram and list of components



POS.	Designation	Description
1	REL 1	40.51.8.230.0000
2	RV1	S 20 K 250
3	Si1	Fuse holder 5 x 20mm with cover
4	F1	Fine wire fuse 200 mA mtr
5	TR1	K65-518A 230V/ 400V/ 8VA
6	J1, J3	STL960/3/7,62-V-G
7	J2	STL950/3/5,08-V-G
8	G2	PKB950/3/5,08
9	G1, G3	PKB960/3/7,62
10	Body shell	UMK-SE 11,25-1
11	Body shell	UMK-BE22,5
12	Body shell	UMK-BE45
13	Circuit board	SAS16-102

## 1.7 EU Konformitätserklärung

### EU DECLARATION OF CONFORMITY FOR SAFETY COMPONENTS FOR LIFTS

<b>Manufacturer:</b>	KW Aufzugstechnik GmbH Zimmersmühlenweg 69 61440 Oberursel
<b>Authorized Person:</b>	Dipl.-Ing. (TU) Hans-Werner Walbert - CEO
<b>Type:</b>	Safety component GOLIATH-90
<b>Description safety:</b>	Function „Safe-Exit-Lock – SAS“ for frequency inverter GOLIATH 90 from KW-Aufzugstechnik with extern component „SAS16-102“ for usage as elevator drive without driving contactors
<b>Production / Serial-number</b>	2024-25400 bis 2024-26600
<b>Year of manufacturing:</b>	2024
<b>Application scope:</b>	Lifts Directive 2014/33/EU
<b>Standard(s) used :</b>	<b>DIN EN 81-20: 2020</b> <b>DIN EN 81-50: 2020</b> Safety rules for the construction and installation of lifts.
<b>Notified body for the EU type examination (Annex V.A)</b>	Liftinstituut B.V. Buikslotermeerplein 381 1025 XE Amsterdam, Netherlands NB no.: 0400
<b>EU type examination certificate no.:</b>	NL16-400-1002-170-03
<b>Notified body for the random checks (Annex XI)</b>	Liftinstituut B.V. Buikslotermeerplein 381 1025 XE Amsterdam, Netherlands NB no.: 0400

Hereby we explain the component assembly GOLIATH-90 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 2.01.2018



Hans-Werner Walbert  
CEO





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## EU-TYPE EXAMINATION CERTIFICATE

Issued by Liftinstituut B.V.  
identification number Notified Body 0400,  
commissioned by Decree no. 2018-0000125182

Certificate no. : NL16-400-1002-170-03 Revision no.: 1  
Description of the product : Frequency inverters for elevator drives without contactors  
Trademark : KW Aufzugstechnik  
Type no. : SAS16 + GOLIATH-90  
Name and address of the manufacturer : KW-Aufzugstechnik GmbH  
Zimmersmühlenweg 69  
61440 Oberursel, Germany  
Name and address of the certificate holder : KW-Aufzugstechnik GmbH  
Zimmersmühlenweg 69  
61440 Oberursel, Germany  
Certificate issued on the following requirements : Lifts Directive 2014/33/EU  
Certificate based on the following standard : EN 81-20:2020, clause 5.9.2.5.4 c), 5.11.2.3 and  
EN 81-50:2020, clause 5.6 and 5.15  
(EN 81-1:1998+A3:2009 clause 12.7, 14.1.2.3, annex H and F.6)  
(EN 81-2:1998+A3:2010, clause 12.4.1, 14.1.2.3, annex H and F.6)  
Test laboratory : Sebert Trillingstechniek B.V., Weg en Land 18,  
2661 DB, Bergschenhoek, The Netherlands  
Date and number of the laboratory report : 29-09-2016; Report M16.001-P16.001 Liftinstituut  
Date of EU-type examination : Original; June – October 2016  
Rev.1; October 2021  
Additional document with this certificate : Report belonging to the EU-type examination certificate  
no.: NL16-400-1002-170-03 rev.1  
Additional remarks : EN 81-50, clause 5.6 and 5.15 resp. EN 81-1/2+A3 Annex H, F.6  
examination and testing were included in the examination  
Conclusion : The safety component meets the requirements of the Lifts  
Directive 2014/33/EU taking into account any additional remarks  
mentioned above.

Amsterdam

Date : 25-10-2021  
Valid until : 25-10-2026

ing A.J. van Ommen  
International Business  
Manager

Certification decision by



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## Report EU-type examination

Report belonging to EU-type examination certificate number	: NL16-400-1002-170-03
Date of issue of original certificate	: October 25, 2016
Certificate applies to	: Safety component
Revision number / date	: 1 / 25-10-2021
Requirements	: Lifts Directive 2014/33/EU Standards: EN 81-20:2020 clause 5.9.2.5.4 c), 5.11.2.3 and EN 81-50:2020 clause 5.6 and 5.15; EN 81-1+A3 clause 12.7, 14.1.2.3, annex H and F.6; EN 81-2+A3 clause 12.4.1, 14.1.2.3, annex H and F.6.
Project number	: P210425

### 1. General specifications

Description of the product	: Frequency inverters for elevator drives without contactors
Trademark	: KW Aufzugstechnik
Type no.	: SAS16 + GOLIATH-90
Name and address of the manufacturer	: KW-Aufzugstechnik GmbH Zimmersmühlenweg 69 61440 Oberursel, Germany
Laboratory	: Sebert Trillingstechniek B.V, Netherlands
Address of examined lift	: KW-Aufzugstechnik GmbH premises Weg en land 18, Bergschenhoek
Date of examination	: Original; June – October 2016 Rev.1; October 2021
Examination performed by	: P.J. Schaareman

### 2. Description safety component

To provide state of the art stopping accuracy for lifts, inverters are more and more used. Today drive manufacturers provide inverters with safe torque off (STO) functionality. This means basically that the safety circuit of the lift is directly controlling the information to the drive if torque to the motor is allowed. Motor power contactors are not necessary anymore.

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To be able to do this the drive manufacturer have to follow a process to prove that the safety and the reliability of this function is in accordance with the current state of the art.

With the SAS function (safe off output) the GOLIATH-90 inverter series can be used in lift applications without the need of main contactors. The device can drive synchronous and asynchronous motors with nominal current from 12 Ampere to 162 Ampere. The SAS function provides the power to the semi-conductors controlling the frequency generator for the AC supply to the motor. The energy for powering the IGBT's is provided by the safety circuit of the lift. This allows an inherent safe circuit; when the safety circuit of the lift is opened the IGBT's cannot be powered anymore.

The safety circuit SAS16-102 replaces the main contactors at the end of the safety circuit. The safety circuit powers the primary winding of the transformer TR4 (J1a, J1b). The secondary winding of the transformer (J3a, J3b) provides with 400 VAC the control power of the IGBT's of the inverter.

Since the galvanic isolated drive stage of the inverter needs a voltage of 400VAC at the terminals LSAS1 and LSAS2 to control the drive stages of the IGBTs, it is ensured that the voltage supply for gate control of the IGBTs T1 / T2 / T3 of the inverter is switched off and T1 / T2 / T3 cannot be controlled if the safety circuit is interrupted. In that case no torque can be generated for the motor.

The inputs of the drive are monitored to check if the power is removed at standstill of the lift. From SAS16 a monitoring output is provided for the controller.

See Annex 1b for a schematic of the SAS16 and GOLIATH-90 STO control.

Technical details	: KW Aufzugstechnik, SAS16 + GOLIATH-90
Printed circuit boards	
Safety circuit	: SAS16-102 (72x76mm)
GOLIATH90 12/22/32A	: GOLIATH90_ANS32M_SAS_02c (146x300mm)
GOLIATH90 42/52A	: GOLIATH90_ANS52M_SAS_01a (255x248mm)
GOLIATH90 62/102/162A	: GOLIATH90_ANS400M_SAS_01b (100x298mm)
Temperature	: +0... +45 °C
Altitude	: Up to 2000m above sea level
Degree of protection	: IP20
For further specifications see manual GOLIATH-90	

See annex 1 for a general overview of the product



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### 3. Examinations and tests

The end of the safety circuit is connected to the SAS16 safety board. On the SAS16 board a relay is present to monitor the safety circuit status.

Safety circuit of the lift is connected to connector J1a and J1b of the SAS16 board. Maximum voltage is 230VAC.

Safety circuit (secondary output) of the lift is connected to connector J3a and J3b of the SAS16 board. Maximum voltage is 400VAC.

Safety circuit (secondary output) of the lift is connected to connector LSAS1 and LSAS2 of the power board of the GOLIATH-90. Maximum voltage is 400VAC.

Other control circuits on the power board related to the STO functionality are on the power board with a maximum voltage of 15VDC.

According to EN 81-50 clause 5.15 resp. Annex H of the EN 81-1+A3 (par 3.1 and 3.6) the creepage and clearance distances shall fulfill the requirements of the EN-IEC 60664-1 taking into account:

- pollution degree 3
- material group III
- inhomogeneous electrical field
- over-voltage category III
- printed wiring column not used

For 400 VAC these distances shall be 6.3mm for creepage and 5.5mm for clearance.  
For 230 VAC these distances shall be 4.0mm for creepage and 3.0mm for clearance.  
For 15 VDC these distances shall be 1.1mm for creepage and 0.8mm for clearance.

The examination covered a check whether compliance with the Lift Directive 2014/33/EU is met, based on the harmonized product standards EN 81-20:2020 and EN 81-50:2020. Additionally, for existing lifts applications, standards EN 81-1/2+A3 were also checked. Issues not covered by or not complying these Standards are directly related to the above mentioned essential requirements based on the risk assessment.

The examination included:

- Examination of the technical file (See annex 2):
- Examination of the representative model in order to establish conformity with the technical file.
- Inspections and tests to check compliance with the requirements.
- An assessment of the relevant information of the component to check, register and report the relevant key interface parameter(s) of the component to be used for UCM protection.
- Temperature, vibration and bumping tests according requirements of the standard EN 81-1 F.6 and EN 81-50 clause 5.6.



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## 4. Results

The creepage distances and clearances between terminals, connected to the safety circuit and tracks behind these terminals to each other and to another voltage do fulfill to the above (chapter 3) mentioned distances or alternative failure exclusion.

The energy flow to the motor is interrupted safely to guarantee that no torque to the motor is generated when the safety circuit of the lift is not available.

After the final examination the product and the technical file were found in accordance with the requirements. The functional tests passed without remarks.

In relation to UCMP we measured a maximum response time of removing torque from the motor after opening the safety circuit of 220ms.

## 5. Conditions

Additional to or in deviation of the applicable demands in the considered requirements / standards (see certificate and/or page 1 of this report), the following conditions shall be taken into account:

- In the final acceptance test it shall be verified that the STO function operates as intended.
- The interruption of the current to the brake shall be separately done by the lift control according the relevant requirements of the standard.
- If for UCMP the motoring torque needs to be taken into consideration, a delay time of 220ms needs to be taken in account for switching off the output of the inverter after opening of the safety circuit of the lift.
- The inverter shall be installed, set, commissioned and maintained according the instructions of the manufacturer.

## 6. Conclusions

Based upon the results of the EU-type examination, Liftinstituut B.V. issues an EU-type examination certificate.

The EU-type examination certificate is only valid for products which are in conformity with the same specifications as the type-certified product. The certificate is issued based on the requirements that are valid at the date of issue. In case of changes of the product specifications, changes in the requirements or changes in the state of the art the certificate holder shall request Liftinstituut B.V. to reconsider the validity of the certificate.



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## 7. CE marking and EU Declaration of conformity

Every safety component that is placed on the market in complete conformity with the examined type must be provided with a CE marking according to article 18 of the Lift directive 2014/33/EU under consideration that conformity with eventually other applicable Directives is proven. Also, every safety component must be accompanied by an EU declaration of conformity according to annex II of the Directive in which the name, address, and Notified Body identification number of Liftinstituut B.V. must be included as well as the number of the EU-type examination certificate.

An EU type-certified safety component shall be random checked e.g., according to annex IX of the Lift directive 2014/33/EU before these safety components may be CE-marked and may be placed on the market. For further information see regulation 2.0.1 'Regulations for product certification' on [www.liftinstituut.com](http://www.liftinstituut.com).

Prepared by:

P.J. Schaareman  
Product Specialist Certification  
Liftinstituut B.V.

Certification decision by:

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Annexes

Annex 1. SAS16 and GOLIATH-90



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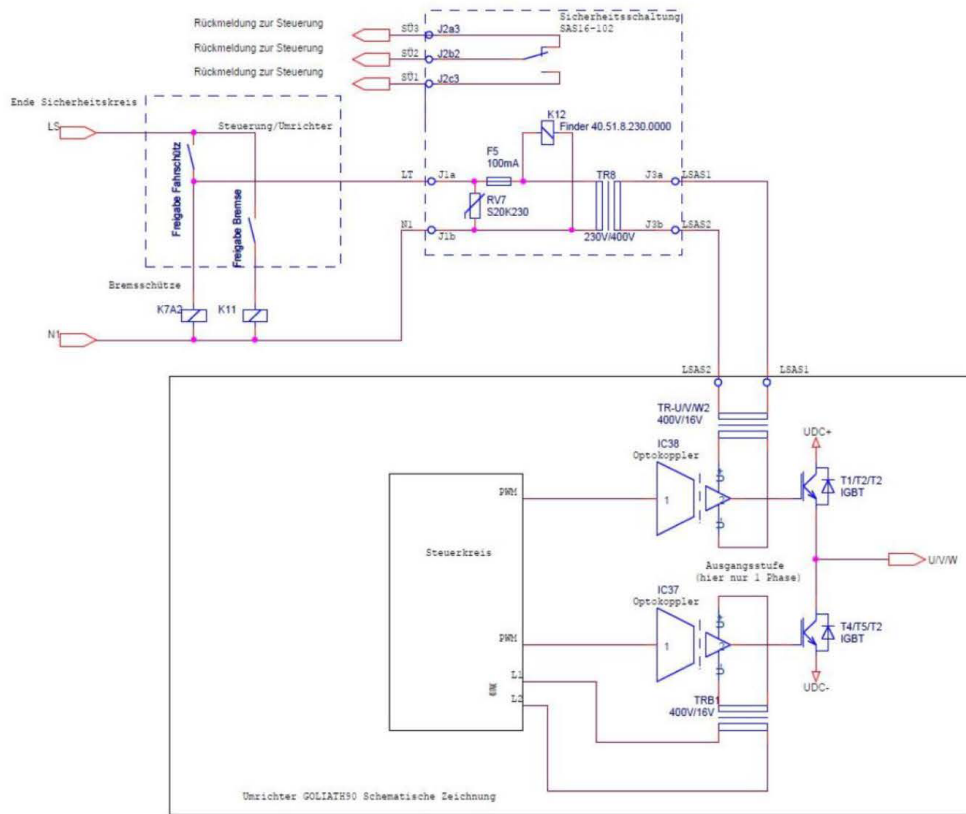
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Annex 1. STO schematic



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**Annex 2. Documents of the Technical File which were subject of the examination**

Title	Document number	Date
Technical file; Functional, and principal description, risk analyses, PCB layouts, BOM lists and failure exclusions SAS16 and Goliath-90	Beschreibung SAS-Goliath90_r31.pdf	17-06-2016
For information: Certificate TUV Thüringen	B-FT-11-0039-40 20120910.pdf	17-06-2016
For information: Annex certificate TUV Thüringen	Anlage FT-11-0039-40 20120910.pdf	17-06-2016
Schematic and PCB file ANS32M	GOLIATH90_ANS32M_SAS_02c	17-06-2016
Schematic and PCB file ANS52M	GOLIATH90_ANS52M_SAS_01a	17-06-2016
Schematic and PCB file ANS400M	GOLIATH90_ANS400M_SAS_01b	17-06-2016
Manual GOLIATH-90	GOLIATH-90-V122-D.pdf	07-07-2016

**Annex 3. Reviewed deviations from the standards**

EN 81-20 par.	Requirement	Accepted design
5.9.2.5.4 c)	5.9.2.5 Removing the power which can cause rotation of the motor 5.9.2.5.4 A.C. or D.C. motor supplied and controlled by static elements c) electrical circuit satisfying 5.11.2.3.	SAS16-102 + GOLIATH-90

EN 81-1 par.	Requirement	Accepted design
12.7	Stopping the machine and checking its stopped condition	SAS16-102 + GOLIATH-90

EN 81-2 par.	Requirement	Accepted design
12.4.1	Stopping the machine and checking its stopped condition	SAS16-102 + GOLIATH-90

**Annex 4. Revision of the certificate and its report**

Rev.:	Date	Summary of revision
-	25-10-2016	Original
1	25-10-2021	5-year re-assessment, update to EN 81-20:2020

## 2.0 Transport / Assembly / Start up

### 2.1 Transport and storage, assembling instructions

The protection circuit SIS16-102 is to be protected before inadmissible demand in the case of transport and handling. The contact of electronic elements and contacts is to be avoided.

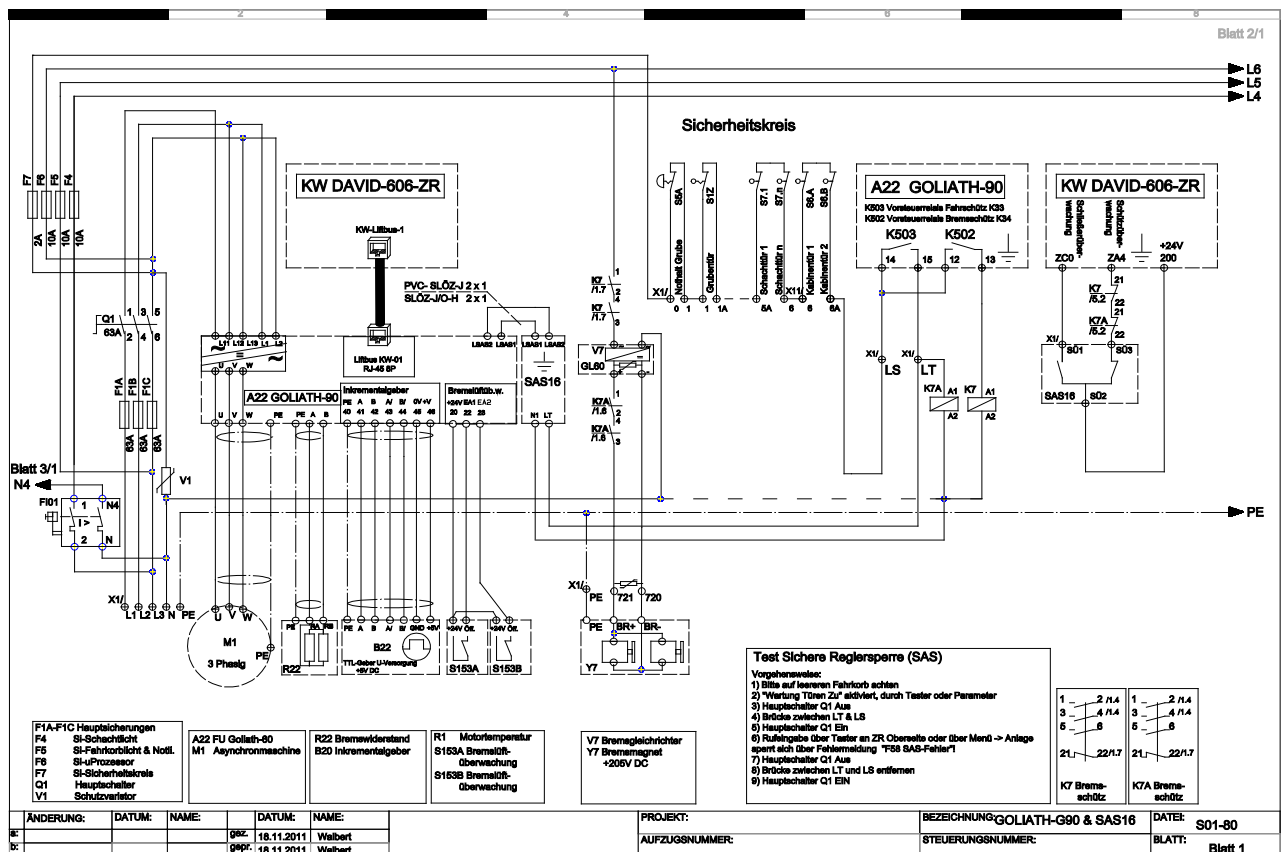
Electrical components may not be damaged or destroyed mechanically. Clamping procedures at the strips may be accomplished only with tension-free equipment.

All leading connections lead also after switching off still tension until the condensers unloaded themselves ( approx. 5 min). Lager dusty condition, penetration of water , high concentration of chemically active pollutants, danger of fungus growth or penetration of parasites endanger safe enterprise of the complete system. Therefore the protection circuit SIS16-102 must be built into a switchgear cabinet. The ambient temperature must be in a range between 0°C and + 65°C.

### 2.2 Connection the assembly instructions

Principle is to prevent external voltages to prevent a drop in the up-and down-contactors and the braking element, despite safety circuit interruption.

An example is shown in the drawing below, the safety circuit of a hydraulic elevator system with control of up-and down-contactors, as well as controlling a one-way lock valve.



As previously mentioned, the control of the service section of the static frequency cahnger from the safety circuit is supplied with tension. As soon as the safety circuit is interrupted, the output stage of the static frequency changer is closed.

The wiring within switchgear cabinet takes place with H07Z-K and/or H07Z-K with 1mm<sup>2</sup> Line in the color white or blue according to firm KW Aufzugstechnik GmbH. The cable routing takes place in wireway. The terminals configuration at the controller A22 GOLIATH-90 and the control compute unit DAVID D606-ZR is to be kept accurately.

According to the switching contacts of the contactors wiring leads to the terminals of the one-way lock valve.

When connecting PVC pipe SLÖZ-J 3 x 1mm<sup>2</sup> or SLÖZ-J/OH 3 x 1mm<sup>2</sup> is used. The valve must be grounded on the PE wire.



## 2.3 Function test – Safe controller lock (SAS)

### Generally

Frequency inverter GOLOATH-90 supervises the terminals LSAS1 and LSAS2 in frequency inverter. Independently of the fact that with opened safety circuit there are no voltage at the terminals LSAS1 and LSAS2.

Frequency inverter close with the message “F58-SAS-fault” if in the stop voltage applied.

(this could be the case, if two clamps were not correct connected with 400VAC ) A restart is only possible after a reset.

if it comes to an interruption while driving of the safety circuit leads this to a trip abort by missing release tension at the terminals LSAS1/2 with the message “F57-SAS blocked”.

### 1.) Process of the external voltage simulation

- 1.) Please pay attention for a empty car!
- 2.) Operate the pushbutton „ Maintenance doors close“ at the top of DAVID-central unit -> Doors close!
- 3.) Frequency inverter Goliath Menü C4- TÜV- SAS test to ON and activate the yellow Pushbutton below
  - > If present, push button S51 controller remote control to press
  - > Lift is blocked with error message „**F58/F158 SAS-blocked**“ >Please unblock the lift.

### Behavior

Frequency inverter GOLIATH-90 closed with message „F58/F158 - SAS-fault“.

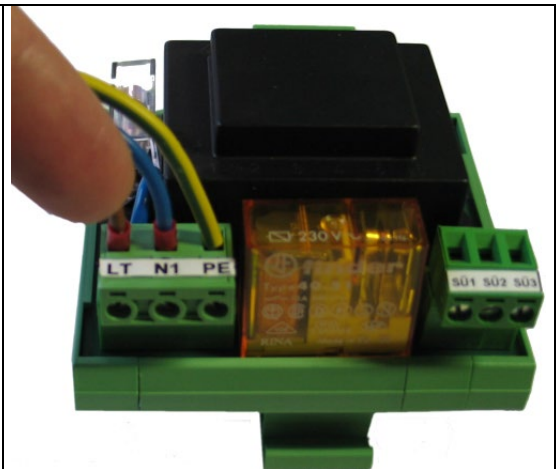
### Unblocking

Activate the main switch, after the switch off the main switch and remove the jumper.

System is ready to start now.

### 2.) Process of the safety circuit interrupt simulation

- 1.) Please pay attention to an empty car!
- 2.) Operate the pushbutton „ Maintenance doors close“ at the top of DAVID-central unit -> Doors close!
- 3.) Attempts of the call input over pushbuttons at central processing unit.
- 4.) **Pull the plug LT- N1 in travel -> see picture!**
- 5.) Inverter closed with the message „**F57/F157 SAS blocked**“
- 6.) Main switch Q1 OFF.
- 7.) **Put the plug LT- N1 -> see picture!**
- 8.) Main switch Q1 ON.



Board SAS16-102 with plug LT-N1

### Behavior

Frequency inverter GOLIATH-90 closed with message „F57/F157 - SAS-blocked“.

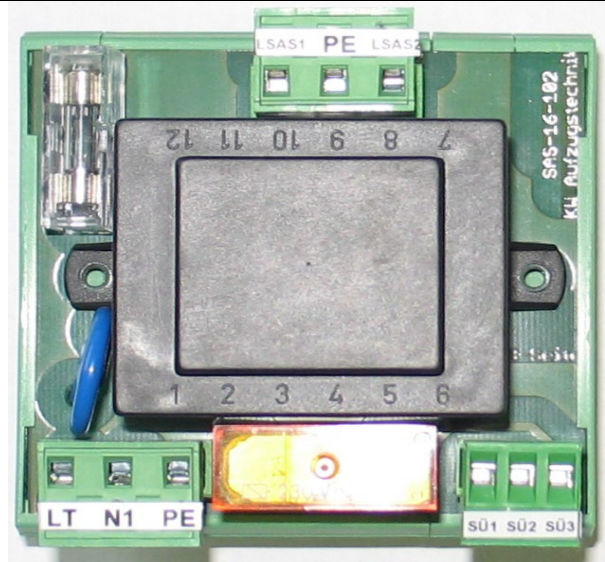
### Unblocking

Main switch deactivate, then pull the plug and activate the main switch again.

System is ready to start now.

### 3.0 Fault clearance

#### 3.1 Risk analysis

	<p>The following table shows possible switching status of the SAS16-102 with construction unit fails.</p> <p>As boundary condition it is accepted that the safety circuit is open and no voltage lies on. (Between Terminal LT and N1)</p>
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Unit	Interruption	Short circuit	Change in higher value (Change of the characteristic)	Change in lower value (Change of the characteristic)
F1	No current flow, no tension on J3a/J3b	There no tension on J1a/b, no tension on J3a/b	There no tension on J1a/b, keine Spannung an J3a/b	There no tension on J1a/b, keine Spannung an J3a/b
RV1	→ irrelevant	There no tension on J1a/b, no tension on J3a/b	See interruption	See short circuit
TR1	No current flow, no tension on J3a/J3b	There no tension on J1a/b, no tension on J3a/b	See interruption	See short circuit
F1	No current flow, no tension on J3a/J3b	There no tension on J1a/b, no tension on J3a/b	See interruption	See short circuit
K1	No current flow no tension on J3a/J3b	There no tension on J1a/b, no tension on J3a/b	See interruption	See short circuit

#### 3.2 Fault clearance

In frequency inverter GOLIATH-90 and microprocessor systems DAVID-606 / 2005 / 912 exist error memory with a depth of 100 possible entries.

The error registrations find in the submenu C error memory at GOLIATH-90 controllers and DAVID-606/205/912 control computers.


The closer handling of the microprocessor system is to find in the appropriate technical manual on our internet side. An exact fault tracing can be made on the basis entry in the error memory.

Fault	Error cause	Fault clearance
<b>F57 SAS blocked</b>	Interruption of the safety circuit while driving leads to a trip abroad by missing tension.	Examine please the electrical and mechanical installation of the lift.
<b>F58 SAS fault</b>	In a stop is a tension on terminals on LSAS1 and LSAS2. → This may be the case, if the two terminals wrongly connected.	Control on the base the connection diagram between GOLIATH-90 → SAS16-102 → Relay GOLIATH-90.

## 4. Maintenance/ Repair/ Disposal of the Component assembly


### Maintenance

The cleaning of the protection circuit SIS16-101 is only with halogeneous-free and dry substances permissible. Examine with each maintenance the c-clamps for their fixity. With each maintenance you must drive through one „Functional test of the Component assembly“. You find the discription in chapter 2.3

	<p><b>Never work under mains voltage – Danger of life!</b></p> <p>Before you begin work on the protection circuit SIS16-101, <b>interrupt voltage supply</b> by main switches and the appropriate safety devices and secure you against <b>erroneous restarting!</b></p> <p>Survey the supply lines for <b>tension free!</b></p> <p>Neighbouring clamps and components, which could be energized must be covered!</p>
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### Repair of the Component assembly

Defective protection circuits SAS16-101 can be repaired only by the manufacturer since it acts over safety components assembly. Therefore you return defective components assembly to the manufacture.

	<p><b>Never work under mains voltage – Danger of life!</b></p> <p>Before you remove and/or dismantle the protection circuit consider the safety and assembling instructions from chapters 1.3 and 2.2!</p>
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### Waste management of the Component assembly

The company KW Aufzugstechnik GmbH takes old devices back when delivery to KW Aufzugstechnik-Werk Oberursel is free of charge.

With user disposal and with the exchange of components the regionally in each case valid waste treatment and disposal regulations for spezial refuse is to be considered.

The company KW Aufzugstechnik GmbH does not take over adhesion for duly not disposed of construction units and components.