LIFTINSTITUUT

GEACCREDITEERD DOOR DE RAAD VOOR ACCREDITATIE

EC TYPE-EXAMINATION CERTIFICATE

Acting under the Wet op de gevaarlijke werktuigen issued by the Liftinstituut
(Stichting Nederlands Instituut voor Lifttechniek), identification number Notified Body 0400,
commissioned by departmental order no. ARBO/APM/97/00293 of april 23rd 1997

Certificate nr.	: NL.03.400.1002.004.30	Object nr.: 1002.004.30
Description of the product	: Safety-circuit used for bridging of door and doorlocking-contacts during levelling	
Trademark, type	: Printed Circuit Board SUET 3.Q	
Name and address of the manufacturer	: Schindler Elettronica Via della Pace 22 CH-6600 Locarno, Switzerland	
Name and address of the certificate holder	: Schindler Elettronica Via della Pace 22 CH-6600 Locarno, Switzerland	
Certificate issued on the basis of the following requirements	: Lifts Directive 95/16/EG	
Test laboratory	: Liftinstituut Amsterdam, The Netherlands Tecnolab Via dell'industria 20 28294 Verbania Fondotoce (VB), Italy	
Date and number of the laboratory report	: NL.03.400.1002.004.30 October, 2003	
Date of EC type-examination	: October, 2003	
Annexes with this certificate	Report belonging to the EC type-examination certificate no: NL.03.400.1002.004.30	
Additional remarks	: The printed circuit board is subjected to the laboratory tests according to Annex F.6 of the NEN-EN 81	
Conclusion	: The printed circuit board **SUET 3.Q** meets the requirements of the Lifts Directive 95/16/EG taking into account any additional remarks mentioned above.	

Issued in Amsterdam
Date of issue : November 27th, 2003

LIFTINSTITUUT
managing director

LIFTINSTITUUT

ACCREDITED BY THE DUTCH COUNCIL FOR ACCREDITATION

Report of EC Type - Examination

-Name and address of Notified Body	**: Liftinstituut Buikslotermeerplein 381 1025 XE Amsterdam The Netherlands**
-Tested on request of	**: Schindler Elettronica SA Via della Pace 22 CH-6600 Locarno Switzerland**
-EC Type-Examination number	**: NL.03.400.1002.004.30**
-Product Description	**: Printed Circuit Board SUET 3.Q**
-Applied Standards	**: EN - 81 (August 1998)**
-Date of Issue	**: Oktober 2003**
-Issued By	**:**

Dr.ir. P.E.T. Striekwold
Technical Director

Table of Contents

1. Principal

Manufacturer Schindler Elettronica SA (Locarno, Switzerland) has ordered the Liftinstituut (Amsterdam , the Netherlands) to examine the printed circuit board SUET 3.Q according to the requirements of the Lifts Directive (95 / 16 / EG) .

2. Test sample

2.1. Manufacturer	Schindler Elettronica SA Via della Pace 22 CH-6600 Locarno Switzerland
2.2. Identification PCB	SUET 3.Q (identification number on component side 591811 and on solder side 205466)
2.3. Technical data	Voltage safety-circuit 125 Volt AC / DC Current max. 1000 mA Voltage safety relays 20,5 Volt DC See technical description Q 42 106 535
2.4. Test laboratory	Liftinstituut Buikslotermeerplein 381 1025 XE Amsterdam The Netherlands
2.5. EC Type-examination number	NL.03.400.1002.004.30

3. General description

The printed circuit board SUET 3.Q is used when door pre-opening is required .
The car- and landing-door already open before the car reaches the destination floor .
In order to enable this operation it is necessary to bypass the door-contacts / door-locking-contacts .
The printed circuit board contains four safety relays RUET, RUET1, RKUET and RFUET .
These four relays together form a safety-circuit for bridging the door safety switches during levelling of the car .
The door-zone signals KUET / KUET1 (magnetic sensors) or PHUET / PHS (optical sensors) are used for activation of the safety relays RUET and RUET1 .
The levelling speed is checked by the microprocessor, safety relay RFUET is activated in case the levelling speed is reached .

Change of state of the door-zone signals KUET / KUET1, PHS / PHUET has to be established within a certain delay time (between 130 and 180msec) .
The purpose of this delay time is to be able to activate both relays RUET and RUET1, in case the door-zone signals are not activated at exact the same time .
Control relay RKUET is connected to the " electronic time delay circuit " and will be de-energized with a delay (may vary between 130 and 180 ms) .

4. Technical documentation

- Technical description PCB Q 42 106 535 (11 pages, modification 0, dated 10-06-2003)
- Schematical drawing S 42106535 (1 page, modification 0, dated 19-09-2003)
- Installation drawing S 194 xxx Smart MRL (1 page, modification & date not marked)
- Installation drawing S001-3.11 Bionic 5 (12 pages, modification & date not marked)
- Assembly drawing Z 42106535 (1 page, modification 0, dated 17-10-2003)
- Lay-out printed circuit board Y 42105062 (2 pages, modification 0, dated 17-02-2000)

5. Test description

5.1. Failure Analysis according to NEN – EN 81

The purpose of the failure analysis it to verify that one or more faults can not lead to a dangerous situation, this means uncontrolled bridging of door-contacts / door-locking-contacts .

Any single fault listed in par. 14.1.1.1. of the EN-81 in the electric equipment of an elevator, if it can not be excluded under conditions described in par. 14.1.1.2. and/or Annex H shall not, on its own, be the cause of a dangerous malfunction of the elevator .
For some (electronic) components short-circuit or open-circuit, change of value or change of function can not be excluded according to Annex H of the EN-81 .
It is necessary that the fuse in the safety-circuit is correctly rated and constructed according to the applicable IEC-standards to prevent a dangerous situation in case of short-circuit .

The required creepage and clearance distances are mentioned in Annex H and therefore part of the failure analysis .
All the relevant distances between the connections to the safety-chain and the tracks behind these connections and to other connections and their associated tracks are measured .

In Annex H there are some requirements about the used materials and (electronic) components, the manufacturer has to make an official declaration about these materials and components .

Note :

When the requirements of Annex H are not fulfilled, there is a possibility for the manufacturer to make his own risk analysis on the subject .
The replacing technical solution has to be of equivalent safety .
It is for the Notified Body whether or not to accept this .

6. Applied standards

The following Standard includes the requirements for the examination of the printed circuit board SUET 3.Q :

- European Harmonized Standard NEN – EN 81 (August 1998)
  (safety rules for the construction and installation of lifts)

  part 1 : Electric Lifts
  part 2 : Hydraulic Lifts

7. Test evaluation

7.1. Failure analysis related to creepage and clearance distances

The creepage and clearance distances have to be according to 3.1. and 3.6. of Annex H of the EN-81 .
The articles (3.1. and 3.6.) refer to the IEC 664-1 (table 2 for the clearance distances and table 4 for the creepage distances) with the following requirements :

- **pollution degree 3**
- **material group III**
- **inhomogeneous electrical field**
- **over voltage category III (see IEC 664-1 , table 1)**
- **printed wiring column not used**

The measured distances are the absolute minimum values in relation to the highest possible difference in potential between two circuits, at least one of these circuits is connected to or behind the safety-chain .
In some cases it is not possible to determine the maximum difference in potential between two or more circuits .
In these cases the manufacturer has to measure in practice with a true RMS-reading Voltmeter, afterwards they have to send the measured values to the Liftinstituut .
The results of these measurements will be evaluated by the Liftinstituut .

7.1.1. Creepage Distances

All the measured creepage distances fulfil the requirements of IEC 664-1, table 4, pollution degree 3 and material group III .
This is in accordance with the requirements of Annex H (article 3.6.) of the EN-81 .

Conclusion :

All the relevant creepage distances on the printed circuit board SUET 3.Q fulfil the requirements of Annex H of the EN-81 .

7.1.2. Clearance Distances

The components used for the printed circuit board SUET 3.Q are mounted in such a way, that the clearance distances to their surrounding components are at least equal to the creepage distances.

Conclusion :

All the relevant clearance distances on the printed circuit board SUET 3.Q fulfil the requirements of Annex H of the EN-81 .

7.2. Safety-circuit

The safety-circuit for bridging the door safety switches is built up of two independent channels (relays RUET and RUET1, and door-zone signals KUET/KUET1 or PHUET/PHS) and a control-circuit (relay RKUET), which monitors the equal status of the two independent channels .
Door safety switch bridging is not possible in case of different status between the two channels .

The functioning of the control-circuit (relay RKUET) itself will be checked each time the elevator reaches a door-zone, after activation of the relay RFUET .

The safety relays RUET, RUET1 and RKUET together form a safety-circuit according to par. 14.1.2.3. of the EN-81 .

7.2.1. Speed control

The speed of the elevator in case of levelling has to be in accordance with par. 14.2.1.2. (point B) .

7.2.2. Door-zone detection

The movement of the elevator, in case the door-contacts / door-locking-contacts are bridged, is limited to the unlocking zone by the door zone signals KUET/KUET1 or PHUET/PHS .
The length of the door-zone has to be in accordance with par. 7.7.1. of the EN-81 .

7.2.3. Failure analysis

The functional operation of the safety-circuit is described by Schindler in the technical description Q 42 106 535 .
According to the requirements of the EN-81, the following faults / defects have to be considered :

Fault A :
Non-separation of relay RUET as a result of a failure (e.g. welding of NO-contacts) .
This fault leads to non-attraction of control relay RKUET and relay RUET1, during the next levelling operation .
The door safety switch bridging is blocked .

This fault scenario also takes place in case door-zone signal KUET or PHS stays activated outside the door-zone .

Fault B :
Non-separation of relay RUET1 as a result of a failure (e.g. welding of NO-contacts) .
This fault leads to non-attraction of control relay RKUET and relay RUET, during the next levelling operation .
The door safety switch bridging is blocked .

This fault scenario also takes place in case door-zone signal KUET1 or PHUET stays activated outside the door-zone .

Fault C :
Non-attraction of control relay RKUET as a result of a failure (e.g. open circuit in supply to coil) .
This fault leads to non-attraction of both relays RUET and RUET1 .
The door safety switch bridging is blocked .

Fault D :
Non-attraction of relay RUET as a result of a failure .
This fault leads to not closing of the NO-contact in the safety-chain during levelling operation, the door safety switch bridging is blocked .

Fault E :
Non-attraction of relay RUET1 as a result of a failure .
This fault leads to not closing of the NO-contact in the safety-chain during levelling operation, the door safety switch bridging is blocked .

Fault F :
Non-separation of control relay RKUET as a result of a failure .
This fault leads to not closing of the NC-contact in the safety-chain during levelling operation, the door safety switch bridging is blocked .

Fault G :
Open-circuit of transistor T1 in neutral line of control relay RKUET as a result of a failure .
This fault leads to non-attraction of control relay RKUET .
Doorzone relays RUET and RUET1 can not be activated, the door safety switch bridging is blocked .

Fault H :
Short-circuit of transistor T1 in neutral line of control relay RKUET as a result of a failure .
This fault leads to a longer time delay (> 180msec) for control relay RKUET .
Capacitor C12 discharges totally over the coil of control relay RKUET and this leads to the possibility that the door safety switch bridging is not activated, in case delay time of C12 is much to long .

After each levelling sequence capacitor C12 will be discharged totally and therefore a dangerous situation can not take place .

Fault I
Short-circuit between the two door-zone signals KUET and KUET1 (magnetic sensors) can be excluded because the required creepage and clearance distances are in accordance with Annex H of the EN-81 .
Loss of redundancy is not possible .

Fault J
Short-circuit between the two door-zone signals PHS and PHUET (optical sensors) can be excluded because the required creepage and clearance distances are in accordance with Annex H of the EN-81 .
Loss of redundancy is not possible .

Fault K
Loss of redundancy between two door-zone signals for two car door entrances is possible, because short-circuit of diodes can not be excluded .
See par. 7.2.6. for the fault analysis .

7.2.4. Safety relays for door safety switch bridging

Simultaneously closing of NO- and NC-contacts can be excluded if the safety relays for door safety switch bridging are in accordance with the requirements of par. 13.2.1.3. of the EN-81 .

Short-circuit between contacts, and contacts and coil can be excluded if the relays fulfil the requirements of par. 13.2.2.3. (par. 14.1.2.2.3.) of the EN-81 .

Manufacturer / type safety relays **RUET and RUET1** :

Hengstler R718 T3
HDZ-468-1146
20,5 VDC (coil)
6A / 230 Volt (contact)
safety relay according to EN-50205

Manufacturer / type safety relays **RKUET and RFUET** :

Hengstler R721 T3
HDZ-468-1150
20,5 VDC (coil)
6A / 230 Volt (contact)
safety relay according to EN-50205

Conclusion :

The safety relays (RUET, RUET1, RKUET and RFUET) used for the door safety switch bridging fulfil the requirements of the EN-81 .

7.2.5. Electronic time delay circuit

The door-zone relays RUET and RUET1 can only be activated in case control relay RKUET is attracted .
In case the door-zone relays RUET / RUET1 are not activated at exact the same time (difference in alignment of the door-zone signals in the shaft), control relay RKUET must fall off with a time delay .
The function of the electronic time delay is to activate both door-zone relays RUET / RUET1 within a certain time, by keeping attracted control relay RKUET after the first door-zone relay is activated .

A failure analysis for the electronic time delay circuit is required .
After each levelling sequence the time delay circuit is discharged totally, so control relay RKUET can not be activated in case door zone relay RUET or RUET1 does not fall off as a result of a failure .
Even in case an electronic component in the time delay circuit fails, a dangerous situation in the safety-circuit can not take place .

Schindler declares that the time delay lays between the following minimum and maximum value :

Minimum value = 130msec
Maximum value = 180msec

7.2.6. Short-circuit of diodes (D11 and D12)

In case of two car door-entrances, four different door-zone signals are required .

For the first car door-entrance the door-zone signals PHUET and PHS are used, these are optical sensors .
For the second car door-entrance the door-zone signals 2PHUET and 2PHS are used, these are optical sensors .

After each door-zone signal a diode is connected .
According to the requirements of Annex H, short-circuit of a diode can not be excluded .
In case of short-circuit of two diodes during a normal operation of the elevator there is a possibility that both car door-entrances are opened, even when there is only one landing door (passengers inside the car are looking against the wall of the shaft) .

This situation can only take place when the car door is not mechanically locked (see Annex of this report regarding to " door locking device ") .
When the car door is mechanically locked because the horizontal distance between the wall of the shaft and the sill exceeds 0,15m, ***opening of the car door is not possible without the presence of a landing door .***

The diodes are manufactured is such a way that short-circuit of two different diodes is almost impossible .
The technical data of the diodes are added to this report (see annex) .

Note :

Only two diodes D11 and D12 are mounted on the SUET 3.Q board (optical sensors PHUET/2PHUET).
The other two diodes are connected on the SDIC board (optical sensors PHS/2PHS) .

7.2.7. Optical sensors

The optical sensors PHUET/2PHUET and PHS/2PHS are used as transmitter elements for the safety-circuit .
These sensors are not tested by the Liftinstituut as part of this EC type examination according to par. 14.1.2.5. of the EN-81 .

The magnetic sensors KUET/KUET1 are in accordance with par. 14.1.2.5. of the EN-81 .
These sensors are already in use for the safety-circuits MXUET and SUET 1.Q .

7.3. Important changes on printed circuit board SUET 3.Q

The following components on the printed circuit board SUET 3.Q are not allowed to be used / mounted :

- ***capacitor C14***
- ***capacitor C15 .***

7.4. Laboratory tests (Annex F.6.)

The printed circuit board SUET 3.Q is a safety-circuit with electronic components and therefore laboratory tests according to Annex F.6. of the EN-81 are required .

The tests are performed at an independent test laboratory, on request of Schindler .
After testing the printed circuit board SUET 3.Q, the Liftinstituut received a copy of the test-results from the test laboratory .
These test-results are satisfactory.
The printed circuit board SUET 3.Q is in accordance with the requirements of Annex F.6. of the EN-81 .

7.5. Declarations manufacturer

Schindler declares the following :

- The general specifications of the printed circuit board are in accordance with EN 62326-1 (3.6. of Annex H) .
- The base material and the solder resist of the printed circuit board are of higher quality than the specifications of EN 60249-2-2 and / or EN 60249-2-3 (3.6. of Annex H) .

This declaration is part of the examination report (see Annex) .

8. EMC exclusion

The printed circuit board SUET 3.Q, with all components, has not been tested in relation to the requirements of EMC-directive (emission and immunity).
Therefore this report of examination does not contain any information about EMC .

9. Conclusion

The printed circuit board **SUET 3.Q** is in accordance with the requirements of the European harmonized standard EN-81 (part 1 and 2) .
Compliance with the relevant parts of the European standard provides one means of conforming with the requirements of the Lifts Directive .

10. General Remarks

- Any modification to the printed circuit board justifies a new examination . A new certificate of type-examination will be issued after approval .
- This technical report is the result of testing a submitted sample of the product, the report does not imply an evaluation of the same products coming from the complete production .
- The manufacturer has to make a declaration of conformity for each identical product and affix the CE-mark on the product . The CE-mark shall be followed by the notified body number, acting in the conformity assessment procedure .
- It is not permitted to multiply or to publish this report without permission of the Liftinstituut .

ANNEXES SUET 3.Q

- SCHINDLER DECLARATIONS
- TECHNICAL DATA SAFETY-RELAYS
- TECHNICAL DATA DIODES
- DOOR-LOCKING DEVICE
- CHANGES ON PCB SUET 3.Q (RELATED TO C14 & C15)

MANUFACTURER's DECLARATION

" Printed Circuit Boards "

Schindler

Name of Manufacturer : Schindler Electronics Ltd.

Address of Manufacturer : Via della Pace, 22
CH – 6600 LOCARNO

This is to certify that the components used on all our Printed Circuit Boards (PCB's) having the function of safety circuit and/or having connections to the safety chain fulfill the requirements of the harmonized standard EN81 - Annex H, in particular:

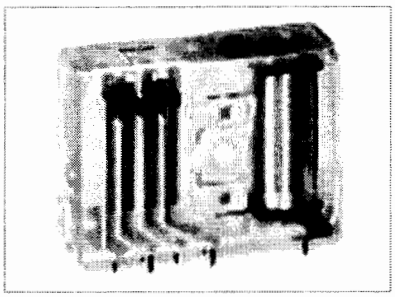
- Optocouplers are in compliance with IEC 60747-5,
- Transformers are in compliance with EN 60742 (paragraph 17.2 and 17.3),
- Relays are in compliance with EN 60947-5-1,
- The general specifications of the PCB's are in compliance with EN 62326-1,
- The base material of the PCB's has a better quality than that specified in EN 60249-2-2 and/or EN 60249-2-3,
- Multilayer PCB's are in compliance with EN60950,
- The coating used on the PCB's guarantees a pollution degree 2 below the coating.

Locarno	19.1.1999	Mr. G.Ostini	Mr. M.Gielis
Place	Date	General Manager	Technical Director
		Signature	Signature

Sicherheitsrelais H-468

Safety Relay H-468

MERKMALE
FEATURES



Zwangsgeführter Kontaktsatz mit 4 Kontakten, unterschiedliche Konfigurationen von Öffnern und Schließern.

- gemäß DIN EN 50205 Anwendungstyp A
- alle Kontakte im Kontaktsatz sind miteinander zwangsgeführt

Isolation 2.000 V AC Prüfwechselspannung
- Ü=III; V=2; 120/240 V: verstärkte Isolierung
- Ü=III; V=2; 230/400 V: Basisisolierung

Anschlüsse
Lötstifte für Leiterplatten

Antrieb
Gleichstrom, gepolt monostabil

Forced guided contact set *with 4 contacts, different configurations of NC and NO contacts.*

- *According to DIN EN 50205 application type A*
- *i. e. all contacts are mutually forced guided within the contact set*

Insulation 2.000 V AC test alternating voltage
- *O=III; P=2; 120/240 V: reinforced insulation*
- *O=III; P=2; 230/400 V: basic insulation*

Connections
Soldering pins for PCB mounting

Drive
DC current, polarized monostable

ZULASSUNGEN
APPROVALS

VDE / TÜV
CUL

VDE / TÜV
CUL

ZUBEHÖR
ACCESSORIES

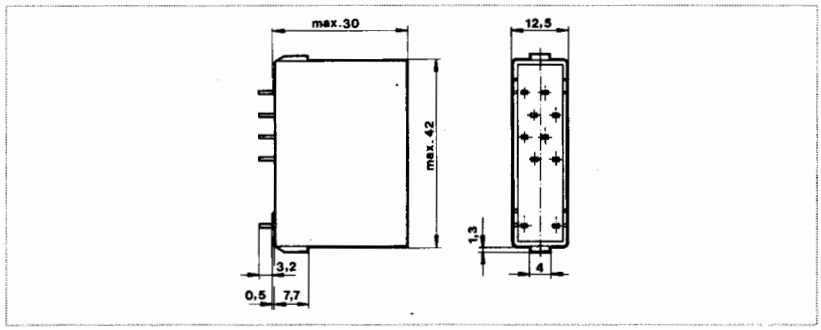
- Stromtreiber DIL-8 Gehäuse
- Stromtreiber SO-8 Gehäuse
- Fassung mit Lötstiften für Leiterplatte
- Fassung mit Lötfahnen
- Adaptierplatine für liegende Aufbaumöglichkeit
- Demontagehilfe

Detaillierte Übersicht siehe Seite 60.

- *Current regulator unit DIL-8 housing*
- *Current regulator unit SO-8 housing*
- *Socket with soldering pins for PCB mounting*
- *Socket for conventional mounting*
- *PCB-kit for low-profile mounting*
- *Removing tool*

Detailed overview see page 60.

HÜLLMASSE
COVER DIMENSIONS



TECHNISCHE DATEN
TECHNICAL DATA

Allgemein	***General***	
Maße in mm	*Dimensions in mm*	42 x 12,5 x 30
Umgebungstemperatur	*Ambient temperature*	-25 ... + 80°C
Max. Schaltleistung	*Max. switching capacity*	1500 VA / 30 W
Max. Schaltstrom	*Max. switching current*	8 A
Dauerstrom I_{th2}*	*Constant current I_{th2}**	6 A
Max. Schaltspannung	*Max. switching voltage*	AC 230 / 240 V; DC 300 V
Schockfestigkeit bei 11 ms	*Shock resistance at 11 ms*	10 g
Schwingfestigkeit bei 10–200 Hz	*Vibration resistance at 10–100 Hz*	5 g
Lebensdauer, mech.	*Service life, mech.*	>10^7 Schaltspiele / *switching cycles*
Lebensdauer, elektr.	*Service life, electr.*	>10^5 Schaltspiele / *switching cycles*

Kontaktsatz	***Contact set***		
Schaltvermögen	*Switching capacity*		
AgNi		I_e = 4 A	(AC-15 230/240 V)
		I_e = 2 A	(DC-13 24 V)
Ansprechzeit bei 1,4 x U_1 typisch	*Operating time at 1.4 x U_1 typical*	$t_{a\text{-}\delta\,/\,a\text{-}nc}$ 12 ms	$t_{a\text{-}s\,/\,a\text{-}no}$ 17 ms
Rückfallzeit bei 1,4 x U_1 typisch	*Releasing time at 1.4 x U_1 typical*	$t_{r\text{-}s\,/\,r\text{-}no}$ 5 ms	$t_{r\text{-}\delta\,/\,r\text{-}nc}$ 7 ms
Kontaktwiderstand	*Contact resistance*	<50 mΩ	

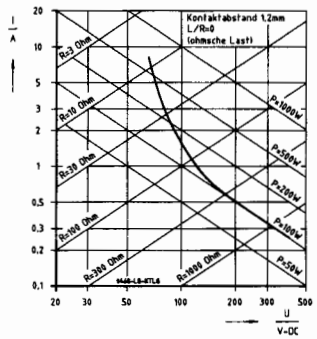
Isolation für Ü=III; V=2	***Insulation for O=III; P=2***				
	AC 120 V	AC 240 V	AC 230 V	AC 400 V	Prüfspannung / *Test voltage*
Kontakt-Kontakt / *Contact-contact*	D-I	D-I	B-I	B-I	2.000 VAC
Kontaktsatz-Antrieb / *Contact set-drive*	D-I	D-I	B-I	B-I	2.500 VAC
D-I =	verstärkte (doppelte) Isolierung			*reinforced (double) insulation*	
B-I =	Basisisolierung			*Basic insulation*	

Weitere Daten können Sie der beigefügten CD-ROM entnehmen. / *Further data see on the enclosed CD-ROM.*

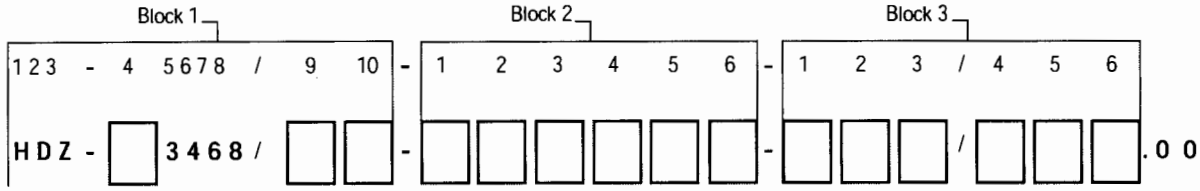
* Werden mehrere Kontakte gleichzeitig belastet, ändern sich die zulässigen Dauerströme.
- 2 Kontakte mit je 4,2 A oder
- 3 Kontakte mit je 3,5 A

** Permissible constant current by simultaneous switching of several contacts*
- *2 contacts 4.2 A each or*
- *3 contacts 3.5 A each*

Lichtbogengrenzkurve
Arc-limiting Graph



BESTELLSCHLÜSSEL
DESIGNATION KEY



Beispiel / *Example*

HDZ - 4 3468 / 1 1 - 0 0 1 0 8 2 - 3 1 0 / 0 0 1 .00

VORZUGSTYPEN
PREFERRED TYPES

468-1003	HDZ-43468/11-001082-310/001.00
468-1017	HDZ-43468/11-001082-220/002.00
468-1009	HDZ-43468/11-001080-310/007.00
468-1010	HDZ-43468/11-001082-310/007.00
468-1050	HDZ-43468/11-001011-310/001.00
468-1024	HDZ-43468/11-001082-220/008.00
468-1016	HDZ-43468/11-001080-220/002.00
468-1002	HDZ-43468/11-001080-310/001.00
468-1051	HDZ-43468/11-001011-220/002.00
468-1140	HOZ-43468/11-001082-310/007.00
468-1023	HDZ-43468/11-001080-220/008.00
468-1133	HOZ-43468/11-001082-310/001.01
468-1130	HDZ-43468/11-001011-310/007.00

BLOCK 1

Ziffern 9 und 10 siehe nächste Seite
Numbers 9 and 10 see next page

1 2 3 Relais / *Relay*

H O Z Offen / *Open (IP 40)*

H D Z Eingießdicht / *Sealed (IP 67)*

4 Antrieb / *Drive*

4 DC gepolt monostabil / *DC polarized monostable*

BLOCK 2

Spulen / *Coils* (Vorzugsvarianten / *Preferred versions*)

Folgende Werte gelten bei einer Umgebungstemperatur von 20 °C
The following values apply to an ambient temperature of 20 °C

1 2 3 4 5 6

Spulenr. / *Coil No.*	Antriebsart / *Drive*	U_1 [V]	U_2 [V]	U_3 [V]	R [Ω]
0 0 1 0 8 2	DC	18,1	50,4	147,7	1020
0 0 1 0 8 0	DC	9,1	25,2	74,4	255
0 0 1 0 1 1	DC	16,3	45,3	134,7	820

Weitere Spulenvarianten siehe Spulentabelle Seite 133 / *More coil versions see coil table page 133*

BLOCK 3

Kontaktsatz / *Contact set*

	1 2 3	**4 5 6**	**4 5 6**	**4 5 6**	**4 5 6**
Anzahl der Kontakte	SÖW	AgNi-10	AgNi-10	$AgSnO_2$	$AgSnO_2$
Number of contacts	NO/NC/CO	0,2 µm Au	2 µm Au	0,2 µm Au	2 µm Au
4	220	002	008	010	012
4	310	001	007	009	011

BESTELLSCHLÜSSEL
DESIGNATION KEY

	Block 1											Block 2						Block 3								
	1	2	3	-	4	5	6	7	8	/	9	10	-	1	2	3	4	5	6	-	1	2	3	/	4	5	6
HDZ -	□	3	4	6	8	/	□	□	-	□	□	□	□	□	□	-	□	□	□	/	□	□	□	.	0	0	

Beispiel / *Example*

HDZ - 4 3468/ 1 1 - 0 0 1 0 8 2 - 3 1 0 / 0 0 1 .00

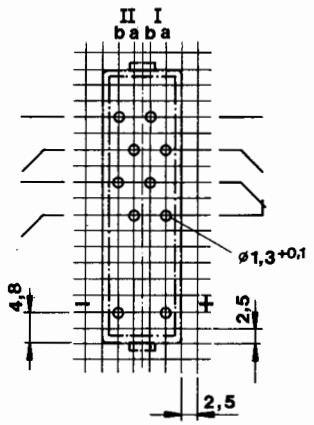
BLOCK 1

Baugröße / *Size*	**9**	**Sonderausführungen / *Special versions***	**10**
4 Kontakte / contacts	1	Keine Besonderheiten / No special features	1

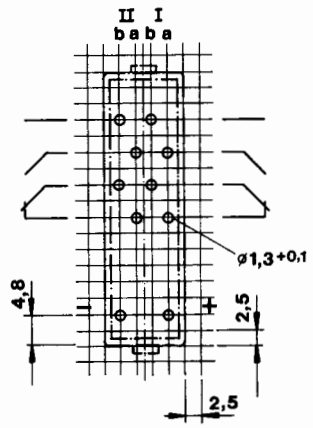
ANSCHLUSSRASTER / *CONNECTION GRID*

(Ansicht auf Lötseite / *view on soldering side)*

Kontaktsatz / *contact set*: 310



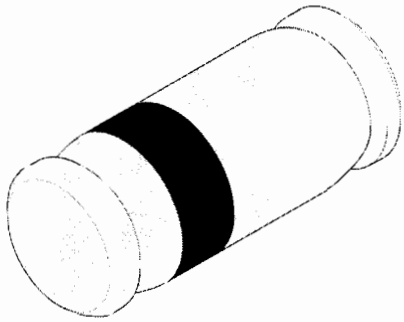
Kontaktsatz / *contact set*: 220



Fast Switching Diode

Features

- Silicon Epitaxial Planar Diodes
- Low forward voltage drop
- High forward current capability



94 9371

Applications

High speed switch and general purpose
use in computer and industrial applications

Order Instruction

Type	Type Differentiation	Ordering Code	Remarks
LL4150	V_{RRM} = 50 V	LL4150–GS08	Tape and Reel

Absolute Maximum Ratings

T_j = 25°C

Parameter	Test Conditions	Type	Symbol	Value	Unit
Repetitive peak reverse voltage			V_{RRM}	50	V
Reverse voltage			V_R	50	V
Peak forward surge current	t_p=1μs		I_{FSM}	4	A
Forward current			I_F	600	mA
Average forward current	V_R=0		I_{FAV}	300	mA
Power dissipation			P_V	500	mW
Junction temperature			T_j	175	°C
Storage temperature range			T_{stg}	–65...+175	°C

Maximum Thermal Resistance

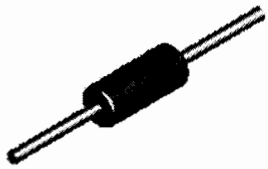
T_j = 25°C

Parameter	Test Conditions	Symbol	Value	Unit
Junction ambient	on PC board 50 mmx50 mmx1.6 mm	R_{thJA}	500	K/W

FAIRCHILD SEMICONDUCTOR™

Discrete POWER & Signal Technologies

1N4150 / FDLL4150



DO-35

LL-34

THE PLACEMENT OF THE EXPANSION GAP HAS NO RELATIONSHIP TO THE LOCATION OF THE CATHODE TERMINAL

COLOR BAND MARKING		
DEVICE	1ST BAND	2ND BAND
FDLL4150	BLACK	ORANGE

High Conductance Ultra Fast Diode

Sourced from Process 1R. See MMBD1201-1205 for characteristics.

Absolute Maximum Ratings*

TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
W_{IV}	Working Inverse Voltage	50	V
I_O	Average Rectified Current	200	mA
I_F	DC Forward Current	400	mA
i_f	Recurrent Peak Forward Current	600	mA
$i_{f(surge)}$	Peak Forward Surge Current Pulse width = 1.0 second Pulse width = 1.0 microsecond	 1.0 4.0	 A A
T_{stg}	Storage Temperature Range	-65 to +200	°C
T_J	Operating Junction Temperature	175	°C

*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

NOTES:
1) These ratings are based on a maximum junction temperature of 200 degrees C.
2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

Thermal Characteristics

TA = 25°C unless otherwise noted

Symbol	Characteristic	Max	Units
		1N / FDLL 4150	
P_D	Total Device Dissipation Derate above 25°C	500 3.33	mW mW/°C
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	300	°C/W

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	PMLL4151		–	75	V
	PMLL4153		–	75	V
V_R	continuous reverse voltage		–	50	V
I_F	continuous forward current	see Fig.2; note 1			
	PMLL4150		–	300	mA
	PMLL4151		–	200	mA
	PMLL4153		–	200	mA
I_{FRM}	repetitive peak forward current				
	PMLL4150		–	600	mA
	PMLL4151		–	450	mA
	PMLL4153		–	450	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 μs	–	4	A
		t = 1 ms	–	1	A
		t = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	500	mW
T_{stg}	storage temperature		–65	+200	°C
T_j	junction temperature		–	200	°C

Note

1. Device mounted on an FR4 printed-circuit board.

Van: "Ernst-Karl Behr" <Ernst-Karl_Behr@ch.schindler.com>
Aan: "Dick Lantsink" <D.Lantsink@liftinstituut.nl>
CC: "Moreno Sasselli" <Moreno_Sasselli@ch.schindler.com>; "Jan Klint Nielsen" <Jan_Klint_Nielsen@ch.schindler.com>
Verzonden: donderdag 9 maart 2000 10:52
Onderwerp: MX-GC vs. Door Locking Device

Dear Mr. Lantsink

Concerning your question we can state as follows.

In case that the distance of the car door to the inner surface of the lift wall exceeds a certain value, we use a locking device for the car-door. The locking device only allows opening of the car-door in the un-locking zone of the corresponding landing door.

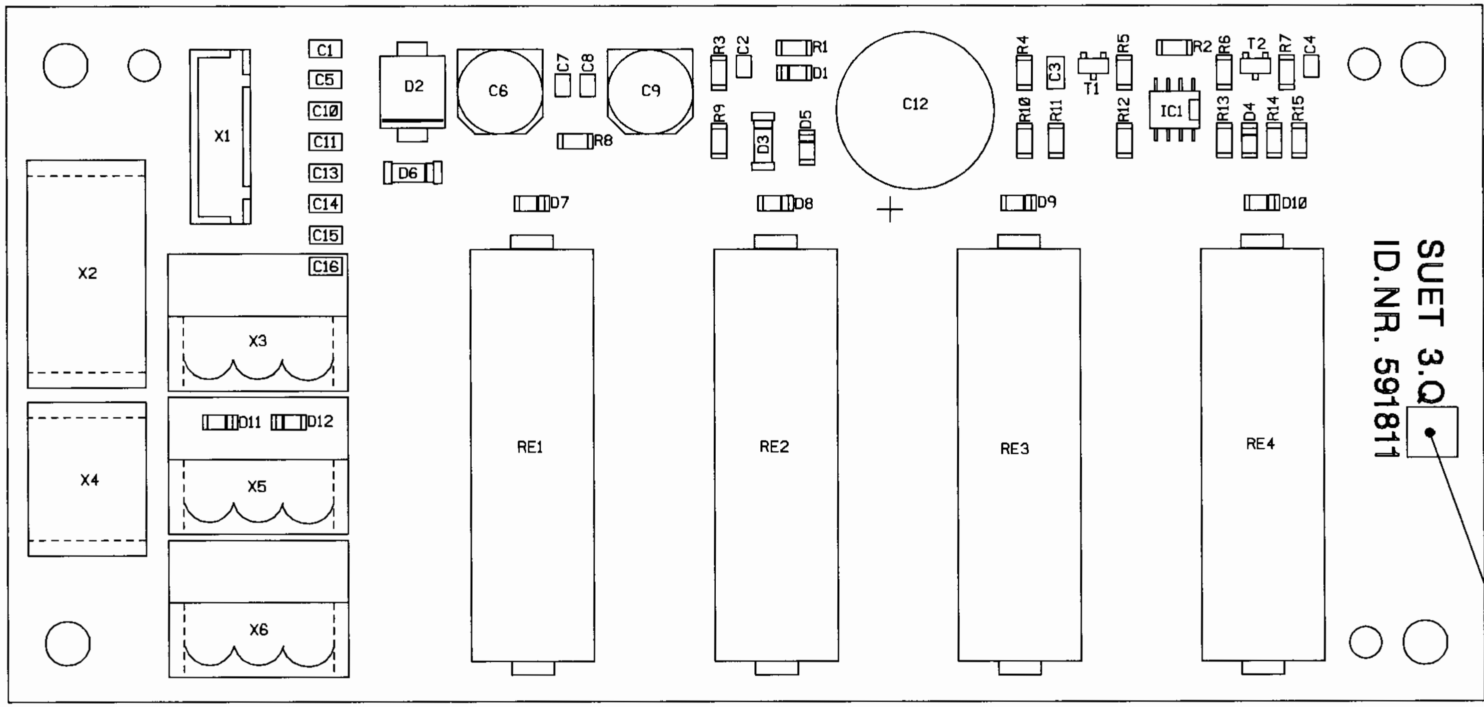
The distances values are conform to EN81-1 chapter 11.2.1. That means in the normal case 0,15m.

Locking of the car-door ist done mechanically when the car leaves the unlocking zone of a landing door. The operation of the lift depends on the locking of the car door by means of a safety switch in the safety chain, which is actuated by the door lock.

In case you need further information don't hesitate to cantact me.

With best regards

Ernst-Karl Behr



Note :"A" stamped inside

Pos.		Elements
1		Blank board
2		X1
3		X2
4		X3,5-6
5		X4
6	*	IC1
7	*	T1-2
8	*	D1,4-5,7-12
9	*	D2
10	*	D3,6
11	*	C2,4
12		C12
13	*	C7-8
14	*	C1,5,10-11,13,16
15	*	C3
16	*	C6,9
17	*	R3
18	*	R7
19	*	R4
20	*	R1
21	*	R8,14
22	*	R10
23	*	R5-6,9,11-13
24	*	R15
25	*	R2
26		RE2-3
27		RE1,4

(*) SMC on top side

Note :C14-C15 NOT MOUNTED

Ident No.	Semi finished product/raw material	IdNo./Matcode	Item	Code surface and heat treatment	Brag/KSL/Model	Weight kg.
Modification	0			Version	accompanying KSL	
KA No.	210265				accompanying KSL	
KA Date	03-10-17				accompanying KSL	
Microfilmed						

Order

PCB SUET 3.QA

Assembly drawing

Scale	Replaces		Date	Signed
2:1		Prepared	03.09.19	maglstgl
	Form	Reviewed	03.09.19	antanlma
		Norm-checked	03.09.19	antanlma
		Released		

INVENTIO AG, CH-6052 Hergiswil

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