

Documentation

Leak Indicating Unit LAE 2–8

• for VLX .. A-Ex



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1. General

1.1 Information

These instructions provide important information on how to use the LAE 2-8 indicating unit. The pre-requisite for workplace safety is the adherence to all safety and handling instructions specified in this manual.

Furthermore, any local regulations for prevention of accidents that are applicable at the site of use of the indicating unit and general safety instructions must be complied with.

1.2 Explanation of Symbols



In these instructions, warnings are marked with the adjacent symbol.

The signal word expresses the level of hazard.

DANGER:

Imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING:

Potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION:

Potentially hazardous situation which, if not avoided, could result in minor or moderate injury.



Information:

Highlights useful tips, recommendations, and information.

1.3 Limitation of Liability

All information and instructions in this documentation have been compiled considering the applicable standards and regulations, the state of the art, and our longstanding experience.

SGB does not assume any liability in the case of:

- Noncompliance with these instructions
- Improper use
- Use by unqualified personnel
- Unauthorized modifications
- Connection to systems not approved by SGB

1.4 Copyright



The contents, texts, drawings, images, and other representations are copyrighted and subject to industrial property rights. Any misuse is punishable.

1.5 Warranty Conditions

We provide warranty for the LAE 2-8 indicating unit for a period of 24 months from the day of installation on site in accordance with our General Terms & Conditions.

The maximum warranty period is 27 months from the date of sale.

The obligation of warranty shall cease to exist in the case of

- inadequate or improper installation,
- improper use,
- modifications/repairs without the manufacturer's consent.

Our warranty does not include parts, which may be perished premature due to their consistence or category of usage (e.g., pumps, valves, gaskets, etc.). Furthermore, we are not liable for defects or corrosion damages caused by humid or inappropriate installation environments.

1.6 Customer Service

Our customer service is available for any inquiries.

For information on contacts, please refer to our website sgb.de/en or the label of the LAE 2-8 indicating unit.

2. Safety

2.1 Intended Use



WARNING!
Danger from
misuse

- Install the leak indicating unit 2-8 outside of the Ex-area
- Install inside a closed and dry room in buildings or alternatively in an outdoor protective box
- Do not install near strong heat sources
- Install with at least 1 m distance from the tool (VLX .. A-Ex)
- Do not install above or below the leak detector
- Conditions from Chap. 3.3 "Field of Application" must be adhered to.
- The power supply cannot be disconnected

Any claims arising from misuse are excluded.

Caution: The protective function of the device may be impaired if it is not used as specified by the manufacturer.

2.2 Obligation of the Operating Company

The leak indicating unit 2-8 is used in the commercial sector. The operating company is therefore subject to statutory occupational safety obligations.

In addition to the safety instructions in this documentation, all applicable safety, accident prevention, and environmental regulations must be adhered to. In particular:



WARNING!
Danger in case
of incomplete
documentation

- Compiling a risk assessment and implementing its results in a directive
- Performing regular checks as to whether the directive is in compliance with the current standards
- The directive includes, among others, how to react to an alarm that might arise
- Arranging for an annual functional check

2.3 Qualification



WARNING!
Danger to hu-
mans and the
environment in
the case of in-
adequate quali-
fication

The personnel must be capable of independently recognizing and avoiding potential risks based on their qualifications.

Companies that put leak detectors or leak indicating units into operation must be trained by SGB or an authorized representative.

National guidelines must be adhered to.

For Germany: Technical service qualification for assembly, commissioning, and maintenance of leak detection systems.

2.4 Personal Protective Equipment (PPE)

Personal protective equipment must be worn during work.

- Wear necessary protective equipment for the relevant work
- Note and comply with existing PPE signs



Entry in the "Safety Book"



Wear HV vest



Wear safety footwear



Wear hard hat



Wear gloves – where necessary



Wear safety goggles – where necessary

2.5 Fundamental Hazards



DANGER:

From electric current

When working on an open leak indicating unit, disconnect it from the power supply.

Comply with relevant regulations regarding electric installation and regulations for prevention of accidents.



DANGER:

From explosive vapor-air mixtures

Comply with explosion regulations, e.g., German Ordinance on Industrial Safety and Health (Betriebssicherheitsverordnung, BetrSichV) (and/or directive 1999/92/EC and the laws of the respective member states resulting therefrom) and/or others.

3. Technical Data of the Leak Indicating Unit

3.1 General Data

Dimension and drilling pattern	see Chap. 7
Weight	5.4 kg
Storage temperature range	-30°C to +70°C
Operating temperature range	0°C to +40°C
Max. height for safe operation:	≤ 2000 m above sea level
Max. relative humidity for safe operation:	95 %
Buzzer volume	>70 dB(A) in 1 m
Housing protection class	IP 40

3.2 Electrical Data



Power supply	100 to 240 V AC, 50-60 Hz
Power input	44 W
Terminals 60(27)/61(28)/62, Potential-free outputs	max. 1.0 A

3.3 Field of Application

3.3.1 General use

The leak indicating unit 2-8 has up to eight boards. Each of these boards has three input channels.

Each channel has two terminals. When connected, a signal circuit is closed between the terminals. If a VLX .. A-Ex is connected, only the first channel can be used. All other channels have to be closed (bridge).

If the signal circuit of the first channel is closed, the indicating unit is in good state. If the signal circuit is interrupted, the alarm is triggered at the LAE.



Note:

Unused channels in the indicating unit must be bridged.

In the event of an alarm, the internal buzzer sounds on the indicating unit and indicator lights on the keypad light up.

The following applies to the alarm display on the keypad:

Alarm channel 1 on board 1: Red LED of the first keypad on.

Alarm channel 1 on board 2: Red LED of the second keypad on.

...

Alarm channel 1 on board 8: Red LED of the eighth keypad on.

Note:

In addition, each board has potential-free relay contacts for forwarding the alarm.

To forward a joint alarm, the terminals of the potential-free contacts must be looped through.



3.3.2 Use as a leak indicating unit for VLX .. A-Ex working devices

VLX .. A-Ex type working devices can be mounted within the Ex-area and are electrically connected to the indicating unit mounted outside the Ex-area.

A working device is connected to one leak indicating unit board at a time. The indicating unit is connected to the potential-free contacts of the working device via the signal circuit, and the indicating unit additionally provides the 230 V AC power supply for the working device.



Note:

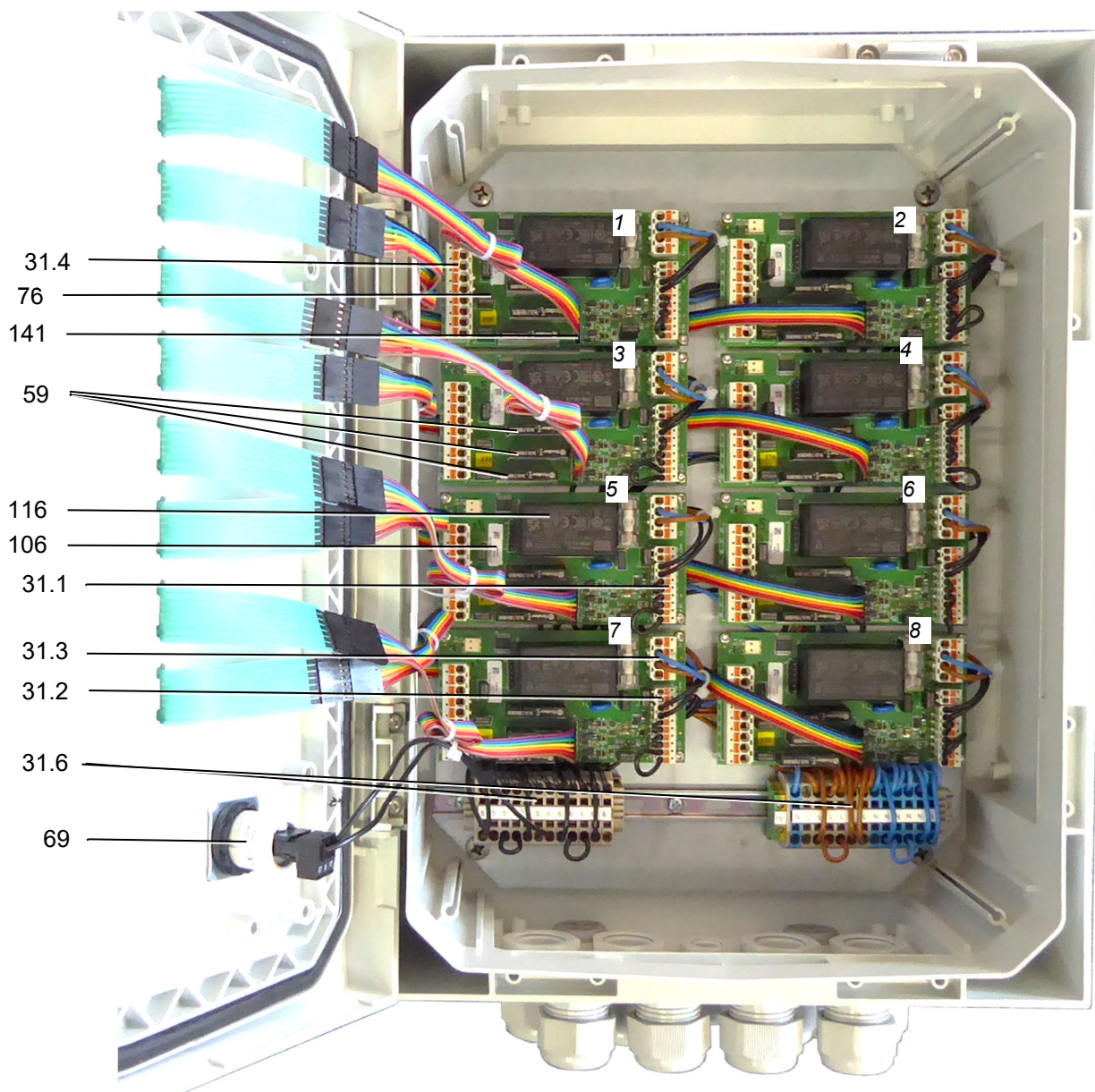
In general, it should be noted that VLX .. A-Ex working devices are only connected to channel 1.

The other channels, 2 and 3, of the indicating unit remain unused and must be closed.

For a connection diagram, the circuit diagram, and an installation example, see Chap. 5.4.

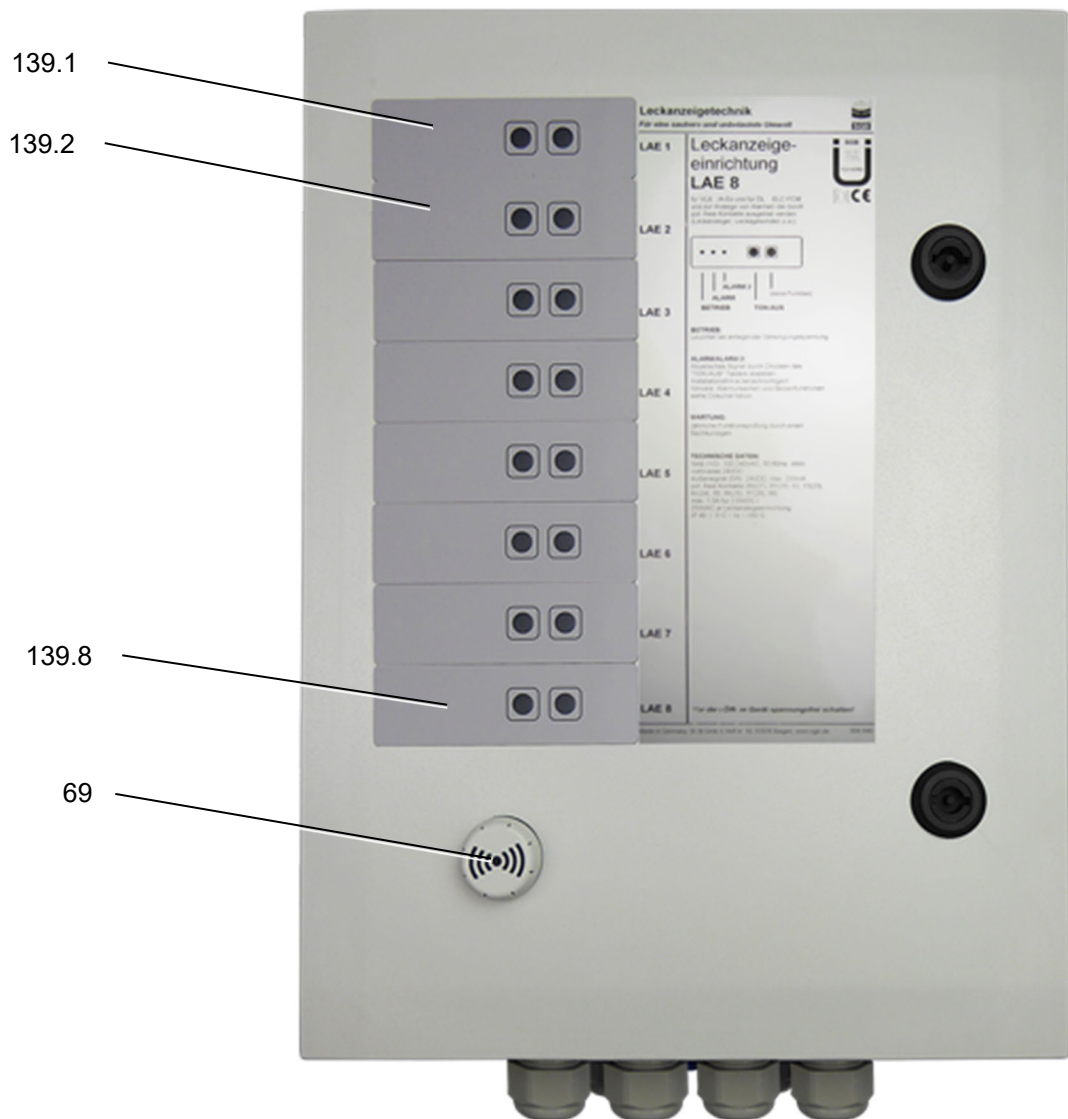
4. Design and Function

4.1 Design



Interior view with:

- 31.1 Terminal strip signal circuit 1 to 3 and external signal
- 31.2 Terminal strip, power supply 24 V DC
- 31.3 Terminal strip, power supply 230 V AC
- 31.4 Terminal strip potential-free contacts for signal circuit 1 to 3
- 31.6 Terminal strip, 24 V DC for alarm forwarding external signal (left) and terminal strip power supply 100–240 V AC (right)
- 59 Relay
- 69 Buzzer
- 76 Main board 1-8
- 106 Contact for serial data transfer
- 116 24 V DC power supply
- 141 Terminal strip, keypad 1-8



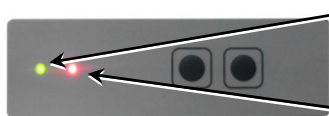
Exterior view with:

- 69 Joint buzzer alarm
- 139.1 Keypad for board 1
- 139.2 Keypad for board 2
- ...
- ...
- 139.8 Keypad for board 8

4.2 Displays and Controls

4.2.1 Display

The indicator lights on the keypad indicate the following:



- Indicator lights, operation, board 1 to 8.
- Individual alarm on channel 1 board 1 to 8: red LED lights up; if the audible alarm is acknowledged, the red LED flashes.

4.2.2 Function "Turn off audible alarm signal"



Press the "Mute" button once; the acoustic signal turns off, and the red LED flashes.

No function

4.3 Alarm

In the event of an alarm, acknowledge the audible signal and check which connected device has triggered the alarm. In the event of alarms from connected leak detection systems, inform the responsible service company immediately. In the case of service notifications, have the necessary measures carried out within the required time frame.

5. Mounting the System

5.1 Basic Instructions



- Prior to commencing work, the documentation must be read and understood. In case of ambiguities, refer to the manufacturer.
- The safety instructions in this documentation must be adhered to.
- Only qualified service companies may be used for mounting and commissioning¹.
- Leadthroughs for connection lines through which the explosion atmosphere can carry over must be sealed gas-tight.
- Comply with relevant regulations regarding electric installation, explosion protection (e.g., EN 60 079-14, -17), and accident prevention.

5.2 Mounting the Indicating Unit



- Wall mounting usually with dowels and screws in a dry room
- **NOT in potentially explosive areas.**
- For housing dimensions and hole pattern, see Chap. 7.

5.3 Electrical Cables



Mains connection LAE and terminals 60 to 68:

- Max. 2.5 mm² without ferrule
- 1.5 mm² with ferrule and plastic collar

Power supply 24 VDC via 40/41, external signal and signal circuits (11/12, 21/22 and 31/32):

- 1.5 mm² without ferrule
- 0.75 mm² with ferrule and plastic collar

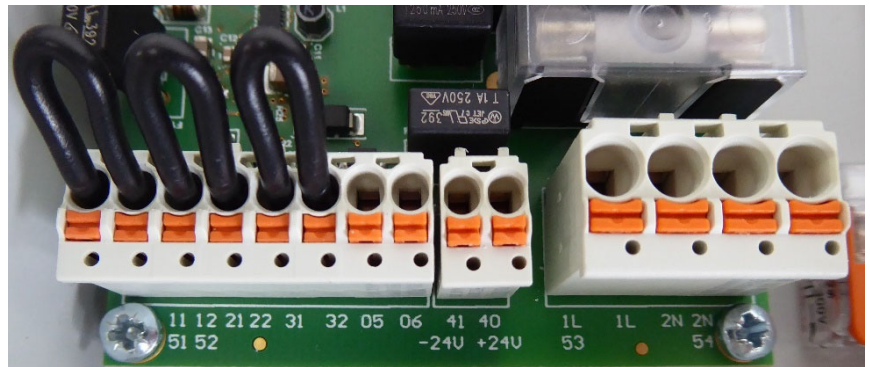
Must be resistant to stored/pumped liquids.

5.4 Electrical Wiring Diagram



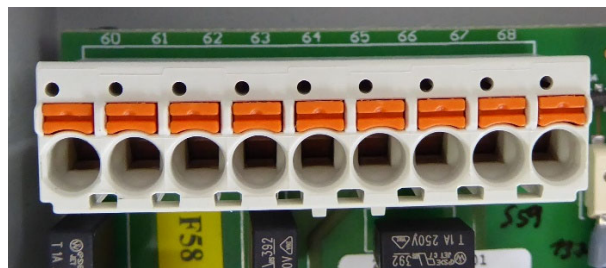
- (1) Install the electrical connection securely, without plug or switching connections.
- (2) Observe the requirements for electric installations, if necessary, also those of the electric companies.
- (3) Terminal layout (see also block diagrams in Chap. 5.4.3 and 5.4.4):

¹ For Germany: Specialist service companies per Water Law that have documented qualifications to install leak detection systems.



- 1/2 Power connection (100 to 240 V AC), wired internally
- 54/53 Power supply (230 V AC) for VLX .. A-Ex tool
- 40/41 free, no function
- 5/6 External signal 24 V DC (+: 5, -: 6), wired internally
- 51/52 Signal circuit for VLX .. A-Ex tool
- 21/22 Signal circuit for channel 2, must be bridged
- 31/32 Signal circuit for channel 3, must be bridged

Potential-free relay contacts:

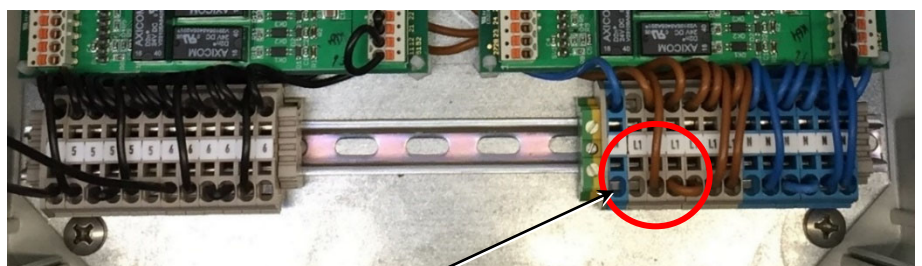


- 60(27)/61(28) Channel 1 open in the case of alarm and power failure
- 60/62 As above, but contacts closed
- 63(23)/64(24) Channel 2, no function
- 63/65 As above, no function
- 66(25)/67(26) Channel 3, no function
- 66/68 As above, no function



- (4) Close unused cable glands properly and professionally.
- (5) Do not apply voltage until all electrical cables are connected and the housing cover is closed.

5.4.1 Power supply 230 V AC



Terminals for the power supply

Mounting

5.4.2 Position of the fuses and their values

24.6 Fuse 1 A potential free contacts (X4.63)

24.5 Fuse 1 A potential free contacts (X4.60)

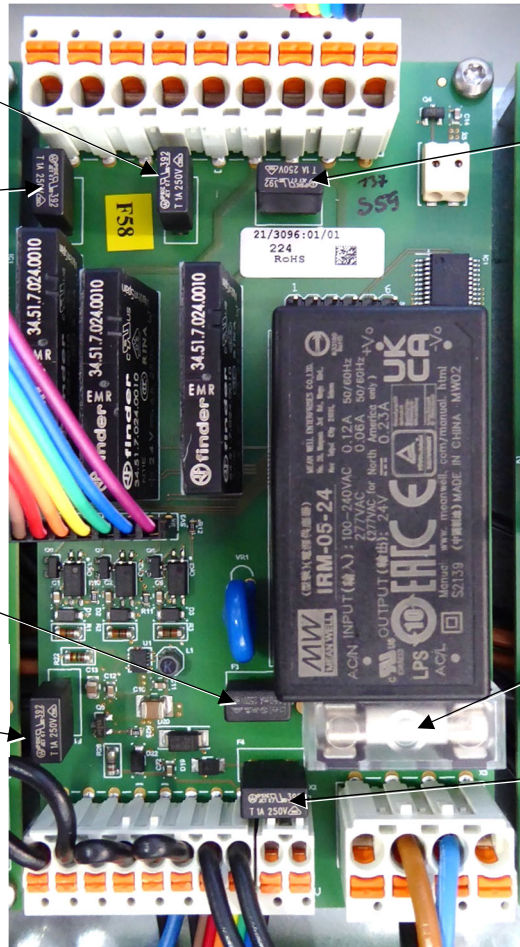
24.3 Fuse 125 mA, fuse for switching power supply

24.1 Fuse 1 A, signal circuits 1-3 (X1) and external signal (X1.5)

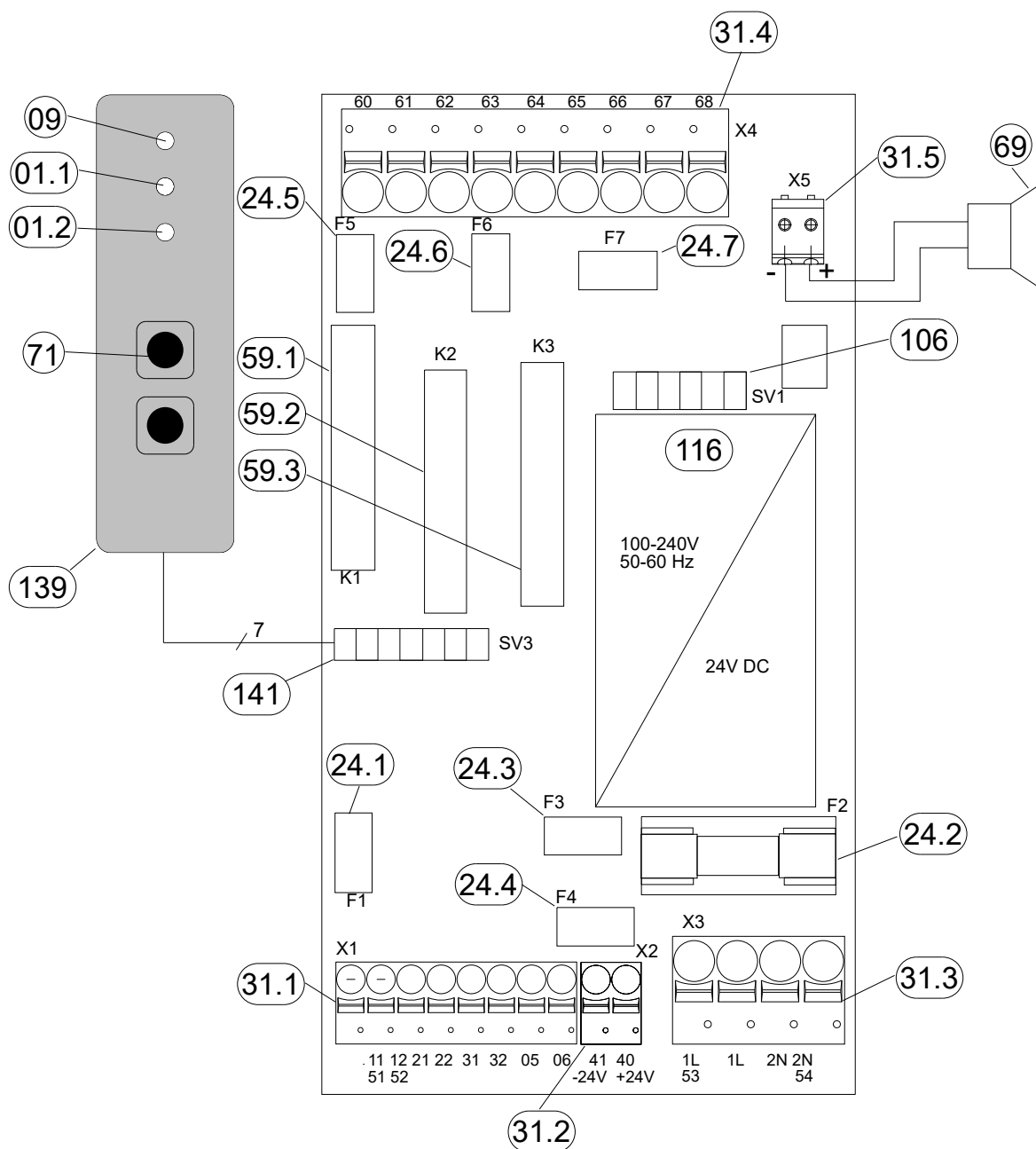
24.7 Fuse 1 A potential free contacts (X4.66)

24.2 Fuse 1 A (1500 A), forwarding power supply 230 V AC (X3.54)

24.4 Fuse 1 A, power supply 24 V DC (X2.40)



5.4.3 Block diagram LAE board (1)



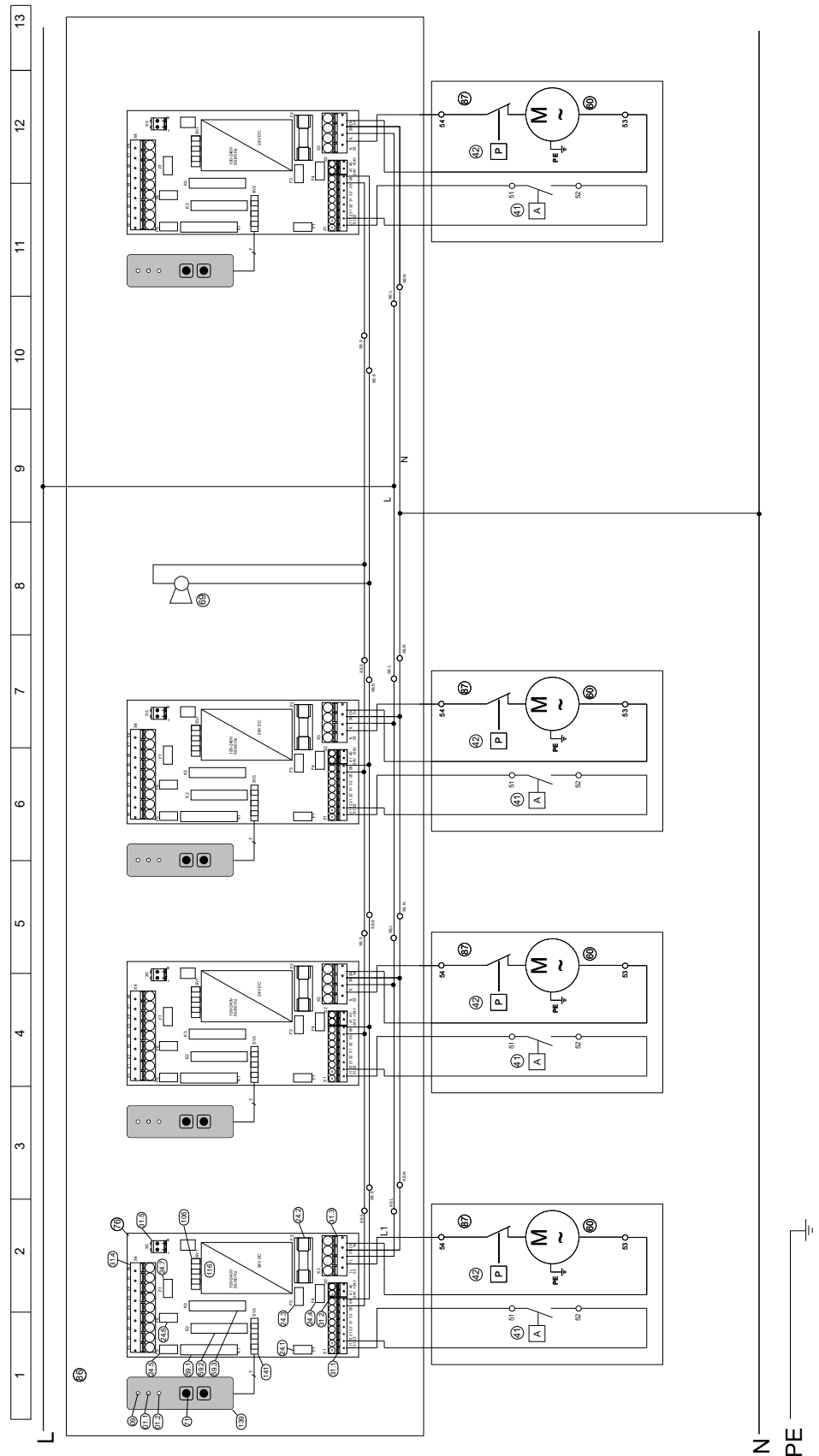
- 01.1 Indicator light, alarm I, red
- 01.2 Indicator light, alarm II, yellow (no function)
- 09 Indicator light "Operation", green
- 24.X Fuse (see page 14)
- 31.1 Terminal strip signal circuit 1 to 3 and external signal
- 31.2 Terminal strip mains, power supply 24 V DC
- 31.3 Terminal strip mains, power supply 230 V AC
- 31.4 Terminal strip potential-free contacts for signal circuit 1 to 3

- 31.5 Terminal strip connection of internal buzzer
- 59 Relay
- 69 Buzzer
- 71 "Mute" button
- 106 Contact for serial data transfer
- 116 24 V DC power supply
- 139 Keypad (1-8)
- 141 Terminal strip for keypad (1-8)

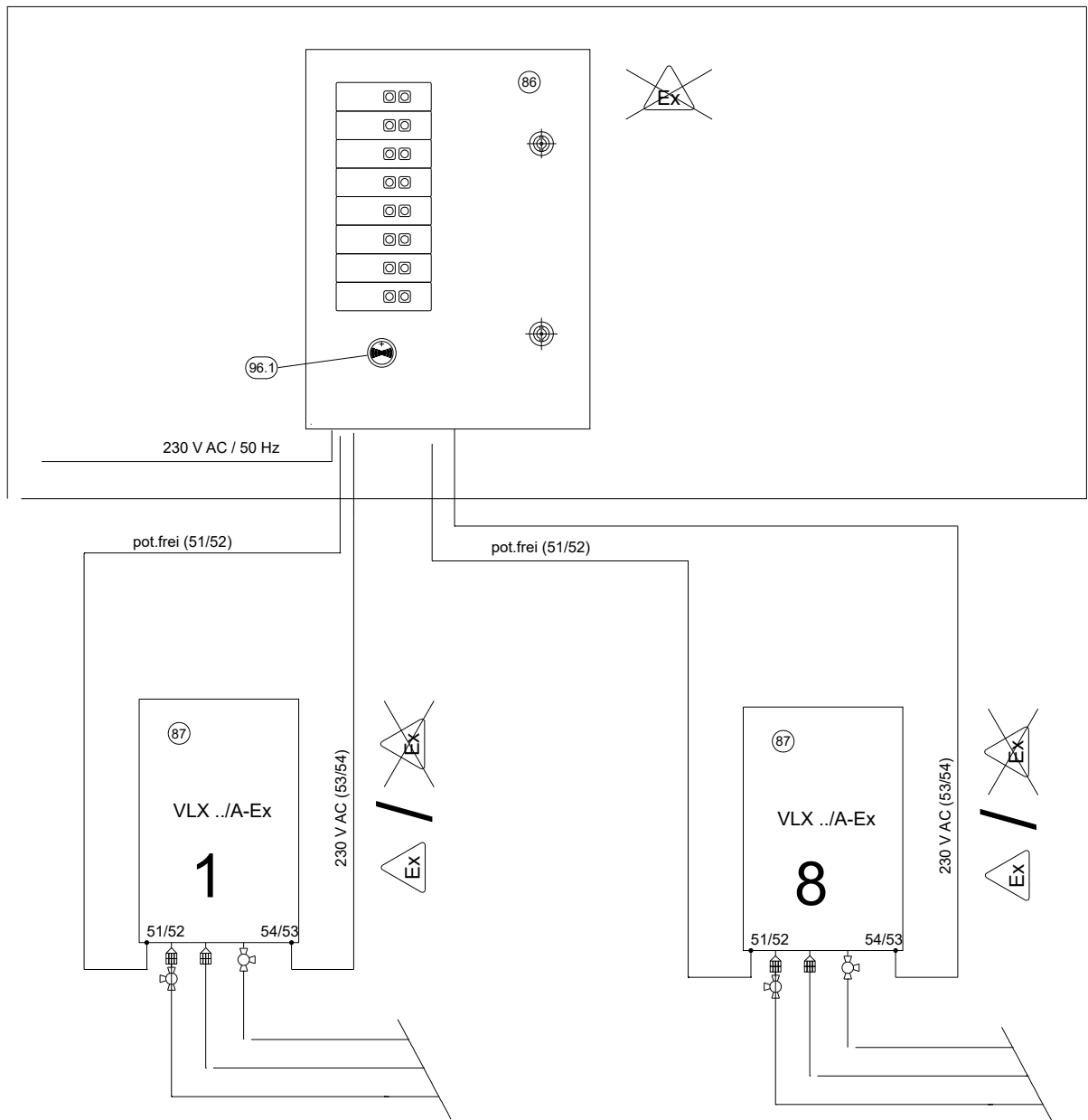
Mounting

5.4.4 Block diagram/connection diagram – Connection of LAE 2-8 with VLX .. A-Ex

- 01.1 Indicator light Alarm I, red
- 09 Indicator light "Operation", green
- 24.1 to 24.7 see page 14
- 31.1 Terminal strip signal circuit 1 to 3 and external signal
- 31.2 Terminal strip mains, power supply 24 V DC
- 31.3 Terminal strip mains, power supply 230 V AC
- 31.4 Terminal strip potential-free contacts for signal circuit 1 to 3
- 31.5 Terminal strip connection of internal buzzer (is not used here)
- 41 Alarm switch (1-8)
- 42 Pump switch (1-8)
- 59 Relay (1-8)
- 60 Vacuum pump (1-8)
- 69 Buzzer (1-8)
- 71 "Mute" button (1-8)
- 76 Main board (1-8)
- 86 Leak indicating unit
- 87 Leak detector (1-8)
- 106 Contact for serial data transfer
- 116 24 V DC power supply
- 139 Keypad (1-8)
- 141 Terminal strip keypad (1-8)



5.4.5 Installation Example



- 86 Indicating unit LAE 3-8
- 87 Tool VLX .. A-Ex 1-8
- 96.1 Buzzer 24 V DC

6. Commissioning, Functional Check, and Maintenance



Only perform commissioning once the steps in section 5 "Mounting" are fulfilled.

6.1 Commissioning the Indicating Unit



- (1) Remove bridges from the indicating unit channels to be used.
- (2) Establish connection lines between the potential-free relay contacts of the devices to be connected and the respective channels of the LAE.

- (3) Connect the power supply to the indicating unit.

Note:

The power supply complies with the requirements described in chapters 3.3, 5.4, and 5.5 as well as in the relevant documentation of the connected device.

- (4) Check that the "Operation" indicator light on the indicating unit lights up.
- (5) When the signal circuits are correctly closed (via leak detector or probe/service contacts or bridges), only the "Operation" indicator lights up.

- (6) Determination of the audible alarm for the individual connected channels. For this purpose, establish the alarm status at the respective connected devices, probes, or service application and determine the audible and visual alarm signal at the indicating unit.

Acknowledge audible alarm(s) if necessary.

Note:

To set the alarm condition, read the relevant documentation for the connected device.

- (7) If an alarm was detected in (5), restore the operating status of the connected devices and check that the respective indicator lights have gone out on the indicating unit (operating status as in (4)).

Note:

To set up the operating status, read the relevant documentation for the connected device.

- (8) Repeat points (5) and (6) for further occupied channels.



6.2 Functional Check and Maintenance

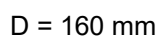
- (1) Once a year as part of the leak detector test.
- (2) Observe regulations and information on the test scope according to the documentation of the connected devices.

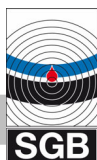


6.3 Test routine/Alarm Test

Press and hold the “Mute” button – the test routine begins. An alarm of all three channels is simulated in succession for three seconds each. The internal buzzer with the external signal and the individual LED on the membrane keyboard are activated, including the potential-free contacts. In order to be able to carry out this test, there must be no alarm!

7. Dimensions and Drilling Pattern





8. EU Declaration of Conformity

We,
SGB GmbH
Hofstr. 10
57076 Siegen
Germany,
hereby declare in sole responsibility that the

Leak indicating unit LAE 2-8

is in conformity with the essential requirements of the EU directives/regulations/UK statutory requirements listed below.

In case the device is modified or used in a way that was not agreed with us, this declaration shall lose its validity.

Number/short title	Satisfied regulations
2014/30/EU EMC Directive SI 2016 No. 1091	EN 61000-6-3:2007 + A1:2011 EN 61000-6-2:2006 EN 61000-3-2:2014 EN 61000-3-3:2013
2014/35/EU Low-voltage Directive SI 1989 No. 728	EN 60335 -1:2012 / A11:2014 / A13:2017 / A1:2019 / A2:2019 / A14:2019 / A15:2020 EN 61010 -1:2010 / A1:2019 EN 60730 -1:2017

Conformity is declared by:

As of: 02/2023

ppa. Martin Hücking
(Technical Director)

9. Manufacturer's Declaration of Compliance



Compliance with the "Muster-Verwaltungsvorschrift Technische Baubestimmungen" (sample administrative regulation technical building regulations) is hereby declared.

Conformity is declared by:

As of: 02/2023

ppa. Martin Hücking
(Technical Director)

10. TÜV-Nord certification

TÜV NORD Systems GmbH & Co. KG
Accredited test lab
Accreditation no.: D-PL-11074-04

Note:
By TÜV not certified
translation of the German
original version

Prüfbericht Test Report

Auftrags-/Prüfberichts-Nr.: 8117149846 Rev. 1
Order-No./Test-report No.:

Auftraggeber: SGB GmbH
Customer: Hofstr. 10
57076 Siegen

Auftrag vom: 6/19/2019
Date of order:

Gegenstand der Prüfung: Indicating unit LAE for leak detectors and leak detection probes in
Test items: accordance with EN 13160:2016 Part 1 and Part 4 with additional
buzzer type PK-20A35EWQ acc. to documentation 605 600, last
updated 06/2019

Art der Prüfungen: Test in accordance with EN 13160-4:2016 section 4.1.1 or EN
Kind of tests: 13160-3:2016 section 4.1.3.5 as well as in accordance with EN
13160-4:2016 section 4.2.1

Zeitraum der Prüfungen: 08/2019-10/2019
timeframe of the tests:

Ergebnis der Prüfungen: The LAE indicating unit with additional buzzer type PK-20A35EWQ
Test result: meets the requirements for temperature resistance and alarm
equipment. As the indicating unit without additional buzzer does not meet
the requirements for alarm equipment, the use of the additional buzzer is
mandatory. General requirements in accordance with EN 13160:2016
Part 1 as well as requirements in accordance with EN 13160:2016 Part 4
with regard to operating temperature range type 2 are met.

Die Prüfungen beziehen sich ausschließlich auf das Prüfobjekt.
The tests refer exclusively to the test object.

Der Prüfbericht darf nur ungekürzt veröffentlicht werden. Die gekürzte oder auszugsweise Veröffentlichung
bedarf der vorherigen schriftlichen Genehmigung des Prüflaboratoriums.
The test report is allowed to be published only in an unabridged form. Any abridged publication or publication in extracts is subject to
previous written authorization by the laboratory.

Dieser Prüfbericht umfasst
This test report comprises:

1 Blatt und 1 Anlage
1 page and 1 annex

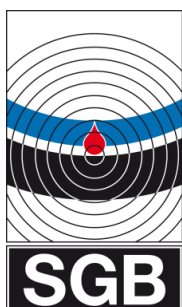
Gesamtblattzahl: 3
total No. of pages: 3

Leiter Prüflabor
Head of Test Laboratory

Hamburg, 12.11.2019

J. Straube





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