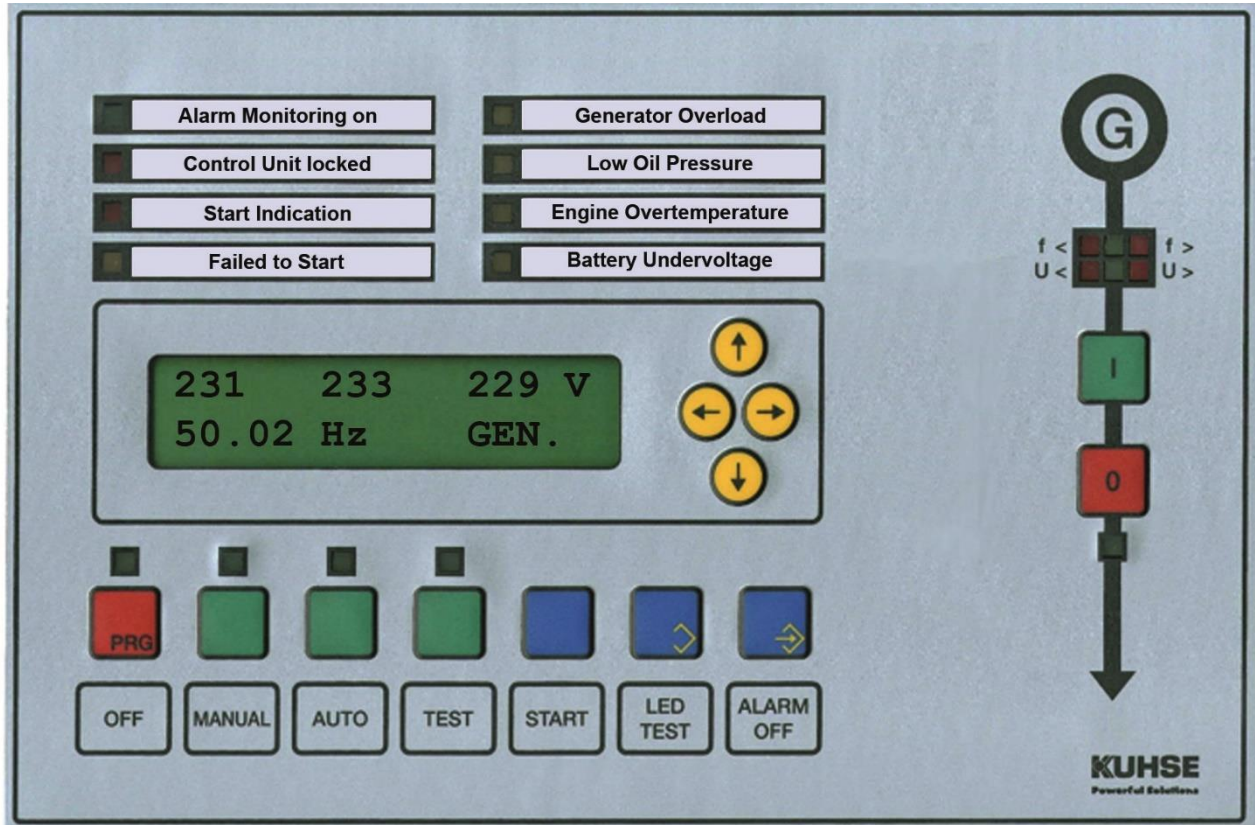


Service instructions

Automatic start/stop system for stand-alone gensets for product: KEA 202 INS

File: SA_KEA 202 INS_EN_Ver 2016-07-01 (replaces version 17-02-2014)



1. Design

The automatic system is installed in the door of the switch cabinet. When installed, a protection rating of IP 44 is achieved for the front. The two rows with LEDs are labelled with exchangeable text strips. The relay units are mounted on the base plate and connected together and to the automatic system element in the door with the cables supplied.

The automatic system is equipped with an FOC or USB interface – automatic switching – via which a PC can be connected.

1.1. Parameterisation

The following settings (entries protected by password) and displays are possible with the PARAWIN parameterisation program:

- Generator voltage monitor
- Generator current sensor
- Entry of texts of alarm messages 1 to 19 and coding of all alarm messages
- Battery monitor
- Parameters for start/stop
- Speed measurement
- Generator switch-on
- Functions of relays and outputs
- Texts and limit values of analogue inputs
- Frequency controller
- Voltage regulator
- General parameters

1.2. Displays

- Actual values
 - o Voltages
 - o Generator currents
 - o Generator power
 - o Cos φ generator
 - o Speed
 - o Battery voltage
 - o Four analog channels' actual values
- Actual values of external signal contacts
- Actual values of output relays
- States of timer stages.

2. Revision history

Created	Changes
17/02/2014	First edition
18/09/2014	Connection diagrams updated

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4. Warnings

4.1. Regulations and instructions

1. Applicable regulations, especially those of the VDE must be observed.
2. The parameterisation of the unit must be carried out in such a way that endangerment of persons and property is excluded.

4.2. Installation and commissioning

The installation and commissioning must only be carried out by sufficiently qualified personnel.

4.3. Connections

1. The connection of the unit must be carried out carefully, as a wrong connection could lead to the destruction of the unit. The connection regulations must be observed!
2. The PE(N) must be connected to the terminal 5 of X403.
3. The shields of the analogue signals must only be connected to the earthing screw next to terminal strip X401 and otherwise no other connection to metal parts.
4. Converter connections k must be connected to the protective conductor.

4.4. Battery and supply voltage

5. If the battery has to be disconnected, the charging unit must be switched off.
6. The battery negative potential must be earthed at the input terminal on the switchboard. The minimum cross-section is 10 mm².
7. The supply voltage (12 or 24 V DC) is selected using a switch located on the RZ-071-D.
8. If the supply voltage of the automatic system was switched off, it must only be switched on again after approx. 20 seconds.
9. The leakage current of the noise filter upon a 2-phase voltage loss is 22 mA.

4.5. Coils

All the coils must be provided with a freewheeling diode (for DC voltage) or with a quench circuit matching the inductance of the coil. This also applies for all relays and inductances that are used in the switchgear or are externally activated.

5. Connection regulations

1. The KEA must only be connected by trained specialists.
 2. The PE(N) must be connected to the terminal 5 of X403.
 3. If the battery has to be disconnected, the charging unit must be switched off.
 4. If the supply voltage of the automatic system was switched off, it must only be switched on again after approx. 20 seconds.
 5. The battery negative potential must be earthed at the input terminal on the switchboard. The minimum cross-section is 10 mm².
 6. The supply voltage (12 or 24 V DC) is selected using a switch located on the RZ-071-D.
 7. The shields of the analogue signals must be connected to the earthing screws next to terminal strip X401 of the KEA hood and must not have any contact to any other metal parts.
- All the coils must be provided with a freewheeling diode (for DC voltage) or with a quench circuit matching the inductance of the coil. This also applies for all relays and inductances that are used in the switchgear or are externally activated!

The following signals are connected directly to the automatic system if required: Mains/generator voltage

- Generator currents
- Four analogue sensors
- Pick-up
- Two analogue output signals
- Fibre optic cable or USB for parameterization

Two CAN bus systems. Ensure that correct polarity is observed when connecting the control voltage, as although the automatic system is equipped with an incorrect polarity protection, the freewheeling diodes or other electronic devices in the circuitry could be damaged.

If the automatic system voltage has been reverse connected, the fuse on the RZ-071-D will melt through!

Because the functions of most control relays can be arbitrarily determined, only the respective status printout delivered with the system should be considered a binding document for an automatic system. It should be noted that any potential replacement delivery cannot be taken into account with subsequent changes to the parameterising.

6. Operation of the display

You select a parameter or a value just like you read a book. The different groups are saved as 'pages'. The groups can be scrolled through forwards and backwards using the [→] and [←] cursor keys. Within a group, they are read like 'lines' of a text from top to bottom. The lines are selected by pressing the cursor buttons [↓] (down) and [↑] (up). If the 'end of the page' is reached, it starts again from the top or the bottom.

By holding the LED TEST key and pressing the [←] key, the ACTUAL VALUES group is directly selected; by holding LED TEST Test and pressing the [→] key, the display per second of all pending alarms is directly selected.

To change a parameter, first enter the valid ID number. A Group 0 parameter, -GENERAL PARAMETERS-, can be changed without entering a valid ID number. A parameter is changed as described above.

1. Select the group of the desired parameters with the [←] and [→] buttons.
2. The display with the required parameter is selected using the [↑] or [↓] key. A maximum of two parameters are displayed.
3. Press the Off and LED Test buttons (function Para on or Para off) at the same time. The parameterisation mode is initiated and is indicated by the solid cursor [█]. The group or the displayed parameter may no longer be deselected.
4. The required parameter is selected with the [↑] or [↓] key.
5. By simultaneously pressing OFF and ALARM OFF (ENTER function), the displayed line is defined, which is indicated by the cursor shape that then displays the parameter position to be changed by an underscore [_]. The line may no longer deselected.
6. The parameter position to be changed is selected using the [←] and [→] cursor buttons and a numeric parameter is increased or decreased by 1 using the [↑] and [↓] buttons. A parameter that is displayed by a letter (prefix, alarm coding), is changed using these buttons in reverse order.
7. The displayed parameter is applied by simultaneously pressing OFF and ALARM OFF. If you want to cancel the parameterisation step, simultaneously press the OFF and LED TEST buttons instead of Off and ALARM OFF.

6.1. Display contrast setting

The display contrast is increased by holding the LED TEST button and pressing the [↑] button (display becomes darker) or decreased by holding the [↓] button (display becomes brighter).

6.2. PIN number, ID number

To change a parameter, first enter the valid ID number. It is compared with the PIN number and allows the device to be parametrised if the numbers match. The PIN NUMBER can be selected by the user of the device in the range from 00000 to 50000. When delivered, the PIN and ID NUMBERS are set to 00000.

If the PIN NUMBER is forgotten, a general valid ID NUMBER can be requested at the factory for entering a new PIN NUMBER. Proceed as follows to change the PIN NUMBER:

- Enter the currently valid ID NUMBER. The PIN number is then also displayed.
- Enter the new PIN NUMBER.

The previously entered ID number is now no longer valid.

The ID number is deleted 15 minutes after the last entry unless it was previously set to an invalid value by the user. **If, however, 00000 is set as the pin, the value is not automatically deleted!**

7. Parameterisation

7.1. Menu layout

Group 0 KEA 202 INS KUHSE GmbH	Group 1 ACTUAL VALUES COUNTER	Group 2 ALARM CODING	Group 3 BATTERY MONITOR	Group 4 GENERATO MONITOR GEN. CURRENT MONITOR
Group 5 ANALOGUE INPUTS ANALOGUE OUTPUTS	Group 6 SPEED SIGNALS SPEED CONTROLLER	Group 7 START/STOP	Group 8 SWITCH-ON GENERATO	Group 9 RELAY/LED FUNCTIONS
Group 10 GENERAL PARAME-	Group 11 FREQUENCY CON- TROLLER	Group 12 *) MOTOR MANAGEMENT ACTUAL VALUES	Group 13 THERE ARE NO ALARMS PEN-	Group 14 *) MOTOR MANAGEMENT CURRENT ALARMS

*) Groups 12 and 14 are only possible when there is a CAN connection to the genset.

Functions and their parameterisation, and the connection of the automatic system are described under FUNCTIONS AND PARAMETERISATION KEA 201 – 202. All possible functions of KEA series 201-202 are explained in this document. It must be noted, therefore, that only the processes stated in the operating instructions are realised. The PARAWIN parameterisation program only shows the parameters applicable to the automatic system.

Group	Function	Section FUNCTIONS AND PARAMETERISATION KEA 202 – 202
2	Alarm coding	Alarm messages
3	Battery voltage monitor	Other parameters
4	Generator voltage monitor	Voltage monitor
4	Generator current sensor	Current sensor
5	Analogue inputs	Analogue interface
5	Analogue outputs	Analogue interface
6	Speed measurement, switch points	Speed measurement
7	Start/stop functions	Start and stop
8	Parameters for generator switch-on	Mains generator switch
9	Parameterisation of relays and displays	Parameterisation of relays
10	General parameters	Other parameters
11	Frequency controller	Synchronisation
11	Voltage regulator	Synchronisation
	Connections of KEA and RZ	Connections
	Operating instructions	See TA202IX3-DE

8. Connection to RZ-071-D

The sensors for connections 1 to 28 must be connected with the negative potential. Connection 29 is intended for an input for generator, terminal D+. A pre-excitation for generators is provided. The allocation of the relays can vary widely because of the parameterisation. Therefore only the respective status printout should be considered a binding document for an automatic system.

The stated contact rating of the relays must not exceeded. As a general rule, all operated coils and inductivities must be provided with inverse diodes (on DC) or with quenching combinations adapted to the inductivity of the coil.

Connection 1 – 14: Inputs for alarms.

The sensor must be switched against the battery negative potential.

Connection 15

The input is not assigned and could be used to connect an external alarm.

Connection 16: Generator is switched off.

An auxiliary contact (NC contact to negative) of the generator circuit breaker (or contactor) must be fed to this terminal for switch setting feedback.

Connection 17: Blocking system for operating mode

If a negative potential is applied to this terminal, the operating mode cannot be changed. A key operated switch may be connected here, so that an unintentional or unacceptable change of a decided selection by unauthorized persons can be avoided.

Connection 18: Remote starting command with generator switch-on

The genset starts in Auto operating mode with the switching on of the generator when a negative potential is applied to connection 18. If it is running in TEST operating mode, or the command "START WITHOUT LOAD" was inactive, the generator switches on automatically.

On disconnecting the signal from terminal 18 (the command "START WITHOUT LOAD" must be inactive), the generator circuit breaker is tripped after elapsed tripping delay time and the engine shutdown takes place after running-out of the coolingdown period.

Connection 19: Quick stop (Emergency Stop)

The signal can be parametrised as an operating current or a standby current (KEA display, Group 6, **PARAMETER WIN**, under **OTHER PARAMETERS**). A signal on this terminal immediately shuts down the genset. The automatic system is inhibited from starting up again. The automatic system is unlocked via the OFF operating mode if there is no longer any signal on the terminal. If the contact is still switched, the AUTOMATIC SYSTEM INHIBITED display remains illuminated.

Connection 20

The input is not assigned and could be used to connect an external alarm.

Connection 21

The input is not assigned and could be used to connect an external alarm.

Connection 22

The input is not assigned and could be used to connect an external alarm.

Connection 23: Sprinkler prompt

The genset is started without switching on the generator if there is a negative potential on this connection. All alarms have only a warning function.

Connection 24: Start release

A manual or automatic start remains blocked until a negative potential is applied to this terminal 24. In this way, start conditions that must be met can be queried before the starter may be actuated. If this function is not used, this connection must have a fixed negative potential.

This function does not comply with the requirement of a start blocking system in accordance with VDE 0107 as a running genset is not stopped, but is used to protect the motor when starting.

Connection 25: starting command without generator switch-on

By means of a command, connected to this terminal, the genset is started-up on AUTOMATIC OPERATIONAL mode without generator being switched on. If an additional command is sent to Input STARTING COMMAND

WITH GENERATOR SWITCH-ON, then the generator will be switched on as well. To stop the generator or to switch off, **both** commands have to be disabled.

Connection 26: Generators switch off immediately

The generator switches off at once when this input is connected with a negative potential. The start-up shall not be released until the signal is removed from this terminal again.

Connection 27: Speed sensor lower

This signal is used for activating the speed controller by an external unit.

Connection 28: Speed sensor higher

This signal is used for activating the speed controller by an external unit.

Connection 29: Generator terminal D+

If present, terminal D+ of the generator is connected here. This pre-excites the generator, the positive signal of the generator is used for interrupting the start.

9. Technical data

9.1. KEA controller

- Unit for front installation, dimensions: (\Rightarrow , \uparrow , depth) 260 x 170 x 100 mm.
- Weight approx. 2.2 kg, any installation position, protection rating (installed) IP 44.
- Ambient temperature: Storage -20°C ... +70°C, operation 0°C ... +55°C.
- Switchable supply voltage 9-~~12~~-15V or 14-~~24~~-35V DC.
- 3 parametrisable relays, 35 V DC, 1 Amp. (e.g. for acoustic transducer).
- Standards/regulations VDE 100, part 710.

9.2. Analogue inputs and outputs

- Generator voltage monitor 3-phase, adjustable in 1-Volt steps. With incorrect rotation field, display <U.
- U_{nom} . 230/400 Volt, adjustable 50 - 300 Volt. . Class accuracy 1.
- Generator frequency monitor 50 or 60 Hz, continuously adjustable from 40 to 70 Hz.
- Generator current measurement 3-phase. Class accuracy 1.
- I_{nom} . 5 A: Measuring range 0.1 – 15 Amp., adjustable in 20 mA steps.
- Battery voltage monitor.
- Input for pick-up.
- Four free analogue inputs can be optionally equipped with interface cards for
 - PT 100/PT1000,
 - Current loops,
 - 0 - 10 V DC,
 - Thermocouple NiCr-Ni,
 - Temperature and pressure: Encoder from VDO,
 - Battery charging circuit*).
- Two analogue outputs, can be optionally equipped with output cards for 0 – 20 mA resp. 0 – 10 Volt.

9.3. Additional relay unit RZ-071-D

- Device for clipping onto top-hat rails, dimensions: (\Rightarrow , \uparrow , depth) 300 x 100 x 90 mm (with multipoint connector).
- Weight approx. 0.7 kg, any installation position, protection rating IP 00.
- equipped with:
 - Input for generator D+ with pre-excitation for AC generators,
 - 14 connections for alarm contacts,
 - 14 general control inputs,
 - 12 relays, of which 8 can be parametrised, contact loading: 2 relays max. 35 Volt, 20 Amp. DC, 10 relays, 250 V AC, 6 Amp.

9.4. Additional relay unit RZ-071-E (optional)

- Device for clipping onto top-hat rails, dimensions: (\Rightarrow , \uparrow , depth) 210 x 100 x 50 mm.
- Weight approx. 0.5 kg, any installation position, protection rating IP 00.
- equipped with 15 relays, of which 14 can be parametrised, contact loading max. 250 V AC, 6 Amp.

9.5. Serial interfaces

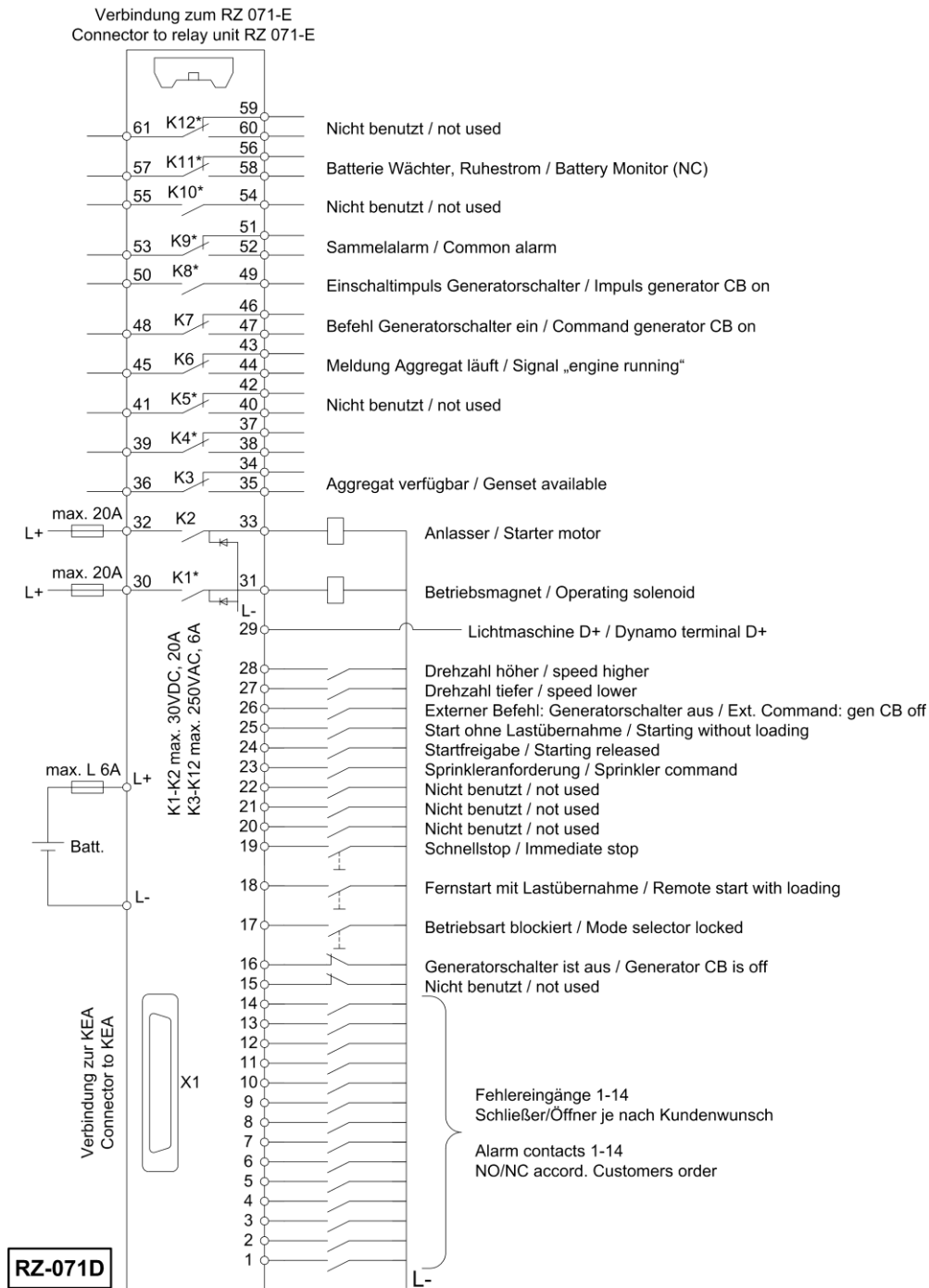
- LWL or USB interface – with atic switching – for parameterisation
- CAN bus interface to a central control system (ZLT)
- CAN bus interface to the motor management (the protocol must be known and implemented).

9.6. KNG for coupling to other systems (option)

Device for clipping onto top-hat rails: KNG (Kuhse Network Gateway) for coupling to other systems via PRO-FIBUS DP or Modbus RTU

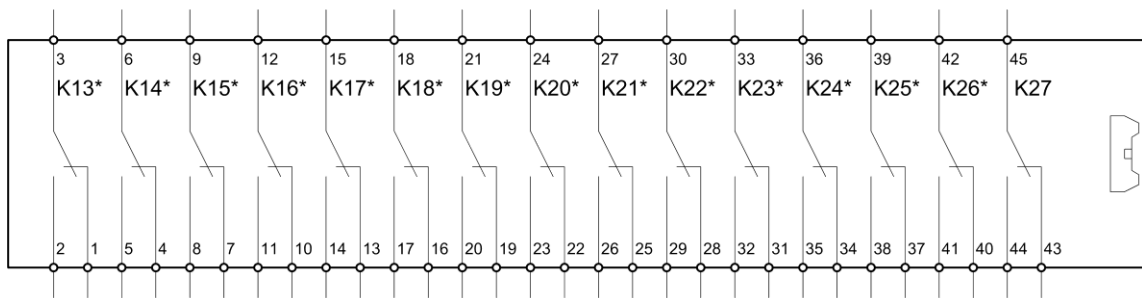
10. Connection diagrams

10.1. Connection diagram RZ-071-D



* Funktion parametrierbar / Function parameterized

10.2. Relay unit RZ-071-E (optional)



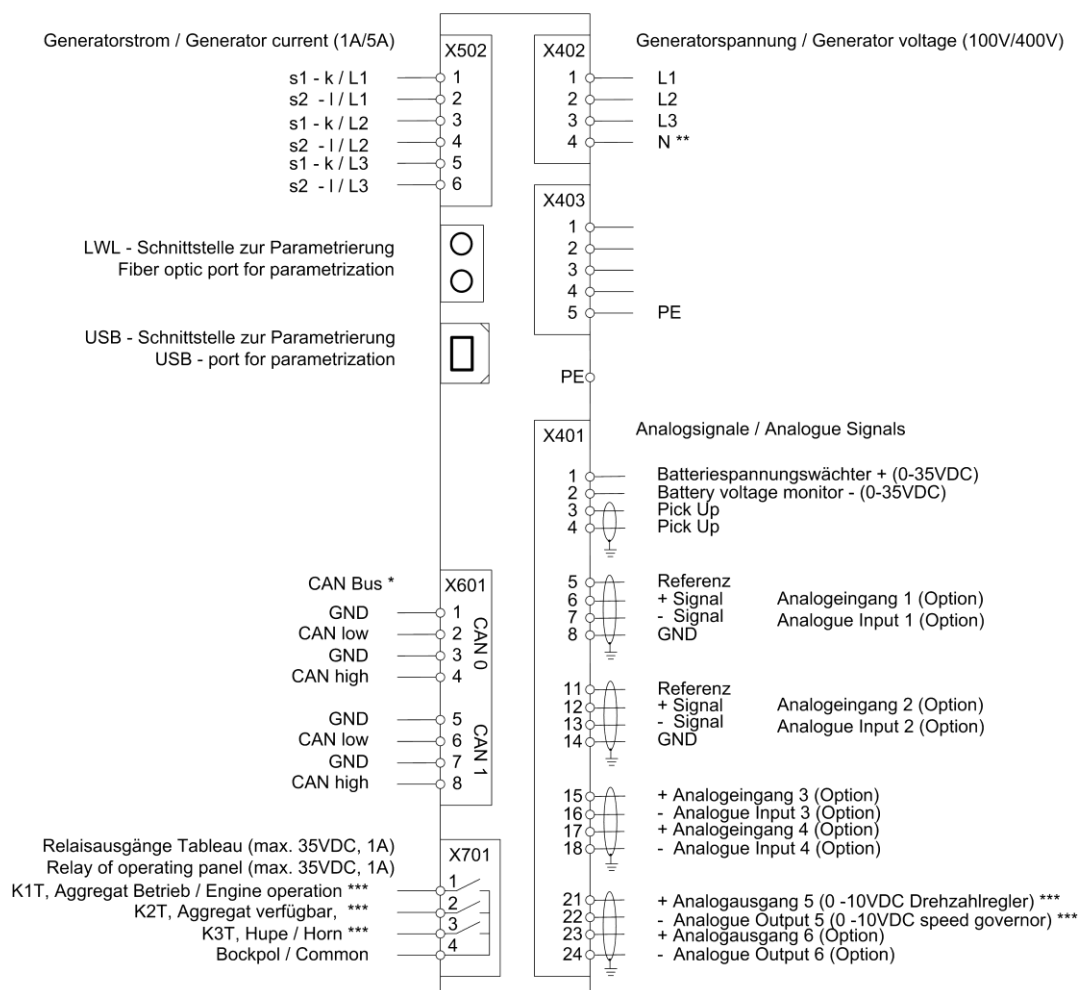
Verbindung zum RZ-071D
Connector to relay unit RZ-071D

RZ-071E

* Funktion parametrierbar / Function parameterized
K13-K27 max. 250VAC, 6A

K27 Nicht benutzt /
not used

10.3. Connection diagram KEA 202 INS

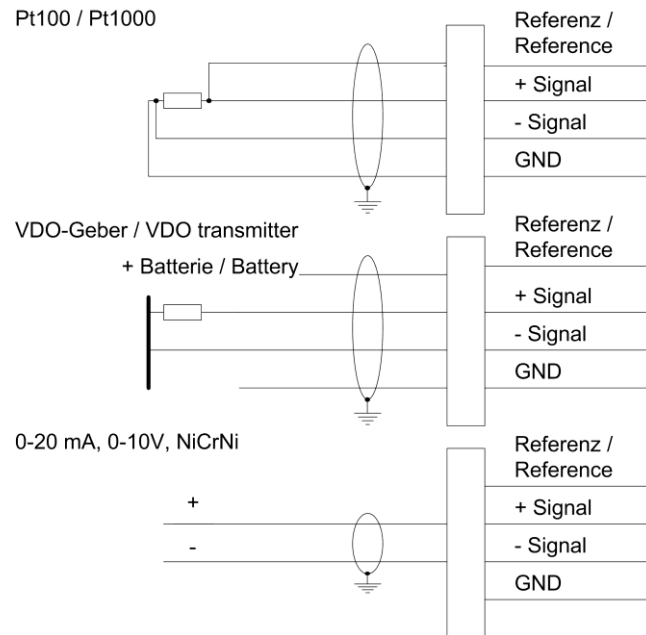


* CAN Bus Abschlusswiderstände eingeschaltet (Steckbrücke intern) / CAN bus termination activ (jumper intern)

** nur bei 400V Messung / only at 400V Measuring

*** Funktion parametrierbar / Function parameterized

10.4. Analogue inputs connection



10.5. Drilling template scale 1:1 – print out without scaling!

