

Documentation for

# KL2602 and KL2622

Two-channel Relay Output Terminals for 230 V<sub>AC</sub> / 30 V<sub>DC</sub>

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**BECKHOFF**

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# 1 Foreword

## 1.1 Notes on the documentation

This description is only intended for the use of trained specialists in control and automation engineering who are familiar with the applicable national standards. It is essential that the following notes and explanations are followed when installing and commissioning these components.

The responsible staff must ensure that the application or use of the products described satisfy all the requirements for safety, including all the relevant laws, regulations, guidelines and standards.

### 1.1.1 Disclaimer

The documentation has been prepared with care. The products described are, however, constantly under development. For that reason the documentation is not in every case checked for consistency with performance data, standards or other characteristics. In the event that it contains technical or editorial errors, we retain the right to make alterations at any time and without warning. No claims for the modification of products that have already been supplied may be made on the basis of the data, diagrams and descriptions in this documentation.

### 1.1.2 Delivery conditions

In addition, the general delivery conditions of the company Beckhoff Automation GmbH apply.

### 1.1.3 Trademarks

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### 1.1.4 Patent Pending

The TwinCAT Technology is covered, including but not limited to the following patent applications and patents: EP0851348, US6167425 with corresponding applications or registrations in various other countries.

### 1.1.5 Copyright

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## 1.2 Safety Instructions

### 1.2.1 State at Delivery

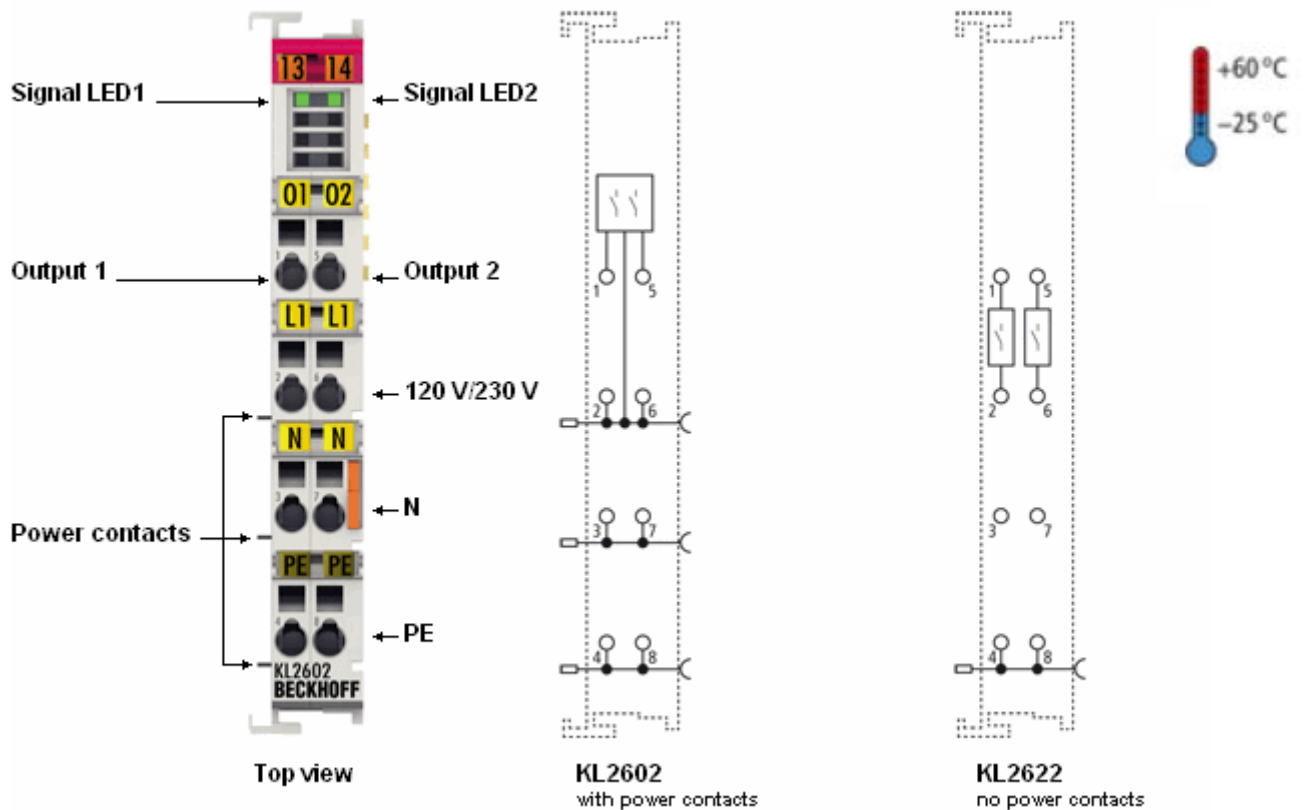
All the components are supplied in particular hardware and software configurations appropriate for the application. Modifications to hardware or software configurations other than those described in the documentation are not permitted, and nullify the liability of Beckhoff Automation GmbH.

### 1.2.2 Description of safety symbols

The following safety symbols are used in this documentation. They are intended to alert the reader to the associated safety instructions.

 <b>DANGER</b>	<p><b>Serious risk of injury!</b></p> <p><b>Failure</b> to follow the safety instructions associated with this symbol directly endangers the life and health of persons.</p>
 <b>WARNING</b>	<p><b>Risk of injury!</b></p> <p><b>Failure</b> to follow the safety instructions associated with this symbol endangers the life and health of persons.</p>
 <b>CAUTION</b>	<p><b>Danger for persons!</b></p> <p><b>Failure</b> to follow the safety instructions associated with this symbol may endanger persons.</p>
 <b>Attention</b>	<p><b>Danger for the environment or equipment</b></p> <p><b>Failure</b> to follow the safety instructions associated with this symbol may endanger the environment or equipment.</p>
 <b>Note</b>	<p><b>Tip or pointer</b></p> <p>This symbol indicates information that contributes to better understanding.</p>

## 2 Product overview



### 2.1 Functional description

The KL2602 and KL2622 output terminals have two relays, each with a single contact, and can be used to switch devices requiring mains power and operating at up to 230 V<sub>AC</sub>. The signal state of each relay is shown by an LED.

- The relay contacts of the KL2602 are joined to the power contacts.
- The relay contacts of the KL2622 are potential-free, and are not joined to the power contacts. The KL2622 only loops through the PE power contact.

#### LED display

The signal LEDs indicate the operational state of the associated terminal channel.

- On: Relay contact closed
- Off: Relay contact opened

#### Watchdog timer overflow

If no process data is transferred to the terminal from the Bus Coupler for 100 ms, the green LEDs go out, and the relay contacts are opened.


#### Process data


The bit-width in the process image is 2 bits.

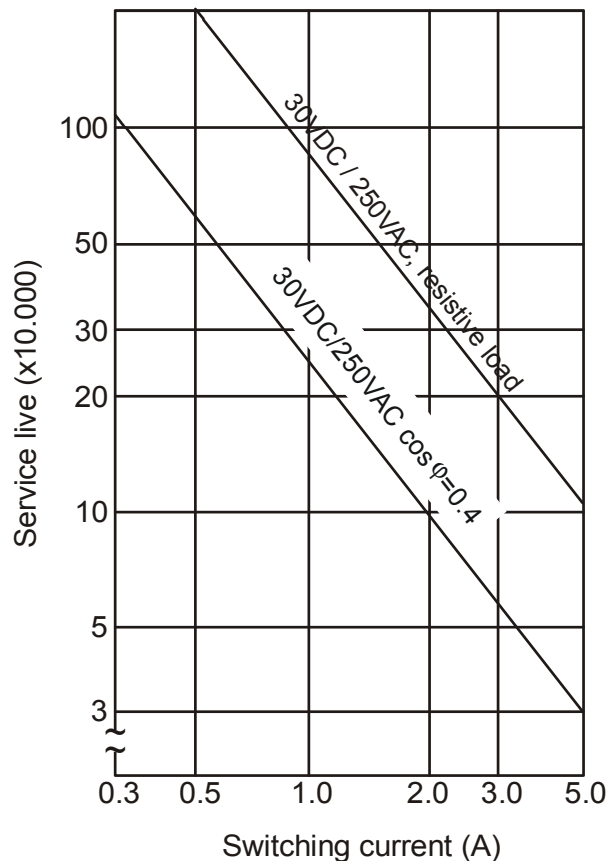
## 2.2 Technical data


Technical data		KL2602	KL2622
Number of outputs		2 N/O contacts for power contact	2 N/O contacts (potential-free)
Contact material		AgCdO	
Switching voltage		max. 250V <sub>AC</sub> / 30V <sub>DC</sub>	
Switching current		max. 5 A	
Switching capacity max. with resistive load		Alternating voltage: 5 A    250 V <sub>AC</sub> 1250 VA Direct voltage: 5 A    30 V <sub>DC</sub> 150 W	
Maximum switching current with inductive load, cosφ=0.4, L/R=7ms		2 A 250 V <sub>AC</sub> 2 A 30 V <sub>DC</sub>	
Minimum permitted load (approximate)		10 mA at 5 V <sub>DC</sub> (as supplied) (after a current of approx. 100 mA (or greater) has been switched at least once)	
Reaction time at a rated load		Reaction time: max. 10 ms Release time: max. 4 ms Bounce time: max. 5 ms	
Electrical isolation		500 V <sub>rms</sub> (K-Bus/mains voltage)	
K-Bus current consumption		80 mA	85 mA
Bit width in process image		2 A	
Service life Mechanical operating cycles		20,000,000 switching operations	
Service life Electrical operating cycles		At least 100,000 switching operations on resistive loads at 250 V <sub>AC</sub> 5 A or 30 V <sub>DC</sub> 5 A	
Permitted switching frequency at maximum contact load		10 switching operations / minute	
Contact resistance max. (new)		< 30 mΩ	
Insulation resistance (min).		100 MΩ at 500 V <sub>DC</sub>	
Test voltage between open contacts		750 V (1 minute between open contacts)	
Configuration		no address or configuration settings	
Weight		approx. 85 g	approx. 80 g
Permissible ambient temperature range	during operation	-25°C ... +60°C in operation 0°C ... +55°C (according to cULus) for Canada and USA 0°C ... +55°C (according to ATEX, see special conditions)	
	during storage	-40°C... +85°C	
Relative humidity		95 % no condensation	
Vibration / shock resistance		conforms to EN 60068-2-6 / EN 60068-2-27	
EMC resistance burst / ESD		conforms to EN 61000-6-2 / EN 61000-6-4	
Installation position		any	
Protection class		IP20	
Approvals		CE, cULus, ATEX, GL	

## 2.3 The correct application of relay terminals



 <b>WARNING</b>	<p><b>Risk of electric shock and damage of device!</b></p> <p>Bring the bus terminal system into a safe, powered down state before starting installation, disassembly or wiring of the Bus Terminals!</p>
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 <b>Note</b>	<p><b>Analyze operation conditions</b></p> <p>It is extremely important to observe the technical specifications if fault-free operation is to be guaranteed. Any time that the stated parameters are exceeded, damage ranging from premature contact ageing up to fused contacts can result.</p> <p>If relays are to be used in a control system the expected operating conditions must be analyzed with great care. Switching capacity, service life (operating cycles) and the number of switches per minute must be considered.</p> <p>Appropriate protective circuits must be used to protect the relay contacts from excessive voltage peaks such as can occur when switching inductive loads (contactors, motors etc.). This allows switching frequencies nearly equal to those appropriate to resistive loads to be achieved. Arcing time when switching DC loads are significantly longer than those for comparable AC voltages (zero crossing); material flow can result.</p> <p>If the terminal is used to change the direction of inductive loads, adequate dead-times during the switch-over must be provided, in order to avoid temporary short-circuits.</p>
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 <b>Attention</b>	<p><b>Attend the maximum values</b></p> <p>It is the maximum values that are to be expected that are critical to selection of the right terminal rather than the technical figures for normal operation!</p>
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## 2.4 ATEX - Special conditions

 <p><b>WARNING</b></p>	<p><b>Observe the special conditions for the intended use of Beckhoff fieldbus components in potentially explosive areas (directive 94/9/EU)!</b></p> <ul style="list-style-type: none"> <li>• The certified components are to be installed in a suitable housing that guarantees a protection class of at least IP54 in accordance with EN 60529! The environmental conditions during use are thereby to be taken into account!</li> <li>• If the temperatures during rated operation are higher than 70°C at the feed-in points of cables, lines or pipes, or higher than 80°C at the wire branching points, then cables must be selected whose temperature data correspond to the actual measured temperature values!</li> <li>• Observe the permissible ambient temperature range of 0 - 55°C for the use of Beckhoff fieldbus components in potentially explosive areas!</li> <li>• Measures must be taken to protect against the rated operating voltage being exceeded by more than 40% due to short-term interference voltages!</li> <li>• The individual terminals may only be unplugged or removed from the Bus Terminal system if the supply voltage has been switched off or if a non-explosive atmosphere is ensured!</li> <li>• The connections of the certified components may only be connected or disconnected if the supply voltage has been switched off or if a non-explosive atmosphere is ensured!</li> <li>• The fuses of the KL92xx power feed terminals may only be exchanged if the supply voltage has been switched off or if a non-explosive atmosphere is ensured!</li> <li>• Address selectors and ID switches may only be adjusted if the supply voltage has been switched off or if a non-explosive atmosphere is ensured!</li> </ul>
 <p><b>Note</b></p>	<p><b>Operation of the Bus Terminal System in potentially explosive areas (ATEX)!</b></p> <p>Pay also attention to the continuative documentation</p> <p><i>Notes about operation of the Bus Terminal System in potentially explosive areas (ATEX)</i></p> <p>that is available in the <a href="#">download area</a> of the Beckhoff homepage <a href="http://www.beckhoff.com!">http://www.beckhoff.com!</a></p>



## 3 Appendix

### 3.1 Support and Service

Beckhoff and their partners around the world offer comprehensive support and service, making available fast and competent assistance with all questions related to Beckhoff products and system solutions.

#### 3.1.1 Beckhoff's branch offices and representatives

Please contact your Beckhoff branch office or representative for local support and service on Beckhoff products!

The addresses of Beckhoff's branch offices and representatives round the world can be found on her internet pages: <http://www.beckhoff.com>

You will also find further documentation for Beckhoff components there.

#### 3.1.2 Beckhoff Headquarters

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#### Beckhoff Support

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