

# TYPE APPROVAL CERTIFICATE

**This is to certify:**

**That the Peripheral Equipment**

with type designation(s)

**Bus Terminals Digital Input, Digital Output, Analog Input, Analog Output**

Issued to

**Beckhoff Automation GmbH & Co. KG  
Verl, Germany**

is found to comply with

**DNV GL rules for classification – Ships, offshore units, and high speed and light craft**

**Application :**

**Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.**

**Location classes:**

**Temperature D**

**Humidity B**

**Vibration B**

**EMC A\*/B**

**Enclosure Required protection according to the Rules shall be provided upon installation on board.**

**\* see Application/Limitation**

Issued at **Hamburg** on **2020-04-08**

This Certificate is valid until **2025-04-07**.

for **DNV GL**

DNV GL local station: **Essen**

Approval Engineer: **Heinz Scheffler**

.....  
**Joannis Papanuskas**  
**Head of Section**

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV GL AS, its parent companies and subsidiaries as well as their officers, directors and employees ("DNV GL") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



## Product description

### Bus Terminals Digital Input

- KL/KS1002: 2-Channel 24 V DC Digital Input, Input filter 3ms
- KL/KS1012: 2-Channel 24 V DC Digital Input, Input filter 0.2ms
- KL/KS1032: 2-Channel 48 V DC Digital Input, Input filter 3ms
- KL/KS1104: 4-Channel 24 V DC Digital Input, Input filter 3ms
- KL/KS1114: 4-Channel 24 V DC Digital Input, Input filter 0.2ms
- KL/KS1212: 2-Channel 24 V DC Digital Input, Input filter 3ms, diagnostics
- KL/KS1352: 2-Channel 24 V DC Digital Input for NAMUR Sensors, Input filter 3ms
- KL/KS1362: 2-Channel 24 V DC Digital Input for break-in alarm
- KL/KS1382: 2-Channel 24 V DC Digital Input for Thermistor
- KL/KS1402: 2-Channel 24 V DC Digital Input, Input filter 3ms
- KL/KS1404: 4-Channel 24 V DC Digital Input, Input filter 3ms
- KL/KS1412: 2-Channel 24 V DC Digital Input, Input filter 0.2ms
- KL/KS1414: 4-Channel 24 V DC Digital Input, Input filter 0.2ms
- KL/KS1408: 8-Channel 24 V DC Digital Input, Input filter 3ms
- KL/KS1418: 8-Channel 24 V DC Digital Input, Input filter 0.2ms
- KL/KS1702: 2-Channel 120 V AC to 230 V AC, 4-wire system
- KL/KS1722: 2-Channel 120 V AC to 230 V AC, without power contacts, 4-wire system

### Bus Terminals Digital Output

- KL/KS2022: 2-Channel 24 V DC Digital Output, max. output 2.0 A
- KL/KS2032: 2-Channel 24 V DC Digital Output, max. output 0.5 A (Reverse voltage protection)
- KL/KS2134: 4-Channel 24 V DC Digital Output, max. output 0.5 A (Reverse voltage protection)
- KL/KS2408: 8-Channel 24 V DC Digital Output, max. output 0.5 A (Reverse voltage protection)
- KL/KS2602: 2-Channel Relay 230 V AC / 30 V DC Digital Output, max. output 2 A AC / DC
- KL/KS2612: 2-Channel Relay 125 V AC / 30 V DC Digital Output, 0.5 A AC / 2 A DC, no power contacts
- KL/KS2622: 2-Channel Relay 230 V AC / 30 V DC Digital Output, max. output 2 A AC / DC, no power contacts
- KL/KS2631: 1-Channel Relay 400 V AC / 300 V DC Digital Output, max. output 1500 VA AC / 0.15 A DC
- KL/KS2702: 2-Channel Solid State Load Relay 0...230 V AC / DC Digital Output, max. output 0.3 A (on each channel)
- KL/KS2712: 2-Channel Triac 12...230 V AC Digital Output, max. output 0.5 A
- KL/KS2722: 2-Channel Triac 12...230 V AC Digital Output, max. output 1 A, mutually locked outputs
- KL/KS2732: 2-Channel Triac 12...230 V AC Digital Output, max. output 1 A, mutually locked outputs, no power contacts

### Bus Terminals Special Functions

- KL/KS6031: Serial interface RS232, 115.2 kbaud
- KL/KS6041: Serial interface RS422/RS485, 115.2 kbaud

### Bus Terminals Analog Input

- KL/KS3011: 1-Channel 0...20 mA Analog Input, differential input, 12 bit
- KL/KS3012: 2-Channel 0...20 mA Analog Input, differential input, 12 bit
- KL/KS3021: 1-Channel 4...20 mA Analog Input, differential input, 12 bit
- KL/KS3022: 2-Channel 4...20 mA Analog Input, differential input, 12 bit
- KL/KS3041: 1-Channel loop-powered 0...20 mA Analog Input, 12 bit
- KL/KS3042: 2-Channel loop-powered 0...20 mA Analog Input, 12 bit
- KL/KS3044: 4-Channel 0...20 mA Analog Input, 12 bit
- KL/KS3051: 1-Channel loop-powered 4...20 mA Analog Input, 12 bit
- KL/KS3052: 2-Channel loop-powered 4...20 mA Analog Input, 12 bit
- KL/KS3054: 4-Channel 4...20 mA Analog Input, 12 bit
- KL/KS3064: 4-Channel 0...10 V Analog Input, single-ended, 12 bit
- KL/KS3201: 1-channel input terminal PT100 (RTD) for resistance sensors, 16 bit, 3-wire system
- KL/KS3202: 2-channel input terminal PT100 (RTD) for resistance sensors, 16 bit, 3-wire system
- KL/KS3204: 4-channel input terminal PT100 (RTD) for resistance sensors, 16 bit, 2-wire system
- KL3314: 4-channel thermocouple input terminal, preset to type K, with wire breakage detection, 16 bit
- KL/KS3404: 4-Channel -10...+10 V Analog Input, 4 x 2-wire system, 12 bit
- KL/KS3408: 8-Channel -10...+10 V Analog Input, 1-wire system, 12 bit

### Bus Terminals Analog Output

- KL/KS4011: 1-Channel 0...20 mA Analog Output, 12 bit
- KL/KS4012: 2-Channel 0...20 mA Analog Output, 12 bit
- KL/KS4021: 1-Channel 4...20 mA Analog Output, 12 bit
- KL/KS4022: 2-Channel 4...20 mA Analog Output, 12 bit
- KL/KS4031: 1-Channel -10 V...+10 V Analog Output, 12 bit
- KL/KS4032: 2-Channel -10 V...+10 V Analog Output, 12 bit
- KL/KS4034: 4-Channel -10 V...+10 V Analog Output, 12 bit
- KL/KS4404: 4-Channel 0 V...10 V Analog Output, 4 x 2-wire system, 12 bit
- KL/KS4408: 8-Channel 0 V...10 V Analog Output, 1-wire system, 12 bit
- KL/KS4414: 4-Channel 0...20 mA Analog Output, 4 x 2-wire system, 12 bit
- KL/KS4418: 8-Channel 0...20 mA Analog Output, 1-wire system, 12 bit
- KL/KS4424: 4-Channel 4...20 mA Analog Output, 4 x 2-wire system, 12 bit
- KL/KS4428: 8-Channel 4...20 mA Analog Output, 1-wire system, 12 bit
- KL/KS4434: 4-Channel -10 V...+10 V Analog Output, 4 x 2-wire system, 12 bit
- KL/KS4438: 8-Channel -10 V...+10 V Analog Output, 1-wire system, 12 bit

### Application/Limitation

**Location classes EMC A:** KL/KS3201, KL/KS3202, KL/KS3204; KL3314; KL/KS6031; KL/KS6041

Please observed the "Notes for operation of the Beckhoff Bus Terminal System in the Marine Sector (DNV GL), Version: 1.1, Date: 2020-02-03" regarding the required Surge filter.

### Approval conditions

The Type Approval covers hardware listed under Product description. When the hardware is used in applications to be classed by DNV GL, documentation for the actual application is to be submitted for approval by the manufacturer of the application system in each case. Reference is made to DNV GL rules for classification of ships Pt.4 Ch.9 Control and monitoring systems.

Job Id: **262.1-032994-1**  
Certificate No: **TAA00002M3**

#### Product certificate

If specified in the Rules, ref. Pt.4 Ch.9 Sec.1, the control and monitoring system in which the above listed hardware is used shall be delivered with a product certificate. For each such delivery the certification test is to be performed at the manufacturer of the application system before the system is shipped to the yard. The test shall be done according to an approved test program. After certification the clause for software control will be put into force.

#### Software control

All changes in software are to be recorded as long as the system is in use on board. Documentation of major changes is to be forwarded to DNV GL for evaluation and approval before implemented on board. Certification of modified functionality may be required for the particular vessel.

### **Type Approval documentation**

Test Reports: TAA00002M3-List of Test Reports, Rev. 1.0  
Documents: TAA00002M3-List of Documents, Rev. 1.0

### **Tests carried out**

Applicable tests according to class guideline DNVGL-CG-0339, November 2016.

### **Marking of product**

The products to be marked with:

- Model name
- Manufacturer name
- Serial number

### **Periodical assessment**

The scope of the periodical assessment is to verify that the conditions stipulated for the type are complied with, and that no alterations are made to the product design or choice of systems, software versions, components and/or materials.

The main elements of the assessment are:

- Ensure that type approved documentation is available
- Inspection of factory samples, selected at random from the production line (where practicable)
- Review of production and inspection routines, including test records from product sample tests and control routines
- Ensuring that systems, software versions, components and/or materials used comply with type approved documents and/or referenced system, software, component and material specifications
- Review of possible changes in design of systems, software versions, components, materials and/or performance, and make sure that such changes do not affect the type approval given
- Ensuring traceability between manufacturer's product type marking and the type approval certificate

Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

END OF CERTIFICATE