

Operating Instructions

KB2 Device versions, incl. enclosure

KB2 Keyboards PD2 Pointing device KB2-HSG / PD2-HSG Assemblies



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1 General information

1.1 Manufacturer

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1.2 Legal notice

1.2.1 Trademark

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1.2.2 Disclaimer

All rights reserved.

- This document may not be reproduced in whole or in part except with the written consent of the publisher.
- This document may be subject to change without notice.

Any warranty claims are limited to the right to demand amendments. Liability for any damage that might result from the contents of these instructions or all other documentation is limited to clear cases of premeditation.

We reserve the right to amend our products and their specifications at any time, provided it is in the interest of technical progress. The information in the current manual (online or on CD / DVD / USB-stick) or in the Operating Instructions included in the delivery applies.

1.3 About these Operating Instructions

1.3.1 Target group

These Operating Instructions are intended for the following groups of people:

Project engineers Electricians and installers Operators Operating staff Maintenance staff

1.3.2 How to use this manual

Read these Operating Instructions, especially the safety notes, carefully before use.

Take note of all other applicable documents (see also chapter <u>1.4 Further documents</u>).

Keep the Operating Instructions throughout the service life of the devices.

Make the Operating Instructions accessible to operating and maintenance staff at all times.

Pass the Operating Instructions on to each subsequent owner or user of the devices.

Update the Operating Instructions every time R. STAHL issues an amendment.

1.3.3 Application

Operating Instructions version: 01.00.06 Hardware revision: -

The following Operating Instructions apply to the following systems:

KB2 Keyboards	KB2 Keyboards
	PD2 Pointing device
Assemblies	KB2-*-HSG-*
	PD2-*-HSG-*

The original instructions are the German edition. They are legally binding in all legal affairs.

1.4 Further documents

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Certificate Compilation KB2 (CE_Keyboards_KB2) Operating Instructions UB03 (OI_UB03) Installation manual KB2 at IT-xx7 Non-Ex device (IM-KB2-an-IT-xx7) 2023348000_1-Arbeitsanweisung KB2 Desktop Binderstecker.pdf

For documents in other languages, see <u>r-stahl.com</u>.

1.5 Conformity with standards and regulations

1.5.1 Certificates

3	Certificates: <u>r-stahl.com</u>				
	The devices have IECEx approval. See IECEx homepage: https://www.iecex-certs.com/#/home to view the certificate				
	Further national certificates can be downloaded via the following link: <u>https://r-stahl.com/en/global/support/downloads/</u>				

1.5.2 Approvals

The following approvals are valid for all devices:

Synonym	Scope of validity	Valid until	Certificate number	Comment	
KB2 / PD2 -	KB2 / PD2 - Z1 (Zone 1, 21 devices)				
CE	Europe	unlimited		According to directive 2014/30/EU	
ATEX	Europe	unlimited	BVS 20 ATEX E 078 X	Issue 00	
IECEx	Global	unlimited	IECEx BVS 20.0065X	Issue 00	
CCC	China	07.05.2026	2021312309000474		
CNEx		16.06.2026	CNEx21.1931X		
BIS	India	22.05.2026	R-41226106		
PESO		31.12.2026	A/P/HQ/TN/104/6230 (P541910) P541910/2 P541910/3		
FM	USA	unlimited	FM21US0031X		
	Canada	unlimited	FM21CA0022X		
KB2 / PD2 -	- Z1-*-HSG*00* / *U3	* (Zone 1, 21	devices in enclosure)		
CE	Europe	unlimited		According to directive 2014/30/EU; 2014/35/EU; 2014/53/EU	
ATEX	Europe	unlimited	BVS 20 ATEX E 106 X	Issue 00	
IECEx	Global	unlimited	IECEx BVS 20.0084X	Issue 00	
CCC	China	13.05.2026	2021312309000476		
CNEx		16.06.2026	CNEx21.1934X		
FM	USA	unlimited	FM21US0031X		
	Canada	unlimited	FM21CA0022X		

The following approvals only apply to devices with a DE (German) and US (American) keyboard layout and the "No coating" enclosure option:

Synonym	Scope of validity	Valid until	Certificate number	Version
KB2 / PD2 - Z	1 (Zone 1, 21 devices)			
KCC	Korea	unlimited	R-R-RSE-KB2-Z1-USB-TB	Trackball
			R-R-RSE-KB2-Z1-USB-TP	Touchpad
			R-R-RSE-KB2-Z1-USB-JS	Joystick
KB2 / PD2 - Z	1 (Zone 1 devices)			
KCS	Korea	unlimited	21-KA4BO-0773X	
KB2 / PD2 - Z	1 (Zone 21 devices)			
KCS	Korea	unlimited	21-KA4BO-0774X	
KB2 / PD2 - Z1-*-HSG*00* (Zone 1 devices inside enclosure)				
KCS	Korea	unlimited	21-KA4BO-0777X	
KB2 / PD2 - Z	1-*-HSG*00* (Zone 21)	devices inside	enclosure)	
KCS	Korea	unlimited	21-KA4BO-0778X	
KB2 / PD2 - Z1-*-HSG*U3* (Zone 1 devices inside enclosure, UB03)				
KCS	Korea	unlimited	21-KA4BO-0779X	
KB2 / PD2 - Z	KB2 / PD2 - Z1-*-HSG*U3* (Zone 21 devices inside enclosure, UB03)			
KCS	Korea	unlimited	21-KA4BO-0780X	

The importer have to use exception documents which are applied in Korea rule for Korea.

A corresponding example document, the so-called "Customer confirmation letter", is included in the CE_Keyboards_KB2 certificate compilation of the devices.

1.5.3 Summary of applied standards

1.5.3.1 ATEX / IECEx

1.5.3.1.1 KB2 device versions

Standard	Classification
ATEX directive 2014/34/EU	Classification
EN IEC 60079-0 : 2018	General requirements
EN 60079-11 : 2012	Protection by intrinsic safety "i"

1.5.3.1.2 KB2-HSG / PD2-HSG assemblies

Standard	Classification
ATEX directive 2014/34/EU	Classification
EN IEC 60079-0 : 2018	General requirements
EN 60079-5 : 2015	Protection by powder filling "q"
EN IEC 60079-7 : 2015 + A1 : 2018	Protection by increased safety "e"
EN 60079-11 : 2012	Intrinsic safety "i"
EN 60079-15 : 2010	Protection by type of protection "n"
EN 60079-31 : 2014	Protected by enclosures "t" (dust)

1.5.3.2 EMC directive 2014/30/EU

1.5.3.2.1 KB2 device versions

Standard	Classification
EN 61326-1 : 2013	Electrical equipment for measurement, control and laboratory use - General requirements
EN IEC 61000-6-2 : 2019	Immunity
EN IEC 61000-6-4 : 2020	Emitted interference

1.5.3.2.2 KB2-HSG / PD2-HSG assemblies

Standard	Classification
EN IEC 61000-6-2 : 2019	Immunity
EN IEC 61000-6-4 : 2020	Emitted interference

1.5.3.3 Low voltage directive 2014/35/EU

Only for versions with "U3".

Standard	Classification	
EN 62368-1 : 2014 + AC : 2015 + A11 : 2017	Audio / video, information and communication technology equipment - Safety requirements	

1.5.3.4 Radio equipment directive 2014/53/EU

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Only for versions with "U3".

Standard	Classification
EN 300330 V2.1.1	Short range devices (SRD)
EN 301489-1 V2.2.3	Electromagnetic compatibility - Standard for radio equipment and services - Common technical requirements
EN 301489-3 V2.1.1	Electromagnetic compatibility and radio spectrum matters (ERM) - Electromagnetic compatibility standard for radio equipment and services - Specific conditions for short range devices (SRD)

1.5.3.5 RoHS directive 2011/65/EU

Standard	Classification
EN IEC 63000 : 2018	Technical documentation for the assessment of electrical and electronic equipment with regard to the restriction of hazardous substances

1.5.3.6 FM USA

Standard	Classification
FM Class 3600: 2022	Electric equipment for use in hazardous areas - general requirements
FM Class 3610: 2021	Intrinsically safe apparatus and associated apparatus for use in Class I, II, and III, Division I, hazardous (classified) locations
FM Class 3611: 2021	Nonincendive electrical equipment for use in Class I and II, Division 2 and Class III, Divisions 1 and 2 hazardous (classified) locations
FM Class 3616: 2022	Dust explosion protection electric equipment - general requirement
FM Class 3810: 2021	Electric equipment for the operation of measuring, control and laboratory equipment
ANSI/UL 50: 2020	Enclosures for electrical equipment, non- environmental considerations
ANSI/UL 50E: 2020	Enclosures for electrical equipment, environmental considerations
ANSI/UL 60079-0: 2019	General requirements
ANSI/UL 60079-5: 2016	Protection by powder filling "q"
ANSI/UL 60079-7: 2016	Protection by increased safety "e"
ANSI/UL 60079-11: 2014	Protection by intrinsic safety "i"
ANSI/UL 60079-15: 2013	Type of protection "n"
ANSI/UL 60079-31: 2015	Protected by enclosures "t" (dust)
ANSI/IEC 60529: 2004 (R2011)	Degrees of protection provided by enclosure (IP code)
ANSI/UL 121201: 2017	Nonincendive electrical equipment for use in Class I and II, Division 2 and Class III, Divisions 1 and 2 hazardous (classified) locations

1.5.3.7 FM Canada

Standard	Classification	
C22.2 No. 0.4-17: 2017	Bonding of electrical equipment	
C22.2 No. 0.5-16: 2016	Threaded conduit entries	
C22.2 No. 25-17: 2017	Enclosures for use in Class II, Division 1, Groups E, F, and G hazardous locations	
C22.2 No. 94.1-15: 2015	Enclosures for electrical equipment, non- environmental considerations	
C22.2 No. 94.2-15: 2015	Enclosures for electrical equipment, environmental considerations	
C22.2 No. 213-17: 2017	Nonincendive electrical equipment for use in Class I and II, Division 2 and Class III, Divisions 1 and 2 hazardous (classified) locations	
CAN/CSA-C22.2 No. 60079-0: 2019	General requirements	
CAN/CSA-C22.2 No. 60079-5: 2016	Protection by powder filling "q"	
CAN/CSA-C22.2 No. 60079-7: 2016	Protection by increased safety "e"	
CAN/CSA-C22.2 No. 60079-11: 2014	Protection by intrinsic safety "i"	
CAN/CSA-C22.2 No. 60079-15: 2018	Type of protection "n"	
CAN/CSA-C22.2 No. 60079-31: 2015	Protected by enclosures "t" (dust)	
CAN/CSA-C22.2 No. 60529: 2016	Degrees of protection provided by enclosure (IP code)	
CAN/CSA-C22.2 No. 61010-1-12: 2012 (R2017)	Safety regulations for electric measuring, control and laboratory equipment – general requirements	

2 Explanation of symbols

2.1 Symbols used in these Operating Instructions

Symbol	Meaning
	Useful hint for making work easier, important note
	Reference to another chapter, another section, another documentation or another web page.

2.2 Warning notes

Dangerous situation which can result in fatal or severe, life-changin injuries if the safety measures are not complied with.	
Dangerous situation which can result in severe injuries if the safety measures are not complied with.	
Dangerous situation which can result in minor injuries if the safety measures are not complied with.	
Dangerous situation which can result in material damage if the safety measures are not complied with.	

Symbol	Meaning
	Heat hazard
	Electrostatic discharge hazard

Symbol	Meaning
Ex	Device certified for hazardous areas according to ATEX directive.
CE	Device marking according to EU directive
0158	ID number of monitoring body
X	Marking according to WEEE directive 2012/19/EU
	Warning - important information
	Warning of hazardous voltage
	Connection for equipotential bonding

2.3 Symbols on the device

3 Safety

The devices have been manufactured according to the state of the art of technology while observing recognised safety-related rules. When using the devices, it is nevertheless possible for hazards to occur to life and limb of the user or third parties or for the devices, environment or material assets to be compromised.

Only use the devices under the following conditions:

If they are not damaged

As intended, while remaining aware of safety and hazards

In accordance with these Operating Instructions

3.1 Intended use

The type KB2 device versions are used to enter data, commands etc. on PCs and similar devices in hazardous areas.

They are explosion-protected equipment for use and installation in hazardous areas of Zones 1, 2, 21 and 22. They must be connected to intrinsically safe USB interfaces. Power supply and data communication takes place only via this USB interface.

The KB2 and PD2 device versions are connected via the cables provided.

Various keyboard versions are available that differ in their layout (German, English, French etc.) and in their design (PC keyboard with trackball, touchpad or with joystick).

The KB2 devices are available in the following versions:

KB2 Keyboards

PD2 Pointing device

The KB2 and PD2 device versions are installed in a type HSG enclosure, which then represents the assembly of the complete system.

In addition to KB2 and PD2 devices, the UB03-* device can also be installed in this enclosure.

3.2 Predictable improper use

The device may only be installed and connected by specifically trained personnel.

3.3 Personnel qualification

Qualified specialist personnel is required to perform the activities described in these Operating Instructions. This primarily applies to work in the following areas:

Product selection and project engineering

Mounting / dismounting the device

Installation

Commissioning

Maintenance, cleaning

Specialists who perform these tasks must have a level of knowledge that meets applicable national or equivalent country-specific standards and regulations. Additional knowledge is required for any activity in hazardous areas !

R. STAHL recommends having a level of knowledge equal to that described in the following standards:

IEC/EN 60079-14 (Electrical installations design, selection and erection)

IEC/EN 60079-17 (Inspection and maintenance of electrical installations)

IEC/EN 60079-19 (Equipment repair, overhaul and reclamation)

3.4 Special conditions of use

The devices (including their connection cables) may only be installed in areas where there are absolutely no intensive electrostatic loading processes.

If the devices are to be used in areas with dust-explosion hazard, they need to be installed in a suitable enclosure to achieve at least IP64 (acc. to EN IEC 60079-0).

If the device is supplied with a current of over 250 mA in an area with dust-explosion hazard, this must be via an ia current (linear characteristic).

Additional requirements for KB2 / PD2 only

When the devices are used in gas hazardous areas they have to be installed in a suitable enclosure so that at least IP20 is achieved (acc. to IEC 60529).

The KB2 and PD2 device versions are suitable for installation into the cut-out of an enclosure with IP64 (acc. to EN IEC 60079-0), or into the cut-out of an enclosure with degree of protection EX eb / ec or Ex tb / tc or Ex p. In this case, they fulfil the respective enclosure requirements.

Additional information for KB2 with pointing device and KB2-HSG only

The connection cable of the devices contains two separate intrinsically safe circuits. The device must be installed in such a way that there is no mechanical impact (tensile force) onto the cable. The cable must be fixed and effectively protected against damage.

Additional information for installation in HSG enclosure

As a minimum, the installed device must have the same IP degree of protection as the enclosure, and must also be separately certified for this IP degree of protection.

The enclosure must be connected to ground potential, and this connection must not exceed 1 M Ω against the ground. Where appropriate, assembly components or the ground connection of the installed devices may be used.

Additional information for HSG enclosures with "U3" device version only

For the connection of the UB03 device a cable must be used that has an insulation of at least 0.5 mm between conductor and outer coating.

The cable must be installed inside the enclosure with a minimum distance of 50 mm to bare, conductive parts of the keyboard / pointing device.

3.5 Installation safety information

- Only use suitable tools for the installation.
- When keyboards and pointing devices are installed into the cut-out of closed enclosures, the nuts used to fix them must be tightened with a tightening torque of at least 1 Nm.
- The connection cable is approx.. 2.4 m long.
- The connection cable must not be extended or replaced by the customer.
- We recommend you use screened cables with the keyboards and pointing devices. Routing of the cable may reduce performance.
- The shield of the connection cable must be grounded with a maximum of 1 $M\Omega$ against the ground.
- The D+ and D- USB data conductors must be twisted right up to the terminals.

Once the devices have been connected to and operated in circuits with ia, ib or ic level of protection or Non-Ex circuits, they must no longer be operated in areas that require circuits with higher levels of protection !
 When installed and wired ex factory, the type plate of the keyboards will indicate the applicable level of protection. For Non-Ex circuits, the type plate will indicate "Industrial use only when supplied with non Ex i circuits".
 If a device is being replaced, the person responsible for the replacement of the old and / or operation of the new device must ensure that the type plate of the new device indicates the level of protection according to the connected circuit.

Additional information for KDB2-HSG / PD2-HSG

- The back cover of the enclosure must be fixed with a tightening torque of 3.4 Nm (+0.6 / - 0 Nm).
- Cable that come into contact with conductive parts must be mechanically protected and / or securely installed to avoid damage to the insulation.
- Make sure you are using the correct insulation / distance to achieve safe cable installation with regard to the standards applicable for degrees of protection "i" and "e".
- All Ex e and Ex i circuits must be completely de-energised before the keyboards and pointing devices are connected. Do not open the lid of the enclosure if the devices are energised.

3.6 Safety information for operation

- Only operate the devices if they are clean and undamaged. If a device is in any way damaged, do not touch it to avoid injury. In the case of any damage that may compromise ingress protection (e.g. cracks, holes or broken components) the devices must be taken out of commission immediately. Before the device is recommissioned the damaged components must be replaced.
- If the devices are to be used in category 2D/3D or EPL Db/Dc dust deposits thicker than 5 mm must be removed. You must ensure that no high-energy loading mechanisms at the operating surface of the keyboards and pointing devices (e.g. pneumatic particle transport) occur during operation. Do not use the keyboards and pointing devices in environments where propagating brush discharges may occur.
- In case of non-compliance with or contravention of the above explosion-protection is no longer guaranteed and all warranty claims shall be null and void.

3.7 Residual risks

3.7.1 Explosion hazard

Despite the device's state-of-the-art design, explosion hazards cannot be entirely eliminated in hazardous areas.

Perform all work steps in hazardous areas with the utmost care at all times !

Possible hazards ("residual risks") can be categorised according to the following causes:

Mechanical damage

The device may become damaged during transport, mounting or commissioning. This kind of damage may, for example, render the device's explosion protection partially or completely ineffective. This may result in explosions causing serious or even fatal injury.

Do not commission a damaged device.

Only transport the device in special transport packaging that reliably protects the device from external influences. Take ambient conditions into account when selecting the transport packaging (see chapter <u>16.1 Technical data</u>).

Do not place any loads on the device.

- Check the packaging and the device for damage. Immediately report any damage to R. STAHL.
- Store the device ideally in its original packaging in a dry place (with no condensation), and make sure that it is stable and protected against the effects of vibrations and knocks.

Do not damage the device or seals during its installation.

Excessive heating or electrostatic charge

- Operate the device only within the prescribed operating conditions (see chapter <u>4.4 Markings</u> <u>on the device</u> and chapter <u>16.1 Technical data</u>).
- Mount and install the device in such a way that it is always operated within the permissible temperature range.

Do not use the device in strong charge-generating environments.

Avoid friction and flow of particle streams.

Regularly inspect the device for a material change. If you spot any changes, test or replace the device.

• Only the manufacturer may paint / coat the devices with a special, conductive paint.

No other person is permitted to paint / coat the device or to touch up its paint / coating. Any repairs must be carried out by the manufacturer only.

Comply with the area specification of EN/IEC 60079-0 when fitting additional plastic adhesive labels.

Clean the device with a damp cloth only.

Improper mounting, installation, commissioning, maintenance or cleaning

Basic work such as installation, commissioning, maintenance or cleaning of the device must always be performed in accordance with the applicable national regulations of the country of use and only by qualified persons. Otherwise, the explosion protection may be rendered ineffective. This may result in explosions causing serious or even fatal injury.

- Have the assembly, installation, commissioning and maintenance work performed by qualified and authorised persons only (see chapter <u>3.3 Personnel qualification</u>).
- Prior to commissioning, check the device is correctly mounted (see chapter <u>7 Mounting and</u> <u>installation</u>).
- Electrical circuits with Ex i type of protection may no longer be operated as electrical circuits with this type of protection after having been operated with electrical circuits with other types of protection.
- Only connect the device to equipment which does not carry voltages higher than 250 VAC (50 60 Hz).

Connect Ex i devices only to intrinsically safe terminals.

- In hazardous areas, always switch the electrical circuits and devices to a de-energised state before disconnecting or connecting and when mounting / dismounting.
- Do not change or modify the device.
- Any repair on the device is to be performed by R. STAHL only.
- Gently clean the device with a damp cloth only do not use scratching, abrasive or aggressive cleaning agents or solutions.

Never clean the device with a strong water jet, such as a pressure washer !

3.7.2 Risk of injury

Falling devices or components

The device or components can fall during transport and mounting, causing injury to persons in the form of bruises and contusions.

- Use transporting and lifting equipment suitable for the size and weight of the device when transporting and mounting it.
- Observe the weight and the maximum load-bearing capacity of the device; see specifications on the shipping label or on the packaging.

Use suitable mounting materials for mounting.

Electric shock

During operation and maintenance, high voltage is at times applied to the device. Because of this, the device must be de-energised during installation. Persons coming into contact with electrical lines carrying excessively high voltage can suffer severe electric shocks and, consequently, injuries.

Only connect electrical circuits to suitable terminals.

3.7.3 Device damage

As a result of unsuitable operating conditions or careless contact the device or individual components may be damaged so significantly that the device does not operate correctly or fails completely.

Do not subject the device to external heat sources or direct sunshine. Ensure that the maximum ambient temperature is never exceeded.

4 Function and device design

4.1 Features and versions

4.1.1 Options

The type KB2 device versions are used to enter data, commands etc. at PCs and similar devices. Usually, the devices are connected to operating devices with device platforms MANTA (xx7), SHARK (xx8) and ORCA (ORCA01*) from R. STAHL. Depending on which version they are, they perform the following tasks:

Technology	Task
KB2 Keyboards	Keyboard with pointing device for entering data and commands
PD2 Pointing device	Separate pointing device to operate menu structures and to pass on commands

4.1.2 Keyboards

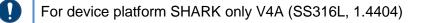
The keyboards are available with the following options:

- Pointing device: trackball, touchpad or joystick
- Keyboard layout: German (QWERTZ), American (QWERTY), French (AZERTY), Spanish, Swiss German, Nordic (Swedish, Finnish, Norwegian, Danish), Slovenian, Japanese Hungarian, Ukrainian (see chapter <u>24.1 Keyboard layouts</u>)

4.1.3 Enclosure

The KB2 and PD2 device versions are installed in a type HSG enclosure, which then represents the assembly of the complete system.

• Enclosure material: Stainless Steel V2A (SS304, 1.4301) or V4A (SS316L, 1.4404)



- Enclosure versions: Keyboard enclosure for Operator station MANTA and ORCA01* (with support arms for FR / CFR / BD enclosure and ORCA OFR) Keyboard enclosure for Operator station SHARK (with support arms for Yokemount) Desktop enclosure with keyboard for Non-Ex applications
- Mounting a KB2 keyboard at the wall mounting bracket of the SHARK device platform requires the optional HSG-xx8-V4A-KB-MOUNT-W mounting kit (adapter kit for mounting an xx8 keyboard at the wall bracket SAP no. 267451). This mounting kit is not part of the delivery and must be ordered separately.
- Enclosure option: additional installation of UB03-*

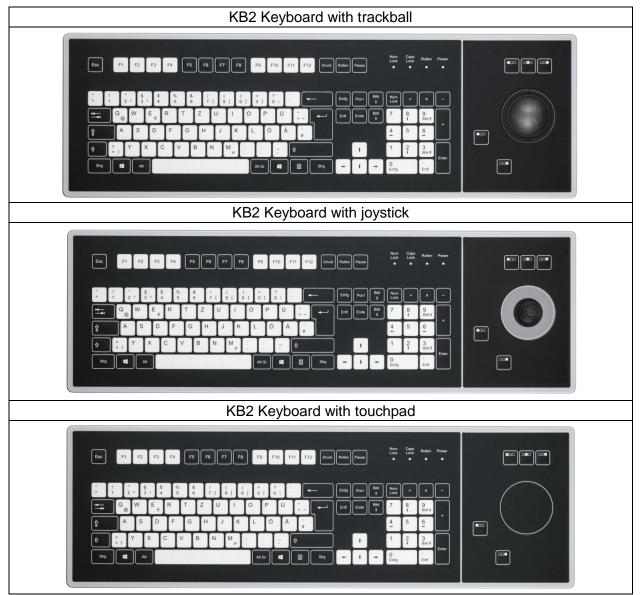


63

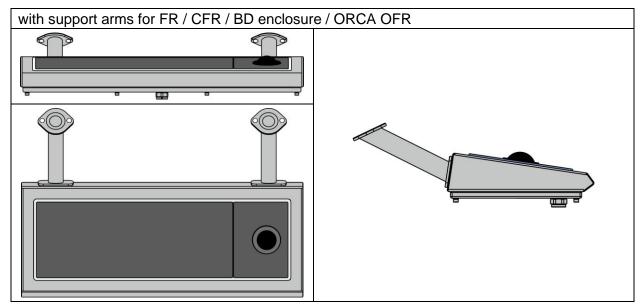
Not for device platform SHARK

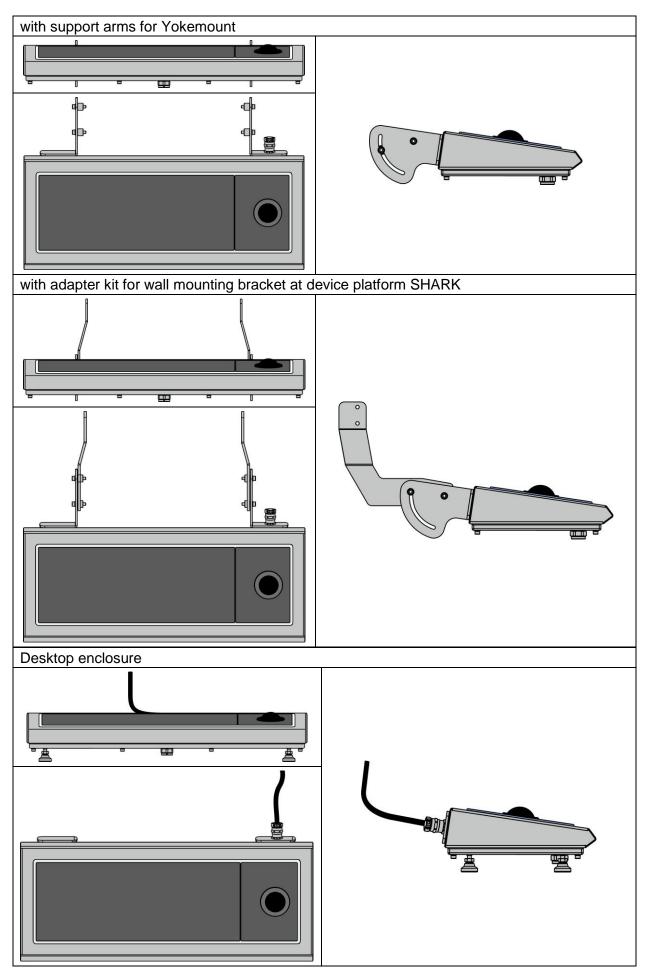
For UB03 documentation, see <u>r-stahl.com</u>.

4.1.4 Keyboard versions



4.1.5 Enclosure versions





 ${\odot}$ R. STAHL HMI Systems GmbH / OI_Keyboard_KB2_en_V_01_00_06.docx / 07.06.2024

Trackball side view	Side view with trackball inside enclosure
Touchpad side view	Side view with touchpad inside enclosure
Joystick side view	Side view with joystick inside enclosure

4.1.6 Pointing device

4.1.7 Scope of delivery

- a) Complete delivery
- KB2 keyboard with pointing device installed inside HSG enclosure and attached to the xx7 operating device, at the yoke of the xx8 operating device or at the ORCA01* Operator Station fully wired and operational
- Suction cup for trackball cleaning

or

- b) KB2-HSG assemblies
- KB2 keyboard with pointing device installed inside HSG enclosure with attached cable (as repair replacement or retrofit).
- Fastening material for mounting at field enclosure for xx7 or fastening material for mounting at yoke for xx8
- Grounding material in bag as loose parts
- Suction cup for trackball cleaning

or

- c) KB2 device versions
- KB2 keyboard with pointing device, with attached cable (as repair replacement)
- · Grounding material in bag as loose parts
- Suction cup for trackball cleaning

or

- d) KB2-Desktop assemblies
- KB2 keyboard with pointing device built into desktop enclosure with connected cable
- Binder material consisting of: cable socket, cable plug, contact sockets, contact pins
- · Grounding material in bag as loose parts
- Suction cup for trackball cleaning

Fastening material for xx7 / ORCA01*		Fastening material for xx8	
Designation	Number	Designation	Number
Mushroom head screw M6 x 20	4	Allen screw M6 x 25	4
Wave washer M6	4	Washer 6.4	4
Hexagon nut M6 self-locking	4	Spacer	4
Flange seal EPDM	2	-	

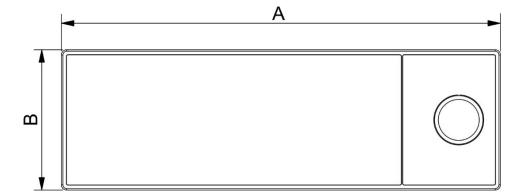
0

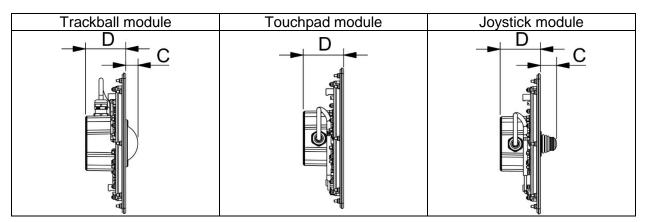
The earthing material in the accessory bag is complete for all device variants. For using the individual earthing components, see earthing material table.

Earthing material				
Description	Picture	Using (quantity)		
		xx7	xx8	ORCA01*
Distance bolt ii M3 x 12		1x	-	-
Distance bolt IA M3 x 12 (SW 5.5)		-	1x	-
Combined screw with tooth lock washer M3 x 6	0	1x	1x	-
Tooth lock washer M3	S	1x	1x	2x
Distance bolt A-A M3 x 8 auf M4 x 8 (SW 5.5)		-	-	1x
Nut M3	\bigcirc	-	-	1x
Spring lock washer M3		-	-	1x
Washer	0	-	-	2x

4.2 Dimensions

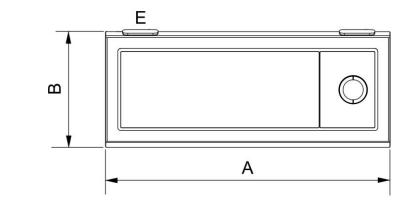
4.2.1 Keyboard with pointing device

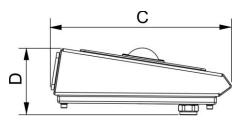




	Dimensions [mm]			
Item	KB2 with TB KB2 with TP KB2 with JS			
А	580			
В	185			
С	16.1 - 21.3			
D		53		

4.2.2 Keyboard with pointing device inside HSG

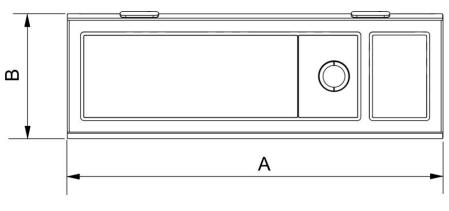




ltem	Dimensions [mm]	
А	635	
В	254	
С	258	
D	92	
Е	4 *	

* The blind plate E has a thickness of 4 mm.

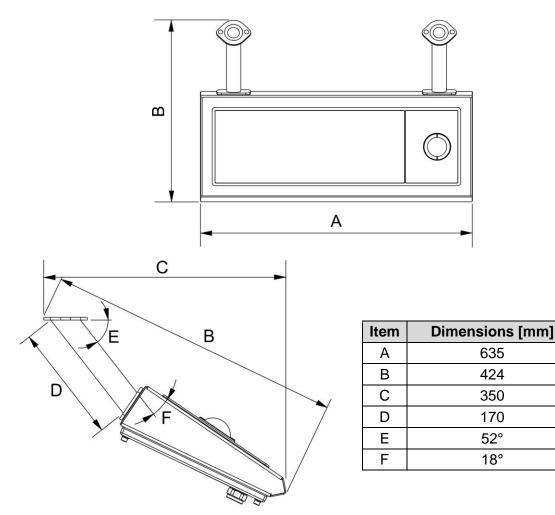
4.2.3 Keyboard with pointing device and UB03 inside HSG



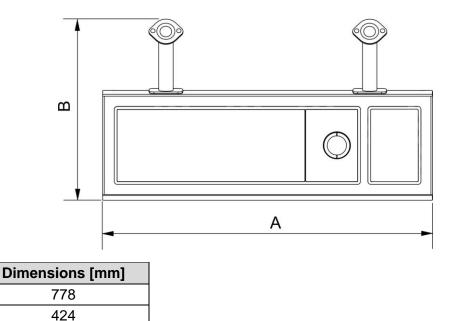
Item	Dimensions [mm]	
Α	778	
В	254	

The dimensions of the side view are identical to the enclosures without UB03.

4.2.4 Keyboard with pointing device inside HSG, support arms for FR / CFR / BD / ORCA OFR



4.2.5 Keyboard with pointing device and UB03 inside HSG, support arms for FR / CFR / BD / ORCA OFR



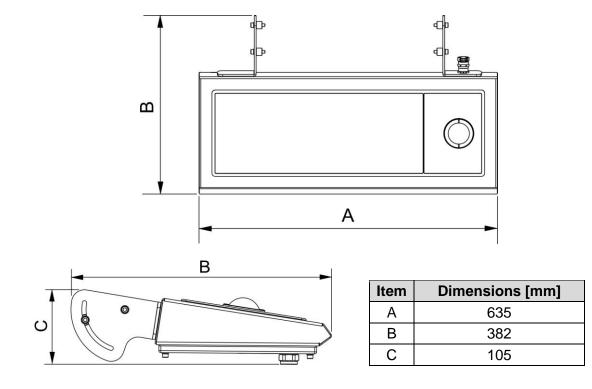
The dimensione	of the eide view	v ara idantical ta tha	analagurag without LIPO2
	o oi the side view	are identical to the	enclosures without UB03.

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Item

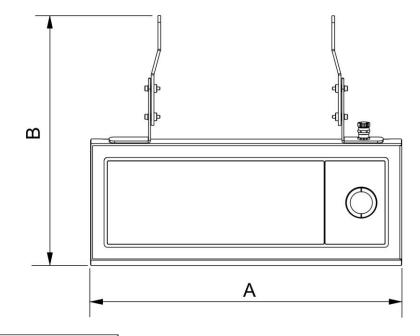
А

В

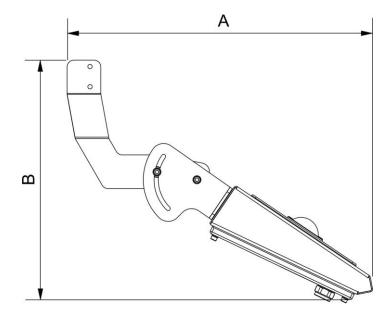


4.2.6 Keyboard with pointing device inside HSG, support arms for Yokemount

4.2.7 Keyboard with pointing device inside HSG for SHARK wall mounting

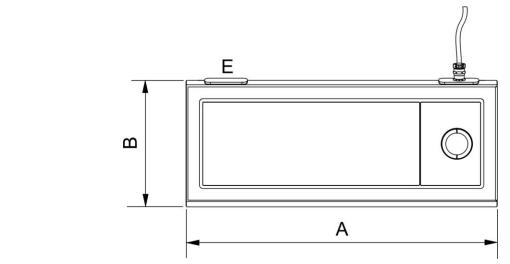


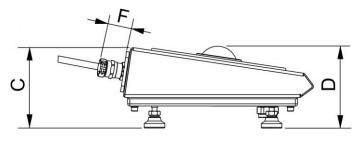
Item	Dimensions [mm]	
А	635	
В	557	



Item	Dimensions [mm]	
А	449	
В	351	

4.2.8 Keyboard with pointing device desktop mounting





Item	Dimensions [mm]		
А	635		
В	254		
С	105		
D	109		
Е	4 *		
F	30		

* The blind plate E has a thickness of 4 mm.

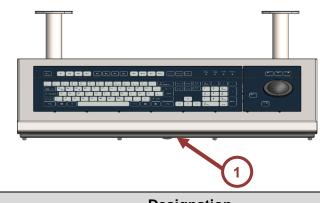
4.3 Operating elements



Item	Designation
1	Key allocation according to keyboard layout German (QWERTZ), American (QWERTY), French (AZERTY), Spanish, Swiss German, Nordic (Swedish, Finnish, Norwegian, Danish), Slovenian, Japanese, Hungarian, Ukrainian (see chapter <u>24.1 Keyboard layouts</u>)
2	LEDs for NumLock, CapsLock, Scrolling, Power
3	Mouse keys left, centre, right
4	Mouse keys left, right

4.4 Markings on the device

4.4.1 Position



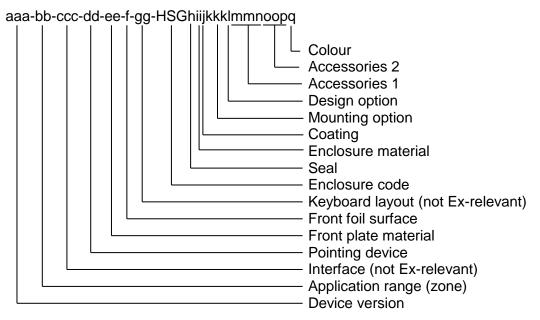
ľ	ltem	Designation	
	1	Type label on back cover, position bottom centre	

4.4.2 Design of a type label

AAA-Z1-C	CC-DD-EE-F-GG-	HSG H II J KK	K L00	D	
Article-Nº- -40°C <= Ta BVS 20 AT IECEX BVS	EX E 106	Serial-N°: 0123456 Date: 01.01.202 HW-Rev: 58	9 ²¹ 10		
II 2G Ex i	a IIC T4 Gb, when supplie b IIC T4 Gb, when supplie a IIIC T200 135°C Db, whe b IIIC T200 135°C Db, whe	d with ib-circuits n supplied with ia-ci			
Checked:	siehe Betriebsanleitung /	see operating instru	uction		
STAHL	R. STAHL HMI System Cologne / Germany www.stahl-hmi.de		Ð	29 50 2	a III Gellinariy
			2020 :	29 50 2	Mau

ltem	Designation	
1	Type key code, see chapter <u>4.4.3 Type key code layout</u>)	
2 Testing authority and certificate number		
3	Ex marking	
4	Operating temperature range	
5	Ex symbol	
6	CE classification	
7	WEEE symbol	
8	Manufacturer	
9	Serial number	
10	Production date	

4.4.3 Type code layout



0

Characters a to g of the type code are also used as a separate type code of the KB2 device versions.

Type code digit	Possible value	Description	
	KB2	Keyboard with / without pointing device	
aaa	PD2	Pointing device (separate)	
	KM2	Keyboard matrix (future realisation)	
	Z1	Devices for Zone 1, Zone 21, EPL Gb, Db	
bb	Z2	Devices for Zone 2, Zone 22, EPL Gc, Dc	
	NX	Devices for Non-Ex	
CCC	USB	Interface (not Ex-relevant)	
	00	no pointing device	
dd	TB	Trackball	
uu	TP	Touchpad	
	JS	Joystick	
ee	AP	Aluminium, coated	
f	Р	Polyester foil	
	DE	German keyboard layout (QWERTZ)	
	US	American keyboard layout (QWERTY)	
	FR	French keyboard layout (AZERTZ)	
	СН	Swiss German keyboard layout	
gg	ES	Spanish keyboard layout	
	SI	Slovenian keyboard layout	
	ND	Nordic keyboard layout (Swedish, Finnish,	
		Norwegian, Danish)	
	JP	Japanese keyboard layout	
	HU	Hungarian keyboard layout	
	UA	Ukrainian keyboard layout	

HSG	HSG	Enclosure
h	1	not used
	2	Silicone foam seal
ii	V2	V2A Stainless steel, SS304, 1.4301
	V4	V4A Stainless steel, SS316L, 1.4404
	N	No coating (natural or anodic)
j	Р	Coating
	М	Metal coating
	M00	Desktop version
	M01	Supporting arms for FR / CFR
kkk	M02	Supporting arms for SHARK
	M03	Supporting arms for ORCA OFR
	M04	Customer specific mounting
	C00	Supporting arms for non-Ex
I	S	Standard
mmn	00	no accessories 1
	U3R	Cut-out for UB03, right side
оор	000	no accessories 2
q	0	no colour

4.4.4 Type key code KB2 device versions

Product type:

Product key structure	Description	
	Variant	
KB2-Zb-USB- TB -AP-P-gg	Keyboard with integrated trackball	
KB2-Zb-USB- TP -AP-P-gg	Keyboard with integrated touchpad	
KB2-Zb-USB- JS -AP-P-gg	Keyboard with integrated joystick	
PD2-Zb-USB- TB -AP-P	Pointing device, trackball	
PD2-Zb-USB- TP -AP-P	Pointing device, touchpad	
PD2-Zb-USB- JS -AP-P	Pointing device, joystick	



The lower case letters of the version key stand for the values from the type key table, with which they are replaced as applicable.

4.4.5 Type key code KB2-HSG assemblies

Product type

Product key structure	Description
	Variant
KB2-Zb-USB- TB -AP-P-gg- HSG2ViNkkkS0000000	Keyboard with integrated trackball, installed inside a standard keyboard enclosure
KB2-Zb-USB- TP -AP-P-gg- HSG2ViNkkkS0000000	Keyboard with integrated touchpad, installed inside a standard keyboard enclosure
KB2-Zb-USB- JS -AP-P-gg- HSG2ViNkkkS0000000	Keyboard with integrated joystick, installed inside a standard keyboard enclosure
KB2-Zb-USB-dd-AP-P-gg- HSG2ViNkkkS U3R 0000	Keyboard with pointing device, installed inside a standard keyboard enclosure with cut-out for UB03, right side



The lower case letters of the version key stand for the values from the type key table, with which they are replaced as applicable.

4.4.6 Ex classification ATEX / IECEx

Ex marking ATEX / IECEx according to IEC 60079-0 and ATEX directive 2014/34/EU.

Versions KB2 / PD2 -Z1 KB2 / PD2 -Z1-*-HSG*00*

Version	2014/34/EU prefix	Ex marking	
	🖾 II 2 G	Ex ia IIC T4 Gb	for supply with ia circuits
Gas	🖾 II 2 G	Ex ib IIC T4 Gb	for supply with ib circuits
	🖾 II 3 G	Ex ic IIC T4 Gc	for supply with ic circuits
	🐼 II 2 D	Ex ia IIIC T ₂₀₀ 135°C Db	for supply with ia circuits
Dust	🐼 II 2 D	Ex ib IIIC T ₂₀₀ 135°C Db	for supply with ib circuits
	🐼 II 3 D	Ex ic IIIC T ₂₀₀ 135°C Dc	for supply with ic circuits

Versions KB2 / PD2 -Z1-*-HSG*U3*

Version	2014/34/EU prefix	Ex marking	
	🖾 II 2 G	Ex eb ia q IIC T4 Gb	for supply with ia circuits
Gas	🖾 II 2 G	Ex eb ib q IIC T4 Gb	for supply with ib circuits
	🖾 II 3 G	Ex eb ic q IIC T4 Gc	for supply with ic circuits
	🖾 II 2 D	Ex ia tb IIIC T135°C Db	for supply with ia circuits
Dust	🖾 II 2 D	Ex ib tb IIIC T135°C Db	for supply with ib circuits
	🖾 II 3 D	Ex ic tb IIIC T135°C Dc	for supply with ic circuits

4.4.7 Ex classification CCC / CNEx

Chinese Ex classification CCC and CNEx according to GB/T 3836.1-2021 and GB/T 3836.4-2021.

Versions KB2 / PD2 -Z1

Version	Ex marking	
	Ex ia IIC T4 Gb	for supply with ia circuits
Gas	Ex ib IIC T4 Gb	for supply with ib circuits
	Ex ic IIC T4 Gc	for supply with ic circuits
Dust	Ex ia IIIC T ₂₀₀ 135°C Db	for supply with ia circuits
	Ex ib IIIC T ₂₀₀ 135°C Db	for supply with ib circuits

Chinese Ex classification CCC and CNEx according to GB/T 3836.1-2021, GB/T 3836.3-2021, GB/T 3836.4-2021, GB/T 3836.7-2017 and GB/T 3836.31-2021.

Versions KB2 / PD2 -Z1-*-HSG*00*

Version	Ex marking	
	Ex ia IIC T4 Gb	for supply with ia circuits
Gas	Ex ib IIC T4 Gb	for supply with ib circuits
	Ex ic IIC T4 Gc	for supply with ic circuits
Dust	Ex ia IIIC T ₂₀₀ 135°C Db	for supply with ia circuits
	Ex ib IIIC T ₂₀₀ 135°C Db	for supply with ib circuits

Versions KB2 / PD2 -Z1-*-HSG*U3*

Version	Ex marking	
	Ex eb ia q IIC T4 Gb	for supply with ia circuits
Gas	Ex eb ib q IIC T4 Gb	for supply with ib circuits
	Ex eb ic q IIC T4 Gc	for supply with ic circuits
Dust	Ex ia tb IIIC 135°C Db	for supply with ia circuits
	Ex ib tb IIIC 135°C Db	for supply with ib circuits

4.4.8 Ex classification KCS

Versions KB2 / PD2 -Z1* KB2 / PD2 -Z1*-HSG*00*

Version	Ex marking	
	Ex ia IIC T4 Gb	for supply with ia circuits
Gas	Ex ib IIC T4 Gb	for supply with ib circuits
	Ex ic IIC T4 Gc	for supply with ic circuits
	Ex ia IIIC T ₂₀₀ 135°C Db	for supply with ia circuits
Dust	Ex ib IIIC T ₂₀₀ 135°C Db	for supply with ib circuits
	Ex ic IIIC T ₂₀₀ 135°C Dc	for supply with ic circuits

Versions KB2 / PD2 -Z1-*-HSG*U3*

Version	Ex marking	
Gas	Ex eb ia q IIC T4 Gb	for supply with ia circuits
	Ex eb ib q IIC T4 Gb	for supply with ib circuits
	Ex eb ic q IIC T4 Gc	for supply with ic circuits
Dust	Ex ia tb IIIC T135°C Db	for supply with ia circuits
	Ex ib tb IIIC T135°C Db	for supply with ib circuits
	Ex ic tb IIIC T135°C Dc	for supply with ic circuits

4.4.9 Ex classification FM USA

Versions KB2 / PD2 -*

Version	Ex marking	
	Class I, Zone 1 AEx ia IIC T4 Gb	for supply with ia circuits
Gas	Class I, Zone 2 AEx ic IIC T4 Gc	for supply with ic circuits
	Class I, Div. 2 Groups A, B, C, D, nonin	cendive

Versions KB2-*-HSG*

Version	Ex marking	
	Class I, Zone 1 AEx ia IIC T4 Gb	for supply with ia circuits
Gas	Class I, Zone 2 AEx ic IIC T4 Gc	for supply with ic circuits
	Class I, Div. 2 Groups A, B, C, D, nonincendive	
	Zone 21, AEx ia IIIC T135°C Db	for supply with ia circuits
Durat	Zone 22, AEx ic IIIC T135°C Dc	for supply with ic circuits
Dust	Class II, III Div. 1 Groups E, F and G, intrinsically safe	
	Class II, III Div. 2 Groups E, F and G, nonincendive	

Versions KB2-*-HSG*U3*

Version	Ex marking
	Class I, Zone 1 AEx eb q IIC T4 Gb
Gas	Class I, Zone 2 AEx ec nC IIC T4 Gc
	Class I, Div. 2 Groups A, B, C, D, nonincendive
	Zone 21, AEx tb IIIC T115°C Db
Dust	Zone 22, AEx tc IIIC T115°C Dc
Dust	Class II, III Div. 1 Groups E, F and G, intrinsically safe
	Class II, III Div. 2 Groups E, F and G, nonincendive

4.4.10 Ex classification FM Kanada

Versions KB2 / PD2 -*

Version	Ex marking	
	Class I, Zone 1 Ex ia IIC T4 Gb	for supply with ia circuits
Gas	Class I, Zone 2 Ex ic IIC T4 Gc	for supply with ic circuits
	Class I, Div. 2 Groups A, B, C, D, noning	cendive

Versions KB2-*-HSG*

Version	Ex marking	
	Class I, Zone 1 Ex ia IIC T4 Gb	for supply with ia circuits
Gas	Class I, Zone 2 Ex ic IIC T4 Gc	for supply with ic circuits
	Class I, Div. 2 Groups A, B, C, D, nonincendive	
	Zone 21, Ex ia IIIC T135°C Db	for supply with ia circuits
Duet	Zone 22, Ex ic IIIC T135°C Dc	for supply with ic circuits
Dust	Class II, III Div. 1 Groups E, F and G, intrinsically safe	
	Class II, III Div. 2 Groups E, F and G, no	onincendive

Versions KB2-*-HSG*U3*

Version	Ex marking
	Class I, Zone 1 Ex eb q IIC T4 Gb
Gas	Class I, Zone 2 Ex ec nC IIC T4 Gc
	Class I, Div. 2 Groups A, B, C, D, nonincendive
	Zone 21, Ex tb IIIC T115°C Db
Dust	Zone 22, Ex tc IIIC T115°C Dc
	Class II, III Div. 1 Groups E, F and G, intrinsically safe
	Class II, III Div. 2 Groups E, F and G, nonincendive

4.4.11 Ex classification PESO

Versions KB2-Z1-*

Version	Ex marking	
	Ex ia IIC T4 Gb	
Gas	Ex ib IIC T4 Gb	

5 Transport and storage

NOTE	No or damaged packaging during transport and storage If the device is transported or stored without packaging, shocks,
	 vibrations, pressure and humidity can directly impact the device. Damaged packaging indicates that the device has been subjected to and possibly been damaged by outside influences. This may result in faulty functionality. Check the state of the packaging. Report any damage sustained in transport to the haulier responsible and have it confirmed. Transport and store the device in undamaged packaging, ideally
	the original packaging.

Transport and store the device carefully and in accordance with the safety notes (see chapter $\underline{3}$ <u>Safety</u>).

Transport and store the device in undamaged packaging, ideally the original packaging.

Ensure specified storage temperature range is not exceeded (see chapter <u>16.1 Technical</u> <u>data</u>).

Store the device in a dry place free of vibrations.

Do not drop the device.

6 Unpacking

Unpack the device at its final destination.

Check the contents are complete and undamaged (see chapter 4.1.5. Scope of delivery)

Contact the manufacturer if the contents are incomplete, damaged or not what you have ordered.

Dispose of the packaging materials according to local regulations.

7 Mounting and installation

7.1 Note on mounting and installation

Observing the following points will ensure a professional and safe assembly and installation

Only use threads or holes already present in the enclosure.

Mount the device carefully and strictly in accordance with the safety notes (see chapter <u>3 Safety</u>).

Study the installation conditions and assembly instructions in these Operating Instructions carefully and follow them to the letter.

7.2 Requirements for site of installation

Mount the device in such a way that it is always operated within the permissible temperature range.

- Observe the stipulated hazardous zones: Z2 devices may only be installed in Zone 2 and Zone 22.
- The site of installation must be stable and suitable for the dimensions of the device, and able to bear the load of its weight and that of any necessary attachments.
- Avoid trackball / touchpad contamination by saltwater: conductive liquids on the trackball / touchpad may restrict functionality. This applies in particular to salt water.

Avoid trackball contamination as this may restrict functionality.

7.3 Mounting types

The device is mounted and operated horizontally with the supporting arms (usually at the enclosure or yoke of the operating device).

These supporting arms are mounted at the HSG enclosure of the assemblies.

(

For a detailed description of how to mount the device refer to the Installation Manual stored on the CD / DVD / USB stick included in the delivery or online at <u>r-stahl.com</u>.

7.4 Installation KB2 in enclosure

For suitable enclosure types, see chapter <u>3.4 Special conditions of use</u>.

NOTE	Possible mechanical or electrical damage to the keyboard Exposed circuit boards and electronic components.	
	 Take ESD protective measures before installation. If possible, do not touch the circuit board areas. 	

- Prepare the mounting cut-out and hole dimensions for the enclosure in accordance with chapter <u>20.1 Cut-out KB2</u>.
- Carefully insert the keypad into the mounting cut-out
- Fasten the keyboard with M3 lock nuts, tightening torque: 1.0 ±0.1 Nm
- Electrical installation, instructions according to chapter 7.5 Installation

7.5 Installation

ANGER	 Explosion hazard due to improper installation ! Non-compliance may result in fatal or serious injuries. Ensure the atmosphere is non-explosive. Make sure that the device is not damaged. If the device is connected to the mains: Disconnect the device from the power supply.
	Explosion hazard due to electrostatic charge!
A DANGER	Non-compliance may result in fatal or serious injuries.

i tori obilo inaj robalt in ratar or obilo do injunicor	
• Do not paint / coat the device or retouch its paint / coating. All	
repairs must be carried out by the manufacturer.	
• If additional sticky labels are attached, the specifications of	

- If additional sticky labels are attached, the specifications of EN IEC 60079-0 must be observed.
- Clean the device with a damp cloth only.

7.5.1 General information on electric connection

- Connect cables carefully.
- Do not screw down on the conductor insulation.
- Do not switch conductors.
- Observe code of practice when connecting conductors.
- Firmly screw down conductors.
- Cables are attached ex factory and must not be extended or replaced.
- The KB2 device versions are fitted with an 8-pole cable (+ shield conductor), and the PD2 versions with a 4-pole cable (+ shield conductor).
- Shield the cable with a maximum of 1 M Ω against ground.
- Twist the D+ and D- data conductors until right up to their terminals.
- Pay attention to specified torques for screws to avoid damage to threads.
- Suitable measures against electrical surge during lightning strike may be necessary.
- Only connect and operate keyboards with the same protection level (see note on "<u>Protection</u> <u>level</u>") !
- For the connection of keyboards to IT-xx7 Non-Ex devices use the "Non-Ex connector KB2 set" (2x USB connector) (SAP no. 301224) !

7.5.2 Connecting the device

- 1. Connect the USB conductors according to the terminal diagram (see chapter <u>19.1 Connection overview terminal assignment KB2)</u>
- 2. Make sure the pin assignment is correct.

7.5.3 Grounding the device

Connect the shield with the cable lug to the PA ground connection (see chapter <u>19.1 Connection overview terminal assignment KB2</u>).

8 Initial start-up

Conditons:

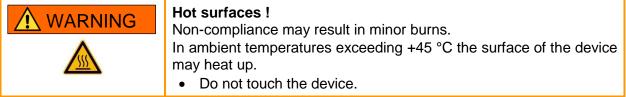
The device has been installed correctly. The device has been connected to the equipotential bonding.

- 1. Since factors such as storage or temperature can have an impact on the cables and cable glands, check the following connections:
 - Connection terminals
 - Existing screw connections
- 2. Switch on the operating device (HMI).
 - o Together with the operating device, the KB2 device is immediately operational.

9 (Re-) Commissioning

- 1. Check the device is correctly installed:
 - o Connection terminals
 - Existing screw connections
- 2. Check the device for visible damage.
 - Only commission the device if there is no visible damage and if it has been correctly installed.
- 3. Switch on the operating device (HMI).
 - Together with the operating device, the KB2 device is immediately operational.

10 Operation		
DANGERExplosion hazard due to damaged device ! Non-compliance may result in fatal or serious injuries. In case of damage or changes to the factory state: 		
ANGER	 Explosion hazard due to electrostatic charge ! Non-compliance may result in fatal or serious injuries Do not paint / coat the device or retouch its paint / coating. All repairs must be carried out by the manufacturer. If additional sticky labels are attached, the specifications of EN IEC 60079-0 must be observed. Clean the device with a damp cloth only. 	
	Hot surfaces !	



• Conductive liquids on the trackball / touchpad may restrict functionality. This applies in particular to salt water.

Avoid contamination of the trackball / touchpad with salt water.

- Avoid trackball contamination as this may restrict functionality.
- Regularly clean the trackball (see chapter <u>22.1 Trackball cleaning</u>).

10.1 Switching the device on and off

The device is switched on and off together with the operating device (HMI). When the operating device is switched on, the device is immediately operational.

11 Maintenance, overhaul and repair

A DANGER	Explosion hazard due to damaged seal ! Non-compliance may result in fatal or serious injuries.
	 In case of damage or changes to the factory state immediately decommission the device. Contact manufacturer.

A DANGER	Explosion hazard due to incorrect maintenance, overhaul or repair !		
	Non-compliance may result in fatal or serious injuries.		
	 Ensure the atmosphere is non-explosive. 		
	 Make sure that the device is not damaged. 		
	 Do not open the enclosure. 		
	 If the device is connected to the operating device: 		
	 Disconnect the operating device from the power supply. Isolate supply and all Ex e circuits and wait 5 minutes before opening the terminal boxes of the operating device. 		

Hot surfaces at the device !

Non-compliance may result in minor burns.
In ambient temperatures exceeding +45 °C the surface of the device may heat up.
Do not touch the device.

11.1 Servicing

When servicing the device, check the following points in addition to those stipulated in the national regulations:

- Damage to seals: cracks or other visible damage to the device enclosure and / or the protective enclosure.
- All cables and conductors securely connected: conductors tightly clamped
- All cables and conductors undamaged
- Compliance with permitted temperature range
- Mounting fits securely, all screws tightened fast
- Ensure pointing devices are clean
- Ensure the device is used as intended
- Only connect and operate keyboards with the same protection level (see note on "<u>Protection</u> <u>level</u>") !

11.2 Maintenance

Because the transmission of the devices remains reliable and stable over long periods of time, regular adjustments are not required.

- Regularly clean the trackball.
- If the device is operated in temperatures around freezing point, clean the trackball regularly to ensure there is no liquid / water inside it.
- Clean the trackball with a damp cloth only. Do not use any abrasive cleaning materials, and no cleaning agents. Under adverse ambient conditions the trackball may have to be cleaned at shorter intervals.
- Replace damaged seals with original parts by the manufacturer only.

For trackball cleaning, see chapter 22.1 Trackball cleaning

11.3 Repair

The devices cannot be repaired by the customer.

- Any repair on the device is to be performed by R. STAHL only.
- The devices must be dismounted by qualified staff only (see chapter <u>3.3 Personnel</u> <u>qualification</u>).
- Returned devices must be accompanied by a description of the fault.
- Remove any residual substances. Take particular care with seal notches and slits to which residual substances might adhere.

removed.		 Substance residues adhering to device Substance residues adhering to the device may result in skin lesions and must be removed. Do not return any devices for which you cannot be absolutely sure that any hazardous substance residues have been completely removed.
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12 Returning the device

Only return or package the devices after consulting R. STAHL. Contact the responsible representative from R. STAHL. R. STAHL's customer service is available to handle returns if repair or service is required.

Contact customer service via E-mail or telephone:

- E: service.dehm@r-stahl.com
- T: +49 221 76806 3000

Requesting a RMA ticked via our website:

- Go to r-stahl.com.
- Under "Support" > "RMA form", select "Request RMA ticket".
- Fill in and send the form.
- You will automatically receive and E-mail with an RMA ticket.
- Print out the RMA ticket.
- Clearly copy the RMA number onto the outside of the package.
- Send the device with the RMA ticket included in the package to R. STAHL HMI Systems GmbH (see chapter <u>1.1 Manufacturer</u> for the address).

13 Cleaning

- Check the device for damage before and after cleaning it. Decommission damaged devices immediately.
- Devices located in hazardous areas may only be cleaned with a damp cloth to avoid electrostatic charge.
- When cleaning with a damp cloth, use water or mild, non-abrasive, non-scratching cleaning agents.
- Do not use abrasive detergents or solvents.
- Never clean the device with a strong water jet, such as a pressure washer.

For trackball cleaning, see chapter 22.1 Trackball cleaning

(3)

14 Disposal

- Observe national, local and statutory regulations regarding disposal.
- Separate materials for recycling.
- Ensure environmentally friendly disposal of all components according to statutory regulations.



For disposal and restricted substances, see <u>Chapter 20.1 Disposal / Restricted</u> <u>substances</u>.

15 Accessories

NOTE	Malfunction or damage to the device due to the use of non-original components.			
	Non-compliance may result in material damage.Only use original R. STAHL HMI Systems GmbH accessories.			

16 Appendix A

16.1 Technical data

Function / Equipment	KB2-HSG assemblies			
Power supply	via USB interface			
Interfaces	USB			
Connection	open cable end			
Cable type	standard USB			
Cable conductors (number)	8 + shield			
Cable lengths				
Total length	2.4 m (must not be extended by the customer !)			
Usable length				
for version M00				
for version M01 (MANTA)	1.95 m from the support arm exit			
for version M02 (SHARK)	from the edge of the enclosure approx. 0.65 m			
for version M03 (ORCA01)				
Keyboard layout (standard)	German (QWERTZ), American (QWERTY), French (AZERTY)			
Other keyboard layouts	Spanish, Swiss German, Nordic (Swedish, Finnish, Norwegian, Danish), Slovenian, Japanese, Hungarian, Ukrainian			
Number of keys	105			
	104 (American), 109 (Japanese)			
Keyboard foil	Polyester			
Key technology				
Switching force / travel	2.55 N / 0.55 mm			
Service life	at least 1,000,000 actuations			
Design				
Trackball				
Ball diameter [mm]	50			
Switching force / travel	2.55 N / 0.55 mm			
Service life	1,000,000 ball rotations			
Joystick				
Length [mm]	24.3			
Switching force / travel	2.55 N / 0.55 mm			
Service life	1,000,000 actuation cycles			
Enclosure	V2A stainless steel (SS304, 1.4301) or V4A stainless steel (SS316L, 1.4404)			
Enclosure protection type	IP66			
Front	IP66			
Back	IP66			
Operating temperature range				
Operation	-40 °C +70 °C			
Storage temperature range	-40 °C +70 °C			
Relative humidity	10% to 90% relative humidity, non-condensing			
Damp heat	+95 °C / 90 %			
MTBF	min. / typ. 50,000 h at Ta 20 °C (68 °F) and intended purpose			

Dimensions [mm]	without cable
Keyboard with enclosure HSG	without cable and screw connections
Width x length (W x L)	635 x 254
Height (H)	92
Width x length (W x L) with UB03	778 x 254
Width x length x height (W x L x H) with support arm for FR / CFR / BD / ORCA OFR	635 x 350 x 424
Width x length x height (W x L x H) with UB03 with support arm for FR / CFR / BD/ ORCA OFR	778 x 350 x 424
Width x length x height (W x L x H) with support arm for Yoke mount	635 x 382 x 105
Keyboard without enclosure	without cable
Width x length x deep (W x L x D)	580 x 185 x 53
Total height (H) with trackball	69.1
Total height (H) with joystick	74.3
Total weight [kg]	
for version M01 (MANTA) and M03 (ORCA01)	8.5
for version M01 (MANTA) with UB03 and M03 (ORCA01)	11
for version M02 (SHARK)	8.2
Own weight keyboard [kg]	2.4

17 Appendix B

17.1 Permitted maximum values

17.1.1 KB2 / PD2 versions

Cable	Colour	Connection	Signal name	Name
1	White		+5 V	Power supply +UB
2	Green	Keyboard	USM_m	Data conductor D-
3	Yellow		USM_p	Data conductor D+
4	Brown		GND	Power supply GND
5	Red		+5 V	Power supply +UB
6	Grey	Pointing device	USM_m	Data conductor D-
7	Pink		USM_p	Data conductor D+
8	Blue		GND	Power supply GND

Cable	Colour	Connection	Signal name	Name
1	White		+5 V	Power supply +UB
2	Green	PD2	USM_m	Data conductor D-
3	Yellow	FDZ	USM_p	Data conductor D+
4	Brown		GND	Power supply GND

Ui		=	5.9	VDC	Uo	=	Ui
l _i	Group III ib / ic	=	250	mA	l _o	=	Li-
Pi		=	650	mW	Po	Ш	Pi
Ci		=	21	μF	Co	Ш	-
Li		Ш	1.68	μH	Lo	Ш	-



For the fixed cable, an additional capacity value of 200 pf/m and inductance value of 1 $\mu\text{H/m}$ must also be taken into account !

When connecting to operating devices with MANTA platform:

When the power supply is located in dust hazardous areas, the devices must be installed inside a suitable enclosure to ensure at least IP64 according to EN IEC 60079-0 !

li	Group II / III ia	=	319	mA	lo	=	li

17.1.2 For HSG enclosures with "U3" device version



Only version UB03-USB is available for KB2 keyboards with UB03. Version UB03-RS-422 is not possible !

Only representation of the relevant data.

	USB version						
Terminal	Pin	Signal	typical col	our coding	Connection / function		
			USB 2.0 cable	Profinet cable			
X1	1	VBUS	Red	Orange	+5 VDC power supply		
	2	USB D-	White	White	Data conductor -		
	3	USB D+	Green	Blue	Data conductor +		
	4	GND	Black	Yellow	0 VDC power supply		
X2			Not in us	e / do not allocate	!		

Device power supplyX1 pins 1 and 4:

Nominal voltage		=	5 30	VDC
Nominal current		=	max. 1	Α
Nominal power		≤	30	W
Max. input voltage	U _m	=	250	VAC

Data cable X1 pins 2 and 3:

Nominal voltage	=	5 VDC
Max. input voltage Um	=	250 VAC

⁰

18 Appendix C

18.1 Proof of intrinsic safety

Proof of intrinsic safety for connection of KB2 keyboards with HMI devices with platforms MANTA (ET-/MT-xx7), SHARK (ET-/MT-xx8) and ORCA (ORCA01*).

18.1.1 General information

Proof of intrinsic safety is given on the basis of the IEC/EN 60079-14 and the standards referred to therein. In particular, we refer to Chapter 12 "Additional requirements for type of protection i - intrinsic safety" in IEC/EN 60079-14.

Proof has been produced on the basis of the Certificate of Conformity according to IEC/EN 60079- 0 and IEC/EN 60079-11 or the EC Type Examination Certificate according to the 2014/34/EU directive and the comparison of the safety-relevant data listed therein.

The following Type Examination Certificates were used:

Device		Type Examination Certificate
ET-xx7	—	BVS 11 ATEX E 102 X
MT-xx7	—	BVS 12 ATEX E 033 X
ET-xx8	—	BVS 14 ATEX E 134 X
MT-xx8	—	DV3 14 ATEX E 134 A
ORCA01*	—	UL 23 ATEX 2902X
		BVS 20 ATEX E 078 X
KB2 keyboards and assemblies		BVS 20 ATEX E 079 X
		BVS 20 ATEX E 106 X
		BVS 20 ATEX E 107 X

The relevant test body has listed <u>all</u> conditions applicable to intrinsic safety in the type examination certificates.

For example, if a type examination certificate for a specific device only lists the applicable voltage (Ui), this means that intrinsic safety is guaranteed for connections if the associated power supply device does not exceed this voltage level (Uo is smaller than / equal to Ui).

Other output parameters defined in the test certificate of the power supply device (e.g. lo, Po) are irrelevant to intrinsic safety concerns.



The data listed in this document **<u>DO NOT</u>** absolve the installers / operators of each system from their duty and responsibility to observe the applicable statutory requirements, directives and regulations. In any case, the associated due diligence remains the responsibility of the installer and / or the operator !

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18.1.2 Connections

Examination of the voltage, current, capacitance and inductance values of all circuits to establish the connection between the KB2 keyboards and assemblies with MANTA (ET-/MT-xx7), SHARK (ET-/MT-xx8) and ORCA (ORCA01*) devices.

a) ET-/MT-xx7 HMI device with KB2 keyboards / assemblies

Source / active		==>	Sink / passive
ET-/MT-xx7			KB2 keyboards / assemblies
Terminals X11 / X12			Keyboard connection
Uo = 5.5 VDC		≤	Ui = 5.9 VDC
lo = 309 mA		≤	li = 319 mA
Po = 629 mW		≤	Pi = 650 mW
Co [µF] =	50	≥	Ci = 21 µF
Lo [µH] =	40	≥	Li = 1.68 µH

 C_{\circ} and L_{\circ} pairs directly above / underneath each other may be used.

For the fixed cable, an additional capacity value of 200 pf/m and inductance value of 1 μ H/m must also be taken into account !

b) ET-/MT-xx8 HMI device with KB2 keyboards / assemblies

	==>	Sink / passive
		KB2 keyboards / assemblies
		Keyboard connection
	VI	Ui = 5.9 VDC
	v	li = 250 mA
	VI	Pi = 650 mW
21	N	Ci = 21 µF
4.68	N	Li = 1.68 μH
		≤ ≤ ≤ 21 ≥

 C_{\circ} and L_{\circ} pairs directly above / underneath each other may be used.

For the fixed cable, an additional capacity value of 200 pf/m and inductance value of 1μ H/m must also be taken into account !

c) ORCA01* device with KB2 keyboards / assemblies

Source / active		==>	Sink / passive
ORCA01*			KB2 keyboards / assemblies
Terminals X5 / X6			Keyboard connection
Uo = 5.36 VDC		≤	Ui = 5.9 VDC
lo = 249 mA		≤	li = 250 mA
Po = 550 mW		≤	Pi = 650 mW
Co [µF] =	21	≥	Ci = 21 µF
Lo [µH] =	5	≥	Li = 1.68 µH

 C_{\circ} and L_{\circ} pairs directly above / underneath each other may be used.

For the fixed cable, an additional capacity value of 200 pf/m and inductance value of 1μ H/m must also be taken into account !

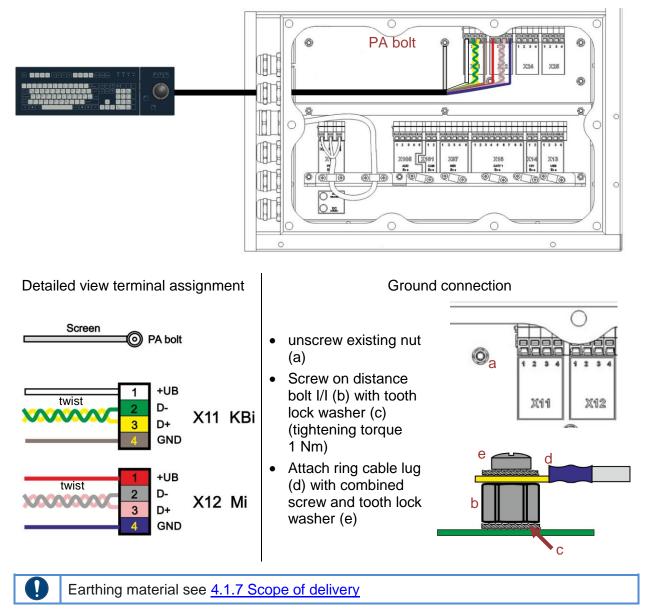
19 Appendix D

19.1 Connection overview cable assignment KB2

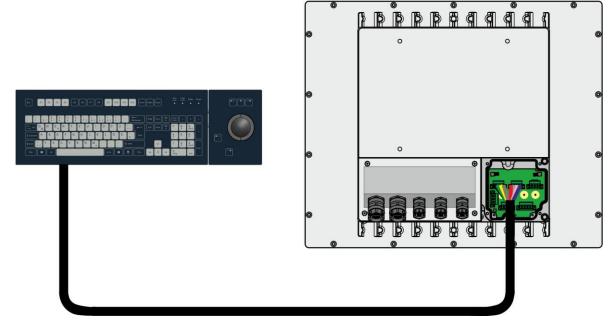
The length of the connection cable (see <u>Technical data</u>) must not be extended or replaced by the customer !

Cable	Colour	Connection	Signal name	Name
1	White		+5 V	Power supply +UB
2	Green	Keyboard	USM_m	Data conductor D-
3	Yellow		USM_p	Data conductor D+
4	Brown		GND	Power supply GND
5	Red		+5 V	Power supply +UB
6	Grey	Pointing device	USM_m	Data conductor D-
7	Pink		USM_p	Data conductor D+
8	Blue		GND	Power supply GND
Screen	-		Screen	Connect shielding to ground (< 1 M Ω)

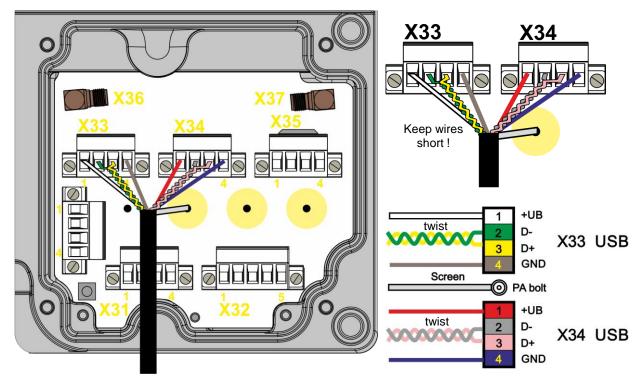
19.1.1 KB2 at ET-/MT-xx7



19.1.2 KB2 at ET-/MT-xx8

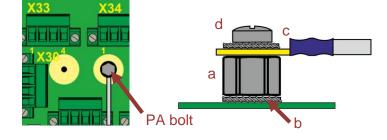


Detailed view terminal assignment



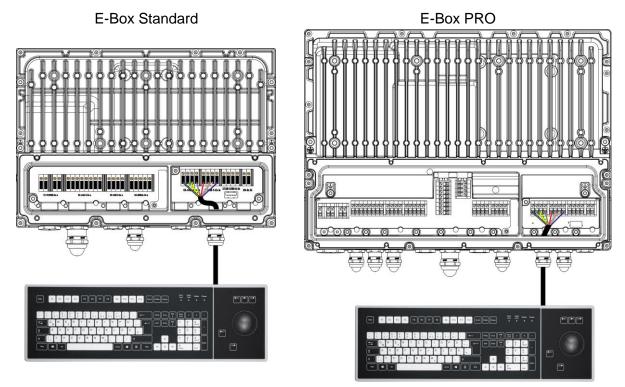
Ground connection

- Screw on distance bolt I/A (a) with toothed washer (b) (tightening torque 1 Nm)
- Attach ring cable lug (c) with combined screw and tooth lock washer (d)

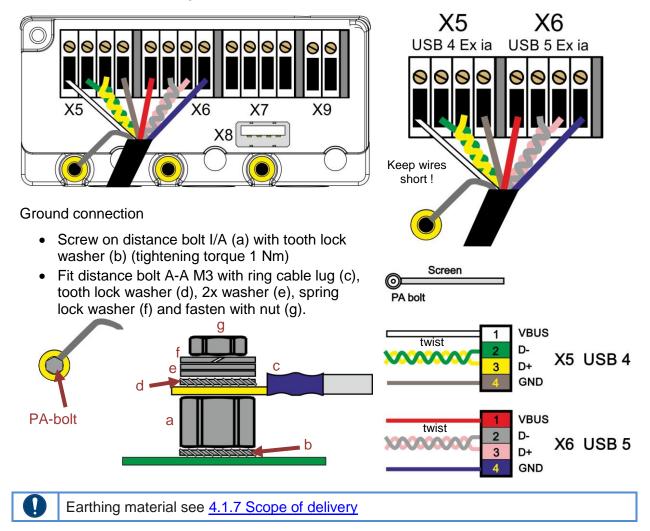


Earthing material see 4.1.7 Scope of delivery

19.1.3 KB2 at ORCA01*



Detailed view terminal assignment (identical for E-Box Standard and PRO)



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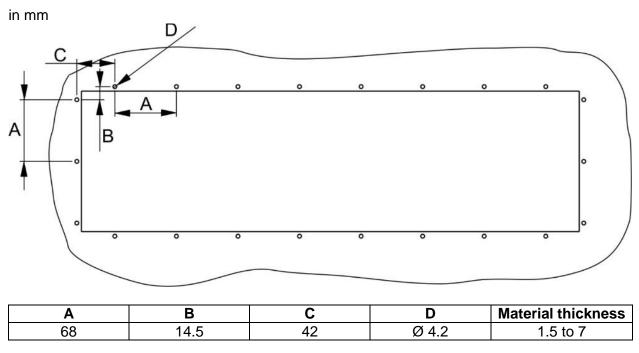
19.2 Connection overview cable assignment PD2

The length of the connection cable (see <u>Technical data</u>) must not be extended or replaced by the customer !.

Cable	Colour	Connection	Signal name	Name
1	White		+5 V	Power supply +UB
2	Green		USM_m	Data conductor D-
3	Yellow	PD2	USM_p	Data conductor D+
4	Brown		GND	Power supply GND
Screen	-		Screen	Connect shielding to ground (< 1 M Ω)

20 Appendix E

20.1 Cut-out KB2



21 Attachment F

21.1 Trackball cleaning

Required materials:

Suction cup (included in the delivery)

a damp, lint-free cloth

Procedure:

- Switch off the device
- Using your fingers, turn black ring to the left and remove it







- Using the included suction cup, carefully remove the trackball



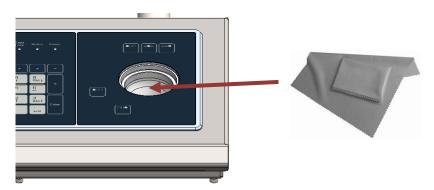
NOTE	Malfunction or damage to the device due to incorrect handling !
	 A damaged surface may result in incorrect functionality ! Handle the trackball carefully Take care not to damage the surface





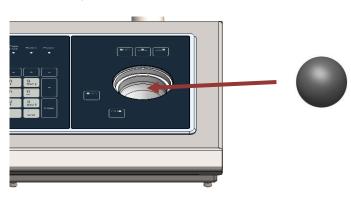


- Clean and dry the recess for the ball with a damp, lint-free cloth



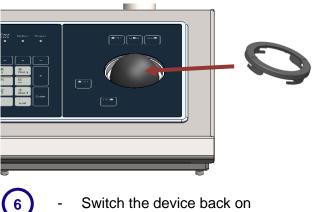


- Slowly and carefully return the trackball to the recess





Using your fingers, replace the ring disk and turn to right.



Switch the device back of
 Check trackball function

22 Appendix G

22.1 Disposal / Restricted substances

Disposal of old electric and electronic devices, packaging and used parts is subject to regulations valid in whichever country the device has been installed.

For countries under the jurisdiction of the EU the corresponding WEEE directive applies.

The devices are classified according to the table below:

Directive	WEEE II Directive 2012/19/EU		
Valid	from 2018-08-15		
Category	SG4 large devices >50 cm		

R. STAHL HMI Systems GmbH meets the requirements of directive 2012/19/EU (WEEE) and is registered under the number DE 15180083.

We shall take back our devices according to our General Terms and Conditions.

22.1.1 Declaration of substances and restricted substances

The present declaration is based on the procedure described in the international standard and directives as listed in the table below:

- IEC 62474 : 2018 (DIN EN IEC 62474 : 2019-09)
- (EG) Nr. 1907/2006 (REACH)
- Directive 2011/65/EU (RoHS)
- Resolution MEPC.269(68) "International Maritime Organization" (IMO); particularly "2015 Guidelines for the Development of the Inventory of the Hazardous Materials" (IHM)

Component	Name	Mass (g)	Declarable Substance Groups and Substances (IEC 62474 database)	CAS No.	Mass %	Exemption (acc. to directive)
-	-	-	No SVHC present	-	-	-

22.1.1.1 Declarable substance groups

22.1.1.2 RoHS directive 2011/65/EC

The devices meet the requirements of RoHS Directive 2011/65/EU.

22.1.1.3 IMO Resolution MEPC.269(68)

The devices meet the requirements of the MEPC.269(68) Resolution of the "International Maritime Organization" (IMO), in particular the "2015 Guidelines for the Development of the Inventory of the Hazardous Materials" (IHM).

23 Appendix H

23.1 Material resistance

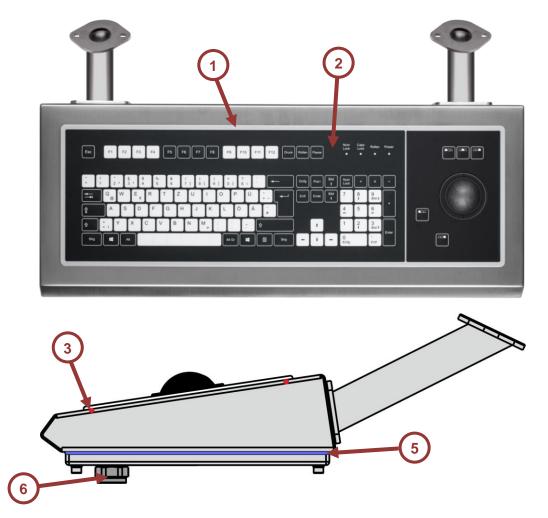
This section deals with the resistance to chemicals of keyboard components that are exposed to the outside environment.

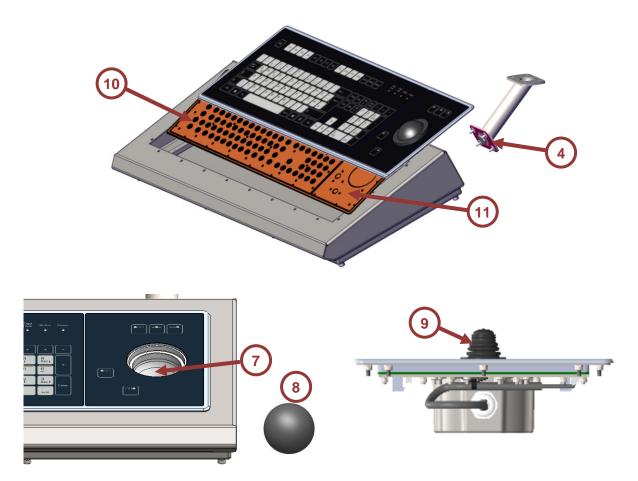
The selection of individual chemicals listed is by no means complete.

23.1.1 Materials

Item	Colour in image	Designation	Position / additional designation	Materials
1	white	Front plate	Powder-coated aluminium	Tiger Drylac series 29
2	black	Front plate membrane	MacDermid Autotex XE	Polyester
3	red	Front plate seal	enclosure-side	Bisco HT-800
4	dark red	Enclosure seal	at the mounting arms	Bisco HT-800
5	blue	Enclosure seal	back cover side	Köpp methyl vinyl polysiloxane gum [VMQ]
6	dark grey	Breather	CMP 781e	Felt insert
7	light grey	Trackball recess	Ball recess featuring trackball optics	Polycarbonate (Lexan) LS2
8	dark grey	Trackball	Trackball itself	Epoxy Resin
9	black	Joystick	Rubber hood	
10 11	orange	Key pad PD2 seal	below front plate	Momentive Silopren LSR2650

Positions





23.1.1.1 Powder coating front plate

Chemical substances	Resistance					
	7 days	1 month	3 months	6 months	9 months	12 months
Ammonia solution 10%	moderate	moderate	-	-	-	-
Sodium hydroxide 10%	yes	yes	moderate	-	-	-
Soda 10%	yes	yes	yes	yes	yes	yes
Acetic acid 10%	yes	yes	moderate	-	-	-
Lactic acid 10%	yes	yes	yes	yes	yes	yes
Phosphoric acid 10%	yes	yes	yes	yes	yes	yes
Nitric acid 10%	yes	yes	moderate	moderate	-	-
Hydrochloric acid 10%	yes	yes	yes	moderate	moderate	moderate
Sulphuric acid 32%	yes	yes	moderate	moderate	moderate	-
Ethanol 96% (rectified spirit)	yes	yes	yes	yes	yes	yes
Isopropyl alcohol	yes	yes	yes	yes	yes	yes
Ethyl acetate	no	-	-	-	-	-
Toluene	no	-	-	-	-	-
Xylene	no	-	-	-	-	-
Diesel fuel	yes	yes	yes	yes	yes	yes
FAM test fluid	moderate	moderate	moderate	no	no	no
Petroleum	yes	yes	yes	yes	yes	yes
Seawater	yes	yes	yes	yes	yes	yes

23.1.1.2 Front plate membrane

The front plate membrane contains a UV-absorbent chemical substance which substantially increases the membrane's resistance to discolouration and premature brittleness with outdoor installation.

When in continuous contact with certain chemicals these may start to remove the UV absorber, reducing the membrane's UV resistance.

The front plate membrane resists exposure for 5 hours to the following chemicals without any visible change or loss of UV resistance. With longer exposure, both the membrane's appearance (colour) and its UV resistance may be affected.

	Resistance for 5 hours						
Diesel fuel	Ammonia 2% *	Acetic acid 5%	Cutting oil	Hydraulic oil			
Glycerin	Sodium hydroxide *	Hydrochloric acid 10%	Paraffin oil	Saltwater			
White spirit *	Potash *	Nitric acid 10%	Pure turpentine	Water			
SBP 60/95 *	Potassium ferricyanide	Phosphoric acid ≥30 %	Linseed oil				
Spirit	Sodium carbonate solution *	Sulphuric acid 10%	Castor oil				

* Exposure to these chemicals lead to an extremely faint sheen of the texture.

Exposure to the following chemicals under the above conditions results in a faint sheen of the texture and a reduction in resistance to UV light of the product.

Chemical substances					
1.1.1. Trichloroethane	Ethyl acetate	Methanol			
Acetaldehyde	Formaldehyde solution	Methylethyl ketone			
Acetone	Formic acid 50%	Toluene *			
Cyclohexanol	Glycol	Xylene			
Cyclohexanone	Industrial methylated spirit				
Ether	Isopropanol				

* Exposure to these chemicals resulted in a white spot on the membrane surface.

The front plate membrane withstands exposure for 5 hours at 50 °C to the following household chemicals:

Chemical substances					
Bleach / toilet cleaner	Cleaner for hard surfaces	Cleaning liquid			
Cream cleaner	Washing powder solutions	Window cleaner			
Fabric conditioner	Washing-up liquid	Tomato ketchup			

The front plate membrane is NOT resistant to the following chemicals:

Chemical substances					
Benzyl alcohol	Concentrated mineral acids	High-pressure steam over 100 °C			
Concentrated alkalis	Dichloromethane				

23.1.1.3 Front plate / enclosure seal HT-800

Generally, the seals show excellent or very good resistance to diluted acids or alkalis, organic liquids and crude oil products.

Chemical substances	Tensile strength (% change)		Dimensional stability (% change)		Compression set (% actual)
	wet	dry	wet	dry	dry
Sulphuric acid 10%	0 - 20	0 - 20	0 - 20	0 - 20	0 - 5
Hydrochloric acid 10%	0 - 20	0 - 20	0 - 20	0 - 20	0 - 5
Acetic acid 10%	40 - 60	0 - 20	0 - 20	0 - 20	0 - 5
Sodium bicarbonate 10%	0 - 20	0 - 20	0 - 20	0 - 20	0 - 5
Ammonia solution 10%	0 - 20	0 - 20	0 - 20	0 - 20	0 - 5
Potassium hydroxide 10%	0 - 20	0 - 20	0 - 20	0 - 20	0 - 5
Isopropyl alcohol	20 - 40	0 - 20	0 - 20	0 - 20	0 - 5
Methanol	0 - 20	0 - 20	0 - 20	0 - 20	0 - 5
Petrol	60 - 80	0 - 20	20 - 40	0 - 20	0 - 5
Mr. Clean®	0 - 20	0 - 20	0 - 20	0 - 20	0 - 5
Fantastik®	0 - 20	0 - 20	0 - 20	0 - 20	0 - 5
Formula 409	0 - 20	0 - 20	0 - 20	0 - 20	0 - 5
Distilled water	0 - 20	0 - 20	0 - 20	0 - 20	0 - 5

23.1.1.4 Enclosure seal VQM

The enclosure seal has a very high thermic resistance, good cold flexibility, good dielectric properties and a very good resistance to oxygen and ozone.

Medium swelling resistance	 with mineral oils (comparable to materials on CR basis) can be operated in water up to +100 °C sufficiently resistant in watery saline solutions sufficiently resistant in monovalent and polyvalent alcohols 		
High degree of swelling in	 low-molecular-weight esters and ethers aliphatic and aromatic hydrocarbons concentrated acids and alkalis Water and steam at temperatures over +100 °C have a highly destructive effect 		
Hardness	10 - 20 Shore A		
Compression set	22 h; 70 °C 50% deformation 5 – 10% 22 h; 24 °C 50% deformation 4 – 6%		
Compressive strength	0.30 - 0.60 N/mm ²		
Tensile strength	0.8 - 1.2 N/mm ²		
Strain	200 - 400%		
Resilience	33%		

23.1.1.5 Breather

No information available

	Chemical resistance to					
Engine oil	Starbite soap and cleaner	Ammonia solution				
		(over 5 volume percent solution)				
Diesel fuel	WD-40	Alcohol				
Antifreeze	Kerosene	Beer (over 5 volume percent alcohol)				
Petrol	Acetone	Suntan lotion				
Automatic transmission fluid	Armor All™ cleaner	Insect repellent				

23.1.1.6 Joystick

23.1.1.7 Trackball recess

The chemical strength of thermoplastics depends on the duration of exposure, temperature and wear (external conditions to which part is subjected) Chemical exposure of a thermoplastic substance can result in discoloration, softening, swelling, cracking or loss of its properties. The chemicals listed below underwent a very strict test procedure to evaluate their effect on the material. This test entailed exposure to the chemical in question under defined conditions, including temperature (20 °C and 80 °C) and load (0.5% and 1%) over a period of seven days.

Very good resistance (unaffected in its performance when exposed for defined duration, under defined temperature and load)			
Boric acid	Polyethylene glycol	Potassium bromide	
Hydrogen chloride 20%	Oxygen	Potassium carbonate	
Hydrogen fluoride 20%	Propylene	Potassium chlorate	
Phosphorous pentoxide dry	Dichlorohydroxybenzene	Potassium chloride 15%	
Phosphoric acid 1%	Aluminium oxide	Potassium cyanide powder	
Phosphorous pentachloride	Copper oxide	Potassium dichromate	
Sulphuric acid 50%	Phenoxyacetic acid	Potassium iodide	
Gallic acid	Aluminium fluoride	Potassium nitrate	
Maleic acid	Aluminium sodium sulphate	Potassium persulphate	
Myristic acid 20%	Ammonium bicarbonate	Potassium sulphate	
Oleic acid	Ammonium bromide	Silver nitrate	
Palmitic acid	Ammonium dichromate	Sodium bisulphate	
Phenoxyacetic acid	Ammonium persulphate	Sodium bromate	
Phthallic anhydride	Barium carbonate	Sodium bromide	
Salycilate acid	Barium chloride	Sodium carbonate	
Tannic acid	Barium sulphate	Sodium chlorate	
Thiodiacetic acid	Calcium chloride	Sodium cyanide	
Ethyl glycol 60%	Calcium sulphate	Sodium fluoride	
Glycerin	Cesium bromide	Sodium hypochlorite 6%	
Octyl alcohol	Copper (II) chloride 5%	Sodium perborate	
Oxydiethanol 2.2	Iron (III) ammonium sulphate	Sodium phosphate	
Polyethylene glycol	Iron (III) chloride saturated	Sodium silicate	
Sorbitol	Iron (III) sulphate	Sodium sulphite	
Triethylene glycol	Lithium bromide	Strontium bromide	

Formaldehyde solvent 37%	Lithium hydroxine powder	Tin (II) chloride
Formalin	Magnesium bromide	Tin (IV) chloride
Thriethanolamine	Magnesium chloride	Titanium tetrachloride
Hydroxylamine	Magnesium nitrate	Zinc bromide
Aluminium hydroxine powder	Magnesium sulphate	Zinc carbonate
Sodium hydroxine dry	Mercury (I) nitrate	Zinc sulphate
Sodium thotalamate	Mono ammonium phosphate	Aluminium acetate
Dosononyl phthalate	Nickel nitrate	Ammonium oxalate
Ethyl bromoacetate	Potassium bicarbonate dry	Aniline sulphate
Methyl acetate	Potassium bisulphate	Valine bromide dl
2 dodecyl phenyl carbonate	Potassium bromate	

Medium resistance (considered to be marginal, only for short exposure at low temperatures or if loss of properties is not critical)			
Sulphamine acid 5%	Isobutanol	Sodium bicarbonate saturated	
Sodium etherlaurysuphate			

No resistance			
(not recommended, results in failure or significant deterioration)			
Hydrogen chloride 25%	Benzyl benzoate	Chlorobenzene	
Nitric acid 70%	Butyl cellosolvate acetate	Chlorobutane	
Perchlorid acid	Butyl stearate	Chloroform	
Phosphoric acid 10%	Cello acetobutyrate	Dibromomethane	
Sulphuric acid 70%	Cellulose acetate	Dichloroethane	
Sulphurous acid 5%	Cellulose proprionate	Dichloromethane	
Acetic anyhydride	Dibutyl phthalate	Methyl ethyl ketone	
Formic acid concentrate	Didecyl carbonate	Arsenic trioxide	
Mercapto acetic acid	Disodecyl phthalate	Calcium oxide paste	
Myristic acid 25%	Dioctyl phthalate	Mercury metallic	
Phenol sulphonic acid	Dioctyl sebacate	Allyl 4 methoxyphenol	
Tannic acid 20%	Ditridecyl carbonate	Cresol	
Trichlor acetic acid	Ditridecyl phthalate	P-Phenylphenol	
Allyl alcohol	Ethyl butyrate	Pentachlorophenol	
Amyl alcohol	Ethyl cellusolve 5%	Phenol sulphonic acid	
Butoxyethanol	Ethyl chloracetate	Phenol 5%	
Chlorethanol 2	Ethyl cyanoacetate	Aluminium ammonium sulphate	
Decyl alcohol	Ethyl lactate	Aluminium chloride	
Ethanol	Ethyl salicylate	Aluminium potassium sulphate	
Ethyl glycol 100%	Isopropyl myristrate	Ammonium carbonate	
Furfuryl alcohol	Methyl calicylate	Calcium carbonate paste	
Hepthyl alcohol	Methylbenzoate	Iron (II) chloride	
Nonyl alcohol	Triacetine	Iron (III) nitrate	
Penethyl alcohol	Tributoexethyl phosphate	Mercury (II) chloride	
Polyalkylene glycol	Tributyl cello phosphate	Potassium chloride saturated	

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Propylene glycol	Ether	Potassium chromium sulphate	
Thiodiglycol 5%	Methyl cellosolve	Potassium permanganate	
Tripropylene glycol	Polyalkylene glycol	Silver chloride saturated	
Acetaldehyde	Polyethylene sulphide	Sodium bicarbonate 13%	
Butyraldehyde	Propylene oxide	Sodium carbonate solvent	
Propionaldehyde	Bromine	Sodium hypochlorite 15%	
Dimethylformamide	Chloracetophenone	Sodium nitrate 10%	
Aniline	Chlorine	Sodium sulphide	
Diphenylamine	lodine	Trisodiumphosphate 5%	
Methylaniline N	Isobutane	Zinc chloride	
Methylene dianiline	Methane	Zinc oxide	
Phenylhydrazine	Ozone 2%	Ammonium acetate	
Pyridine	Sulphur dioxide	Potassium acetate 30%	
Ammonium concentrate	Sulphur hexafluoride	Quinine sulphate	
Ammonium hydroxide 0.13%	Acetylene dibromo	Sodium acetate 30%	
Calcium hydroxide	Acetylene tetrachloride		
Potassium hydroxide 10%	Bromochloromethane		
Sodium hydroxide 10%	Carbon tetrachloride		

23.1.1.8 Trackball (itself)

The trackball was subjected to the following chemical tests:

Fluid group	Flu	id type	Test fluid	Test fluid temperature (+/- 2 °C)
		Kerosene	ISO 1817, Test liquid F	70
	Fuels	Petrol	ISO 1817, Test liquid B	40
		Ester based	ISO 1817, Test liquid 101	150
Fuels and			Propan-2-ol (isopropyl alcohol)	50
Solvents	Solvents and cleaning fluids		Solvent – DTD 929	23
			Denatured alcohol	23
			Detergent Cleaning compound for aircraft surfaces	23
Oils	Hydraulic oils	Mineral oil based	NATO H-520/NATO H-515	70
Olis	Lubricating oils	Mineral based	NATO O-1176(OMD 80)	70
	De-icing & a	ntifreeze fluids	Inhibited ethylene glycol (BS6580) 80% and 50% solution in water (v/v)	23
De-Icers	Runway de-icers		25% urea / 25% ethylene glycol in water (v/v)	23
			50% inhibited potassium acetate in water	23
Corrosion preventative fluid		Def Stan 68-10, NATO C-634	23	
Corrosion	Beverages		Теа	23
preventatives and beverages			Coffee	23
and beverages			Fruit Juices	16
			Minerals	16
	Fire extingui	chanta	Protein: NATO Stock #4210 99 224 6855	23
	Fire extingui	Shants	Fluoroprotein: NATO Stock #4210 99 224 6854	23
Extinguishers and NBC	NBC decontamination agents		Chemical Agent Decontaminant (CAD) - an aqueous solution of hydroxide and sodium dischloroisocyanurate buffered at pH 10.5 with boric acid (exposure duration 5 minutes)	16
			Super Tropical Bleach (STB) or High-Test Hypochlorite (HTH) - chlorinated lime containing 30% or 37% free chlorine by weight (exposure duration 5 minutes)	16
			Fullers earth powder (exposure duration 5 minutes)	16

23.1.1.9 Key pad / PD2 seal

The key pad / PD2 seal has only a limited contact to the outside. The keyboard membrane contains small airing channels through which substances may penetrate under a large pressure difference or with a hard water jet.

The LSR materials are resistant to diluted acids and alkalis. This resistance weakens under increased concentration or temperature. Boiling water has no significant effect on the LSR materials.

The LSR materials begin to slowly disintegrate under water vapour of a temperature of 100 °C and above.

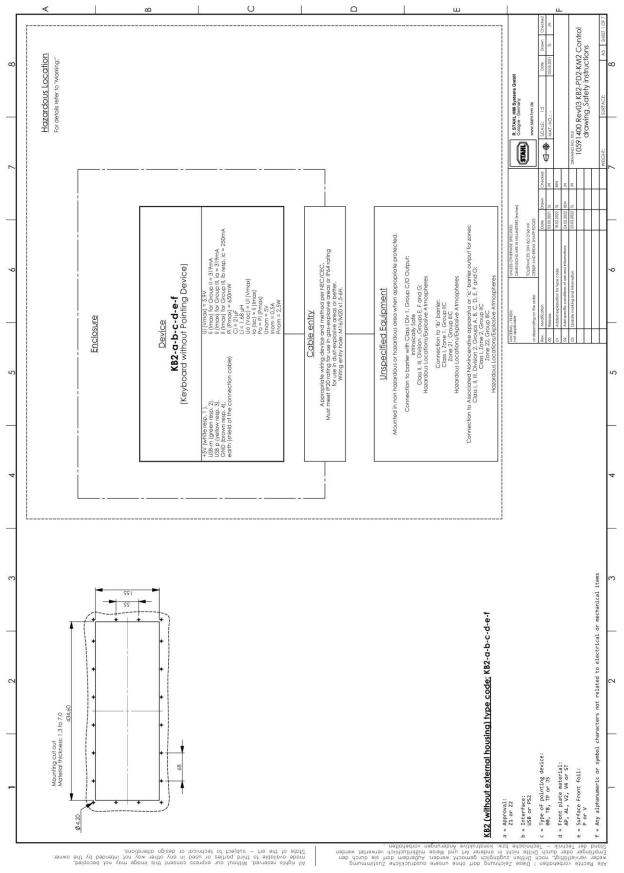
The swelling degree of the LSR materials under exposure to chemicals refers to a Shore A hardness of about 50.

Swelling degree of LSR under exposure to chemicals (testing period 8 days)				
Chemical substance	Test temperature in °C	Change to Shore hardness	Swelling in volume %	
Acetone	20	-8	33	
Ammonia, diluted 25%	20	3	4	
Baysilone® oil M10 (100 cSt at 25 °C)	150	-10	72	
n-Butanol	20	-8	19	
Chloroform	20	-12	218	
Cyclohexane	20	-10	10	
Glacial acetic acid	20	-2	128	
Ethanol	20	-5	10	
Ethyl acetate	20	-11	113	
Glycol	20	0	0	
Methanol	20	-3	8	
Methyl ethyl ketone	20	-10	80	
Dichloromethane	20	-10	103	
Mineral oil ASTM No. 2	150, 72 h	-4	9	
Mineral oil ASTM No. 3	150, 72 h	-12	42	
Sodium hydroxide 20%	20	0	0	
Olive oil	100	0	0	
Petroleum ether	20	-10	237	
Phosphoric acid 50%	20	0	0	
Nitric acid 10%	20	0	0	
Hydrochloric acid 20%	20	0	0	
Sulphuric acid 20%	20	0	1	
Carbon tetrachloride	20	-40	192	
Trichloroethylene	20	-13	150	
Vaseline	100	-8	14	
Xylene	20	-20	127	

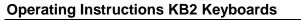
24 Appendix I

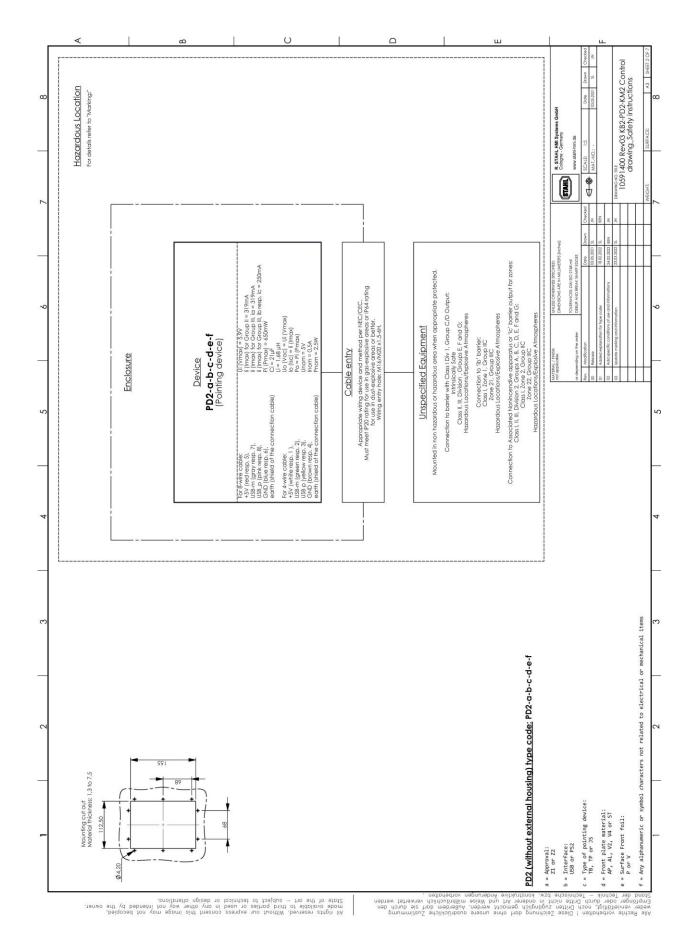
24.1 Control Drawing for USA and Canada

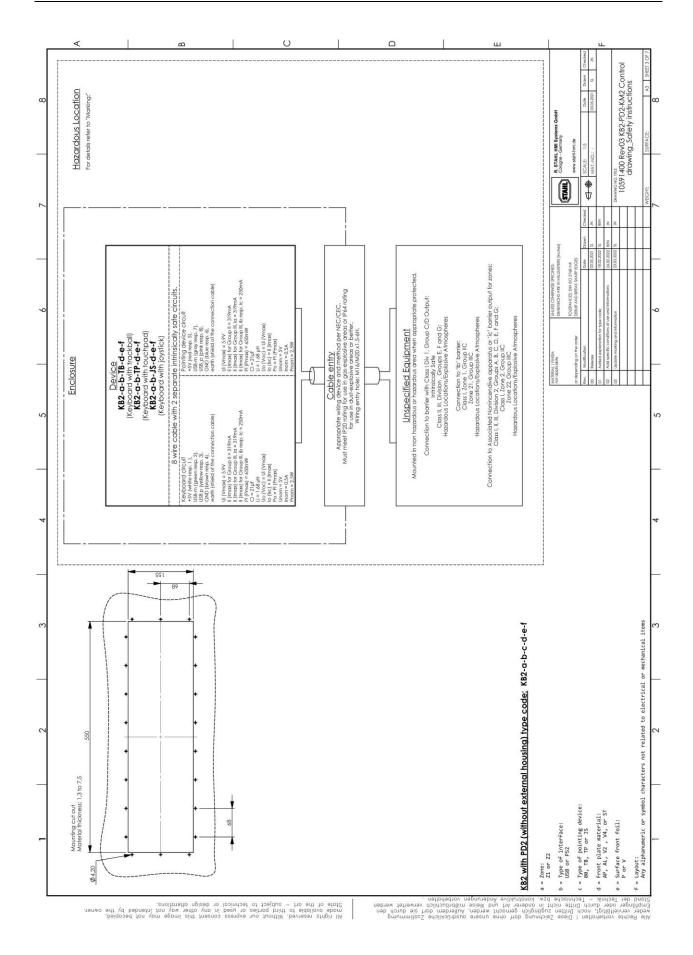
24.1.1 KB2 / PD2 versions

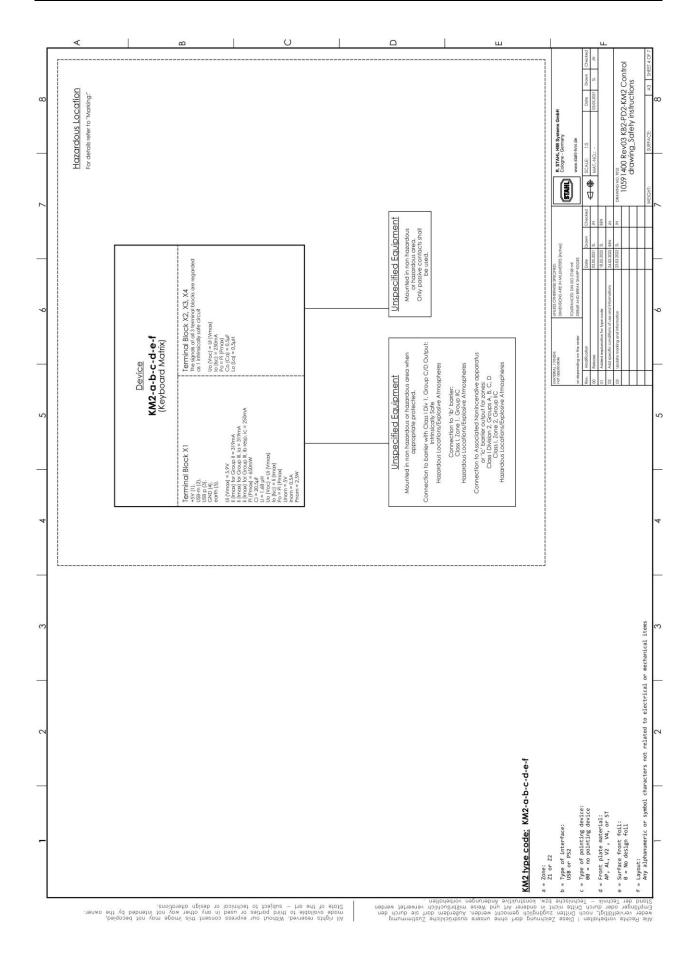


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-	Notes: The devices are explosion-protected equipment for installation in hoardous areas and can be operated in areas noted on the device. The intended us of the devices is to enter and process data to the connected device e.g. HMs.	The aversar may any be installed and operated in on unduraged, any and each contains in younder me explosion protection. The national assembly and installation rules and the periorialy need in the periorial previncial of the periorial previncial periorial previncial according to applicable standards, directives and installation guidelines. Only quarter perioriane that has been instructed accordingly are obvied to install the device and its accessories must be connected and operated according to applicable standards, directives and installation guidelines. For outdoor use. Altitude up to 2000m.	Field Wing shall be rated for +75°C. Before operating the device you must ensure that it has been installed according to regulations and that its cables are undamaged. Only appropriate tools must be used for the installation. Fixe flash and zone 2 parallation, the Model hype K82 Keyboard and Model PD2 Pointing device shall be installed into an op the final enclosure shall meet the requirements of all east P20 and also meet the enclosure requirements of UUCAN 60104. For Class II, III, zone 21 and zone 22 thataliation, the Model IVpe K82 Keyboard and Model PD2 Pointing device shall be installed into an op For Class II, III, zone 21 and zone 22 thataliation, the Model IVpe K82 Keyboard and Model PD2 Pointing device shall be installed into a For Class II, III, zone 21 and zone 22 thataliation, the Model IVpe K82 Keyboard and Model PD2 Pointing device shall be installed into a fibe final enclosure shall meeting the eactering the capacitienter of and base meet the enclosure requirements of UUCAN 400740 and	The sheld of the connection cable resp. Fin 5 of X1 at KN2, must be connected to earth potential with max. IMD. For K82 and type FD2 and LM2 when used in dust-explosive areas: When supplied with > 250 mk in dust-explosive areas: The device must be supplied by an in-criticuit (innear characteristics). For K82 and type FD2 and LM2 when used in dust-explosive areas: When supplied with > 250 mk in dust-explosive areas: When supplied with > 250 mk in dust-explosive areas: The device must be supplied by an in-criticuit (innear characteristics). For the permanently, connected cable. The following values have to be respected additionally: Ccable = 200 pF(m. Lcable = 1 µH/m for the permanently connected coble. The following values have to be respected additionally: Ccable = 200 pF(m. Lcable = 1 µH/m for the permanently connected coble. The following values have to be respected additionally: Ccable = 200 pF(m. Lcable = 1 µH/m for the permanently connected coble. The following values have the stabled and certified for the area of installation and adjusted if the costor. Country specific installation methods must be betweed. Cable entities unturble and certified for the lacate stade in the vEC/CEC. When installed with cable. This device shall be installed in areas where the cables has been deemed suitable for the locals as defined in the vEC/CEC. The devices (inclusive connection cables) shall only be intalled in areas where the cables has been deemed suitable processes are excluded.	The Post Rest. 1	Any repairs must always be carried out by the manufacturer. No revision to drawing without prior FM Approved for installations in the U.S. The Associated Apparatus shall be FM Approved for installations in the U.S. The Associated Apparatus must be Canadian Approved for installations in Canada. Associated apparatus manufacturer's installation drawing shall be followed when installing this equipment.	-
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4		The Nonincendrive Field Wing Cifcuit Concept allows inherconnection of Nonincendrive apparatus with associated Nonincendrive apparatus not specifically examined in combination as a system when: Uo s Ui , Co 2 Ci + Ccable, Lo 2 Li + Lcable, Installation in the U.S. should be in accordance with the National Electrical Code® (ANSN-RPA 70).		The control room equipment connected to Associated Apparatus shall not generate more than 253 Vrms or Vdc, or the marked Um on the associated apparatus, whichever is less. Installations in the U.S. should be in accordance with ANS/USA RP12.06.01 "Installation of Infinitional Section	g is true:		FM3610 – Intimically Safe Equipment, PM3610 – Équipement à sécurité intiméque M ARNING – Substitution of components moy impair intimics Safely, A VERTISSEMENT – La substitution de composants peut compromettre la sécurité intiméque i	wer before sevicing. A VERTISSEMENT – Ne pas débrancher l'équipement en présence d'atmosphère inflammable ou combustible	while clicults are alive. AVERTISSEMENT – Déconneclez l'équipement de l'alimentation avant d'ouvrir le batter pour réduire le risque d'inflammation d'armaphéres dangereuses.	 With the box provided on the nomeptate. The user shall prevent the type of protection chosen for the specific installation. Once the type of protection data been marked if shall not be changed. The examplement that be installed to mark the type of protection chosen for the specific installation. Once the type of protection data be installed as user, the examplement shall be installed in such a way that mechanical effects (pulling faces) on the cable are excluded. The cable strate fract shall be installed as user, the examplement shall be installed in such a way that mechanical effects (pulling faces) on the cable are excluded. The cable strate fract shall be installed as user, the examplement shall be installed at the cable strate for the protected optimized faces (policin ce TR, Te al.S) is included, and shall be installed as user, the examplement shall be installed at more are excluded. The cable strate for the protected optimized faces (policin ce TR, Te al.S) is included, and shall be installed in such as way that mechanical effects (pulling faces) on the cable strate for the sequipment image graves are on optimized and the examplement shall be installed in a local more and the installed and user of the builds of the builds of the builds of the build strated on an sufficient optimized faces (policin ce the installed to a local more and the examplement and strated on the builds of the builds of the build strated on any under an examplement is out to example when the examplement and inclusion of the builds of the builds (policin concise) with the 3 aquinement is out to an examplement and the installed on such strates and the installed to a such strates and the installed on the wood table installed to a such the prevent impoct and facton. When installed on part of that enclosure, the gaster states of the wood table indication experiments to C222 to G42. When installed and the enclosure the protectine tweet effect occorrely with the 3 aquivenents to C222 to G4		 Using the box provided on the nameptate, the User shall permanently mark the type of probability of protection that been marked if shall not be changed. In the nameptate, the User shall permanently mark the type of probability requires the type of protection has been marked if shall not be changed. The non-mediate participation compete the relationer of the protection chosen for the protection of the name protection of the name protection of the name participation. The name participation is the relationer of the non-mediate participation is the relationer of the name participation of the name partity of the name partity of the name participation o		protection chosen for the specific installation. Once the type of protection has been marked it shall not be changed and be in compliance with the mounting, spacing and segregation requirements of the utilinate application.				
_		with associated No	trical Code, Part I,	50 Vrms or Vdc, or th	s when the followin		i de composants p	stervicing. AVERT	rcuits are alive. AV6	an chosen for the sp e a minimum encl ing device (Option incapable level of e tential risk of ignition cs were verified to e verified to compl		n chosen for the speed a minimum encloved a minimum enclo-capable level of enclosed is respected by it risk of ignition by it are verified to comply with Tyr		on chosen for the s in compliance with				
ю		onincendive apparatus Code® (ANSI-NFPA 70).	22.1 Canadian Elec	herate more than 25 lation of Intrinsically	an 1.0 Ohm. cally safe apparatu		ue ENT – La substitution	onnect power befc	nove cover while c.	he type of protectik lenctosure shall ha he khodel PD2 point te. • a nignitior 7 a nuch surfaces. • a nuch surfaces. • considered a poi Keyboard Electronics wer ard Electronics wer		he type of protectio al enclosure shall han generate an ignition s on such surfaces, nsidered a potentia ranting Device we frontics were verified						
_		connection of Nonin ional Electrical Cod	test edition of the C	aaratus shall not ger A RP12.06.01 "Instal	und shall be less thc iparatus and intrinsic		t à sécurité intrinsèq Safety, AVERTISSEM	e atmospheres, disc	spheres., do not ren .d -e-f:	permanently mark t closure and the finc cale circuits when T ted against damag lis equipment may t is equipment may t to the Model K82 Keybo e Model K82 Keybo	·d -e-f:	permanently mark t closure and the finc is equipment may { electrostatic charge terials which are co faired which are co fis of the Model PDC KB2 Keyboard Elect	-d-e-f:	permanently mark - ng minimum protec				
2		ble. ble. dance with the Nati	ordance with the lat	d to Associated App rdance with ANSI/IS	ound and earth gro on of associated ap		A3610 – Équipement may impair Intrinsic .	able or combustible	of hazardous atmo or KB2-a-b-C-1	kale, the User shall r mplete the final en poracie initinsically. I d effectively protect d effectively protect and protect of the to the build-up of the nay contain metallik may contain the gasket seals of th	or PD2-a-b-c-	late, the User shall f mplete the final eru i the enclosure of th i to the build-up of f and in metallic ma contain metallic ma ure, the gaster sea i seals of the Model	or KM2-a-b-c	plate, the User shall, final enclosure havir				
_	eld Wiring:	The konincendrive Field Witing Circuit Concept allows interconnection of N to s Ui . Co \gtrsim C1 + Ccable. Lo \gtrsim U + Lcable. It is unit to the VS - should be in accordance with the National Electrical installation in the U.S. should be in accordance with the National Electrical	installation in Canada should be in accordance with the latest edition of the C22.1 Canadian Electrical Code, Part I, Notes for Intrinsic safety:	uipment connected S. should be in accor	Resistance between Initinsically Safe Ground and earth ground shall be less than 1,0 0hm. The Entity Concept allows interconnection of associated apparatus and initinsically safe apparatus when the following is true: In a Entity Concept Caro, 2C1+ Cramber Los 21+1 cramber.		FM3610- Intrinsically Safe Equipment, FM3610- Équipement à sécurité intrinséque WARNING - Substitution of components may impair Intrinsic Safery, AVERTISSEMEN	WARNING - To prevent ignition of flammable or combustible atmospheres, disconnect pa	WARNING - to reduce the risk of grithon of hazardous atmospheres. do not remove cover Specific conditions of use for KB2-a-b-c-d -e-f;	Bing the box provided on the nomepole, the User shall permanently mark the type of protect the equipment shall be included to complete the final enclosure and the final enclosure shall be included the couple shall not a separate initinisciply safe circular when the Model PD2 point excludent. The couple shall be fixed on deflectively protected against domage, the normerbic positive conductive to mapping the induction of the positive of the protection of the couple shall be fixed on deflectively positive and the state of an excludent. The combrandic positive couple of the positive of against the induction positive of the build-up of electrostatic charge on such sufficient the work is beyond electrost may be publicly of the positive of the Model KB2 keyboard Electro When matched as part of a final enclosure, the gaster states of the Model KB2 keyboard Electrost when matched as part of a final enclosure. The gaster states of the Model KB2 keyboard Electrost Minimides to the couple with the gaster states of the Model KB2 Keyboard Electrost of XAC-2222. 46329.	Specific conditions of use for PD2-a-b-c-d -e-f:	g the box provided on the namebidle, the User shall permanently mark the type o equipment state teritisation complete the fuer ancious and the final enclosus non-metallic part incorporated in the enclosure of this equipment may generate aretimal contributions are considered to the enclosure of this equipment market and the installed of the enclosure of this equipment may generate are installed part incorporated in the enclosure of this equipment may model to part of the enclosure, the gatest seals of the Model TO2 Pariting and to find enclosure, the gatest seals of the Model TO2 Pariting and to find enclosure, the gatest seals of the Model RD2 Pariting and to find enclosure.	Specific conditions of use for KM2-a-b-c-d-e-f:	Using the box provided on the nameptate, the User shall permonently mark the type of the equipment shall be installed in a final enclosure having minimum protection of #22				
-	Notes for NI Field Wiring:	The Nonincendive Fi Uo s Ui , Co 2 Ci + C(Installation in the U.S.	Installation in Canada should be in Notes for Intrinsic safety	The control room eq Installations in the U.S	Resistance between The Entity Concept c	Warnings:	FM3610 - Intrinsically WARNING - Substituti	WARNING - To preve	WARNING - to reduc Specific cond	 Using the box provided on the nonneptote, the User sholl permonently mork the type of 2. The equipment sholl be included. Comprehent the function encource and the equipment sholl be included. The complete the functional value of the fund encource and the completion cable contraint two separate thirtingcally rate circuit when the Model 1 and the contraction cable contraint wo separate thirtingcally rate circuit when the Model 1 excluded. The cable shall be fixed and effectively protected against damage. The contraction cable contraints more protected or the enclosure of the equipment may generate the externation conditions are contractive to the build-up of effectively and exteriorability enclosed and the evoluated as part of nind enclosure, the gasteri seate of the Model M22 keyboard intelled as part of nind enclosure. The gasteri seate of the Model KB2 keyboard Electively conditions are contactive. 	Specific cond	 Using the box provided on the namebrate, the User shall permanently mark the type of 2. The non-metallic parts incorporated in the enclosure of this exultanent more generators the non-metallic parts incorporated in the enclosure of this exultanent more generators the external conditions are acroduce to the building or electronic change on such the internal conditions are enclosure to the building conditioned on such the model PD2 pointing device more contain mediatic metallicits which are considered 5. When installed as part of third enclosure, the gasket seals of the woodel PD2 Pointing L so part of chird enclosure, the gasket seals of the woodel PD2 Pointing L 2222, 6055. 	Specific cond	 Using the box prov 2. The equipment sh 				
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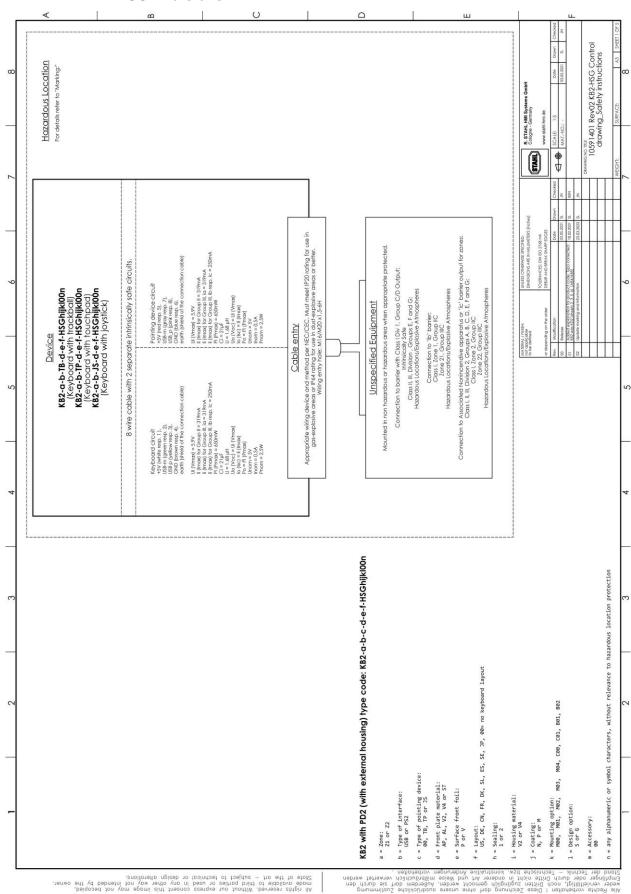
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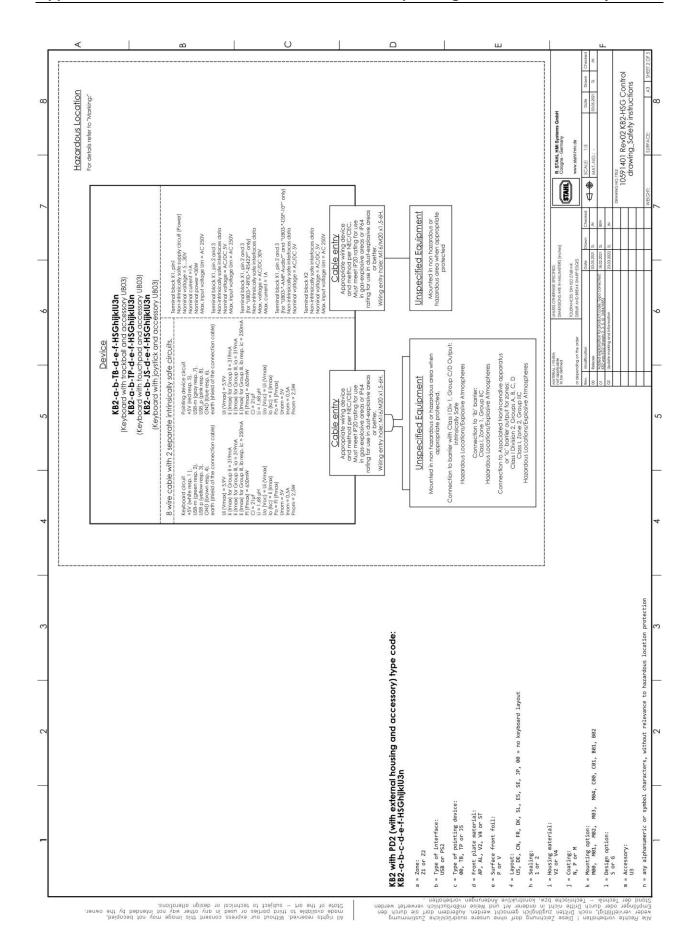
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6		Marting for Keyboard with pointing device type Ki2-ab-c-d-ef and PD2-ab-c-d-ef for US: NORMEENDARY CLASS L DANOR 2, RC, D SCLASS L DONE 1, Add C E CLASS L DONE 1, Add C E CLASS L DONE 2, Add NOL 1, Add E CLASS L DONE 1, Add C E CLASS L DONE 2, Add NOL 1, Add E CLASS L DONE 2, Add NOL 1, Add E CLASS L DONE 2, Add NOL 1, Add E CLASS L DONE 1, Add E CLA	Marking for Keyboard with pointing device type K82-ob-c-d-e-f for Canada: KNANCENDVE CLASS I, DVISION 2, GROUPS A, B, C, D Exil CLI 40 Exil CLASS 14 forms = 40°C to +70°C Exil CLASS 14 forms =		P20 M2310 - Intrinsically Safe Equipment, FM3610 - Équipement à sécurité intrusèque M2810 - Intrinsically Safe Equipment, FM3610 - Équipement à sécurité intrusèque WARNNC - Substruction et l'amonte WARNNC - To pevent l'aprilion of flammable or combustible atmospheres, discorriect power belore servicing, AVERTISSEMENT - Ne pas débrancher l'équipement en présence d'atmosphère inflammable ou combustible I & STAHL HMI Systems GmbH, Coogne / Germany & STAHL HMI Systems GmbH, Coogne / Germany		FM2ICA0022K FM2IO-Initriacialy Safe Equipment, FM34I0 - Equipment à sécurité intrinsèque FM34IO - Initriacialy safe Equipment, FM34I0 - Equipment à sécurité la substitution de composants peut componentre la sécurité intrinsèque 1 WARNIG - To prevent ignition of formable or combustible atmospheres, discornect power before servicing, A VERTISSEMENT - Ne pas débrancher l'équipement en présence d'atmosphére inflammable ou combustible ! & STAHL HMI System GmbH, Cologne / Germany R. STAHL HMI System GmbH, Cologne / Germany		Hurld Cherwicz 915710 Hurld Cherwicz 915710 Hurld Cherwicz 915710 Hurld Cherwicz 915710 Hurld Cherwicz 91510 Hurld Cherwicz 91510 Hurld Cherwicz 915 Hurld Cherwicz 915 Hurld Cherwicz 91 Hurld Cherwicz
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24.1.2 KB2-*-HSG-* versions



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	inected device e.g. 35, directives and insi		nd effectively prote using in such a way		At 855 Christman Proc. Petc., At 855 Christman Proc. Petc., Dutter and Sector and the Authority Species Christman Proc. Spectra Spectra Christman Proc. Spectra Spectra (2003) 2019 [2013] 2013 [2013] 2013 [2013] 2013 [2013] 2013 [2013] 2013 [2013] 2013 [201
9	icess data to the corr applicable standarc		able has to be fixed (Ū	NURH (Industry) a discrete (Industry) Development Deve
5	and can be operated in areas noted on the device. The intended use of the devices is to enter and process data to the connected device e.g. HMs, condition1 Any damage may compromise the explosion protection!	9 <u>4</u>	are excluded. The oc meching cable must	Profing of the housing and must be separately certified for the respective type of protection. Re parts. All screws are lightened properly. All cables and lines are properly connected and undamaged clian provided by the equipment may be imported. Stanling this equipment.	MAX TERM.1 / F No. 4 deficiency to a dependent to dependent to a dependent to a dependent to a dependent
	ded use of the devic action! e connected and or	ents can be used for racteristics).	forces) on the cable d if necessary. /CEC. 1 connection. The co	arespective type of a	
4	and can be operated in areas noted on the device. The intended us configured in Any damage may compromise the explosion protection. Utes must be observed. The device and its accessates must be con-	wed to install the device. C. Humidity up to 95%. o regulations and that its cobies are undamaged. (1MΩ. . ThΩ. . ThΩ. areas: The device must be supplied by an is-circuit (linear characteristics).	= 1µH/m mical effects (pulling talalation and adjuste as defined in the NEC e excluded. • e excluded. • be used for the UB0.	Prating of the housing and must be separately certified for the respective type of protection, re parts. All screws are tightened property. All cables and lines are property connected and u clion provided by the equipment may be imparied.	
	d in areas noted on age may compromi	vice. 3%. at its cables are und conents or the earth . ust be supplied by ar	additionally: Ccable = 200 pF/m, Icable= 1µH/m to be instaled in such a way that mechanical et is lobe instaled in such a way that mechanical et sinche and centiled for the area of instalention in the and centiled for the boat as adhiting the extending processes are a exclu- native electronicic or outer shearth) must be use the traned.	ig and must be sepo- te tightened propert equipment may be ent.	
ო	Notes: The devices are explosion-protected equipment for instantiation in hazardous and can be operated in areas noted on the device. The intended use of the devices is to enter and process data to the connected device e.g. HMIs. The devices may only be installed and operated in number of the device. The intended use of the devices is to enter and process data to the connected device e.g. HMIs. The analyzers may any be installed and operated in an undamaged, dry and clean conditiont Any damage may compromite the explosion protection!	Only qualited personnel or personnel that has been instructed accordingly are allowed to install the device. For outdoor use. Altitude up to 2000m. Ambient temperature resp. temperature at the place of installation Ta = -40°C70°C. Humidity up to 95%. Eledi wring shall be rated for +75°C. Before operating the device your must ensure that it has been installed according to regulations and that its cables are undamaged. Only oppropriate took the use used for the installation. Ta = -40°C70°C, Humidity up to 95%. The shalp alter or the active your must ensure that it has been installed according to regulations and that its cables are undamaged. Device operating the device your must ensure that it has been installed according to regulations and that its cables are undamaged. The shalp of the connection cable must be connected to earth potential with max. I M.O. The enclosure, must be connected to earth potential with max. I M.O. The enclosure, must be connected to earth potential with max. I M.O. When used in dust explosive areas: When supplied with > 250 mA in dust explosive areas: The device must be supplied by an fa-circuit		For KB2-orb-cd-eFHSChiptime. The associated equipment has to fulfil at least the IP-rating of the housing and must be separately cer No live maintenance permitted. System maintenance should focus on the following. Seal wear, Damage to enclosure parts. All screws are lightened property. All cable System maintenance should focus on the following. Seal wear, Damage to enclosure parts. All screws are lightened property. All cable Cleans the device only with a damp cloth. Any repairs must always the carried out by the manufacturer, the protection provided by the equipment may be imparied any repairs must always the carried out by the manufacturer. The Associated Apparatus shall be FM Approved for installations in the U.S. The Associated Apparatus must be Candapproved for installations in Canada.	
	on in hazardous area: maged, dry and clea	d accordingly are all allation ta = -40°C7 allation ta = -40°C7 arth polential with mc ax. 1 M.D. If applicable 3 m.A in dust-explosive	have to be respected ype KB2*****_Js***. ficults. The device ho incuts the cables and where hat he cables led in areas where int ble with min. 0.5 mm blow ith min. 0.5 mm blow the preson	as to fulfill at least the ar. Damage to enclos inufacturer, the prote ons in the U.S. Installations in Canaa al be followed when	
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_	d Wiring: Wiring Circuit Conc	old: Lo≥Li+Lcable ould be in accordc hould be in accord	c safety:	ment connected to tould be in accorde	rinsically Safe Grout		le Equipment. FM36	gnition of flammab	he risk of ignition of ons of Use:	ed on the nameplat is incorporated in the demal conditions a ard may contain m						-
-	Notes for NI Field Wiring: The honincendive Field Wiring Circuit Concept allows interconnection of Nonincendive ap	00 s Ui , Co ≈ C1 + Coable; Lo ≥ Li + Leable. Instalation in the U.S. should be in accordance with the National Electrical Code® (ANSI-NFFA 70). Instalation in Canada should be in accordance with the latest edition of the C22.1 Canadian Electrical Code, Part L	Notes for Intrinsic safety:	The control room equipment corrrected to Associated Apparatus shall not generate more than 250 Virtis or Vdc; or the marked Um on the associated apparatus, whichever is tess installations in the U.S. should be in accordance with AVS/VSA RP12.06.01 "installation of Intificationly Safe Systems for Hazardous (Classified) Locations" and the latest edition of the N	Resistance between Intimiscally Safe Ground and earth ground shall be less than 1.0 Ohm. The Entlity Concept allows interconnection of associated apparatus and intimiscally safe apparatus when the following is true:	Warnings:	FM3610 - Intrinsically Safe Equipment, FM3610 - Équipement à sécurité intrinséque Vue baunce : substitutions of components non-intrinsic todas à vitetitettettet (or institution do components conti components) to Adminid Statedorium (WARNING - To prevent ignition of flammable or combustible atmospheres.	WARNING - to reduce the risk of ignition of hazardous atmospheres, do nat remove cover Specific Conditions of Use:	Jsing the box provide the non-metallic parti- acation where the ex the Model KB2 keybox						-
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24.2 Installation Instructions Requirements China

24.2.1 KB2 / PD2 versions

安装使用要求

Installation Instructions Requirements



认证编号

Certification No.

CN2021C2309-000201-1

本产品经认证符合 CNCA-C23-01: 2019《强制性产品认证实施规则 防爆电气》的要求。 The product(s) is verified and certified according to CNCA-C23-01: 2019 China Compulsory Certification Implementation Rule on Explosion Protected Electrical Product.

#	产品名称 Product	防爆标志
	型号 Type	Ex Marking
1	防爆键盘 KB2-Z1-CCC-DD-EE-F-GG*, PD2-Z1-CCC-DD-EE-F-GG*, KM2-Z1-CCC-DD-EE-F-GG*	型号 KB2-Z1, PD2-Z1, KM2-Z1: 当连接到ia电路时: Ex ia IIC T4 Gb, Ex ia IIIC T ₂₀₀ 135℃ Db 当连接到ib电路时: Ex ib IIC T4 Gb, Ex ib IIIC T ₂₀₀ 135℃ Db 当连接到ic电路时: Ex ic IIC T4 Gc

系列标准	GB/T3836.1-2021, GB/T3836.4-2021
Series standards	
安全使用条件	- 型号KB2-Z1 和 PD2-Z1:
Specific conditions of safety use:	- 对于用于爆炸性气体环境,必须将设备安装在最低防护等级为IP20 (GB/T4208)的外壳中。
	- 型号KB2-Z1, PD2-Z1和KM2-Z1:
	- 对于用于爆炸性粉尘环境,必须将设备安装在最低防护等级为IP64 (GB/T3836.1)的外壳中。
	- 当在粉尘爆炸区域供电>250 mA时:设备必须由ia电路供电(线性特性)。
	- 型号KB2-Z1-***-TB-**-*-***, KB2-Z1-***-TP-**-**和KB2-Z1- ***-JS-**-*-***:
	- 连接电缆包含2个独立的本安电路。
	- 该设备的安装方式必须排除电缆上的机械影响(拉力)。
	- 电缆必须固定并有防止损坏措施。
	- 该设备(包括连接电缆)不能安装在强静电充电过程的区域。

- Type KB2-Z1 and type PD2-Z1 :
 For use in gas-explosive areas, the devices must be installed in a suitable enclosure to obtain at least IP20 in accordance with GB/T4208.
- Type KB2-Z1 and type PD2-Z1 and KM2-Z1 :
 When used in dust-explosive areas, the device has to be installed in a suitable enclosure to obtain at least IP64 in accordance with GB/T3836.1.
 When supplied with > 250 mA in dust-explosive areas: The device must be supplied by an ia-circuit (linear characteristics).
 Type KB2-Z1-***-TB-**-* and type KB2-Z1-***-TP-**-* and type KB2-Z1-***-JS-**-*-**
- The connection cable contains 2 separate intrinsically safe circuits.
- The device has to be installed in such a way that mechanical effects (pulling forces) on the cable are excluded.
- The cable has to be fixed and effectively protected against damage.
 The devices (inclusive connection cables) shall only be installed in areas where intensive electrostatic charging processes are excluded.

R. STAHL HMI Systems GmbH

产品上的符合性标志:

Compliance marks on product:



中国强制性认证 China Compulsory Certification CCC: 2021312309000474

德国制造 Made in Germany Doc No.: Approved: Date: 2023.03.20

24.2.2 KB2-*-HSG-* versions

安装使用要求

Installation Instructions Requirements



认证编号

Certification No.

CN2021C2309-000197-1

本产品经认证符合 CNCA-C23-01: 2019《强制性产品认证实施规则 防爆电气》的要求。 The product(s) is verified and certified according to CNCA-C23-01: 2019 China Compulsory Certification Implementation Rule on Explosion Protected Electrical Product.

#	产品名称 Product	防爆标志
	型号 Type	Ex Marking
1	防爆键盘	型号KB2-Z1HSG00 和 PD2-Z1HSG00:
	KB2-Z1HSG,	当连接到ia电路时:Ex ia IIC T4 Gb, Ex ia IIIC T ₂₀₀ 135℃ Db
	PD2-Z1HSG	当连接到ib电路时:Ex ib IIC T4 Gb, Ex ib IIIC T ₂₀₀ 135℃ Db
		当连接到ic电路时:Ex ic IIC T4 Gc
		型号KB2-Z1HSGU3和PD2-Z1HSGU3:
		当连接到ia电路时:Ex eb ia q IIC T4 Gb, Ex ia tb IIIC T135°C Db
		当连接到ib电路时:Ex eb ib q IIC T4 Gb, Ex ib tb IIIC T135℃ Db
		当连接到ic电路时:Ex eb ic q IIC T4 Gc

系列标准 Series standards	GB/T3836.1-2021, GB/T3836.3-2021, GB/T3836.4-2021, GB/T3836.7-2017, GB/T3836.31-2021
安全使用条件 Specific conditions of safety use:	 - 外壳防护等级: IP66。 - 型号KB2-Z1和 PD2-Z1: - 当在粉尘爆炸区域供电>250 mA时:设备必须由ia电路供电(线性特性)。 - 型号KB2-Z1-***-TB-**-*-HSG * *** **** *、KB2-Z1-***- TP-**-*-HSG * *** **** *和KB2-Z1-***-JS-**-*-HSG * *** ******* - 连接电缆包含2个独立的本安电路。 - 该设备的安装方式必须排除电缆上的机械影响(拉力)。 - 电缆必须固定并有防止损坏措施。
	- 该设备(包括连接电缆)不能安装在强静电充电过程的区域。

- 外壳必须接地, 接地电阻小于1MΩ。如果适用, 可使用安装部件或 已安装部件的接地。
- 对于型号KB2-*-HSG*U3*或PD2-*-HSG*U3*,UB03连接必须使用 绝缘层至少为0.5 mm的连接电缆(导线/外护套)。连接电缆必须 安装在外壳中,确保与键盘/定点设备的裸露导电部件之间至少有 50 mm的距离。
- Ingress protection: IP66.
- Type KB2-Z1 and type PD2-Z1 :
 When supplied with > 250 mA in dust-explosive areas: The device must be supplied by an ia-circuit (linear characteristics).
- Type KB2-Z1-***-TB-**-*-HSG * ** * *** * ** *,
Type KB2-Z1-***-TP-**_*-HSG * ** * *** * ** *,
Type KB2-Z1-***-JS-**-*-HSG * ** * *** * ** *:
 The connection cable contains 2 separate intrinsically safe circuits.
 The device has to be installed in such a way that mechanical effects (pulling forces) on the cable are excluded.
 The cable has to be fixed and effectively protected against damage.
 The devices (inclusive connection cables) shall only be installed in areas where intensive electrostatic charging processes are excluded.
- The enclosure, must be connected to earth potential with max. $1M\Omega$. If applicable, the mounting components or the earth of mounted components can be used for this.
 For the variants KB2-*-HSG*U3* or PD2-*-HSG*U3* a connecting cable with min. 0.5 mm insulation (conductor / outer sheath) must be used for the UB03 connection. The connecting cable must be installed in the housing in such a way that a distance of min. 50 mm to bare conductive parts of the keyboard / pointing device is ensured.

R. STAHL HMI Systems GmbH

产品上的符合性标志:

Compliance marks on product:



中国强制性认证 China Compulsory Certification CCC: 2021312309000476

德国制造 Made in Germany Doc No.: Approved: Date: 2023.03.20

STAHL

25 Appendix J

25.1 Declarations of conformity

25.1.1 EU

25.1.1.1 KB2 / PD2 -Z1

EU-Konformitätserklärung EU Declaration of Conformity Déclaration de Conformité UE R. STAHL HMI Systems GmbH • Adolf-Grimme-Allee 8 • 50829 Köln, Germany erklärt in alleiniger Verantwortung, declares in its sole responsibility, déclare sous sa seule responsabilité,

dass das Produkt: that the product: que le produit: Keyboard with pointing device Pointing device

Typ(en), type(s), type(s):

KB2-Z1-CCC-DD-EE-F-*

PD2-Z1-CCC-DD-EE-F-* mit den Anforderungen der folgenden Richtlinien und Normen übereinstimmt.

is in conformity with the requirements of the following directives and standards. est conforme aux exigences des directives et des normes suivantes.

Richtlinie(n) / L	Directive(s) / Directive(s)	Norm(en) / Standard(s) / Norme(s)	
2014/34/EU 2014/34/EU 2014/34/UE	ATEX-Richtlinie ATEX Directive Directive ATEX	EN IEC 60079-0:2018 EN 60079-11:2012	
Kennzeichnung	g, marking, marquage:	 Il 2G Ex ia IIC T4 Gb Il 2D Ex ia IIIC T₂₀₀ 135°C Db (when supplied with ia-circuits) 	
		 Il 2G Ex ib IIC T4 Gb Il 2D Ex ib IIIC T₂₀₀ 135°C Db (when supplied with ib-circuits) 	C€0158
		 II 3G Ex ic IIC T4 Gc II 3D Ex ic IIIC T₂₀₀ 135°C Dc (when supplied with ic-circuits) 	
EU-Baumusterpr EU Type Examina Attestation d'exan		BVS 20 ATEX E 078 X (DEKRA EXAM GmbH Dinnendahlstraße 9, 44809 Bochum, Germany,	NB0158)
2014/30/EU 2014/30/EU 2014/30/UE	EMV-Richtlinie EMC Directive Directive CEM	DIN EN 61326-1:2013-07 DIN EN IEC 61000-6-2:2019-11 DIN EN IEC 61000-6-4:2020-09	
Product standards	nach RoHS-Richtlinie (2011/65/EU): according to RoHS Directive: ilt pour la Directive RoHS:	EN IEC 63000:2018	
For specific chara	erkmale und Bedingungen siehe Betriebsa cteristics and conditions see operating inst stiques et conditions spécifiques, voir le me	tructions.	
Köln, 2021-04-22	i.v. Jogshin	Duran IV. A. Ty	
Ort und Datum Place and date Lieu et date	J. Düre Technical Di		
20210970020 Konform	itätserklärung KB2-PD2-Z1.docx	Template_EGEU_Konf_2015(0720 docx Page 1 / 1

25.1.1.2 KB2 / PD2 - Z2

EU-Konformitätserklärung

EU Declaration of Conformity Déclaration de Conformité UE



R. STAHL HMI Systems GmbH • Adolf-Grimme-Allee 8 • 50829 Köln, Germany

erklärt in alleiniger Verantwortung, declares in its sole responsibility, déclare sous sa seule responsabilité,

dass das Produkt: that the product: que le produit:

Keyboard with pointing device Pointing device

KB2-Z2-CCC-DD-EE-F-*

BVS 20 ATEX E 079 X

(DEKRA EXAM GmbH

DIN EN 61326-1:2013-07

EN IEC 63000:2018

DIN EN IEC 61000-6-2:2019-11

DIN EN IEC 61000-6-4:2020-09

Dinnendahlstraße 9, 44809 Bochum, Germany, NB0158)

Typ(en), type(s), type(s):

PD2-Z2-CCC-DD-EE-F-* mit den Anforderungen der folgenden Richtlinien und Normen übereinstimmt. is in conformity with the requirements of the following directives and standards.

	est conforme aux exigences des directives et des normes suivantes.	
1		

Norm(en) / Standard(s) / Norme(s)	
EN IEC 60079-0:2018 EN 60079-11:2012	
EX II 3G Ex ic IIC T4 Gc II 3D Ex ic IIIC T ₂₀₀ 135°C Dc	CE
	EN IEC 60079-0:2018 EN 60079-11:2012

EU-Baumusterprüfbescheinigung: EU Type Examination Certificate: Attestation d'examen UE de type:

2014/30/EU **EMV-Richtlinie** 2014/30/EU

EMC Directive Directive CEM

Produktnormen nach RoHS-Richtlinie (2011/65/EU): Product standards according to RoHS Directive: Normes des produit pour la Directive RoHS:

Für spezifische Merkmale und Bedingungen siehe Betriebsanleitung. For specific characteristics and conditions see operating instructions. Pour les caractéristiques et conditions spécifiques, voir le mode d'emploi.

Köln, 2021-04-22

2014/30/UE

Jure logdily

Ort und Datum Place and date Lieu et date

J. Düren

Technical Director

i.V.

A. Jung Ex Representative

20210970030 Konformitätserklärung KB2-PD2-Z2.docx

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25.1.1.3 KB2 / PD2 -Z1 -HSG

EU-Konformitätserklärung

EU Declaration of Conformity Déclaration de Conformité UE



R. STAHL HMI Systems GmbH • Adolf-Grimme-Allee 8 • 50829 Köln, Germany

erklärt in alleiniger Verantwortung, declares in its sole responsibility, déclare sous sa seule responsabilité,

and and and

dass das Produkt: that the product: que le produit: Keyboard with pointing device and enclosure Pointing device and enclosure

Typ(en), type(s), type(s):

B' 1 (1) 1 / 1 / D' / / 1 / D

KB2-Z1-CCC-DD-EE-F-GG-HSG H II J KKK L MM * PD2-Z1-CCC-DD-EE-F-GG-HSG H II J KKK L MM *

mit den Anforderungen der folgenden Richtlinien und Normen übereinstimmt. is in conformity with the requirements of the following directives and standards. est conforme aux exigences des directives et des normes suivantes.

Richtlinie(n) / Directive(s) / Directive(s)	Norm(en) / Standard(s) / Norme(s)
2014/34/EU ATEX-Richtlinie 2014/34/EU ATEX Directive 2014/34/UE Directive ATEX	EN IEC 60079-0:2018 EN 60079-5:2015 EN IEC 60079-7:2015 + A1 :2018 EN 60079-11:2012 EN 60079-31:2014
Kennzeichnung, marking, marquage:	<u>Type KB2-Z1HSG00</u> <u>Type PD2-Z1HSG00</u> II 2G Ex ia IIC T4 Gb II 2D Ex ia IIIC T ₂₀₀ 135°C Db
	(when connected to an la-circuits)
	 II 2G Ex ib IIC T4 Gb II 2D Ex ib IIIC T₂₀₀ 135°C Db (when connected to an ib-circuits)
	<u>Туре КВ2-Z1HSGU3</u>
	Type PD2-Z1HSGU3 Il 2G Ex eb ia q IIC T4 Gb Il 2D Ex ia tb IIIC T135°C Db (when connected to an ia-circuits)
	 Il 2G Ex eb ib q IIC T4 Gb Il 2D Ex ib tb IIIC T135°C Db (when connected to an ib-circuits)
EU-Baumusterprüfbescheinigung: EU Type Examination Certificate: Attestation d'examen UE de type:	BVS 20 ATEX E 106 X (DEKRA EXAM GmbH Dinnendahlstraße 9, 44809 Bochum, Germany, NB0158)
2014/30/EU EMV-Richtlinie 2014/30/EU EMC Directive 2014/30/UE Directive CEM	DIN EN IEC 61000-6-2:2019-11 DIN EN IEC 61000-6-4:2020-09
2014/53/EU Funkanlagen-Richtlinie 2014/53/EU Radio Equipment Directive 2014/53/UE Directive Équipement Radioélectrique	For type with MM=U3 only: ETSI EN 300 330 V2.1.1 ETSI EN 301 489-1 V2.2.3 ETSI EN 301 489-3 V2.1.1
Produktnormen nach Niederspannungsrichtlinie: Product standards according to Low Voltage Directive: Normes des produit pour la Directive Basse Tension:	For type with MM=U3 only: EN 62368-1:2014/AC:2015/A11:2017
20210970040 Konformitätserklärung KB2 HSG-Z1.docx	Template_EGEU_Konf_20150720.docx, Page 1 / 2

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EU-Konformitätserklärung *EU Declaration of Conformity Déclaration de Conformité UE*

Produktnormen nach RoHS-Richtlinie (2011/65/EU): Product standards according to RoHS Directive: Normes des produit pour la Directive RoHS: EN IEC 63000:2018

Für spezifische Merkmale und Bedingungen siehe Betriebsanleitung. For specific characteristics and conditions see operating instructions. Pour les caractéristiques et conditions spécifiques, voir le mode d'emploi.

i.V.

Köln, 2021-04-22

1cc

Ort und Datum Place and date Lieu et date J. Düren Technical Director

i.V. A. Jung

Ex Representative

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25.1.1.4 KB2 / PD2 –Z2 -HSG

EU-Konformitätserklärung

EU Declaration of Conformity Déclaration de Conformité UE



R. STAHL HMI Systems GmbH • Adolf-Grimme-Allee 8 • 50829 Köln, Germany erklärt in alleiniger Verantwortung, declares in its sole responsibility, déclare sous sa seule responsabilité,

dass das Produkt: that the product: que le produit: Keyboard with pointing device and enclosure Pointing device and enclosure

Typ(en), type(s), type(s):

KB2-Z2-CCC-DD-EE-F-GG-HSG H II J KKK L MM * PD2-Z2-CCC-DD-EE-F-GG-HSG H II J KKK L MM *

mit den Anforderungen der folgenden Richtlinien und Normen übereinstimmt. is in conformity with the requirements of the following directives and standards. est conforme aux exigences des directives et des normes suivantes.

Richtlinie(n)	/ Directive(s) / Directive(s)	Norm(en) / Standard(s) / Norme(s)
2014/34/EU 2014/34/EU 2014/34/UE	ATEX-Richtlinie ATEX Directive Directive ATEX	EN IEC 60079-0:2018 EN IEC 60079-7:2015 + A1 :2018 EN 60079-11:2012 EN 60079-15:2010 EN 60079-31:2014
Kennzeichn	ung, marking, marquage:	Type KB2-Z2HSG00 Type PD2-Z2HSG00 II 3G Ex ic IIC T4 Gc II 3D Ex ic IIIC T ₂₀₀ 135°C Dc Type KB2-Z2HSGU3 Type PD2-Z2HSGU3 Type PD2-Z2HSGU3 Type Z2-ZHSGU3 Type D2-Z2HSGU3 Type D2-Z2HSGU3 Type Z2-ZHSGU3 Type Z2-ZHSGU3
EU Type Exan	r prüfbescheinigung: nination Certificate: xamen UE de type:	BVS 20 ATEX E 107 X (DEKRA EXAM GmbH Dinnendahlstraße 9, 44809 Bochum, Germany, NB0158)
2014/30/EU 2014/30/EU 2014/30/UE	EMV-Richtlinie EMC Directive Directive CEM	DIN EN IEC 61000-6-2:2019-11 DIN EN IEC 61000-6-4:2020-09
2014/53/EU 2014/53/EU 2014/53/UE	Funkanlagen-Richtlinie Radio Equipment Directive Directive Équipement Radioélectrique	For type with MM=U3 only: ETSI EN 300 330 V2.1.1 ETSI EN 301 489-1 V2.2.3 ETSI EN 301 489-3 V2.1.1
Product standa	en nach Niederspannungsrichtlinie: rds according to Low Voltage Directive: oduit pour la Directive Basse Tension:	For type with MM=U3 only: EN 62368-1:2014/AC:2015/A11:2017
Product standa	en nach RoHS-Richtlinie (2011/65/EU): rds according to RoHS Directive: oduit pour la Directive RoHS:	EN IEC 63000:2018

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EU-Konformitätserklärung *EU Declaration of Conformity Déclaration de Conformité UE*

Für spezifische Merkmale und Bedingungen siehe Betriebsanleitung. For specific characteristics and conditions see operating instructions. Pour les caractéristiques et conditions spécifiques, voir le mode d'emploi.

Köln, 2021-04-22

i.V. Toalin Duce

Ort und Datum Place and date Lieu et date

J. Düren **Technical Director**

i.V. A. Jung

Ex Representative

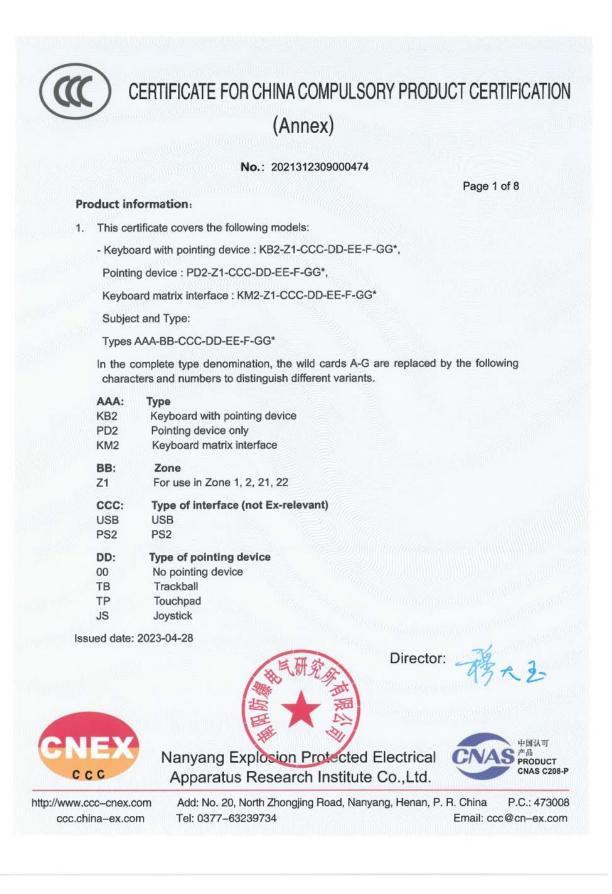
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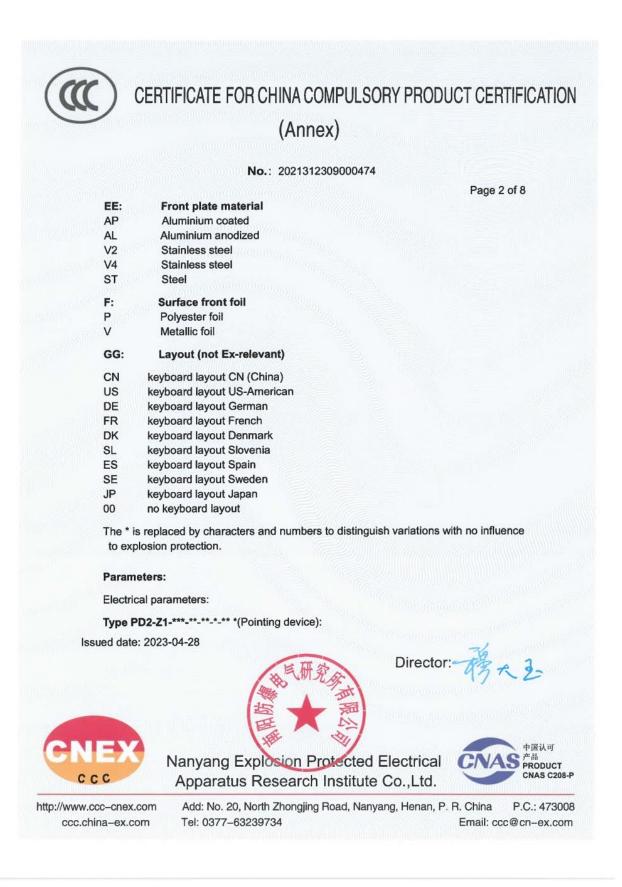
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25.1.2 CCC

25.1.2.1 KB2 / PD2 - Z1







No.: 2021312309000474

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Supply via a permanently connected cable with max. 5 m length.

Wires: for 8-wire cable: +5V (red resp. 5), USB-m (gray resp. 7), USB_p (pink resp. 8) and GND (blue resp. 6).

for 4-wire cable: +5V (white resp. 1), USB-m (green resp. 2), USB_p (yellow resp. 3) and GND (brown resp. 4).

Maximum input voltage Ui	5.9V DC
Maximum input current I	
For Group II	319mA
For Group III, ia	319mA
For Group III, ib	250mA
Maximum input power Pi	650mW
Effective internal capacitance Ci	21µF
Effective internal inductance Li	1.68µH
For the permanently connected cable additionally:	e, the following values have to be respected
Cable capacitance Cc	200pF/m
Cable inductance Lc	1µH/m

Type KB2-Z1-***-00-**-**** (Keyboard without Pointing Device) :

Supply via a permanently connected cable with max. 5 m length.

Wires: +5V (white resp. 1), USB-m	n (green resp. 2), USB_p (yellow resp. 3) and GND
(brown resp. 4).	
Mandara in the desider of the	E OV DO

Maximum input voltage Ui	5.9V DC	
Maximum input current li		allande

Issued date: 2023-04-28



No.: 2021312309000474

Page 4 of 8

For Group II	319mA	
For Group III, ia	319mA	
For Group III, ib	250mA	
Maximum input power Pi	650mW	
Effective internal capacitance Ci	21µF	
Effective internal inductance Li	1.68µH	
For the permanently connected cable additionally:	e, the following values have to be respected	
Cable capacitance Cc	200pF/m	
Cable inductance L _c	1µH/m	

Type KB2-Z1-***-TB-**-*-** *, KB2-Z1-***-TP-**-*-** *, KB2-Z1-***-JS-**-*-***:

(Keyboard with Pointing Device)

Supply with 2 separate intrinsically safe circuits via an 8-wire permanently connected cable with max. 5 m length.

Keyboard-circuit:

Wires: +5V (white resp. 1), USB-m (green resp. 2), USB_p (yellow resp. 3) and GND (brown resp. 4).

Maximum input voltage Ui	5.9V DC
Maximum input current Ii	
For Group II	319mA
For Group III, ia	319mA
For Group III, ib	250mA
Maximum input power Pi	650mW

Issued date: 2023-04-28





PRODUCT CNAS C208-F Apparatus Research Institute Co., Ltd.

http://www.ccc-cnex.com ccc.china-ex.com

Add: No. 20, North Zhongjing Road, Nanyang, Henan, P. R. China P.C.: 473008 Tel: 0377-63239734 Email: ccc@cn-ex.com

Director:

No.: 2021312309000474

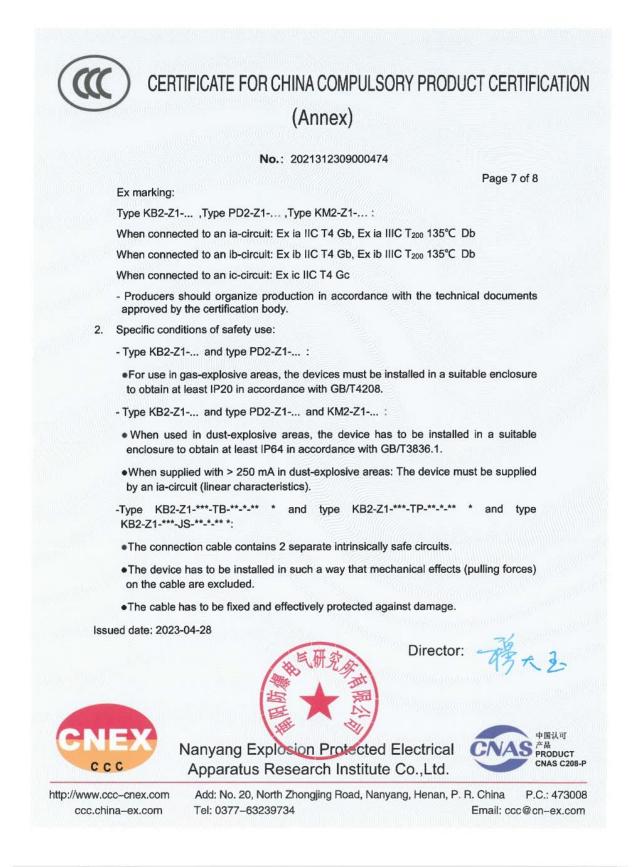
 $\begin{tabular}{|c|c|c|c|c|} \hline Page 5 of 8 \\ \hline Effective internal capacitance C_i & 21 \mu F \\ \hline Effective internal inductance L_i & 1.68 \mu H \\ \hline For the permanently connected cable, the following values have to be respected additionally: \\ \hline Cable capacitance C_c & 200 p F/m \\ \hline Cable inductance L_c & 1 \mu H/m \\ \hline \end{tabular}$

Pointing Device-Circuit :

Maximum input voltage Ui	5.9V DC
Maximum input current li	
For Group II	319mA
For Group III, ia	319mA
For Group III, ib	250mA
Maximum input power Pi	650mW
Effective internal capacitance Ci	21µF
Effective internal inductance Li	1.68µH
For the permanently connected cable additionally:	e, the following values have to be respected
Cable capacitance C _c	200pF/m
Cable inductance L _c	1µH/m

Type KM2-Z1-***-**-** *(Keyboard Matrix):

	4)	Annex)
	No.: 20	21312309000474
		Page 6 of 8
	Supply:	
	Terminal block X1	
	Terminals:+5V (1), USB_m (2), USB_p	9 (3), GND (4).
	Maximum input voltage Ui	5.9V DC
	Maximum input current Ii	
	For Group II	319mA
	For Group III, ia	319mA
	For Group III, ib	250mA
	Maximum input power Pi	650mW
	Effective internal capacitance C _i	20.5µF
	Effective internal inductance Li Terminal 5 is intended for connection	1.68µH
	(The signals at all 3 terminal blocks are Maximum output voltage U _o	e regarded as 1 intrinsically safe circuit)
	Maximum output current Io	250 mA
	Maximum output power Po	= Pi
	Maximum external capacitance Co	0.5µF
	Maximum external inductance Lo	0.5µH
	Ambient temperature:-40°C~+70°C	
lss	ued date: 2023-04-28	Director: 73-2





25.1.2.2 KB2 / PD2 - Z1-*-HSG*00* / *U3*

CERTIFICATE FOR CHINA COMPULSORY PRODUCT CERTIFICATION

No.: 2021312309000476

Applicant	R. STAHL HMI Systems GmbH			
Address	Adolf-Grimme-Allee 8, 50829 Koln, Germany			
Manufacturer	R. STAHL HMI Systems GmbH			
Address	Adolf-Grimme-Allee 8, 50829 Koln, Germany			
Production Factory	R. STAHL HMI Systems GmbH			
Production Address	Adolf-Grimme-Allee 8, 50829 Koln, Germany			
Product	Keyboard			
Model/Type	KB2-Z1HSG, PD2-Z1HSG			
Ex marking	See Annex			
Reference Standards	GB/T 3836.1-2021, GB/T 3836.3-2021, GB/T 3836.4-2021, GB/T 3836.7-2017, GB/T 3836.31-2021			

Certification mode Type Test + Initial Factory Inspection + Post-Certification Surveillance

The product(s) is verified and certified according to CNCA-C23-01: 2019 China Compulsory Certification Implementation Rule on Explosion Protected Electrical Product and CNEX-C2301-2019 Guideline of China Compulsory Certification Implementation Rule on Explosion Protected Electrical Product.

See Annex for the detailed product information (9 pages)

Initial issue date: 2021-05-14

Issued date: 2023-04-29

Valid to: 2026-05-13

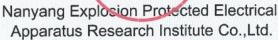
The validity of this certificate is maintained through the regular supervision of the issuing authority during the validity period.

Where any discrepancy arises between the English translation and the original Chinese version, the Chinese version shall prevail.





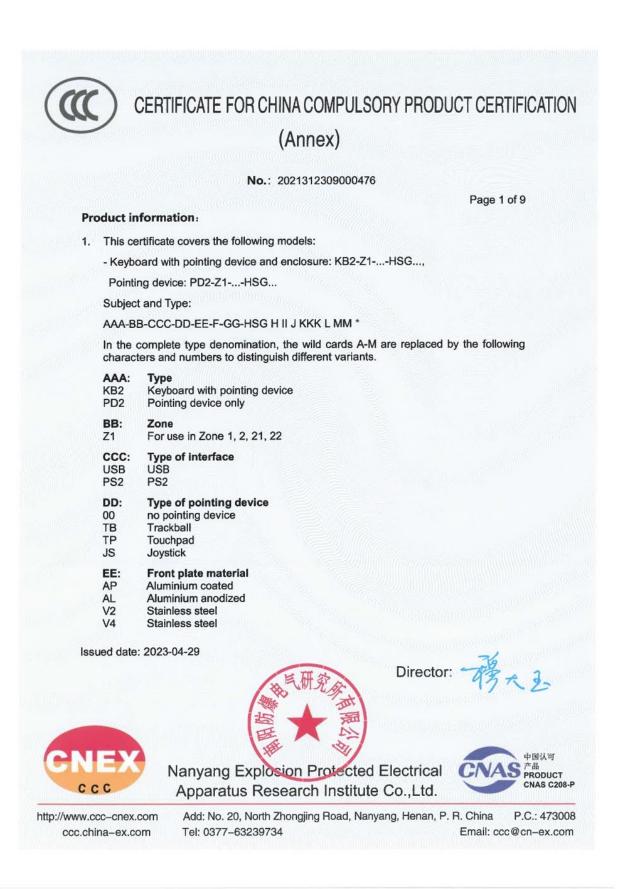


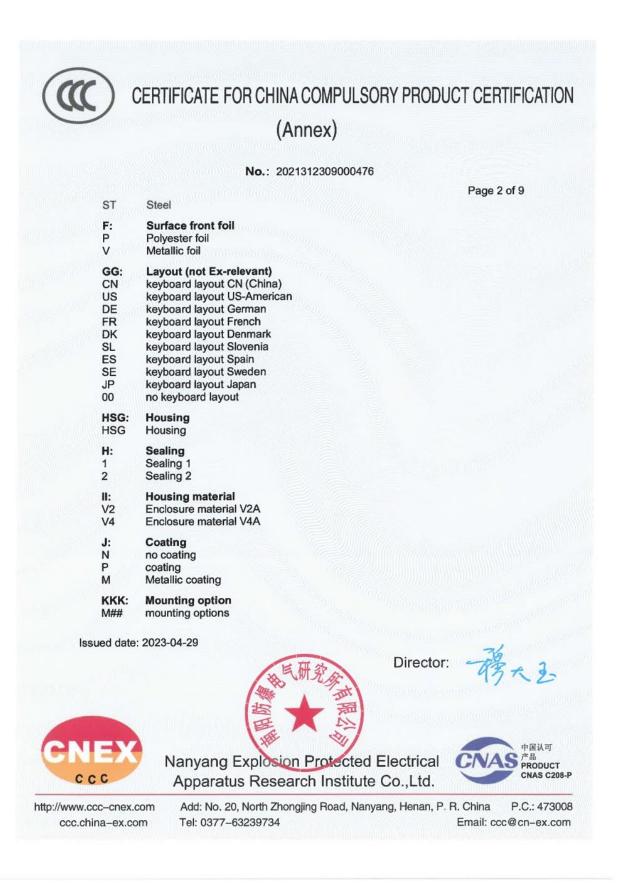


中国认可 产品 PRODUCT CNAS C208-P

http://www.ccc-cnex.com ccc.china-ex.com Add: No. 20, North Zhongjing Road, Nanyang, Henan, P. R. ChinaP.C.: 473008Tel: 0377-63239734Email: ccc@cn-ex.com







		(Annex)
	Ne	o.: 2021312309000476
	NC	Page 3 of 9
B##	backcover type	
L:	Design option (not Ex-	-relevant)
S G	Standard GMP-option	
MM: 00 U3	Accessory no accessory UB03	
	is replaced by characters a losion protection.	and numbers to distinguish variations with no influence
	is replaced by one charact losion protection.	ter or number to distinguish variations with no influence
Param	ieters:	
Electri	cal parameters:	
Type F	PD2-Z1-***-**-**-**-HSG *	* ** * *** * ** *(Pointing device) :
Supply	via a permanently connect	cted cable with max. 5 m length.
Wires	for 8-wire cable: +5V (red	resp. 5), USB-m (gray resp. 7), USB_p (pink resp. 8)
		re cable: +5V (white resp. 1), USB-m (green resp. 2),
and the second se	p (yellow resp. 3) and GNE m input voltage Ui	D (brown resp. 4).
	m input current li	
For Grou		319 mA
For Grou		319 mA
For Grou	Jp III, ib	250 mA
sued date	e: 2023-04-29	Director:

No.: 2021312309000476

	Page 4
Maximum input power Pi	650 mW
Effective internal capacitance Ci	21 µF
Effective internal inductance L	1.68 µН
For the permanently connected cabl additionally:	le, the following values have to be respected
Cable capacitance Cc	200 pF/m
Cable inductance L _c	1 µH/m

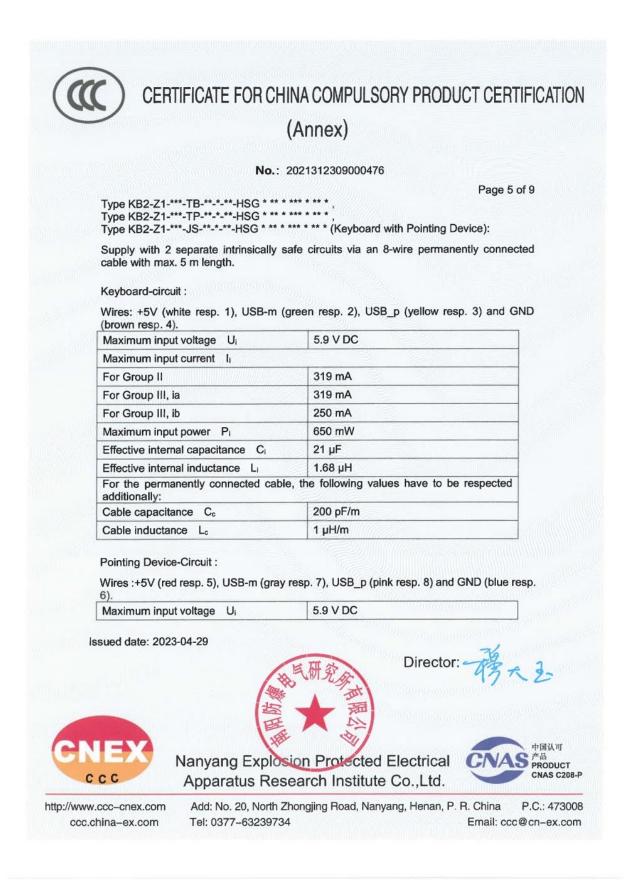
Type KB2-Z1-***-00-**-*-HSG * ** * *** * ** *(Keyboard without Pointing Device) :

Supply via a permanently connected cable with max.5m length.

Wires: +5V (white resp.1), USB-m (green resp. 2), USB_p (yellow resp. 3) and GND (brown resp. 4).

Maximum input voltage Ui	5.9 V DC			
Maximum input current li				
For Group II	319 mA			
For Group III, ia	319 mA			
For Group III, ib	250 mA			
Maximum input power Pi	650 mW			
Effective internal capacitance Ci	21 µF			
Effective internal inductance Li	1.68 µH			
For the permanently connected cable additionally:	e, the following values have to be respected			
Cable capacitance Cc	200 pF/m			
Cable inductance Lc	1 μH/m			





CERTIFICATE FOR CHINA COMPULSORY PRODUCT CERTIFICATION (Annex)

No.: 2021312309000476

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Maximum input current li	
For Group II	319 mA
For Group III, ia	319 mA
For Group III, ib	250 mA
Maximum input power Pi	650 mW
Effective internal capacitance Ci	21 µF
Effective internal inductance Li	1.68 µH
For the permanently connected cable additionally:	e, the following values have to be respected
Cable capacitance C _c	200 pF/m
Cable inductance L _c	1 µH/m

Type ***-Z1-***_**-*-*-HSG * ** * *** * U3 *(Accessory UB03) :

Terminal block X1, pin1		
Non-intrinsically safe supply circ	uit (Power)	
Nominal voltage	5~30V DC	n no
Nominal current	≤ 1 A	
Nominal power	≤ 30 W	
Max. input voltage Um	250V AC	
Terminal block X1, pin 2 and 3		all
Non-intrinsically safe interfaces of	data	
Nominal voltage	5V AC/DC	<u>11</u> 14
Max. input voltage Um	250V AC	all
Terminal block X1, pin 2 and 3 (1	for "UB03-*-RFID-*-RS422*" only)	

Issued date: 2023-04-29



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CERTIFICATE FOR CHINA COMPULSORY PRODUCT CERTIFICATION (Annex)

No.: 2021312309000476

	Page 7
Non-intrinsically safe interfaces	data
Max. voltage	30V AC/DC
Max. current	≤1A
Terminal block X1, pin 2 and only)	3 (for "UB03-*-AMP-Audio*" and "UB03-*-DSP-10*"
Non-intrinsically safe interfaces	data
Max. output voltage	30V AC/DC
S SOUL	

Terminal block X2	
Non-intrinsically safe interfaces d	ata
Nominal voltage	5V AC/DC
Max. input voltage Um	250V AC

Rated ambient temperature range: -40 °C up to +70 °C Ex marking:

Type KB2-Z1-...-HSG...00... and Type PD2-Z1-...-HSG...00... : When connected to an ia-circuit: Ex ia IIC T4 Gb, Ex ia IIIC T₂₀₀ 135°C Db When connected to an ib-circuit: Ex ib IIC T4 Gb, Ex ib IIIC T₂₀₀ 135°C Db When connected to an ic-circuit: Ex ic IIC T4 Gc Type KB2-Z1-...-HSG...U3... and Type PD2-Z1-...-HSG...U3... : When connected to an ia-circuit: Ex eb ia q IIC T4 Gb, Ex ia tb IIIC T135°C Db When connected to an ib-circuit: Ex eb ia q IIC T4 Gb, Ex ib tb IIIC T135°C Db When connected to an ib-circuit: Ex eb ib q IIC T4 Gb, Ex ib tb IIIC T135°C Db When connected to an ic-circuit: Ex eb ib q IIC T4 Gb, Ex ib tb IIIC T135°C Db

Issued date: 2023-04-29



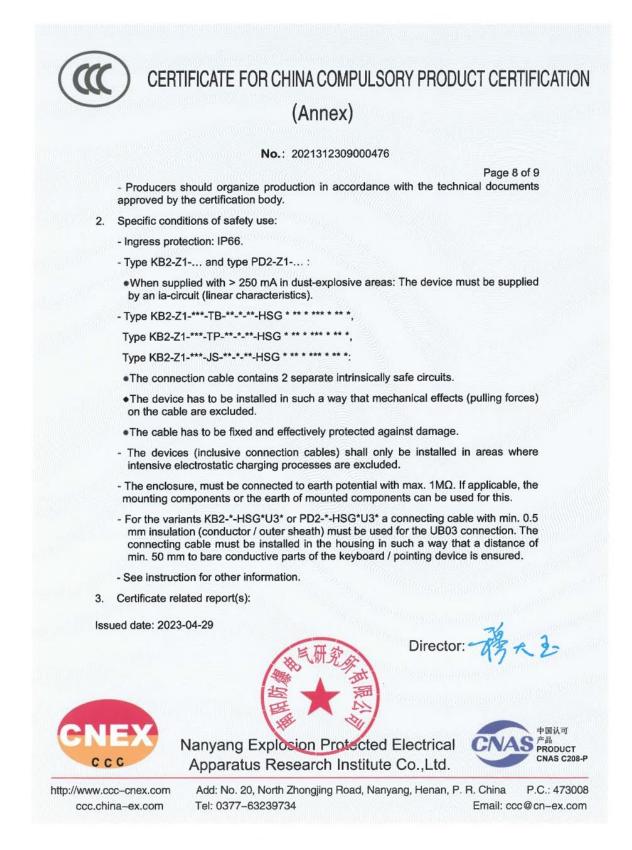


Nanyang Explosion Protected Electrical Apparatus Research Institute Co.,Ltd.



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Director





25.1.3 KCC

25.1.3.1 KB2-Z1-*-TB-*

86F1-AB74-E036-35BA	21-043669-0
방송구	통신기자재등의 적합등록 필증
Registration	n of Broadcasting and Communication Equipments
상호 또는 성명 Trade Name or Registrant	알스탈주식회사
기자재명칭(제품명칭) Equipment Name	Keyboard with trackball
기기부호/추가 기기부호 Equipment code /Additional Equipment code	IND
기본모델명 Basic Model Number	KB2-Z1-USB-TB-AP-P-DE
파생모델명 Series Model Number	
등록번호 Registration No.	R-R-RSE-KB2-Z1-USB-TB
제조자/제조국가 Manufacturer/Country of Origin	R.stahl HMI Systems GmbH / 독일
등록연월일 Date of Registration	2022-03-23
기타 Others	
	」제58조의2 제3항에 따라 등록되었음을 증명합니다. equipment has been registered under the Clause 3, Article 58-2 of Radio 2022년(Year) 03월(Month) 23일(Day
	국립전파연구원장 <mark>국립신</mark> 한연구 한장인
Director	General of National Radio Research Agency
※ 적합등록 방송	통신기자제는 반드시 "적 합성평가표시" 를 부착하여 유통하여야 합니다. 위반시 과태료 처분 및 등록이 취소될 수 있습니다.

25.1.3.2 KB2-Z1-*-TP-*

Registratio 상호 또는 성명 Trade Name or Registrant 기자재명칭(제품명칭) Equipment Name	통신기자재등의 적합등록 필증 n of Broadcasting and Communication Equipments
상호 또는 성명 Trade Name or Registrant 기자재명칭(제품명칭) Equipment Name	
Trade Name or Registran 기자재명칭(제품명칭) Equipment Name	알스탈주식회사
Equipment Name	
	Keyboard with touchpad
기기부호/추가 기기부호 Equipment code /Additional Equipment code	IND
기본모델명 Basic Model Number	KB2-Z1-USB-TP-AP-P-DE
파생모델명	
Series Model Number	
등록번호 Registration No.	R-R-RSE-KB2-Z1-USB-TP
제조자/제조국가 Manufacturer/Country of Origin	R.stahl HMI Systems GmbH / 독일
등록연월일 Date of Registration	2022-03-23
기타 Others	
	」제58조의2제3항에따라 등록되었음을 증명합니다.
Waves Act.	equipment has been registered under the Clause 3, Article 58-2 of Radio
	2022년(Year) 03월(Month) 23일(Day)
	그리고리성그의가파연구
	국립전파연구원장 탄장인
Director	General of National Radio Research Agency
※ 적합등록 방송	통신기자재는 반드시 "적 합성평가표시" 를 부착하여 유통하여야 합니다. 위반시 과태료 처분 및 등록이 취소될 수 있습니다.

25.1.3.3 KB2-Z1-*-JS-*

방송통신기자재등의 적합등록 필증 Registration of Broadcasting and Communication Equipments 상호 또는 성명 Trade Name or Registrant 알스탈주식회사 기가재명칭(제품명칭) Equipment Name 기기부호/추가기기부호 Equipment code Additional Equipment code	
Trade Name or Registrant 필드릴다니되자 기자재명칭(제품명칭) Equipment Name Keyboard with joystick 기기부호/추가기기부호 Equipment code (Additional Equipment code IND	
기자재명칭(제품명칭) Equipment Name Keyboard with joystick 기기부호/추가기기부호 Equipment code IND IND	
Equipment code IND	
7] में प जी में	
기근도일경 KB2-Z1-USB-JS-AP-P-DE Basic Model Number	
파생모델명 Series Model Number	
등록번호 Registration No. R-R-RSE-KB2-Z1-USB-JS	
제조자/제조국가 Manufacturer/Country of Origin	
등록연월일 Date of Registration 2022-03-22	
기타 Others	
위 기자재는 「전파법」제58조의2제3항에 따라 등록되었음을 증명합니다. It is verified that foregoing equipment has been registered under the Clause 3, Article 58-2 o Waves Act. 2022년(Year) 03월(Month) 2 고립전파연구원장 Director General of National Radio Research Agency * 적합등록 방송통신기자제는 반드시 "적합성평가표시" 를 부착하여 유통하여야합니다. 위반시 파태료 처분 및 등록이 취소될수 있습니다.	2일(Day

26 Appendix K

26.1 Keyboard layouts

26.1.1 German - DE



26.1.2 American - US

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26.1.4 Spanish - ES

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26.1.5 Swiss German - DE-CH

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26.1.6 Nordic

Swedish, Finnish, Norwegian, Danish



26.1.7 Slovenian - SL

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JIS standard

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26.1.9 Hungarian - HU



^{26.1.10} Ukrainian - UA

In preparation

27 Appendix L

27.1 Release notes

The chapter entitled "Release Notes" contains all the changes made in every version of the Operating Instructions.

Version 01.00.06

- Removal of older release notes
- Correction of CE / ATEX listing in section "Certificates"
- Changing designation "International" to "Global" in section "Approvals"
- Removal of EAC certification
- Removal of EAC Ex classification
- Removal of EAC declaration of conformity
- Update CCC certification, adaption Ex classification
- Renew CCC certificates (english), (chinese certificates in "certificate combination KB2 (CE_Keyboards_KB2)"
- Renew BIS approval
- Adaption earthing material in section "Scope of delivery"
- Adaption text and drawing for earthing material for xx7 and xx8 in section "Connection overview cable assignment KB2"
- Adaption text and drawing for earthing material for ORCA01* in section "Connection overview cable assignment KB2"
- Deleted "Standard cable length of 2.4 m" in section "Proof of intrinsic safety Connections"
- Changing / addition of attribute description for cable length in section "Technical data"
- Addition of section "Installation Instructions Requirements China" in Appendix I
- Addition of code "NX Devices for Non-Ex" in section "Type code layout"
- Addition of "Desktop enclosure with keyboard for Non-Ex applications" in section "Enclosure"
- Addition of reference to document "2023348000_1-Arbeitsanweisung KB2 Desktop Binderstecker.pdf" in section "Further documents"
- Addition of "KB2 desktop assemblies" in section "Scope of delivery"
- Addition of drawings "Desktop enclosure with keyboard" in section "Enclosure versions"
- Addition of section "Keyboard with pointing device desktop mounting"
- Addition of "Symbol electrostatic discharge hazard" in section "Warning notes"
- Addition of section "Installation KB2 in enclosure"
- Addition of "Comment" according to ATEX / IECEx in section "Approvals"
- Changing picture "Design of a type label"
- Adaption values for Co and Lo in section "Connections"
- Formal changes

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