

GKey – Safety Lock

Excerpts from the original instructions



- [EN] The complete original instructions can be found at:
 [DE] Die komplette Originalbetriebsanleitung ist zu finden unter:
 [ES] La versión original de la instrucciones está disponible en:
 [FR] La notice originale intégrale est disponible sur :
 [IT] Le istruzioni originali complete si trovano qui:
 [SV] Den kompletta bruksanvisningen i original finns på:
 [ZH] 完整的原始说明可以在以下网址查阅:

www.abb.com/jokabsafety

General description

GKey safety lock incorporate an RFID interlock switch and is designed to fit to the leading edge of machine guard doors to provide robust guard locking and double tamper resistant interlock mechanism. It is designed to provide position interlock detection for moving guards and will keep the guard locked until a voltage is applied to the switch solenoid.

GKey safety lock will hold guards closed up to 3000 N. It can be used in conjunction with delay timers to provide the solenoid energize signal only after a pre-determined time has run down. GKey housing can incorporate positions for mounting of standard 22 mm pushbuttons, switches or lamps to facilitate machine request functions and diagnostics all in one housing. These pilot devices are ordered separately.

Installation

Installation of all GKey safety locks must be in accordance with a risk assessment for the individual application.

Installation shall only be carried out by competent personnel and in accordance with these instructions.

Use 16-28 AWG copper conductors. Terminal torque 0.7 Nm.

 **Caution!** Make sure the Manual unlock function selector is in “Locked” position before putting the cover back on.

Mount the GKey rigidly to the fixed frame of the guard or machine. Fit the actuator to the moving part of the guard and align it to the switch entry aperture.

1. M5 mounting bolts must be used to fix the switch and actuator mounting.
The tightening torque to ensure reliable fixing is 4.0 Nm.
Tightening torque for the lid screws and cable glands must be 1.5 Nm to ensure the IP seal.
Always fit the aperture plug to the unused entry aperture to prevent debris entering the switch mechanism.
2. Always fit a mechanical stop to the guard to prevent damage to the switch.
Ensure correct alignment of actuator and handle with front apertures of the switch and guide. Use alignment guides to ensure that the actuator enters the switch without interfering with the sides of the aperture.
Do not mount adjacent switches or actuators closer than 100 mm.
3. The manual unlock function is achieved by using a tool and is to be used in exceptional circumstances. The release can be protected by use of a tamper coating to prevent unintended operation. If operated, this tamper protection is damaged and must be restored to ensure protection.
4. When fitting a handle, ensure that M6 mounting bolts are used to fix the mounting plate. The tightening torque to ensure reliable fixing is 4.0 Nm.

 **Warning!** When cutting the panel to allow the movement of the rear handle:

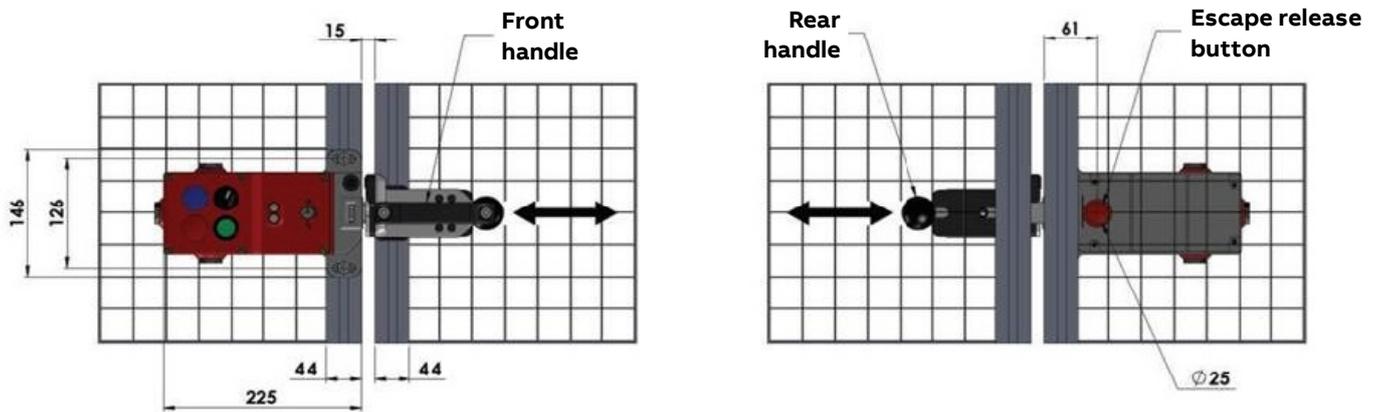
- Consider the opening when calculating the safety distance
- Make sure that there are no remaining sharp cutting edges

Check after installation

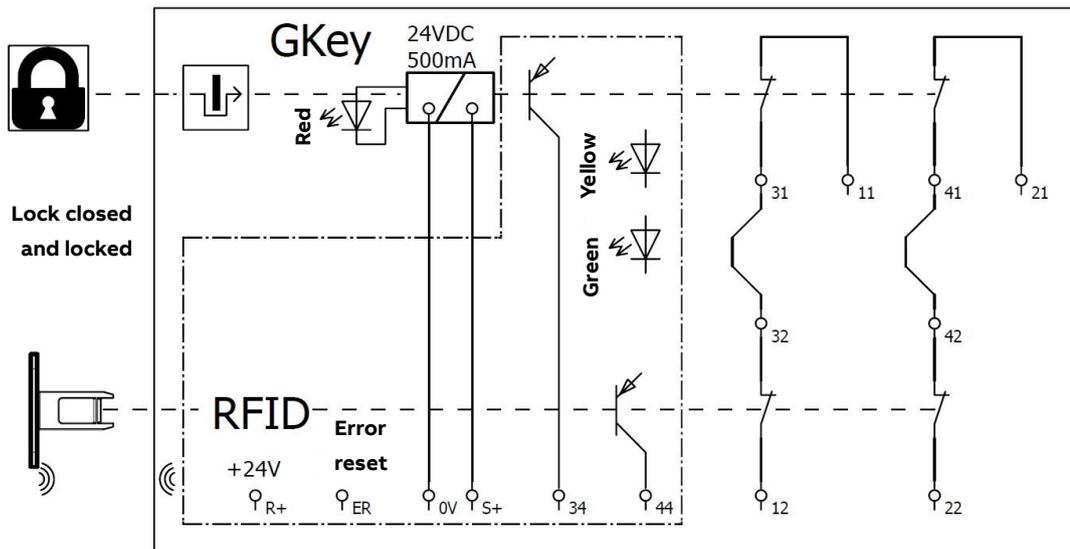
After installation operation of all control circuits, the locking function and rear escape release functions shall be checked.

Before the lock out function is used, a test is needed. To ensure the lock out function and that it is not possible to close the GKey when a padlock is hung on the handle, the selected padlocks and GKey must be tested in combination.

For applications with a run-down time after removing power, ensure that the correct timing allowance has been made before the solenoid is energized.



Electrical connections



Terminal connections	
0 V	Supply 0 V
R+	Supply +24 VDC
S+	Unlock signal (solenoid) +24 VDC in
11/12	Safety interlock and lock monitoring circuit
21/22	Safety interlock and lock monitoring circuit
44	Guard opened signal +24 VDC out
34	Guard unlocked signal +24 VDC out
ER	External Reset Signal

LED Diagnostics

There are two LED indicators on the GKey switch.

Safety lock state	LED 1 (Green/Yellow)	Comment
Guard Open	OFF	
Guard Closed + Locked	Steady green	Safety outputs ON
Guard Closed + Unlocked	Flashing green	
Guard Closed + Misaligned/ Wrong actuator	Alternate flashing green/ yellow	
Fault	Steady yellow	See Reset instructions (in complete original instructions)
Problem with reset procedure	Steady green and yellow	Make sure the RFID actuator is in contact with GKey (guard closed) and cycle the power.

Solenoid state	LED 2 (Red)
Energized	ON
De-energized	OFF

Maintenance

Every month: Check correct operation of all circuits and the Lock function. If any part of the GKey product displays mechanical damage, then remove and replace.

Every six months: Isolate power and remove cover. Check screw terminal tightness and check for signs of moisture ingress. Re-check according to the installation instructions in this manual.

 **Warning!** The safety functions and the mechanics shall be tested regularly.

 **Warning!** In case of breakdown or damage to the product, contact the nearest ABB Jokab Safety representative. Do not try to repair the product yourself since it may accidentally cause permanent damage to the product, impairing the safety of the device which in turn could lead to serious injury to personnel.

Manufacturer	
Address	ABB AB, Jokab Safety Varlabergsvägen 11 SE-434 39 Kungsbacka Sweden

Technical data	
Supply voltage	+24 VDC ±10 %
Power consumption	R+ 1.2 W (50 mA max.) S+ 12 W (500 mA max.)
Safety circuits	+24 VDC, 200 mA max. switching
Auxiliary circuits (34 & 44)	+24 VDC, 200 mA max. output feed
Rated insulation voltage	500 VAC
Rated impulse withstand	1000 VAC
Holding force	F1 max. 3000 N
Switch holding force (F_{Zh})	2307 N
Classification and coding level (EN ISO 14119)	Type 4 high
Actuator insertion distance for assured locking	5 mm
S_{ao} (RFID)	10 mm
S_{ar} (RFID)	20 mm
Operating frequency	1 Hz max.
Actuator entry minimum radius	175 mm
Body material	Die-cast metal aluminum alloy
Head material	Stainless steel
Mechanical actuator material	Stainless steel
Enclosure protection	IP65
Operating temperature	-25 °C to +40 °C
Mechanical life expectancy (B_{10D})	2.5×10^6 cycles at 100 mA load
Vibration	IEC 60068-2-6, 10-55 Hz+1 Hz Excursion: 0.35 mm, 1 octave/min

Safety / Harmonized standards	
Conformity	European Machine Directive 2006/42/EC EN 60947-5-3, EN ISO 13849-1, EN 62061, EN ISO 14119, UL 508
EN ISO 13849-1	Performance level: PL e (If both channels are used in conjunction with a SIL3/PL e control device) Category 4, $MTTF_d = 1100$ a Diagnostic coverage: DC = 99% (High)
EN 62061 (used as a subsystem)	Safety integrity level: SIL3 PFH (1/h) = $4.77E-10$ (Corresponds to 4.8% of SIL3) PFD = $4.77E-10$ (Corresponds to 4.2% of SIL3) Proof test interval $T_1 = 20$ a
Operating assumptions	Days per year: $d_{op} = 365$ d Hours per day: $h_{op} = 24$ h
Note: If the usage of the product differs from these assumptions (different load, operating frequency, etc.) the values must be adjusted accordingly.	
Certifications	cULus, TÜV Rheinland

Information for use in USA/Canada	
Enclosure	Type 1
Maximum temperature	40 °C
Conductors	Use 16-28 AWG copper conductors (rated +90 °C)
Terminal torque	6 lb ins. (0.7 Nm)
Intended for same polarity use	
Safety circuits (11-31 & 21-41)	A300 Pilot duty 240 V 3A (PF 0.38 or greater tested for 6,000 cycles endurance)
Push button ratings (optional)	120 - 240 VAC, 1.5 - 1.0 A 24 - 125 VDC, 0.3 - 0.2 A
Use one polymeric conduit connection. Not suitable for connection to rigid metal conduit. (Earth bonding terminal inside enclosure if required – use 16-12 AWG conductors)	



Descriptions and examples show how the product works and can be used. It does not mean that it fulfills the requirements for all types of machines and processes. The buyer/user is responsible for installing and using the product according to applicable standards and regulations. We reserve the right to make changes to the product and the documentation without prior notice.