



# KILLARK

**HUBBELL ELECTRICAL PRODUCTS**  
 A Division of HUBBELL INC. (Delaware)  
 2112 Fenton Logistics Park Blvd  
 Fenton, Missouri 63026 USA

## INSTALLATION, OPERATION & MAINTENANCE DATA SHEET

### Series "GZ" and "GZ...-M" Operators

#### APPLICATION

Series GZ and GZ...-M include pilot lights, pushbutton switches, illuminated pushbutton switches, selector switches and (operator/actuator with contact block) combinations. They are used in control stations, panels and enclosures used in areas made hazardous due to the presence of flammable vapors, gases or combustible dusts.

#### UL/CSA application details:

Identification:	Class I, Division 1, Groups B, C, D Class II, Division 1, Groups E, F, G Class III E12379
Certificate:	E12379
Ambient temperature range:	-50°C to +60°C
Service temperature range:	-50°C to +100°C
Thread:	M22x1,5 (GZ*-M); 3/4" x 14 NPSM (GZ*) M16x1,5 (GZ*16*); M10x1,5 (GZ*10*)
Required threads (Class I)	Six (6) full threads engaged (GZ*-M, GZ*16* and GZ*10*)
Required threads (Class II and III):	Seven (7) full threads engaged (GZ*) Three (3) full threads engaged (GZ*-M, GZ*, GZ*16* and GZ*10*)
Ingress protection:	Type 4X
Storage temperature in original packaging	-20°C to +50°C

#### APPLICABLE STANDARDS

- UL 1203 Standard for Explosion-Proof and Dust-Ignition-Proof Electrical Equipment for use in Hazardous (Classified) Locations
- UL 50E Enclosures for Electrical Equipment
- UL 508 Standard for Industrial Control Equipment
- CSA C22.2 No. 25-17 Enclosures for use in Class II, Division 1, Groups E, F, G Hazardous Locations
- CSA C22.2 No. 30-20 Explosion-proof Enclosures
- CSA C22.2 No. 94-M91 Special Purpose Enclosures Industrial
- CSA C22.2 No. 14-18 Industrial Control Equipment
- EN 60079-0:2012/A11 | IEC 60079-0:2011 6<sup>th</sup> Ed.
- EN 60079-1:2014 | IEC 60079-1:2014 7<sup>th</sup> Ed.
- EN 60079-31:2014 | IEC 60079-31:2013 2<sup>nd</sup> Ed.

#### ELECTRICAL SPECIFICATIONS

##### PUSHBUTTONS:

<b>Rated voltage</b>	Ui 500 V	
<b>Rated current</b>	Ith 10A	
<b>Breaking capacity for AC15</b>	<b>Voltage</b>	<b>Current</b>
	220 V	10 A
	380 V	7.5 A
	500 V	5 A
<b>Breaking capacity for DC13</b>	<b>Voltage</b>	<b>Current</b>
	24 V	2.75 A
	60 V	1.10 A
	110 V	0.55 A
	220 V	0.27 A

##### PILOT LIGHTS:

##### LED SOCKET

		
<b>L001</b>	<b>LC240</b>	<b>LC480</b>
<b>12 V / 24 V / 120 V</b>	<b>240 VAC</b>	<b>480 VAC</b>
Rated voltage: 250VAC/VDC	Rated voltage: 240VAC	Rated Voltage: 480 VAC
Maximum power: 2.6 W	Maximum power: 2.6 W	Maximum power: 2.6 W

**NOTE 1:** To reach Pilot Light voltages, the socket and LED voltage combinations must be according to Note 2.

NOTE 2:	PILOT LIGHT VOLTAGE	SOCKET	LED VOLTAGE
	12 VAC/VDC	L001	12 V
	24 VAC/VDC	L001	24 V
	120 VAC/VDC	L001	120 V
	240 VAC	LC240	120 V
	480 VAC	LC480	120 V

##### POTENTIOMETERS:

##### Single Turn:

<b>Mechanical Rotation</b>	315°
<b>Power Rating</b>	0.25 W
<b>Resistance Value (Ω)</b>	220R, 470R, 1k, 2.2k, 4.7k, 10k, 22k, 47k, 100k, 220k, 470k, 1M

#### IMPORTANT NOTE

Please read these instructions carefully before installing or maintaining this equipment. When Series GZ and GZ...-M devices are to be installed in OEM equipment, refer to Installation Instruction Sheet that came with the OEM equipment for proper installation. Sound electrical practices should be followed at all times and this data should be used as a guide only.

#### IECEx and ATEX application details:

Identification:	II 2G Ex db IIC Gb II 2D Ex tb IIIC Db UL 22 ATEX 0000U <sup>1</sup> IECEx ULBR 22.0000U <sup>1</sup>
Certificates:	IECEx ULBR 22.0000U <sup>1</sup>
Ambient temperature range:	-50°C to +60°C
Service temperature range:	-50°C to +100°C
Thread:	M22x1,5 (GZ*-M); 3/4" x 14 NPSM (GZ*) M16x1,5 (GZ*16*); M10x1,5 (GZ*10*)
Required threads (EN 60079-1)	8 mm threads engaged (GZ*-M, GZ*16* and GZ*10*)
Required threads (EN 60079-31)	Five (5) threads engaged (GZ*) 3 mm (GZ*-M, GZ*16* and GZ*10*) 3.7 mm (GZ*)
Ingress Protection:	IP66W (salt spray)
Storage temperature in original packaging	-20°C to +50°C

<sup>1</sup> Note: The numbers "0000" will be replaced by the official certificate numbers

#### TECHNICAL DATA

The product is not intended to be used alone and the electrical apparatus or systems to which it was incorporated require certification as a whole, when intended for use in explosive atmospheres. The 3/4" NPSM, M22x1,5, M16x1,5 or M10x1,5 thread joint of this product, and the thread of the equipment to which it is being incorporated, must have a female 3/4" NPSM, M22x1,5, M16x1,5 or M10x1,5 thread meeting the requirements for threaded joints. **"GZ" operators are available in three bushing thread lengths; 25mm (0.94"), 40mm (1.57"), 57mm (2.24") and 67mm (2.64").**

**CAUTION:** Before installing, make sure you are compliant with area classifications, as failure to do so may result in bodily injury, death and property damage. Do not attempt installation until you are familiar with the following procedures. All installation must comply with the applicable Electrical Code(s). Make sure that the circuit is de-energized before starting installation or maintenance. Verify that the installation is grounded. Failure to ground will create electrical shock hazards, which can cause serious injury and or death.

##### ROTARY SWITCHES:

BREAKING CAPACITY FOR AC	RATED CURRENT 20 A	BREAKING CAPACITY FOR DC	RATED CURRENT 20 A
AC-3	220-240 V 3.0 kW 380-440 V 5.5 kW	24 V 48 V 60 V 110 V	
AC-15	220-240 V 5 A 380-440 V 4 A	Resistive loads T<1ms	20 A 12 A 4.5 A 1 A
AC-22A	220-240 V 20 A 380-440 V 20 A	Inductive loads T=50ms	12 A 2 A 1 A 0.4 A
AC-23A	220-240 V 3.7 kW 380-440 V 7.5 kW		
RATED VOLTAGE	690 V	RATED CURRENT	20 A
MAX. N° CONTACT CHAMBERS	6		

##### ILLUMINATED PUSHBUTTONS:

##### CONTACT BLOCK INFORMATION

<b>Rated voltage</b>	Ui 500 V	
<b>Rated current</b>	Ith 6 A	
<b>Contacts for AC 15</b>	<b>Voltage</b>	<b>Current</b>
	250 V	6 A
<b>Contacts for DC 13</b>	<b>Voltage</b>	<b>Current</b>
	24 VDC	3 A

##### LED SOCKET

<b>Maximum Power</b>	2.6 W
<b>Maximum Voltage</b>	250 V

##### Multi-Turn:

<b>Mechanical Rotation</b>	3600° (10 turns of 360°)
<b>Power Rating</b>	2 W
<b>Resistance Values (Ω)</b>	100R, 200R, 500R, 1k, 2k, 5k, 10k, 20k, 50k, 100k





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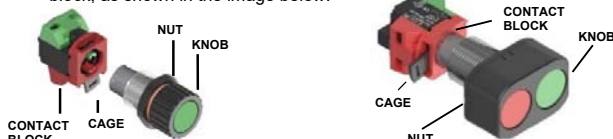
## INSTALLATION, OPERATION & MAINTENANCE DATA SHEET

### Series "GZ" and "GZ...-M" Operators

#### MOUNTING INSTRUCTIONS

##### PUSHBUTTONS:

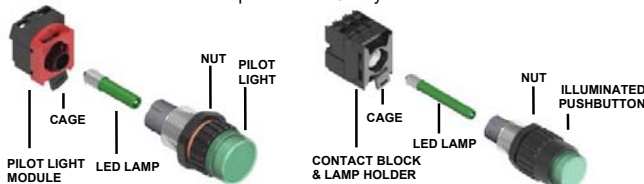
1. Disconnect the contact block from the assembly by sliding the cage locking tab clockwise.
2. Remove the nut and protective sleeve from the threaded body.
3. Place the legend plate under the knob, or attach to the enclosure, if applicable.
4. Make sure the operator threads and surface being attached to are clean and free of debris. Screw the pushbutton assembly into the enclosures 3/4" NPSM (GZ\*) or M22x1,5 (GZ\*-M) threaded entry and torque 3 N-m to 6 N-m (27 in.-lbs. to 53 in.-lbs.). Ensure legend plate is held in place to prevent rotation, if applicable.
5. Install the nut onto the assembly threaded body and torque to 2 N-m (18 in.-lbs.) with an appropriate tool.
6. Installing the contact block to the assembly:
  - a. With the cage locking tab held in the clockwise position, align the assembly channel with the locking cage ID tabs on the contact block and slide the block onto the assembly.
  - b. Move the cage tab counterclockwise to lock switch in place.
  - c. Verify orientation of block is such that control wires and certification tag won't be directed into flame path of cover/body.
  - d. The Double Push Button operator must be mounted in line with the contact block, as shown in the image below.



After performing the connections described above, the product can be safely used, and the ingress of protection is assured.

##### PILOT LIGHTS AND ILLUMINATED PUSHBUTTONS:

1. Install LED into terminal block.
2. Remove the nut and protective sleeve from the threaded body.
3. Remove the nut and protective sleeve from the threaded body.
4. Place the legend plate under the knob or attach to the enclosure.
5. Make sure the operator threads and surface being attached to are clean and free of debris. Apply STL thread lubricant and screw the pushbutton assembly into the enclosures 3/4" NPSM (GZ\*) or M22x1,5 (GZ\*-M) threaded entry and torque to 3 N-m to 6 N-m (27 in.-lbs. to 53 in.-lbs.).
6. Install the nut onto the assembly threaded body and torque to 2 N-m (18 in.-lbs.) with an appropriate tool.
7. Installing the contact block to the assembly:
  - a. With the cage locking tab oriented in the bottom, ensure it is slid to the left position.
  - b. Align the assembly channel with the locking cage ID tabs on the contact block and slide the block onto the assembly.
  - c. Move the cage tab counterclockwise to lock switch in place.
  - d. Verify orientation of block is such that control wires and certification tag won't be directed into flame path of cover/body.



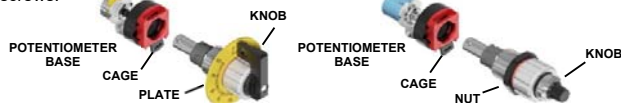
##### TEST BUTTON:

1. Screw the knob in the enclosure through thread M10x1,5 (GZ\*10") with a torque of 3 Nm.
2. Put the washer with bigger hole at the end of the rod, then the plate (also fitting in the plate attached to the CBHMCB), and then the washer with the smallest hole.
3. Place the screw with the toothed washer on the thread at the end of the rod.



##### POTENTIOMETERS (for multi-turn potentiometer, omit Step 2):

1. Remove the nut of button.
2. Put the plate in button.
3. Screw the knob in the enclosure through thread 3/4"NPSM (SGEX26) or M22x1,5 (SGEX22) with a torque of 3 Nm to 6 Nm.
4. Make the adjust of base with regard to position marked in button with potentiometer base inside the enclosure.
5. Remove the potentiometer base, put the nut of button and tighten with appropriate device, with a torque of 2 Nm.
6. Fix the cables/wires in potentiometer terminals through weld.
7. Plug the potentiometer base in the knob and fix it with your cage. Tighten Allen screws.



P/N KIL00921506 FORM NO. K1506 R10/22 ECO-3-044-22

##### ROTARY SWITCHES

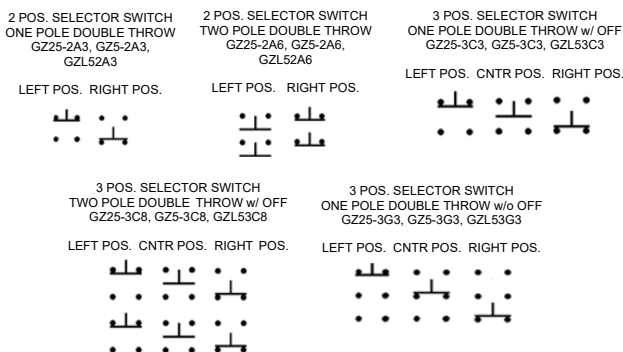
1. Disconnect the rotary switch from the switch assembly by sliding the cage locking tab clockwise.
2. Remove the nut and protective sleeve from the threaded body.
3. Place the legend plate when used under the rotary knob or attach to the enclosure if applicable.
4. Make sure the operator threads and surface being attached to are clean and free of debris. Screw the pushbutton assembly into the enclosures 3/4" NPSM (GZ\*) or M22x1,5 (GZ\*-M) threaded entry and torque 3 N-m to 6 N-m (27 in.-lbs. to 53 in.-lbs.).
5. Align the rotary knob pointer to the legend plate.
6. Install the nut onto the switch assembly threaded body, but do not tighten yet.
7. Installing the rotary switch to the switch assembly:
  - a. With the cage locking tab held in the clockwise position, align the assembly channel with the locking cage ID tabs on the rotary switch and slide onto the assembly.
  - b. Apply pressure to the rotary switch while rotating the knob handle until the splined shaft aligns and drops into place.
  - c. Move the cage tab counter/clockwise to lock switch in place.
  - d. If the knob pointer is misaligned from the legend plate markings, the switch assembly may need to be rotated by threading the assembly in or out while maintaining the 27 in.-lbs. to 53 in.-lbs. (3 N-m to 6 N-m) torque requirement.
  - e. Torque nut to 18 in.-lbs. (2 N-m) with an appropriate tool.

**NOTE:** During the cables/wires installation, make sure that no mechanical tension is applied to the rotary switch to avoid any damage.



After performing the connections described above, the product can be safely used, and the ingress of protection is assured.

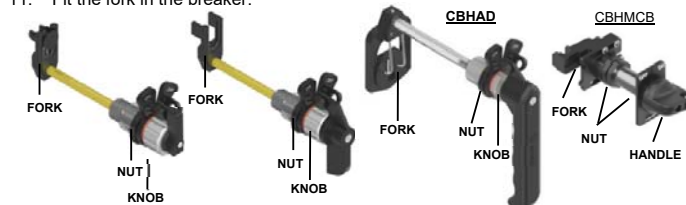
##### TYPICAL CONTACT POSITIONS



##### CIRCUIT BREAKER ACTUATOR

(for CBHAD omit Step 8; for CBHMCB omit Step 8, 9):

1. Remove the fork of the circuit breaker actuator.
2. Remove the nut.
3. For CBHMCB, remove the handle.
4. Screw the actuator in the enclosure through thread 3/4"NPSM (GZ\*), M22x1,5 (GZ\*-M) or M16x1,5 (GZ\*16") with a torque of 3 Nm to 6 Nm.
5. Make the adjustment of the jamb for padlock.
6. Put the nut of actuator and tighten with appropriate device, with a torque of 2 Nm.
7. Replace the fork in the component rod.
8. Fix the lateral screw with the aid of an Allen wrench.
9. Make adjust the height of the fork and fix the screw with the aid of Allen wrench.
10. For CBHMCB, replace the handle.
11. Fit the fork in the breaker.



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## Series “GZ” and “GZ...-M” Operators

**WIRE SIZE CHART**

The chart below shows the wire size for each type of devices.

Device type	IECEx and ATEX		UL		Torque
	Hard wire (up to 2 wires)	Flexible cable (up to 2 wires)	Hard wire (up to 2 wires)	Flexible cable (up to 2 wires)	
Pushbuttons and lights	2.5mm <sup>2</sup>	1.5mm <sup>2</sup>	18 - 13 AWG	20 - 15 AWG	9 in.-lbs. (1 N-m)
Selector switches	2.5mm <sup>2</sup>	2.5mm <sup>2</sup>	12 AWG	14 AWG	9 in.-lbs. (1 N-m)

**IECEx AND ATEX SPECIAL CONDITIONS FOR SAFE USE**

- For flameproof applications, the actuators and signaling elements shall only be installed in Ex d enclosures with maximum internal volume of 35 liters and approved for at least Group IIC according to EN60079-1/IEC 60079-1.
- For flameproof applications, the actuators and signaling elements shall only be installed in Ex d enclosures with maximum internal explosion pressure of 20 bar for Group IIC according to EN60079-1/IEC 60079-1.
- The actuators and signaling elements shall only be used for a service temperature range of -50°C to +100°C.
- For flameproof applications, the actuators and signaling elements shall only be threaded in enclosure walls having a minimum length of 8.0 mm for M22x1,5, M16x1,5 and M10x1,5 thread, and at least five (5) threads engaged for 3/4" NPSM thread, according to table 4, from EN 60079-1/IEC 60079-1. The maximum thickness of the enclosure wall is limited by size (length) of the actuating and signal elements.
- For dustproof applications, the actuators and signaling elements shall only be threaded in enclosure wall having a minimum length of 3,0 mm for M22x1,5, M16x1,5 and M10x1,5, or 3,7 mm for 3/4"NPSM thread, and at least threads engaged according to EN 60079-31/IEC 60079-31. The maximum thickness of the enclosures wall is limited by size (length) of the actuating and signal elements. The elements have to be fixed in the electrical equipment in such a way that rotation and accidental loosening will be prevented.
- For the pilot light and illuminated buttons, the maximum load for LED is 2 W.
- The outer molding of the elements has to be tightened according manufacturer's instructions.
- For flameproof applications, the actuators and signalling elements shall only be installed in Ex d enclosures with maximum internal volume of 160 litres and approved for at most Group IIB+H2, according to EN60079-1/IEC 60079-1.
- For flameproof applications, the actuators and signaling elements shall only be installed in Ex d enclosures with maximum internal volume of 35 liters and approved for at least Group IIC, according to EN60079-1/IEC 60079-1
- The flameproof joints are not intended to be repaired.
- WARNING – POTENCIAL ELECTROSTATIC CHARGING HAZARD – SEE INSTRUCTIONS** – For dustproof applications, Mushroom Head Buttons, Rotary Switches, Potentiometers, Adjustable Circuit Breaker (only \*CBHGA\* and \*CBHMCB\*), Pilot Light and Illuminated Push Button shall be cleaned with a damp cloth, only.
- These Ex devices are to be mounted on the wall position, only.

Note: The special condition for safe use described above: "These Ex devices are to be mounted on the wall position, only", is included due to the IPX6 (water jet) Ingress Protection.

**STORAGE**

Upon receiving the product, the parts must stored in a covered, clean and dry place so that there is no contact between threads of the products.

**INSPECTION AND MAINTENANCE**

Inspection and maintenance must be performed in accordance with the applicable codes of practice by an appropriately trained person.

**REPAIR**

A properly trained person shall perform the repair of equipment in accordance with the manufacturer's instructions and applicable codes of practice. Repair/modification must be performed only with manufacturer original parts and should be limited to the replacement of the following parts:

- Gasket
- Contact blocks
- Power supply module for pilot light
- Color calotte for signaling

**UL/CSA CONDITIONS OF ACCEPTABILITY**

- Open type devices should be mounted through covers / walls of enclosures having adequate strength and thickness in the intended manner. The manufacturer's instructions must be followed.
- The devices have been assessed for use in a ambient temperature range of -50°C to +60°C.
- With regards to Unclassified Location assessment, gasket temperatures must not exceed 70°C.
- All dead-metal parts shall be grounded or shall contact grounded metal parts in the final assembly.
- The threaded joint located between the auxiliary device body and the end equipment enclosure shall consist of at least six (6) full threads of engagement for M22x1,5, M16x1,5, M10x1,5, and at least seven (7) full threads of engagement for 3/4"NPSM for Class I locations, and 3 full threads of engagement for Class II and III locations.
- These devices were only evaluated relevant to their installation through covers / walls of enclosures with a free volume up to 160 dm<sup>3</sup> with a maximum internal explosion pressure of 20 bar (290 psi), all requirements from the relevant standards must be considered in the end application.
- The devices were evaluated for ingress protection when installed in an enclosure wall/cover, and it is known to be Type 4X. When installed on enclosure walls/covers, and the enclosure is also rated Type 4X, it is known to maintain the enclosure ingress protection.
- Metric threads shall have a tolerance Class of 6g/6H or better according to Standard for General Purpose Metric Screw Threads - Tolerances - Part 1, ISO 965-1 and the Standard for General Purpose Metric Screw Threads - Tolerances - Part 3, ISO 965-3.
- The maximum load for LED is 2 W.

**IMPORTANT:**

Technical information, advice and recommendations contained in these documents is based upon information that Killark believes to be reliable.

All the information and advice contained in these documents is intended for use only by persons having been trained and possessing the requisite skill and know-how and to be used by such persons only at their own discretion and risk.

The nature of these instructions is informative only and does not cover all of the details, variations or combinations in which this equipment may be used, its storage, delivery, installation, check out, safe operation and maintenance.

Since conditions of use of the product are outside of the care, custody and control of Killark, the purchaser should determine the suitability of the product for his intended use and assumes all risk and liability whatsoever in connection therewith.



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RESERVED FOR ATEX DECLARATION OF CONFORMITY