Approval data for GK03-EXI

Optionally there is an intrinsically safe approved version of the GK03 limit switch for gas and dust environments according to ATEX/IECEx regulations.

These intrinsically safe switches marked with Ex ia label must be operated with a certified switch amplifier.

Approval:

II 1 G Ex ia IIC T6 Ga
II 1/2 G Ex ia IIC T6 Ga/Gb
II 2 G Ex ia IIC T6 Gb
II 1 D Ex ia IIIC T100°C Da

Certificate no.:	TÜV 18 ATEX 214370 X Issue 01, IECEx TUN 17.0039X
Permissible ambient temperature:	$-40\ °C \le T_a \le +75\ °C$
Electrical data for intrinsically safe application:	$U_i = 28\ V$ $I_i = 125\ mA$ $P_i = 0.5\ W$ C_i = Capacitance of 10 m connection cable = 2nF L_i = Inductance of 10 m connection cable = 10µF For devices with connected cables, an additional capacitance of 200pF/m and an additional inductance of 1µH/m must be calculated.
Standards applied:	EN IEC 60079-0:2018, IEC 60079-0:2017 EN 60079-11:2012, IEC 60079-11:2011 EN 60079-26:2015, IEC 60079-26:2014-10

CAUTION

Special Conditions for Use

1. Metallic process connection parts have to be included in the local potential equalization. A good electrically conductive connection between float switch and system ground must be ensured.
2. For the use in IIC-areas that require EPL Ga each float switch and limit switch, have to be installed and used in such a way that electrostatic charges through operation, maintenance and cleaning are excluded.
3. For the use in areas that require EPL Da all float switches and limit switch have to be protected from strong charge generation mechanisms.
4. For EPL Ga/Gb applications and at risks by pendulum or vibration the respective parts of the float switches resp. the limit switch have to be secured effectively against these dangers.
5. For EPL Ga/Gb applications the medium tangent materials of the float switches resp. the limit switch have to be resistant to the media.
6. For EPL Ga/Gb applications the whole devices shall be mounted in a way that allows an installation that results in a sufficient tight joint (IP66 or IP67) or a flameproof joint (IEC 60079-1) in the direction of the less endangered area.

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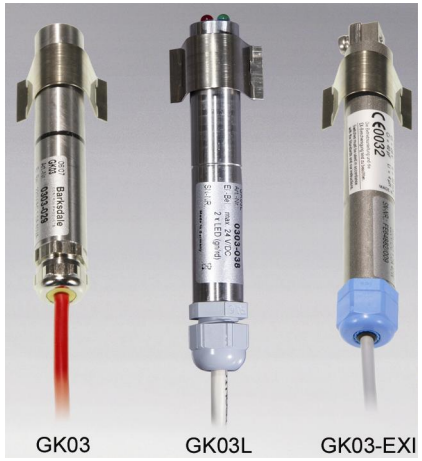
Operating Instructions

Limit Switch for Bypass Level Indicator GK03



Barksdale
CONTROL PRODUCTS

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Art. no. 923-1638
Index H, 14.02.2024
Specifications are subject to changes without notice!

Refer to data sheet for further technical data.

CRANE Barksdale, Inc./Barksdale GmbH
A Subsidiary of Crane Co.

1 Intended Applications

The GK03 limit switches for bypass level indicators serve for recording limit values on magnetically controlled level indicators.

DANGER

Read the operating instructions and the safety instructions carefully before using the limit switch. Nonobservance may cause injuries to health or material damage.
Barksdale GmbH cannot be held liable for any damage resulting from incorrect use.

The limit switch may only be used in the specified fields of application (see nameplate).

The temperature has to be within the specified ranges, the pressure values and the electrical rating must not exceed the values specified.

Observe also the applicable national safety instructions for assembly, commissioning and operation of the limit switch.

2 Safety Instructions

The safety instructions are intended to protect the user from dangerous situations and/or material damage.

In the operating instructions the seriousness of the potential risk is designated by the following signal words:

DANGER

Refers to imminent danger to men.

Nonobservance may result in fatal injuries.

WARNING

Refers to a recognizable danger.

Nonobservance may result in fatal injuries, and destroy the equipment or plant parts.

CAUTION

Refers to a danger.

Nonobservance may result in light injuries and material damage to the switch and/or to the plant.

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IMPORTANT

Refers to important information essential to the user.

Disposal

The limit switch must be disposed of correctly in accordance with the local regulations for electric/electronic equipment.

The limit switch must not be disposed of with the household garbage!

3 Standards

The standards applied during development, manufacture and configuration are listed in the CE / UKCA conformity and manufacturer's declaration.

4 Warranty/Guaranty

Warranty

Our scope of delivery and services is governed by the legal warranties and warranty periods.

Terms of guaranty

We guaranty for function and material of the limit switch under normal operating and maintenance conditions in accordance with the statutory provisions.

Loss of guaranty

The agreed guaranty period will expire in case of:

- incorrect use
- incorrect installation
- incorrect handling or operation contrary to the provisions of these operating instructions

No liability is assumed for any damage resulting therefrom, or any consequential damage.

5 Principle of Operation

The limit switch for bypass level indicators works according to the principle shown in Figure 1.

The tank to be monitored is connected with the bypass level Indicator by two connecting lines. The liquid to be measured is always at the same level in the tank and in the bypass level indicator.

The float contains a magnetic system which acts on the one hand on the magnetic rotors of the indication bar and on the other hand on the limit switches.

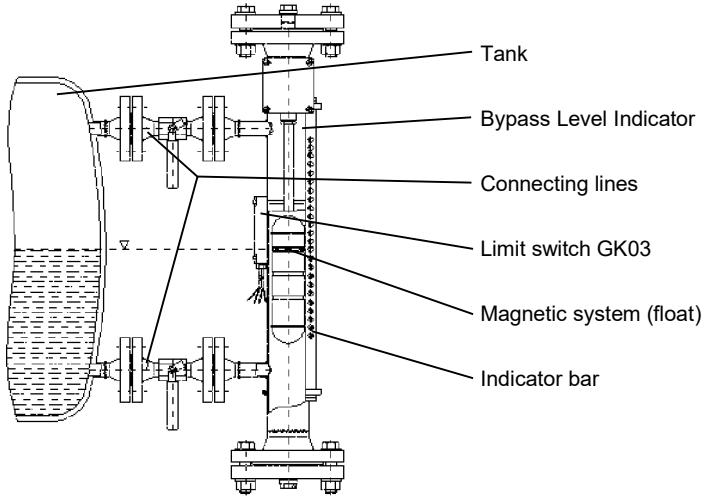

Figure 1: Sectional drawing of limit switch and bypass level indicator (BNA)

6 Installation/Commissioning

⚠	**DANGER**
Prior to any work on electrical components disconnect them from power supply. The electrical connection may only be made by trained expert staff!	

The electrical limit switch may be installed at any point in the range of the indicator bar of the bypass limit switch (BNA). It is attached by means of a stainless steel strip with screw connection.

☞	**IMPORTANT**
Ensure that the stainless steel strips are passed below the indicator bar.	

☞	**IMPORTANT**
The principle of operation of the Bypass Level Indicator is based on the magnetic field principle. No **magnetic iron parts** (e.g. screws, clamps etc.) may be used in the vicinity of the level tube.	

☞	**IMPORTANT**
Comply with the torque values provided in the pipeline construction.	
It is recommended that the electrical connections are made in accordance with the relevant standards.	
Tightening torques for cable glands (which are delivered):	
PG 9 (plastic) intermediate nozzle	4 Nm
PG 9 (plastic) cap nut	2,5 Nm
PG 9 (metall	8 Nm
M 16 x 1,5	2 Nm

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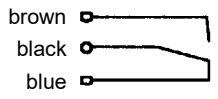


Figure 2: Schematic diagram GKHT1

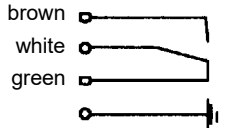
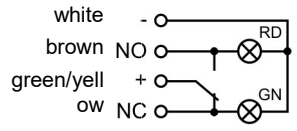


Figure 3: Schematic diagram GK03 / GK03-EXI



RD (red LED) = full
GN (green LED) = empty

Figure 4: Schematic diagram GK03L

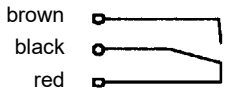


Figure 5: Schematic diagram GK03-UL

The switches shown correspond to the switch position in dry state. To inverse the function interchange the blue and brown or the green and brown wires of the limit switches.

Commissioning of the electric limit switches

- Check that the limit switches supplied correspond to your order specification.
- Type of protection: Make sure that the limit switch is to be used for an intrinsically safe circuit.

Fix the limit switch to the BNA in the desired position with the cable pointing down.

☞	**IMPORTANT**
If the air gap is enlarged, the limit switch will not function properly. Ensure that the limit switch is securely fixed to the tube.	

Function of the limit switches GK03

All limit switches have three connection wires (brown, white, green) and a grounding clip on request. The white wire constitutes the common pole for the switching function (normally closed / normally open).

The normally-closed function / normally-open function is always related to the magnetic polarity of the actuating magnet.

☞	**IMPORTANT**
In every case, the float of the BNA must be moved past the limit switch once from top to bottom before commissioning to ensure alignment. Then the normally closed or normally open contact can be set.	

If the limit switch has been actuated for example by a south pole (possibly externally), its switching function is inversed if the BNA float used has a north pole.

Example:

- The limit switch has been attached to the tube with brown and white leads connected; the switch is open.
- The float of the BNA has a different polarity from the magnet by which the switch has been actuated.

When the float of the BNA passes the switch point of the limit switch, the limit switch is actuated twice. When the float returns, the normally closed contact has become a normally open contact.

If an alarm system is directly connected, it is often overlooked that the switch is actuated twice, and it is assumed that the limit switch is defective. In fact, however, the limit switch has been actuated twice and changed its switching function.

☞	**IMPORTANT**
In this case never actuate the limit switch externally by means of a separate magnet!	

➢ Move the float again past the limit switch in both directions.
➢ Interchange the green and brown wires so that a normally closed or a normally open contact is available as desired.

7 Troubleshooting

Error	Cause	Action to take
Failure of limit switches in spite of correct optical indication of BNA.	Switch defective due to excessive electrical load	Reduce load by use of auxiliary relay
	Switch incorrectly connected	Compare wiring diagram with switch contact arrangement
	Switch in wrong position	Correct switch position
	Switch defective due to excessive temperature	Use spacer if possible
Instead of the red LED the green LED is on and vice versa. (GK03L / GK01L)		Change the switching function: • using the level indicator float, see OI BNA • using the ring magnet (Art. no. 920-0003)

8 Maintenance/Cleaning

Maintenance

The limit switch for bypass level indicators is maintenance free.

Cleaning

⚠	**CAUTION**
Do not bend or hit the stem when cleaning the guide tube!	

Proceed **carefully** to remove medium residues from the guide tube, if necessary.

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9 Technical Data

	GKHT1	GK03	GK03L	GK03-UL
Housing material	AL	1.4305 and M 16 x 1.5 cable gland (PA)	1.4305 and M 16 x 1.5 cable gland (PA)	1.4571 and M16 x 1.5 cable gland (PA or PVDF)
Cable	---	Silicone 3 x 0.5 mm² or PVC 3 x 0.34 mm², length 1.3 m or 5 m	PVC 4 x 0.5 mm², length 2 m	PVC 3 x AWG22 length 1,3,5,10 m
Protection class	IP65	IP65 optional Ex ia *	IP65	Type 4X (IP65)
Type of switch	bistable	bistable	bistable	bistable
Max. switching capacity	220 V AC / 1.0 A / 80 VA	230 V AC / 1,0 A / 60 VA, 230 V DC / 1,0 A / 60 W	24... 28 V DC = U_{supply} max. 40 W (max. 1 A)	42 V AC / 0,7 A
Temperature range	-55 °C... +350 °C	-55 °C... +140 °C	-5 °C... +70 °C	-40 °C... +100 °C
* Intrinsically safe applications are subject to the max. operating conditions according to the approval.				

Dimensions Dimensions in mm

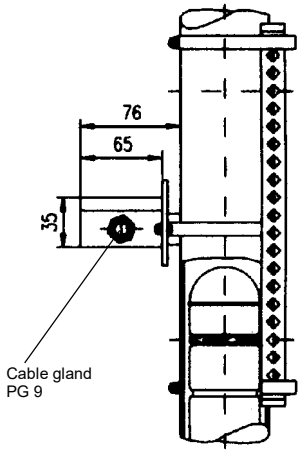

Figure 6: GKHT1

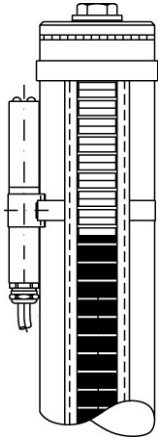

Figure 7 : GK03L

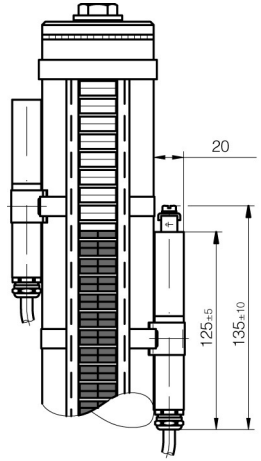

Figure 8: GK03 / GK03-EXI