

Documentation

about
Ex i ... 8 V DC limit switch boxes
with
Pepperl+Fuchs sensors
for
pneumatic rotary- and linear actuators
acc. to
guideline 2014/34/EU, I BExU 04 ATEX 1211

 II 2G Ex ia/ib IIC/IIB T6 Gb  II 2D Ex ia/ib IIIC T 80 °C Db

and

 I M2 Ex ia/ib I Mb (for mining industry)



**MADE
IN
GERMANY**

| Topic: | Page: |
|--|--------------|
| 1. Objectives and practical use | 3 |
| 2. Technical specifications | 4 |
| 3. Possible versions | 5 |
| 4. Connection of the sensors | 6 |
| 5. Cam switches / cams | 7 |
| 6. Mounting on the actuator / technical indication of membrane vent | 8 |
| 6.1 Mechanical mounting | 8 |
| 6.2 Electrical mounting | 8 |
| 6.3 Technical indication of membrane vent | 8 |
| 7. Components and parts list | 9-12 |
| 7.1 Slot sensors | 9 |
| 7.2 Cylindrical sensors | 10 |
| 7.3 Cuboid sensors | 11 |
| 7.4 Low temperature limit switch box | 12 |
| 8. Appendix | 13-22 |
| 9. Applicable standards | 23 |

1. Objectives and practical use

The positions of industrial valves represent an important piece of information for the course of action of a production. These valves are e.g. actuated with pneumatic rotary- and linear actuators at which the end position of the valve like **open** or **closed** is reported back to a control system. This is done via a mounted limit switch box which is placed on/at the actuator, see image 1-4 and page 13 image 12-32.

Use of the above mentioned limit switch boxes can be found in endangered explosive areas as in the chemicals industry, equipment group II, category 2G, zones 1, 2 or 2D, zones 21, 22.

Besides the polyamide limit switch boxes, image 1 will be insert in explosive areas in the mining industry of equipment group I, category M2.

Another possibility also can be found the low temperature limit switch box, image 4a and image 20-22, page 15, in explosive areas as the extremely cold zones in Siberia, equipment group II, category 2G, zones 1, 2 or 2D, zones 21, 22.




For pressure compensation can be use a membrane vent witch is fixed in the ground of the limit switch boxes, see image 27, page 17.



Image 1-4+4a: **Image 1:** polyamide limit switch boxes (this type with ex certification you can use specially in the mining industry), 120x80x55 mm for rotary actuators, **Image 2+3:** polyamide and aluminium limit switch boxes for linear actuators, 120/125x80x55/57 mm. **Image 4 +4a:** aluminium limit switch box and low temperature limit switch box for rotary actuators, 125x80x57 mm

2. Technical specifications

Table 1: Technical specifications as well as conditions of use for the limit switch boxes equipment group II, category 2G, zones 1, 2 or 2D, zones 21, 22 and equipment group I, category M2

| Term / Identifier: | Technical specifications: |
|--|---|
| Materials and dimensions housings | - Polyamide,(=vestamide), $R_o \leq 10^9 \Omega$, RAL 9005 black, 120x80x55 mm ^{1), 2)} - Aluminium, grey, 125x80x57 mm ²⁾ |
| Connection limit switch box to bracket ^{1), 2)} | 4x M6-winding at the bottom hole circle \varnothing 50 mm, F05-slot |
| Connection limit switch box to bracket for rotary- or linear actuator ^{1), 2)} | - acc. to VDI/VDE 3845, steam height 20, 30 and 50 mm, hole spacing 80x30 mm and 130x30 mm - mounting set f. linear actuators acc. to IEC 534 |
| Ambient temperature range ^{1), 2)} | -25 °C $\leq T_a \leq$ +70 °C (for all versions acc. to table 2) -25 °C $\leq T_a \leq$ +66 °C (for all versions acc. to table 2) ³⁾ -40 °C $\leq T_a \leq$ +70 °C (for version low temperature limit switch box, table 2 with SJ 3,5-SN and membrane vent, see table 7 and NJ2-12GK-SN, see image 22) -45 °C $\leq T_a \leq$ +70 °C (for version low temperature limit switch box, table 2 with SJ 3,5-SN) |
| Protection class ^{1), 2)} | IP 65 |
| ATEX identification ²⁾ |  II 2G Ex ia/ib IIC/IIB T6 Gb  II 2D Ex ia/ib IIIC T 80 °C Db |
| ATEX identification ²⁾ |  I M2 Ex ia/ib I Mb |
| Temperature class ²⁾ | T6 |
| <ul style="list-style-type: none"> • Nominal voltage ^{1), 2)} • Nominal current ^{1), 2)} • Power ^{1), 2)} | $U_i = 16$ V (for all versions acc. to table 2) $I_i = 25$ mA $P_i = 34$ mW ($P_i = 64$ mW) ³⁾ |
| Cable gland ^{1), 2)} | M20x1,5 mm, clamp range: \varnothing 11-9,5 mm, \varnothing 9-7 mm, \varnothing 7-5,5 mm, specially for low temperature limit switch box: \varnothing 14-9 mm and \varnothing 9-5 mm |
| Mini-terminals ^{1), 2)} | 2-pole and 3-pole, maximum 2,5 mm ² |
| <ul style="list-style-type: none"> - Limit switch box for rotary actuators: weight without/with ss-standard-bracket - limit switch box for linear actuator: weight without/with aluminium-plate and mounting set | <ul style="list-style-type: none"> - polyamide limit switch box^{1) 2)} = 0,3 kg / polyamide limit switch box^{1) 2)} = 0,6 kg - aluminium limit switch box²⁾ = 0,57 kg / aluminium limit switch box²⁾ = 0,87 kg - aluminium limit switch box²⁾ = 0,57 kg / aluminium limit switch box²⁾ = 1,67 kg²⁾ |
| Display and switching range ^{1), 2)} | 0° up to 180° |

¹⁾ for limit switch boxes of equipment group I (mining industry)

²⁾ for limit switch boxes of equipment group II

³⁾ connection only when: $U_i = 16$ V (for all versions acc. to table 2), $I_i = 25$ mA, $P_i = 64$ mW by ambient temperature -25 °C $\leq T_a \leq$ +66 °C

3. Possible versions

Table 2: Possible versions of the limit switch boxes, equipment group II and I with the special intrinsically safe, inductive sensors of Pepperl+Fuchs, see page 13, image 12-32

| limit switch box type: for PA-box: ^{1), 2)} | limit switch box type: for AL-box: ²⁾ | slot ensors: | C _i (nF)/ L _i (μH) |
|---|---|-------------------------------------|---|
| SB-PA-SC 3,5-G-N0 | or SB-AL-SC 3,5-G-N0 | 2 or 1 x SC 3,5-G-N0 | 150/150 |
| SB-PA-SC 3,5-N0 | or SB-AL-SC 3,5-N0 | 2 or 1 x SC 3,5-N0 | 150/150 |
| SB-PA-SC 3,5-N0-BU | or SB-AL-SC 3,5-N0-BU | 2 or 1 x SC 3,5-N0-BU | 50/150 |
| SB-PA-SJ 3,5-N | or SB-AL-SJ 3,5-N | 2 or 1 x SJ 3,5-N | 50/250 |
| SB-PA-SJ 3,5-SN | or SB-AL-SJ 3,5-SN | 2 or 1 x SJ 3,5-SN | 30/100 |
| SB-PA-SJ 3,5-S1N | or SB-AL-SJ 3,5-S1N | 2 or 1 x SJ 3,5-S1N | 30/100 |
| SB-AL-SJ 3,5-SN-T ³⁾ | | 2 or 1 x SJ 3,5-SN | 30/100 |
| limit switch box type: for PA-box: ^{1), 2)} | limit switch box type: for AL-box: ²⁾ | cylindrical sensors: | |
| SB-PA-NJ2-11-N-G | or SB-AL-NJ2-11-N-G | 2 or 1 x NJ2-11-N-G | 30/50 |
| SB-PA-NJ2-12-GM-N | or SB-AL-NJ2-12GM-N | 2 or 1 x NJ2-12GM-N | 30/50 |
| SB-PA-NJ2-12-GK-N | or SB-AL-NJ2-12GK-N | 2 or 1 x NJ2-12GK-N ⁴⁾ | 45/50 |
| SB-PA-NJ4-12-GK-N | or SB-AL-NJ4-12GK-N | 2 or 1 x NJ4-12GK-N ⁵⁾ | 45/50 |
| SB-PA-NJ2-12GK-SN | or SB-AL-NJ2-12GK-SN | 2 or 1 x NJ2-12GK-SN | 50/150 |
| SB-PA-NJ2-11-SN-G | or SB-AL-NJ2-11-SN-G | 2 or 1 x NJ2-11-SN-G | 50/150 |
| SB-PA-NCB2-12GM35-N0 | or SB-AL-NCB2-12GM35-N0 | 2 or 1 x NCB2-12GM35-N0 | 90/100 |
| SB-PA-NCN4-12GM35-N0 | or SB-AL-NCN4-12GM35-N0 | 2 or 1 x NCN4-12GM35-N0 | 95/100 |
| SB-PA-NJ3-18GK-S1N | or SB-AL-NJ3-18GK-S1N | 2 or 1 x NJ3-18GK-S1N ⁶⁾ | 70/200 |
| SB-PA-NJ4-12-GM-N | or SB-AL-NJ4-12GM-N | 2 or 1 x NJ4-12GM-N | 45/50 |
| SB-PA-NJ5-18GM-N | or SB-AL-NJ5-18GM-N | 1 x NJ5-18GM-N | 70/50 |
| SB-PA-NJ5-18GK-N | or SB-AL-NJ5-18GK-N | 1 x NJ5-18GK-N | 70/50 |
| SB-PA-NJ5-18GK-SN | or SB-AL-NJ5-18-GK-SN | 2 or 1 x NJ5-18GK-SN | 120/200 |
| SB-PA-NJ5-11-N-G | or SB-AL-NJ5-11-N-G | 2 or 1 x NJ5-11-N-G | 45/50 |
| SB-PA-NJ5-18GK-N | or SB-AL-NJ5-18GK-N | 2 or 1 x NJ5-18GK-N | 70/50 |
| limit switch boxes type: for PA-box: ^{1), 2)} | limit switch boxes type: for AL-box: ²⁾ | cuboid sensors: | |
| SB-PA-NJ2-V3-N | or SB-AL-NJ2-V3-N | 2 x NJ2-V3-N | 40/50 |
| SB-PA-NCB2-V3-N0 | or SB-AL-NCB2-V3-N0 | 2 x NCB2-V3-N0 | 100/100 |
| SB-PA-NCN4-V3-N0 | or SB-AL-NCN4-V3-N0 | 2 x NCN4-V3-N0 | 100/100 |

SB = Sensor Box PA = Polyamide /G = closed Cover /S = with yellow 2D-indicator under the transparent window
AL = Aluminium C_i = Capacity L_i = Inductivity

¹⁾ for limit switch boxes of equipment group I, but with - U (mining industry), for example: SB-PA-SJ 3,5-N-U

²⁾ for limit switch boxes of equipment group II

³⁾ limit switch boxes version Low Temperature limit switch boxes, but with - T, for example: SB-AL-SJ 3,5-SN-T

⁴⁾ approve according by IBExU-declaration from 24.11.05 (He/Hüb 8491/05)

⁵⁾ approve according by IBExU-declaration from 13.08.07 (He/Hüb 6095/07)

⁶⁾ approve according by IBExU-declaration from 4.3.09 (He/Leh 1413/09)

4. Connection of the sensors

The slot, cylindrical and cuboid sensors are all mounted according to the wiring diagram which always can be found within the inside of the housing.

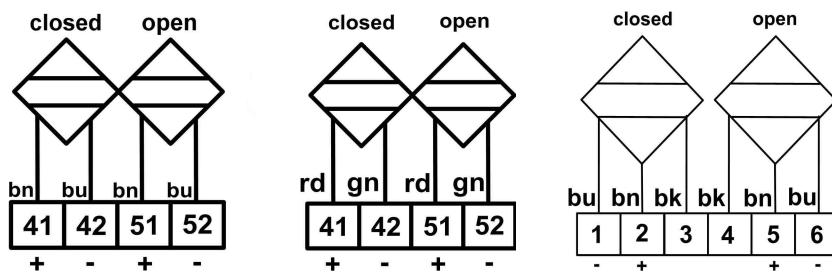


Image 5 and 5a, 6: bn = brown cable +, bu = blue cable -, rd = red cable +, gn = green cable -, (bk = black), 41 42 51 52 (1-6, only for sensor NJ3-18GK-S1N) = clamp allocation, closed = left sensor, open = right sensor

The left sensor usually is mounted at the clamp 41 42 and labelled with a small sticker "closed". The right sensor is being connected analogically.

5. Cam switches / Cams

Table 3: Overview over the standard cam switches and special cam switches

| Term/Identifier: | Technical specification: |
|---|--|
| Standard cam switch for slot sensors | Image 7: 2 pieces separately adjustable cam switches made from aluminium, 0° - 180° possible |
| Standard cam switch for cylindrical sensors | Image 8: one-piece cam switch of stainless steel, 0° - 90° |
| Standard cam switch for cuboid sensors | Image 9: plastic cam with 2 pieces of brass switching points, 0° - 90° |
| Special cam switch for cylindrical sensors | Image 10: 2 pieces cam switch of stainless steel, 0° - 180° possible |
| Special cam switch for slot sensors | Image 11: one-pieces cam switch of stainless steel, 0° - 90° or 0° - 180° (de-energized) |



Image 7



Image 8



Image 9



Image 10



Image 11

6. Mounting on the actuator / technical indication of membrane vent

6.1 Mechanical mounting: The limit switch box with the mounted bracket or the mounted aluminium plate (via F05-slot) and the mounting set is placed on the actuator and screwed together.

6.2 Electrical mounting: The limit switch box is electrically mounted to the 2x2 or 2x3 mini-terminals within the housing through the cable glands with tightening torques, see operating instructions 1-2 in the appendix, page 19-22. Data like cable thickness and cable cross section are shown in table 1, page 4. You also have to take the attached wiring diagrams into consideration which can always be found in the housing or directly on the pcb-see image 5 and 6, page 6.

Metal parts have to be grounded or the metal housing has to be connected to the equipotential bonding.

6.3 Technical indication of membrane vent: The safety or rather the protection class of the housing is only when the membrane vent resident sealed fixed in the housing ground (between actuator and housing with mounted kid).

At use in the group II outside of the normal temperature range at a minimal ambient temperature up to -40 °C the membrane vent must be installed and operated mechanically protected according to the low risk of mechanical danger according to EN 60079-0: 2004, paragraph 26.4.2.

At the use of the membrane vent in group I the mounting location must be selected in such a way, that it is protected against the risk of mechanical danger during the normal operation based on the requirements of EN 60079-0: 2004, paragraph 9.2.

Damaged membrane vents have to be replaced immediately.

7. Components and parts lists,

7.1 Slot sensors

Table 4: Components and parts list of limit switch boxes for slot P+F sensors

| Term/Identifier | Article-No. | Material | Comments |
|--|--|--|--|
| Polyamide empty housing: Consisting of a lower part with F05-slot, shaft bushing Ø 12 mm, tap hole M20x1,5 mm, cover with flag window as well as 4 pieces of cover screws | SB-PA-L | Polyamide | 120x80x55 mm, black |
| Aluminium empty housing: Consisting of a lower part with F05-slot, shaft bushing Ø 12 mm, tap hole M20x1,5 mm, closed cover as well as 4 pieces of cover screws | SB-AL-L | Aluminium-Si 12 | 125x80x57 mm, grey |
| Cable gland, blue-black | SB-Cg-20 | Polyamide | M20x1,5 mm, clamp range: Ø 11-9,5 mm, Ø 9-7 mm, Ø 7-5,5 mm, Cooper Crouse-Hinds-type: GHG9601955R0109 |
| 2x Mini-terminals 2-pole with clamp indicators | SB-V | Thermoplastic plastic and Cu alloy | Maximum, 2,5 mm ² , blue, Bartec: 07-9702-0220/2 |
| Pcb for slot sensors | SB-PL | Stainless steel | 93x70x1 mm, drawing-No.: 001 |
| Attachment screws for pcb, 4 pieces | SB-B | Stainless steel | M3x4 mm |
| Shaft for slot sensors | SB-W-schl | Stainless steel | Ø 12x64 mm, drawing-No.: 002 |
| O-ring for shaft | SB-O | NBR 70 | 9x1,5 mm |
| Washer for shaft, 2 pieces | SB-U | Polyamide | Ø 18 / Ø 12x1,2 mm |
| Lock washer for shaft, 2 pieces | SB-S | Stainless steel | DIN 6799-9 |
| Cam switches for shaft, 2 pieces | SB-S-s | Aluminium | drawing-No.: 003 |
| 2D-indicator yellow with shaft extension | SB-2D-y | Plastic / Stainless steel | 40x18x3 mm, drawing-No.: 0019 |
| Fasteners for cam switches | SB-B-S | Stainless steel | M8 / M4-socket screw, M8-nut, washer for M8 |
| Cable binder, 2 pieces | SB-K | Nylon | 99x2,5 mm |
| Wiring diagram/ sensor indication | SB-Sch-S | Polyvinylchlorid self-adhesive | 30x32 mm and 2 pieces 8x4 mm |
| Type label | SB-type | Aluminium foil self-adhesive | 70x32 mm |
| Membrane vent with sealing (option) | SB-D | Stainless steel | M12x1,5mm, Company RST |
| <u>Harting connection</u> housing bulkhead mounting housing screw mounting hood top-entry housing bulkhead mounting hood top-entry crimp terminal crimp terminal crimp terminal crimp terminal crimp terminal crimp terminal different crimp contact | SB-HA-AL-A SB-HA-AL-E SB-HA-AL-T SB-HA-PC-A SB-HA-PC-T SB-HA-2611 SB-HA-2633 SB-HA-2711 SB-HA-2733 SB-HA-3031 SB-HA-3131 | Aluminium, grey Aluminium, grey Aluminium, grey Polycarbonate, black Polycarbonate, black Plastic, 4+ground Plastic, 4+ground Plastic, 4+ground Plastic, 4+ground Plastic, 7+ground Plastic, 7+ground Nickel or gold plated | 09 20 003 0301 19 20 003 1150 19 20 003 1440 19 20 003 0327 19 20 003 0427 09 20 004 2611 09 20 004 2633 09 20 004 2711 09 20 004 2733 09 21 007 3031 09 21 007 3131 |
| Aluminium plate grey or black for mounting set acc. to Namur IEC 534 | SB-AB | Aluminium | 135x80x10 mm, drawing-No.: 061 |
| Pepperl+Fuchs sensors | SB-P+F | Plastic and stainless steel | see page 5, table 2 |
| Stainless steel brackets standard for rotary actuators | SB-VA-K | Stainless steel | 70x130x45/55 mm, for actuators acc. to VDI/VDE 3845 |
| Aluminium mounting plate for linear actuators with 4x fastening-screws | SB-AL-P | Aluminium | 135x80x10 mm, drawing-No.: 061 |
| Stainless steel mounting set for linear actuators | SB-AB | Stainless steel and plastic | acc. to NAMUR IEC 534 |

7.2 Cylindrical sensors

Table 5: Components and parts list of limit switch boxes for cylindrical P+F sensors

| Term/Identifier | Article-No. | Material | Comments |
|--|--|--|--|
| Polyamide empty housing: Consisting of a lower part with F05-slot, shaft bushing \varnothing 12 mm, tap hole M20x1,5 mm, cover with flag window as well as 4 pieces of cover screws | SB-PA-L | Polyamide | 120x80x55 mm, black |
| Aluminium empty housing: Consisting of a lower part with F05-slot, shaft bushing \varnothing 12 mm, tap hole M20x1,5 mm, closed cover as well as 4 pieces of cover screws | SB-AL-L | Aluminium-Si 12 | 125x80x57 mm, grey |
| Cable gland, blue-black | SB-Cg-20 | Polyamide | M20x1,5 mm, clamp range: \varnothing 11-9,5 mm, \varnothing 9-7 mm, \varnothing 7-5,5 mm, Cooper Crouse-Hinds-type: GHG9601955R0109 |
| 2x Mini-terminals 2-pole and 3-pole with clamp indicators | SB-V | Thermoplastic plastic and Cu alloy | Maximum, 2,5 mm ² , blue, Bartec: 07-9702-0220/2 and 07-9702-0320/2 |
| Pcb for cylindrical sensors | SB-zy | Stainless steel | 93x70x1 mm, drawing-No.: 004 |
| Attachment screws for pcb, 4 pieces | SB-B | Stainless steel | M3x4 mm |
| Shaft for cylindrical sensors | SB-W-zy | Stainless steel | \varnothing 12x64 mm, drawing-No.: 005 |
| O-Ring for shaft | SB-O | NBR 70 | 9x1,5 mm |
| Washer for shaft, 2 pieces | SB-U | Polyamide | \varnothing 18 / \varnothing 12x1,2 mm |
| Lock washer for shaft, 2 pieces | SB-S | Stainless steel | DIN 6799-9 |
| Switching cam for shaft | SB-S-S | Stainless steel | drawing-No.: 006 |
| 2D-indicator yellow with shaft extension | SB-2D-y | Plastic / stainless steel | 40x18x3 mm, drawing-No.: 0019 |
| Fasteners for cam switches | SB-B-z | Stainless steel | M4x6-socket screw and spring ring for M4 |
| Cable binder, 2 pieces | SB-K | Nylon | 99x2,5 mm |
| Wiring diagram/ sensor indication | SB-Sch-S | Polyvinylchlorid self-adhesive | 30x32 mm u. 2 pieces 8x4 mm |
| Type label | SB-type | Aluminium foil self-adhesive | 70x32 mm |
| Membrane vent with sealing (option) | SB-D | Stainless steel | M12x1,5 mm, Company RST |
| <u>Harting connection</u> housing bulkhead mounting housing screw mounting hood top-entry housing bulkhead mounting hood top-entry crimp terminal crimp terminal crimp terminal crimp terminal crimp terminal crimp terminal crimp terminal different crimp contact | SB-HA-AL-A SB-HA-AL-E SB-HA-AL-T SB-HA-PC-A SB-HA-PC-T SB-HA-2611 SB-HA-2633 SB-HA-2711 SB-HA-2733 SB-HA-3031 SB-HA-3131 | Aluminium, grey Aluminium, grey Aluminium, grey Polycarbonate, black Polycarbonate, black Plastic, 4+ground Plastic, 4+ground Plastic, 4+ground Plastic, 4+ground Pplastic, 7+ground Nickel or gold plated | 09 20 003 0301 19 20 003 1150 19 20 003 1440 19 20 003 0327 19 20 003 0427 09 20 004 2611 09 20 004 2633 09 20 004 2711 09 20 004 2733 09 21 007 3031 09 21 007 3131 |
| Aluminium plate grey or black for mounting set acc. to Namur IEC 534 | SB-AB | Aluminium | 135x80x10 mm, drawing-No.: 061 |
| Pepperl+Fuchs sensors | SB-P+F | Plastic and stainless steel | see page 5, table 2 |
| Stainless steel brackets standard for rotary actuators | SB-VA-K | Stainless steel | 70x130x45/55 mm, for actuators acc. to VDI/VDE 3845 |
| Aluminium mounting plate for linear actuators with 4x fastening-screws | SB-AI-P | Aluminium | 135x80x10 mm, drawing-No.: 061 |
| Stainless steel mounting set for linear actuators | SB-AB | Stainless steel and plastic | acc. to NAMUR IEC 534 |

7.3 Cuboid sensors

Table 6: Components and parts list of limit switch boxes for cuboid P+F sensors

| Term/Identifier | Article-No. | Material | Comments |
|---|--|---|--|
| Polyamide empty housing: Consisting of a lower part with F05-slot, shaft bushing Ø 12 mm, tap hole M20x1,5 mm, cover with flag window as well as 4 pieces of cover screws | SB-PA-L | Polyamide | 120x80x55 mm, black |
| Aluminium empty housing: Consisting of a lower part with F05-slot, shaft bushing Ø 12 mm, tap hole M20x1,5 mm, closed cover as well as 4 pieces of cover screws | SB-AL-L | Aluminium-Si 12 | 125x80x57 mm, grey |
| Cable gland, blue-black | SB-Cg-20 | Polyamide | M20x1,5 mm, clamp range: Ø 11-9,5 mm, Ø 9-7 mm, Ø 7-5,5 mm, Cooper Crouse-Hinds-type: GHG9601955R0109 |
| 2x Mini-terminals 2-pole with clamp indicators | SB-V | Thermoplastic plastic and Cu alloy | Maximum, 2,5 mm ² , blue, Bartec: 07-9702-0220/2 |
| Pcb for cylindrical sensors | SB-q | Stainless steel | 93x70x1 mm, drawing-No.: 007 |
| Attachment screws for pcb, 4 pieces | SB-B | Stainless steel | M3x4 mm |
| Shaft for cuboid sensors | SB-W-q | Stainless steel | Ø 12x77 mm, drawing-No.:008 |
| O-Ring for shaft | SB-O | NBR 70 | 9x1,5 mm |
| Lock washer for shaft, 2 pieces | SB-U | Polyamide | Ø 18 / Ø 12x1,2 mm |
| Lock washer for shaft, 2 pieces | SB-S | Stainless steel | DIN 6799-9 |
| Cam for shaft attachment screw M4 | SB-S-q | Polyamide | drawing-No.: 009 |
| 2D-indicator yellow with shaft extension | SB-2D-y | Plastic / stainless steel | 40x18x3 mm, drawing-No.: 0019 |
| Attachment bent/attachment screws (2 pieces) for sensor | SB-B-S-q | Polyamide/ Stainless steel | 17x29x9,5 mm, 2 pieces M3x32 mm |
| Cable binder | SB-K | Nylon | 99x2,5 mm |
| Wiring diagram/ sensor indication | SB-Sch-S | Polyvinylchlorid self-adhesive | 30x32 mm u. 2 pieces 8x4 mm |
| Type label | SB-type | Aluminium foil self-adhesive | 70x32 mm |
| Membrane vent with sealing (option) | SB-D | Stainless steel | M12x1,5 mm, Company RST |
| Harting connection housing bulkhead mounting housing screw mounting hood top-entry housing bulkhead mounting hood top-entry crimp terminal crimp terminal crimp terminal crimp terminal crimp terminal crimp terminal crimp terminal different crimp contact | SB-HA-AL-A SB-HA-AL-E SB-HA-AL-T SB-HA-PC-A SB-HA-PC-T SB-HA-2611 SB-HA-2633 SB-HA-2711 SB-HA-2733 SB-HA-3031 SB-HA-3131 | Aluminium, grey Aluminium, grey Aluminium, grey Aluminium, grey Polycarbonate, black Polycarbonate, black Plastic, 4+ground Plastic, 4+ground Plastic, 4+ground Plastic, 4+ground Plastic, 7+ground Plastic, 7+ground Nickel or gold plated | 09 20 003 0301 19 20 003 1150 19 20 003 1440 19 20 003 0327 19 20 003 0427 09 20 004 2611 09 20 004 2633 09 20 004 2711 09 20 004 2733 09 21 007 3031 09 21 007 3131 |
| Pepperl+Fuchs sensors | SB-P+F | Plastic | see page5, table 2 |
| Stainless steel brackets standard for rotary actuators | SB-VA-K | Stainless steel | 70x130x45/55 mm, for actuators acc. to VDI/VDE 3845 |

7.4 low temperature limit switch box

Table 7: Components and parts list of low temperature limit switch box with Pepperl+Fuchs sensor SJ 3,5-SN, ambient **temperature range: $-45\text{ °C} \leq T_a \leq +70\text{ °C}$**

| Term/Identifier | Article-No. | Material | Comments |
|--|--------------|------------------------------------|---|
| Aluminium empty housing: Consisting of a lower part with F05-slot, shaft bushing \varnothing 12 mm, tap hole M20x1,5 mm, closed cover as well as 4 pieces of cover screws | SB-AL-L-T | Aluminium-Si 12 | 125x80x55 mm, grey |
| Cable gland with silicone O-ring | SB-Cg-MsT | Messing nickel-plated | M20x1,5 mm, clamping range for cables \varnothing 14-9 mm and \varnothing 9-5 mm Pflitsch-type: bg 220msHTex -55 °C up to +160 °C |
| Cable gland with silicone O-ring | SB-Cg-VA-T | Stainless steel | M20x1,5 mm, clamping range for cables \varnothing 14-9 mm and \varnothing 9-5 mm Pflitsch-type: bg 220VAHTex -55 °C up to +160 °C |
| 2x Mini-terminals 2-pole with clamp indicators | SB-V | Thermoplastic plastic and Cu alloy | Maximum, 2,5 mm ² , blue, Bartec: 07-9702-0220/2 |
| Shaft for trench shaped sensors | SB-W-schl | Stainless steel | \varnothing 12x64 mm, drawing-No.: 002 |
| O-Ring for shaft | SB-O-T | Silicone | 9x1,5 mm |
| Washer for shaft, 2 pieces | SB-U | Stainless steel | \varnothing 18 / \varnothing 12x1,2 mm |
| Lock washer for shaft, 2 pieces | SB-S | Stainless steel | DIN 6799-9 |
| Cam switches for shaft, 2 pieces | SB-S-s | Aluminium | drawing-No.: 003 |
| Cable binder, 2 pieces | SB-K | Nylon | 99x2,5 mm |
| Wiring diagram/ sensor indication I | SB-Sch-S | Polyvinylchlorid self-adhesive | 30x32 mm and 2 pieces 8x4 mm |
| Type label | SB-type | Aluminium foil self-adhesive | 70x32 mm |
| Membrane vent with sealing (option) | SB-D | Stainless steel | M12x1,5 mm, Company RST ambient temperature range: $-40\text{ °C} \leq T_a \leq +70\text{ °C}$ |
| Aluminium plate grey or black for mounting set acc. to Namur IEC 534 | SB-AI-P | Aluminium | 135x80x10 mm, drawing-No.: 061 |
| Pepperl+Fuchs sensors | SB-SJ 3,5-SN | Plastic | ambient temperature range: $-50\text{ °C} \leq T_a \leq +100\text{ °C}$ |
| stainless steel brackets standard for rotary actuators | SB-VA-K | Stainless steel | 70x130x45/55 mm, for actuators acc. to VDI/VDE 3845 |
| Aluminium mounting plate for linear actuators with 4x fastening-screws | SB-AI-P | Aluminium | 135x80x10 mm, drawing-No.: 061 |
| Stainless steel mounting set for linear actuators | SB-AB | Stainless steel and plastic | acc. to NAMUR IEC 534 |

8. Appendix

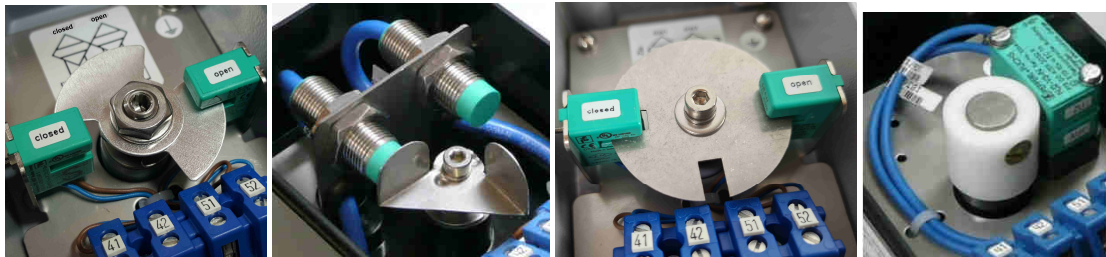
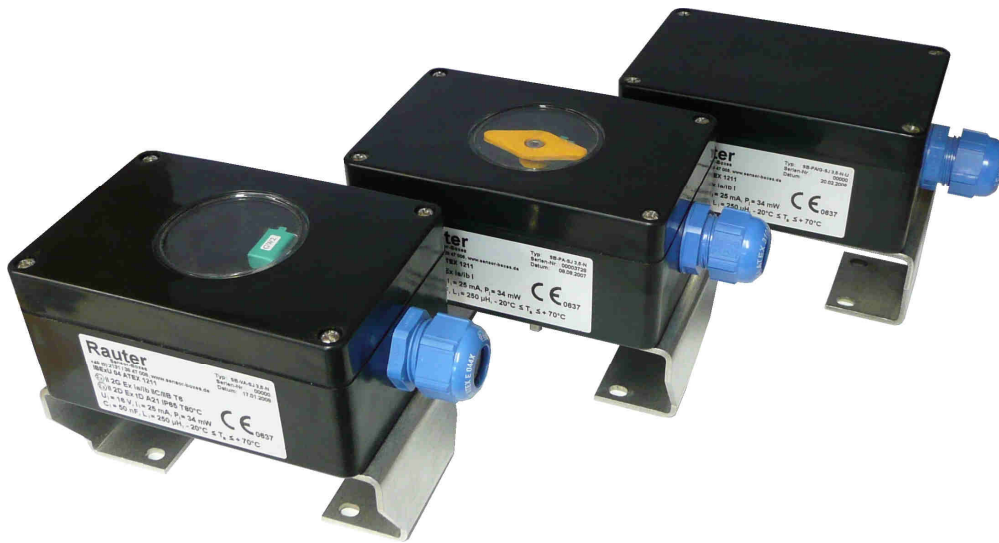


Image 12-15+15a: polyamide limit switch boxes, 120x80x55 mm and different inner views with Pepperl+Fuchs SJ 3,5-SN (Image 13), NJ2-12GK-N (Image 14), SJ 3,5-N (Image 15) and NJ2-V3-N (Image 15a)



Image 16-19: aluminium limit switch boxes, 125x80x57 mm and different inner views with Pepperl+Fuchs SJ 3,5-SN (Image 17), NJ2-12GK-N (Image 18), NJ2-V3-N (Image 19)

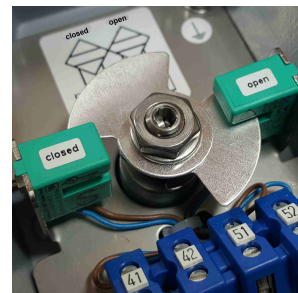


Image 20+21: Aluminium (125x80x57 mm) low temperature limit switch box with 2x Pepperl+Fuchs SJ 3,5-SN, ambient temperature range: $-45\text{ °C} \leq T_a \leq +70\text{ °C}$



Image 22: Aluminium (125x80x57 mm) low temperature limit switch box with 2x Pepperl+Fuchs NJ2-12GK-SN, ambient temperature range: $-40\text{ °C} \leq T_a \leq +70\text{ °C}$



Image 23+23a: Polyamide and aluminium limit switch box for linear actuators, 120x80x55 mm and 125x80x57 mm



Image 24-26: inner views with P+F sensors SJ 3,5-SN (Image 24), NJ2-12GK-N (Image25), NJ2-V3 (Image 26)

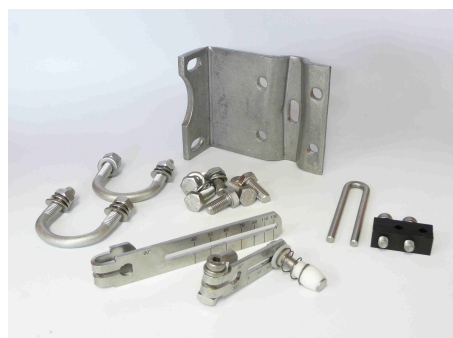


Image 26a: mounting set acc. to Namur IEC 534 for linear actuators

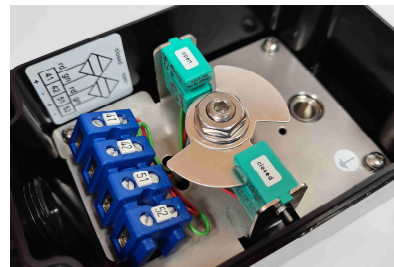


Image 27+27a+27b: Ex i ... 8 V DC polyamide limit switch box equipped with stainless steel membrane vent for avoidance of condensation water.



Image 28: rapid changing polyamide limit switch box with Harting connector



Image 29: interlock



Image 30: unlock



Image 31: pull out / push in



Image 32: connector protection cover

Operating instruction 1

Tightening torque **M20x1,5 mm = 4 Nm**

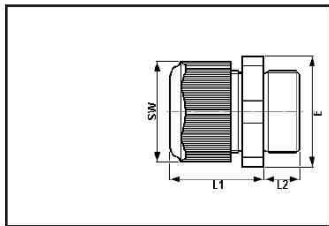
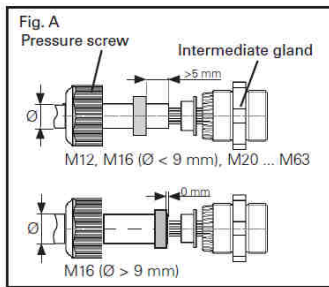
Extract from Cooper-Crouse-Hinds operating instruction, page 13+14

Cable entries, blanking plugs, screw plugs, trumpet-shaped cable glands, reducing glands and drain plugs

GB

Dimension drawings and dimensions in mm

1 Technical data



1.1 Technical details for:

Cable entries (KLE) M12x1,5 to M63x1,5

| | |
|--|-----------------------------------|
| ATEX type examination certificate: | PTB 14 ATEX 1015 X ^(A) |
| Marking acc. to 2014/34/EU and standard: | EN 60079-0 |
| | II 2 G Ex e IIC Gb |
| | II 2 D Ex tb IIIC Db |
| IECEX type examination certificate: | IECEX PTB 14.0027X ^(A) |
| Category of application: | IEC60079-0 Ex e IIC Gb |
| | Ex tb IIIC Db |

^(A) The EC-Type Examination Certificate and any future supplements thereto shall, at the same time, be regarded as supplements to the EC-Type Examination Certificates PTB 99 ATEX 3128 X and PTB 99 ATEX 3101 X

Perm. storage temperature in original packing: -20° C to +70° C

Degree of protection to IEC/EN 60529: IP 66*¹⁾ (when fully assembled)

*¹⁾ M40, M50 und M63 with suitable flange seal

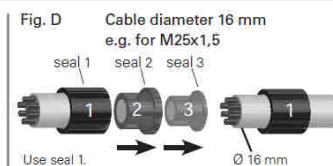
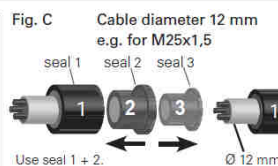
| Type | SW | L1 | L2 | E | weight app. |
|---------|-------|---------|------------|---------|-------------|
| M12x1,5 | 15 mm | 19,3 mm | 12 / 8 mm | 16,2 mm | 3,4 g |
| M16x1,5 | 20 mm | 23,0 mm | 12 / 8 mm | 22,0 mm | 6,5 g |
| M20x1,5 | 24 mm | 25,0 mm | 13 / 8 mm | 26,5 mm | 10,1 g |
| M25x1,5 | 29 mm | 29,5 mm | 13 / 8 mm | 32,0 mm | 16,9 g |
| M32x1,5 | 36 mm | 35,5 mm | 15 / 10 mm | 40,0 mm | 27,6 g |
| M40x1,5 | 46 mm | 39,5 mm | 15 / 10 mm | 50,5 mm | 50,3 g |
| M50x1,5 | 55 mm | 44,0 mm | 16 / 12 mm | 60,0 mm | 75,9 g |
| M63x1,5 | 68 mm | 47,0 mm | 16 / 12 mm | 75,0 mm | 117,6 g |

| Type | operating temperature | impact resistance | Cable diameter | | | | | | | | | | Screw-in thread in enclosure | Colour of dust protection cover | | | |
|-----------------|-----------------------|-------------------|--------------------|------|---------------------|------|----------------|------|---------------------|------|------------|------|------------------------------|---------------------------------|------|--|-------|
| | | | Seal 1+2+3 (1,2,3) | | | | Seal 1+2 (1,2) | | | | Seal 1 (1) | | | | | | |
| | | | min. | | max. | | min. | | max. | | min. | | | | max. | | |
| | °C | Joule | Ø | Nm** | Ø ⁽¹⁾⁽²⁾ | Nm** | Ø | Nm** | Ø ⁽¹⁾⁽²⁾ | Nm** | Ø | Nm** | Ø ⁽²⁾ | Nm** | Nm** | | |
| M12x1,5 | -20 - 70 | 4 | | | | | | | | | 5,0 | 0,8 | 7,0 | 1,0 | 1,2 | | white |
| M16x1,5 | -20 - 70 | 4 | | | | | 5,5 | 1,0 | 7,0 | 1,0 | 7,0 | 1,0 | 10,0 | 1,4 | 3,3 | | white |
| M20x1,5 | -20 - 70 | 7 | 5,5 | 1,5 | 7,0 | 1,0 | 7,0 | 1,5 | 9,0 | 1,4 | 9,5 | 1,0 | 13,0 | 1,7 | 2,7 | | white |
| M20x1,5 | -40 - 70 | 4 | 5,5 | 1,5 | 7,0 | 1,0 | 7,0 | 1,5 | 9,0 | 1,4 | 9,5 | 1,0 | 11,0 | 1,7 | 2,7 | | green |
| M25x1,5 | -20 - 70 | 7 | 8,0 | 1,5 | 10,0 | 2,0 | 10,0 | 2,3 | 13,0 | 2,6 | 13,5 | 1,3 | 17,5 | 2,3 | 3,0 | | white |
| M25x1,5 | -55 - 70 | 7 | 8,0 | 1,5 | 10,0 | 2,0 | 10,0 | 2,3 | 13,0 | 2,6 | 13,5 | 1,5 | 15,0 | 2,3 | 3,0 | | green |
| M32x1,5 | -20 - 70 | 7 | | | | | 14,0 | 3,0 | 17,0 | 4,0 | 17,5 | 1,5 | 21,0 | 1,3 | 5,0 | | white |
| M32x1,5 | -55 - 70 | 7 | | | | | 14,0 | 3,0 | 17,0 | 4,0 | 17,5 | 1,5 | 21,0 | 1,3 | 5,0 | | green |
| M40x1,5 | -55 - 70 | 7 | | | | | 19,0 | 3,3 | 22,0 | 5,5 | 22,0 | 3,3 | 28,0 | 6,7 | 7,5 | | green |
| M50x1,5 | -55 - 70 | 7 | | | | | 24,0 | 6,0 | 28,0 | 7,0 | 28,0 | 5,0 | 35,0 | 7,0 | 7,5 | | green |
| M63x1,5 | -55 - 70 | 7 | | | | | 29,0 | 12,0 | 35,0 | 12,0 | 36,0 | 12,0 | 41,0 | 13,0 | 7,5 | | green |
| additional seal | | | | | | | 41,0 | 13,0 | 48,0 | 7,8 | | | | | | | |

** Test torques at 20°C

⁽¹⁾ The tests of clamping ranges and torque values were performed with metal mandrel. The clamping range can vary by using cables with different manufacturing tolerances and material properties. Please use the combination of sealing 1 + 2 + 3 for the intermediate region.

⁽²⁾ When selecting the seal rubber, ensure that the cap nut can be tightened when carrying out any future maintenance work on the cable entry.

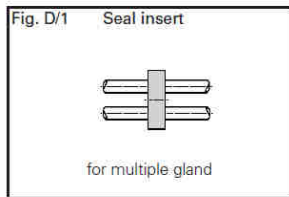
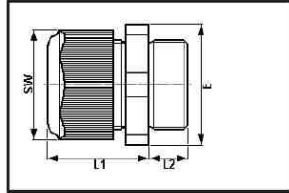


F.T.N

13

Cable entries, blanking plugs, screw plugs, trumpet-shaped cable glands, reducing glands and drain plugs

Dimension drawings and dimensions in mm

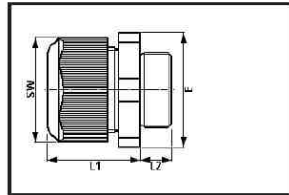


1.2 Multiple glands

| Type | SW | L1 | L2 | E | weight app. |
|---------------------|-------|---------|------------|---------|-------------|
| M25x1,5 2- times | 29 mm | 29,5 mm | 13 / 8 mm | 32,0 mm | 16,9 g |
| M32x1,5 4- times | 36 mm | 35,5 mm | 15 / 10 mm | 40,0 mm | 27,6 g |

| Type | Operating temperature | Impact resistant | Cable diameter | | | | |
|---------------------|-----------------------|------------------|----------------|-----|--------|-----|-----|
| | | | Seal 1 | | Seal 2 | | |
| | °C | Joule | Ø | Nm | Ø | Nm | |
| M25x1,5 2- times | -20 - 70 | < 7 | 2x | 4,5 | 2,0 | 7,0 | 2,0 |
| M32x1,5 4- times | -20 - 70 | < 7 | 4x | 4,5 | 3,0 | 7,0 | 3,5 |

1.3 Enlargement glands



| Type | SW | L1 | L2 | E | weight app. |
|-------------------|-------|---------|-------|---------|-------------|
| M16x1,5 / M20x1,5 | 24 mm | 25,0 mm | 12 mm | 26,5 mm | 9,2 g |
| M20x1,5 / M25x1,5 | 29 mm | 29,5 mm | 13 mm | 32,0 mm | 16,7 g |
| M25x1,5 / M32x1,5 | 36 mm | 35,5 mm | 15 mm | 40,0 mm | 27,0 g |
| M32x1,5 / M40x1,5 | 46 mm | 39,5 mm | 15 mm | 50,5 mm | 46,5 g |
| M40x1,5 / M50x1,5 | 55 mm | 44,0 mm | 15 mm | 60,0 mm | 73,5 g |
| M50x1,5 / M63x1,5 | 68 mm | 47,0 mm | 16 mm | 75,0 mm | 106,4 g |

| Type | Operating temperature | Impact resistant | Cable diameter | | | | | | | | | | | | Screw-in thread in enclosure |
|-------------------|-----------------------|------------------|----------------|------|---------------------|------|----------|------|---------------------|------|--------|------|------------------|------|------------------------------|
| | | | Seal 1+2+3 | | | | Seal 1+2 | | | | Seal 1 | | | | |
| | | | min. | max. | | Nm** | min. | max. | | Nm** | min. | max. | | Nm** | |
| | °C | Joule | Ø | Nm** | Ø ⁽¹⁾⁽²⁾ | Nm** | Ø | Nm** | Ø ⁽¹⁾⁽²⁾ | Nm** | min. | Nm** | Ø ⁽¹⁾ | Nm** | Nm** |
| M16x1,5 / M20x1,5 | -20 - 70 | < 7 | 5,5 | 1,5 | 7,0 | 1,0 | 7,0 | 1,5 | 9,0 | 1,4 | 9,5 | 1,0 | 13,0 | 1,7 | 3,3 |
| | -40 - 70 | < 4 | 5,5 | 1,5 | 7,0 | 1,0 | 7,0 | 1,5 | 9,0 | 1,4 | 9,5 | 1,0 | 11,0 | 1,7 | 3,3 |
| M20x1,5 / M25x1,5 | -20 - 70 | < 7 | 8,0 | 1,5 | 10,0 | 2,0 | 10,0 | 2,3 | 13,0 | 2,6 | 13,5 | 1,3 | 17,5 | 2,3 | 2,7 |
| | -40 - 70 | < 4 | 8,0 | 1,5 | 10,0 | 2,0 | 10,0 | 2,3 | 13,0 | 2,6 | 13,5 | 1,5 | 15,0 | 2,3 | 2,7 |
| M25x1,5 / M32x1,5 | -55 - 70 | < 7 | | | | | 14,0 | 3,0 | 17,0 | 4,0 | 17,5 | 1,5 | 21,0 | 1,3 | 3,0 |
| M32x1,5 / M40x1,5 | -55 - 70 | < 7 | | | | | 19,0 | 3,3 | 22,0 | 5,5 | 22,0 | 3,3 | 28,0 | 6,7 | 5,0 |
| M40x1,5 / M50x1,5 | -55 - 70 | < 7 | | | | | 24,0 | 6,0 | 28,0 | 7,0 | 28,0 | 5,0 | 35,0 | 7,0 | 7,5 |
| M50x1,5 / M63x1,5 | -55 - 70 | < 7 | | | | | 29,0 | 12,0 | 35,0 | 12 | 36,0 | 12,0 | 41,0 | 13,0 | 7,5 |
| additional seal | | | | | | | 41,0 | 13,0 | 48,0 | 7,8 | | | | | |

** Test torques at 20°C

⁽¹⁾ The tests of clamping ranges and torque values were performed with metal mandrel. The clamping range can vary by using cables with different manufacturing tolerances and material properties. Please use the combination of sealing 1 + 2 + 3 for the intermediate region.

⁽²⁾ When selecting the seal rubber, ensure that the cap nut can be tightened when carrying out any future maintenance work on the cable entry.

Operating instruction 2 (only for low temperature limit switch box, see image 20-22, page 15),

Tightening torque **M20x1,5 mm = 10 Nm**

Betriebsanleitung · Operating instructions



PTB 11 ATEX 1007X

blueglobe HT Ex e

**Messing vernickelt/blank und
Edelstahl**

Für Kabel- und Leitungseinführungen (KLE)
der Zündschutzart „Erhöhte Sicherheit – Ex „e““

Anwendung:

Die Kabel- und Leitungseinführungen (KLEs) blueglobe HT Ex e dienen zur Einführung von fest verlegten Kabeln und Leitungen in einen Anschlussraum oder in ein Gehäuse eines explosionsgeschützten elektrischen Betriebsmittels der Gerätegruppe II und der Kategorien 2 G/D und 3 G/D.

Der Anschlussraum oder das Gehäuse muss der Zündschutzart „Erhöhte Sicherheit – Ex „e““ nach den Normen EN 60079-0:2012 + A11:2013, EN 60079-7:2015, EN 60079-31:2014 entsprechen.

Die KLE ist für Betriebsmittel mit dem Grad der mechanischen Gefahr „hoch“ nach EN 60079-0 geeignet. Bei ordnungsgemäßer Montage der KLE kann die Schutzart IP 66/68 nach IEC 529 oder EN 60529 erreicht werden.

Kennzeichnung:

Die Kabel- und Leitungseinführungen blueglobe HT Ex e entsprechen den Normen EN 60079-0:2012 + A11:2013, EN 60079-7:2015, EN 60079-31:2014. Sie sind von der Physikalisch-Technischen Bundesanstalt (PTB) einer EG-Baumusterprüfung nach EG-Richtlinie 94/9/EG unterzogen worden.

Sie sind deshalb wie folgt gekennzeichnet:



Kennzeichnung Zulassungsnummer und Kennzeichen der Prüfstelle:

  PTB 11 ATEX 1007X xx  CE 0102

Kennzeichnung Gas:

  II 2G Ex e IIC Gb

Kennzeichnung Staub:

  II 2D Ex tb IIIC Db IP 66/68

Kennzeichnung extrem kleiner Bauteile:*

  II 2G/II 2D CE 0102

Weitere Zertifikate:

IECEX – IECEX PTB 11.0019X

EAC – RU C-DE.MLU06.B.00119

*Kennzeichnung auf Kabelverschraubung

PTB 11 ATEX 1007X

blueglobe HT Ex e

brass nickel-plated, brass and stainless steel

For cable glands and cable entry systems (CG/CES) of the
ignition protective class Ex “e”

Application:




The cables glands and cable entry systems (CG/CES) blueglobe HT Ex e are used to insert permanently laid lines and cables into a connection space or housing of an explosion-protected electrical operating material of the appliance group II and categories 2 G/D and 3 G/D. The connection space or housing must conform to the ignition protective class “Increased safety – Ex e” in accordance with the standards EN 60079-0:2012 + A11:2013, EN 60079-7:2015 and EN 60079-31:2014. The CG/CES is suitable for operating material with the degree of mechanical risk “high” as per EN 60079-0. In selecting the material for the sealing insert, the ambient, surface and operating temperature at the installation point is to be observed. With proper assembly of the KLE, the protective class IP 66/68 according to IEC 529 or EN 60529 can be attained.

Designation:

The cable glands and cable entry systems (CG/CES) blueglobe HT Ex e conform with the standards EN 60079-0:2012 + A11:2013, EN 60079-7:2015, EN 60079-31:2014. They were subjected to an EC design test in accordance with EC directive 94/9/EC by the Physical-Technical Federal Institute (PTB).

They are therefore designated as follows:



ID of approval no. and ID of testing authority:

  PTB 11 ATEX 1007X xx  CE 0102



Designation gas:

  II 2G Ex e IIC Gb

Designation dust:

  II 2D Ex tb IIIC Db IP 66/68

Designation of extremely small components:*

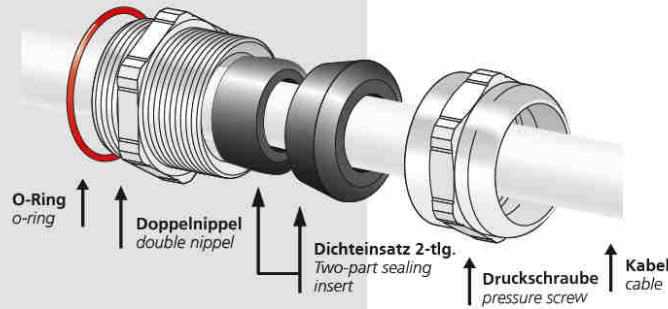
  II 2G/II 2D CE 0102

ID of Approval IECEX:

IECEX – IECEX PTB 11.0019X

EAC – RU C-DE.MLU06.B.00119

*Designation on cable gland



Montage

Als Montagewerkzeug kann der PFLITSCH Steckschlüssel M28 verwendet werden.

Einsatztemperaturbereich:

Temperaturbereich Silikon: -55 °C bis +160 °C

Mindestwandstärken

- beim Einbau in Geräten mit Gewindebohrungen:
s = 5,0 mm (Kunststoff); 3,0 mm (Metall)
- beim Einbau in Geräten mit Durchgangsbohrungen:
s = 2,0 mm (Kunststoff); 1,0 mm (Metall)

Hinweis zur Zugentlastung der Kabelverschraubung:

Die KLE ist nur für fest verlegte Leitungen und Kabel geeignet. Der Betreiber muss in diesem Fall für geeignete Maßnahmen sorgen, um eine Zugentlastung zu gewährleisten.

Wichtig:

Dichtringe dürfen nicht mit dem Messer ausgeschnitten werden!

Demontage:

Die Demontage erfolgt in umgekehrter Reihenfolge.

Instandhaltung:

Die Blindstopfen sind in die Kontrollen bei der Inspektion und Wartung der elektrischen Betriebsmittel einzubeziehen.

Anschlussmaße für Durchgangsbohrungen:

| Metrisch/metric | M12 | M16 | M20 | M25 | M32 | M40 | | | |
|-----------------|------|------|------|------|------|------|--|--|--|
| d [mm] 0/+ 0,3 | 12,0 | 16,0 | 20,0 | 25,0 | 32,0 | 40,0 | | | |

Anzugsmomente:

| Gewinde/Thread | M12 | M16 | M20 | M25 | M32 | M40 | | | |
|----------------|-----|-----|-----|-----|-----|-----|--|--|--|
| Nm | 5 | 8 | 10 | 15 | 15 | 20 | | | |

Mechanische Festigkeit:

| Gewinde/Thread | M12 | M16 | M20 | M25 | M32 | M40 | | | |
|----------------|-----|-----|-----|-----|-----|-----|--|--|--|
| Joule | 7 | 7 | 7 | 7 | 7 | 7 | | | |

Assembly

The PFLITSCH socket spanner M28 can be used as a tool

Application temperature range:

Temperature range silicone: -55 °C bis +160 °C

Minimum wall thicknesses

- for installation in appliances with threaded holes:
s = 5.0 mm (plastic); 3.0 mm (metal)
- for installation in appliances with throughholes:
s = 2.0 mm (plastic); 1.0 mm (metal)

Pointer for strain relief of the cable gland:

The CG/CES are only suitable for permanently laid lines and cables. In this case, the operator must adopt appropriate measures to ensure strain relief.

Important:

Sealing rings must not be cut out with a knife!

Disassembly:

Disassembly is carried out in the reverse order.

Maintenance:

The CG/CES are to be included in the inspection and maintenance of the electrical operating material.

Connection dimensions for throughholes:

Tightening torques:

Mechanical strength:

9. Applicable standards

EN 60079-0: 2018

Explosive atmospheres - Part 0: Equipment - General requirements

EN 60079-11: 2012

Explosive atmospheres - Part 11: Equipment protection by intrinsic safety “i”