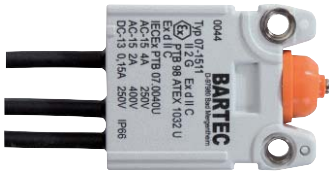


ATEX Switches DATASHEET

JUNHO 2013

Tel: (+351) 21 843 64 00
Fax: (+351) 21 843 64 09
geral@bhb.pt www.bhb.pt



Insert switch



Limit switch

Description

Insert switch with connection cores

This switching element can be universally used for switching, controlling and regulating operations within Ex-areas. The insert switch is audited by the PTB according to the latest EC guideline 94/9/EC. Devices equipped with these insert switches have to be approved by a testing authority, the switch itself needs not be retested.

The cores are cast-in at the back of the switch. Their standard length is 500 mm; other lengths are available on request. To connect the cores we recommend the miniterminals from BARTEC.

Limit switch with connection cable

The limit switches have been developed for Ex-areas where safe and reliable signalling is required, for example on pumps, petrol pumps, as well as in mechanical and high-tec engineering. The switches must be mounted into the respective devices or systems in such a way as to guarantee mechanical protection. No further tests are required. The connection cable is cast in on the back of the switch. For the connection in Ex-areas BARTEC provides a large variety of terminals and terminal boxes.

Explosion protection

Ex protection type

Insert switch	Ex II 2G Ex d IIC
	Ex I M2 Ex d I
Limit switch	Ex II 2G Ex d IIC T6
	Ex II 2D Ex DA21 IP 66 T 80 °C

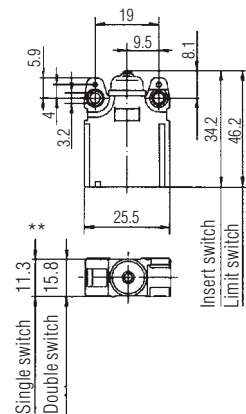
Certifications

Insert switch	PTB 98 ATEX 1032 U
	IECEX PTB 07.0040 U
Limit switch	PTB 00 ATEX 1093 X
	IBExU01ATEX1007 X
	IECEX PTB 07.0045 X

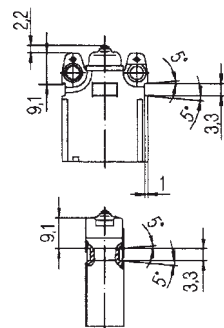
Ambient temperature

- 20 °C to +40 °C (-55 °C to +75 °C)
- 20 °C to +75 °C for DustEx
- 55 °C on request

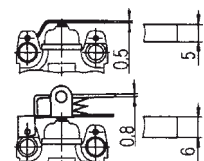
Dimensions in mm



Clip-on pockets



Lever widths





Technical data

Ex d insert switch/limit switch

EN 60947-5-1

EN 60947-1

Protection class

IEC/EN 60529:IP 66

Electrical data for control switch in accordance with DIN EN 60947-5-1

Rated operating voltage AC 400 V

Utilization category

AC-15 2 A 400 V

DC-13 0.15 A 250 V

Isolation voltage 400 V

(further electrical data on request)

Electrical data for switch

Rated current

AC 2 A 400 V

AC 7 A 250 V

DC 0.5 A 250 V

(further electrical data on request)

Ambient temperature +40 °C

AC switching capacity

	ohmic load	inductive load $\cos \varphi = 0,6$
400 V	3 A	2 A
250 V	5 A	3 A
30 V	7 A	5 A

DC switching capacity

	ohmic load	inductive load $L/R = 3 \mu s$
250 V	0.4 A	0.03 A
30 V	7 A	5 A

Tightening torque of fixing screws

0.6 Nm

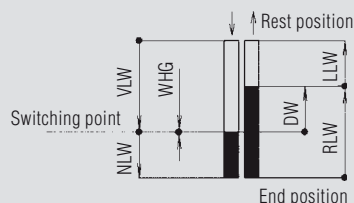
Rating of gold-coated contacts

Voltage: min. 5 V/max. 30 V

Current: min. 4 mA/max. 400 mA

- the product of voltage and current should not exceed 0.12 VA
- for alternating current these values have to be interpreted as peak values

Contact Travels



Contact break distance $2 \times \geq 0.3 \text{ mm}$

Contact travels (in mm)

Pretravel	VLW	max. 0.9
Overtravel	NLW	min. 0.5
Differential value	DW	max. 0.45
Release travel	RLW	0.9
Release travel	LLW	0.1 to 0.45
Repeat accuracy WHG (for repetitive actuation)		± 0.02

Service life

mechanical	$> 2 \times 10^6$
electrical	dependent on load
max. switching rate	1000 operations/h

Switching actuation force

Single-break switch	max. 2.0 N
Double-break switch	max. 3.6 N

Reset force

Single-break switch	min. 0.4 N
Double-break switch	min. 0.8 N
Operating rate	$\geq 10 \mu\text{m/sec.}$

Electrical connection

- Insert switch: cores 4 GAF 0.75
- Limit switch:
cable H05VV-F 0.75/A05VV-F 0.75
(other cables on request)

Conductor diameter

2-wire $6.1 \pm 0.3 \text{ mm}$

3-wire $6.6 \pm 0.3 \text{ mm}$

4-wire $6.7 \pm 0.3 \text{ mm}$

6-wire $8.9 \pm 0.3 \text{ mm}$

Contact element

snap-action contact element (double-break) as, normally-open, normally-closed, changeover contact as well as N/O + N/C contacts for circuits with equal potentials.

Contact material

Silver or gold-coated contacts
(all contact elements have a standard protective gold-coating as standard)

Double-break switch (switch options)

- *simultaneous switch sequence:*
chamber I and II almost simultaneous
- *defined switch sequence:*
chamber I switches mechanically safe 0.03 up to 0.3 mm before chamber II

Weight

- Insert switch with 500 mm cores:
single-break switch 35 g,
double-break switch 70 g
- Limit switch with 3 m cable:
single-break switch 210 g,
double-break switch 415 g

Housing material

plastic (thermoplastics)

Plunger/additional actuator

stainless steel

Technical data subject to change without notice.



Miniature Insert switch/ Limit switch

Description

BARTEC miniature switches are used in areas with of limited space for a flameproof switching element.

They are especially suitable for applications in valves, thermostats, push switches, servo components, level metres and switching gears. The smallest Ex d miniature switch in the world is encapsulated in a plastic enclosure. The leads or cable tail are potted in at the base.

The standard version of the BARTEC miniature switches contains fine silver contacts. Other contact materials such as gold plated silver or solid gold are available for low currents and voltages.

Limit switch with connection cable

Switches with connector cables have been approved by PTB with EC model test certification. The switches can therefore be mounted at any time into devices and systems which offer mechanical protection – no further testing is required.

The connector cable is cast into the back of the switch. The wires are colour-coded.

The (standard) cable length is 3 m; other lengths are available on request.

Insert switch with connection cores

The insert switch with wires is available as a building block for your explosion-proofing solution.

These insert switches are tested and approved by PTB (the Federal Physical-Technical Institute) according to Ex Guideline 94/9/EC.

After installation, the complete device is tested by an authorized institution.

Thanks to its PTB approval, the microswitch itself needs not be individually tested.

The leads are individually marked. The length of the cable is 50 cm (standard). Other lengths can be supplied on request.

For the connection of the cores we recommend our BARTEC Ex Mini-terminals.

Explosion protection

Ex protection type

Limit switch Ex II 2G Ex d IIC T6

Insert switch Ex II 2G Ex d IIC

Ex I M2 Ex d I

FM approved for Class 1, Div. 2

Certification

Limit switch
with cable tail: PTB 01 ATEX 1005 X
IECEx PTB 07.044 X

Insert switch
with cores: PTB 98 ATEX 1033 U
IECEx PTB 09.0032 U

The current carrying capacity depends on the ambient temperature.

Temperature class	Ambient temperature	Rated current at AC
T6	65 °C	5 A
T6	70 °C	4 A
T5	80 °C	5 A
T5	90 °C	3 A

Technical data

Protection class

IP 54/IEC 60529

Rated voltage

AC 250 V

Rated current

Switching capacity with AC		
	ohmic load	inductive load
250 V	5 A	5 A
30 V	5 A	5 A

Switching capacity with DC		
	ohmic load	inductive load
250 V	0.25 A	0.03 A
125 V	0.5 A	0.06 A
75 V	1 A	1 A
30 V	5 A	5 A

Contact elements

see table

Tightening torque of fixing screws

max. 0.6 Nm

Operating force

max. 1.4 N

Release force

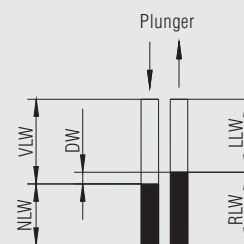
min. 0.25 N

Switching cycles

max. 1 000/h

Contact travels

- Pretravel (VLW) 0.5 to 1.0 mm
- Overtravel (NLW) min. 0.2 mm
- Reset travel (RLW) ~0.55 mm
- Differential value (DW) max. 0.13 mm
- No-load travel (LLW) ~0.5 mm



Mechanical life

10⁷ switching cycles

Electrical life

dependent on load

Electrical connection

Type 07-2501-....

LSYY 0.75 mm² (-40 °C to +70 °C)

Type 07-1501-....

Radox 0.75 mm² (-55 °C to +90 °C)

4GAF 0.75 mm² (-40 °C to +90 °C)

H05V2-K 0.75 mm² (-40 °C to +80 °C)

Enclosure

Duroplast

Plunger/additional actuator

stainless steel

Weight

with 0.5 m cores approx. 25 g

with 1 m cable approx. 50 g



Limit switch plastic encapsulated

BARTEC



Limit switch plastic encapsulated

Features

- Positive break contacts
- Very robust construction
- IP 65 protection class
- 13 different actuator versions
- Operator protection in accordance with GS-ET 15

Description

Besides the metal-enclosed precision switch of the RET series, BARTEC also offers a series of limit switches with plastic bodies. The enclosure is made of shock impact resistant proof plastic providing an IP 65 protection class according to IEC/EN 60529. Due to its format several limit switches can be mounted in tandem formation requiring very little space.

This allows a multiple triggering of switching operations. The connection cable is equipped with a strain relief device, prewired and safely cast into the enclosure by means of epoxy resin. We supply this robust limit switch with a standard length of 3 m; special lengths are available on request.

The integrated switching element changes over via NC contact with positive break operation. Operator protection corresponds the the GS-ET 15 requirements.

Its high vibration resistance and long life are the result of a most extensive laboratory research. The certification for hazardous areas and the high protection class granted thanks to its structural characteristics are the ideal prerequisites for its use in almost all fields of automation, mechanical and high-tec engineering.

Explosion protection

Ex protection type

- Ex II 2G Ex d IIC T6/T5
- Ex II 2D Ex tD A21 IP 65 T 80 °C/90 °C

Certification

PTB 03 ATEX 1143 X

Ambient temperature

- 20 °C to +65 °C for T6
- 20 °C to +90 °C for T5 at 3 A

Technical data

Protection class

IEC/EN 60529:IP 65

Enclosure

shock-resistant thermoplastic material,
self-extinguishing
UL 94-V0

Switching element

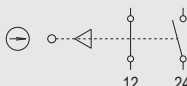
- 1 NO/1 NC contact
- both galvanically isolated
- NC contact with pos. break
- (VDE 0113, Teil 1)

Connection

- 4 core cable H05VV-F
- cross section: 0.75 mm²
- cable length: 3 meters
- other lengths on request

Colour coding of the flexible leads

- 11 = BN
- 12 = BU
- 23 = BK
- 24 = GY



Electrical structure

- EN 60947-5-1
- EN 60947-1

Nominal voltage

AC 250 V/DC 230 V

Nominal current

- AC 6 A
- DC 0.25 A

Switching capacity

	with AC 15	with DC 13
250 V	6 A	-
230 V	-	0.25 A

Mechanical datas

Switching point tolerance

± 0.5 mm depending on the actuator

Actuality force tolerance

± 1 N

Repeat accuracy of switching

± 0.02 mm

Mechanical life cycles

5 x 10⁶ cycles

Max. switching frequency

1 800 cycles/h

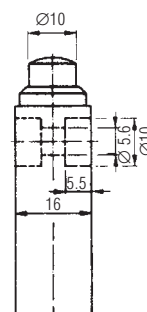
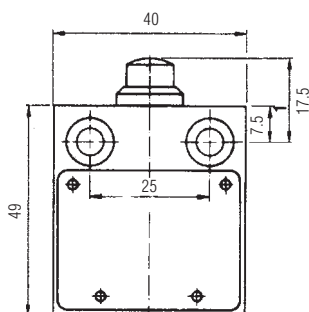
Vibration resistance

10 g at 10 to 2 000 Hz

Shock resistance/shock stability

50 g at a shock duration 6 ms

Dimensions





Position switch

Features

- Dimensions and mounting dimensions according to DIN EN 50041
- Compatible with non-Ex DIN limit switches
- Different switching elements

Description

All dimensions and actuating elements of the Ex d position switch correspond to the DIN EN 50041 standard.

Its 30 x 60 mm mounting dimensions make the switch directly compatible to the position switch corresponding to the same DIN standard. The switch is equipped with snap-action contacts with several switching element versions. A micro-switch with connection cable Type 07-2511 is mounted as switching element.

Different actuators are available for the variety of actuating possibilities. After the removal of four screws these knobs can be rotated by 90 °C allowing so four different directions of actuation.

Gold-plated or gold-nickel contacts are available for the switching of low currents of voltages.

Standard length of the connection cables are 3 m.

BARTEC has designed a very extensive range of Ex e terminal boxes of polyester and aluminium for the connection of the position switch within the Ex area.

Explosion protection

Ex protection type

- Ex II 2G Ex d IIC T6
- Ex II 2D Ex tD A21 IP 66 T 80 °C

Installation

Type 07-2511

Certification

PTB 00 ATEX 1093 X
IBExU01ATEX1007 X
IECEx PTB 07.0045 X

Ambient temperature

-20 °C to +60 °C
(-55 °C to +90 °C on request)

Technical data

Protection class

IEC/EN 60529:IP 66

Electrical data according to DIN EN 60947-5-1

Rated operating voltage AC 400 V

Utilisation category

AC 15	2 A	400 V
DC 13	0.15 A	250 V

Isolation voltage 400 V

(further electrical data on request)

Electrical data

Nominal current

AC	2 A	400 V
AC	7 A	250 V
DC	0.5 A	250 V

(further electrical data on request)

Ambient temperature +40 °C		
Switching capacity AC		
	ohmic load	inductive load cosφ = 0.6
400 V	3 A	2 A
250 V	5 A	3 A
30 V	7 A	5 A

Schaltleistung bei DC		
	ohmic load	inductive load L/R = 3 µs
250 V	0.4 A	0.03 A
30 V	7 A	5 A

Switching elements

see table

Travels, forces

see table

Max. switching frequency

1 000 h

Mechanical life

max. 10⁶ switching cycles

depending on plunger operating
speed and angle

Electrical life

dependent on load

Electrical connection

connection cable HO5VV-F/A05VV-F

Enclosure material

aluminium



Position switch

Features

- Dimensions and mounting dimensions according to DIN EN 50041
- Electronic switching inserts with individually adjustable switching points
- Analog switching inserts can transmit through current or voltage paths
- All mechanical N/C contacts as positive opening operation contacts
- Actuating elements can be turned by 4 x 90°
- Model with Ex d "flameproof enclosure" type of protection

Description

Position switches are used wherever movable parts on machinery and systems have to be positioned, controlled and monitored.

They control and facilitate signalling in switching gear or function as switches in regulating and control devices.

The flameproof encapsulated BARTEC position switches can be used in hazardous (potentially explosive) areas in Zones 1 and 2 in accordance with the certified explosion subgroups IIA, IIB and IIC and the temperature class T6 and in Zones 21 and 22 according to the certified maximum surface temperature.

Position switch without actuator

➤ Explosion protection

Ex protection type

- ⊕ II 2G Ex d IIC T6
- ⊕ II 2D Ex tD A21 IP65 T80 °C
- CE 0044

Certification

PTB 09 ATEX 1048 X

Ambient temperature

Operation -20 °C to +60 °C
Storage, transport -20 °C to +80 °C

Approved for Zone

1 + 21 and 2 + 22

➤ Technical data

Protection class

IP 66 (IEC/EN 60529)

Weight

approx. 160 g

■ Mechanical switching unit

Rated insulation voltage

400 V

Rated operating voltage/current

AC 15	4 A	400 V
AC 15	6 A	24 V and 240 V
DC 13	3 A	24 V
DC 13	0.8 A	110 V
DC 13	0.3 A	220 V

Rated impulse strength

4 kV AC

Switching frequency

up to 6000/h depending on the type

Service life

mechanical max. 10⁶ switching cycles
depending on plunger operating angle/speed

■ Electronic switching unit

Rated voltage

up to DC 30 V

Rated operating voltage/current

DC 12 V	0.015 A
DC 24 V	0.018 A
DC 30 V	0.019 A

Tightening torques

Lid screws	max. 0.9 Nm
Pressure screw	5 Nm

Enclosure/plunger material

Thermoplastic



Actuator

Technical data

Weight

depending on the model

Tightening torque

Actuator screws 0.9 Nm

Cable entries

Technical data

Pressure screw

M20 x 1.5

Conductor diameter 5 to 8.4 mm

Washer

Outer diameter 18.3 mm

Inner diameter 8.7 mm

Thickness 1 mm

Sealing ring (fitted, without marking)

Outer diameter 18.5 mm

Inner diameter 8.4 mm

Height 13 mm

Conductor diameter 8 to 12 mm

Washer:

Outer diameter 18.3 mm

Inner diameter 12.2 mm

Thickness 1 mm

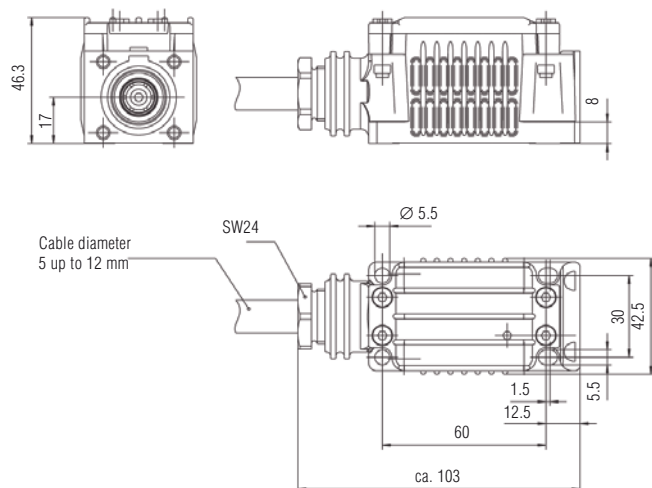
Sealing ring (without marking)

Outer diameter 18.5 mm

Inner diameter 11.7 mm

Height 13 mm

Dimensions



Contactos/Contacts:

Comercial/Commercial:

Fernando Mena Costa
e-mail: fcosta@bhb.pt
Tel: (+351) 21 843 64 00
Fax: (+351) 21 843 64 09

Assistência/Service:

Patricia Costa
e-mail: ppcosta@bhb.pt
Tel: (+351) 21 843 64 00

