# 8.1 Technical details

| Technical details | |
|---|---|
| Application range | **Failsafe** |
| Maximum achievable category in accordance with **EN 954-1** | **4** |
| Maximum achievable SIL value | **SIL3** |
| Module's device code | **0C03h** |
| Number of FS output bits | **2** |
| Support in system environment A | **yes** base type, T-type<br>**no** R-type |
| from FS firmware version for other head modules | **4** base type, T-type |
| from FS firmware version PSSu H F PN | **1** base type, T-type |
| Support in system environment B | **yes** |
| from head module FS firmware version | **1.0.0** base type, T-type<br>**1.5.0** R-type |
| **Electrical data** | |
| Internal supply voltage (module supply) | |
| Supply voltage range of module supply | **4.8 - 5.4 V** |
| Module's current consumption | **40 mA** |
| Module's power consumption | **0.20 W** |
| Periphery's supply voltage (periphery supply) | |
| Voltage range | **16.8 - 30.0 V** |
| Module's current consumption with no load | **60 mA** |
| Module's power consumption with no load | **1.50 W** |
| Max. power dissipation of the module | **2.50 W** |
| **Outputs** | |
| Number of relay outputs | **2** |
| Contact material | **AgCuNi + 0.2 µm Au** |
| External contact fuse protection ($I_K$ = 1 kA) to **VDE 0660** | |
| quick | **10 A** |
| slow | **6 A** |
| slow | **6 A** R-type |
| Potential isolation between relay contact and periphery supply | **4900 V (safe separation)** |
| Potential isolation between relay contact and module supply | **4900 V (safe separation)** |
| Potential isolation between relay contact and C-rail | **3050 V (basic insulation)** |
| Potential isolation between relay contact 1 and relay contact 2 | **4900 V (safe separation)** |

## 8.1 Technical details

| | |
|---|---|
| **Outputs** | |
| Utilisation category in accordance with **EN 60947-4-1** | |
| Safety contacts: AC1 at **250 V** | $I_{min}$: **10.00 mA** , $I_{max}$: **8.0 A**<br>$P_{max}$: **2000 VA** |
| Safety contacts: AC1 with condensation at **30 V** R-type, T-type | $I_{min}$: **10 mA** R-type, T-type , $I_{max}$: **8 A** R-type, T-type<br>$P_{max}$: **240 VA** R-type, T-type |
| Safety contacts: DC1 at **24 V** | $I_{min}$: **10.00 mA** , $I_{max}$: **8.0 A**<br>$P_{max}$: **192 W** |
| Safety contacts: DC1 at **60 V** R-type | $I_{min}$: **10 mA** R-type , $I_{max}$: **1.66 A** R-type<br>$P_{max}$: **100 W** R-type |
| Utilisation category in accordance with **EN 60947-5-1** | |
| Safety contacts: AC15 at **230 V** | $I_{max}$: **3.0 A** |
| Safety contacts: AC15 with condensation at **30 V** R-type, T-type | $I_{max}$: **3 A** R-type, T-type |
| Safety contacts: DC13 at **24 V** (6 cycles/min) | $I_{max}$: **5.0 A** |
| Safety contacts: DC13 at **60 V** R-type | $I_{max}$: **0.7 A** R-type |
| Switching capability in accordance with **UL 508** base type, T-type | |
| **240 V AC G. P.** base type, T-type | **3.0 A** base type, T-type |
| **24 V DC G. P.** base type, T-type | **3.0 A** |
| **Pilot Duty** base type, T-type | **B300, R300** base type, T-type |
| Permitted loads | **inductive**, **resistive** |
| **Times** | |
| Max. processing time for relay output when signal changes from “1” to “0” | **120 ms** |
| Max. processing time for relay output when signal changes from “0” to “1” | **60 ms** |
| **Environmental data** | |
| Climatic suitability | **EN 50125-1**, **EN 50125-3**, **EN 60068-2-14**, **EN 60068-2-1**, **EN 60068-2-2**, **EN 60068-2-30**, **EN 60068-2-78** |
| Ambient temperature in accordance with **EN 60068-2-14** base type, T-type | **-40 - 60 °C** T-type<br>**0 - 60 °C** base type |
| Max. ambient temperature in accordance with **UL 508** base type, T-type | **60 °C** base type, T-type |
| Storage temperature in accordance with **EN 60068-2-1/-2** | **-25 - 70 °C** base type<br>**-40 - 70 °C** T-type |
| Climatic suitability in accordance with **EN 60068-2-30**, **EN 60068-2-78** | **93 % r. h. at 40 °C** base type, T-type |
| Condensation | **temporary (only with protective extra low voltage)** T-type<br>**no** base type |
| EMC | **EN 61000-4-2**, **EN 61000-4-3**, **EN 61000-4-4**, **EN 61000-4-5**, **EN 61000-4-6**, **EN 61000-6-2**, **EN 61000-6-4** |
| Vibration to **EN 60068-2-6** base type, T-type | |
| Frequency | **10 - 150 Hz** base type, T-type |
| Max. acceleration | **1g** base type, T-type |
| Broadband noise in accordance with **EN 60068-2-64** T-type | |
| Frequency | **5 - 500 Hz** T-type |
| Max. acceleration | **1.9grms** T-type |


Pilz GmbH & Co. KG, Felix-Wankel-Straße 2, 73760 Ostfildern, Germany
Telephone: +49 711 3409-0, Telefax: +49 711 3409-133, E-Mail: pilz.gmbh@pilz.de

## 8.1 Technical details

| | |
|---|---|
| **Environmental data** | |
| Shock stress | |
| **EN 60068-2-27** base type, T-type | **15g** base type, T-type |
| | **11 ms** base type, T-type |
| **EN 60068-2-29** base type, T-type | **10g** base type, T-type |
| | **16 ms** base type, T-type |
| Protection type in accordance with **EN 60529** base type, T-type | |
| Mounting (e.g. cabinet) | **IP54** base type, T-type |
| Housing | **IP20** base type, T-type |
| Terminals | **IP20** base type, T-type |
| Airgap creepage in accordance with **EN 60664-1** base type, T-type | |
| Overvoltage category | **III** base type, T-type |
| Pollution degree | **2** base type, T-type |
| **Environmental data for railway applications** | |
| Installation location in accordance with **EN 50125-3** R-type | **Track area (1m – 3m)** R-type |
| Installation location in accordance with **EN 61373** R-type | **Category 1, Class A + B** R-type |
| Climatic suitability | **50125-1**, **50125-3**, **50155** |
| Max. operating height above sea level | **2,000 m** R-type |
| Ambient temperature in accordance with **EN 50155** R-type | **-40 ... +70 °C** R-type |
| Ambient temperature in accordance with **EN 50125-1** R-type, **EN 50125-3** R-type | **-40 ... +70 °C** R-type |
| Shock stress **EN 50125-3** R-type | |
| | **2 g** R-type |
| | **11 ms** R-type |
| Vibration to **50125-3** R-type | |
| | **0.23 g** R-type |
| | **5 ... 2,000 Hz** R-type |
| Shock stress **EN 61373** R-type | |
| | **5 g** R-type |
| | **30 ms** R-type |
| Broadband noise in accordance with **EN 61373** R-type | |
| Max. acceleration | **0.79 g RMS** R-type |
| Frequency | **5 ... 150 Hz** R-type |
| Protection type in accordance with **EN 60529** R-type | |
| Mounting (e.g. cabinet) | **IP51** R-type |
| Housing | **IP20** R-type |
| Terminals | **IP20** R-type |
| Airgap creepage in accordance with **EN 50124-1** R-type | |
| Overvoltage category | **OV2** R-type |
| Pollution degree | **PD1** R-type |
| Supply interruptions in accordance with **EN 50155** R-type | **S2, C1, C2** R-type |
| **Mechanical data** | |
| Housing material | |
| Front | **PC** |
| Bottom | **PC** |
| Coding | **PA** |
| Dimensions | |
| Height | **76.0 mm** |
| Width | **25.4 mm** |
| Depth | **60.2 mm** |

## 8.1 Technical details

| Mechanical data | |
|---|---|
| Weight | **99 g** |
| Mechanical coding | |
| Type | **H** |
| Colour | **yellow** |

**Safety characteristic data**

| Unit | Operating mode | EN ISO 13849-1: 2006 PL | EN 954-1 Category | EN IEC 62061 SIL CL | PFH [1/h] | EN ISO 13849-1: 2006 $T_M$ [year] |
|---|---|---|---|---|---|---|
| **relay outputs** | single-channel | **PL c** (**Cat. 1**) | **Cat. 2** | **-** | **7.60E-08** | **20** |
| **relay outputs** | dual-channel | **PL e** (**Cat. 4**) | **Cat. 4** | **SIL CL 3** | **7.78E-10** | **20** |

Requirement on 1-channel relay outputs for Cat. 2 in accordance with EN 954-1: An additional output switches to a safe condition in the event of an error or, if that is impossible, signals a hazardous condition.

**CAUTION!**
It is essential to consider the relay's service life graphs. The relay outputs' safety-related characteristic data is only valid if the values in the service life graphs are met.

The PFH value depends on the switching frequency and the load on the relay output. If the service life graphs are not accessible, the stated PFH value can be used irrespective of the switching frequency and the load, as the PFH value already considers the relay's B10d value as well as the failure rates of the other components.

All the units used within a safety function must be considered when calculating the safety characteristic data.

The standards current on **2009-10** apply.


Pilz GmbH & Co. KG, Felix-Wankel-Straße 2, 73760 Ostfildern, Germany
Telephone: +49 711 3409-0, Telefax: +49 711 3409-133, E-Mail: pilz.gmbh@pilz.de

## 8.2 Service life graph

The service life graphs indicate the number of cycles from which failures due to wear must be expected. The wear is mainly caused by the electrical load; the mechanical load is negligible.

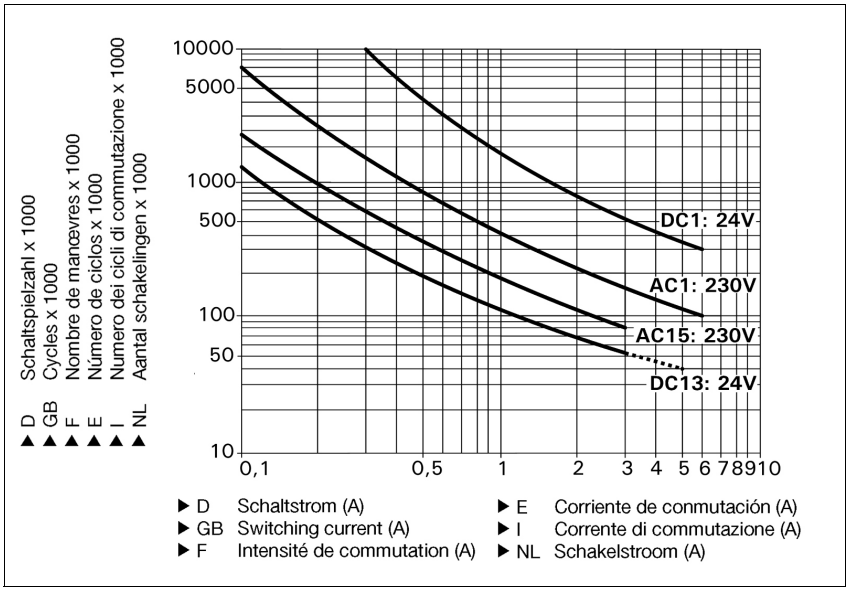


Fig. 8-1: Service life graph (base type and T-type)

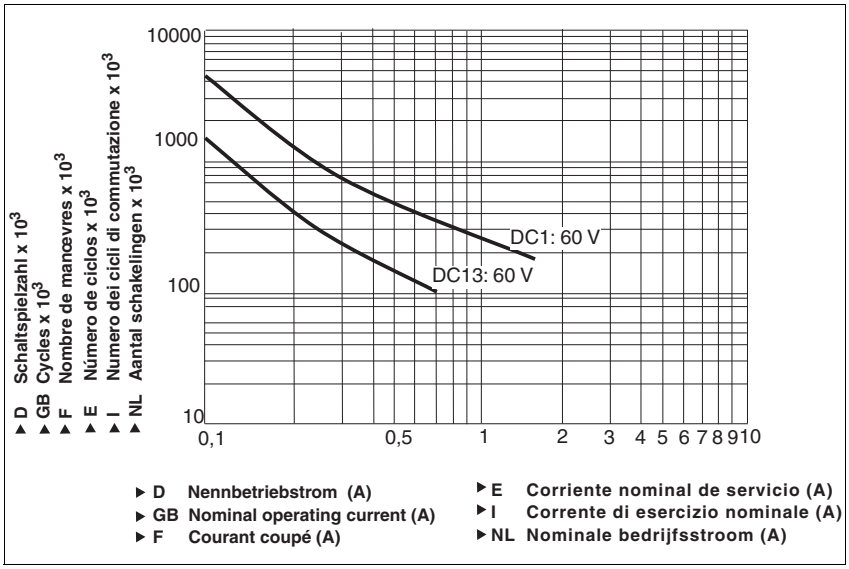


Fig. 8-2: Service life graph (R-type)

**Example**

- Inductive load: 0,2 A
- Utilisation category: AC15
- Contact service life: 1,000,000 cycles

## 8.2 Service life graph

Provided the application requires fewer than 1,000,000 cycles, the PFH value (see technical details) can be used in the calculation.

To increase the service life, sufficient spark suppression must be provided on all output contacts. With capacitive loads, any power surges that occur must be noted. With contactors, use freewheel diodes for spark suppression.

We recommend you use semiconductor outputs to switch 24 VDC loads.


Pilz GmbH & Co. KG, Felix-Wankel-Straße 2, 73760 Ostfildern, Germany
Telephone: +49 711 3409-0, Telefax: +49 711 3409-133, E-Mail: pilz.gmbh@pilz.de

## 8.3 Order reference

| Order reference |
|---|

| Description | Order no. |
|---|---|
| PSSu E F 2DOR 8<br>(Electronic module) | 312 225 |
| PSSu E F 2DOR 8-T<br>(Electronic module, T-type) | 314 225 |
| PSSu E F 2DOR 8-R<br>(Electronic module, R-type) | 315 225 |

| Base modules | Order no. |
|---|---|
| PSSu BP 2/16S<br>(Base module without C-rail with screw terminals) | 312 628 |
| PSSu BP 2/16S-T<br>(Base module without C-rail with screw terminals, T-type) | 314 628 |
| PSSu BP 2/16C<br>(Base module without C-rail with cage clamp terminals) | 312 629 |
| PSSu BP 2/16C-T<br>(Base module without C-rail with cage clamp terminals, T-type) | 314 629 |
| PSSu BP-C 2/16S<br>(Base module with C-rail and screw terminals) | 312 630 |
| PSSu BP-C 2/16S-T<br>(Base module with C-rail and screw terminals, T-type) | 314 630 |
| PSSu BP-C 2/16C<br>(Base module with C-rail and cage clamp terminals) | 312 631 |
| PSSu BP-C 2/16C-T<br>(Base module with C-rail and cage clamp terminals, T-type) | 314 631 |