

Reliability values acc. to EN ISO 13849-1

Values for complete systems:

Subsystems can represent a safety function by itself or they can be used together with other subsystems.

ATTENTION: In some subsystems, positively driven relays are included which are not wear-free. Several different systems which have restrictions regarding the number of switching cycles are listed in the EUCHNER library. If other values are required these values can be requested from EUCHNER directly.

| Subsystems: non-contact safety switches | | | | | |
|---|---|------------------|----|-----|--|
| Name | Documentation | PFH _d | PL | Cat | |
| CEM-A... Read head for CES evaluation system | The read head CEM-A... is already included in the evaluation unit and doesn't have a safety value. | - | - | - | |
| CEM...-C40... Safety switch with guard locking | CEM...-C40... Safety switches with guard locking for process protection and integrated evaluation electronics | 4,5E-09 | e | 4 | |
| CES...-AS1, non-contact safety system | CES evaluation unit Unicode or Multicode for one or four read heads with AS-i interface inclusive read heads and actuators. Read heads CES..., CKS..., ET-AX... or CEM... ATTENTION: CET-AX... with mounting head upward only category 3 and PFH _d = 4.3E-08 | 6,5E-09 | e | 4 | |
| CES-A-BA... complete, <= 0.1 A, <= 760,000 cycles per year, non contact safety system | CES evaluation unit for 1 read head Unicode or Multicode with read head and actuator. Read head CES..., CKS... or CEM... ATTENTION: maximum number of switching cycles 760,000 per year, switching current <= 0.1 A at 24 V DC | 4,3E-08 | e | 3 | |
| CES-A-BA... complete, <= 1 A, <= 153,000 cycles per year, non contact safety system | CES evaluation unit for 1 read head Unicode or Multicode with read head and actuator. Read head CES..., CKS... or CEM... ATTENTION: maximum number of switching cycles 153,000 per year, switching current <= 1 A at 24 V DC | 4,3E-08 | e | 3 | |

Subsystems: non-contact safety switches

| Name | Documentation | PFH _d | PL | Cat |
|--|--|------------------|----|-----|
| CES-A.BA... complete, <= 3 A, <= 34,600 cycles per year, non contact safety system | <p>CES evaluation unit for 1 read head Unicode or Multicode with read head and actuator. Read head CES..., CKS... or CEM...</p> <p>ATTENTION: maximum number of switching cycles 34,600 per year, switching current <= 3 A at 24 V DC</p> | 4,3E-08 | e | 3 |
| CES-AR-ES..., <= 0.1 A, <= 720,000 cycles per year, non contact safety system | <p>CES evaluation unit for up to 12 serial wired safety switches family AR.</p> <p>ATTENTION: maximum number of switching cycles 720,000 per year, switching current <= 0.1A at 24 V DC</p> | 1,5E-08 | e | 4 |
| CES-AR-ES..., <= 1 A, <= 540,000 cycles per year, non contact safety system | <p>CES evaluation unit for up to 12 serial wired safety switches family AR.</p> <p>ATTENTION: maximum number of switching cycles 540,000 per year, switching current <= 1 A at 24 V DC</p> | 1,5E-08 | e | 4 |
| CES-AR-ES... , <= 3 A, <= 107,000 cycles per year, non contact safety system | <p>CES evaluation unit for up to 12 serial wired safety switches family AR.</p> <p>ATTENTION: maximum number of switching cycles 107,000 per year, switching current <= 3 A at 24 V DC</p> | 1,5E-08 | e | 4 |
| CES-AZ-BS... complete, <= 0.1 A, <= 760,000 cycles per year, non contact safety system | <p>CES evaluation unit for 1 read head Unicode or Multicode with read head and actuator. Read head CES..., CKS..., CET-AX... or CEM...</p> <p>ATTENTION: maximum number of switching cycles 760,000 per year, switching current <= 0.1 A at 24 V DC</p> <p>ATTENTION: CET-AX... with mounting head upward only category 3 and PFH_d = 4.3E-08</p> | 4,3E-08 | e | 3 |

Subsystems: non-contact safety switches

| Name | Documentation | PFH _d | PL | Cat |
|---|--|------------------|----|-----|
| CES-AZ-BS... complete, <= 1 A, <= 153,000 cycles per year, non contact safety system | <p>CES evaluation unit for 1 read head Unicode or Multicode with read head and actuator. Read head CES..., CKS..., CET-AX... or CEM...</p> <p>ATTENTION: maximum number of switching cycles 153,000 per year, switching current <= 1 A at 24 V DC</p> <p>ATTENTION: CET-AX... with mounting head upward only category 3 and PFH_d = 4.3E-08</p> | 4,3E-08 | e | 3 |
| CES-AZ-BS... complete, <= 3 A, <= 34,600 cycles per year, non contact safety system | <p>CES evaluation unit for 1 read head Unicode or Multicode with read head and actuator. Read head CES..., CKS..., CET-AX... or CEM...</p> <p>ATTENTION: maximum number of switching cycles 34,600 per year, switching current <= 3 A at 24 V DC</p> <p>ATTENTION: CET-AX... with mounting head upward only category 3 and PFH_d = 4.3E-08</p> | 4,3E-08 | e | 3 |
| CES-A-EA... complete, <= 0.1 A, <= 506,000 cycles per year, non contact safety system | <p>CES evaluation unit for 2 or 4 read heads Unicode or multicode with up to 2 resp. 4 read heads and actuators. Read heads CES..., CKS... or CEM...</p> <p>ATTENTION: maximum number of switching cycles 506,000 per year, switching current <= 0.1 A at 24 V DC</p> | 1,3E-08 | e | 4 |
| CES-A-EA... complete, <= 1 A, <= 100,000 cycles per year, non contact safety system | <p>CES evaluation unit for 2 or 4 read heads Unicode or Multicode with up to 2 resp. 4 read heads and actuators. Read heads CES..., CKS... or CEM...</p> <p>ATTENTION: maximum number of switching cycles 100,000 per year, switching current <= 1 A at 24 V DC</p> | 1,3E-08 | e | 4 |

| Subsystems: non-contact safety switches | | | | | |
|---|---|------------------------|-----------|------------|--|
| Name | Documentation | PFH_d | PL | Cat | |
| CES-A-.EA... complete, <= 3 A, <= 23,000 cycles per year, non contact safety system | <p>CES evaluation unit for 2 or 4 read heads Unicode or Multicode with up to 2 resp. 4 read heads and actuators. Read heads CES..., CKS... or CEM...</p> <p>ATTENTION: maximum number of switching cycles 23,000 per year, switching current <= 3 A at 24 V DC</p> | 1,5E-08 | e | 4 | |
| CES-AZ-.ES... complete, <= 0.1 A, <= 760,000 cycles, non contact safety system | <p>CES evaluation unit for 1 up to 4 read heads Unicode or multicode with up to 1 resp. 4 read heads and actuators. Read heads CES..., CKS..., CET-AX... or CEM...</p> <p>ATTENTION: maximum number of switching cycles 760,000 per year, switching current <= 0.1 A at 24 V DC</p> <p>ATTENTION: CET-AX... with mounting head upward only category 3 and PFH_d = 4.3-08</p> | 1,9E-08 | e | 4 | |
| CES-AZ-.ES... complete, <= 1 A, <= 153,000 cycles per year, non contact safety system | <p>CES evaluation unit for 1 up to 4 read heads Unicode or multicode with up to 1 resp. 4 read heads and actuators. Read heads CES..., CKS..., CET-AX... or CEM...</p> <p>ATTENTION: maximum number of switching cycles 153,000 per year, switching current <= 1 A at 24 V DC</p> <p>ATTENTION: CET-AX... with mounting head upward only category 3 and PFH_d = 4.3-08</p> | 1,9E-08 | e | 4 | |

| Subsystems: non-contact safety switches | | | | |
|--|--|------------------------|-----------|------------|
| Name | Documentation | PFH_d | PL | Cat |
| CES-AZ.-.ES... complete, <= 3 A, <= 34,600 cycles per year, non contact safety system | <p>CES evaluation unit for 1 up to 4 read heads Unicode or Multicode with up to 1 resp. 4 read heads and actuators. Read heads CES..., CKS..., CET-AX... or CEM...</p> <p>ATTENTION: maximum number of switching cycles 34,600 per year, switching current <= 3 A at 24 V DC</p> <p>ATTENTION: CET-AX... with mounting head upward only category 3 and PFH_d = 4.3-08</p> | 1,9E-08 | e | 4 |
| CES-AZ.-LS... complete, <= 0.1 A, <= 760,000 cycles, non contact safety system | <p>CES evaluation unit for up to 4 read heads Unicode with up to 4 read heads and actuators. Read heads CES..., CKS..., CET-AX... or CEM...</p> <p>ATTENTION: maximum number of switching cycles 760,000 per year, switching current <= 0.1 A at 24 V DC</p> <p>ATTENTION: CET-AX... with mounting head upward only category 3 and PFH_d = 4.3-08</p> | 1,9E-08 | e | 4 |
| CES-AZ.-.LS... complete, <= 1 A, <= 153,000 cycles per year, non contact safety system | <p>CES evaluation unit for up to 4 read heads Unicode with up to 4 read heads and actuators. Read heads CES..., CKS..., CET-AX... or CEM...</p> <p>ATTENTION: maximum number of switching cycles 153,000 per year, switching current <= 1 A at 24 V DC</p> <p>ATTENTION: CET-AX... with mounting head upward only category 3 and PFH_d = 4.3-08</p> | 1,9E-08 | e | 4 |

Subsystems: non-contact safety switches

| Name | Documentation | PFH _d | PL | Cat |
|---|--|------------------|----|-----|
| CES-AZ..-LS... complete, <= 3 A, <= 34,600 cycles per year, non contact safety system | CES evaluation unit for up to 4 read heads Unicode with up to 4 read heads and actuators. Read heads CES..., CKS..., CET-AX... or CEM... ATTENTION: maximum number of switching cycles 34,600 per year, switching current <= 3 A at 24 V DC ATTENTION: CET-AX... with mounting head upward only category 3 and PFH _d = 4.3-08 | 1,9E-08 | e | 4 |
| CES-CB... complete | CES evaluation unit for 1 up to 4 read heads Unicode or Multicode. Read heads CES..., CKS..., CET-AX... or CEM... ATTENTION: CET-AX... with mounting head upward only category 3 and PFH _d = 4.3-08 | 7,2E-09 | e | 4 |
| CES-A-C5E... complete, non contact safety system | CES compact evaluation unit with integrated read head, incl. actuator. | 4,3E-08 | e | 3 |
| CES-A-W5... complete, non contact safety system | CES compact evaluation unit with integrated read head, incl. actuator. | 3,7E-09 | e | 4 |
| CES-A-C5H... complete, non contact safety system | CES compact evaluation unit with integrated read head, incl. actuator. | 3,7E-09 | e | 4 |
| CES-AH... complete, non contact safety system | CES compact unit with integrated read head, incl. actuator. | 1,0E-07 | d | 3 |
| CES-AP-C01...complete, non contact safety system | CES compact evaluation unit with integrated read head, incl. actuator. | 2,1E-09 | e | 4 |
| CES-AP-C.2...complete, non contact safety system | CES compact evaluation unit with integrated read head, incl. actuator. | 1,8E-09 | e | 4 |
| CES-AR-C01... complete, non contact safety system | CES compact evaluation unit with integrated read head, for serial wiring incl. actuator. | 2,1E-09 | e | 4 |
| CES-AR-C.2... complete, non contact safety system | CES compact evaluation unit with integrated read head, for serial wiring incl. actuator. | 1,9E-09 | e | 4 |
| CES-A-S5H... complete, non contact safety system | CES compact evaluation unit with integrated read head, incl. actuator. | 3,7E-09 | e | 4 |
| CES-FD-AP... field evaluation unit, non contact safety system | CES-FD field evaluation unit with separate read head and actuator. | 4,5E-09 | e | 4 |

| Subsystems: non-contact safety switches | | | | |
|---|--|------------------------|-----------|------------|
| Name | Documentation | PFH_d | PL | Cat |
| CES-I-AP..C04.. complete, non contact safety system | CES compact evaluation unit with integrated read head, incl. actuator. | 4,1E-09 | e | 4 |
| CES-I-AR..C04.. complete, non contact safety system | CES compact evaluation unit with integrated read head, incl. actuator. | 4,1E-09 | e | 4 |
| CES-I-AS...C04.. | Non contact safety switch incl. Read heads with integrated AS-Interface | 4,5E-09 | e | 4 |
| CES-I-BR...C07.. | CES compact evaluation unit with integrated read head, incl. actuator. | 6,0E-10 | e | 4 |
| CET-AP... complete, non contact safety system with guard locking and guard locking monitoring | CET non contact guard locking with guard locking monitoring incl. actuator. ATTENTION: CET with mounting head upward only category 3 and PFH _d = 4.3-08 | 3,1E-09 | e | 4 |
| CET-AR... complete, non contact safety system with guard locking and guard locking monitoring | CET non contact guard locking with guard locking monitoring, for serial wiring incl. actuator. ATTENTION: CET with mounting head upward only category 3 and PFH _d = 4.3-08 | 3,1E-09 | e | 4 |
| CET...AS1 complete, non contact safety system | CET locking unit with integrated AS-interface, incl. actuator. ATTENTION: CET with mounting head upward only category 3 and PFH _d = 4.3-08 | 3,1E-09 | e | 4 |
| CET-AX... Read head for CES evaluation unit | The read head CET-AX... is already included in the evaluation unit and doesn't have a safety value. | - | - | - |
| CKS-A... Read head for CES evaluation unit | The read head CKS-A... is already included in the evaluation unit and doesn't have a safety value. | - | - | - |
| CMS...AS1 | Non contact safety switch incl. Read heads with integrated AS-Interface | 4,3E-08 | e | 3 |
| CMS-E-AR, up to 2 read heads, <= 0.1 A, <= 96,000 cycles per year, non contact safety system | CMS evaluation unit completely with maximum 2 read heads and actuators. ATTENTION: maximum number of switching cycles 96,000 per year, switching current <= 0.1 A at 24 V DC | 4,3E-08 | d | 3 |

| Subsystems: non-contact safety switches | | | | |
|--|---|------------------------|-----------|------------|
| Name | Documentation | PFH_d | PL | Cat |
| CMS-E-AR, up to 2 read heads, <= 1 A, <= 75,000 cycles per year, non contact safety system | CMS evaluation unit completely with maximum 2 read heads and actuators. ATTENTION: maximum number of switching cycles 75,000 per year, switching current <= 1 A at 24 V DC | 4,3E-08 | d | 3 |
| CMS-E-AR, up to 2 read heads, <= 3 A, <= 18,000 cycles per year, non contact safety system | CMS evaluation unit completely with maximum 2 read heads and actuators. ATTENTION: maximum number of switching cycles 18,000 per year, switching current <= 3 A at 24 V DC | 4,3E-08 | d | 3 |
| CMS-E-AR, more than 2 read heads, <= 0.1 A, <= 96,000 cycles per year, non contact safety system | CMS evaluation unit completely with more than 2 read heads and actuators. ATTENTION: maximum number of switching cycles 96,000 per year, switching current <= 0.1 A at 24 V DC | 1,1E-06 | c | 1 |
| CMS-E-AR, more than 2 read heads, <= 1 A, <= 75,000 cycles per year, non contact safety system | CMS evaluation unit completely with more than 2 read heads and actuators. ATTENTION: maximum number of switching cycles 75,000 per year, switching current <= 1 A at 24 V DC | 1,1E-06 | c | 1 |
| CMS-E-AR, more than 2 read heads, <= 3 A, <= 18,000 cycles per year, non contact safety system | CMS evaluation unit completely with more than 2 read heads and actuators. ATTENTION: maximum number of switching cycles 18,000 per year, switching current <= 3 A at 24 V DC | 1,1E-06 | c | 1 |
| CMS-E-BR, 1 read head, <= 0.1 A, <= 100,000 cycles per year, non contact safety system | CMS evaluation unit completely with 1 read head and actuator. ATTENTION: maximum number of switching cycles 100,000 per year, switching current <= 0.1 A at 24 V DC | 2,5E-08 | e | 4 |

Subsystems: non-contact safety switches

| Name | Documentation | PFH _d | PL | Cat |
|--|--|------------------|----|-----|
| CMS-E-BR, 1 read head, <= 1 A, <= 18,500 cycles per year, non contact safety system | CMS evaluation unit completely with 1 read head and actuator. ATTENTION: maximum number of switching cycles 18,500 per year, switching current <= 1 A at 24 V DC | 2,5E-08 | e | 4 |
| CMS-E-BR, 1 read head, <= 3 A, <= 9,000 cycles per year, non contact safety system | CMS evaluation unit completely with 1 read head and actuator. ATTENTION: maximum number of switching cycles 9,000 per year, switching current <= 3 A at 24 V DC | 2,5E-08 | e | 4 |
| CMS-E-BR, more than 1 read head, <= 0.1 A, <= 100,000 cycles per year, non contact safety system | CMS evaluation unit completely with more than 1 read head and actuator. ATTENTION: maximum number of switching cycles 100,000 per year, switching current <= 0.1 A at 24 V DC | 1,0E-07 | d | 3 |
| CMS-E-BR, more than 1 read head, <= 1 A, <= 18,500 cycles per year, non contact safety system | CMS evaluation unit completely with more than 1 read head and actuator. ATTENTION: maximum number of switching cycles 18,500 per year, switching current <= 1 A at 24 V DC | 1,0E-07 | d | 3 |
| CMS-E-BR, more than 1 read head, <= 3 A, <= 9,000 cycles per year, non contact safety system | CMS evaluation unit completely with more than 1 read head and actuator. ATTENTION: maximum number of switching cycles 9,000 per year, switching current <= 3 A at 24 V DC | 1,0E-07 | d | 3 |
| CMS-E-ER, 1 read head, <= 0.1 A, <= 166,000 cycles per year, non contact safety system | CMS evaluation unit completely with 1 read head and actuator. ATTENTION: maximum number of switching cycles 166,000 per year, switching current <= 0.1 A at 24 V DC | 2,5E-08 | e | 4 |

Subsystems: non-contact safety switches

| Name | Documentation | PFH _d | PL | Cat |
|--|--|------------------|----|-----|
| CMS-E-ER, 1 read head, <= 1 A, <= 70,000 cycles per year, non contact safety system | CMS evaluation unit completely with 1 read head and actuator. ATTENTION: maximum number of switching cycles 70,000 per year, switching current <= 1 A at 24 V DC | 2,5E-08 | e | 4 |
| CMS-E-ER, 2 read heads, <= 0.1 A, <= 166,000 cycles per year, non contact safety system | CMS evaluation unit completely 2 read heads and actuators. ATTENTION: maximum number of switching cycles 166,000 per year, switching current <= 0.1 A at 24 V DC | 1,0E-07 | d | 3 |
| CMS-E-ER, 2 read heads, <= 1 A, <= 70,000 cycles per year, non contact safety system | CMS evaluation unit completely with 2 read heads and actuators. ATTENTION: maximum number of switching cycles 70,000 per year, switching current <= 1 A at 24 V DC | 1,0E-07 | d | 3 |
| CMS-E-FR, 1 read head, <= 0.1 A, <= 166,000 cycles per year, non contact safety system | CMS evaluation unit completely with 1 read head and actuator. ATTENTION: maximum number of switching cycles 166,000 per year, switching current <= 0.1 A at 24 V DC | 2,5E-08 | e | 4 |
| CMS-E-FR, 1 read head, <= 1 A, <= 70,000 cycles per year, non contact safety system | CMS evaluation unit completely with 1 read head and actuator. ATTENTION: maximum number of switching cycles 70,000 per year, switching current <= 1 A at 24 V DC | 2,5E-08 | e | 4 |
| CMS-E-FR, more than 1 read head, <= 0.1 A, <= 166,000 cycles per year, non contact safety system | CMS evaluation unit completely with more than 1 read head and actuator. ATTENTION: maximum number of switching cycles 166,000 per year, switching current <= 0.1 A at 24 V DC | 1,0E-07 | d | 3 |

Subsystems: non-contact safety switches

| Name | Documentation | PFH _d | PL | Cat |
|--|---|------------------|----|-----|
| CMS-E-FR, more than 1 read head, <= 1 A, <= 70,000 cycles per year, non contact safety system | CMS evaluation unit completely with more than 1 read head and actuator. ATTENTION: maximum number of switching cycles 70,000 per year, switching current <= 1 A at 24 V DC | 1,0E-07 | d | 3 |
| CTP-L...-AP... complete, non contact safety system with guard locking and guard locking monitoring | CTP non contact guard locking with guard locking monitoring incl. actuator. | 4,1E-09 | e | 4 |
| CTP-L...-AR... complete, non contact safety system with guard locking and guard locking monitoring | CTP non contact guard locking with guard locking monitoring, for serial wiring incl. actuator. | 4,1E-09 | e | 4 |
| ESL... Safety system with handle | Interlocking device for safeguarding of machines and other equipment, incl. actuator. | 1,9E-09 | e | 4 |
| MGB... Multifunctional Gate Box. Control of the guard locking | Interlocking system or locking system with guard locking monitoring for safeguarding of movable guards. Control of the guard locking Valid for all versions except Profinet. | 2,8E-09 | e | 4 |
| MGB... Multifunctional Gate Box | Interlocking system or locking system with guard locking monitoring for safeguarding of movable guards. Monitoring of guard locking and the position of the safety guard. Valid for all versions except Profinet. ATTENTION: E-stop functionality has to be calculated separately with an additional subsystem e-stop evaluation (not part of the MGB!) using the element "MGB e-stop device"! For more information see this element. | 3,7E-09 | e | 4 |

| Subsystems: non-contact safety switches | | | | |
|--|---|------------------------|-----------|------------|
| Name | Documentation | PFH_d | PL | Cat |
| MGB..El... Multifunctional Gate Box with Ethernet/IP | <p>Interlocking system or locking system with guard locking monitoring for safeguarding of movable guards.</p> <p>Valid for all versions with integrated Ethernet/IP.</p> <p>ATTENTION: E-stop functionality and enabling switch functionality have to be calculated separately using the according subsystems evaluation in MGB-El. For more information see these subsystems.</p> | 3,4E-09 | e | 4 |
| MGB..El... E-stop evaluation | <p>E-stop evaluation within MGB with integrated Ethernet. The evaluation of the E-stop is carried out in dual channel mode in Category 4, with a Diagnostic Coverage of DC 99%.</p> <p>ATTENTION: E-Stop functionality has to be calculated separately using element "MGB..El... e-stop" and this subsystem!</p> <p>Composition of block diagram for e-stop device in MGB Ethernet: Typically the evaluation is built by the subsystem control together with the subsystem "MGB..El... e-stop evaluation" in combination with another subsystem using the element "MGB..El e-stop".</p> | 3,1E-09 | e | 4 |
| MGB..El... Enabling switch evaluation | <p>Enabling switch evaluation within MGB with integrated Ethernet/IP. The evaluation of the enabling switch is carried out in dual channel mode in Category 4, with a Diagnostic Coverage of DC 99%.</p> <p>ATTENTION: The enabling switch functionality has to be calculated using the according element of the used enabling switch and this subsystem!</p> | 3,1E-09 | e | 4 |
| MGB..El... Solenoid control evaluation | Internal electronic in the MGB for solenoid control evaluation | 4,9E-09 | e | 4 |

| Subsystems: non-contact safety switches | | | | | |
|---|--|------------------------|-----------|------------|--|
| Name | Documentation | PFH_d | PL | Cat | |
| MGB..PN... Multifunctional Gate Box with Profinet | <p>Interlocking system or locking system with guard locking monitoring for safeguarding of movable guards.</p> <p>Valid for all versions with integrated Profinet.</p> <p>ATTENTION: E-stop functionality and enabling switch functionality have to be calculated separately using the according subsystems evaluation in MGB-PN! For more information see these subsystems.</p> | 4,1E-08 | e | 4 | |
| MGB..PN... E-stop evaluation | <p>E-stop evaluation within MGB with integrated Profinet. The evaluation of the E-stop is carried out in dual channel mode in Category 4, with a Diagnostic Coverage of DC 99%.</p> <p>ATTENTION: E-Stop functionality has to be calculated separately using element "MGB..PN... e-stop" and this subsystem!</p> <p>Composition of block diagram for e-stop device in MGB Profinet:</p> <p>Typically the evaluation is built by the subsystem control together with the subsystem "MGB..PN... e-stop evaluation" in combination with another subsystem using the element "MGB..PN e-stop".</p> | 4,1E-08 | e | 4 | |
| MGB..PN... Solenoid control evaluation | Internal electronic in the MGB for solenoid control evaluation | 3,9E-08 | e | 4 | |
| MGB..PN... Enabling switch evaluation | <p>Enabling switch evaluation within MGB with integrated Profinet. The evaluation of the enabling switch is carried out in dual channel mode in Category 4, with a Diagnostic Coverage of DC 99%.</p> <p>ATTENTION: The enabling switch functionality has to be calculated using the according element of the used enabling switch and this subsystem!</p> | 4,1E-08 | e | 4 | |

| | | | | |
|--|--|----------|---|---|
| MGB2..Modular.. Multifunctional Gate Box 2 | <p>Safety functions: Monitoring of the guard lock and the position of the safety guard Control of the guard locking</p> <p>Interlocking system or locking system with guard locking monitoring for safeguarding of movable guards.</p> <p>Industrial Ethernet connection via bus module MBM..Modular</p> <p>ATTENTION: The emergency stop function, the enabling function and the key switch function must be evaluated separately via the associated subsystem evaluation in the "MGB2..Modular". Evaluation of safety signals in included submodules"! Further notes in the corresponding subsystems.</p> | 2,62E-10 | e | 4 |
| MGB2..Modular... Evaluation of safety signals in included submodules | <p>Evaluation of safety signals in contained submodules within the MGB2 Modular Locking Module. The submodules are evaluated on two channels in category 4 with a diagnostic DC coverage of 99%.</p> <p>ATTENTION: The emergency stop/key switch function has to be implemented using the element "MSM.. Emergency Stop Control Panel/Key Switch" and this subsystem!</p> <p>Structure of the block diagram for the safety signals in MSM submodules:</p> <p>Typical is the evaluation in the controller + subsystems MBM + subsystem Evaluation of safety signals in contained submodules + another subsystem containing the element "MSM..." connected in series</p> | 2,62E-10 | e | 4 |

| | | | | |
|---|---|---------|---|---|
| MBM..PN..Modular... Bus module | For the connection of MGB2 or MCM modules Connection to PROFINET/PROFIsafe | 3,5E-09 | e | 4 |
| MCM..Modular..Evaluation of safety signals in included submodules | <p>Evaluation of safety signals in contained submodules within the MCM Modular. The submodules are evaluated on two channels in category 4 with a diagnostic coverage of 99% DC.</p> <p>ATTENTION: The emergency stop/key switch function has to be implemented with the "MSM.. Emergency Stop/Key Switch" and this subsystem!</p> <p>Structure of the block diagram for the safety signals in MSM submodules:</p> <p>Typical is the evaluation in the controller + subsystems MBM + subsystem Evaluation of safety signals in contained submodules + another subsystem containing the element "MSM..." connected in series</p> | 2,8E-09 | e | 4 |

| Subsystems: safety relay | | | | |
|--|---|------------------------|-----------|------------|
| Name | Documentation | PFH_d | PL | Cat |
| ESM-2H2... , <= 0.1 A, <= 500,000 cycles per year, safety relay 2-Hand | All versions of type series ESM-2H2... ATTENTION: maximum number of switching cycles 500,000 per year, switching current <= 0.1 A at 24 V DC | 1,2E-08 | e | 4 |
| ESM-2H2... , <= 1 A, <= 100,000 cycles per year, safety relay 2-Hand | All versions of type series ESM-2H2... ATTENTION: maximum number of switching cycles 100,000 per year, switching current <= 1 A at 24 V DC | 1,2E-08 | e | 4 |

| | | | | |
|---|---|---------|---|---|
| ESM-2H2... , <= 3 A, <= 22,500 cycles per year, safety relay 2-Hand | All versions of type series ESM-2H2... ATTENTION: maximum number of switching cycles 22,500 per year, switching current <= 3 A at 24 V DC | 1,2E-08 | e | 4 |
| ESM-BA2... , <= 0.1 A, <= 500,000 cycles per year, safety relay base unit | All versions of type series ESM-BA2... ATTENTION: maximum number of switching cycles 500,000 per year, switching current <= 0.1 A at 24 V DC | 1,2E-08 | e | 4 |
| ESM-BA2... , <= 1 A, <= 73,000 cycles per year, safety relay base unit | All versions of type series ESM-BA2 .. ATTENTION: maximum number of switching cycles 73,000 per year, switching current <= 1 A at 24 V DC | 1,2E-08 | e | 4 |
| ESM-BA2... , <= 2 A, <= 17,000 cycles per year, safety relay base unit | All versions of type series ESM-BA2... ATTENTION: maximum number of switching cycles 17,000 per year, switching current <= 2 A at 24 V DC | 1,2E-08 | e | 4 |
| ESM-BA3... , <= 0.1 A, <= 500,000 cycles per year, safety relay base unit | All versions of type series ESM-BA3... ATTENTION: maximum number of switching cycles 500,000 per year, switching current <= 0.1 A at 24 V DC | 1,2E-08 | e | 4 |

Subsystems: safety relay

| Name | Documentation | PFH _d | PL | Cat |
|---|---|------------------|----|-----|
| ESM-BA3... , <= 1 A, <= 350,000 cycles per year, safety relay base unit | All versions of type series ESM-BA3... ATTENTION: maximum number of switching cycles 350,000 per year, switching current <= 1 A at 24 V DC | 1,2E-08 | e | 4 |

| | | | | |
|---|---|---------|---|---|
| ESM-BA3... , <= 2 A, <= 100,000 cycles per year, safety relay base unit | All versions of type series ESM-BA3... ATTENTION: maximum number of switching cycles 100,000 per year, switching current <= 2 A at 24 V DC | 1,2E-08 | e | 4 |
|---|---|---------|---|---|

| | | | | |
|---|---|----------|---|---|
| ESM-BA7... , <= 0.1 A, <= 500,000 cycles per year, safety relay base unit | All versions of type series ESM-BA7... ATTENTION: maximum number of switching cycles 500,000 per year, switching current <= 0.1 A at 24 V DC | 2,5E-08 | e | 4 |
| ESM-BA7... , <= 1 A, <= 350,000 cycles per year, safety relay base unit | All versions of type series ESM-BA7... ATTENTION: maximum number of switching cycles 350,000 per year, switching current <= 1 A at 24 V DC | 2,5E-08 | e | 4 |
| ESM-BA7... , <= 2 A, <= 100,000 cycles per year, safety relay base unit | All versions of type series ESM-BA7... ATTENTION: maximum number of switching cycles 100,000 per year, switching current <= 2 A at 24 V DC | 2,5E-08 | e | 4 |
| ESM-BL2... , <= 0.1 A, <= 500,000 cycles per year, safety relay base unit | All versions of type series ESM-BL2... ATTENTION: maximum number of switching cycles 500,000 per year, switching current <= 0.1 A at 24 V DC | 1,03E-07 | d | 3 |
| ESM-BL2... , <= 1 A, <= 73,000 cycles per year, safety relay base unit | All versions of type series ESM-BL2... ATTENTION: maximum number of switching cycles 73,000 per year, switching current <= 1 A at 24 V DC | 1,03E-07 | d | 3 |

Subsystems: safety relay

| Name | Documentation | PFH _d | PL | Cat |
|--|--|------------------|----|-----|
| ESM-BL2... , <= 2 A, <= 17,000 cycles per year, safety relay base unit | All versions of type series ESM-BL2... ATTENTION: maximum number of switching cycles 17,000 per year, switching current <= 2 A at 24 V DC | 1,03E-07 | d | 3 |

| | | | | |
|---|---|----------|---|---|
| ESM-BT4... , <= 0.1 A, <= 500,000 cycles per year, safety relay base unit | All versions of type series ESM-BT4... ATTENTION: maximum number of switching cycles 500,000 per year, switching current <= 0.1 A at 24 V DC | 4,22E-08 | e | 3 |
| ESM-BT4... , <= 1 A, <= 350,000 cycles per year, safety relay base unit | All versions of type series ESM-BT4... ATTENTION: maximum number of switching cycles 350,000 per year, switching current <= 1 A at 24 V DC | 4,22E-08 | e | 3 |
| ESM-BT4... , <= 2 A, <= 100,000 cycles per year, safety relay base unit | All versions of type series ESM-BT4... ATTENTION: maximum number of switching cycles 100,000 per year, switching current <= 2 A at 24 V DC | 4,22E-08 | e | 3 |
| ESM-CB..., <= 0.1 A, <= 500,000 cycles per year | Safety relay with IO-Link ATTENTION: maximum number of switching cycles 500,000 per year, switching current <= 0.1 A at 24 V DC | 1,00E-09 | e | 4 |
| ESM-CB..., <= 1 A, <= 50,000 cycles per year | Safety relay with IO-Link ATTENTION: maximum number of switching cycles 50,000 per year, switching current <= 1 A at 24 V DC | 1,00E-09 | e | 4 |

| Name | Documentation | PFH _d | PL | Cat |
|---|---|------------------|----|-----|
| Subsystems: safety relay | | | | |
| ESM-CB..., <= 4 A, <= 15,000 cycles per year | Safety relay with IO-Link ATTENTION: maximum number of switching cycles 15,000 per year, switching current <= 4 A at 24 V DC | 1,00E-09 | e | 4 |
| ESM-ES3..., <= 0.1 A, <= 500,000 cycles per year, safety relay extension unit | All versions of type series ESM-ES3... ATTENTION: maximum number of switching cycles 500,000 per year, switching current <= 0.1 A at 24 V DC ATTENTION: category 4 only combined with ESM-BA... base unit and assembly within an electrical cabinet, otherwise category 3 with PFH _d =4.22E-08 | 1,20E-08 | e | 4 |
| ESM-ES3..., <= 1 A, <= 73,000 cycles per year, safety relay extension unit | All versions of type series ESM-ES3... ATTENTION: maximum number of switching cycles 73,000 per year, switching current <= 1 A at 24 V DC ATTENTION: category 4 only combined with ESM-BA... base unit and assembly within one electrical cabinet, otherwise category 3 with PFH _d =4.22E-08 | 1,20E-08 | e | 4 |

| | | | | |
|---|--|----------|---|---|
| ESM-ES3... , <= 2 A, <= 17,000 cycles per year, safety relay extension unit | All versions of type series ESM-ES3... ATTENTION: maximum number of switching cycles 17,000 per year, switching current <= 2 A at 24 V DC | 1,20E-08 | e | 4 |
|---|--|----------|---|---|

Subsystems: safety relay

| Name | Documentation | PFH _d | PL | Cat |
|--|---|------------------|----|-----|
| ESM-TE3... , <= 0.1 A, <= 500,000 cycles per year, safety relay extension unit | All versions of type series ESM-TE3... ATTENTION: maximum number of switching cycles 500,000 per year, switching current <= 0.1 A at 24 V DC | 1,03E-07 | d | 3 |
| ESM-TE3... , <= 1 A, <= 73,000 cycles per year, safety relay extension unit | All versions of type series ESM-TE3... ATTENTION: maximum number of switching cycles 73,000 per year, switching current <= 1 A at 24 V DC | 1,03E-07 | d | 3 |
| ESM-TE3... , <= 2 A, <= 17,000 cycles per year, safety relay extension unit | All versions of type series ESM-TE3... ATTENTION: maximum number of switching cycles 17,000 per year, switching current <= 2 A at 24 V DC | 1,03E-07 | d | 3 |

Subsystems: AS-i safety monitors and outputs

| Name | Documentation | PFH _d | PL | Cat |
|------------------------------------|--|------------------|----|-----|
| GMO... Safety monitor with gateway | All versions of type series GMO... with different power supply possibilities | 4,0E-09 | e | 4 |

| | | | | |
|--|--|---------|---|---|
| GMOX... Safety monitor with gateway | All versions of type series GMOX... with different power supply possibilities. | 5,4E-09 | e | 4 |
| SBM... AS-i Safety base monitor with integrated master | All versions of monitor type series SBM... | 5,1E-09 | e | 4 |
| SFM... AS-i safety monitor | All versions of monitor type series SFM-... | 9,1E-09 | e | 4 |
| SMOX... AS-i safety monitor | All versions of monitor type series SMOx... | 5,4E-09 | e | 4 |
| SOM... safe AS-i output | All safe AS-i output modules SOM... | 3,3E-09 | e | 4 |

| Subsystems: Safety Controller | | | | | |
|--------------------------------------|--|------------------------|-----------|------------|--|
| Name | Documentation | PFH_d | PL | Cat | |
| MSC-CB-... | <p>MSC is a modular safety controller. It consists of a master unit (MSC-CB), which can be configured using the "EUCHNER Safety Designer". Expansion units can be connected to the Master via the proprietary MSC bus.</p> <p>MSC-CB has:</p> <ul style="list-style-type: none"> - 2 MASTER ENABLE inputs; - 8 digital inputs; - 2 OSSD pairs; - 2 programmable digital signal outputs; - 2 inputs for Feedback | 6,1E-09 | e | 4 | |
| MSC-...-FI16-... | <p>MSC Expansion Unit with:</p> <ul style="list-style-type: none"> - 16 digital inputs; - 4 TEST outputs for sensor monitoring; - 6x terminal set. <p>Important notice: the final PFH_d value, Category and PL depends on the total number of modules connected, as well as the software configuration.</p> | 4,9E-09 | e | 4 | |
| MSC-...-FM4-... | <p>MSC Expansion Unit with:</p> <ul style="list-style-type: none"> - 12 digital inputs; - 8 TEST outputs for sensor monitoring; - 6x terminal set. <p>Important notice: the final PFH_d value, Category and PL depends on the total number of modules connected, as well as the software configuration.</p> | 5,6E-09 | e | 4 | |
| Subsystems: Safety Controller | | | | | |

| Name | Documentation | PFH _d | PL | Cat |
|-----------------------|--|------------------|----|-----|
| MSC-...-AC-FI8FO2-... | <p>MSC Expansion Unit with:</p> <ul style="list-style-type: none"> - 8 digital inputs; - 2 OSSD pairs; - 2 programmable digital signal outputs; - 2 inputs for Feedback - 4 TEST outputs for sensor monitoring; - 6x terminal set. <p>Important notice: the final PFHd value, Category and PL depends on the total number of modules connected, as well as the software configuration.</p> | 5,7E-09 | e | 4 |
| MSC-...-FI8-... | <p>MSC Expansion Unit with:</p> <ul style="list-style-type: none"> - 8 safety inputs; - 4 TEST outputs for sensor monitoring; - 4x terminal set. <p>Important notice: the final PFHd value, Category and PL depends on the total number of modules connected, as well as the software configuration.</p> | 4,5E-09 | e | 4 |
| MSC-...-AC-F02-... | <p>MSC Expansion Unit with:</p> <ul style="list-style-type: none"> - 2 OSSD pairs; - 2 programmable digital signal outputs; - 2 inputs for Feedback - 4x terminal set. <p>Important notice: the final PFHd value, Category and PL depends on the total number of modules connected, as well as the software configuration.</p> | 4,1E-09 | e | 4 |
| MSC-...-AC-F04-... | <p>MSC Expansion Unit with:</p> <ul style="list-style-type: none"> - 4 OSSD pairs; - 4 programmable digital signal outputs; - 4 inputs for Feedback - 6x terminal set. <p>Important notice: the final PFHd value, Category and PL depends on the total number of modules connected, as well as the software configuration.</p> | 5,8E-09 | e | 4 |

Subsystems: Safety Controller

| Name | Documentation | PFH _d | PL | Cat |
|--------------------------------------|---|------------------|----|-----|
| MSC-...-AZ-F04... | <p>MSC Expansion Unit with:</p> <ul style="list-style-type: none"> - 4 Relay Outputs - 4 inputs for Feedback - 4x terminal set <p>Important notice: the final PFHd value, Category and PL depends on the total number of modules connected, as well as the software configuration.</p> | 2,9E-09 | e | 4 |
| MSC-...-AZ-F0408... | <p>MSC Expansion Unit with:</p> <ul style="list-style-type: none"> - 4 Relay Outputs - 8 programmable digital signal outputs - 4 inputs for Feedback - 6x terminal set <p>Important notice: the final PFHd value, Category and PL depends on the total number of modules connected, as well as the software configuration.</p> | 2,9E-09 | e | 4 |
| MSC-...SPM0 | <p>MSC Expansion Unit for safe speed control with:</p> <ul style="list-style-type: none"> - Connection of two proximity switches - 4x terminal set <p>Important notice: the final PFHd value, Category and PL depends on the total number of modules connected, as well as the software configuration.</p> | 6,0E-09 | e | 4 |
| MSC-...SPM1H | <p>MSC Expansion Unit for safe speed control with:</p> <ul style="list-style-type: none"> - Connection of two proximity switches - Connection of one HTL Encoder - 4x terminal set <p>Important notice: the final PFHd value, Category and PL depends on the total number of modules connected, as well as the software configuration.</p> | 6,7E-09 | e | 4 |
| Subsystems: Safety Controller | | | | |

| Name | Documentation | PFH _d | PL | Cat |
|---------------|---|------------------|----|-----|
| MSC-...SPM1TB | <p>MSC Expansion Unit for safe speed control with:</p> <ul style="list-style-type: none"> - Connection of two proximity switches - Connection of one TTL Encoder - 4x terminal set <p>Important notice: the final PFHd value, Category and PL depends on the total number of modules connected, as well as the software configuration.</p> | 7,8E-09 | e | 4 |
| MSC-...SPM1S | <p>MSC Expansion Unit for safe speed control with:</p> <ul style="list-style-type: none"> - Connection of two proximity switches - Connection of one sin/cos Encoder - 4x terminal set <p>Important notice: the final PFHd value, Category and PL depends on the total number of modules connected, as well as the software configuration.</p> | 7,9E-09 | e | 4 |
| MSC-...SPM2H | <p>MSC Expansion Unit for safe speed control with:</p> <ul style="list-style-type: none"> - Connection of two proximity switches - Connection of two TTL Encoders - 4x terminal set <p>Important notice: the final PFHd value, Category and PL depends on the total number of modules connected, as well as the software configuration.</p> | 7,4E-09 | e | 4 |
| MSC-...SPM2TB | <p>MSC Expansion Unit for safe speed control with:</p> <ul style="list-style-type: none"> - Connection of two proximity switches - Connection of two TTL Encoders - 4x terminal set <p>Important notice: the final PFHd value, Category and PL depends on the total number of modules connected, as well as the software configuration.</p> | 9,6E-09 | e | 4 |

Subsystems: Safety Controller

| Name | Documentation | PFH _d | PL | Cat |
|------|---------------|------------------|----|-----|
|------|---------------|------------------|----|-----|

| | | | | |
|--------------|--|---------|---|---|
| MSC-...SPM2S | <p>MSC Expansion Unit for safe speed control with:</p> <ul style="list-style-type: none">- Connection of two proximity switches- Connection of two sin/cos Encoders- 4x terminal set <p>Important notice: the final PFHd value, Category and PL depends on the total number of modules connected, as well as the software configuration.</p> | 9,9E-09 | e | 4 |
|--------------|--|---------|---|---|

Reliability values acc. to EN ISO 13849-1

Values for blocks:

A block does not fulfill any safety function by itself. It can be loaded from the EUCHNER SISTEMA library within a subsystem and is configured completely. The calculation is made automatically.

| Blocks: EKS FSA | | | |
|--|--|-----------------------|-----|
| Name | Documentation | MTTF _d [a] | DC |
| Electronic-Key-System EKS FSA (data channel plus 1 switching output) | <p>EKS with additional switching output for safety related applications.</p> <p>Key holding devices with PROFIBUS-, PROFINET, USB- or Ethernet Interfaces.</p> <p>ATTENTION: Data Channel AND additional one switching output (LA) have to be evaluated!</p> | 416 | 92% |
| Electronic-Key-System EKS FSA (data channel plus 2 switching outputs) | <p>EKS with additional switching output for safety related applications.</p> <p>Key holding devices with PROFIBUS-, PROFINET, USB- or Ethernet Interfaces.</p> <p>Both switching outputs (LA and LB) are used.</p> <p>ATTENTION: Data channel AND additional both switching channels (LA and LB) have to be evaluated!</p> | 803 | 92% |
| Electronic-Key-System EKS Light FSA compact | <p>EKS light compact unit with switched outputs for safety related applications.</p> <p>Both switching outputs (LA1 and LA2) are used.</p> <p>ATTENTION: Standard outputs AND additional both switching channels (LA1 and LA2) have to be evaluated!</p> | 200 | 92% |
| Electronic-Key-System EKS Light FSA modular | <p>EKS light modular unit incl. read head FHM with switched outputs for safety related applications.</p> <p>Both switching outputs (LA1 and LA2) are used.</p> <p>ATTENTION: Standard outputs AND additional both switching channels (LA1 and LA2) have to be evaluated!</p> | 200 | 92% |

Reliability values acc. to EN ISO 13849-1

Values for electromechanical safety components (not wear-free).

MTTF_d calculation according to annex C of EN ISO 13849-1.

In SISTEMA you can find the values in the EUCHNER library. The number of the yearly cycles has to be added at every element. Then SISTEMA is calculating the MTTF_d value automatically.

| Elements: switch with guard-locking | | |
|--|--|---------------|
| Name | Documentation | B10d [cycles] |
| NZ..VZ..VS Safety switch with separate actuator - metal housing - with guard locking, without guard locking monitoring | All safety switches type series NZ..VZ..VS with separate actuator (guard locking without guard locking monitoring), with the different switching elements and plug connectors. | 4,50E+06 |
| STA... Safety switch with separate actuator - metal housing - with guard locking and guard locking monitoring | All safety switches type series STA (with guard locking and guard locking monitoring) with separate actuator, with the different switching elements and plug connectors. Also all mechanical versions such as escape release, emergency release, mechanical release, push buttons on the front side and others. Also versions with integrated AS-Interface Safety at Work. | 1,15E+07 |
| STA-BI Safety switch with separate actuator - metal housing - with guard locking and guard locking monitoring | All safety switches type series STA-BI (with guard locking and guard locking monitoring) with separate actuator, with the different switching elements and plug connectors. Also all mechanical versions such as escape release, emergency release, mechanical release, push buttons on the front and others. | 3,00E+06 |
| STA..TW.. Safety switch with separate actuator - metal housing - with guard locking and guard locking monitoring, with 2 actuating heads | All safety switches type series STA..TW.. (with guard locking and guard locking monitoring and 2 actuating heads) with separate actuators, with the different switching elements and plug connectors. Also all mechanical versions such as escape release, emergency release, mechanical release and others. | 4,50E+06 |
| STM Safety switch with separate actuator - plastic housing with metal head - with guard locking and guard locking monitoring | All safety switches type series STM (with guard locking and guard locking monitoring) with separate actuator, with the different switching elements and plug connectors. Also all mechanical versions such as escape release, emergency release, mechanical release and others. | 2,00E+06 |

| Elements: switch with guard-locking | | |
|---|--|---------------|
| Name | Documentation | B10d [cycles] |
| STP Safety switch with separate actuator - plastic housing with metal head - with guard locking and guard locking monitoring | All safety switches type series STP (with guard locking and guard locking monitoring) with separate actuator, with the different switching elements and plug connectors. Also all mechanical versions such as escape release, emergency release, mechanical release, push buttons on the front and others. Also versions with integrated AS-Interface Safety at Work. | 5,00E+06 |
| STP-BI Safety switch with separate actuator - plastic housing with metal head - with guard locking and guard locking monitoring | All safety switches type series STP-BI (with guard locking and guard locking monitoring) with separate actuator, with the different switching elements and plug connectors. Also all mechanical versions such as escape release, emergency release, mechanical release, push buttons on the front and others. | 3,00E+06 |
| STP..TW.. Safety switch with separate actuator - plastic housing - with guard locking and guard locking monitoring, with 2 actuating heads in metal | All safety switches type series STP..TW (with guard locking and guard locking monitoring and 2 actuating heads) with separate actuators, with the different switching elements and plug connectors. Also all mechanical versions such as escape release, emergency release, mechanical release, push buttons on the front and others. Also versions with integrated AS-Interface Safety at Work. | 4,50E+06 |
| STP..TW..BI Safety switch with separate actuator - plastic housing - with guard locking and guard locking monitoring, with 2 actuating heads in metal | All safety switches type series STP..TW..BI (with guard locking and guard locking monitoring and 2 actuating heads) with separate actuators, with the different switching elements and plug connectors. Also all mechanical versions such as escape release, emergency release, mechanical release, push buttons on the front and others. | 3,00E+06 |
| TK Safety switch - plastic housing - with guard locking without guard locking monitoring | All safety switches type series TK (guard locking without guard locking monitoring), with the different switching elements and plug connectors. | 2,00E+06 |
| TP Safety switch with separate actuator - plastic housing - with guard locking and guard locking monitoring | All safety switches type series TP (with guard locking and guard locking monitoring) with separate actuator, with the different switching elements and plug connectors. Also all mechanical versions such as escape release, emergency release, mechanical release, push buttons on the front and others. Also versions with integrated AS-Interface Safety at Work. | 3,00E+06 |

| Elements: switch with guard-locking | | |
|---|--|---------------|
| Name | Documentation | B10d [cycles] |
| TP..TW.. Safety switch with separate actuator - plastic housing - with guard locking and guard locking monitoring, with 2 actuating heads | All safety switches type series TP..TW (with guard locking and guard locking monitoring and 2 actuating heads) with separate actuators, with the different switching elements and plug connectors. Also all mechanical versions such as escape release, emergency release, mechanical release, push buttons on the front and others. | 2,00E+06 |
| TX Safety switch with separate actuator - metal housing - with guard locking and guard locking monitoring | All safety switches type series TX (with guard locking and guard locking monitoring) with separate actuator, with the different switching elements and plug connectors. Also all mechanical versions such as escape release, emergency release, mechanical release, push buttons on the front and others. Also versions with integrated AS-Interface Safety at Work. | 6,00E+06 |
| TZ Safety switch with separate actuator - metal housing - with guard locking and guard locking monitoring | All safety switches type series TZ (with guard locking and guard locking monitoring) with separate actuator, with the different switching elements and plug connectors. Also all mechanical versions such as escape release, emergency release, mechanical release, push buttons on the front and others. Also versions with integrated AS-Interface Safety at Work. | 3,00E+06 |

| Elements: switch with separated actuator | | |
|---|--|---------------|
| Name | Documentation | B10d [cycles] |
| GP... Safety switch with separate actuator - plastic housing | All safety switches type series GP with separate actuator, with the different switching elements and plug connectors. Also versions with integrated AS-Interface Safety at Work. | 3,00E+06 |
| NM.VZ... Safety switch with separate actuator - plastic housing | All safety switches type series NM..VZ with separate actuator, with the different switching elements and plug connectors. | 4,00E+06 |
| NP... Safety switch with separate actuator - plastic housing | All safety switches type series NP with separate actuator, with the different switching elements and plug connectors. | 3,00E+06 |

| Elements: switch with separated actuator | | |
|--|--|---------------|
| Name | Documentation | B10d [cycles] |
| NX.. Safety switch with separate actuator - metal housing | All safety switches type series NX with separate actuator, with the different switching elements and plug connectors. Also versions with integrated AS-Interface Safety at Work. | 4,50E+06 |
| NZ.VZ... Safety switch with separate actuator - metal housing | All safety switches type series NZ..VZ (except NZ-VZ-VS...) with separate actuator, with the different switching elements and plug connectors. Also versions with integrated AS-Interface Safety at Work. | 4,50E+06 |
| SGA... Safety switch with separate actuator - metal housing | All safety switches type series SGA with separate actuator, with the different switching elements and plug connectors. Also versions with integrated AS-Interface Safety at Work. | 3,00E+06 |
| SGP... Safety switch with separate actuator - plastic housing with metal head | All safety switches type series SGP with separate actuator, with the different switching elements and plug connectors. Also versions with integrated AS-Interface Safety at Work. | 3,00E+06 |
| SGP...TW Safety switch with separate actuator - plastic housing with 2 actuating metal heads | All safety switches type series SGP..TW (2 actuating heads) with separate actuators, with the different switching elements and plug connectors. | 2,00E+06 |

| Elements: switch with integrated actuator | | |
|--|---|---------------|
| Name | Documentation | B10d [cycles] |
| N1A.. Safety switch with integrated actuator with switching elements 508, 514 or 588 - metal housing | All safety switches type series N1A with safety function, with switching elements 508, 514 or 588 and plug connectors. Type series: N1AD, N1AR, N1ARL, N1AW | 2,00E+07 |
| NB01.. Safety switch with integrated actuator with switching element 588 - metal housing | All safety switches type series NB01 with safety function, with switching element 588 and plug connectors. Type series: NB01D, NB01R | 2,00E+07 |
| NM.. Safety switch with integrated actuator - plastic housing | All safety switches type series NM with safety function, with the different switching elements and plug connectors. Type series: NM..HB, NM..RB, NM..WO, NM..KB, NM..AV, NM..AG, NM..AL, NM..AG, NM..AK | 2,00E+07 |

| Elements: switch with integrated actuator | | |
|--|--|---------------|
| Name | Documentation | B10d [cycles] |
| NZ.. Safety switch with integrated actuator - metal housing | All safety switches type series NZ with safety function, with the different switching elements and plug connectors. Type series: NZ..HS, NZ..HB, NZ..RS, NZ..WO, NZ..RK, NZ..RG, NZ..RL, NZ..PS, NZ..PB Also versions with integrated AS-Interface Safety at Work. | 2,00E+07 |
| Elements: Non-contact safety switch magnetically coded (without EUCHNER evaluation unit) | | |
| Name | Documentation | B10d [cycles] |
| CMS-R-AZA... | Read head with according actuator based on reed contacts which is not connected to an EUCHNER CMS evaluation unit. | 2,00E+07 |
| CMS-R-BZB... | Read head with according actuator based on reed contacts which is not connected to an EUCHNER CMS evaluation unit. | 2,00E+07 |
| Elements: enabling switch | | |
| Name | Documentation | B10d [cycles] |
| HBA... Enabling switch 3-stage | All enabling switches 3-stage except type series ZXЕ integrated into pendant stations HBA. | 1,00E+05 |
| HBA... Enabling switch 3-stage ZXЕ | All enabling switches 3-stage type series ZXЕ integrated into pendant stations HBA. | 7,50E+05 |
| HBA... Enabling switch 2-stage ZS... | Enabling switches 2-stage are not covered by EN 60947-5-8. With this a B10d value cannot be given. For more information see Annex C of EN ISO 13849-1. | - |
| HBL... Enabling switch 3-stage ZSE | All enabling switches 3-stage type series ZSE integrated into pendant stations HBL. | 5,00E+05 |
| HBL... Enabling switch 2-stage ZS... | Enabling switches 2-stage are not covered by EN 60947-5-8. With this a B10d value cannot be given. For more information see Annex C of EN ISO 13849-1. | - |
| HBM... Enabling switch 3-stage | All enabling switches 3-stage except type series ZXЕ integrated into pendant stations HBM. | 1,00E+05 |
| HBM... Enabling switch 3-stage ZXЕ | All enabling switches 3-stage type series ZXЕ integrated into pendant stations HBM. | 7,50E+05 |
| HBM... Enabling switch 2-stage ZS... | Enabling switches 2-stage are not covered by EN 60947-5-8. With this a B10d value cannot be given. For more information see Annex C of EN ISO 13849-1. | - |

| Elements: enabling switch | | |
|---|--|---------------|
| Name | Documentation | B10d [cycles] |
| ZSA... Enabling switch 3-stage, black housing G1 | All enabling switches type series ZSA with the different switching elements as well as cables and plug connectors. Also kit version. Also versions with integrated AS-Interface Safety at Work. | 5,00E+05 |
| ZSA... Enabling switch 2-stage, black housing G1 | Enabling switches 2-stage are not covered by EN 60947-5-8. With this a B10d value cannot be given. For more information see Annex C of EN ISO 13849-1. | - |
| ZSB... Enabling switch 3-stage, black housing G1 | All enabling switches type series ZSB, black housing G1, with the different switching elements and control elements as well as cables and plug connectors. Also versions with integrated AS-Interface Safety at Work. | 5,00E+05 |
| ZSB... Enabling switch 3-stage, yellow housing G3 | All enabling switches type series ZSB, yellow housing G3, with the different switching elements and control elements as well as cables and plug connectors. | 5,00E+05 |
| ZSE... Enabling switch 3-stage for panel mounting | All enabling switches type series ZSE with the different switching elements. | 5,00E+05 |
| ZSG... Enabling switch 2-stage for panel mounting | Enabling switches 2-stage are not covered by EN 60947-5-8. With this a B10d value cannot be given. For more information see Annex C of EN ISO 13849-1. | - |
| ZSM... Enabling switch 3-stage, grey housing | All enabling switches type series ZSM, grey housing, with the different switching elements and control elements as well as cables and plug connectors. | 1,00E+05 |
| ZSR... Enabling switch 3-stage, yellow housing G2 | All enabling switches type series ZSR with the different switching elements as well as cables and plug connectors. | 5,00E+05 |
| ZXE... Enabling switch 3-stage for panel mounting | All enabling switches type series ZSX with the different switching elements. | 7,50E+05 |

| Element: rope pull switch | | |
|---|---|---------------|
| Name | Documentation | B10d [cycles] |
| RPS Rope pull switch | All rope pull switches of the RPS type series (except RPS-M) with the different switching elements and all accessories. Also versions with integrated AS-Interface Safety at Work. | 1,00E+05 |
| RPS-M... Rope pull switch metal housing | All metal rope pull switches of the RPS-M type series with the different switching elements and all accessories. | 2,00E+05 |

| Elements: hinge switch | | |
|---------------------------------------|---|---------------|
| Name | Documentation | B10d [cycles] |
| ESH... Safety hinge | All safety switches type series ESH, except ESH..ARO (re-adjustable version) with the different switching elements and different plug connectors including the empty hinge. | 2,00E+06 |
| ESH-ARO... Safety hinge re-adjustable | All safety switches type series ESH...ARO (re-adjustable version) with the different switching elements and different plug connectors including the empty hinge. | 2,00E+06 |

| Elements: E-stop | | |
|--------------------------|---|---------------|
| Name | Documentation | B10d [cycles] |
| ES-FB1W... E-Stop device | All E-Stop devices type series ES-FB1W.... Also versions with integrated AS-Interface Safety at Work. | 1,00E+05 |
| ES-XN... E-Stop device | All E-Stop devices type series ES-XN... | 1,00E+05 |
| ES-XW... E-Stop device | All E-Stop devices type series ES-XW... Also versions with integrated AS-Interface Safety at Work | 1,00E+05 |
| HBA... E-stop device | All e-stop devices built-in into an HBA | 1,00E+05 |
| HBL... E-stop device | All e-stop devices built-in into an HBL | 1,00E+05 |
| HBM... E-stop device | All e-stop devices built-in into an HBM | 1,00E+05 |
| MGB E-Stop devices | All E-Stop devices integrated in the MGB. ATTENTION: For electronics and guard locking see subsystems. | 6,50E+04 |

| Elements: E-stop | | |
|--------------------------------|---|---------------|
| Name | Documentation | B10d [cycles] |
| MGB...PN... E-stop devices | All E-Stop devices integrated in the MGB-PN with Profinet. ATTENTION: Evaluation has to be added as subsystem "MGB...PN... E-stop evaluation" | 1,00E+05 |
| MGB...EI... E-stop devices | All E-Stop devices integrated in the MGB-EI with Ethernet/IP. ATTENTION: Evaluation has to be added as subsystem "MGB...EI... E-stop evaluation" | 1,00E+05 |
| MSM... E-stop devices | Valid for all MSM modules integrated in the MGB2 with emergency stop. ATTENTION: The evaluation "MGB2..Modular. Evaluation of safety signals in contained submodules" has to be added as subsystem. | 1,30E+05 |
| MSM...SSG10 key switch | Valid for all MSM modules integrated in the MGB2 with SSG10 key switch. ATTENTION: The evaluation "MGB2..Modular. Evaluation of safety signals in contained submodules" has to be added as subsystem. | 3,00E+04 |
| MSM...OM.R key switch | Valid for all MSM modules integrated in the MGB2 with OM.R key switch ATTENTION: The evaluation "MGB2..Modular. Evaluation of safety signals in contained submodules" has to be added as subsystem. | 3,00E+04 |
| MSM...E2, E7, E22 key switch | Valid for all MSM modules integrated in the MGB2 with E2, E7, E22 key switch ATTENTION: The evaluation "MGB2..Modular. Evaluation of safety signals in contained submodules" has to be added as subsystem. | 3,00E+04 |
| MP-A-E...E-stop device for MGB | All e-stop devices for integrating into an MGB control unit incl. the switching elements. | 1,00E+05 |
| ZSB... E-stop device | All e-stop devices built-in into a ZSB | 1,00E+05 |
| ZSM... E-stop device | All e-stop devices built-in into a ZSM | 1,00E+05 |

Note:

Bolts, flange connectors and similar accessories are not safety components. Therefor no safety-related values can be
The red marked numbers are B10 instead of B10d values