



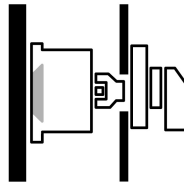
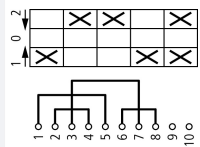
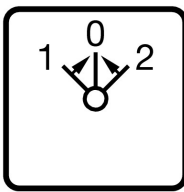
Reversing switches, T0, 20 A, rear mounting, 3 contact unit(s), Contacts: 5, 45 °, momentary, With 0 (Off) position, with spring-return from both directions to 0, 1>0<2, Design number 8228

Part no. T0-3-8228/Z  
 Catalog No. 074437



Similar to illustration

**Delivery program**

|  |                |                 |  |
|--|----------------|-----------------|--|
| Product range                                      |                |                 | Control switches   |
| Part group reference                               |                |                 | T0   |
| Basic function                                     |                |                 | Reversing switches<br>with black thumb grip and front plate  |
| Contacts   |                |                 | 5  |
| Degree of Protection                               |                |                 | Front IP65   |
| Design   |                |                 | rear mounting<br>    |
| Contact sequence                                   |                |                 |                     |
| Switching angle                                    |                | °               | 45   |
| Switching performance                              |                |                 | momentary<br>With 0 (Off) position<br>with spring-return from both directions to 0                     |
| Design number                                      |                |                 | 8228   |
| Front plate no.                                    |                |                 | <br><b>FS 4011</b> |
| front plate  |                |                 | 1>0<2  |
| <b>Motor rating AC-23A, 50 - 60 Hz</b>             |                |                 |  |
| 400 V  | P              | kW              | 5.5  |
| Rated uninterrupted current                        | I <sub>u</sub> | A               | 20   |
| Note on rated uninterrupted current I <sub>u</sub> |                |                 | Rated uninterrupted current I <sub>u</sub> is specified for max. cross-section.                        |
| Number of contact units                            |                | contact unit(s) | 3  |

**Technical data**

|                     |  |    |  |
|---------------------|--|----|--|
| <b>General</b>      |  |    |  |
| Standards           |  |    | IEC/EN 60947, VDE 0660, IEC/EN 60204, CSA, UL<br>Switch-disconnector according to IEC/EN 60947-3 |
| Climatic proofing   |  |    | Damp heat, constant, to IEC 60068-2-78<br>Damp heat, cyclic, to IEC 60068-2-30                   |
| Ambient temperature |  |    |  |
| Open                |  | °C | -25 - +50  |

|                                       |           |      |             |
|---------------------------------------|-----------|------|-------------|
| Enclosed                              |           | °C   | -25 - +40   |
| Overvoltage category/pollution degree |           |      | III/3       |
| Rated impulse withstand voltage       | $U_{imp}$ | V AC | 6000        |
| Mechanical shock resistance           |           | g    | 15          |
| Mounting position                     |           |      | As required |

## Contacts

|   |          |           |  |
|---|----------|-----------|--|
| Electrical characteristics                          |          |           |  |
| Rated operational voltage                           | $U_e$    | V AC      | 690  |
| Rated uninterrupted current                         | $I_u$    | A         | 20   |
| Note on rated uninterrupted current $I_u$           |          |           | Rated uninterrupted current $I_u$ is specified for max. cross-section. |
| Load rating with intermittent operation, class 12   |          |           |  |
| AB 25 % DF  |          | x $I_e$   | 2  |
| AB 40 % DF  |          | x $I_e$   | 1.6  |
| AB 60 % DF  |          | x $I_e$   | 1.3  |
| Short-circuit rating                                |          |           |  |
| Fuse  |          | A gG/gL   | 20   |
| Rated short-time withstand current (1 s current)    | $I_{cw}$ | $A_{rms}$ | 320  |
| Note on rated short-time withstand current $I_{cw}$ |          |           | Current for a time of 1 second   |
| Rated conditional short-circuit current             | $I_q$    | kA        | 6  |

## Switching capacity

|  |              |          |       |
|--|--------------|----------|-------|
| cos $\varphi$ rated making capacity as per IEC 60947-3         |              | A        | 130   |
| Rated breaking capacity cos $\varphi$ to IEC 60947-3           |              | A        |       |
| 230 V  |              | A        | 100   |
| 400/415 V  |              | A        | 110   |
| 500 V  |              | A        | 80    |
| 690 V  |              | A        | 60    |
| Safe isolation to EN 61140                                     |              |          |       |
| between the contacts   |              | V AC     | 440   |
| Current heat loss per contact at $I_e$                         |              | W        | 0.6   |
| Current heat loss per auxiliary circuit at $I_e$ (AC-15/230 V) |              | CO       | 0.6   |
| Lifespan, mechanical   | Operations   | x $10^6$ | > 0.4 |
| Maximum operating frequency                                    | Operations/h |          | 1200  |
| AC   |              |          |       |
| AC-3   |              |          |       |
| Rating, motor load switch                                      | P            | kW       |       |
| 220 V 230 V  | P            | kW       | 3     |
| 230 V Star-delta   | P            | kW       | 5.5   |
| 400 V 415 V  | P            | kW       | 5.5   |
| 400 V Star-delta   | P            | kW       | 7.5   |
| 500 V  | P            | kW       | 5.5   |
| 500 V Star-delta   | P            | kW       | 7.5   |
| 690 V  | P            | kW       | 4     |
| 690 V Star-delta   | P            | kW       | 5.5   |
| Rated operational current motor load switch                    |              |          |       |
| 230 V  | $I_e$        | A        | 11.5  |
| 230 V star-delta   | $I_e$        | A        | 20    |
| 400V 415 V   | $I_e$        | A        | 11.5  |
| 400 V star-delta   | $I_e$        | A        | 20    |
| 500 V  | $I_e$        | A        | 9     |
| 500 V star-delta   | $I_e$        | A        | 15.6  |
| 690 V  | $I_e$        | A        | 4.9   |
| 690 V star-delta   | $I_e$        | A        | 8.5   |
| AC-21A   |              |          |       |
| Rated operational current switch                               |              |          |       |

|  |                   |                |  |
|--|-------------------|----------------|--|
| 440 V  | I <sub>e</sub>    | A              | 20   |
| <b>AC-23A</b>                                      |                   |                |  |
| Motor rating AC-23A, 50 - 60 Hz                    | P                 | kW             |  |
| 230 V  | P                 | kW             | 3  |
| 400 V 415 V  | P                 | kW             | 5.5  |
| 500 V  | P                 | kW             | 7.5  |
| 690 V  | P                 | kW             | 5.5  |
| <b>Rated operational current motor load switch</b> |                   |                |  |
| 230 V  | I <sub>e</sub>    | A              | 13.3   |
| 400 V 415 V  | I <sub>e</sub>    | A              | 13.3   |
| 500 V  | I <sub>e</sub>    | A              | 13.3   |
| 690 V  | I <sub>e</sub>    | A              | 7.6  |
| <b>DC</b>  |                   |                |  |
| <b>DC-1, Load-break switches L/R = 1 ms</b>        |                   |                |  |
| Rated operational current                          | I <sub>e</sub>    | A              | 10   |
| Voltage per contact pair in series                 |                   | V              | 60   |
| <b>DC-21A</b>                                      |                   |                |  |
| Rated operational current                          | I <sub>e</sub>    | A              | 1  |
| Contacts   |                   | Quantity       | 1  |
| <b>DC-23A, motor load switch L/R = 15 ms</b>       |                   |                |  |
| <b>24 V</b>  |                   |                |  |
| Rated operational current                          | I <sub>e</sub>    | A              | 10   |
| Contacts   |                   | Quantity       | 1  |
| <b>48 V</b>  |                   |                |  |
| Rated operational current                          | I <sub>e</sub>    | A              | 10   |
| Contacts   |                   | Quantity       | 2  |
| <b>60 V</b>  |                   |                |  |
| Rated operational current                          | I <sub>e</sub>    | A              | 10   |
| Contacts   |                   | Quantity       | 3  |
| <b>120 V</b>                                       |                   |                |  |
| Rated operational current                          | I <sub>e</sub>    | A              | 5  |
| Contacts   |                   | Quantity       | 3  |
| <b>240 V</b>                                       |                   |                |  |
| Rated operational current                          | I <sub>e</sub>    | A              | 5  |
| Contacts   |                   | Quantity       | 5  |
| <b>DC-13, Control switches L/R = 50 ms</b>         |                   |                |  |
| Rated operational current                          | I <sub>e</sub>    | A              | 10   |
| Voltage per contact pair in series                 |                   | V              | 32   |
| Control circuit reliability at 24 V DC, 10 mA      | Fault probability | H <sub>F</sub> | < 10 <sup>-5</sup> , < 1 failure in 100,000 switching operations |

### Terminal capacities

|                                      |  |                 |                                      |
|--------------------------------------|--|-----------------|--------------------------------------|
| Solid or stranded                    |  | mm <sup>2</sup> | 1 x (1 - 2,5)<br>2 x (1 - 2,5)       |
| Flexible with ferrules to DIN 46228  |  | mm <sup>2</sup> | 1 x (0.75 - 2.5)<br>2 x (0.75 - 2.5) |
| Terminal screw                       |  |                 | M3.5                                 |
| Tightening torque for terminal screw |  | Nm              | 1                                    |

### Technical safety parameters:

|              |  |  |   |
|--------------|--|--|---|
| <b>Notes</b> |  |  | B10 <sub>d</sub> values as per EN ISO 13849-1, table C1 |
|--------------|--|--|---|

### Rating data for approved types

|                                  |                |      |     |
|----------------------------------|----------------|------|-----|
| <b>Contacts</b>                  |                |      |     |
| Rated operational voltage        | U <sub>e</sub> | V AC | 600 |
| Rated uninterrupted current max. |                |      |     |
| <b>Main conducting paths</b>     |                |      |     |
| General use                      |                | A    | 16  |
| Auxiliary contacts               |                |      |     |

|  |                |       |                |
|--|----------------|-------|----------------|
| General Use                              | I <sub>u</sub> | A     | 10             |
| Pilot Duty                               |                |       | A 600<br>P 300 |
| Switching capacity                       |                |       |                |
| Maximum motor rating                     |                |       |                |
| Single-phase                             |                |       |                |
| 120 V AC                                 |                | HP    | 0.5            |
| 200 V AC                                 |                | HP    | 1              |
| 240 V AC                                 |                | HP    | 1.5            |
| Three-phase                              |                |       |                |
| 200 V AC                                 |                | HP    | 3              |
| 240 V AC                                 |                | HP    | 3              |
| 480 V AC                                 |                | HP    | 7.5            |
| 600 V AC                                 |                | HP    | 7.5            |
| Short Circuit Current Rating             |                | SCCR  |                |
| Basic Rating                             |                | kA    | 5              |
| max. Fuse                                |                | A     | 50             |
| High fault rating                        |                | kA    | 10             |
| max. Fuse                                |                | A     | 20, Class J    |
| Terminal capacity                        |                |       |                |
| Solid or flexible conductor with ferrule |                | AWG   | 18 - 14        |
| Terminal screw                           |                |       | M3.5           |
| Tightening torque                        |                | lb-in | 8.8            |

## Design verification as per IEC/EN 61439

|  |                   |    |  |
|--|-------------------|----|--|
| Technical data for design verification   |                   |    |  |
| Rated operational current for specified heat dissipation   | I <sub>n</sub>    | A  | 20   |
| Heat dissipation per pole, current-dependent   | P <sub>vid</sub>  | W  | 0.6  |
| Equipment heat dissipation, current-dependent  | P <sub>vid</sub>  | W  | 0  |
| Static heat dissipation, non-current-dependent   | P <sub>vs</sub>   | W  | 0  |
| Heat dissipation capacity  | P <sub>diss</sub> | W  | 0  |
| Operating ambient temperature min.   |                   | °C | -25  |
| Operating ambient temperature max.   |                   | °C | 50   |
| IEC/EN 61439 design verification   |                   |    |  |
| 10.2 Strength of materials and parts   |                   |    |  |
| 10.2.2 Corrosion resistance  |                   |    | Meets the product standard's requirements.   |
| 10.2.3.1 Verification of thermal stability of enclosures   |                   |    | Meets the product standard's requirements.   |
| 10.2.3.2 Verification of resistance of insulating materials to normal heat   |                   |    | Meets the product standard's requirements.   |
| 10.2.3.3 Verification of resistance of insulating materials to abnormal heat and fire due to internal electric effects |                   |    | Meets the product standard's requirements.   |
| 10.2.4 Resistance to ultra-violet (UV) radiation   |                   |    | UV resistance only in connection with protective shield.   |
| 10.2.5 Lifting   |                   |    | Does not apply, since the entire switchgear needs to be evaluated.   |
| 10.2.6 Mechanical impact   |                   |    | Does not apply, since the entire switchgear needs to be evaluated.   |
| 10.2.7 Inscriptions  |                   |    | Meets the product standard's requirements.   |
| 10.3 Degree of protection of ASSEMBLIES  |                   |    | Does not apply, since the entire switchgear needs to be evaluated.   |
| 10.4 Clearances and creepage distances   |                   |    | Meets the product standard's requirements.   |
| 10.5 Protection against electric shock   |                   |    | Does not apply, since the entire switchgear needs to be evaluated.   |
| 10.6 Incorporation of switching devices and components   |                   |    | Does not apply, since the entire switchgear needs to be evaluated.   |
| 10.7 Internal electrical circuits and connections  |                   |    | Is the panel builder's responsibility.   |
| 10.8 Connections for external conductors   |                   |    | Is the panel builder's responsibility.   |
| 10.9 Insulation properties   |                   |    |  |
| 10.9.2 Power-frequency electric strength   |                   |    | Is the panel builder's responsibility.   |
| 10.9.3 Impulse withstand voltage   |                   |    | Is the panel builder's responsibility.   |
| 10.9.4 Testing of enclosures made of insulating material   |                   |    | Is the panel builder's responsibility.   |
| 10.10 Temperature rise   |                   |    | The panel builder is responsible for the temperature rise calculation. Eaton will provide heat dissipation data for the devices. |

|                                     |  |  |
|-------------------------------------|--|--|
| 10.11 Short-circuit rating          |  | Is the panel builder's responsibility. The specifications for the switchgear must be observed.           |
| 10.12 Electromagnetic compatibility |  | Is the panel builder's responsibility. The specifications for the switchgear must be observed.           |
| 10.13 Mechanical function           |  | The device meets the requirements, provided the information in the instruction leaflet (IL) is observed. |

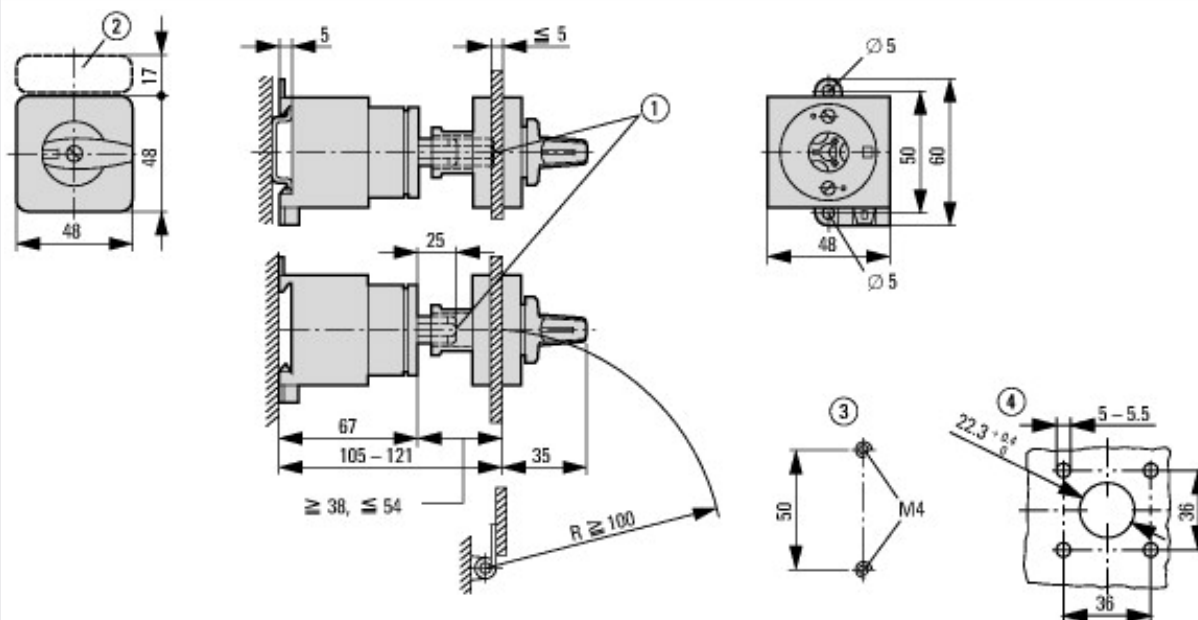
## Technical data ETIM 7.0

|   |    |                  |
|---|----|------------------|
| Low-voltage industrial components (EG000017) / Off-load switch (EC001105)   |    |                  |
| Electric engineering, automation, process control engineering / Low-voltage switch technology / Off-load switch, circuit breaker, control switch / Changeover switch (ecI@ss10.0.1-27-37-14-05 [AKF062013]) |    |                  |
| Model   |    | Reversing switch |
| Number of poles   |    | 3                |
| With 0 (off) position   |    | Yes              |
| With retraction in 0-position   |    | Yes              |
| Rated permanent current I <sub>u</sub>  | A  | 20               |
| Rated operation current I <sub>e</sub> at AC-3, 400 V   | A  | 11.5             |
| Rated operation power at AC-3, 400 V  | kW | 4                |
| Degree of protection (IP), front side   |    | IP65             |
| Degree of protection (NEMA), front side   |    | 12               |
| Number of auxiliary contacts as normally closed contact   |    | 0                |
| Number of auxiliary contacts as normally open contact   |    | 0                |
| Number of auxiliary contacts as change-over contact   |    | 0                |
| Suitable for ground mounting  |    | Yes              |
| Suitable for front mounting 4-hole  |    | No               |
| Suitable for distribution board installation  |    | No               |
| Suitable for intermediate mounting  |    | Yes              |
| Complete device in housing  |    | No               |
| Material housing  |    | Plastic          |
| Type of control element   |    | Toggle           |
| Type of electrical connection of main circuit   |    | Screw connection |

## Approvals

|                                      |  |   |
|--------------------------------------|--|---|
| Product Standards                    |  | UL 60947-4-1; CSA - C22.2 No. 60947-4-1-14; CSA-C22.2 No. 94; IEC/EN 60947-3; CE marking                                  |
| UL File No.                          |  | E36332  |
| UL Category Control No.              |  | NLRV  |
| CSA File No.                         |  | 12528   |
| CSA Class No.                        |  | 3211-05   |
| North America Certification          |  | UL listed, CSA certified  |
| Specially designed for North America |  | Yes, with an alternative front plate and/or terminal markings to those of the IEC type in combination with "+NA" (105864) |
| Suitable for                         |  | Branch circuits, suitable as motor disconnect   |
| Degree of Protection                 |  | IEC: IP65; UL/CSA Type 1, 12  |

## Dimensions



- ① Shaft extension with ZAV-T0 possible, max.  $4 \times 25 = 100$  mm
- ② ZFS-... Label mount not included as standard
- ③ Drilling dimensions base
- ④ Drilling dimensions door

## Assets (links)

### Declaration of CE Conformity

00003075

### Instruction Leaflets

IL03801021Z2018\_05

## Additional product information (links)

### IL03801021Z (AWA1150-0587) Cam switch: Rear mounting

|  |   |
|--|---|
| IL03801021Z (AWA1150-0587) Cam switch: Rear mounting         | <a href="ftp://ftp.moeller.net/DOCUMENTATION/AWA_INSTRUCTIONS/IL03801021Z2018_05.pdf">ftp://ftp.moeller.net/DOCUMENTATION/AWA_INSTRUCTIONS/IL03801021Z2018_05.pdf</a>                           |
| Display flip catalog page.                                   | <a href="http://ecat.moeller.net/flip-cat/?edition=K115A&amp;startpage=48">http://ecat.moeller.net/flip-cat/?edition=K115A&amp;startpage=48</a>   |
| Technical overview cam switch, switch-disconnector           | <a href="http://de.ecat.moeller.net/flip-cat/?edition=HPLTEv1&amp;startpage=4.2">http://de.ecat.moeller.net/flip-cat/?edition=HPLTEv1&amp;startpage=4.2</a>                                     |
| System overview cam switch T                                 | <a href="http://de.ecat.moeller.net/flip-cat/?edition=HPLTEv1&amp;startpage=4.4">http://de.ecat.moeller.net/flip-cat/?edition=HPLTEv1&amp;startpage=4.4</a>                                     |
| System overview switch-disconnector P                        | <a href="http://de.ecat.moeller.net/flip-cat/?edition=HPLTEv1&amp;startpage=4.6">http://de.ecat.moeller.net/flip-cat/?edition=HPLTEv1&amp;startpage=4.6</a>                                     |
| Key to part numbers Cam switch                               | <a href="http://de.ecat.moeller.net/flip-cat/?edition=HPLTEv1&amp;startpage=4.8">http://de.ecat.moeller.net/flip-cat/?edition=HPLTEv1&amp;startpage=4.8</a>                                     |
| Key to part numbers Switch-disconnector                      | <a href="http://de.ecat.moeller.net/flip-cat/?edition=HPLTEv1&amp;startpage=4.8">http://de.ecat.moeller.net/flip-cat/?edition=HPLTEv1&amp;startpage=4.8</a>                                     |
| Switches for ATEX  | <a href="http://www.coopercrouse-hinds.eu/en/products/25-ex-safety-and-main-current-switches.html">http://www.coopercrouse-hinds.eu/en/products/25-ex-safety-and-main-current-switches.html</a> |
| Ordering form for SOND switches and SOND front plates(DE_EN) | <a href="ftp://ftp.moeller.net/DOCUMENTATION/PDF/MZ008005ZU_Orderform_Customized_Switch.pdf">ftp://ftp.moeller.net/DOCUMENTATION/PDF/MZ008005ZU_Orderform_Customized_Switch.pdf</a>             |
| Ordering form for SOND switches and SOND front plates(DE_EN) | <a href="ftp://ftp.moeller.net/DOCUMENTATION/PDF/MZ008006ZU_Orderform_Customized_Switch.pdf">ftp://ftp.moeller.net/DOCUMENTATION/PDF/MZ008006ZU_Orderform_Customized_Switch.pdf</a>             |