



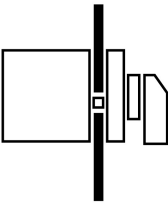
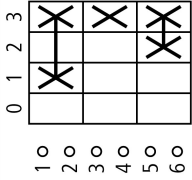
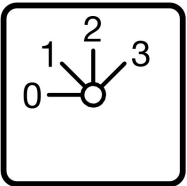
Step switches, Contacts: 3, 20 A, front plate: 0-3, 45 °, maintained, flush mounting

Part no. T0-2-8311/E  
Article no. 011786



Similar to illustration

## Delivery program

|  |                |                 |   |
|--|----------------|-----------------|---|
| Product range                          |                |                 | Control switches  |
| Part group reference                   |                |                 | T0  |
| Basic function                         |                |                 | Step switches<br>with black thumb grip and front plate  |
| Contacts                               |                |                 | 3   |
| Degree of Protection                   |                |                 | Front IP65  |
| Design                                 |                |                 | flush mounting<br>  |
| Contact sequence                       |                |                 |                    |
| Switching angle                        |                | °               | 45  |
| Switching performance                  |                |                 | maintained<br>With 0 (Off) position   |
| Front plate no.                        |                |                 | <br><b>FS 420</b> |
| front plate                            |                |                 | 0-3   |
| <b>Motor rating AC-23A, 50 - 60 Hz</b> |                |                 |   |
| 400 V                                  | P              | kW              | 5.5   |
| Rated uninterrupted current            | I <sub>u</sub> | A               | 20  |
| Number of contact units                |                | contact unit(s) | 2   |

## 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                   |
| Protection against direct contact when actuated from front (EN 50274) |           |      | Finger and back-of-hand proof |

## 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  |          | $\times I_e$ | 2  |
| AB 40 % DF  |          | $\times I_e$ | 1.6  |
| AB 60 % DF  |          | $\times I_e$ | 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   | $\times 10^6$ | > 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  | $I_e$        | 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   |
| Rated operational current motor load switch   |                   |                |   |
| 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>                                     |                   |                |   |
| DC-1, Load-break switches L/R = 1 ms          |                   |                |   |
| Rated operational current                     | I <sub>e</sub>    | A              | 10  |
| Voltage per contact pair in series            |                   | V              | 60  |
| DC-21A  |                   |                |   |
| Rated operational current                     | I <sub>e</sub>    | A              | 1   |
| Contacts                                      |                   | Quantity       | 1   |
| DC-23A, motor load switch L/R = 15 ms         |                   |                |   |
| 24 V  |                   |                |   |
| Rated operational current                     | I <sub>e</sub>    | A              | 10  |
| Contacts                                      |                   | Quantity       | 1   |
| 48 V  |                   |                |   |
| Rated operational current                     | I <sub>e</sub>    | A              | 10  |
| Contacts                                      |                   | Quantity       | 2   |
| 60 V  |                   |                |   |
| Rated operational current                     | I <sub>e</sub>    | A              | 10  |
| Contacts                                      |                   | Quantity       | 3   |
| 120 V   |                   |                |   |
| Rated operational current                     | I <sub>e</sub>    | A              | 5   |
| Contacts                                      |                   | Quantity       | 3   |
| 240 V   |                   |                |   |
| Rated operational current                     | I <sub>e</sub>    | A              | 5   |
| Contacts                                      |                   | Quantity       | 5   |
| DC-13, Control switches L/R = 50 ms           |                   |                |   |
| 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 fault in 100000 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                                 |
| Max. tightening torque              |  | 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. |                |      |     |
| Main conducting paths            |                |      |     |
| General use                      | I <sub>U</sub> | A    | 16  |
| Auxiliary contacts               |                |      |     |
| General Use                      | I <sub>U</sub> | A    | 10  |

|  |    |       |                |
|--|----|-------|----------------|
| Pilot Duty                               |    |       | A 600<br>P 600 |
| 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   | $I_n$      | A  | 20   |
| Heat dissipation per pole, current-dependent   | $P_{vid}$  | W  | 0.6  |
| Equipment heat dissipation, current-dependent  | $P_{vid}$  | W  | 0  |
| Static heat dissipation, non-current-dependent   | $P_{vs}$   | W  | 0  |
| Heat dissipation capacity  | $P_{diss}$ | 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   |            |    |  |
|  |            |    | Please enquire   |
| 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 6.0

Low-voltage industrial components (EG000017) / Control switch (EC002611)

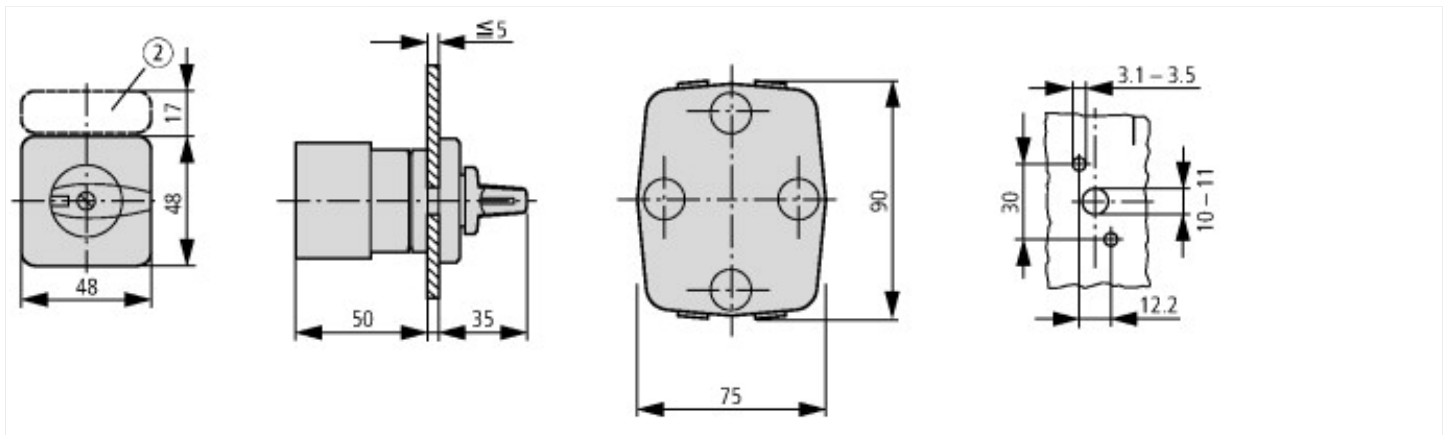
Electric engineering, automation, process control engineering / Low-voltage switch technology / Off-load switch, circuit breaker, control switch / Control switch (ecl@ss8.1-27-37-14-14 [ACN998008])

|  |   |                 |
|--|---|-----------------|
| Type of switch                               |   | Level switch    |
| Number of poles                              |   | 3               |
| Max. rated operation voltage Ue AC           | V | 690             |
| Rated permanent current Iu                   | A | 20              |
| Number of switch positions                   |   | 4               |
| With 0 (off) position                        |   | Yes             |
| With retraction in 0-position                |   | No              |
| Device construction                          |   | Built-in device |
| Width in number of modular spacings          |   | 0               |
| Suitable for ground mounting                 |   | No              |
| Suitable for front mounting 4-hole           |   | Yes             |
| Suitable for distribution board installation |   | No              |
| Suitable for intermediate mounting           |   | No              |
| Complete device in housing                   |   | No              |
| Type of control element                      |   | Toggle          |
| Front shield size                            |   | 48x48 mm        |
| Degree of protection (IP), front side        |   | IP65            |

## Approvals

|                             |  |   |
|-----------------------------|--|---|
| Product Standards           |  | UL 508; CSA-C22.2 No. 14-05; 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  |
| Suitable for                |  | Branch circuits, suitable as motor disconnect                             |
| Degree of Protection        |  | IEC: IP65; UL/CSA Type 1, 12  |

## Dimensions



② ZFS-... Label mount not included as standard

## Additional product information (links)

IL03801020Z (AWA1150-0586) Cam switches: flush mounting

|   |   |
|---|---|
| IL03801020Z (AWA1150-0586) Cam switches: flush mounting | <a href="ftp://ftp.moeller.net/DOCUMENTATION/AWA_INSTRUCTIONS/IL03801020Z2016_07.pdf">ftp://ftp.moeller.net/DOCUMENTATION/AWA_INSTRUCTIONS/IL03801020Z2016_07.pdf</a>                           |
| Display flip catalog page.                              | <a href="http://ecat.moeller.net/flip-cat/?edition=K115A&amp;startpage=90">http://ecat.moeller.net/flip-cat/?edition=K115A&amp;startpage=90</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> |