

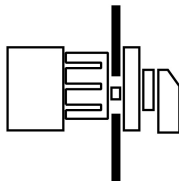
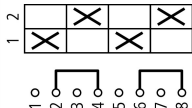
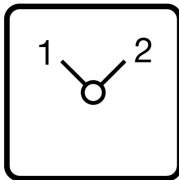
Changeoverswitches, Contacts: 4, 20 A, front plate: 1-2, 90 °, maintained, centre mounting



Part no. T0-2-8221/EZ  
Catalog No. 010372

EL-Nummer 0001417002  
(Norway)

## Delivery program

|                                                    |                |                 |                                                                                                       |
|----------------------------------------------------|----------------|-----------------|-------------------------------------------------------------------------------------------------------|
| Product range                                      |                |                 | Control switches                                                                                      |
| Part group reference                               |                |                 | T0                                                                                                    |
| Basic function                                     |                |                 | Changeoverswitches                                                                                    |
|                                                    |                |                 | with black thumb grip and front plate                                                                 |
| Contacts                                           |                |                 | 4                                                                                                     |
| Degree of Protection                               |                |                 | Front IP65                                                                                            |
| Design                                             |                |                 | centre mounting                                                                                       |
|                                                    |                |                 |                     |
| Contact sequence                                   |                |                 |                    |
| Switching angle                                    |                | °               | 90                                                                                                    |
| Switching performance                              |                |                 | maintained<br>Without 0 (Off) position                                                                |
| Design number                                      |                |                 | 8221                                                                                                  |
| Front plate no.                                    |                |                 | <br><b>FS 943</b> |
| front plate                                        |                |                 | 1-2                                                                                                   |
| <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) | 2                                                                                                     |

## Technical data

### General

|                                       |                  |      |                                                                                                  |
|---------------------------------------|------------------|------|--------------------------------------------------------------------------------------------------|
| 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 <sub>imp</sub> | V AC | 6000                                                                                             |

|                             |  |   |             |
|-----------------------------|--|---|-------------|
| Mechanical shock resistance |  | g | 15          |
| Mounting position           |  |   | As required |

## Contacts

|                                                            |                 |                  |                                                                                 |
|------------------------------------------------------------|-----------------|------------------|---------------------------------------------------------------------------------|
| Electrical characteristics                                 |                 |                  |                                                                                 |
| Rated operational voltage                                  | U <sub>e</sub>  | V AC             | 690                                                                             |
| 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. |
| Load rating with intermittent operation, class 12          |                 |                  |                                                                                 |
| AB 25 % DF                                                 |                 | x I <sub>e</sub> | 2                                                                               |
| AB 40 % DF                                                 |                 | x I <sub>e</sub> | 1.6                                                                             |
| AB 60 % DF                                                 |                 | x I <sub>e</sub> | 1.3                                                                             |
| Short-circuit rating                                       |                 |                  |                                                                                 |
| Fuse                                                       |                 | A gG/gL          | 20                                                                              |
| Rated short-time withstand current (1 s current)           | I <sub>cw</sub> | A <sub>rms</sub> | 320                                                                             |
| Note on rated short-time withstand current I <sub>cw</sub> |                 |                  | Current for a time of 1 second                                                  |
| Rated conditional short-circuit current                    | I <sub>q</sub>  | kA               | 6                                                                               |

## Switching capacity

|                                                                         |                |                   |       |
|-------------------------------------------------------------------------|----------------|-------------------|-------|
| cos φ rated making capacity as per IEC 60947-3                          |                | A                 | 130   |
| Rated breaking capacity cos φ 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 <sub>e</sub>                         |                | W                 | 0.6   |
| Current heat loss per auxiliary circuit at I <sub>e</sub> (AC-15/230 V) |                | CO                | 0.6   |
| Lifespan, mechanical                                                    | Operations     | x 10 <sup>6</sup> | > 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 <sub>e</sub> | A                 | 11.5  |
| 230 V star-delta                                                        | I <sub>e</sub> | A                 | 20    |
| 400V 415 V                                                              | I <sub>e</sub> | A                 | 11.5  |
| 400 V star-delta                                                        | I <sub>e</sub> | A                 | 20    |
| 500 V                                                                   | I <sub>e</sub> | A                 | 9     |
| 500 V star-delta                                                        | I <sub>e</sub> | A                 | 15.6  |
| 690 V                                                                   | I <sub>e</sub> | A                 | 4.9   |
| 690 V star-delta                                                        | I <sub>e</sub> | A                 | 8.5   |
| AC-21A                                                                  |                |                   |       |
| Rated operational current switch                                        |                |                   |       |
| 440 V                                                                   | I <sub>e</sub> | A                 | 20    |
| AC-23A                                                                  |                |                   |       |
| 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                                                 |
| DC                                            |                   |                |                                                     |
| 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                                 |
| 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

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

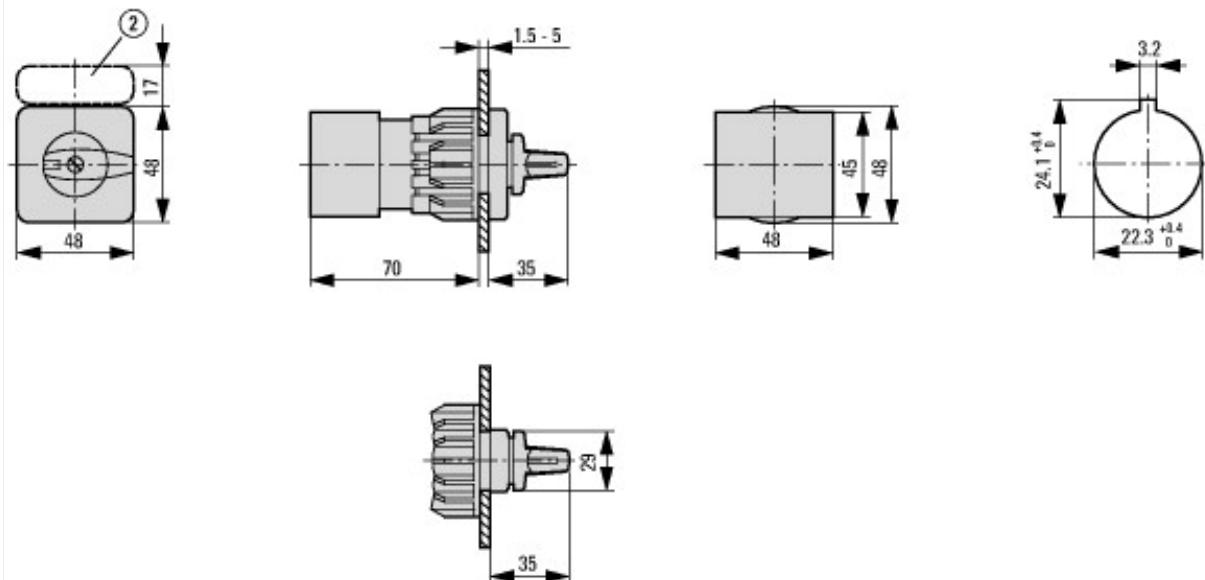
## Technical data ETIM 7.0

|                                                                                                                                                                                                             |  |    |                  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----|------------------|
| 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 (ecl@ss10.0.1-27-37-14-05 [AKF062013]) |  |    |                  |
| Model                                                                                                                                                                                                       |  |    | Reverser         |
| Number of poles                                                                                                                                                                                             |  |    | 2                |
| With 0 (off) position                                                                                                                                                                                       |  |    | No               |
| With retraction in 0-position                                                                                                                                                                               |  |    | No               |
| 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                                                                                                                                                                                |  |    | No               |
| Suitable for front mounting 4-hole                                                                                                                                                                          |  |    | Yes              |
| Suitable for distribution board installation                                                                                                                                                                |  |    | No               |
| Suitable for intermediate mounting                                                                                                                                                                          |  |    | No               |
| 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                                                                 |
| 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

## Assets (links)

### Declaration of CE Conformity

00003075

### Instruction Leaflets

IL03801020Z2018\_05