000700
TM-2-8231/EZ

DELIVERY PROGRAM

Product range
Control switches

Part group reference
TM

Basic function
Step switches

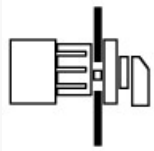
with black thumb grip and front plate

Contacts
4

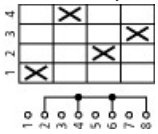
Number of steps
4 steps, 60°

Degree of Protection
Front IP65

Design
centre mounting



Contact sequence



Switching angle
60 °

Switching performance
maintained
Without 0 (Off) position

Design number
8231

Front plate no.

F 077

front plate
1-4

Motor rating AC-23A, 50 - 60 Hz [P]

400 V [P]
3 kW

Rated uninterrupted current [I_u]
10 A

Note on rated uninterrupted current I_u
Rated uninterrupted current I_u is specified for max.
cross-section.

Number of contact units
2 contact unit(s)

TECHNICAL DATA

General

Standards
IEC/EN 60947, VDE 0660, CSA, UL
Control switch as per IEC/EN 60947-5-1
Auxiliary switch as per IEC/EN 60947-5-1

Climatic proofing
Damp heat, constant, to IEC 60068-2-78
Damp heat, cyclic, to IEC 60068-2-30

Ambient temperature
Open
-25 - +50 °C

Overvoltage category/pollution degree
III/3

Rated impulse withstand voltage [U_{imp}]
4000 V AC

Mounting position
As required

Contacts

Electrical characteristics
Rated operational voltage [U_e]
500 V AC

Electrical characteristics
Rated uninterrupted current [I_u]
10 A

Electrical characteristics
Note on rated uninterrupted current I_u
Rated uninterrupted current I_u is specified for max. cross-section.

Short-circuit rating
Fuse
10 A gG/gL

Switching capacity

Safe isolation to EN 61140
Current heat loss per contact at I_e
0.15 W

Safe isolation to EN 61140
Current heat loss per auxiliary circuit at I_e (AC-15/230 V)
0.15 CO

Lifespan, mechanical [Operations]
> 1 x 10^6

Maximum operating frequency [Operations/h]
1200

AC
AC-21A
Rated operational current switch
400 V 415 V [I_e]
10 A

AC
AC-23A
Motor rating AC-23A, 50 - 60 Hz [P]
400 V 415 V [P]
3 kW

Control circuit reliability at 24 V DC, 10 mA [Fault probability]
< 10^{-5},< 1 failure in 100,000 switching operations
H_F

Terminal capacities

Solid or stranded
1 x 1,5
2 x 1,5 mm^2

Flexible with ferrules to DIN 46228
1 x 1.0
2 x 1.0 mm^2

Flexible
1 x 1.5
2 x 1.5 mm^2

Terminal screw
M2.5

Tightening torque for terminal screw
0.4 Nm

Rating data for approved types

Contacts
Rated operational voltage [U_e]
300 V AC

Contacts
Rated uninterrupted current max.
Main conducting paths
General use
10 A

Contacts
Rated uninterrupted current max.
Auxiliary contacts
General Use [I_U]
10 A

Contacts
Rated uninterrupted current max.
Auxiliary contacts
Pilot Duty
A 300

Switching capacity
Maximum motor rating
Single-phase
120 V AC
0.33 HP

Switching capacity
Maximum motor rating
Single-phase
240 V AC
0.75 HP

Switching capacity
Maximum motor rating

Single-phase
277 V AC
0.75 HP

Switching capacity
Maximum motor rating
Three-phase
120 V AC
0.75 HP

Switching capacity
Maximum motor rating
Three-phase
240 V AC
1 HP

Terminal capacity
Solid or flexible conductor with ferrule
14 AWG

Terminal capacity
Terminal screw
M2.5

Terminal capacity
Tightening torque
3.5 lb-in

DESIGN VERIFICATION AS PER IEC/EN 61439

Technical data for design verification

Rated operational current for specified heat dissipation [I_n]
10 A

Heat dissipation per pole, current-dependent [P_{vid}]
0.15 W

Equipment heat dissipation, current-dependent [P_{vid}]
0 W

Static heat dissipation, non-current-dependent [P_{vs}]
0 W

Heat dissipation capacity [P_{diss}]
0 W

Operating ambient temperature min.
-25 °C

Operating ambient temperature max.
+50 °C

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 Strength of materials and parts
10.2.3.1 Verification of thermal stability of enclosures
Meets the product standard's requirements.

10.2 Strength of materials and parts
10.2.3.2 Verification of resistance of insulating materials to normal heat
Meets the product standard's requirements.

10.2 Strength of materials and parts
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 Strength of materials and parts
10.2.4 Resistance to ultra-violet (UV) radiation
UV resistance only in connection with protective shield.

10.2 Strength of materials and parts
10.2.5 Lifting
Does not apply, since the entire switchgear needs to be evaluated.

10.2 Strength of materials and parts
10.2.6 Mechanical impact
Does not apply, since the entire switchgear needs to be evaluated.

10.2 Strength of materials and parts

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 Insulation properties
10.9.3 Impulse withstand voltage
Is the panel builder's responsibility.

10.9 Insulation properties
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) / Control switch (EC002611)

Electric engineering, automation, process control engineering / Low-voltage switch technology / Off-load switch, circuit breaker, control switch / Control switch (ecl@ss10.0.1-27-37-14-14 [ACN998011])

Type of switch
Level switch

Number of poles
1

Max. rated operation voltage Ue AC
500 V

Rated permanent current Iu
10 A

Number of switch positions
4

With 0 (off) position
No

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
30x30 mm

Degree of protection (IP), front side
IP65

Degree of protection (NEMA), front side
Other

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.
UL report applies to both US and Canada

North America Certification
UL listed, certified by UL for use in Canada

Degree of Protection
IEC: IP65; UL/CSA Type: –

DIMENSIONS

Key operation lock mechanism

Door drilling dimensions
Drilling dimensions: either 16.2 mm = without reduction □ RMQ16 or 22.3 mm = with reduction □ RMQ Titan