

Step switches, TM, 10 A, flush mounting, 2 contact unit(s), Contacts: 4, 60 °, maintained, Without 0 (Off) position, 1-4, design no. 8231

Part no. TM-2-8231/E
Catalog No. 044029

Similar to illustration

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			flush mounting
Switching angle		°	60
Switching performance			maintained Without 0 (Off) position
Design number			8231
front plate			1-4
Motor rating AC-23A, 50 - 60 Hz			
400 V	P	kW	3
Rated uninterrupted current	I _u	A	10
Note on rated uninterrupted current I _u			Rated uninterrupted current I _u is specified for max. cross-section.
Number of contact units		contact unit(s)	2

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		°C	-25 - +50
Overvoltage category/pollution degree			III/3
Rated impulse withstand voltage	U _{imp}	V AC	4000
Mounting position			As required

Contacts

Electrical characteristics			
Rated operational voltage	U _e	V AC	500
Rated uninterrupted current	I _u	A	10
Note on rated uninterrupted current I _u			Rated uninterrupted current I _u is specified for max. cross-section.
Short-circuit rating			
Fuse		A gG/gL	10

Switching capacity

Safe isolation to EN 61140			
Current heat loss per contact at I _e		W	0.15
Current heat loss per auxiliary circuit at I _e (AC-15/230 V)		CO	0.15
Lifespan, mechanical	Operations	x 10 ⁶	> 1
Maximum operating frequency	Operations/h		1200
AC			

AC-21A			
Rated operational current switch			
400 V 415 V	I _e	A	10
AC-23A			
Motor rating AC-23A, 50 - 60 Hz	P	kW	
400 V 415 V	P	kW	3
Control circuit reliability at 24 V DC, 10 mA	Fault probability	H _F	< 10 ⁻⁵ , < 1 failure in 100,000 switching operations

Terminal capacities

Solid or stranded		mm ²	1 x 1,5 2 x 1,5
Flexible with ferrules to DIN 46228		mm ²	1 x 1.0 2 x 1.0
Flexible		mm ²	1 x 1.5 2 x 1.5
Terminal screw			M2.5
Tightening torque for terminal screw		Nm	0.4

Rating data for approved types

Contacts			
Rated operational voltage	U _e	V AC	300
Rated uninterrupted current max.			
Main conducting paths			
General use		A	10
Auxiliary contacts			
General Use	I _U	A	10
Pilot Duty			A 300
Switching capacity			
Maximum motor rating			
Single-phase			
120 V AC		HP	0.33
240 V AC		HP	0.75
277 V AC		HP	0.75
Three-phase			
120 V AC		HP	0.75
240 V AC		HP	1
Terminal capacity			
Solid or flexible conductor with ferrule		AWG	14
Terminal screw			M2.5
Tightening torque		lb-in	3.5

Design verification as per IEC/EN 61439

Technical data for design verification			
Rated operational current for specified heat dissipation	I _n	A	10
Heat dissipation per pole, current-dependent	P _{vid}	W	0.15
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			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 8.0

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	V	500
Rated permanent current Iu	A	10
Number of switch positions		4
With zero (off) position		No
With retraction in 0-position		No
Device construction		Built-in device
Width in number of modular spacings		0
Suitable for floor mounting		No
Suitable for front mounting		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		12