

**Changeoverswitches, TM, 10 A, centre mounting, 2 contact unit(s),
Contacts: 4, 60 °, maintained, Without 0 (Off) position, 1-2, design no. 8221**



Part no. **TM-2-8221/EZ**
Catalog No. **015197**

Similar to illustration

Delivery program

Product range	Control switches		
Part group reference	TM		
Basic function	Changeoverswitches		
	with black thumb grip and front plate		
Contacts	4		
Degree of Protection	Front IP65		
Design	centre mounting		
Switching angle	° 60		
Switching performance	maintained Without 0 (Off) position		
Design number	8221		
front plate	1-2		
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

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		A	10
General use			
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) / 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 zero (off) position		No
With retraction in 0-position		No
Rated permanent current I_p	A	10
Rated operation current I_e at AC-3, 400 V	A	0
Rated operation power at AC-3, 400 V	kW	2.2
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 floor mounting		No
Suitable for front mounting		Yes
Suitable for distribution board installation		No
Suitable for intermediate mounting		No
Complete device in housing		No
Material housing		Plastic
Type of control element		Short thumb-grip
Type of electrical connection of main circuit		Screw connection