

Step switches, T0, 20 A, flush mounting, 10 contact unit(s), Contacts: 20, 60  $^{\circ}$ , maintained, Without 0 (Off) position, 1-5, design no. 8478



Part no. T0-10-8478/E Catalog No. 009927

Delivery program			
Product range			Control switches
Part group reference			ТО
Basic function			Step switches
			with black thumb grip and front plate
Contacts			20
Degree of Protection			Front IP65
Design			flush mounting
Contact sequence			
Switching angle		0	60
Switching performance			maintained Without 0 (Off) position
Design number			8478
Front plate no.			FS 608
front plate			1-5
Motor rating AC-23A, 50 - 60 Hz			
400 V	Р	kW	5.5
Rated uninterrupted current	I <sub>u</sub>	Α	20
Note on rated uninterrupted current !u			Rated uninterrupted current $I_{\rm u}$ is specified for max. cross-section.
Number of contact units		contact unit(s)	

#### Technical data General

Contract	
Standards	IEC/EN 60947, VDE 0660, IEC/EN 60204, CSA, UL Switch-disconnector according to IEC/EN 60947-3
Climatic proofing	Damp heat, constant, to IEC 60068-2-78

			Damp heat, cyclic, to IEC 60068-2-30
Ambient temperature			
Open		°C	-25 - +50
Enclosed		°C	-25 - +40
Overvoltage category/pollution degree			111/3
Rated impulse withstand voltage	U <sub>imp</sub>	V AC	6000
Mechanical shock resistance		g	15
Mounting position			As required
Contacts			
Electrical characteristics		V 40	
Rated operational voltage	U <sub>e</sub>	V AC	690
Rated uninterrupted current	I <sub>u</sub>	Α	20
Note on rated uninterrupted current !u			Rated uninterrupted current $I_{\rm u}$ 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 lcw			Current for a time of 1 second
Rated conditional short-circuit current	Iq	kA	6
Switching capacity			
$\cos \phi$ rated making capacity as per IEC 60947-3		Α	130
Rated breaking capacity $\cos\phi$ to IEC 60947-3		Α	
230 V		Α	100
400/415 V		Α	110
500 V		Α	80
690 V		Α	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	Р	kW	5.5
400 V 415 V	Р	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>	Α	11.5
230 V star-delta	l <sub>e</sub>	Α	20
400V 415 V	l <sub>e</sub>	A	11.5
400 V star-delta	l <sub>e</sub>	A	20
500 V	l <sub>e</sub>	A	9
500 V star-delta	l <sub>e</sub>	Α	15.6
690 V	le	Α	4.9

Motor rating AC-ZA, 10-10-142	690 V star-delta		٨	8.5
Motur antiny AC-20, Sc -60 ht   P		l <sub>e</sub>	Α	8.5
			kW	
		Р	kW	3
Part	400 V 415 V	Р	kW	5.5
Plated operational current motar inead serich	500 V	P	kW	7.5
1	690 V	P	kW	5.5
400 V 415 V	Rated operational current motor load switch			
SOUN	230 V	l <sub>e</sub>	Α	13.3
BBN	400 V 415 V	I <sub>e</sub>	Α	13.3
Dec	500 V	I <sub>e</sub>	A	13.3
DC	690 V		Α	7.6
DC-1, Lond-break soviches L/R - 1 ms   Rated operational current   In		C		
Rated operational current				
Voltage per contact pair in series  IC-21A  Rated operational current  Contacts  IC-23A, motor load switch L/R = 15 ms  JAV  Rated operational current  Contacts  Contacts  ABV  Rated operational current  Contacts  BOV  Rated operational current  Contacts  IL-A  Rated operational current  Contacts  BOV  Rated operational current  Contacts  LL-A  Rated operational current  LL-A  Rated operational current  LL-A  Rated operational current  LL-A  Contacts  Duantity  Rated operational current  LL-A  Contacts  LL-A  Rated operational current  LL-A  Contacts  Duantity  Rated operational current  LL-A  Contacts  Duantity  Rated operational current  LL-A  Contacts  Duantity  Rated operational current  LL-A  Contacts  DU-A  Rated operational current  LL-A  Contacts  DU-A  Rated operational current  LL-A  Duantity  S  Contacts  DC-13, Control whiches L/R = 50 ms  Rated operational current  LL-A  DU-A  S  Contacts  DC-13, Control whiches L/R = 50 ms  Rated operational current  LL-A  DU-A  DU-A  Rated operational current  LL-A  DU-A  DU-A  DU-A  Rated operational current  LL-A  DU-A  DU			٨	10
DC-21A Rated operational current  Contacts  Contacts  24 V Rated operational current Contacts  24 V Rated operational current Contacts		I <sub>e</sub>		
Rated operational current  Contacts  DC-23A, motor load switch L/R = 15 ms 24 V  Rated operational current  Contacts  4				60
Contacts		l <sub>e</sub>	Α	
DC-22A, metor load switch L/R = 15 ms	Rated operational current	I <sub>e</sub>	Α	1
Rated operational current	Contacts		Quantity	1
Rated operational current	DC-23A, motor load switch L/R = 15 ms			
Contacts	24 V			
Contacts	Rated operational current	I <sub>e</sub>	Α	10
Rated operational current	Contacts		Quantity	1
Rated operational current   I				
Contacts		l <sub>o</sub>	Α	10
Rated operational current   I		·e		
Rated operational current   I			Quantity	
Contacts   Quantity   Rated operational current   Ie			٨	10
Rated operational current Contacts 240 V Rated operational current Contacts  Rated operational current  Ie  A  10  Contacts  Contacts  Voltage per contact pair in series  Control circuit reliability at 24 V DC, 10 mA  Fault probability  Faul		I <sub>e</sub>		
Rated operational current			Quantity	3
Contacts 240 V Rated operational current  Ie A 5 Contacts  Contacts  DC-13, Control switches L/R = 50 ms Rated operational current  Voltage per contact pair in series  Control circuit reliability at 24 V DC, 10 mA  Fault probability  Fault p				
Rated operational current  Rated operational current  Contacts  DC-13, Control switches L/R = 50 ms Rated operational current  Voltage per contact pair in series  Control circuit reliability at 24 V DC, 10 mA  Fault probability  Fault (1-2.5)  2 x (1-2.5)  2 x (1-2.5)  2 x (0.75-2.5)  2 x (0.75-2.	Rated operational current	l <sub>e</sub>	Α	5
Rated operational current Contacts  DC-13, Control switches L/R = 50 ms Rated operational current Voltage per contact pair in series  Control circuit reliability at 24 V DC, 10 mA  Fault probability  Fault (1-2,5) 2 x	Contacts		Quantity	3
Contacts  DC-13, Control switches L/R = 50 ms  Rated operational current  Voltage per contact pair in series  Control circuit reliability at 24 V DC, 10 mA  Fault probability  Feult pr	240 V			
DC-13, Control switches L/R = 50 ms Rated operational current Voltage per contact pair in series  Control circuit reliability at 24 V DC, 10 mA  Fault probability  Fault probability  Fault probability  HF  Control circuit reliability at 24 V DC, 10 mA  Fault probability  Fault probability  HF  Control circuit reliability at 24 V DC, 10 mA  Fault probability  HF  Control circuit reliability at 24 V DC, 10 mA  Fault probability  HF  Control circuit reliability at 24 V DC, 10 mA  Fault probability  HF  Control circuit reliability at 24 V DC, 10 mA  Fault probability  HF  Control circuit reliability at 24 V DC, 10 mA  Fault probability  HF  Control circuit reliability at 24 V DC, 10 mA  Fault probability  HF  Control circuit reliability at 24 V DC, 10 mA  Fault probability  HF  Control circuit reliability at 24 V DC, 10 mA  Fault control 100,000 switching operations  1	Rated operational current	le	Α	5
Rated operational current Voltage per contact pair in series  Control circuit reliability at 24 V DC, 10 mA  Fault probability  Flexible with ferrules to DIN 4624 V DC, 10 mA  Fault probability  Flexible with ferrules to DIN 46228  Ma3.5  Tightening torque for terminal screw  Ma 1  Technical safety parameters:  Notes  Blog values as per EN ISO 13849-1, table C1  Rating data for approved types  Contacts  Rated operational voltage  Rated uninterrupted current max.  Main conducting paths  General use  A 16	Contacts		Quantity	5
Voltage per contact pair in series  Control circuit reliability at 24 V DC, 10 mA  Fault probability  Fault probability  HF  <10 <sup>-5</sup> ,< 1 failure in 100,000 switching operations  Terminal capacities  Solid or stranded  mm²  1 x (1 - 2,5) 2 x (1 - 2,5) 2 x (1 - 2,5) 2 x (0.75 - 2.5)  Terminal screw  Tightening torque for terminal screw  Tightening torque for terminal screw  Notes  Technical safety parameters:  Notes  Rating data for approved types  Contacts  Rated operational voltage  Rated uninterrupted current max.  Main conducting paths  General use  A 16	DC-13, Control switches L/R = 50 ms			
Voltage per contact pair in series  Control circuit reliability at 24 V DC, 10 mA  Fault probability  Fault probability  HF  <10 <sup>-5</sup> ,< 1 failure in 100,000 switching operations  Terminal capacities  Solid or stranded  mm²  1 x (1 - 2,5) 2 x (1 - 2,5) 2 x (1 - 2,5) 2 x (0.75 - 2.5)  Terminal screw  Tightening torque for terminal screw  Tightening torque for terminal screw  Notes  Technical safety parameters:  Notes  Rating data for approved types  Contacts  Rated operational voltage  Rated uninterrupted current max.  Main conducting paths  General use  A 16	Rated operational current	I <sub>e</sub>	Α	10
Control circuit reliability at 24 V DC, 10 mA  Fault probability  Terminal capacities  Solid or stranded  mm² 1 x(1 - 2,5) 2 x (1 - 2,5) 2 x (1 - 2,5) 2 x (1 - 2,5) 2 x (0.75 - 2.5)  Terminal screw  Ma.5  Tightening torque for terminal screw  Technical safety parameters:  Notes  B10 <sub>d</sub> values as per EN ISO 13849-1, table C1  Rating data for approved types  Contacts  Rated operational voltage  Rated uninterrupted current max.  Main conducting paths  General use  A 16				
Terminal capacities  Solid or stranded		Fault		
Solid or stranded mm² 1x (1 - 2,5) 2x (1 - 2,5)  Flexible with ferrules to DIN 46228 mm² 1x (0.75 - 2.5) 2x (0.75 - 2.5)  Terminal screw M3.5  Tightening torque for terminal screw M3.5  Technical safety parameters:  Notes B10 <sub>d</sub> values as per EN ISO 13849-1, table C1  Rating data for approved types  Contacts B10 <sub>d</sub> values as per EN ISO 13849-1, table C1  Rated operational voltage U <sub>e</sub> V AC 600  Rated uninterrupted current max.  Main conducting paths  General use A 16				< 10 ,< 1 milling in 100,000 switching operations
Flexible with ferrules to DIN 46228  Flexible with ferrules to DIN 46228  Flexible with ferrules to DIN 46228  Freminal screw  M3.5  Tightening torque for terminal screw  Mm 1  Technical safety parameters:  Notes  Rating data for approved types  Contacts  Rated operational voltage  Rated uninterrupted current max.  Main conducting paths  General use  Main data for approved types  A 16	Terminal capacities			
Flexible with ferrules to DIN 46228  mm² 1x (0.75 - 2.5) 2x (0.75 - 2.5)  Terminal screw M3.5  Tightening torque for terminal screw Nm 1  Technical safety parameters:  Notes B10 <sub>d</sub> values as per EN ISO 13849-1, table C1  Rating data for approved types  Contacts Rated operational voltage Ue VAC 600  Rated uninterrupted current max. Main conducting paths General use A 16	Solid or stranded		mm <sup>2</sup>	1 x (1 - 2,5) 2 x (1 - 2,5)
Terminal screw  M3.5  Tightening torque for terminal screw  Nm 1  Technical safety parameters:  Notes  Rating data for approved types  Contacts  Rated operational voltage  Rated uninterrupted current max.  Main conducting paths  General use  M3.5  Nm 1   VM 1   VMC 600  A 16	Flovible with formulas to DIN 45220		2	
Tightening torque for terminal screw  Technical safety parameters:  Notes  B10 <sub>d</sub> values as per EN ISO 13849-1, table C1  Rating data for approved types  Contacts  Rated operational voltage  Rated uninterrupted current max.  Main conducting paths  General use  Nm 1  1  4 16	ו ופאוטופ איונון ופון נופט נט טווא 40270		mm <sup>2</sup>	
Technical safety parameters:  Notes  B10 <sub>d</sub> values as per EN ISO 13849-1, table C1  Rating data for approved types  Contacts  Rated operational voltage  Ue  V AC  600  Rated uninterrupted current max.  Main conducting paths  General use  A 16	Terminal screw			M3.5
Technical safety parameters:  Notes  B10 <sub>d</sub> values as per EN ISO 13849-1, table C1  Rating data for approved types  Contacts  Rated operational voltage  Ue  V AC  600  Rated uninterrupted current max.  Main conducting paths  General use  A 16	Tightening torque for terminal screw		Nm	1
Notes  Rating data for approved types  Contacts  Rated operational voltage  Rated uninterrupted current max.  Main conducting paths  General use  B10 <sub>d</sub> values as per EN ISO 13849-1, table C1  8100				
Contacts Rated operational voltage Ue VAC 600 Rated uninterrupted current max. Main conducting paths General use A 16				B10 <sub>d</sub> values as per EN ISO 13849-1, table C1
Rated operational voltage  Ue VAC 600  Rated uninterrupted current max.  Main conducting paths General use  A 16	Rating data for approved types			
Rated uninterrupted current max.  Main conducting paths  General use  A 16	Contacts			
Main conducting paths  General use  A 16	Rated operational voltage	U <sub>e</sub>	V AC	600
Main conducting paths  General use  A 16	Rated uninterrupted current max.			
General use A 16				
			Α	16
	,			

General Use	I <sub>U</sub>	Α	10
Pilot Duty			A 600 P 300
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		Α	50
High fault rating		kA	10
max. Fuse		Α	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

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Technical data for design verification			
Rated operational current for specified heat dissipation	In	Α	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) / 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		4	
Max. rated operation voltage Ue AC	V	/ 690	
Rated permanent current lu	А	A 20	
Number of switch positions		5	
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		48x48 mm	
Degree of protection (IP), front side		IP65	
Degree of protection (NEMA), front side		12	

## **Approvals**

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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**

