### **DATASHEET - T0-5-8281/IVS**



Step switches, T0, 20 A, service distribution board mounting, 5 contact unit(s), Contacts: 9, 45  $^{\circ}$ , maintained, With 0 (Off) position, 0-3, design no. 8281



Part no. T0-5-8281/IVS Catalog No. 055463

Similar to illustration

Delivery was arem			
Delivery program			
Product range			Control switches
Part group reference			ТО
Basic function			Step switches
			with black thumb grip and front plate
Contacts			9
Number of steps			3 steps, 45°
Degree of Protection			Front IP30
Design			service distribution board mounting
Contact sequence			
Switching angle		0	45
Switching performance			maintained With 0 (Off) position
Design number			8281
Front plate no.			FS 420
front plate			0-3
Motor rating AC-23A, 50 - 60 Hz			
400 V	P	kW	5.5
Rated uninterrupted current	Iu	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)	5

# Technical data General

donora.		
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

Marie Impulses of Marie Impulses   Mar	Overvoltage category/pollution degree			III/3
Manufaction		11.	VAC	
Part		U <sub>imp</sub>		
Partial specialized Sectical factor sections of selegies			g	
Reduct operational value   V				As required
Rated coparational voltage				
Residual sanistemungendi currents   Ignature   Ignatu		ш	VAC	600
Note or rotated suntinerrogated coursent 1, is specified for max. closes-section.				
Load rating with intermitters operation, class 1?         x   1           A8 29 N DF         x   1           A8 94 N DF         x   1           A8 95 N DF         x   1           A8 66 N DF         x   2           Siturt-criter atteing         x   2           Rated short-line withstand current for         x   2           Rated distort-line withstand current for         x   4           Rated distort-line withstand current for         x   4           Rated distort-line withstand current for         x   4           Sovice and advanciance withstand current for         x   4           Accommon for a since of 1 according         x   4           Rated caredinates administer gracely one with ED 6987-3         x   4           Rated braining capacity one year one UED 6987-3         x   4           Rated braining capacity one year one UED 6987-3         x   4           Rated braining capacity one year one UED 6987-3         x   4           Rated braining capacity one year one UED 6987-3         x   4           Rated braining capacity one year one UED 6987-3         x   4           Rated braining capacity one year year one year one year year one year year one year year one year year year year year year year yea	·	Iu	А	
A6 25 5, 10				Rated uninterrupted current $I_u$ is specified for max. cross-section.
AB 80 No DF         x   x   x   13           AB 80 No CF color arring         x   x   x   13           Fluxe and confidence without current (1 a current)         A g/G/L         200           Read and not channed understand current (1 a current)         In a current of the without current (1 a current)         In a current of the without current (1 a current)         In a current of the without current (1 a current)           Nature in consideration with current (1 a current)         In a current of the without current (1 a current)         In a current (1 a current)         In a current (1 a current)           Nature in consideration with current (1 a current)         In a current (1 a current)         In a current (1 a current)         In a current (1 a current)           Nature in consideration with current (1 a current)         In a current (1 a current)         In a current (1 a current)         In a current (1 a current)           Solito for consideration with current (1 a current)         In a current (1 a current)         In a current (1 a current)         In a current (1 a current)           Solito Vince (1 a current)         In a current (1 a current)         In a current (1 a current)         In a current (1 a current)           Solito Vince (1 a current)         In a current (1 a current)         In a current (1 a current)         In a current (1 a current)           Solito Vince (1 a current)         In a current (1 a current)         In a current (1 a current)         In a	Load rating with intermittent operation, class 12			
AB 60 % 0 F	AB 25 % DF		x l <sub>e</sub>	2
Short-circuit rating   Face   A 50°   A 50°	AB 40 % DF		x I <sub>e</sub>	1.6
Fibre   Common transformation (common 11 s current)   Common transformation (common 11 s current)   Common transformation (common transformation (common transformation)   Common transformation (common transformation)	AB 60 % DF		x I <sub>e</sub>	1.3
Nation clast distort-line withstand current (1 s current)   Nation crasted stort-line withstand current (1 s current)   Nation capacity   Switching capacity   Switching capacity as per ICE 08947-3   Switching capacity as per ICE 08947-3   Switching capacity as per ICE 08947-3   Switching capacity cos gr to ICE 08947-3   Switching capacity capaci	Short-circuit rating			
Note or rated short-time withstand current lew         Incompany (any or stand making expacity as per IEC 89847-3         Incompany (any or stand making expacity as per IEC 89847-3         A lad (any or stand making expacity as per IEC 89847-3         A lad (any or stand making expacity as per IEC 89847-3         A lad (any or stand making expacity as per IEC 89847-3         A lad (any or stand making expacity as per IEC 89847-3         A lad (any or stand making expacity or stand	Fuse		A gG/gL	20
Rate   conditional short-circuit current   Say   Say	Rated short-time withstand current (1 s current)	I <sub>cw</sub>	A <sub>rms</sub>	320
Switching capacity as per IEC 80947-3	Note on rated short-time withstand current lcw			Current for a time of 1 second
Switching capacity   Switchi	Rated conditional short-circuit current	Iq	kA	6
cos e y rate making capacity as per IED 60947-3         A         10           229 V         A         40           400415 V         A         10           509 V         A         80           Side isolation to EN S1140         A         40           between the contacts         Current heat loss per contact at 1 <sub>n</sub> VAC         40           Current best loss per contact at 1 <sub>n</sub> VAC         40           Current best loss per suckinsty circuit at 1 <sub>n</sub> (AC-15230 V)         POPRATION         70           Maximum operating frequency         Operations         100           AC-3         PAC         A           Reting, motor load switch         P         KW         5           220 V 220 V Stur-delta         P         KW         5           400 V Stur-delta         P         KW         5           500 V Stur-delta         P         KW         5           680 V Stur-delta         P         KW         5           880 V Stur-delta         P         KW         5           900 V Stur-delta         P         KW         5           880 V Stur-delta         P         KW         5           900 V Stur-delta         P		٦		
230 \			Α	130
Modulator V	Rated breaking capacity cos φ to IEC 60947-3		Α	
Sol V	230 V		Α	100
880 V         A         80           Safe isolation to EN 61140         V         440           between the contacts         V         40           Current heat loss per contact at I <sub>e</sub> V         00           Current heat loss per auxiliary circuit at I <sub>e</sub> (AC-15/230 V)         00         60           Lifespan, mechanical         Operations/         120         120           Maximum operating frequency         Operations/         120         120           AC-3         T         120         120           Rating, motor load switch         P         KW         3           220 V 230 V         P         KW         5           400 V 15 V - dolta         P         KW         5           400 V 15 V - dolta         P         KW         5           500 V Star-dolta         P         KW         5           680 V Star-dolta         P         KW         5           680 V Star-dolta         P         KW         5           230 V star-dolta         P         KW         5           400 V 15 V - dolta         P         KW         5           230 V star-dolta         P         KW         15           400 V	400/415 V		Α	110
Same isolation to EN 61140         FAC 20 440           between the contacts of Light Current hear loss per contact at Light Carley (AC-15/230 V)         VA 0.6           Lifespan, mechanical         Operations 2 1/6 20         > 0.4           Meximum operating frequency         Operations 2 1/6 20         200           AC-3         TO 100         NO 100           AC-3         P NW 100         3           AC-3 20 V 230 V         P NW 100         3           A 00 V Star-delta         P NW 100         5.5           4 00 V Star-delta         P NW 100         7.5           5 00 V Star-delta         P NW 100         7.5           6 80 V Star-delta         P NW 100         7.5           6 80 V Star-delta         P NW 100         7.5           8 0 V Star-delta         P NW 100         7.5           9 NW 100         1.5         1.5           1 0 NW 100         1.5         1.5           2 0 V Star-delta         1.6         A 1.5           4 000 V Star-delta         1.6         A 2.0	500 V		Α	80
between the contacts         V AC         440           Current heat loss per contact at l₀         W         0.8           Current heat loss per auxiliary circuit at l₀ (AC-15/230 V)         CD         0.8           Lifespan, mechanical         Operations/h         x10 <sup>8</sup> > 0.4           Maximum operating frequency         Operations/h         1200           AC-3         Bating, motor load switch         P         kW           220 V 220 V         P         kW         5.5           400 V 15 V         P         kW         5.5           400 V 15 V         P         kW         5.5           500 V         P         kW         5.5           500 V Star-delta         P         kW         5.5           680 V         P         kW         5.5           680 V         P         kW         5.5           680 V Star-delta         P         kW         5.5           680 V Star-delta         P         kW         5.5           818ted operational current motor load switch         I         A         2.0           230 V Star-delta         I         A         2.0           4000 V star-delta         I         A         2.0	690 V		Α	60
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)         CD         0.8           Lifespan, mechanical         Operations/mechanical         2.04           Maximum operating frequency         Operations/methods         1200           AC         AC-3         1200           Rating, motor load switch         P         kW         0           220 V 230 V         P         kW         3           400 V 15 V         P         kW         5.5           400 V 15 V         P         kW         5.5           400 V 5tar-delta         P         kW         7.5           500 V         P         kW         7.5           680 V Star-delta         P         kW         7.5           Rated operational current motor load switch         P         kW         5.5           Rated operational current motor load switch         P         kW         4.0           230 V         I <sub>0</sub> A         1.15           400 V star-delta         I <sub>0</sub> A         2.0           400 V star-delta         I <sub>0</sub> A         2.0           500 V star-delta         I <sub>0</sub> A	Safe isolation to EN 61140			
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)         CD         0.8           Lifespan, mechanical         Operations/mechanical         2.04           Maximum operating frequency         Operations/methods         1200           AC         AC-3         1200           Rating, motor load switch         P         kW         0           220 V 230 V         P         kW         3           400 V 15 V         P         kW         5.5           400 V 15 V         P         kW         5.5           400 V 5tar-delta         P         kW         7.5           500 V         P         kW         7.5           680 V Star-delta         P         kW         7.5           Rated operational current motor load switch         P         kW         5.5           Rated operational current motor load switch         P         kW         4.0           230 V         I <sub>0</sub> A         1.15           400 V star-delta         I <sub>0</sub> A         2.0           400 V star-delta         I <sub>0</sub> A         2.0           500 V star-delta         I <sub>0</sub> A	between the contacts		V AC	440
Current heat loss per auxiliary circuit at I <sub>q</sub> (AC-15/220 V)         CO         0.6           Maximum operating frequency         Operations/h         1200           AC-3         1200           AC-3         Naminamination of load switch         P         WW         W           220 V 230 V         P         WW         3         P         W         55           400 V 15 V         P         WW         5.5         P         WW         7.5         P         WW         8.5         P         WW         9.0         WW         9.0         P         WW         9.0         P         WW         9.0         P         WW         9.0         P <td>Current heat loss per contact at I.</td> <td></td> <td>W</td> <td>0.6</td>	Current heat loss per contact at I.		W	0.6
Lifespan, mechanical       Operations/haximum operating frequency       2100         AC-3       Rating, motor load switch       P       KW         220 V 230 V       P       kW       3         400 V 415 V       P       kW       5.5         400 V 51sr-delta       P       kW       5.5         400 V 51sr-delta       P       kW       5.5         500 V       P       kW       5.5         690 V       P       kW       7.5         690 V Star-delta       P       kW       5.5         Rated operational current motor load switch       P       kW       5.5         Rated operational current motor load switch       Io       A       11.5         230 V star-delta       Io       A       11.5         400 V 415 V       Io       A       11.5         400 V 415 V       Io       A       10.0         400 V 5tar-delta       Io       A       10.0         400 V 5tar-delta       Io       A       10.0         500 V 5tar-delta       Io       A       10.0         690 V 5tar-delta       Io       A       20         690 V 5tar-delta       Io       A       10.0 <td></td> <td></td> <td></td> <td></td>				
Maximum operating frequency       Operations/h       1200         AC-3       Reting, motor load switch       P       kW         220 V 230 V       P       kW       5.5         400 V Star-delta       P       kW       5.5         400 V Star-delta       P       kW       5.5         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       Io       A       11.5         230 V star-delta       Io       A       11.5         400 V star-delta       Io       A       20         400 V star-delta       Io       A       20         500 V       Io       A       20         500 V       Io       A       20         500 V star-delta       Io       A       20         690 V star-delta       Io       A       20         690 V star-delta       Io       A       4         690 V star-delta       Io       A       4.9         690 V star-del		Operations		
AC-3  Rating, motor load switch P	, .		x 10°	
AC-3  Rating, motor load switch  P		Operations/h		1200
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         4           690 V         P         kW         5.5           Rated operational current motor load switch         S         5.5           230 V         Ie         A         11.5           230 V star-delta         Ie         A         11.5           400 V star-delta         Ie         A         11.5           400 V star-delta         Ie         A         20           500 V         Ie         A         9           500 V star-delta         Ie         A         15.6           690 V star-delta         Ie         A         4.9           690 V star-delta         Ie         A         4.9           690 V star-delta         Ie         A         4.9           690 V star-delta         Ie         <				
220 V 230 V   P		_		
230 V Star-delta				
400 V 415 V				
A00 V Star-delta				
S00 V   Star-delta   P   kW   5.5		Р	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				
690 V Star-delta P kW 5.5  Rated operational current motor load switch  230 V le A 11.5  230 V star-delta le A 20  400V 415 V le A 11.5  400 V star-delta le A 20  500 V le A 9  500 V star-delta le A 9  690 V star-delta le A 15.6  690 V le A 4.9  690 V star-delta le A 5.5  AC-23A  Motor rating AC-23A, 50 - 60 Hz P kW				
690 V Star-delta       P       kW       5.5         Rated operational current motor load switch       Ie       A       11.5         230 V       Ie       A       20         400V star-delta       Ie       A       11.5         400 V star-delta       Ie       A       20         500 V       Ie       A       9         500 V star-delta       Ie       A       9         690 V star-delta       Ie       A       4.9         690 V star-delta       Ie       A       4.9         690 V star-delta       Ie       A       8.5         AC-23A         Motor rating AC-23A, 50 - 60 Hz       P       kW				
Rated operational current motor load switch       Ie       A       11.5         230 V star-delta       Ie       A       20         400V 415 V       Ie       A       11.5         400 V star-delta       Ie       A       20         500 V       Ie       A       9         500 V star-delta       Ie       A       15.6         690 V       Ie       A       4.9         690 V star-delta       Ie       A       8.5         AC-23A       Motor rating AC-23A, 50 - 60 Hz       P       kW				
230 V       I <sub>e</sub> A       11.5         230 V star-delta       I <sub>e</sub> A       20         400 V 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-23A       AC-23A, 50 - 60 Hz       P       kW		Р	kW	5.5
230 V star-delta				
400 V star-delta	230 V	l <sub>e</sub>	Α	11.5
400 V star-delta	230 V star-delta	l <sub>e</sub>	Α	20
500 V	400V 415 V	le	Α	11.5
500 V star-delta	400 V star-delta	I <sub>e</sub>	Α	20
500 V star-delta       Ie       A       15.6         690 V       Ie       A       4.9         690 V star-delta       Ie       A       8.5         AC-23A       P       kW	500 V	l <sub>e</sub>	Α	9
690 V I <sub>e</sub> A 4.9 690 V star-delta I <sub>e</sub> A 8.5 AC-23A Motor rating AC-23A, 50 - 60 Hz P kW	500 V star-delta		Α	15.6
690 V star-delta				
AC-23A  Motor rating AC-23A, 50 - 60 Hz  P kW				
Motor rating AC-23A, 50 - 60 Hz P kW		'e	A	U.J
		D	LAA	
ZSU V P KW 3				
	23U V	۲	KVV	3

400 V 415 V	P	kW	5.5
500 V	Р	kW	7.5
690 V	Р	kW	5.5
Rated operational current motor load switch			
230 V	l <sub>e</sub>	Α	13.3
400 V 415 V	l <sub>e</sub>	Α	13.3
500 V	I <sub>e</sub>	Α	13.3
690 V	I <sub>e</sub>	Α	7.6
DC			
DC-1, Load-break switches L/R = 1 ms			
Rated operational current	I <sub>e</sub>	Α	10
Voltage per contact pair in series		V	60
DC-21A	l <sub>e</sub>	Α	
Rated operational current	I <sub>e</sub>	Α	1
Contacts		Quantity	1
DC-23A, motor load switch L/R = 15 ms			
24 V			
Rated operational current	I <sub>e</sub>	Α	10
Contacts		Quantity	1
48 V			
Rated operational current	I <sub>e</sub>	Α	10
Contacts		Quantity	2
60 V			
Rated operational current	I <sub>e</sub>	Α	10
Contacts		Quantity	3
120 V		,	
Rated operational current	l <sub>e</sub>	A	5
Contacts		Quantity	3
240 V		,	
Rated operational current	I <sub>e</sub>	Α	5
Contacts		Quantity	5
DC-13, Control switches L/R = 50 ms		,	
Rated operational current	I <sub>e</sub>	Α	10
Voltage per contact pair in series		V	32
Control circuit reliability at 24 V DC, 10 mA	Fault	H <sub>F</sub>	< 10 <sup>-5</sup> ,< 1 failure in 100,000 switching operations
	probability	'	< 10 ,< 1 failure in 100,000 Switching Operations
Terminal capacities			4 (4 05)
Solid or stranded		mm <sup>2</sup>	1 x (1 - 2,5) 2 x (1 - 2,5)
Flexible with ferrules to DIN 46228		mm <sup>2</sup>	1 x (0.75 - 2.5)
			2 x (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	U <sub>e</sub>	V AC	600
Rated uninterrupted current max.			
Main conducting paths			
General use		Α	16
Auxiliary contacts			
General Use	lu	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	SCC	R
Basic Rating	kA	5
max. Fuse	А	50
High fault rating	kA	10
max. Fuse	А	20, Class J
Terminal capacity		
Solid or flexible conductor with ferrule	AWO	G 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	$P_{vs}$	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			Meets the product standard's requirements.
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 switch gear must be observed. $\label{eq:specification}$
10.12 Electromagnetic compatibility			Is the panel builder's responsibility. The specifications for the switch gear must be observed. $\label{eq:specification}$

#### **Technical data ETIM 7.0**

Low-voltage industrial components (EG000017) / Control switch (EC002611)

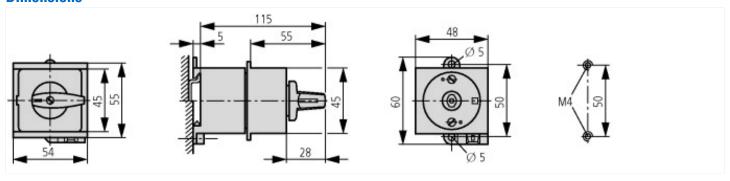
Electric engineering, automation, process control engineering / Low-voltage switch technology / Off-load switch, circuit breaker, control switch / Control switch (ecl@ss10.0.1-27-37-14-14 [ACN998011])

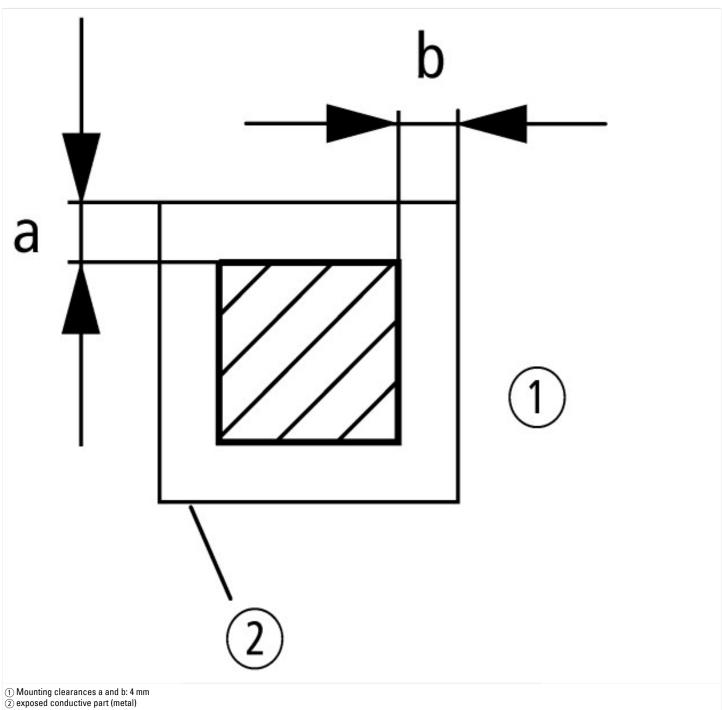
	Level switch
	3
V	690
Α	20
	4
	Yes
	No
	Built-in device
	4
	Yes
	No
	Yes
	No
	No
	Toggle
	Other
	IP30
	Other

## **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: IP30; UL/CSA Type: –

#### **Dimensions**





# **Additional product information (links)**

The state of the s	
Display flip catalog page.	http://ecat.moeller.net/flip-cat/?edition=K115A&startpage=81
Technical overview cam switch, switch-disconnector	http://de.ecat.moeller.net/flip-cat/?edition=HPLTEv1&startpage=4.2
System overview cam switch T	http://de.ecat.moeller.net/flip-cat/?edition=HPLTEv1&startpage=4.4
System overview switch-disconnector P	http://de.ecat.moeller.net/flip-cat/?edition=HPLTEv1&startpage=4.6
Key to part numbers Cam switch	http://de.ecat.moeller.net/flip-cat/?edition=HPLTEv1&startpage=4.8
Key to part numbers Switch-disconnector	http://de.ecat.moeller.net/flip-cat/?edition=HPLTEv1&startpage=4.8
Switches for ATEX	http://www.coopercrouse-hinds.eu/en/products/25-ex-safety-and-main-current-switches.html