TECO Technology (Vietnam) Co,. LTD
KCN Long Thanh, Huyen Long Thanh, Tinh Dong Nai
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Power Devices Catalogue
2013

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Company Profile

TECO Technology (Vietnam) Company was established since year 2006, which was located in Long Thanh, Dong Nai, Vietnam. TECO Technology (Vietnam) Company was approved by the Vietnam Government to invest in the establisment from TECO Electric & Machinery.

TECO Electric & Machinery was founded in 1956, initially in the motor production, has entered the heavy electric, electronic control, home appliances, information, communications, electronics and key components, infrastructure construction and financial investment in the core business areas of development.

TECO Electric & Machinery Company in 1968 with the American Company, ***General Electric*** *and Japan Company,****Yaskawa*** *electromechanical technical cooperation, followed by cooperated with the* ***U.S. Westinghouse, Japan's Hitachi, Sweden Ericsson, Mitsubishi, NEC, Deutsche Telekom, Germany's Siemens*** *and other international electronic, electrical and communications group to establish business cooperation relationship. TECO Group currently has about 30 of affiliated companies at home and abroad, the cause of the territory has been expanded to Asia, the Americas and Europe, and distribution of the global staff of more than million people to become well-known, one of the world-class group.*

TECO Technology (Vietnam) Company was division of the Electrical and Controller, which products manufacturing such as circuit breaker and low voltage power distribution equipment belonging to Group management and control. Division formerly known as Taian Electric, since its founding in 1969 to the October 2003 merger with TECO date, high voltage power distribution equipment, generator sets, power strips, inverter, programmable controller and servo controller products to meet customer the most basic electrical safety requirements, and provide a holistic automation services.

Years of hardwork, and TECO Electric & Machinery by heavy electric appliance field, to become a global high-tech enterprise, from manufacturing, marketing, service to the development, the establishment of an aspect of the world of international brand TECO. Teco Group abundant resources of integration comprehensive efficiency TECO Technology (Vietnam) Company will be established in Vietnam and its neighboring countries in Southeast Asia's production and sales base through continuous innovation and Houzhi R & D technology, to provide customer satisfaction as the guide of products and improve after-sales service, the progressive realization become Vietnam cum-low-voltage power distribution equipment in Southeast Asia, the renowned first-class brand manufacturers.

Molded Case Circuit Breakers

Type	Series	Model	kA	Poles	Current Range
			380V Icu/Ics		AT (Rated Current) A
Non- Adjustable Thermal	Series E	TO50E	2.5/1.3	2	15, 20, 30, 40, 50
		TO50EC	2.5/1.3	3	15, 20, 30, 40, 50
		TO100EB	15/7.5	2/3	15, 20, 30, 40, 50, 60, 75, 100
		TO125EC	22/11	2/3	125
		TO225E	15/7.5	2/3	125, 150, 175, 200, 225
		TO250EB	22/11	2/3	250
		TO400E	22/11	2/3	250, 300, 350, 400
		TO630EB	25/13	3	500, 600
		TO800EB	30/15	3	700, 800
	Series S	TO125SB	35/15	2/3	15, 20, 30, 40, 50, 60, 75, 100, 125
		TO125S	35/15	3	15, 20, 30, 40, 50, 60, 75, 100, 125
		TO225S	35/15	3	125, 150, 175, 200, 225
		TO250SB	35/15	2/3	250
		TO400S	42/21	2/3	250, 300, 350, 400
		TO600S	42/21	3	500, 600
		TO800S	65/33	3	700, 800
	Series H	TG100H	50/25	3	15, 20, 30, 40, 50, 60, 75, 100
		TG225H	50/25	3	125, 150, 175, 200, 225
		TG400H	50/25	3	250, 300, 350, 400
		TG600H	50/25	3	500, 600
		TG800H	100/50	3	700, 800
		TG125HB	65/33	3/4	15, 20, 30, 40, 50, 60, 75, 100, 125
		TG250HB	65/33	3/4	125,150 ,160, 175 ,200, 225, 250
		TG400HB	65/33	3/4	250, 300, 350, 400
		TG630HB	65/33	3/4	500, 600, 630
		TG800HB	65/33	3/4	700, 800
Adjustable Thermal	Series HJ	TG125HJ	65/33	3/4	20, 32, 50, 63,100, 125
		TG250HJ	65/33	3/4	160, 250
		TG400HJ	65/33	3/4	250, 400
Adjustable Electronic	Electronic Series	TE600	50/25	3	300, 350, 400, 500, 600
		TE800	50/25	3	400, 450, 500, 600, 700, 800
		TE1000	85/43	3	500, 600, 700, 800, 900, 1000
		TE1200	85/43	3	600, 700, 800, 1000, 1200
		TE1600	100/50	3	800, 900,1000,1200, 1400, 1600

TO Series Economical Type

Frame size (AF)		50		50		100		100		125	
Type		TO—50E		TO—50EC		TO—100EB		TO—100EC		TO—125EC	
Number of poles		2		3		2	3	3		2*	3
Rated current(A) at ambient temperature 40℃		15 40 20 50 30		15 40 20 50 30		15 40 75 20 50 100 30 60		15 40 75 20 50 100 30 60		125	
Rated insulation voltage (V) CNS,IEC		690						690			
Rated breaking capacity (kA)											
IEC 60947-2 EN 60947-2 CNS 14816-2 Icu/Ics	AC 500V	1.5/0.8				7.5/3.8		5/5		10/5	
	AC 440V	2.5/1.3				10/5		7.5/7.5		15/7.5	
	AC 415V	2.5/1.3				10/5		7.5/7.5		15/7.5	
	AC 380V	2.5/1.3				15/7.5		10/10		22/11	
	AC 230V	5/2.5				25/13		18/15		30/15	
CNS 2931 JIS C8370	AC 550V 600V	1.5/1.5				7.5/7.5		5/2.5		10/10	
	AC 440V 480V	2.5/2.5				12/10		7.5/3.8		18/15	
	AC 380V	2.5/2.5				18/15		10/5		25/22	
Asym/sym	AC 220V 240V	5/5				30/25		15/7.5		35/30	
DC	250V	2.5				7.5		5		10	
	125V	5				15		5		15	
Dimensions (mm)	a	50	75			50	75	75		60	90
	b	130				130		130		155	
	c	60				68		68		68	
	ca	79				87		87		86	
	aa	—	25			—	25	25		—	30
	bb	111				111		111		132	
Weight (kg)		0.4	0.6			0.62	0.8	0.8		0.7	1.0
Features											
Automatic tripping device		Fixed-thermal and fixed-magnetic									
Trip button		●									
ON / OFF Indicator		—									
Handle lock (OFF - POSITION)		—									
Connections		Terminal screw									
Accessories (option)											
Internally mounted	Shunt trip SHT	●③		●③		●③		●③		●	
	Under voltage trip UVT	●③		●③		●③		●③		—	
	Auxiliary switch AUX	●③		●③		●③		●③		●	
	Alarm switch ALT	●③		●③		●③		●③		●	
	Alarm + Auxiliary switch AUX+ALT	●③		●③		●③		●③		●	
Externally mounted	Electrical operation mechanics CD	—		●④		—	●④	●④		—	●④
	External operating handle FH	—		●		—	●	●		—	—
	External operating handle FL	—		—		—	—	—		—	●
	External operating handle FG	—		●②		—	●②	●②		—	●②
	External operating handle TFJ	—		—		—		—		—	
	Extension handle EHA	—		—		—		—		—	
	Attached flat bar TBB	—		—		—		—		—	
	Interpole barrier TQQ	●		●		●①		●		●①	
	Terminal cover XPR	—		●		—	●	●		—	●
Approval	CE Declaration	●		●		●		●		●	
	TUV Certificate	●		●		●		●		—	
	CNS Certificate	●		●		●		●		●	

Note : ● : Available — : Not Available ① : Standard Accessory ② : IP rating meets IP 42.
③ : Can be supplied separately. ④ : Supplied to order.
* : Special Request

TO Series Economical Type

Frame size (AF)		225		250		400		630	800
Type		TO-225E		TO-250EB		TO-400E		TO-630EB	TO-800EB
Number of poles		2*	3	2*	3	2*	3	3	3
Rated current(A) at ambient temperature 40°C		125 200 150 225 175		250		250 350 300 400		500 600	700 800
Rated insulation voltage (V) CNS,IEC		690							
Rated breaking capacity (kA)									
IEC 60947-2 EN 60947-2 CNS 14816-2 Icu/Ics	AC 500V	10/5		10/5		15/7.5		18/9	25/13
	AC 440V	15/7.5		15/7.5		20/10		25/13	25/13
	AC 415V	15/7.5		15/7.5		20/10		25/13	25/13
	AC 380V	15/7.5		22/11		22/11		25/13	30/15
	AC 230V	25/13		30/15		30/15		35/18	50/25
CNS 2931 JIS C8370 Asym/sym	AC 550V 600V	10/10		10/10		18/15		20/18	22/20
	AC 440V 480V	18/15		18/15		22/20		30/25	30/25
	AC 380V	18/15		25/22		25/22		30/25	35/30
	AC 220V 240V	30/25		35/30		35/30		40/35	60/50
DC	250V	10		10		20		20	40
	125V	15		15		20		—	—
Dimensions (mm)	a	105		105		140		210	210
	b	160		165		260		275	275
	c	60		68		103		103	103
	ca	83		89		130		145	145
	aa	35		35		45		70	70
	bb	124		126		214		243	243
Weight (kg)		1.7	2.0	1.2	1.4	4.8	5.6	9	9.4
Features									
Automatic tripping device		Fixed-thermal and adjustable-magnetic						Fixed-thermal and adjustable-magnetic	
Trip button				●				●	
ON / OFF indicator		●		—		●		—	
Handle lock (OFF - POSITION)		—		—				● Option ③	
Connections		Terminal screw		Terminal screw		Busbar			
Accessories (option)									
Internally mounted	Shunt trip SHT	●⑤		●		●		●	●
	Under voltage trip UVT	—		—		—		●	●
	Auxiliary switch AUX	—		●		●		●	●
	Alarm switch ALT	—		●		●		●	●
	Alarm + Auxiliary switch AUX+ALT	—		●		●		●	●
Externally mounted	Electrical operation mechanics CD	—		●④		●④		●④	●④
	External operating handle FH	●		—		●		—	—
	External operating handle FL	—		●		—		—	—
	External operating handle FG	●⑤		●⑤		—		—	—
	External operating handle TFJ	—		—		●④		●④	●④
	Extension handle EHA	—		—		—		●	●
	Attached flat bar TBB	●		●		●②		●②	●②
	Interpole barrier TQQ	●①		●①		●①		●①	●①
	Terminal cover XPR	●		●		●		●	●
Approval	CE Declaration	●		●		●		●	●
	TUV Certificate	●		—		●		—	●
	CNS Certificate	●		●		●		●	●

Note : ● : Available — : Not available ① : Standard accessory ② : Built in
③ : Lock off attachment can be supplied with handle when ordered. ④ : Supplied to order. ⑤ : IP rating meets IP 42.
⑥ : Can be supplied separately.
* : Special Request

TO Series Standard Type

Frame size (AF)		125		125	225	250		
Type		TO-125SB		TO-125S	TO-225S	TO-250SB		
Number of poles		2*	3*	3	3	2*	3	
Rated current(A) at ambient temperature 40°C		15 40 75 20 50 100 30 60 125		15 40 75 20 50 100 30 60 125	125 175 250 150 200 160 225	250		
Rated insulation voltage (V) CNS,IEC								
Rated breaking capacity (kA)								
IEC 60947-2 EN 60947-2 CNS 14816-2 Icu/Ics	AC 500V	12/6		12/6	12/6	12/6		
	AC 440V	25/13		25/13	25/13	25/13		
	AC 415V	25/13		25/13	25/13	25/13		
	AC 380V	30/15		30/15	30/15	30/15		
	AC 230V	50/25		50/25	50/25	50/25		
CNS 2931 JIS C8370 Asym/sym	AC 550V 600V	18/15		18/15	18/15	18/15		
	AC 440V 480V	30/25		30/25	30/25	30/25		
	AC 380V	35/30		35/30	35/30	35/30		
	AC 220V 240V	60/50		60/50	60/50	60/50		
DC	250V	15		15	15	15		
	125V	20		20	20	20		
Dimensions (mm)	a	60	90	90	105	105		
	b	155		155	165	165		
	c	68		68	68	68		
	ca	86		86	89	89		
	aa	—	30	30	35	35		
	bb	132		132	126	126		
Weight (kg)		0.7	1.0	1.0	1.4	1.2	1.4	
Features								
Automatic tripping device		Fixed-thermal and fixed-magnetic						
Trip button		●		●	●	●		
ON / OFF Indicator		—		—	—	—		
Handle lock (OFF - POSITION)		—		—	—	—		
Connections		Terminal screw						
Accessories (option)								
Internally mounted	Shunt trip SHT	●		●	●	●		
	Under voltage trip UVT	—		—	—	—		
	Auxiliary switch AUX	●		●	●	●		
	Alarm switch ALT	●		●	●	●		
	Alarm + Auxiliary switch AUX+ALT	●		●	●	●		
Externally mounted	Electrical operation mechanics CD	—	●④	●④	●④	●④		
	External operating handle FH	—	—	—	—	—		
	External operating handle FL	—	●	●	●	●		
	External operating handle FG	—	●②	●②	●②	●②		
	External operating handle TFJ	—	—	—	—	—		
	Extension handle EHA	—		—	—	—		
	Attached flat bar TBB	—		—	●	●		
	Interpole barrier TQQ	●①		●①	●①	●①		
	Terminal cover XPR	—	●	●	●	●		
Approval	CE Declaration	●		●	●	●		
	CNS Certificate	●		●	●	●		

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* : Special Request

TO Series Standard Type

Frame size (AF)		400		600	800		
Type		TO-400S		TO-600S	TO-800S		
Number of poles		2*	3	3	3		
Rated current(A) at ambient temperature 40°C		250 350 300 400		500 600	700 800		
Rated insulation voltage (V) CNS,IEC		690					
Rated breaking capacity (kA)							
IEC 60947-2 EN 60947-2 CNS 14816-2 Icu/Ics	AC 500V	22/11		25/13	35/18		
	AC 440V	30/15		35/18	42/21		
	AC 415V	30/15		35/18	42/21		
	AC 380V	42/21		42/21	65/33		
	AC 230V	65/33		65/33	85/43		
CNS 2931 JIS C8370	AC 550V 600V	22/20		22/20	—		
	AC 440V 480V	35/30		40/35	50/42		
	AC 380V	50/42		50/42	75/65		
Asym/sym	AC 220V 240V	75/65		75/65	100/85		
DC	250V	40		40	40		
	125V	40		—	—		
Dimensions (mm)	a	140		210	210		
	b	260		275	275		
	c	103		103	103		
	ca	130		145	145		
	aa	45		70	70		
	bb	214		243	243		
Weight (kg)		4.8	5.6	9	9.4		
Features							
Automatic tripping device		Fixed-thermal and adjustable-magnetic					
Trip button		●		●	●		
ON / OFF Indicator		●		—	—		
Handle lock (OFF - POSITION)		—		● Option ③	● Option ③		
Connections		Busbar					
Accessories (option)							
Internally mounted	Shunt trip SHT	●		●	●		
	Under voltage trip UVT	—		●	●		
	Auxiliary switch AUX	●		●	●		
	Alarm switch ALT	●		●	●		
	Alarm + Auxiliary switch AUX+ALT	●		●	●		
Externally mounted	Electrical operation mechanics CD	●④		●④	●④		
	External operating handle FH	●		—	—		
	External operating handle FL	—		—	—		
	External operating handle FG	—		—	—		
	External operating handle TFJ	●④		●④	●④		
	Extension handle EHA	—		●	●		
	Attached flat bar TBB	●②		●②	●②		
	Interpole barrier TQQ	●①		●①	●①		
	Terminal cover XPR	●		●	●		
Approval	CE Declaration	●		●	●		
	CNS Certificate	●		●	●		

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TG Series High-Fault Level Type

Frame size (AF)		100	225	400	600	800
Type		TG-100H	TG-225H	TG-400H	TG-600H	TG-800H
Number of poles		3*	3*	3*	3*	3*
Rated current(A) at ambient temperature 40°C		15 40 75 20 50 100 30 60	125 200 150 225 175	250 350 300 400	500 600	700 800
Rated insulation voltage (V) CNS,IEC		690				
Rated breaking capacity (kA)						
IEC 60947-2 EN 60947-2 CNS 14816-2 Icu/Ics	AC 500V	25/13	25/13	30/15	35/18	65/33
	AC 440V	42/21	42/21	42/21	42/21	85/43
	AC 415V	42/21	42/21	42/21	42/21	85/43
	AC 380V	50/25	50/25	50/25	50/25	100/50
	AC 230V	85/43	85/43	85/43	85/43	130/65
CNS 2931 JIS C8370	AC 550V 600V	—				75/65
	AC 440V 480V	50/42				100/85
	AC 380V	60/50				120/100
Asym/sym	AC 220V 240V	100/85				150/130
DC	250V	40	40	40	40	40
	125V	40	40	40	—	—
Dimensions (mm)	a	90	105	140	210	
	b	150	200	260	275	
	c	85	103	103	103	
	ca	103	121	130	145	
	aa	30	35	45	70	
	bb	130	155	214	243	
Weight (kg)		1.35	3	5.6	9	9.4
Features						
Automatic tripping device		Fixed-thermal and fixed-magnetic		Fixed-thermal and adjustable-magnetic		
Trip button		●	●		●	
ON / OFF Indicator		●	●		—	
Handle lock (OFF - POSITION)		—	—		● Option ③	
Connections		Terminal screw	Busbar			
Accessories (option)						
Internally mounted	Shunt trip SHT	●⑥	●	●	●	●
	Under voltage trip UVT	—	—	—	●	●
	Auxiliary switch AUX	●⑥	●	●	●	●
	Alarm switch ALT	●⑥	●	●	●	●
	Alarm + Auxiliary switch AUX+ALT	●⑤	●	●	●	●
Externally mounted	Electrical operation mechanics CD	●④	●④	●④	●④	●④
	External operating handle FH	●	●	●	—	—
	External operating handle FL	—	—	—	—	—
	External operating handle FG	●⑤	●⑤	—	—	—
	External operating handle TFJ	—	—	●④	●④	●④
	Extension handle EHA	—	—	—	●	●
	Attached flat bar TBB	—	●②	●②	●②	●②
	Interpole barrier TQQ	●①	●①	●①	●①	●①
	Terminal cover XPR	—	—	●	●	●
Approval	CE Declaration	●	●	●	●	●
	CNS Certificate	●	●	●	●	●

Note : ● : Available — : Not available ① : Standard accessory ② : Built in
③ : Lock off attachment can be supplied with handle when ordered. ④ : Supplied to order. ⑤ : IP rating meets IP 42.
⑥ : Can be supplied separately.
* : Special Request

TG Series High-Fault Level Type

Frame size (AF)		125		250		400		630		800	
Type		TG-125HB		TG-250HB		TG-400HB		TG-630HB		TG-800HB	
Number of poles		3*	4*	3*	4*	3*	4*	3*	4*	3*	4*
Rated current(A) at ambient temperature 40℃		15 40 75 20 50 100 30 60 125		125 175 250 150 200 160 225		250 350 300 400		500 600 630		700 800	
Rated insulation voltage (V) CNS,IEC		690									
Rated breaking capacity (kA)											
IEC 60947-2 EN 60947-2 CNS 14816-2 Icu/Ics	AC 500V	35/18									
	AC 440V	50/25									
	AC 415V	50/25									
	AC 380V	65/33									
	AC 230V	100/50									
CNS 2931 JIS C8370 Asym/sym	AC 550V 600V	40/35									
	AC 440V 480V	60/50									
	AC 380V	75/65									
	AC 220V 240V	120/100									
DC	250V	40									
	125V	40									
Dimensions (mm)	a	90	120	105	140	140	185	210	280	210	280
	b	155		165		260		275			
	c	86		86		103		103			
	ca	106		108		145		145			
	aa	30	60	35	70	45		70			
	bb	132		126		214		243			
Weight (kg)		1.4	1.7	1.8	2.72	5.3	6.9	9	10.6	9.4	12.7
Features											
Automatic tripping device		Fixed-thermal and fixed-magnetic				Fixed-thermal and adjustable-magnetic					
Trip button		●				●					
ON / OFF Indicator		—				—					
Handle lock (OFF - POSITION)		—				● Option③					
Connections		Terminal screw		Busbar		Busbar					
Accessories (option)											
Internally mounted: Shunt trip	SHT	●				●		●			
Under voltage trip	UVT	—				—		●			
Auxiliary switch	AUX	●				●		●			
Alarm switch	ALT	●				●		●			
Alarm + Auxiliary switch	AUX+ALT	●				●		●			
Externally mounted: Electrical operation mechanics	CD	●④				●④		●④			
External operating handle	FH	—				●		—			
	FL	●				—		—			
	FG	●				—		—			
	TFJ	—				●④		●④			
Extension handle	EHA	—				—		●			
Attached flat bar	TBB	●②				●②		●②			
Interpole barrier	TOQ	●①				●①		●①			
Terminal cover	XPR	●	—	●	—	●	—	●	—	●	—
Approval: CE Declaration		●				●		●			
CNS Certificate		●				●		●			

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③ : Lock off attachment can be supplied with handle when ordered. ④ : Supplied to order.
* : Special Request

TG Series High-Fault Level Type

Frame size (AF)		125		250		400	
Type		TG-125HJ		TG-250HJ		TG-400HJ	
Number of poles		3*	4*	3*	4*	3*	4*
Rated current(A) at ambient temperature 40℃		Adjustable In (1 In, 0.8 In) ④ 20 50 100 32 63 125		Adjustable In (1 In, 0.8 In) ④ 160 250		Adjustable In (1 In, 0.8 In) ④ 250 400	
Rated insulation voltage (V) CNS,EC		690					
Rated breaking capacity (kA)							
IEC 60947-2 EN 60947-2 CNS 14816-2 Icu/Ics	AC 500V	35/18					
	AC 440V	50/25					
	AC 415V	50/25					
	AC 380V	65/33					
	AC 230V	100/50					
CNS 2931 JIS C8370 Asym/sym	AC 550V 600V	40/35					
	AC 440V 480V	60/50					
	AC 380V	75/65					
	AC 220V 240V	120/100					
DC	250V	40					
	125V	40					
Dimensions (mm)	a	90	120	105	140	140	185
	b	155		165		260	
	c	86		86		103	
	ca	106		108		145	
	aa	30	60	35	70	45	
	bb	132		126		214	
Weight (kg)		1.4	1.7	1.8	2.72	5.3	6.9
Features							
Automatic tripping device		Adjustable-thermal and fixed-magnetic				Adjustable-thermal and adjustable-magnetic	
Trip button		●					
ON / OFF Indicator		—					
Handle lock (OFF - POSITION)		—					
Connections		Terminal screw		Busbar			
Accessories (option)							
Internally mounted: Shunt trip	SHT	●		●		●	
Under voltage trip	UVT	—		—		—	
Auxiliary switch	AUX	●		●		●	
Alarm switch	ALT	●		●		●	
Alarm + Auxiliary switch	AUX+ALT	●		●		●	
Externally mounted: Electrical operation mechanics	CD	●③		●③		●③	
External operating handle	FH	—		—		●	
	FL	●		●		—	
	FG	●		●		—	
	TFJ	—		—		●③	
Extension handle	EHA	—		—		—	
Attached flat bar	TBB	●②		●②		●②	
Interpole barrier	TOQ	●①		●①		●①	
Terminal cover	XPR	●	—	●	—	●	—
Approval: CE Declaration		●		●		●	
CNS Certificate		●		●		●	

Note : ● : Available — : Not available ① : Standard accessory ② : IP rating meets IP 42.
③ : Supplied to order. ④ : HJ type is adustable at In, 0.8In and 0.63In and is supplied to order.
* : Special Request

TE Series Electronic Type

Frame size (AF)		600	800	1000	1200	1600
Type		TE—600	TE—800	TE—1000	TE—1200	TE—1600
Number of poles		3*	3*	3	3	3
Rated current(A) at ambient temperature 40℃		Adjustable 300 400 600 350 500	Adjustable 400 500 700 450 600 800	Adjustable 500 700 900 600 800 1000	Adjustable 600 800 1200 700 1000	Adjustable 800 1000 1400 900 1200 1600
Rated insulation voltage (V) CNS,IEC		690				
Rated breaking capacity (kA)						
IEC 60947-2 EN 60947-2 CNS 14816-2 Icu/Ics	AC 660V	20/10		25/13		45/23
	AC 500V	35/18		45/23		65/33
	AC 440V	50/25		65/33		85/43
	AC 415V	50/25		65/33		85/43
	AC 380V	50/25		85/43		100/50
	AC 230V	85/43		100/50		130/65
CNS 2931 JIS C8370 Asym/sym	AC 550V 600V	40/35		60/50		75/65
	AC 440V 480V	60/50		75/65		100/85
	AC 380V	60/50		100/85		120/100
	AC 220V 240V	100/85		120/100		150/130
Dimensions (mm)	a	210		210		210
	b	275		370		370
	c	103		140		140
	ca	145		191		191
	aa	70		70		70
	bb	243		338		338
Weight (kg)		9.6	9.7	24		27
Features						
Automatic tripping device		Electronic				
Trip button		●				
ON / OFF Indicator		—				
Handle lock (OFF - POSITION)		● Option ③				
Connections		Busbar				
Accessories (option)						
Internally mounted: Shunt trip	SHT	●	●	●	●	●
Under voltage trip	UVT	●	●	●	●	●
Auxiliary switch	AUX	●	●	●	●	●
Alarm switch	ALT	●	●	●	●	●
Alarm + Auxiliary switch	AUX+ALT	●	●	●	●	●
Electrical operation mechanics	CD	●④	●④	●④	●④	●④
Externally mounted: External operating handle	FH	—	—	—	—	—
	FL	—	—	—	—	—
	FG	—	—	—	—	—
	TFJ	●④	●④	●④	●④	●④
Extension handle	EHA	●	●	●①	●①	●①
Attached flat bar	TBB	●②	●②	●②	●②	●②
Interpole barrier	TQQ	●①	●①	●①	●①	●①
Terminal cover	XPR	●	●	●	●	●
Approval	CNS Certificate	●	●	●	●	●

Note : ● : Available — : Not available ① : Standard accessory ② : Built in
③ : Lock off attachment can be supplied with handle when ordered. ④ : Supplied to order.
* : Special Request

TLB Series RCBOs

Frame size (AF)		100 NEW		100 NEW	125	125	
Type		TLB—100L1		TLB—100E	TLB—125E	TLB—125S	
Number of poles		3*	4*	3*	3*	3*	4*
Rated current(A) at ambient temperature 40℃		15 20 30 40 50 60 75 100		15 20 30 40 50 60 75 100	15 20 30 40 50 60 75 100 125	15 20 30 40 50 60 75 100 125	
Phases and wires		1φ2W 1φ3W 3φ3W	3φ4W	1φ2W 1φ3W 3φ3W	1φ2W 1φ3W 3φ3W	1φ2W 1φ3W 3φ3W	3φ4W
Rated insulation voltage (V)		110~440		110~440	220-440	220-440	
Rated sensitivity current (mA) [ ] : rated non-tripping current (mA)	Standard goods	30(15)		30(15)	30(15)	30(15)	
	Order goods	100(50),200(100), 500(250) changeover ③		100(50),200(100), 300(150) changeover ③	100(50),200(100), 300(150) changeover ③	100(50),200(100), 300(150) changeover ③	
Max. operation time (sec.)		≤ 0.1					
Earth leakage indication		Indicator					
Rated beaking capacity (kA)							
IEC 60947-2 EN 60947-2 CNS 14816-2 Icu/Ics	AC 440V	7.5/3.8		7.5/3.8	15/7.5	25/13	
	AC 415V	7.5/3.8		10/5	22/11	30/15	
	AC 380V	7.5/3.8		10/5	22/11	30/15	
	AC 220V	10/5		15/7.5	30/15	50/25	
CNS 5422 JIS C8371	AC 440V 480V	7.5/3.8		7.5	15	25	
	AC 380V	7.5/3.8		10	22	30	
	AC 220V 240V	7.5/3.8		15	30	50	
Icu	AC 100V 110V	10/5		15	—	—	
Dimensions (mm)	a	75	100	90	90	90	120
	b	130	130	155	155	155	
	C (high)	60	60	68	68	86	
	ca	80	80	86	86	106	
	aa	25	25	30	30	30	
	bb	111	111	132	132	132	
Weight (kg)		0.71	0.83	1.2	1.2	1.5	1.8
Features							
Automatic tripping device		Hydraulic-magnetic		Fixed thermal and fixed magnetic			
Earth leakage tripping device		Electronic		Electronic			
Trip button		●		●			
Connections		Terminal screw		Terminal screw			
Accessories (option)							
Internally mounted: Shunt trip	SHT	●		●	●	●	
Under voltage trip	UVT	—		—	—	—	
Auxiliary switch	AUX	●		●	●	●	
Alarm switch	ALT	●		●	●	●	
Externally mounted: Electrical operation mechanics	CD	—		—	—	—	
External operating handle	FH	—		—	—	—	
	FL	—		●	●	●	
	FG	●		●	●	●	
	TFJ	—		—	—	—	
Extension handle	EHA	—		—	—	—	
Attached flat bar	TBB	—		—	—	—	
Interpole barrier	TQQ	●①		●①	●①	●①	
Terminal cover	XPR	●		●	●	●	—
Approval	CNS Certificate	●		●	●	●	

Note : ● : Available — : Not available ① : Standard accessory ② : Built in ③ : Supplied to order.
* : Special Request

TLB Series RCBOs

Frame size (AF)		250	250 NEW	400		
Type		TLB—250E	TLB—250S	TLB—400S		
Number of poles		3*	3* 4*	3*		
Rated current(A) at ambient temperature 40℃		125 150 175 200 225 250	125 150 175 200 225 250	250 300 350 400		
Phases and wires		1φ2W 1φ3W 3φ3W	1φ2W 1φ3W 3φ3W / 3φ4W	1φ2W 1φ3W 3φ3W		
Rated insulation voltage (V)		220-440	220-440	220 / 380-440		
Rated sensitivity current (mA) ( ) : rated non-tripping current (mA)	Standard goods	30(15) ③	30(15) ③	30(15),100(50), 500(250) changeover		
	Order goods	100(50),200(100), 300(150) changeover	100(50),200(100), 300(150) changeover	—		
Max. operation time (sec.)		≦ 0.1				
Earth leakage indication		Indicator	Indicator	Mechanical button		
Rated beaking capacity (kA)						
IEC 60947-2	AC 440V	15/7.5	25/13	25/13		
EN 60947-2	AC 415V	22/11	30/15	30/15		
CNS 14816-2	AC 380V	22/11	30/15	30/15		
Icu/Ics	AC 220V	30/15	50/25	50/25		
CNS 5422 JIS C8371 Icu	AC 440V 480V	15	25	25		
	AC 380V	22	30	30		
	AC 220V 240V	30	50	50		
	AC 100V 110V	—	—	—		
Dimensions (mm)	a	105	105 / 140	140		
	b	165	165	257		
	C (hight)	68	86	97		
	ca	89	108	155		
	aa	35	35	44		
	bb	126	126	194		
Weight (kg)		1.4	1.8 / 2.7	5.4		
Features						
Automatic tripping device		Fixed-thermal and fixed magnetic				
Earth leakage tripping device		Electronic				
Trip button		●				
Connections		Terminal screw		Busbar		
Accessories (option)						
Internally mounted	Shunt trip SHT	●	●	●		
	Under voltage trip UVT	—	—	●		
	Auxiliary switch AUX	●	●	●		
	Alarm switch ALT	●	●	●		
Externally mounted	Electrical operation mechanics CD	—	—	—		
	External operating handle FH	—	—	●		
	External operating handle FL	●	●	—		
	External operating handle FG	●	●	—		
	External operating handle TFJ	—	—	—		
	Extension handle EHA	—	—	●		
	Attached flat bar T8B	●	●	●②		
	Interpole barrier TOQ	●①	●①	●①		
	Terminal cover XPR	●	● / —	—		
Approval	CNS Certificate	●	●	●		

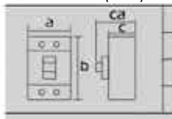
Note : ● : Available — : Not available ① : Standard accessory ② : Built in ③ : Supplied to order.
* : Special Request

TLZ/TLB Series ELCBs

Frame size (AF)		40		40		50		50		100	
Type		TLZ-40E		TLZ-40		TLB-50		TLB-50S		TLB-100	
Number of poles		2	3	2	3	1P2E	2P2E	1P2E	2P2E	3	
Rated current(A) at ambient temperature 40℃		5 10 15 20 30		5 10 15 20 30 40	5 10 15 20 30 40	15 20 30 40 50	15 20 30 40 50	15 20 30 40 50	15 20 30 40 50	15 30 50 75 20 40 60 100	
Phases and wires		3φ3W		1φ2W	1φ2W 3φ3W 1φ3W	1φ2W		1φ2W		1φ2W 3φ3W 1φ3W	
Rated insulatioin voltage (V)		380-440		110-220		110-220	220	110-220	220	110-220	380-440
Rated sensitive current (mA)		30		30		30		30		30 ChangeOver	
Max. operation time (sec.)		≤ 1									
Earth leakage indication		—		—		button		button		button	
Rated breaking capacity (kA)	AC 440V	—	1.5	—	1.5	—		—		—	7.5/7.5
	AC 380V	—	1.5	—	1.5	—		—		—	10/10
	AC 220V	—		2.5		5	10	10	15	16/15	—
	AC 110V	—		2.5		10	—	15	—	—	—
Dimensions (mm)	a	68	90	68	90	25	50	25	50	75	
	b	70	80	70	80	113	113	113	113	177	
	c	40	40	40	40	60	60	60	60	68	
	d	65	65	65	65	77	80	77	80	87	
	aa	34	56	34	56	—	—	—	—	25	
	bb	60	70	60	70	—	—	—	—	160	
Weight (kg)		0.22	0.26	0.22	0.26	0.2	0.36	0.2	0.36	0.9	

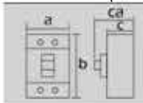
Note : ● : Available — : Not available

RC Series RCCBs

		RCCB				
Frame Size (AF)		63				
Type		RC-362		RC-364		
Characteristic						
Number of poles		2	2	4	4	
Ambient temperature (°C)		40°C				
Rated voltage (V) AC		240	240	240/415	240/415	
Leakage Acting Current		30mA	100mA	30mA	100mA	
Rated Current (A)						
	1A	–	–	–	–	
	2A	–	–	–	–	
	3A	–	–	–	–	
	6A	–	–	–	–	
	10A	–	–	–	–	
	16A	–	–	–	–	
	20A	–	–	–	–	
	25A	●	●	●	●	
	32A	●	●	●	●	
	40A	●	●	●	●	
	50A	–	–	–	–	
	63A	●	●	●	●	
Dimension (mm)						
	a	36		72		
	b	82				
	c	50				
	ca	75				
Automatic tripping device		Fixed-Thermal and Fixed magnetic				
Mount		On 35 mm DIN rail				
Weight (kg)		0.2	0.2	0.35	0.35	
Connections		Terminal screw				

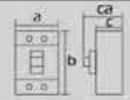
Note : ●: Available — : Not Available
Remark : This product is designed specific for South East Asia

TJ Series MCBs

		MCB 6kA			MCB 10kA		
Frame Size (AF)		63			63		
Type		TJ-636S			TJ-6310S		
Characteristic		"C" Curve			"C" Curve		
Number of poles		1	2	3	1	2	3
Ambient temperature (°C)		40°C			40°C		
Rated voltage (V) AC		240/415	415	415	240/415	415	415
Rated breaking capacity (kA)							
IEC 60898 Icu	AC 415V	6kA	6kA	6kA	10kA	10kA	10kA
	AC 240V	6kA	6kA	6kA	10kA	10kA	10kA
Rated Current (A)							
	1A	●	●	●	●	●	●
	2A	●	●	●	●	●	●
	3A	●	●	●	●	●	●
	6A	●	●	●	●	●	●
	10A	●	●	●	●	●	●
	16A	●	●	●	●	●	●
	20A	●	●	●	●	●	●
	25A	●	●	●	●	●	●
	32A	●	●	●	●	●	●
	40A	●	●	●	●	●	●
	50A	●	●	●	●	●	●
	63A	●	●	●	●	●	●
Dimension (mm)							
	a	18	36	54	18	36	54
	b	82			82		
	c	50			50		
	ca	75			75		
Automatic tripping device		Fixed-Thermal and Fixed magnetic			Fixed-Thermal and Fixed magnetic		
Mount		On 35 mm DIN rail			On 35 mm DIN rail		
Weight (kg)		0.1	0.2	0.3	0.1	0.2	0.3
Connections		Terminal screw			Terminal screw		

Note : ●: Available — : Not Available
Remark : This product is designed specific for South East Asia

SB Series Safety Switch

		SB
Frame Size (AF)		32
Type		**TSS**
Characteristic		
Number of poles		2
Ambient temperature (°C)		40°C
Rated voltage (V) AC		240
Rated breaking capacity (kA)		
IEC 60818 Icu	AC 415V	
	AC 240V	1.5kA
Rated Current (A)		
	1A	–
	2A	–
	3A	–
	6A	●
	10A	●
	16A	●
	20A	●
	25A	●
	32A	●
	40A	–
	50A	–
	63A	–
Dimension (mm)		
	a	32
	b	70
	c	26
	ca	50
Automatic tripping device		Fixed-Thermal and Fixed magnetic
Mount		On 35 mm DIN rail
Weight (kg)		0.1
Connections		Terminal screw

Note : ●: Available – : Not Available
Remark : This product is designed specific for South East Asia

Certification and Approvals

Certificates

Catalogue number	Canada	Canada & U.S.A		Germany	EC Declaration of conformity
	cSPus	cTÜVus	cULus		CE
Miniature Contactors					
CN-5	●		●	●	●
CN-5K	●		●		●
CN-6	●		●	●	●
CN-6K	●		●		●
CNL-5	●		●	●	●
CNL-5K	●		●		●
CNL-6	●		●	●	●
CNL-6K	●		●		●
U Series IEC Contactors					
CU-9	●		●	●	●
CU-11	●		●	●	●
CU-16	●		●	●	●
CU-18	●		●	●	●
CU-18/4P			●		
CU-22	●		●	●	●
CU-22/4P	●		●		
CU-32R					
CU-38	●		●		●
CU-40	●		●	●	●
CU-50	●		●	●	●
CU-65	●		●	●	●
CU-80	●		●	●	●
CU-90					
CUL-90	●		●	●	●
CUL-11	●		●	●	●
CUL-16	●		●	●	●
CUL-18	●		●	●	●
CUL-18/4P			●		
CUL-22	●		●	●	●
CUL-22/4P	●		●		
CUL-32R					
CUL-38	●		●		
CUL-40	●		●	●	●
CUL-50	●		●	●	●
CUL-65	●		●	●	●
CUL-80	●		●	●	●
CUL-90					
N Series IEC Contactors					
CN-100R			●		●
CN-125R			●		●
CN-150	●		●	●	●
CN-180	●		●	●	●
CN-220	●		●		●
CN-300	●		●		●
CN-400(K)					●
CN-500(K)					●
CN-630(K)					●
CNL-100R			●		●
CNL-125R			●		●
CNL-150	●		●		●
CNL-180	●		●		●
CNL-220	●		●		●
CNL-300	●		●		●

Certificates

Catalogue number	Canada	Canada & U.S.A		Germany	EC Declaration of conformity
	cSPus	cTÜVus	cULus		CE
RHU / RHN Series Thermal Overload Relays					
RHU-5	●		●		●
RHU-10	●		●		●
RHU-80/P	●		●		●
RHN-180/P	●		●		
D.O.L. Magnetic Starters					
HUE-11/16				●	●
HUEB-11/16				●	●
HUF-11/16/18				●	●
HUFB-11/16/18				●	●
Definite Purpose Contactors					
DPA-10	●	●			●
DPA-15	●	●			●
DPA-20	●	●			●
DPA-30	●	●			●
Accessories					
CUA-2	●		●	●	●
CUA-4	●		●	●	●
CNA-2M	●		●	●	●
CNA-4M	●		●	●	●
CNA-110	●		●	●	●
CNA-111B(C)	●		●	●	●
CNA-111SR	●		●	●	●
RAU-4	●		●		
RAM-4	●		●		●
RAM-4K	●		●		●
CNI-18	●		●		
CNE-1/(S)(C)	●		●		
CSS-1/2(S)			●		

1 High Performance

- Comply with IEC 60947, UL 508 CSA C22.2, GB 14048
- Electrical Lifespan : 1M Operation

2 High Reliability

- Dual Points Aux. Contact Design

3 Safety

- V-0 Flame Retardant Materials in Casing
- IP-20 Finger Protection Terminals

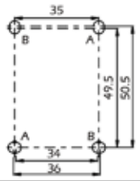
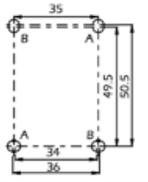
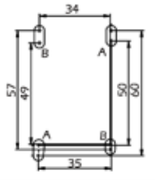
4 Green Products

- Compliance with RoHS
- Environmentally Friendly Materials

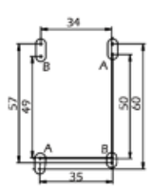
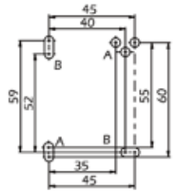
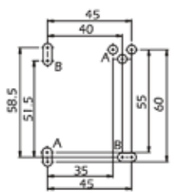
5 Universal Design

- New Appearance with Streamline Front Cover Design
- Approvals : cSAus cULus CE

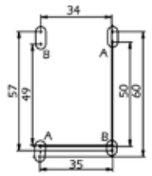
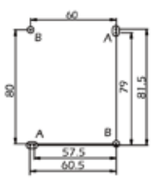
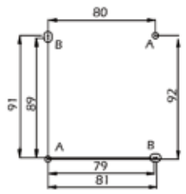
CU/CN Series IEC Contactors

Catalogue number			CN-5(K)	CN-6(K)	CU-9	CU-11
	Non-reversing type					
	Pin		CN-5P(K)	CN-6P(K)		
						
					CUL-9	CUL-11
	Reversing type		CNL-5(K)	CNL-6(K)		
						
Rated Insulation Voltage (Ui) IEC V			690		690	690
Rated Operational Voltage (Ue) IEC V			690		690	690
Thermal Current (Ith) IEC/UL A			20/20		25/24	25/24
			A / kW / Hp	A / kW / Hp	A / kW / Hp	A / kW / Hp
Rated Power Capacities (Ie) AC3 IEC 60947-4-1	Single	110V	8 / 0.37 / 0.5	10.5 / 0.55 / 0.75	10.5 / 0.55 / 0.75	10.5 / 0.55 / 0.75
		220V	7 / 0.75 / 1	10 / 1.1 / 1.5	10.5 / 1.1 / 1.5	10.5 / 1.1 / 1.5
	Three phase	220/230V	7.5 / 1.5 / 2	10.1 / 2.2 / 3	11.5 / 2.5 / 3.5	12 / 3 / 4
		380/400V	7 / 3 / 4	9 / 4 / 5.5	11 / 4 / 5.5	12 / 5.5 / 7.5
		415V	6.5 / 3 / 4	8.5 / 4 / 5.5	10 / 4 / 5.5	11 / 5.5 / 7.5
		440V	6 / 3 / 4	8 / 4 / 5.5	9 / 4 / 5.5	11 / 5.5 / 7.5
		500V	5 / 3 / 4	6.5 / 4 / 5.5	8 / 4 / 5.5	9 / 5.5 / 7.5
		660V	4 / 3 / 4	5 / 4 / 5.5	6 / 4 / 5.5	7 / 5.5 / 7.5
		690V	4 / 3 / 4	5 / 4 / 5.5	6 / 4 / 5.5	7 / 5.5 / 7.5
Rated Power Capacities (Ie) AC3 UL 508	Single	110-120V	— / — / —	— / — / —	13.8 / — / 0.75	16 / — / 1
		220-240V	— / — / —	— / — / —	12 / — / 2	12 / — / 2
	Three phase	200-208V	7.5 / — / 2	11 / — / 3	12 / — / 3	18 / — / 5
		220-240V	6.8 / — / 2	9.6 / — / 3	9.6 / — / 5	15.2 / — / 5
		440-480V	4.8 / — / 3	7.6 / — / 5	7.6 / — / 5	11 / — / 7.5
		550-600V	3.9 / — / 3	6.1 / — / 5	6 / — / 7.5	11 / — / 10
NEMA Class			00		0	0
Contact Configuration	Non-reversing		3A1a or 3A1b		3A1a ,3A1b,4A	3A1a ,3A1b,4A
	Reversing		3A1a x 2 or 3A1b x 2		3A1a x 2 or 3A1b x 2	3A1a x 2 or 3A1b x 2
Electrical Durability (ops) AC-3			1M	1M	1M	1M
Mechanical Durability (ops)			5M	5M	5M	5M
Operating Temperature (℃)			−20℃~55℃ (non frozen or non dew)			
Contact Capacities: Rated Insulation Voltage (Ui) V			690/600			
Contact Capacities: Thermal Current AC/DC (Ith) A			10/2.5			
Contact Capacities: Rated Operational Current Ie(A)	AC 15	120V	6			
		240V	3			
		380V	1.9			
Overall Dimensions (w* h * d) mm / (kg)	Non-reversing		45 * 58 * 54 / 0.18		45*70 *82 / 0.3	45*70*82 / 0.3
			45 * 58 * 54 / 0.18			
	Reversing		100 * 58 * 54 / 0.4		100*70 *82 / 0.65	100*70 *82 / 0.65
Installation information						

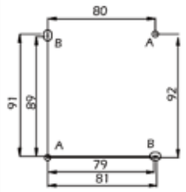
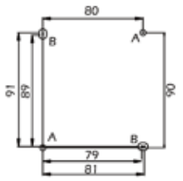
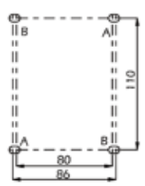
CU/CN Series IEC Contactors

Catalogue number			CU-16			CU-18			CU-22			CU-32R		
	Non-reversing type													
	Reversing type		CUL-16			CUL-18			CUL-22			CUL-32R		
														
Rated Insulation Voltage (Ui) IEC V			690			1000			1000			1000		
Rated Operational Voltage (Ue) IEC V			690			690			690			690		
Thermal Current (Ith) IEC/UL A			25/32			35/35			40/40			60/50		
			A	kW	Hp	A	kW	Hp	A	kW	Hp	A	kW	Hp
Rated Power Capacities (Ie) AC3 IEC 60947-4-1	Single	110V	13.5	0.75	1	19.5	1.1	1.5	25.5	1.5	2	35	1.5	2
		220V	14	1.5	2	20.5	2.2	3	26	3	4	35	3.7	5
	Three phase	220/230V	16	4	5.5	23	5.5	7.5	27	7.5	10	35	9	12
		380/400V	16	7.5	10	22	11	15	26	11	15	32	15	20
		415V	15	7.5	10	21	11	15	21	11	15	32	15	20
		440V	15	7.5	10	21	11	15	21	11	15	32	15	20
		500V	13	7.5	10	19	11	15	19	11	15	30	18.5	25
		660V	10	7.5	10	14	11	15	14	11	15	23	18.5	25
		690V	10	7.5	10	14	11	15	14	11	15	22	18.5	25
Rated Power Capacities (Ie) AC3 UL 508	Single	110-120V	20	—	1.5	24	—	2	24	—	2	24	—	2
		220-240V	17	—	3	17	—	3	28	—	5	28	—	5
	Three phase	200/208V	18	—	5	26	—	7.5	26	—	7.5	25.3	—	7.5
		220-240V	15.2	—	5	22	—	7.5	28	—	10	28	—	10
		440-480V	14	—	10	21	—	15	27	—	20	27	—	20
		550-600V	11	—	10	17	—	15	22	—	20	27	—	25
NEMA Class			0			1			1			2		
Contact Configuration	Non-reversing		3A1a ,3A1b,4A			3A1a1b, 3A2a			3A1a1b, 3A2a			3A1a1b, 3A2a		
	Reversing		3A1a x 2 or 3A1b x 2			3A1a1b x 2			3A1a1b x 2			3A1a1b x 2		
Electrical Durability (ops) AC-3			1M			1M			1M			1M		
Mechanical Durability (ops)			5M			5M			5M			5M		
Operating Temperature (℃)			−20℃~55℃ (non frozen or non dew)											
Contact Capacities: Rated Insulation Voltage (Ui) V			690/600											
Contact Capacities: Thermal Current AC/DC (Ith) A			10/2.5											
Contact Capacities: Rated Operational Current Ie(A) AC 15		120V	6											
		240V	3											
		380V	1.9											
Overall Dimensions (w* h * d) mm / (kg)		Non-reversing	45*70*82 / 0.3			55*72*92 / 0.4						55*75*92 / 0.4		
		Reversing	100*70*82 / 0.65			120*72*92 / 0.85						110*75*92 / 0.85		
Installation information														

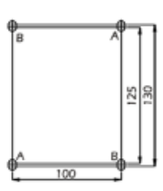
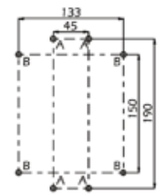
CU/CN Series IEC Contactors

Catalogue number			CU-38			CU-40			CU-50			CU-65		
	Non-reversing type													
	Reversing type		CUL-38			CUL-40			CUL-50			CUL-65		
														
Rated Insulation Voltage (Ui) IEC V			1000			1000			1000			1000		
Rated Operational Voltage (Ue) IEC V			690			690			690			690		
Thermal Current (Ith) IEC/UL A			60/55			60/60			70/72			80/85		
			A	kW	Hp	A	kW	Hp	A	kW	Hp	A	kW	Hp
Rated Power Capacities (Ie) AC3 IEC 60947-4-1	Single	110V	39	2.2	3	43	2.2	3	48	3	4	50	3	4
		220V	39	5	7	43	5.5	7.5	48	6	8	50	6	8
	Three phase	220/230V	39	11	15	44	11	15	55	15	20	65	18.5	25
		380/400V	38	18.5	25	40	20	27	55	25	35	64	30	40
		415V	38	22	30	40	22	30	52	25	35	64	33	45
		440V	38	22	30	40	22	30	52	30	40	64	37	50
		500V	33	22	30	35	22	30	45	30	40	55	37	50
		660V	25.2	22	30	26	22	30	35	30	40	45	37	50
		690V	24.2	22	30	26	22	30	35	30	40	45	37	50
Rated Power Capacities (Ie) AC3 UL 508	Single	110-120V	34	—	3	34	—	3	56	—	5	56	—	5
		220-240V	40	—	7.5	40	—	7.5	50	—	10	68	—	15
	Three phase	200/208V	32.2	—	10	49	—	15	49	—	15	63	—	20
		220-240V	42	—	15	42	—	15	54	—	20	68	—	25
		440-480V	40	—	30	40	—	30	52	—	40	65	—	50
		550-600V	32	—	30	41	—	40	52	—	50	62	—	60
NEMA Class			2			2			2			3		
Contact Configuration	Non-reversing		3A1a1b			3A1a1b			3A2a2b			3A2a2b		
	Reversing		3A1a1bx2			3A1a1bx2			3A2a2bx2			3A2a2bx2		
Electrical Durability (ops) AC-3			1M			1M			1M			1M		
Mechanical Durability (ops)			5M			5M			5M			5M		
Operating Temperature (℃)			−20℃~55℃ (non frozen or non dew)											
Contact Capacities: Rated Insulation Voltage (Ui) V			690/600											
Contact Capacities: Thermal Current AC/DC (Ith) A			10/2.5											
Contact Capacities: Rated Operational Current Ie(A) AC 15		120V	6											
		240V	3											
		380V	1.9											
Overall Dimensions (w* h * d) mm / (kg)		Non-reversing	58*94.3*111.7 / 0.7			69*99*111.7 / 0.8			93.5*116*123 / 1.3					
		Reversing	126*94.3 *111.7 / 1.45			148*99*111.7 / 1.77			235*150 *127 / 3.5					
Installation information														

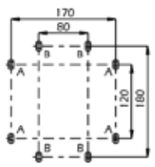
CU/CN Series IEC Contactors

Catalogue number			CU-80	CU-90	CN-100R	CN-125R
	Non-reversing type					
	Reversing type		CUL-80	CUL-90	CNL-100R	CNL-125R
						
Rated Insulation Voltage (Ui) IEC V			1000	1000	1000	1000
Rated Operational Voltage (Ue) IEC V			690	690	690	690
Thermal Current (Ith) IEC/UL A			100/104	135/120	135/130	150/150
			A / kW / Hp	A / kW / Hp	A / kW / Hp	A / kW / Hp
Rated Power Capacities (Ie) AC3 IEC 60947-4-1	Single	110V	60 / 4 / 5.5	—	—	—
		220V	55 / 7.5 / 10	—	—	—
	Three phase	220/230V	75 / 22 / 30	85 / 25 / 35	115 / 30 / 40	138 / 40 / 54
		380/400V	72 / 37 / 50	85 / 45 / 60	115 / 60 / 80	138 / 75 / 100
		415V	72 / 40 / 54	85 / 45 / 60	105 / 60 / 80	138 / 75 / 100
		440V	70 / 40 / 54	85 / 51 / 70	105 / 60 / 80	135 / 75 / 100
		500V	65 / 45 / 60	80 / 55 / 75	93 / 65 / 85	105 / 75 / 100
		660V	60 / 45 / 60	65 / 55 / 75	75 / 65 / 85	85 / 75 / 100
		690V	60 / 45 / 60	65 / 55 / 75	75 / 65 / 85	85 / 75 / 100
Rated Power Capacities (Ie) AC3 UL 508	Single	110-120V	80 / — / 7.5	80 / — / 7.5	100 / — / 10	— / — / —
		220-240V	68 / — / 15	68 / — / 15	68 / — / 15	— / — / —
	Three phase	200/208V	79 / — / 25	79 / — / 25	92 / — / 30	120 / — / 40
		220-240V	80 / — / 30	80 / — / 30	104 / — / 40	130 / — / 50
		440-480V	77 / — / 60	77 / — / 60	96 / — / 75	124 / — / 100
		550-600V	62 / — / 60	77 / — / 75	99 / — / 100	99 / — / 100
NEMA Class			2	3	4	
Contact Configuration	Non-reversing		3A2a2b	3A2a2b	3A2a2b (Max. 3A4a4b)	
	Reversing		3A2a2bx2	3A2a2bx2	3A2a2b x 2 (Max. 3A3a3bx2)	
Electrical Durability (ops) AC-3			1M	1M	1M	
Mechanical Durability (ops)			5M	5M	5M	
Operating Temperature (℃)			−20℃~55℃ (non frozen or non dew)			
Contact Capacities: Rated Insulation Voltage (Ui) V			690/600			
Contact Capacities: Thermal Current AC/DC (Ith) A			10/2.5			
Contact Capacities: Rated Operational Current Ie(A)	AC 15	120V	6			
		240V	3			
		380V	1.9			
Overall Dimensions (w* h * d) mm / (kg)		Non-reversing	93.5*150*123 / 1.3	93.5*150*123 / 1.3	100*150*140~150 / 2.2	
		Reversing	235*150 *127 / 3.5	235*150*127 / 3.5	240*180*136.2 / 3.8	
Installation information						

CU/CN Series IEC Contactors

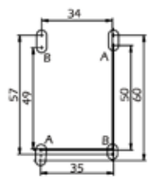
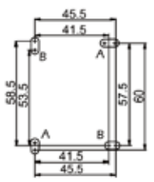
Catalogue number			CN-150	CN-180	CN-220	CN-300
	Non-reversing type					
	Reversing type		CNL-150	CNL-180	CNL-220	CNL-300
						
Rated Insulation Voltage (Ui) IEC V			1000	1000	1000	1000
Rated Operational Voltage (Ue) IEC V			690	690	690	690
Thermal Current (Ith) IEC/UL A			200/200	240/240	260/260	350/350
			A / kW / Hp	A / kW / Hp	A / kW / Hp	A / kW / Hp
Rated Power Capacities (Ie) AC3 IEC 60947-4-1	Single	110V	—	—	—	—
		220V	—	—	—	—
	Three phase	220/230V	150 / 45 / 60	182 / 55 / 75	225 / 65 / 85	300 / 90 / 120
		380/400V	147 / 80 / 110	179 / 95 / 125	225 / 120 / 160	300 / 160 / 220
		415V	138 / 80 / 110	182 / 100 / 136	220 / 125 / 170	300 / 160 / 220
		440V	131 / 80 / 110	182 / 110 / 150	220 / 132 / 180	300 / 160 / 220
		500V	129 / 90 / 125	156 / 110 / 150	190 / 132 / 180	250 / 160 / 220
		660V	107 / 100 / 136	118 / 110 / 150	140 / 132 / 180	220 / 220 / 270
		690V	107 / 100 / 136	118 / 110 / 150	140 / 132 / 180	220 / 220 / 270
Rated Power Capacities (Ie) AC3 UL 508	Single	110-120V	— / — / —	— / — / —	— / — / —	— / — / —
		220-240V	— / — / —	— / — / —	— / — / —	— / — / —
	Three phase	200/208V	150 / — / 50	177 / — / 60	221 / — / 75	285 / — / 100
		220-240V	154 / — / 75	192 / — / 75	248 / — / 100	312 / — / 125
		440-480V	156 / — / 125	180 / — / 150	240 / — / 200	302 / — / 250
		550-600V	125 / — / 125	144 / — / 150	192 / — / 200	242 / — / 250
NEMA Class			4			
Contact Configuration	Non-reversing		3A2a2b (Max. 3A4a4b)			
	Reversing		3A2a2b x 2 (Max. 3A3a3bx2)			
Electrical Durability (ops) AC-3			1M		1M	
Mechanical Durability (ops)			5M		5M	
Operating Temperature (℃)			−20℃~55℃ (non frozen or non dew)			
Contact Capacities: Rated Insulation Voltage (Ui) V			690/600			
Contact Capacities: Thermal Current AC/DC (Ith) A			10/2.5			
Contact Capacities: Rated Operational Current Ie(A)	AC 15	120V	6			
		240V	3			
		380V	1.9			
Overall Dimensions (w* h * d) mm / (kg)		Non-reversing	146 *222.4 *157.2 / 4.1		146*228.4*183.2 / 6.7	
		Reversing	375 *255 *160.4 / 10.8		375 *255 *186.4 / 15	
Installation information						

CU/CN Series IEC Contactors

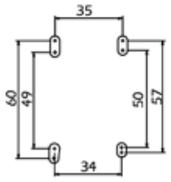
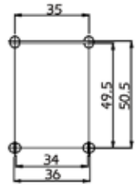
Catalogue number			CN-400(K)-R			CN-500(K)			CN-630(K)		
	Non-reversing type										
	Reversing type		CNL-400(K)-R			CNL-500(K)			CNL-630(K)		
											
Rated Insulation Voltage (Ui) IEC V			1000			1000			1000		
Rated Operational Voltage (Ue) IEC V			690			690			690		
Thermal Current (Ith) IEC/UL A			450/—			550/—			660/—		
			A	kW	Hp	A	kW	Hp	A	kW	Hp
Rated Power Capacities (Ie) AC3 IEC 60947-4-1	Single	110V	—	—	—	—	—	—	—	—	—
		220V	—	—	—	—	—	—	—	—	—
	Three phase	220/230V	400	110	150	500	150	205	630	200	270
		380/400V	400	200	270	500	257	350	630	335	450
		415V	400	220	300	460	257	350	600	355	480
		440V	400	220	300	430	257	350	600	375	500
		500V	375	257	350	410	280	380	525	355	480
		660V	330	300	410	355	335	450	460	450	610
		690V	330	300	410	355	335	450	460	450	610
Rated Power Capacities (Ie) AC3 UL 508	Single	110-120V	—	—	—	—	—	—	—	—	—
		220-240V	—	—	—	—	—	—	—	—	—
	Three phase	200/208V	—	—	—	—	—	—	—	—	—
		220-240V	—	—	—	—	—	—	—	—	—
		440-480V	—	—	—	—	—	—	—	—	—
		550-600V	—	—	—	—	—	—	—	—	—
NEMA Class			4								
Contact Configuration	Non-reversing		3A2a2b (Max. 3A4a4b)								
	Reversing		3A2a2b x 2 (Max. 3A4a4b x 2)								
Electrical Durability (ops) AC-3			0.5M								
Mechanical Durability (ops)			1M								
Operating Temperature (℃)			−20℃~55℃ (non frozen or non dew)								
Contact Capacities: Rated Insulation Voltage (UI) V			690/600								
Contact Capacities: Thermal Current AC/DC (Ith) A			10/2.5								
Contact Capacities: Rated Operational Current Ie(A) AC 15		120V	6								
		240V	3								
		380V	1.9								
Overall Dimensions (w* h * d) mm / (kg)	Non-reversing		233*238*232 / 10.8						309*304 *255 / 17.4		
	Reversing		485*238*232 / 22.9						636*304*255 / 38.8		
Installation information											

CU/CN Series IEC Contactors

4 - Pole

Catalogue number			CU-10/4P		CU-18/4P		CU-22/4P	
								
Rated Insulation Voltage (Ui) IEC V			690		1000		1000	
Rated Operational Voltage (Ue) IEC V			660		660		660	
Thermal Current (Ith) IEC/UL A			25/24		35/35		40/40	
			A (AC1)	KW (AC1)	A (AC1)	KW (AC1)	A (AC1)	KW (AC1)
Rated Power Capacities (Ie) AC3 IEC 60947-4-1	Single	110V	25	2.7	35	3.9	40	4.3
		220V	25	5.5	35	8	40	8.8
	Three phase	220V	25	9.5	35	13	40	15
		380V	25	16	35	23	40	26
		415V	25	18	35	25	40	28
		440V	25	19	35	27	40	29
		500V	—	—	—	—	—	—
		660/690V	—	—	—	—	—	—
Contact Configuration			4A		4A or 2A2B			
Electrical Durability (ops) AC-3			1M		1M			
Mechanical Durability (ops)			5M		5M			
Operating Temperature (℃)			−20℃~55℃ (non frozen or non dew)					
Contact Capacities: Rated Insulation Voltage (Ui) V			690/600					
Contact Capacities: Rated Insulation Voltage (Ue V			660/600					
Contact Capacities: Thermal Current AC/DC (Ith) A			10/2.5					
Contact Capacities: Rated Operational Current Ie(A) AC 15 /A600		120V	6					
		240V	3					
		380V	1.9					
Overall Dimensions (w* h * d) mm / (kg)	Non-reversing		45*70*52 / 0.3		55*72*92 / 0.4			
Installation information								

RAU/RAM Series IEC Contactors

Catalogue number			RAU-4	RAM-4	RAM-4K
					
Rated insulation voltage (Ui) IEC		V	690	690	
Rated operational voltage (Ue) IEC		V	690	690	
Thermal current AC/DC (Ith)		A	10	10	
Contact rating code designation UL			A600 Q300	A600 Q300	
Rated operational current Ie (A) IEC 60947-5-1 UL 508	AC 15 /A600	120V	6	6	
		240V	3	3	
		380V	1.9	1.9	
		480V	1.5	1.5	
		500V	1.4	1.4	
		600V	1.2	1.2	
	DC 13 /Q300	125V	0.55	0.55	
		250V	0.27	0.27	
Contact configuration			4a, 3a1b, 2a2b, 1a3b, 4b	4a, 3a1b, 2a2b	
Electrical durability (ops) AC 15			1M	1M	
Mechanical durability (ops)			5M	5M	
Weight (kg)			0.3	0.18	
Overall Dimensions (w* h * d) mm			45*70*82	45*58*54	
Installation information					

Features

*4,6,8 auxiliary contacts avaliable
*Easy installation by screw and DIN rail
*Protective cover design
*Dual contacts design
*Flame-retardant engineering plastics in coil set

RHU/RHN Series Thermal Overload Relays

Catalogue number			RHU-5/□	RHU-10/□1	RHU-10/□2	RHU-80/□□1	RHU-80/□2	RHU-80/□3
Frame Size (mm)			45			56		
Rated Insulation Voltage (Ui)			UL 600V, IEC 690V					
Setting Current Range (A)			0.1~0.16 0.16~0.25 0.25~0.4 0.35~0.5 0.45~0.63 0.55~0.8 0.75~1 0.9~1.3 1.1~1.6 1.4~2 1.8~2.5 2.3~3.2 2.9~4 3.5~4.8 4.5~6.3 5.5~7.5 7.2~10 9~12.5	0.1~0.16 0.16~0.25 0.25~0.4 0.35~0.5 0.45~0.63 0.55~0.8 0.75~1 0.9~1.3 1.1~1.6 1.4~2 1.8~2.5 2.3~3.2 2.9~4 3.5~4.8 4.5~6.3 5.5~7.5 7.2~10 9~12.5 11.3~16 15~20 17.5~21.5 21~25 24.5~30 29~36 33~38	9~12.5 11.3~16 15~20 17.5~21.5 21~25 24.5~30 29~36 33~38	17~25 24.5~36	17~25 24.5~36 35~47	24.5~36 34~47 45~60 58~75 72~90
For Use With Contactors			CN-5(K)/CN-6(K)	CU-9/11/16/18/ 22/32R	CU-38	CU-18/22/32R	CU-40	CU-50/65/80/90
Type of Terminal			Screw					
Reset Mode			Automatic, Manual					
Contacts Configuration			1a+1b					
Temperature Compensation Range			—5℃ ~ +55℃					
Trip Class			10A					
Contact Capacities	AC 15	120V	6					
		240V	3					
		380V	1.9					
	Ith	N.C. Contact	10					
		N.C. Contact	10					
Applicable adapter			RP-10		—			
Maximum wire size in AWG			AWG10 (5.3mm^2)	AWG8 (8.4mm^2)	AWG4 (22mm^2)		AWG3 (38mm^2)	

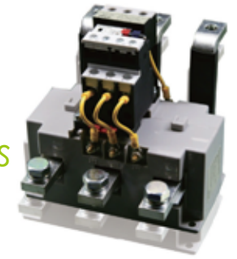
Features

*Reduce power consumption for energy saving and reduction of carbon emissions
*Comply with IEC, and China GB standard
*Certificate : CSA, UL
*Comply with RoHS, CE
*Phase failure protection
*Trip class : 10A

RHU/RHN Series Thermal Overload Relays

Catalogue number			RHU-80/□□4	RHU-80/□P	RHN-180/□1	RHN-180/□2	RHN-180/□3	RHN-180/□4
Frame Size (mm)			56		100			
Rated Insulation Voltage (Ui)			UL 600V, IEC 690V					
Setting Current Range (A)			17~25 24.5~36 34~47	17~25 24.5~36 34~47 45~60 58~75 72~90 77~97	65~95 85~125 110~160	65~95 85~125 110~160	110~160 125~185	110~160 125~185
For Use With Contactors			CU-38	With adapter	CN-100R/125R	CN-150	CN-180	CN-220
Type of Terminal			Screw					
Reset Mode			Automatic, Manual					
Contacts Configuration			1a+1b					
Temperature Compensation Range			—5℃ ~ +55℃					
Trip Class			10A					
Contact Capacities	AC 15	120V	6					
		240V	3					
		380V	1.9					
	Ith	N.C. Contact	10		6			
		N.C. Contact	10		6			
Applicable adapter			—					
Maximum wire size in AWG			AWG4 (22mm^2)	AWG3/0 (38mm^2)	AWG3/0 (80mm^2)	AWG3/0 (80mm^2)	AWG4/0 (100mm^2)	

RHU/RHN Series Thermal Overload Relays



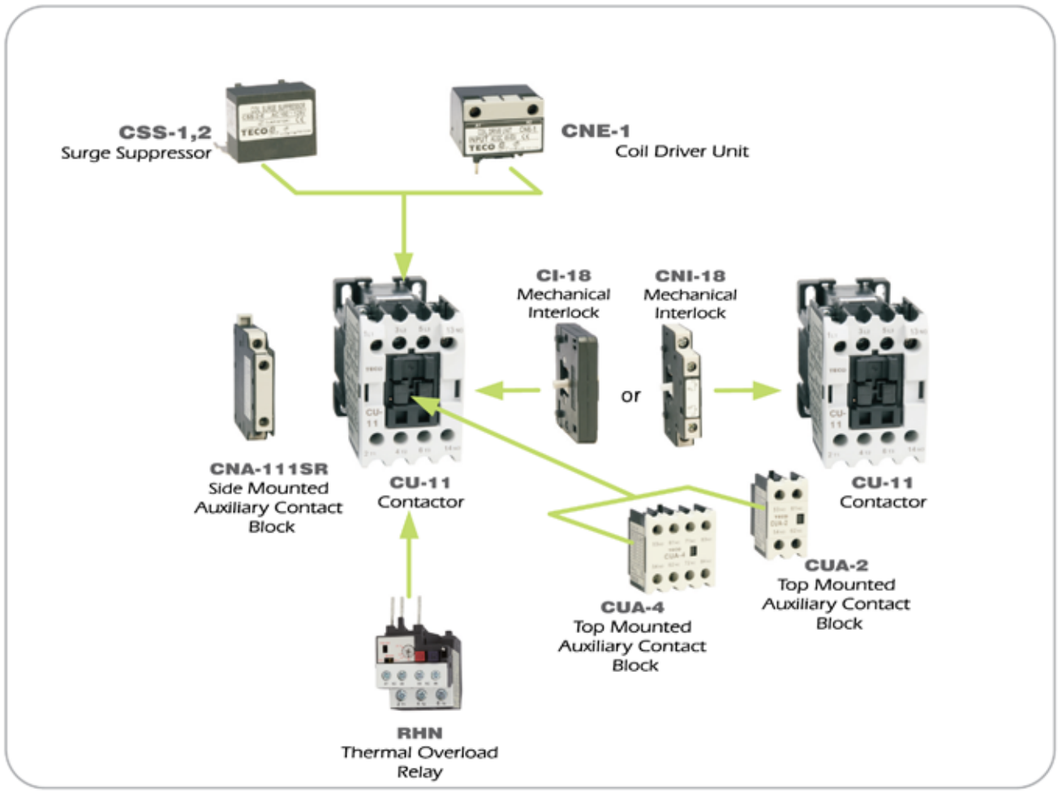
Catalogue number			RHN-180/□P	RHN-300/□	RHN-300/□P	
Frame Size (mm)			100	150		
Rated Insulation Voltage (Ui)			UL 600V, IEC 690V			
Setting Current Range (A)			65~95 85~125 110~160 125~185	145~200 175~240 203~280 245~336	145~200 175~240 203~280 245~336	
For Use With Contactors			—	CN-220/300	—	
Type of Terminal	Power Side		Screw	Terminal	Screw	
	Load Side		Screw			
Reset Mode			Automatic, Manual			
Contacts Configuration			1a+1b			
Temperature Compensation Range			—5℃ ~ +55℃			
Trip Class			10A			
Contact Capacities	AC 15	120V	6			
		240V	3			
		380V	1.9			
	Ith	N.C. Contact	6	10		
		N.C. Contact	6	10		
Applicable adapter			—			
Maximum wire size in AWG			—			

H Series Magnetic Starters


HUEB-11 HUFB-18

Catalogue number	IP 40	HUEB-11			HUEB-16			HUB-18			HUB-22			HUB-32R			HUB-40		
	IP 42	HUPB-11			HUPB-16			HUPB-18			HUPB-22			—			—		
	IP 65	HUFB-11			HUFB-16			HUFB-18			HUFB-22			—			—		
Rated Insulation Voltage (Ui) IEC V		690			690			1000			1000			1000			1000		
Rated Operational Voltage (Ue) IEC V		690			690			690			690			690			690		
Thermal Current (Ith) IEC/UL A		25/24			25/32			35/35			40/40			60/55			60/60		
		A	kW	Hp	A	kW	Hp	A	kW	Hp	A	kW	Hp	A	kW	Hp	A	kW	Hp
Rated Power Capacities (Ie) AC3 IEC 60947-4-1	Single 110V	10.5	0.55	0.75	13.5	0.75	1	19.5	1.1	1.5	25.5	1.5	2	35	1.5	2	43	2.2	3
	Single 220V	10.5	1.1	1.5	14	1.5	2	20.5	2.2	3	26	3	4	35	3.7	5	43	5.5	7.5
	Three phase 220V	12	3	4	16	4	5.5	23	5.5	7.5	27	7.5	10	35	9	12	44	11	15
	Three phase 380V	12	5.5	7.5	16	7.5	10	22	11	15	26	11	15	32	15	20	40	20	27
	Three phase 415V	11	5.5	7.5	15	7.5	10	21	11	15	21	11	15	32	15	20	40	22	30
	Three phase 440V	11	5.5	7.5	15	7.5	10	21	11	15	21	11	15	32	15	20	40	22	30
	Three phase 500V	9	5.5	7.5	13	7.5	10	19	11	15	19	11	15	30	18.5	25	35	22	30
	Three phase 660V	7	5.5	7.5	10	7.5	10	14	11	15	14	11	15	23	18.5	25	26	22	30
	Three phase 690V	7	5.5	7.5	10	7.5	10	14	11	15	14	11	15	22	18.5	25	26	22	30
Rated Power Capacities (Ie) AC3 UL 508	Single 110-120V	16	—	1	20	—	1.5	24	—	2	24	—	2	24	—	2	34	—	3
	Single 220-240V	12	—	2	17	—	3	17	—	3	28	—	5	28	—	5	40	—	7.5
	Three phase 200/208V	18	—	5	18	—	5	26	—	7.5	26	—	7.5	25.3	—	75	49	—	15
	Three phase 220-240V	15.2	—	5	15.2	—	5	22	—	7.5	28	—	10	28	—	10	42	—	15
	Three phase 440-480V	11	—	7.5	14	—	10	21	—	15	27	—	20	27	—	20	40	—	30
	Three phase 550-600V	11	—	10	11	—	10	17	—	15	22	—	20	27	—	25	41	—	40
For use with bimetallic overload relays		RHU-10/□1			RHU-10/□1			RHU-10/□1			RHU-10/□1			RHU-10/□2			RHU-80/□2		
For use with contactors		CU-11			CU-16			CU-18			CU-22			CU-32R			CU-40		
Contact Configuration		3A1a or 3A1b						3A1a 1b											
Electrical Durability (ops)		1M						1M											
Mechanical Durability (ops)		5M						5M											
Overall Dimensions (w* h * d) mm / (kg)	IP 40	88*160*107.5 / 0.9						100*170.6*117.3 / 2.0						100*170.6*117.3 / 2.0			130*240*136 / 2.0		
	IP 42	90*184*112 / 0.9						100*194*122.5 / 0.9						—			—		
	IP 65																		

Accessories



Catalogue number		CI-18	CI-35	CNI-6	CNI-18	CNI-100
						
For use with	U Series	CU-11/16/18/22 32R/38	CU-40/50/65 /80/90	—	CU-11/16/18/22 32R/38	—
	N Series	—	—	CN-5/6	—	CN-100R/125R/ 150/180/220 300
Operational type		Mechanical	Mechanical	Mechanical	Mechanical	Mechanical
Part number for order		V57909	V57912	V83153	V96450	V77662

CUA/CNA Series

Catalogue number			CNA-2M	CNA-4M	CUA-2	CUA-4	CNA-111SR	CNA-111B(C)
								
Rated insulation voltage (Ui) IEC		V	690					
Contact rating code designation UL			A 600 Q300					
Thermal current AC/DC (Ith)		A	10 / 2.5					
Rated operational current Ie (A) IEC 60947-5-1 UL 508	AC 15	120V	6					
		240V	3					
		380V	1.9					
		480V	1.5					
		500V	1.4					
		600V	1.2					
	DC 13	125V	0.55					
		250V	0.27					
Contact configuration			2a, 2b ,1a1b	4a, 3a1b, 2a2b, 1a3b, 4b	2a, 2b, 1a1b	4a, 4b, 3a1b, 2a2b,1a3b	1a1b	1a1b
Electrical durability (ops) AC 15			1M					
Mechanical durability (ops)			5M					
Weight (kg)			0.035	0.04	0.025	0.045	0.04	0.04
For use with	U Series		—	—	CU-11/16/18/ 22/32R/38/40/ 50/65/80/90	CU-11/16/18/ 22/32R/38/40/ 50/65/80/90	CU-11/16/18/ 22/32R/38/40	—
	N Series		CN-5/6 CN-5K/6K	CN-5/6 CN-5K/6K	—	—	—	CN-100R/125R/ 150/180/200/ 300

Motor Protection Circuit Breaker

Product Overview

1. Complied with IEC 60947, UL 508
2. Applicable to Protect Motors below 55KW/100A
3. Combined and High-breaking Protection
4. Short Circuit and Overload Protection
5. Comply with Snap-on Accessories

Specification	TMS-32S	TMS-63S	TMS-100S
Maximum Rated Current (A)	32	63	100
Rated Operational Voltage (V/AC)	690		
Trip Class	10		
Operational Frequency (Hz)	50/60		
Temperature Compensation	Yes		
Phase Loss Protection	No		
Protection Degree	IP20		
Mechanical Durability (Ops)	100,000	50,000	50,000
Electrical Durability (Ops)	100,000	50,000	30,000
Operating Environmental Temperature (°C)	-20°C ~ +60°C		
Storage Environmental Temperature (°C)	-20°C ~ +60°C		
Altitude (m)	3,000	2,000	
Rated impulse Withstand Voltage (kV)	6	8	

Rated Breaking Capacity (kA)		TMS-32S				
		220V 230V 240V	415V 400V	460V 440V	525V 500V	690V 600V
		Icu/Ics	Icu/Ics	Icu/Ics	Icu/Ics	Icu/Ics
Rated Current Change	0.1~0.16	100/100	100/100	100/100	100/100	100/100
	0.16~0.25	100/100	100/100	100/100	100/100	100/100
	0.25~0.4	100/100	100/100	100/100	100/100	100/100
	0.4~0.63	100/100	100/100	100/100	100/100	100/100
	0.63~1.0	100/100	100/100	100/100	100/100	100/100
	1.0~1.6	100/100	100/100	100/100	100/100	100/100
	1.6~2.5	100/100	100/100	100/100	100/100	3/3
	2.5~4.0	100/100	100/100	50/38	50/38	3/3
	4~6	100/100	100/100	50/38	50/38	3/3
	5~8	100/100	100/100	15/11	10/10	3/3
	6.3~10	100/100	50/38	15/11	10/10	3/3
	9~13	100/100	50/38	15/11	6/5	3/3
	11~16	100/100	25/19	15/11	6/5	3/3
	14~20	50/50	25/19	10/8	6/5	3/3
	19~25	50/50	25/19	10/8	6/5	3/3
	24~32	50/50	25/19	10/8	5/4	3/3