VEGA Electric

Control Panels

VEGA Electric

Code Development

Automation Design

Rockwell Automation
A-B QUALITY
Authorized Distributor
Allen-Bradley · Rockwell Software

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VEGA Electric

CONTACT	
MCCB	**Molded Case Circuit Breakers**
MCB/RCCB	Miniature Circuit Breakers
MC/TOR	Contactors and Overload Relays
MMS	**Manual motor controller**


MCCB
TS 800L
Susol
TS 630L
TS 250L
TS 125L
TS 250L
ON
OFF
TRIP

Range of LS's low voltage circuit breakers

Susol

	Main switchboard	Main / Sub switchboard
Type of circuit breakers	ACB	MCCB
Rated current, In	630~5000A	16~800A
Breaking capacity, Icu	65~100kA	50, 65, 85, 100, 150kA
Service breaking capacity (% Icu), Ics	100%	100%
Rated short time withstand current, Icw	65~85kA	-
Applied standard	IEC 60947-2	IEC 60947-2
Utilization category	B	A
Image of circuit breaker		
Brand name	Ace-MEC	Susol
Image of brand	ACE MEC	Susol
Model name	LBA series	TD, TS series

Main / Sub switchboard			Final distribution
MCCB	MCCB	MCCB	MCB
16~1600A	3~1200A	15~600A	1~125A
35, 50, 85kA	5~85kA	25, 35, 50kA	6, 10kA
75%	50%		
-	-	-	-
IEC 60947-2	IEC 60947-2	UL489	IEC 60947-2 / IEC 60898
A	A		
			
Meta-MEC	Meta-MEC	Meta-MEC	-
GB series	AB series	AB-U series	BK series

Range of Susol products

Susol

	160AF		250AF		
	Susol TD circuit breakers				
For power distribution					
	TD100	TD160			
	Thermal magnetic trip unit				
	FTU	FTU			
	FMU	FMU			
	Susol TS circuit breakers				
For power distribution					
			TS100	TS160	TS250
			Thermal magnetic trip unit		
			FTU (Fixed thermal, Fixed magnetic trip unit)		
			FMU (Adjustable thermal, Fixed magnetic trip unit)		
			ATU (Adjustable thermal, Adjustable magnetic trip unit)		
			Electronic trip unit		
			ETS (Electronic trip unit, Standard)		
	Susol TS circuit breakers				
For motor protection			MTU (Magnetic only trip unit)		
	Susol switch-disconnectors				
Switch disconnector					
		TD160NA	TS100NA	TS160NA	TS250NA
		Disconnecting switch unit			
			DSU (Disconnecting switch unit)		

	630AF		800AF
For power distribution			
	Susol TS circuit breakers		
For power distribution			
	TS400	TS630	TS800
	Thermal magnetic trip unit		
	FTU (Fixed thermal, Fixed magnetic trip unit)		
	FMU (Adjustable thermal, Fixed magnetic trip unit)		
	ATU (Adjustable thermal, Adjustable magnetic trip unit)		
	Electronic trip unit		
	ETS (Electronic trip unit, Standard)		
	ETM (Electronic trip unit, Multifunction)		
	Susol TS circuit breakers		
For motor protection	MTU (Magnetic only trip unit)		
	Susol switch-disconnectors		
Switch disconnector			
	TS400NA	TS630NA	TS 800NA
	Disconnecting switch unit		
	DSU (Disconnecting switch unit)		

Overview of TD/TS family

Susol

TD series



MCCBs for power distribution			TD100			TD160			TS100		
Frame size		[AF]	100			160			100		
Rated current, In♣		[A]	16~100			100, 125, 160			40~100		
No. of poles			2*, 3, 4			2*, 3, 4			2*, 3, 4		
Rated operational voltage, Ue	AC	[V]	690			690			690		
	DC	[V]	500			500			500		
Rated impulse withstand voltage, Uimp		[kV]	8			8			8		
Rated insulation voltage, Ui		[V]	750			750			750		
Rated ultimate short-circuit breaking capacity, Icu			N	H	L	N	H	L	N	H	L
AC 50/60Hz	220/240V	[kA]	85	100	200	85	100	200	100	120	200
	380/415V	[kA]	50	85	150	50	85	150	50	85	150
	440/460V	[kA]	50	70	130	50	70	130	50	70	130
	480/500V	[kA]	30	50	65	30	50	65	42	65	85
	660/690V	[kA]	5	8	10	5	8	10	10	15	20
DC	250V	[kA]	42	65	100	42	65	100	50	85	100
DC(2poles in series)	500V	[kA]	42	65	100	42	65	100	50	85	100
Rated service breaking capacity, Ics		[%Icu]	100%	100%	100%	100%	100%	100%	100%	100%	100%

MCCBs for motor protection									
Frame size		[A]	-			-			100
Poles			-			-			3
Operational voltage, Ue		[V]	-			-			690
Breaking capacities								N	H	L
	Icu at 380/415V	[kA]	-			-			50	85	150
Trip unit	Magnetic only		-			-			●	●	●

Switch-disconnectors									
Rated thermal current, Ith		[A]	-			160			100
Rated operational current, Ie		[A]	-			160			100
Poles			-			2, 3, 4			2, 3, 4
Operational voltage, Ue	AC 50-60Hz	[V]	-			690			690
	DC	[V]	-			500			500
Rated short-circuit making capacity,Icm		[kA peak]	-			3.1			2.8
Rated short-time withstand current, Icw	1s	[A rms]	-			2200			2000
	3s	[A rms]	-			2200			2000
	20s	[A rms]	-			960			690

Basic dimensions			W	H	D	W	H	D	W	H	D
front connection	3-pole	[mm]	90	140	86	90	140	86	105	160	86
	4-pole	[mm]	120	140	86	120	140	86	140	160	86

♣ Applicable to MCCBs equipped with FTU, FMU, ATU

* 2 pole MCCB in 3pole frame size ** 700A only available for TS800FTU

TS series



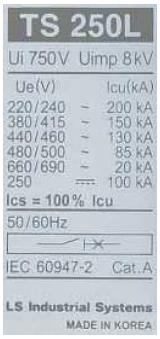


	TS160			TS250			TS400			TS630			TS800		
	160			250			400			630			800		
	100, 125, 160			125, 160, 200, 250			300, 400			500, 630			700**, 800		
	2*, 3, 4			2*, 3, 4			2*, 3, 4			2*, 3, 4			2*, 3, 4		
	690			690			690			690			690		
	500			500			500			500			500		
	8			8			8			8			8		
	750			750			750			750			750		
	N	H	L	N	H	L	N	H	L	N	H	L	N	H	L
	100	120	200	100	120	200	100	120	200	100	120	200	100	120	200
	50	85	150	50	85	150	65	85	150	65	85	150	65	100	150
	50	70	130	50	70	130	65	85	130	65	85	130	65	100	130
	42	65	85	42	65	85	42	65	85	42	65	85	42	85	100
	10	15	20	10	15	20	10	20	35	10	20	35	10	20	35
	50	85	100	50	85	100	50	85	100	50	85	100	50	85	100
	50	85	100	50	85	100	50	85	100	50	85	100	50	85	100
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

	160			250			400			630			800		
	3			3			3			3			3		
	690			690			690			690			690		
	N	H	L	N	H	L	N	H	L	N	H	L	N	H	L
	50	85	150	50	85	150	65	85	150	65	85	150	65	100	150
	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	160			250			400			630			800		
	160			250			400			630			800		
	2, 3, 4			2, 3, 4			2, 3, 4			2, 3, 4			2, 3, 4		
	690			690			690			690			690		
	500			500			500			500			500		
	3.6			4.9			7.1			8.5			12		
	2500			3500			5000			6300			8000		
	2500			3500			5000			6300			8000		
	960			1350			1930			2320			2560		

	W	H	D	W	H	D	W	H	D	W	H	D	W	H	D
	105	160	86	105	160	86	140	260	110	140	260	110	210	320	135
	140	160	86	140	160	86	185	260	110	185	260	110	280	320	135



Molded Case Circuit Breakers

The new series of TD and TS circuit-breakers is available in four frame sizes
: 160, 250, 630, 800AF
The breakers are able to cover a range of service currents up to 800A and are available in the fixed version and plug-in version.
The breaking capacities, at 380/415V, are classified by following letters:

N: 50kA for 160 and 250AF
65kA for 630 and 800AF
H: 85kA for 160, 250 and 630AF
100kA for 800AF
L: 150kA for 160, 250, 630, 800AF

TD & TS circuit-breakers are climate-proof. The breakers are intended for use in rooms where there are no excessive operating conditions (e.g. dust, corrosive vapors, gases).
If the circuit-breakers are used in dusty or humid locations, suitable enclosures should be provided. Sufficient fresh air supply must be provided if there are harmful gases (e.g. hydrogen-sulfide vapor) in the ambient air.

All Susol TD and TS circuit breakers offer positive contact indication and are suitable for isolation in compliance with standards IEC 60947-1 and 2.

TD & TS circuit-breakers are suitable for protection of
- Power distribution systems supplied by transformers or generators
- Motor and generator

A switch-disconnector of Susol TD and TS circuit breakers is available for for circuit control and isolation.

Standards & Approval

Susol

Susol-TD and TS series circuit breakers and auxiliaries comply with the following international standard:

IEC 60947-1

Low-voltage switchgear and controlgear
- Part 1: General rules

IEC 60947-2

Low-voltage switchgear and controlgear
- Part 2: Circuit-breakers

IEC 60947-3

Low-voltage switchgear and controlgear
- Part 3: Switches, disconnectors, switchdisconnectors and fuse-combination units

IEC 60947-4

Low-voltage switchgear and controlgear
- Part 4-1: Contactors and motor-starters
  Electromechanical contactors and motor starters Switches, disconnectors, switchdisconnectors
- Part 4-2: Contactors and motor-starters
  AC semiconductor motor controllers and starters
- Part 4-3: Contactors and motor-starters
  AC semiconductor controllers and contactors for non-motor loads

The following certificates are available on a request.
- CE Declaration of conformity
- Certificate of conformance test (CB) - IEC 60947
- Full type test report issued by KEMA
- Certificate of conformance test - CCC (China)
- Letter of origin

CE conformity marking

The CE conformity marking shall indicate conformity to all the obligations imposed on the manufacturer, as regards his products, by virtue of the European Community directives providing for the affixing of the CE marking.
When the CE marking is affixed on a product, it represents a declaration of the manufacturer or of his authorized representative that the product in question conforms to all the applicable provisions including the conformity assessment procedures. This prevents the Member States from limiting the marketing and putting into service of products bearing the CE marking, unless this measure is justified by the proved non-conformity of the product.

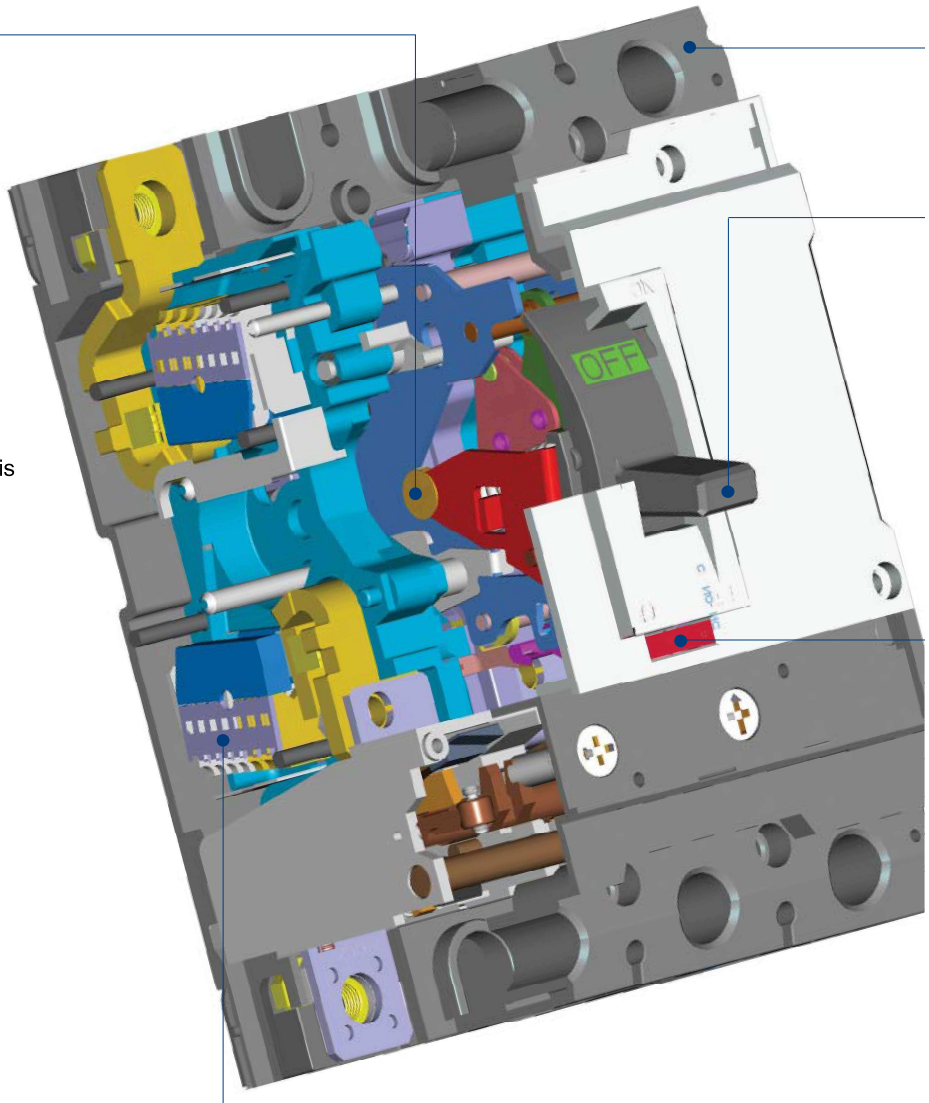
IECEE CB SCHEME

The IECEE CB Scheme is the world's first truly international system for acceptance of test reports dealing with the safety of electrical and electronic products. It is a multilateral agreement among participating countries and certification organizations. A manufacturer utilizing a CB test report issued by one of these organizations can obtain national certification in all other member countries of the CB Scheme.
The Scheme is based on the use of international (IEC) Standards. If some members' national standards are not yet completely harmonized with IEC Standards, national differences are permitted if clearly declared to all other members. The CB Scheme utilizes CB Test Certificates to attest that product samples have successfully passed the appropriate tests and are in compliance with the requirements of the relevant IEC Standard and with the declared national differences of various member countries.
The main objective of the Scheme, is to facilitate trade by promoting harmonization of the national standards with international Standards and cooperation among product certifiers worldwide in order to bring product manufacturers a step closer to the ideal concept of "one product, one test, one mark, where applicable'.

Structure

Susol

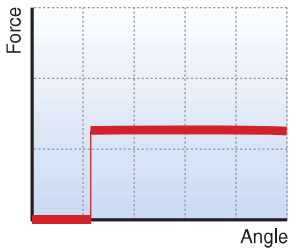
The primary components are: a switching mechanism, an automatic tripping device (and manual trip button), contacts, an arc-extinguishing device, terminals and a molded case.



Mechanism unit

- Unvarying contact force regardless of over travel
- RTA (Rapid Toggle Area) Open speed of moving contact is rapid by **optimized cam curve** regardless of trip signal

Optimized cam curve



Unvarying contact force

Molded case

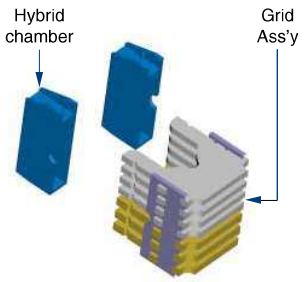
- UL94 V-0 flame retarded
- High strength

Trip button (push to trip)

- Enables tripping mechanically from outside, for confirming the operation of the accessory switches and the manual resetting function.

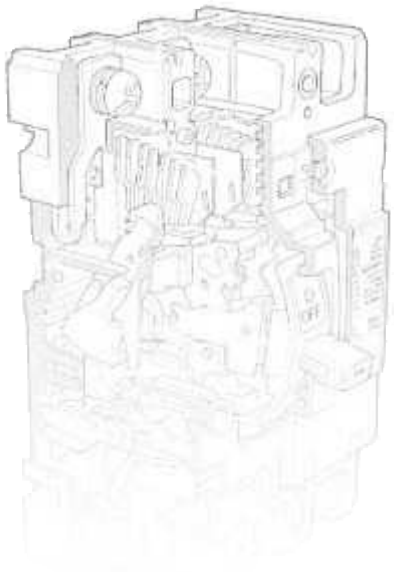
Arc-Extinguishing unit

- PASQ Type Quenching Chamber
- Very superior to increasing arc voltage during short time
- PASQ ;
  - Puffer Assisted Self-Quenching
  - Patented by LSIS



Handle

- Function of indications
  - "ON" "OFF" "TRIP"
- Resetting
  When the handle indicates "tripped" position it must first be reset by moving the handle to the "OFF" position and then closing is possible
- Trip-Free even if the handle is held at "ON", the breaker will trip if an over current flows
- Suitable for Verification of the main contact position under abnormal conditions because the handle doesn't indicate open position



Marking and configuration

Susol

Rated frequency

Symbol indicating suitability for isolation as defined by IEC 947-2

Standard

Manufacturer

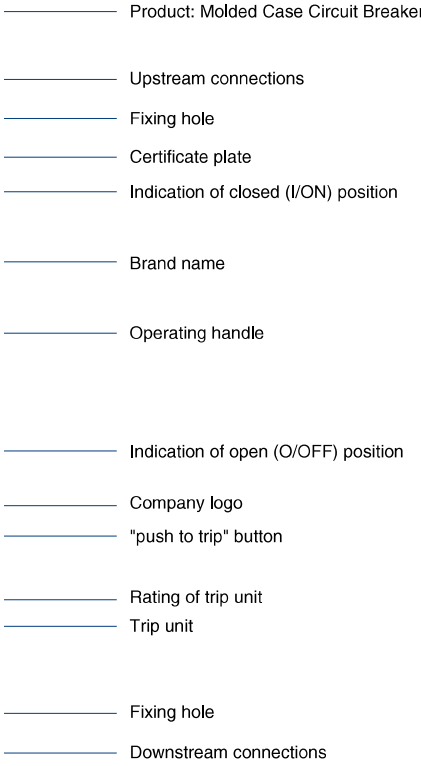
Utilization category

Model (Rating and breaking capacity)
- TS: Series
- 250: Max. Ampere rating
- N: Normal (Standard)
- H: High
- L: Current limiting

Standardized characteristics:
- Ui: Rated insulation voltage
- Uimp: Impulse withstand voltage
- Ue: Rated operational voltage
- Icu: Ultimate breaking capacity
- Ics: Service breaking capacity

	160AF	250AF	630AF	800AF
N - -	TD100N TD160N -	TS100N TS160N TS250N	TS400N TS630N -	TS800N - -
H - -	TD100H TD160H -	TS100H TS160H TS250H	TS400H TS630H -	TS800H - -
L - -	TD100L TD160L -	TS100L TS160L TS250L	TS400L TS630L -	TS800L - -

N	50kA	50kA	65kA	65kA
H	85kA	85kA	85kA	100kA
L	150kA	150kA	150kA	150kA



Overview of trip units

Susol

On TS100 to TS800 circuit breakers, the thermal-magnetic and electronic trip units are interchangeable and may be rapidly fitted to the circuit breakers.
It is therefore easy to change the protection of a given circuit following a modification in an installation. On TS400 and 630 circuit breakers, the electronic trip units are interchangeable plug-in modules. Trip unit ETM offers a large number of protection settings.

Each Trip devices has different types of protection depending on the associated trip unit:

- Standard protection
- Protection of networks supplied by line distribution
- Protection of long cables
- Protection of DC networks
- Protection of motor-starters
- Service connection circuit breaker (for special subscriber contracts)

Susol TD100, TD160 circuit breakers may be equipped with either FTU or FMU.
The trip units are not interchangeable types and can be supplied only after fixed with circuit breakers.

Ampere ratings

MCCB frame type		Type of trip unit	Rated current, In[A]						
			Thermal magnetic release				Electronic release		DSU
			FTU	FMU	ATU	MTU	ETS	ETM	
	TD100	Built in unit	16, 20, 25, 32, 40, 50, 63, 80, 100	16, 20, 25, 32, 40, 50, 63, 80, 100	-	-	-	-	-
	TD160		100, 125, 160	100, 125, 160	-	-	-	-	160
	TS100	Inter changeable trip unit	40, 50, 63, 80, 100	40, 50, 63, 80, 100	-	1.6, 3.2, 6.3, 12, 20, 32, 50, 63, 100	40, 80	-	100
	TS160		100, 125, 160	100, 125, 160	100, 125, 160	32, 50, 63, 100, 160	40, 80, 160	-	160
	TS250		125, 160, 200, 250	125, 160, 200, 250	125, 160, 200, 250	100, 160, 220	40, 80, 160, 250	-	250
	TS400		300, 400	300, 400	300, 400	320	160, 250, 400	160, 250, 400	400
	TS630		500, 630	500, 630	500, 630	500	160, 250, 400, 630	160, 250, 400, 630	630
	TS800		700, 800	800	800	630	630, 800	630, 800	800

Types of trip units

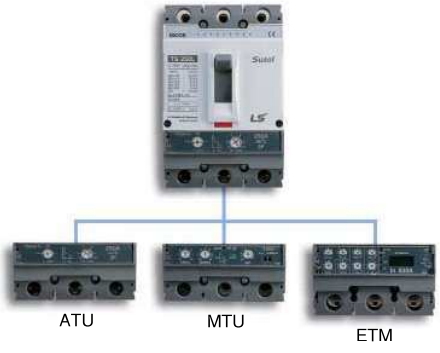
	FTU	• Fixed thermal, Fixed magnetic
	FMU	• Adjustable thermal, Fixed magnetic
	ATU	• Adjustable thermal, Adjustable magnetic
	MTU	• Magnetic only
	ETS	• Electronic (LSI)
	ETM	• Electronic (LSIG, Ammeter, Communication, Zone selective interlocking)
	DSU	• Disconnecting switch

Trip unit identification

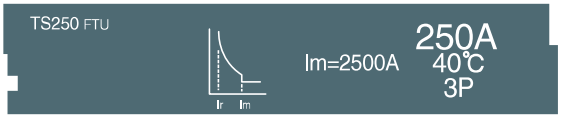
TS250 FMU

TS250 — MCCB frame type

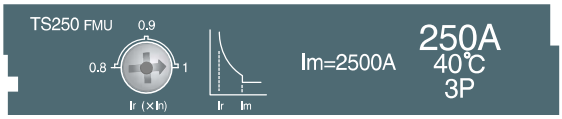
FMU — Trip unit function



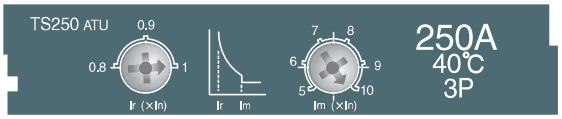
FTU **Fixed-thermal, fixed-magnetic**



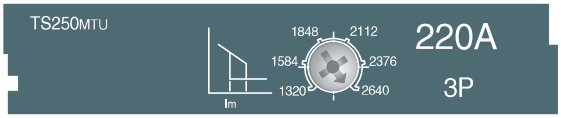
FMU **Adjustable-thermal, fixed-magnetic**



ATU **Adjustable-thermal, adjustable-magnetic**

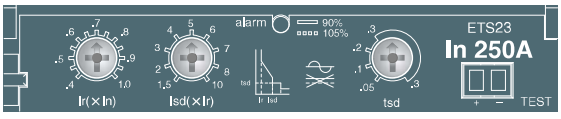


MTU **Magnetic only**

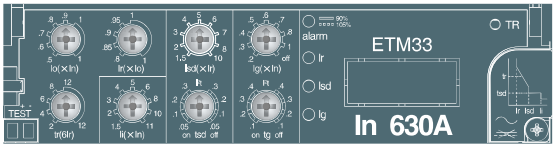


DSU **Disconnecting switch**

ETS **Electronic (LSI)**



ETM **Electronic (LSIG, multi-function unit)**



Double contactor structure

Optimize

Repulsion force

Shape of contactor

- Induce easily the arc mobility to grid direction
- Rapidly redeploy the arc from moving contactor
- Prevent contact tip from erosion

Open speed & contact force

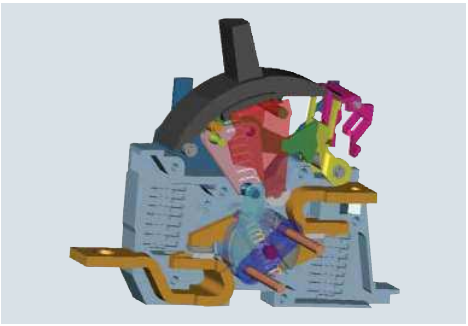


Fig. 3 “ON“ position

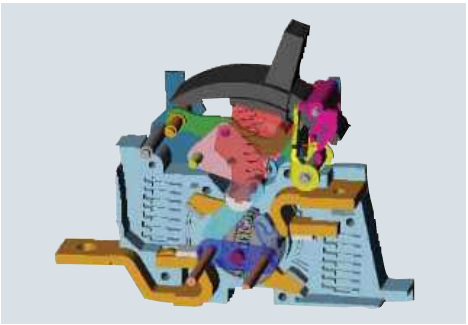


Fig. 4 “OFF“ position

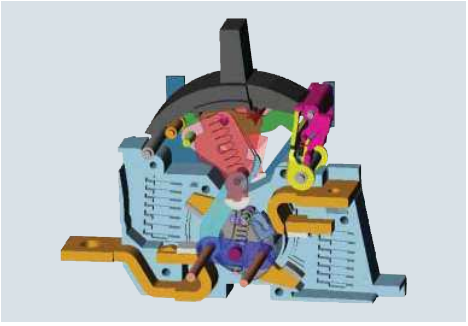
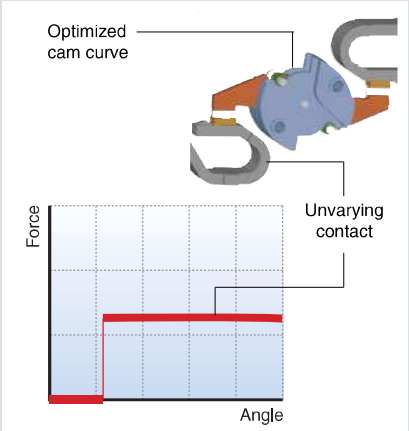


Fig. 5 “TRIP“ position

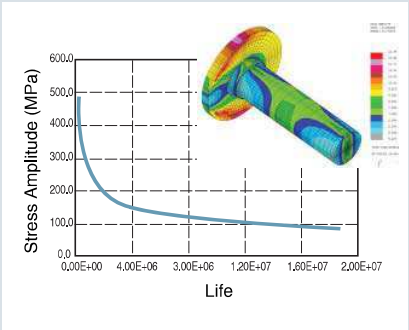
ON position

- Unvarying contact force regardless of over travel
- Open speed of moving contact is rapid by optimized cam curve regardless of trip signal
- Function of trip free



OFF position

- Push to trip in OFF position
  * Reset pin moment < Main spring moment
- Stability of endurance



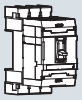
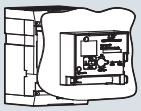
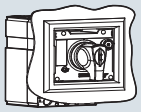
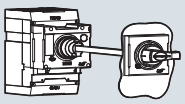
TRIP position

- Enables tripping mechanically from outside, for confirming the operation of the accessory switches and the manual resetting function

Degree of protection

Susol

The table indicates the degrees of protection guaranteed by Susol TD and TS circuit-breakers according to several type of installation. Basically, the fixed parts are always preset with IP20 degree of protection.
IP65 degree of protection can be obtained with the circuit-breaker installed in a switchboard fitted with an extended rotary handle operating mechanism transmitted on the compartment door.

Type	Degree of protection	IP	Protection of persons against access to hazardo us parts with:
 Circuit breaker	Full penetration of 12.5mm diameter sphere not allowed. The jointed test finger shall have adequate clearance from hazardous parts	IP20	Wire
 Circuit breaker with terminal cover	The access probe of 2.5mm diameter shall not penetrate.	IP30	Wire
 Plug-in circuit breaker	Full penetration of 12.5mm diameter sphere not allowed. The jointed test finger shall have adequate clearance from hazardous parts. * When the circuit breaker is installed and the supplied covers are mounted.	IP20 or IP30	Wire
 Circuit breaker with cover frame for door cutout	The access probe of 1.0mm shall not penetrate.	IP40	Wire
 Circuit breaker with cover frame and motor operator	The access probe of 1.0mm diameter shall not penetrate.	IP40	Wire
 Circuit breaker with cover frame and rotary direct handle	The access probe of 1.0mm diameter shall not penetrate.	IP40	Wire
 Circuit breaker with cover frame and rotary extended handle	Totally protected against ingress of dust and water jets fromany direction	IP65	Wire

MCB & RCCB

Miniature Circuit Breakers & Residual Current Devices

The best solution for perfect safety environment, customer satisfaction through best quality and service, LS produces the world's best products.

Suitable for protection against overload & short circuit(BKN, BKH, BKP, BF series) ground fault & over circuit(RKP, RKS) ground fault(RKN) surge protect device(BKS) 1, 2, 3, 4 poles & isolator 35mm DIN rail mounting & Plug-in types rated voltage 230/400V characteristics: B, C, D according to IEC 60898-1 for MCB accessories: auxiliary switch CE, KEMA, SEMKO, CQC/CCC, SABS, SASO, GOST, UL1077, SNI

Contents

04 Quick selection table

08 Main characteristics

08 MCB-Miniature Circuit Breakers

32 RCBO-Residual Current Circuit Breakers with Overcurrent protection

43 RCCB-Residual Current Circuit Breakers

47 Isolator

48 60mm depth Miniature Circuit Breakers

50 Standard busbars

51 Characteristics curves & temperature compensation

54 Overall dimensions

BKN-b type (High rupturing capacity)

CE 10000 3

CE
Certificate
Patent
protection

BKN-b 2P

Technical data

Standard		Confirming to IEC 60898-1, IEC 60947-2	
Approval		KEMA CB, SABS, CE	
Protection		Against overload and short circuit	
Rated current		1, 2, 3, 4, 6, 10, 16, 20, 25, 32, 40, 50, 63A	
Rated voltage		1pole 240/415VAC 50/60Hz 2, 3, 4pole 415VAC 50/60Hz	
Ambient temperature		-5°Cto +40°C pursuant to IEC 60898-1	
Breaking capacity		10kA	
Characteristic		B, C, D curve	
Number of poles		1P, 1P+N, 2P, 3P, 3P+N and 4P	
Rated insulation voltage [Ui]		500V	
Rated impulse withstand voltage [Uimp]		4kV	
Type of trip		Thermal-magnetic release	
Type of terminal		Dual type (Lug & Screw)	
Terminal capacity		Cables up to 25mm²	
Installation		Mounting on 35mm DIN rail	
Width		17.8mm per pole	
Electrical endurance		—	
	In	1 ... 32A	40 ... 63A
	Endurance	4,000 operations	4,000 operations
	Max. frequency (Cycles/hour)	240	120

Influence of ambient temperature on nominal currents

Nominal current of MCB (A)	Internally resis-tance (mohm)	Power loss (W)	Max. impedance of impedance loop (Ohm)			Thermal correction of nominal currents				
			B	C	D	20°C	30°C	40°C	50°C	60°C
1	1215.69	1.24	46.20	25.70	14.40	1.05	1	0.95	0.90	0.85
2	343.28	1.38	21.60	12.02	6.73	2.08	2	1.92	1.84	1.74
3	128.09	1.15	16.90	9.40	5.26	3.18	3	2.82	2.61	2.37
4	105.53	1.68	10.68	5.94	3.33	4.24	4	3.76	3.52	3.24
6	29.22	1.08	7.14	3.97	2.22	6.24	6	5.76	5.52	5.30
10	14.49	1.55	3.87	2.15	1.21	10.60	10	9.30	8.60	7.80
16	10.00	2.56	2.24	1.25	0.70	16.80	16	15.20	14.20	13.30
20	8.02	3.32	1.55	0.86	0.48	21.00	20	19.00	17.80	16.80
25	3.11	2.00	2.43	1.35	0.76	26.20	25	23.70	22.20	20.70
32	3.05	3.17	1.27	0.71	0.40	33.50	32	30.40	28.40	27.50
40	2.16	3.40	0.60	0.33	0.19	42.00	40	38.00	35.60	33.20
50	1.65	4.20	0.71	0.39	0.22	52.50	50	47.40	44.00	40.50
63	1.68	6.30	0.47	0.32	0.15	66.20	63	58.00	54.20	49.20

Optional accessories. SHT, OVT/UVT

SHT-b	Rated voltage (Ue)	AC 110~415V
	Operate voltage range	70~110% Ue
U/OVT-b	Rated voltage (Ue)	AC 230V
	Over-voltage tripping range	AC 280V±5%
	Under-voltage tripping range	AC 170V±5%
ELectric-mechanical endurance		10,000 operations
Termianl		MS screw (cable up to 25mm²)
Width		18mm

BKN-b type, B curve

CE 10000 3

10kA at 240/415VAC

BKN-b 1P

In	Model	Order No.	Pack. unit (Pcs.)	Price
1A	BKN-b 1P B1A	06110160R0	120	
2A	BKN-b 1P B2A	06110161R0	120	
3A	BKN-b 1P B3A	06110162R0	120	
4A	BKN-b 1P B4A	06110163R0	120	
6A	BKN-b 1P B6A	06110164R0	120	
10A	BKN-b 1P B10A	06110165R0	120	
16A	BKN-b 1P B16A	06110166R0	120	
20A	BKN-b 1P B20A	06110167R0	120	
25A	BKN-b 1P B25A	06110168R0	120	
32A	BKN-b 1P B32A	06110169R0	120	
40A	BKN-b 1P B40A	06110170R0	120	
50A	BKN-b 1P B50A	06110171R0	120	
63A	BKN-b 1P B63A	06110172R0	120	

10kA at 240/415VAC

BKN-b 1P+N

In	Model	Order No.	Pack. unit (Pcs.)	Price
1A	BKN-b 1P+N B1A	06120417R0	60	
2A	BKN-b 1P+N B2A	06120418R0	60	
3A	BKN-b 1P+N B3A	06120419R0	60	
4A	BKN-b 1P+N B4A	06120420R0	60	
6A	BKN-b 1P+N B6A	06120421R0	60	
10A	BKN-b 1P+N B10A	06120422R0	60	
16A	BKN-b 1P+N B16A	06120423R0	60	
20A	BKN-b 1P+N B20A	06120424R0	60	
25A	BKN-b 1P+N B25A	06120425R0	60	
32A	BKN-b 1P+N B32A	06120426R0	60	
40A	BKN-b 1P+N B40A	06120427R0	60	
50A	BKN-b 1P+N B50A	06120428R0	60	
63A	BKN-b 1P+N B63A	06120429R0	60	

10kA at 415VAC

BKN-b 2P

In	Model	Order No.	Pack. unit (Pcs.)	Price
1A	BKN-b 2P B1A	06120430R0	60	
2A	BKN-b 2P B2A	06120431R0	60	
3A	BKN-b 2P B3A	06120432R0	60	
4A	BKN-b 2P B4A	06120433R0	60	
6A	BKN-b 2P B6A	06120434R0	60	
10A	BKN-b 2P B10A	06120435R0	60	
16A	BKN-b 2P B16A	06120436R0	60	
20A	BKN-b 2P B20A	06120437R0	60	
25A	BKN-b 2P B25A	06120438R0	60	
32A	BKN-b 2P B32A	06120439R0	60	
40A	BKN-b 2P B40A	06120440R0	60	
50A	BKN-b 2P B50A	06120441R0	60	
63A	BKN-b 2P B63A	06120442R0	60	

BKN-b type, B curve

CE 10000 3

BKN-b 3P

10kA at 415VAC

In	Model	Order No.	Pack. unit (Pcs.)	Price
1A	BKN-b 3P B1A	06120443R0	40	
2A	BKN-b 3P B2A	06120444R0	40	
3A	BKN-b 3P B3A	06120445R0	40	
4A	BKN-b 3P B4A	06120446R0	40	
6A	BKN-b 3P B6A	06120447R0	40	
10A	BKN-b 3P B10A	06120448R0	40	
16A	BKN-b 3P B16A	06120449R0	40	
20A	BKN-b 3P B20A	06120450R0	40	
25A	BKN-b 3P B25A	06120451R0	40	
32A	BKN-b 3P B32A	06120452R0	40	
40A	BKN-b 3P B40A	06120453R0	40	
50A	BKN-b 3P B50A	06120454R0	40	
63A	BKN-b 3P B63A	06120455R0	40	

BKN-b 3P+N

10kA at 415VAC

In	Model	Order No.	Pack. unit (Pcs.)	Price
1A	BKN-b 3P+N B1A	06120456R0	30	
2A	BKN-b 3P+N B2A	06120457R0	30	
3A	BKN-b 3P+N B3A	06120458R0	30	
4A	BKN-b 3P+N B4A	06120459R0	30	
6A	BKN-b 3P+N B6A	06120460R0	30	
10A	BKN-b 3P+N B10A	06120461R0	30	
16A	BKN-b 3P+N B16A	06120462R0	30	
20A	BKN-b 3P+N B20A	06120463R0	30	
25A	BKN-b 3P+N B25A	06120464R0	30	
32A	BKN-b 3P+N B32A	06120465R0	30	
40A	BKN-b 3P+N B40A	06120466R0	30	
50A	BKN-b 3P+N B50A	06120467R0	30	
63A	BKN-b 3P+N B63A	06120468R0	30	

BKN-b 4P

10kA at 415VAC

In	Model	Order No.	Pack. unit (Pcs.)	Price
1A	BKN-b 4P B1A	06120430R0	30	
2A	BKN-b 4P B2A	06120431R0	30	
3A	BKN-b 4P B3A	06120432R0	30	
4A	BKN-b 4P B4A	06120433R0	30	
6A	BKN-b 4P B6A	06120434R0	30	
10A	BKN-b 4P B10A	06120435R0	30	
16A	BKN-b 4P B16A	06120436R0	30	
20A	BKN-b 4P B20A	06120437R0	30	
25A	BKN-b 4P B25A	06120438R0	30	
32A	BKN-b 4P B32A	06120439R0	30	
40A	BKN-b 4P B40A	06120440R0	30	
50A	BKN-b 4P B50A	06120441R0	30	
63A	BKN-b 4P B63A	06120442R0	30	

RKN type

Certificate

Technical data

Standard		Confirming to IEC61008
Protection		Ground fault
Rated current		25. 32, 40, 63A
Number of poles		2 (1+N), 4 (3+N)pole
Rated sensitivity currents, I△n		30, 100, 300mA
Rated residual non-operating current		0.5×I△n
Rated voltage	2pole	240VAC
	4pole	240/415VAC
Residual current off-time at I△n		≤ 0.1s
Rated insulation voltage [Ui]		500V
Rated impulse withstand voltage [Uimp]		4kV
Rated making capacity, Im		500A for In=25, 32, 40A 630A for In=63A
Rated conditional short-circuit current, Inc		6kA for In=25, 32, 40, 63A
Type of trip		Electro-magnetic
Type of terminal		Lug type
Terminal capacity		Cables up to 35mm²
Installation		35mm DIN rail
Type of operation		A/AC
Slot size		45mm

Order No.

Pole	In	I△n	Model	Order No.	Pack. unit (Pcs.)
1P+N	25A	30mA	RKN 1P+N 25A 30mA	06220103R0	60
	32A		RKN 1P+N 32A 30mA	06220106R0	60
	40A		RKN 1P+N 40A 30mA	06220109R0	60
	63A		RKN 1P+N 63A 30mA	06220112R0	60
	25A	100mA	RKN 1P+N 25A 100mA	06220104R0	60
	32A		RKN 1P+N 32A 100mA	06220107R0	60
	40A		RKN 1P+N 40A 100mA	06220110R0	60
	63A		RKN 1P+N 63A 100mA	06220113R0	60
	25A	300mA	RKN 1P+N 25A 300mA	06220105R0	60
	32A		RKN 1P+N 32A 300mA	06220108R0	60
	40A		RKN 1P+N 40A 300mA	06220111R0	60
	63A		RKN 1P+N 63A 300mA	06220114R0	60

Pole	In	I△n	Model	Order No.	Pack. unit (Pcs.)
3P+N	25A	30mA	RKN 3P+N 25A 30mA	06240013R0	30
	32A		RKN 3P+N 32A 30mA	06240016R0	30
	40A		RKN 3P+N 40A 30mA	06240019R0	30
	63A		RKN 3P+N 63A 30mA	06240022R0	30
	25A	100mA	RKN 3P+N 25A 100mA	06240014R0	30
	32A		RKN 3P+N 32A 100mA	06240017R0	30
	40A		RKN 3P+N 40A 100mA	06240020R0	30
	63A		RKN 3P+N 63A 100mA	06240023R0	30
	25A	300mA	RKN 3P+N 25A 300mA	06240015R0	30
	32A		RKN 3P+N 32A 300mA	06240018R0	30
	40A		RKN 3P+N 40A 300mA	06240021R0	30
	63A		RKN 3P+N 63A 300mA	06240024R0	30

DIN rail mounting

RKN type

Certificate

Order No. A type

Pole	In	I∆n	Model	Order No.	Pack. unit (Pcs.)
1P+N	25A	30mA	RKN 1P+N 25A 30mA A type	06220444R0	60
	32A		RKN 1P+N 32A 30mA A type	06220447R0	60
	40A		RKN 1P+N 40A 30mA A type	06220450R0	60
	63A		RKN 1P+N 63A 30mA A type	06220453R0	60
	25A	100mA	RKN 1P+N 25A 100mA A type	06220445R0	60
	32A		RKN 1P+N 32A 100mA A type	06220448R0	60
	40A		RKN 1P+N 40A 100mA A type	06220451R0	60
	63A		RKN 1P+N 63A 100mA A type	06220454R0	60
	25A	300mA	RKN 1P+N 25A 300mA A type	06220446R0	60
	32A		RKN 1P+N 32A 300mA A type	06220449R0	60
	40A		RKN 1P+N 40A 300mA A type	06220452R0	60
	63A		RKN 1P+N 63A 300mA A type	06220455R0	60

Pole	In	I∆n	Model	Order No.	Pack. unit (Pcs.)
3P+N	25A	30mA	RKN 3P+N 25A 30mA A type	06220456R0	30
	32A		RKN 3P+N 32A 30mA A type	06220459R0	30
	40A		RKN 3P+N 40A 30mA A type	06220462R0	30
	63A		RKN 3P+N 63A 30mA A type	06220465R0	30
	25A	100mA	RKN 3P+N 25A 100mA A type	06220457R0	30
	32A		RKN 3P+N 32A 100mA A type	06220460R0	30
	40A		RKN 3P+N 40A 100mA A type	06220463R0	30
	63A		RKN 3P+N 63A 100mA A type	06220466R0	30
	25A	300mA	RKN 3P+N 25A 300mA A type	06220458R0	30
	32A		RKN 3P+N 32A 300mA A type	06220461R0	30
	40A		RKN 3P+N 40A 300mA A type	06220464R0	30
	63A		RKN 3P+N 63A 300mA A type	06220467R0	30

RKN-b type

Certificate

Technical data

Standard		Confirming to IEC61008	
Protection		Ground fault	
Rated current		63AF: 25, 40, 63A	100AF: 80, 100A
Number of poles		2 (1+N), 4 (3+N)pole	
Rated sensitivity currents, I△n		30, 100, 300mA	
Rated residual non-operating current		0.5×I△n	
Rated voltage	2pole	240VAC	
	4pole	240/415VAC	
Residual current off-time at I△n		≤ 0.1s	
Rated insulation voltage [Ui]		500V	
Rated impulse withstand voltage [Uimp]		4kV	
Rated making capacity, Im		500A for In=25, 32, 40A 630A for In=63A 800A for In=80A 1000A for In=100A	
Rated conditional short-circuit current, Inc		10kA for In=25, 40, 63, 80, 100A	
Type of trip		Electro-magnetic	
Type of terminal		Lug type	
Terminal capacity		Cables up to 35mm²	
Installation		35mm DIN rail	
Type of operation		A/AC	
Slot size		45mm	

Order No.

Pole	In	I△n	Model	Order No.	Pack. unit (Pcs.)
1P+N	25A	30mA	RKN-b 1P+N 25A 30mA	06220663R0	60
	40A		RKN-b 1P+N 40A 30mA	06220669R0	60
	63A		RKN-b 1P+N 63A 30mA	06220672R0	60
	80A		RKN-b 1P+N 80A 30mA	06220678R0	60
	100A		RKN-b 1P+N 100A 30mA	06220681R0	60
	25A	100mA	RKN-b 1P+N 25A 100mA	06220664R0	60
	40A		RKN-b 1P+N 40A 100mA	06220670R0	60
	63A		RKN-b 1P+N 63A 100mA	06220673R0	60
	80A		RKN-b 1P+N 80A 100mA	06220679R0	60
	100A		RKN-b 1P+N 100A 100mA	06220682R0	60
	25A	300mA	RKN-b 1P+N 25A 300mA	06220665R0	60
	40A		RKN-b 1P+N 40A 300mA	06220671R0	60
	63A		RKN-b 1P+N 63A 300mA	06220674R0	60
	80A		RKN-b 1P+N 80A 300mA	06220680R0	60
	100A		RKN-b 1P+N 100A 300mA	06220683R0	60

Pole	In	I△n	Model	Order No.	Pack. unit (Pcs.)
1P+N	25A	30mA	RKN-b 3P+N 25A 100mA	06240095R0	30
	40A		RKN-b 3P+N 40A 100mA	06240101R0	30
	63A		RKN-b 3P+N 63A 100mA	06240104R0	30
	80A		RKN-b 3P+N 80A 100mA	06240110R0	30
	100A		RKN-b 3P+N 100A 100mA	06240113R0	30
	25A	100mA	RKN-b 3P+N 25A 300mA	06240096R0	30
	40A		RKN-b 3P+N 40A 300mA	06240102R0	30
	63A		RKN-b 3P+N 63A 300mA	06240105R0	30
	80A		RKN-b 3P+N 80A 300mA	06240111R0	30
	100A		RKN-b 3P+N 100A 300mA	06240114R0	30
	25A	300mA	RKN-b 3P+N 25A 300mA	06240096R0	30
	40A		RKN-b 3P+N 40A 300mA	06240102R0	30
	63A		RKN-b 3P+N 63A 300mA	06240105R0	30
	80A		RKN-b 3P+N 80A 300mA	06240111R0	30
	100A		RKN-b 3P+N 100A 300mA	06240114R0	30

DIN rail mounting

RKN-b type

CE
Certificate

Order No. A type

Pole	In	I∆n	Model	Order No.	Pack. unit (Pcs.)
1P+N	25A	30mA	RKN-b 1P+N 25A 30mA A type	06220749R0	60
	40A		RKN-b 1P+N 40A 30mA A type	06220755R0	60
	63A		RKN-b 1P+N 63A 30mA A type	06220758R0	60
	25A	100mA	RKN-b 1P+N 25A 100mA A type	06220750R0	60
	40A		RKN-b 1P+N 40A 100mA A type	06220756R0	60
	63A		RKN-b 1P+N 63A 100mA A type	06220759R0	60
	25A	300mA	RKN-b 1P+N 25A 300mA A type	06220751R0	60
	40A		RKN-b 1P+N 40A 300mA A type	06220757R0	60
	63A		RKN-b 1P+N 63A 300mA A type	06220760R0	60

Pole	In	I∆n	Model	Order No.	Pack. unit (Pcs.)
3P+N	25A	30mA	RKN-b 3P+N 25A 30mA A type	06240148R0	30
	40A		RKN-b 3P+N 40A 30mA A type	06240154R0	30
	63A		RKN-b 3P+N 63A 30mA A type	06240157R0	30
	25A	100mA	RKN-b 3P+N 25A 100mA A type	06240149R0	30
	40A		RKN-b 1P+N 40A 100mA A type	06240155R0	30
	63A		RKN-b 3P+N 63A 100mA A type	06240158R0	30
	25A	300mA	RKN-b 3P+N 25A 300mA A type	06240150R0	30
	40A		RKN-b 3P+N 40A 300mA A type	06240156R0	30
	63A		RKN-b 3P+N 63A 300mA A type	06240159R0	30

Rated conditional short-circuit capacity

RCCB (RKN, RKN-b)				
		BKN 1~63A (B, C, D)	BKN-b 1~63A (B, C, D)	BKH 63~125A (C, D)
1P+N	25A	6kA	10kA	-
	32A	6kA	10kA	-
	40A	6kA	10kA	-
	63A	6kA	10kA	10kA
	80A	-	-	10kA
	100A	-	-	10kA
3P+N	25A	6kA	10kA	-
	32A	6kA	10kA	-
	40A	6kA	10kA	-
	63A	6kA	10kA	10kA
	80A	-	-	10kA
	100A	-	-	10kA

Metasol Meta Solution

MC/TOR

Contactors and Overload Relays

LSIS

Contactors and Overload Relays

Motor Starters

- *Compact design for space saving*
- *DIN rail and screw mountable (upto 150AF)*
- *Overload relays directly mountable to contactors separately*
- *Finger-proof design*
- *Easy to combine with manual motor starters*
- *Broad range of accessories*
- *World class products conforming to IEC and UL standards*

18AF	22AF	40AF	65AF	100AF	150AF
Contactor	**Contactor**	**Contactor**	**Contactor**	**Contactor**	**Contactor**
MC-6a, 9a, 12a, 18a	**MC-9b, 12b, 18b, 22b**	**MC-32a, 40a**	**MC-50a, 65a**	**MC-75a, 85a, 100a**	**MC-130a, 150a**
Rated current: 6, 9, 12, 18A	Rated current: 9, 12, 18, 22A	Rated current: 32, 40A	Rated current: 50, 65A	Rated current: 75, 85, 100A	Rated current: 130, 150A
Rated insulation voltage: 690V	Rated insulation voltage: 690V	Rated insulation voltage: 1000V	Rated insulation voltage: 1000V	Rated insulation voltage: 1000V	Rated insulation voltage: 1000V
Overload relay MT-12	**Overload relay MT-32**	**Overload relay MT-32**	**Overload relay MT-63**	**Overload relay MT-95**	**Overload relay MT-150**
Current range: 0.1~18A	Current range: 0.1~40A	Current range: 0.1~40A	Current range: 4~65A	Current range: 7~100A	Current range: 34~150A
Trip class: Class10A, 20	Trip class: Class10A, 20	Trip class: Class10A, 20	Trip class: Class10A, 20	Trip class: Class10A, 20	Trip class: Class10A, 20

225AF	400AF	800AF	1260AF	2650AF
Contactor **MC-185a, 225a** Rated current: 185, 225A Rated insulation voltage: 1000V **Overload relay MT-225** Current range: 65~240A Trip class: Class10A, 20	**Contactor** **MC-265a, 330a, 400a** Rated current: 265, 330, 400A Rated insulation voltage: 1000V **Overload relay MT-400** Current range: 85~400A Trip class: Class10A, 20	**Contactor** **MC-500a, 630a, 800a** Rated current: 500, 630, 800A Rated insulation voltage: 1000V **Overload relay MT-800** Current range: 200~800A Trip class: Class10A, 20	**Contactor** **MC-1260a** Rated current: 1260A Rated insulation voltage: 1000V	**Contactor** **MC-1400a, 1700a, 2100a. 2650a** Rated current: 1400, 1700, 2100, 2650A Rated insulation voltage: 1000V

MC/TOR
Accessories

Perfect combination of peripheral devices and various accessories

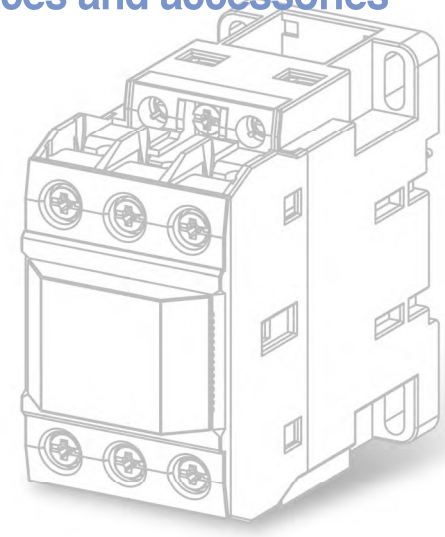
Offering economical solution with compact size & easy connection

Perfect system with other devices and accessories

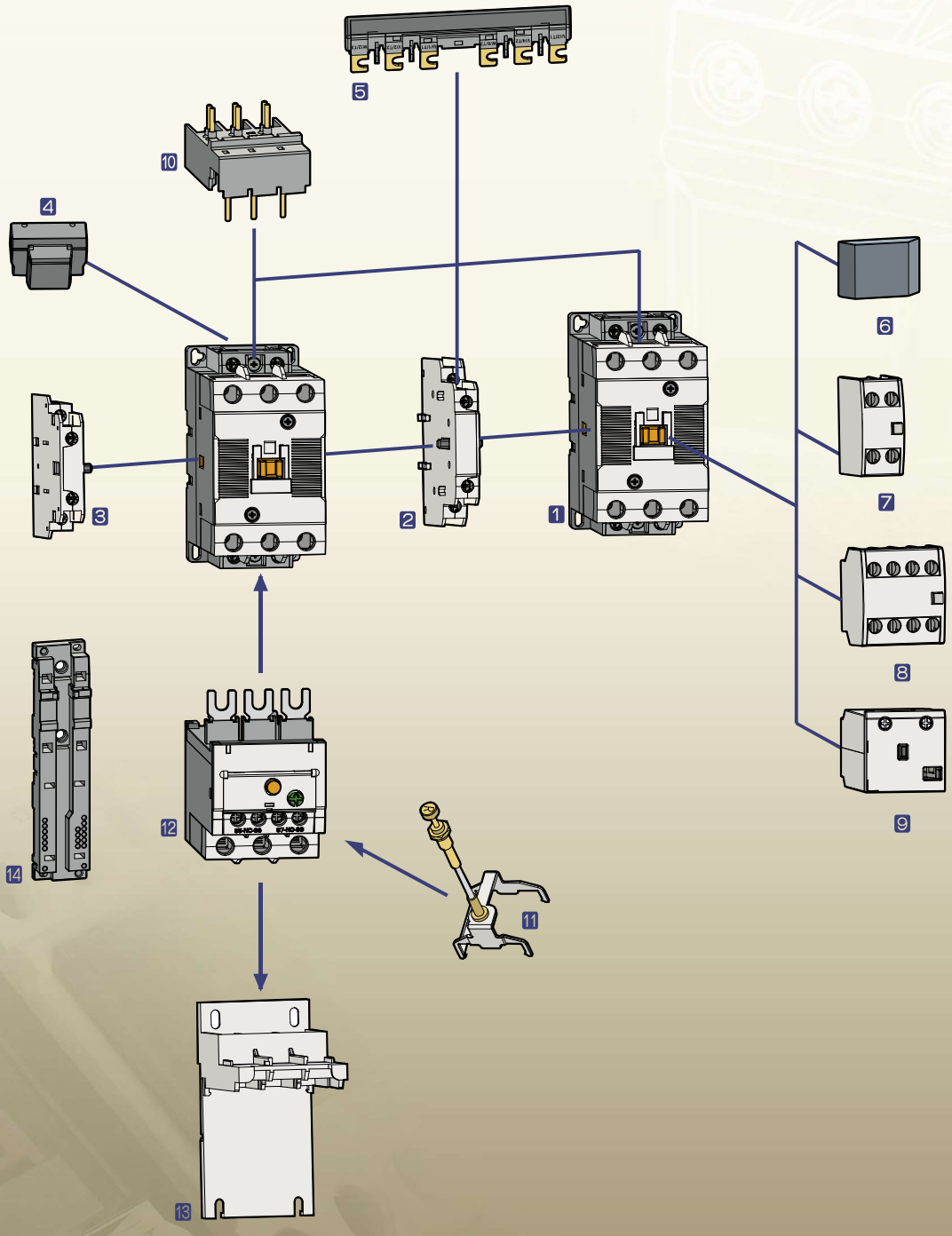
■ One-touch connection
- Din Rail connection without any special tools
- Direct combine a surge unit

■ Simple wiring
- Mounting unit, Adapter
- Reversing wire set

■ Easy Maintenance
- 4-terminal type: Easy wiring of operation coil
- Module type of Screw terminal
- Interlock unit with built-in auxiliary contacts(2NO built-in)



Advanced accessories for Metasol contactors



1 Contactor
2 Interlock unit
3 Auxiliary contact unit
- side mount
4 Surge unit
5 Wire kit
6 Safety cover (Option)
7 Auxiliary contact unit
- front mount(2p)
8 Auxiliary contact unit
- front mount(4p)
9 Mechanical latch unit
10 Direct adaptor to MMS
11 Remote reset unit
12 Overload relay
13 Separate mounting unit
14 Mounting unit for use with MMS

Table of specifications

MC type
Magnetic Contactors

Frame size				18AF				22AF			
Type				MC-6a	MC-9a	MC-12a	MC-18a	MC-9b	MC-12b	MC-18b	MC-22b
	screws clamp terminals			●	●	●	●	●	●	●	●
	Lug clamp terminals										
Number of poles				3pole				3pole			
Rated operational voltage, Ue				690V				690V			
Rated insulation voltage, Ui				690V				690V			
Rated frequency				50/60Hz				50/60Hz			
Rated impulse withstand voltage, Uimp				6kV				6kV			
Maximum operating rate in operating cycles per hour(AC3)				1800 operations per hour				1800 operations per hour			
Durability	Mechanical			15 mil. operations				15 mil. operations			
	Electrical			2.5 mil. operations				2.5 mil. operations			
Current and power	AC-1, Thermal current		A	25	25	25	32	25	27	32	45
	AC-3	200/240V	kW	2.2	2.5	3.5	4.5	2.5	3.5	4.5	5.5
			A	9	11	13	18	11	13	18	22
		380/440V	kW	3	4	5.5	7.5	4	5.5	7.5	11
			A	7	9	12	18	9	12	18	22
		500/550V	kW	3	4	7.5	7.5	4	7.5	7.5	15
			A	6	7	12	13	7	12	13	20
		690V	kW	3	4	7.5	7.5	4	7.5	7.5	15
			A	4	5	9	9	6	9	9	18
		1000V	kW	-	-	-	-	-	-	-	-
			A	-	-	-	-	-	-	-	-
Rated Short-time withstand current (IEC 60947)		1s	A	210	250	280	300	250	280	300	400
		10s	A	105	110	120	130	110	120	154	186
		30s	A	70	70	80	85	70	80	100	130
		1min	A	61	61	61	70	61	61	84	90
		3min	A	40	45	47	50	45	50	60	60
		10min	A	30	30	30	40	30	30	40	50
		≥15min	A	25	26	28	30	26	28	30	45
UL rating (50/60Hz)	Continuous current		A	25	25	25	32	25	25	40	40
	Single phase	110~120V	HP	0.5	0.5	0.75	1	0.5	0.75	1	2
		220~240V	HP	1.5	1.5	2	3	1.5	2	3	3
	Three phase	200~208V	HP	2	2	3	7.5	2	3	7.5	7.5
		220~240V	HP	3	3	5	7.5	3	5	7.5	10
		440~480V	HP	5	5	7.5	10	5	7.5	10	15
		550~600V	HP	7.5	7.5	10	15	7.5	10	15	20
	NEMA size			00	00	0	1	00	0	1	
Size and weight	AC control	Weight	kg	0.33				0.34			
		Size(W×H×D)	mm	45×73.5×80.4				45×73.5×87.4			
	DC control	Weight	kg	0.4				0.41			
		Size(W×H×D)	mm	45×73.5×96.6				45×73.5×103.6			
Auxiliary(standard)				1a or 1b				1a1b			
Auxiliary	Side mount			UA-1				UA-1			
	Front mount			UA-2, UA-4				UA-2, UA-4			

Note) Minimum conduct current of Auxiliary contactor is DC 17V 5mA.

MT type
Thermal Overload Relays

Type				MT-12/□	MT-32/□
	screws clamp terminals			●	●
	Lug clamp terminals				
Rated operational voltage, Ue				690V	690V
Rated insulation voltage, Ui				690V	690V
Rated impulse withstand voltage, Uimp				6kV	6kV
Trip class				10A, 20	10A, 20
Setting range				0.1~18A	0.1~40A
Size and weight		Weight	kg	0.1	0.17
		Size(W×H×D)	mm	45×73.2×63.7	45×75×90

* The safety cover of magnetic contactor and thermal overload relay is optional.

40AF		65AF		100AF		
MC-32a	MC-40a	MC-50a	MC-65a	MC-75a	MC-85a	MC-100a
●	●	●	●	●	●	●
		●	●	●	●	●
3pole		3pole		3pole		
1000V		1000V		1000V		
1000V		1000V		1000V		
50/60Hz		50/60Hz		50/60Hz		
8kV		8kV		8kV		
1800 operations per hour		1200 operations per hour		1200 operations per hour		
12 mil. operations		12 mil. operations		12 mil. operations		
2 mil. operations		2 mil. operations		2 mil. operations		1 mil. operations
55	60	100	115	125	135	160
7.5	11	15	18.5	22	25	30
32	40	55	65	75	85	105
15	18.5	22	30	37	45	55
32	40	50	65	75	85	105
18.5	22	30	33	37	45	55
28	32	43	60	64	75	85
18.5	22	30	33	37	45	55
20	23	28	35	42	45	65
22	22	30	30	37	37	37
17	17	23	23	28	28	28
600	700	1000	1050	1100	1200	1320
260	300	550	700	750	800	900
160	190	330	380	400	450	500
100	120	250	270	300	350	400
70	80	150	200	220	270	270
55	65	90	120	140	170	180
50	60	87	96	114	150	160
50	60	70	100	110	135	160
2	3	3	5	5	7.5	10
5	7.5	10	15	15	15	20
7.5	15	20	25	25	30	30
10	15	25	30	30	40	40
20	30	40	50	50	60	75
25	30	50	60	60	75	75
1P	2				3	
0.55		1.05		1.93		
69×83×90		79×106×119		94×140×135.8		
0.77		1.3		2.8		
69×83×117.1		79×106×146.4		94×140×172.3		
2a2b		**2a2b**		**2a2b**		
UA-1		UA-1		UA-1		
UA-2, UA-4		UA-2, UA-4		UA-2, UA-4		

MT-32/□	MT-63/□	MT-95/□
●	●	●
	●	●
690V	690V	690V
690V	690V	690V
6kV	6kV	6kV
10A, 20	10A, 20	10A, 20
0.1~40A	4~65A	7~100A
0.17	0.31/0.33	0.48/0.5
45×75×90	55×81×100	70×97×110

Table of specifications

MC type
Magnetic Contactors



Frame size				150AF		225AF		400AF		
Type				MC-130a	MC-150a	MC-185a	MC-225a	MC-265a	MC-330a	MC-400a
	screws clamp terminals			●	●	●	●	●	●	●
	Lug clamp terminals			●	●	●	●			
Number of poles				3pole		3pole		3pole		
Rated operational voltage, Ue				1000V		1000V		1000V		
Rated insulation voltage, Ui				1000V		1000V		1000V		
Rated frequency				50/60Hz		50/60Hz		50/60Hz		
Rated impulse withstand voltage, Uimp				8kV		8kV		8kV		
Maximum operating rate in operating cycles per hour(AC3)				1200 operations per hour		1200 operations per hour		1200 operations per hour		
Durability	Mechanical			5 mil. operations		5 mil. operations		5 mil. operations		2.5 mil. operations
	Electrical			1 mil. operations		1 mil. operations		1 mil. operations		0.5 mil. operations
Current and power	AC-1, Thermal current		A	200	250	300	350	400	500	520
	AC-3	200/240V	kW	37	45	55	75	80	90	125
			A	130	150	185	225	265	330	400
		380/440V	kW	60	75	90	132	147	160	200
			A	130	150	185	225	265	330	400
		500/550V	kW	60	70	110	132	147	160	225
			A	90	100	180	200	225	280	350
		690V	kW	55	55	110	140	160	200	250
			A	60	60	120	150	185	220	300
		1000V	kW	75	75	132	132	147	147	147
			A	50	50	90	90	105	105	105
Rated Short-time withstand current (IEC 60947)		1s	A	1350	1800	2000	2500	3500	4000	4600
		10s	A	950	1200	1500	1700	2400	3000	4400
		30s	A	700	800	1000	1200	1500	2500	2974
		1min	A	550	600	800	1000	1100	1700	1846
		3min	A	350	450	520	700	800	1000	1313
		10min	A	200	300	350	500	600	620	760
		≥15min	A	175	280	320	400	500	553	699
UL rating (50/60Hz)	Continuous current		A	200	250	300	350	400	500	520
	Single phase	110~120V	HP	10	15	15	15	-	-	-
		220~240V	HP	20	25	30	40	-	-	-
	Three phase	200~208V	HP	40	40	60	60	75	100	125
		220~240V	HP	40	50	60	75	100	100	150
		440~480V	HP	75	100	125	150	200	200	300
		550~600V	HP	75	75	125	150	200	200	300
	NEMA size				4			5		
Size and weight 	AC control	Weight	kg	2.4		5.4		9.2		
		Size(W×H×D)	mm	119×158×130.3		138×203×185.1		163×243×204.4		
	DC control	Weight	kg							
		Size(W×H×D)	mm							
Auxiliary(standard)				2a2b		2a2b		2a2b		
Auxiliary	Side mount			UA-1		AU-100, AU-100E (Max.4a4b)		AU-100, AU-100E (Max.4a4b)		
	Front mount			UA-2, UA-4		-		-		

MT type
Thermal Overload Relays



Type				MT150/□	MT225/□	MT400/□
	screws clamp terminals			●	●	●
	Lug clamp terminals			●	●	
Rated operational voltage, Ue				690V	690V	690V
Rated insulation voltage, Ui				690V	690V	690V
Rated impulse withstand voltage, Uimp				6kV	6kV	6kV
Trip class				10A, 20	10A, 20	10A, 20
Setting range				34~150A	65~240A	85~400A
Size and weight		Weight	kg	0.67	2.5	2.6
		Size(W×H×D)	mm	95×109×113	147×141×184	151×171×198

* The safety cover of magnetic contactor and thermal overload relay is optional.

LS Meta-MEC Manual Motor Starters provide completed ranges up to 100A

32AF

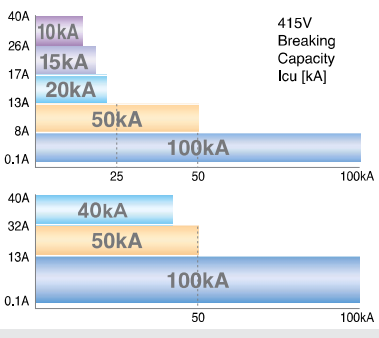
0.1~0.16... 28~40A (17 step)

MMS-32S

- Standard

MMS-32H
MMS-32HI

- High break
- Magnetic release



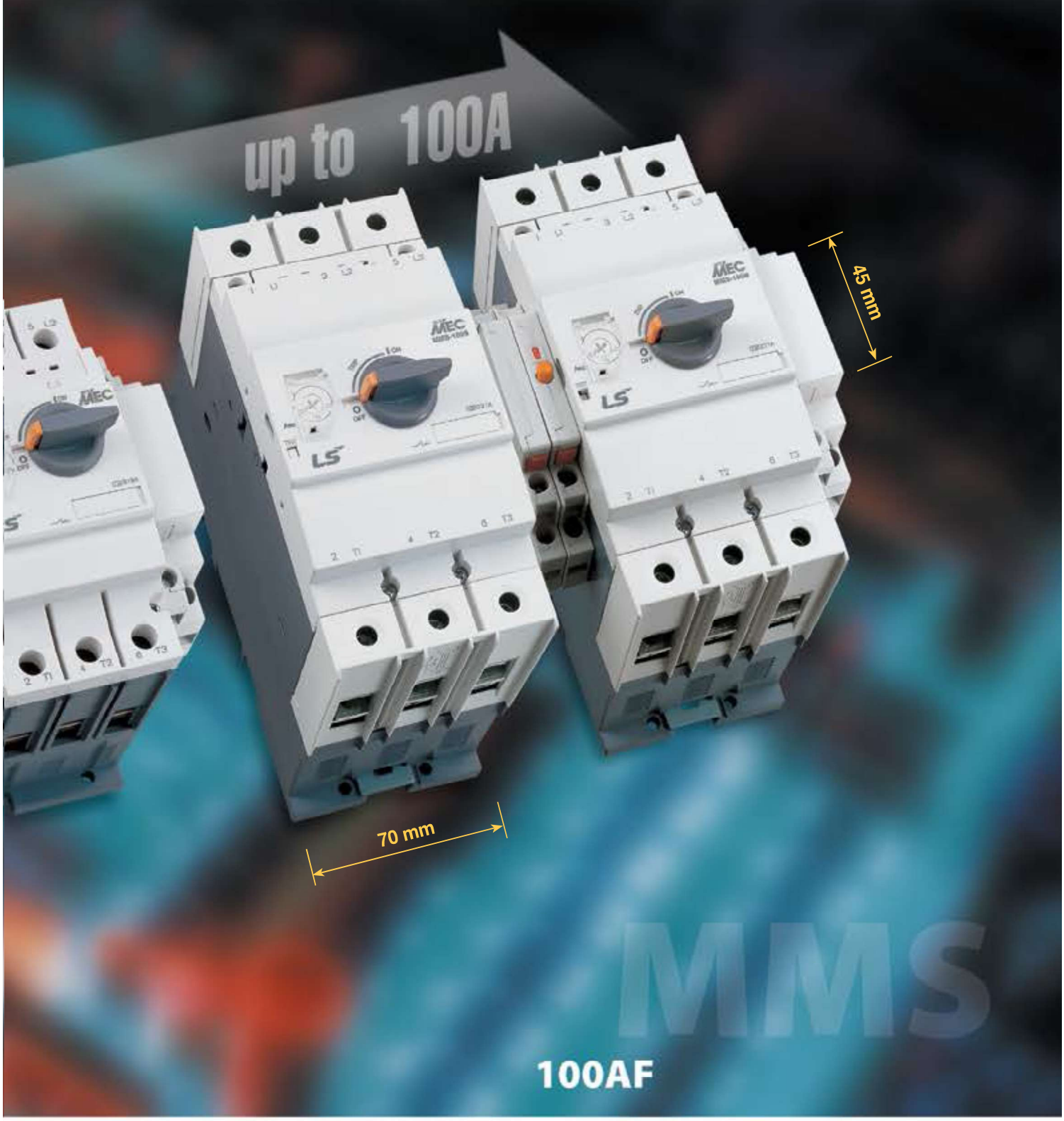
6~10... 47~65A (10 step)

MMS-63S

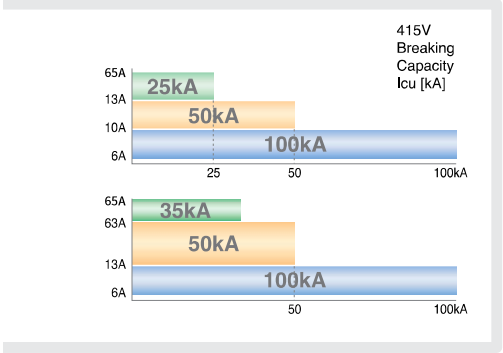
- Standard

MMS-63H
MMS-63HI

- High break
- Magnetic release



63AF

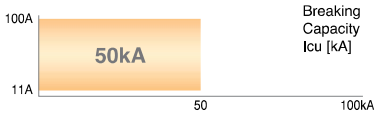


100AF

11~17... 80~100A (10 step)

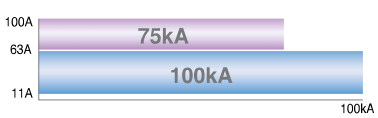
MMS-100S

- Standard



MMS-100H
MMS-100HI

- High break
- Magnetic release



LS Meta-MEC Manual Motor Starters deliver more efficiency through various functions and compact design

MMS 32H... 32A

[Scale 1:1]

- Finger safe terminals
- Front mounted auxiliary contact
- Dial cover
- Easy mounting onto DIN-rails
- Large scale for current setting
- Handle Lock device(Off position)
- Auxiliaries are just snapped on: easy, fast, without tools
- Three position operator handle: ON-OFF-TRIP (Only 100AF is applied)
- Dial cover lock device
- Test trip device for checks of the trip mechanism
- Identification labels

Handle Lock

Dial cover

Terminals

MMS-32

Screw

MMS-63

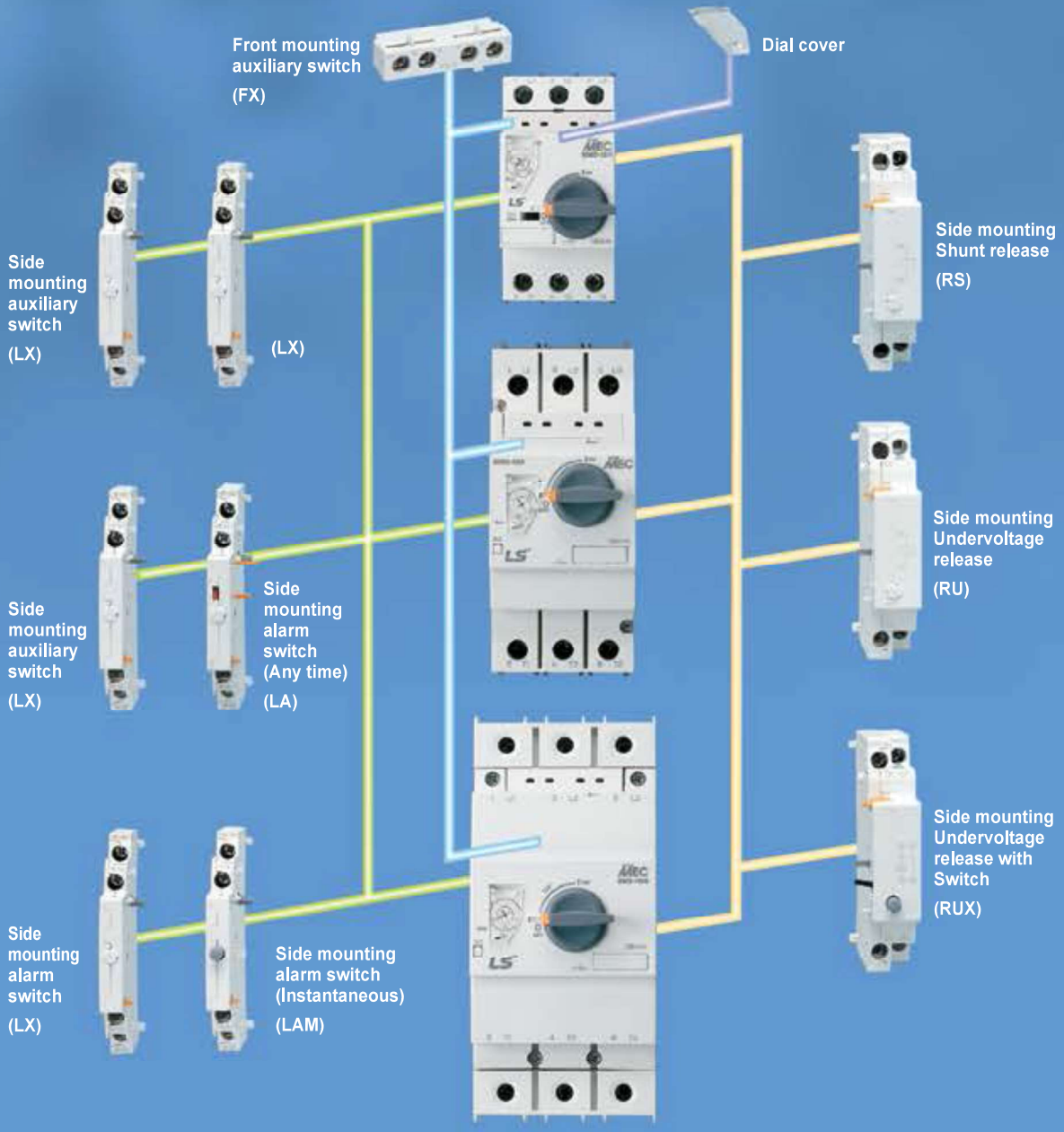
Lug

MMS-100

Lug

Common use from 32 to 100AF

A wide variety of accessories enables a flexible response to changes in specifications



Function

- Protection of group installation
- Protection of circuits
- Motor protection
- Starter protection
- Wide range of ambient temperature compensation
- Phase failure protection

Feature

- 45mm width(32AF), 55mm width(63AF), 70mm width(100AF)
- Three position operator : ON-OFF-TRIP (Only 100AF is applied)
- Complete range of common accessories
- Handle lock in the OFF position
- Class 10 overload trip characteristics
- Trip test
- Finger safe terminal
- Din rail & Screw mounting
- Ready for IE3

Standard

- Comply with the specifications in accordance with
  IEC 60947-2 & IEC 60947-4-1
  UL508 (Manual motor controller)
  UL508 (Combination motor controller type E starter)
  CSA C22.2 NO.14
  GB14048

Certification

- KEMA CB type certificate
- EC-Declaration of conformity
- UL listed
- CSA certified
- CCC

IEC 60947, UL 508
UL 508 Type E, K 60947, GB 14048

Manual Motor Starters

Product Selection Guide

Quick selection table ... IEC rating

Frame			32AF																			
Type	Current adjustable type		MMS-32S										MMS-32H									
	Instantaneous type		-										MMS-32HI									
Breaking capacity			Standard										High breaking									
Handle Type			Toggle										Rotary									
Number of poles			3										3									
Rated operational voltage (Ue)			Up to 690V										Up to 690V									
Rated frequency			50/60 Hz										50/60 Hz									
Rated insulation voltage (Ui)			690V										690V									
Rated impulse voltage (Uimp)			6kV										6kV									
Utilization category	IEC 60 947-2 (Breaker)		Cat. A										Cat. A									
	IEC 60 947-4 (Motor starter)		AC 3										AC 3									
Mechanical endurance (Operating)			100,000										100,000									
Electrical endurance (Cycles)			100,000										100,000									
Max operating frequency per hour (Ope./h)			25										25									
Temperature compensation (Operation)			-20 ~ +60°C										-20 ~ +60°C									
Instantaneous short circuit release			13 × Ie max.										13 × Ie max.									
Overload protection			O										O									
Phase failure function			O										O									
Trip indicating function			×										×									
Test function			O										O									
Weight (g)			320										360									
Rated breaking capacity (kA)	Rated operational current (Ie)	Thermal release Adjustment range (Ie)	220V 240V 230V		415V 400V		460V 440V		525V 500V		690V 600V		220V 240V 230V		415V 400V		460V 440V		525V 500V		690V 600V	
			Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics
	0.16	0.1~0.16	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	0.25	0.16~0.25	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	0.4	0.25~0.4	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	0.63	0.4~0.63	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	1	0.63~1	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	1.6	1~1.6	100	100	100	100	100	100	100	100	3	3	100	100	100	100	100	100	100	100	100	100
	2.5	1.6~2.5	100	100	100	100	100	100	50	38	3	3	100	100	100	100	100	100	100	100	8	8
	4	2.5~4	100	100	100	100	50	38	15	11	3	3	100	100	100	100	100	100	100	100	8	8
	6	4~6	100	100	100	100	15	11	10	8	3	3	100	100	100	100	100	100	100	100	6	6
	8	5~8	100	100	100	100	15	11	10	8	3	3	100	100	100	100	50	38	50	38	6	6
	10	6~10	100	100	50	38	15	11	6	5	3	3	100	100	100	100	50	38	50	38	6	6
	13	9~13	100	100	50	38	10	8	6	5	3	3	100	100	100	100	50	38	42	32	6	6
	17	11~17	50	38	20	15	10	8	6	5	3	3	100	100	50	38	20	15	10	8	4	4
	22	14~22	40	30	15	11	8	6	6	5	3	3	100	100	50	38	20	15	10	8	4	4
	26	18~26	40	30	15	11	8	6	5	4	3	3	100	100	50	38	20	15	10	8	4	4
	32	22~32	30	22	10	5	6	4	5	4	3	3	100	100	50	38	20	15	10	8	4	4
	40	28~40	20	15	10	5	5	3	4	3	2	2	100	100	40	30	15	11	8	6	3	3
	50	34~50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	63	45~63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	65	47~65	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	75	55~75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	90	70~90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	100	80~100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-




63AF																				100AF																			
MMS-63S										MMS-63H										MMS-100S										MMS-100H									
-										MMS-63HI										-										MMS-100HI									
Standard										High breaking										Standard										High breaking									
Rotary										Rotary										Rotary										Rotary									
3										3										3										3									
Up to 690V										Up to 690V										Up to 690V										Up to 690V									
50/60 Hz										50/60 Hz										50/60 Hz										50/60 Hz									
1,000V										1,000V										1,000V										1,000V									
8kV										8kV										8kV										8kV									
Cat. A										Cat. A										Cat. A										Cat. A									
AC 3										AC 3										AC 3										AC 3									
50,000										50,000										50,000										50,000									
25,000										25,000										25,000										25,000									
25										25										25										25									
-20 ~ +60°C										-20 ~ +60°C										-20 ~ +60°C										-20 ~ +60°C									
13 × Ie max.										13 × Ie max.										13 × Ie max.										13 × Ie max.									
O										O										O										O									
O										O										O										O									
×										×										O										O									
O										O										O										O									
1,000										1,000										2,200										2,200									
220V 240V 230V		415V 400V		460V 440V		525V 500V		690V 600V		220V 240V 230V		415V 400V		460V 440V		525V 500V		690V 600V		220V 240V 230V		415V 400V		460V 440V		525V 500V		690V 600V		220V 240V 230V		415V 400V		460V 440V		525V 500V		690V 600V	
Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100	100	100	100	15	12	10	8	4	3	100	100	100	100	50	38	50	38	6	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100	100	50	38	10	8	6	5	4	3	100	100	100	100	50	38	42	32	6	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100	100	25	19	10	8	6	5	4	3	100	100	50	50	50	38	12	9	5	5	100	100	50	38	40	30	25	19	10	8	100	100	100	100	50	38	35	27	12	9
50	38	25	19	10	8	6	5	4	3	100	100	50	50	50	38	12	9	5	5	100	100	50	38	40	30	25	19	10	8	100	100	100	50	50	38	35	27	12	9
50	38	25	19	10	8	6	5	4	3	100	100	50	50	35	27	12	9	5	5	100	100	50	38	40	30	25	19	10	8	100	100	100	50	50	38	35	27	12	9
50	38	25	19	10	8	6	5	4	3	100	100	50	50	35	27	10	8	5	5	100	100	50	38	40	30	15	11	10	8	100	100	100	50	50	38	25	19	12	9
50	38	25	19	10	8	6	5	4	3	100	100	50	50	35	27	10	8	5	5	100	100	50	38	40	30	15	11	6	5	100	100	100	50	50	38	20	15	12	9
50	38	25	19	10	8	6	5	4	3	100	100	50	50	35	27	10	8	5	5	100	100	50	38	40	30	12	9	6	5	100	100	100	50	50	38	15	11	10	8
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50	38	25	19	10	8	6	5	4	3	75	50	35	27	25	19	6	5	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	100	50	38	40	30	8	6	5	4	100	100	75	50	50	38	12	9	6	6
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	100	50	38	40	30	8	6	5	4	100	100	75	50	50	38	12	9	6	6
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	100	50	38	40	30	8	6	5	4	100	100	75	50	50	38	12	9	6	6

Manual Motor Starters

Product Selection Guide

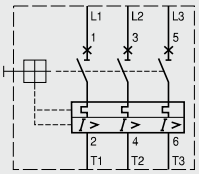
Standard type

- Adjustable thermal release
- Magnetic release 13 Ie max.
- Trip class 10
- Protective function
- Phase-failure protection
  - phase-failure
  - short circuit
  - overload

MMS-32S

MMS-63S

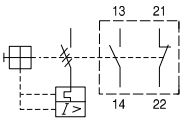
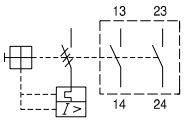
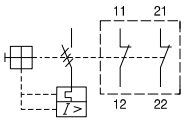
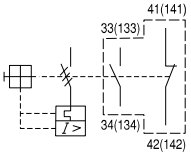
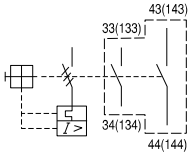
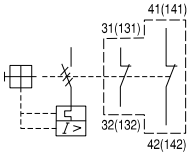
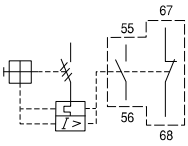
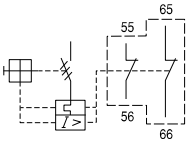
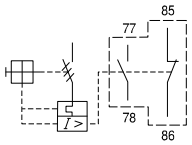
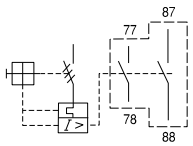
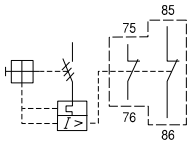
MMS-100S



(Circuit diagram)

Type	Rated operational current Ie [A]	Thermal release Adjustment range [A]	Magnetic release Operating current [A]	Switching of 3 phase AC motors, AC-2, AC-3						400/415V	
				3-phase [kW] (50/60Hz)			3-phase [HP] (60Hz)				
				230V	400V	690V	230V	460V	575V	Icu [kA]	Ics [kA]
MMS-32S	0.16	0.1...0.16	2.1	-	0.02	-	-	-	-	100	100
	0.25	0.16...0.25	3.3	0.03	0.06	-	-	-	-	100	100
	0.4	0.25...0.4	5.2	0.06	0.09	-	-	-	-	100	100
	0.63	0.4...0.63	8.2	0.09	0.12	0.25	-	-	-	100	100
	1	0.63...1.0	13	0.12	0.25	0.55	-	1/2	1/2	100	100
	1.6	1.0...1.6	20.8	0.25	0.55	1.1	1/3	3/4	1	100	100
	2.5	1.6...2.5	32.5	0.37	0.75	1.5	1/2	1½	1½	100	100
	4	2.5...4.0	52	0.75	1.5	3	1	2	3	100	100
	6	4...6	78	1.5	2.2	4	1½	5	5	100	100
	8	5...8	104	1.5	3	5.5	2	5	5	100	100
	10	6...10	130	3	4	7.5	3	7½	10	50	38
	13	9...13	169	3	5.5	11	3	7½	10	50	38
	17	11...17	221	4	7.5	11	5	10	15	20	15
	22	14...22	286	4	7.5	15	7½	15	20	15	11
	26	18...26	338	5.5	11	18.5	7½	15	20	15	11
	32	22...32	416	7.5	15	22	10	20	30	10	5
	40	28~40	520	7.5	18.5	30	15	30	40	10	5
MMS-63S	10	6~10	130	3	4	7.5	3	7½	10	100	100
	13	9~13	169	3	5.5	11	3	7½	10	50	38
	17	11~17	221	4	7.5	11	5	10	15	25	19
	22	14~22	286	4	7.5	15	7½	15	20	25	19
	26	18~26	338	5.5	11	18.5	10	20	25	25	19
	32	22~32	416	7.5	15	22	10	25	30	25	19
	40	28~40	520	7.5	18.5	30	15	30	40	25	19
	50	34~50	650	11	22	45	15	40	50	25	19
	63	45~63	819	15	30	55	20	50	60	25	19
	65	47~65	845	15	30	55	20	50	60	25	19
MMS-100S	17	11~17	221	4	7.5	11	5	10	15	50	38
	22	14~22	286	4	7.5	15	7½	15	20	50	38
	26	18~26	338	5.5	11	18.5	10	20	25	50	38
	32	22~32	416	7.5	15	22	10	25	30	50	38
	40	28~40	520	7.5	18.5	30	15	30	40	50	38
	50	34~50	650	11	22	45	15	40	50	50	38
	63	45~63	819	15	30	55	20	50	60	50	38
	75	55~75	975	22	37	63	25	60	75	50	38
	90	70~90	1170	30	45	75	30	75	100	50	38
	100	80~100	1300	30	45	90	40	75	100	50	38

Accessories (Electrical Auxiliaries)

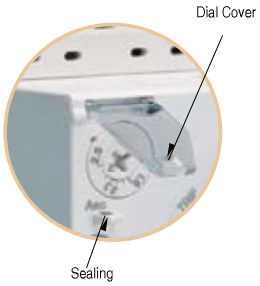
Type	Description	Connection diagram
FX... 	**Auxiliary Switch** · Front mounting · 2-pole · One front mounting module per circuit breaker	1NO1NC  2NO  2NC 
LX... 	**Auxiliary Switch** · Side mounting on the left · 2-pole · One side mounting module per circuit breaker	1NO1NC  2NO  2NC 
LA... 	**Any Trip Alarm Switch** · Operates in case of trip · Side mounting on the left · 2-pole · Set LA first in case of using LX together (MMS-63 can not accept LX and LA together) · For MMS-32 and MMS-63/100 products are separated.	1NO1NC  2NC 
LAM... 	**Magnetic Trip Alarm Switch** · Operates in case of short circuit accidents that is over 20 times of the rated current · Side mounting on the left · 2-pole · Set LAM first in case of using LX together	1NO1NC  2NO  2NC 

● Enclosure

Case cover of MMS enclosure is specifically designed with dust-proof and corrosive-proof structure.
Therefore, it is the optimum product to use in dusty areas such as cement plants, cotton mills as well as in the presence of corrosive gas or liquid (excl. explosive, flammable gas) such as fertilizer, refinery, and plating plant.

· Application Model: MMS-32H/HI
· Operation temp. : -20~ +60°C
· CE and UL certified
· Degree of protection : IP65
· Material of insulation :Plastic(ABS)

Type	Application MMS	Remarks
EPH-32	MMS-32H, 32HI	Surface mount



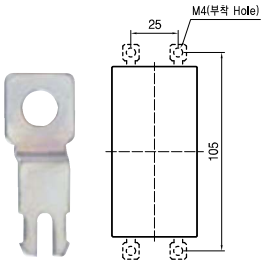
● Dial Cover

Dial cover is used to protect the set value from the operation that is not intended.
· Application Model : MMS-32, 63,100 (All types)

● Insulation Barrier

Insulation barrier is used to enlarge the creepage distance and clearance to meet the requirement of UL.
· Application Model : MMS-100

Type	Application MMS
IB100	MMS-100S, 100H, 100HI



● Screw mounting holder

32AF MMS is only for DIN rail mountable by itself. Screw mounting holder is used to mount MMS on a panel by screws.
· Application Model : MMS-32

Type	Application MMS	Remarks
MP-32	MMS-32S, 32H, 32HI	For M4 screw

IEC performance data (Motor protection)

Standard type

● MMS 32S

Rated operational current I_e		0.16	0.25	0.4	0.63	1	1.6	2.5	4	6	8	10	13	17	22	26	32	40
Switching of standard three-phase motors AC-2, AC-3																		
230/240V	[kW]	-	0.03	0.06	0.09	0.12	0.18/0.25	0.37	0.55/0.75	1.1/1.5	1.5	2.2/3	3	3.7/4	4	5.5	7.5	7.5
400/415V	[kW]	0.02	0.06	0.09	0.12	0.18/0.25	0.37/0.55	0.75	1.1/1.5	2.2	3	3.7/4	5.5	7.5	7.5	11	15	18.5
500V	[kW]	-	-	-	0.25	0.37	0.55/0.75	1.1	1.5/2.2	3	3.7	4/5.5	7.5	11	11	15	18.5	22
690V	[kW]	-	-	-	0.25	0.37/0.55	0.75/1.1	1.5	2.2/3	3.7/4	5.5	7.5	11	11	15	18.5	22	30
Back-up fuses gG, gL,, only if Icc>I_{cu} (* = No back up fuse required)																		
230/240V	[kA]	*	*	*	*	*	*	*	*	*	*	*	*	*	125	125	125	160
400/415V	[kA]	*	*	*	*	*	*	*	*	*	*	80	80	100	100	100	100	125
440/460V	[kA]	*	*	*	*	*	*	*	50	50	63	63	80	80	100	100	100	100
500V	[kA]	*	*	*	*	*	*	50	40	50	63	63	80	80	80	80	80	80
690V	[kA]	*	*	*	*	*	20	35	40	50	63	63	63	63	63	63	63	63
Ultimate short-circuit breaking capacity I_{cu}																		
230/240V	[kA]	100	100	100	100	100	100	100	100	100	100	100	100	50	40	40	30	20
400/415V	[kA]	100	100	100	100	100	100	100	100	100	100	50	50	20	15	15	15	10
440/460V	[kA]	100	100	100	100	100	100	100	50	15	15	15	10	10	8	8	6	5
500V	[kA]	100	100	100	100	100	100	50	15	10	10	6	6	6	6	6	5	4
690V	[kA]	100	100	100	100	100	3	3	3	3	3	3	3	3	3	3	3	2
Rated service short-circuit breaking capacity I_{cs}																		
230/240V	[kA]	100	100	100	100	100	100	100	100	100	100	100	100	38	30	30	22	15
400/415V	[kA]	100	100	100	100	100	100	100	100	100	100	38	38	15	11	11	11	8
440/460V	[kA]	100	100	100	100	100	100	100	38	11	11	11	8	8	6	6	4	3
500V	[kA]	100	100	100	100	100	100	38	11	8	8	5	5	5	5	5	4	3
690V	[kA]	100	100	100	100	100	3	3	3	3	3	3	3	3	3	3	3	2

● MMS 63S

Rated operational current I_e		10	13	17	22	26	32	40	50	63	65
Switching of standard three-phase motors AC-2, AC-3											
230/240V	[kW]	2.2/3	3	3.7/4	4	5.5	7.5	7.5	11	15	15
400/415V	[kW]	3.7/4	5.5	7.5	7.5	11	15	18.5	22	30	30
500V	[kW]	4/5.5	7.5	11	11	15	18.5	22	30	37	37
690V	[kW]	7.5	11	11	15	18.5	22	30	45	55	55
Back-up fuses gG, gL,, only if Icc>I_{cu} (* = No back up fuse required)											
230/240V	[kA]	*	*	*	125	125	160	160	160	200	200
400/415V	[kA]	*	80	100	125	125	125	125	160	160	180
440/460V	[kA]	80	80	100	100	100	100	100	100	125	125
500V	[kA]	80	80	80	80	80	80	80	80	80	80
690V	[kA]	63	63	63	63	63	63	63	63	80	60
Ultimate short-circuit breaking capacity I_{cu}											
230/240V	[kA]	100	100	100	50	50	50	50	50	50	50
400/415V	[kA]	100	50	25	25	25	25	25	25	25	25
440/460V	[kA]	15	10	10	10	10	10	10	10	10	10
500V	[kA]	10	6	6	6	6	6	6	6	6	6
690V	[kA]	4	4	4	4	4	4	4	4	4	4
Rated service short-circuit breaking capacity I_{cs}											
230/240V	[kA]	100	100	100	38	38	38	38	38	38	38
400/415V	[kA]	100	38	19	19	19	19	19	19	19	19
440/460V	[kA]	12	8	8	8	8	8	8	8	8	8
500V	[kA]	8	5	5	5	5	5	5	5	5	5
690V	[kA]	3	3	3	3	3	3	3	3	3	3

Standard type

● MMS 100S

Rated operational current I_e		17	22	26	32	40	50	63	75	90	100
Switching of standard three-phase motors AC-2, AC-3											
230/240V	[kW]	3.7/4	4	5.5	7.5	7.5	11	15	22	30	30
400/415V	[kW]	7.5	7.5	11	15	18.5	22	30	37	45	45
500V	[kW]	11	11	15	18.5	22	30	37	45	55	63
690V	[kW]	11	15	18.5	22	30	45	55	63	75	90
Back-up fuses gG, gL,, only if Icc>I_{cu} (* = No back up fuse required)											
230/240V	[kA]	*	*	*	*	*	*	*	*	*	*
400/415V	[kA]	100	125	125	125	160	160	160	160	160	160
440/460V	[kA]	100	125	125	125	125	125	160	160	160	160
500V	[kA]	100	100	100	100	100	100	100	125	125	125
690V	[kA]	63	80	80	80	80	80	80	100	125	125
Ultimate short-circuit breaking capacity I_{cu}											
230/240V	[kA]	100	100	100	100	100	100	100	100	100	100
400/415V	[kA]	50	50	50	50	50	50	50	50	50	50
440/460V	[kA]	40	40	40	40	40	40	40	40	40	40
500V	[kA]	25	25	25	15	15	12	12	8	8	8
690V	[kA]	10	10	10	10	6	6	6	5	5	5
Rated service short-circuit breaking capacity I_{cs}											
230/240V	[kA]	100	100	100	100	100	100	100	100	100	100
400/415V	[kA]	38	38	38	38	38	38	38	38	38	38
440/460V	[kA]	30	30	30	30	30	30	30	30	30	30
500V	[kA]	19	19	19	11	11	9	9	6	6	6
690V	[kA]	8	8	8	8	5	5	5	4	4	4

High breaking type

● MMS 32H

Rated operational current I_e		0.16	0.25	0.4	0.63	1	1.6	2.5	4	6	8	10	13	17	22	26	32	40
Switching of standard three-phase motors AC-2, AC-3																		
230/240V	[kW]	-	0.03	0.06	0.09	0.12	0.18/0.25	0.37	0.55/0.75	1.1/1.5	1.5	2.2/3	3	3.7/4	4	5.5	7.5	7.5
400/415V	[kW]	0.02	0.06	0.09	0.12	0.18/0.25	0.37/0.55	0.75	1.1/1.5	2.2	3	3.7/4	5.5	7.5	7.5	11	15	1.8
500V	[kW]	-	-	-	0.25	0.37	0.55/0.75	1.1	1.5/2.2	3	3.7	4/5.5	7.5	11	11	15	18.5	22
690V	[kW]	-	-	-	0.25	0.37/0.55	0.75/1.1	1.5	2.2/3	3.7/4	5.5	7.5	11	11	15	18.5	22	30
Back-up fuses gG, gL,, only if Icc>I_{cu} (* = No back up fuse required)																		
230/240V	[kA]	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
400/415V	[kA]	*	*	*	*	*	*	*	*	*	*	*	*	100	125	125	125	160
440/460V	[kA]	*	*	*	*	*	*	*	*	*	80	80	80	80	100	100	100	125
500V	[kA]	*	*	*	*	*	*	*	*	*	63	80	80	80	80	80	80	100
690V	[kA]	*	*	*	*	*	*	35	40	50	63	63	63	63	63	63	63	80
Ultimate short-circuit breaking capacity I_{cu}																		
230/240V	[kA]	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
400/415V	[kA]	100	100	100	100	100	100	100	100	100	100	100	100	50	50	50	50	40
440/460V	[kA]	100	100	100	100	100	100	100	100	100	50	50	50	20	20	20	20	15
500V	[kA]	100	100	100	100	100	100	100	100	100	50	50	42	10	10	10	10	8
690V	[kA]	100	100	100	100	100	100	8	8	6	6	6	6	4	4	4	4	3
Rated service short-circuit breaking capacity I_{cs}																		
230/240V	[kA]	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
400/415V	[kA]	100	100	100	100	100	100	100	100	100	100	100	100	38	38	38	38	30
440/460V	[kA]	100	100	100	100	100	100	100	100	100	38	38	38	15	15	15	15	11
500V	[kA]	100	100	100	100	100	100	100	100	100	38	38	32	8	8	8	8	6
690V	[kA]	100	100	100	100	100	100	8	8	6	6	6	6	4	4	4	4	3

Note) * = Short circuit proof up to 50 or 100kA. No back up fuse required.

Manual motor controller (UL 508, CSA C22.2 as Manual motor controllers)

Combination Motor Controller
- Group Installation
- Type E starter

• MMS 32S

Rated operational current Ie			0.16	0.25	0.4	0.63	1	1.6	2.5	4	6	8	10	13	17	22	26	32	40
Max. short-circuit current																			
	240V	[kA]	100	100	100	100	100	100	100	100	100	100	50	50	40	30	30	20	20
	480V	[kA]	50	50	50	50	50	50	50	50	25	25	10	10	10	10	7.5	7.5	7.5
	600V	[kA]	10	10	10	10	10	10	10	5	5	5	5	5	5	5	5	5	5
Motor load																			
1 Phase	115V	[HP]	-	-	-	-	-	-	-	1/8	1/4	1/3	1/2	1/2	1	1½	2	2	3
	230V	[HP]	-	-	-	-	-	1/10	1/6	1/3	1/2	1	1½	2	3	3	3	5	7½
3 Phase	200V	[HP]	-	-	-	-	-	-	1/2	3/4	1	2	2	3	3	5	7½	7½	10
	230V	[HP]	-	-	-	-	-	-	1/2	3/4	1½	2	3	3	5	7½	7½	10	10
	460V	[HP]	-	-	-	-	-	3/4	1	2	3	5	5	7½	10	15	15	20	30
	575V	[HP]	-	-	-	-	1/2	3/4	1½	3	5	5	7½	10	15	20	20	30	30
Max. fuse size		[A]	1	1	1	1	3	6	10	15	20	30	40	50	60	80	100	125	125
Max. breaker size		[A]	15	15	15	15	15	15	15	15	20	30	40	50	60	80	100	125	125

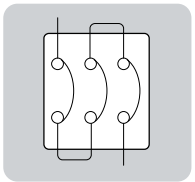
• MMS 63S

Rated operational current Ie			10	13	17	22	26	32	40	50	63	65
Max. short-circuit current												
	240V	[kA]	100	100	100	100	100	100	100	100	100	100
	480V	[kA]	50	50	40	40	40	40	40	40	40	40
	600V	[kA]	10	10	10	10	10	10	10	10	10	10
Motor load												
1 Phase	115V	[HP]	1/2	1/2	1	1½	2	2	3	3	5	5
	230V	[HP]	1½	2	3	3	3	5	7½	10	10	10
3 Phase	200V	[HP]	2	3	3	5	7½	7½	10	15	20	20
	230V	[HP]	3	3	5	7½	7½	10	10	15	20	20
	460V	[HP]	5	7½	10	15	15	20	30	30	40	40
	575V	[HP]	7½	10	15	20	20	30	30	40	60	60
Maximum rated current of fuse or breaker		[A]	600	600	600	600	600	600	600	600	600	600

• MMS 100S

Rated operational current Ie			17	22	26	32	40	50	63	75	90	100
Max. short-circuit current												
	240V	[kA]	100	100	100	100	100	100	100	100	100	100
	480V	[kA]	50	50	50	50	50	50	40	40	40	40
	600V	[kA]	10	10	10	10	10	10	10	10	10	10
Motor load												
1 Phase	115V	[HP]	1	1½	2	2	3	3	5	5	7½	10
	230V	[HP]	3	3	3	5	7½	10	10	15	20	20
3 Phase	200V	[HP]	3	5	7½	7½	10	15	20	20	25	30
	230V	[HP]	5	7½	7½	10	10	15	20	25	30	30
	460V	[HP]	10	15	15	20	30	30	40	50	60	75
	575V	[HP]	15	20	20	30	30	40	60	60	75	100
Maximum rated current of fuse or breaker		[A]	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000

In case of 1-phase use
in series as shown below



• MMS 32S

Rated operational current Ie			0.16	0.25	0.4	0.63	1	1.6	2.5	4	6	8	10	13	17	22	26	32	40
Max. short-circuit current																			
	240V	[kA]	100	100	100	100	100	100	100	100	100	100	50	50	40	30	30	20	20
	480V	[kA]	50	50	50	50	50	50	50	50	25	25	10	10	10	10	7.5	7.5	7.5
	600V	[kA]	10	10	10	10	10	10	10	5	5	5	5	5	5	5	5	5	5
Motor load																			
1 Phase	115V	[HP]	-	-	-	-	-	-	-	1/8	1/4	1/3	1/2	1/2	1	1½	2	2	3
	230V	[HP]	-	-	-	-	-	1/10	1/6	1/3	1/2	1	1½	2	3	3	3	5	7½
3 Phase	200V	[HP]	-	-	-	-	-	-	1/2	3/4	1	2	2	3	3	5	7½	7½	10
	230V	[HP]	-	-	-	-	-	-	1/2	3/4	1½	2	3	3	5	7½	7½	10	10
	460V	[HP]	-	-	-	-	-	3/4	1	2	3	5	5	7½	10	15	15	20	30
	575V	[HP]	-	-	-	-	1/2	3/4	1½	3	5	5	7½	10	15	20	20	30	30
Max. fuse size		[A]	1	1	1	1	3	6	10	15	20	30	40	50	60	80	100	125	150
Max. breaker size		[A]	15	15	15	15	15	15	15	15	20	30	40	50	60	80	100	125	150

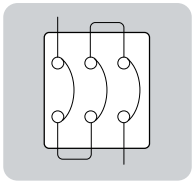
• MMS 63S

Rated operational current Ie			10	13	17	22	26	32	40	50	63	65
Max. short-circuit current												
	240V	[kA]	100	100	100	100	100	100	100	100	100	100
	480V	[kA]	25	25	25	25	25	25	25	25	25	25
	600V	[kA]	10	10	10	10	10	10	10	10	10	10
Motor load												
1 Phase	115V	[HP]	1/2	1/2	1	1½	2	2	3	3	5	5
	230V	[HP]	1½	2	3	3	3	5	7½	10	10	10
3 Phase	200V	[HP]	2	3	3	5	7½	7½	10	15	20	20
	230V	[HP]	3	3	5	7½	7½	10	10	15	20	20
	460V	[HP]	5	7½	10	15	15	20	30	30	40	40
	575V	[HP]	7½	10	15	20	20	30	30	40	60	60
Max. fuse size		[A]	40	50	60	80	100	125	150	200	250	250
Max. breaker size		[A]	40	50	60	80	100	125	150	200	250	250

• MMS 100S

Rated operational current Ie			17	22	26	32	40	50	63	75	90	100
Max. short-circuit current												
	240V	[kA]	100	100	100	100	100	100	100	100	100	100
	480V	[kA]	25	25	25	25	25	25	25	25	25	25
	600V	[kA]	10	10	10	10	10	10	10	10	10	10
Motor load												
1 Phase	115V	[HP]	1	1½	2	2	3	3	5	5	7½	10
	230V	[HP]	3	3	3	5	7½	10	10	15	20	20
3 Phase	200V	[HP]	3	5	7½	7½	10	15	20	20	25	30
3 Phase	230V	[HP]	5	7½	7½	10	10	15	20	25	30	30
	460V	[HP]	10	15	15	20	30	30	40	50	60	75
	575V	[HP]	15	20	20	30	30	40	60	60	75	100
Max. fuse size		[A]	60	80	100	125	150	200	250	300	350	400
Max. breaker size		[A]	60	80	100	125	150	200	250	300	350	400

In case of 1-phase use
in series as shown below



VEGA Electric

CONTACT	
MCB	**Miniature Circuit Breakers**
DL9-40	**MICRO Circuit Breakers**
TML1-63	**Residual Current Circuit Breakers**
AUT1	**Isolator Switch**
AUQ1	**Change Over Switch**
BRD	**Surg Arrester type 2**
GRT8-A/B	**Single-function Time Relay**
GRT8-M	**Multifunction Time Relay**
GRT8-LS	**Staircase Switch**
GRT8-ST	**Star/delta ON Delay Time Relay**
GRV8	**3-phase Voltage Relay**
AUP	Modular Pushbutton Switch

Application and functions

The Miniature Circuit Breaker (MCB) WDS63 automatically cuts off circuit when overload or short circuit occur, and provides function of switching, isolation and controlling. The device is suitable for use in residential building, non-residential building, energy sources, industry and infrastructure under the following different loads:

- B curve (3-5In) protection for circuit with low inductive load such as IT system
- C curve (5-10In) protection for circuit with inductive load or highly inductive innlumination system
- D curve (10-20In) protection for circuit with high inductive load or electric distribution system with high surge current such as LV/LV transformer, pumps, vertical transport devices

Advantages

- Two types of protection against overload and short circuit
- High short circuit breaking capacity 6kA
- The handle being sealable or equipped with padlock brackets avoids dangerous operation changes (ON/OFF)
- Full set of auxiliary devices available
  - auxiliary contact WDS63-AX
  - shunt trip WDS63-SR
  - under-voltage and over-voltage trip WDS63-SU

Range

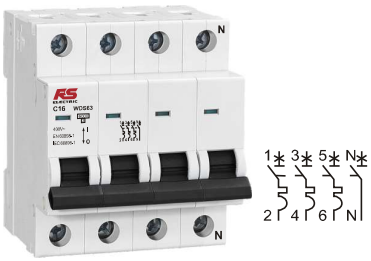
reference	pole no.	rated current In, A	tripping curve	pcs /ctn
WDS63 1P C1	1	1	C	120
WDS63 1P C2	1	2	C	120
WDS63 1P C3	1	3	C	120
WDS63 1P C4	1	4	C	120
WDS63 1P C6	1	6	C	120
WDS63 1P C10	1	10	C	120
WDS63 1P C13	1	13	C	120
WDS63 1P C16	1	16	C	120
WDS63 1P C20	1	20	C	120
WDS63 1P C25	1	25	C	120
WDS63 1P C32	1	32	C	120
WDS63 1P C40	1	40	C	120
WDS63 1P C50	1	50	C	120
WDS63 1P C63	1	63	C	120

WDS63 1P+N C1	1P+N	1	C	120
WDS63 1P+N C2	1P+N	2	C	120
WDS63 1P+N C3	1P+N	3	C	120
WDS63 1P+N C4	1P+N	4	C	120
WDS63 1P+N C6	1P+N	6	C	120
WDS63 1P+N C10	1P+N	10	C	120
WDS63 1P+N C13	1P+N	13	C	120
WDS63 1P+N C16	1P+N	16	C	120
WDS63 1P+N C20	1P+N	20	C	120
WDS63 1P+N C25	1P+N	25	C	120
WDS63 1P+N C32	1P+N	32	C	120
WDS63 1P+N C40	1P+N	40	C	120
WDS63 1P+N C50	1P+N	50	C	120
WDS63 1P+N C63	1P+N	63	C	120

Range (continued)

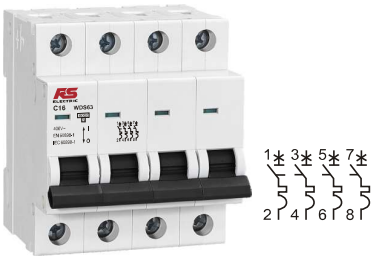
reference	pole no.	rated current In, A	tripping curve	pcs /ctn
WDS63 2P C1	2	1	C	60
WDS63 2P C2	2	2	C	60
WDS63 2P C3	2	3	C	60
WDS63 2P C4	2	4	C	60
WDS63 2P C6	2	6	C	60
WDS63 2P C10	2	10	C	60
WDS63 2P C13	2	13	C	60
WDS63 2P C16	2	16	C	60
WDS63 2P C20	2	20	C	60
WDS63 2P C25	2	25	C	60
WDS63 2P C32	2	32	C	60
WDS63 2P C40	2	40	C	60
WDS63 2P C50	2	50	C	60
WDS63 2P C63	2	63	C	60

WDS63 3P C1	3	1	C	40
WDS63 3P C2	3	2	C	40
WDS63 3P C3	3	3	C	40
WDS63 3P C4	3	4	C	40
WDS63 3P C6	3	6	C	40
WDS63 3P C10	3	10	C	40
WDS63 3P C13	3	13	C	40
WDS63 3P C16	3	16	C	40
WDS63 3P C20	3	20	C	40
WDS63 3P C25	3	25	C	40
WDS63 3P C32	3	32	C	40
WDS63 3P C40	3	40	C	40
WDS63 3P C50	3	50	C	40
WDS63 3P C63	3	63	C	40



WDS63 3P+N C1	3P+N	1	C	40
WDS63 3P+N C2	3P+N	2	C	40
WDS63 3P+N C3	3P+N	3	C	40
WDS63 3P+N C4	3P+N	4	C	40
WDS63 3P+N C6	3P+N	6	C	40
WDS63 3P+N C10	3P+N	10	C	40
WDS63 3P+N C13	3P+N	13	C	40
WDS63 3P+N C16	3P+N	16	C	40
WDS63 3P+N C20	3P+N	20	C	40
WDS63 3P+N C25	3P+N	25	C	40
WDS63 3P+N C32	3P+N	32	C	40
WDS63 3P+N C40	3P+N	40	C	40
WDS63 3P+N C50	3P+N	50	C	40
WDS63 3P+N C63	3P+N	63	C	40

Range (continued)



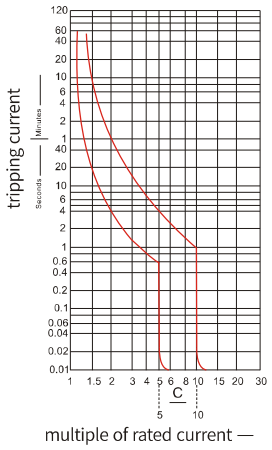
reference	pole no.	rated current In, A	tripping curve	pcs /ctn
WDS63 4P C1	4	1	C	30
WDS63 4P C2	4	2	C	30
WDS63 4P C3	4	3	C	30
WDS63 4P C4	4	4	C	30
WDS63 4P C6	4	6	C	30
WDS63 4P C10	4	10	C	30
WDS63 4P C13	4	13	C	30
WDS63 4P C16	4	16	C	30
WDS63 4P C20	4	20	C	30
WDS63 4P C25	4	25	C	30
WDS63 4P C32	4	32	C	30
WDS63 4P C40	4	40	C	30
WDS63 4P C50	4	50	C	30
WDS63 4P C63	4	63	C	30

*WDS63 of B, D curves are available upon request.

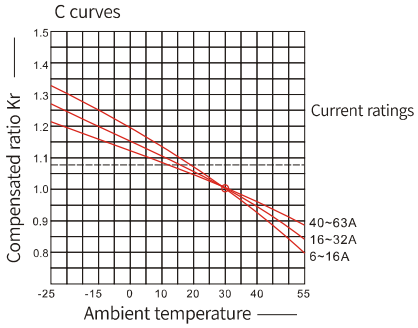
Technical data

Standards	IEC60898-1; EN608988-1
Approvals	S, CB, CE
Number of poles	1, 1P+N, 2, 3, 3P+N, 4
Rated current In, A	1, 2, 3, 4, 6, 10, 13, 16, 20, 25, 32, 40, 50, 63
Rated voltage Un, V	230/400
Rated insulation voltage Ui, V	500
Rated frequency, Hz	50/60
Rated short-circuit breaking cakacity Icn, A	6000
Rated impulse withstand voltage Uimp, kV	4
Dielectric strength test voltage for 1min., kV	2
Mechanical and electrical endurance, cycles	4000
Protection degree	IP20
Connection capacity, mm^2	25
Terminal tightening torque, N.m	2.5
Ambient temperature, °C	-25~+40

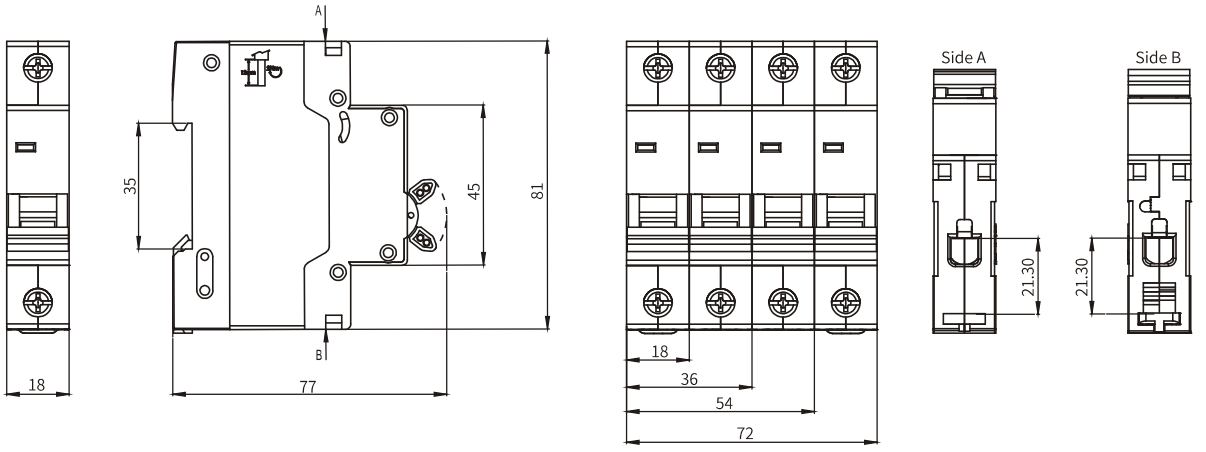
Tripping curves



Temperature compensation curves



Dimensions (mm)



Application and functions

The Micro Circuit Breaker DL9-40 automatically cuts off circuit when overload and short circuit occur, and provides function of switching, isolation and controlling.

- C curve (5-10 In) protection for circuit with inductive load or highly inductive illumination system

Advantages

- Two types of protection against overload and short circuit
- Width=9mm saves installation space
- High short circuit breaking capacity 4500A
- Full set of accessories available
  -Auxiliary contact
  -Alarm contact
  -Over-voltage and under-voltage trip
  -Shunt trip

Range

	reference	pole no.	rated current In, A	tripping curve	wodule width, mm
 	DL9-40 1P C6	1	6	C	9
	DL9-40 1P C10	1	10	C	9
	DL9-40 1P C16	1	16	C	9
	DL9-40 1P C20	1	20	C	9
	DL9-40 1P C25	1	25	C	9
	DL9-40 1P C32	1	32	C	9
	DL9-40 1P C40	1	40	C	9
 	DL9-40 1P+N C6	1P+N	6	C	18
	DL9-40 1P+N C10	1P+N	10	C	18
	DL9-40 1P+N C16	1P+N	16	C	18
	DL9-40 1P+N C20	1P+N	20	C	18
	DL9-40 1P+N C25	1P+N	25	C	18
	DL9-40 1P+N C32	1P+N	32	C	18
	DL9-40 1P+N C40	1P+N	40	C	18
 	DL9-40 2P C6	2	6	C	18
	DL9-40 2P C10	2	10	C	18
	DL9-40 2P C16	2	16	C	18
	DL9-40 2P C20	2	20	C	18
	DL9-40 2P C25	2	25	C	18
	DL9-40 2P C32	2	32	C	18
	DL9-40 2P C40	2	40	C	18

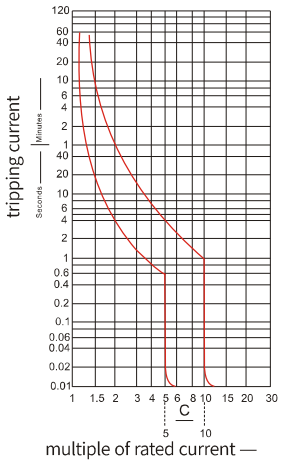
Range (continued)

	reference	pole no.	rated current In, A	tripping curve	wodule width, mm
	DL9-40 3P C6	3	6	C	27
	DL9-40 3P C10	3	10	C	27
	DL9-40 3P C16	3	16	C	27
	DL9-40 3P C20	3	20	C	27
	DL9-40 3P C25	3	25	C	27
	DL9-40 3P C32	3	32	C	27
	DL9-40 3P C40	3	40	C	27
	DL9-40 3P+N C6	3P+N	6	C	36
	DL9-40 3P+N C10	3P+N	10	C	36
	DL9-40 3P+N C16	3P+N	16	C	36
	DL9-40 3P+N C20	3P+N	20	C	36
	DL9-40 3P+N C25	3P+N	25	C	36
	DL9-40 3P+N C32	3P+N	32	C	36
	DL9-40 3P+N C40	3P+N	40	C	36
	DL9-40 4P C6	4	6	C	36
	DL9-40 4P C10	4	10	C	36
	DL9-40 4P C16	4	16	C	36
	DL9-40 4P C20	4	20	C	36
	DL9-40 4P C25	4	25	C	36
	DL9-40 4P C32	4	32	C	36
	DL9-40 4P C40	4	40	C	36

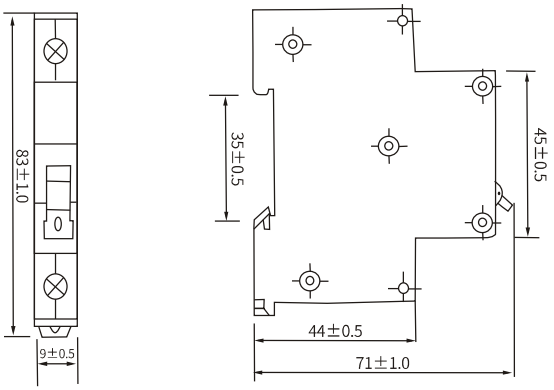
Technical data

Standards	IEC60898-1
Approvals	CE, CB, S
Number of poles	1, 1+N, 2, 3, 3+N, 4
Tripping curve	C
Rated current In, A	6, 10, 16, 20, 25, 32, 40
Rated short-circuit breaking capacity Icn, A	4500
Rated voltage Un, V	230/400
Rated frequency, Hz	50/60
Maximum service voltage, V	264
Contact position indication	Yes
Energy limiting class	3
Electrical endurance, cycles	>6000
Mechanical endurance, cycles	15000
Terminal type	Screw terminal
	Pillar terminal with clamp
Connection capacity, mm^2	1~16
Installation	Symmetrical DIN aril 35mm
	Panel mounting
Accessories	OF: Auxiliary contact
	FB: Auxiliary alarm
	QY: Under/over volage trip
	FL: Shunt trip

Tripping curves



Dimensions (mm)



TML1-63 Residual Current Circuit Breaker

Application and functions

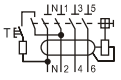
The Residual Current Circuit Breaker (RCCB) TML1-63 automatically cuts off circuit when earth leakage fault occurs.
The device is suitable for use in residential building, non-residential building, energy sources, industry and infrastructure by providing following functions.

- switching and isolation function
- protection against AC earth fault current
- protection against pulsating DC earth fault current
- protection against indirect contacts and additional protection against direct contacts
- protection against fire hazard caused by insulation faults

Advantages

- Electro-magnetic type, voltage independent
- The handle being sealable or equipped with padlock brackets avoids dangerous operation changes (ON/OFF)
- Independent contact position indicator
- High conditional short-circuit capacity 10kA
- "TEST" button for testing the devices operation and the correctness of terminal connection
- Integrated with diodes to avoid unwanted tripping against surge current resulted from lightening

Range

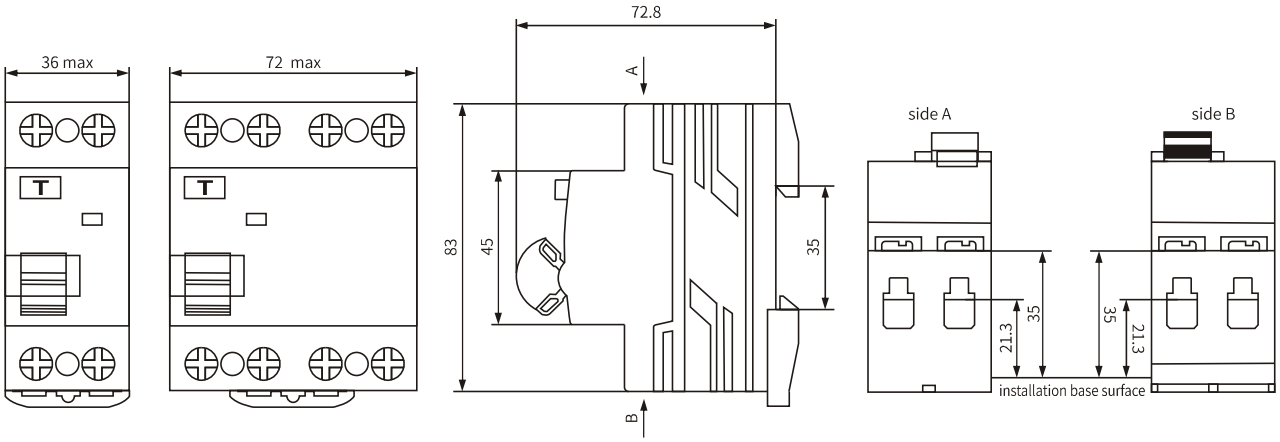


reference	pole no.	rated current In, A	rated residual current I△n, mA	type
TML1-63 2P 25/0.03A	1P+N	25	30mA	A
TML1-63 2P 40/0.03A	1P+N	40	30mA	A
TML1-63 2P 63/0.03A	1P+N	63	30mA	A
TML1-63 2P 25/0.1A	1P+N	25	100mA	A
TML1-63 2P 40/0.1A	1P+N	40	100mA	A
TML1-63 2P 63/0.1A	1P+N	63	100mA	A
TML1-63 2P 25/0.3A	1P+N	25	300mA	A
TML1-63 2P 40/0.3A	1P+N	40	300mA	A
TML1-63 2P 63/0.3A	1P+N	63	300mA	A
TML1-63 4P 25/0.03A	3P+N	25	30mA	A
TML1-63 4P 40/0.03A	3P+N	40	30mA	A
TML1-63 4P 63/0.03A	3P+N	63	30mA	A
TML1-63 4P 25/0.1A	3P+N	25	100mA	A
TML1-63 4P 40/0.1A	3P+N	40	100mA	A
TML1-63 4P 63/0.1A	3P+N	63	100mA	A
TML1-63 4P 25/0.3A	3P+N	25	300mA	A
TML1-63 4P 40/0.3A	3P+N	40	300mA	A
TML1-63 4P 63/0.3A	3P+N	63	300mA	A

Technical data

Standards	IEC61008-1; EN61008-1
Approvals	S, CB, CE
RCCB type	A type, electro-magnetic type
Tripping time	⩽40ms
Number of poles	2 (1P+N); 4(3P+N)
Rated current In, A	25, 40, 63
Rated voltage Un, V	230/400
Rated insulation voltage Ui, V	500
Rated frequency, Hz	50/60
Rated residual current I△n, mA	30, 100, 300
Rated conditional short-circuit current Inc, A	10000
Rated conditional residual short-circuit current I△c, A	10000
Rated making and breaking capacity Im, A	1000
Rated residual making and breaking capacity I△m, A	1000
Rated impulse withstand voltage Uimp, kV	4
Dielectric strength test voltage for 1min., kV	2
Mechanical and electrical endurance, cycles	4000
Protection degree	IP20
Connection capacity, mm^2	25
Terminal tightening torque, N.m	2.5
Ambient temperature,°C	-25~+40

Dimensions



Application and functions

Capable of switch electric circuit with load

Adaptable to padlock device

Contact position indication

Capable of quickly releasing stored energy operation

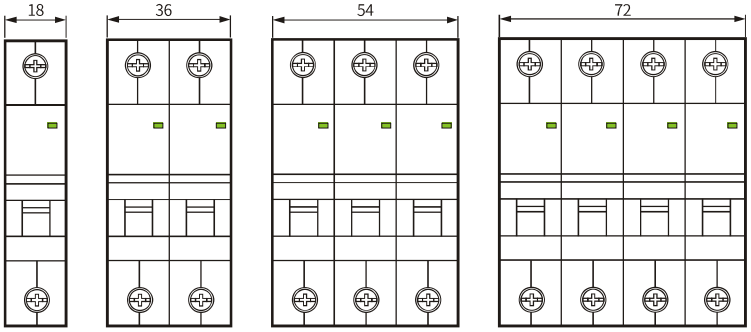
Higlighted of high making and breaking capacity

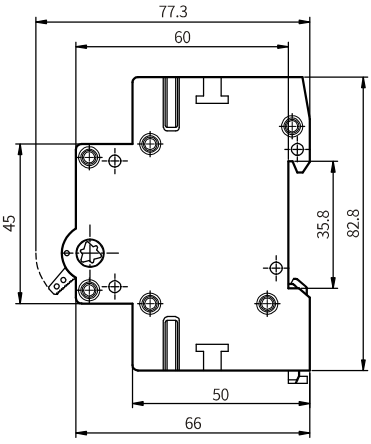
Used as main switch for household and similar installation

Technical data

Standards	IEC60947-3; EN60947-3
Approvals	S, CE
Rated current In, A	20, 32, 63, 80, 100, 125
Rated voltage Un, V	230/240, 400/415
Number of poles	1, 2, 3, 4
Rated frequency, Hz	50/60
Electrical endurance, cycles	10000
Mechanical endurance, cycles	20000
Rated impulse withstand voltage Uimp, kV	6
Protection degree	IP20
Terminals	pillar type
Connection capacity, mm^2	25
Terminal tightening torque, N.m	2.5

Dimensions (mm)





AUQ1 Changeover Switch

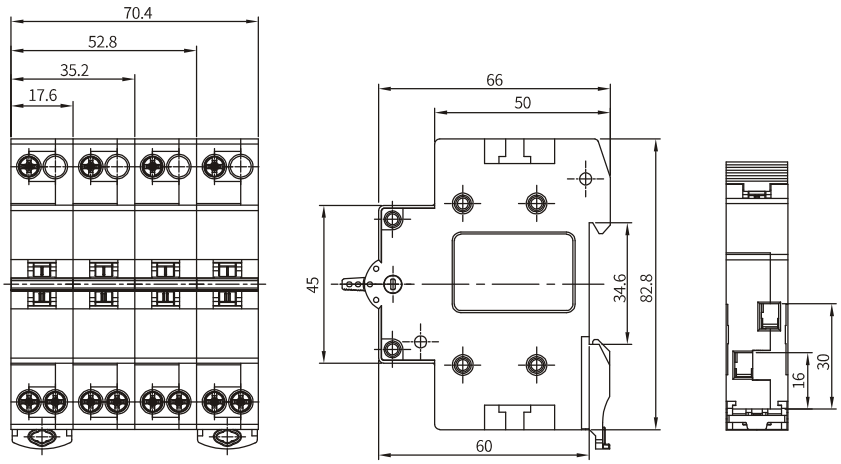
Application and Functions

Handle with 3 positions: I-O-II
Changeover switch with zero position in middle
Modularized and Din Rail mounting

Technical data

Standards	IEC60947-3; EN60947-3
Approvals	CE
Rated current In, A	6, 10, 16, 20, 25, 32, 40
Rated voltage Un, V	230/240, 400/415
Rated frequency, Hz	50/60
Number of poles	1, 2, 3, 4
Electrical endurance,cycles	10000
Mechanical endurance,cycles	20000
Rated impulse withstand voltage Uimp, kV	4
Protection degree	IP20
Terminals	pillar type
Connection capacity, mm^2	25
Terminal tightening torque, N.m	2.5

Dimensions (mm)



Application and functions

The BRD Surge Arrester (SPD) provide protection against electric system and on boarding electrical apparatus from lightning and transient over-voltage. The1+1 and 3+1 SPDs are suitable for TT and TN power supply system while 1-4 pole SPDs are suitable for TN power system.

Advantages

- high discharge capacity and low residual voltage
- modular design with standard dimensions and an option of DIN rail installation
- removable function unit
- compatible with mounting of auxiliary contact 1NO+1NC
- designed with status indication window

Range

reference	max. cont. operating voltage, Uc, V	norminal discharge current In, kA	max. discharge current Imax, kA	voltage protection level Up, kV	pole no.	protection mode
BRD-20C 275/1	275	10	20	1.3	1	L/N-PE
BRD-20C 275/1+1	275	10	20	1.3/1.5	1+1	L-N-PE, N-PE
BRD-20C 275/2	275	10	20	1.3	2	L-PE, N-PE
BRD-20C 275/3	275	10	20	1.3	3	L-PE
BRD-20C 275/3+1	275	10	20	1.3/1.5	3+1	L-N-PE, N-PE
BRD-20C 275/4	275	10	20	1.3	4	L-PE, N-PE
BRD-20C 320/1	320	10	20	1.5	1	L/N-PE
BRD-20C 320/1+1	320	10	20	1.5/1.5	1+1	L-N-PE, N-PE
BRD-20C 320/2	320	10	20	1.5	2	L-PE, N-PE
BRD-20C 320/3	320	10	20	1.5	3	L-PE
BRD-20C 320/3+1	320	10	20	1.5/1.5	3+1	L-N-PE, N-PE
BRD-20C 320/4	320	10	20	1.5	4	L-PE, N-PE
BRD-20C 385/1	385	10	20	1.8	1	L/N-PE
BRD-20C 385/1+1	385	10	20	1.8/1.5	1+1	L-N-PE, N-PE
BRD-20C 385/2	385	10	20	1.8	2	L-PE, N-PE
BRD-20C 385/3	385	10	20	1.8	3	L-PE
BRD-20C 385/3+1	385	10	20	1.8/1.5	3+1	L-N-PE, N-PE
BRD-20C 385/4	385	10	20	1.8	4	L-PE, N-PE
BRD-20C 440/1	440	10	20	2.1	1	L/N-PE
BRD-20C 440/1+1	440	10	20	2.1/1.5	1+1	L-N-PE, N-PE
BRD-20C 440/2	440	10	20	2.1	2	L-PE, N-PE
BRD-20C 440/3	440	10	20	2.1	3	L-PE
BRD-20C 440/3+1	440	10	20	2.1/1.5	3+1	L-N-PE, N-PE
BRD-20C 440/4	440	10	20	2.1	4	L-PE, N-PE

Range (continued)

reference	max. cont. operating voltage, Uc, V	norminal discharge current In, kA	max. discharge current Imax, kA	voltage protection level Up, kV	pole no.	protection mode
BRD-40C 275/1	275	20	40	1.3	1	L/N-PE
BRD-40C 275/1+1	275	20	40	1.3/1.5	1+1	L-N-PE, N-PE
BRD-40C 275/2	275	20	40	1.3	2	L-PE, N-PE
BRD-40C 275/3	275	20	40	1.3	3	L-PE
BRD-40C 275/3+1	275	20	40	1.3/1.5	3+1	L-N-PE, N-PE
BRD-40C 275/4	275	20	40	1.3	4	L-PE, N-PE
BRD-40C 320/1	320	20	40	1.5	1	L/N-PE
BRD-40C 320/1+1	320	20	40	1.5/1.5	1+1	L-N-PE, N-PE
BRD-40C 320/2	320	20	40	1.5	2	L-PE, N-PE
BRD-40C 320/3	320	20	40	1.5	3	L-PE
BRD-40C 320/3+1	320	20	40	1.5/1.5	3+1	L-N-PE, N-PE
BRD-40C 320/4	320	20	40	1.5	4	L-PE, N-PE
BRD-40C 385/1	385	20	40	1.8	1	L/N-PE
BRD-40C 385/1+1	385	20	40	1.8/1.5	1+1	L-N-PE, N-PE
BRD-40C 385/2	385	20	40	1.8	2	L-PE, N-PE
BRD-40C 385/3	385	20	40	1.8	3	L-PE
BRD-40C 385/3+1	385	20	40	1.8/1.5	3+1	L-N-PE, N-PE
BRD-40C 385/4	385	20	40	1.8	4	L-PE, N-PE
BRD-40C 440/1	440	20	40	2.1	1	L/N-PE
BRD-40C 440/1+1	440	20	40	2.1/1.5	1+1	L-N-PE, N-PE
BRD-40C 440/2	440	20	40	2.1	2	L-PE, N-PE
BRD-40C 440/3	440	20	40	2.1	3	L-PE
BRD-40C 440/3+1	440	20	40	2.1/1.5	3+1	L-N-PE, N-PE
BRD-40C 440/4	440	20	40	2.1	4	L-PE, N-PE

Range (continued)

reference	max. cont. operating voltage, Uc, V	norminal discharge current In, kA	max. discharge current Imax, kA	voltage protection level Up, kV	pole no.	protection mode
BRD-60C 275/1	275	30	60	1.6	1	L/N-PE
BRD-60C 275/1+1	275	30	60	1.6/1.5	1+1	L-N-PE, N-PE
BRD-60C 275/2	275	30	60	1.6	2	L-PE, N-PE
BRD-60C 275/3	275	30	60	1.6	3	L-PE
BRD-60C 275/3+1	275	30	60	1.6/1.5	3+1	L-N-PE, N-PE
BRD-60C 275/4	275	30	60	1.6	4	L-PE, N-PE
BRD-60C 320/1	320	30	60	1.8	1	L/N-PE
BRD-60C 320/1+1	320	30	60	1.8/1.5	1+1	L-N-PE, N-PE
BRD-60C 320/2	320	30	60	1.8	2	L-PE, N-PE
BRD-60C 320/3	320	30	60	1.8	3	L-PE
BRD-60C 320/3+1	320	30	60	1.8/1.5	3+1	L-N-PE, N-PE
BRD-60C 320/4	320	30	60	1.8	4	L-PE, N-PE
BRD-60C 385/1	385	30	60	2.1	1	L/N-PE
BRD-60C 385/1+1	385	30	60	2.1/1.5	1+1	L-N-PE, N-PE
BRD-60C 385/2	385	30	60	2.1	2	L-PE, N-PE
BRD-60C 385/3	385	30	60	2.1	3	L-PE
BRD-60C 385/3+1	385	30	60	2.1/1.5	3+1	L-N-PE, N-PE
BRD-60C 385/4	385	30	60	2.1	4	L-PE, N-PE
BRD-60C 440/1	440	30	60	2.4	1	L/N-PE
BRD-60C 440/1+1	440	30	60	2.4/1.5	1+1	L-N-PE, N-PE
BRD-60C 440/2	440	30	60	2.4	2	L-PE, N-PE
BRD-60C 440/3	440	30	60	2.4	3	L-PE
BRD-60C 440/3+1	440	30	60	2.4/1.5	3+1	L-N-PE, N-PE
BRD-60C 440/4	440	30	60	2.4	4	L-PE, N-PE

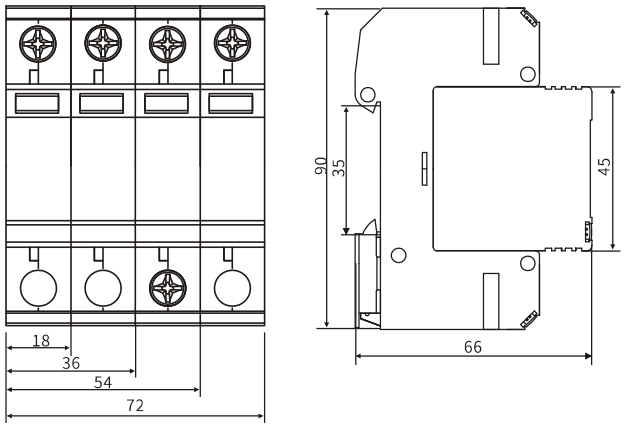
Technical data

Model	BRD-20C	BRD-40C	BRD-60C
Standards	IEC 61643-1	IEC 61643-1	IEC 61643-1
Approvals	CE	CE	CE
Test class	2/II	2/II	2/II
Number of poles	1, 1+1, 2, 3, 3+1, 4	1, 1+1, 2, 3, 3+1, 4	1, 1+1, 2, 3, 3+1, 4
Rated voltage Un, V	230/400	230/400	230/400
Max. continuous operating voltage Uc, V	275/320/ 385/ 440	275/320/385/440	275/320/385/440
Max. continuous operating voltage (N-PE) Uc, V	255	255	255
Norminal discharge current (8/20μs) In, kA	10	20	30
Max.discharge current (8/20μs) Imax, kA	20	40	60
Voltage protection level Up, kV	1.3/1.5/1.8/2.1	1.3/1.5/1.8/2.1	1.6/1.8/2.1/2.4
Voltage protection level 5kA Up, kV	1.15/1.25/1.45/1.75	1.1/1.2/1.4/1.7	1.05/1.35/1.6/1.65
Voltage protection level (N-PE) Up, kV	1.5	1.5	1.5
Follow current extinguishing capacity (N-PE) Ifi, Arms	100	100	100
Max. backup fuse gL/gG, A	63	125	160
Response time tA, ns	25	25	25
Response time (N-PE) tA, ns	100	100	100
TOV (temp. over-voltage) withstanding (5s) UT, V	335	335	335
Ambient temperature,°C	-40~+80	-40~+80	-40~+80
Operating state/fault indication	green/red	green/red	green/red
Protection degree	IP20	IP20	IP20
Connection capacity, mm^2	35	35	35
Terminal tightening torque, N.m	2.8	2.8	2.8

Auxiliary contact (to supply upon request)

	contacts	max. load	min. load
	1NO+1NC	3A, 24V DC	0.5A, 250V AC

Dimensions (mm)



Application and functions

The BCH8 modular contactors designed for remote control of following applications in AC network up to 400V 50/60Hz.

- Lighting, heating, ventilation, roller blinds, sanitary hot water.
- Mechanical, ventilation system.

Advantage

- Compact size in modular design saves space and make easy installation
- Low holding and triggering noise level
- Visual indication of the main contact status
- High mechanical and electrical durability
- Compatible with mounting of auxiliary contact

Type designation

Model	Frame size	X	XXX	XX		XXX
		Pole no.	Current rating (AC-7a)	Contact type		Coil voltage
				NO	NC	
BCH8	25	2	016=16A	2	0	024=24V
	25M	3	020=20A	1	1	110=110V
	63	4	025=25A	0	2	230=230V
	63M		032=32A	3	0	
	100		040=40A	0	3	
			063=63A	4	0	
			100=100A	0	4	
				2	2	
				3	1	
				1	3	

General

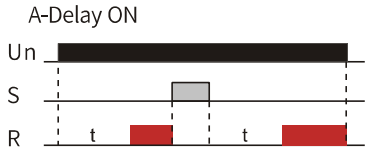
- Applications
  - Suitable for applications where function and time requirements are known.
  - Time switch , possible to be used for pump decay time after switching off heating, switching off fans.
- Function features
  - Single-function relay with possibility of time setting by a potentiometer.
  - Choice of 2 functions: A:Delay ON B:Delay OFF
  - Time scale 0.1 s - 10 days divided into 10 ranges..
  - Relay status is indicated by LED.
  - 1-module,DIN rail mounting.
- Type designation

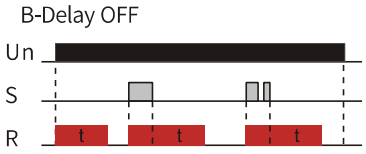
GRT8 — □ □/□
- Rated control supply voltage: A230: AC230V; W240: AC/DC12V-240V
- Number of contacts: 1: 1×SPDT; 2: 2×SPDT
- Function mode: A-Delay ON; B-Delay OFF
- GRT8 Series

Range

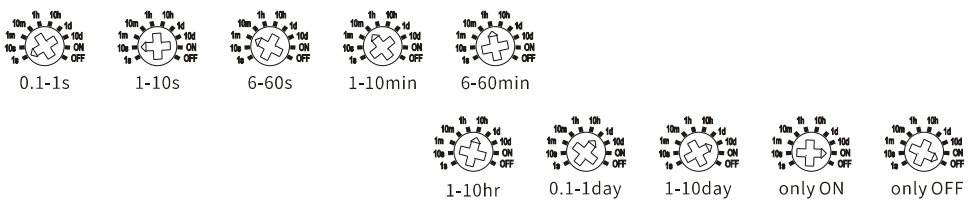
reference	function	contact type	contact capacity AC1, A	supply voltage range
GRT8-A1/A230	ON delay 0.1s-10 days	1xSPDT	16	230V AC
GRT8-A1/W240	ON delay 0.1s-10 days	1xSPDT	16	12-240V AC/DC
GRT8-A2/A230	ON delay 0.1s-10 days	2xSPDT	16	230V AC
GRT8-A2/W240	ON delay 0.1s-10 days	2xSPDT	16	12-240V AC/DC
GRT8-B1/A230	OFF delay 0.1s-10 days	1xSPDT	16	230V AC
GRT8-B1/W240	OFF delay 0.1s-10 days	1xSPDT	16	12-240V AC/DC
GRT8-B2/A230	OFF delay 0.1s-10 days	2xSPDT	16	230V AC
GRT8-B2/W240	OFF delay 0.1s-10 days	2xSPDT	16	12-240V AC/DC

Function diagram





Time range

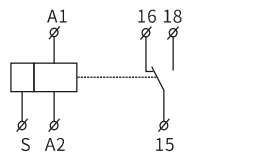


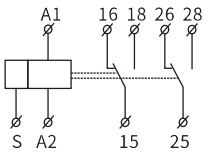
GRT8-A/B Single-function Time Relay

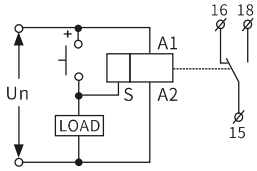
Technical data

Model	GRT8-A1/B1	GRT8-A2/B2
Function	delay ON	delay OFF
Supply terminals	A1-A2	
Voltage range (W240)	AC/DC 12-240V(50-60Hz)	
Power consumption	AC 0.09-3VA/DC 0.05-1.7W	
Voltage range(A230)	AC 230V(50-60Hz)	
Power consumption	AC max.6VA/1.3W	AC max.6VA/1.9W
Supply voltage tolerance	-15%; +10%	
Supply indication	green LED	
Time ranges	0.1s-10days, ON, OFF	
Time setting	potentiometer	
Time deviation	5%-mechanical setting	
Repeat accuracy	0.2%-set value stability	
Temperature coefficient	0.05%/, at=20°C(0.05%, at=68°F)	
Contact	1×SPDT	2×SPDT
	16A/AC1	
	250VAC/24VDC	
Min.breaking capacity DC	500mW	
Output indication	red LED	
Mechanical life	1×10^7	
Electrical life(AC1)	1×10^6	
Reset time	max.200ms	
Operating temperature	-20°C to +55°C(-4°F to 131°F)	
Storage temperature	-35°C to +75°C(-22°F to 158°F)	
Mounting/DIN rail	Din rail EN/IEC 60715	
Protection degree	IP40 for front panel/IP20 terminals	
Operating position	any	
Over-voltage category	III.	
Pollution degree	2	
Max.cable size(mm^2)	solid wire max.1×2.5or 2×1.5/with sleeve max.1×2.5(AWG 12)	
Dimensions	90×18×64mm	
Weight	1×SPDT: W240-60g, A230-59g	
	2×SPDT: W240-81g, A230-79g	
Standards	IEC 60947-5-1, EN 61812-1	

Wiring diagram

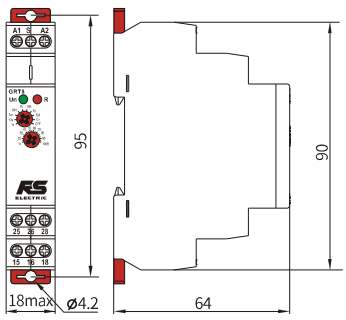






It is possible to connect load between S-A2(e.g contactor , control of light or any other device, without disturbing correct function of relay(load is energized while the switch is ON.)

Dimensions(mm)



General

- Applications
  - Multifunction time relay can be used for electrical appliances, control of lights, heating, motors, pumps and fans (10 functions, 10 time ranges, multi-voltage).
- Function features
  - 10 functions: -5 time functions controlled by supply voltage
    - 4 time functions controlled by control input
    - 1 function of latching relay
  - Comfortable and well-arranged function and time-range setting by rotary switches.
  - Time scale 0.1 s - 10 days divided into 10 ranges.
  - Relay status is indicated by LED.
  - 1-module, DIN rail mounting.
- Type designation

GRT8 — M □/□
- Rated control supply voltage: A230: AC230V; W240: AC/DC12V-240V
- Number of contacts: 1: 1×SPDT; 2: 2×SPDT
- Multifunction time relay
- GRT8 Series

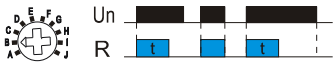
Range

reference	function	contact type	contact capacity AC1, A	supply voltage range
GRT8-M1/A230	A, B, C, D, E, F, G, H, I, J	1xSPDT	16	230V AC
GRT8-M1/W240	A, B, C, D, E, F, G, H, I, J	1xSPDT	16	12-240V AC/DC
GRT8-M2/A230	A, B, C, D, E, F, G, H, I, J	2xSPDT	16	230V AC
GRT8-M2/W240	A, B, C, D, E, F, G, H, I, J	2xSPDT	16	12-240V AC/DC

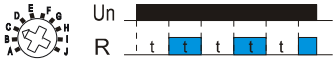
Function diagram

A:On Delay
When the input voltage Un is applied, timing delay "t" begins. Contacts "R" switch to close status when time delay "t" is complete. Contacts "R" return to their open status when Un is cancelled. Trigging signal S is invalid for function A.

B:OFF delay
When input voltage Un is applied, contacts R switch to close status while time delay t begins. When time delay "t" is complete, contacts return to open status. Upon cancellation of Un before "t" is complete, contact return to open satus. Trigging signal S is invalid for function B.

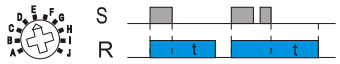


C: Delay cycling (starting from OFF status)
When input voltage Un is applied, time delay "t" begins. Contacts R switch to close status when this 1st "t" is complete. After 2nd "t", contacts R switch to open status. Such OFF-ON cycle repeats until Un is cancelled. Trigging signal S is invalid for function C.

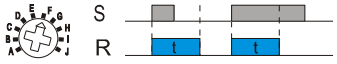


D: Delay Cycle (Starting from ON status)
When input voltage Un is applied, contacts R switch to close status and time delay "t" begins. Contacts R return to open status when this 1st "t" is complete. After 2nd "t", contacts R switch to close status. Such ON-OFF cycle repeats until Un is cancelled. Trigging signal S is invalid for function D.

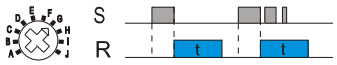
E: OFF Delay (S Break)
With input voltage Un being applied, contacts R switch to close status upon trigger switch S being closed. Time delay "t" begins when S get disconnected. When "t" is completed, contacts R switch to open status. In case S is re-closed before completion of "t", then "t" automatically resets to zero.



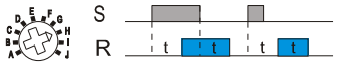
F:Single Shot
Upon application of the input voltage Un, the relay is ready accept trigger signal S. Upon application of the trigger signal S, the relay contacts R transfer and the preset time "t" begins. During time-out, the trigger signal S is ignored. The relay resets by applying the trigger switch S when the relay is not energized.



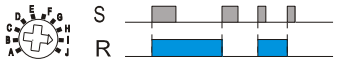
G:Single Shot Trailing Edge (Non-Retriggerable)
Upon application of input voltage Un, relay is ready to accept trigger signal S. Upon application of the trigger signal S, contacts R transfer and the preset time "t" begins. At the end of the preset time "t", contacts R return to their normal status unless the trigger switch S is opened and closed prior to time out "t" (befor preset time elapses). Continuous cycling of the trigger switch S at a rate faster than the preset time will cause the relay contacts R to remain closed. If input voltage Un is cancelled, contacts R return to their initial status.



H:ON/OFF Delay
Input voltage Un must be applied continuously. When trigger switch S is closed, time delay "t" begins. When time delay "t" is completed, relay contacts R switch to close status and remain transferred until trigger switch S is opened. Upon input voltage Un being cancelled, relay contacts R return to their initial status.



I:Latching relay
Input voltage Un must be applied continuously. Relay contacts R changes status with every trigger switch S being actuated. If input voltage U is cancelled, relay contacts R return to their initial status.



J:Pulse generator
Upon application of input voltage Un, a single output of 0.5 seconds is delivered to relay after time delay "t". Power must be cancelled and re-applied to repeat pulse. Trigger switch S is invalid for function J.

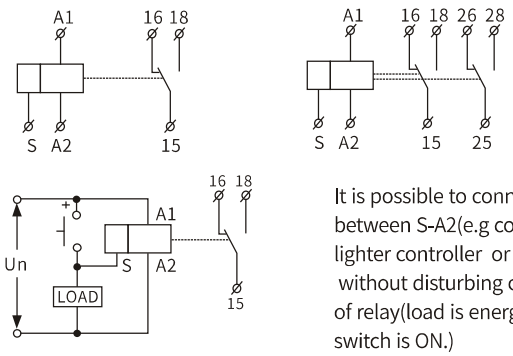
PULS = 0.5 s

Time Range

Technical data

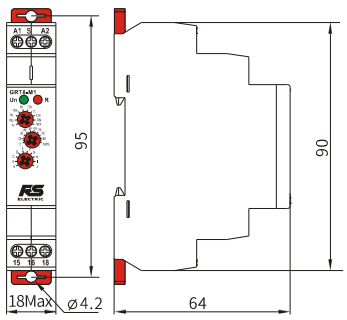
Model	GRT8-M1	GRT8-M2
Function	A, B, C, D, E, F, G, H, I, J	
Supply terminals	A1-A2	
Voltage range(W240)	AC/DC 12-240V(50-60Hz)	
Power consumption	AC 0.09-3VA/DC 0.05-1.7W	
Voltage range (A230)	AC 230V(50-60Hz)	
Power consumption	AC max.6VA/1.3W	AC max.6VA/1.9W
Supply voltage tolerance	-15%; +10%	
Supply indication	green LED	
Time ranges	0.1s-10days, ON, OFF	
Time setting	potentiometer	
Time deviation	5%-mechanical setting	
Repeat accuracy	0.2%-set value stability	
Temperature coefficient	0.05%/, at=20°C(0.05%, at=68°F)	
Contact	1×SPDT	2×SPDT
	16A/AC1	
	250VAC/24VDC	
Min.breaking capacity DC	500mW	
Output indication	red LED	
Mechanical life	1×10^7	
Electrical life(AC1)	1×10^6	
Reset time	max.200ms	
Operating temperature	-20°C to +55°C (-4°F to 131°F)	
Storage temperature	-35°C to +75°C (-22°F to 158°F)	
Mounting/DIN rail	Din rail EN/IEC 60715	
Protection degree	IP40 for front panel/IP20 terminals	
Operating position	any	
Over-voltage category	III.	
Pollution degree	2	
Max.cable size(mm^2)	solid wire max.1×2.5or 2×1.5/with sleeve max.1×2.5(AWG 12)	
Dimensions	90×18×64mm	
Weight	1×SPDT: W240-62g, A230-60g	
	2×SPDT: W240-82g, A230-81g	
Standards	IEC 60947-5-1, EN 61812-1	

Wiring diagram



It is possible to connect load between S-A2(e.g contactor , lighter controller or any other device, without disturbing correct function of relay(load is energized while the switch is ON.)

Dimensions(mm)



GRT8-LS Staircase Switch

General

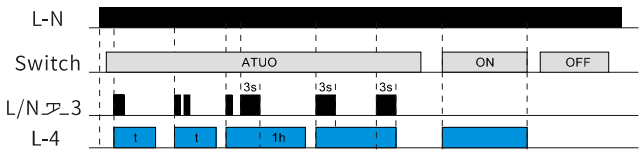
- Applications
  - The product is used for delayed switching of lights in the corridors, entrances, staircase, halls or for delayed stop of ventillation fans (WC, bathroom etc.).
- Function features
  - Operating system switch:
    ON - output is constantly ON .
    AUTO - timing according to adjustment by potentiometer within range 0.5 - 20 min
    OFF - output is constantly OFF.
  - Voltage range: AC 230 V, clamp terminals.
  - Relay status LED indication.
  - 1-module, DIN rail mounting.
- Type designation

GRT8 — LS/□
- □: Rated control supply voltage: A230: AC230V
- LS: Staircase Switch
- GRT8: GRT8 Series

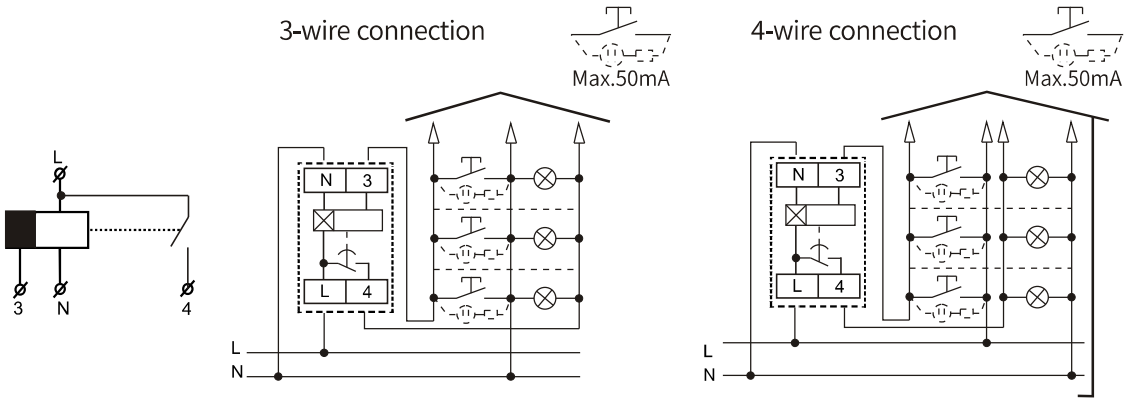
Range

reference	function	contact type	contact capacity AC1, A	supply voltage range
GRT8-LS/A230	ON, OFF, AUTO (OFF delay 0.5-20 min)	1xSPST	16	230V AC

Function diagram



Wiring diagram



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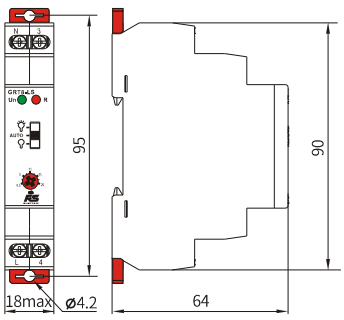
Staircase Switch | **GRT8-LS**

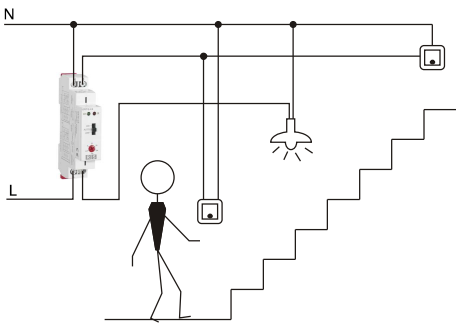
Technical data

Model	GRT8-LS
Function	OFF delay reacting to actuation
Supply terminals	L-N
Voltage range	AC 230V(50-60Hz)
Power consumption	AC max.6VA/1.3W
Supply voltage tolerance	-15%;+10%
Supply indication	green LED
Time ranges	AUTO:0.5-20min ON OFF
Time setting	potentiometer
Time deviation	5%-mechanical setting
Repeat accuracy	0.2%-set value stability
Mininum power time	200ms
Glow tubes connetions	Yes(N-3 or L-3)
Max.amount of glow lamps	230V,max.75pcs(Measured with glow lamp 0.68mA/230V AC)
Temperature coefficient	0.05%°C/,at=20°C(0.05%°F,at=68°F)
Contact	1×SPST
	16A/AC1
	250VAC/24VDC
Min.breaking capacity DC	500mW
Output indication	red LED
Mechanical life	1×10^7
Electrical life(AC1)	1×10^6
Reset time	max.200ms
Operating temperature	-20°C to +55°C （-4°F to 131°F）
Storage temperature	-35°C to +75°C （-22°F to 158°F）
Mounting/DIN rail	Din rail EN/IEC 60715
Protection degree	IP40 for front panel/IP20 terminals
Operating position	any
Overvoltage category	III.
Pollution degree	2
Max.cable size(mm^2)	solid wire max.1×2.5or 2×1.5/with sleeve max.1×2.5(AWG 12)
Dimensions	90×18×64mm
Weight	61g
Standards	IEC 60947-5-1, EN 61812-1, EN 60669-2-3

Dimensions(mm)



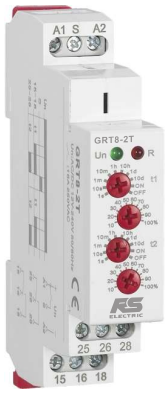
Example



Types of lamps

	2000W
	2000W
	1000W
	900W (125uF)
	400W
LED	300W

GRT8-2T Double delay Time Relay



General

- Applications
  -For gradual switching of heavy powers (e.g. el.heating), prevents currentstrokes in the main.

- Function features
  - 2x Delay ON (2 time relays in one)
  -Time scale 0.1s - 10 days divided into 10 time ranges:
  0.1s - 1s / 1s - 10s / 0.1min - 1min / 1min - 10min / 0.1h - 1h / 1h - 10hrs / 0.1 day - 1 day / 1 day - 10 days / ON / OFF.
  -Times t1 and t2 are independantly adjustable.
  - t1 and t2 are switched on after supply voltage connection
  - Relay status is indicated by LED.
  -1-module,DIN rail mounting.

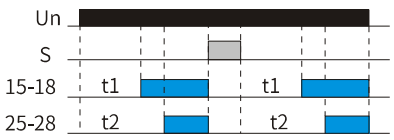
- Type designation

GRT8 — 2T /□
- Rated control supply voltage: A230: AC 230V; W240: AC/DC 12V-240V
- Double time delay relay
- GRT8 Series

Range

reference	function	contact type	contact capacity AC1, A	supply voltage range
GRT8-2T/A230	2x ON delya 0.1s-10 day	2xSPDT	16	120V AC
GRT8-2T/W240	2x ON delya 0.1s-10 day	2xSPDT	16	12-240V AC/DC

Function diagram



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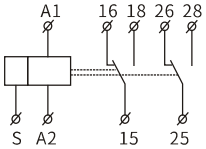
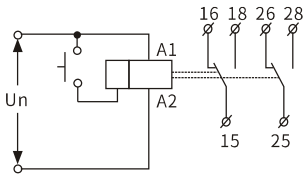
Double delay Time Relay | **GRT8-2T**

Technical data

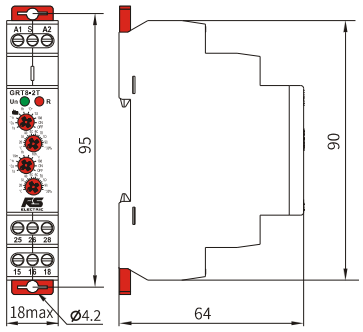
Model	GRT8-2T
Function	2xDelay ON
Supply terminals	A1-A2
Voltage range(W240)	AC/DC 12-240V(50-60Hz)
Burden	AC 0.09-3VA/DC 0.05-1.7W
Voltage range(A230)	AC 230V(50-60Hz)
Power input	AC max.6VA/1.9W
Supply voltage tolerance	-15%; +10%
Supply indication	green LED
Time ranges	0.1s-10days, ON, OFF
Time setting	potentiometer
Time deviation	10%-mechanical setting
Repeat accuracy	0.2%-set value stability
Temperature coefficient	0.05%/°C，at=20°C(0.05%°F，at=68°F)
Output	2×SPDT
Current rating	16A/AC1
Switching voltage	250VAC/24VDC
Min.breaking capacity DC	500mW
Output indication	red LED
Mechanical life	1×10^7
Electrical life(AC1)	1×10^5
Reset time	max.200ms
Operating temperature	-20°C to +55°C（-4°F to 131°F）
Storage temperature	-35°C to +75°C（-22°F to 158°F）
Mounting/DIN rail	Din rail EN/IEC 60715
Protection degree	IP40 for front panel/IP20 terminals
Operating position	any
Overvoltage category	III.
Pollution degree	2
Max.cable size(mm^2)	solid wire max.1×2.5or 2×1.5/with sleeve max.1×2.5(AWG 12)
Dimensions	90×18×64mm
Weight	W240-82g, A230-82g
Standards	IEC60947-5-1, EN 61812-1

Wiring diagram

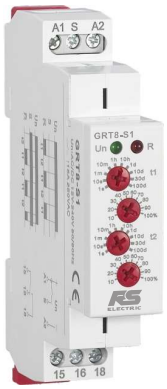




Dimensions (mm)



GRT8-S Asymmetric Cycler Time Relay



General

- Applications
  -It is used for regular room ventilation, cyclic dehumidification, light control, circulating pumps, noon signs, etc.
- Function features
  -2 time functions:
  -Cycler beginning with pulse
  -Cycler beginning with pause
  -Function choice is done by an external jumper of terminals S-A1.
  -Time scale 0.1 s - 100 days devided into 10 time ranges:
  (0.1 s - 1 s / 1 s - 10 s / 0.1 min - 1 min / 1 min - 10 min / 0.1 hrs - 1 h / 1 hrs - 10 hrs / 0.1 day - 1 day /1 day - 10 days /3 days - 30 days / 10 days - 100 days).
  -Relay status is indicated by LED.
  -1-module,DIN rail mounting.
- Type designation

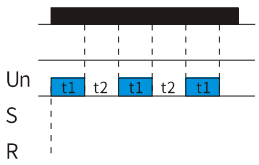
GRT8 — S □/□
- Rated control supply voltage: A230: AC230V; W240: AC/DC12V-240V
- Number of contacts: 1: 1×SPDT; 2: 2×SPDT
- Asymmetric cycler
- GRT8 Series

Range

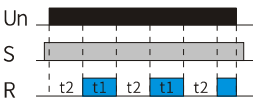
reference	function	contact type	contact capacity AC1, A	supply voltage range
GRT8-S1/A230	ON-OFF delay cycling 0.1s-100 days	1xSPDT	16	230V AC
GRT8-S1/W240	ON-OFF delay cycling 0.1s-100 days	1xSPDT	16	12-240V AC/DC
GRT8-S2/A230	ON-OFF delay cycling 0.1s-100 days	2xSPDT	16	230V AC
GRT8-S2/W240	ON-OFF delay cycling 0.1s-100 days	2xSPDT	16	12-240V AC/DC

Function diagram

Cycler beginning with pulse



Cycler beginning with pulse(jumper A1-S)



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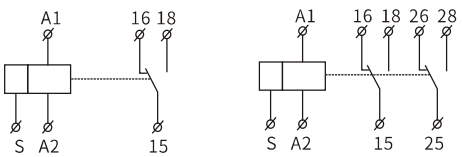
Asymmetric Cycler Time Relay **GRT8-S**

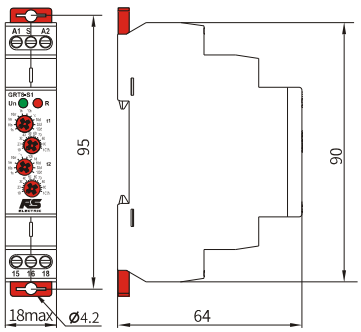
Technical data

Model	GRT8-S1	GRT8-S2
Function	Asymmetric cycler time relay	
Supply terminals	A1-A2	
Voltage range(W240)	AC/DC 12-240V(50-60Hz)	
Burden	AC 0.09-3VA/DC 0.05-1.7W	
Voltage range(A230)	AC 230V(50-60Hz)	
Power input	AC max.6VA/1.3W	AC max.6VA/1.9W
Supply voltage tolerance	-15%;+10%	
Supply indication	green LED	
Time ranges	0.1s-10days	
Time setting	potentiometer	
Time deviation	10%-mechanical setting	
Repeat accuracy	0.2%-set value stability	
Temperature coefficient	0.05%/°C, at=20°C(0.05%°F, at=68°F)	
Output	1×SPDT	2×SPDT
Current rating	1×16A(AC1)	2×16A(AC1)
Switching voltage	250VAC/24VDC	
Min.breaking capacity DC	500mW	
Output indication	red LED	
Mechanical life	1×10^7	
Electrical life(AC1)	1×10^5	
Reset time	max.200ms	
Operating temperature	-20°C to +55°C（-4°F to 131°F）	
Storage temperature	-35°C to +75°C（-22°F to 158°F）	
Mounting/DIN rail	Din rail EN/IEC 60715	
Protection degree	IP40 for front panel/IP20 terminals	
Operating position	any	
Overvoltage category	III.	
Pollution degree	2	
Max.cable size(mm^2)	solid wire max.1×2.5or 2×1.5/with sleeve max.1×2.5(AWG 12)	
Dimensions	90×18×64mm	
Weight	1×SPDT: W240-62g, A230-61g 2×SPDT: W240-82g, A230-82g	
Standards	IEC60947-5-1, EN 61812-1	

Wiring diagram



Dimensions (mm)



GRT8-ST Star/delta ON Delay Time Relay

General

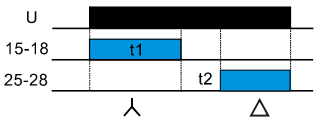
- Applications
  - Designed for delay ON of star/delta controlled motor.
- Function features
  - Time t1 (star) :
    time scale 0.1 s - 10min divided into 4 time ranges
    time setting by rotary switch.
  - Time t2 (delay) :
    time scale 0.1 s - 1 s
    time setting by potentiometer
  - Relay status LED indication
  - 1-module, DIN rail mounting.
- Type designation

GRT8 — ST/□
- □: Rated control supply voltage:
  - A230: AC230V
  - A400: AC400V
  - W240: AC/DC12V-240V
- ST: ON delay star/delta
- GRT8: GRT8 Series

Range

reference	function	contact type	contact capacity AC1, A	supply voltage range
GRT8-ST/A230	start-up delay 0.1s-10min, changeover delay 0.1s-1s	2xSPDT	16	230V AC
GRT8-ST/A400	start-up delay 0.1s-10min, changeover delay 0.1s-1s	2xSPDT	16	400V AC
GRT8-ST/W240	start-up delay 0.1s-10min, changeover delay 0.1s-1s	2xSPDT	16	12-240V AC/DC

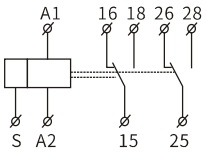
Function diagram

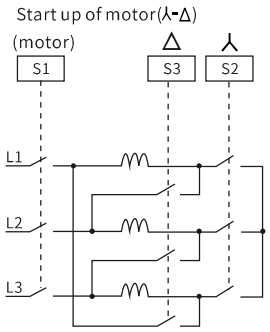


Technical data

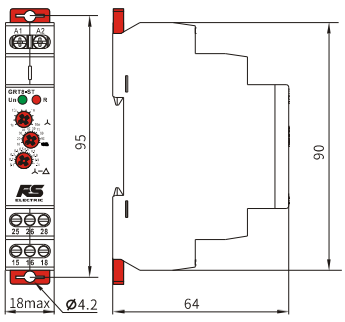
Model	GRT8-ST
Function	Star / delta ON Delay
Supply terminals	A1-A2
Voltage range(W240)	AC/DC 12-240V(50-60Hz)
Power consumption	AC 0.3-2VA / DC 0.1-1.2W
Voltage range(A230, A400)	AC 230V / AC 400V(50-60Hz)
Power consumption	AC max.6VA/1.3W
Supply voltage tolerance	-15%; +10%
Supply indication	green LED
Time ranges	Range of time delay t1: 0.1s-10min, changeover time t2: 0.1s-1s
Time setting	potentiometer
Time deviation	5%-mechanical setting
Repeat accuracy	0.2%-set value stability
Temperature coefficient	0.05%°C/, at=20°C(0.05%°F, at=68°F)
Contact	2×SPDT
	16A/AC1
	250VAC/24VDC
Min.breaking capacity DC	500mW
Output indication	red LED
Mechanical life	1×10^{7}
Electrical life(AC1)	1×10^{6}
Reset time	max.200ms
Operating temperature	-20°C to +55°C（-4°F to 131°F）
Storage temperature	-35°C to +75°C（-22°F to 158°F）
Mounting/DIN rail	Din rail EN/IEC 60715
Protection degree	IP40 for front panel/IP20 terminals
Operating position	any
Over-voltage category	III.
Pollution degree	2
Max.cable size(mm^2)	solid wire max.1×2.5or 2×1.5/with sleeve max.1×2.5(AWG 12)
Dimensions	90×18×64mm
Weight	W240-82g, A230-80g
Standards	IEC 60947-5-1, EN 61812-1

Wiring diagram

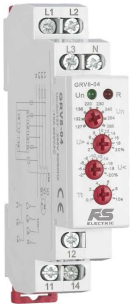




Dimensions(mm)



GRV8 3-phase Voltage Relay



General

- Applications
  - control of movable equipments (site equipment, agricultural equipent, refrigerator trucks).
  - protection against reverse operation
  - normal/emergency power supply
  - prevent failure phase of a motor load
- Function features
  - monitor its own supply voltage(true RMS measurement).
  - 8 optional rated voltage ratings, applicable worldwidely.
  - frequency range: 45Hz-65Hz.
  - voltage measurement accuracy<1%.
  - relay status LED indication
  - 1 module, DIN rail mounting.
- Type designation

GRV8 — □/□

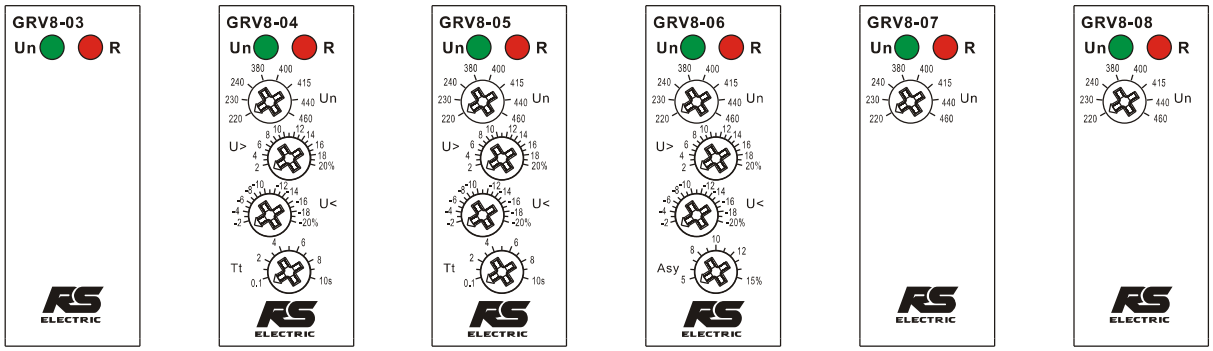
- Rated control supply voltage:
  M265:127-132-138-220-230-240-254-265VAC(P-N)
  M460:220-230-240-380-400-415-440-460VAC(P-P)
- Function mode:Table1
- GRV8 Series

Table1

function code	over-voltage (uo)	under-voltage (uu)	asymmetry (ua)	delay time	phase sequence	phase failure
03	—	—	—	—	●	●
04	2-20%	-20-2%	—	0.1-10s	●	●
05	2-20%	-20-2%	8%	0.1-10s	●	●
06	2-20%	-20-2%	5%-15%	2s	●	●
07	—	—	8%	2s	●	●
08	15%	-15%	8%	2s	●	●

Note: ●available

Panel diagram

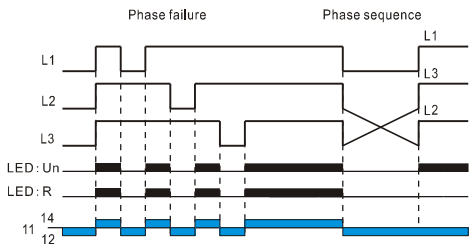


Range

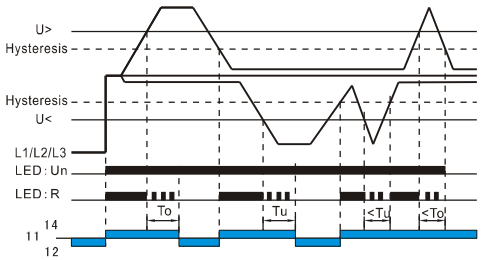
reference	function	contact type	contact capacity AC1, A	supply voltage range
GRV8-03/M265	protection against phase sequence and phase failure	1xSPDT	10	127-132-138-220-230 -240-254-265 (P-N)
GRV8-04/M265	protection against Uo: 2-20% and Uu: -20-2% delay 0.1s-10s, phase sequence and failure	1xSPDT	10	127-132-138-220-230 -240-254-265 (P-N)
GRV8-05/M265	protection against Uo: 2-20%, Uu: -20-2%, Ua: 8%, delay 0.1s-10s, phase sequence and failure	1xSPDT	10	127-132-138-220-230 -240-254-265 (P-N)
GRV8-06/M265	protection against Uo: 2-20%, Uu: -20-2%, Ua: 5-15%, delay 2s, phase sequence and failure	1xSPDT	10	127-132-138-220-230 -240-254-265 (P-N)
GRV8-07/M265	protection against Ua: 8%, delay 2s, phase sequence and phase failure	1xSPDT	10	127-132-138-220-230 -240-254-265 (P-N)
GRV8-08/M265	protection against Uo: 15%, Uu: -15%, Ua: 8%, delay 2s, phase sequence and failure	1xSPDT	10	127-132-138-220-230 -240-254-265 (P-N)
GRV8-03/M460	protection against phase sequence and phase failure	1xSPDT	10	220-230-240-380-400 -415-440-460 (P-P)
GRV8-04/M460	protection against Uo: 2-20% and Uu: -20-2% delay 0.1s-10s, phase sequence and failure	1xSPDT	10	220-230-240-380-400 -415-440-460 (P-P)
GRV8-05/M460	protection against Uo: 2-20%, Uu: -20-2%, Ua: 8%, delay 0.1s-10s, phase sequence and failure	1xSPDT	10	220-230-240-380-400 -415-440-460 (P-P)
GRV8-06/M460	protection against Uo: 2-20%, Uu: -20-2%, Ua: 5-15%, delay 2s, phase sequence and failure	1xSPDT	10	220-230-240-380-400 -415-440-460 (P-P)
GRV8-07/M460	protection against Ua: 8%, delay 2s, phase sequence and phase failure	1xSPDT	10	220-230-240-380-400 -415-440-460 (P-P)
GRV8-08/M460	protection against Uo: 15%, Uu: -15%, Ua: 8%, delay 2s, phase sequence and failure	1xSPDT	10	220-230-240-380-400 -415-440-460 (P-P)

Function diagram

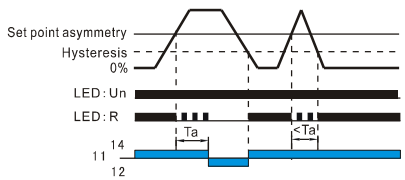
● phase failure and phase sequence protection



● over-voltage and under-voltage protection



● asymmetry protection



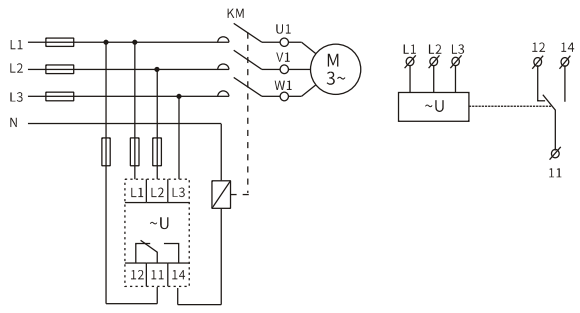
To: over-voltage threshold tripping delay
Tu: under-voltage threshold tripping delay
Ta: asymmetry threshold tripping delay

GRV8 3-phase Voltage Relay

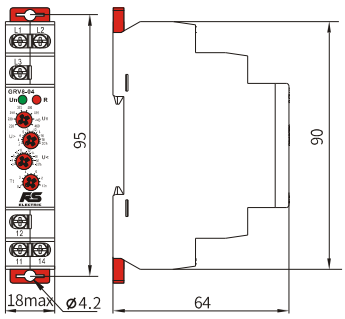
Technical data

Model	M265	M460
Function	Monitoring 3-phase voltage	
Monitoring terminals	L1-L2-L3-N	L1-L2-L3
Supply terminals	L1-N	L1-L2
Voltage range	127-132-138-220-230 -240-254-265(P-N)	220-230-240-380-400 -415-440-460(P-P)
Rated frequency	45Hz-65Hz	
Measuring range	101V-318V	176V-552V
Voltage threshold	2%-20%of Un selected	
Assymetry threshold	5%-15%	
Hysteresis	2%	
Supply indication	green LED	
Time delay	Adjustable 0.1s-10s,10%	
Measurement tolerance	1%	
Run up delay at power up	0.5s time delay	
Konb setting accuracy	5% of scale value	
Reset time	1000ms	
Temperature coefficient	0.05%°C/, at=20°C(0.05%°F, at=68°F)	
Contact	1×SPDT	
	10A/AC1	
	250VAC/24VDC	
Min.breaking capacity DC	500mW	
Output indication	red LED	
Mechanical life	1×10^7	
Electrical life(AC1)	1×10^6	
Operating temperature	-20°C to +55°C（-4°F to 131°F）	
Storage temperature	-35°C to +75°C（-22°F to 158°F）	
Mounting/DIN rail	Din rail EN/IEC 60715	
Protection degree	IP40 for front panel/IP20 terminals	
Over-voltage category	III.	
Pollution degree	2	
Max.cable size(mm^2)	solid wire max.1×2.5 or 2×1.5/with sleeve max.1×2.5(AWG 12)	
Dimensions	90×18×64mm	
Weight	64g	
Standards	IEC 60947-5-1, EN 60255-1	

Wiring diagram



Dimensions(mm)



Application and functions

Controlling electrical either directly or via starters, contactors, relays etc.
Pushbutton with lamp could be used as indicator

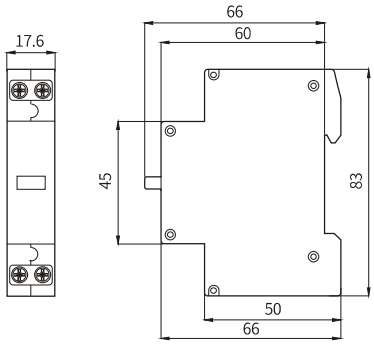
Range

reference	rated voltage, V	module width, mm	pcs /ctn
AUP2-A	one button, 230V AC, 16A	18	120
AUP2-B	two button, 230V AC, 16A	18	120
AUP2-C	one button with LED light, 230V AC, 16A	18	120

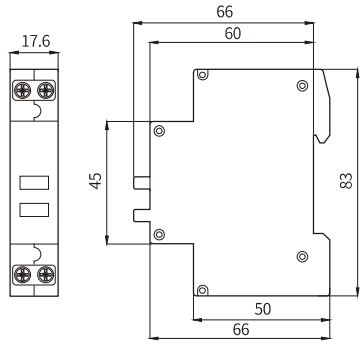
Technical data

Standards	IEC60947-5-1; EN60947-5-1
Approvals	CE
Rated voltage Un, V	230
Rated operational current, mA	⩽20
Rated frequency, Hz	50/60
Utilization category	AC-14
Rated conventional heating current Ith, A	16
Rated current Ie, A	6
Contact type	1NC+1NO, 2NC+1NO, 3NO, 2NC+2NO
Electrical endurance,cycles	100,000
Mechanical endurance,cycles	250,000
Rated impulse withstand voltage Uimp, V	500
Rated insulation voltage Ui, V	500
Protection degree	IP20
Terminals	pillar type
Connection capacity, mm^2	10
Terminal tightening torque, N.m	1.2

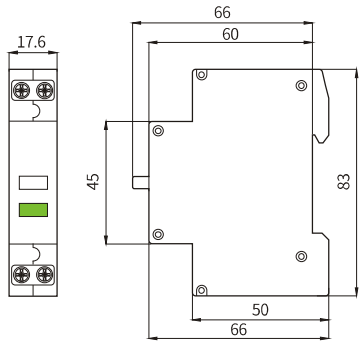
Dimensions (mm)



AUP2-A



AUP2-B



AUP2-C

DRT-341A/D

Three phase four wire DIN rail energy meter M20 0122

Technical data

Standards	EN 50470-1, EN 50470-3
Nominal voltage(Un)	3x230/400V AC
Operation voltage	3x161/279 to 300/500V AC
Ambient temperature	-25°C - +55°C
Storage temperature	-30°C - +70°C
Operating humidity	⩽75%
Storage humidity	⩽95%
Accuracy class	B
Protection degree	IP51
Insulating encased meter of protective class	II
Basic current(Ib)	5A
Maximum rated current(Imax)	80A
Starting current(mA)	0.4% of Ib
Operation frequency range	50Hz±10%
Power consumtion of current	⩽2W/10VA per phase
Pulse output rate	400/1000imp/kWh

Description

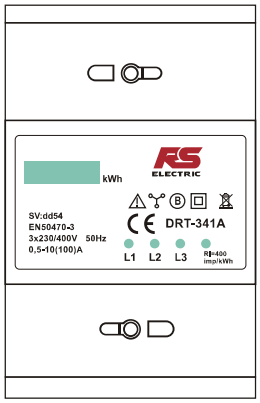
A	Front panel
B	Cover
C	Mounting(Base)
D	Protection cover
E	Security hasp
F	Consumption indicator(L1,L2,L3)
G	Pulse output

Dimensions

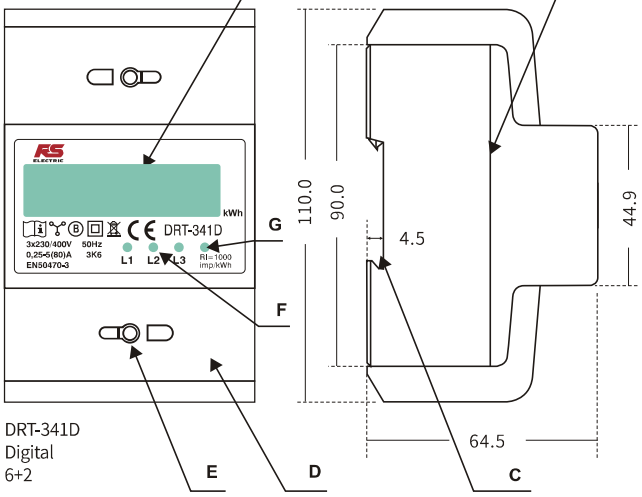
Height	110mm
Width	70mm
Depth	64.5mm
Weight	0.4Kg(net)

Mounting

DIN Rail 35mm



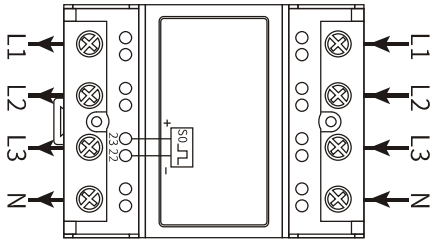
DRT-341A
Register
5+1



DRT-341D
Digital
6+2

Wiring diagram

L1	L1 phase wire
L2	L2 phase wire
L3	L3 phase wire
N	Neutral wire
22 and 23	Pulse output contact



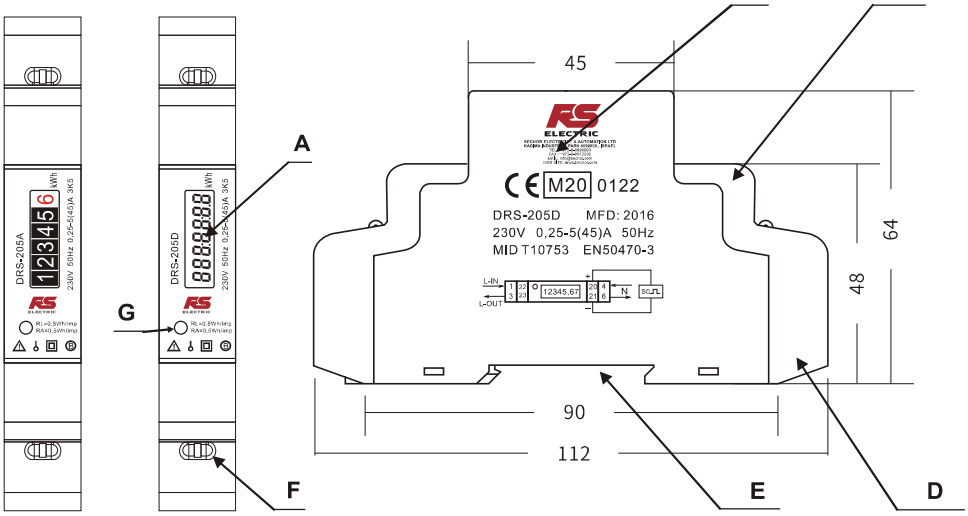
ELECTRIC

Single phase two wire DIN rail energy meter M20 0122

DRS-205A/D

Technical data

Standards	EN 50470-1, EN 50470-3
Nominal voltage(Un)	230V AC
Operation voltage	195-253V AC
Ambient temperature	-25°C - + 55°C
Storage temperature	-30°C - + 70°C
Accuracy class	B
Protection degree	IP51
Insulating encased meter of protective class	II
Basic current(Ib)	5A
Maximum rated current(Imax)	45A
Operation frequency range	50Hz±10%
Test output flash rate (RED LED)	1000/2000imp/kWh
Pulse output rate (pins 20 & 21)	1000/2000imp/kWh
Consumption indicator (RED LED)	Flashing at load running



Description

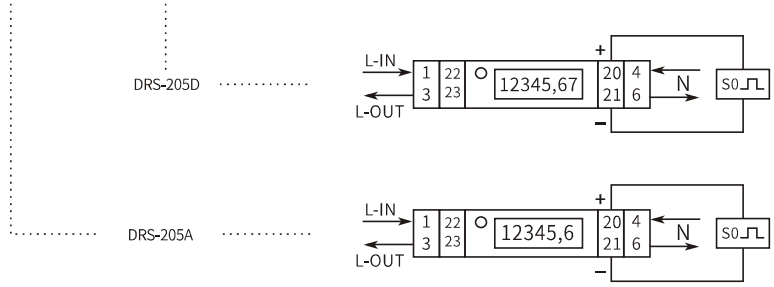
A	Register(or LCD)
B	Case
C	Terminal block
D	Protection cover
E	Mounting
F	Security hasp
G	Consumption indicator

Dimensions

Height	112mm
Width	17.5mm
Depth	64mm
Weight	0.12Kg(net)

Mounting

DIN Rail 35mm



Wiring diagram

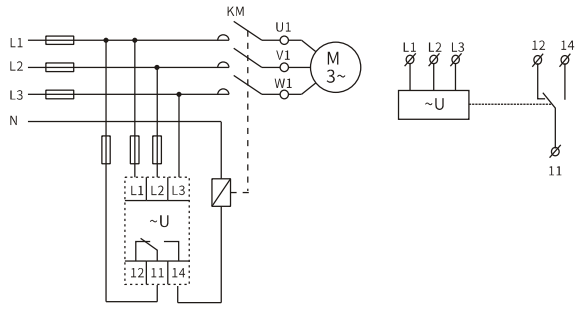
1	Inlet phase line
4	Inlet neutral line
3	Outgoing phase line
6	Outgoing neutral line
20 and 21	Pulse output contact

GRV8 3-phase Voltage Relay

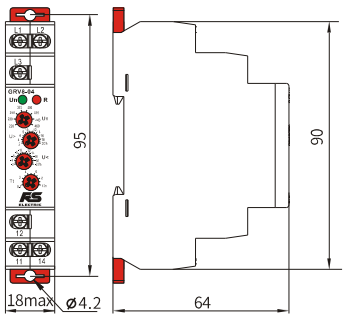
Technical data

Model	M265	M460
Function	Monitoring 3-phase voltage	
Monitoring terminals	L1-L2-L3-N	L1-L2-L3
Supply terminals	L1-N	L1-L2
Voltage range	127-132-138-220-230 -240-254-265(P-N)	220-230-240-380-400 -415-440-460(P-P)
Rated frequency	45Hz-65Hz	
Measuring range	101V-318V	176V-552V
Voltage threshold	2%-20%of Un selected	
Assymetry threshold	5%-15%	
Hysteresis	2%	
Supply indication	green LED	
Time delay	Adjustable 0.1s-10s,10%	
Measurement tolerance	1%	
Run up delay at power up	0.5s time delay	
Konb setting accuracy	5% of scale value	
Reset time	1000ms	
Temperature coefficient	0.05%°C/, at=20°C(0.05%°F, at=68°F)	
Contact	1×SPDT	
	10A/AC1	
	250VAC/24VDC	
Min.breaking capacity DC	500mW	
Output indication	red LED	
Mechanical life	1×10^7	
Electrical life(AC1)	1×10^6	
Operating temperature	-20°C to +55°C（-4°F to 131°F）	
Storage temperature	-35°C to +75°C（-22°F to 158°F）	
Mounting/DIN rail	Din rail EN/IEC 60715	
Protection degree	IP40 for front panel/IP20 terminals	
Over-voltage category	III.	
Pollution degree	2	
Max.cable size(mm^2)	solid wire max.1×2.5 or 2×1.5/with sleeve max.1×2.5(AWG 12)	
Dimensions	90×18×64mm	
Weight	64g	
Standards	IEC 60947-5-1, EN 60255-1	

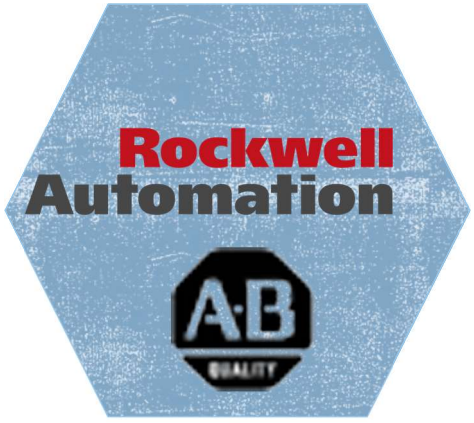
Wiring diagram



Dimensions(mm)



VEGA Electric



CONTACT
DRIVERS
Programmable Controllers
Power Supply
OPERATOR INTERFACE Graphic Terminals

Smart Motor Control

POWER

Smart Motor Controller 150 SMC™-50

- Internal Bypass Power Structure
  - Ideal for standard applications
  - Current ratings of 108...480 A
- Solid-State Power Structure
  - Ideal for harsh environments
  - Ideal for more aggressive duty-cycle applications
  - Current ratings of 90...520 A
  - Normal and heavy-duty ratings
- 17 Start/stop modes and 3 slow-speed modes
- DeviceLogix programming for embedded user logic

The scalable design of the SMC-50 satisfies a wide variety of control needs. Advanced monitoring, superior communications capabilities and Energy Saver mode help increase efficiency and reduce downtime. The Internal Bypass power structure automatically closes when the motor reaches its nominal speed, minimizing heat generation. It offers reduced enclosure size and cost. The Solid-State power structure offers higher operations per hour, scalable thermal ratings and higher SCCR ratings.

			 SMC 50 with Internal Bypass	 150 SMC 50 Solid-State
Simplified, Scalable Application Setup	*Optional parameter configuration module, human interface module, or PC-based software for programming and monitoring simplifies setup.*	• *Setup efficiency* • *Process optimization*	✓	✓
Hardware Expansion Ports	*Three hardware expansion ports accept optional digital and analog I/O expansion modules as well as a protection module (PTC, Ground Fault, Current Feedback).*	• *Process scalability and optimization* • *Application flexibility (simple to complex)*	✓	✓
Common Control Module	*All features/functions are included in standard control module including linear acceleration/deceleration, torque control, pump control, Smart Motor Braking (SMB), and Energy Saver mode.*	• *Reduced inventory* • *Increased efficiency*	✓	✓
Hold to Test/Push to Reset Button	*Used to quickly test for fault conditions or reset the unit.*	• *Reduces downtime* • *Assist during setup*	✓	✓
LED Display	*Multi-colored LED provides both diagnostics and controller status information.*	• *Instant status display* • *Assists during troubleshooting*	✓	✓
Communications	*Optional communication modules allow the SMC-50 to be connected to multiple networks.*	• *Common DPI modules reduce inventory* • *EtherNet/IP, DeviceNet, ControlNet and other networks available*	✓	✓

Product Selection

Line-Connected Controllers

Rated Voltage [V AC]	Motor Current [A]	kW	Hp, 60 Hz	Open Type		IP65 (Type 4/12) Enclosed Non-Combination Controllers
				100...240V AC, 50/60 Hz	24V DC	
				Cat. No.	Cat. No.	Cat. No. [1,2]
Internal Bypass						
400/415 (kW) 460 (Hp)	27...108	55	75	150-S108NBD	150-S108NBR	150S-D10JDC
	34...135	75	100	150-S135NBD	150-S135NBR	150S-D13JDC
	67...201	110	150	150-S201NBD	150-S201NBR	150S-D20JDC
	84...251	132	200	150-S251NBD	150-S251NBR	150S-D25JDC
	106...317	160	250	150-S317NBD	150-S317NBR	150S-D31JDC
	120...361	200	300	150-S361NBD	150-S361NBR	150S-D36JDC
	160...480	250	400	150-S480NBD	150-S480NBR	150S-D48JDC
Solid-State						
400/415 (kW) 460 (Hp)	30...90	17	25...60	150-SB1NBD	150-S1NBR	150S-C90JCD-3B-BP [3]
	37...110	20	30...75	150-SB2NBD	150-SB2NBR	150S-D11JCD-3B-BP [3]
	47...140	30	40...100	150-SB3NBD	150-SB3NBR	150S-D14JCD-3B-BP [3]
	60...180	37	50...150	150-SB4NBD	150-SB4NBR	150S-D18JCD-3B-BP [3]
	70...210	40	60...150	150-SC1NBD	150-SC1NBR	150S-D21JCD-3B-BP [3]
	87...260	50	75...200	150-SC2NBD	150-SC2NBR	150S-D26JCD-3B-BP [3]
	107...320	63	100...250	150-SC3NBD	150-SC3NBR	150S-D32JCD-3B-BP [3]
	120...361	75	100...300	150-SD1NBD	150-SD1NBR	150S-D36JCD-3B-BP [3]
	140...420	80	125...300	150-SD2NBD	150-SD2NBR	150S-D42JCD-3B-BP [3]
	174...520	100	150...450	150-SD3NBD	150-SD3NBR	150S-D52JCD-3B-BP [3]

[1] Line and load termination are provided as standard.

[2] These controllers require a separate 100...240V, 50/60 Hz single-phase control source. To add a control circuit transformer to the enclosure, add the appropriate option code to the catalog number.

[3] Requires a bypass contactor. Add **-BP** or **-NB** to the end of the catalog number to denote an IEC or NEMA bypass contactor, respectively. Example: For an IEC bypass contactor, catalog number 150-SB1NBD becomes catalog number 150-SB1NBD-**BP**.

Accessories

Option Modules

Description	Cat. No.
PTC, ground fault & current feedback	150-SM2
Analog I/O: 2 Inputs, 2 outputs	150-SM3
Digital I/O : 4 100...240V AC inputs, 3 relay outputs	150-SM4
Basic parameter configuration	150-SM6
Core Balance Ground Fault Sensor [4]	825-CBCT

[4] Used with a Cat. No. 150-SM2.

Communication Modules [5]

Network	Cat. No.
EtherNet/IP	20-COMM-E
Dual-port EtherNet/IP	20-COMM-ER
DeviceNet	20-COMM-D
ControlNet (Coax)	20-COMM-C

Bypass Kit (Solid State Only)

Description	Cat. No.
C-Frame Bypass Kit (210...320 A)	150-SCBK
D-Frame Bypass Kit (361...520 A)	150-SDBK

Protective Modules

AC Line Voltage (VAC)	Cat. No.
200...480	150-F84L
200...600	150-F86L

Line-Connected Controllers Terminal Lug Kits

Current Rating [A]	Wire Size	Total No. of Line Controller Terminal Lugs		Pkg. Qty.	Cat. No.	Terminal Covers
		Per Line Side	Per Load Side			Cat. No.
Internal Bypass						
108...135 [6]	#6...250 MCM AWG 16...120 mm²	3	3	3	199-LF1	150-TC1
201...251 [6]		6	6	3		150-TC2
317...480 [6]	#4...500 MCM AWG 25...240 mm²	6	6	3	199-LG1	150-TC3
Solid-State						
90...180	#6...250 MCM AWG, 16...120 mm²	3	3	3	199-LF1 [7]	150-STCB
210...320	#6...250 MCM AWG, 16...120 mm²	6 [8]	6	3	199-LF1	-
361...520	#4...500 MCM AWG, 25...240 mm²	6 [8]	6	3	199-LG1	-

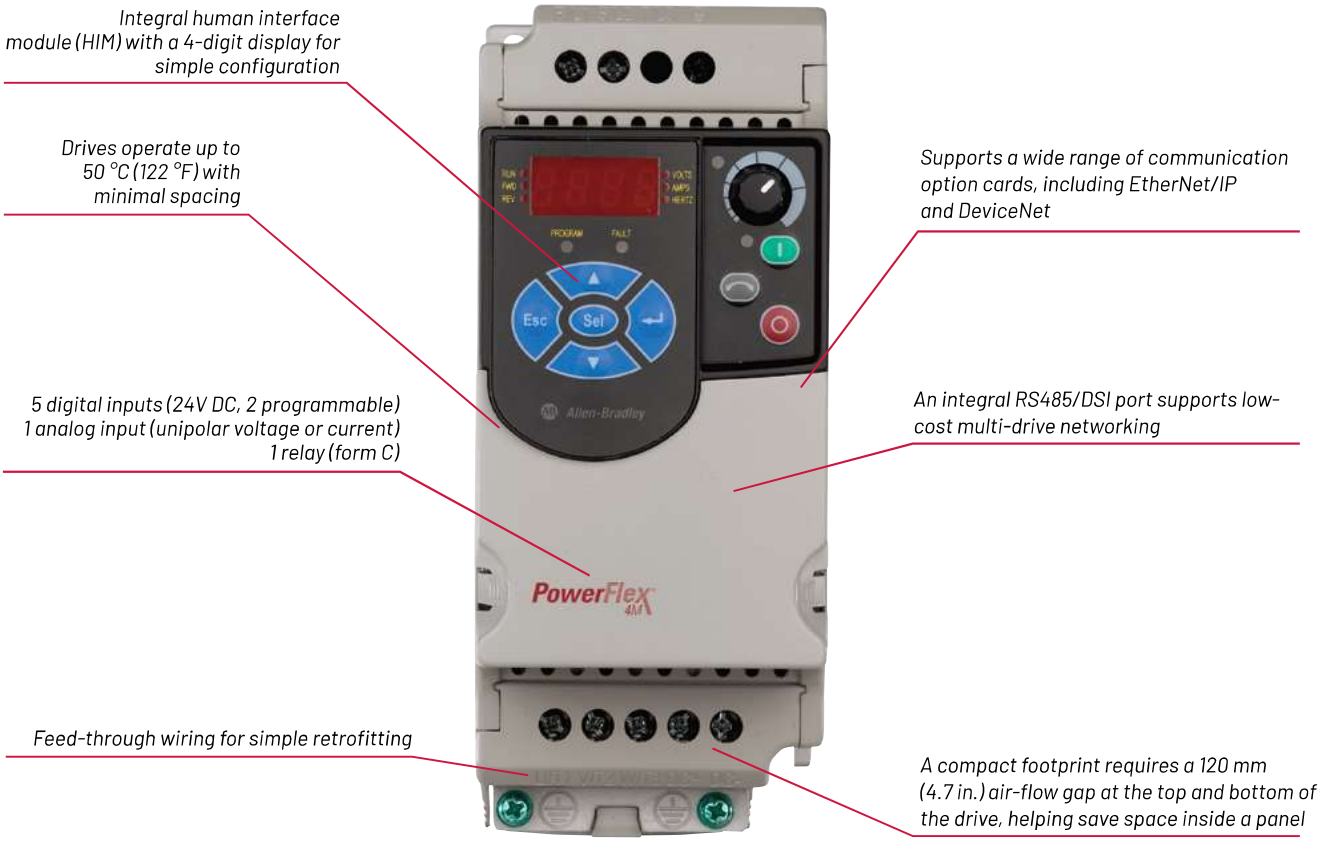
Drives

POWER

AC Drives
22F PowerFlex® 4M

- Power ratings of 0.2...11 kW / 0.25...15 Hp at 120V, 240V, and 480V to meet a wide range of applications
- Volts per hertz and slip compensation to meet application demands
- Flexible, time-saving installation using DIN Rail mounting with A and B frame drives
- Feed-through wiring for simple retrofitting into applications requiring variable speed motor control
- Side-by-side mounting in ambient temperatures up to 40 °C (104 °F), saving valuable panel space

Providing powerful motor speed control in a compact, space saving design, the Allen-Bradley® PowerFlex 4M AC drive is the smallest and most cost effective member of the PowerFlex family of drives.



Product Selection

Single-Phase, 50/60 Hz, No Brake, IP20, NEMA/UL Type Open

Drive Ratings		100...120V AC			200...240V AC			Cat. No. with EMC Filter
kW	Hp	Output Current [A]	Frame Size	Cat. No.	Output Current [A]	Frame Size	Cat. No.	
0.2	0.25	1.6	A	22F-V1P6N103	1.6	A	22F-A1P6N103	22F-A1P6N113
0.4	0.5	2.5	A	22F-V2P5N103	2.5	A	22F-A2P5N103	22F-A2P5N113
0.75	1	4.5	B	22F-V4P5N103	4.2	A	22F-A4P2N103	22F-A4P2N113
1.1	1.5	6	B	22F-V6P0N103	–	–	–	–
1.5	2	–	–	–	8	B	22F-A8P0N103	22F-A8P0N113
2.2	3	–	–	–	11	B	22F-A011N103	22F-A011N113

Three-Phase, 50/60 Hz, No Brake, IP20, NEMA/UL Type Open

Drive Ratings		200...240V AC			380...480V AC			Cat. No. with EMC Filter
kW	Hp	Output Current [A]	Frame Size	Cat. No.	Output Current [A]	Frame Size	Cat. No.	
0.2	0.25	1.6	A	22F-B1P6N103	–	–	–	–
0.4	0.5	2.5	A	22F-B2P5N103	1.5	A	22F-D1P5N103	22F-D1P5N113
0.75	1	4.2	A	22F-B4P2N103	2.5	A	22F-D2P5N103	22F-D2P5N113
1.5	2	8	A	22F-B8P0N103	4.2	A	22F-D4P2N103	22F-B8P0N103
2.2	3	12	B	22F-B012N103	6	B	22F-D6P0N103	22F-D6P0N113
3.7	5	17.5	B	22F-B017N103	8.7	B	22F-D8P7N103	22F-D8P7N113
5.5	7.5	25	C	22F-B025N104	13	C	22F-D013N104	22F-D013N114
7.5	10	33	C	22F-B033N104	18	C	22F-D018N104	22F-D018N114
11	15	–	–	–	24	C	22F-D024N104	22F-D024N114

Specifications

Power Ratings	100...120V: 0.2...1.1 kW / 0.25...1.5 Hp 200...240V: 0.2...7.5 kW / 0.25...10 Hp	380...480V: 0.4...11 kW / 0.5...15 Hp	
Motor Control	Volts per hertz	Slip compensation	–
Application	Open loop speed regulation	–	–
Control I/O	5 digital inputs (24V DC, 2 programmable)	1 analog input (unipolar voltage or current)	1 relay (form C)
Communications	Integral RS485 with Modbus RTU/DSI	Optional: DeviceNet, Bluetooth, EtherNet/IP, PROFIBUS DP, ControlNet, BACnet (Optional networks for use only with external DSI communications kit)	
Control Features	Flying start V/F ratio	Bus regulator Auto Restart	4 preset speeds Multi-drive connectivity (requires communication option card)

Drives

POWER

AC Drives
25A PowerFlex® 523

- Power ratings of 0.2...22 kW / 0.25...30 Hp in global voltage classes from 100...600V to meet a wide range of applications
- Modular design features a removable control module that allows simultaneous wiring installation and software configuration to help increase productivity
- AppView® application parameter groups and CustomView™ configuration help speed machine commissioning
- Volts per hertz and sensorless vector control provide flexible motor control options

Allen-Bradley PowerFlex 523 AC drives are designed to help reduce installation and configuration time while offering the control you need for your application. These drives offer convenient programming features and installation flexibility in a cost-effective solution.

Supports a wide range of communication option cards, including dual port EtherNet/IP™ and DeviceNet

An integral RS485/DSI port supports low-cost multi-drive networking

A compact footprint requires a 50 mm (1.96 in.) mounting clearance for air flow at the top and bottom of the drive, helping save space inside a panel

An integral LCD human interface module (HIM) eases configuration with multi-language support and QuickView™ scrolling text to help explain parameters and codes

Drives operate in ambient temperatures from -20... +50 °C (-4...+122 °F). With current derating and a control module fan kit, up to 70 °C (158 °F)

5 digital inputs (24V DC, 4 programmable)
1 analog input (unipolar voltage or current)
1 relay (form C)

Explore the PowerFlex 523 AC drive in our virtual brochure:

https://rok.auto/PowerFlex520

Product Selection

Single-Phase

Drive Ratings, Normal & Heavy Duty		100...120V AC, 50/60 Hz			200...240V AC, 50/60 Hz			
kW	Hp	Output Current [A]	Frame Size	Cat. No.	Output Current [A]	Frame Size	Cat. No.	Cat. No. with EMC Filter
0.2	0.25	1.6	A	25A-V1P6N104	1.6	A	25A-A1P6N104	25A-A1P6N114
0.4	0.5	2.5	A	25A-V2P5N104	2.5	A	25A-A2P5N104	25A-A2P5N114
0.75	1	4.8	B	25A-V4P8N104	4.8	A	25A-A4P8N104	25A-A4P8N114
1.1	1.5	6	B	25A-V6P0N104	–	–	–	–
1.5	2	–	–	–	8	B	25A-A8P0N104	25A-A8P0N114
2.2	3	–	–	–	11	B	25A-A011N104	25A-A011N114

Three-Phase

Drive Ratings													
Normal Duty		Heavy Duty		200...240V AC, 50/60 Hz			380...480V AC, 50/60 Hz				525...600V AC, 50/60 Hz		
kW	Hp	kW	Hp	Output Current [A]	Frame Size	Cat. No.	Output Current [A]	Frame Size	Cat. No.	Cat. No. with EMC Filter	Output Current [A]	Frame Size	Cat. No.
0.2	0.25	0.2	0.25	1.6	A	25A-B1P6N104	–	–	–	–	–	–	–
0.4	0.5	0.4	0.5	2.5	A	25A-B2P5N104	1.4	A	25A-D1P4N104	25A-D1P4N114	0.9	A	25A-E0P9N104
0.75	1	0.75	1	4.8	A	25A-B5P0N104	2.3	A	25A-D2P3N104	25A-D2P3N114	1.7	A	25A-E1P7N104
1.5	2	1.5	2	8	A	25A-B8P0N104	4	A	25A-D4P0N104	25A-D4P0N114	3	A	25A-E3P0N104
2.2	3	2.2	3	11	A	25A-B011N104	6	A	25A-D6P0N104	25A-D6P0N114	4.2	A	25A-E4P2N104
4	5	4	5	17.5	B	25A-B017N104	10.5	B	25A-D010N104	25A-D010N114	6.6	B	25A-E6P6N104
5.5	7.5	5.5	7.5	24	C	25A-B024N104	13	C	25A-D013N104	25A-D013N114	9.9	C	25A-E9P9N104
7.5	10	7.5	10	32.3	D	25A-B032N104	17	C	25A-D017N104	25A-D017N114	12	C	25A-E012N104
11	15	11	15	48.3	E	25A-B048N104	24	D	25A-D024N104	25A-D024N114	19	D	25A-E019N104
15	20	11	15	62.1	E	25A-B062N104	30	D	25A-D030N104	25A-D030N114	22	D	25A-E022N104
18.5	25	15	20	–	–	–	37	E	–	25A-D037N114	27	E	25A-E027N104
22	30	18.5	25	–	–	–	43	E	–	25A-D043N114	32	E	25A-E032N104

Specifications

Power Ratings	100...120V: 0.2...1.1 kW / 0.25...1.5 Hp 380...480V: 0.4...22 kW / 0.5...30 Hp	200...240V: 0.2...15 kW / 0.25...20 Hp 525...600V: 0.4...22 kW / 0.5...30 Hp	
Motor Control	Volts per hertz	Sensorless vector control	Sensorless vector control with Economizer
Application	Open loop speed regulation	–	–
Control I/O	5 digital inputs (24V DC, 4 programmable)	1 relay (form c)	1 analog input (unipolar voltage or current)
Communications	Integral RS485 with Modbus RTU/DSI PROFIBUS® DP option card	DeviceNet option card	Dual port EtherNet/IP option card
Control Features	Flying start V/F ratio Bus regulator Process PID	Common DC bus Fiber application specific features PTC input compatible 1/2 DC bus operation	8 datalinks (4 in and 4 out, requires comm. option card) Multi-drive connectivity (requires comm. option card) 8 preset speeds

Drives

POWER

AC Drives
25B PowerFlex® 525

- Power ratings of 0.4...22 kW / 0.5...30 Hp in global voltage classes from 100...600V to meet a wide range of applications
- Standard built-in single port for EtherNet/IP and Safe Torque-off
- AppView application parameter groups and CustomView configuration help speed machine commissioning

Allen-Bradley PowerFlex 525 AC drives are designed to support fast and easy installation and configuration and provide a variety of motor control and flexible mounting options. Available with standard built in EtherNet/IP communications and safe torque-off.

An embedded port for EtherNet/IP supports seamless integration into the Logix environment and EtherNet/IP networks

- *7 digital inputs (24V DC, 6 programmable)*
- *2 analog inputs (1 bipolar voltage, 1 current)*
- *2 digital outputs*
- *1 analog output (1 unipolar voltage or current)*
- *2 relays (1 form A relay & 1 form B relay; 24V DC, 120V AC, 240V AC)*

Embedded Safe Torque-Off can help to protect personnel

Modular design features a removable control module that allows simultaneous wiring installation and software configuration to help increase productivity

Volts per hertz, sensorless vector control, closed loop velocity vector control and permanent magnet motor control to meet a wide range of applications [1]

A built in DSI port supports multi-drive networking, connecting up to five PowerFlex AC drives on one node

[1] Permanent magnet motor control is scheduled for a future firmware release.

Product Selection

Single-Phase

Drive Ratings, Normal & Heavy Duty		100...120V AC, 50/60 Hz			200...240V AC, 50/60 Hz			
kW	Hp	Output Current [A]	Frame Size	Cat. No.	Output Current [A]	Frame Size	Cat. No.	Cat. No. with EMC Filter
0.4	0.5	2.5	A	25B-V2P5N104	2.5	A	25B-A2P5N104	25B-A2P5N114
0.75	1	4.8	B	25B-V4P8N104	4.8	A	25B-A4P8N104	25B-A4P8N114
1.1	1.5	6	B	25B-V6P0N104	–	–	–	–
1.5	2	–	–	–	8	B	25B-A8P0N104	25B-A8P0N114
2.2	3	–	–	–	11	B	25B-A011N104	25B-A011N114

Three-Phase

Drive Ratings													
Normal Duty		Heavy Duty		200...240V AC, 50/60 Hz			380...480V AC, 50/60 Hz				525...600V AC, 50/60 Hz		
kW	Hp	kW	Hp	Output Current [A]	Frame Size	Cat. No.	Output Current [A]	Frame Size	Cat. No.	Cat. No. with EMC Filter	Output Current [A]	Frame Size	Cat. No.
0.4	0.5	0.4	0.5	2.5	A	25B-B2P5N104	1.4	A	25B-D1P4N104	25B-D1P4N114	0.9	A	25B-E0P9N104
0.75	1	0.75	1	4.8	A	25B-B5P0N104	2.3	A	25B-D2P3N104	25B-D2P3N114	1.7	A	25B-E1P7N104
1.5	2	1.5	2	8	A	25B-B8P0N104	4	A	25B-D4P0N104	25B-D4P0N114	3	A	25B-E3P0N104
2.2	3	2.2	3	11	A	25B-B011N104	6	A	25B-D6P0N104	25B-D6P0N114	4.2	A	25B-E4P2N104
4	5	4	5	17.5	B	25B-B017N104	10.5	B	25B-D010N104	25B-D010N114	6.6	B	25B-E6P6N104
5.5	7.5	5.5	7.5	24	C	25B-B024N104	13	C	25B-D013N104	25B-D013N114	9.9	C	25B-E9P9N104
7.5	10	7.5	10	32.3	D	25B-B032N104	17	C	25B-D017N104	25B-D017N114	12	C	25B-E012N104
11	15	11	15	48.3	E	25B-B048N104	24	D	25B-D024N104	25B-D024N114	19	D	25B-E019N104
15	20	11	15	62.1	E	25B-B062N104	30	D	25B-D030N104	25B-D030N114	22	D	25B-E022N104
18.5	25	15	20	–	–	–	37	E	–	25B-D037N114	27	E	25B-E027N104
22	30	18.5	25	–	–	–	43	E	–	25B-D043N114	32	E	25B-E032N104

Specifications

Power Ratings	100...120V: 0.2...1.1 kW / 0.25...1.5 Hp 380...480V: 0.4...22 kW / 0.5...30 Hp	200...240V: 0.2...15 kW / 0.25...20 Hp 525...600V: 0.4...22 kW / 0.5...30 Hp	
Motor Control	Volts per hertz	Sensorless vector control	Sensorless vector control with Economizer
Application	Open loop speed regulation	–	–
Control I/O	5 digital inputs (24V DC, 4 programmable)	1 relay (form c)	1 analog input (unipolar voltage or current)
Communications	Integral RS485 with Modbus RTU/DSI PROFIBUS® DP option card	DeviceNet option card	Dual port EtherNet/IP option card
Control Features	Flying start, Fiber application specific features, 8 datalinks (4 in and 4 out), V/F ratio, Common DC bus, Position control, Bus regulator, 1/2 DC bus operation, StepLogic Function (Relay & Timers), Process PID, Regulation with encoder feedback or analog input, 16 preset speeds, PTC input compatible, Multi-drive connectivity (requires communication option card)		

Programmable Controllers

LOGIC

Micro Controllers
Micro800™ Family, Bulletin 2080

- Wide range of micro controllers (built-in I/O from 10...48 pts)
- Use Connected Components Workbench™ software to program your Micro800 Controllers
- Micro800 Expansion I/O and plug-in modules to customize your controller
- Supports a wide variety of communication protocols to suit specific application needs: EtherNet/IP™, DeviceNet®, Modbus TCP, Modbus RTU, ASCII and Open socket capabilities

Micro800 Control Systems are easy to install and maintain. One software package applies to the entire family. Right-size your controllers for your standalone machines. Invest in the functionality you need, and use Expansion I/O and plug-in modules for a system tailored to your specific application.

Micro810® Controllers
Smart Relay Micro PLC

- Offers 12-point controllers
- Includes 8 A outputs, which replace the need for external relays
- Supports program download through USB programming port (adapter required)
- Allows you to configure and operate smart relay function blocks without a PC (LCD required)

* Product selection starts on page 2-22.

Micro820® Controllers
Remote Automation Micro PLC

- Offers 20-point controllers
- Provides embedded 0...10V non-isolated 4-channel analog input and 1-channel analog output for speed control of an AC drive
- Communicates via EtherNet/IP and serial
- Supports program download through USB with an optional 3.5 in. remote LCD
- Supports up to two Micro800 plug-in modules

* Product selection starts on page 2-22.

Connected Components Workbench™ Software

- Single software to program your controllers, configure your drives, servo drives and safety relays, and design your human machine interface (HMI) screens
- Easy to Configure – Single software for the Micro Control System reduces machine development time and cost
- Easy to Program – Simplify programming with sample code, user-defined function blocks (UDFB) and user-defined data types (UDDT)
- Easy to Visualize – Reference Micro800 and CompactLogix™ controller variables when creating HMI tags

Download Connected Components Workbench software!

https://rok.auto/ccw

Micro830® Controllers
Flexible Micro PLC with Simple Motion

- Offers 10-point, 16-point, 24-point, and 48-point controllers
- Supports up to five Micro800 plug-in modules
- Provides embedded motion capabilities, up to three axes with 100 kHz pulse train outputs, (PTO)
- Provides embedded communications via USB programming port and non-isolated serial port

* Product selection starts on page 2-22.

Micro870 Controller with Expansion I/O Modules

Micro850® and Micro870® Controllers
Scalable Micro PLCs with Ethernet

- Provides embedded communications via non-isolated serial port (for RS-232 and RS-485 communications) and Ethernet port
- Provides embedded motion capabilities: Micro850 – up to three axes with 100 kHz PTO; Micro870 – up to two axes with 100 kHz PTO

Micro850 Controllers

- Supports up to five Micro800 plug-in modules and up to four Micro800 expansion I/O modules
- Offers 24-point and 48-point controllers

Micro870 Controllers

- Twice the memory capacity of Micro850 controller that supports up to 20,000 program steps and up to 128 KB user data
- Supports up to three plug-in modules, up to eight Expansion I/O modules and up to 304 I/O points
- Offers 24-point controllers

* Product selection starts on page 2-23.

Programmable Controllers

Product Selection

Micro810® Controllers, 12 Point

Line Power	Inputs	Outputs	Cat. No.
24V DC	(8) 12/24V DC [1]	(4) relay	2080-LC10-12QWB
120/240V AC	(8) 120/240V AC	(4) relay	2080-LC10-12AWA
24V DC	(8) 12/24V DC [1]	(4) 24V source DC	2080-LC10-12QBB
12V DC	(8) 12V DC [1]	(4) relay	2080-LC10-12DWD

Accessories	
Description	**Cat. No.**
USB adapter plug	2080-USBADAPTER
1.5 in. LCD display and keypad	2080-LCD
120/240V AC to 24V DC power supply for Micro810, Micro820 and Micro830 10/16pt	2080-PSAC-12W

[1] Four configurable as analog.

Micro820® Controllers, 20 Point

Line Power	Inputs	Outputs	Cat. No.
24V DC	(12) 24V DC	(7) 24V DC source	2080-LC20-20QBB
	(12) 24V DC	(7) relay	2080-LC20-20QWB
	(8) 120V AC (4) 24V DC	(7) relay	2080-LC20-20AWB
	(12) 24V DC	(7) 24V DC source	2080-LC20-20QBBR
	(12) 24V DC	(7) relay	2080-LC20-20QWBR
	(8) 120V AC (4) 24V DC	(7) relay	2080-LC20-20AWBR

Accessories	
Description	**Cat. No.**
Micro800™ 3.5 inch remote LCD display module	2080-REMLCD
MicroSD™ card 2 GB	2080-SD-2GB
120/240V AC to 24V DC power supply Micro810, Micro820 and Micro830 10/16pt	2080-PSAC-12W

Micro830® Controllers, 10...48 Points

Line Power	Inputs	Outputs	Cat. No.
24V DC	(2) normal 24V DC/AC (4) fast 24V DC	(4) relay	2080-LC30-10QWB
	(2) normal 24V DC/AC (4) fast 24V DC	(2) normal 24V DC sink, (2) fast 24V DC sink	2080-LC30-10QVB
	(10) 120V AC	(6) relay	2080-LC30-16AWB
	(6) normal 24V DC/AC (4) fast 24V DC	(4) normal 24V DC sink, (2) fast 24V DC sink	2080-LC30-16QVB
	(6) normal 24V DC/AC (4) fast 24V DC	(6) relay	2080-LC30-16QWB
	(6) normal 24V DC/AC (8) fast 24V DC	(8) normal 24V DC source, (2) fast 24V DC source	2080-LC30-24QBB
	(6) normal 24V DC/AC (8) fast 24V DC	(8) normal 24V DC sink, (2) fast 24V DC sink	2080-LC30-24QVB
	(6) normal 24V DC/AC (8) fast 24V DC	(10) relay	2080-LC30-24QWB
	(28) 120V AC	(20) relay	2080-LC30-48AWB
	(16) normal 24V DC/AC (12) fast 24V DC	(16) normal 24V DC source, (4) fast 24V DC source	2080-LC30-48QBB
	(16) normal 24V DC/AC (12) fast 24V DC	(16) normal 24V DC sink, (4) fast 24V DC sink	2080-LC30-48QVB
	(16) normal 24V DC/AC (12) fast 24V DC	(20) relay	2080-LC30-48QWB

Accessories	
Description	**Cat. No.**
120/240V AC to 24V DC power supply for Micro800	2080-PS120-240VAC

Product Selection

Micro850® Controllers, 24...48 Points

Line Power	Inputs	Outputs	Cat. No.
24V DC	(14) 120V AC	(10) relay	2080-LC50-24AWB
	(14) 24V DC	(10) 24V DC source	2080-LC50-24QBB
	(14) 24V DC	(10) 24V DC sink	2080-LC50-24QVB
	(14) 24V DC	(10) relay	2080-LC50-24QWB
	(28) 120V AC	(20) relay	2080-LC50-48AWB
	(28) 24V DC	(20) 24V DC source	2080-LC50-48QBB
	(28) 24V DC	(20) 24V DC sink	2080-LC50-48QVB
	(28) 24V DC	(20) relay	2080-LC50-48QWB

Accessories	
Description	**Cat. No.**
120/240V AC to 24V DC power supply for Micro800	2080-PS120-240VAC

Expansion I/O Modules

Description	Cat. No.
8-point, 120V AC input	2085-IA8
8-point, 240V AC input	2085-IM8
8-point, 120/240V AC triac output	2085-OA8
16-point, 12/24V DC sink/source input	2085-IQ16
32-point, 12/24V DC sink/source input	2085-IQ32T
16-point, 12/24V DC sink transistor output	2085-OV16
16-point, 12/24V DC source transistor output	2085-OB16
8-point, AC/DC relay output	2085-OW8
16-point, AC/DC relay output	2085-OW16
4-channel, 14-bit isolated voltage/current input	2085-IF4
8-channel, 14-bit isolated voltage/current input	2085-IF8
4-channel, 12-bit isolated voltage/current output	2085-OF4
4-channel, 16-bit RTD and TC isolated input	2085-IRT4
2085 bus terminator	2085-ECR
Expansion power supply module	2085-EP24VDC

Micro870® Controllers, 24 Point

Line Power	Inputs	Outputs	Cat. No.
24V DC	(14) 24V DC	(10) relay	2080-LC70-24QWB
24V DC	(14) 24V DC	(10) 24V DC source	2080-LC70-24QBB

Plug-in Modules [1]

Description	Cat. No.
4-channel V/I analog input unipolar 0...20 mA, 0...10V, 12bits (non-isolated)	2080-IF4
2-channel V/I analog input unipolar 0...20 mA, 0...10V, 12bits (non-isolated)	2080-IF2
2-channel V/I analog output unipolar 0...20 mA, 0...10V, 12 bits	2080-OF2
RS232/485 isolated serial port	2080-SERIALISOL
6-channel trim pot analog input	2080-TRIMPOT6
Project, data log, recipe backup and high accuracy RTC 1	2080-MEMBAK-RTC 2080-MEMBAK-RTC2
2-channel RTD (non-isolated)	2080-RTD2
2-channel thermocouple (non-isolated)	2080-TC2
4-point, 12/24V DC sink/source input	2080-IQ4
4-point relay output, individually isolated, 2 A	2080-OW4I
8-point combo, 12/24V DC, sink/source input, 12/24V DC sink output	2080-IQ4OV4
8-point combo, 12/24V DC sink/source input 12/24V DC source output	2080-IQ4OB4
4-point, 24V DC source output	2080-OB4
4-point, 24V DC sink output	2080-OV4
High speed counter, 250 kHz	2080-MOT-HSC
20-node DeviceNet® scanner	2080-DNET20

[1] All plug-in modules are for use with the Micro820, Micro830, Micro850 and Micro870 controllers, except catalog number 2080-MEMBAK-RTC and 2080-MEMBAK-RTC2. 2080-MEMBAK-RTC is for use with Micro830 and Micro850 controllers. 2080-MEMBAK-RTC2 is for use with Micro830, Micro850 and Micro870 controllers.

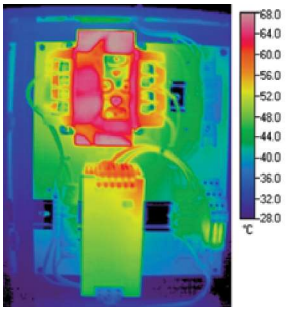
Power Supplies

Power Supplies
1606

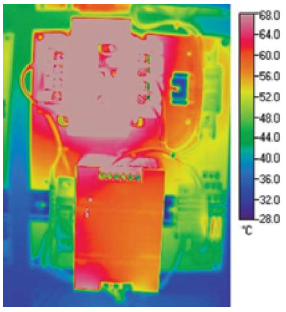
- Intelligent circuit design with long-life electrolytic capacitors
- Allows 20% continuous (XLE/XLD family) or 50% temporary (XLS family) additional power reserve without reducing output voltage, while minimizing ripple and noise
- Redundancy modules or power supplies with built-in redundancy provide a means for managing multiple power supplies for back-up power
- Compact size saves valuable panel space

Allen-Bradley efficiency = smaller enclosures

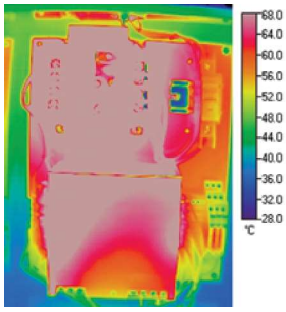
These thermal images show the difference an efficient power supply can make in a panel. All three power supplies are using the same transformer, but the Allen-Bradley power supply has the whole package running cooler due to its more efficient design.



A-B 1606-XLS – 10A, 24V DC – 93% Efficiency



Competitor A – 10A, 24V DC – 91% Efficiency



Competitor B – 10A, 24V DC – 84% Efficiency

Selection Criteria

Power Supply Family	Basic 1606-XLB	Essential 1606- XLE	DC-DC Converter 1606-XLD	Compact 1606-XLP	Performance 1606-XLS
Input Voltage	Single phase	Single/multi phase	DC Voltage	Single/multi phase	Single/multi phase
Watt Range	36...480W	80...960 W	92...240 W	15...100 W	80... 960 W
Multiple Output Voltages	24...28V DC	X	24, 48V DC	X	X
Terminations	Screw, push-in	Screw, cam lock spring, plug, push-in	Cam lock spring, screw	Cam lock spring, screw,	Cam lock spring, screw
Auto Select Input	X	X	-	X	X
Power Boost	-	120%	120%	-	150%/5 s
DC OK Relay Output	X	X	X	X	X
DC OK LED Indicator	X	X	X	X	X
Conformal Coat for Harsh Environments	-	X	-	-	X
Hazardous Location Approvals	-	X	X	X	X

Product Selection – 1606-XLB

Basic Power Supplies - Single-phase

Input Voltage	Output Voltage [V DC]	Output Power [W]	Output Current [A]	Steady-state Input Current [V AC]		Cat. No.
				@ 120V AC	@ 230V AC	
AC 100...240V	24...28	36	1.5	0.6	0.38	1606-XLB36EH
AC 100...240V	12...15	60	5	1.0	0.6	1606-XLB60BH
AC 100...240V	24...28	60	2.5	1.0	0.6	1606-XLB60EH
AC 100...240V		60	2.5	1.0	0.6	1606-XLB60E
AC 100...240V		90	3.75	1.45	0.95	1606-XLB90EH
AC 100...240V			3.75	1.45	0.95	1606-XLB90E
AC 100...240V			3.75	1.45	0.95	1606-XLB90EQ
100...120/200...240V AC		120	5	1.72	1.05	1606-XLB120E
100...240V AC		240	10	2.17	1.18	1606-XLB240E
AC 100...240V		480	60	4.3	2.3	1606-XLB480E

Product Selection – 1606-XLD

Basic Power Supplies - Single-phase

Input Voltage	Output Voltage [V DC]	Output Power [W]	Output Current [A]	Steady-state Input Current [V DC]		Cat. No.
				@ 24V DC	@ 48V DC	
24	24	92	3.8	4.25		1606-XLDC92D
24	24	240	10	10.5		1606-XLDD240E
48	24	120	5		2.75	1606-XLDF120E
48	48	240	5		5.3	1606-XLDF240F

Power Supplies

Product Selection – 1606-XLE

Essential Power Supplies

Phase	Input Voltage	Output Voltage [V DC]	Output Power [W]	Output Current [A]	Steady-state Input Current [V AC / V AC]		Cat. No.
					120	230	
1	100...240V AC	24...28	80	3.3	1.24	0.68	1606-XLE80E
			120	5	1.09	0.6	1606-XLE120E
			120	5	1.09	0.6	1606-XLE120EC [1]
	100...120V AC		120	5	1.94	-	1606-XLE120EN
	200...240V AC		120	5	2.2	-	1606-XLE120EE
	100...240V AC		240	10	2.15	1.13	1606-XLE240E
	100...120V AC		240	10	3.84	-	1606-XLE240EN
	200...240V AC		240	10	2.2	-	1606-XLE240EE
	100...120/200...240V AC	48...52	240	5	0.7	0.6	1606-XLE240F
	110...300V DC	48...56	480	10	4.26	2.23	1606-XLE480FP-D
2	380...480V AC	12...15	96	8	0.64 / 0.56A @ 3 x 400/480V AC		1606-XLE96B-2
3		48...56	240	5	0.7 / 0.6A @ 3 x 400/480V AC		1606-XLE240F-3
2		24...28	120	5	0.75 / 0.68A @ 3 x 400/480V AC		1606-XLE120E-2
3			240	10	0.7 / 0.6A @ 3 x 400/480V AC		1606-XLE240E-3
		24V	960	40	1.4A @ 3 x 480V AC		1606-XLE960DX-3N
1	AC 100...240V	48...56	260	5.4	2.32	1.20A	1606-XLE260F
		24...28	240	10	2.15	1.13A	1606-XLE240EC
		24V	240	10	2.17	1.14A	1606-XLE240ERL
			240	10	2.17	1.14A	1606-XLE240ERZ
			240	10	2.17	1.14A	1606-XLE240ECRZ
		24...28	240	10	2.15	1.13A	1606-XLE240EL
			240	10	2.15	1.13A	1606-XLE240EH
		24V	240	10	2.17	1.14A	1606-XLE240EDRZ
		24...28	120	5	1.09	0.6A	1606-XLE120EL
			120	5	1.09	0.6A	1606-XLE120EH
			120	5	1.09	0.6A	1606-XLE120ED
		48...56	120	2.5	1.09	0.6A	1606-XLE120F
		24V	480	20	4.28	2.25A	1606-XLE480ERL
			480	20	4.28	2.25A	1606-XLE480ERZ
			480	20	4.28	2.25A	1606-XLE480ECRZ
		24...28	480	20	4.26	2.23A	1606-XLE480EL
			480	20	4.26	2.23A	1606-XLE480EH
			480	20	4.26	2.23A	1606-XLE480EM
		24V	480	20	4.28	2.25A	1606-XLE480EDRZ

[1] The **C** suffix in the catalog number indicates that the product has conformal coating.

Please see technical data for additional catalog numbers available.

Product Selection – 1606-XLP

Compact Power Supplies

Phase	Input Voltage	Output Voltage [V DC]	Output Power [W]	Output Current [A]	Steady-state Input Current [V AC]		Cat. No.
					120	230	
1	100...240V AC, 85...375V DC	5...5.5	15 [1]	3	0.28	0.17	1606-XLP15A
		12...15	15 [1]	1.3	0.28	0.17	1606-XLP15B
		24...28	15 [1]	0.6	0.28	0.17	1606-XLP15E
		5...5.5	25 [1]	5	0.60	0.30	1606-XLP25A
		10...12	30 [1]	3	0.60	0.25	1606-XLP30B
		24...28	30 [1]	1.3	0.60	0.35	1606-XLP30E
		24...28	30 [1]	1.3	0.54	0.30	1606-XLP30EQ
		±12/15	36 [1]	2.8	0.65	0.40	1606-XLP36C
		12...15	50 [1]	4.2	1.00	0.60	1606-XLP50B
		24...28	50 [1]	2.1	0.77	0.44	1606-XLP50E
		24...28	50 [1]	2.1	1.00	0.60	1606-XLP50EZ
		48...56	50 [1]	1	1.00	0.60	1606-XLP50F
	100...240V AC, 110...300V DC	12...15	60 [1]	4.5	0.91	0.54	1606-XLP60BQ
			60 [1]	4.5	0.97	0.61	1606-XLP60BQT
		24...28	72 [1]	2.5	0.98	0.58	1606-XLP60EQ
			90 [1]	2.5	1.05	0.66	1606-XLP60EQT
	100...120/220...240V AC, 220...375V DC		95 [1]	3	1.60	0.80	1606-XLP72E
		12...15	100	7.5	1.90	0.90	1606-XLP90B
	100...200/200...240V AC, 220...375V DC	24...28	100	3.9	2.00	0.95	1606-XLP95E
			90 [1]	4.2	2.10	1.00	1606-XLP100E
		48...56	100	2.1	2.10	1.00	1606-XLP100F
2	380...480V AC	24...28	90	3.75	2 x 0.36 @400...480 V AC		1606-XLP90E-2
			100	4.2	2 x 0.40 @400...480 V AC		1606-XLP100E-2

[1] NEC CLASS 2 Rated

Power Supplies

Product Selection – 1606-XLS

Performance Power Supplies

Phase	Input Voltage	Output Voltage [V DC]	Output Power [W]	Output Current [A]	Steady-state Input Current		Cat. No.
					120 [V AC / V DC]	230 [V AC / V DC]	
1	100...240V AC, 110...300V DC	24...48	80	3.3	1.42	0.82	1606-XLS80E
			120	5	1.10	0.62	1606-XLS120E
							1606-XLS120EA
		12...15	180	15	1.65	0.93	1606-XLS180B
	100...240V AC, 110...150V DC	24...48	240	10	2.22	1.22	1606-XLS240E
							1606-XLS240EA [1]
							1606-XLS240EC [1]
	100...240V AC 110...300V DC	24...28	240	10	2.22	1.22	1606-XLS240E-D
		48...56	240	5	2.22	1.22	1606-XLS240F-D
	100...240V AC, 110...150V DC	48...56	240	5	2.22	1.22	1606-XLS240F
		28...32	240	8	2.22	1.22	1606-XLS240K
		24...48	480	20	4.56	2.48	1606-XLS480E
							1606-XLS480EA [1]
							1606-XLS480EC [1]
	600V DC				0.79A @ 600V DC		1606-XLS480E-D
	200...240V AC	24...48	480	20	–	4.45	1606-XLS480EE
	100...240V AC, 110...150V DC	48...56	480	10	4.56	2.48	1606-XLS480F
		36...42	480	13.3	4.56	2.48	1606-XLS480G
	200...240V AC, 220...300V DC	24...28	960	34.3	–	4.6	1606-XLS960EE
		48...56	960	20	–	4.6	1606-XLS960FE
	100...240V AC	24...28	960	40	8.6	4.5	1606-XLS960E
	100...240V AC	48...56	960	20	8.6	4.5	1606-XLS960F
	100...240V AC 110...300V DC	24...28	240	10	2.22	1.22	1606-XLS240E-D
	100...240V AC 110...300V DC	48...56	240	5	2.22	1.22	1606-XLS240F-D
3	380...480V AC	24...28	480	20	3 x 0.65V AC @400...480		1606-XLS480E-3
							1606-XLS480E-3C [1]
	380...480V AC	48...56		10	3 x 0.65V AC @400...480		1606-XLS480F-3
		36...42		13.3			1606-XLS480G-3
		24...28	960	40	3 x 1.35V AC @400...480		1606-XLS960E-3
		48...54		20			1606-XLS960F-3

[1] The **C** suffix in the catalog number indicates that the product has conformal coating. The **A** suffix in the catalog number indicates that the product carries the ATEX rating.

Graphic Terminals

OPERATOR INTERFACE

PanelView™ 800 Graphic Terminals 2711R

- High-resolution display (65K colors) with LED backlight, supporting simple graphic animation
- Communicate with MicroLogix™, Micro800™, CompactLogix™ 5370 and CompactLogix™ 5380 controllers and other devices using serial (RS232, RS422/485) protocols and Ethernet
- Review alarm status, history and time/date of equipment events even after power cycle
- Languages supported: French, German, Italian, Portuguese, Spanish and Simplified Chinese

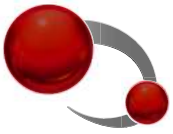
The PanelView 800 graphic terminal features a high-speed processor, high-resolution display with LED backlight and internal memory; helping to improve productivity and maintenance, while enjoying the convenience and efficiencies of single-source buying.

Landscape and Portrait Modes

Serial or Ethernet Network

Optimized for use with Micro800 and MicroLogix controllers.

Connected Components Workbench Software



Connected Components Workbench™ software is a single software environment supporting...

- E200™ electronic overload relays
- Guardmaster® 440C-CR30 software configure safety relay
- Guardmaster speed monitory safety relays
- GuardShield™ 450L safety light curtains
- Kinetix® servo drives
- Micro800 controllers
- PanelView 800 graphic terminals
- PowerFlex® drives
- SMC™ soft starters

...in your standalone machines.

Product Selection

PanelView™ 800 Specifications

Feature	4-inch	7-inch	10-inch
				
Catalog Number	**2711R-T4T**	**2711R-T7T**	**2711R-T10T**
Resolution	480 x 272 WQVGA	800 x 480 WVGA	800 x 600 SVGA
Display type	TFT touch screen, wide LCD		
Display hour	40,000 hours		
Colors	65K colors		
Backlight	LED		
Operator input	Resistive touch and tactile function keys	Resistive touch	
Power supply	24V DC		
Processor, CPU speed	800 MHz		
Internal storage	256 MB		
RAM	256 MB DDR		
Operation system	Microsoft Windows CE 6.0		
Real-time clock with battery	Yes		
Operating temperature	0...50 °C		
RS232/RS422/485 (isolated)	Separate RS232 and RS422/RS485 connectors		
Ethernet 10/100 Mbps	1		
USB host (USB 2.0)	Yes		
microSD™ slot	Yes		
Product dimension (mm) (height x width x depth)	116 x 138 x 43	144 x 197 x 54	225 x 287 x 55
Panel cutout (mm) (height x width)	99 x 119	125 x 179	206 x 269
Weight	0.35 kg (0.76 lb)	0.68 kg (1.48 lb)	1.57 kg (3.41 lb)
Front bezel protection	IP65, NEMA 4X, 12, 13		
Certifications	cULus listed; Class I Div 2, Groups A,B,C,D, T4A, CE, RCM, KC, RoHS		
Software	Connected Components Workbench software release 8.00 or later		

Accessories

Catalog Number	-	2711R-APK7	2711R-APK10
Accessories	-	7" Adapter plate kit	10" Adapter plate kit

For more information on our complete family of PanelView 800 Component products, please visit:
https://rok.auto/PanelView800

VEGA Electric

momentary pushbuttons
Mushroom pushbuttons non-illuminated
Selector switches
indicator
enclosures with control units
“Joy Stick” selector switch
Button accessories

ANUEC momentary pushbuttons

LA158-2BA31

LA158-2BA42

LA158-2BP31

LA158-2BL31

LA158-2BL42

LA158-2BA3311

LA158-2BC31

LA158-2BS542-3

LA158-2BS442

LA158-2BS142

LA158-2BS142

LA158-2BR42

LA158-2BR31

LA158-2BK125M5

LA158-2BD21

LA158-2BD33

LA158-2BJ33

LA158-2BJ21

LA158-2BG33

LA158-2BW8365

LA158-2BV64

LA158-2BW3462

LA158-2B

ANUEC series indicator

AD118-16DS

AD118-16DS

AD118-22SK

AD118-22FD

AD118-22SM

AD118-22M

AD118-22SM

AD118-22HS

AD118-22F

AD118-22DS

ANUEC series control box

XAL-B222

XAL-B101

XAL-J174H29

XAL-B132H29

XAL-D114

XAL-D222

XAL-D324

XAL-D114

XAL-D114

XAL-D114

XAL-D324

LA158-XAI

ANUEC Rocker series

LA158-PA22CR

LA158-PA24CR

LA158-2011

LA158-4022

ANUEC Button accessories













220V


220V


EMERGENCY
STOP


EMERGENCY
STOP
EMERGENCY
STOP

System Encluser

Small enclosures

Compact enclosures

Enclosure systems

IT rack systems

IT enclosures

Console systems/PC enclosure systems/Industrial Workstations

Operating housings/ support arm systems/ stand systems

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Outdoor enclosures

VEGA ELECTRIC

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