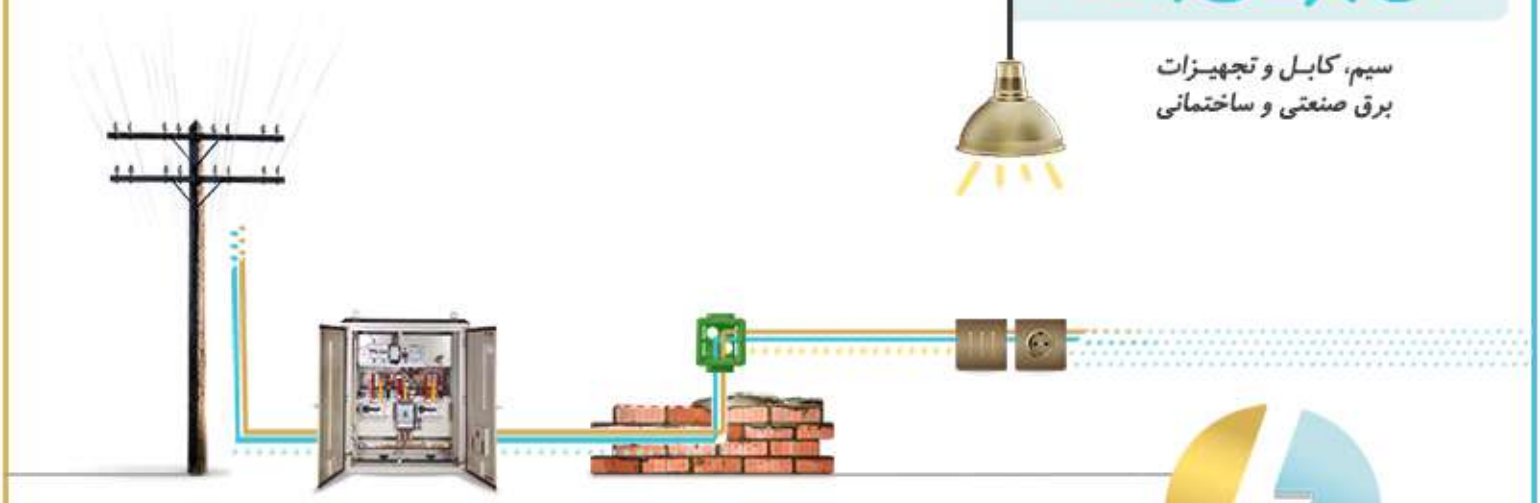
برق و صنعت سروین

کل جریان با ما

سیم، کابل و تجهیزات
برق صنعتی و ساختمانی



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اراک. خیابان شهید بهشتی. خیابان عضد. نبش عضد یک

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KAVEH

ELECTRO KAVEH

Mfg. & Ind. Group

LV PRODUCTS CATALOGUE 2018

INDEX

Introduction :

In 1982, Electro Kaveh Manufacturing Industrial Group was established by the certificate of Ministry of Industries to produce all kinds of Electric Cam operated switches. In the same year this group did the first and primary actions to construct the factory in Kaveh industrial city. In 1986, After constructing the building and fixing and operating the machinery and equipment, and as soon as the parts were available for assembling and started its production activities formally.

In 1988, Electro Kaveh designed and Produced a Floating Switch.

In 1991, by producing all kinds of the required metal and plastic parts, this company reached self-sufficiency and then gradually and little by little succeeded to do mass-production of Electric Cam switches from 12A up to 630A in various types.

In 1996, the production line of Miniature Circuit Breakers in Electro Kaveh factory was operated and it succeeded to produce MCB switches from 2A up to 63A in SP, DP, TP and TPN types. Their design updated in 2013 and increase rated current up to 125A for AC & DC MCBs and added the RCCBs and RCBOs to KAVEH products.

In 2006, in order to give variety to the products , the company put the production of Electric Automotive parts into the program of its activities and succeeded to produce kinds of DC relays for light & heavy vehicles.

In 2011, Electro Kaveh designed and produced the Changeover Switch.

In 2013, Electro Kaveh started the MCCB production project and in 2016 produced them.

In 2015, Electro Kaveh produced the Single Phase Multi-Tariff Electronic Energy Meter.

In 2016, Electro Kaveh designed and produced the AC Contactor and Thermal Over load relay.

In 2016, Electro Kaveh Manufacturing Industrial Group by means of its 30-year experience has conformed itself with the modern world technology and has put in its programs and activities the new design of Cam switches in high protection degree (IP 65).

In 2017, Electro Kaveh designed and produced the Electronic Relays.

Cam - Operated Switch

CONTENTS

Cam - Operated Switch

General :

Cam - Operated Switch is a kind of switch with semi-independent manual operation that is defined in the standard as follows :

Switch: Mechanical Making and Breaking device capable of connecting to, Transmit & disconnect the circuit is in normal conditions which may include specified operating overload conditions and can also be for a certain period under abnormal conditions such as short circuit current will crossing. A Switch short-circuit currents may be able to connect, but can not break it.

Semi – independent manual operation: The action applies only to direct energy to be done manually. Manually force to a much greater extent so that it leads to increased switching Unless the operator is deliberately delayed .

Cam operated & Selector Switches from Electro Kaveh company, covers a full range of cam operated switches which are suitable for Switching circuits and power supplies, Changeover switch (power - generator), Multi-step switch (selector switch), Ammeter switch, voltmeter switch and Motor Reversing cam switches like star – triangle , … .

Rated currents from 12A up to 630A with rotation angles of 30, 45, 60 and 90 degrees, ability to install inter - lock mechanism and very high variation in the layout and arrangement of contacts in utilization category AC-23A (switching motor loads or other loads to highly inductive) in accordance with international standards IEC60947-1&3 and national standards ISIRI4835 –1&3 are been produced in Electro Kaveh Group.

The quality of Electro Kaveh Switch is far beyond the expectations and requirements of the standards. The products not only approved by famous European institutions such as the International German VDE and Semko of Sweden but also local organizations like the Niroo Research Institute (NRI) and the organizations affiliated to the Ministry of Petroleum and Ministry of Energy.

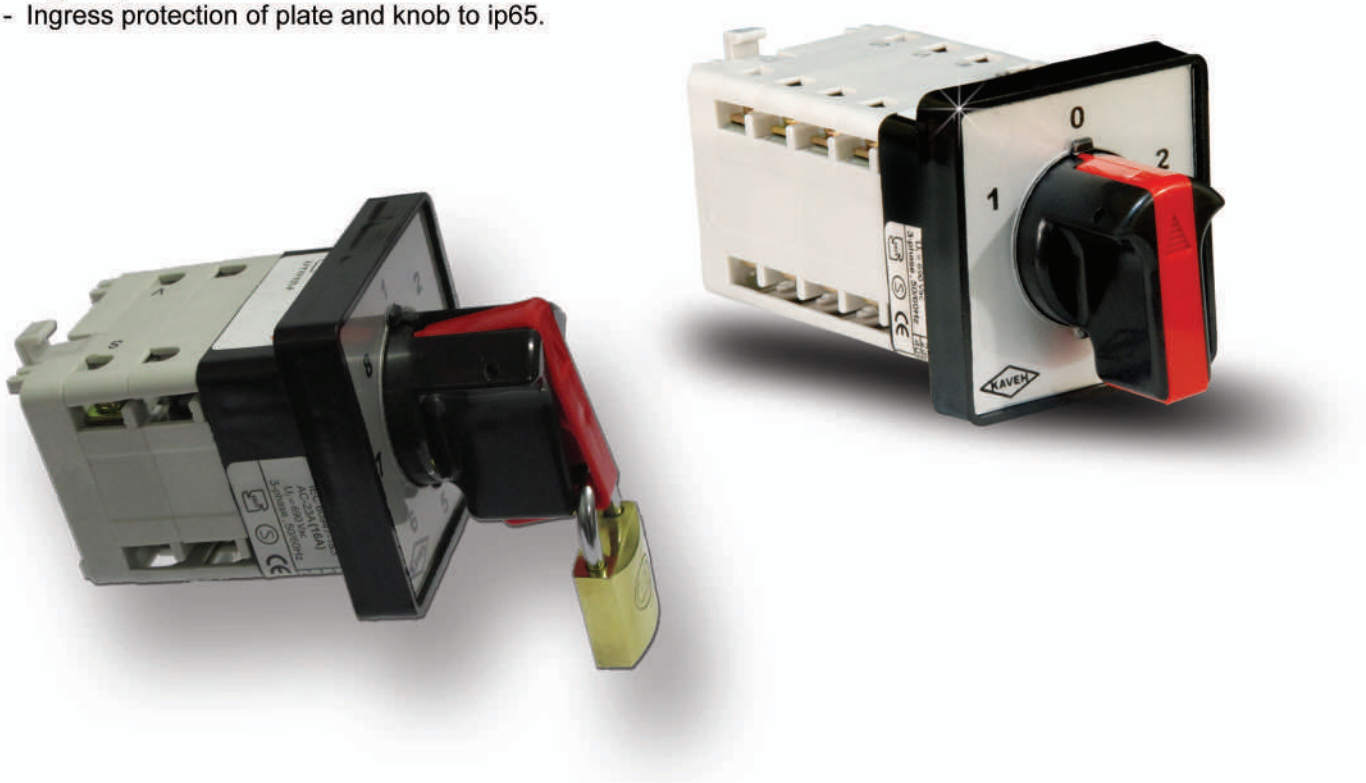
Electro kaveh has certification mandatory standard from National Iranian Standards Organization .

KS Model Cam-Operated switch:

KS Model is an evolution of com-operated switches produced during several based on the experience acquired in manufacturing different kinds of switches to local foresees industry market.
In most attempts has been taken in this type of switch to add features and capabilities and advantages other its previous ones . In order to increase our loyal customer's satisfaction.

Technical features of KS Model :

- Dimensional compatibilityfor mounting on the equipment ease of installation.
- Operation endurance in vibration condition.
- Variety of contact configuration to cover different needs ability to be installed on MCB Rail.
- Capability of locking in each position.
- Better performance longer lifetime than ever other designs.
- Ingress protection of terminal to IP20.
- Ingress protection of plate and knob to ip65.

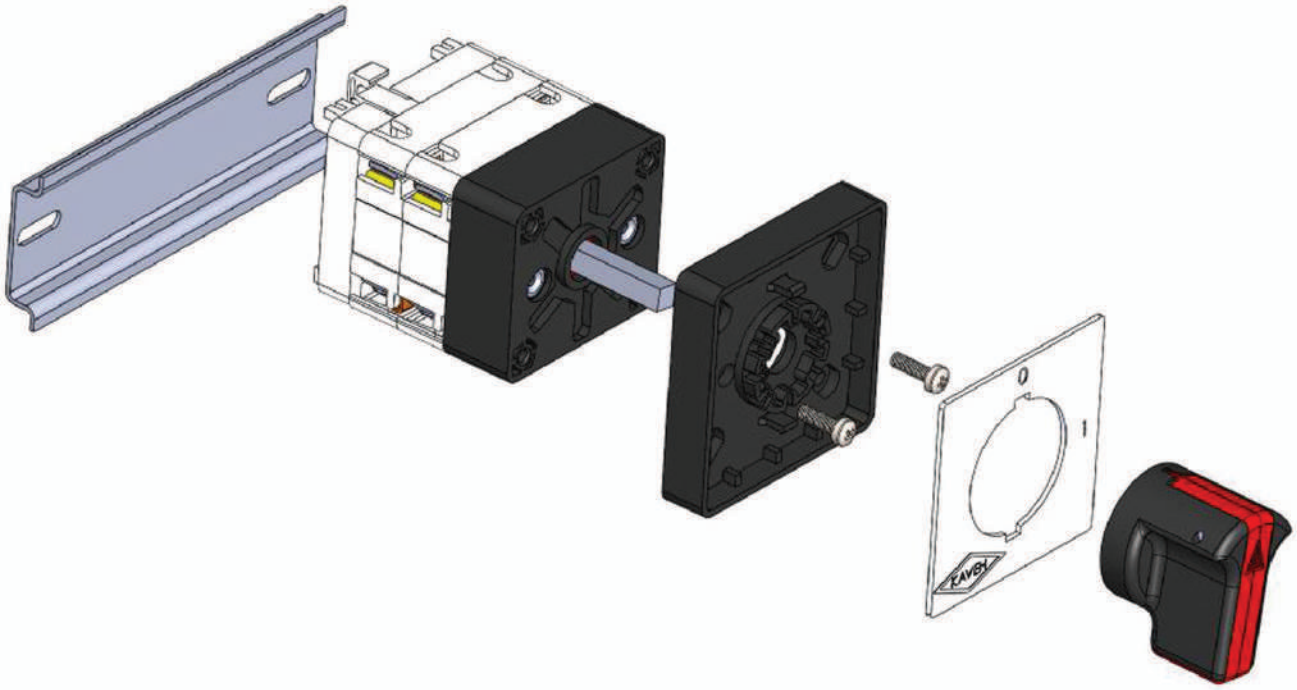


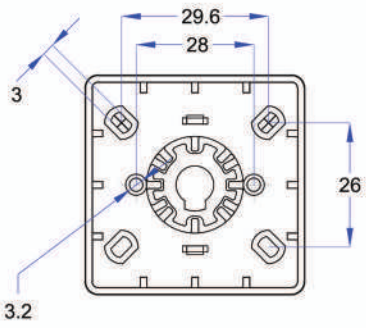
Technical Specification:

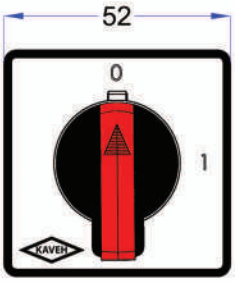
Rated Voltage (Vn)	230/400 Vac
Rated Frequency	50/60 Hz
Utilization Category	AC-23A
Rated Current (In)	12A , 16A , 20A
Thermal Current (Ith)	16A , 20A , 25A
Rated Power (400Vac)	4kW , 7.5kW , 9kW
Standard No.	IEC/EN 60947-1&3

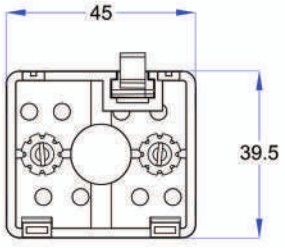
Cam - Operated Switch

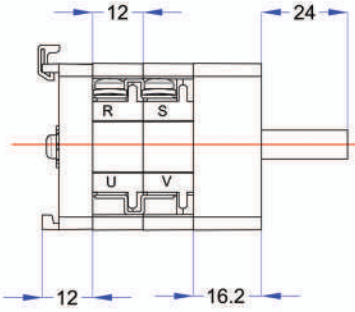
Dimension of KS Model Cam-Operated switch:

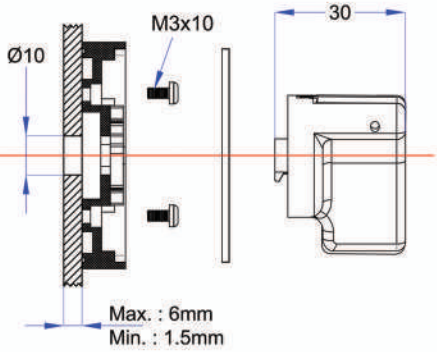












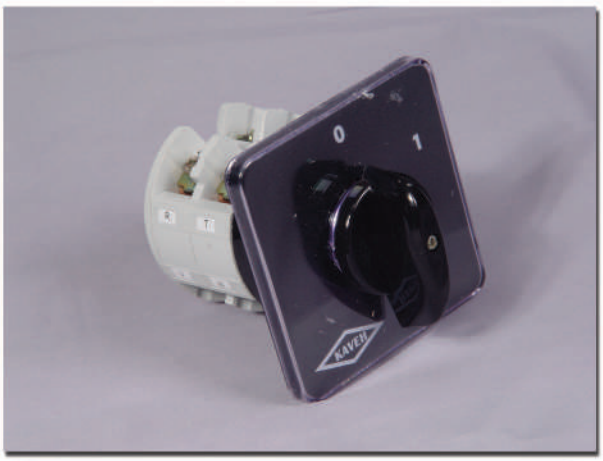
All sizes are in "mm"

Cam - Operated Switch

KA Model Classification :

KA16.00 Series

KA25.00 Series



KA50.00 Series

KA63.00 Series

KA100.00 Series

KA200.00 Series

Cam - Operated Switch

AC Utilization Category :

Utilization Cat. / Rated Current		Power (KW)											
		12A	16A	20A	25A	32A	40A	50A	63A	100A	200A	400A	630A
Single Phase	**110V**	0.75	1.00	1.30	1.60	2.30	3.00	3.90	5.10	8.10	10.0	18.0	28.0
	230V	1.50	2.10	2.60	3.30	4.60	6.10	7.80	10.3	16.2	20.0	36.0	56.0
	400V	2.60	3.60	4.50	5.70	8.00	10.0	13.3	17.6	28.0	34.0	62.0	96.0
AC1 Non-inductive or slightly inductive loads (Resistance furnaces,lighting circuits).	**110V**	1.80	2.50	3.00	3.50	5.00	6.20	6.90	10.0	13.2	26.0	50.0	80.0
	230V	3.50	4.40	5.50	7.00	10.0	12.5	13.8	20.0	26.5	52.0	100	160
	400V	6.00	7.50	9.50	12.0	17.0	20.0	24.0	33.0	45.6	90.0	172	275
AC2 Slip-Ring Motors: Starting &Reversing the motor rapidly while the motor is running.	**110V**	1.50	2.20	2.80	3.20	4.40	5.50	6.50	8.20	13.0	23.0	44.0	70.0
	230V	3.00	4.50	5.50	6.60	8.80	11.0	13.0	16.5	26.0	46.0	88.0	140
	400V	5.10	7.40	9.00	11.7	15.2	19.0	23.0	28.5	44.0	78.0	150	240
AC3 Squirrel cage motors: Starting ,Switching OFF motors during running.	**110V**	1.30	1.80	2.20	2.50	4.00	5.10	6.00	8.00	11.0	20.0	38.0	60.0
	230V	2.20	3.70	4.00	5.50	7.50	9.00	11.0	15.0	22.0	30.0	76.0	120
	400V	3.50	5.50	7.50	10.0	15.0	16.3	18.0	22.0	37.0	45.0	130	205
AC4 Squirrel Cage motors: Starting ,Plugging , Inching.	**110V**	1.00	1.40	1.70	2.00	3.00	3.80	4.20	6.10	7.00	14.0	26.0	41.0
	230V	2.00	2.70	3.30	4.00	6.10	7.70	8.50	12.0	17.5	28.0	52.0	82.0
	400V	3.40	4.70	5.50	7.00	10.3	13.2	14.7	21.3	30.0	48.0	89.0	141
AC-21A(1) Switching of resistive loads including moderate overloads.	**110V**	2.00	2.75	3.30	4.40	5.50	6.90	8.50	11.0	17.6	32.0	57.0	90.0
	230V	4.00	5.50	6.60	8.80	11.0	13.8	17.0	22.0	35.2	64.0	114	180
	400V	6.90	9.50	11.4	15.7	19.0	24.0	28.8	38.0	60.0	108	196	310
AC-22A Switching of mixed resistive &inductive loads including moderate overloads.	**110V**	1.80	2.50	3.00	3.90	5.00	6.30	7.60	9.80	15.6	28.0	49.0	77.0
	230V	3.50	5.00	6.00	7.80	10.0	12.5	13.3	19.6	31.2	56.0	98.0	154
	400V	6.00	8.50	10.3	13.5	17.3	21.5	25.7	34.0	54.0	95.0	168	265
AC-23A Switching of motor Overloads or other Highly inductive loads.	**110V**	1.50	2.10	2.60	3.30	4.20	5.20	6.40	8.30	13.2	24.0	41.0	64.0
	230V	3.00	4.00	5.50	8.50	10.0	12.0	15.0	18.5	30.0	48.0	82.0	128
	400V	4.00	7.50	9.00	15.0	18.5	21.0	25.0	30.0	45.0	82.0	141	220

(1) - A: **Frequent Operations.** B: Infrequent Operations.

Cam - Operated Switch

DC Utilization Category :

Rated Current (AC-23A)		12A	16A	20A	25A	32A	40A	50A	63A	100A	200A
Utilization Cat.	**V(DC)**	**Power (KW)**									
Single Pole Switching of resistive loads	**24**	0.28	0.38	0.48	0.60	0.75	0.90	1.15	1.40	2.20	4.50
	48	0.50	0.68	0.86	1.05	1.35	1.60	2.05	2.50	3.95	8.10
	110	1.00	1.30	1.65	2.05	2.50	3.15	4.00	5.00	8.00	15.0
	250	1.50	2.00	2.50	3.10	3.85	4.80	6.10	7.75	12.0	22.5
DC -21B (1) Switching of resistive loads including moderate overloads.	**24**	0.25	0.34	0.43	0.55	0.67	0.80	1.00	1.25	2.00	4.00
	48	0.45	0.61	0.77	0.94	1.20	1.45	1.80	2.25	3.60	7.20
	110	0.90	1.15	1.50	1.80	2.25	2.80	3.60	4.50	7.20	13.5
	250	1.35	1.80	2.25	2.75	3.40	4.30	5.45	6.95	10.8	20.2
DC -22B Switching of mixed resistive & inductive loads including moderate overloads.	**24**	0.19	0.25	0.32	0.41	0.50	0.60	0.75	0.94	1.50	3.00
	48	0.34	0.45	0.58	0.70	0.90	1.10	1.35	1.69	2.70	5.40
	110	0.67	0.86	1.12	1.35	1.69	2.10	2.70	3.35	5.40	10.1
	250	1.00	1.35	1.69	2.05	2.55	3.22	4.05	5.20	8.10	15.1
DC -23B Switching of motor Overloads or other Highly inductive loads.	**24**	0.13	0.17	0.21	0.27	0.33	0.40	0.50	0.62	1.00	2.00
	48	0.22	0.30	0.38	0.47	0.60	0.77	0.90	1.13	1.80	3.60
	110	0.45	0.57	0.75	0.90	1.13	1.40	1.80	2.25	3.60	6.75
	250	0.65	0.90	1.12	1.35	1.70	2.10	2.65	3.40	5.00	10.0

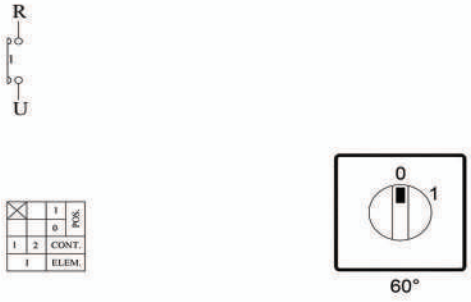
(1) - A: **Frequent Operations.** B: Infrequent Operations.

Cam - Operated Switch

Standard Diagrams :

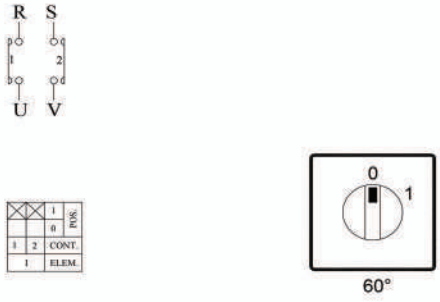
Code:01 کلیـــد تـــک فـــاز یکطرفـــه

Single . Pole Switch



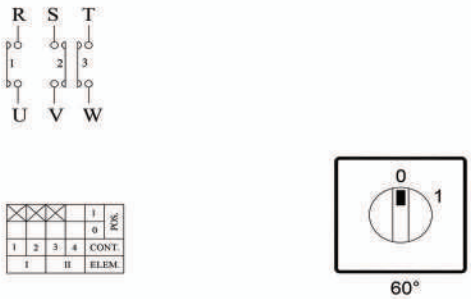
Code:02 کلیـــد دو فـــاز یکطرفـــه

Double . Pole Switch



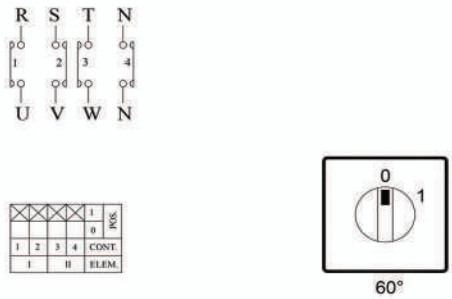
Code:03 کلیدســـه فـــاز یکطرفـــه

Three . Pole Switch



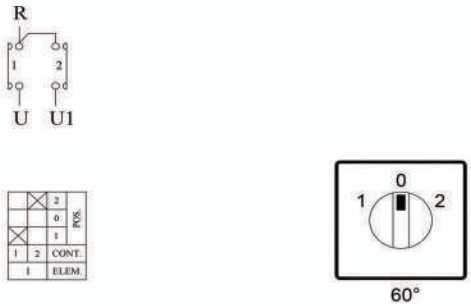
Code:04 کلیـــد سه فـــاز و نـــول یکطرفـــه

Four . Pole Switch



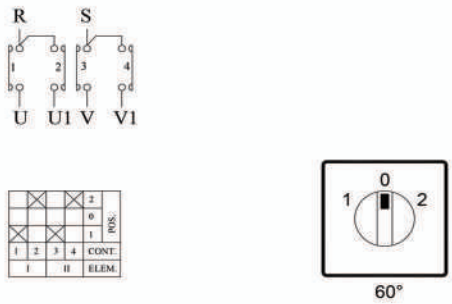
Code:05 کلیـــد تـــک فـــاز دو طرفـــه

Single . Pole Line Change Over Switch



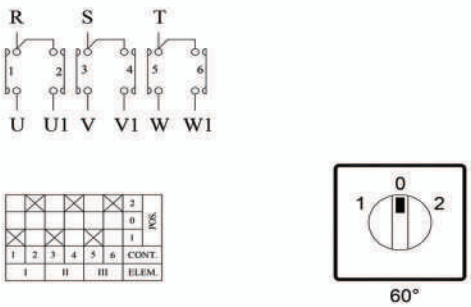
Code:06 کلیـــد دو فـــاز دو طرفـــه

Double . Pole Line Change Over Switch



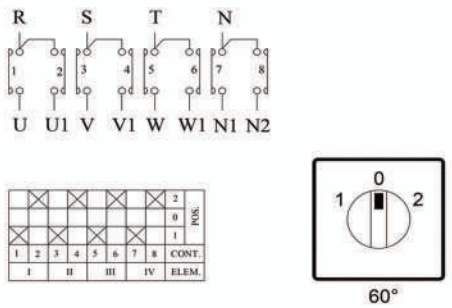
Code:07 کلیـــد سه فـــاز دوطرفـــه

Three . Pole Line Change Over Switch



Code:07/2 N کلیـــد سه فـــاز بـــا نـــول دوطرفـــه

Four . Pole Line Change Over Switch

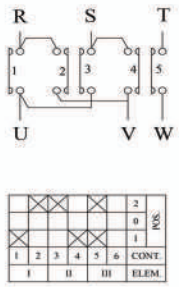


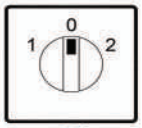
Cam - Operated Switch

Standard Diagrams :

Code:08 کلیـــد سه فـاز چپگـــرد راســـتگرد

Three . Pole Reversing Switch

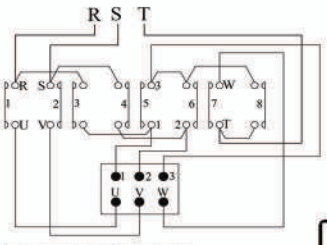


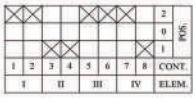


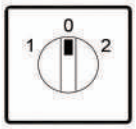
60°

Code:09 کلیدســـه فـاز دو ســـرعته

Pole Changing Switch



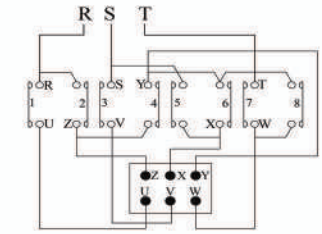


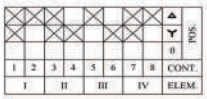


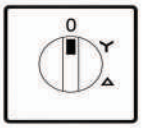
60°

Code:10 کلیدســـــتاره مثلـــث

Star . Delta Starter



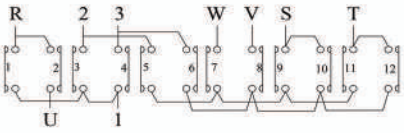


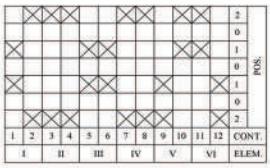


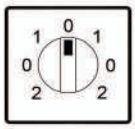
60°

Code:11 کلیـــــدچپگرد و راســـتگرد دو ســـرعته

Pole Changing and Reversing Switch



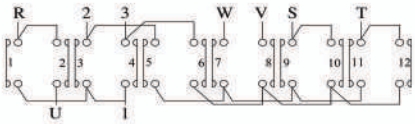


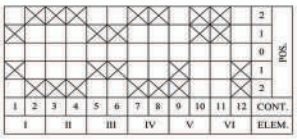


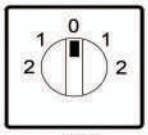
45°

Code:11/1 کلیـــــدچپگرد و راســـتگرد دو ســـرعته بـدون صـفر

Pole Changing and Reversing Switch without "0"



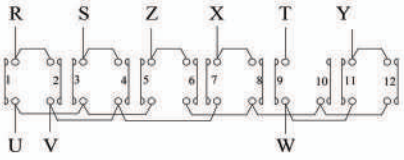


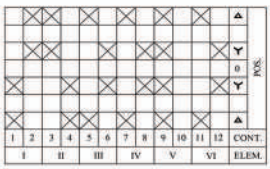


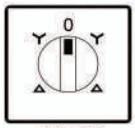
45°

Code:12 کلیدســـــتاره مثلـــث چپگـــرد و راســـتگرد

Star . Delta Starting and Severing Switch



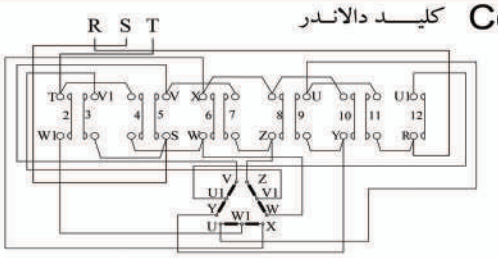


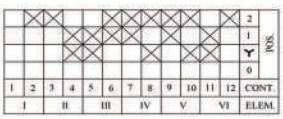


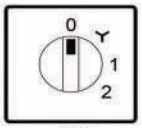
45°-90°

Code:13 کلیـــد دالانـدر

Pole Changing and Star . Delta Starting



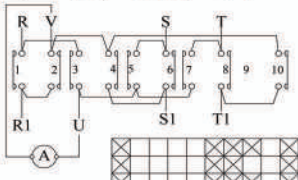


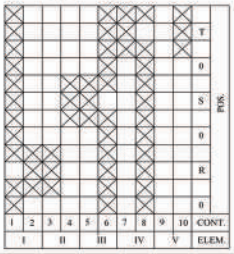


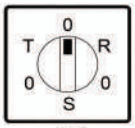
45°

Code:14 کلیدســـنجش آمـپر بـرای آمپرمتربـــدون تـرانس کـوران

Ampermetric Change Over Switch for Direct Measure







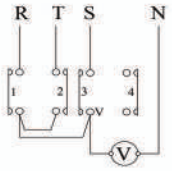
60°

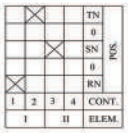
Cam - Operated Switch

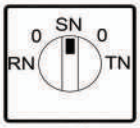
Standard Diagrams :

Code:15 کلیـــد ولـت بیـــن فـاز و نـول

Voltmetric Change Over Switch Phase - Neutral



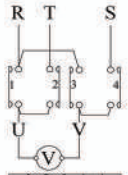


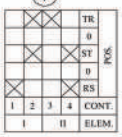


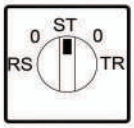
45°

Code:16 کلیـــد ولـت بیـــن فـاز و فـاز

Voltmetric Change Over Switch Phase - Phase



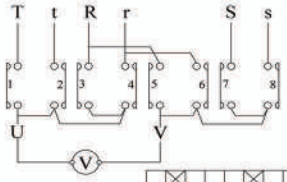


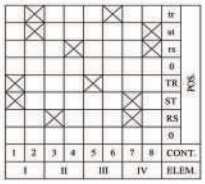


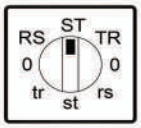
45°

Code:17 کلیـــد ولـت بیـــن فـاز و فـاز بـرای دو ولتـاژ سه فـاز

Voltmetric Change Over Switch Phase - Phase for 2 Three-Phase Voltages



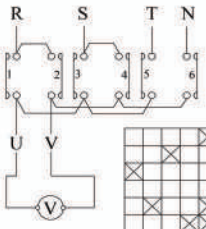


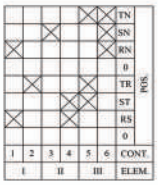


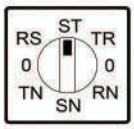
45°

Code:18 کلیـــد ولـت بیـــن فـاز و فـاز و هر فـاز و نـول

Voltmetric Change Over Switch Phase - Phase - Neutral



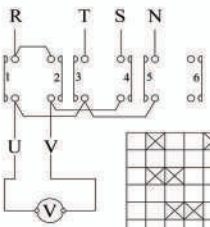


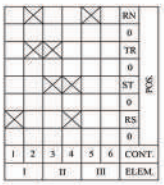


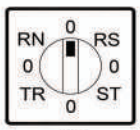
45°

Code:19 کلیـــد ولـت بیـــن یـک فـاز بـا نـول و فـاز و فـاز

Voltmetric Change Over Switch Phase - Neutral - phase - Phase



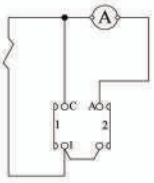


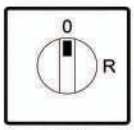


45°

Code:20 کلیـــد تـک فـاز آمپرمـــتر

Single-Pole Ampermetric Change Over Switch for 1Divider

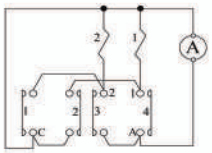


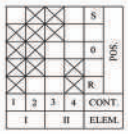


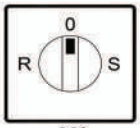
90°

Code:21 کلیـــد دو فـاز آمپرمـــتر

Single-Pole Ampermetric Change Over Switch for 2 Dividers



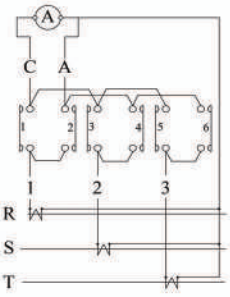


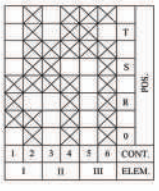


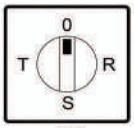
90°

Code:22 کلیـــد سه فـاز آمپرمـــتر بـا تـرانس کـوران

Single-Pole Ampermetric Change Over Switch for 3 Dividers







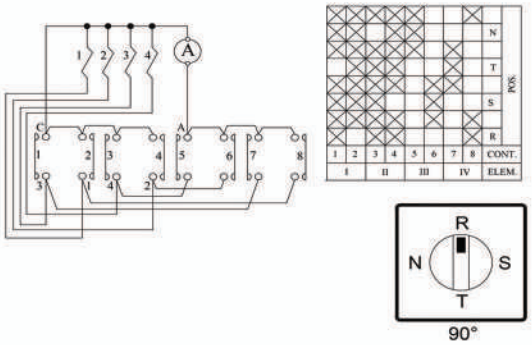
90°

Cam - Operated Switch

Standard Diagrams :

Code:23 کلیـــد سه فـاز و نـول آمپرمـــتر

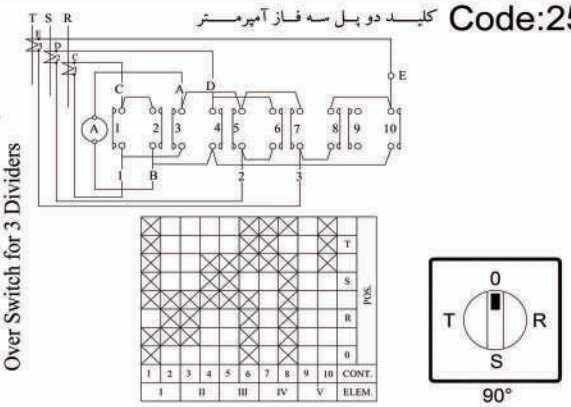
Single-Pole Ampermetric Change Over Switch for 4 Dividers



90°

Code:25 کلیـــد دو پـل سه فـاز آمپرمـــتر

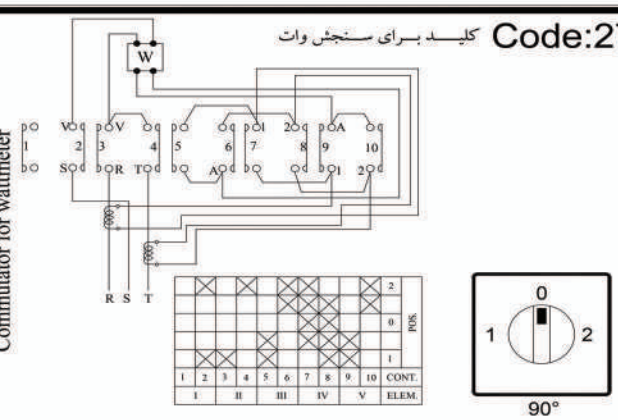
Two-Pole Ampermetric Change Over Switch for 3 Dividers



90°

Code:27 کلیـــد بـــرای ســنجش وات

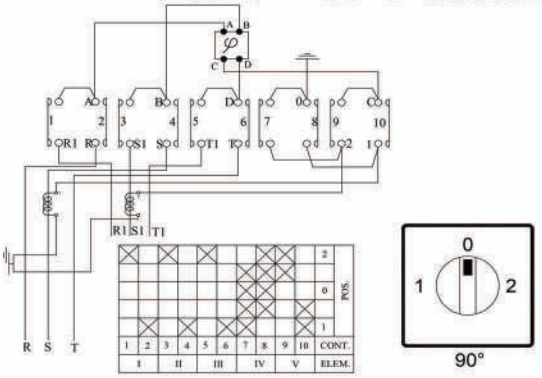
Commutator for wattmeter



90°

Code:28 کلیـــد بـــرای ســنجش ضـــریب تـــوان

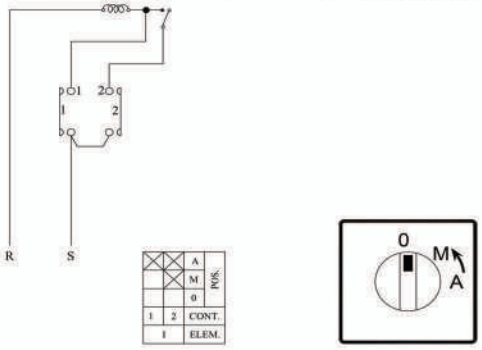
Commutator for Power-factor meter



90°

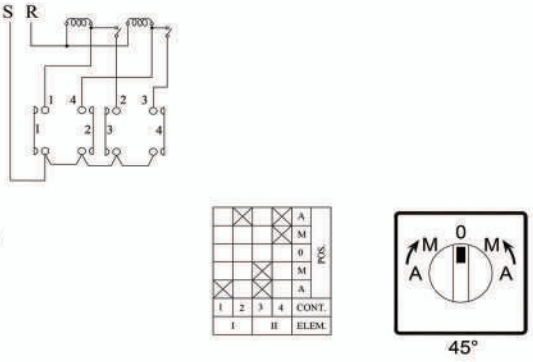
Code:29 کلیـــد کنـــترل دســـتی اســـتارت خور

Commutator for remote control switch operation



Code:30 کلیـــد کنـــترل دســـتی اســـتارت خور چپگـــرد و راســـتگرد

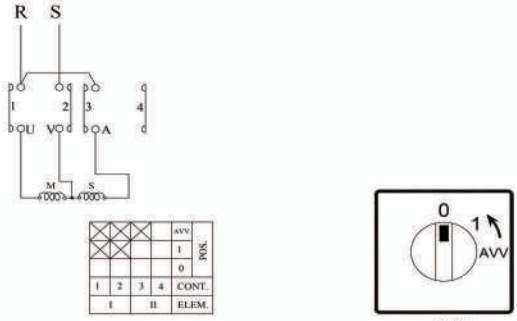
Commutator for remote control Reverser- operation



45°

Code:31 کلیـــد تـــک فـاز بـا فـاز کمکـــی فرمـــان

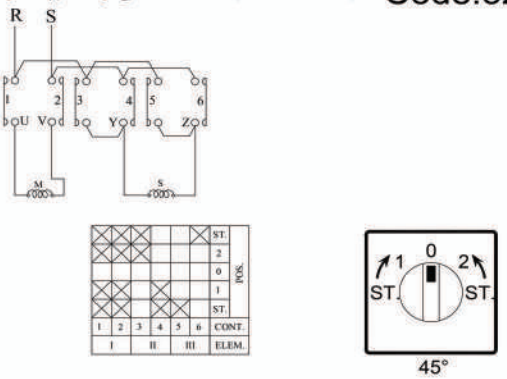
Switch for Single - phase motor with auxiliary phase



45°

Code:32 کلیـــد تـــک فـاز بـا فـاز کمکـــی فرمـــان چپگـــرد وراســـتگرد

Reverser for Single - phase motor with auxiliary phase



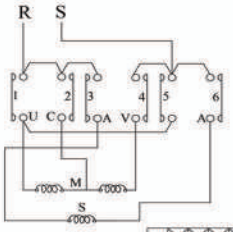
45°

Cam - Operated Switch

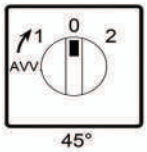
Standard Diagrams :

Code:33 کلید تک فاز دو طرفه با فاز کمکی فرمان

Pole change Switch for Single - phase motor with auxiliary phase



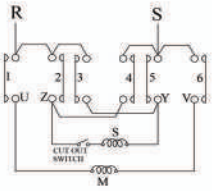
					2	POS.
					0	
					1	
				AVV		
1	2	3	4	5	6	CONT.
I		II		III		ELEM.



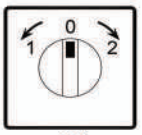
45°

Code:34 کلید تک فاز چپگرد و راستگرد با قطع کننده گریز از مرکز

Reverser for Single - Phase Motor With Centrifugal Cut-Out Switch



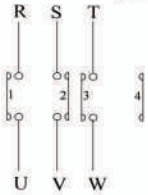
					2	POS.
					0	
					1	
1	2	3	4	5	6	CONT.
I		II		III		ELEM.



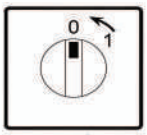
60°

Code:35 کلید سه فاز یکطرفه خود برگشت

Three pole switch with break self-return



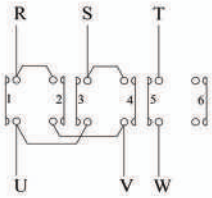
				1	POS.
				0	
1	2	3	4	CONT.	
I		II		ELEM.	



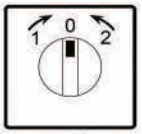
45°

Code:36 کلید سه فاز چپگرد و راستگرد خود برگشت

Three Pole Reverser With Break Self - Return



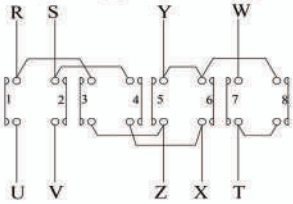
					2	POS.
					0	
					1	
1	2	3	4	5	6	CONT.
I		II		III		ELEM.



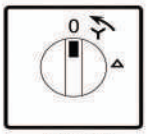
45°

Code:37 کلید ستاره مثلث خود برگشت از ستاره به صفر

Star- delta starter with self-return to o position from star position



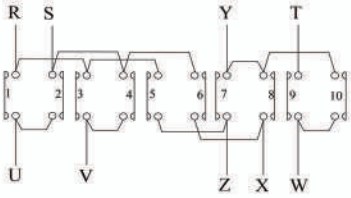
							Δ	POS.
							Y	
							0	
1	2	3	4	5	6	7	8	CONT.
I		II		III		IV		ELEM.



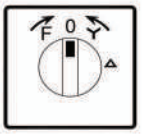
30°-90°

Code:38 کلید ستاره مثلث با ترمز در جهت مقابل جریان

Star- delta starter with counter current break



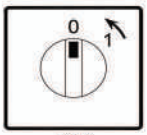
								Δ		POS.
								Y		
								0		
								F		
1	2	3	4	5	6	7	8	9	10	CONT.
I		II		III		IV		V		ELEM.



Code:39 کلید تک فاز یکطرفه خودبرگشت

1 Pole Switch With Break Self-Return 2 Positions

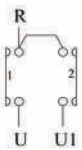
		1	POS.
		0	
1	2	CONT.	
I		ELEM.	



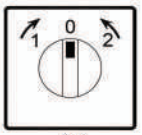
45°

Code:40 کلید تک فاز دو طرفه خودبرگشت

1 Pole Switch With Break Self-Return 3 Positions



		2	
		0	POS.
		1	
1	2	CONT.	
I		ELEM.	



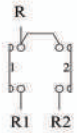
45°

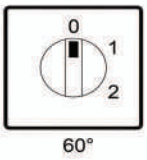
Cam - Operated Switch

Selector Switch Diagrams :

Code:CM012 کلیـــد تـــک فـــاز دو حالتـــه بـــا صـــفر

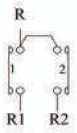
1 Pole Changeover Switch 2 Positions,with"0"

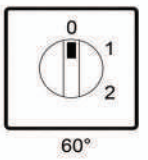




Code:CM012/1 کلیـــد تـــک فـــاز دو حالتـــه بـــا صـــفر در حالیکـــه کنتاکتهـــــای قبلـــی وصـل هســـتند

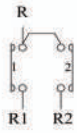
1Pole Changeover Switch 2Positions,with "0" whereas previous contacts are connected

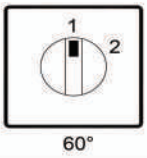




Code:CM12 کلیـــد تـــک فـــاز دو حالتـــه بـــدون صـــفر

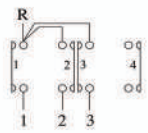
1 Pole Changeover Switch 2 Positions,without"0"

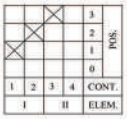


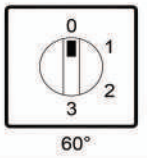


Code:CM013 کلیـــد تـــک فـــاز سه حالتـــه بـــا صـــفر

1 Pole Changeover Switch 3 Positions,with"0"

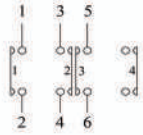


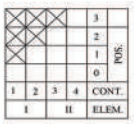


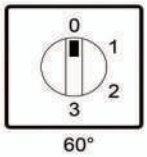


Code:CM013/1 کلیـــد تـــک فـــاز سه حالتـــه بـــا صـــفر در حالیکـــه کنتاکتهـــــای قبلـــی وصـل هســـتند

1Pole Changeover Swith 3Positions,with "0" whereas previous contacts are connected

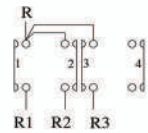


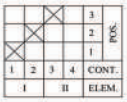


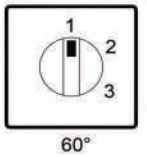


Code:CM13 کلیـــد تـــک فـــاز سه حالتـــه بـــدون صـــفر

1 Pole Changeover Switch 3 Positions,without"0"

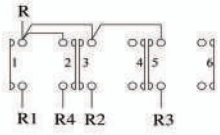


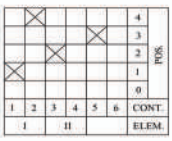


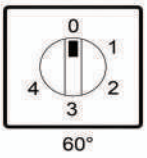


Code:CM014 کلیـــد تـــک فـــاز چهار حالتـــه بـــا صـــفر

1 Pole Changeover Switch 4 Positions,with"0"

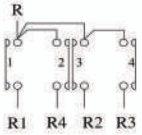


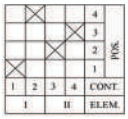


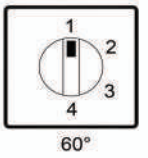


Code:CM14 کلیـــد تـــک فـــاز چهار حالتـــه بـــدون صـــفر

1 Pole Changeover Switch 4 Positions,without"0"





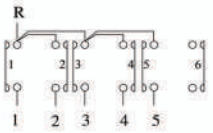


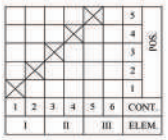
Cam - Operated Switch

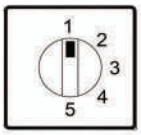
Selector Switch Diagrams :

Code:CM15 کلید تک فاز پنج حالته بدون صفر

1 Pole Changeover Switch 5
Positions,without"0"



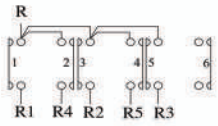


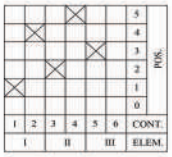


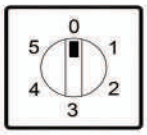
45°

Code:CM015 کلید تک فاز پنج حالته با صفر

1 Pole Changeover Switch 5
Positions,with"0"



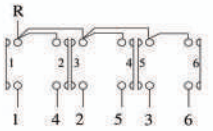


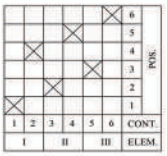


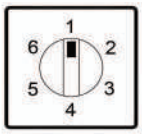
60°

Code:CM16 کلید تک فاز شش حالته بدون صفر

1 Pole Changeover Switch 6
Positions,without"0"



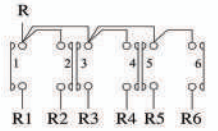


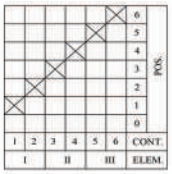


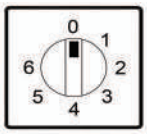
60°

Code:CM016 کلید تک فاز شش حالته با صفر

1 Pole Changeover Switch 6
Positions,with"0"



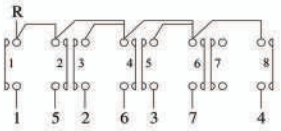


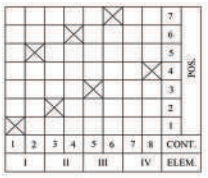


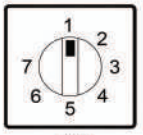
45°

Code:CM17 کلید تک فاز هفت حالته بدون صفر

1 Pole Changeover Switch 7
Positions,without"0"



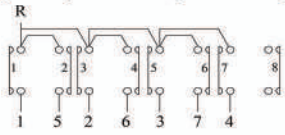


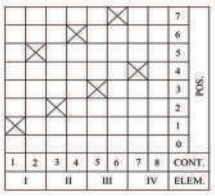


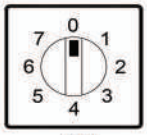
45°

Code:CM017 کلید تک فاز هفت حالته با صفر

1 Pole Changeover Switch 7
Positions,with"0"



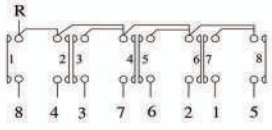


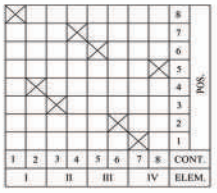


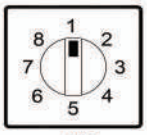
45°

Code:CM18 کلید تک فاز هشت حالته بدون صفر

1 Pole Changeover Switch 8
Positions,without"0"



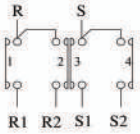


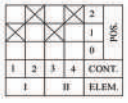


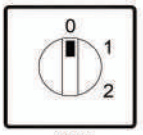
45°

Code:CM022 کلید دو فاز دو حالته با صفر

2 Poles Changeover Switch
2 Positions,with"0"







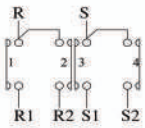
60°

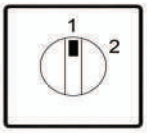
Cam - Operated Switch

Selector Switch Diagrams :

Code:CM22 کلیـــد دوفـاز دو حالتـــه بـدون صـــفر

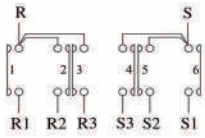
2 Poles Changeover Switch
2 Positions,without"0"

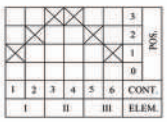


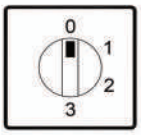


Code:CM023 کلیـــد دو فـاز سه حالتـــه بـا صـــفر

2 Poles Changeover Switch
3 Positions,with"0"

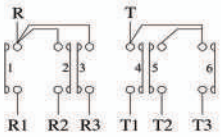


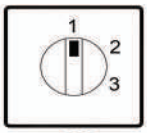




Code:CM23 کلیـــد دو فـاز سه حالتـــه بـدون صـــفر

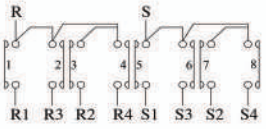
2 Poles Changeover Switch
3 Positions,without"0"

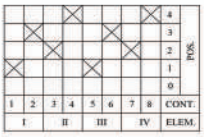


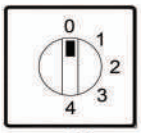


Code:CM024 کلیـــد دو فـاز چهار حالتـــه بـا صـــفر

2 Poles Changeover Switch
4 Positions,with"0"

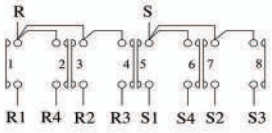


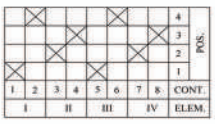


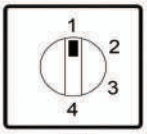


Code:CM24 کلیـــد دو فـاز چهار حالتـــه بـدون صـــفر

2 Poles Changeover Switch
4 Positions,without"0"

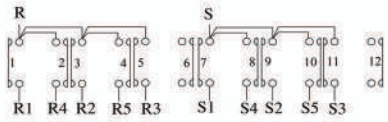


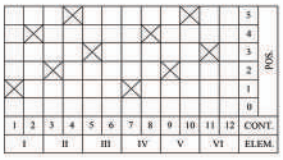


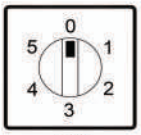


Code:CM025 کلیـــد دو فـــازپنج حالتـــه بـا صـــفر

2 Poles Changeover Switch
5 Positions,with"0"

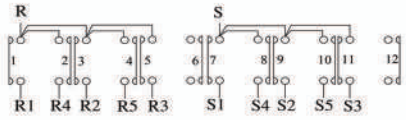


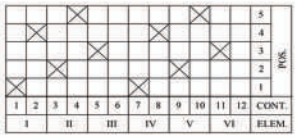


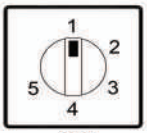


Code:CM25 کلیـــد دو فـاز پنج حالتـــه بـدون صـــفر

2 Poles Changeover Switch
5 Positions,without"0"

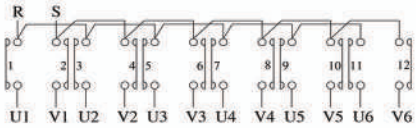


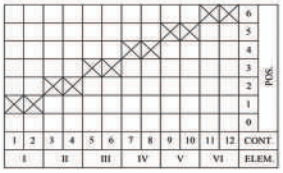


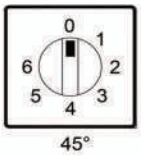


Code:CM026 کلیـــد دو فـاز شش حالتـــه بـا صـــفر

2 Poles Changeover Switch
6 Positions,with"0"







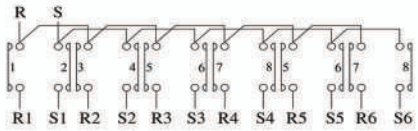
Cam - Operated Switch

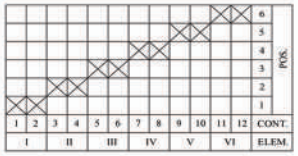
Selector Switch Diagrams :

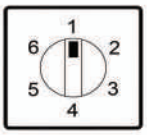
Code:CM26

کلیـــد دو فـاز شش حالتـــه بـدون صـــفر

2 Poles Changeover Switch
6 Positions,without"0"





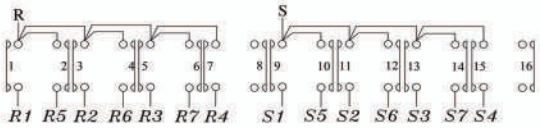


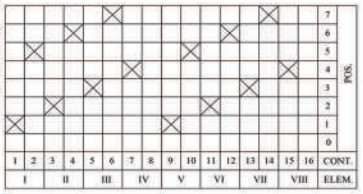
60°

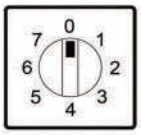
Code:CM027

کلیـــد دو فـاز هفت حالتـــه بـا صـــفر

2 Poles Changeover Switch
7 Positions,with"0"





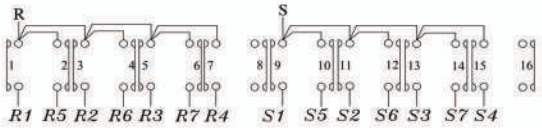


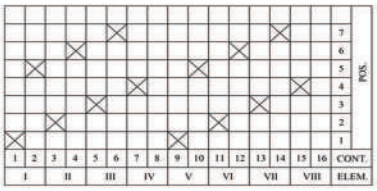
45°

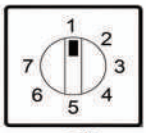
Code:CM27

کلیـــد دو فـاز هفت حالتـــه بـدون صـــفر

2 Poles Changeover Switch
7 Positions,without"0"





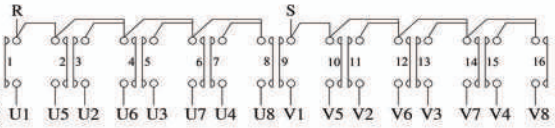


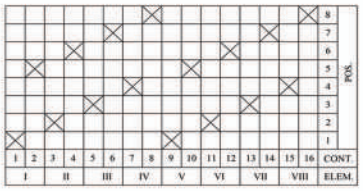
45°

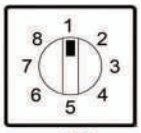
Code:CM28

کلیـــد دو فـاز هشت حالتـــه بـدون صـــفر

2 Poles Changeover Switch
8 Positions,without"0"





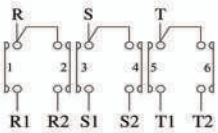


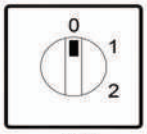
45°

Code:CM032

کلیـــد سه فـاز دو حالتـــه بـا صـــفر

3 Poles Changeover Switch
2 Positions,with"0"



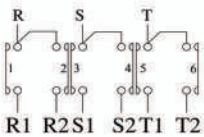


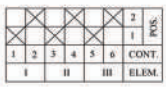
60°

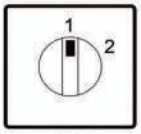
Code:CM32

کلیـــد سه فـاز دو حالتـــه بـدون صـــفر

3 Poles Changeover Switch
2 Positions,without"0"





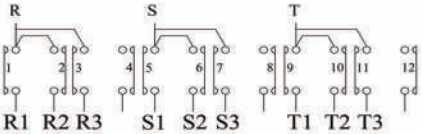


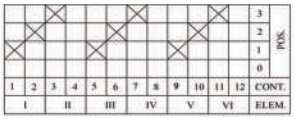
60°

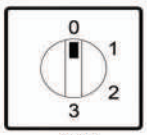
Code:CM033

کلیـــد سه فـاز سه حالتـــه بـا صـــفر

3 Poles Changeover Switch
3 Positions,with"0"





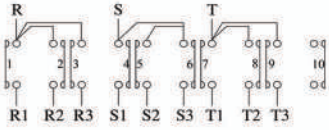


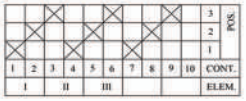
60°

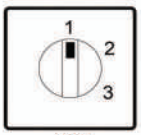
Code:CM33

کلیـــد سه فـاز سه حالتـــه بـدون صـــفر

3 Poles Changeover Switch
3 Positions,without"0"







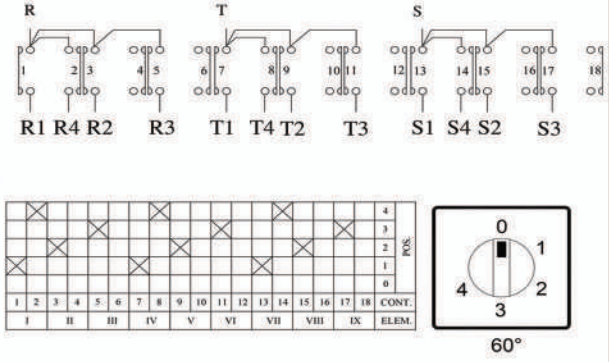
60°

Cam - Operated Switch

Selector Switch Diagrams :

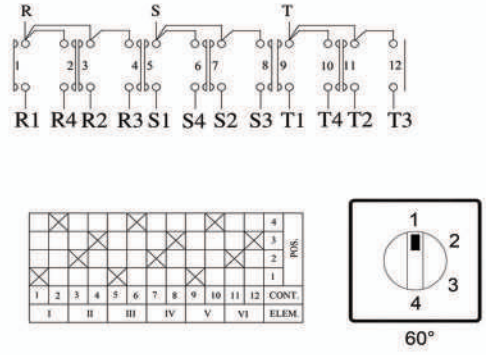
Code:CM034 کلیـــد سه فـاز چهار حالتـــه بـا صـــفر

3 Poles Changeover Switch
4 Positions,with"0"



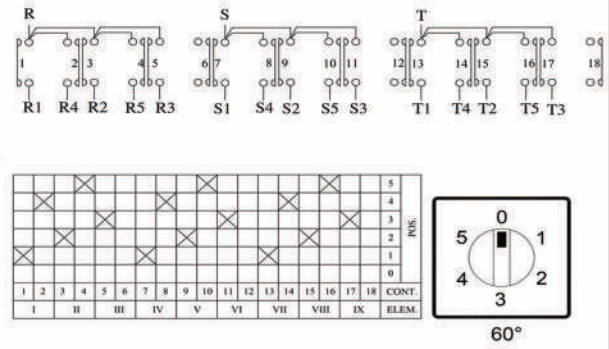
Code:CM34 کلیـــد سه فـاز چهار حالتـــه بـدون صـــفر

3 Poles Changeover Switch
4 Positions,without"0"



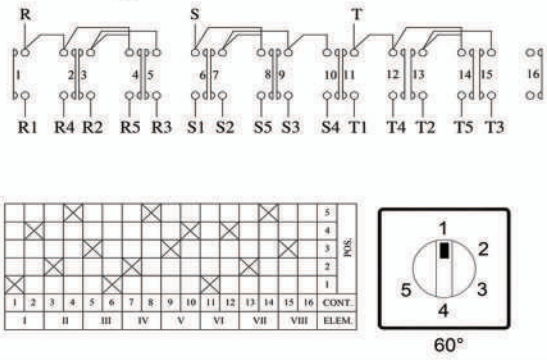
Code:CM035 کلیـــد سه فـاز پنـــج حالتـــه بـا صـــفر

3 Poles Changeover Switch
5 Positions,with"0"



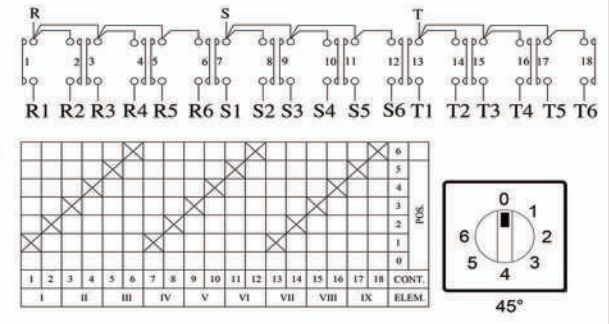
Code:CM35 کلیـــد سه فـاز پنـــج حالتـــه بـدون صـــفر

3 Poles Changeover Switch
5 Positions,without"0"



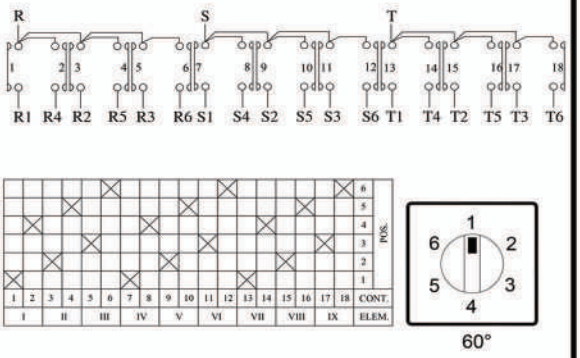
Code:CM036 کلیـــد سه فـاز شش حالتـــه بـا صـــفر

3 Poles Changeover Switch
6 Positions,with"0"



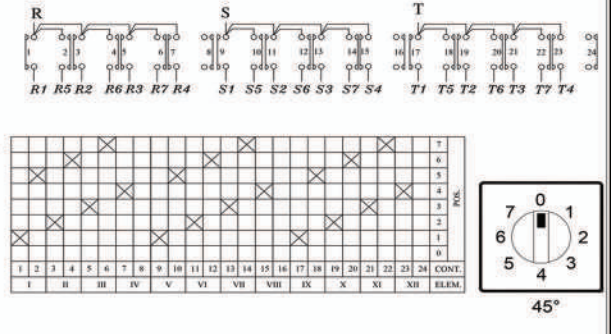
Code:CM36 کلیـــد سه فـاز شش حالتـــه بـدون صـــفر

3 Poles Changeover Switch
6 Positions,without"0"



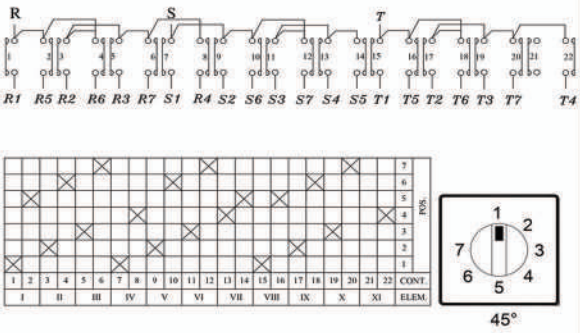
Code:CM037 کلیـــد سه فـاز هفـت حالتـــه بـا صـــفر

3 Poles Changeover Switch
7 Positions,with"0"



Code:CM37 کلیـــد سه فـاز هفـت حالتـــه بـدون صـــفر

3 Poles Changeover Switch
7 Positions,without"0"

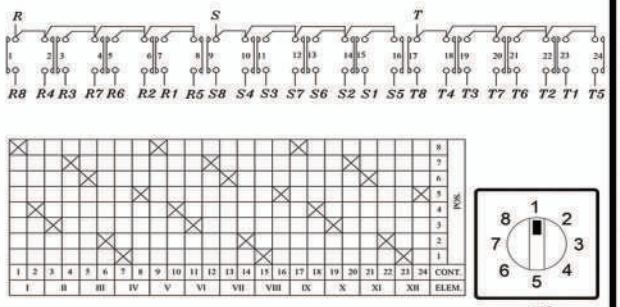


Cam - Operated Switch

Selector Switch Diagrams :

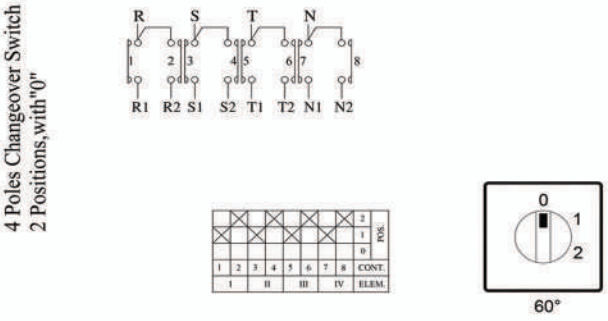
Code:CM38 کلیـــد سه فـاز هشت حالتـــه بـدون صـــفر

3 Poles Changeover Switch
8 Positions,without"0"



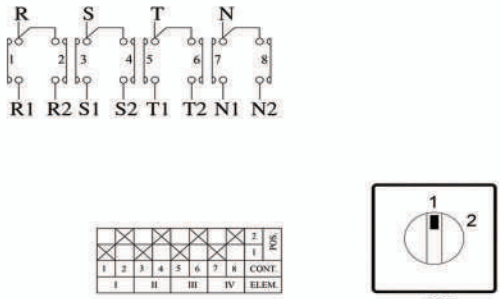
Code:CM042 کلیـــد چهار پـل دو حالتـــه بـا صـــفر

4 Poles Changeover Switch
2 Positions,with"0"



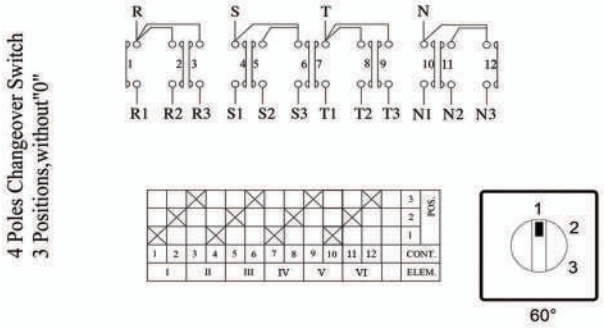
Code:CM42 کلیـــد چهار پـل دو حالتـــه بـدون صـــفر

4 Poles Changeover Switch
2 Positions,without"0"



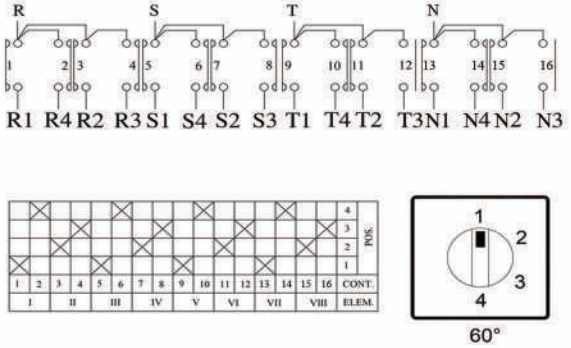
Code:CM43 کلیـــد چهار پـل سه حالتـــه بـدون صـــفر

4 Poles Changeover Switch
3 Positions,without"0"



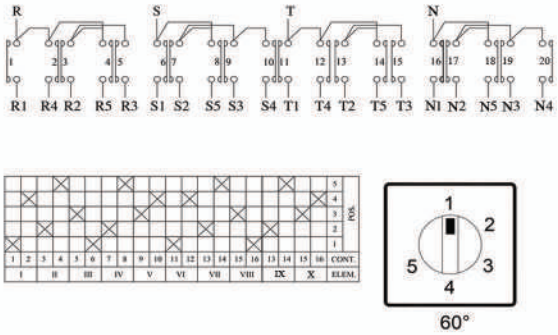
Code:CM44 کلیـــد چهار پـل چهار حالتـــه بـدون صـــفر

4 Poles Changeover Switch
4 Positions,without"0"



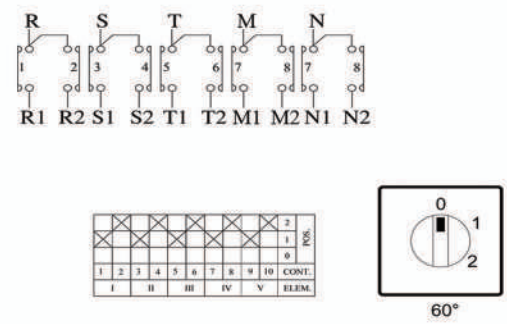
Code:CM45 کلیـــد چهار پـل پنـج حالتـــه بـدون صـــفر

4 Poles Changeover Switch
5 Positions,without"0"



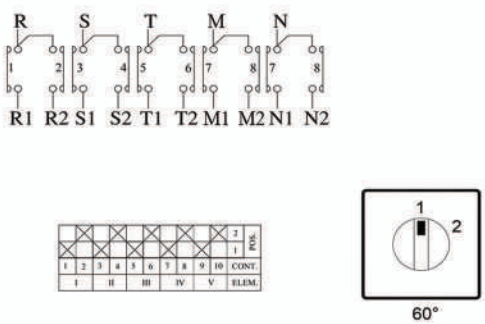
Code : CM052 کلیـــد پنج پل، دو حالتـــه بـا صـــفر

5 Poles Changeover Switch
2 Positions,with"0"



Code:CM52 کلیـــد پنج پـل دو حالتـــه بـدون صـــفر

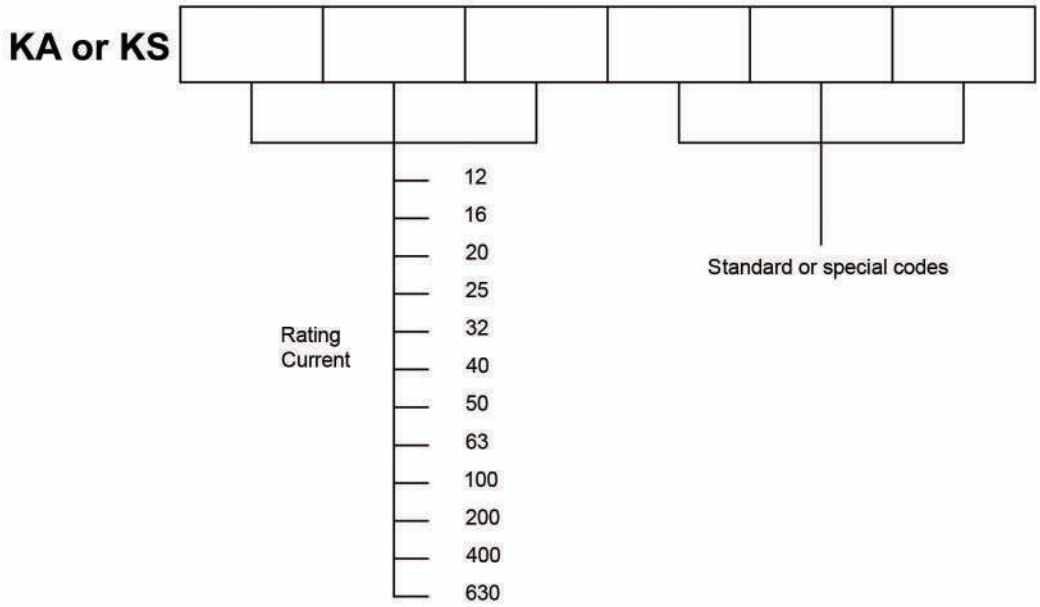
5 Poles Changeover Switch
2 Positions,without"0"



Ordering Information :

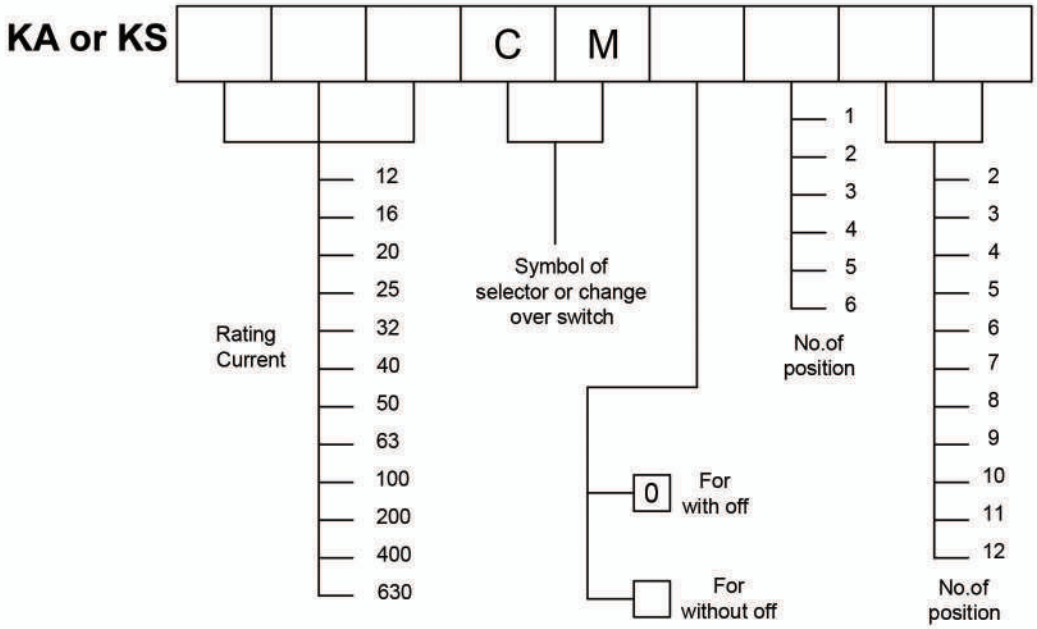
Standard and special switches in according AC-23A (AC3)

Standard switch , available for prompt delivery in flush and rear mounting version A... The diagram number forms part of the switches ,in the last two position. For example :A three - pole linechange - over switch (diagram 07)in 25A Series (A.2500) is identified by the type number 2507.



Selector and changeover switches in according AC-23A(AC3)

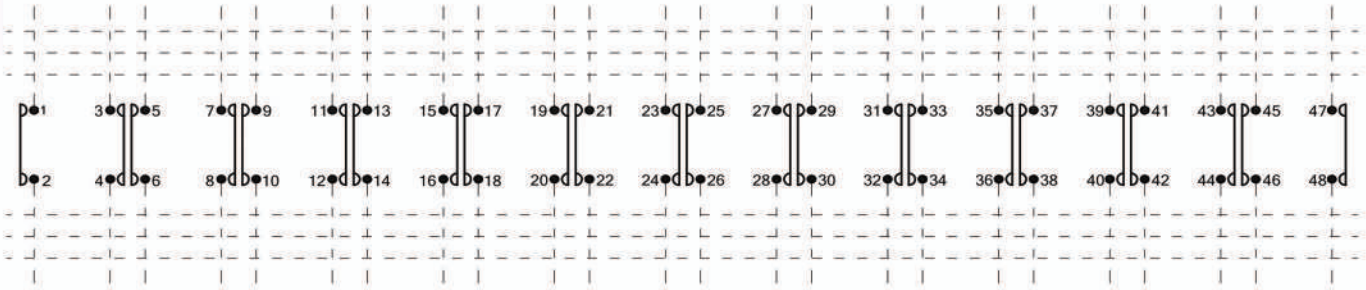
For example:A three - pole changeover switch 2 position,without off in 16A is identified by the number 16CM32.



Cam - Operated Switch

Order sheet for Special :

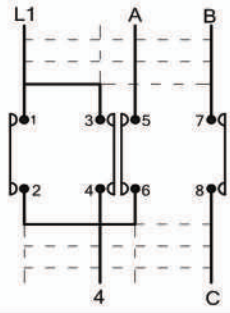
External Connection & Terminals Symbol

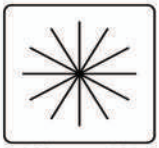


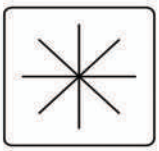
Internal Function

POSITION																								
ELEMENT	1		2		3		4		5		6		7		8		9		10		11		12	
CONTACT	1 - 2	3 - 4	5 - 6	7 - 8	9 - 10	11-12	13-14	15-16	17-18	19-20	21-22	23-24	25-26	27-28	29-30	31-32	33-34	35-36	37-38	39- 40	41- 42	43- 44	45- 46	47- 48

Example







- ☐ Open Contact
- ☒ Closed contact
- ☒ Closed contact with break in current between positions
- ☒ Closed contact with out break in current between positions
- short-circuited contacts
- 1 / 2 spring-return
- open contact with advanced closing

Series	Dimention of Plate
12 A to 20 A	52 x 52 mm ☐
12 A to 25 A	64 x 64 mm ☐
12 A to 40 A	75 x 75 mm ☐
	PADLOCK PLATE 75x75 mm ☐
40 A to 100 A	105 x 105 mm ☐
	PADLOCK PLATE 105x105 mm ☐
100 A to 630A	130 x 130 mm ☐

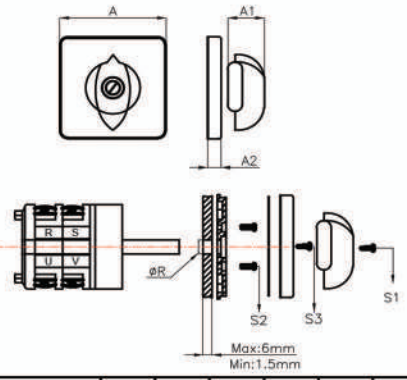
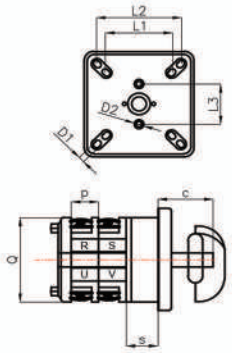
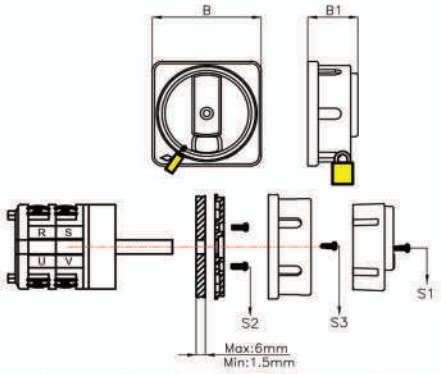
- Without Back Plate ☐
- Metal Back Plate ☐
- Plastic Back Plate ☐

Customer :	Date :	Dwg.No. :
Current Rating (A) :	Voltage(V) :	Series :
Version :	Quantity :	Packing :

Note :

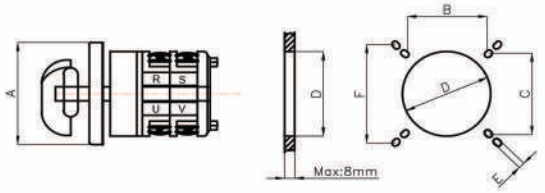
Cam - Operated Switch

Dimensions for KA Model Switches :

Plastic Plate Version	Installation Diagram	Pad Lock Plate Version
		

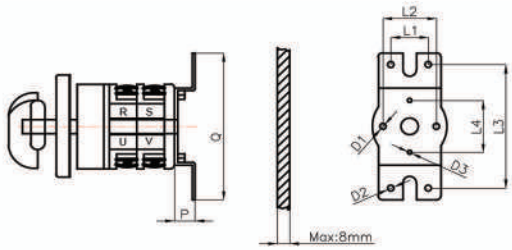
Series	A	A1	A2	B	B1	R	C	P	S	Q	L1	L2	L3	D1	D2	S1	S2	S3
A16.00	52	19	7	52	24	10	22	12	16	39	—	37	28	4	4	2.9x9.5	3.5x10	2.9x6.5
	64	20	9	75	28	10	24	12	16	39	—	47	28	4	4	2.9x9.5	3.5x10	2.9x6.5
	75	20	9	75	28	10	24	18	20	58	44	59	28	4	4	2.9x9.5	3.5x10	2.9x6.5
A25.00	64	20	9	75	28	10	24	18	20	58	—	47	28	4	4	2.9x9.5	3.5x10	2.9x6.5
	75	20	9	75	28	10	24	18	20	58	44	59	28	4	4	2.9x9.5	3.5x10	2.9x6.5
	105	30	11	105	40	10	24	18	20	58	—	85	28	5.5	5.5	4x10	3.5x12	2.9x11
A50.00	105	30	11	105	40	12	36	18.3	20	73	—	85	40	5.5	5.5	4x10	5x12	2.9x11
A63.00	105	30	11	105	40	12	36	25	30	84	—	85	40	5.5	5.5	4x10	5x12	2.9x11
A100.00	130	42	13	—	—	16.5	46	30	30	110	—	110	89	5.5	5.5	5x20	5x25	2.9x13
A200.00	130	42	13	—	—	16.5	46	39	30	110	—	110	89	5.5	5.5	5x20	5x25	2.9x13

Chase Assembly Of Plastic Or Pad -Lock Plate



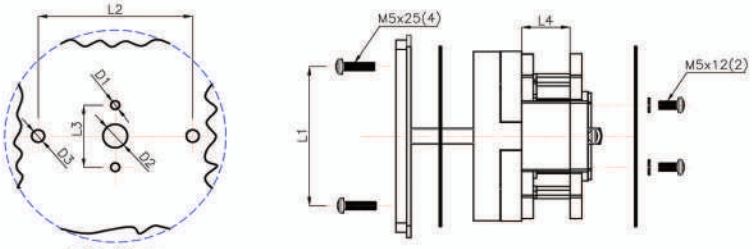
Series	A	B	C	D	E	F
A16.00	52	36	36	40	4	36
	64	48	48	40	4	48
	75	44	44	40	4	58
A25.00	64	48	48	58	4	58
	75	44	44	58	5.5	85
	105	85	85	58	5.5	85
A50.00	105	85	85	73	5.5	85
A63.00	105	85	85	84	5.5	85
A100.00	130	95	95	110	5.5	110
A200.00	130	95	95	110	5.5	110

Metal Back Plate Assembly



Series	L1	L2	L3	L4	D1	D2	D3	Q	P
A16.00	18	27	60	28	4	5	4	71	10
A25.00	18	27	60	28	4	5	4	71	10
A50.00	26	40	87	40	5.3	5.3	5.3	99	12.5
A63.00	26	40	87	40	5.3	5.3	5.3	99	12.5

Assembly Template



Side View

Series	L1	L2	L3	L4	D1	D2	D3
A100.00	89.5	96	40	30	5.5	15	10
A200.00	89.5	96	40	40	5.5	15	10

All sizes are in"mm".

Cam - Operated Switch

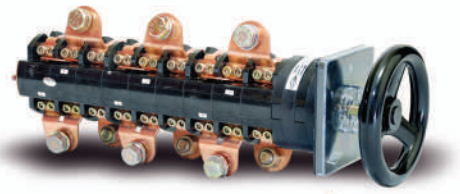
Accessories :

1- Handles & Install Plates

General Type :
Transparent Plates :
52 , 64 , 75 , 105 & 130 mm
with Black Knob , IP40.
In = 16A upto 630A.

B&G (2Pcs) Type :
Transparent Plates :
52, 64, 75 mm with Black and
Gray Knob , IP40.
In = 16A upto 40A.

Lock Type :
Yellow plates : 52,75,105 & 130 mm
with Red padlock knob
(Max. 3 padlocks) , IP40.
In = 16A upto 630A.



Handwheel Type :
Transparent Plates :
130 x 130 mm , IP40
with Black Handwheel.
In = 100A upto 630A.

2- Thermoplastic Enclosure Boxes :

Protection degree upto IP65 .
Front or Lateral lever drive .
Small Box Size : 120 x 95 x 77 mm (L x W x D).
Large Box Size : 190 x 135 x 114 mm (L x W x D).

Handles & Install plates type :
BLU : Lock type & Front. , **BLS :** Lock type & Lateral.
BPU : Genral type & Front. , **BPS :** General type & Lateral.
BCS : Black Lever Length from Lateral.

3- Mechanical door Inter lock

Handles and Install Plates with Inter Lock

Size of Plates :
52 x52, 64x64, 75x75, 105x105mm

Handel type :
General, B&G, Lock, Black lever length

4- Transparent Terminal Cover :

Transparent cover on main switches body for avoiding accessibility on electrical Sections and prevent dusts.
There are 3 types: 16,25,63A series.

5- Base mount by Metal Bracket (MBP):

The MBP assembly is the switch which enables the user to mount the Switch to internal plate of switch cabinet. This bracket can be mount to switch up to 63A types.
There are 2 sizes :
Small: 12A upto 40A.
Large: 50A upto 63A.
For upper types, this possibility is considered generally & no need for this bracket.

Miniature Circuit Breaker

CONTENTS

Miniature Circuit Breaker

General :

Miniature switch as a circuit breaker in most homes today and protect sensitive systems for phones and safety of persons and equipment against overload and short circuit currents are used to.
Miniature Circuit Breaker structure is as follows:
Base & Cover : All parts inside are MCB and must be insulated with a Min. voltage of 2500 V and a thermal resistance of 960°C with a flare (Normally the Bakelite,melamine or a particular type of polyamide).
Magnet : Copper coil , fixed and mobile core made of ferromagnetic materials , springs , fittings and ... is composed that Several times of the rated current MCB (the MCB type lighting or motor or hard motor is than 3 times the rated current is equal to 20) or short-circuit reacts and MCB will cause immediate trip . The standard MCB for each rated current, its own magnet.
Handel : Means for inserting a MCB is plugged in or disconnected mode.
Bi-Metal : Overload Relay used in MCBs is a kind of Bi-metal . When the MCB is generated by a miniature screws, precision switch nominal current is set by the factory polish . It works off the circuit against overload relay is responsible .
Arc chamber : Is composed of parallel metal plates, are separated by a layer of insulation, when trip into small spark to ignite dangerous sparks and noise and helps prevent overheating. The MCBs are usually of poor quality and cheap price, there's this piece is perhaps the simplest or most basic way to identify it, is the MCB to weight loss.
Springs and connectors : These components must be mechanically and possesses a special structure and are resistant to corrosion.
Terminals : Stainless conductors must be designed to be comfortable in it.

Use protective equipment to avoid dangers such as fires in a circuit, overload and short circuit caused the error occurred in the system is required . One of these devices due to the unique characteristics such as being used after each cut, etc. used today, has three phase synchronous automatic trip Switch-es, are or miniaturized .Usually two types of AC and DC will be produced.

Miniature Circuit Breakers Kaveh three types of alternating current brightness (B) and motor (C) and (D) in a variety of single-pole, single pole with neutral (1P+N), two-poles, three-poles, three poles and neutral (3P+N) and the four bridges are produced.
Currently, two international standards IEC/EN 60898-1 and IEC/EN 60947-2 in accredited facilities and building miniature Circuit Breakers are used. In IRAN, the national standard for Miniature Circuit Breakers is ISIRI2611-1 foundation developed the standard IEC/EN 60898-1.
It should be noted that the AC MCB in DC circuit cannot be used under any circumstances that the risks, such as failure to stop short time (due to union contacts) includes, It's a slow burn also added several contacts resulting in improper connection of fixed &moving contacts and the heat is generated.
DC Miniature Circuit Breakers, in addition to having a natural magnet for the relay to operate on direct current is magnetic. So we can also use the DC MCBs in AC circuits .

Miniature Circuit Breaker

Technical Information (AC) :

	Description	Unit	Specification of KAVEH MCB		
			IEC/EN 60898-1		IEC/EN 60947-2
Electrical Features	Rated current I_n	A	2 , 4 , 6 , 10 , 16 , 20 , 25 , 32 , 40 , 50 , 63 , 80 , 100 , 125		
	Poles	n	1P , 1P+N , 2P , 3P , 3P+N , 4P		
	Rated voltage U_e	V	240 / 415		
	Insulation voltage U_i	V	500		
	Rated frequency	Hz	50 - 60		
	Rated breaking capacity	A	6000 , 10000		10000 , 15000
	Energy limiting class	n	3		3
	Rated impulse withstand voltage Uimp	V	6000		
	Dielectric test voltage at ind. Freq. for 1 min.	KV	2.5		
	Pollution degree	n	3		
	Power loss per pole	W	2A(2.1 W) , 4A(2.3 W) , 6A(2.6 W) , 10A(2.7 W)		
		W	16A(3.2 W) , 20A(3.9 W) ,25A(4.2 W) , 32A(5.3 W)		
		W	40A(6.9 W) , 50A(8.2 W) , 63A(11.5 W)		
	Thermo-magnetic release characteristic		B	C	D
			3 - 5 I_n	5 - 10 I_n	10 - 20 I_n
Mechanical Features	Electrical life	Cycle	6000 for In≤ 32A , 4000 for In>32A		
	Mechanical life	Cycle	20000		
	Contact position indicator		Yes		
	protection degree		IP 20		
	Reference temperature for setting of thermal element	°C	30		
	Ambient temperature (with daily averages ≤ 35°C)	°C	- 5 ... +40 (Special application please refer to P03 for temperature compensation correction)		
	Storage temperature	°C	-25 ... +70		
	Vibration	g	5		
	Shock	mm	40mm free fall		
Installation	Terminal connection type		Cable / U - type busbar / Pin - type busbar		
	Terminal size top/bottom for flexible cables	mm^2	25 (Upto 63A) , 50 (80A to 125A)		
		AWG	18 - 3 , 3 - 1		
	Terminal size top/bottom for rigid cables	mm^2	35 (Upto 63A) , 70 (80A to 125A)		
		AWG	16 - 2 , 2 - 00		
	Tightening torque	N.m	2.5 (Upto 63A) , 3 (80A to 125A)		
		in-lbs.	22 , 26.5		
	Installation position		Vertical / Horizontal		
	Mounting		on DIN rail EN60715 (35mm) by means of fast clip device		
	Connection		From top and bottom		
	Base & Cover material		Moulded, Flame retardant thermoplastic in accordance IEC60695		
Combination with Accessories	Auxiliary contact		Yes		
	Shunt release		Yes		
	Under voltage release		Yes		
	Alarm contact		Yes		

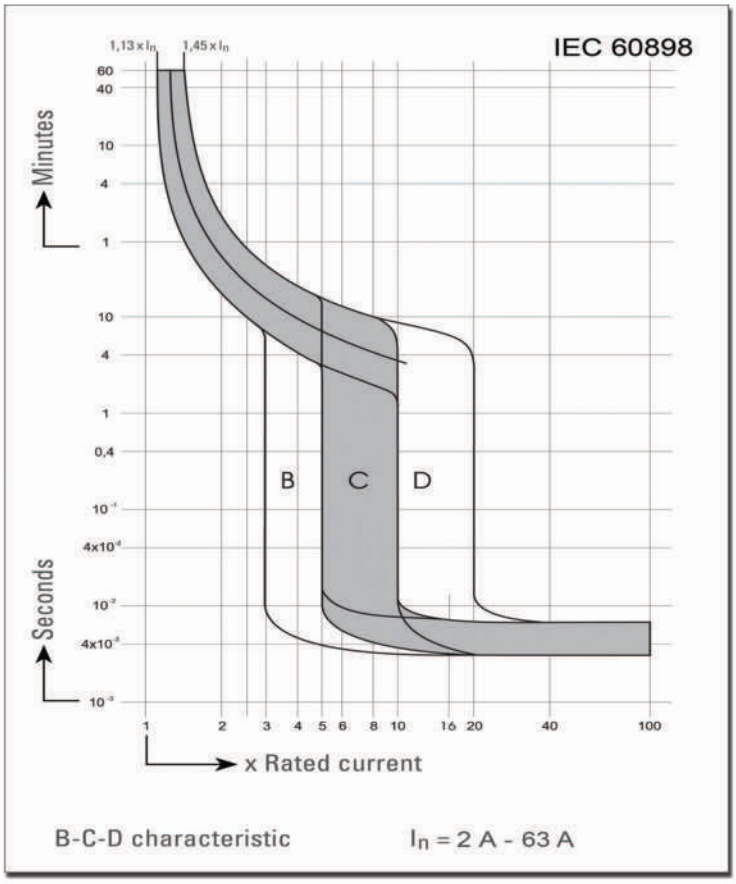
Miniature Circuit Breaker

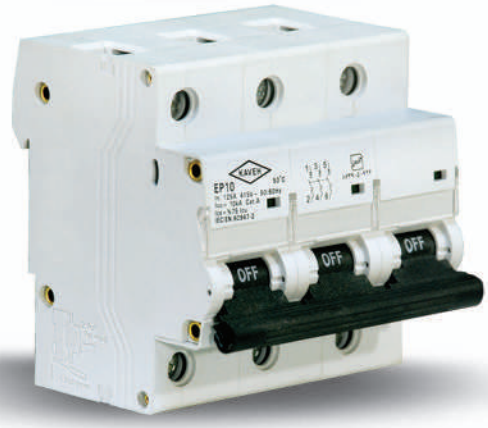
Technical Information (DC) :

	Description	Unit	Specification of KAVEH MCB IEC/EN 60898-1
Electrical Features	Rated current I_n	A	1 , 2 , 4 , 6 , 10 , 16 , 20 , 25 , 32 , 40 , 50 , 63
	Poles	n	1P , 2P
	Rated voltage U_e	V	240
	Insulation voltage U_i	V	500
	Rated breaking capacity (Icu)	KA	6 , 10
	Rated breaking capacity (Icn)	A	6000
	Energy limiting class	n	3
	Rated impulse withstand voltage Uimp	V	6000
	Dielectric test voltage at ind. Freq. for 1 min.	KV	2.5
	Pollution degree	n	3
	Power loss per pole	W	1A(1.5 W) ,2A(2.2 W) ,4A(2.6 W) ,6A(2.5 W) ,10A(2.5 W)
		W	16A(3 W) , 20A(3.2 W) ,25A(3.9 W) , 32A(4.5 W)
		W	40A(6.1 W) , 50A(7.8 W) , 63A(9.8 W)
	Thermo-magnetic release characteristic		B: 3 - 5 I_n ; C: 5 - 10 I_n ; D: 10 - 20 I_n
Mechanical Features	Electrical life	Cycle	4000
	Mechanical life	Cycle	20000
	Contact position indicator		Yes
	protection degree		IP 20
	Reference temperature for setting of thermal element	°C	30
	Ambient temperature (with daily averages ≤ 35°C)	°C	- 5 ... +40 (Special application please refer to P03 for temperature compensation correction)
	Storage temperature	°C	-25 ... +70
	Vibration	g	5
	Shock	mm	40mm free fall
Installation	Terminal connection type		Cable / U - type busbar / Pin - type busbar
	Terminal size top/bottom for flexible cables	mm^2	25
		AWG	18 - 3
	Terminal size top/bottom for rigid cables	mm^2	35
		AWG	16 - 2
	Tightening torque	N.m	2.5
		in-lbs.	22
	Installation position		Vertical / Horizontal
	Mounting		on DIN rail EN60715 (35mm) by means of fast clip device
	Connection		From top and bottom
	Base & Cover material		Moulded, Flame retardant thermoplastic in accordance IEC60695
Combination with Accessories	Auxiliary contact		Yes
	Shunt release		Yes
	Under voltage release		Yes
	Alarm contact		Yes

Miniature Circuit Breaker

Tripping Characteristic Curve:

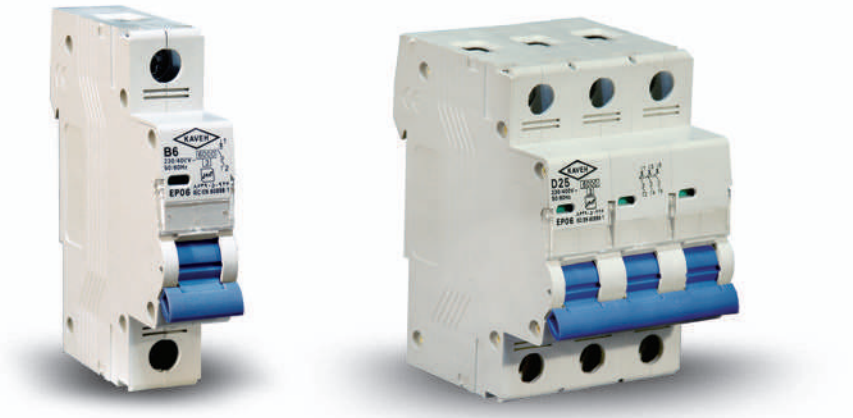




As per Standard IEC60898	Thermal Tripping				Magnetic Tripping		
	Notripping current I_1	Tripping current I_2	Tripping current I_3	Time Limits	Hold Current I_4	Rapidly trip Current I_5	Time Limits
B	1.13 I_n	1.45 I_n	2.55 I_n	> 1h < 1h $I_n \leq 32A, 1 < t \leq 60s$ $I_n > 32A, 1 < t \leq 120s$	3 I_n	5 I_n	> 0.1s ≤ 0.1s
C	1.13 I_n	1.45 I_n	2.55 I_n	> 1h < 1h $I_n \leq 32A, 1 < t \leq 60s$ $I_n > 32A, 1 < t \leq 120s$	5 I_n	10 I_n	> 0.1s ≤ 0.1s
D	1.13 I_n	1.45 I_n	2.55 I_n	> 1h < 1h $I_n \leq 32A, 1 < t \leq 60s$ $I_n > 32A, 1 < t \leq 120s$	10 I_n	20 I_n	> 0.1s ≤ 0.1s

Miniature Circuit Breaker

Isolating Switches :



Rated current I_e	A	16 , 20 , 25 , 32 , 40 , 50 , 63 , 80 , 100 , 125
Rated voltage U_e	V	240 / 415 AC (110/220VDC)
Poles	n	1P , 2P , 3P , 4P
Utilization category		AC - 22A / DC - 22B
Insulation voltage U_i	V	690
Rated frequency	Hz	50 / 60
Rated making & breaking capacity		$3I_e$, $1.05U_e$, PF=0.65
Rated short - circuit making capacity Icn		$20I_e$, t = 0.1s
Rated impulse withstand voltage Uimp	V	6000
Dielectric test voltage at ind. Freq. for 1 min.	KV	2.5
Pollution degree	n	3
Icw		$12I_e$, t=1s
Electrical life	Cycle	1500
Mechanical life	Cycle	8500
Contact position indicator		Yes
protection degree		IP 20
Reference standard No.		IEC60947-3
Ambient temperature (with daily averages ≤ 35°C)	°C	- 15 ... +55
Storage temperature	°C	-25 ... +70
Vibration	g	6
Shock	mm	40mm free fall
Terminal connection type		Cable / U - type busbar / Pin - type busbar
Terminal size top/bottom for flexible cables	mm^2	25 (Upto 63A) , 50 (80A to 125A)
	AWG	18 - 3 , 3 - 1
Terminal size top/bottom for rigid cables	mm^2	35 (Upto 63A) , 70 (80A to 125A)
	AWG	16 - 2 , 2 - 00
Tightening torque	N.m	2.5 (Upto 63A) , 3 (80A to 125A)
	in-lbs.	22 , 26.5
Installation position		Vertical / Horizontal
Mounting		on DIN rail EN60715 (35mm) by means of fast clip device
Connection		From top and bottom
Base & Cover material		Moulded, Flame retardant thermoplastic in accordance IEC60695

Miniature Circuit Breaker

Accessories:

General :

Standard No.	Confirming to EN/IEC 60947-5-1
Rated Insulation Voltage Ui	500 VAC
Rated Voltage Un	230 VAC
Electric Endurance	30000 Cycle
Mechanical Endurance	40000 Cycle
Dielectric Strength	2000VAC / 1Minute
Protection Degree	IP20

OF Auxiliary Contact :

	AC	DC
Contact Capacity	3A / 400V	1A / 125V
	6A / 230V	2A / 48V
	6A / 125V	3A / 24V
Dielectric Strength	2000VAC / 1Minute	

Mounted on the Left side of the MCB

SD Alarming Contact :

Send out signal when the circuit breaker pail to trips.
Mechanical indicator on the front panel, which can indicate failure trip.
Screw-type thread pressed terminal, can connect with 1 or 2 conducting wire of 2.5mm 2 Max. cross sectional area.
Obvious marks upon terminal.
Mounted on the Left side of the MCB. Indication "ON" , "OFF" status of combined MCB.

MX Shunt trip :

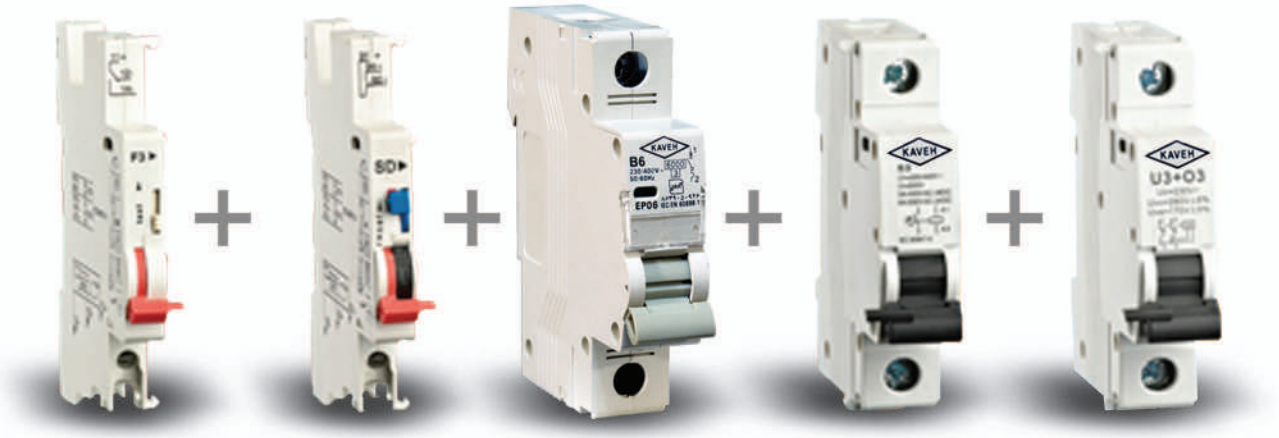
Rated Insulation Voltage Ui	500VAC	
Rated Power Voltage Us	125VAC , 230VAC , 400VAC	
Operate Voltage Range	70% ~ 100% Us	
Contact Capacity	AC	DC
	3A / 400V	1A / 125V
	6A / 230V	2A / 48V
	9A / 125V	3A / 24V
Dielectric Strength	2000VAC / 1Minute	

Mounted on the Right side of the MCB/RCBO, used to trip the combined MCB/RCBO by remote controlling device.

MN Over-Voltage / Under-Voltage trip :

Rated Voltage Ue	230VAC
Rated Insulation Voltage Ui	500VAC
Over-Voltage tripping range	280VAC ± 5%
Under-Voltage tripping range	170VAC ± 5%

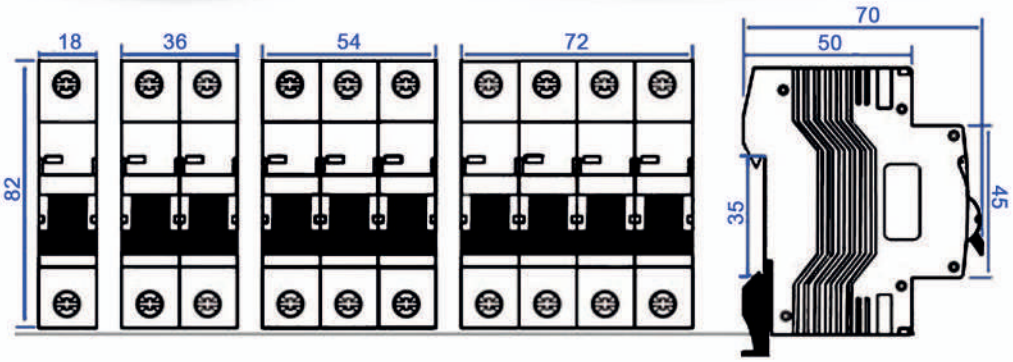
Mounted on the Right side of circuit breaker, actuate the combined device to trip in case of under-voltage or over-voltage, effectively prevent the device from closing operation under abnormal power voltage condition.



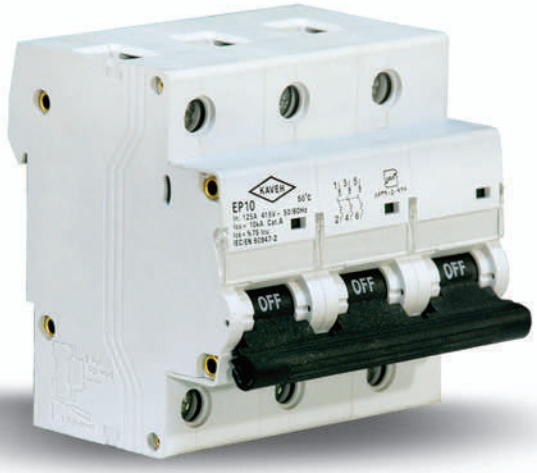
Miniature Circuit Breaker

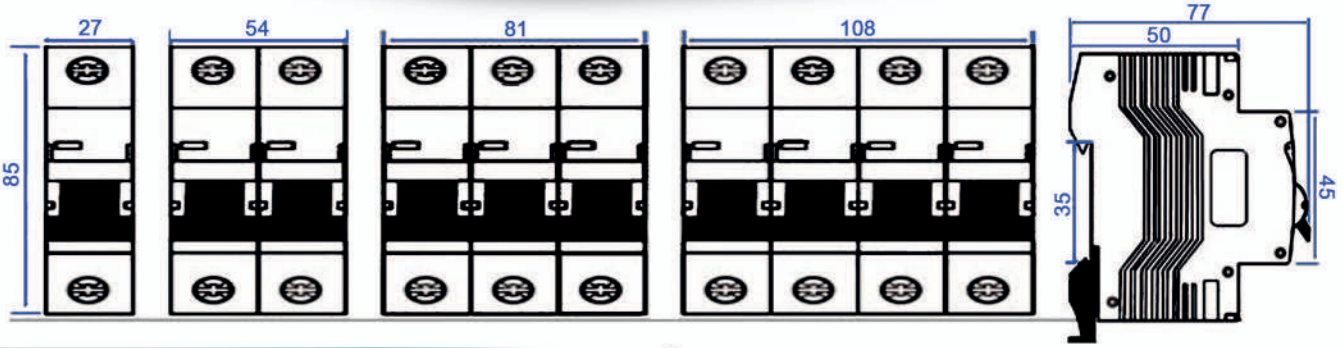
Dimensions :

Dimension of MCBs from 1A upto 63A



Dimension of MCBs from 80A upto 125A

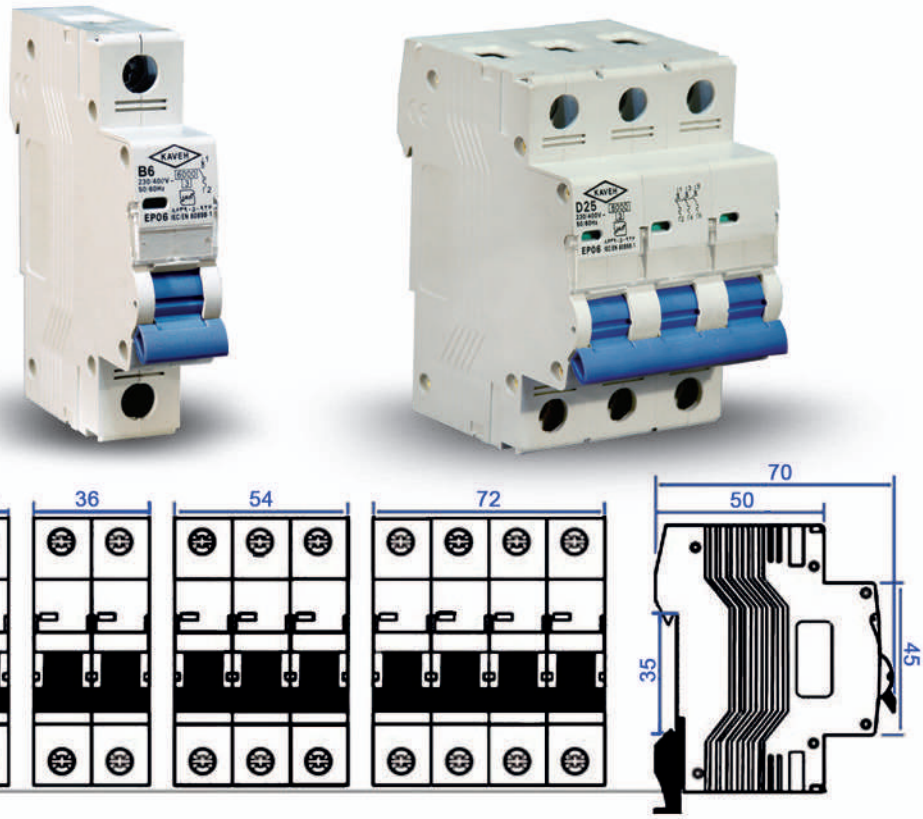




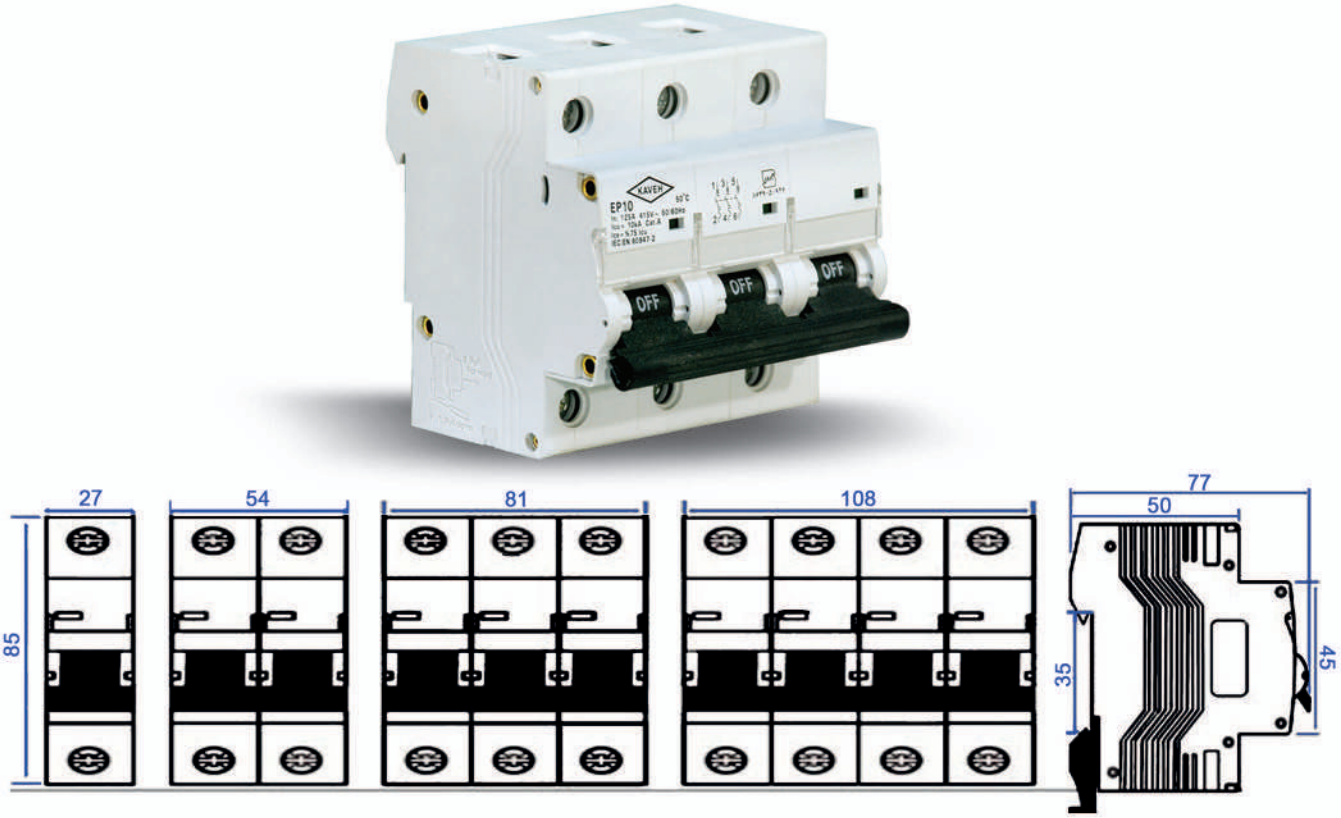
Miniature Circuit Breaker

Dimensions :

Dimension of Isolating switches from 16A upto 63A



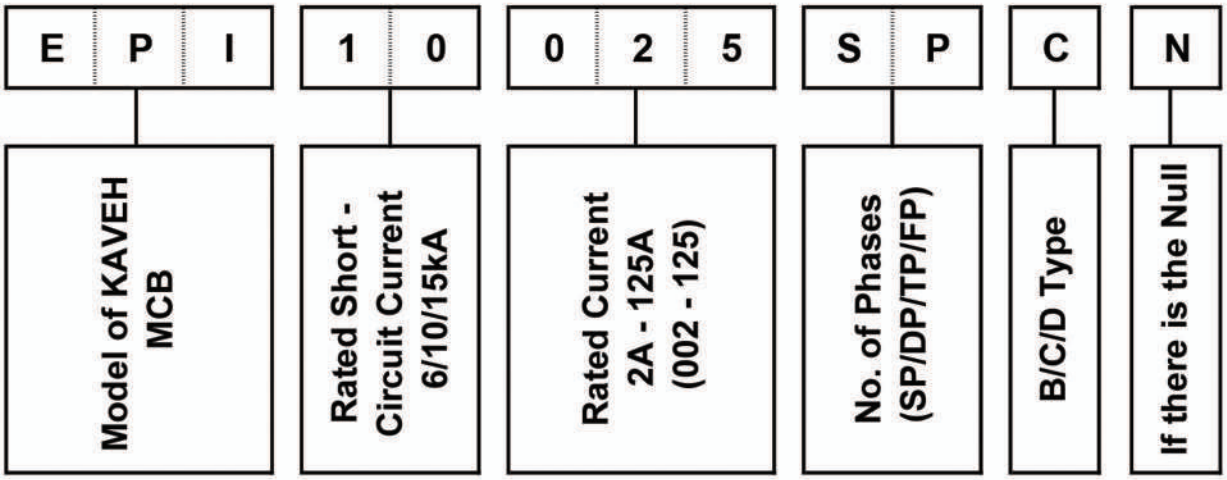
Dimension of Isolating switches from 80A upto 125A



Miniature Circuit Breaker

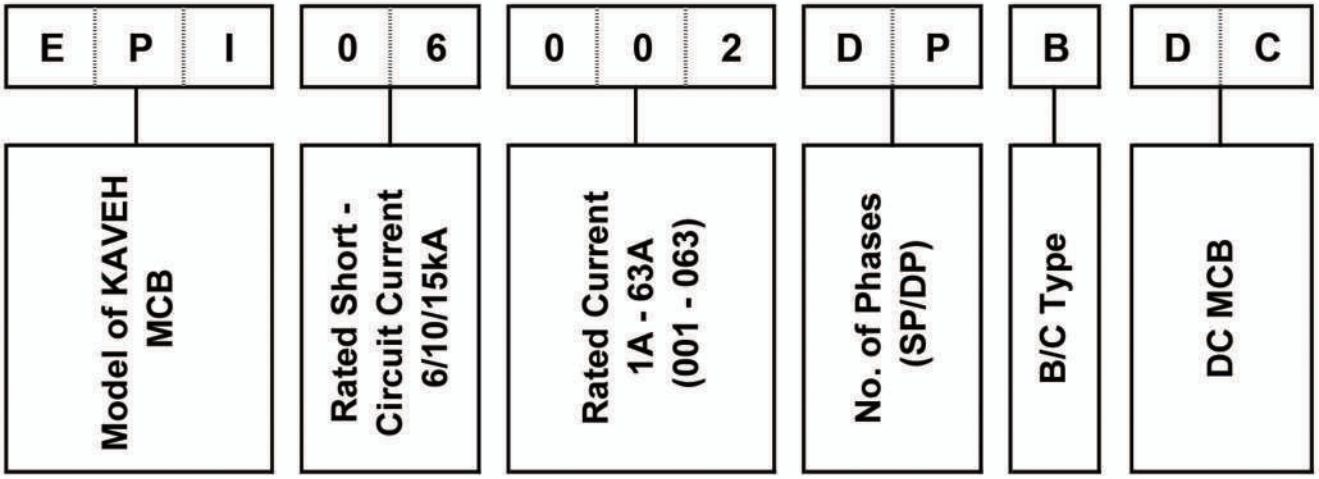
Ordering Information:

- AC MCB



Example : AC MCB , 10kA , 25A and C type , Single pole + Null

- DC MCB



Example : DC MCB , 6kA , 2A and B type , Double pole

Residual Current Circuit Breaker

CONTENTS

Residual Current Circuit Breaker

General :

Nothing is enjoyed at the cost of human safety and when it comes to electrical devices, there can be no compromises. The KAVEH range of human safety devices protect all the appliances present in your homes by efficient power distribution and effective earthing wherever required. Better monitoring and control is now possible with just the installation of these devices from KAVEH. The range of devices which are used for human safety do not let the residual current harm the users. They provide protection from various factors such as overload, short circuit, faulty equipment etc. Built using the best materials, these equipment last for longer periods compared to any of their counterparts and serve their purpose effectively. The product range includes RCCB & RCBO. You can choose from this range the ones that match your requirement the best.

Residual current circuit breaker (RCCB) :

KAVEH has been the pioneer in launching the most innovative electrical products from past many decades. It has become a household name for switchgear given to its high quality products backed by best-in-class technology. For protection of circuit, equipment's and human safety, we rely on protection devices, such as, MCBs, RCCBs, surge protection devices, etc. To see the complete range of best switchgear by KAVEH, browse online.

Usage of electrical equipment's calls for electric current which always has its set of risks. Essentially, incorrect use of an electrical device, poorly insulated equipment, and faulty wires lets current to flow through the wrong path to the earth, resulting in leakage current. Earth leakage causes electrical shocks and risk of fire, which can be prevented by RCCB, also called Earth Leakage Circuit Breaker (ELCB).

Residual Current Circuit Breaker (RCCB) is a mechanical switching device intended to make, carry and break currents under normal service conditions and to cause the opening of the contacts when the leakage current attains a given value under predefined conditions. Using KAVEH higher rating RCCBs, you can provide due protection against electric shocks and fire caused by earth faults.

Available online in Double Pole (DP) & Four Pole (FP) versions, the Residual Current Circuit Breaker is the best device for ensuring human safety against electrical shocks due to leakage current. Get higher rating RCCB for high-load applications for best protection. JAVEH offers the best quality RCCB in DP and FP versions, in different ratings, to meet different electrical requirements.

Residual current circuit breaker with overload & Short circuit (RCBO):

Based out of IRAN, KAVEH is a renowned brand for switches, switchgear and electronic products,. It has always been the pioneer in introducing the latest switchgear to ensure human safety and protection against earth leakage faults, over currents, overload and short circuit. To ensure the safety of your loved ones and protection of your electronic equipment, you must install quality switchgear in your building. Browse online to know more!

In its range of human safety devices , KAVEH has introduced the latest RCBO which is a single composite device to provide protection against over currents, short circuits and earth leakage faults. The Residual Current Circuit Breaker with Overload and Short Circuit Protection (RCBO) comes in the same width and profile as that of a standard MCB. It is designed for use in domestic, commercial and industrial distribution systems at the most downstream circuit for ensuring high degree of protection to the user for a particular circuit.

Check online to know more about its detailed features and technical specifications . Made in accordance with IEC 61009-1 specifications, the RCBO by KAVEH is available in the rating from 25A to 40A. The Residual Current Circuit Breaker with Overload and Short Circuit Protection is offered in Single Pole & Neutral (1P+N) and Three Pole & Neutral (3P+N) versions. To ensure human safety against fault currents and protection of electronic system, the RCBO is a great device.

Products Overview of Residual Current Protective Devices

Product name	RCCB		RCBO	
Product range	EPR		EPBR-i	EPRM
Product picture				
Standard	IEC/EN 61008 1		IEC/EN 61009-1	IEC/EN 61009-1
Number of poles	2 (1P+N)	4 (3P+N)	1P+N	1P+N
Electrical characteristics				
Rated current(A) In	16~80		6~40	6~40
Rated voltage(V)	240VAC	415VAC	240VAC	240VAC
Rated residual current(mA)	30,100,300		30,100,300	30,100,300
Breaking capacity(kA)	6,10		6,10	6,10
Overload protection function	Without		With	With
Tripping curve	———		B,C	B,C
Residual current operating characteristic	AC		AC	AC
Residual current protection mode	Electro-magnetic		Electronic	Electronic/ Electro-magnetic

EPR Series
Residual Current Circuit Breaker

Technical data

Standard	EN / IEC61008-1
Rated conditional short-circuit current, Inc	6kA
Protection	Ground fault
Rated current, In	25,32,40,50,63A
Number of poles	2(1+N),4(3+N)pole
Rated sensitivity currents, I△n	10,30,100,300mA
Rated residual non-operating current	0.5 X I△n
Rated impulse withstand voltage Uimp	4000V
Rated voltages 2pole	240VAC
4pole	415VAC
Ambient temperature (°C)	-25~+40,Max. 95%humidity
Residual current off-time at I△n	≤0.1s
Rated residual current making & breaking capacity, I△m	500A for In=16,25,32,40,50A 630A for In=63A
Type of trip	Electro-magnetic release
Type of terminal	Lug type and Pin type
Terminal capacity	Cables up to 25mm²
Protection degree	IP20
Installation	35mm DIN rail

EPR-2P

EPR-4P

EPR Series
Residual Current Circuit Breaker

1. Life

In	Operating cycles		Operating frequency (operations/h)
	On-load operating cycles	Off-load operating cycles	
25,32	2000	2000	240
40,50,63	2000	1000	120

2. Breaking time of residual current

Max.breaking time					
In (A)	I△n(A)	I△n	2I△n	5I△n	5A、10A、20A、50A、100A、200A、500A
25,32,40,50,63	0.03,0.1,0.3	0.1s	0.08s	0.04s	0.04s

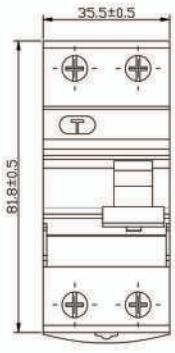
3. Wiring The suitable conductors should be used for connection,see table below for relative parameters.

Rated current In (A)	Nominal cross section area of lead (mm^2)	Tightening torque (N.m)
25	4	2.5
32	6	2.5
40	10	2.5
50	16	2.5
63	16	2.5

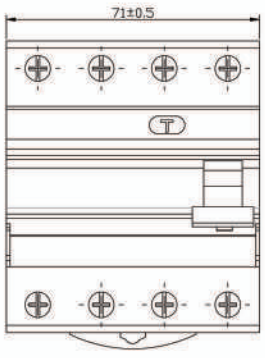
4. Features

When designing residual current devices, manufacturing technology and type of routine tests, the IEC / EN 61008 standards were considered. Important features are:
Up to date design
User-friendly connection of conductors and busbars
Resistance to current surges; unwanted tripping excluded
Simple and solid fixing to a 35 mm mounting rail in compliance with EN 60715
Additional colour display of main contacts position (red:contacts closed, green:contacts open)

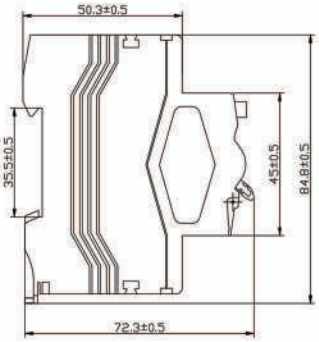
5. Overall and mounting dimensions



EPR-2



EPR-4



EPBR-i Series (Electronic)
Residual Current Operated Circuit Breaker(RCBO)

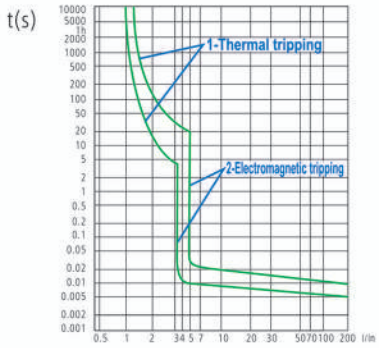
Technical data

Standard	EN / IEC61009-1
Breaking Capacity	6KA,10KA
Number of poles	1P+N(1 module)
Rated current ,In	6,10,16, 20, 25, 32, 40A
Rated voltage	240VAC
Rated Tripping Current	10,30,100,300mA
Residual current off time	≤0.1s
Characteristic	B,C Curve
Electrical endurance	4000
Mechanical endurance	10000
Ambient temperature (°C)	-25~+40, Max. 95%humidity
Connection terminal	Flexible conductor 16mm² Rigid conductor 25mm²
Type of terminal	Lug type and Pin type
Width	17.8mm

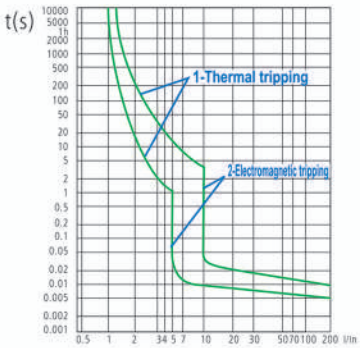
EPBR-i 10K

EPBR-i Series (Electronic)
Residual Current Operated Circuit Breaker(RCBO)

1. Curves



B type



C type

2. Breaking time of residual current

In (A)	I△n (A)	Max. Breaking times			
		I△n	2I△n	5I△n	5A, 10A, 20A, 50A, 100A, 200A, 500A
6~40	0.01,0.03,0.1,0.3	0.1s	0.08s	0.04s	0.04s

3. Wiring

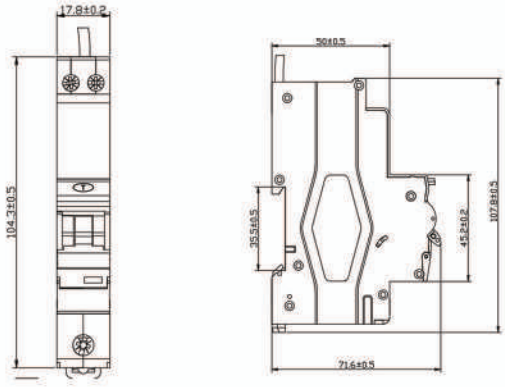
The suitable conductors should be used for connection,see table below for relative parameters.

Rated current In (A)	Cross section area s (mm²)	Tightening torque (N . m)
25	4	2
32	6	2
40	10	2

4. Functions

Switching and isolation function.
Protection against overload and short-circuit currents.
Protection against the effects of sinusoidal alternating earth fault currents.
Protection against indirect contacts and additional protection against direct contacts.
Protection against fire hazard caused by insulation faults.
Used in residential building and distribution boards.

5. Overall and mounting dimensions



EPBR-i

EPRM Series (Electronic/Electro-magnetic) Residual Current Operated Circuit Breaker(RCBO)

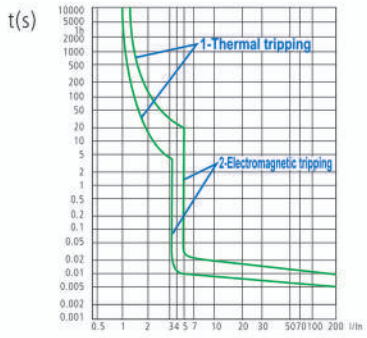
Technical data

Standard	EN / IEC 61009 -1
Breaking capacity	6kA ,10kA
Protection	Ground fault, overcurrent and short circuit
Rated current,In	16, 20, 25, 32, 40A
Operating, I△n	30,100,300mA
Characteristic	B,C Curve
Rated residual current operated making & breaking capacity I△m	500A
Rated residual non-operated current I△n	0.5I△n
Rated impulse withstand voltage Uimp	4000V
Number of poles	1P+N
Rated voltages 2pole	240VAC
Ambient temperature (°C)	-25~+40,Max. 95%humidity
Residual current off-time	≤ 0.1 sec.
Type of trip Ground fault	Electronic/Electro-magnetic
Over current	Thermal-magnetic
Protection degree	IP20
Terminal capacity	10mm² flexible/16mm² rigid
Installation	35mm DIN rail
Width	2 modules
Type of terminal	Lug type and Pin type

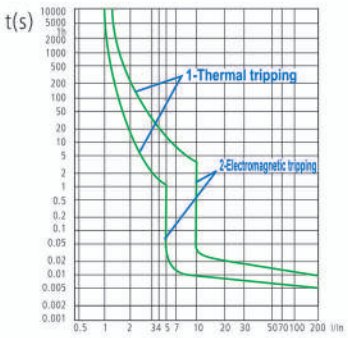
EPRM

EPRM Series (Electronic/Electro-magnetic) Residual Current Operated Circuit Breaker(RCBO)

1. Curves



B type



C type

2. Wiring

The suitable conductors should be used for connection,see table below for relative parameters.

Rated current In (A)	Cross section area s (mm²)	Tightening torque (N . m)
16~20	2.5	2
25	4	2
32	6	2
40	10	2

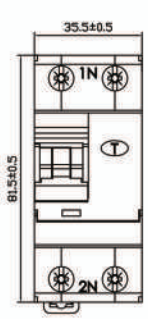
3. Types

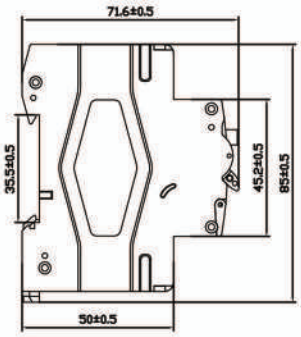
Both RCCBs and RCBOs are devided into types depending on the operating function:
Type AC ⊠ : For which tripping is ensured for residual sinusoidal alternating currents, whether suddenly applied or slowly rising.
Type A ⊠ :For which tripping is ensued for residual sinusoidal alternating currents and residual pulsating direct currents, whether suddenly applied or slowly rising.

4. Tripping sensitivity data

RCD with a rated residual current of maximum 30 mA are used for personnel,material and fire protection, as well as for protection against direct contact.
RCD with a rated residual current of maximum 300 mA are used as preventative fire protection in case of insulation faults.
RCD with a rated residual current of 100 mA co-ordinated with the earth system according to the formula $I_{\Delta n} < 50/R$, to provide protection again indirect contacts.

5. Overall and mounting dimensions





EPRM

ELECTROKAVEH Co.

MCCB Catalogue

Smart size and safety

- Wide adjustment range for overload protection:80%to100%
- Version with fixed overload available at lower prices
- Electronic type available for full range from 100A to 1250A Flame
- MCCB with earth leakage protection available from 100A to 800A Flame

Internal Accessories

*Unique accessory cover opens with two screws

*Practical accessories can be installed with one touch

*auxiliary switch
*alarm switch
*shunt trip
*undervoltage trip

ELECTROKAVEH
Laboratory Service Center

ISO 9001 System Certification

ISIRI Certification for
ELECTROKAVEH
Laboratory Service Center

SGM3 Moulded Case Circuit Breaker

Technical Data

IEC60947-2

Fixed Thermal Magnetic		SGM3-63		SGM3-125			SGM3-250		
Frame Size		63		125			250		
Number of Poles		3P	4P	2P	3P	4P	2P	3P	4P
Breaking Capacity Level		L	M	L	M	H	L	M	H
Rated Ultimate Short-circuit Breaking Capacity Icu (kA rms)		25	50	36	50	85	36	50	85
Rated Service Short-circuit Breaking Capacity Ics (kA rms)		18	36	27	36	50	27	36	50
Mechanical Durabilities	On-off Cycle	11000		11000			10000		
Electrical Durabilities	On-off Cycle	6000		6000			3000		
Tripping Unit									
Rated Current (A)	In	10,16,20,25,32,40,50,63		16,20,25,32,40,50,63,80,100,125			100,125,160,180,200,225,250		
Accessories									
Indication Accessories		■		■			■		
OF		■		■			■		
SD		■		■			■		
Control Accessories									
MX(AC400, 230V, DC220V)		■		■			■		
MN (AC400, 230V)		■	-	■			■		
Extended Rotary Handle (Round and Square)		■		■			■		
AC Motor Mechanism (AC400, 230V)		■		■			■		
Mechanical Interlock		■	-	■		-	■		-
Mounting & Connection									
Fixed, Front Connection		■		■			■		
Fixed, Rear Connection		■		■			■		
Plug-in, Rear Connection		■	-	■			■		
Plug-in, Front Connection		-		■			■		
Drawer-out, Rear Connection		-		-			-		
Connection									
Spreader		■		■			■		
Protection									
Phase Barrier		■		■			■		
Electronic type		-		SGM3E-125			SGM3E-250		

"■" shows it has this option;

"-" means it has no this option.

SGM3 Moulded Case Circuit Breaker

Technical Data

IEC60947-2

Fixed Thermal Magnetic		SGM3-400		SGM3-630		SGM3-800		SGM3-1250	
Frame Size		400		630		800		1250	
Number of Poles		3P	4P	3P	4P	3P	4P	3P	4P
Breaking Capacity Level		M	H	M	H	M	H	M	H
Rated Ultimate Short-circuit Breaking Capacity Icu (kA rms)		65	100	65	100	75	100	75	100
Rated Service Short-circuit Breaking Capacity Ics (kA rms)		42	65	42	65	50	65	50	65
Mechanical Durabilities	On-off Cycle	4000		4000		2500		2500	
Electrical Durabilities	On-off Cycle	2000		1500		1000		1000	
Tripping Unit									
Rated Current (A)	In	200,225,250,315 350,400		400,500,630		400,500,630,700,800		700,800,900,1000,1250	
Accessory									
Indication Accessories		■		■		■		■	
OF		■		■		■		■	
SD		■		■		■		■	
Control Accessories									
MX(AC400, 230V, DC220V)		■		■		■		■	
MN (AC400, 230V)		■		■		■		■	
Extended Rotary Handle (Round and Square)		■		■		■		■	
AC Motor Mechanism (AC400, 230V)		■		■		■		■	
Mechanical Interlock		■	-	■	-	■	-	■	-
Mounting & Connection									
Fixed, Front Connection		■		■		■		■	
Fixed, Rear Connection		■		■		■		■	
Plug-in, Rear Connection		■		■		■		■	
Plug-in, Front Connection		-		-		-		-	
Drawer-out, Rear Connection		■		■		■		■	
Connection									
Spreader		■		■		■		■	
Protection									
Phase Barrier		■		■		■		■	
Electronic type		SGM3E-400		SGM3E-630		SGM3E-800		SGM3E-1250	

“■” shows it has this option;

“-” means it has no this option.

SGM3 Moulded Case Circuit Breaker

Technical Data

IEC60947-2

Thermo-adjustable		SGM3S-63		SGM3S-125			SGM3S-250		
Frame Size		63		125			250		
Number of Poles		3P	4P	2P	3P	4P	2P	3P	4P
Breaking Capacity Level		L	M	L	M	H	L	M	H
Rated Ultimate Short-circuit Breaking Capacity Icu (kA rms)		25	50	36	50	85	36	50	85
Rated Service Short-circuit Breaking Capacity Ics (kA rms)		18	36	27	36	50	27	36	50
Mechanical Endurance	On-off Cycle	11000		11000			10000		
Electrical Endurance	On-off Cycle	6000		6000			3000		
Tripping Unit									
Rated Current (A)	In	10,16,20,25,32,40,50,63		16,20,25,32,40,63,80,100,125			100,125,160,180,200,225,250		
Thermo-adjustable Setting (Ir)	In	0.8/0.9/1.0In		0.8/0.9/1.0In			0.8/0.9/1.0In		
Accessories									
Indication Accessories									
OF		■		■			■		
SD		■		■			■		
Control Accessories									
MX(AC400, 230V, DC220V)		■		■			■		
MN (AC400, 230V)		■	-	■		-	■		
Extended Rotary Handle (Round and Square)		■		■			■		
AC Motor Mechanism (AC400, 230V)		■		■			■		
Mechanical Interlock		■	-	■		-	■		-
Mounting & Connection									
Fixed, Front Connection		■		■			■		
Fixed, Rear Connection		■		■			■		
Plug-in, Rear Connection		■	-	■		-	■		
Plug-in, Front Connection		-		-			■		
Drawer-out, Rear Connection		-		-			-		
Connection									
Spreader		■		■			■		
Protection									
Phase Barrier		■		■			■		
MCCB With ELCB		-		SGM3L-125			SGM3L-250		

"■" shows it has this option;

"-" means it has no this option.

SGM3 Moulded Case Circuit Breaker

Technical Data

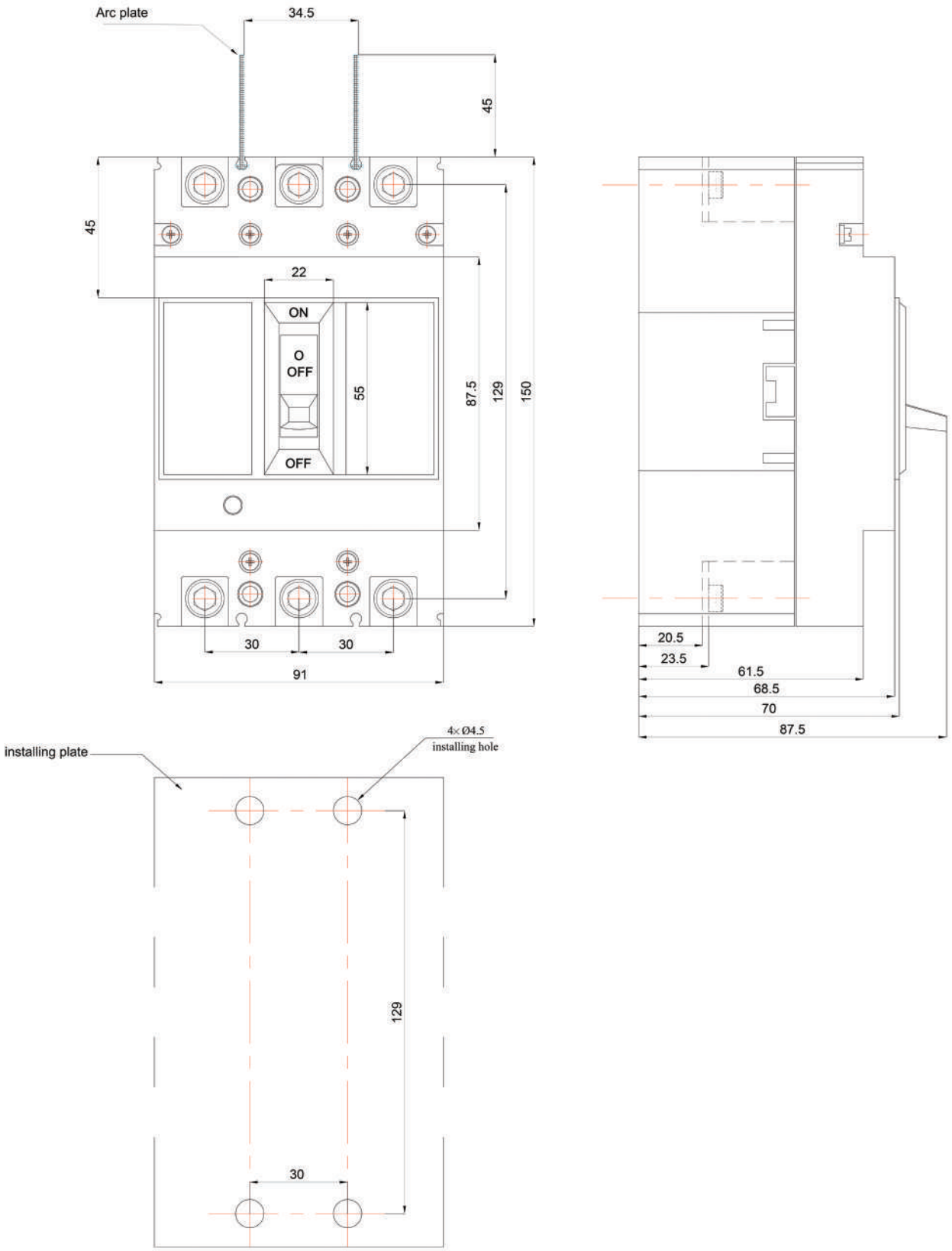
IEC60947-2

Thermo-adjustable		SGM3S-400		SGM3S-630		SGM3S-800	
Frame Size		400		630		800	
Number of Poles		3P	4P	3P	4P	3P	4P
Breaking Capacity Level		M	H	M	H	M	H
Rated Ultimate Short-circuit Breaking Capacity Icu (kA rms)		50	85	65	100	75	100
Rated Service Short-circuit Breaking Capacity Ics (kA rms)		36	50	42	65	50	65
Mechanical Endurance	On-off Cycle	4000		4000		2500	
Electrical Endurance	On-off Cycle	2000		1500		1000	
Rated Current (A)	In	200,225,250,315,350,400		400,500,630		400/500/630/700/800	
Thermo-adjustable Setting (Ir)	In	0.8/0.9/1.0In		0.8/0.9/1.0In		0.8/0.9/1.0In	
Accessory							
Indication Accessories							
OF		■		■		■	
SD		■		■		■	
Control Accessories							
MX(AC400, 230V, DC220V)		■		■		■	
MN (AC400, 230V)		■		■		■	
Extended Rotary Handle (Round and Square)		■		■		■	
AC Motor Mechanism (AC400, 230V)		■		■		■	
Mechanical Interlock		■	-	■		■	-
Mounting & Connection							
Fixed, Front Connection		■		■		■	
Fixed, Rear Connection		■		■		■	
Plug-in, Rear Connection		■		■		■	
Plug-in, Front Connection		-		-		-	
Drawer-out, Rear Connection		■		■		■	
Connection							
Spreader		■		■		■	
Protection							
Phase Barrier		■		■		■	
MCCB With ELCB		SGM3L-400		SGM3L-630		SGM3L-800	

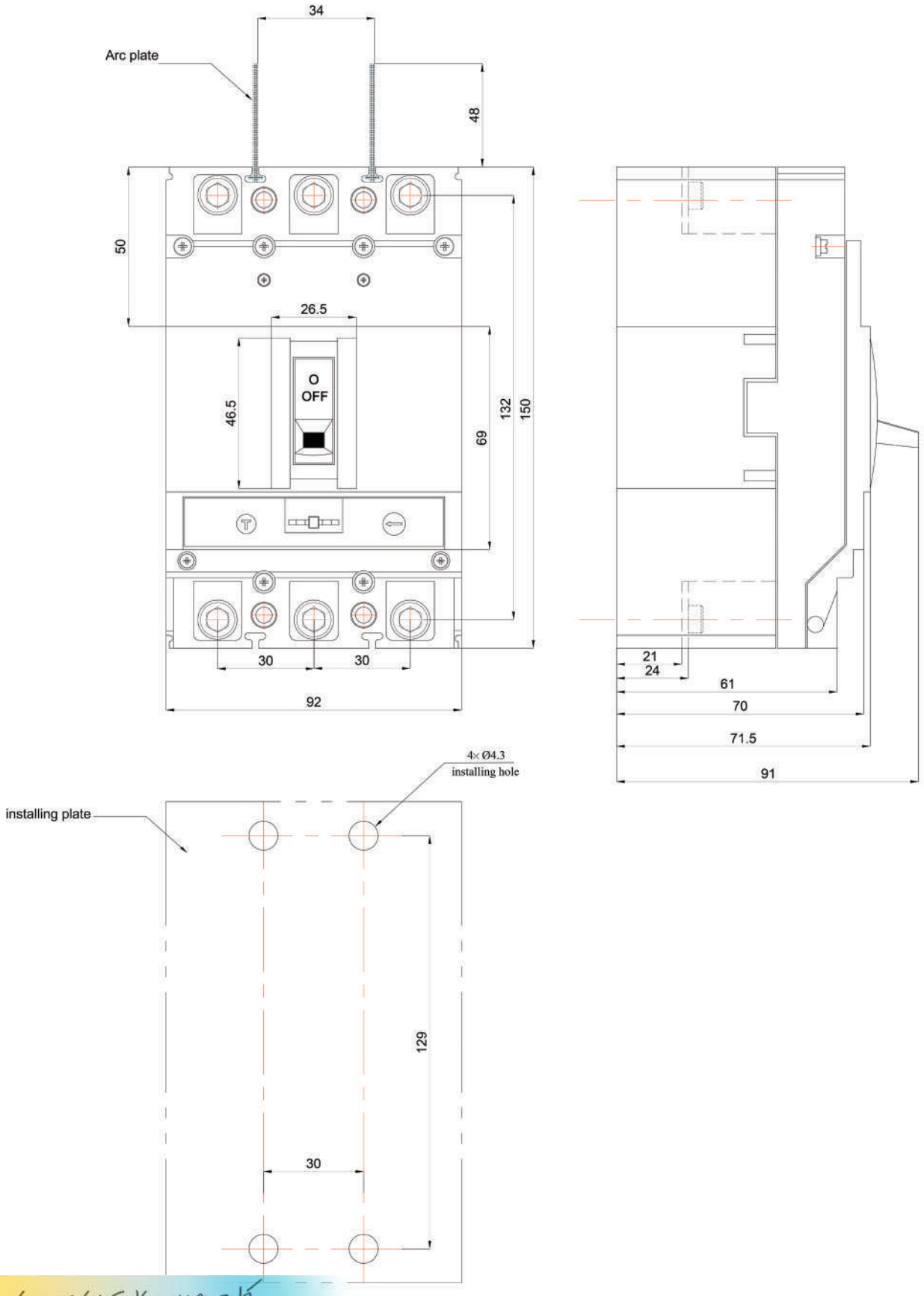
"■" shows it has this option;

"-" means it has no this option.

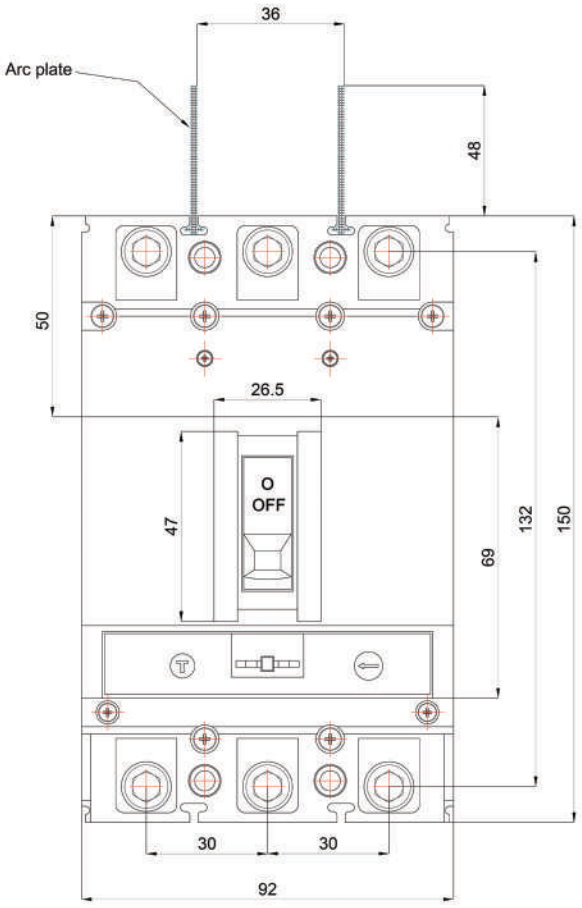
3P, 16A-160A, Thermal-Magnetic Fixed Type

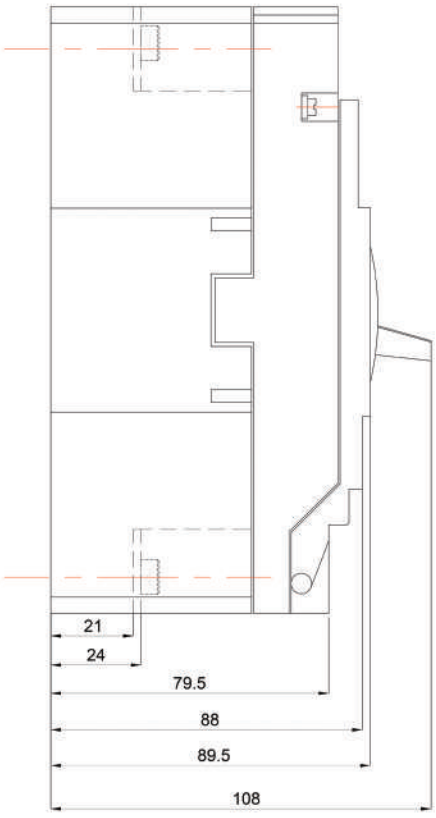


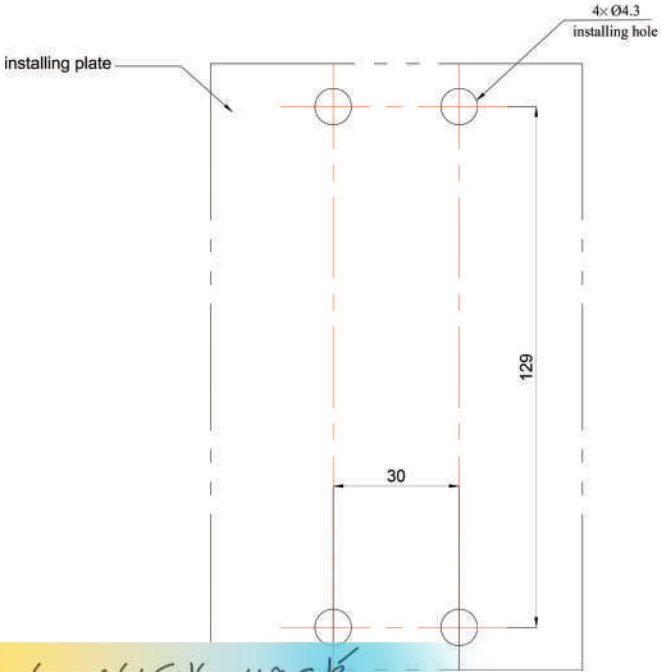
3P, 63A-160A, Thermal-Magnetic Adjustable Type



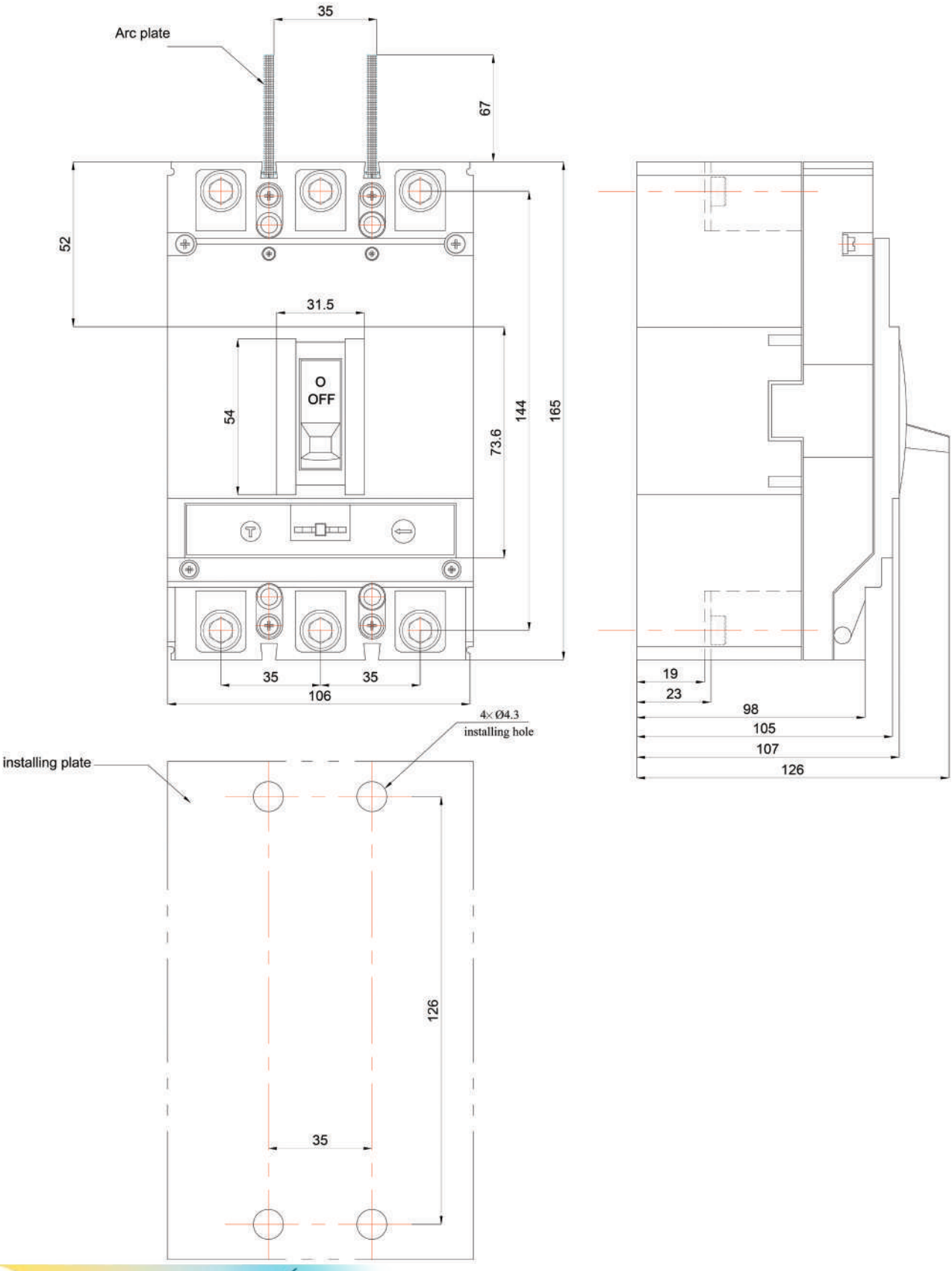
3P, 160A - M, Thermal-Magnetic Adjustable Type



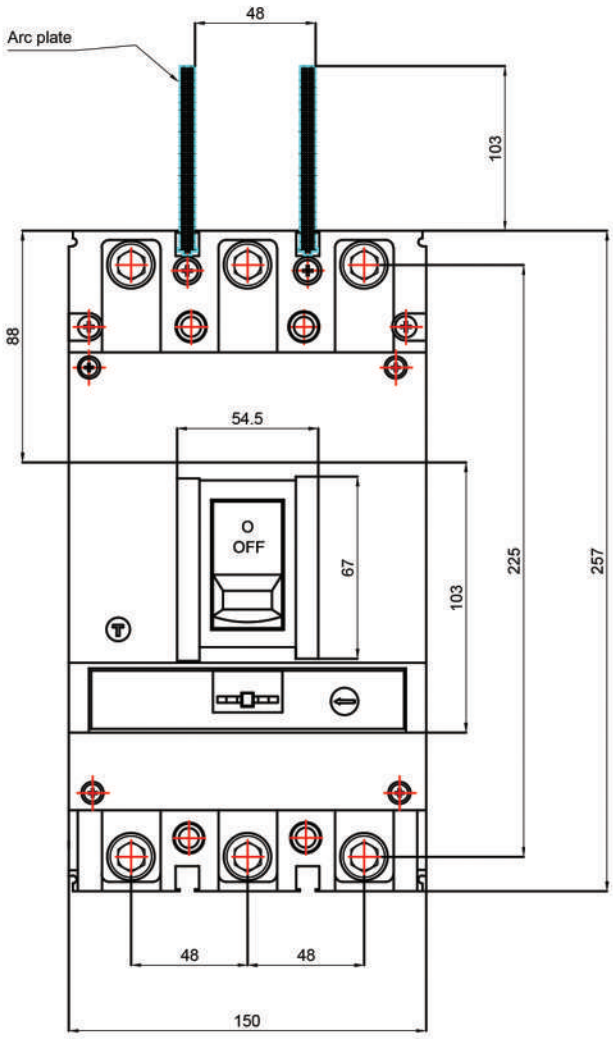


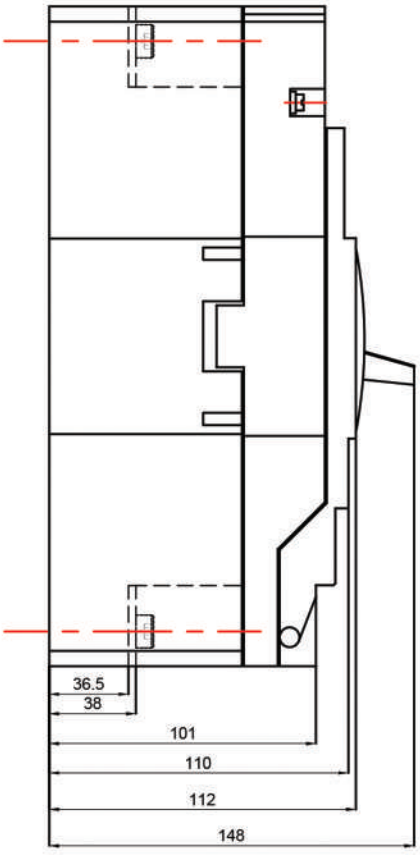


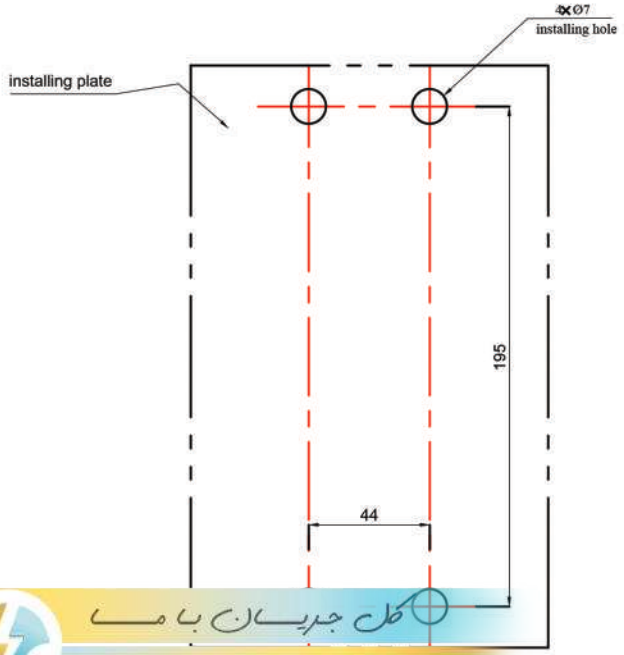
3P, 200A-250A, Thermal-Magnetic Adjustable Type



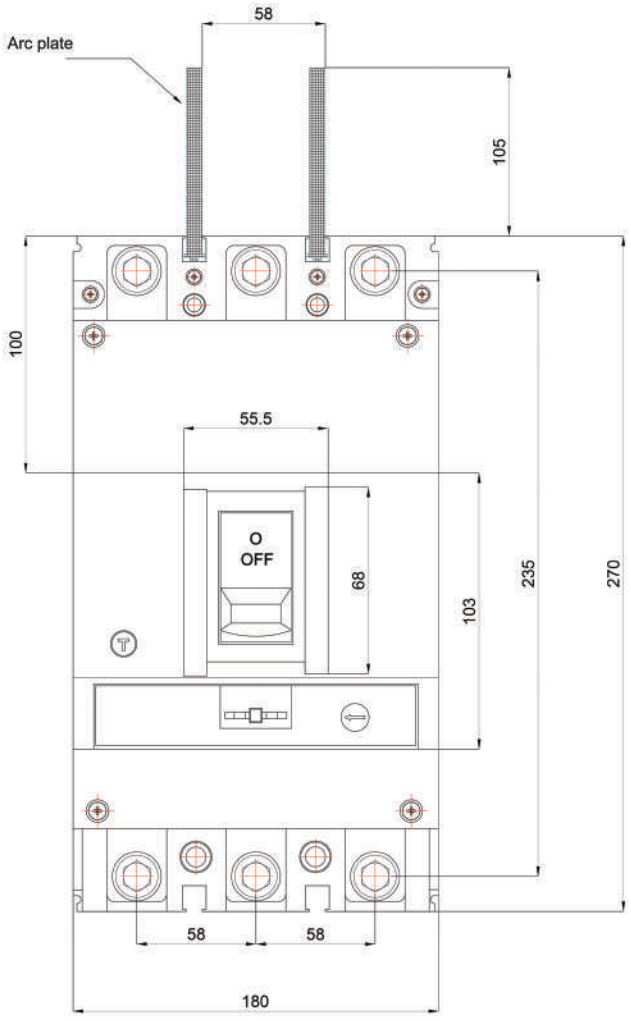
3P, 300A-400A, Thermal-Magnetic Adjustable Type

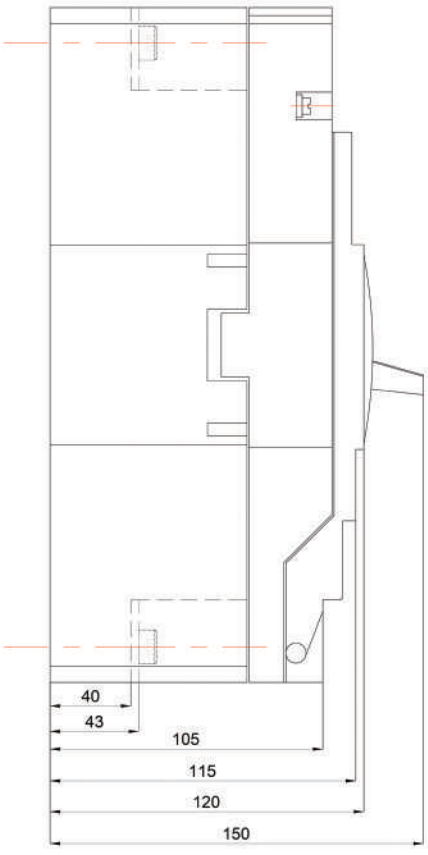


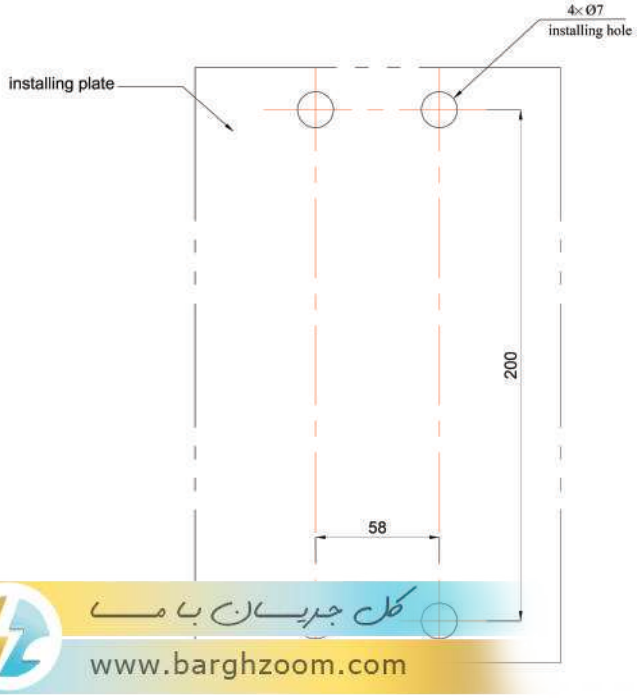


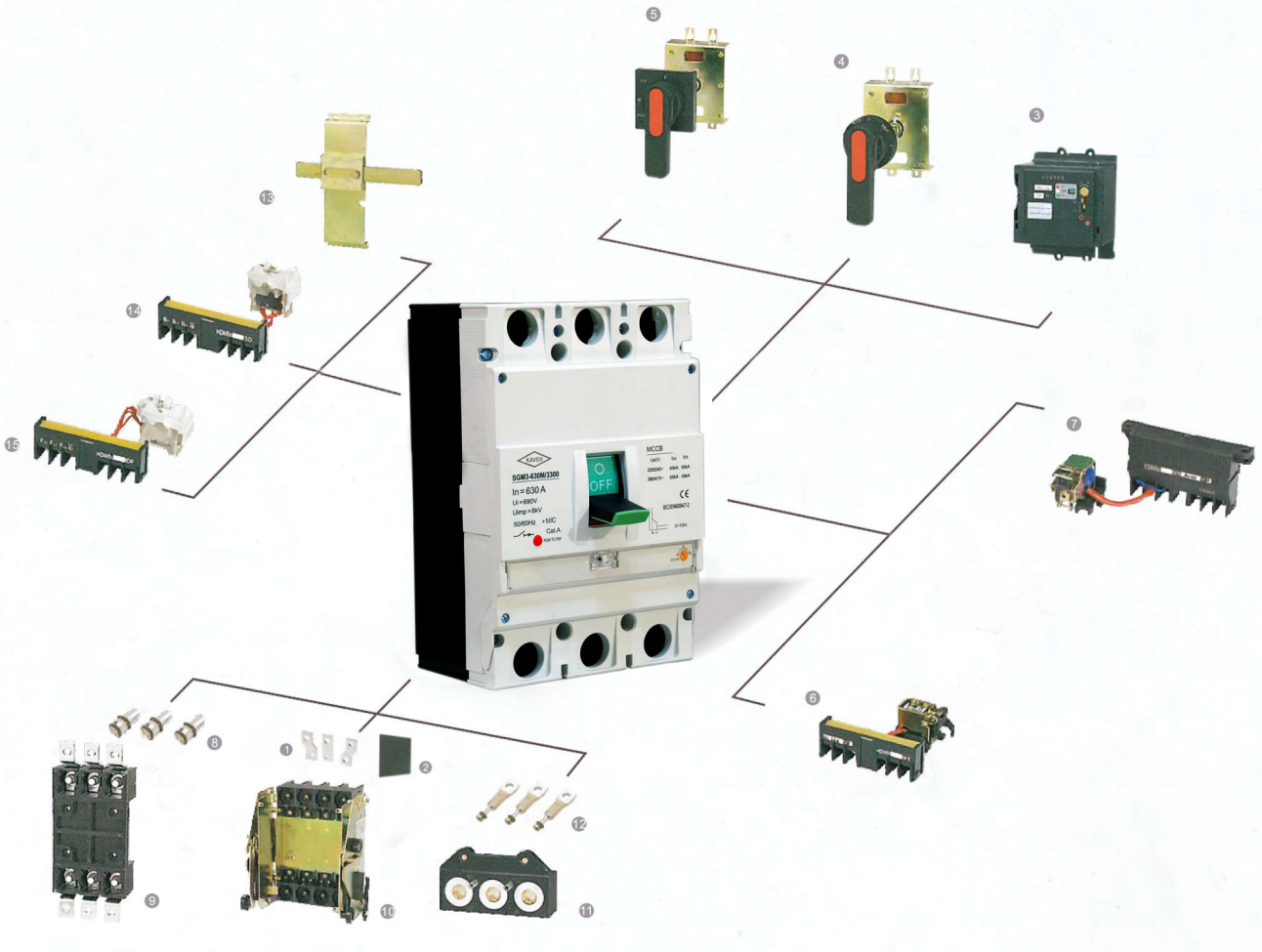


3P, 630A-800A, Thermal-Magnetic Adjustable Type









1	Spreader	6	MX	11	Plug-in Rear Connection
2	Phase Barrier	7	MN	12	Fixed Rear Connection
3	AC Motor Mechanism	8	Plug-in Connecting Terminal	13	Mechanical Interlock
4	Round Extended Rotary Handle	9	Plug-in Front Connection	14	SD
5	Square Extended Rotary Handle	10	Drawer-out Rear Connection	15	OF

KAVEH

ELECTRO KAVEH Co.

SGM3(E)

Moulded Case Circuit Breaker
Electronic type Manual

KAVEH

CONTENTS

1. Range of application and Standard

1.1 Range of application

SGM3E series MCCB is supplied with rated insulation voltage 800V and used for circuit of AC 50Hz ,rated operating voltage AC 400V ,rated Ampere 16A-800A,rated operating voltage AC 400V . Equipped with the protection devices for over-current,short circuit and under voltage,the product is capable of preventing damage of circuits and supplying units the product according to IEC60947-2 .

1.2Function

SGM3E series MCCB can be connected with the shunt release ,under voltage release,Auxiliary contact,Alarm contact,Electric operating mechanism,Rotary handle operating mechanism etc..Auxiliary products for the MCCB .

1) Under voltage release use for circuits and power supply's under voltage protection
2) Shunt release use to trip the combined MCCB by remote controlling device .
3) Auxiliary contact use for MCCB to control circuit and signal circuit for automatic control
4) Alarm contact use to overload ,short circuit protection and under voltage trip for the MCCB 's protect device
5) Electric operating mechanism is used to automatic and remote control the "on " or "OFF" for the MCCB
6) Rotary handle operating mechanism is used for operating out of distribution box and used for the mechanical interlock when the MCCB in the switch on state.

1.3Standard

The product is in conformity with the below standard:
IEC60947-1 and GB14048.1 general rule
IEC60947-2 and GB14048.2 low voltage circuit breaker
IEC60947-4-1 and GB14048.4 electro-mechanical contactor and electromotor starter
IEC60947-5-1 and GB14048.5 electromechanical control circuit devices.

2. Working operation requirement

2.1Temperature
Average temperature less than +35℃ within 24 hours for -5℃~ +40℃.

2.2Altitude of installation
Altitude of installation shall be less than 2000m,and the capacity reduction is adopted for being used at 2000+ m

2.3 Condition of the atmosphere
The relative temperature of the atmosphere is not more than 50% when the highest temperature is +40℃,and the relative remperture is higher under lower temperature (e.g. 90% at +20℃) ,and the condensation formed on the surface of the products for temperature change shall be considered.

2.4 Pollution level: Ⅲ

2.5 Installation category : Ⅲ

2.6Installation conditions
Any installation place of the external magnetic field direction should not exceed 5 times of the geomagnetic field , Vertical installation, handle up to position, turning on the power supply installation area should be no significant impact and vibration .

2.7 Mode of Connection
Using screw terminals, fasten the screw to fix the wire.

2.8Utilization category
A TYPE: In the case of short circuit, circuit breaker without specifying a series connection in circuit used as the load side another short circuit device of selective protection(in the case of short circuit,
Selective protection without person is short time delay) .According to MCCB :100 /225

B TYPE: In the case of short circuit, circuit breaker specifying a series connection in circuit used as the load side another short circuit device of selective protection(in the case of short circuit,
Selective protect person is short time delay) .According to MCCB :400/630/800

KAVEH

3. Performance and parameter

3.1 MCCB rated Ampere

Frame Inm A	Breaking capacity Class	kA Icu/Ics	Rated Ampere In(A)
		400V	
100	M	35/22	32A(Setting Ampereing 16A-32A) 63A(Setting Ampereing 32A-63A) 100A(Setting Ampereing 63A-100A)
	H	50/35	
225	M	35/22	225A(Setting Ampereing 100A-225A)
	H	50/35	
400	M	65/42	400A(Setting Ampereing 200A-400A)
	H	100/65	
800	M	65/42	630A(Setting Ampereing 400A-630A)
	H	100/65	800A(Setting Ampereing 630A-800A)

3.2Endurance (operations)

	100A、225A	400A、800A
Mechanical endurance	20000	10000
Electrical endurance	8000	7500

3.3 Time current delay trip performance

Long time delay tripting

Ampere		trip time							
for distribution	1.05Irl	≤2h no trip							
	1.3Irl	≤1h trip							
	2Irl	setting time t1(S)	Inm=100、225A				Inm=400A、630A 、800A			
			12	60	80	100	12	60	100	150
for motor protection	1.05Irl	≤2h no trip							
	1.2Irl	≤1h trip							
	1.5Irl	setting timeT1(S)	nm=100、225A				Inm=400、630A			
			21.3	107	142	178	21.3	107	178	267
	2Irl	setting time t1(S)	12	60	80	100	12	60	100	150
	7.2Irl	setting timeT1(S)	0.93	4.63	6.17	7.72	0.93	4.63	7.72	11.6
	tripping cldss		-	10	10	20	-	10	20	30

Note:1.Tripping time according to $I^2T1=(2Ir1 \leq I < Ir2)$
2.Tripping time tolerance±20%
3.Return time≥70%tripping time

Short time delay tripping perfermance

Ampere	trip time					
Rated Ampere			100A	225A	400A	800A
Ir2≤I<1.5Ir2	inverse time limit		$I^2T2=(1.5Ir2)^2t2$			
1.5Ir2≤I<Ir3	fixed time limit	setting time t2(S)	0.06	0.1	0.2	0.3
		tolerance(S)	±0.02	0.03	±0.04	±0.06
		Return time			0.14	0.21

Note:The tolerance of inverse time limit:±20%

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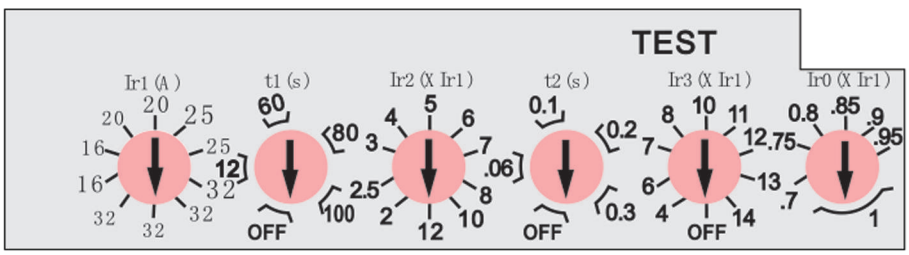
4.Setting ampere and Electronic tripping characteristics

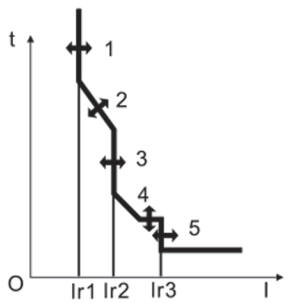
100

1.Adjustable long time prote ction tripping current Ir1,according to different rated current, can be adjusted 10position .
2.Adjustable long time delay tripping time t 1,Can be adjusted 4position.
3.Adjustable short time delay tripping time of short current Ir2,can be adjusted 10 position.
4.Adjustable short time delay tripping time t2,can be adjusted 4 position.
5.Adjustable instantaneous tripping current Ir3,can be adjusted 10 position.
6.Adjustable pre-alarmming tripping current Ir0,can be adjusted 7 position

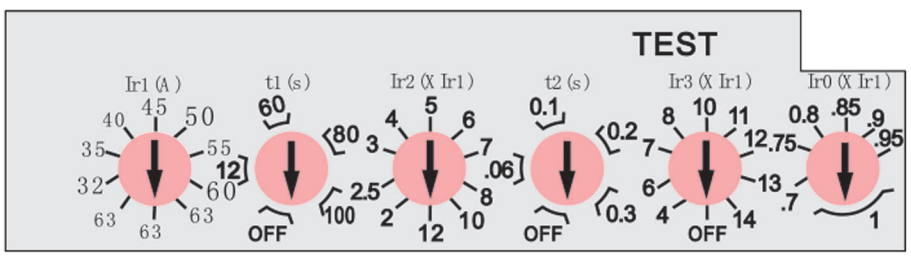
100,In=32AElectronic tripping device



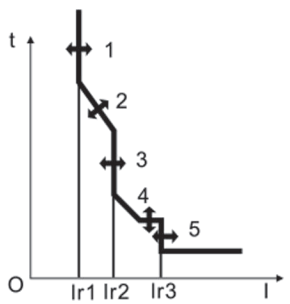
Electronic tripping characteristics curve



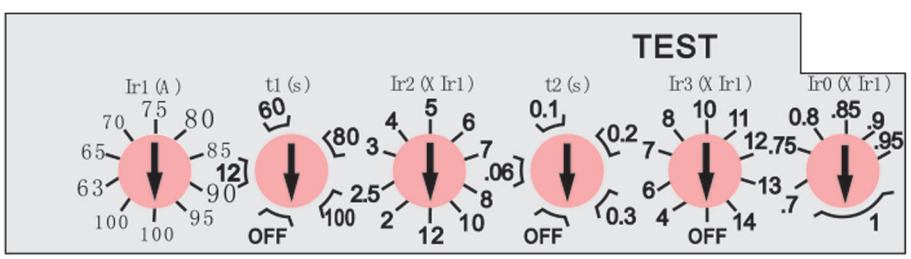
100,In=63AElectronic tripping device



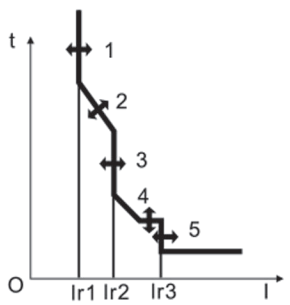
Electronic tripping characteristics curve



100,In=100AElectronic tripping device



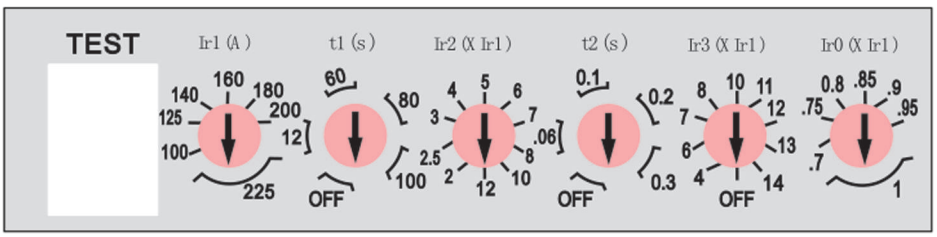
Electronic tripping characteristics curve



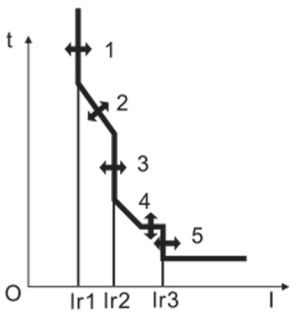
225

1.Adjustable long time prote ction tripping current Ir1,according to different rated current, can be adjusted 7position .
2.Adjustable long time delay tripping time t 1,Can be adjusted 4position.
3.Adjustable short time delay tripping time of short current Ir2,can be adjusted 10 position.
4.Adjustable short time delay tripping time t2,can be adjusted 4 position.
5.Adjustable instantaneous tripping current Ir3,can be adjusted 10 position.
6.Adjustable pre-alarmming tripping current Ir0,can be adjusted 7 position

225,In=225AElectronic tripping device



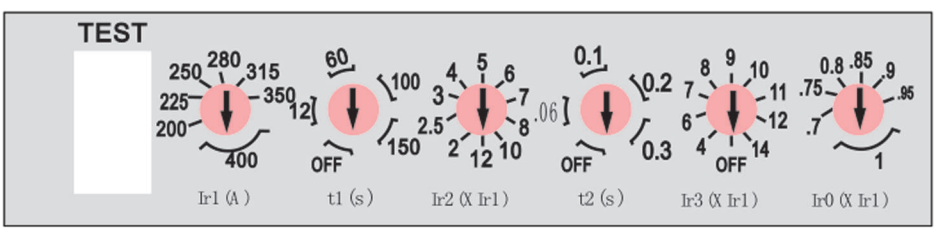
Electronic tripping characteristics curve



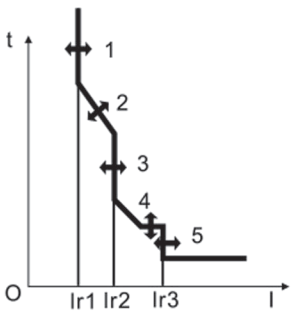
400

1.Adjustable long time prote ction tripping current Ir1,according to different rated current, can be adjusted 7position .
2.Adjustable long time delay tripping time t 1,Can be adjusted 4position.
3.Adjustable short time delay tripping time of short current Ir2,can be adjusted 10 position.
4.Adjustable short time delay tripping time t2,can be adjusted 4 position.
5.Adjustable instantaneous tripping current Ir3,can be adjusted 10 position.
6.Adjustable pre-alarmming tripping current Ir0,can be adjusted 7 position

400,In=400AElectronic tripping device



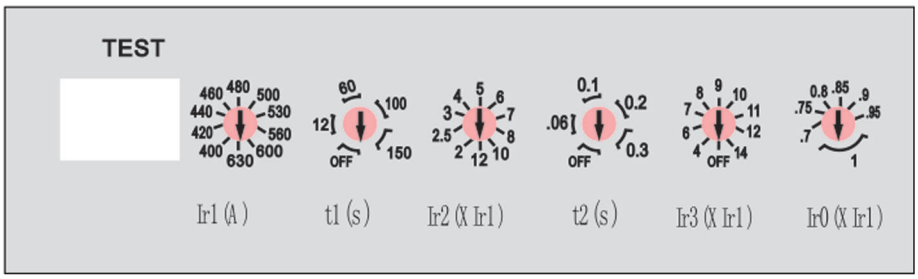
Electronic tripping characteristics curve



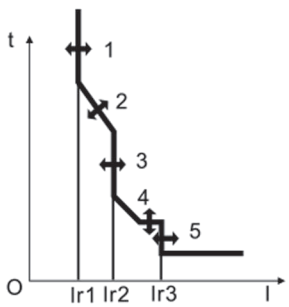
630

1.Adjustable long time prote ction tripping current Ir1,according to different rated current, can be adjusted 10position .
2.Adjustable long time delay tripping time t 1,Can be adjusted 4position.
3.Adjustable short time delay tripping time of short current Ir2,can be adjusted 10 position.
4.Adjustable short time delay tripping time t2,can be adjusted 5 position.
5.Adjustable instantaneous tripping current Ir3,can be adjusted 10 position.
6.Adjustable pre-alarmming tripping current Ir0,can be adjusted 7 position.

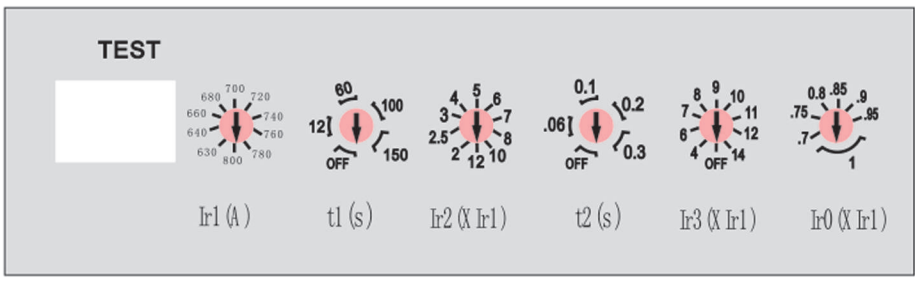
630,In=630AElectronic tripping device



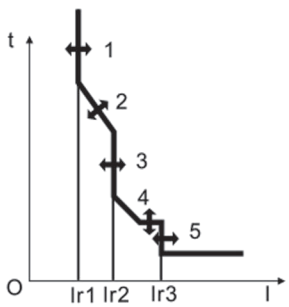
Electronic tripping characteristics curve



800,In=800AElectronic tripping device

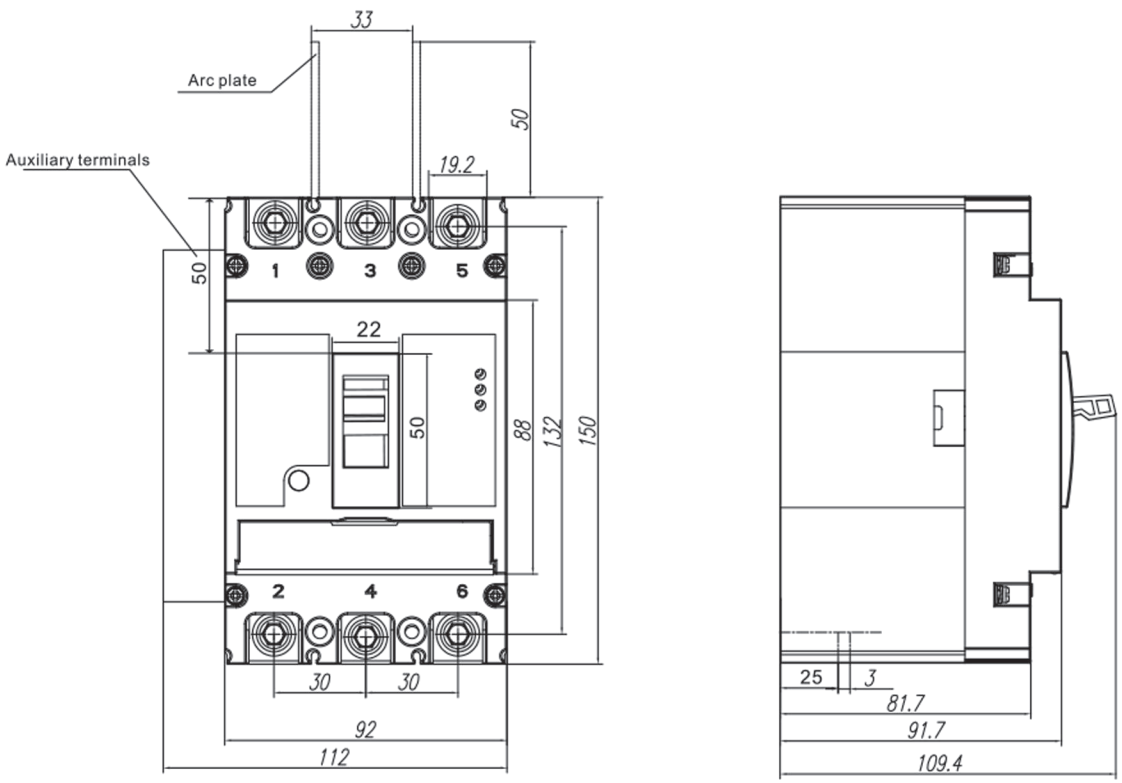


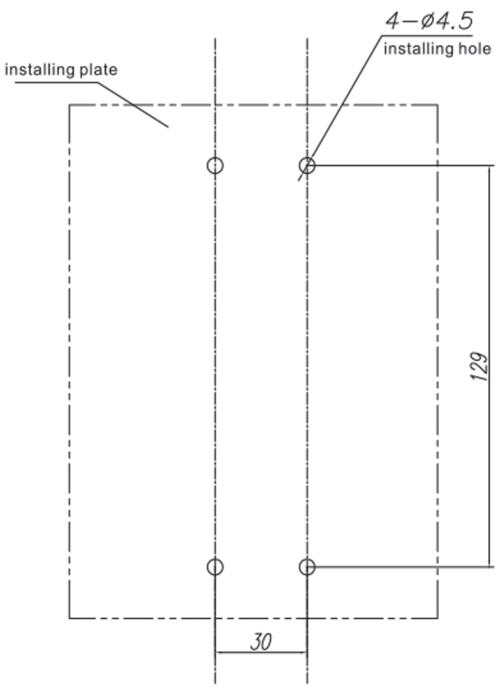
Electronic tripping characteristics curve



5.Appearance and Installation dimensions

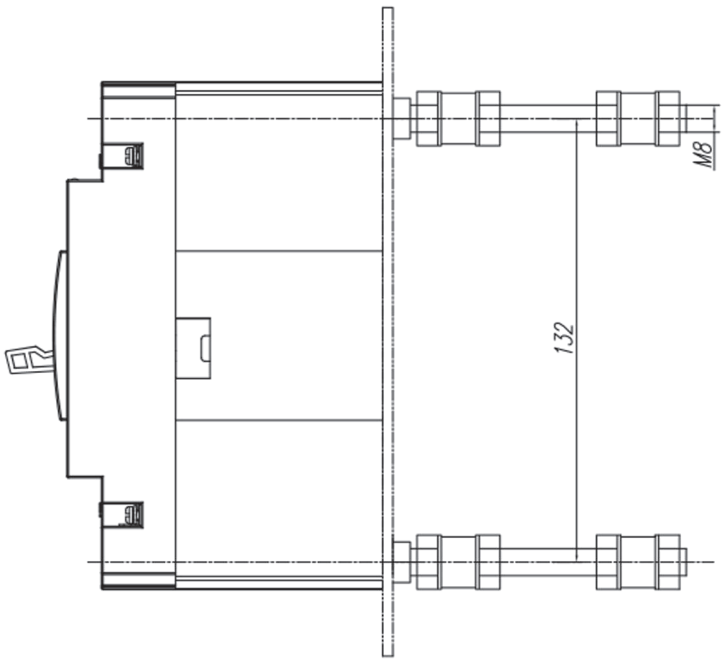
3P100 wiring in front of plate

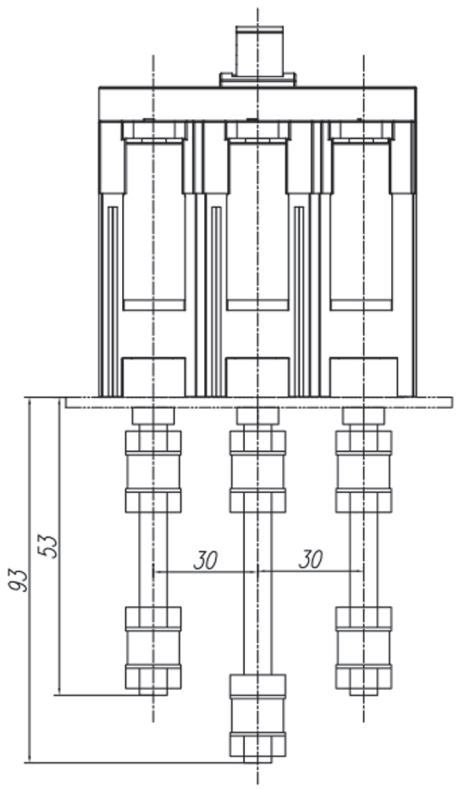


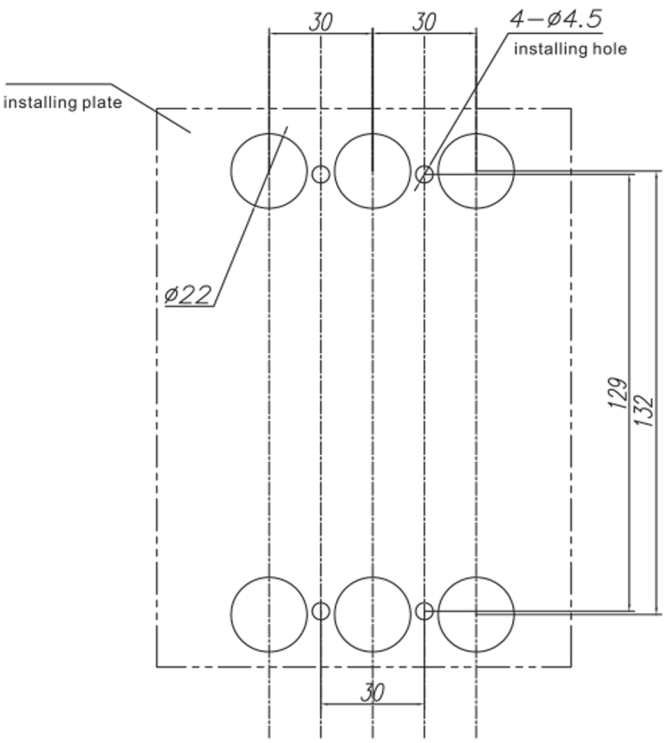


KAVEH

3P100 back panel wiring

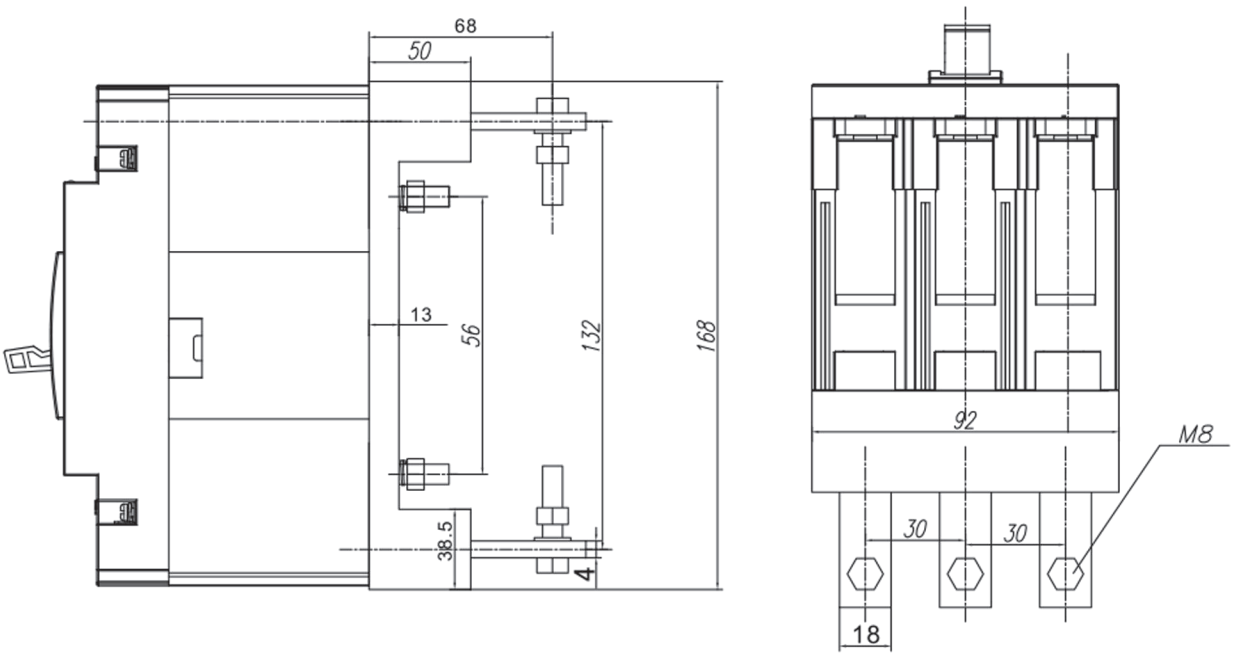


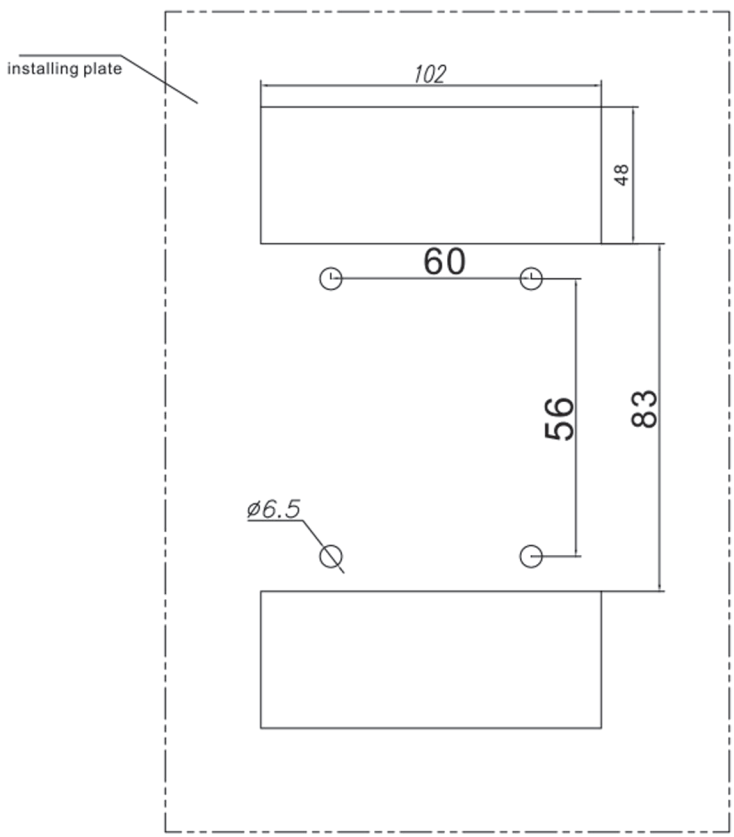




KAVEH

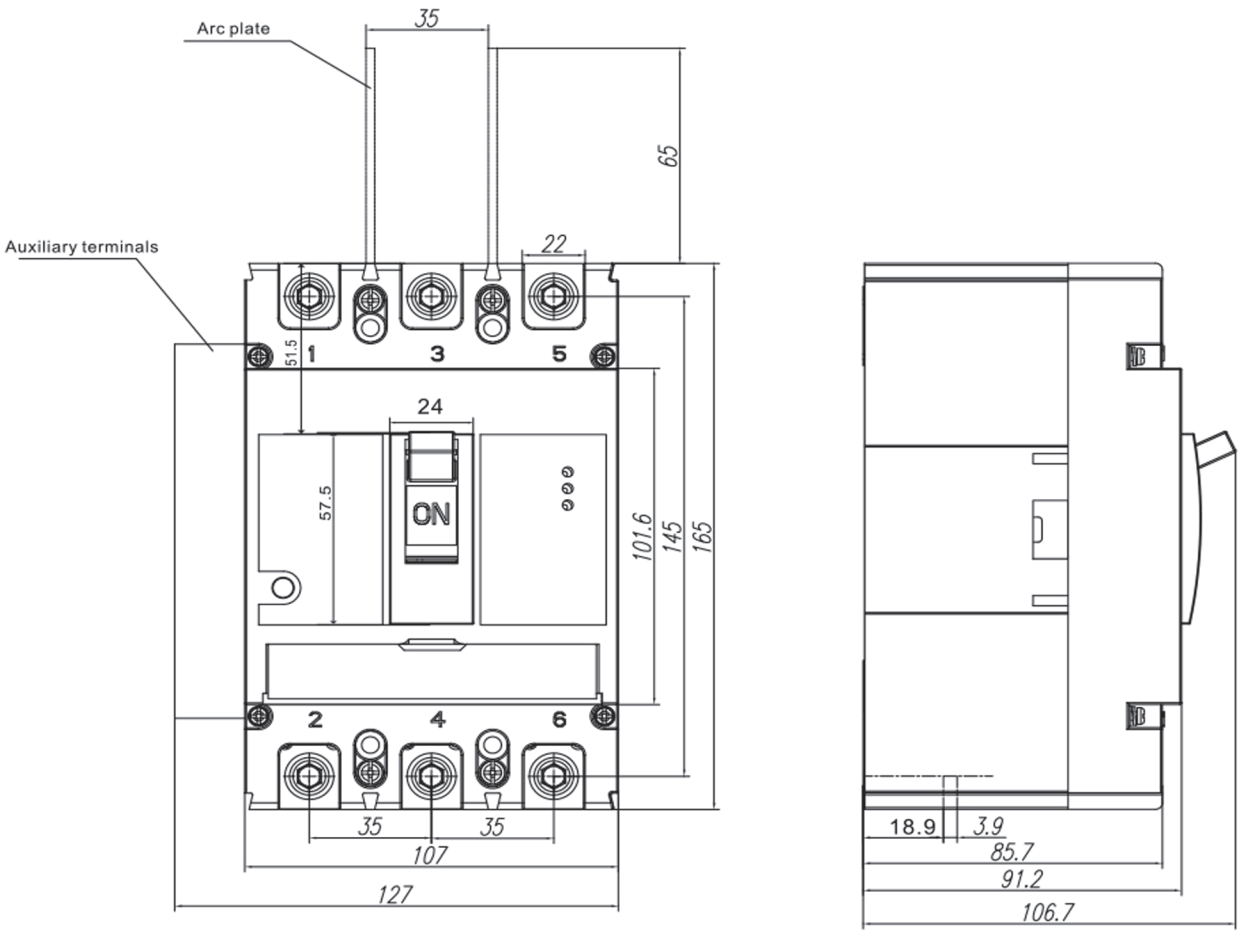
3P100 Plug-in wiring

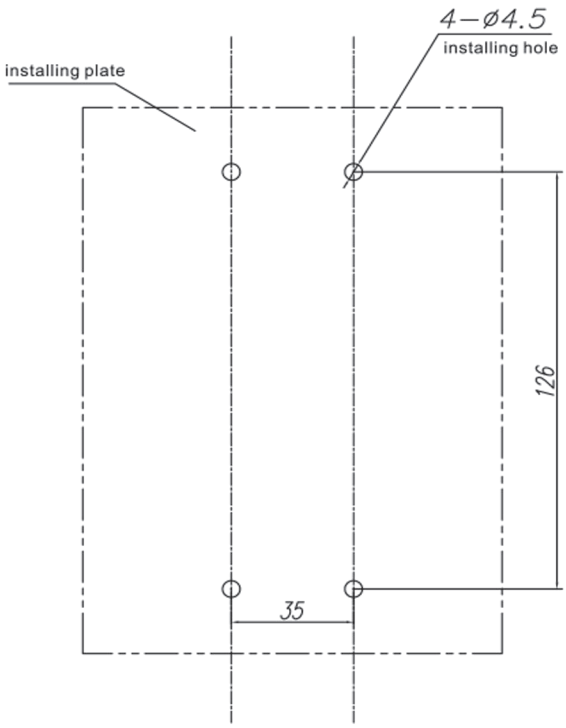




KAVEH

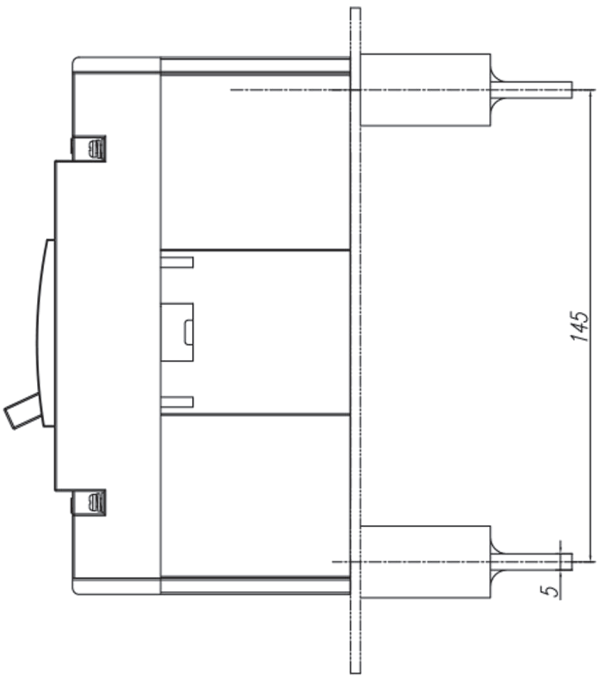
3P225 wiring in front of plate

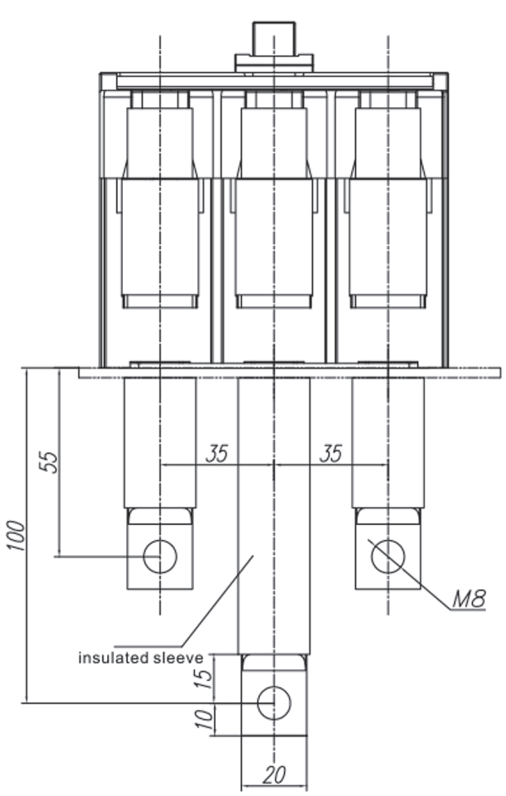


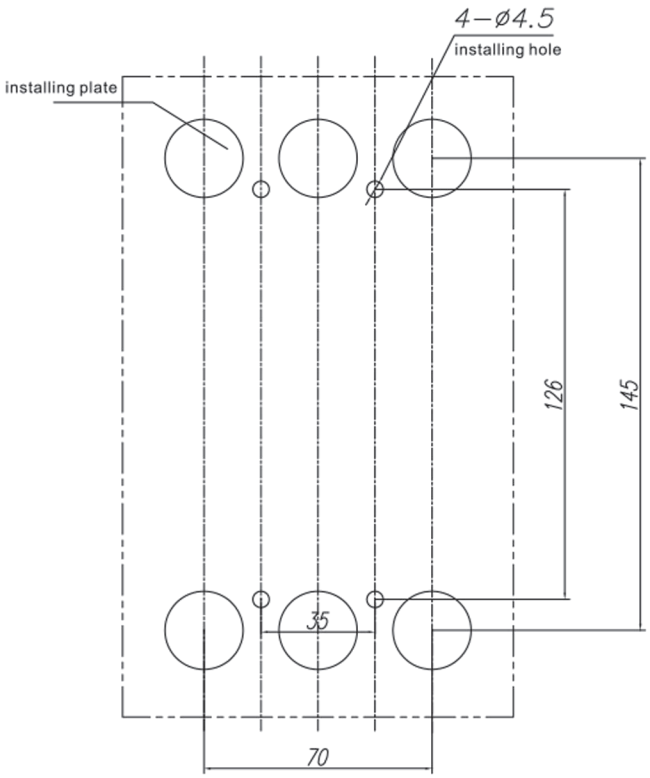


KAVEH

3P225 back panel wiring

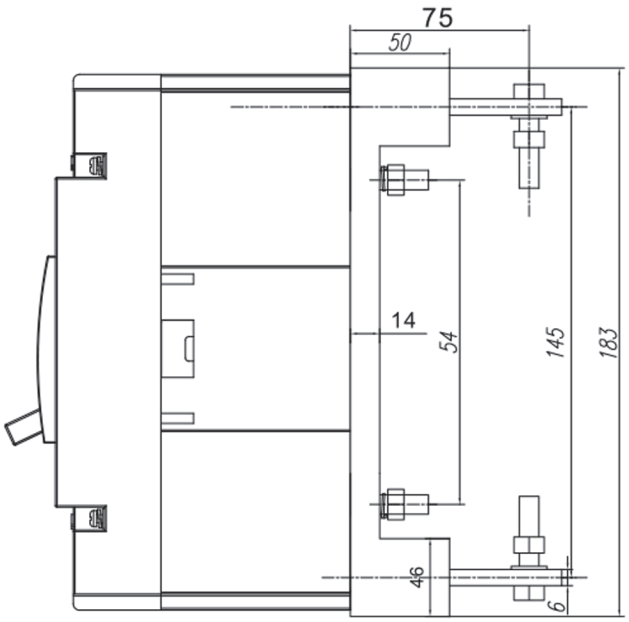


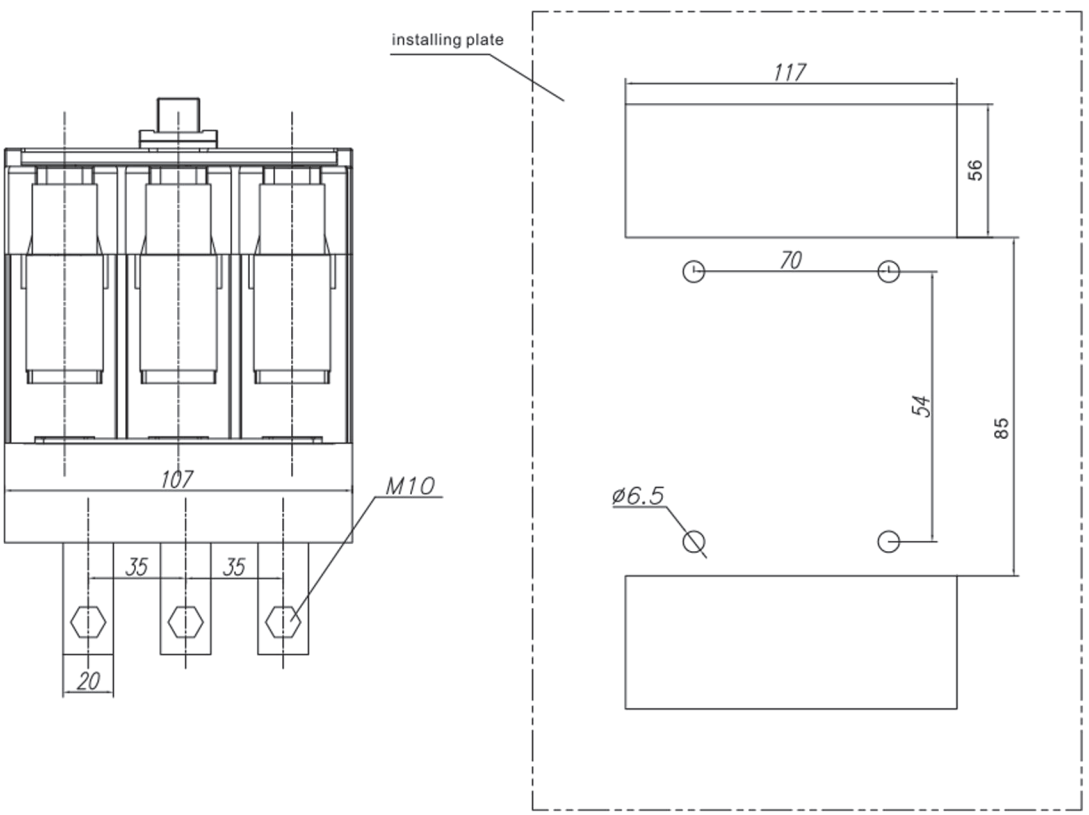




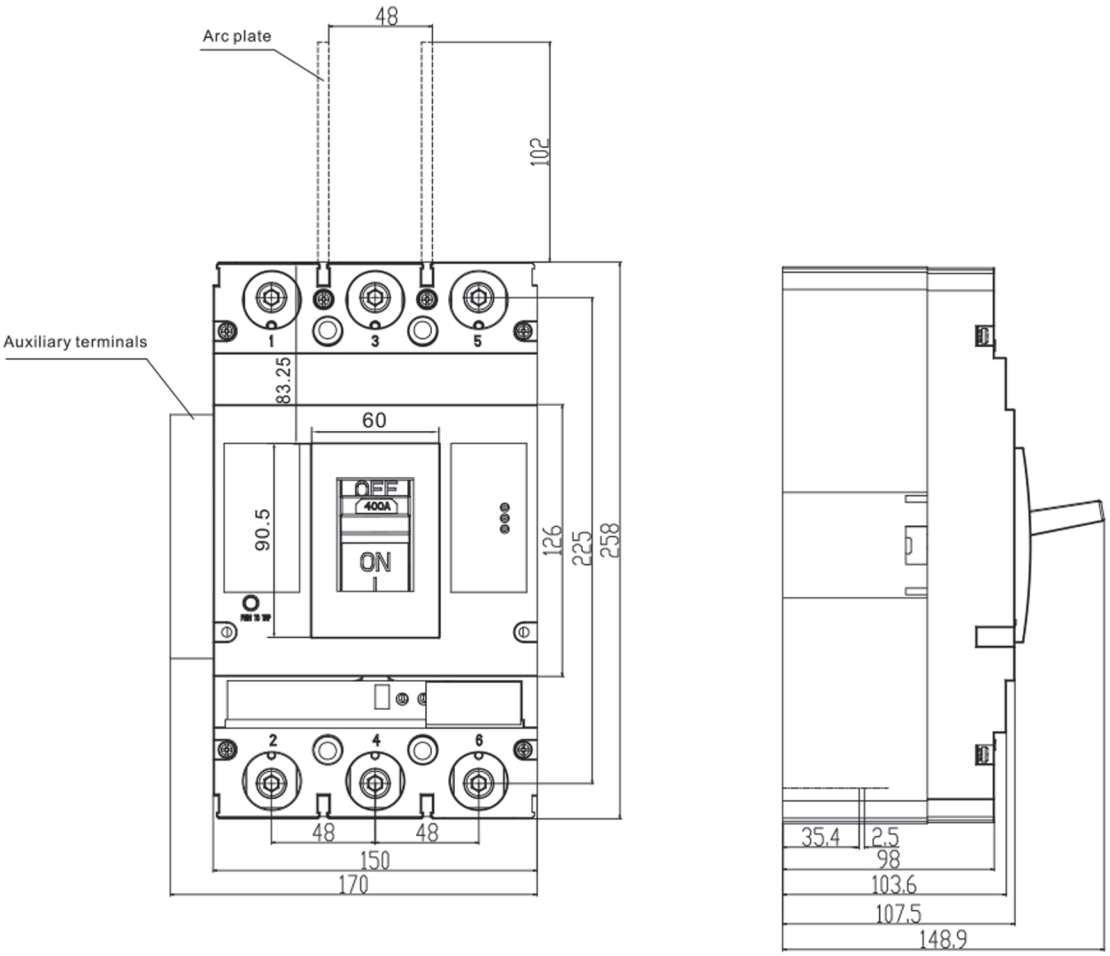
KAVEH

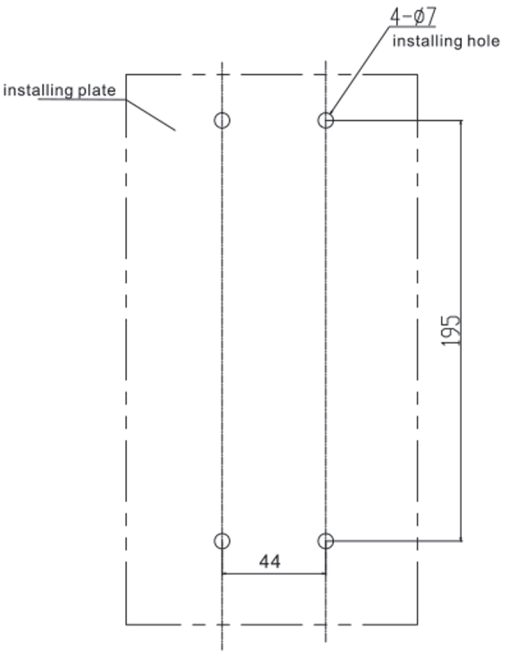
3P225 Plug-in wiring





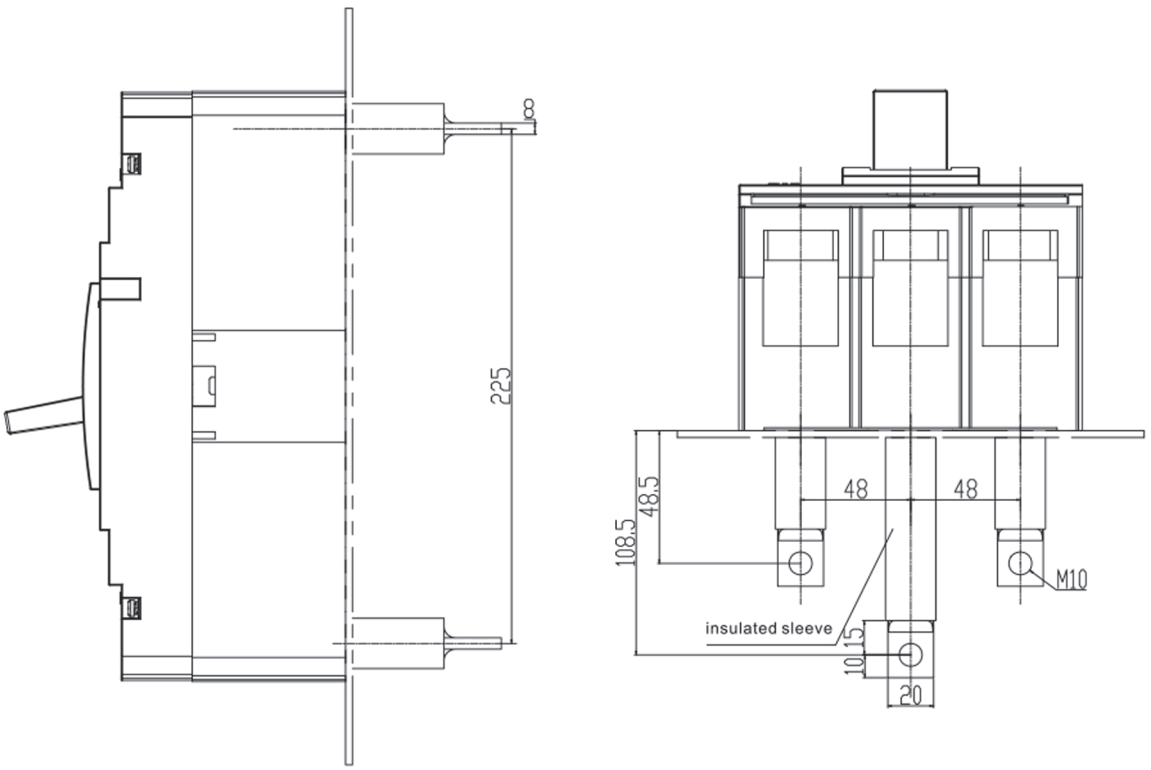
3P400 wiring in front of plate

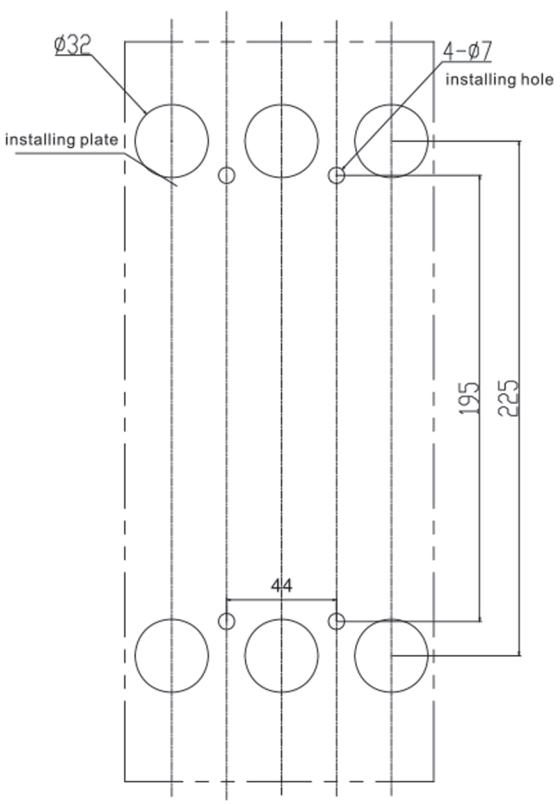




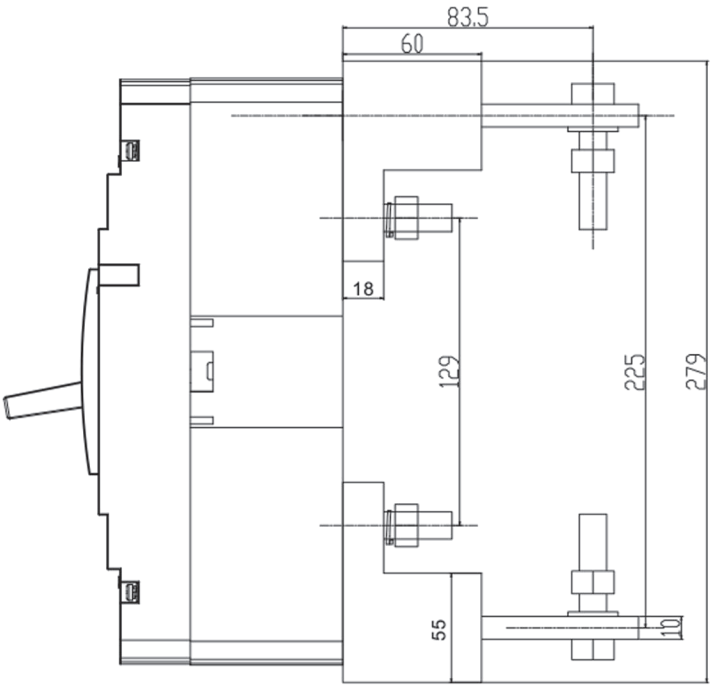
KAVEH

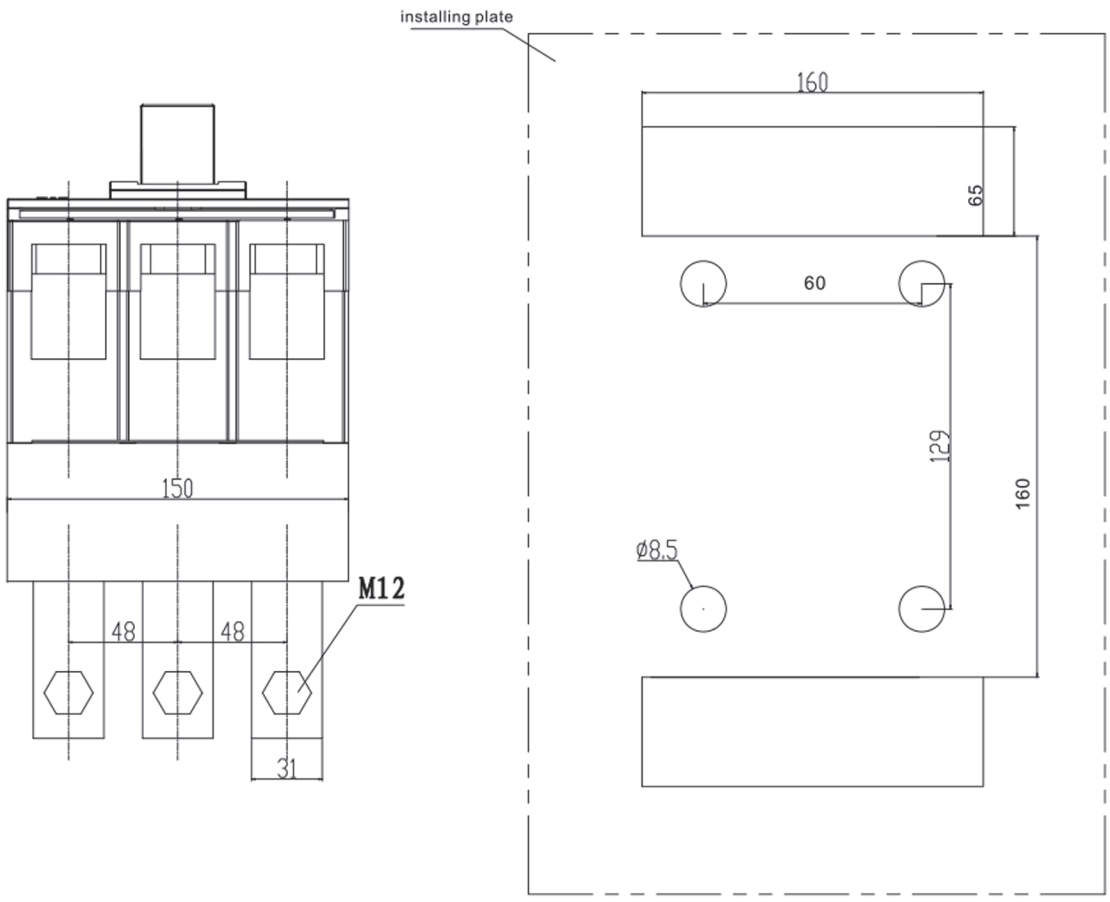
3P400 back panel wiring



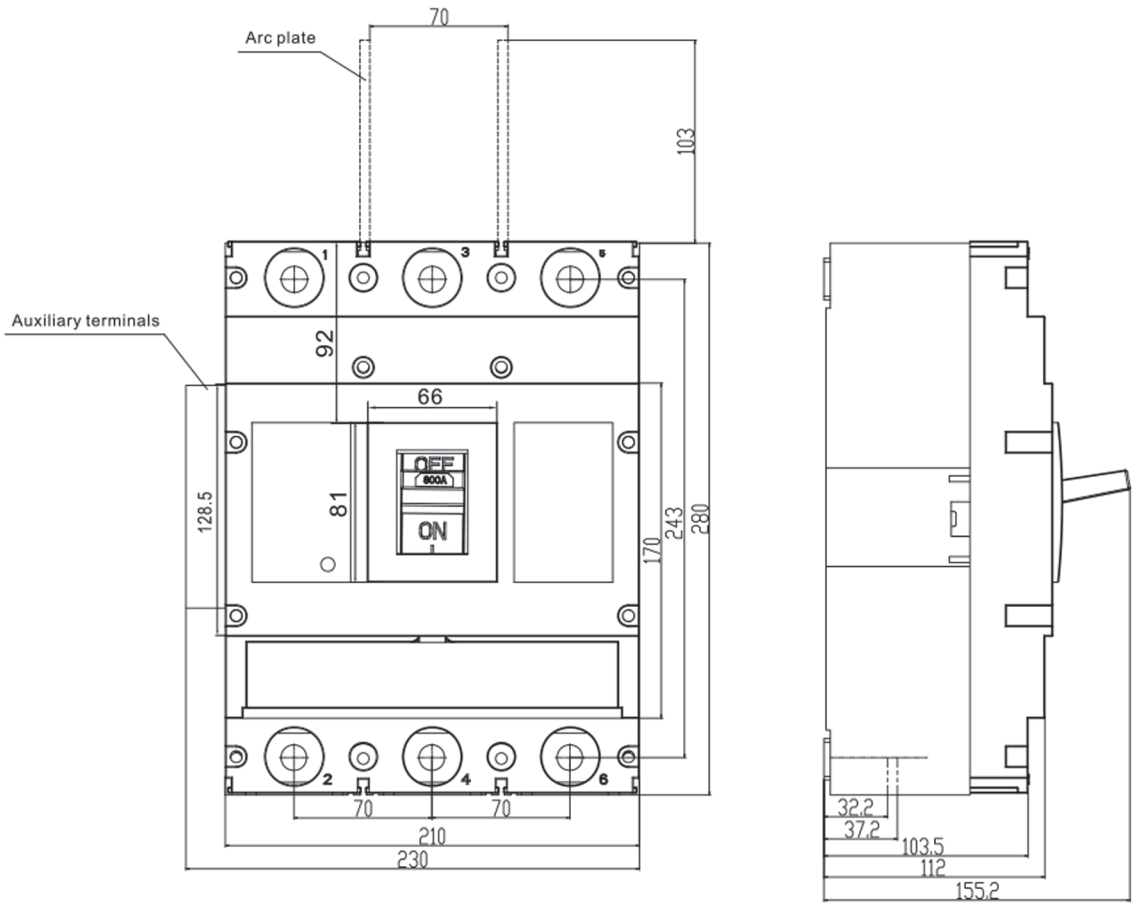


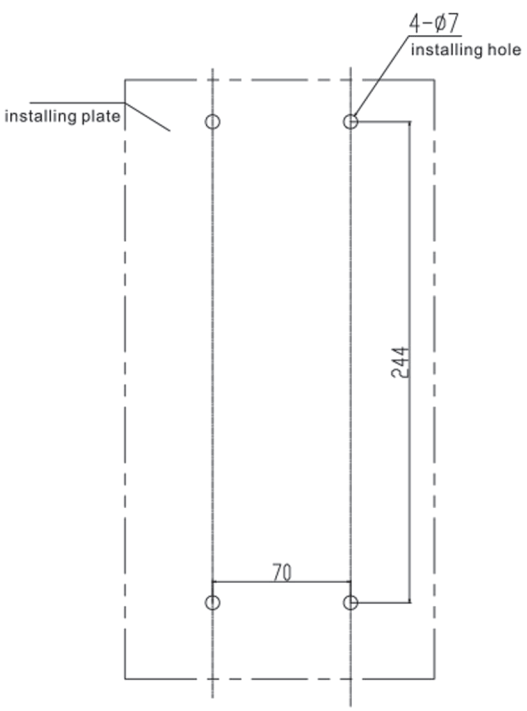
3P400 Plug-in wiring



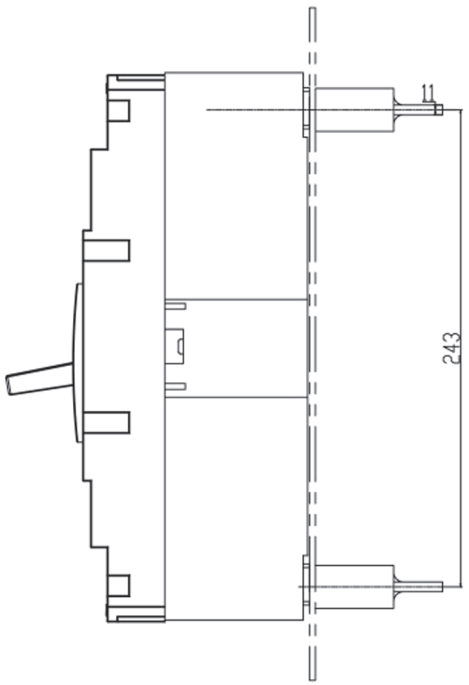


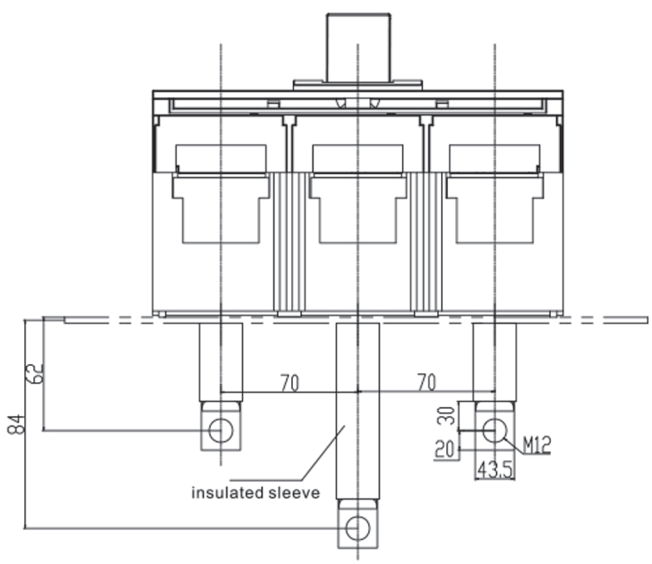
3P630 wiring in front of plate

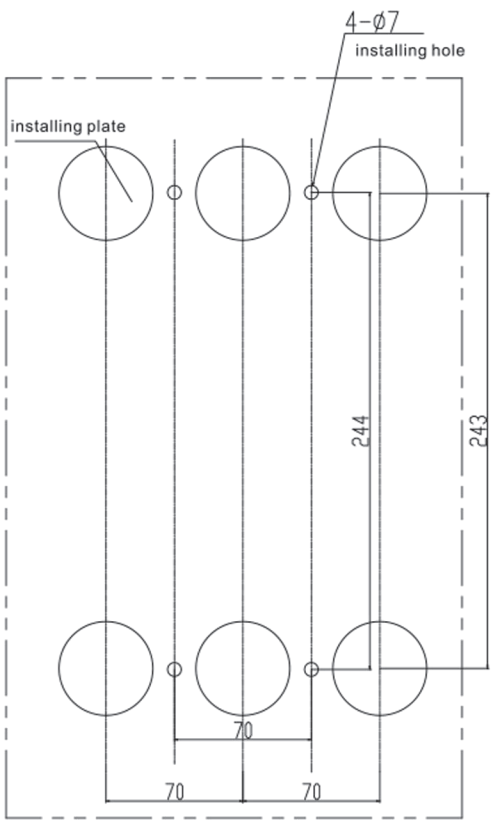




3P630 back panel wiring

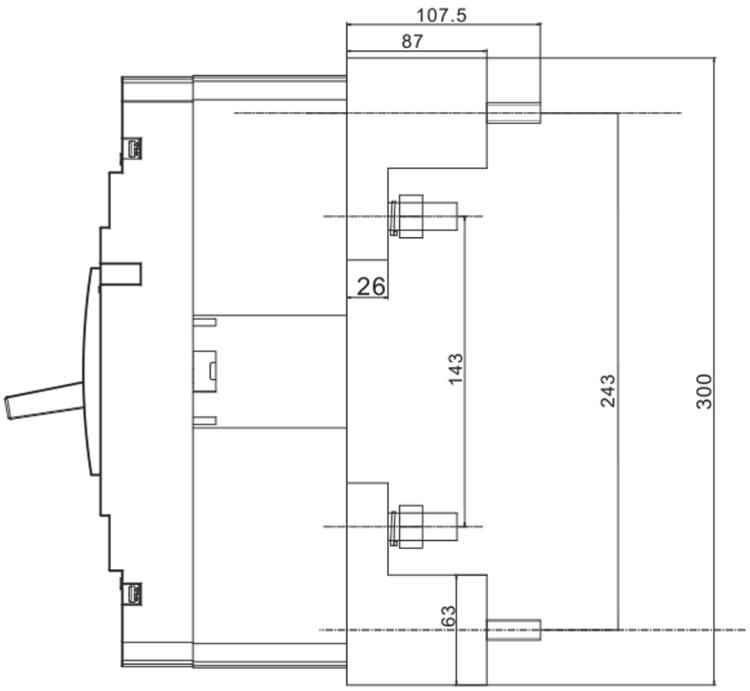


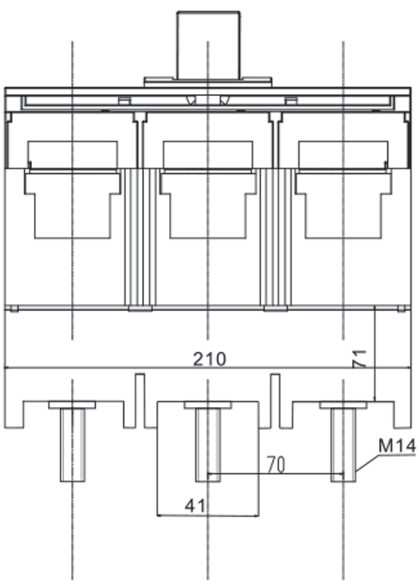


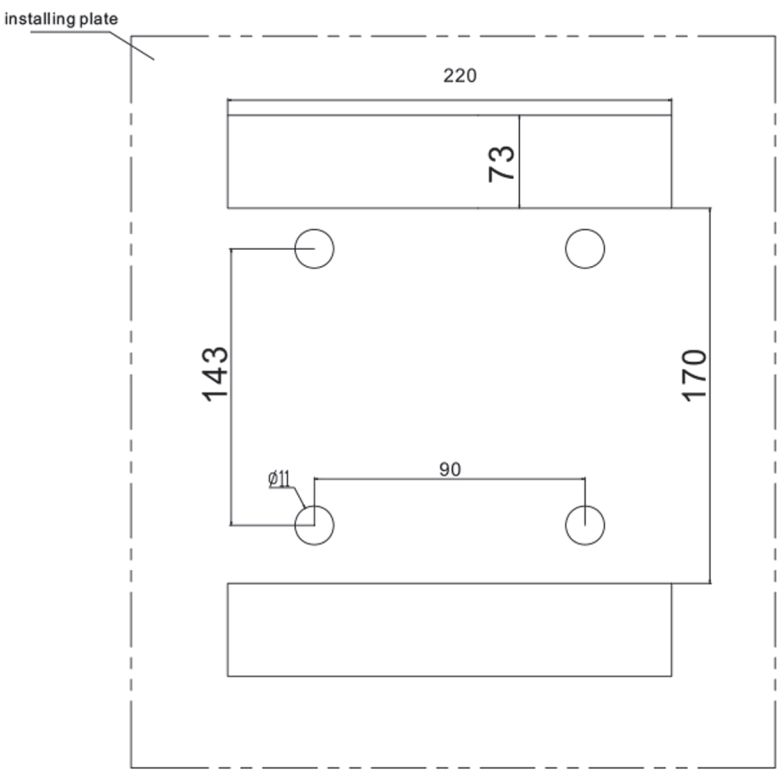


KAVEH

3P630 Plug-in wiring

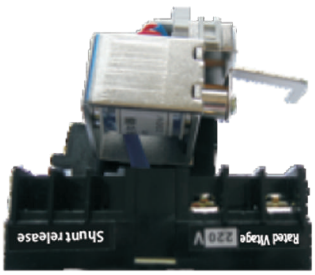


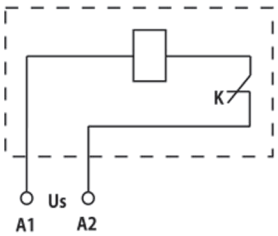




6.Auxiliaries for MCCB

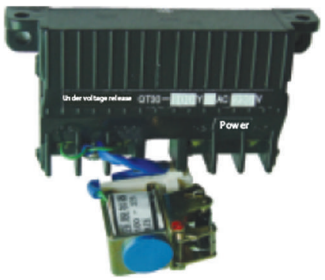
Shunt release

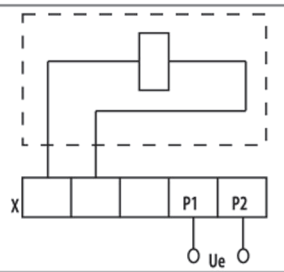


rated supply voltageUs [V]	AC230V、AC400V；DC24V、DC110V、DC220V
Operation voltage [v]	(0.7~1.1)Us
Wiring diagram	

Remark：K-the microswitch in series with coil in the shunt release is the normally closed contact,when circuit breaker opening,the contact disconnect automatically,switch on when closing;in the box is the circuit breaker inner wiring diagram.

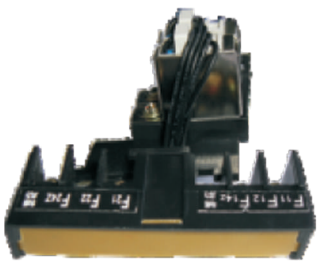
Under voltage release

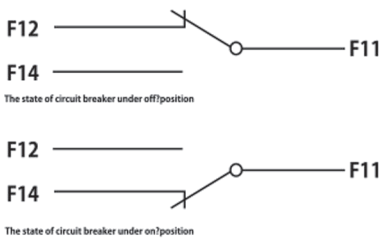


rated supply voltageUs [V]	AC230V、AC400V
Operation voltage [v]	When the voltage is 35%-70% of rated operational voltage,make the circuit breaker tripped stably; When 85%-110%,guarantee the circuit breaker switched on,when lower than 35% should prevent switch on.
Wiring diagram	

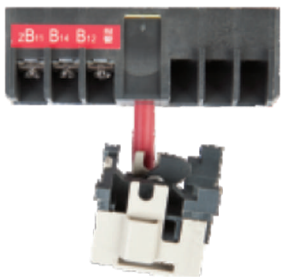
Remark：X-terminal blocks ,in the dotted box is the circuit breaker inner wiring diagram.

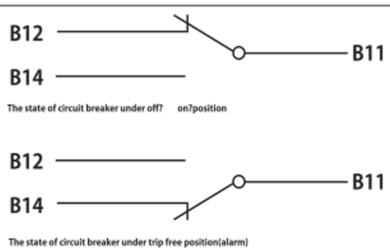
Auxiliary contact



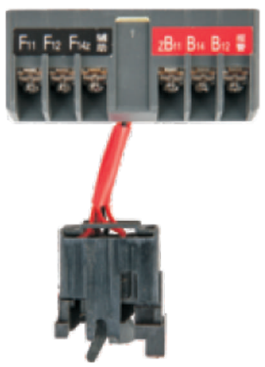
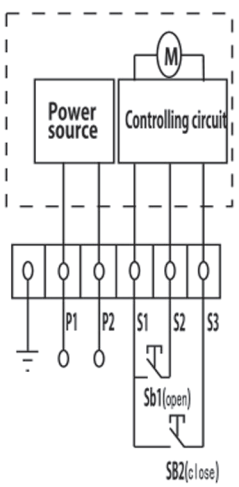
Conventional thermal currentIth[A]	3A
Rated operational currentIe[A]	In≤225A:0.26A； In≥400A:0.3A
Wiring diagram	

Alarm contact

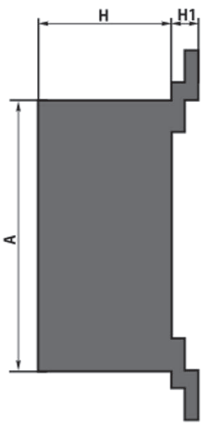


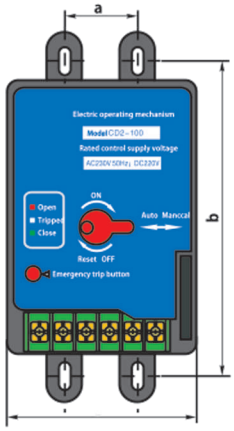
Conventional thermal current Ith[A]	3A
Rated operational currentIe[A]	In≤225A:0.26A； In≥400A:0.3A
Wiring diagram	

KAVEH

Auxiliary contact Alarm contact 	Conventional thermal current Ith [A]	3A
	Rated operational current [A]	In≤225A:0.26A; In≥400A:0.3A
	Wiring diagram	F12 F11 F14 The state of circuit breaker under off?position F12 F11 F14 The state of circuit breaker under on?position B12 B11 B14 The state of circuit breaker under off? on?position B12 B11 B14 The state of circuit breaker under trip free position(alarm)
	Input voltage [v]	AC230V、AC400V; DC110V, DC230V, DC24V
	Wiring diagram	 Instruction:P1-P2: DC IN; SB1,SB2: operating button(Equipped by user) Remarkin the dotted box is the circuit breaker inner wiring diagram.

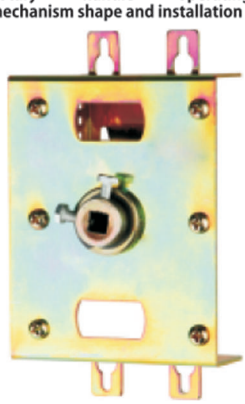
Electric operating mechanism shape and installation size

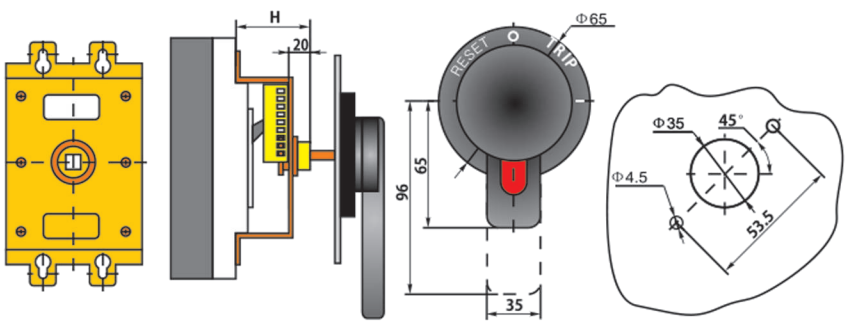




	Shape size [mm]				Installation size [mm]	
	L1	B	H	H1	a	b
SGM3E-100	116	90	77	12.5	30	129
SGM3E-225	116	90	77	15	35	126
SGM3E-400	176	130	115	27	44	215
SGM3E-630	176	130	115	31	70	243
SGM3E-800	176	130	115	31	70	243

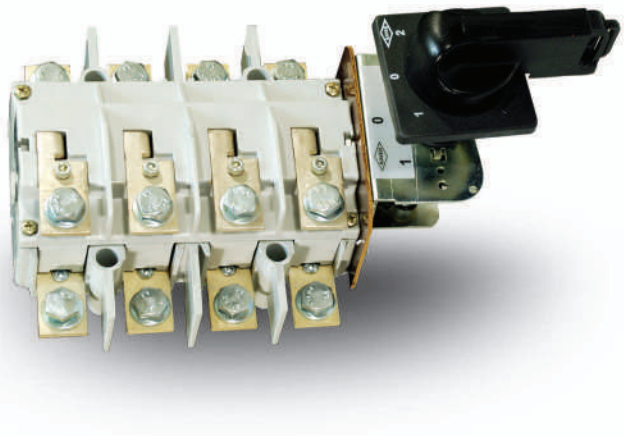
Rotary handle operating mechanism shape and installation size





Model	SGM3E-100	SGM3E-225	SGM3E-400	SGM3E-630	SGM3E-800
Installation size H (mm)	49	55	74	66	66

Ghange Over Switch



CONTENTS

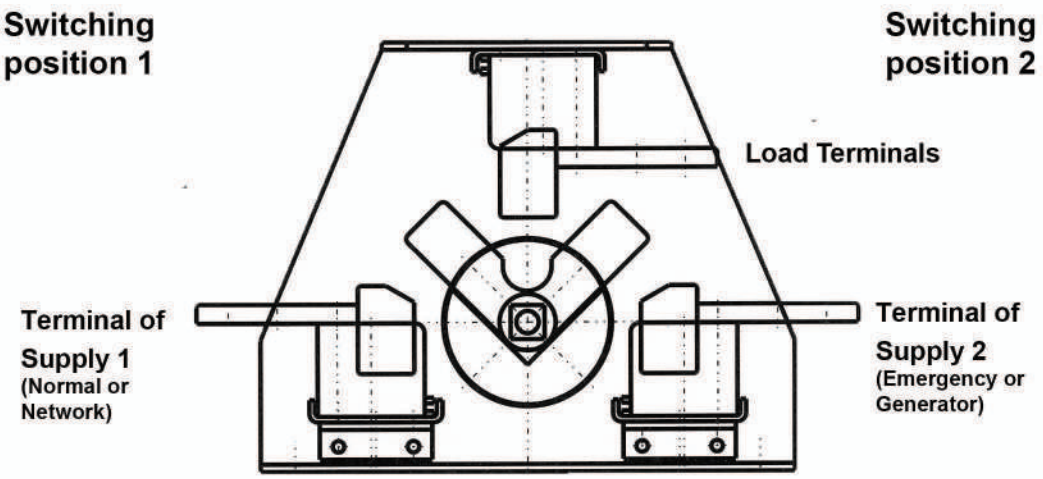
Ghange Over Switch

General :

According to the unique combined contacts, in the KAVEH Changeover Switches ,the changeover switching function is able to take place within a single switch space.

The switch can be supplied with a Centre OFF position , preparing the user a compact , safe and user friendly installed unit ,without any complex linkages or difficult wiring connections.

ON - Load changeover switch in “OFF” - position



Application:

Stand-by power supplies, Bypass systems, Drive systems and Generator set switchboards for :

- Water Industries
- Telecom
- Railways
- Communications & Broadcasting
- Manufacturing Companies
- Airports
- Hospitals

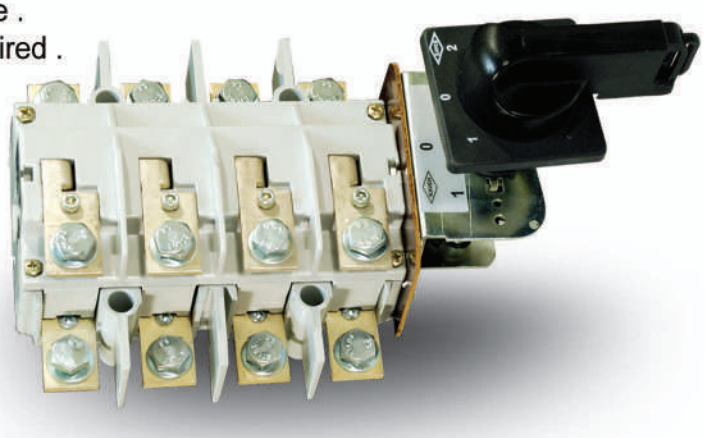
Chang over switch

Technical information:

Type LCHS / 3 - poles	20/3	25/3
Type LCHS / 4 - poles	20/4	25/4
Rated Current (A)		
I_{th} Open (45°C to 55°C)	200	250
I_{th} in enclosure (45°C to 55°C)	200	250
Standards	IEC/EN 60947 - 1&3 VDE 660 – 107 ISIRI 4835 – 1&3	
Rated Frequency (Hz)	40 - 60	40 - 60
Cross section (Min. / Max.) (mm^2)	70-150	95-150
Rated Operational Voltage (V)	690	690
Rated Insulation Voltage (V)	1000	1000
Test Voltage (V)	3500	3500
Rated Operational Current (A)		
AC 21B , Cosφ = 0.95 , 400 Vac	200	250
Rated Operational Current (A)		
AC 22B , Cosφ = 0.65 , 400 Vac	200	250
Rated Breaking Capacity (A)		
AC 22B , Cosφ = 0.65 , 400 Vac	600	750
Rated Operational Power (KW)		
AC 22B , Cosφ = 0.85 , 400 Vac	68	85
AC 22B , Cosφ = 0.65 , 400 Vac	52	65
Short Circuit Making Capacity (I_{cm}) (KA)	2	2.5
Short Time Withstand Capacity (KA) (1sec. eff.) (I_{cw})	1.2	1.2
Rated Fused short circuit current (KA)	50	50
RMS Max. HRC - Fuse	250 AgI	300 AgI
Mechanical Endurance	$2x10^4$	$2x10^4$
Electrical Endurance		
AC 22B , Cosφ = 0.85 , 400 Vac	800	750
AC 22B , Cosφ = 0.65 , 400 Vac	600	500

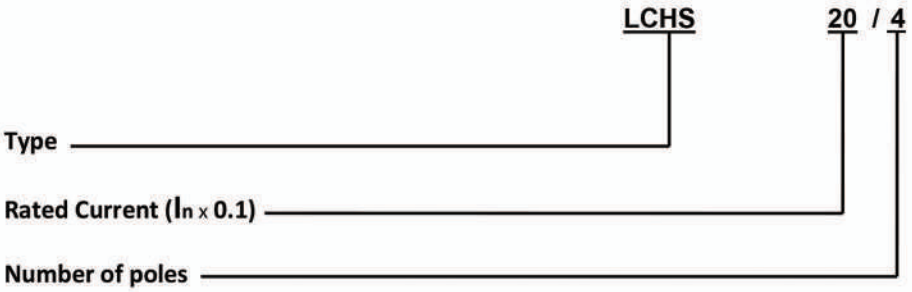
Design features :

- Complete changeover switching system in one switch.
- Compact design saves up to 60% panel space .
- No excess wiring or bus bar connections required .
- Excellent electrical performance .
- Especial L- shaped knife contact .
- Contacts visible for inspection .
- Reduces enclosure size .
- Full load breaking capacity .
- Quick ON – OFF action .
- Double break contacts .
- Forced operation in case of light welding .



Ghange Over Switch

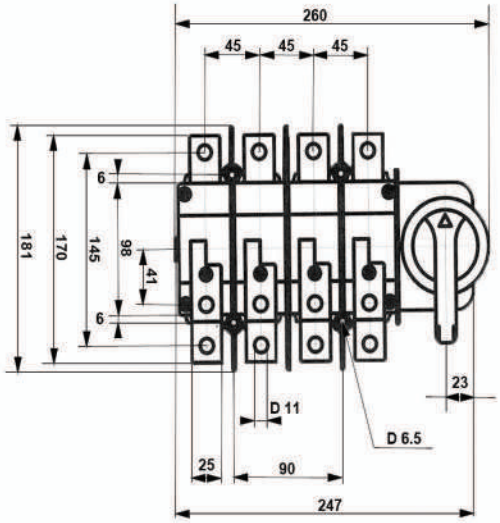
Ordering details :

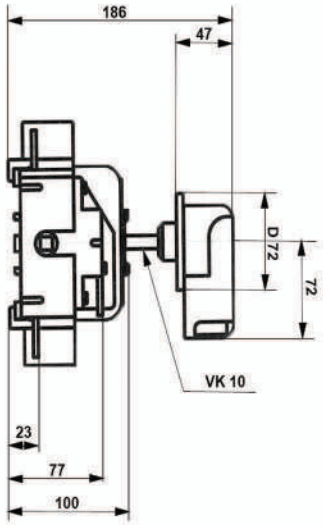


No.	Type	No. of Poles	In (AC23B/ 400V)	Weight (Kg)	Terminal Screw	Fixing Torque (Nm)	Dimension W(Wide) x H(Height) x D(Depth) (mm)
1	LCHS 20/3	3	200 A	2.2	M10	10	260 x 181 x 186
2	LCHS 20/4	4	200 A	2.4	M10	10	260 x 181 x 186
3	LCHS 25/3	3	250 A	2.2	M10	10	260 x 181 x 186
4	LCHS 25/4	4	250 A	2.4	M10	10	260 x 181 x 186

Dimension :

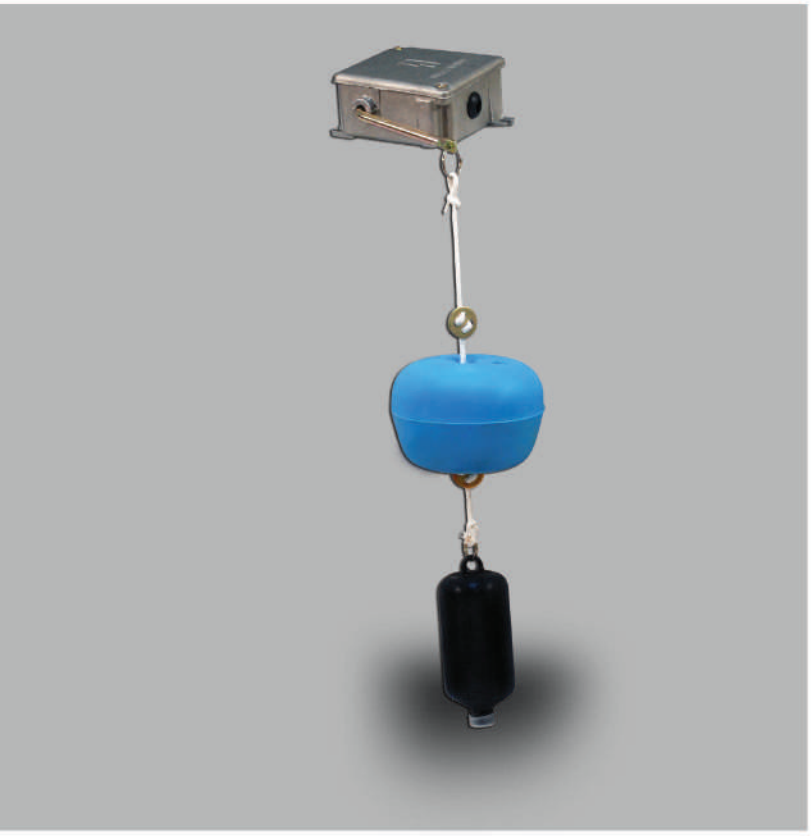
3-poles switches are same dimensions , 4th pole is without contacts





LCHS20/3
LCHS20/4
LCHS25/3
LCHS25/4

Floating Switch



CONTENTS

Floating Switch

General :

Electro Kaveh Floating switches are electromechanical switches and they are used to control the liquid level electrically.

They are 2 types :

1- F2001 : Plastic ball for being used into water tanks and wells.
2- F1002 : Metal ball for being used into chemical materials and fuel tanks.

Floating switches have got changeover contacts which can be used to turn on & turn off Electromotor or Electro pump to control liquid level and also to alarm when Electro pump will be turn on and turn off.

Special feature :

Useable in tanks and deep wells with a diameter of at least 20 cm.

Installation conditions :

Please note the following before installing the Electro kaveh Floating switch

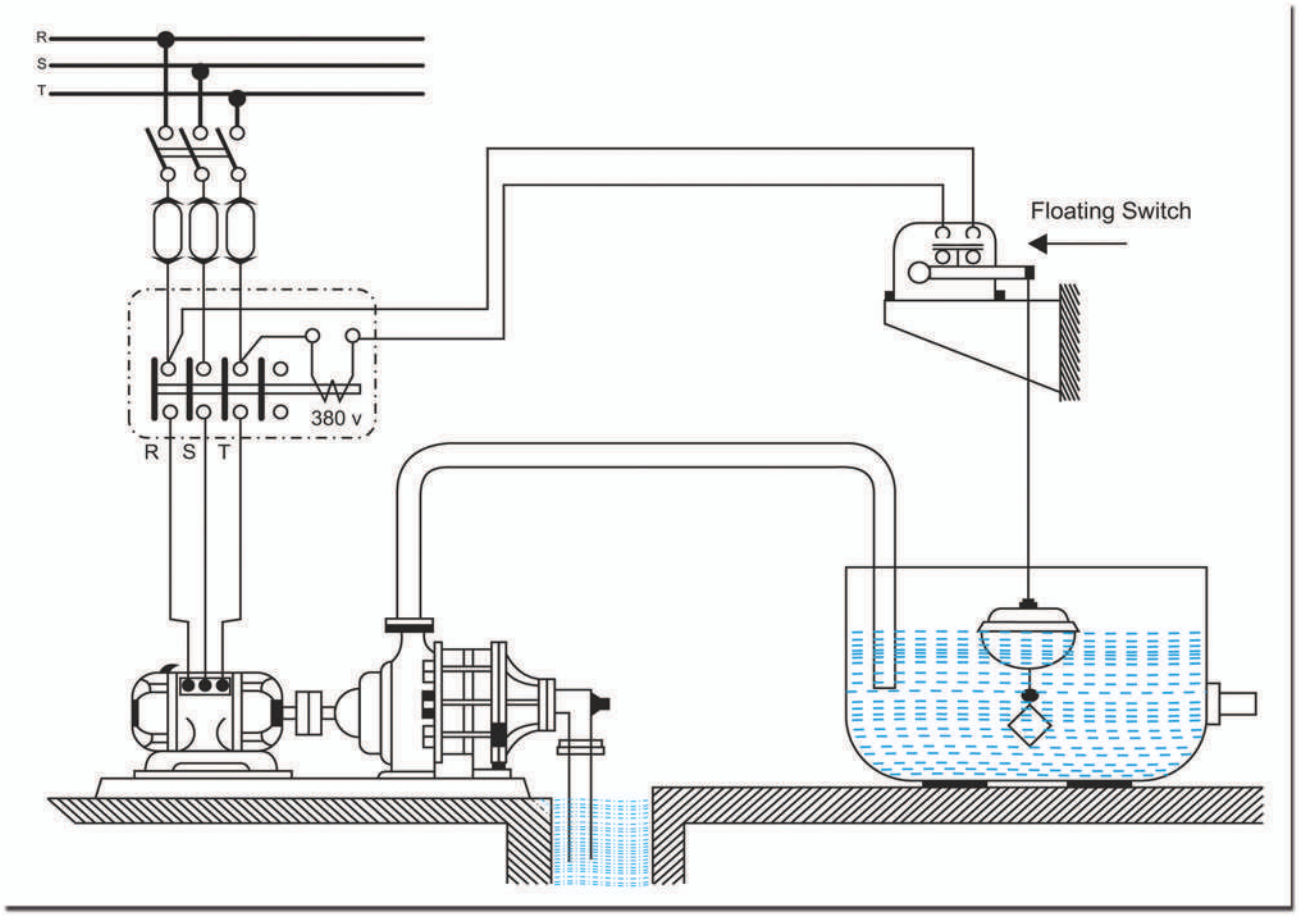
1 - For proper operation (Just for F2001 type), the amount of sand or water in the floating ball (from the place where it is located above of plastic ball) is poured.
2 - For the longer life of contacts, consider the contents of the operation table.
3 - Use this flutter in the control circuit to turn on and off the electro-motor and pumps more than 1hp.

F2001

F1002

Floating switch

Diagram :



Utilization table :

IEC60947-1&3		Rated Voltage (V)					
Rated Current (A) / Utilization category		50	120	240	380	415	500
	AC - 21B	9	7	5	3	2.5	2
	DC - 21B	1.2	1.2	....	....	....	....

Multi Tariff Electronic Energy Meter

CONTENTS

Multi Tariff Electronic Energy Meter

General :

Model DDS26D Single-phase Multi-Tariff Electronic Energy Meter is used to measure 50/60Hz Single phase AC active energy, which can be programmed to set 4 tariffa and 10 time intervals by management software.

All the property completely conforms to the related stipulations on class 1 and single - phase energy meter in IEC 62053-21 standard.

Data communication Criteria conforms to related requirement for IEC 62056-21.

Max. demand record

4Channals Load profiles

Encrypted Password Protection

With LCD back light, awake LCD when power off

Accuracy class1 active energy measurment

Replaceable battery, with battery detection technology

Functions:

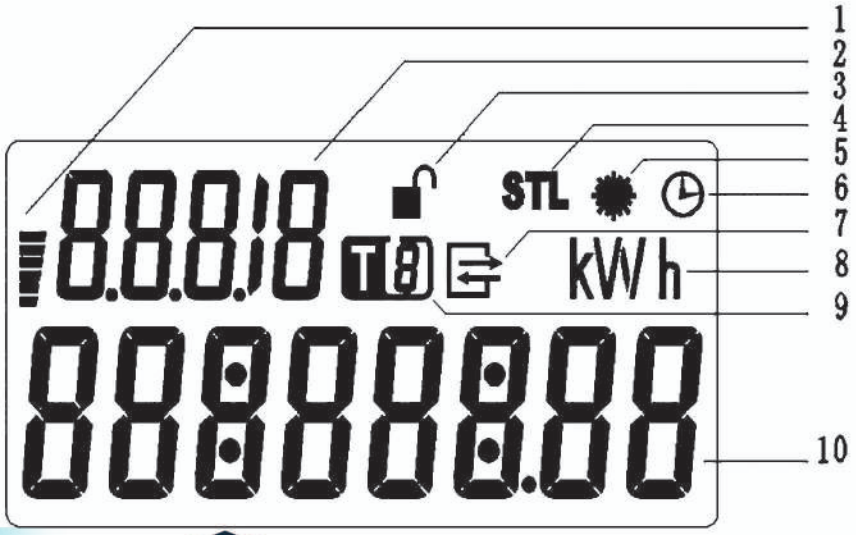
Active power energy measurement	Measure total accumulative forward and reverse energy, and forward and reverse energy for each tariff.
Multi-tariff function	Energy meter can be programmed to set at most 8 season tariff tables, 8 weekly tariff tables, 12 daily tariff tables, 45 holiday tariff tables, at most 10 time intervals.
Multi-tariff functionMeter data automatic transfer function	Energy meter could program to transfer data 12 times one year.
Maximum Demand Calculation	The calculation method of maximum demand is interval mode, demand calculation period is 15 minutes.
Event record function	Record for open cover events, power off events, programming events, real time demand over limits events, and so on.
Data communication function	communications through RS485 port and infrared port (Optional)
Hard ware self-detecting	The meter will do the self-detection during power on.
LCD back light display	Meter has the back light display function.
Reverse detection	Meter is capable to detect current reverse
Daylight saving switching function in spring and autumn	Automatically daylight saving
Real time clock	The meter was embedded with the real time clock and adopts long life and Environmental lithium battery as back–up battery

Multi Tariff Electronic Energy Meter

General Specifications:

Standards	IEC62052-11, IEC62053-21, IEC 62056-21
Reference voltage	230V (-20% to +20%)
Operation range	150V - 276V
Basic current	10A
Maximum current	100A
Reference frequency	50/60 Hz (-5% to +5%)
Accuracy	Active Class 1
Meter Constant	1000imp/kWh
Start Current	0.004Ib
Power Consumption	Voltage Circuit ≤0.8W
	≤1VA
	Current Circuit ≤0.4 VA
Display	LCD; 6 integers + 2 decimals
Communication	Optical port, RS485
Communication Protocol	IEC 62056-21
RTC Accuracy	≤0.5S/Day（23℃）
	0.1S/℃
Insulation class	Double insulation

Display Diagram :



Multi Tariff Electronic Energy Meter

1	Indication for battery energy status	6	Clock error indication
2	Display item code	7	Indication code for communication
3	Opening terminal indication	8	unit
4	Indication in the searching state	9	Tariff sign
5	Reverse indication	10	Data displaying

EMC Capabilities :

Immunity to electromagnetic RF fields	IEC 61000-4-3（30 V/m）
Immunity to conducted RF	IEC 61000-4-6（10V）
Electrostatic discharge test	IEC 61000-4-2（Air ±15KV）
Fast transient burst	IEC 61000-4-4（±4KV）
Surge immunity test	IEC 61000-4-5（±4KV 2Ω）
AC voltage test	IEC62052-11（4KV 1min）
Impulse withstand test	IEC 60060-1（1,2/50 impulse）

Mechanical Features :

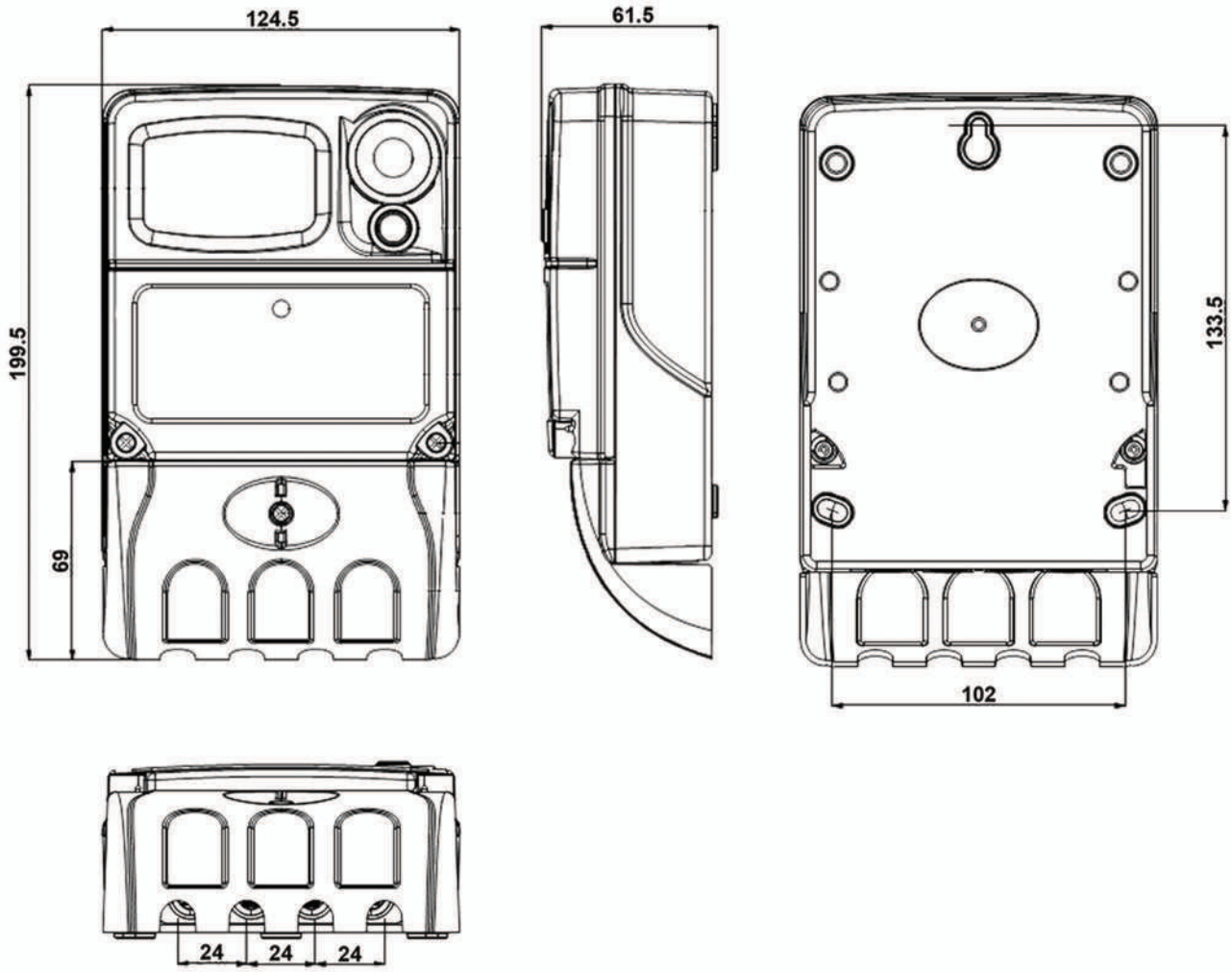
Mechanical Compliance	BS Standard
Protection class	IP54
Terminal material	Reinforced poly carbonate,anti-flame, anti-UV
Terminal cover material	Reinforced poly carbonate,anti-flame, anti-UV
Base cover and upper cover Material	Reinforced poly carbonate,anti-flame, anti-UV
Meter glass material	Transparent poly carbonate,anti-flame, anti-UV
Meter weight	674 gram
Meter Size	199.5mm×124.5mm×61.5mm

Multi Tariff Electronic Energy Meter

Climatic Features :

Normal operation temperature scope	-25℃ ~ +65℃
Limited Operation Temperature Scope	-25℃ ~ +70℃
Limited Scope for Storage and Transportation	-40℃ ~ +80℃
Year average	＜75%
Humidity Other time some time reach to	95%

Dimension :



Multi Tariff Electronic Energy Meter

Out door Meter :