



### MOULDED CASE CIRCUIT BREAKER DEMONSTRATION AND USERS MANUAL

Thank you for choosing Moulded Case Circuit Breaker MCCB. Please read this manual before installation, operation and maintenance.

#### OVERVIEW

Molded Case Circuit Breakers providing protection against overload and short-circuits. With rated insulation voltage of 690V, rated operating voltage of 600V, AC 50 Hz and rated operating current range of 10A-1600A, it protects the electrical devices against power distribution, extreme loading, short-circuits and low voltage, and enables electrical circuit to be switched under normal conditions.

#### STANDARD AND QUALITY CERTIFICATES

Ref. No.	Maximum Rated Current of Frame (A)	Certification
VMF1-SN2	125	TS EN 60947-2, C, CE
VMF2-SN2/VMT2-SN2/VMR2-SN2	160	TS EN 60947-2, C, CE
VMF3-SN2/VMT3-SN2	250	TS EN 60947-2, C, CE
VMR3-SN2	250	TS EN 60947-2, C, CE
VMF4-SN2/VMT4-SN2	400	TS EN 60947-2, C, CE
VMF4-SN2/VMR4-SN2	630	TS EN 60947-2, C, CE
VMF5-SN2	800	TS EN 60947-2, C, CE
VMF5-SN2	1000	BS EN 60947-2, C, CE
VMF5-SN2	1000	TS EN 60947-2, C, CE
VMF6-SN2	1600	TS EN 60947-2, C, CE



- 1-Auxiliary Contact
- 2-Under-Voltage Release
- 3-Shunt Release
- 4-Interface Barrier
- 5-Handle Operating Mechanism
- 6-Motor Mechanism

#### TECHNICAL INFORMATION

##### Normal Operating Conditions:

Ambient temperature; maximum ambient temperature should be +40 °C, minimum ambient temperature should be -5 °C and daily average should be less than +35 °C. Ambient atmosphere conditions; relative humidity of installed MCCB should be less than 50 % when ambient temperature is +40 °C; it may be higher when ambient temperature is lower; monthly average of minimum temperature +25 °C and monthly average of maximum relative humidity is %90. When temperature changes, the surface humidity of MCCB should be considered.

##### Installation Conditions:

MCCB should be installed at environments that are free of explosives and the environment should also be free of metal dust, insulation gas and dust on electricity transmission areas. MCCB should not be installed to places open to rain and snow. Contamination Class; 3.

Installation class (Over-voltage classification): MCCB is used for installation class III. In=160 A and lower MCCB should be installed according to additional circuit and control circuit classification II. In=250A and higher MCCB should be installed according to additional circuit and control circuit classification III.

#### Breaking capacity of MCCB is given in Table 1.

TABLE 1 RATED BREAKING CAPACITY	Maximum Rated Current of Frame	Rated Insula- tion voltage			Rated short- circuit breaking capac- ity	Power Factor	Fec- quency	Fip	Rated short- circuit making capac- ity		Rated short- circuit making capac- ity	Limitation distance
		U <sub>i</sub>	U <sub>m</sub>	U <sub>s</sub>					I <sub>sc</sub>	I <sub>sc</sub>		
Type		U <sub>i</sub>	U <sub>m</sub>	U <sub>s</sub>	I <sub>sc</sub>	I <sub>sc</sub>	I <sub>sc</sub>	I <sub>sc</sub>	I <sub>sc</sub>	I <sub>sc</sub>	I <sub>sc</sub>	mm
VMF1-SN2	125	500	400	25	0.25	50	3	2.1 kA	50%ka	0.25	≤30	
VMF2/VMT2/VMR2-SN2	160	500	400	35	0.25	50	3	2.1 kA	75%ka	0.25	≤30	
VMF3/VMT3/VMR3-SN2	250	690	400	35	0.25	50	3	2.1 kA	75%ka	0.25	≤30	
VMF4/VMT4/VMR4-SN2	400	690	400	50	0.25	50	3	2.2 kA	75%ka	0.25	≤50	
VMF5-SN2	800	690	400	50	0.25	50	4	2.2 kA	75%ka	0.25	≤60	
VMF5-SN2	1000	750	400	35	0.25	50	3	2.0 kA	75%ka	0.25	≤60	
VMF5-SN2	800	690	400	50	0.25	50	3	2.1 kA	75%ka	0.25	≤50	
VMF5-SN2	1000	750	400	35	0.25	50	3	2.2 kA	75%ka	0.25	≤60	
VMF5-SN2	1000	750	400	65	0.25	50	3	2.1 kA	75%ka	0.25	≤60	
VMF5-SN2	1000	750	400	70	0.25	50	3	2.1 kA	75%ka	0.25	≤60	

Inverse time delay range is 0.7-1 In (frame grade current In=160, 250, 400), proper maximum is In and proper minimum is 0.7 In.

#### For the current settings of instantaneous over-current release, see Table 2.

TABLE 2 Declared instant short-circuit current setting	Rated operating current A	Declared instant short-circuit current setting (%I <sub>no</sub> )	
		Used for distribu- tion protection	Used for motor protection.
Type			
VMF1 / VMF2-SN2	16	10In	12In
VMF1 / VMF2 / VMT2-SN2	25, 32, 40	10In	12In
VMF1/VMF2/VMR2/VMR2-SN2	50, 63, 80, 100, 125	10In	12In
VMF3/VMT3/VMR3-SN2	160	10In	12In
VMF3/VMT3/VMR3-SN2	200, 250	10In	12In
VMF4/VMT4/VMR4-SN2	315	10In	12In
VMF4/VMT4/VMR4-SN2	400, 500	10In	12In
VMF5/VMT5/VMR5-SN2	800	10In	12In
VMF5/VMT5/VMR5-SN2	800, 1000, 1250, 1600	10In	12In

#### Over-load protection characteristics (measured temperature +40 °C), Table 3

Test Item	In/n Multiple	In=ISA	In=ISA Promised Term	In=250A	In=500A	Starting State
Promissory On-Tripped Current	1.05	±1	63±4h±250A	±1	±2	Cold State
Promissory On-Tripped Current	1.3	±1	±2	±2	±2	Hot State
Characteristic Minimum Time	3	±50%	±80%	±12m	±12m	Cold State

#### MCCB power loss and weight (fixed type) Table 4

Rated Current of Frame Size	Power Loss (W)	Weight (kg)
125	25	0.9
160	40	1.1
250	50	2.5
400	70	5.5
500	100	9.2
600	100	10
800	150	13.3
1000	150	13.3
1250	150	13.3
1600	150	13.3

#### ACCESSORY RATED VOLTAGE AT CONTROL CIRCUIT

Type	Arma İşletme Gerilim			
	AC 50Hz	DC	AC 230V	DC 220V
Shunt Release (Us)	220	380	110	220
Under Voltage Release (Us)	220	380	110	220
Electrical Operating Mechanism (Us)	220	380	110	220

#### Table 5

**Shunt Release:** Should be tripped when voltage is 70-110% of the rated voltage at all operating conditions. During emergencies, coil is energized when 'stop' button is pressed. With the energized coil, the switch is turned on by the trip coil and the circuit current will be cut off.

**Under-Voltage Release:** Should be tripped when power voltage is 70-35% of rated operating voltage. When the voltage falls below the operating voltage range or energy is cut off, under voltage release device turns on the switch. Under-Voltage Release shall prevent closing of MCCB when power source voltage is less than 35% of the rated voltage and shall ensure secure closing of MCCB when power source voltage is more than 85% of rated operating voltage.

**Electrical Operation Mechanism:** Should guarantee MCCB to be closed and break the circuit when power source voltage is 65-110% of the rated operating voltage. Electrical operation mechanism enables remotely performing processes like setting up, turning on or re-setting tripped switch.

**Auxiliary Contact Block:** There are two contacts as NO and NC. To identify the position of the switch, warning lamps are connected to the cables on auxiliary contact block.

**Alarm Contact Block:** When the switch is turned off, a sound alarm is given from the transmitter connected to the alarm contact block. The purpose of this alarm is to announce that the switch is turned off.

#### Table 6 RATED VALUE OF AUXILIARY AND ALARM CONTACTS

Promissory Contact In A	Rated Insulation Voltage UNV	Rated Operating Current			Applicable Frame Item A
		AC 380V	AC 230V	DC 220V	
4	220	-	3	-	125-160
6	380	3	6	0.15	250-400
6	380	3	6	0.2	630 and above

#### Attention!

- Please read the user's guide carefully before installing and operating the product.
- The electrical appliances must be connected and installed by a technician with the required qualification certificate only.
- Make sure to disconnect power before installing the products.
- The guarantee excludes the use of the product contrary to the issues included in the User's Guide, its operation beyond the mentioned voltage, current and environmental conditions and the damaging of the product due to fire, inundation, earthquake, lightning and similar disasters.
- The Legal Guarantee period commences as of the invoice date of the product and continues for 2 years.
- The switch should be turned to the off position when it is needed to be setup.
- Please check all the technical parameters on the label to see if the installation is in line with the given instructions or not.
- Recommended connection cable section for the respective rated current Table 7 and Table 8

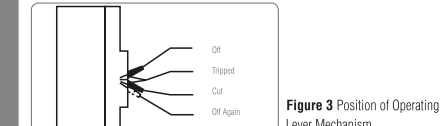
#### Table 7 RECOMMENDED CONNECTION CABLE SECTION FOR THE RESPECTIVE RATED CURRENT

Rated Current A	10	12.5	16	20	25	32	40	50	63	68	100	125	160	200	250	315	400
The Transverse average of the connection wire mm <sup>2</sup>	1.5	2.5	6	10	16	25	35	50	70	95	120	185	240				

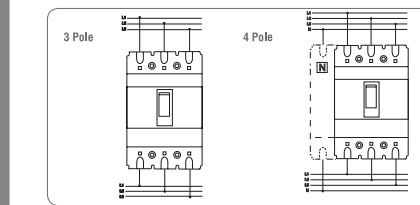
#### Table 8 THE SIZE OF THE CONNECTION COPPER OR WIRE WITH CORRESPONDING RATED CURRENT

Rated Current A	Connection Wire		Connection Wire	
	Number (pieces)	Wire Transverse average (mm <sup>2</sup> )	Number (pieces)	Size (mm x mm)
500	2	150	2	30 X 5
630	2	185	2	40 X 5
700-800	2	240	2	50 X 5

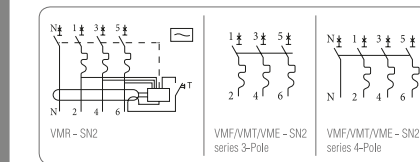
To show the three states individually, the operating lever can be in ON, OFF and TRIPPED position. When in TRIPPED position, you should push the lever towards circuit breaking direction to re-trip and turn off MCCB. The lever's position is shown in Figure 3. To check the characteristic of the relay, please push the "TEST" button after installing and operating MCCB for a while. When MCCB is tripped while running, you should check for any possible overload or short-circuit in the load circuit and equipment before turning off. If out of service, the problem should be solved and then it should be turned off again.



#### CONNECTION DIAGRAM



#### ELECTRICAL DIAGRAM



#### DIMENSIONS

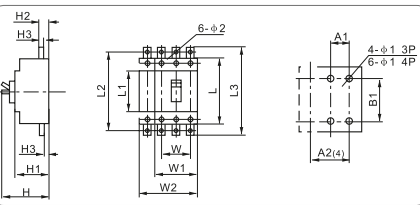


Figure 1 Front Terminal Connection Cable Grid

Table 9 DIMENSION AND INSTALLATION DIMENSION OF MCCB (mm)

Type	Dimension										Installation Size									
	H1	H2	H	W1	L1	L3	A1	A2	B1	B2	H1	L1	L2	W	L1	L2	W	L1	L2	
VMF1-SN2	76.2	103	91	70	120	-	35	38	100	-	25.3	45	-	500	5	-				
VMF2/VMT2/VMR2-SN2	91	129	93	70	120	-	30	60	100	-	27.5	45	-	600	5	-				
VMF3/VMT3/VMR3-SN2	105	148	105	103.5	170	235	35	70	138	31	25	105	210	70	6	8.5				
VMF4/VMT4/VMR4-SN2	140	184	135	103.5	254	310	44	87.5	214	31	25	105	285	87.5	6	11				
VMF5/VMT5/VMR5-SN2	210	280	167.5	103.5	288	365	70	140	237	4.5	30.5	105	345	140	6	11				
VMF6/VMT6/VMR6-SN2	210	280	167.5	103.5	406	540	70	140	237	-	-	105	-	140	6	-				

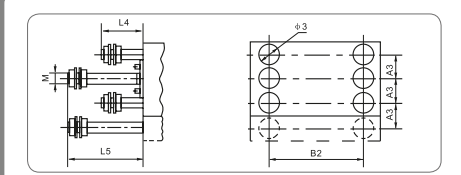


Figure 2 Back Terminal Connection Cable Grid

Table 10 DIMENSION OF BACK TERMINAL CONNECTION CABLE GRID

Type	A3	B2	L4	L5	3	M
VMF1-SN2	25	102	42	75	18	M8
VMF2/VMT2/VMR2-SN2	30	102	42	75	18	M8
VMF3/VMT3/VMR3-SN2	35	143	55	100	24	M12
VMF4/VMT4/VMR4-SN2	43.75	218	62	108	30	M16
VMF5/VMT5/VMR5-SN2	70	241	68	68	50	M24 X 2
VMF6/VMT6/VMR6-SN2	70	315	-	-	80	-

#### WARRANTY CONDITIONS

- Warranty period starts as of the delivery date of the product and it is 2 years.
- Warranty covers the malfunctions likely to occur due to the manufacturing defects of the product and within the warranty period.
- The product including all of its parts is under warranty as a whole. If the product turns out to be defective, the consumer can use one of the following rights stipulated in Article 11 of Consumer Protection Law no. 6502:
  - Demanding free repair,
  - Demanding discount from sales fee
  - Demanding the replacement of the sold one with a fungible one free from defects,
  - Demanding free repair among those rights; the dealer is obliged to repair the product or have the product repaired without claiming any fee under the name of replaced part fee, labor cost or for any other reasons. The consumer can also use the right of free repair against the manufacturer or exporter. The dealer, manufacturer and exporter are jointly and severally liable for the usage of this right by the consumer.
  - In case the consumer uses the right of free repair and if the product falls within the warranty period again and the maximum period required for the repair is exceeded and Authorized service station, dealer, manufacturer or exporter state that it's not possible to repair the product in a report, the consumer can demand the return of the product fee, fee discount at the ratio of the defect or the replacement with the one free of defects, if possible, from the dealer. The dealer can not reject the demand of the consumer. In case this demand is not met, the dealer, manufacturer and exporter shall jointly and severally be held responsible.

#### WARRANTY CONDITIONS

- The repair period of the product can not exceed 20 business days.
- This period starts on the notification of the failure on the product to the authorized service station or the dealer within the warranty period and from the date of delivery of the product to the authorized service station out of warranty period. In case of not eliminating the product malfunction within 10 business days, manufacturer or importer is obliged to dedicate another product with similar characteristics to the use of the consumer until the completion of the product repair. In case the product falls within the warranty period, elapsed time is added to the warranty period.
- Usage of the product contrary to the rules stipulated in user's manual, operating out of determined voltage, current and environmental conditions, damage on the cable connection due to the user's fault and failure of the product due to the facts arising from the fire, flood, earthquake, lightning and similar disasters are not under warranty.
- The consumer can apply to the arbitration committee for consumers or the consumer court where the consumer operations are made or in the residential area for the disputes to be occurred regarding the usage of the rights arising from the warranty.
- In case the dealer doesn't provide this certificate of warranty, the consumer can apply to the General Directorate of Consumer Protection and Market Surveillance of Ministry of Customs and Trade.

#### WARNING

- Ensure that the power is cut off before the assembly of the products.
- Connection and assembly of the electrical devices should be carried out only by the technical personnel having certificate of competency.
- No responsibility is assumed for the entire of the malfunction, accident and loss arising from the assembly or interference of the persons not having the competency certificate.
- Never use alcohol, chlorine, detergent or other similar chemicals for cleaning. Do not perform wet cleaning do not contact the product with water when the product is energized.
- Keep the product away from the damp or wet environment during the transportation and shipping.

#### PANASONIC AND ENVIRONMENT

As Panasonic, we are aware of the contribution of a balanced relation established between human and nature to the sustainable life. Thanks to our continuous innovation and R&D studies, we prefer materials and technologies that are not affecting the environment in a negative way during the production and usage of the products starting from the designing phase. We take necessary measures to use energy and natural sources in a more efficient way.

This symbol indicates separate collection of waste electrical and electronic equipment.

#### PANASONIC CUSTOMER RELATIONS

Dear Customer, We believe in providing quality service to your as well as offering quality products.

#### WARNING

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