

# MOLDED-CASE CIRCUIT BREAKER MX Series 30AF~630AF





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# ***MX SERIES***





We introduce full set of production equipment and top production technologies from Fukuyama Works. Follow the strict and complete management systems established by MITSUBISHI Electric for manufacturing industry.

Since MX series molded-case circuit breaker was launched into the market in 2012, it has been highly praised by the OEM customers in the fields such as elevator and large-sized machine tool and in the secondary power distribution market because of its high quality and high reliability.

We made improvements in the dimensions and accessories, making it a real simple and useful product in Mitsubishi Electric's family of circuit breaker products.





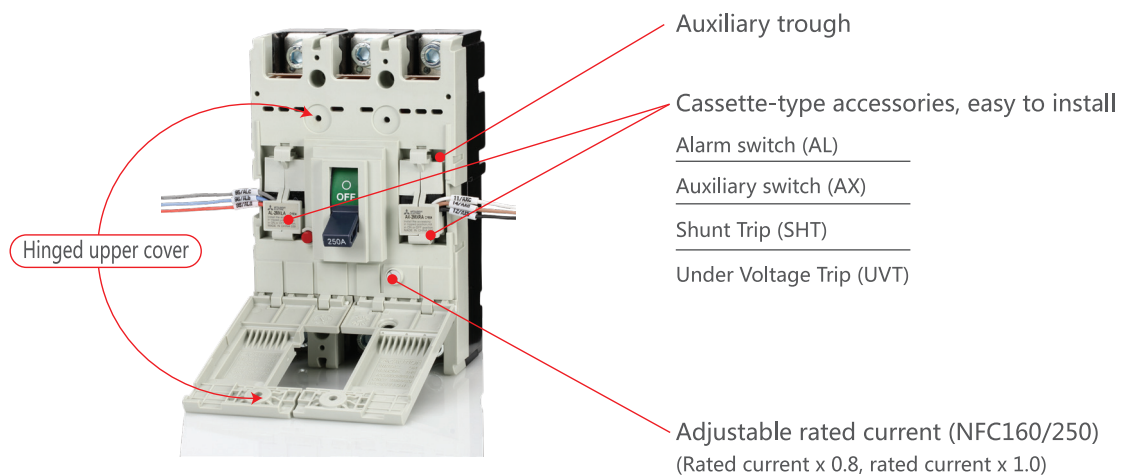
# Features >>>

## ● Compact



## ● Flexible

With corresponding cassette-type internal accessories, it can be installed on site.





# MX SERIES

- **User-friendly**

Plug-in terminal cover makes it user-friendly

Corresponding isolation function makes it applicable to mechanical equipment

- **Standard**

Compliance with GB/T and IEC standards

The main models have passed KEMA certification



Standards:

- IEC 60947-2, GB/T14048.2

Directives:

- EC Directive: "Low Voltage Directive" (LVD) EN60947-2



# Models >>>



## ■ Quality Management System

ISO 9001 Standard

## ■ Environment Management System, Social Responsibility

ISO 14001 Standard

OHSAS18001 Occupation Health and Safety Management System

## ■ Green Product, Environment Protection

Compliance with RoHS Directive








Minimize the impact on the environment by optimizing the material selection, processing technology and packaging method.







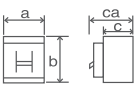
# MX SERIES

## ■ Rated short-circuit breaking capacity list

Rated short-circuit breaking capacity Icu (kA)		Frame (A)						
		30	60	100	160	250	400	630
AC400V	AC230V							
50	85						NFC400-HMXA	NFC630-HMXA
36	85				NFC160-HMXA	NFC250-HMXA		
36	65			NFC100-HMXA				
36	50						NFC400-SMXA	NFC630-SMXA
25	50			NFC100-SMXA	NFC160-SMXA	NFC250-SMXA		
15	30				NFC160-CMXA	NFC250-CMXA		
10	25		NFC60-HMXA	NFC100-CMXA				
7.5	10		NFC60-SMXA					
5	7.5	NFC30-SMX	NFC60-CMXA					

Note: Please refer to the Product Specification for specific number of poles.

# Specifications >>>

Frame(A)			30				60			
Series			S		C		S		H	
Model			NFC30-SMX		NFC60-CMXA		NFC60-SMXA		NFC60-HMXA	
Rated current In (A)			3, 4, 6, 10, 15, 20, 25, 30				15, 16, 20, 25, 30, 32, 40, 50, 60			
Image										
Rated ambient temperature (°C)			40		40		40		40	
Number of poles			2   3		2   3		2   3   4		2   3   4	
Rated insulation voltage Ui (V AC)			690		690		690		690	
Rated short-circuit breaking capacity (kA)	IEC60947-2 EN60947-2 (Icu/Ics)	AC	415V	5/2.5	5/2.5	7.5/4	10/5			
			400V	5/2.5	5/2.5	7.5/4	10/5			
			380V	5/2.5	5/2.5	7.5/4	15/7.5			
			230V	7.5/4	7.5/4	10/5	25/12.5			
	GB/T14048.2 (Icu/Ics)	AC	400V	5/2.5	5/2.5	7.5/4	10/5			
			230V	7.5/4	7.5/4	10/5	25/12.5			
Rated impulse withstand voltage Uimp (kV)			8		8		8		8	
Suitability for isolation			● (*1)		●		●		●	
Reverse connection			-		-		-		-	
Number of operating cycles	Without current		10,000		10,000		10,000		10,000	
	With current		1,500		1,500		1,500		1,500	
Utilization category			A		A		A		A	
Pollution degree			3		3		3		3	
Overall Dimension (mm)		a	50   75	50   75	50   75   100	50   75   100				
		b	130	130	130	130				
		c	68	68	68	68				
		ca	90	92	92	92				
Mass(kg)			0.5   0.7		0.6   0.8		0.6   0.8   1.0		0.6   0.8   1.0	
Installation and connection (Front connection ) (F)			Screw terminal		Screw terminal		Screw terminal		Screw terminal	
Internal accessory (cassette-type)	Alarm switch	AL	● (*2)		●		●		●	
	Auxiliary switch	AX	● (*2)		●		●		●	
	Alarm Auxiliary switch	ALAX	-		●		●		●	
	Shunt trip	SHT	● (*2)		●		●		●	
	Undervoltage trip	UVT	-	● (*2)	●	●	●	●	●	●
External accessories	External operating handle	F	-	●	-	●	-	●	-	●
		V	-	●	-	●	-	●	-	●
	Terminal cover	TC-L	●		●		●		●	
		TC-S	●		●		●		●	
Certification	CE	Self declaration		Self declaration		Self declaration		KEMA		
	CCC	Passed		Passed		Passed		Passed		
Automatic tripping device			Hydraulic-Magnetic		Thermal-magnetic		Thermal-magnetic		Thermal-magnetic	

\*1. While installing the external operating handle, the isolation function is unavailable for NFC30-SMX.



\*2. Not cassette-type accessory.

\*3. The rated current of NFC160-CMXA, NFC160-SMXA and NFC160-HMXA are adjustable.


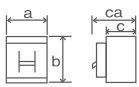
They can be adjusted to rated current x0.8 or 1.0. (for example: 125A can be adjusted to 100A and 125A)



# MX SERIES

100						160					
C		S			H	C		S		H	
NFC100-CMXA		NFC100-SMXA			NFC100-HMXA	NFC160-CMXA		NFC160-SMXA		NFC160-HMXA	
15, 16, 20, 25, 30, 32, 40, 50, 60, 63, 75, 80, 100						125, 140, 150, 160(*3)					
											
40		40			40	40		40		40	
2	3	2	3	4	3	4	3	3	4	3	4
690		690			690	690		690		690	
10/5		25/12.5			36/18	15/7.5		25/12.5		36/18	
10/5		25/12.5			36/18	15/7.5		25/12.5		36/18	
15/7.5		30/15			36/18	22/11		30/15		36/18	
25/12.5		50/25			65/33	30/15		50/25		85/43	
10/5		25/12.5			36/18	15/7.5		25/12.5		36/18	
25/12.5		50/25			65/33	30/15		50/25		85/43	
8		8			8	8		8		8	
•		•			•	•		•		•	
-		-			-	-		-		-	
10,000		10,000			10,000	8,000		8,000		8,000	
1,500		1,500			1,500	1,000		1,000		1,000	
A		A			A	A		A		A	
3		3			3	3		3		3	
50	75	50	75	100	75	100	105	105	140	105	140
130		130			130	165		165		165	
68		68			68	68		68		68	
92		92			92	92		92		92	
0.6	0.9	0.6	0.9	1.1	0.9	1.1	1.8	1.8	2.0	1.8	2.0
Screw terminal		Screw terminal			Screw terminal	Screw terminal		Screw terminal		Screw terminal	
•		•			•	•		•		•	
•		•			•	•		•		•	
•		•			•	•		•		•	
•		•			•	•		•		•	
•	•	•	•	•	•	•	•	•	•	•	•
-	•	-	•	•	•	•	•	•	•	•	•
-	•	-	•	•	•	•	•	•	•	•	•
•		•			•	•		•		•	
•		•			•	-		-		-	
KEMA		KEMA			Self declaration	Self declaration		KEMA		Self declaration	
Passed		Passed			Passed	Passed		Passed		Passed	
Thermal-magnetic		Thermal-magnetic			Thermal-magnetic	Thermal-magnetic		Thermal-magnetic		Thermal-magnetic	

# Specifications >>>

Frame(A)	250						
Series	C		S		H		
Model	NFC250-CMXA		NFC250-SMXA		NFC250-HMXA		
Rated current In (A)	175, 200, 225, 250 (*2)						
Image							
Rated ambient temperature (°C)	40		40		40		
Number of poles	3		3		4		
Rated insulation voltage Ui (V AC)	690		690		690		
Rated short-circuit breaking capacity (kA)	IEC60947-2 EN60947-2 (Icu/Ics)	AC	415V	15/7.5	25/12.5	36/18	
			400V	15/7.5	25/12.5	36/18	
			380V	22/11	30/15	36/18	
			230V	30/15	50/25	85/43	
	GB/T14048.2 (Icu/Ics)	AC	400V	15/7.5	25/12.5	36/18	
			230V	30/15	50/25	85/43	
Rated impulse withstand voltage Uimp (kV)	8		8		8		
Suitability for isolation	●		●		●		
Reverse connection	-		-		-		
Number of operating cycles	Without current		8,000		8,000		
	With current		1,000		1,000		
Utilization category	A		A		A		
Pollution degree	3		3		3		
Overall Dimension (mm)		a	105	105	140	105	140
		b	165	165		165	
		c	68	68		68	
		ca	92	92		92	
Mass(kg)	1.8		1.8		2.0		
Installation and connection (Front connection ) (F)	Screw terminal		Screw terminal		Screw terminal		
Internal accessory (cassette-type)	Alarm switch	AL	●		●		
	Auxiliary switch	AX	●		●		
	Alarm Auxiliary switch	ALAX	●		●		
	Shunt trip	SHT	●		●		
	Undervoltage trip	UVT	●		●		
External accessories	External operating handle	F	●		●		
		V	●		●		
	Terminal cover	TC-L	●		●		
		TC-S	-		-		
Certification	CE		Self declaration		KEMA		
	CCC		Passed		Passed		
Automatic tripping device	Thermal-magnetic		Thermal-magnetic		Thermal-magnetic		



\*1. While installing the external operating handle, the isolation function are unavailable for NFC400-SMXA, NFC400-HMXA, NFC630-SMXA and NFC630-HMXA.

\*2. The rated current of NFC250-CMXA, NFC250-SMXA and NFC250-HMXA are adjustable. They can be adjusted to rated current x0.8 or 1.0. (for example: 200A can be adjusted to 160A and 200A)

\*3. The instantaneous trip current of NFC630-SMXA and NFC630-HMXA are adjustable. They can be adjusted to rated current x4 or x7 or x10 or x13. (for example: 500A can be adjusted to 2000A, 3500A, 5000A and 6500A)



# MX SERIES

400				630			
S		H		S		H	
NFC400-SM X A		NFC400-HM X A		NFC630-SM X A		NFC630-HM X A	
250, 300, 350, 400				500, 600, 630 (*3)			
							
40		40		40		40	
3	4	3	4	3	4	3	4
690		690		690		690	
36/18		50/25		36/18		50/25	
36/18		50/25		36/18		50/25	
36/18		50/25		36/18		50/25	
50/25		85/43		50/25		85/43	
36/18		50/25		36/18		50/25	
50/25		85/43		50/25		85/43	
8		8		8		8	
●(*1)		●(*1)		●(*1)		●(*1)	
-		-		-		-	
5,000		5,000		5,000		5,000	
1,000		1,000		1,000		1,000	
A		A		A		A	
3		3		3		3	
140	185	140	185	210	280	210	280
257		257		275		275	
103		103		103		103	
155		155		155		155	
5.7	7.5	5.7	7.5	10	13	10	13
Screw terminal		Screw terminal		Screw terminal		Screw terminal	
●		●		●		●	
●		●		●		●	
-		-		-		-	
●		●		●		●	
●		●		●		●	
●	-	●	-	●	-	●	-
●		●		●		●	
●		●		●		●	
-		-		-		-	
Self declaration		Self declaration		Self declaration		Self declaration	
Passed		Passed		Passed		Passed	
Thermal-magnetic		Thermal-magnetic		Thermal-magnetic		Thermal-magnetic	

# Internal and External Accessories >>>

## Internal Accessories

### 1. Alarm Switch (AL) Operation

Circuit Breaker Status	AL Switch Contact

### Auxiliary switch ( AX ) Operation

Circuit Breaker Status	AX Switch Contact

### 2.AL · AX Switch Rating

Model Name	Type	AC			DC		
		Voltage (V)	Current (A)		Voltage (V)	Current (A)	
			Resistive Load	Inductive Load		Resistive Load	Inductive Load
NFC30-SMX (*1) NFC60-SMXA NFC100-CMXA NFC100-HMXA NFC160-SMXA NFC160-HMXA NFC250-CMXA NFC250-HMXA	AL-2MXLA AL-2MXRA AX-2MXLA AX-2MXRA ALAX-2MXA	125	5	3	125	0.4	0.4
NFC400-SMXA NFC630-SMXA	AL-4MXLA (*2) AX-4MXA (*3)	125 250	5 3	3 2	125 -	0.4 -	0.4 -

\*1. AL and AX for NFC30-SMX are not cassette-type accessories and need to be assembled at factory.  
\*2. Can be installed only on left pole. \*3. Can be installed on both left and right poles.

### 3.SHT Rating

Model Name	Type	Cut-off Switch	Voltage (V)	Input Power Requirement (VA)		Operating Time (ms)
				AC	DC	
NFC30-SMX (*1) NFC60-SMXA NFC100-CMXA NFC100-HMXA NFC160-SMXA NFC160-HMXA NFC250-CMXA NFC250-HMXA	SHTA120-2MXLA SHTA120-2MXRA SHTA440-2MXLA SHTA440-2MXRA SHTD024-2MXLA SHTD024-2MXRA SHTD048-2MXLA SHTD048-2MXRA SHTD100-2MXLA SHTD100-2MXRA	Equipped	AC100-120V AC220-440V DC24V DC48V DC100V	120 — — 120	— — — —	15 or less
NFC400-SMXA NFC630-SMXA	SHTA220-4MXRA (*2) SHTA440-4MXRA SHTD024-4MXRA SHTD048-4MXRA	Equipped	AC110-220V AC380-440V DC24V DC48V	120 — — 120	— — — —	

\*1. SHT for NFC30-SMX is not cassette-type accessory and need to be assembled at factory. \*2. SHT for NFC400 and NFC630 can not be installed on left pole.

### 4.UVT Rating

Model Name	Type	Resettable/ Non-resettable	Voltage (V)	Input Power Requirement (VA)		Operating Time (ms)
				AC	DC	
NFC30-SMX (*1) NFC60-SMXA NFC100-CMXA NFC100-HMXA NFC160-SMXA NFC160-HMXA NFC250-CMXA NFC250-HMXA	UVTSA120-2MXRA (*2) UVTSA240-2MXRA UVTSA400-2MXRA UVTSA460-2MXRA	Resettable	AC100-120V AC220-240V AC380-400V AC440-460V	5 — — —	— — — —	30 or less
NFC400-SMXA NFC630-SMXA	UVTSA120-4MXRA (*2) UVTSA240-4MXRA UVTSA415-4MXRA UVTSA460-4MXRA	Resettable	AC110-120V AC200-240V AC380-415V AC440-460V	5 — — —	— — — —	

\*1. UVT for NFC30-SMX is not cassette-type accessory and need to be assembled at factory. \*2. UVT can not be installed on left pole.

### 5.Maximum Number of Internally Mounted Accessories

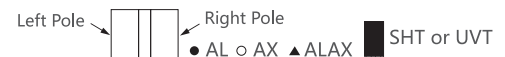
Model Name	Number of Poles	Accessories									
		AL	AX	SHT or UVT	AL + AX	ALAX	AL + SHT or UVT	AX + SHT or UVT	AL+AX+SHT/UVT	ALAX+SHT/UVT	
NFC60-CMXA NFC60-SMXA NFC60-HMXA NFC100-CMXA NFC100-SMXA NFC100-HMXA	2P										
NFC160-CMXA NFC160-SMXA NFC160-HMXA NFC250-CMXA NFC250-SMXA NFC250-HMXA	3P,4P										
NFC400-SMXA NFC630-SMXA	3P,4P										

\*1. UVT can not be installed on left pole.

\*2. When UVT is provided, the UVT voltage module will come in the vertical lead wire terminal block type. (SHT does not have a voltage module.)

\*3. AX can be installed on where AL is installed.

\*4. It can be also installed on left and right pole, but it is better to install on left pole unless the AX QTY is more than 3 for NFC400 or more than 4 for NFC630.

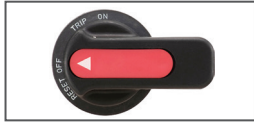




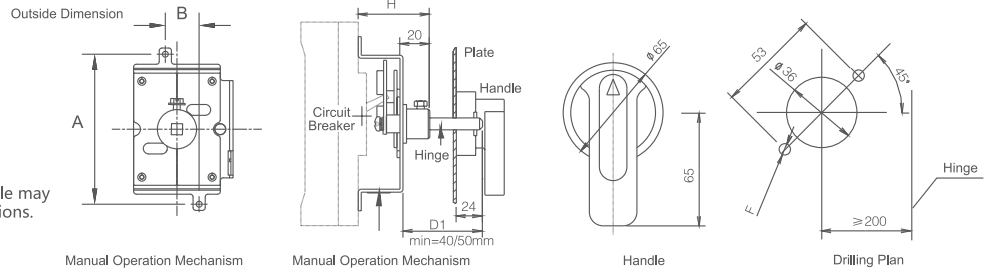
## External Accessories

### 1. V-type Operating Handle

Exterior (Color: black)



- IP50 rating (IEC 60529)
- Three padlocks which are commercially available may realize locking function in the ON or OFF positions.
- The door lock mechanism makes the door open only in the OFF position.



#### Summary of Dimensions

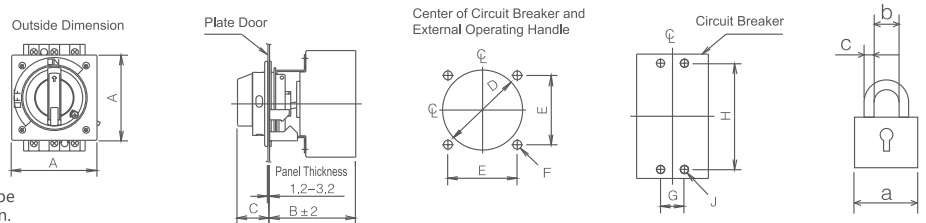
Model Name	Type	Number of Poles	Dimension ( mm )				Lock Position	Panel door open position	Padlock(See drawing below)		
			A	B	D1	F			H	a	b
NFC30-SMX	V-05MX	3P	111	25	MIN:50 MAX:150	Ø7	ON,OFF	OFF	35~40	19~22	5~6
NFC60-CMXA NFC60-SMXA NFC60-HMXA NFC100-CMXA NFC100-SMXA	V-05MXA	3P,4P	111	25	MIN:40 MAX:144						
NFC100-HMXA	V-1MXA	3P,4P	111	25		55					
NFC160-CMXA NFC160-SMXA NFC160-HMXA NFC250-CMXA NFC250-SMXA NFC250-HMXA	V-2MXA	3P,4P	126	35	55						
NFC400-SMXA NFC400-HMXA	V-4MXA	3P,4P	221	45	MIN:50 MAX:150	Ø5.5	85				
NFC630-SMXA NFC630-HMXA	V-6MXA	3P,4P	242	70			85				

### 2. F-type Operating Handle

Exterior (Color: white)



- Installed with the safety device, the plate door can't be opened when the circuit breaker is in the ON position.
- The handle can be locked while in the ON or OFF position.
- IP30 rating (IEC60529)
- The door lock mechanism makes the door open only in the OFF position.



#### Summary of Dimensions

Model Name	Type	Number of Poles	Dimension ( mm )								Lock Position	Panel door open position	Padlock			
			A	B	C	D	E	F	G	H			J	a	b	c
NFC30-SMX	F-05MX	3P	104	105	39	90	78	10	25	111	M4 Screw or Ø5	ON,OFF,RESET	RESET	35~40	19~22	5~6
NFC60-CMXA NFC60-SMXA NFC60-HMXA NFC100-CMXA NFC100-SMXA	F-05MXA	3P,4P	104	105	39	90	78	10	25	111						
NFC100-HMXA	F-1MXA	3P,4P	104	105	39	90	78	10	25	111		ON,OFF	OFF			
NFC160-CMXA NFC160-SMXA NFC160-HMXA NFC250-CMXA NFC250-SMXA NFC250-HMXA	F-2MXA	3P,4P	104	105	39	90	78	10	35	126						
NFC400-SMXA NFC400-HMXA (*1)	F-4MXA	3P	150	173	60	108	112	10	44	194						
NFC630-SMXA NFC630-HMXA (*1)	F-6MXA	3P	150	173	60	108	112	10	70	243						

\*1. The F handle is unavailable for 4P product of NFC400-SMXA, NFC400-HMXA, NFC630-SMXA, NFC630-HMXA.

### 3. Terminal cover

Model Name	Number of Poles	Large Terminal Cover (TC-L)		Small Terminal Cover (TC-S)		
		Image	Dimensions	Image	Dimensions	
NFC30-SMX	(*2)		TCL-05MX2	50X65X32	TCS-05MX2	50X65X5
NFC60-CMXA NFC60-SMXA NFC60-HMXA			TCL-05MX3	75X65X32	TCS-05MX3	75X65X5
NFC100-CMXA NFC100-SMXA NFC100-HMXA			TCL-05MX4	100X65X32	TCS-05MX4	100X65X5
NFC160-CMXA NFC160-SMXA NFC160-HMXA (*2)	(*2)		TCL-2MX3	105X65X39	-	-
NFC250-CMXA NFC250-SMXA NFC250-HMXA			TCL-2MX4	140X65X39	-	-
NFC400-SMXA NFC400-HMXA	(*3) (*4)		TCL-4MX3	171X98X110	-	-
			TCL-4MX4	240X98X110	-	-
NFC630-SMXA NFC630-HMXA	(*3) (*4)		TCL-6MX3	220X98X131	-	-
			TCL-6MX4	290X98X131	-	-

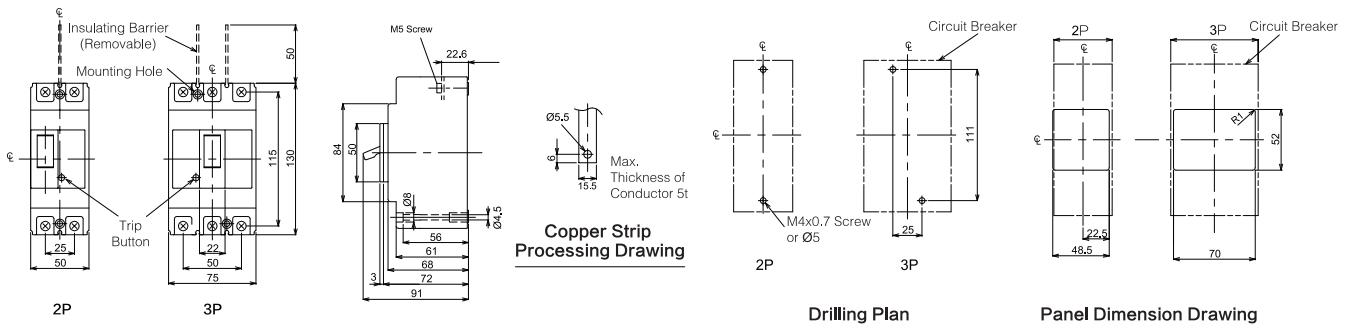
\*1. The outside dimension is A×B×C(mm). \*2. Installation method: plug-in

\*3. Installation method: lock screw \*4. The terminal cover cannot be installed while using the V or F type Operating Handle.

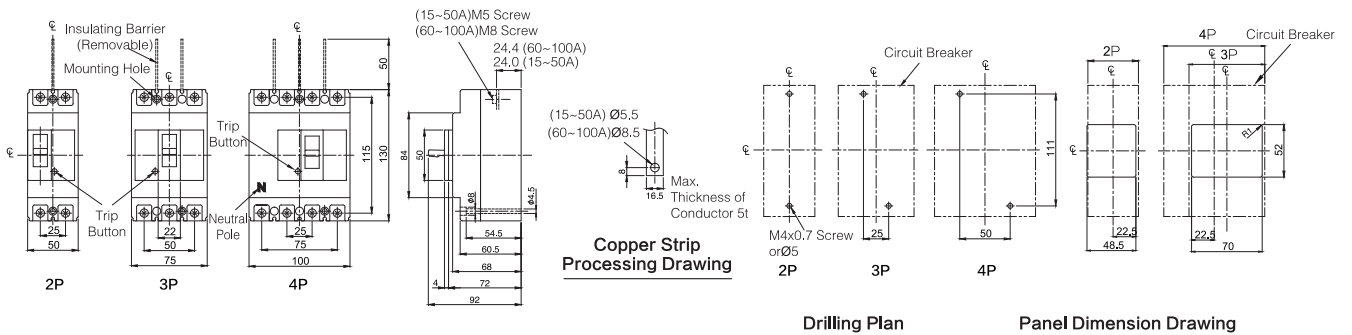
# Characteristics and Dimensions >>>

## Dimension

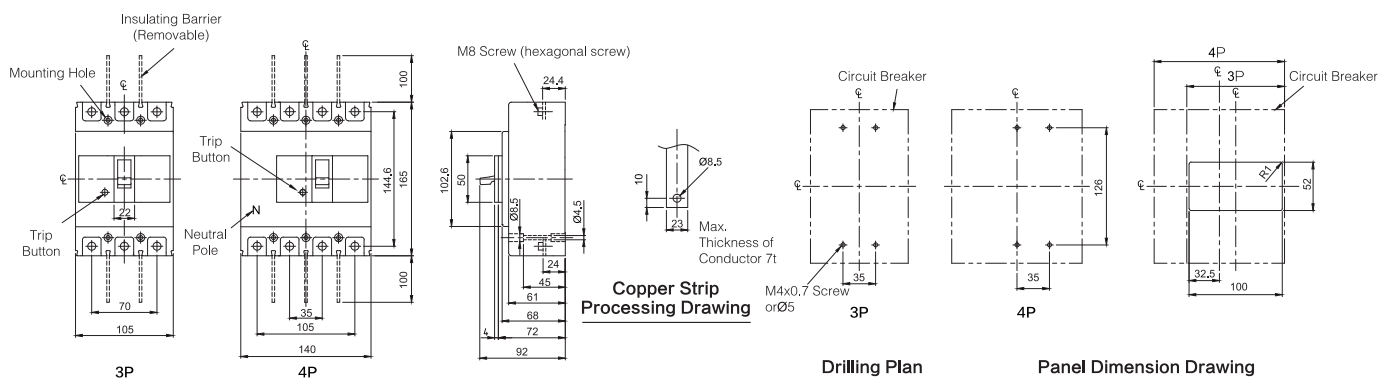
### NFC30-SMX



### NFC60-CMXA/SMXA/HMXA NFC100-CMXA/SMXA/HMXA



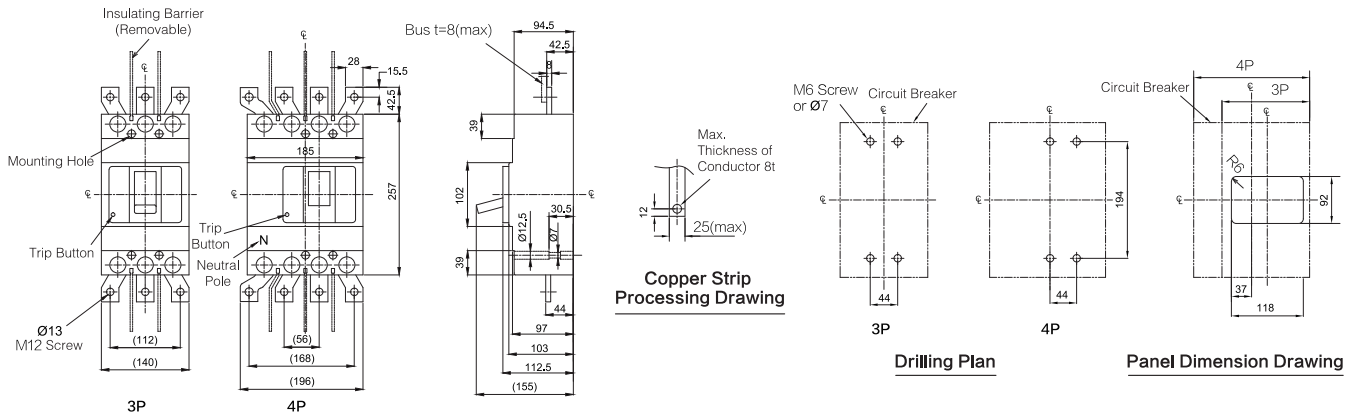
### NFC160-CMXA/SMXA/HMXA NFC250-CMXA/SMXA/HMXA



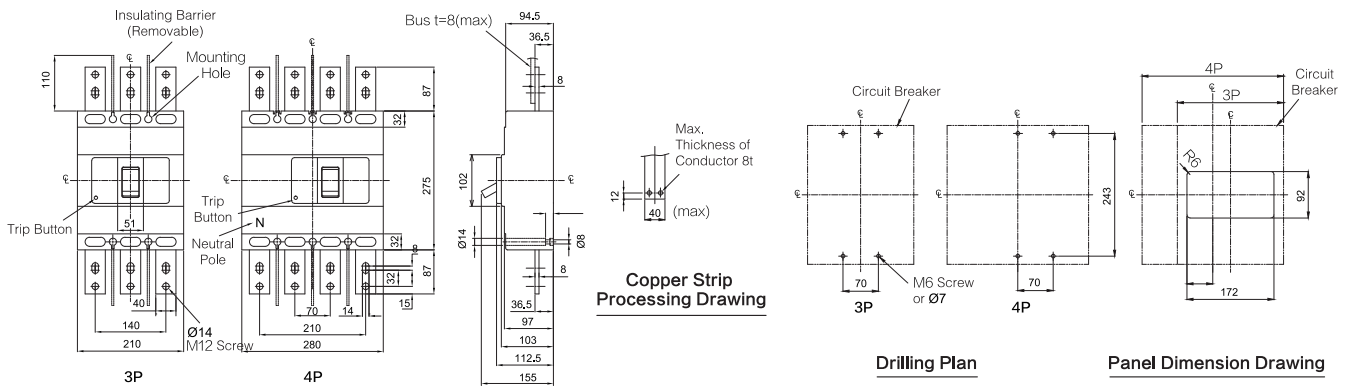
# MX SERIES

## Dimension

### NFC400-SMXA/HMXA



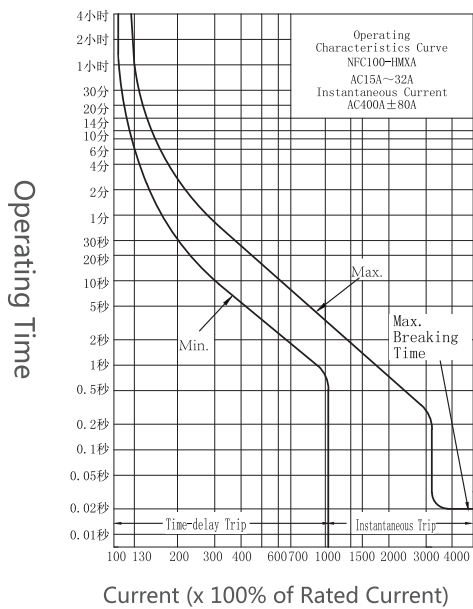
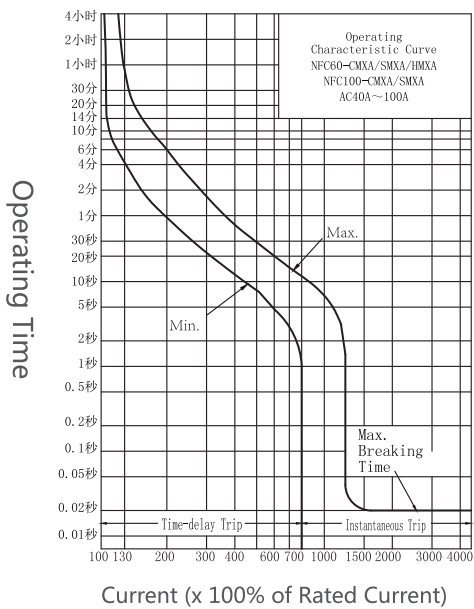
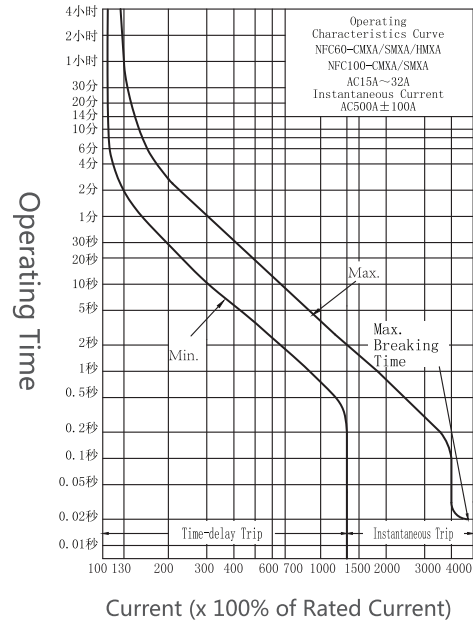
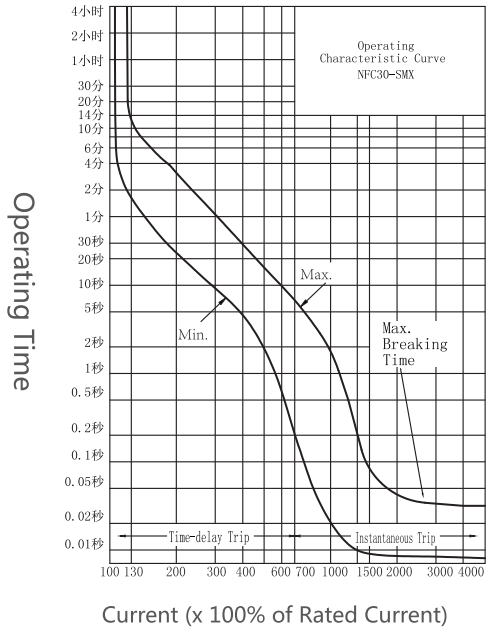
### NFC630-SMXA/HMXA



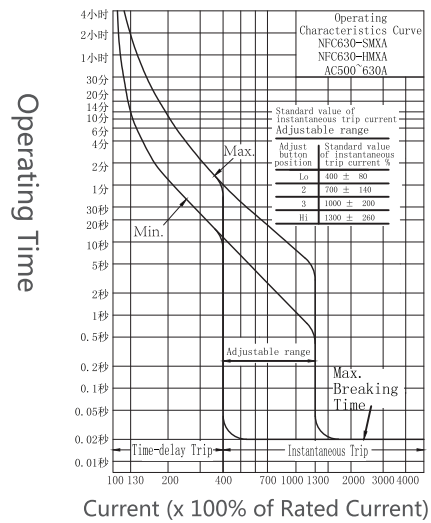
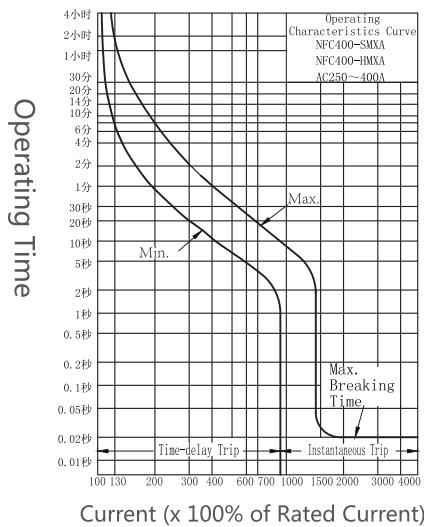
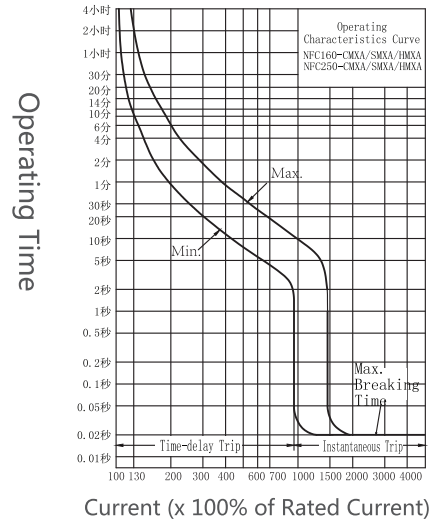
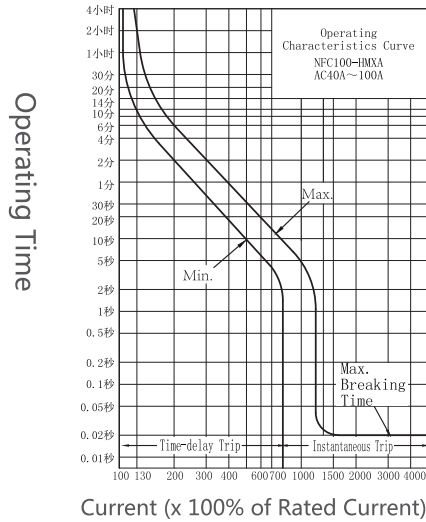


# Characteristics and Dimensions >>>

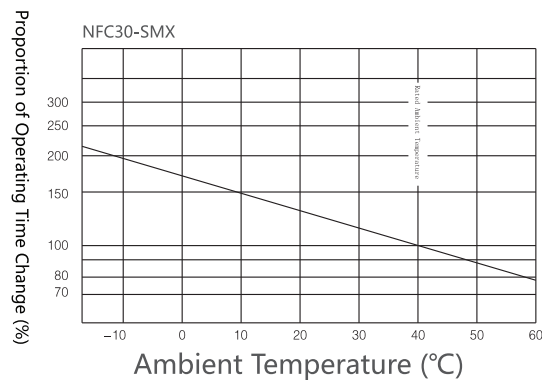
## ■ Operating Characteristics



## Operating Characteristics



## Temperature Characteristics Curve



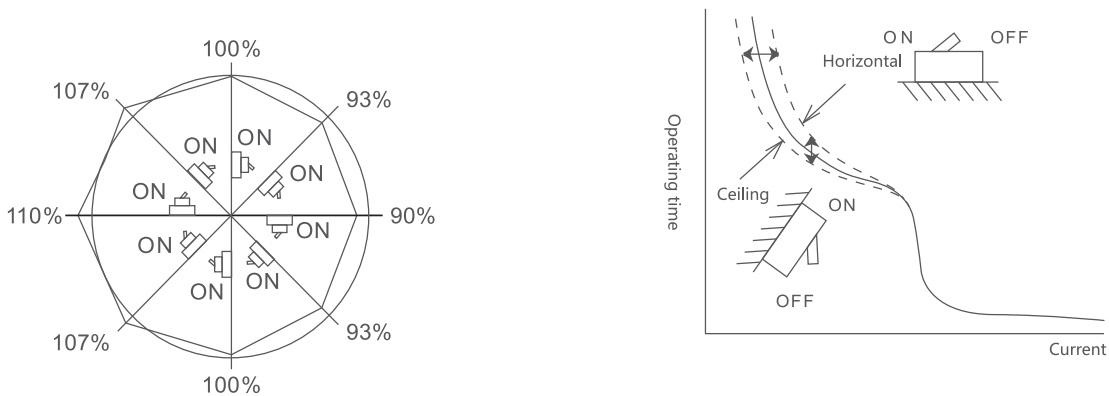
# Installation and Ordering Information >>>

## ■ Installation direction

- The trip way of NFC30-SMX is hydraulic-magnetic type. Please pay attention to the mounting position while installing it.  
The time-delay trip characteristic varies depending on the mounting position. It is recommended to mount it vertically.

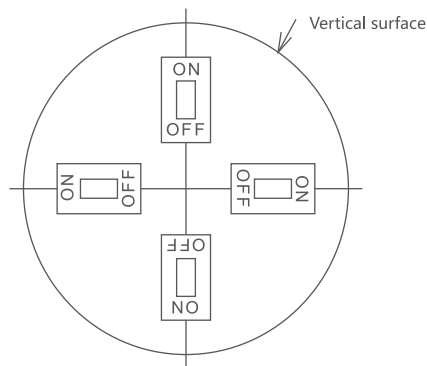
Model
NFC30-SMX

### (1) Change Rate of Rated Current at Different Mounting Angles:



Mounting direction will change the effective height of magnetic core.

### (2) Mounting methods which will not influence the tripping characteristic.



### 2. Thermal-magnetic type won't be affected by the mounting method:

Model		
NFC60-CMXA	NFC60-SMXA	NFC60-HMXA
NFC100-CMXA	NFC100-SMXA	NFC100-HMXA
NFC160-CMXA	NFC160-SMXA	NFC160-HMXA
NFC250-CMXA	NFC250-SMXA	NFC250-HMXA
NFC400-SMXA	NFC400-HMXA	
NFC630-SMXA	NFC630-HMXA	



# MX SERIES



## Ordering Information

Model	Number of Poles	Rated Current (A)	Internal Accessories	Quantity	External Accessories
NFC60-CMXA	3P	60A	AL,AX,SHT(AC100-120V)	100台	F, V, TC-S, TC-L
NFC30-SMX	2,3P	3,4,6,10,15,20,25,30A	AL (Alarm Switch)		F (External Operating Handle)
NFC60-CMXA	2,3P	15,16,20,25,30,32,40,50,60A	AX (Auxiliary Switch)		V (External Operating Handle)
NFC60-SMXA	2,3,4P	15,16,20,25,30,32,40,50,60A	ALAX (Alarm Auxiliary Switch)		TC-S (Short Terminal Cover)
NFC60-HMXA	2,3,4P	15,16,20,25,30,32,40,50,60A	SHT (Shunt Trip) ( AC:100-120, 110-220, 220-440, 380-440V; DC:24, 48, 100V )		TC-L (Long Terminal Cover)
NFC100-CMXA	2,3P	15,16,20,25,30,32,40,50,60,63,75,80,100A	UVT (Undervoltage Trip) ( AC:100-120, 110-120, 200-240, 220-240, 380-400, 380-415, 440-460V )		
NFC100-SMXA	2,3,4P	15,16,20,25,30,32,40,50,60,63,75,80,100A			
NFC100-HMXA	3,4P	15,16,20,25,30,32,40,50,60,63,75,80,100A			
NFC160-CMXA	3P	125,140,150,160A			
NFC160-SMXA	3,4P	125,140,150,160A			
NFC160-HMXA	3,4P	125,140,150,160A			
NFC250-CMXA	3P	175,200,225,250A			
NFC250-SMXA	3,4P	175,200,225,250A			
NFC250-HMXA	3,4P	175,200,225,250A			
NFC400-SMXA	3,4P	250,300,350,400A			
NFC400-HMXA	3,4P	250,300,350,400A			
NFC630-SMXA	3,4P	500,600,630A			
NFC630-HMXA	3,4P	500,600,630A			

\*1. The internal accessories for NFC30-SMX need to be assembled at factory. Please order together with the body model.  
The other accessories are all cassette-type and realized field installation.

\*2. Please refer to page11~12 for accessories' model name.