



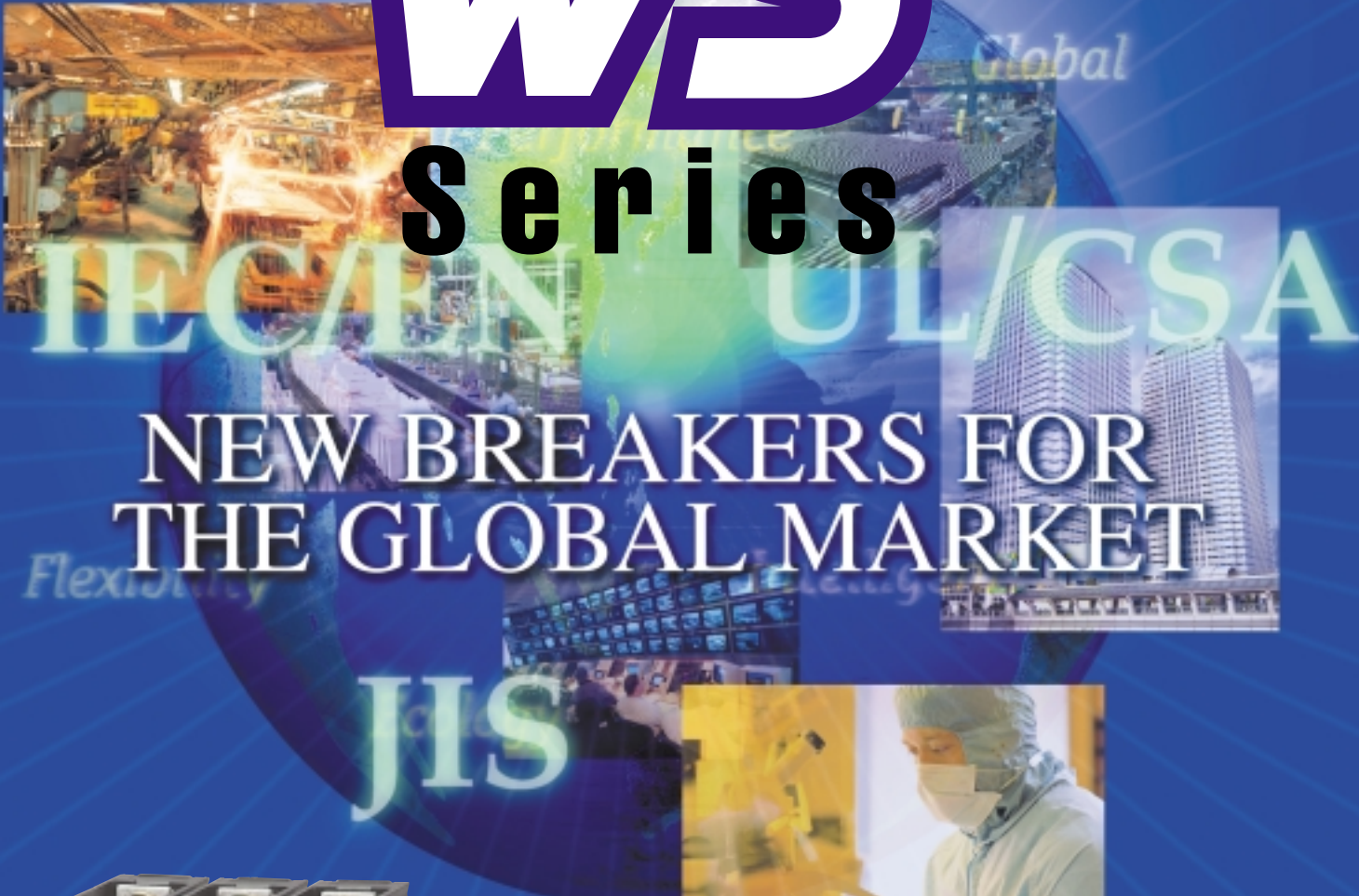
# MITSUBISHI

## MOLDED-CASE CIRCUIT BREAKERS & EARTH-LEAKAGE CIRCUIT BREAKERS

World Super

# W/S

# Series



# IEC/EN UL/CSA

## NEW BREAKERS FOR THE GLOBAL MARKET



Mitsubishi Electric Corporation's Fukuoka Works, which produces these products, is certified in accoring the ISO 14001 environmental management system standard. Certification No. EC7011128 Date of Certification: Nov-26,1997

# Mitsubishi Presents the the High Demands of

Mitsubishi Presents the WS Series, Satisfying the High Demands of the Global Standard New from Mitsubishi Electric, the company which has used its impressive controller device line-up in realizing high precision FA support, the WS (World Super) Series of next generation molded case circuit breakers and earth-leakage circuit



## High-Performance

Long service life and high reliability, made possible by new equipment breakthroughs.



## Reliable

The quest for truly superb breaker function, realizing performance at a full class higher.



## Global

Compliance with the



# WS Series, Satisfying the Global Standard

breakers. This series complies with IEC and UL/CSA, JIS standards, achieving a stellar level of globalization to satisfy genuine international needs. A product line-up designed with the environment in mind, together with the pursuit of easy usage and high performance to forge the way to a bright new future for breakers.



bal

ne global standards.



Best Solution

Product design for greater easy usage, through wide variations.

Intelligent

New system configuration, on the strength of intelligent breakers.

World Super

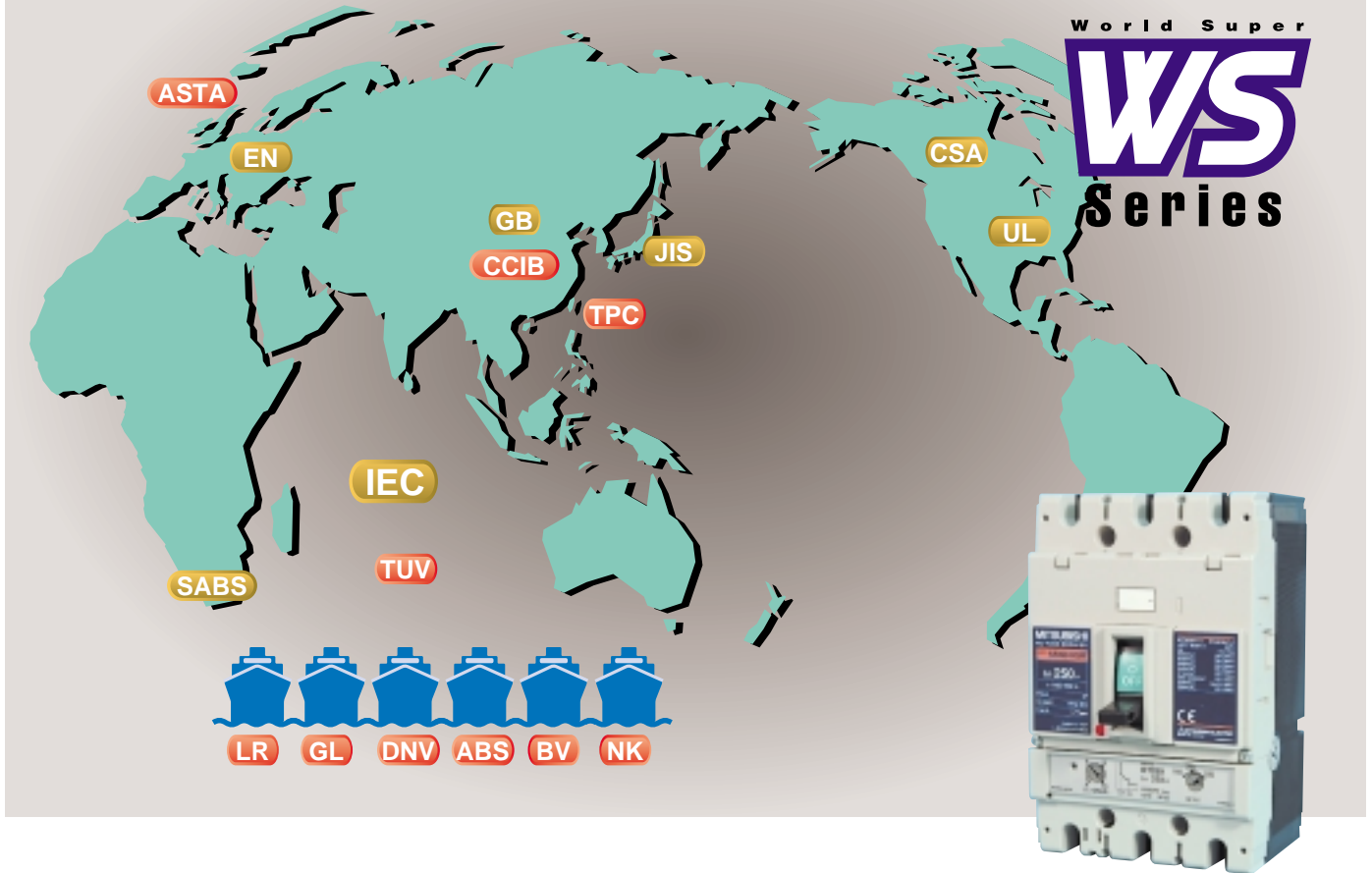


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## MITSUBISHI World Super Series Designed for Global Application



**Complete change in Mitsubishi breaker design colors**  
 Complete color change to ivory from WS Series. Use of shift to white breakers and more stylish design to boost attention on the international market.

**Complying with the various world standards**  
 Besides obvious conforming standards of IEC, UL, CSA and JIS, third-party certification and ship classification standards will also be obtained in each country, to respond to the world market. (Refer to the left entries for more details.)

**Raise each rating to address the international market.**  
 (1) NF30-SP ⇒ NF32-SW  
 (2) NF60-HP ⇒ NF63-HW  
 (3) NF100-SP ⇒ NF125-SW

### WS Series International Standard Conformance List

Standards	Safety Certification			Marine Approvals							
	IEC	JIS	EN	UL	CSA	LR	GL	DNV	ABS	BV	NK
	International	Japan	Europe	USA	Canada	UK	Germany	Norway	USA	France	Japan
WS Series	●	●	●	○	○	○	○	○	○	○	○

(Notes) “●” responds with standard item. “○” will manufacture according to instructions.



# Targets one-class higher performance, in realizing superb breaking performance

## The WS Series presents a new technology.

### Relay

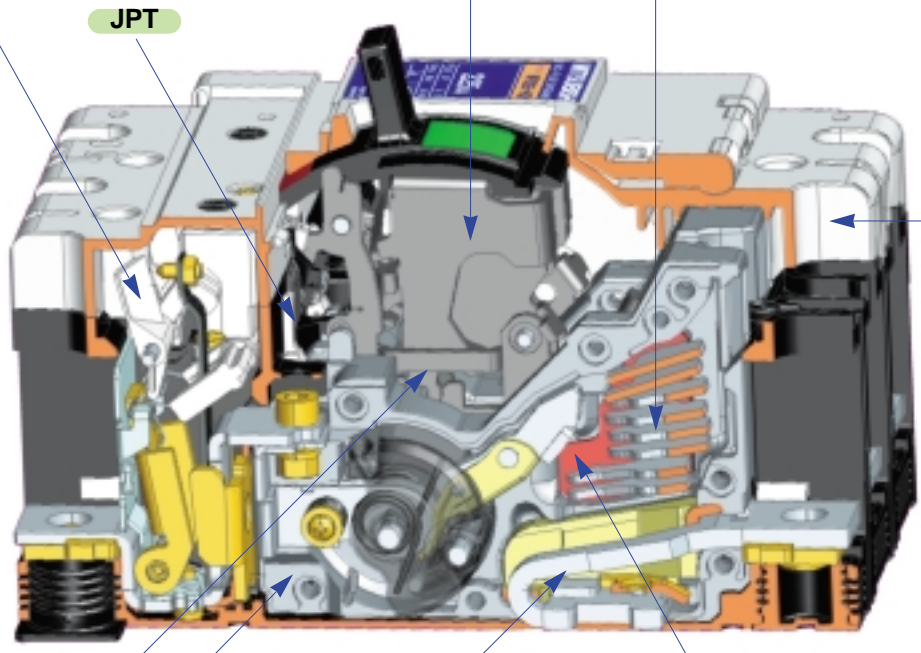
- Interchangeable Relay-unit  
Thermal type ↔ Electronic type
- AC/DC common use
- T/A adjustable range is expanded.

### Mechanism

- Isolation suitability
- Class II insulation
- Extending operating cycles

### Breaking Performance

- Increased Icu
- High voltage
- Ics=100% Icu
- Co-ordination type "2"



### Terminal

- IP20 Mold-cover Finger protection
- Front compression terminal ↔ Box terminal ↔ Rear ↔ PM

### Internal Accessories

- Cassette-type accessories
- Wide range of Rated Voltage

### Shunt-less

### Advanced ISTAC

### PA Auto-Puffer

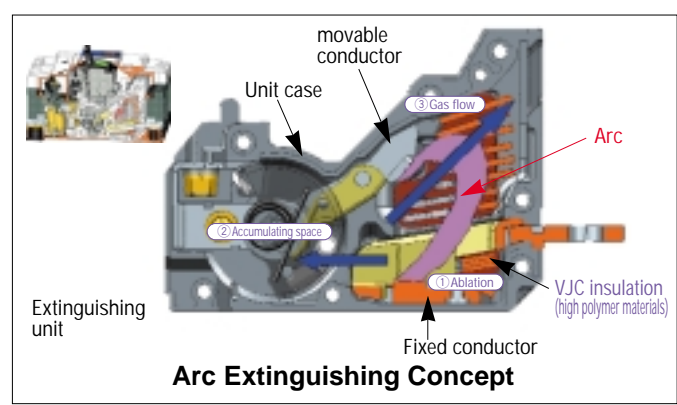
### External Accessories

- Electric operators
  - ① High speed type
  - ② Isolation suitability
- IP20 PM with Safety Device
- Handle Lock Device
- R/V handle
- IP40 Terminal cover

### [PA Auto-Puffer]

Polymer Ablation type Auto-Puffer [Adopted on SGW, HGW, RGW, UGW]

PA auto-puffer is the technology to increase the interrupting performance by blowing out the gas to the arc by right angle. The gas pressure which is generated from high-polymer materials is accumulated in the accumulating space, and the gas is blown to the arc to extinguish. Especially this technology improves the high voltage breaking performance.

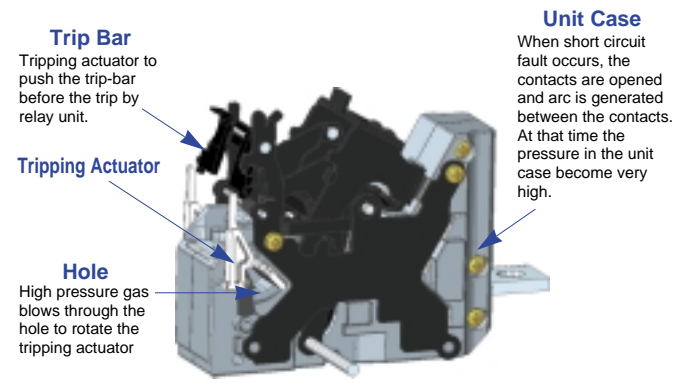


① Ablation ⇒ ② Gas accumulating ⇒ ③ Gas flow ⇒ Arc extinguishing

### [JPT]

Jet Pressure Trip Mechanism [Adopted on SGW, HGW, RGW, UGW]

Ablation gas jet through the hole installed on the unit case directly activates the trip mechanism. This acts faster than the relay (magnet), and contributes to improved current-limiting performance and breaking reliability.

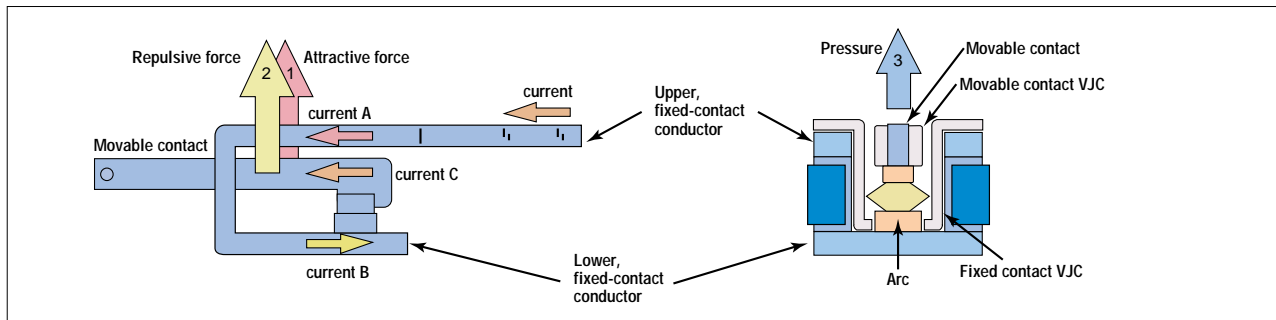


# Targets one-class higher performance, in realizing superb breaking performance

## [Advanced ISTAC] Advanced Impulsive Slot-Type Accelerator [Adopted on SGW, HGW, RGW, UGW]

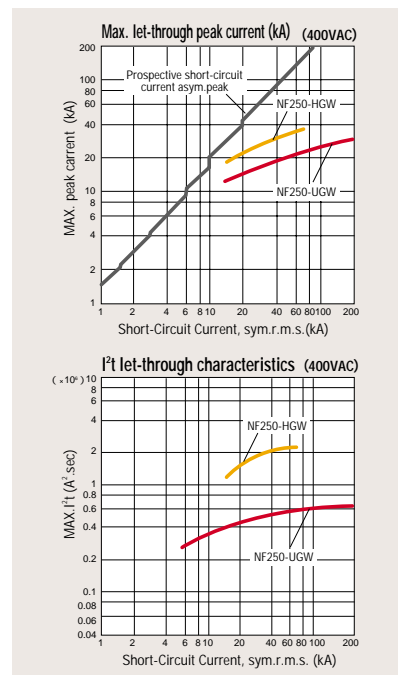
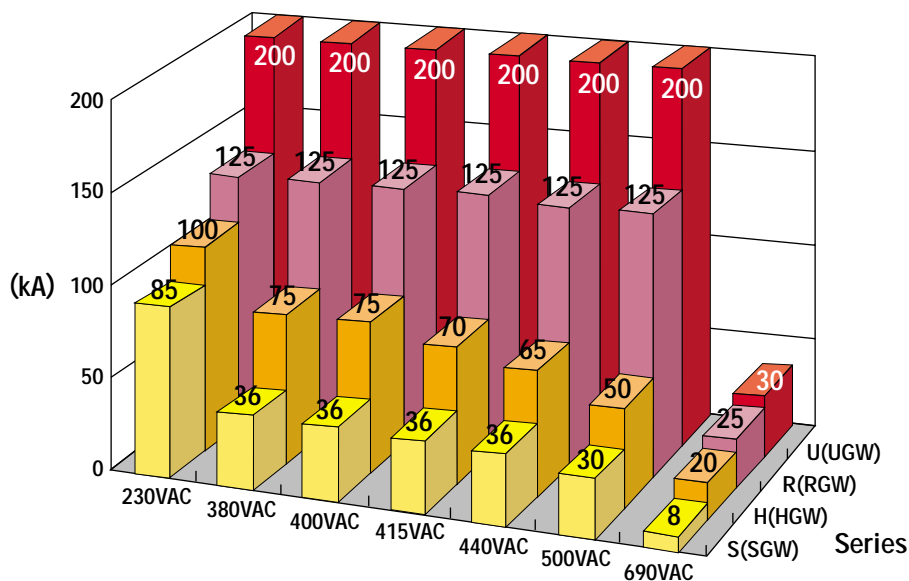
Further evolution in Mitsubishi original ISTAC breaking technology\*. Optimization of the current path and the added magnetic core enhance driving electromagnetic forces. By the high-speed opening and the arc driving, the rising rate of arc voltage is increased and the peak current "I<sub>p</sub>" is decreased.

\*The triple forces which are the repulsive force, the attractive force, and the pressure accelerate the separating speed of the movable conductor.



- (1) Electromagnetic attractive force between Current A and Current C
  - (2) Electromagnetic repulsive force between Current B and Current C
  - (3) Ablation gas pressure
- These three forces generated high-speed drive

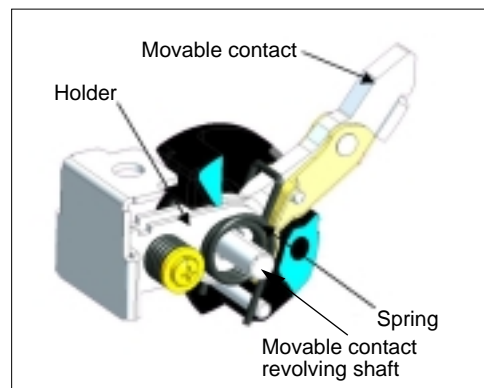
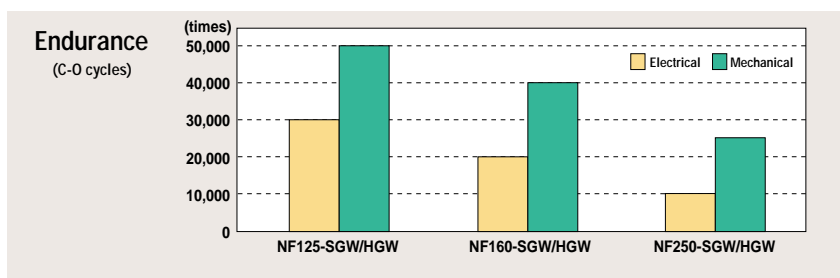
## Breaking Capacity I<sub>cu</sub>/I<sub>cs</sub>



## [Shunt-less]

### Shunt-less Current Flow Technology [Adopted on SGW, HGW, RGW, UGW]

Double plates conductors hold the movable conductor without flexible wires. This shunt-less structure achieves the extending operating cycles.



During revolution the movable contact is constantly in contact with the holder, maintaining current flow.

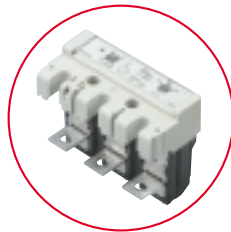
## Interchangeable Relay Unit

To enhance flexibility, the Mitsubishi WS Series is equipped with interchangeable relay units (available in thermal or electronic types).

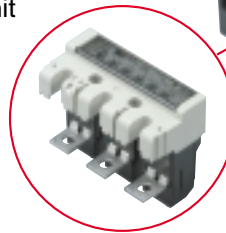
The move has been made to AC/DC common use, while the expanded adjustment range enables reduction in the number of 250AF relays from 10 to 7 types.

A magnetic adjustable function has been added to the thermal type, while 4P neutral protection has also been enhanced.

(Note: Only authorized members available to replace)



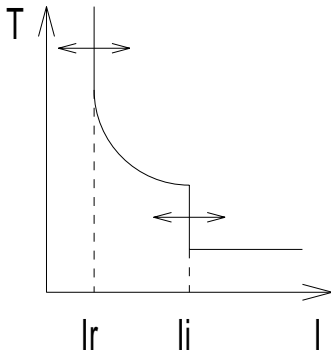
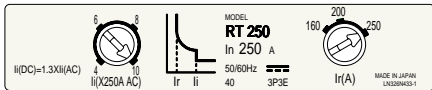
Thermal type unit



Electronic type unit



## Thermal Adjustable Relay



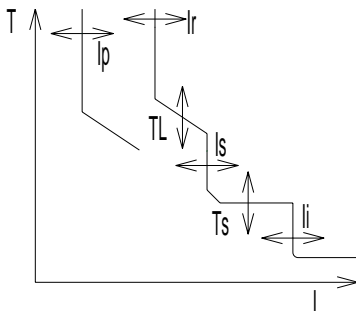
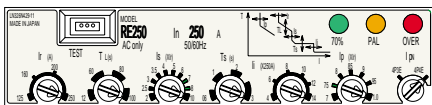
Rating	In (A)	25	40	63	100	125	160	250
Type	NF250-SGW / HGW						●	●
	NF160-SGW / HGW						●	
	NF125-SGW / HGW	●	●	●	●	●		

Overload Protection (Thermal)							
Tripping threshold Ir (A)	Adjustable						
	16-25	25-40	40-63	63-100	80-125	125-160	160-250 (160-225)
Neutral protection (note 1)	4P 3E	No Protection					
	4P 4E	1 × Ir					

Short-Circuit Protection (Magnetic)		
Tripping threshold li	Fixed	Adjustable
	10 × In	4 to 10 × In

Note: (1) The type 4P 3E is standard. If the type 4P 4E is required, specify the type 4P 4E separately and explicitly.

## Electronic Relay



Rating	In (A) (40°C)	32	63	100	125	160	250
Type	NF250-SGW / HGW						●
	NF160-SGW / HGW					●	
	NF125-SGW / HGW	●	●	●	●		

Overload Protection						
Tripping threshold Ir (A)	Adjustable					
	16-32	32-63	63-100	75-125	80-160	125-250
LTD	Tripping time TL(s)	12-60-80-100 step adjustable (at 2 × Ir)				
	Neutral protection (Selectable)	0-1 × Ir (Step adjustable)				

Short-Circuit Protection		
STD	Pickup current Is	2-2.5-3-3.5-4-5-6-7-8-10 × Ir step adjustable
	Tripping time Ts(s)	0.06-0.1-0.2-0.3 step adjustable (at 1.5 × Is)
INST	Tripping threshold li	4 to 14 × In continuous adjustable

Pre-Alarm		
PAL	Pickup current Ip	0.7-0.75-0.8-0.85-0.9-0.95-1.0 × Ir step adjustable
	Operating time Tp	TL/2

Indicator (LED)	
70%-LED (green)	Lit at 0.7 × Ir
PAL-LED (orange)	Flashing at Ip and lit at Tp
Over-LED (red)	Lit at 1.15 × Ir

## Internal Accessories

Adopted for the internal accessories is a easily installed cassette type. Common use of different voltages realizes major reductions in types.

The UVT for ELCB is also possible. Time delay type variations have also been expanded, addressing a wide range of applications.

	Prebius models		WS Series (New)	
SHT voltage	AC (V)	(24), (48), 100-120, 200-240, 380-450, (440-550)	24-48, 100-240, 380-550	
	DC (V)	(12), (24), (36), (48), 100, (110), (125), (220)	12, 24-36, 36-48, 100-125, (220-250)	
UVT voltage	AC (V)	100-110, (100-120), 200-220, (220-240), (380-415), 400-440, (440-480), (500-550)	24/48, 100-110/120-130, 200-220/230-250, 380-415/440-480, 500-550	
	DC (V)	(24), (48), 100, (110)	24/48, 100-110, 110-125	

### 3 Way Lead Wire (Selectable)



Vertical Lead-wire Terminal Block (SHT)



Lead-wire to Line side



Flying Lead-wire

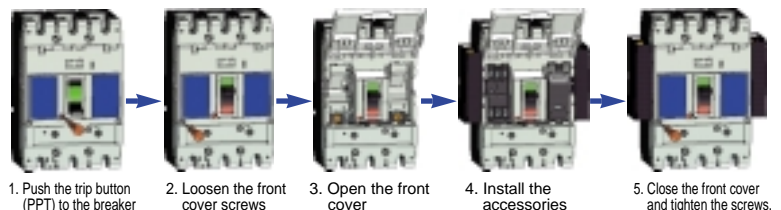
### \*Cassette-type Accessories

Cassette-type accessories ensure flexibility when upgrading circuits.

Ordering is easy, and installation is one touch simple and safe too thanks to the insulated cassette design.

#### Fits all breaker series

The alarm switch (AL), auxiliary switch (AX), shunt trip (SHT), and undervoltage trip (UVT) all comes as cassette-type accessories to suit all breaker series.



## External Accessories

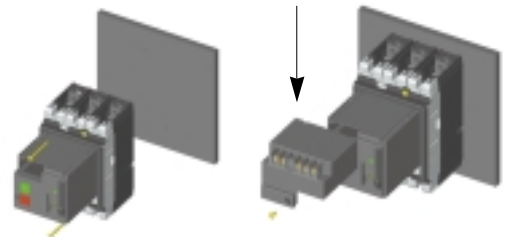
### High speed Motor Device

Supplied for the 125 through 250AF is a motor device easier to use, which simplifies installation.

\* Adoption of a spring charge mechanism for high-speed operation (0.05~0.1seconds)

\* Swift and simple installation, by tightening only two screws.

### Power Supply Module



### External Handle

Adoption of a safer and easy to operate handle.

\* Complying with protection degree IP65.

\* Isolation function achieved through combination with the breaker unit.

\* Structured to allow relay adjustments after installation as well.

\* Equipped with cylinder key (option) to prevent deliberate operation.



V-Handle



R-Handle

### IP-20PM with Safety Device

Specialized for 3-and4-poles use (2 pole incompatible).

\* Complies with protection degree IP20.

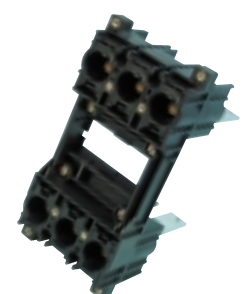
\* Safety device supplied as option.

\* May be connected with up to nine leads (for PLT).

\* May be modified from front connection to rear connection.

(Note: Modification by end users not authorized)

IP20: Finger protection.



(IP-20PM)



# Product design which pursues greater use ease by wide variations

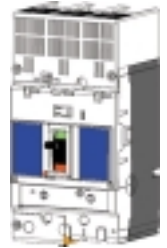
## IP-20 Terminal Connection

With the SGW, HGW, connection safety has been further elevated.  
 \*Standard IP-20 protection degree secured.



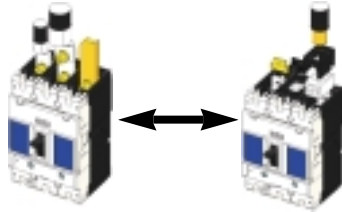
## Terminal Cover

Major improvements have been made in front connection terminal safety.  
 \*With terminal covers, IP40 protection degree is ensured.



## Variable Connections

Compatible with various connection methods. Solderless terminals extending outside the breaker unit on the conventional type have been upgraded to a built-in internal type (see Diagram 2). Maximum connecting Cable of 185mm<sup>2</sup> (SGW/HGW).  
 (Note: Certain models have externally attached terminals)



## IEC Rail Mounting for 32, 63AF

The 32,63AF includes installation hooks to IEC rails as standard equipment, greatly simplifying installation work.



## Handle Locks

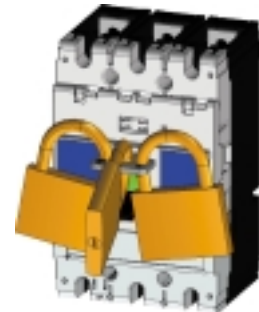
With the WS Series, ON/OFF locking is possible through the padlock to the breaker unit.  
 Up to three padlocks may be attached.  
 \*Customers are requested to supply their own padlocks



ON Lock



OFF Lock



OFF Lock with 3 Padlock



# New system configuration through the use of an intelligent breaker



AE-SS MDU

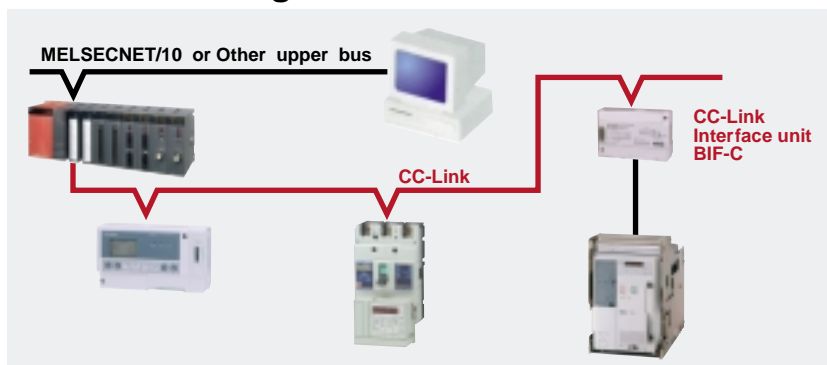


WSS MDU

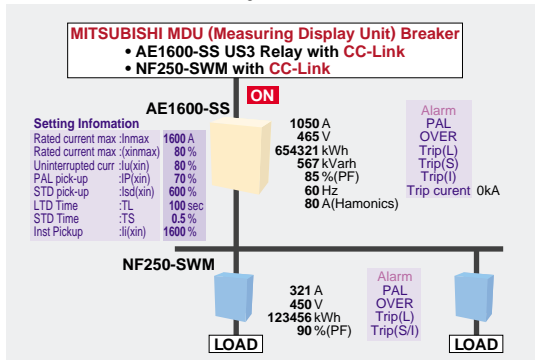


Eco Monitor

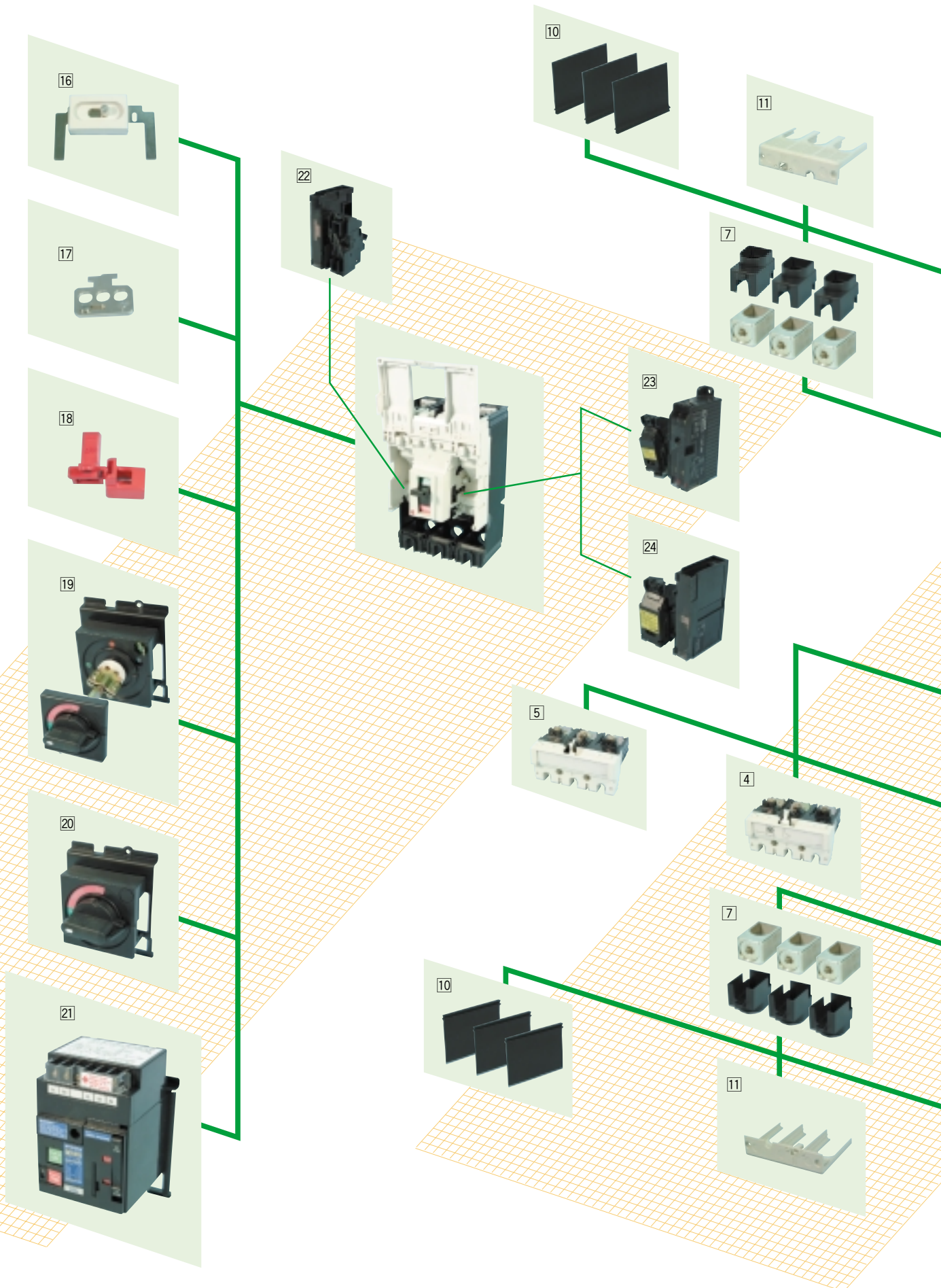
## Data Measuring & Transmission

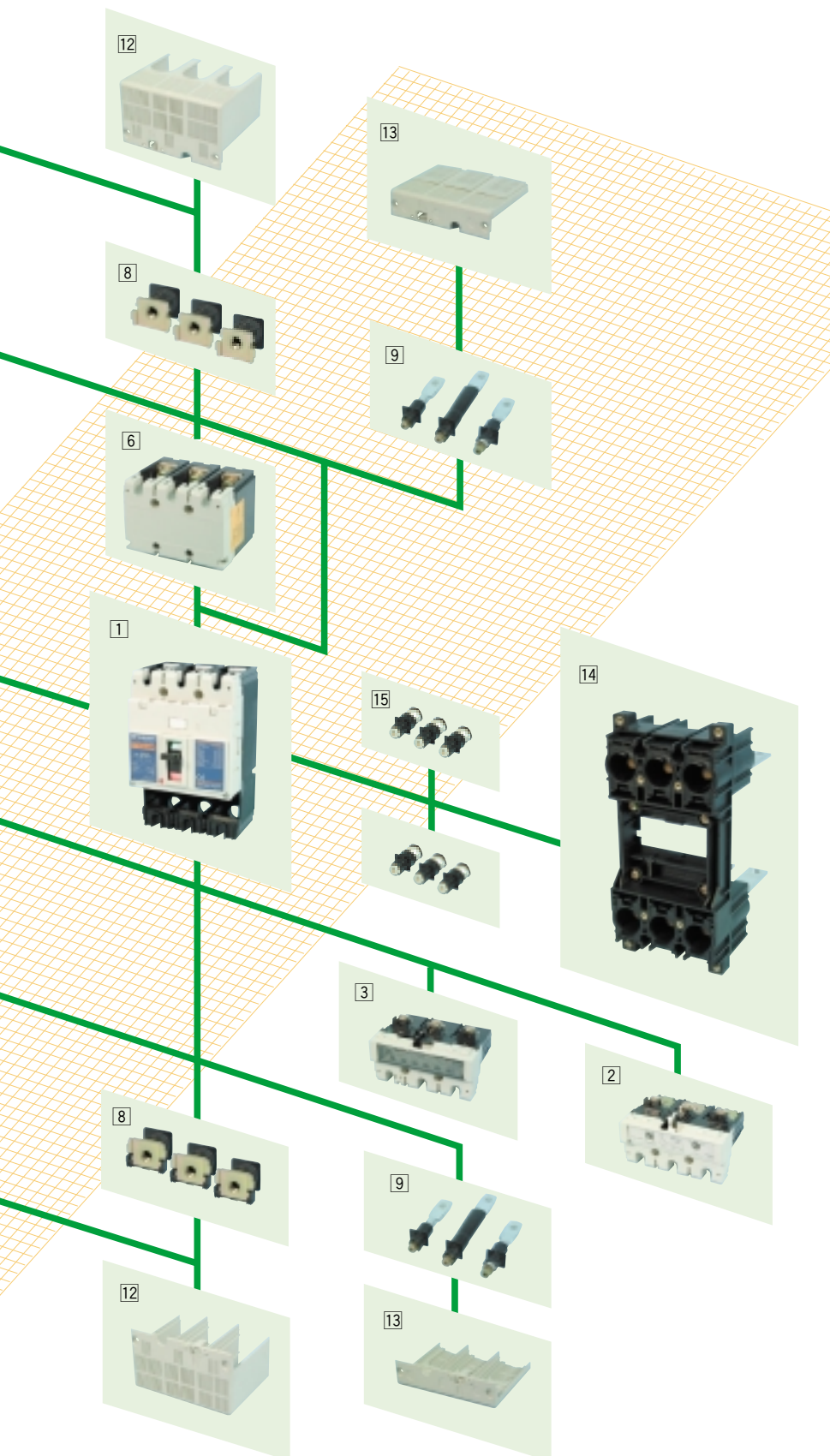


Working through a sequence CC-Link interface unit makes it possible to collect electrical circuit measuring data.



## 250AF Product Skelton













- 1 MCCB
- 2 Relay unit (Thermal type) (RT)
- 3 Relay unit (Electronic type) (RE)
- 4 Relay unit (Magnetic only type) (RM)
- 5 Relay unit (Switch-disconnector type)\*
- 6 Super current-limiting unit\*
- 7 Solderless (Box) terminals
- 8 Front connection nuts
- 9 Rear connections
- 10 Insulating barrier (BA-F)
- 11 Small terminal cover (TC-S)
- 12 Large terminal cover (TC-L)
- 13 Rear terminal cover (BTC)
- 14 Plug-in base (PM)
- 15 Connections for Plug-in
- 16 Mechanical interlock device (MI)
- 17 OFF Lock with 3 Padlock (HLF3)
- 18 Handle lock device (LC/HLF/HLN/HLS)
- 19 Variable-depth operating handle (V type)
- 20 Rotary operating handle (R type)
- 21 Electrical operation device (MD)
- 22 Alarm/Auxillary switch device (AL/AX)
- 23 Under voltage trip device (UVT)
- 24 Shunt trip device (SHT)


Note \*: All the accessories are field mounting type except No.5 and 6.








# 1. Series Configuration and List of Product Models




## Series Configuration

Molded-case circuit breakers			
NF-C Economy type	NF-S Standard type	NF-H High-performance type	NF-U Current limiting-type ultra breaker
			

Earth-leakage circuit breakers			
NV-C Economy type	NV-S Standard type	NV-H High-performance type	NV-U Ultra current-limiting type
			



Motor-protection breakers
<p><b>MB</b> Motor breaker</p> 

Miniature circuit breakers						
BH	BH-P	BH-S	BH-PS	BH-D6	BV-D	KB-D
NEMA-type for consumer unit				DIN-series for general consumer unit		
						

Circuit protectors		
CP30-BA	CP-B	CP-S
For equipment		
		

## List of Product Models The models shown in shaded boxes are WS series.)

Series	Frame A	32 (30)	63	125 (100)	160	250	400	630	800	1000	1250 (1200)	1600	2000	2500	(3200)	4000
Molded-case circuit breaker	NF-C Economy type	NF30-CS	NF63-CW	NF125-CW		NF250-CW	NF400-CP	NF630-CP	NF800-CEP							
	NF-S Standard type	NF32-SW	NF63-SW	NF125-SW	NF160-SW	NF250-SW	NF400-SP	NF630-SP	NF800-SDP	NF1000-SS	NF1250-SS (NF1200-SS)	NF1600-SS	NF2000-S	NF2500-S	NF3200-S	NF4000-S
	NF-H High-performance type		NF63-HW	NF125-HW	NF160-HW	NF250-HW	NF400-HEP	NF630-HEP	NF800-HEP	NF1000-SSD	NF1250-SSD	NF1600-SSD	NFE2000-S		NFE3000-S	NFE4000-S
	NF-U Ultra current-limiting type			NF125-RGW		NF250-RGW	NF400-UEP	NF630-UEP	NF800-UEP		NF1250-UR					
Earth-leakage circuit breaker	NV-C Economy type	NV30-CS	NV63-CW	NV125-CW		NV250-CW	NV400-CP	NV630-CP								
	NV-S Standard type	NV32-SW	NV63-SW	NV125-SW		NV250-SW	NV400-SP	NV630-SP	NV800-SEP	NV1000-SB	NV1200-SB					
	NV-H High-performance type		NV63-HW	NV125-HW		NV250-HW	NV400-HEP	NV630-SEP	NV800-HEP							
	NV-U Ultra current-limiting type			NV125-RW		NV250-RW										
Motor protection breaker	MB Motor breaker	MB30-CS	MB50-CW	MB100-SW		MB225-SW										
		MB30-SW	MB50-SW													

UL listed products	
<b>NF-UL</b> UL489 Listed Molded-case circuit breaker	<b>NV-UL</b> Earth-leakage protector UL489 Listed Molded-case circuit breaker
	
	(Details will be available upon request.)

Series	Frame A	50	100	150	225	250	400	600
UL listed products	UL489 Listed Molded-case circuit breaker	NF50-SWU	NF100-CWU NF100-SWU	NF-SFW	NF225-CWU	NF-SJW NF-HJW	NF-SKW	NF-SLW
	Earth-leakage protector UL489 Listed Molded-case circuit breaker (Details will be available upon request.)	NV50-SWU	NV100-SWU		NV225-CWU			

- : Released in April 2001
- : Scheduled to be released in October 2001
- : Available soon

### Miniature Circuit Breaker

AF	60	100
BH	BH	
	BH-P	
	BH-S	—
	BH-PS	—

### DIN Series







AF	63 and less
MCB	BH-D6
RCCB	BV-D
RCBO	BV-DN
Isolating switch	KB-D

### Circuit Protectors

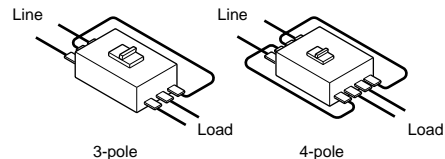
AF	30 and less
CP	CP30-BA
	CP-B
	CP-S

# 2. Detailed Specifications

## Molded-Case Circuit Breakers

Series			C series			S series			H series											
Group			WSS G1			WSS G2			WSS G1											
Frame Size			63			125			250											
Type name	Photo								Available soon											
	WS series		NF63-CW			NF125-CW			NF250-CW			NF32-SW			NF63-SW			NF63-HW		
Rated current In (Amp.)			3 4 6 10 16 20 25 32 40 50 63			50 63 80 100 125			125 150 175 200 225 250			3 4 6 10 16 20 25 32			3 4 6 10 16 20 25 32 40 50 63			10 16 20 25 32 40 50 63		
Rated ambient temperature (°C)			40			40			40			40			40					
Number of poles			2 3			2 3			2 3			2 3 4			2 3 4					
Rated insulation voltage Ui (V)			600			600			600			600			690					
Rated short-circuit breaking capacities (kA)	IEC60947-2 (Icu/Ics)	AC (50/60Hz)	690V	-		-		-		-		-		2.5/1		-				
			525V	-		-		-		-		-		-		-				
			500V	2.5/1		7.5/4		10/5		2.5/1		7.5/4		7.5/4		7.5/4				
			440V	2.5/1		10/5		15/8		2.5/1		7.5/4		10/5		10/5				
			415V	2.5/1		10/5		18/9		2.5/1		7.5/4		10/5		10/5				
		400V	5/2		10/5		18/9		5/2		7.5/4		10/5		10/5					
		380V	5/2		10/5		18/9		5/2		7.5/4		10/5		10/5					
		230V	7.5/4		30/15		35/18		7.5/4		15/8		25/13		25/13					
		250V	2.5/1		-		7.5/4 *1		10/5 *1		2.5/1		-		7.5/4		-			
		300V	-		-		-		-		-		-		-		-			
Suitability for isolation $\sim$ *			-			-			-			-			-					
Utilization category			A			A			A			A			A					
Reverse connection (terminals unmarked)			-			-			-			-			-					
Rated impulse withstand voltage Uimp (kV)			6			8			6			6			6					
Pollution degree			2			3			2			2			2					
Number of operating cycles	without current		10,000		10,000		8,000		10,000		15,000		15,000		15,000					
	with current	440V-In/2	6,000		6,000		4,000		6,000		15,000		15,000		15,000					
		440V-In	6,000		6,000		4,000		6,000		8,000		8,000		8,000					
		690V-In/2	-		-		-		-		-		-		-					
Overall dimensions (mm)	a		50 75		60 90		105		50 75		50 75 100		50 75 100		90					
	b		130		130		165		130		130		130		130					
	c		68		68		68		68		68		68		68					
	ca		90		90		92		90		90		90		90					
	Screw terminal		-		-		-		-		-		-		-		-			
Installation and connections	Fixed	Front	Solderless (box) terminal (SL)		-		-		-		-		-		-		-			
		Rear	Busbar terminal		-		-		-		-		-		-		-			
	Plug-in	Rear	(B)		-		-		-		-		-		-		-			
		Rear/front IP20	(PM-IP)		-		-		-		-		-		-		-			
IEC 35mm rail		Mounting hook (option)		-		-		-		-		-		-		-				
Adapter (option)		-		-		-		-		-		-		-		-				
Cassette-type accessories	Alarm switch		(AL)		-		-		-		-		-		-		-			
	Auxiliary switch		(AX)		-		-		-		-		-		-		-			
	Shunt trip		(SHT)		-		-		-		-		-		-		-			
	Undervoltage trip (UVT)	Non-Synchronous Closing (UVT-N)		-		-		-		-		-		-		-		-		
Synchronous Closing (UVT-S)		-		-		-		-		-		-		-		-				
Accessories connection	with Lead-wire terminal block		(SLT)		-		-		-		-		-		-		-			
	with Internal terminal type		-		-		-		-		-		-		-		-			
	with Flying leads		-		-		-		-		-		-		-		-			
Built-in accessories	Pre-alarm (contact output) *3		(PAL)		-		-		-		-		-		-		-			
	Overcurrent trip alarm *3		(OAL)		-		-		-		-		-		-		-			
	Cylinder key lock		-		-		-		-		-		-		-		-			
External accessories	Enclosure	Dustproof	(S)		-		-		-		-		-		-		-			
		Waterproof	(W)		-		-		-		-		-		-		-			
	Electrical operation device		(MD)		-		-		-		-		-		-		-			
	Mechanical interlock	Slide plate type		(MI-S)		-		-		-		-		-		-		-		
		Walking beam type		(MI-W)		-		-		-		-		-		-		-		
	Handle lock device	Handle lock		(HL)		-		-		-		-		-		-		-		
		(HL-S)		-		-		-		-		-		-		-		-		
	Lock cover		(LC)		-		-		-		-		-		-		-			
	External operating handle	Door mounting	(V)		-		-		-		-		-		-		-			
		Mounted on breaker	(R)		-		-		-		-		-		-		-			
	Insulating barrier	Between phase	(BA-F)		-		-		-		-		-		-		-			
		To ground	(BA-G)		-		-		-		-		-		-		-			
	Terminal cover	Large	(TC-L)		-		-		-		-		-		-		-			
Small		(TC-S)		-		-		-		-		-		-		-				
Transparent		(TTC)		-		-		-		-		-		-		-				
for rear connection for plug-in		(BTC)		-		-		-		-		-		-		-				
Marine approval	Available soon		L/R		-		-		-		-		-		-		-			
	G/L		-		-		-		-		-		-		-		-			
	BV		-		-		-		-		-		-		-		-			
	DNV		-		-		-		-		-		-		-		-			
	AB		-		-		-		-		-		-		-		-			
Automatic tripping device			Hydraulic-magnetic			Thermal-magnetic			Thermal-magnetic			Hydraulic-magnetic			Hydraulic-magnetic					
Trip button			Equipped			Equipped			Equipped			Equipped			Equipped					

Notes \*1: Use two poles in the case of three-pole or four-pole products.  
 In addition, wiring as shown to the right allows the three poles to be used for up to 400V DC and the four poles to be used for up to 500V DC.  
 \*2: Use two poles in the case of three-pole or four-pole products.  
 In addition, wiring as shown to the right allows the three poles to be used for up to 500V DC and the four poles to be used for up to 600V DC.  
 \*3: Both PAL and OAL is not available. Only one specified.



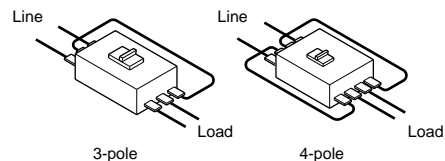


# 2. Detailed Specifications

## Molded-Case Circuit Breakers

Series		H series						S series							
Group		WSS G3		WSS G4		WSS G3		WSS G4							
Frame Size		160		160		250		250							
Type name	Photo														
	WS series	NF160-HW		NF160-HGW RT		NF160-HGW RE		NF250-SW		NF250-SGW RT		NF250-SGW RE			
Rated current In (Amp.)		125 150 160		125-160		80-160		125 150 175 200 225 250		125-160 160-250		125-250			
Rated ambient temperature (°C)		40		40		40		40		40		40			
Number of poles		2 3 4		2 3 4		3 4		2 3 4		2 3 4		3 4			
Rated insulation voltage Ui (V)		690		690		690		690		690		690			
Rated short-circuit breaking capacities (kA)	IEC60947-2 (Icu/Ics)	AC (50/60Hz)	690V	5/3	20/20	20/20	20/20	20/20	20/20	8/8	8/8	8/8	8/8		
			525V	-	35/35	35/35	35/35	35/35	35/35	22/22	22/22	22/22	22/22		
			500V	30/8	50/50	50/50	50/50	50/50	15/8	30/30	30/30	30/30	30/30	30/30	
			440V	50/13	65/65	65/65	65/65	65/65	25/13	36/36	36/36	36/36	36/36	36/36	
			415V	50/13	70/70	70/70	70/70	70/70	30/15	36/36	36/36	36/36	36/36	36/36	
			400V	50/13	75/75	75/75	75/75	75/75	30/15	36/36	36/36	36/36	36/36	36/36	
			380V	50/13	75/75	75/75	75/75	75/75	30/15	36/36	36/36	36/36	36/36	36/36	36/36
			230V	100/25	100/100	100/100	100/100	100/100	50/25	85/85	85/85	85/85	85/85	85/85	85/85
			250V	40/20 *1	-	-	-	-	15/8 *1	-	-	-	-	-	-
			300V	-	40/40 *2	-	-	-	20/20 *2	-	-	-	-	-	-
Suitability for isolation		A		A		A		A		A		A			
Utilization category		A		A		A		A		A		A			
Reverse connection (terminals unmarked)		-		-		-		-		-		-			
Rated impulse withstand voltage Uimp (kV)		6		8		8		6		8		8			
Pollution degree		2		3		3		2		3		3			
Number of operating cycles	without current	12,000		40,000		40,000		12,000		25,000		25,000			
		with current	440V-In/2	4,000	30,000	30,000	30,000	4,000	15,000	15,000	15,000	15,000	15,000		
			440V-In	4,000	20,000	20,000	20,000	4,000	10,000	10,000	10,000	10,000	10,000		
			690V-In/2	1,000	1,000	1,000	1,000	-	1,000	1,000	1,000	1,000	1,000		
			690V-In	1,000	1,000	1,000	1,000	-	1,000	1,000	1,000	1,000	1,000		
Overall dimensions (mm)		a	105	140	105	140	105	140	105	140	105	140	105	140	
		b	165	165	165	165	165	165	165	165	165	165	165		
		c	68	86	86	86	86	68	86	86	86	86	86		
		ca	92	111	111	111	111	92	111	111	111	111	111		
		ca'	92	111	111	111	111	92	111	111	111	111	111		
Installation and connections	Fixed	Front	Screw terminal	-	-	-	-	-	-	-	-	-	-		
		Solderless (box) terminal (SL)	-	-	-	-	-	-	-	-	-	-	-		
	Plug-in	Rear	Busbar terminal (B)	-	-	-	-	-	-	-	-	-	-		
		Rear/front IP20 (PM-IP)	-	-	-	-	-	-	-	-	-	-	-		
IEC 35mm rail	Mounting hook (option)	-	-	-	-	-	-	-	-	-	-	-			
	Adapter (option)	-	-	-	-	-	-	-	-	-	-	-			
Cassette-type accessories	Alarm switch (AL)	-	-	-	-	-	-	-	-	-	-	-			
	Auxiliary switch (AX)	-	-	-	-	-	-	-	-	-	-	-			
	Shunt trip (SHT)	-	-	-	-	-	-	-	-	-	-	-			
	Undervoltage trip (UVT)	Non-Synchronous Closing (UVT-N)	-	-	-	-	-	-	-	-	-	-			
Accessories' connection	with Lead-wire terminal block (SLT)	-	-	-	-	-	-	-	-	-	-	-			
	with Internal terminal type with Flying leads	-	-	-	-	-	-	-	-	-	-	-			
Built-in accessories	Pre-alarm (contact output) *3 (PAL)	-	-	-	-	-	-	-	-	-	-	-			
	Overcurrent trip alarm *3 (OAL)	-	-	-	-	-	-	-	-	-	-	-			
	Cylinder key lock	-	-	-	-	-	-	-	-	-	-	-			
External accessories	Enclosure	Dustproof (S)	-	-	-	-	-	-	-	-	-	-			
		Waterproof (W)	-	-	-	-	-	-	-	-	-	-			
	Electrical operation device	(MD)	-	-	-	-	-	-	-	-	-	-			
		Slide plate type (MI-S)	-	-	-	-	-	-	-	-	-	-			
	Mechanical interlock	Walking beam type (MI-W)	-	-	-	-	-	-	-	-	-	-			
		(HL)	-	-	-	-	-	-	-	-	-	-			
	Handle lock device	Handle lock (HL-S)	-	-	-	-	-	-	-	-	-	-			
		(LC)	-	-	-	-	-	-	-	-	-	-			
	Lock cover	(V)	-	-	-	-	-	-	-	-	-	-			
		Door mounting (S)	-	-	-	-	-	-	-	-	-	-			
		Mounted on breaker (R)	-	-	-	-	-	-	-	-	-	-			
	Insulating barrier	Between phase (BA-F)	-	-	-	-	-	-	-	-	-	-			
		To ground (BA-G)	-	-	-	-	-	-	-	-	-	-			
	Terminal cover	Large (TC-L)	-	-	-	-	-	-	-	-	-	-			
		Small (TC-S)	-	-	-	-	-	-	-	-	-	-			
Transparent (TTC)		-	-	-	-	-	-	-	-	-	-				
for rear connection (BTC)		-	-	-	-	-	-	-	-	-	-				
Marine approval	Available soon	L/R	-	-	-	-	-	-	-	-	-	-			
		G/L	-	-	-	-	-	-	-	-	-	-			
		BV	-	-	-	-	-	-	-	-	-	-			
		DNV	-	-	-	-	-	-	-	-	-	-			
		AB	-	-	-	-	-	-	-	-	-	-			
Automatic tripping device		Thermal-magnetic		Thermal-magnetic		Electronic		Thermal-magnetic		Thermal-magnetic		Electronic			
Trip button		Equipped		Equipped		Equipped		Equipped		Equipped		Equipped			

Notes \*1: Use two poles in the case of three-pole or four-pole products. In addition, wiring as shown to the right allows the three poles to be used for up to 400V DC and the four poles to be used for up to 500V DC.  
 \*2: Use two poles in the case of three-pole or four-pole products. In addition, wiring as shown to the right allows the three poles to be used for up to 500V DC and the four poles to be used for up to 600V DC.  
 \*3: Both PAL and OAL is not available. Only one specified.







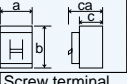






# 2. Detailed Specifications

## Earth-Leakage Circuit Breakers

Series		C series			S series		H series		
Group		WSS G1	WSS G2	WSS G3	WSS G1		WSS G1		
Frame size		63	125	250	32	63	63		
Type name	Photo	 Available soon			 Available soon	 Available soon	 Available soon		
	WS series	NV63-CW	NV125-CW	NV250-CW	NV32-SW	NV63-SW	NV63-HW		
Rated current I <sub>n</sub> (Amp.)		16 20 25 32 40 50 63	63 80 100 125	125 150 175 200 225 250	6 10 16 20 25 32	16 20 25 32 40 50 63	16 20 25 32 40 50 63		
Rated ambient temperature (°C)		40	40	40	40	40	40		
Number of poles		3	3	3	3	3	3		
Rated operational voltage U <sub>e</sub> (AC V)		230–400–440 Multi-voltage type	230–400–440 Multi-voltage type	230–400–440 Multi-voltage type	230–400–440 Multi-voltage type	230–400–440 Multi-voltage type	230–400–440 Multi-voltage type		
High-speed type	Rated current sensitivity I <sub>n</sub> (mA)	30·100·500 Selectable	30·100·500 Selectable	30·100·500 Selectable	30·100·500 Selectable	30·100·500 Selectable	30·100·500 Selectable		
	Max. operating time at 5I <sub>n</sub> (s)	0.04	0.04	0.04	0.04	0.04	0.04		
Time-delay type	Rated current sensitivity I <sub>n</sub> (mA)	–	100·300·500 Selectable	100·300·500 Selectable	–	–	–		
	Max. operating time at 2I <sub>n</sub> (s)	–	0.45·1.0·2.0 Selectable	0.45·1.0·2.0 Selectable	–	–	–		
	Inertial non-operating time at 2I <sub>n</sub> (s)	–	0.1·0.5·1.0	0.1·0.5·1.0	–	–	–		
Earth-leakage indication system		Button	Button	Button	Button	Button	Button		
Rated breaking capacity (kA) IEC60947-2 (I <sub>cu</sub> /I <sub>cs</sub> )		AC440V	2.5/1	10/5	15/8	5/2	7.5/4	10/5	
		AC400V	5/2	10/5	18/9	5/2	7.5/4	10/5	
		AC380V	5/2	–	–	5/2	7.5/4	10/5	
		AC230V	7.5/4	30/15	35/18	10/5	15/8	25/13	
Number of operating cycles		without current	10,000	10,000	8,000	10,000	15,000	15,000	
		with current	440V-I <sub>n</sub> /2 440V-I <sub>n</sub>	6,000 6,000	6,000 6,000	4,000 4,000	6,000 6,000	15,000 8,000	15,000 8,000
Overall dimensions (mm)			a	75	90	105	75	75	
			b	130	130	165	130	130	130
			c	68	68	68	68	68	68
			ca	90	90	92	90	90	90
			ca	90	90	92	90	90	90
Installation and connections	Fixed	Front	Screw terminal Solderless (box) terminal (SL) Busbar terminal	–	–	–	–	–	
		Rear	(B)	–	–	–	–	–	
	Plug-in	Rear	(PM)	–	–	–	–	–	
		Rear/front	IP20 (PM-IP)	–	–	–	–	–	
IEC 35mm rail	Mounting hook (option)	–	–	–	–	–	–		
	Adapter (option)	–	–	–	–	–	–		
Cassette-type accessories	Alarm switch	(AL)	–	–	–	–	–		
	Auxiliary switch	(AX)	–	–	–	–	–		
	Shunt trip	(SHT)	–	–	–	–	–		
	Undervoltage trip (UVT)	Non-synchronous closing (UVT-N) Synchronous closing (UVT-S)	–	–	–	–	–		
Built-in accessories	Insulation switch	(MG)	–	–	–	–	–		
	Earth-leakage trip alarm	(EAL)	–	–	–	–	–		
	Test button module	(TBM)	–	–	–	–	–		
	Pre-alarm-contact output	(PAL)	–	–	–	–	–		
	Cylinder key lock	–	–	–	–	–	–		
Accessories' connection	with Lead-wire terminal block with Flying leads	(SLT)	–	–	–	–	–		
External accessories	Enclosure	Dustproof	(S)	–	–	–	–	–	
			(I)	–	–	–	–	–	
		Waterproof	(W)	–	–	–	–	–	
	Electrical operation device	(MD)	–	–	–	–	–		
	Mechanical interlock	(MI)	–	–	–	–	–		
	Handle lock device	Handle lock	(HL)	–	–	–	–	–	
			(HL-S)	–	–	–	–	–	
	Lock cover	(LC)	–	–	–	–	–		
	External operating handle	Door mounting	(V)	–	–	–	–	–	
			(S)	–	–	–	–	–	
		Mounted on breaker	(R)	–	–	–	–	–	
	Insulating barrier	Between phase	(BA-F)	–	–	–	–	–	
			(BA-G)	–	–	–	–	–	
To ground		(TC-L)	–	–	–	–	–		
Terminal cover	Large	(TC-S)	–	–	–	–	–		
		(TTC)	–	–	–	–	–		
	Small	(TTC)	–	–	–	–	–		
		Transparent for rear connection for plug-in	(BTC)	–	–	–	–	–	
Automatic tripping device		Hydraulic-magnetic	Thermal-magnetic	Thermal-magnetic	Hydraulic-magnetic	Hydraulic-magnetic	Hydraulic-magnetic		
Trip button		Equipped	Equipped	Equipped	Equipped	Equipped	Equipped		

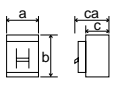
Note \*1: 125A rated current is 3p only.

Rated operational voltage	230–400–440V
Available voltage range	195–484V



# 2. Detailed Specifications








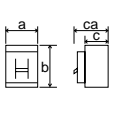
## Motor-Protection Breakers

Frame A				30			50						100			225		
Type name				MB30-SW Available soon			MB50-CW Available soon			MB50-SW Available soon			MB100-SW			MB225-SW		
Rated current In (Amp.) Rated motor capacity: kW  Reference ambient temperature 40°C (45°C for marine applications)				A	200/220V kW	400/440V kW	A	200/220V kW	400/440V kW	A	200/220V kW	400/440V kW	A	200/220V kW	400/440V kW	A	200/220V kW	400/440V kW
				25	5.5	11	45	11	22	7.1	1.5	—	100	—	55	225	55	110
16	3.7	7.5	40	—	18.5	5	—	2.2	90	22	45	200	—	—				
12	—	5.5	32	7.5	15	4	0.75	1.5	71	18.5	37	175	45	90				
10	2.2	—	25	5.5	11	2.5	0.4	—	63	15	30	150	37	75				
8	—	3.7	16	3.7	7.5	2	—	0.75	(40)	—	19	125	30	—				
7.1	1.5	—	12	—	5.5	1.4	0.2	—	32	7.5	15							
5	—	2.2	10	2.2	—	1.2	—	0.4	(25)	5.5	11							
4	0.75	1.5	8	—	3.7	0.8	—	—	(16)	3.7	7.5							
2.5	0.4	—							(12.5)	—	5.5							
2	—	0.75																
1.4	0.2	—																
1.2	—	0.4																
0.8	—	—																
Number of poles				3			3			3			3					
Rated insulation voltage Ui (V)				500			500			500			500					
Rated short-circuit breaking capacities (kA)	IEC60947-2 JIS C 8201-2 (Icu/Ics)	AC	440V	2.5/1			2.5/1			7.5/4			25/13					
			400V	7.5/4			7.5/4			7.5/4			30/15					
			230V	7.5/4			7.5/4			15/8			50/25					
Overall dimensions (mm)			a	75			75			75			90					
			b	130			130			130			130					
			c	68			68			68			68					
			ca	90			90			90			90					
Connection method	Front connection (F)		● Crimp contact			● Crimp contact			● Crimp contact			● Crimp contact						
	Rear connection (B)		● Round stud			● Round stud			● Round stud			● Bar stud						
	Plug-in (PM)		●			●			●			●						

Remark: The products of which rated current is parenthesized will be produced when an order is placed.

# 2. Detailed Specifications

## UL Listed Products

Frame A			100		225		50		100		150		250								
Type name			NF100-CWU		NF225-CWU		NF50-SWU		NF100-SWU		NF-SFW		NF-SJW			NF-HJW					
Photo																					
Rated current I <sub>n</sub> (Amp.) at ambient temperature 40°C (IEC30°C)			50 60 75 100		125 150 175 200 225		5 10 15 20 30 40 50		15 20 30 40 50 60 75 100		15 20 30 40 50 60 70 80 90 100 110 125 150		(125) (150) 175 200 225 250			125 150 175 200 225 250					
Number of poles			2 3		3		2 3		2 3		3		3			3					
Rated short-circuit breaking capacities (kA)	UL489	AC	Rated voltage (V AC)		240		240		240		480Y/277		600Y/347			600Y/347			600Y/347		
			600Y/347V										14			14			18		
			480V										35			35			50		
			480Y/277V								22		35			35			50		
	240V		10		35		10		35		65			65			100				
	JIS C 8201-2 IEC60947-2 (Icu/Ics)	AC	Rated insulation voltage U <sub>i</sub> (V)		600		600		600		690		690			690			690		
			690V								8 / 4		8 / 8			8 / 8			15 / 15		
			500V		7.5 / 4		10 / 5		7.5 / 4		18 / 9		30 / 30			30 / 30			36 / 36		
			440V		10 / 5		15 / 8		7.5 / 4		25 / 13		36 / 36			36 / 36			50 / 50		
			415V		10 / 5		18 / 9		7.5 / 4		30 / 15		36 / 36			36 / 36			50 / 50		
400V			10 / 5		18 / 9		7.5 / 4		30 / 15		36 / 36			36 / 36			50 / 50				
380V			10 / 5		18 / 9		7.5 / 4		30 / 15		36 / 36			36 / 36			50 / 50				
DC	230V		30 / 15		35 / 18		15 / 8		50 / 25		85 / 85			85 / 85			100 / 100				
	250V *3		7.5 / 4		10 / 5				15 / 8		20 / 20			20 / 20			20 / 20				
Compatible to AC/DC *1			●		●		●		●		●			●			●				
Suitability for isolation			●		●		●		●		●			●			●				
Reverse connection			●		●		●		●		●			●			●				
Overall dimensions (mm)		a		60 90		105		50 75		60 90		105			105			105			
		b		150		165		150		150		185			185			185			
		c		68		68		68		68		86			86			86			
		ca		90		92		90		90		110			110			110			
Mass of front-face type (kg)			0.7 0.95		1.5		0.55 0.75		0.7 0.95		2.0		2.0			2.0					
Connection method	Front connection	Crimp contact	(F)	●		●		●		●		●			●						
		Solderless terminal	(SL)	●		●		●		●		●			●						
Accessories #2	Alarm switch		(AL)	●		●		●		●		●			●						
	Auxiliary switch		(AX)	●		●		●		●		●			●						
	Shunt trip		(SHT)	●		●		●		●		●			●						
	Under-voltage trip		(UVT)	●		●		●		●		●			●						
	Vertical lead-wire terminal unit		(SLT)	●		●		●		●		●			●						
External accessories #2	Mechanical interlock		(MI)	●		●		●		●		●			●						
	Handle lock device		(HL)	●		●		●		●		●			●						
	Operating handle	F	●	●		●		●		●		●			●						
		S	●	●		●		●		●		●			●						
		V	●	●		●		●		●		●			●						
	Insulating barrier		(IB)	●		●		●		●		●			●						
	Terminal cover	Large	(TC-L)	●		●		●		●		●			●						
Small		(TC-S)	●		●		●		●		●			●							
IEC 35mm rail fixture											Supplied standardly										
Over current trip means			Thermal - magnetic		Thermal - magnetic		Hydraulic-magnetic		Thermal - magnetic		Thermal - magnetic			Thermal adjustable - magnetic			Thermal adjustable - magnetic				
Trip button			Equipped		Equipped		Equipped		Equipped		Equipped			Equipped			Equipped				
TÜV type approval			●		●		●		●		●			●			●				

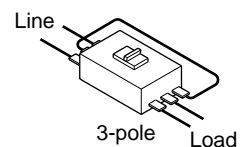
Notes: \*1 The trip action characteristics differ between AC and DC for products that are compatible to both AC and DC.

\*2 Specifications for products with a CE mark differ from those for general-purpose products. Details will be available upon request.

\*3 Use two poles among the three poles in the case of three-pole products. In addition, wiring as shown to the right allows the models of NF100-CWU, NF100-SWU and NF225-CWU to be used for up to 400 V DC and the models of NF-SFW, NF-SJW, and NF-HJW to be used for up to 500 V DC.

\*4 The standard configuration contains a protection cover and adopts the IP20 (finger protection) structure.

Remark: The products of which rated current is parenthesized will be produced when an order is placed.



# 3. MDU Breaker (Measuring Display Unit)

## ■ Summary

The circuit breaker incorporates a digital Measuring Display Unit (MDU). It can measure and display a range of circuit condition data for more efficient energy management.

## ■ Features

- Measuring and displaying the load current, line voltage, harmonic current, power, electric energy and power factor.
- Direct connection to open network CC-Links is possible.
- The measuring VT and CT are installed within the circuit breaker, thus offering savings on space and wiring.

## ■ Appearance



NF250-SWM 3P

## ■ MDU breaker product lineup and measuring display items

Measurement and display items	Applicable type	MCCB
		NF250-SWM
Load current for each phase: present value, demand value, maximum demand value		●
Line voltage: present value		●
Harmonic current: 3, 5, 7, 11, 13, 17, 19th, total harmonics Present value, demand value, maximum demand value		●
Power: present value, demand value, maximum demand value		●
Electric energy: electric energy, time electric energy, maximum time electric energy		●
Power factor: present value		●

## ■ Specifications

Series			S series	
Group			WSS MDU	
Frame size			250	
Type name			NF250-SWM	
Rated current I <sub>n</sub> (Amp.)			125 150 175 200 225 250	
Rated ambient temperature (°C)			40	
Number of poles			3, 4	
Supply system			3ø3W, 1ø3W for 3 poles, 3ø4W for 4 poles (1ø2W available for 3 poles)	
Rated insulation voltage U <sub>i</sub> (V)			690	
Rated short-circuit breaking capacities (kA)	IEC60947-2 (I <sub>cu</sub> /I <sub>cs</sub> )	AC (50/60Hz)	500V	15/8
			440V	25/13
			415V	30/15
			400V	30/15
			380V	30/15
			240V	50/25
			230V	50/25
Connection			Front type (F), Rear type (B) *1	
Transmission (option) *2		Pulse output	Solid-state relay (SSR), no-voltage a contact, DC24V/AC100–200V 20mA Output pulse unit: 1–10–100–1000–10000kWh/pulse set, pulse width 0.35–0.45 sec.	
		CC-Link	Load current, Line voltage, Harmonic current, Power, Electric energy, Power factor	
Maximum measuring current (Amp.)			500	
Maximum measuring voltage			690V AC	
MDU control power supply			(For 100–240V AC/DC, allowable voltage range: 85%–110%) 12VA (Use a fuse with a 4A rated current or larger) *3	

Notes: \*1 Apply the MDU panel mounting type when the breaker is to be on the back.

\*2 With pulse output attached type and CC-Link attached type cannot be used at the same time.





\*3 Use a separate power supply when CC-Link attached type is used. Use (insulating transformers) (12VA/unit) when connecting directly to the main circuit.

# 4. Connection Method

## 1. Connection Types

The front connection model will be delivered unless otherwise specified. Notice, however, that you can convert the front connection model to other types (excluding the plug-in) by using an appropriate connection component, which is separately available.

Table 4-1: Connection Types

Connection Method (Abbreviation)	Front connection (F)	Solderless terminal	Rear connection (B)	Plug-in (PM)
Appearance			 *1	

Note \*1: Rear studs are bar studs for the models of 125A, 160A and 250A of frame size, and round studs for other types of models.

## 2. Connection Accessories

Table 4-2: List of Connection Accessories

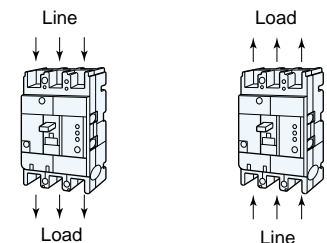
Type name		Solderless terminal (SL)	Rear studs (B-ST)	Plug-in (PM) *1
NF32-SW, NF63-CW/SW/HW	2P		ST-05SW2	PM-05SW2
NF32-SW, MB30-SW, MB50-CW/SW, NF63-CW/SW/HW, NV32-SW, NV63-CW/SW/HW	3P		ST-05SW3	PM-05SW3
NF63-SW/HW	4P		ST-05SW4	PM-05SW4
NF125-CW/SW	2P		ST-1SW2	PM-1SW2
NF125-HW	2P	SL-1SW4	ST-1HW2	PM-1HW2
NF125-CW/SW/HW, MB100-SW, NV125-CW/SW/HW	3P	SL-1SW3	ST-1SW3	PM-1SW3
NF125-RW/UW, NV125-RW	3P			PM-1UW3
NF125-SW/HW/UW, NV125-SW/HW	4P	SL-1SW4	ST-1SW4	PM-1SW4
NF125-UW	4P			
NF250-CW/SW/HW, NF160-SW/HW	2P	SL-1SW4	ST-2SW2	PM-2SW2
NF250-CW/SW/HW, MB225-SW, NF160-SW/HW, NV250-CW/SW/HW/RW/SEW/HEW	3P	SL-2UW3	ST-2UW3	PM-2SW3
NV250-RW	3P			
NF250-SW/HW, NF160-SW/HW, NV250-SW/HW/SEW/HEW	4P	SL-1SW4	ST-2SW4	PM-2SW4
NF250-SGWHGW, NF160-SGWHGW, NF125-SGWHGW	2P	SL-2GSW4	ST-2GSW2	PM-2GSWIP2 *2
NF250-RGW/UGW, NF125-RGW/UGW	2P			PM-2SW2
NF250-SGWHGW, NF160-SGWHGW, NF125-SGWHGW	3P	SL-2GSW3	ST-2GSW3	PM-2GSWIP3 *2
NF250-RGW/UGW, NF125-RGW/UGW	3P			PM-2SW3
NF250-SGWHGW, NF160-SGWHGW, NF125-SGWHGW	4P	SL-2GSW4	ST2GSW4	PM-2GSWIP4 *2
NF250-UGW, NF125-UGW	4P			

Notes: \*1 You can use the plug-in terminal unit (PM) when the wiring of terminal units is required in advance, and the delivery of both the main body and the components at the same time, which is normal, is not allowed. Furthermore specify the nonuse of plug-in terminal (PM-N) for the connection of circuit breaker.  
\*2 IP20 with safety device.

## 3. Connection of Line and Load

The standard wiring of line and load on the circuit breaker is (a) normal connection shown on the right. Avoid the wiring shown in (b) reverse connection, which may lead to the decrease in breaking performance. However, the reverse connection is allowed for the following models (except NF and NV models with MDU).

NF-C series, NF-S series, NF-H series, NF-U series, MB series, C · S series of NV400-800A Frame	Reverse connection is allowed for the standard models.
---	--



Normal connection (a) Reserve connection (b)

Normal and reverse connection methods

# 5. Accessories

## Internal Accessories

### 1. Accessories

Table 5-1: Accessories

Internal accessories	Function	Applicable models	Cassette-type of accessories
<b>AL</b> Alarm switch	A switch that electrically indicates the trip status of the circuit breaker.	NF-C·S·H·U, NV-C·S·H·U and MB series	●
<b>AX</b> Auxiliary switch	A switch that electrically indicates the ON-OFF status of the circuit breaker.		●
<b>SHT</b> Shunt trip	A device that electrically trips the circuit breaker from a remote distance. Permissible working voltages are 70 to 110% of the AC rated voltage or 70 to 125% of the DC rated voltage.	NF-C·S·H·U and MB series	●
<b>UVT</b> Undervoltage trip	A device that automatically trips the circuit breaker if the voltage is lowered. Working voltages are 70 to 35% of the UVT rated voltage. When the voltage recovers to 85% or higher, you can reset the device and put into operation.	NF-C·S·H·U, (Note 1) NV-C·S·H·U and MB series	●
<b>EAL</b> Earth-leakage alarm switch	A switch that electrically indicates the trip status of the earth leakage circuit breaker caused by a ground fault. This switch is available only for models with the vertical lead-wire terminal unit (SLT).	NV-C·S·U	-
<b>TBM</b> Test button module	This module allows you a remote testing by applying a voltage. An external sequence common to SHT can be used. (The standard configuration requires the vertical lead-wire terminal unit (SLT).)	NV-C·S·U	-
<b>MG</b> Insulation switch	The incorporation of this switch enables the measurement of insulation resistance between the terminals of the load with the circuit breaker being turned OFF.	NV-C·S·U	-

Note: (1) Models NV250-SEW/HEW are excluded.

Remark: (1) Accessory terminals are marked by both IEC-based terminal symbols and conventional symbols, like 98/ALa.

### 2. Switch Operation and Rating

Table 5-2: AL Switch Operation

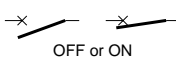
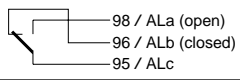
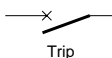
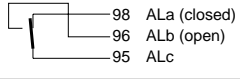
Circuit breaker status	AL switch contact
 OFF or ON	
 Trip	

Table 5-3: AX Switch Operation

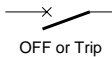
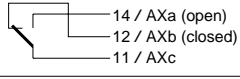
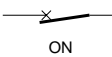
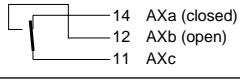
Circuit breaker status	AX switch contact
 OFF or Trip	
 ON	

Table 5-4: EAL Switch Operation

Circuit breaker status	EAL switch contact
Over current trip, short circuit trip, ON, OFF	EALa (open) EALc
Ground fault trip	EALa (closed) EALc

Table 5-5: MG Switch Operation

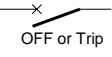
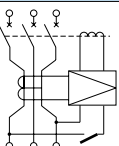
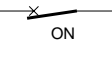
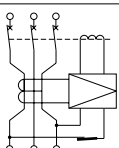
Circuit breaker status	MG switch status
 OFF or Trip	
 ON	

Table 5-6: AL and AX Switch Rating

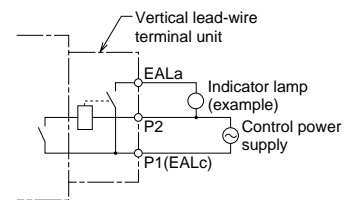
Switch type	AC			DC		
	Voltage (V)	Current (A)		Voltage (V)	Current (A)	
		Resistive load	Inductive load		Resistive load	Inductive load
S	460	-	-	250	0.2	0.2
	250	3	2	125	0.4	0.4
	125	5	3	30	4	3

Please contact us for applications in the field of smaller current values.

Table 5-7: EAL Switch Rating

Voltage (V)	AC	
	Current A	
	Resistive load	Inductive load
200	3	2
100	3	2

A control power supply (compatible to 100 and 200V AC) is required; see the diagram on the right showing its wiring. (The permissible range of voltage of the control power supply is 80 to 242V AC, and the power requirement is 10VA.)





### 3. Combinations of Accessories



**Table 5-8: Combinations of Accessories**

Series	NF-C · S · H · U, MB		NV-C · S · H · U
	Type name	Accessories	Accessories
	NF32-SW NF63-CW/SW/HW NF125-CW/SW	NF32-SW(3P) NF63-CW/SW/HW(3P) NF125-CW(3P), NF125-SW(3P, 4P) NF125-HW, NF125-SGW/HGW NF125-RGW/UGW NF160-SW/SW/SW/HW/HGW NF250-CW/SW/HW NF250-SGW/HGW NF250-RGW/UGW MB30-SW, MB50-CW/SW MB100-SW, MB225-SW	NV32-SW NV63-CW/SW/HW NV125-CW/SW/HW NV250-CW/SW/HW NV250-SEW/HEW NV125-RW, NV250-RW
	2-pole	2-pole, 3-pole, 4-pole	2-pole, 3-pole, 4-pole
AL			
AX			
AL+AX		(Note 1)	(Note 1)
SHT or UVT	(Note 2)	(Note 2) (Note 3)	(Note 2) (Note 4) (Note 6)
AL+SHT or UVT		(Note 2)	
AX+SHT or UVT		(Note 2)	
AL+AX+SHT or UVT		(Note 1) (Note 2)	
MG			
AL+MG			
AX+MG			
EAL			(Note 5)
TBM			

- Notes: (1) Second AX can substitute the AL on the left-pole.  
 (2) Models with UVT require a UVT voltage module to be installed on the lead-wire terminal unit. (No such voltage module is required for SHT.) Part of UVT accessories is not of cassette type. (Details will be available upon request.)  
 (3) UVTs for left-pole installation can be produced, if specified, for frame current values of 32, 63 and 125A (excluding SGW/HGW/RGW/UGW).  
 (4) SHT cannot be installed.  
 (5) EALs are available only for models with the vertical lead-wire terminal unit (SLT). Specify a control power supply of either 100 or 200 V AC.  
 (6) Models NV250-SEW/HEW are not allowed to install the UVT device.

- Remarks: (1) Circled numbers indicate the order of installation.  
 (2) Accessories of EAL, and TBM can be installed independent of installations of AL, AX, and MG. (Two units among EAL, and TBM cannot be installed at the same time.)

# 5. Accessories

## Internal Accessories

### 4. Shunt Trip (SHT)

Table 5-9: Standard Coil Rating

Series		Cut-off switch	Voltage (V)	Input power requirement (VA) (Note 1)		Operating time (ms) (Note 2)
				AC	DC	
NF-C·S·H·U MB	32(30)·63A Frame 125A Frame (NF125-SGW/HGW/RGW/UGWare excluded)	Equipped	AC100-240 380-550 (Compatible to 50 and 60Hz.) DC100-125	120	50	15 or less
				60		

Notes: (1) Secure a sufficient input power so that the voltage will not drop below the permissible lower working voltage (70% of the lowest rated voltage).  
(2) The operating time denotes the time from when the rated voltage is applied to SHT until when the main contact of the breaker starts to open.

### 5. Undervoltage Trip (UVT)

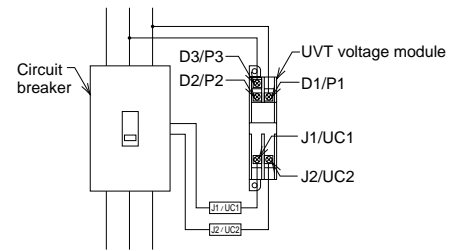
Table 5-10: Standard Coil Rating

Series	Voltage (V) (Note 1)	Input power (VA)	Operating time (ms) (Note 2) (Note 3)
All models	AC100-110/120-130 selectable 200-220/230-250 selectable 380-415/440-480 selectable (Compatible to 50 and 60Hz.) DC100/110 selectable	5	30 or less

Notes: (1) A desired voltage can be selected by changing the terminal wiring.  
(2) The operating time denotes the time from when no voltage is applied to UVT until when the main contact of the breaker starts to open.  
(3) Time-delayed types can be produced. Details will be available upon request.

#### ● UVT Voltage Module

The UVT voltage module is normally installed on the vertical lead-wire terminal unit (SLT). (A separate-mount type can be produced upon request.)



UVT Voltage Module Wiring Diagram  
(Lead-Wire Connection)

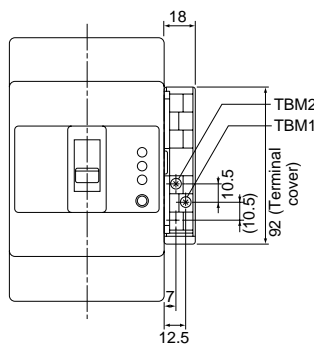
### 6. Test Button Module (TBM)

- The effect of pressing the test button on the breaker main body is produced while the input control voltage is applied. (Apply the voltage for more than two seconds for the breaker main body of time-delayed NV models.)
- The model with the vertical lead-wire terminal unit (SLT) is standard.

Table 5-11

Series	NV-C·S·H·U
Input rated control voltage (V)	Compatible to AC100-240/ DC100-240 (DC24) (Note 1)
Input control power (VA)	1VA or less

Note: (1) The specifications of 100-240V AC/100-240V DC are standard unless otherwise specified. The specifications of 24 V DC are available if requested.



### 7. Lead-wire Specifications

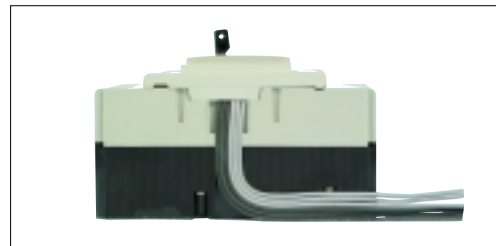
Table 5-12

Type	Size	Length	Marking	Ring-mark example
Heat-resistant wire	0.5mm <sup>2</sup>	(Note 1) 450mm	A ring-mark marked by the terminal symbol is attached to each lead-wire.	[98/ALa], [96/ALb], [95/ALc] [C1/S1], [C2/S2]

Note: (1) The length is 400 mm for the model of four-pole, right-pole installation.

- Lead wires are normally extended laterally.
- Grooves are provided standardly on the side face of the breaker, allowing the extension of the lead wires along them. (Note 1)

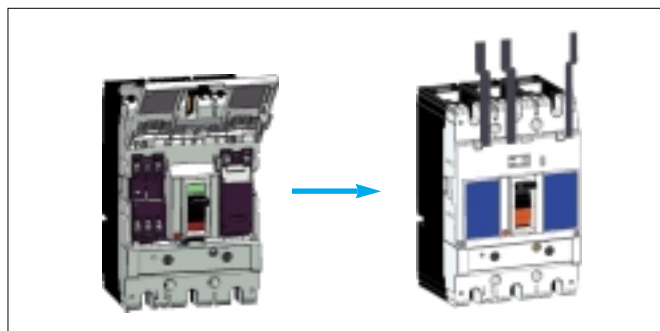
Note: (1) The models of NF125-SGW/HGW/RGW/UGW, NF160-SGW/HGW, NF250-SGW/HGW/RGW/UGW are excluded.



### 8. Internal Terminal Type (INT)

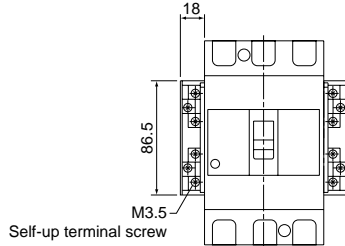
- This unit is an internal accessory that is provided with terminal screws for lead-wire connection.

Remark: (1) Available for the models of NF125-SGW/HGW/RGW/UGW, NF160-SGW/HGW, NF250-SGW/HGW/RGW/UGW.



## 9. Vertical Lead-wire Terminal Block (SLT)

- The circuit breaker can be mounted, being closely fitted to the unit.
- Terminal screws are arranged in a zigzag pattern, and screws can be tightened further after wiring.
- A terminal cover is provided standardly.
- This unit supports the models of front connection, rear connection, and plug-in type (excluding PLT).



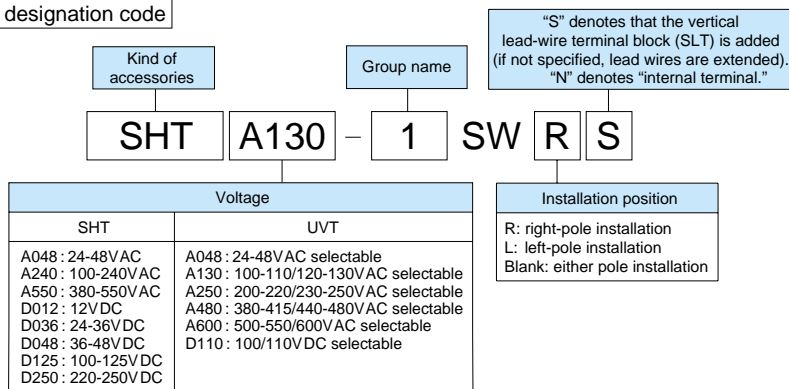
## 10. Cassette-type Accessories

- Cassette-type of accessories can be mounted onto and demounted from the circuit breaker by users themselves.

Table 5-13: Cassette Types of Accessories

Applicable models	Group name	Kind of accessories					
		AL	AX	AL + AX	SHT (Note 1)	UVT (UVTN or UVTS) (Note 2)	
NF32-SW, NF63-CW/SW/HW NV32-SW, NV63-CW/SW/HW MB30-SW, MB50-SW	05	AL-05SWL(S) AL-05SWR(S)	AX-05SWL(S) AX-05SWR(S)	ALAX-05SWL(S) ALAX-05SWR(S)	SHTA240-05SWR(S) SHTA550-05SWR(S) SHTD125-05SWR(S)	UVTNA130-05SWR(S) UVTNA130-05SWL(S) UVTNA250-05SWR(S) UVTNA250-05SWL(S)	UVTNA480-05SWR(S) UVTNA480-05SWL(S) UVTND110-05SWR(S) UVTND110-05SWL(S)
NF125-CW/SW/HW NV125-CW/SW/HW/RW MB100-SW	1	AL-1SW AL-1SWLS AL-1SWRS	AX-1SW AX-1SWLS AX-1SWRS	ALAX-1SW ALAX-1SWLS ALAX-1SWRS	SHTA240-1SWR(S) SHTA550-1SWR(S) SHTD125-1SWR(S)	UVTNA130-1SW UVTNA130-1SWLS UVTNA250-1SW UVTNA250-1SWRS UVTNA250-1SWLS UVTNA480-1SW UVTNA480-1SWLS UVTNA480-1SWRS UVTND110-1SW UVTND110-1SWRS	UVTND110-1SWRS UVTND110-1SWLS UVTSA130-1SW UVTSA130-1SWRS UVTSA250-1SW UVTSA250-1SWRS UVTSA480-1SW UVTSA480-1SWRS UVTSD110-1SW UVTSD110-1SWRS
NF250-CW/SW/HW NF160-SW/HW NV250-CW/SW/HW/RW/SEW/HEW	2	AL-2SWL(S) AL-2SWR(S)	AX-2SWL(S) AX-2SWR(S)	ALAX-2SWL(S) ALAX-2SWR(S)	SHTA240-2SWR(S) SHTA550-2SWR(S) SHTD125-2SWR(S)	UVTNA130-2SWR(S) UVTNA130-2SWL(S) UVTNA250-2SWR(S) UVTNA250-2SWL(S)	UVTNA480-2SWR(S) UVTNA480-2SWL(S) UVTND110-2SWR(S) UVTND110-2SWL(S)
NF250-SGW/HGW/RGW/UGW NF160-SGW/HGW NF125-SGW/HGW/RGW/UGW	2G	AL-2GSWL(S) AL-2GSWR(S) AL-2GSWN	AX-2GSWL(S) AX-2GSWR(S) AX-2GSWN	ALAX-2GSWL(S) ALAX-2GSWR(S) ALAX-2GSWN	SHTA240-2GSWR(S) SHTA550-2GSWR(S) SHTD125-2GSWR(S) SHTA240-2GSWRN SHTA550-2GSWRN SHTD125-2GSWRN	UVTSA130-2GSWR(S) UVTSA250-2GSWR(S) UVTSA480-2GSWR(S) UVTSD110-2GSWR(S)	UVTSA130-2GSWRN UVTSA250-2GSWRN UVTSA480-2GSWRN UVTSD110-2GSWRN

### Model designation code



Notes: (1) NV models are excluded.

(2)	UVTN	Non-Synchronous closing
	UVTS	Synchronous closing

With the UVTS model, the breaker can be reset even if the voltage is not applied.  
NF250-SEW/HEW models cannot be produced.

Remarks: (1) Refer to Combinations of Accessories for details of combinations and poles.

(2) A cassette type of AL cannot be installed on circuit breakers with MG switch.

## 11. Pre-alarm Modules (PAL)

- The PAL can be installed on the right side face of electronic circuit breaker.

Table 5-14

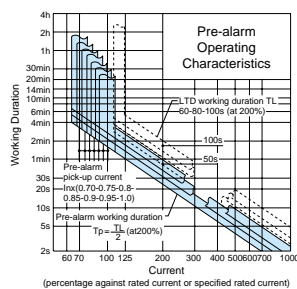
	Pre-alarm SSR output	Pre-alarm module (mechanical contact output) (Note 2)
NF125-SGW/HGW NF160-SGW/HGW NF250-SGW/HGW	Option	Option (Note 1)
NV250-SEW/HEW	• (Note 3)	Option (Note 1)

Notes: (1) A control power supply (compatible to 100–200V AC) is required.

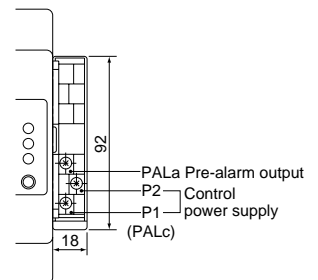
(2) An additional accessory cannot be installed on the right pole in this case.

(3) LED indicate only

### •Pre-alarm Characteristics



### •Pre-alarm Module



The self-hold type is standard, but an automatic-reset type can be produced upon request.



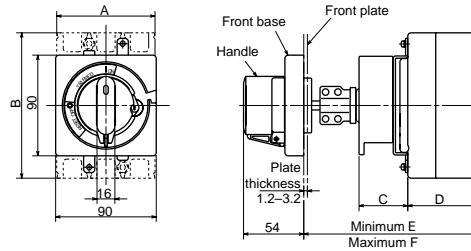
### 3. V-type Operating Handle

● Appearance (Color N1.5)

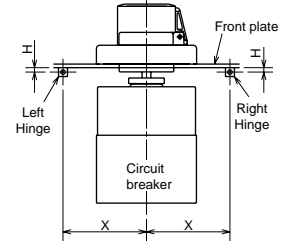


- This handle in conjunction with the breaker main enables the isolation function effective.
- The safety standards of EN Standards (EN60204-1) are satisfied.
- Degrees of protection (IEC60529) IP65 is satisfied standardly.
- OFF-position lock only is available for up to three commercial padlocks (ø8).
- A door-lock mechanism allows the door to be opened at OFF-position only.

#### ● Outside Dimension Diagram



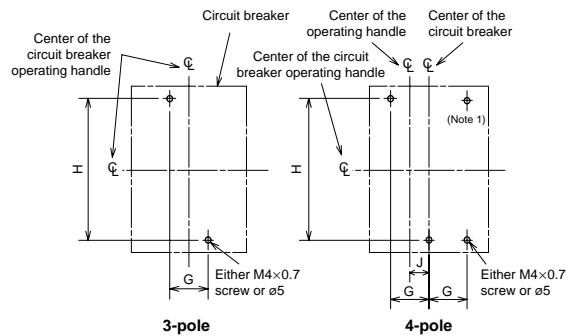
#### Center of Hinge and Circuit Breaker



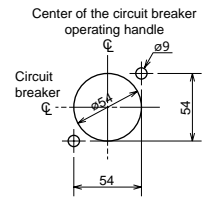
H	X
0 or higher	(5H+100) or higher

The above illustration shows a view of the hinges and the circuit breaker when viewed from the direction of the load.

#### ● Mounting-hole Drilling Dimension Diagram



#### ● Front Plate Drilling Dimension Diagram



Note 1: The drilling at this position is not required for the models of both V2GSW and V2GSWF.

Table 5-17: Summary of Dimensions

Type name	Applicable models	Number of poles	Dimensions (mm)								
			A	B	C	D	E	F	G	H	J
(Note 2) (Note 3) V05SWF	NF32-SW, NF63-CW/SW/HW, NV32-SW NV63-CW/SW/HW, MB30-SW MB50-CW/SW	3P	75	130	44	61	125		25	111	12.5
		4P									
V1SW (Note 2) V1SWF	NF125-CW/SW/HW, NV125-CW/SW/HW MB100-SW	3P	90	130	44	61	154	518	30	111	15
		4P					125				
V2SW (Note 2) V2SWF	NF160-SW/HW, NF250-CW/SW/HW, NV250-CW/SW/HW NV250-SEW/HEW, MB225-SW	2P, 3P	105	165	46	61	154	518	35	126	17.5
		4P					125				
V2GSW (Note 2) V2GSWF	NF125-SGW/HGW, NF160-SGW/HGW, NF250-SGW/HGW	3P	105	165	46	79	172	536	35	126	17.5
		4P					143				

Notes: (1) This hole is not required for two and three poles.

(2) The last letter of "F" of the type designations of V-type operating handles denotes a fixed type. Attach the letters of "4P" to the end of designation for four-pole models of circuit breaker main body.

(3) Adjustable types can be produced upon request. Please contact us for details.

Remark: (1) You may contact us for details of the V-type operating handle for the U series.

\* Equipped with cylinder key (option) to prevent deliberate operation.

# 5. Accessories

## External Accessories

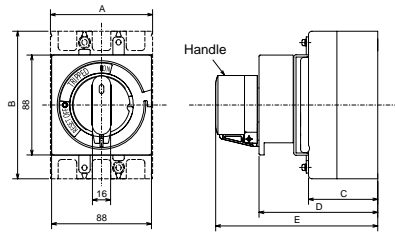
### 4. R-type Operating Handle

- Appearance (Color N1.5)

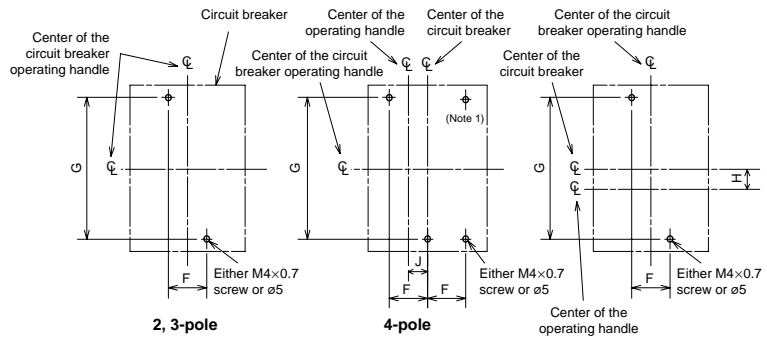


- This handle in conjunction with the breaker main enables the isolation function effective.
- OFF-position lock only is available for up to three commercial padlocks (ø8).
- Equipped with cylinder key (option) prevent deliberate operation.

- Outside Dimension Diagram



- Mounting-hole Drilling Dimension Diagram



Note 1: The drilling at this position is not required for the models of R2GSW.

Table 5-18: Summary of Dimensions

Type name	Applicable models	Number of poles	Dimensions (mm)								
			A	B	C	D	E	F	G	H	J
R1SW	NF125-CW, NF125-SW, NF125-HW NV125-CW, NV125-SW, NF125-HW	3P	90	130	61	105	142	30	111	—	—
		4P	120								15
R1UW	NV125-RW	3P	90	191	61	105	142	30	172	30.5	—
R2SW	NF160-SW, NF160-HW, NF250-CW, NF250-SW, NF250-HW NV250-CW, NV250-SW, NF250-HW, NV250-SEW NV250-HEW	2P, 3P	105	165	61	107	144	35	126	—	—
		4P	140								17.5
R2UW	NV250-RW	3P	105	240	61	107	144	35	201	37.5	—
R2GSW	NF125-SGW, NF125-HGW, NF160-SGW, NF160-HGW, NF250-SGW, NF250-HGW	2P, 3P	105	165	79	125	162	35	126	—	—
		4P	140								17.5
R2GUW	NF125-RGW, NF125-UGW, NF250-RGW, NF250-UGW	3P	105	240	79	125	162	35	201	37.5	—

\* Equipped with cylinder key (option) to prevent deliberate operation.

Remark: (1) You may contact us for details of the V-type operating handle for the U series.

### 5. Circuit Breaker Box and Box-type Circuit Breaker

Table 5-19: Types and Specifications

	Dustproof (S)	Dustproof (I)	Waterproof (W)
Appearance			
Degrees of protection (IEC60529)	IP3X	IP4X	IP54
Number of poles	2P, 3P	2P, 3P	3P
NF32-SW, NF63-CW/SW/HW, NV32-SW NV63-CW/SW/HW, MB30-SW, MB50-CW/SW	NFS-05SW (Note 1)	NFI-05SW	NFW-05SW
NF125-CW/SW, NV125-CW/SW, MB100-SW	NFS-1SW (Note 1)	NFI-1SW	NFW-1SW
NF125-HW, NV125-HW			NFW-1HW
NF160-SW, NF250-CW/SW, NV250-CW/SW, NV250-SEW, MB225-SW	NFS-2SW	NFI-2SW	NFW-2SW
NF160-HW, NF250-HW, NV250-HW, NV250-HEW	-		NFW-2SW
NF125-SGW/HGW, NF160-SGW/HGW, NF250-SGW/HGW	-	NFI-2GSW	NFW-2GSW

Note: (1) Attach the letters of "2P" to the end of type designation when the circuit breaker of external two poles.

Remarks: (1) Use your working current by 80% and under of rated current.  
(2) The dustproof type (I) is not suitable for isolation.

## 6. Terminal Cover

Table 5-20

Breaker type			Large terminal cover (TC-L)	Small terminal cover (TC-S)	Transparent terminal cover (TTC)	Rear terminal cover (BTC)	Plug-in terminal cover (PTC)
NF32-SW, NF63-CW/SW/HW	2P	IP20	(Note 1) TCL-05SW2W (50 × 65.5 × 25)	(Note 1) TCS-05SW2W (50 × 65.5 × 5)	(Note 1) TTC-05SW2 (50 × 65.5 × 25)	BTC-05SW2W (50 × 65.5 × 5)	PTC-05SW2W (50 × 65.5 × 6.5)
NF32-SW, NF63-CW/SW/HW NV32-SW, NV63-CW/SW/HW, MB30-SW MB50-CW/SW	3P		(Note 2) TCL-05SW3W (75 × 65.5 × 25)	(Note 2) TCS-05SW3W (75 × 65.5 × 5)	(Note 2) TTC-05SW3 (75 × 65.5 × 25)	BTC-05SW3W (75 × 65.5 × 5)	PTC-05SW3W (75 × 65.5 × 6.5)
NF125-CW/SW/HW	2P		(Note 1) TCL-1SW2W (60 × 65.5 × 40)	(Note 1) TCS-1SW2W (60 × 65.5 × 6.5)	(Note 1) TTC-1SW2 (60 × 65.5 × 40)	BTC-1SW2W (60 × 65.5 × 6.5)	PTC-1SW2W (60 × 65.5 × 6.5)
NF125-CW/SW/HW, NV125-CW/SW/HW, NV125-RW, MB100-SW	3P		(Note 2) TCL-1SW3W (90 × 65.5 × 40)	(Note 2) TCS-1SW3W (90 × 65.5 × 6.5)	(Note 2) TTC-1SW3 (90 × 65.5 × 40)	BTC-1SW3W (90 × 65.5 × 6.5)	PTC-1SW3W (90 × 65.5 × 6.5)
NF160-SW/HW, NF250-CW/SW/HW, NV250-CW/SW/HW, NV250-SEW/HEW, NV250-RW MB225-SW	2P 3P		(Note 2) TCL-2SW3W (105 × 65.5 × 40)	(Note 2) TCS-2SW3W (105 × 65.5 × 6.5)	(Note 2) TTC-2SW3 (105 × 65.5 × 40)	BTC-2SW3W (105 × 65.5 × 6.5)	PTC-2SW3W (105 × 65.5 × 6.5)
NF125-SGW/HGW/RGW/UGW, NF160-SGW/HGW NF250-SGW/HGW/RGW/UGW	2P 3P		IP40	(Note 2) TCL-2GSW3W (105 × 84 × 40)	(Note 2) TCS-2GSW3W (105 × 84 × 6.5)	(Note 2) TTC-2GSW3 (105 × 84 × 40)	BTC-2GSW3W (105 × 84 × 6.5)

Notes: (1) Attach the letter "F" to the end of model designation for models with F-type operating handle. (Those are F-type operating-handle dedicated models, and screws are used for fixing.)  
 (2) An F-type operating handle can be installed standardly.

Remarks: (1) Parenthesized numbers denote the outside dimensions (A×B×C in mm).  
 (2) The terminal cover for a four-pole model can be produced upon request.

## 7. Electrical Operation Device

Table 5-21: Summary of Model Designations

Applicable models (Note 1)		NF125-CW(3P) NF125-SW(3P, 4P) NF125-HW	NF160-SW/HW NF250-CW/SW/HW	NF125-SGW/HGW NF160-SGW/HGW NF250-SGW/HGW	NV125-CW/SW/HW	NV250-CW/SW/HW	NV250-SEW/HEW
Rated operating voltage	24V DC	MDS024-NF1SWE	MDS024-NF2SWE	MDS024-NF2GSWE	MDS024-NV1SWE	MDS024-NV2SWE	MDS024-NVE2SWE
	Compatible to 100-240V AC/100-250V DC	MDSAD240-NF1SWE	MDSAD240-NF2SWE	MDSAD240-NF2GSWE	MDSAD240-NV1SWE	MDSAD240-NV2SWE	MDSAD240-NVE2SWE

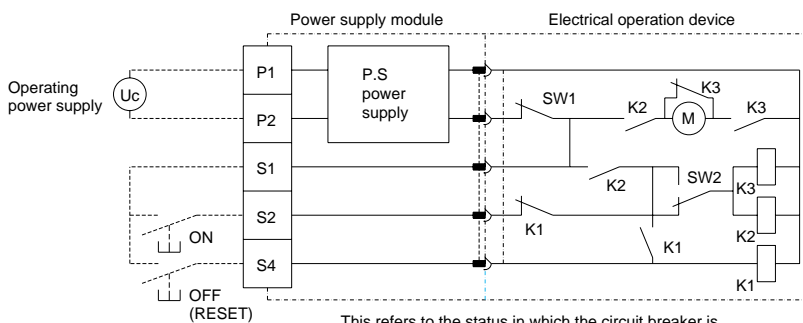


Table 5-22: Specifications

Rated operating voltage (Allowable voltage range 85-110%)		24V DC	Compatible to 100-240V AC/100-250V DC
Operating time (s)	ON action	0.05-0.1	
	OFF action	0.6 or less	
	Charging action	1.2 or less	
Power requirement (VA)		150	

Note: (1) Place an order of other models in conjunction with the circuit breaker.

Remarks: (1) The standard terminal cover can be used.  
 (2) Please contact us for details of the outside dimensions.



This refers to the status in which the circuit breaker is OFF and the electrical operation device is charged.

P.S	Switching power supply (100-240V AC/100-250V DC model only)
SW1	Automatic/manual selection switch
SW2	Charge/Discharge Sensing switch
(M)	Motor
K1	Relay (OFF)
K2	Relay (Motor)
K3	Relay (Motor)

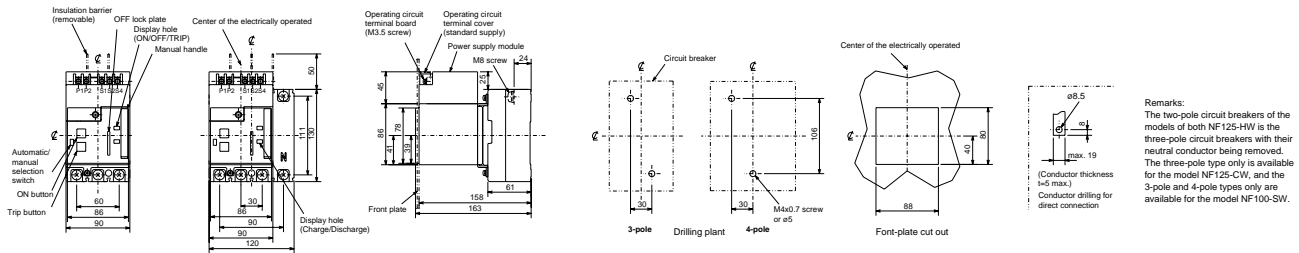
# 5. Accessories

## External Accessories

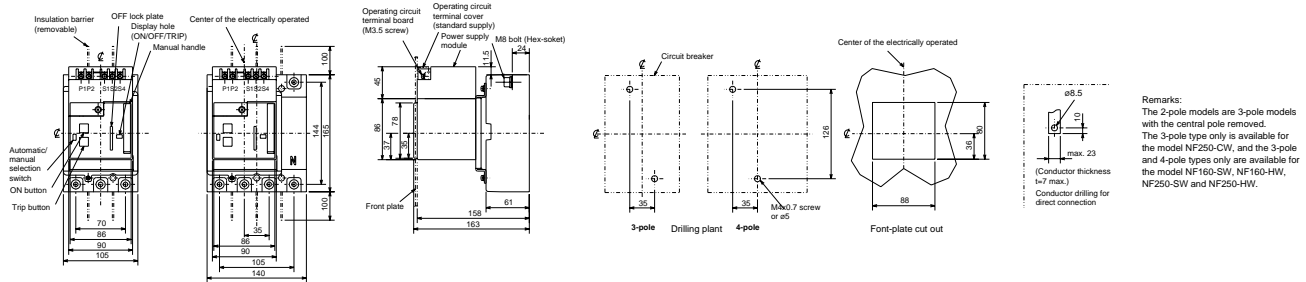
### Dimensions

#### Front connection

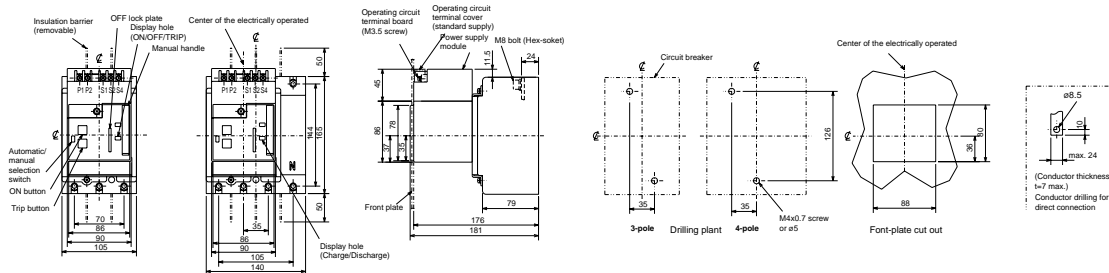
#### ● NF125-CW, NF125-SW, NF125-HW



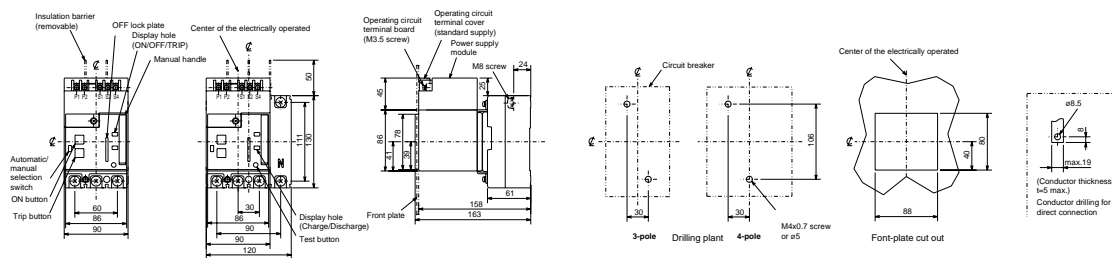
#### ● NF160-SW, NF160-HW, NF250-CW, NF250-SW, NF250-HW



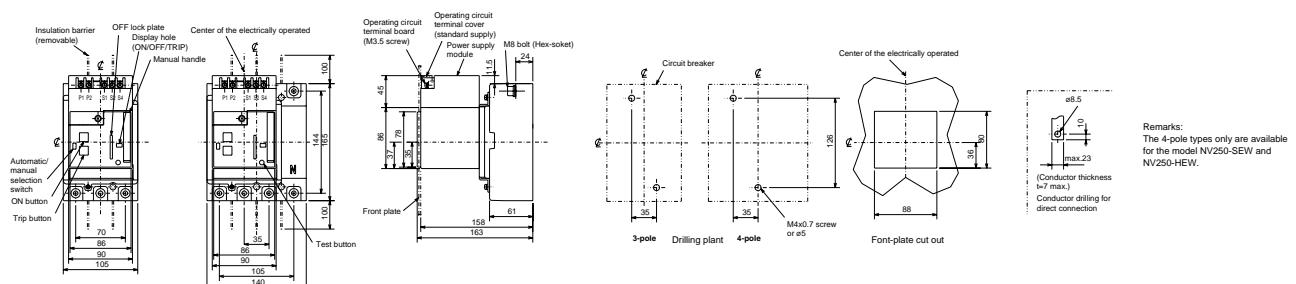
#### ● NF125-SGW, NF125-HGW, NF160-SGW, NF160-HGW, NF250-SGW, NF250-HGW



#### ● NV125-CW, NV125-SW, NV125-HW



#### ● NV250-SEW, NV250-HEW





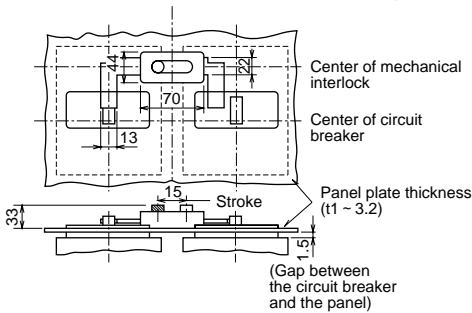
## 8. Mechanical Interlocks (MI)

Table 5-23

Applicable models	Number of poles	Panel mounting		Direct mount on circuit breaker
		Front connection, Rear connection, Plug-in	Dimension A mm	
NF32-SW, NF63-CW/SW/HW	2P	MI-05SW3	47.5	-
NF32-SW, NF63-CW/SW/HW, NV32-SW, NV63-CW/SW/HW, MB30-SW, MB50-CW/SW	3P		-	MI-05SWFB3
NF63-SW/HW	4P	MI-05SW4	45	-
NF125-CW/SW/HW	2P	MI-05SW3		-
NF125-CW/SW/HW, NV125-CW/SW/HW, MB100-SW, NV125-RW	3P		MI-1SW4	MI-1SWFB3
	4P	-	-	
NF160-SW/HW, NF250-CW/SW/HW, NV250-CW/SW/HW, NV250-SEW/HEW, MB225-SW, NV250-RW	2P	MI-05SW3	-	MI-2SWFB3
	3P			-
NF160-SW/HW, NF250-SW/HW, NV250-SW/HW/SEW/HEW	4P	MI-2SW4	-	-
NF125-SGW/HGW/RGW/UGW, NF160-SGW/HGW, NF250-SGW/HGW/RGW/UGW	3P	MI-2SGW3	-	MI-2SGW3
NF125-SGW/HGW/UGW, NF160-SGW/HGW, NF250-SGW/HGW/UGW	4P	MI-2SGW4	-	-

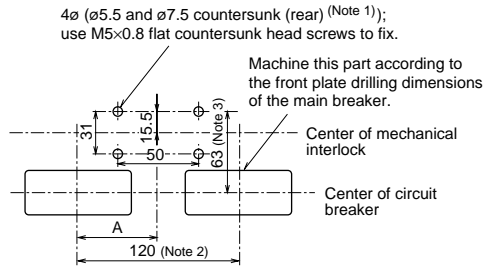
### ● Outside Dimension Diagram

(Front connection, Rear connection, and Plug-in)



### ● Drilling Dimension Diagram

(Front connection, Rear connection, and Plug-in)



- Notes: (1) When the panel plate thickness is 2.3 or more, prepare four holes (ø5.5 and ø9.5 countersunk (rear)).  
 (2) These are standard dimensions for 2- and 3-pole models, but can be altered upon request.  
 (3) The U series have different dimensions. Please contact us for details.

- Remarks: (1) Please contact us for outside dimensions of other models of different specifications.  
 (2) These are not isolation-compatible.

## 9. Handle Lock Devices and Card Holder

Table 5-24

Description	Lock cover (LC)	Handle lock (HL)	Handle lock (HL-S) (Note 2)	OFF Lock with 3 Padlock	Card holder	
Appearance						
NF32-SW, NF63-CW/SW/HW	2P	(Note 1)	HLS-05SW2P	-	CH-P No.5	
NF32-SW, NF63-CW/SW/HW, NV32-SW, NV63-CW/SW/HW, MB30-SW, MB50-CW/SW	3P	LC-05SW	HLF-05SW HLN-05SW			HLS-05SW
NF63-SW/HW	4P	LC-1SW	HLF-1SW HLN-1SW			HLS-1SW2P
NF125-CW/SW/HW	2P					HLS-1SW
NF125-CW/SW, NV125-CW/SW/HW, MB100-SW, NV125-RW	3P	LC-2SW	HLF-2SW HLN-2SW			HLS-2SW
NF125-SW/HW, NV125-SW/HW	4P					HLS-2GSW
NF160-SW/HW, NF250-CW/SW/HW, NV250-CW/SW/HW, NV250-SEW/HEW, MB225-SW, NV250-RW	2P 3P 4P	LC-2GSW	HLF-2GSW (Note 1) HLN-2GSW			HLS-2GSW
NF125-SGW/HGW, NF160-SGW/HGW, NF250-SGW/HGW	3P, 4P					

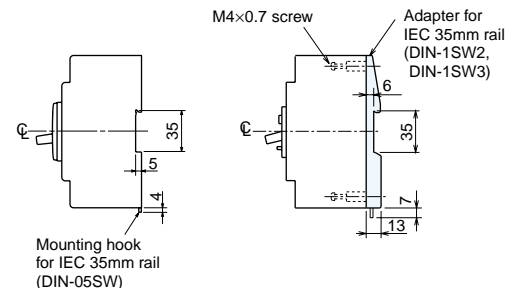
- Notes: (1) HLF types are used for OFF-lock, and HLN types for ON-lock.  
 (2) HL-S types are used for OFF-lock.

Remark: (1) Users are requested to prepare padlocks for HL and HL-S types. (25mm padlock for HL, and 35mm padlock for HL-S.)

## 10. IEC 35mm Rail Mounting Adapters

Table 5-25

Applicable models	Number of poles	Parts number
NF32-SW, NF63-CW/SW/HW, NV32-SW, NV63-CW/SW/HW, MB30-SW, MB50-CW/SW	2P 3P	DIN-05SW
NF125-CW/SW	2P	DIN-1SW2
	3P	DIN-1SW3
NF125-HW, NV125-CW/SW/HW, MB100-SW	2P	
	3P	



# 6. Characteristics and Dimensions

## Molded-Case Circuit Breakers and Motor Breakers

**NF32-SW**    **NF63-CW**  
**NF63-SW**    **NF63-HW**  
**MB30-SW**    **MB50-CW**  
**MB50-SW**

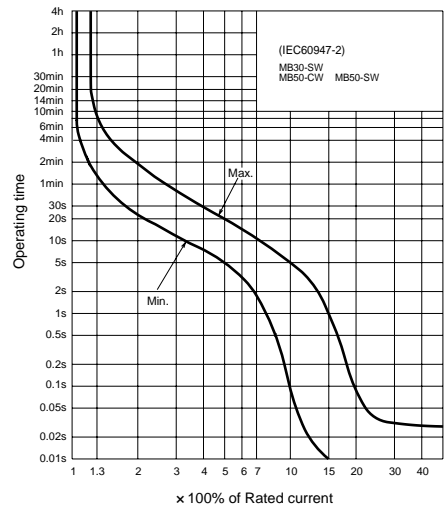
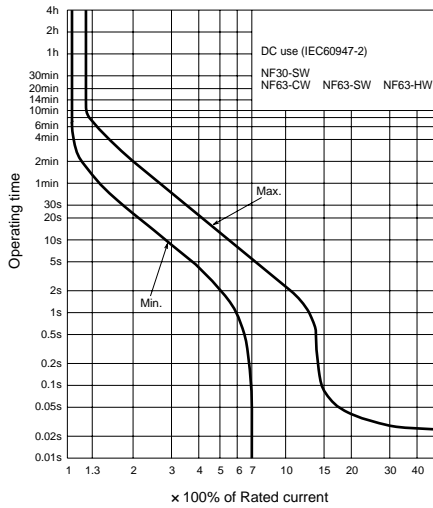
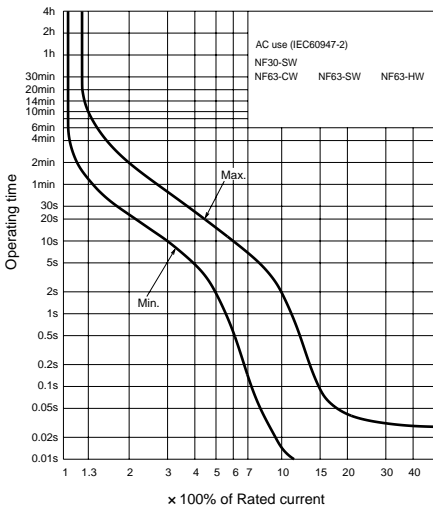


Type NF32-SW

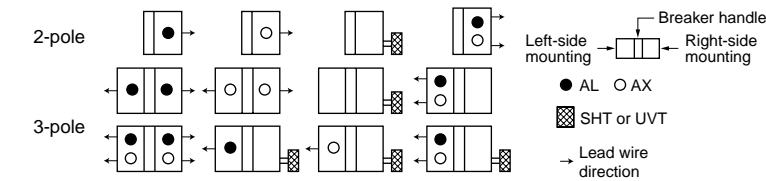
Series	S series			C series			S series			H series			S series			C series			S series					
Group	WSS G1			WSS G1			WSS G1			WSS G1			WSS G1			WSS G1			WSS G1					
Frame size	32			63			63			63			30			50			50					
Type name	NF32-SW			NF63-CW			NF63-SW			NF63-HW			MB30-SW			MB50-CW			MB50-SW					
Rated current In (Amp.)	3 4 6 10 16 20 25 32			3 4 6 10 16 20 25 32 40 50 63			3 4 6 10 16 20 25 32 40 50 63			10 16 20 25 32 40 50 63			0.8 1.2 1.4 2 2.5 4 5 7.1 8 10 12 16 25			8 10 12 16 25 32 40 45			0.8 1.2 1.4 2 2.5 4 5 7.1					
Number of poles	2 <sup>1</sup> 3			2 <sup>1</sup> 3			2 <sup>1</sup> 3 4			2 <sup>1</sup> 3 4			3			3			3					
Rated insulation voltage Ui (V)	600			600			600			690			500			500			500					
Rated short-circuit breaking capacity (kA)	IEC60947-2 (Icu/Ics)	AC (50/60Hz)	690V	-			-			2.5/1			-			-			-					
			500V	2.5/1			2.5/1			7.5/4			7.5/4			-			-					
			440V	2.5/1			2.5/1			7.5/4			10/5			2.5/1			2.5/1			7.5/4		
			400V	5/2			5/2			7.5/4			10/5			7.5/4			7.5/4			7.5/4		
			230V	7.5/4			7.5/4			15/8			25/13			7.5/4			7.5/4			15/8		
DC	250V	2.5/1			-			2.5/1			-			7.5/4			-			-				
Suitability for isolation	●			●			●			●			●			●			●					
Utilization category	A			A			A			A			A			A			A					
Reverse connection (terminals unmarked)	●			●			●			●			●			●			●					
Rated impulse withstand voltage Uimp (kV)	6			6			6			6			6			6			6					
Pollution degree	2			2			2			2			2			2			2					

\*1: Types of DC specifications can be produced upon request.

### Operating Characteristics

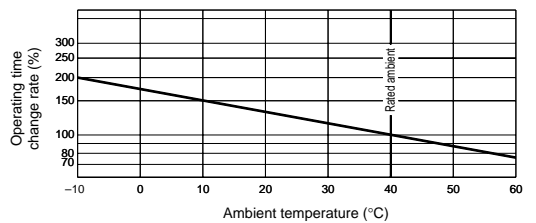


### Internal Accessories



Remark: (1) refer to 24.

### Temperature Characteristics



### External Accessories

Accessories		Type name	Reference page	Accessories		Type name	Reference page	
Operating handle	F	F05SW (*1)	27	Mechanical interlock	MI	MI-05SW3 (*1)	32	
	S	S05SW						
	V	V05SWF	28	Terminal cover	Small	TC-S	TCS-05SW3W (*1)	
	R	—			Large	TC-L	TCL-05SW3W (*1)	
Enclosure	Dustproof	S	NFS-05SW		30	Skeleton	TTC	TTC-05SW3 (*1)
	Waterproof	I	NFI-05SW			Rear	BTC	BTC-05SW3W (*1)
Handle lock device	LC	LC-05SW	32	IEC 35mm rail mounting adapters	Plug-in	PTC	PTC-05SW3W (*1)	
	HL	HLF-05SW			DIN-05SW	32		
	HL	HLN-05SW						
	HL-S	HLS-05SW (*1)						

Notes: (\*1) The designation depends on the number of poles. Refer to the reference page.  
(\*2) HLF types are used for OFF-lock, and HLN types for ON-lock.

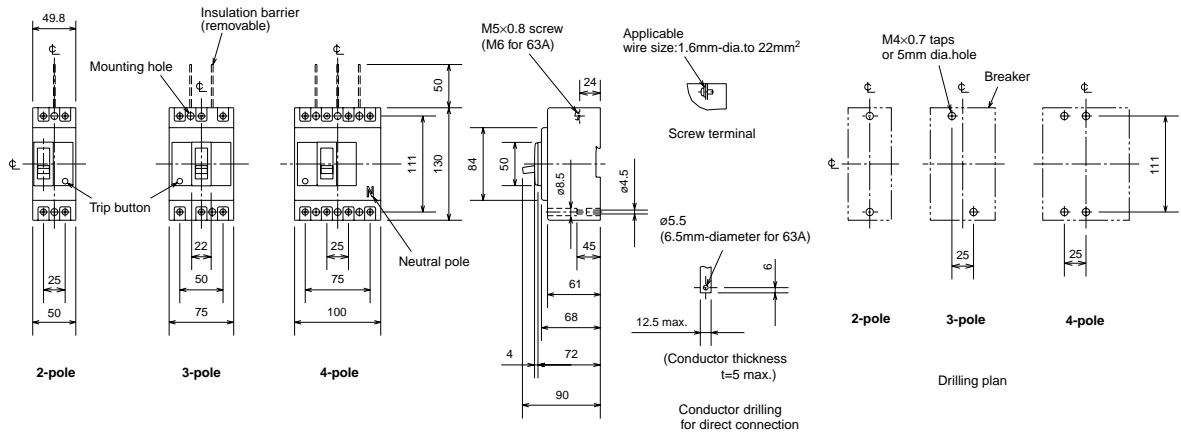
### Standard Attached Parts (Front connection)

Mounting screw: M4×0.7×55  
(2 and 3P: 2pcs, 4P: 4pcs)  
(Note)  
Insulation barrier: (2P: 1pc, 3P: 2pcs, 4P: 3pcs)

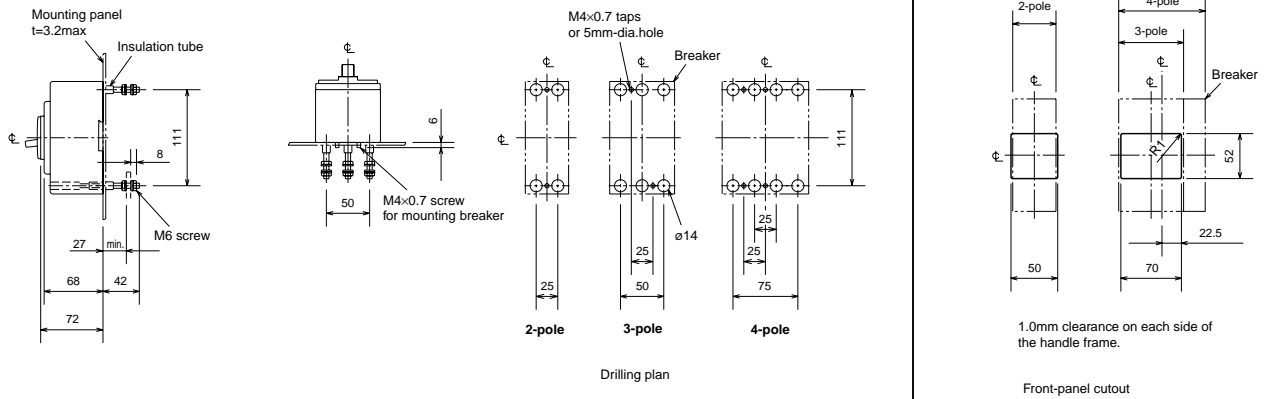
Note: These are supplied with NF63-SW, NF63-HW, and MB50-SW models.

# ● NF32-SW, NF63-CW, NF63-SW, NF63-HW, MB30-SW, MB50-CW, MB50-SW

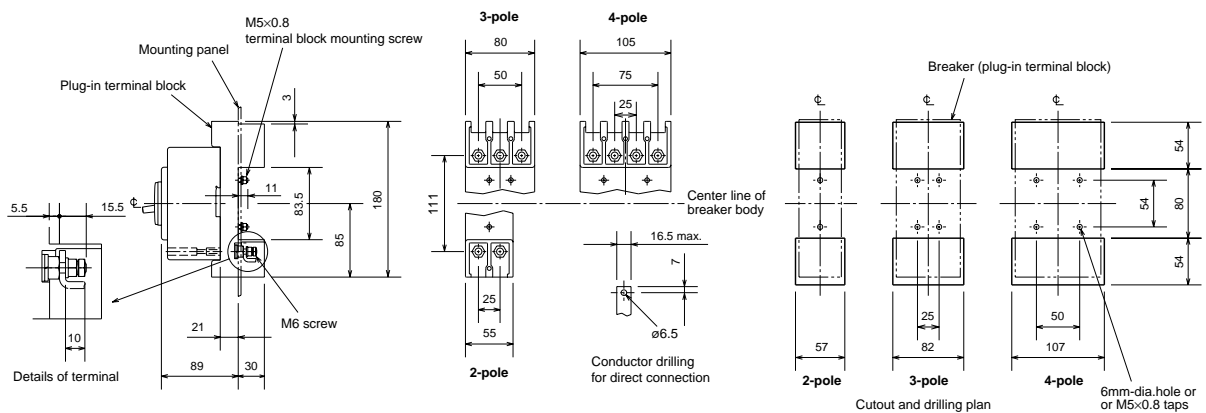
## Front connection



## Rear connection



## Plug-in



# 6. Characteristics and Dimensions

## Molded-Case Circuit Breakers and Motor Breakers

NF125-CW    NF125-SW  
 NF125-HW    MB100-SW

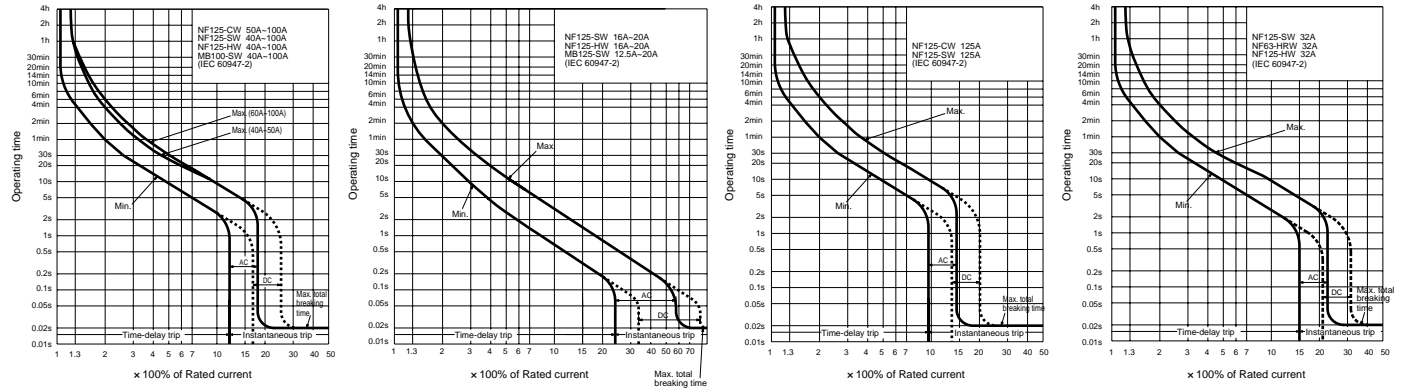


Type NF125-CW

Series		C series		S series		H series		S series		
Group		WSS G2		WSS G2		WSS G2		WSS G2		
Frame size		125		125		125		100		
Type name		NF125-CW		NF125-SW		NF125-HW		MB100-SW		
Rated current In (Amp.)		50 63 80 100 125		16 20 32 40 50 63 80 100 125		16 20 32 40 50 63 80 100		(12.5) (16) (25) 32 (40) 45 63 71 90 100		
Number of poles		2 3		2 3 4		2 3 4		3		
Rated insulation voltage Ui (V)		600		690		690		500		
Rated short-circuit breaking capacity (kA)	IEC60947-2 (Icu/lcs)	AC (50/60Hz)	690V	-		8/4		10/5		-
			500V	7.5/4		18/9		30/15		-
			440V	10/5		25/13		50/25		25/13
			400V	10/5		30/15		50/25		30/15
		230V	30/15		50/25		100/50		50/25	
		DC *1	250V	7.5/4	-	15/8	-	40/20	-	-
400V	-		7.5/4	-	15/8	-	40/20	-		
500V	-		-	-	15/8	-	40/20	-		
Suitability for isolation		●		●		●		●		
Utilization category		A		A		A		A		
Reverse connection (terminals unmarked)		●		●		●		●		
Rated impulse withstand voltage Uimp (kV)		8		8		8		8		
Pollution degree		3		3		3		3		

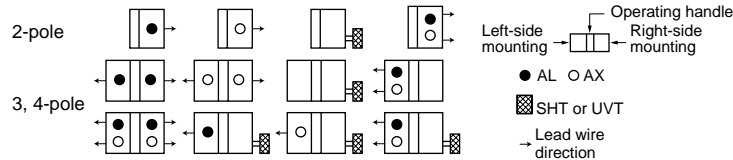
\*1: When wired as shown at the bottom of page 13, 3-pole models can be used for up to 400 V DC, and 4-pole models for up to 500 V DC.

### Operating Characteristics



Remark: (1) Only AC characteristics are available for the model MB100-SW.

### Internal Accessories



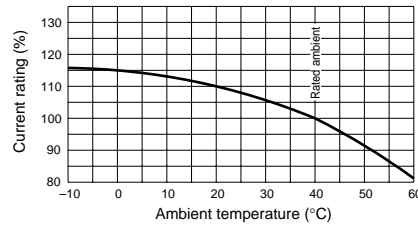
Remark: (1) refer to 24.

### External Accessories

Accessories	Type name	Reference page	Accessories	Type name	Reference page	
Operating handle	F F1SW (*1)	27	Mechanical interlock	MI MI-05SW3 (*1)	32	
	S S1SW					
	V V1SW (*2)	28		Small TC-S	TCS-1SW3W (*1)	30
	R R1SW			Large TC-L	TCL-1SW3W (*1)	
Enclosure	S NFS-1SW	29	Skeleton TTC	TTC-1SW3 (*1)		
	I NFI-1SW		Rear BTC	BTC-1SW3W (*1)		
	W NFW-1SW/1HW		Pul-g-in PTC	PTC-1SW3W (*1)		
Handle lock device	LC LC-1SW	32	IEC 35mm rail mounting adapters	DIN-1SW3 (*1)	32	
	HL HLF-1SW		Electrical operation device	MDS-NF1SWE (*3)	30	
	HL HLN-1SW					
	HL-S HLS-1SW (*1)(*4)					

Notes: (\*1) The designation depends on the number of poles. Refer to the reference page.  
 (\*2) Attach the letter "F" to the end of designation for a fixed type.  
 (\*3) Specify the working voltage. An order of MB100-SW should be placed at the same time as an order of circuit breaker main body.  
 (\*4) HLF types are used for OFF-lock, and HLN types for ON-lock.

### Ambient Compensating Curve



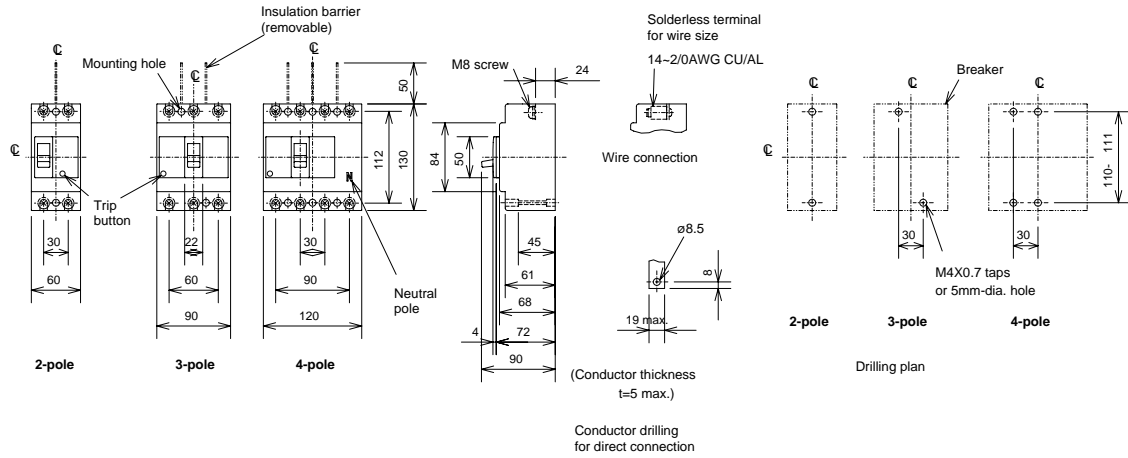
### Standard Attached Parts (Front connection)

Mounting screw: M4x0.7x55  
 (2 and 3P: 2pcs, 4P: 4pcs)  
 (Note)  
 Insulation barrier: (2P: 1pc, 3P: 2pcs, 4P: 3pcs)

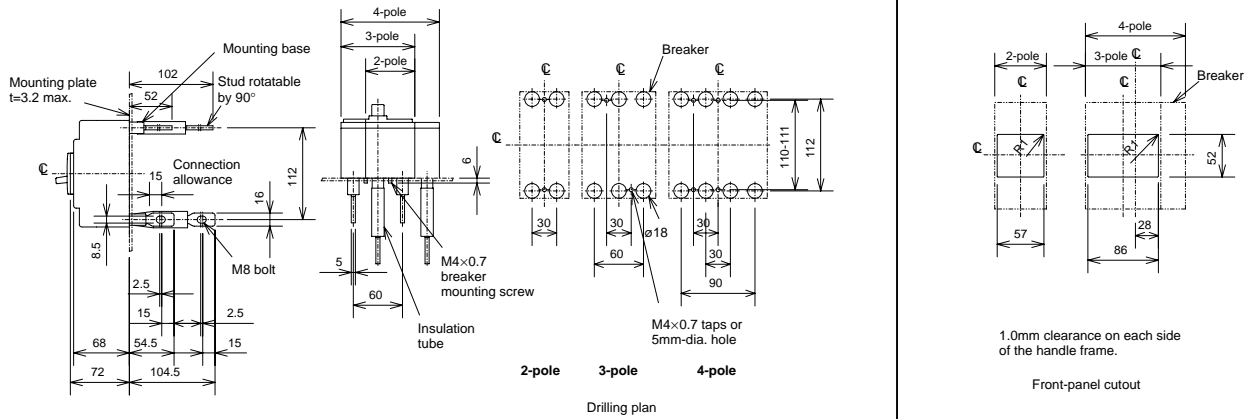
Note: These are supplied with NF125-SW, NF125-HW, and MB100-SW models.

# ● NF125-CW, NF125-SW, NF125-HW, MB100-SW

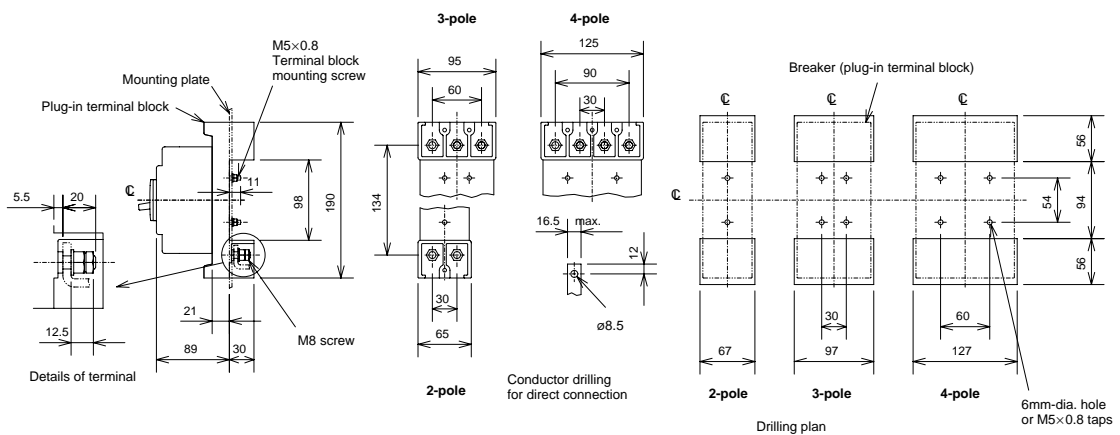
## Front connection



## Rear connection



## Plug-in



Remark: 2-pole model of NF125-HW are 3-pole model with the central pole removed.

# 6. Characteristics and Dimensions

## Molded-Case Circuit Breakers and Motor Breakers

**NF250-CW**    **NF250-SW**  
**NF250-HW**    **NF160-SW**  
**NF160-HW**    **MB225-SW**

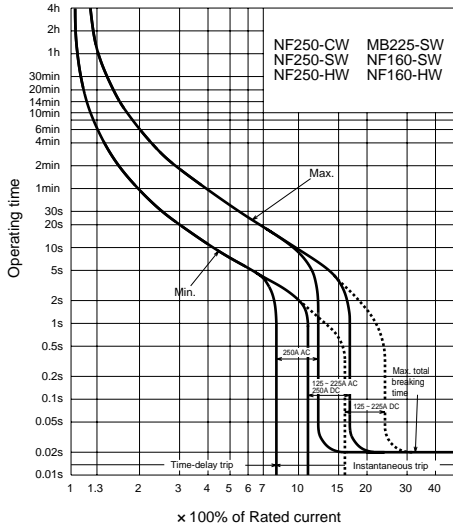


Type NF250-CW

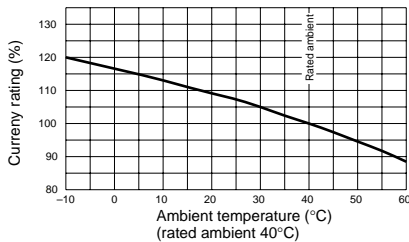
Series	S series			H series			C series			S series			H series			S series									
Group	WSS G3			WSS G3			WSS G3			WSS G3			WSS G3			WSS G3									
Frame size	160			160			250			250			250			225									
Type name	NF160-SW			NF160-HW			NF250-CW			NF250-SW			NF250-HW			MB225-SW									
Rated current In (Amp.)	125	150	160	125	150	160	125	150	175	200	225	250	125	150	175	200	225	250							
Number of poles	2	3	4	2	3	4	2	3	2	3	4	2	3	4	2	3	4	3							
Rated insulation voltage Ui (V)	690			690			600			690			690			500									
Rated short-circuit breaking capacity (kA)	IEC60947-2 (Icu/Ics)	AC (50/60Hz)	690V	-			5/3			-			5/3			-									
			500V	15/8			30/8			10/5			15/8			30/8									
			440V	25/13			50/13			15/8			25/13			50/13									
			400V	30/15			50/13			18/9			30/15			50/13									
			230V	50/25			100/25			35/18			50/25			100/25									
		DC	250V	15/8	-			40/20	-			10/5	-			15/8	-			40/20	-				
			400V	-	15/8	-			40/20	-			-	10/5	-			15/8	-			40/20	-		
			500V	-	-	15/8	-			-	40/20	-			-	-	15/8	-			-	40/20	-		
			Suitability for isolation	●			●			●			●			●			●						
			Utilization category	A			A			A			A			A			A						
Reverse connection (terminals unmarked)	●			●			●			●			●			●									
Rated impulse withstand voltage Uimp (kV)	6			6			6			6			6			6									
Pollution degree	2			2			2			2			2			2									

\*1: When wired as shown at the bottom of page 13, 3-pole models can be used for up to 400 V DC, and 4-pole models for up to 500 V DC.

### Operating Characteristics

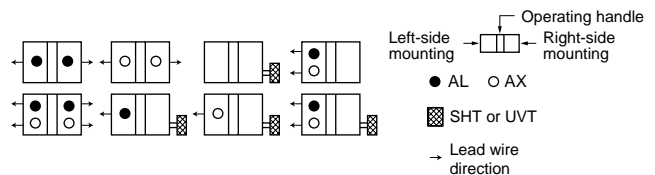


### Ambient Compensating Curve



Remark: The reference ambient temperature for IEC models is 30°C.

### Internal Accessories



### External Accessories

Accessories	Type name	Reference page	Accessories	Type name	Reference page
Operating handle	F F2SW	27	Mechanical interlock	MI MI-05SW3 (*1)	32
	S S2SW				
	V V2SW (*3)				
Enclosure	R R2SW	28	Terminal cover	Small TC-S TCS-2SW3W (*1)	30
	I NFS-2SW (*5)			Large TC-L TCL-2SW3W (*1)	
	W NFI-2SW			Skeleton TTC TTC-2SW3 (*1)	
Handle lock device	W NFW-2SW	29		Rear BTC BTC-2SW3W (*1)	
	LC LC-2SW			Plug-in PTC PTC-2SW3W (*1)	
	(*4) HLF HLF-2SW			Electrical operation device MDS-NF2SWE (*2)	
	HLN HLN-2SW	32			
	HLS HLS-2SW				

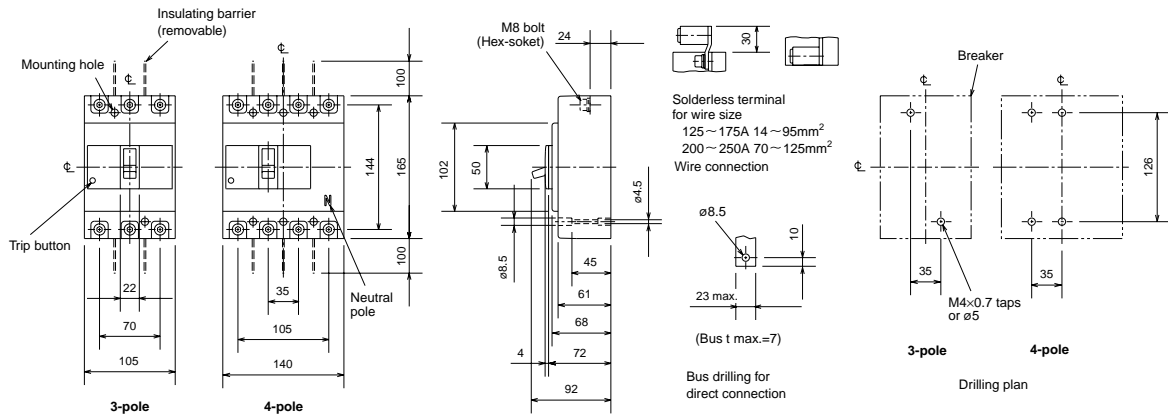
Notes: (\*1) The designation depends on the number of poles. Refer to the reference page.  
(\*2) Specify the working voltage. An order of MB225-SW should be placed at the same time as an order of circuit breaker main body.  
(\*3) Attach the letter "F" to the end of designation for a fixed type.  
(\*4) HLF types are used for OFF-lock, and HLN types for ON-lock.  
(\*5) NF160-HW, NF250-HW model cannot be produced.

### Standard Attached Parts (Front connection)

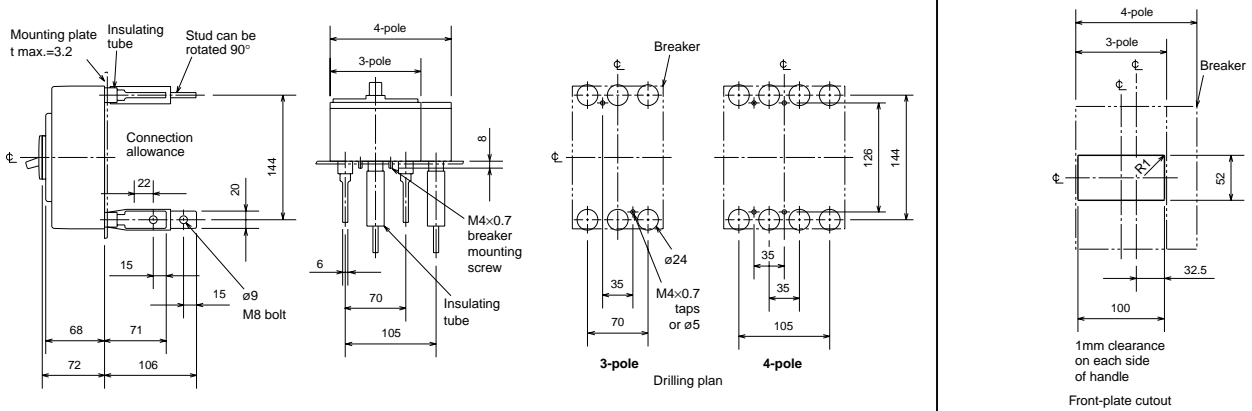
Mounting screw: M4×0.7×55  
(2 and 3P: 2pcs, 4P: 4pcs)  
Insulation barrier: (2P: 2pcs, 3P: 4pcs, 4P: 6pcs)

# ● NF250-CW, NF250-SW, NF250-HW, NF160-SW, NF160-HW, MB225-SW

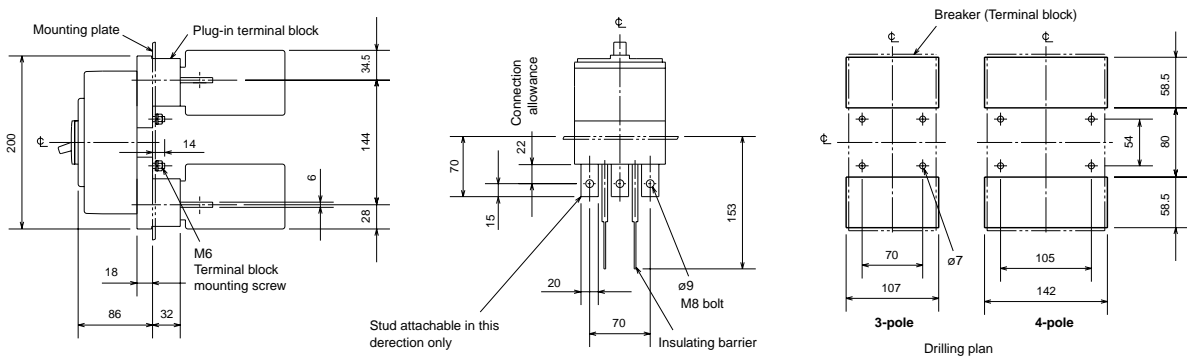
## Front connection



## Rear connection



## Plug-in



Remarks: 1. 2-pole models are 3-pole models with the central pole removed.  
2. Only 2- and 3-pole models are available for the model of NF250-CW, and only 3-pole models are available for the model of MB225-SW.

# 6. Characteristics and Dimensions

## Molded-Case Circuit Breakers

**NF250-SGW**   **NF250-HGW**  
**NF160-SGW**   **NF160-HGW**  
**NF125-SGW**   **NF125-HGW**



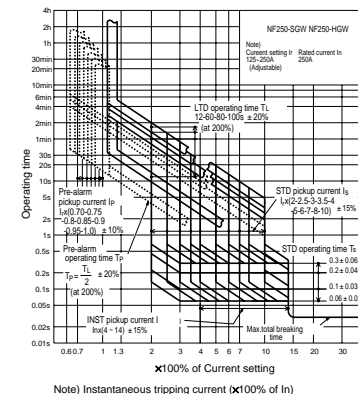
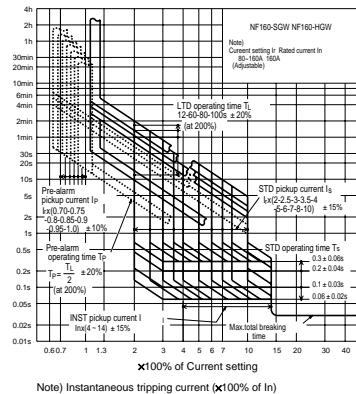
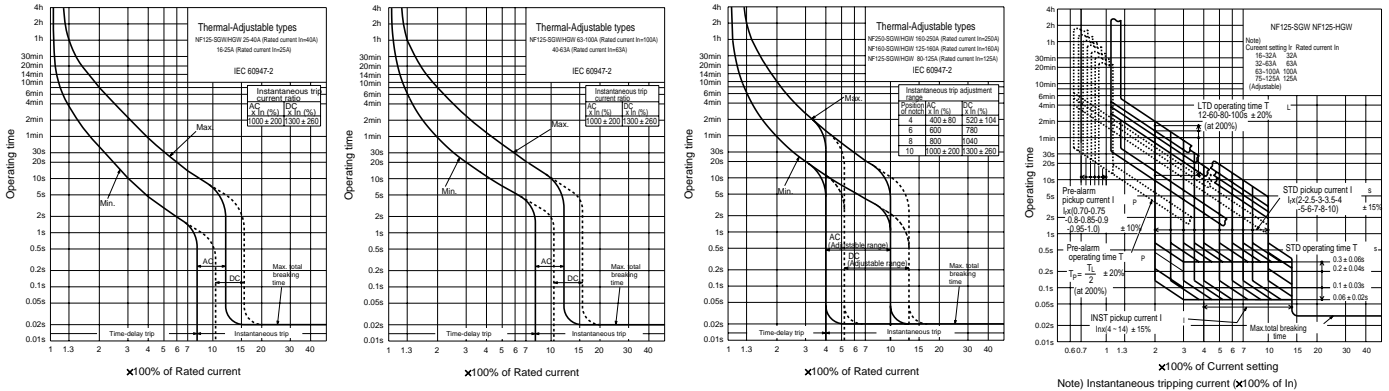
Type NF250-SGW

Series	S series			S series			H series			H series			S series			S series		
Group	WSS G4			WSS G4			WSS G4			WSS G4			WSS G4			WSS G4		
Frame size	125			125			125			125			160			160		
Type name	NF125-SGW RT			NF125-SGW RE			NF125-HGW RT			NF125-HGW RE			NF160-SGW RT			NF160-SGW RE		
Rated current In (Amp.)	18-25, 25-40, 40-63, 63-100, 80-125			16-32, 32-63, 63-100, 75-125			16-25, 25-40, 40-63, 63-100, 80-125			16-32, 32-63, 63-100, 75-125			125-160			80-160		
Number of poles	2	3	4	3	4	2	3	4	3	4	2	3	4	2	3	4	3	4
Rated insulation voltage Ui (V)	690			690			690			690			690			690		
Rated short-circuit breaking capacity (kA)	IEC 60947-2 (Icu/Ics)	AC (50/60Hz)	690V	8/8	8/8	20/20	20/20	20/20	8/8	8/8	8/8	8/8	8/8	8/8	8/8	8/8	8/8	8/8
			500V	30/30	30/30	50/50	50/50	30/30	30/30	30/30	30/30	30/30	30/30	30/30	30/30	30/30	30/30	30/30
			440V	36/36	36/36	65/65	65/65	36/36	36/36	36/36	36/36	36/36	36/36	36/36	36/36	36/36	36/36	36/36
			400V	36/36	36/36	75/75	75/75	36/36	36/36	36/36	36/36	36/36	36/36	36/36	36/36	36/36	36/36	36/36
			230V	85/85	85/85	100/100	100/100	85/85	85/85	85/85	85/85	85/85	85/85	85/85	85/85	85/85	85/85	85/85
			DC *1	300V	20/20	—	—	40/40	—	—	—	—	—	—	—	20/20	—	—
500V	—	20/20	—	—	40/40	—	—	—	—	—	—	—	—	20/20	—	—		
600V	—	—	20/20	—	—	—	—	—	—	—	—	—	—	—	20/20	—	—	
Suitability for isolation	●			●			●			●			●			●		
Utilization category	A			A			A			A			A			A		
Reverse connection (terminals unmarked)	●			●			●			●			●			●		
Rated impulse withstand voltage Uimp (kV)	8			8			8			8			8			8		
Pollution degree	3			3			3			3			3			3		

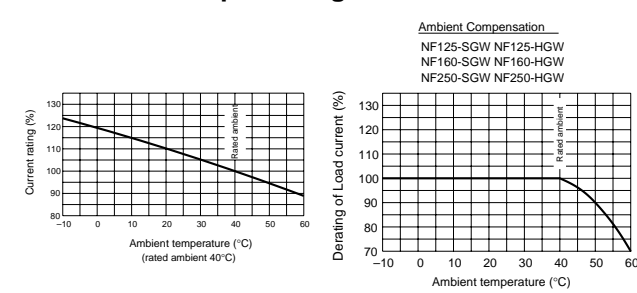
Series	H series			H series			S series			S series			H series			H series		
Group	WSS G4			WSS G4			WSS G4			WSS G4			WSS G4			WSS G4		
Frame size	160			160			250			250			250			250		
Type name	NF160-HGW RT			NF160-HGW RE			NF250-SGW RT			NF250-SGW RE			NF250-HGW RT			NF250-HGW RE		
Rated current In (Amp.)	125-160			80-160			125-160, 160-250			125-250			125-160, 160-250			125-250		
Number of poles	2	3	4	3	4	2	3	4	3	4	2	3	4	2	3	4	3	4
Rated insulation voltage Ui (V)	690			690			690			690			690			690		
Rated short-circuit breaking capacity (kA)	IEC 60947-2 (Icu/Ics)	AC (50/60Hz)	690V	20/20	20/20	8/8	8/8	20/20	20/20	20/20	8/8	8/8	8/8	8/8	8/8	8/8	8/8	8/8
			500V	50/50	50/50	30/30	30/30	50/50	50/50	30/30	30/30	30/30	30/30	30/30	30/30	30/30	30/30	30/30
			440V	65/65	65/65	36/36	36/36	65/65	65/65	36/36	36/36	36/36	36/36	36/36	36/36	36/36	36/36	36/36
			400V	75/75	75/75	36/36	36/36	75/75	75/75	36/36	36/36	36/36	36/36	36/36	36/36	36/36	36/36	36/36
			230V	100/100	100/100	85/85	85/85	100/100	100/100	85/85	85/85	85/85	85/85	85/85	85/85	85/85	85/85	85/85
			DC *1	300V	40/40	—	—	20/20	—	—	—	—	—	—	—	—	40/40	—
500V	—	40/40	—	—	20/20	—	—	—	—	—	—	—	—	—	40/40	—		
600V	—	—	40/40	—	—	—	—	—	—	—	—	—	—	—	—	40/40		
Suitability for isolation	●			●			●			●			●			●		
Utilization category	A			A			A			A			A			A		
Reverse connection (terminals unmarked)	●			●			●			●			●			●		
Rated impulse withstand voltage Uimp (kV)	8			8			8			8			8			8		
Pollution degree	3			3			3			3			3			3		

\*1: Use either 2-pole. When wired as shown at the bottom of page 13, 3-pole models can be used for up to 500 V DC, and 4-pole models for up to 600V DC.

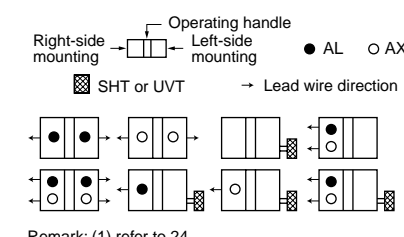
### Operating Characteristics



### Ambient Compensating Curve



### Internal Accessories



### External Accessories

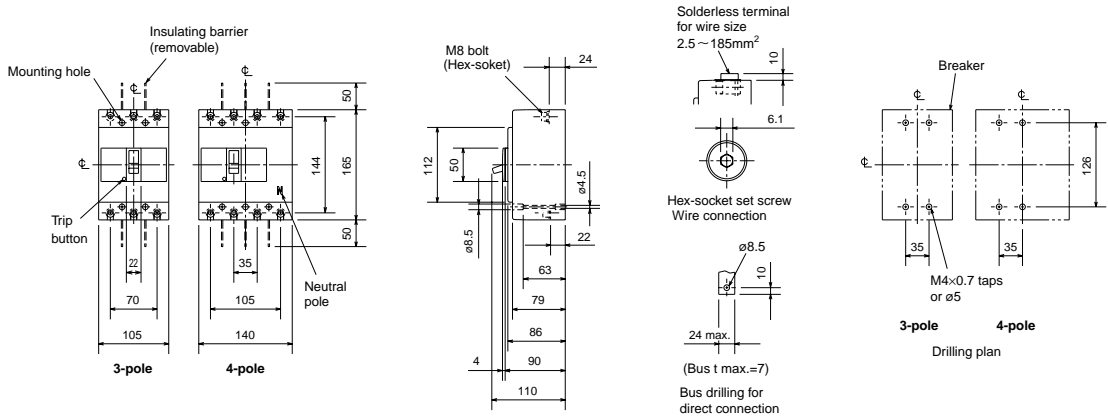
Accessories	Type name	Reference page	Accessories	Type name	Reference page	
Operating handle	F F2GSW	27	Mechanical interlock	MI MI-05SW3 (*)	32	
	S S2GSW	28		Terminal cover	Small TC-S TCS-2GSW3W (*)	30
	V V2GSW (*)				Large TC-L TCL-2GSW3W (*)	
	R R2GSW				Skeleton TTC TTC-2GSW3 (*)	
Enclosure	S —	29	Plug-in	Rear BTC BTC-2GSW3W (*)	30	
	I NFI-2GSW			Waterproof		PTC PTC-2GSW3W (*)
	W NFW-2GSW					Handle lock device
LC LC-2GSW	32	HL HLF-2GSW	32			
HL HLN-2GSW		HL-S HLS-2GSW				

Notes:  
 (\*) The designation depends on the number of poles. Refer to the reference page.  
 (\*\*) HLF types are used for OFF-lock, and HLN types for ON-lock.  
 (\*\*\*) Attach the letter "F" to the end of designation for a fixed type.

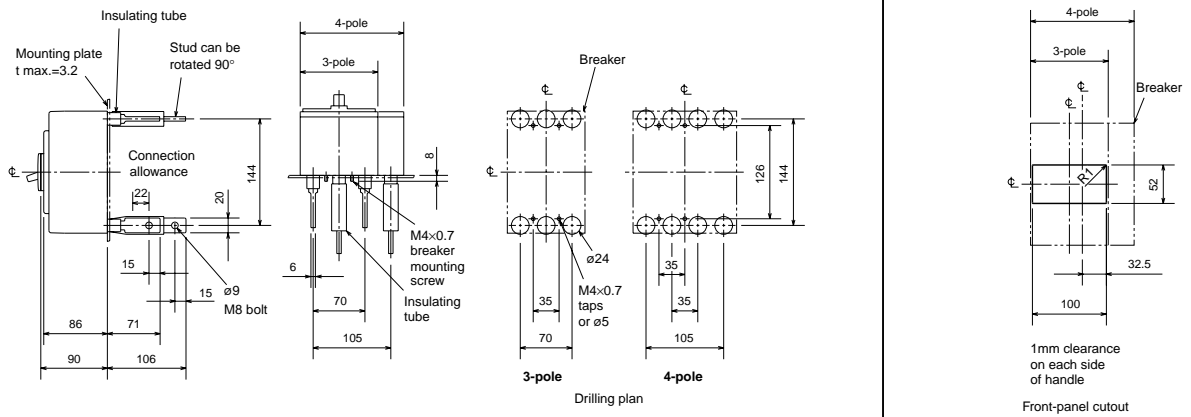


● NF250-SGW, NF160-SGW, NF125-SGW, NF250-HGW, NF160-HGW, NF125-HGW

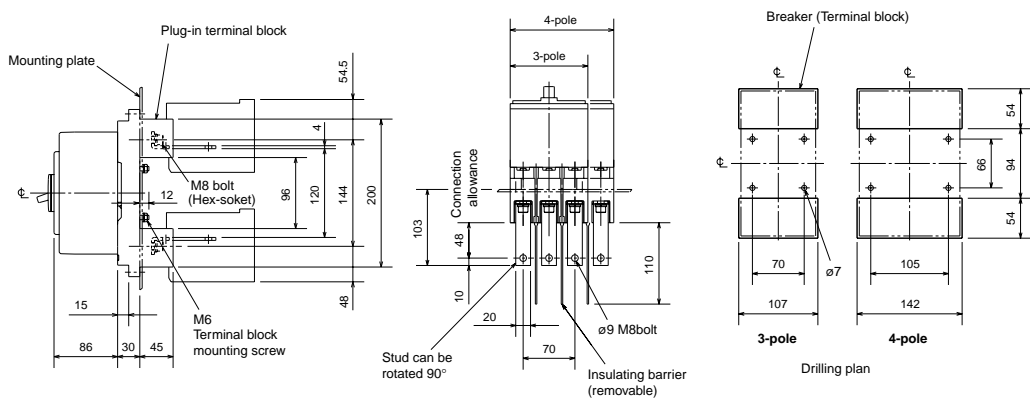
**Front connection**



**Rear connection**



**Plug-in**



Remark: 2-pole models are 3-pole models with the central pole removed.

# 6. Characteristics and Dimensions

## Molded-Case Circuit Breakers

NF250-RGW    NF250-UGW  
NF125-RGW    NF125-UGW

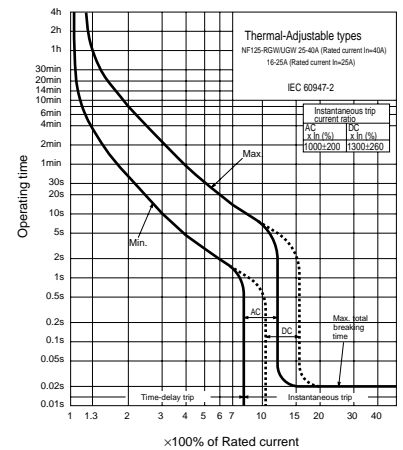
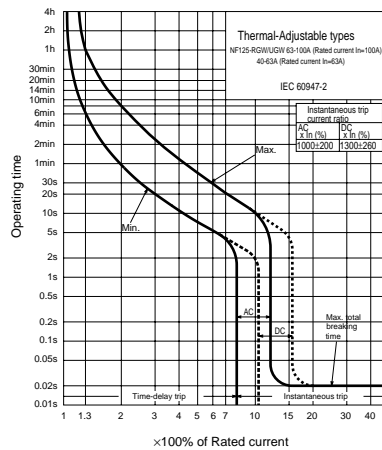
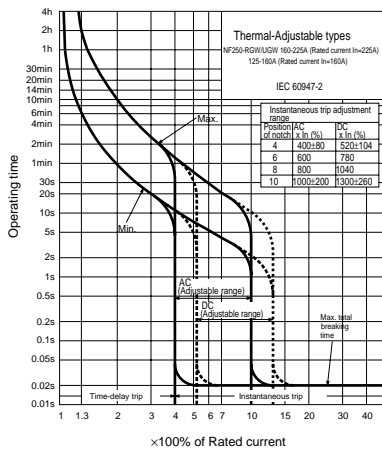


Type NF250-UGW

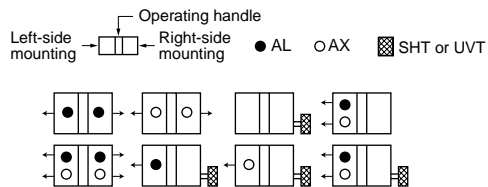
Series		U series																													
Group		WSS G4			WSS G4			WSS G4			WSS G4																				
Frame size		125			125			250			250																				
Type name		NF125-RGW RT			NF125-UGW RT			NF250-RGW RT			NF250-UGW RT																				
Rated current In (Amp.)		16-25 25-40 40-63 63-100			16-25 25-40 40-63 63-100			125-160 160-225			125-160 160-225																				
Number of poles		2			3			2			3			2			3			4			2			3			4		
Rated insulation voltage Ui (V)		690																													
Rated short-circuit breaking capacity (kA)	IEC60947-2 (Icu/Ics)	AC (50/60Hz)	690V		25/25		30/30		25/25		30/30		690V		25/25		30/30		25/25		30/30		690V		25/25		30/30				
			500V		125/125		200/200		125/125		200/200		500V		125/125		200/200		125/125		200/200		500V		125/125		200/200				
			440V		125/125		200/200		125/125		200/200		440V		125/125		200/200		125/125		200/200		440V		125/125		200/200				
			400V		125/125		200/200		125/125		200/200		400V		125/125		200/200		125/125		200/200		400V		125/125		200/200				
			230V		125/125		200/200		125/125		200/200		230V		125/125		200/200		125/125		200/200		230V		125/125		200/200				
		DC	300V		40/40		-		40/40		-		40/40		-		40/40		-		40/40		-		40/40		-				
			500V		-		40/40		-		40/40		-		40/40		-		40/40		-		40/40		-		40/40				
			600V		-		-		40/40		-		-		-		40/40		-		-		-		40/40		-				
			-		-		-		-		-		-		-		-		-		-		-		-		-				
			-		-		-		-		-		-		-		-		-		-		-		-		-				
Suitability for isolation		●																													
Utilization category		A																													
Reverse connection (terminals unmarked)		●																													
Rated impulse withstand voltage Uimp (kV)		8																													
Pollution degree		3																													

Note: When wired as shown at the bottom of page 13, 3-pole models can be used for up to 400 V DC, and 4-pole models for up to 600 V DC.

### Operating Characteristics

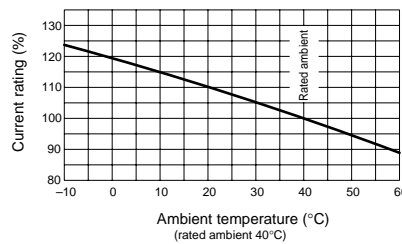


### Internal Accessories



Remark: (1) refer to 24.

### Ambient Compensating Curve



Remark: The reference ambient temperature for IEC models is 30°C.

### External Accessories

Accessories		Type name	Reference page	Accessories		Type name	Reference page
Operating handle	F	-	-	Terminal cover	Small	TC-S	TCS-2GSW3W (*1)
	S	-	-		Large	TC-L	TCL-2GSW3W (*1)
	V	V2GUW	28		Skeleton	TTC	TTC-2GSW3 (*1)
	R	R2GUW	29		Rear	BTC	BTC-2GSW3W (*1)
Enclosure	Dustproof	S	-		Plug-in	PTC	PTC-2GSW3W (*1)
		I	-	Handle lock device		LC	LC-2GSW
Waterproof	W	-	(*3)		HLF	HLF-2GSW	
	Mechanical interlock	MI	MI-05SW3 (*1)		HL	HLN-2GSW	
Electrical operation device	☆ (*2)	30	HL-S		HLS-2GSW		

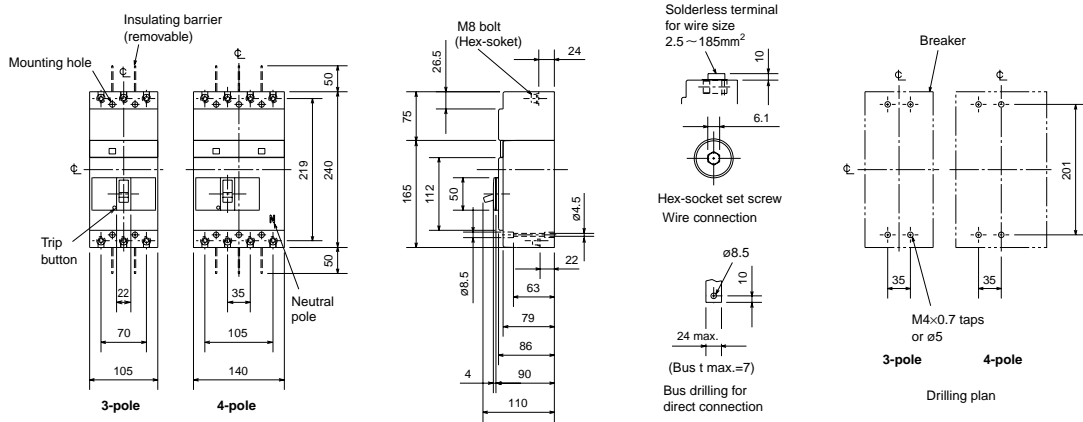
Notes: (\*1) The designation depends on the number of poles. Refer to the reference page.  
(\*2) An order should be placed at the same time as an order of circuit breaker main body.  
(\*3) HLF types are used for OFF-lock, and HLN types for ON-lock.

### Standard Attached Parts (Front connection)

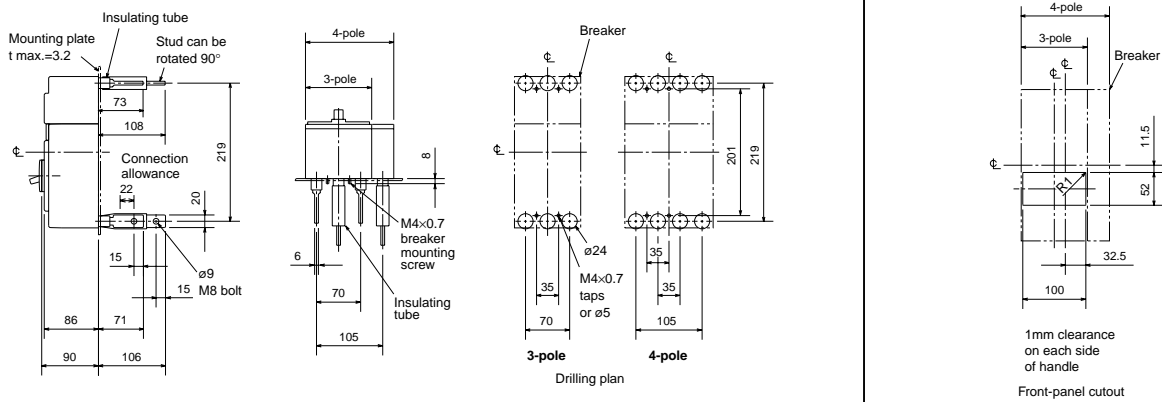
Mounting screw: M4×0.7×55 (4pcs)

# ● NF250-RGW, NF125-RGW, NF250-UGW, NF125-UGW

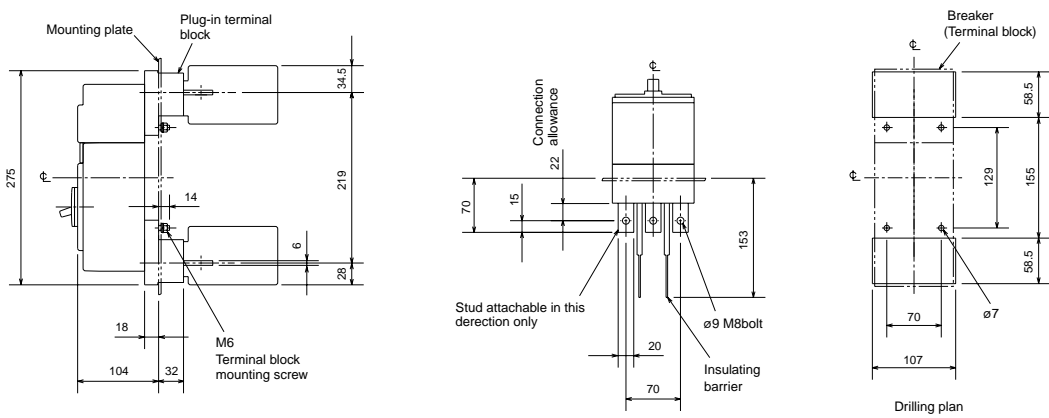
## Front connection



## Rear connection



## Plug-in



Remark: 2-pole models are 3-pole models with the central pole removed.

# 6. Characteristics and Dimensions

## Earth-Leakage Circuit Breakers

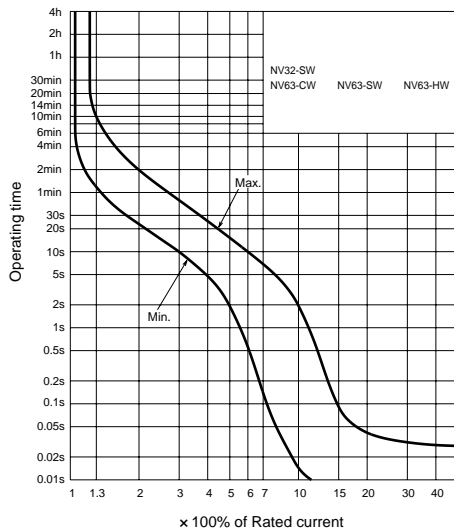
**NV32-SW**    **NV63-CW**  
**NV63-SW**    **NV63-HW**



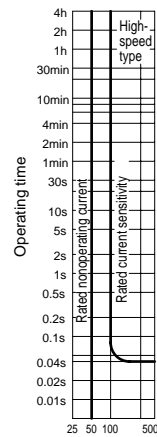
Type NV32-SW

Series	S series	C series	S series	H series
Group	WSS G1	WSS G1	WSS G1	WSS G1
Frame size	32	63	63	63
Type name	NV32-SW	NV63-CW	NV63-SW	NV63-HW
Rated current In (Amp.)	6 10 16 20 25 32	16 20 25 32 40 50 63	16 20 25 32 40 50 63	16 20 25 32 40 50 63
Number of poles	3	3	3	3
Rated operational voltage Ue (V AC)	230-400-440 Multi-voltage type	230-400-440 Multi-voltage type	230-400-440 Multi-voltage type	230-400-440 Multi-voltage type
High-speed type	Rated current sensitivity IΔn (mA)	30•100•500 Selectable	30•100•500 Selectable	30•100•500 Selectable
	Max. operating time at 5IΔn (s)	0.04	0.04	0.04
Earth-leakage indication system		Button	Button	Button
Rated breaking capacity (kA) IEC60947-2 (Icu/Ics)	AC440V	5/2	2.5/1	7.5/4
	AC400V	5/2	5/2	7.5/4
	AC380V	5/2	5/2	7.5/4
	AC230V	10/5	7.5/4	15/8
Standard Attached Parts (Front connection)		Mounting screw: M4×0.7×55 (2pcs) Insulation barrier: (3P: 2pcs) excluding models of NV63-CW		

### ■ Operating Characteristics

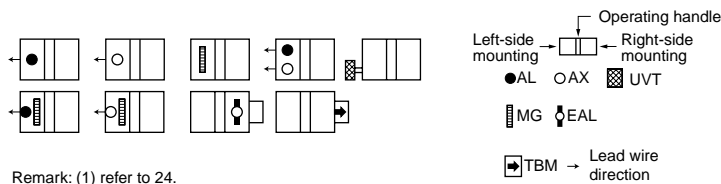


### ■ Earth-Leakage Tripping Characteristics



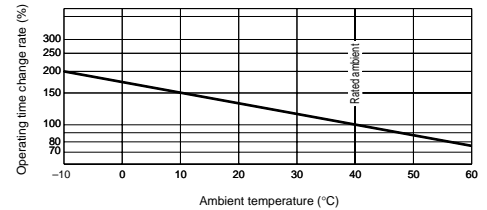
Ground-fault current(% of rated current sensitivity)

### ■ Internal Accessories



Remark: (1) refer to 24.

### ■ Temperature Characteristics

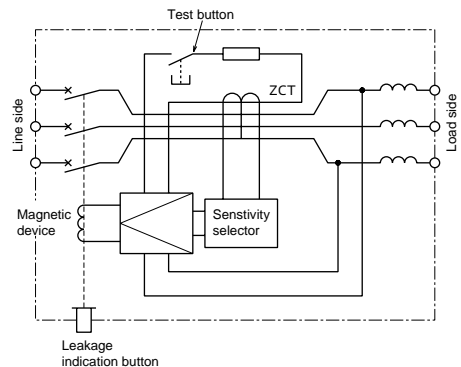


### ■ External Accessories

Accessories	Type name	Reference page	Accessories	Type name	Reference page
Operating handle	F F05SW	27	Mechanical interlock	MI MI-05SW3 (*1)	32
	S S05SW				
	V V05SWF				
Enclosure	S NFS-05SW	29	Terminal cover	Small TC-S TCS-05SW3W	30
	I NFI-05SW			Large TC-L TCL-05SW3W	
	Waterproof W NFW-05SW			Skeleton TTC TTC-05SW3	
	Rear BTC BTC-05SW3W				
Handle lock device	LC LC-05SW	32	IEC 35mm rail mounting adapters	Plug-in PTC PTC-05SW3W	32
	(*1) HLF HLF-05SW				
	HL HLN-05SW				
	HL-S HLS-05SW				

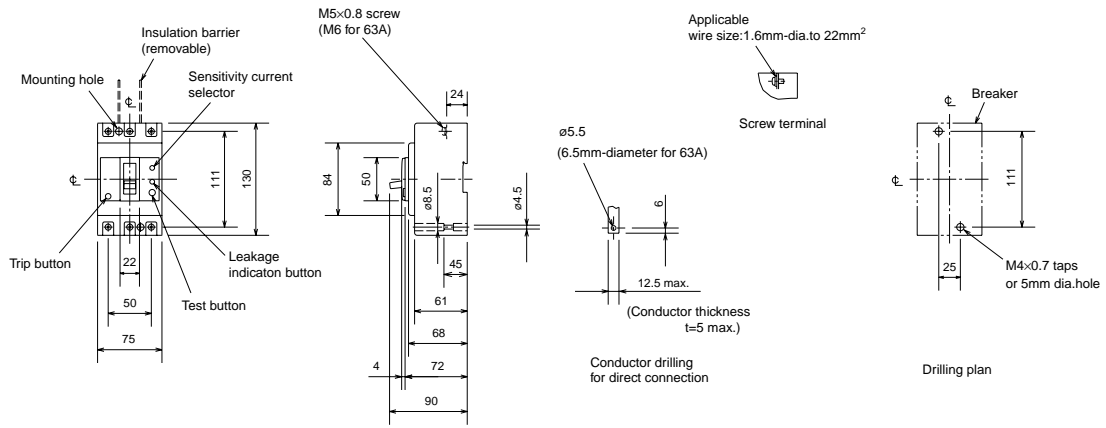
Note: (\*1) HLF types are used for OFF-lock, and HLN types for ON-lock.

### ■ Internal Wiring Diagram

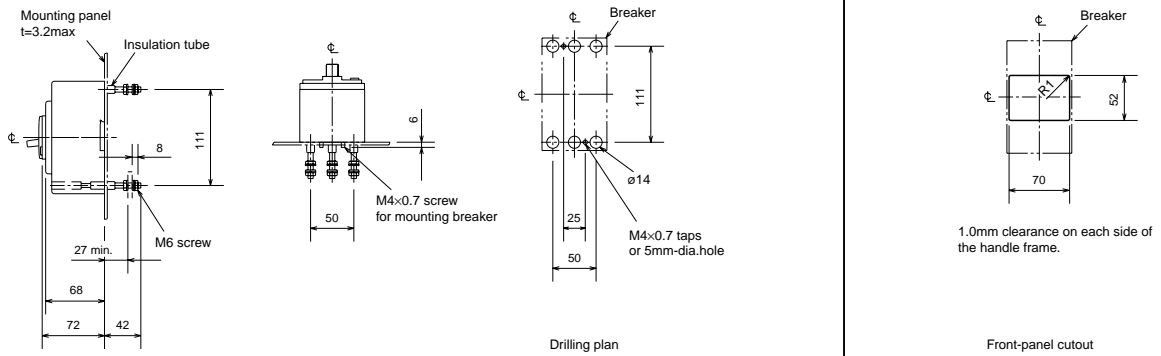


# ● NV63-CW, NV63-SW, NV63-HW, NV32-SW

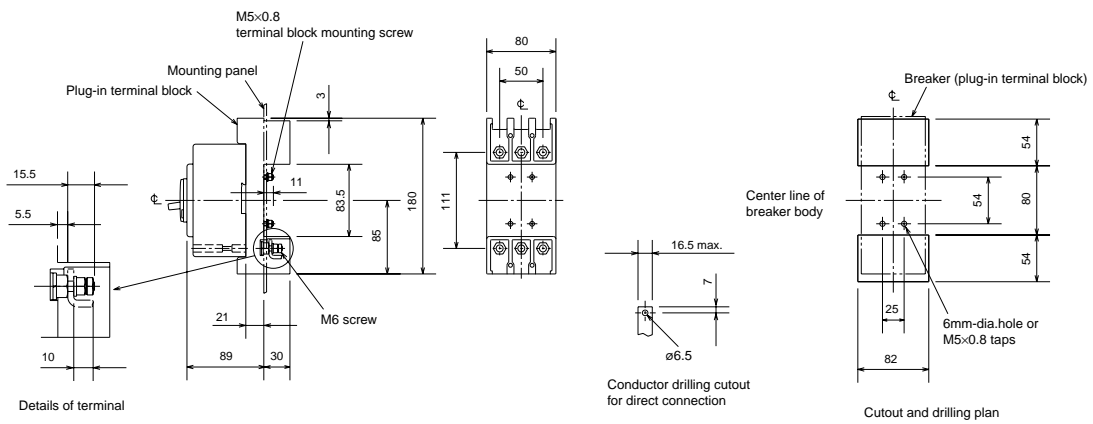
## Front connection



## Rear connection



## Plug-in



# 6. Characteristics and Dimensions

## Earth-Leakage Circuit Breakers

NV125-CW NV125-SW  
NV125-HW



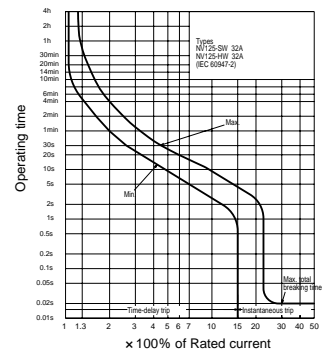
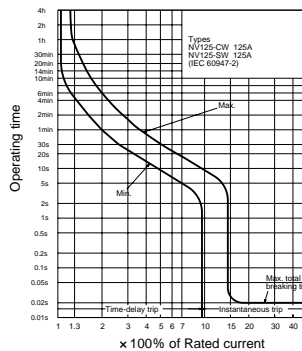
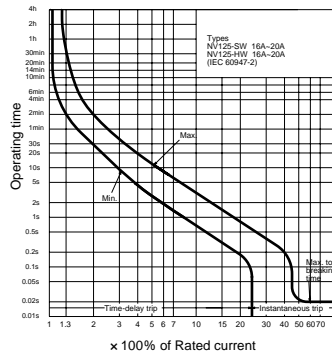
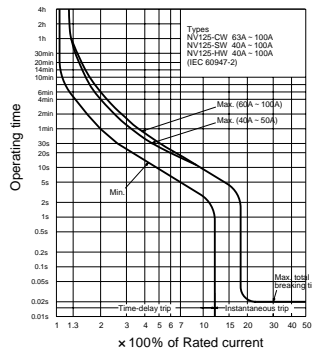
Type NV125-CW

Series	C series	S series	H series
Group	WSS G2	WSS G2	WSS G2
Frame size	125	125	125
Type name	NV125-CW	NV125-SW	NV125-HW
Rated current In (Amp.)	63 80	16 20 32	16 20 32
	100 125	40 50 63	40 50 63
		80 100 (125) <sup>*1</sup>	80 100 125
Number of poles	3	3 4	3 4
Rated operational voltage Ue (V AC)	230-400-440	230-400-440	230-400-440
	Multi-voltage type	Multi-voltage type	Multi-voltage type
High-speed type	Rated current sensitivity IΔn (mA)	30•100•500 Selectable	30•100•500 Selectable
	Max. operating time at 5IΔn (s)	0.04	0.04
Time-delay type	Rated current sensitivity IΔn (mA)	100•300•500 Selectable	100•300•500 Selectable
	Max. operating time at 5IΔn (s)	0.45•1.0•2.0 Selectable	0.45•1.0•2.0 Selectable
	Inertial non-operating time at 2IΔn (s)	0.1•0.5•1.0	0.1•0.5•1.0
Earth-leakage indication system		Button	Button
Rated breaking capacity (kA) IEC60947-2 (Icu/Ics)	AC440V	10/5	25/13
	AC400V	10/5	30/15
	AC230V	30/15	50/25
Standard Attached Parts (Front connection)		Mounting screw: M4×0.7×55 (3P: 2pcs, 4P: 4pcs) Insulation barrier: (3P: 2pcs, 4P: 3pcs) excluding models of NV125-CW	

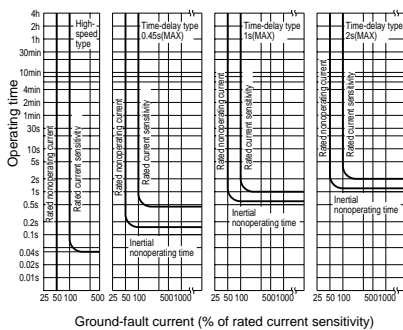
\*1: 3P only

Note: The time-delayed types will be produced when they have the current specifications of 20A or more.

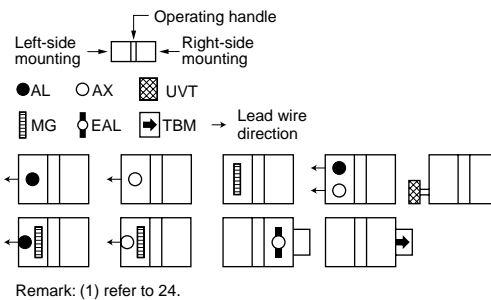
### Operating Characteristics



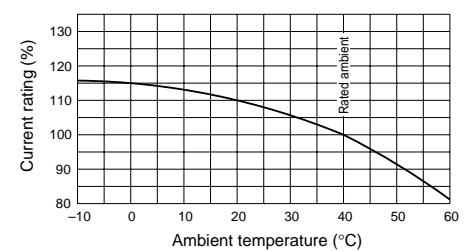
### Earth-Leakage Tripping Characteristics



### Internal Accessories



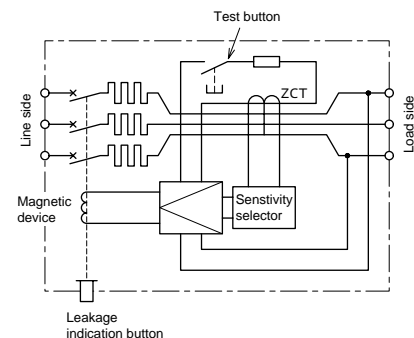
### Temperature Characteristics



### External Accessories

Accessories	Type name	Reference page	Accessories	Type name	Reference page
Operating handle	F F1SW	27	Mechanical interlock	MI MI-05SW3 (*4)	32
	S S1SW				
	V V1SW (*1)		Terminal cover	Small TC-S TCS-1SW3W (*4)	30
R R1SW	Large TC-L TCL-1SW3W (*4)				
S NFS-1SW	Skeleton TTC TTC-1SW3(*4)				
Enclosure	I NFI-1SW	29	Rear BTC BTC-1SW3W (*4)	30	
	W NFW-1SW/1HW		Plug-in PTC PTC-1SW3W (*4)		
Handle lock device	LC LC-1SW	32	IEC 35mm rail mounting adapters		DIN-1SW (*4)
	(*)2 HLF-1SW		Electrical operation device		
	HL HLN-1SW		32		
	HL-S HLS-1SW				

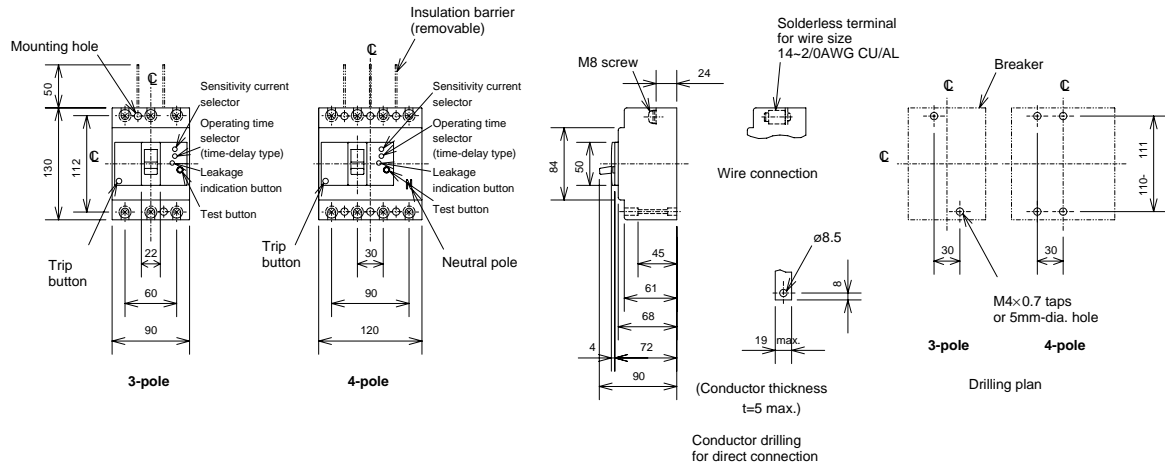
### Internal Wiring Diagram



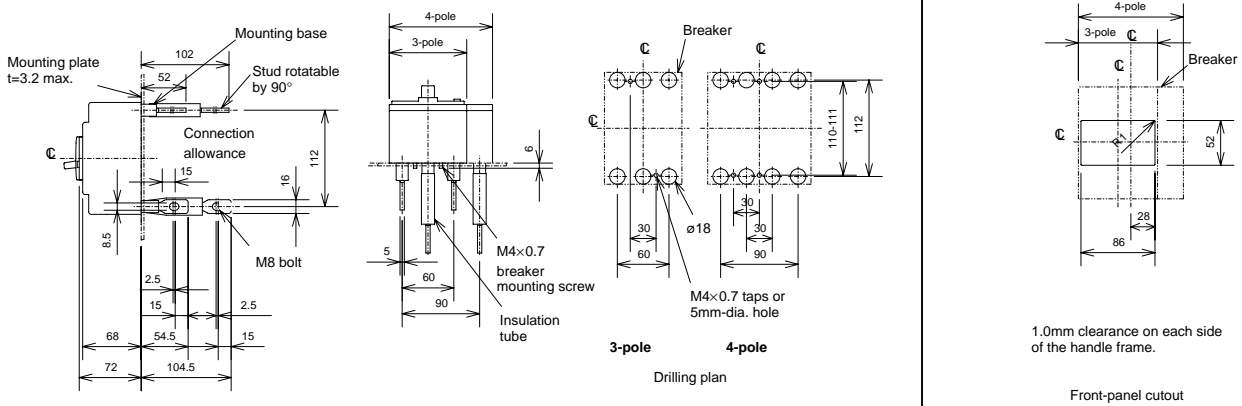
Notes: (\*1) Attach the letter "F" to the end of designation for a fixed type.  
(\*2) HLF types are used for OFF-lock, and HLN types for ON-lock.  
(\*3) Specify the working voltage.  
(\*4) The designation depends on the number of poles. Refer to the reference page.

# ● NV125-CW, NV125-SW, NV125-HW

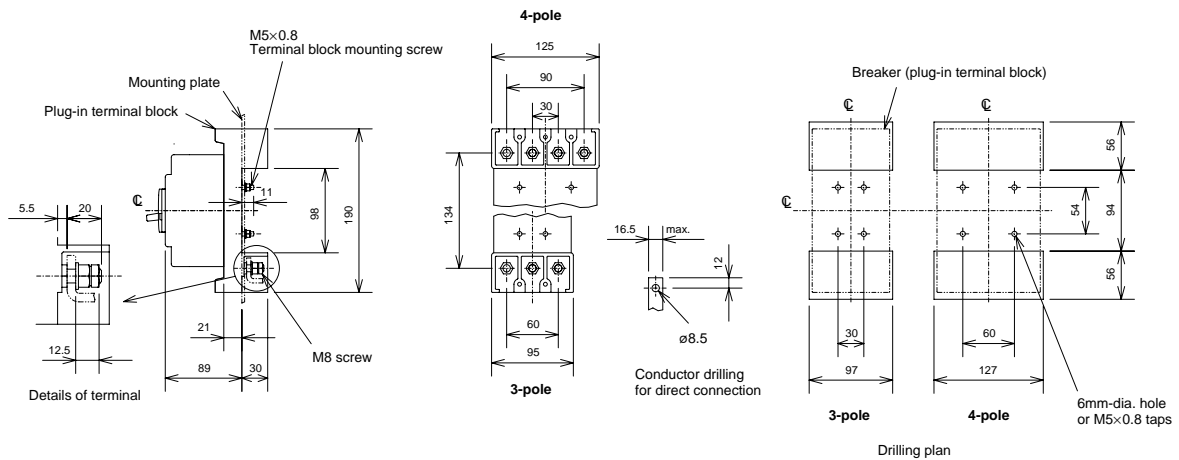
## Front connection



## Rear connection



## Plug-in



Remark: NV125-CW is available in 3-pole only.

# 6. Characteristics and Dimensions

## Earth-Leakage Circuit Breakers

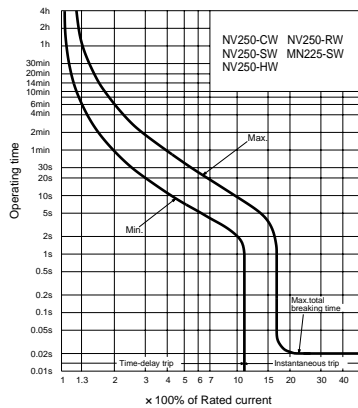
NV250-CW NV250-SW  
NV250-HW



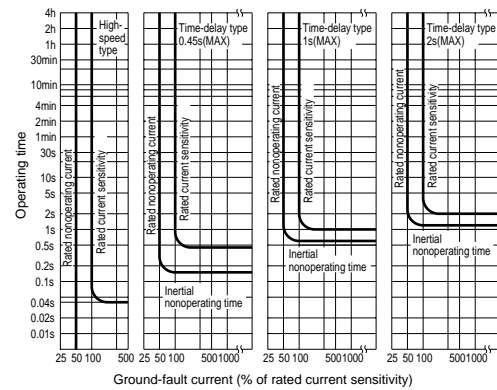
Type NV250-CW

Series	C series	S series	H series
Group	WSS G3	WSS G3	WSS G3
Frame size	250	250	250
Type name	NV250-CW	NV250-SW	NV250-HW
Rated current In (Amp.)	125 150 175 200 225 250	125 150 175 200 225 250	125 150 175 200 225
Number of poles	3	3	4
Rated operational voltage Ue (V AC)	230-400-440 Multi-voltage type	230-400-440 Multi-voltage type	230-400-440 Multi-voltage type
High-speed type	Rated current sensitivity IΔn (mA)	30•100•500 Selectable	30•100•500 Selectable
	Max. operating time at 5IΔn (s)	0.04	0.04
Time-delay type	Rated current sensitivity IΔn (mA)	100•300•500 Selectable	100•300•500 Selectable
	Max. operating time at 5IΔn (s)	0.45•1.0•2.0 Selectable	0.45•1.0•2.0 Selectable
	Inertial non-operating time at 2IΔn (s)	0.1•0.5•1.0	0.1•0.5•1.0
Earth-leakage indication system		Button	Button
Rated breaking capacity (kA) IEC60947-2 (Icu/Ics)	AC440V	15/8	25/13
	AC400V	18/9	30/15
	AC230V	35/18	50/25
Standard Attached Parts (Front connection)		Mounting screw: M4x0.7x55 (3P: 2pcs, 4P: 4pcs) Insulation barrier: (3P: 4pcs, 4P: 6pcs)	

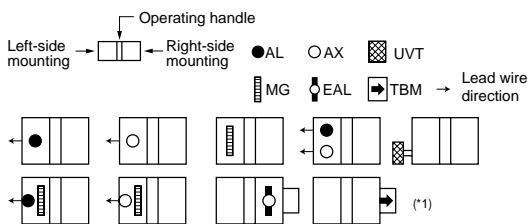
### Operating Characteristics



### Earth-Leakage Tripping Characteristics

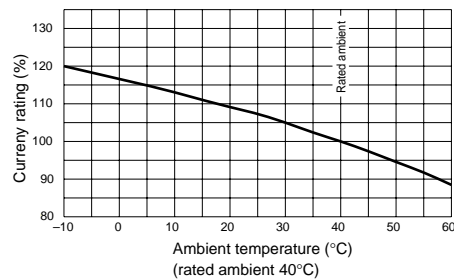


### Internal Accessories



Remark: (1) refer to 24.

### Temperature Characteristics

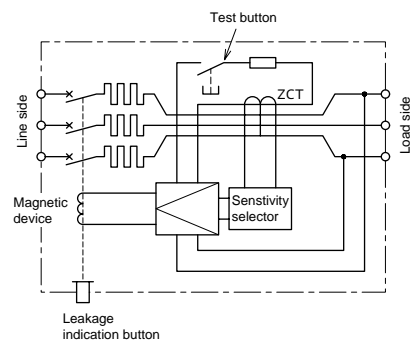


### External Accessories

Accessories	Type name	Reference page	Accessories	Type name	Reference page	
Operating handle	F F2SW	27	Mechanical interlock	MI MI-05SW3 (*3)	32	
	S S2SW					
	V V2SW (*1)	28	Terminal cover	Small TC-S TCS-2SW3W (*3)		
	R R2SW			Large TC-L TCL-2SW3W (*3)		
Enclosure	S NFS-2SW (*5)	29		Skeleton TTC TTC-2SW3 (*3)	30	
	I NFI-2SW			Rear BTC BTC-2SW3W (*3)		
Waterproof	W NFW-2SW	30		Plug-in PTC PTC-2SW3W (*3)		Electrical operation device
	LC LC-2SW					
Handle lock device	(*)2 HLF-2SW	32				
	HL HLN-2SW					
	HL-S HLS-2SW					

Notes: (\*1) Attach the letter "F" to the end of designation for a fixed type.  
 (\*2) HLF types are used for OFF-lock, and HLN types for ON-lock.  
 (\*3) The designation depends on the number of poles. Refer to the reference page.  
 (\*4) Specify the working voltage.  
 (\*5) NV250-HW model cannot be produced.

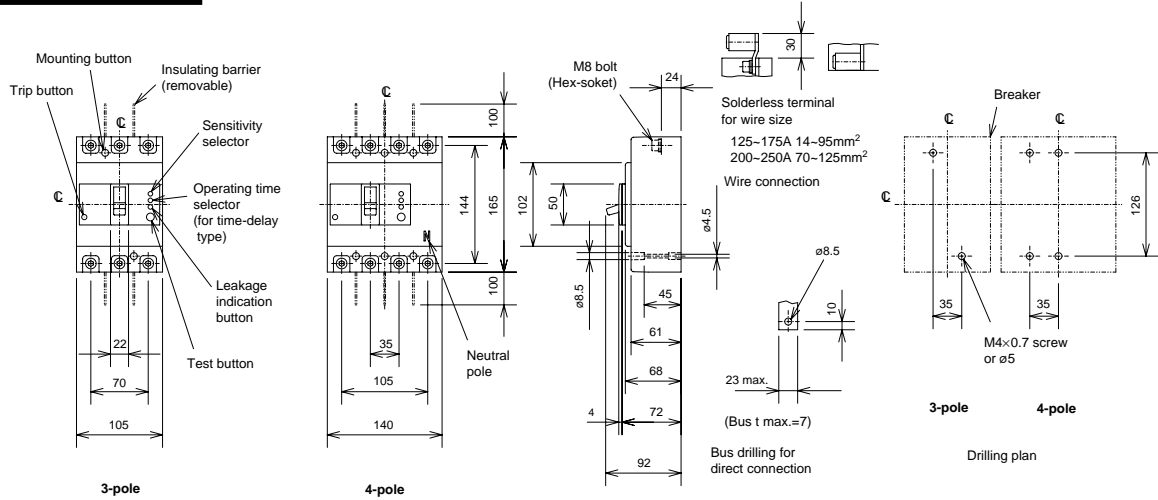
### Internal Wiring Diagram



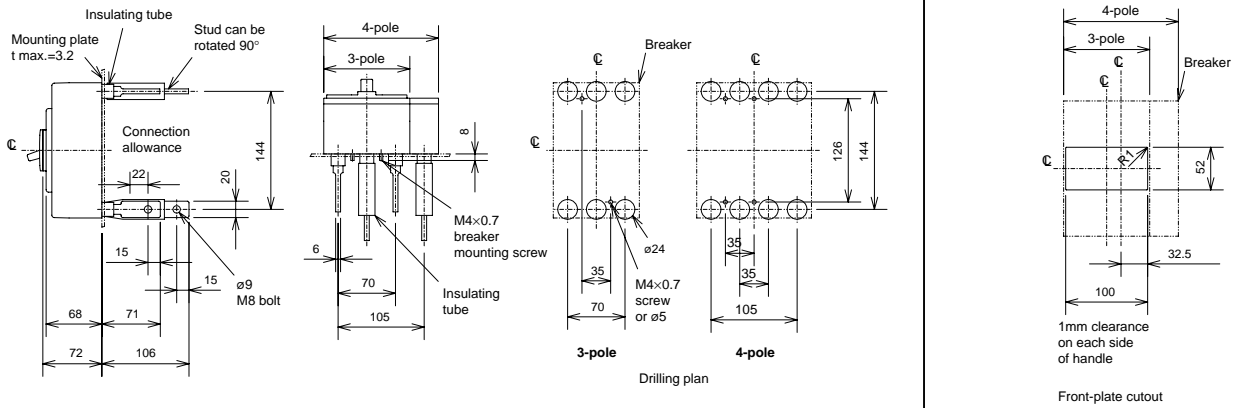


# ● NV250-CW, NV250-SW, NV250-HW

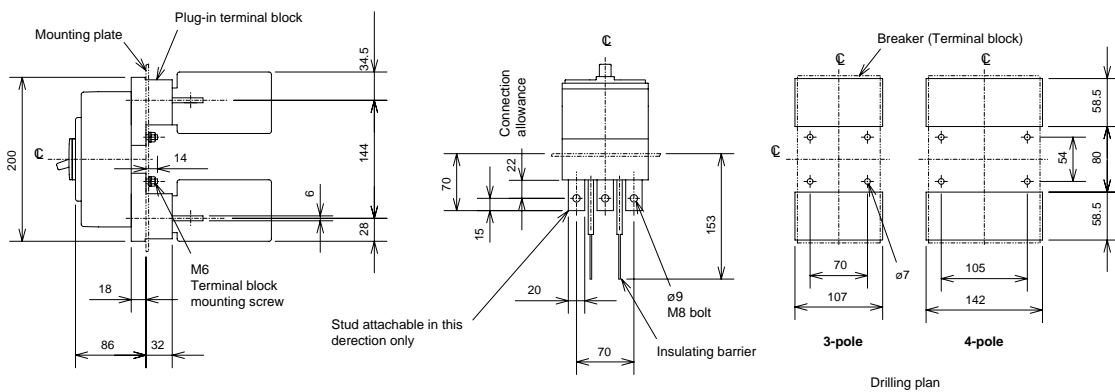
## Front connection



## Rear connection



## Plug-in



Remark: NV250-CW are available in 3-pole only.

# 6. Characteristics and Dimensions

## Earth-Leakage Circuit Breakers

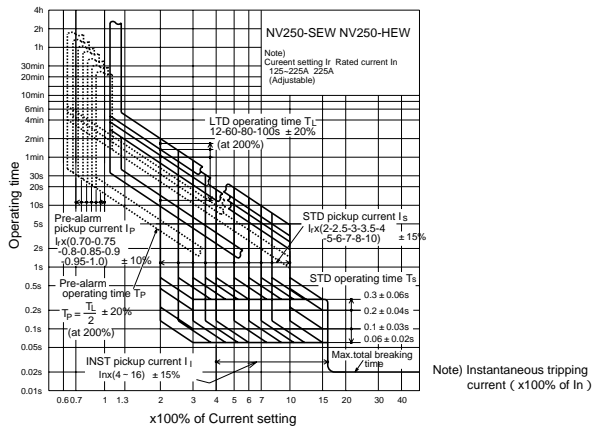
### NV250-SEW NV250-HEW



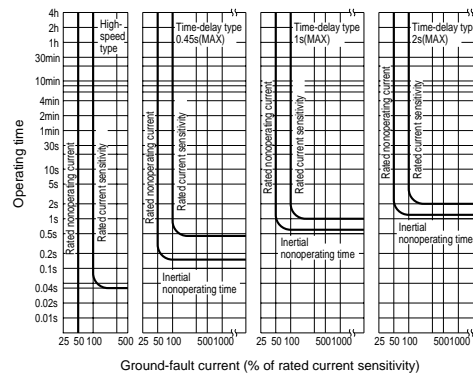
Type NV250-SEW

Series		S series	H series
Group		WSS G3	WSS G3
Frame size		250	250
Type name		NV250-SEW	NV250-HEW
Rated current $I_n$ (Amp.)		125–225 Adjustable	125–225 Adjustable
Number of poles		3   4	3   4
Rated operational voltage $U_e$ (V AC)		230–400–440 Multi-voltage type	230–400–440 Multi-voltage type
High-speed type	Rated current sensitivity $I_{\Delta n}$ (mA)	30•100•500 Selectable	30•100•500 Selectable
	Max. operating time at $5I_{\Delta n}$ (s)	0.04	0.04
Time-delay type	Rated current sensitivity $I_{\Delta n}$ (mA)	100•300•500 Selectable	100•300•500 Selectable
	Max. operating time at $5I_{\Delta n}$ (s)	0.45•1.0•2.0 Selectable	0.45•1.0•2.0 Selectable
	Inertial non-operating time at $2I_{\Delta n}$ (s)	0.1•0.5•1.0	0.1•0.5•1.0
Earth-leakage indication system		Button	Button
Rated breaking capacity (kA) IEC60947-2 (Icu/Ics)	AC440V	25/13	50/13
	AC400V	30/15	50/13
	AC230V	50/25	100/25
Standard Attached Parts (Front connection)		Mounting screw: M4×0.7×55 (3P: 2pcs, 4P: 4pcs) Insulation barrier: (3P: 4pc, 4P: 6pcs)	

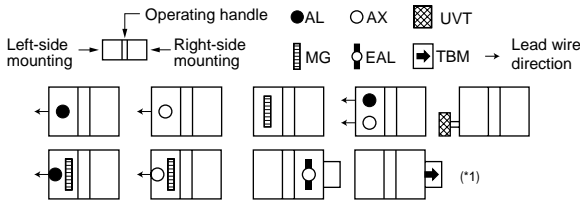
### Operating Characteristics



### Earth-Leakage Tripping Characteristics

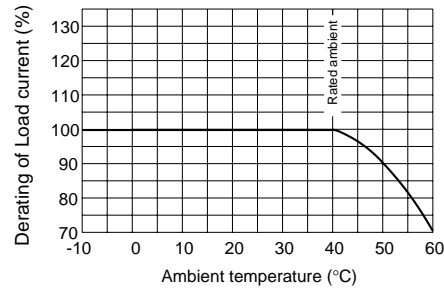


### Internal Accessories



Note: (\*) Parenthesized dimensions represent those for models with PAL, EAL, or TBM. Flush-mounted models with PAL, EAL, or TBM have an outside view different from the standard outside view, which will be available upon request.  
Remark: (1) refer to 24.

### Temperature Characteristics

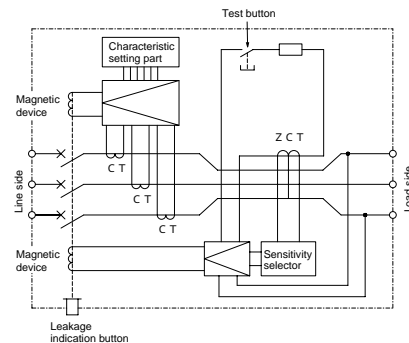


### External Accessories

Accessories	Type name	Reference page	Accessories	Type name	Reference page
Operating handle	F F2SW	27	Mechanical interlock	MI MI-05SW3 (*3)	32
	S S2SW				
	V V2SW (*1)				
Enclosure	R R2SW	29	Terminal cover	Small TC-S TCS-2SW3W (*3)	30
	S NFS-2SW (*5)				
	I NFI-2SW				
	W NFW-2SW				
	LC LC-2SW				
Handle lock device	HLF HLF-2SW	32	Electrical operation device	MDS-NVE2SWE (*4)	30
	HL HLN-2SW				
	HL-S HLS-2SW				

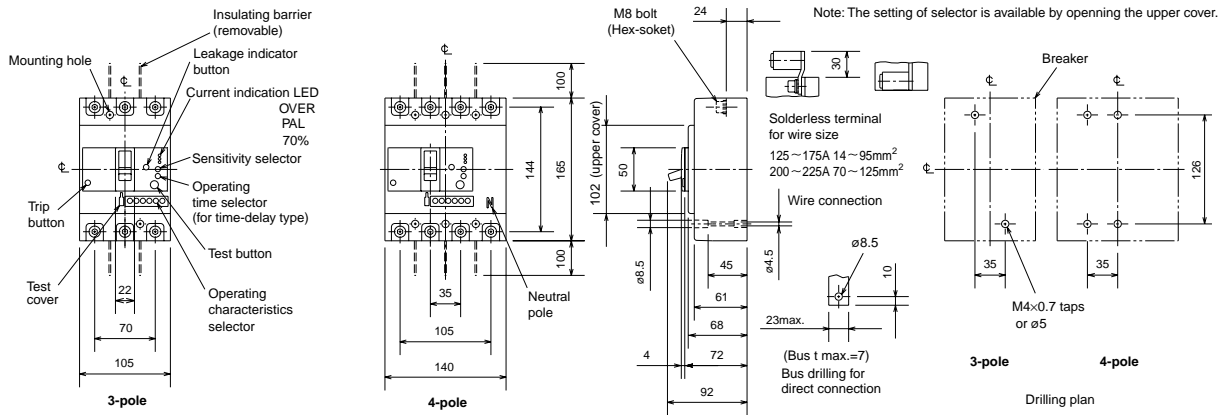
Notes: (\*1) Attach the letter "F" to the end of designation for a fixed type.  
(\*2) HLF types are used for OFF-lock, and HLN types for ON-lock.  
(\*3) The designation depends on the number of poles. Refer to the reference page.  
(\*4) Specify the working voltage.  
(\*5) NV250-HEW model cannot be produced.

### Internal Wiring Diagram

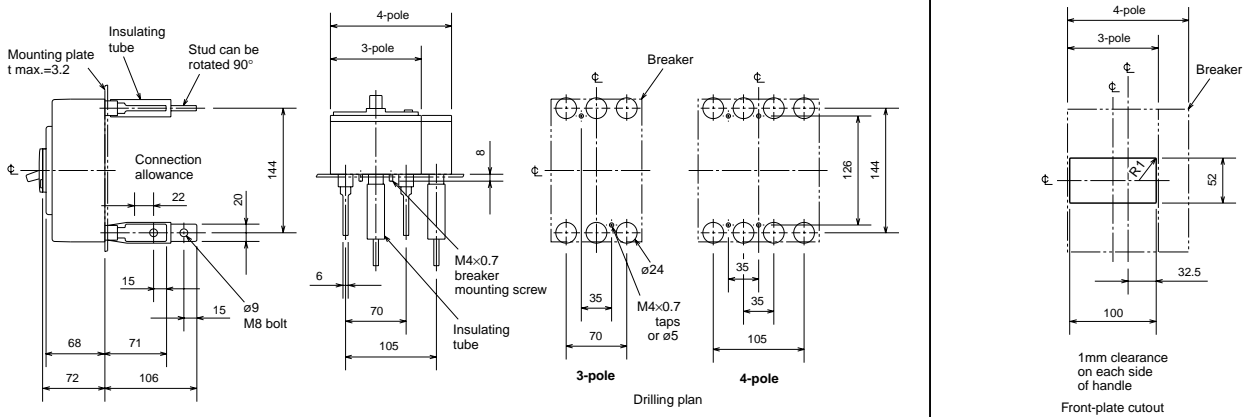


# ● NV250-SEW, NV250-HEW

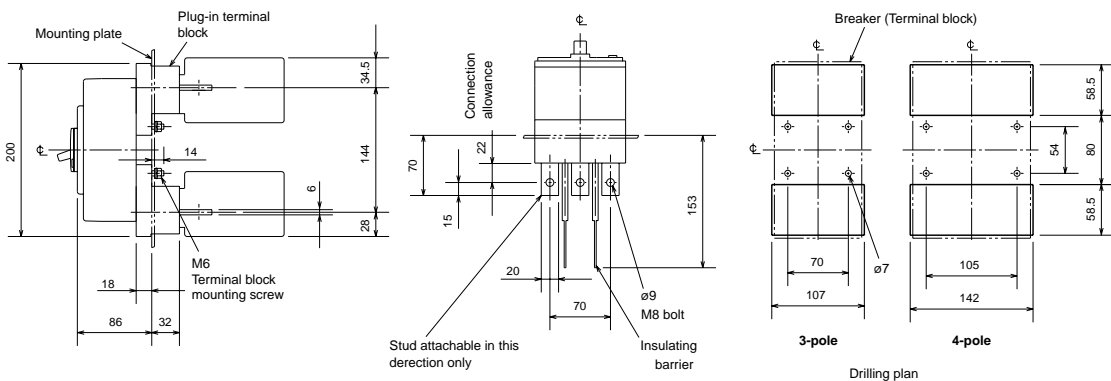
## Front connection



## Rear connection



## Plug-in



# 6. Characteristics and Dimensions

## Earth-Leakage Circuit Breakers

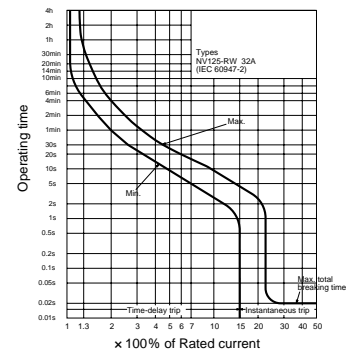
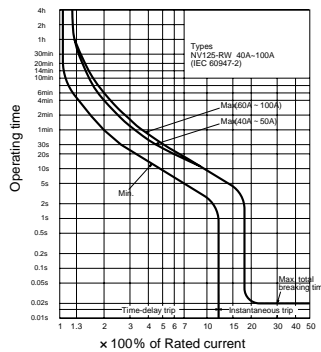
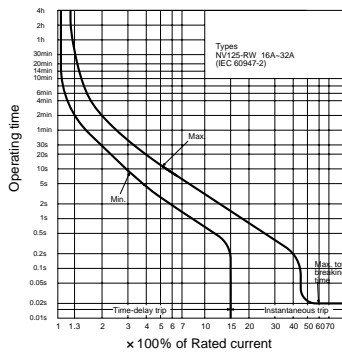
### NV125-RW



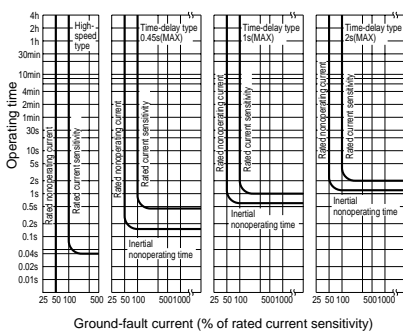
Type NV125-RW

Series		U series
Group		WSS G2
Frame size		125
Type name		NV125-RW
Rated current In (Amp.)		16 20 32 40 50 63 80 100
Number of poles		3
Rated operational voltage Ue (V AC)		230-400-440 Multi-voltage type
High-speed type	Rated current sensitivity IΔn (mA)	30•100•500 Selectable
	Max. operating time at 5IΔn (s)	0.04
Time-delay type	Rated current sensitivity IΔn (mA)	100•300•500 Selectable
	Max. operating time at 5IΔn (s)	0.45•1.0•2.0 Selectable
	Inertial non-operating time at 2IΔn (s)	0.1•0.5•1.0
Earth-leakage indication system		Button
Rated breaking capacity (kA) IEC60947-2 (Icu/Ics)	AC440V	125/125
	AC400V	125/125
	AC230V	125/125

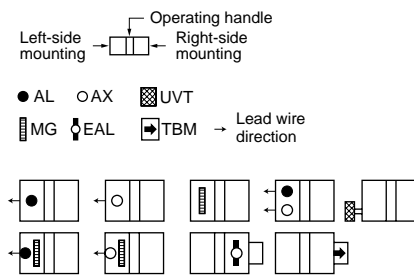
### Operating Characteristics



### Earth-Leakage Tripping Characteristics

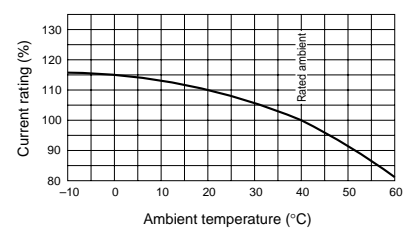


### Internal Accessories



Remark: (1) refer to 24.

### Temperature Characteristics

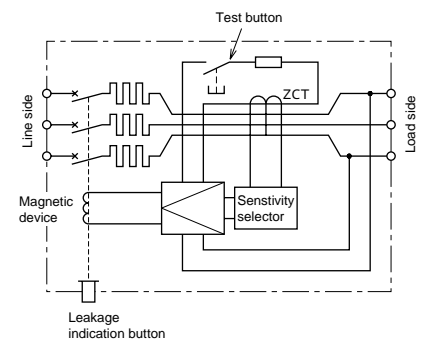


### External Accessories

Accessories	Type name	Reference page	Accessories	Type name	Reference page	
Operating handle	F F1UW	27	Terminal cover	Small TC-S	TCS-1SW3W (*1)	30
	S S1UW			Large TC-L	TCL-1SW3W (*1)	
	V V1UW	28		Skeleton TTC	TTC-1SW3 (*1)	
	R R1UW	29		Rear BTC	BTC-1SW3W (*1)	
				Plug-in PTC	PTC-1SW3W (*1)	
Enclosure	Dustproof S	-	Handle lock device	LC	LC-1SW	32
	Waterproof W			(*3) HLF	HLF-1SW	
				HL	HLN-1SW	
Mechanical interlock	MI MI-05SW3 (*1)	32	HL-S	HLS-1SW		
Electrical operation device	(*2)	30				

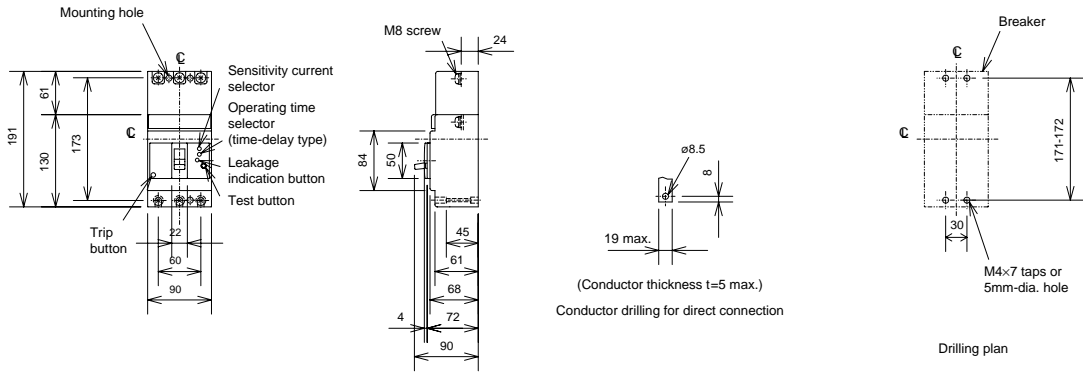
Notes: (\*1) The designation depends on the number of poles. Refer to the reference page.  
 (\*2) An order should be placed at the same time as an order of circuit breaker main body.  
 (\*3) HLF types are used for OFF-lock, and HLN types for ON-lock.

### Internal Wiring Diagram

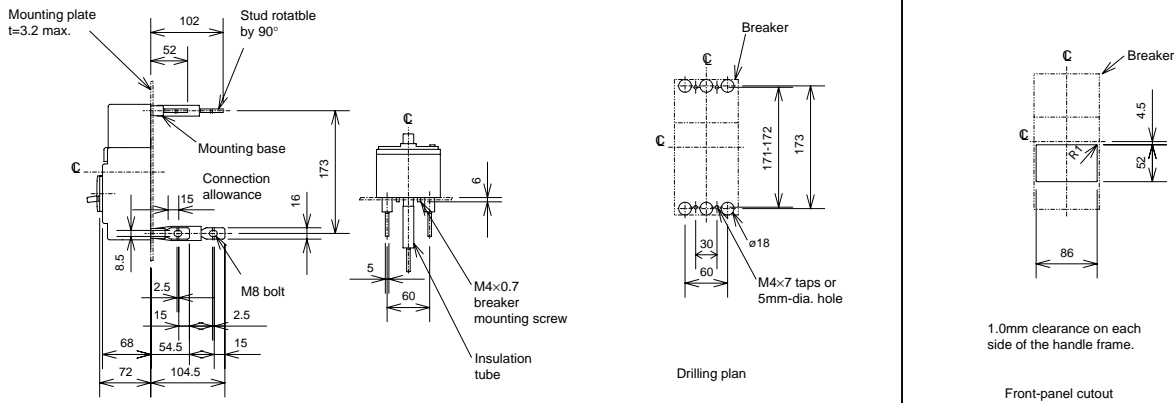


# NV125-RW

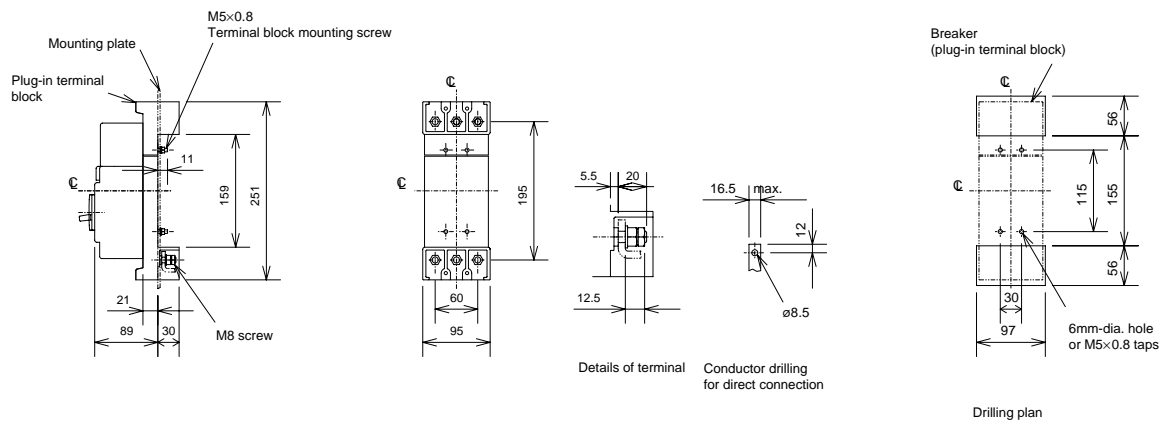
## Front connection



## Rear connection



## Plug-in



# 6. Characteristics and Dimensions

## Earth-Leakage Circuit Breakers

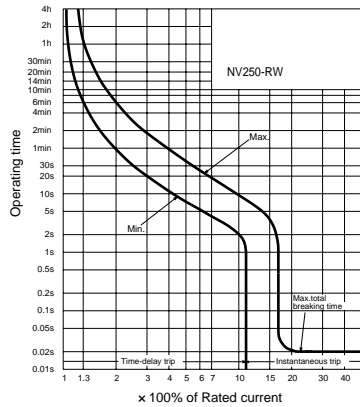
### NV250-RW



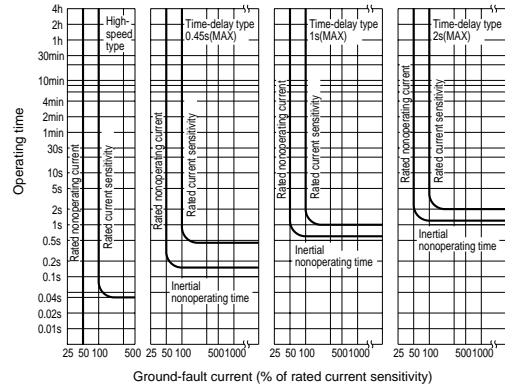
Type NV250-RW

Series		R series
Group		WSS G3
Frame size		250
Type name		NV250-RW
Rated current I <sub>n</sub> (Amp.)		125 150 175 200 225
Number of poles		3
Rated operational voltage U <sub>e</sub> (V AC)		230–400–440 Multi-voltage type
High-speed type	Rated current sensitivity IΔn (mA)	30•100•500 Selectable
	Max. operating time at 5IΔn (s)	0.04
Time-delay type	Rated current sensitivity IΔn (mA)	100•300•500 Selectable
	Max. operating time at 5IΔn (s)	0.45•1.0•2.0 Selectable
	Inertial non-operating time at 2IΔn (s)	0.1•0.5•1.0
Earth-leakage indication system		Button
Rated breaking capacity (kA) IEC60947-2 (I <sub>cu</sub> /I <sub>cs</sub> )	AC440V	125/125
	AC400V	125/125
	AC230V	125/125

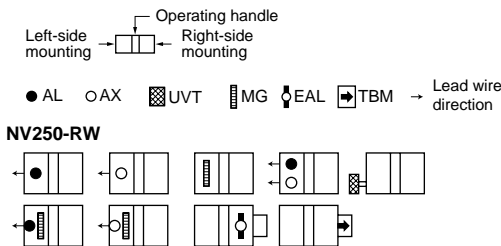
### Operating Characteristics



### Earth-Leakage Tripping Characteristics

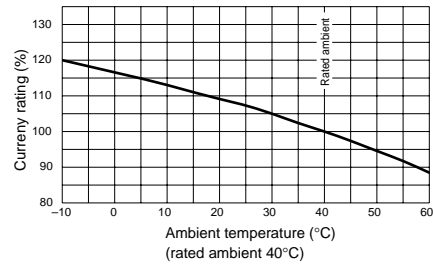


### Internal Accessories



Remark: (1) refer to 24.

### Ambient Compensating Curve

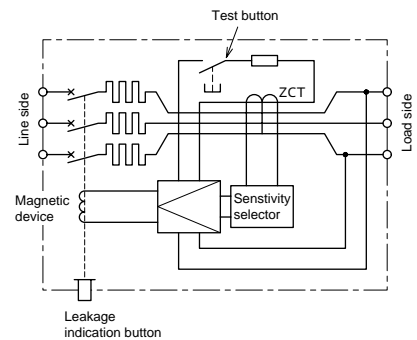


### External Accessories

Accessories	Type name	Reference page	Accessories	Type name	Reference page
Operating handle	F F2UW	27	Mechanical interlock	MI MI-05SW3 (*1)	34
	S S2SW				
	V V2UW				
	R R2UW				
Enclosure	S -	-	Terminal cover	Small TC-S TCS-2SW3W (*1)	30
	I -			Large TC-L TCL-2SW3W (*1)	
	W -			Skeleton TTC TTC-2SW3 (*1)	
Handle lock device	LC LC-2SW	32	Electrical operation device	Rear BTC BTC-2SW3W (*1)	(*3)
	(*2) HLF HLF-2SW				
	HL HLN-2SW				
	HL-S HLS-2SW				

Notes: (\*1) The designation depends on the number of poles. Refer to the reference page.  
 (\*2) HLF types are used for OFF-lock, and HLN types for ON-lock.  
 (\*3) An order should be placed at the same time as an order of circuit breaker main body.

### Internal Wiring Diagram





# 6. Characteristics and Dimensions

## UL489 Listed Molded-Case Circuit Breakers

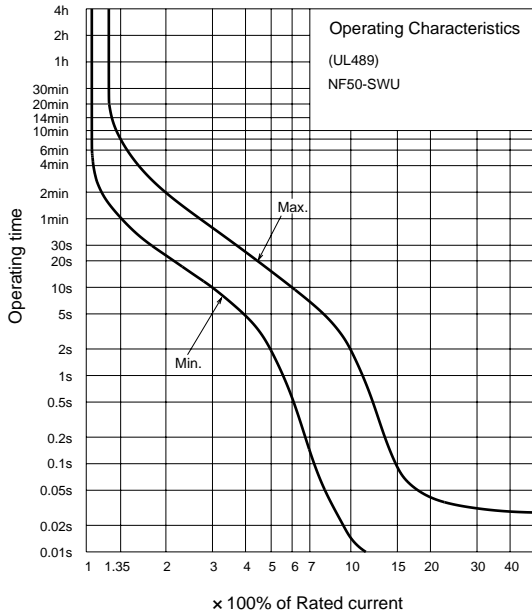
### NF50-SWU



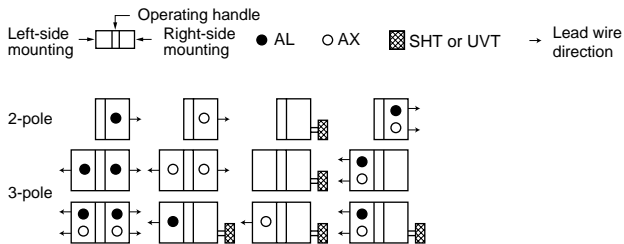
Type NF50-SWU

Series		S series		
Group		WSS G1		
Frame size		50		
Type name		NF50-SWU		
Rated current I <sub>n</sub> (Amp.)		5 10 15 20 30 40 50		
Number of poles		2	3	
Rated braking capacity (kA)	UL489	Rated voltage (AC V)		
		AC	240V	
	IEC60947-2 JIS C 8201-2 (Icu/Ics)	Rated insulation voltage U <sub>i</sub> (V)		
		AC	500V	7.5/4
			440V	7.5/4
400V	7.5/4			
		230V	15/8	
Standard attached parts		Mounting screw: M4×0.7×55 (2pcs) Insulation barrier: (2P: 2pcs, 3P: 4pcs), Insulation board: (1pc)		

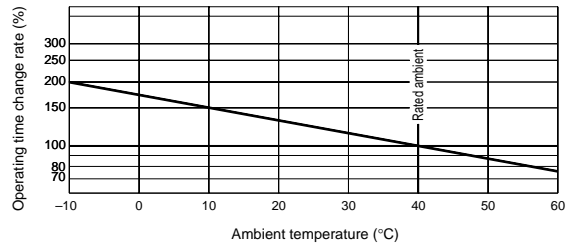
### Operating Characteristics



### Internal Accessories



### Temperature Characteristics



### External Accessories

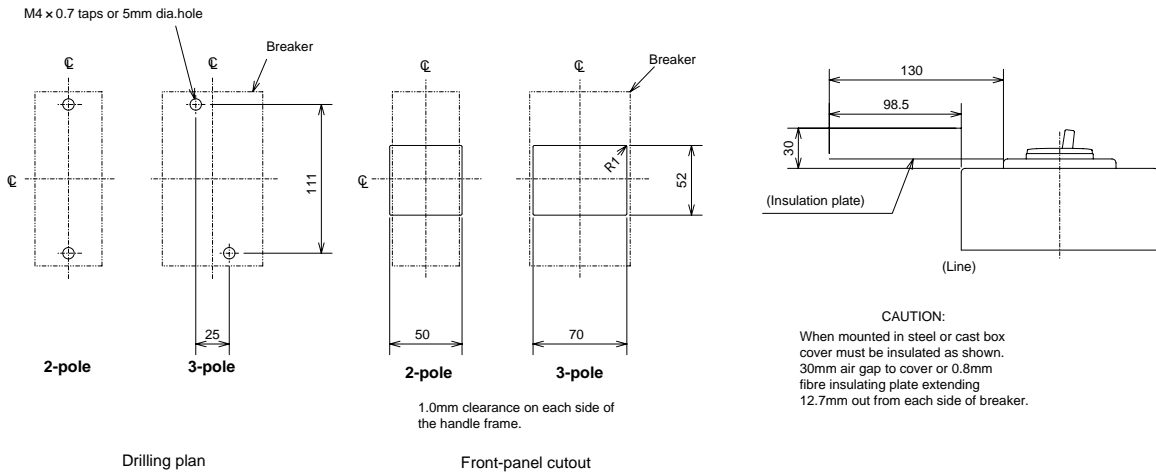
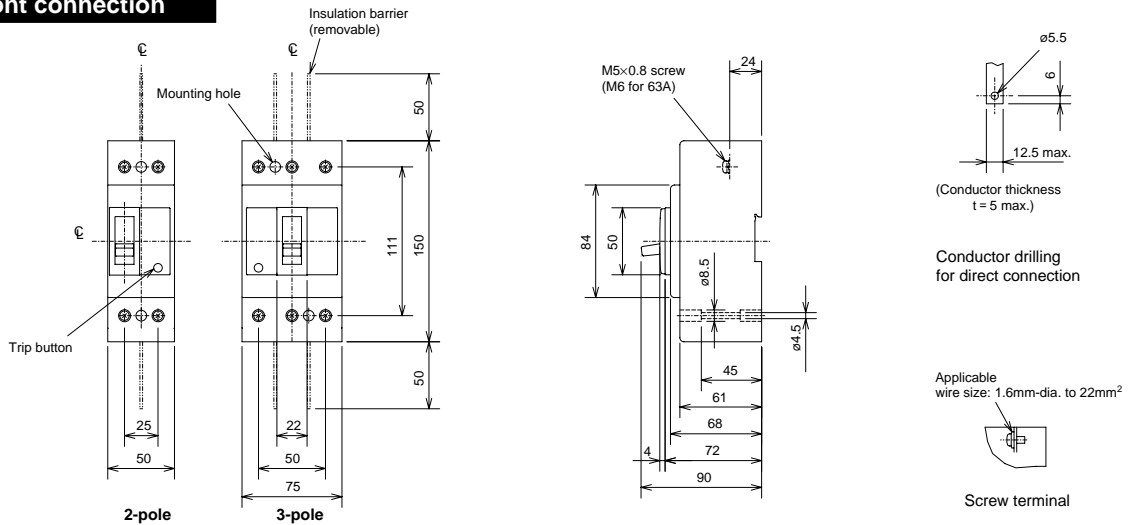
Accessories	Type name	Accessories	Type name
Operating handle	F	F05SWU2P F05SWU	Mechanical interlock MI
	S	S05SWU	
	V	V05SWUF (*1)	Terminal cover Large
Handle lock device	HL	TC-L	

Note: (\*1) Adjustable types can be produced upon request.



# ● NF50-SWU

## Front connection



# 6. Characteristics and Dimensions

## UL489 Listed Molded-Case Circuit Breakers

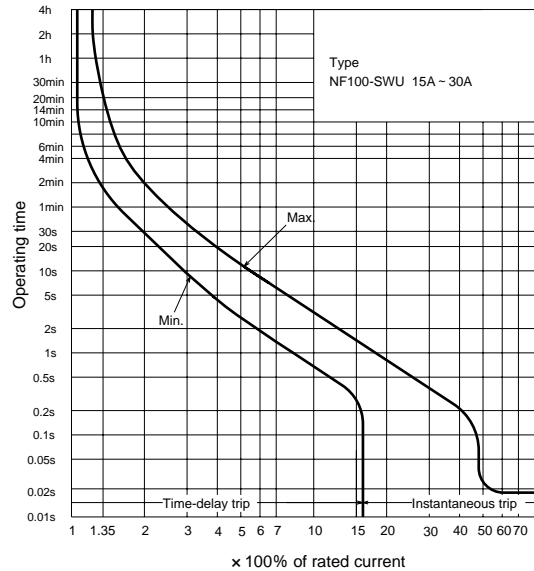
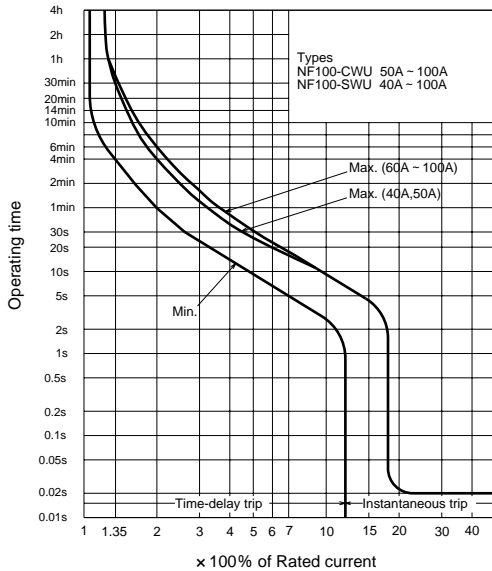
### NF100-CWU NF100-SWU



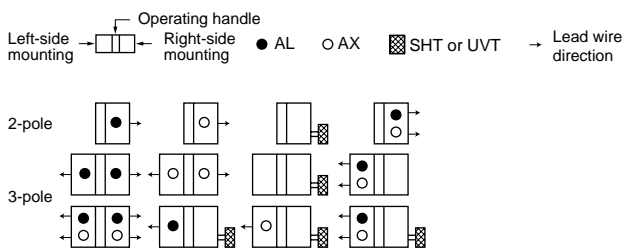
Type NF100-SWU

Series		C series	S series	
Group		WSS G2	WSS G2	
Frame size		100	100	
Type name		NF100-CWU	NF100-SWU	
Rated current In (Amp.) at ambient temperature 40°C (IEC30°C)		50 60 75 100	15 20 30 40 50 60 75 100	
Number of poles		2   3	2   3	
Rated short-circuit breaking capacities (kA)	UL489	Rated voltage (AC V)	240   480Y/277	
		AC	480Y/277V: – 240V: 10   35	
	IEC60947-2 JIS C 8201-2 (Icu/Ics)	Rated insulation voltage Ui (V)	600   690	
		AC	690V	–   8/4
			500V	7.5/4   18/9
			440V	10/5   25/13
400V	10/5   30/15			
DC	250V	7.5/4   15/8		
Standard attached parts		Mounting screw: M4×0.7×55 (2pcs) Insulation barrier: (2P: 2pcs, 3P: 4pcs), Insulation board: (1pc)		

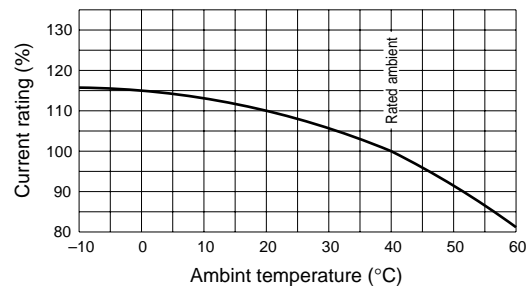
### Operating Characteristics



### Internal Accessories



### Ambient Compensating Curve



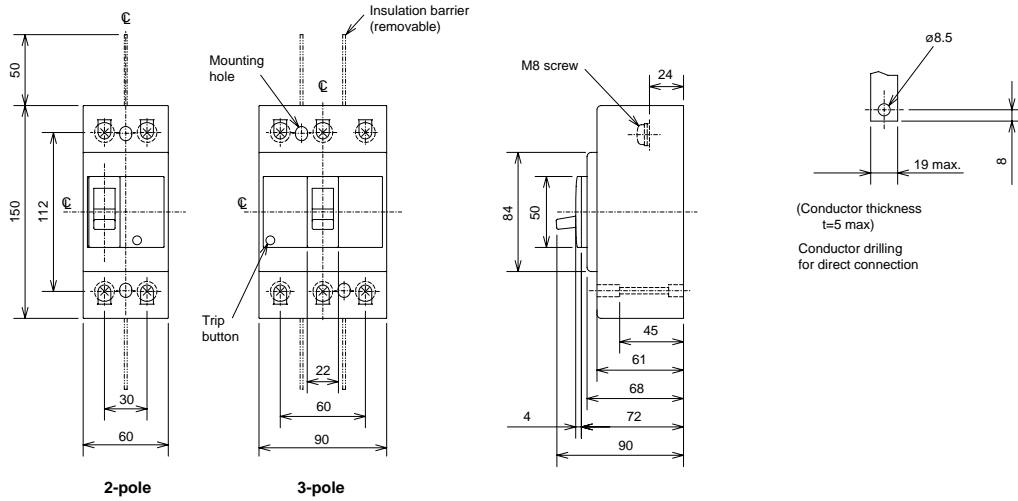
### External Accessories

Accessories	Type name	Accessories	Type name
Operating handle	F	Mechanical interlock	MI
	S		MI-05SWU
	V	Terminal cover	Large
HL	TCL-1SWU2 TCL-1SWU3		

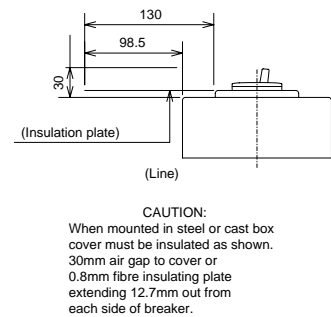
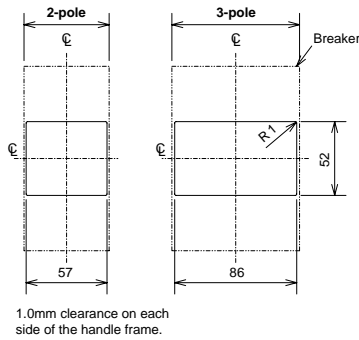
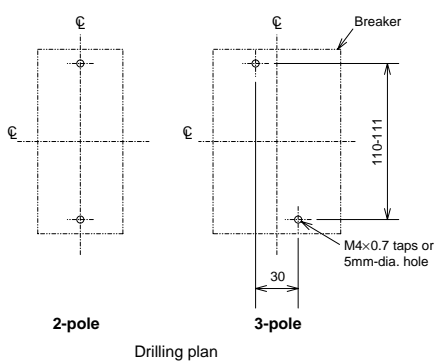
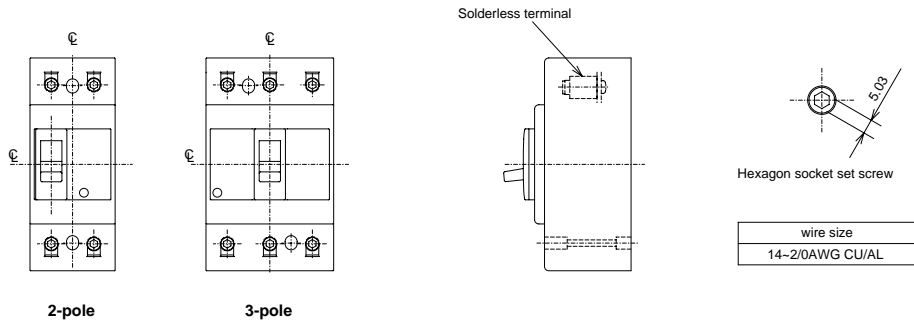
Note: (\*1) Attach the letter "F" to the end of designation for a fixed type.

# ● NF100-CWU, NF100-SWU

## Front connection (Standard)



## Front connection (Solderless terminal) (Option)



# 6. Characteristics and Dimensions

## UL489 Listed Molded-Case Circuit Breakers

### NF225-CWU

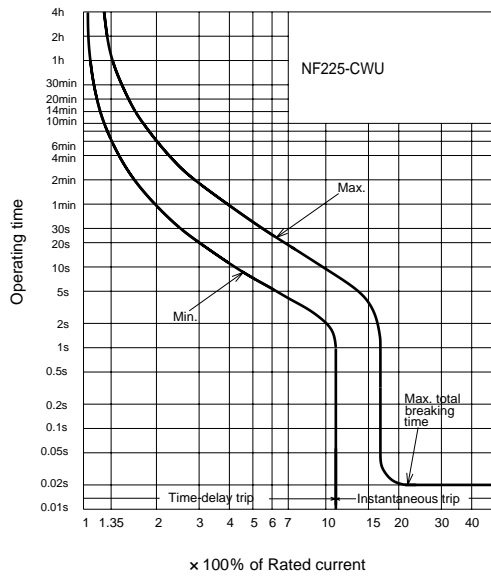


Type NF225-CWU

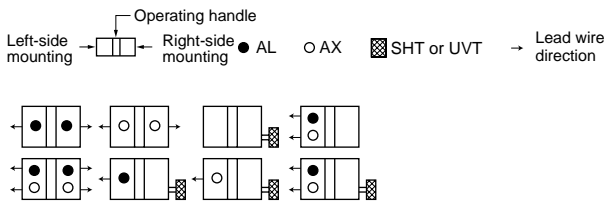
Series		C series		
Group		WSS G3		
Frame size		225		
Type name		NF225-CWU		
Rated current I <sub>n</sub> (Amp.) at ambient temperature 40°C (IEC30°C)		125 150 175 200 225		
Number of poles		3		
Rated short-circuit braking capacities (kA)	UL489	Rated voltage (AC V)		
		AC	240V	
	IEC60947-2 JIS C 8201-2 (Icu/Ics)	Rated insulation voltage U <sub>i</sub> (V)		
		AC	500V	10/5
			440V	15/8
			400V	18/9
DC	230V	35/18		
DC	250V	10/5 (*1)		
Standard attached parts		Mounting screw: M4×0.7×55 (2pcs) Insulation barrier: (4pcs) Terminal cover: (1 set),(*2) Insulation board: (1pc)		

Notes: (\*1) Use either two poles. When wired as shown at the bottom of page 13, the models can be used for up to 400 V DC.  
(\*2) The standard configuration contains a protection cover and adopts the IP20 (finger protection) structure.

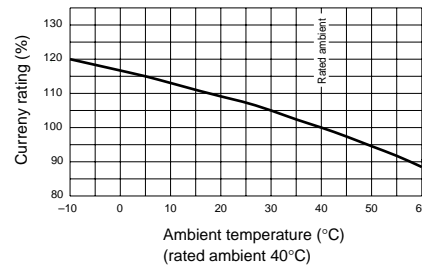
### Operating Characteristics



### Internal Accessories



### Ambient Compensating Curve



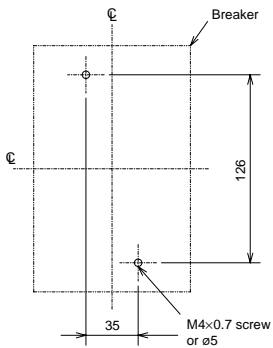
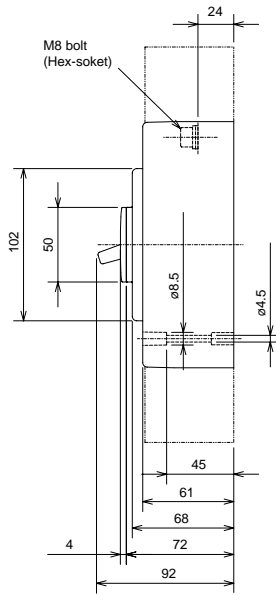
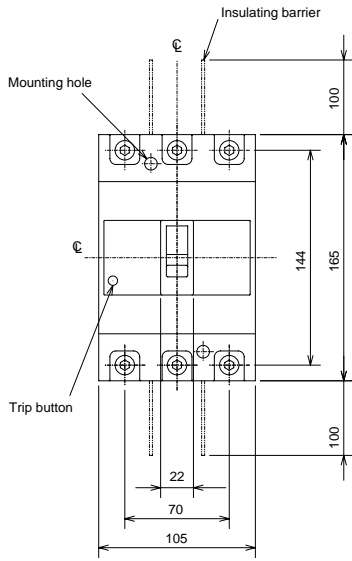
### External Accessories

Accessories	Type name	Accessories	Type name
Operating handle	F F2SWU	Mechanical interlock	MI MI-05SWU
	S S2SWU		
	V V2SWU (*1)	Terminal cover	Large TC-L TCL-2SWU3
HL HLF-2SWU			

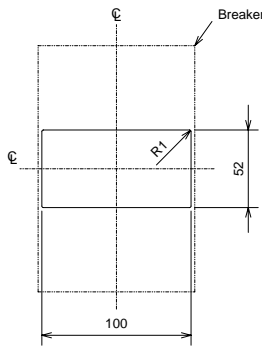
Note: (\*1) Attach the letter "F" to the end of designation for a fixed type.

# ● NF225-CWU

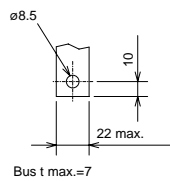
## Front connection



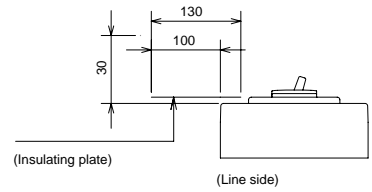
Drilling plan



Front cover cutout  
1mm clearance on each side of handle



Bus drilling for direct connection



**CAUTION:**  
When mounted in steel or cast box cover must be insulated as shown.  
30mm air gap to cover or t0.8 fibre insulating plate extending 12.7mm out from each side of breaker.

# 6. Characteristics and Dimensions

## UL489 Listed Molded-Case Circuit Breakers

NF-SFW  
NF-SJW  
NF-HJW

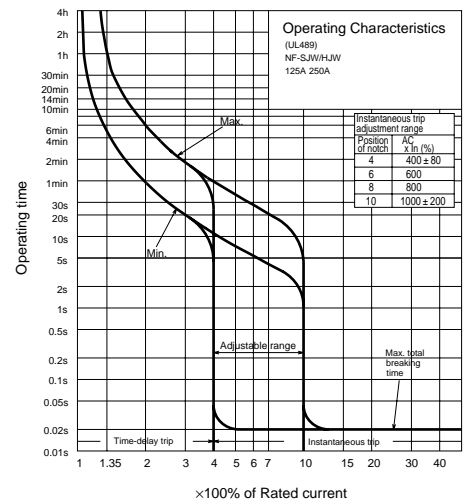
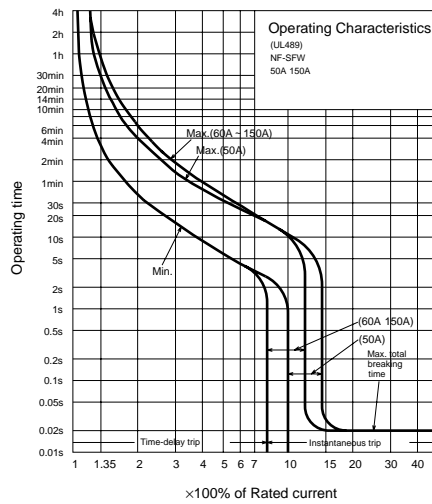
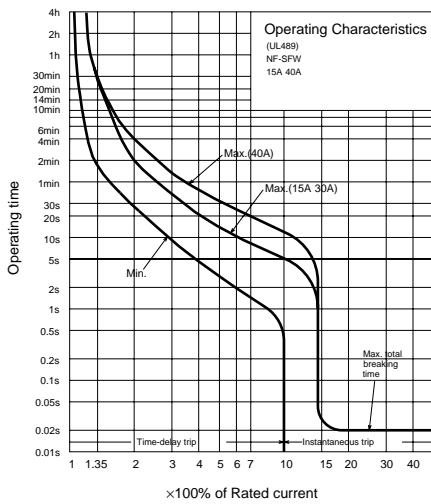


Type NF-SFW

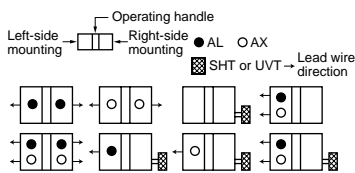
Series		S series		H series			
Group		WSS G4	WSS G4	WSS G4			
Frame size		150	250	250			
Type name		NF-SFW	NF-SJW	NF-HJW			
Rated current I <sub>n</sub> (Amp.) at ambient temperature 40°C (IEC30°C)		15 20 30 40 50 60 70 80 90 100 110 125 150	(125) (150) 175 200 225 250	125 150 175 200 225 250			
Number of poles		3	3	3			
Rated short-circuit braking capacities (kA)	UL489	Rated voltage (AC V)	600Y/347	600Y/347	600Y/347		
			AC	480V	14	14	18
				240V	35	35	50
	IEC60947-2 JIS C 8201-2 (Icu/Ics)	Rated insulation voltage U <sub>i</sub> (V)	690	690	690		
			AC	690V	8/8	8/8	15/15
				500V	30/30	30/30	36/36
				440V	36/36	36/36	50/50
				400V	36/36	36/36	50/50
	DC	230V	85/85	85/85	100/100		
		250V (*1)	20/20	20/20	20/20		
Standard attached parts		Mounting screw: M4×0.7×73 (4pcs) Insulation barrier: (4pcs), Insulation board: (1pc)					

Note: (\*1) Use either two poles. When wired as shown at the bottom of page 13, the models can be used for up to 500 V DC.

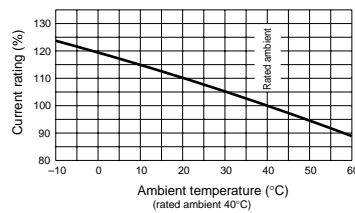
### Operating Characteristics



### Internal Accessories



### Ambient Compensating Curve



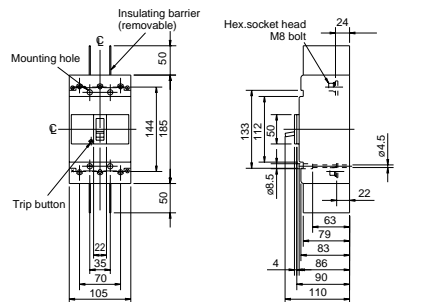
### External Accessories

Accessories	Type name	Accessories	Type name
Operating handle	F F2GSWU	Mechanical interlock	MI MI-05SWU
	S S2GSWU		Terminal cover
	V V2GSWU (*1)		
Handle lock device	HL HLF-2GSWU		

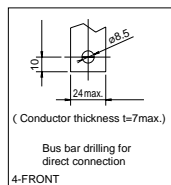
Note: (\*1) Attach the letter "F" to the end of designation for a fixed type.

## NF-SFW, NF-SJW, NF-HJW

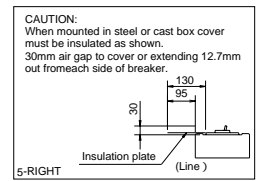
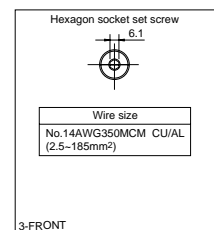
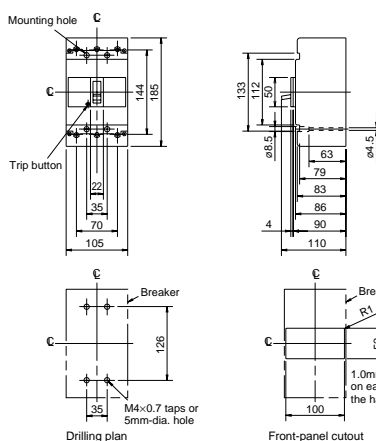
### Front connection (Standard)



CAUTION:  
Insulating barriers must be used with uninsulated bus bars or clamp on terminals.



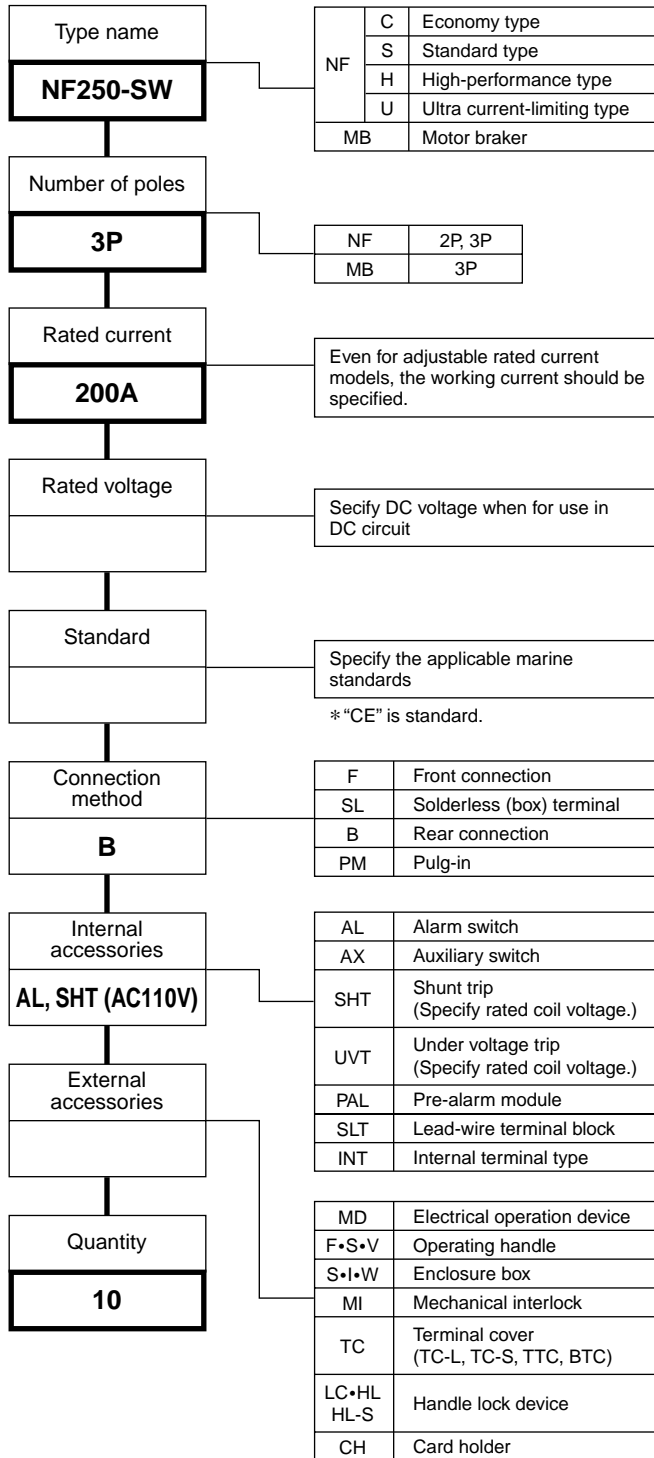
### Front connection (Solderless terminal) (Option)



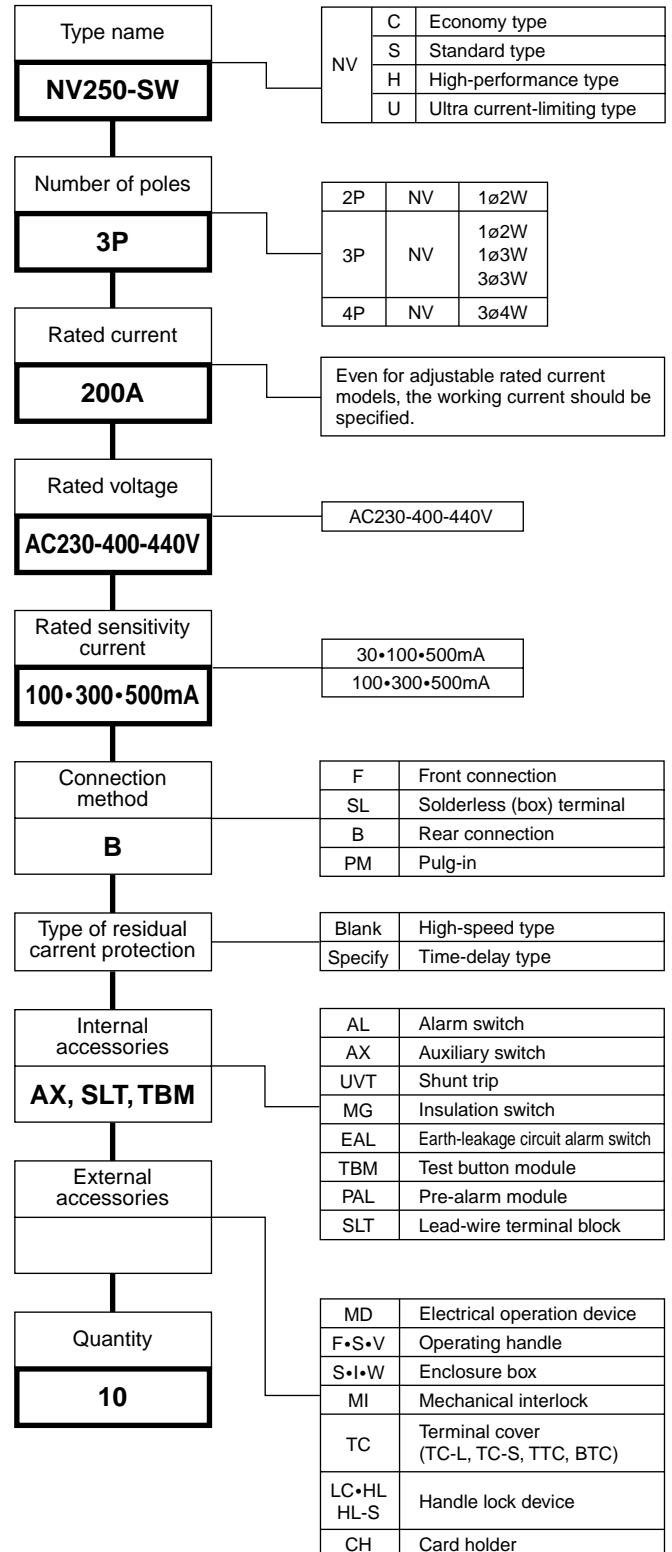
Outline and dimensions (mm (inch))  
Type NF-SFW, NF-SJW, NF-HJW

# 7. Ordering Information

## Molded-Case Circuit Breakers



## Earth-Leakage Circuit Breakers



# Service Network

Country / Region	Company	Address	Telephone
Australia	Mitsubishi Electric Australia Pty. Ltd.	348 Victoria Road, Rydalmere, N.S.W. 2116, Australia	612-9684, 7586
Belgium	Emac S.A.	Industrialaan 1, B-1702 Groot-Bijgaarden, Belgium.	32-(0)2-4810211
Chile	RHONA S.A.	Vte. Agua Santa 4211 Casilla 30-D (P.O. Box) Viña Del Mar, Chile	(32)-611896
China	SHANGHAI SETSUYO TRADING CO.,LTD.	Building of Innovation Center, Room No. 406A, 680 Guiping Road Shanghai, P.R.China	021-6485-6611
	RYODEN INTERNATIONAL LTD.	(Shanghai) 3F, Block 5, 103 Cao Bao Road, Shanghai, China	021-6475-3228
Colombia	Proelectrico Representaciones S.A.	Cra 53 No 29C-73 U.I.C.- Medellín. COLOMBIA.	574-235-00-28
Denmark	Louis Poulsen CO. A/S	Geminivej 32, DK-2670 Greve, Denmark.	45-(0)43-95-95-95
Egypt	CAIRO ELECTRICAL GROUP	9 Rostoum Street Garden City, APT. 5, P.O. BOX: 165-11516, Cairo-Egypt.	20-2-7961337
Germany	Mitsubishi Electric Europe B.V. German Branch.	Gothaer Strasse 8, 40880 Ratingen, Germany.	49-(0)2102-4860
Greece	Drepanias Antonios S.A.	52, Arkadias STR.GR 121 32. Peristeri Athens Greece.	30(1)57 81 599 699
Hong Kong	Ryoden international Ltd.	10/F Manulife Tower 169 Electric Road North Point. Hong Kong.	28878870
Indonesia	P.T.SAHABAT INDONESIA.	JL. Muara Karang Selatan Blok A/Utara No.1 kav. NO.11 P.O. Box 5045/Jakarta/11050. Jakarta Indonesia.	021-6621780
Ireland	Mitsubishi Electric Europe B.V. Irish Branch.	Westgate Business Park, Ballymount, Dublin 24, Ireland.	353-(0)1-4505007
Italy	Mitsubishi Electric Europe B.V. Italy	C.D. Colleoni-P. Perseo Ing. 2, Via Paracelso 12 1-20041 Agrate Brianza (M1)	39-(0)39 60 531
Korea	HAN NEUNG TECHNO Co., Ltd.	2 Fl. Dong Seo Game Channel Bldg ., 1F 660-11 Deungchon-Dong, Kanguseo-Ku, Seoul, 157-030 Korea	017-255-0174
Kuwait	SALEM M AL-NISF ELECTRICAL CO.W.L.L.	P.O. Box 4784. Safat. 13048 Kuwait.	965-484-5660
Lao PDR	SOCIETE LAO IMPORT-EXPORT	43-47 Lane Xang Road P.O. BOX 2789 VT Vientiane Lao PDR.	21-215043, 21-215110
Lebanon	COMPTOIR D'ELECTRICITE GENERALE INTERNATIONAL	Cebaco Center-Block A. Autostrade Dora, P.O. BOX: 90-1314 Beirut-Lebanon.	961-1-240430
Myanmar	PEACE MYANMAR ELECTRIC CO., LTD.	No. 216, Bo Aung Gyaw Street, Botataung 11161, Yangon, Myanmar.	951-295426
Nepal	Watt & Volt House Co., Ltd.	KHA 2-65, Volt House Dilli Bazar Post Box: 2108, kathmandu, Nepal	977-1-411330
Netherlands	Imtech Marine & Industry	Postbox 5054, NL-3008 AB-Rotterdam, Netherlands.	31-(0)10 487 19 11
New Zealand	Melco Sales (N.Z.) Ltd.	1 Parliament Street Lower Hutt. New Zealand.	644-569-7350
Norway	SCANELEC	Leirvikasen 43B, N5020 Bergen, Norway.	47-55-506000
Pakistan	Prince Electric Co.	16 Brandreth Road Lahore 54000. Pakistan.	042-7654342
Peru	I.T.E.	Ingenieros s.a. Paseo de la Republica 3573 Lima 27. Peru.	(1) 221-2710
Philippines	EDISON ELECTRIC INTEGRATED, INC.	24th Fl. Galleria Corporate Center Edsa Cr. Ortigas Ave. Quezon City, Metro Manila. Philippines.	02-643-8691
Poland	MPL Technology Sp zo.o.	ul. Wroclawska 53, PL-30011 Kraków, Poland.	48-(0)12 632 28 85
Saudi Arabia	CENTER OF ELECTRICAL GOODS	Al-Nabhaniya Street-4th Crossing, Al-Hassa Road, P.O. BOX: 15955, Riyadh 11454, Saudi Arabia.	966-1-4770149
Singapore	MITSUBISHI ELECTRIC ASIA PTE LTD.	307 Alexandra Road #05-01/02 Mitsubishi Electric Building Singapore 159943	65-473-2308
Slovenia	INEA d.o.o.	Ljubljanska 80, SI-61230 Domzale, Slovenia.	386-(0)17 21 80 00
South Africa	M.S.A.MANUFACTURING (PTY) LTD.	Bramley 2018, Johannesburg, South Africa.	27-11-444-8080
Spain	Mitsubishi Electric Europe B.V. Spanish Branch.	Pologono Industrial "Can Magi", Calle Joan Buscalla 2-4, Apartado de Correos 420,08190 Sant Cugat del Valles, Barcelona, Spain.	34-93-565-3160
Sweden	Euro Energy Components AB	Box 103 48 S-434 24 Kungsbocka, Sweden.	46-(0)300-69 00 40
Switzerland	Trielec A G	Mühentalstrasse 136, 8201 Schaffhausen, Switzerland	41-(0)52-6258425
Taiwan	Setsuyo Enterprise Co., Ltd.	5F, NO. 105 Wu-Kung 3rd rd., Wu-Ku Hsiang, Taipei Hsien Taiwan	02-2298-8889
Thailand	UNITED TRADING & IMPORT CO., LTD.	77/12 Bumrungmuang Road, Klong Mahanak, Pomprab Bangkok 10100.	223-4220-3
Turkey	HEDEF DIS Tic. ve Musavirlik LTD. STI	Barbaros Bulvari Gaziumurpasa sok. 9/4, TR-Balmumcu-Istanbul, Turkey.	90-(0)212-2754876
U.K.	Mitsubishi Electric Europe B.V. UK-Branch.	Travellers Lane, Hatfield, Herts, AL10 8xB, U.K.	44-(0)1707-276-100
Uruguay	Fierro Vignoli S.A.	AV. URUGUAY 1274, Montevideo. Uruguay.	598-2-92-08-08
Venezuela	ADESCO C.A.	Lle 8, Calpon Elinsu, La Urbina-EDO, Miranda P.O. BOX 78034 Caracas 1074A., Venezuela	58-2-241-7634
Vietnam	Sa Giang Techno Co., Ltd.	207/4 Nguyen Van Thu St., Dist 1, Ho Chi Minh City, Vietnam	848-821-6453

**Safety Tips** : Be sure to read the instruction manual fully before using this product.

 **MITSUBISHI ELECTRIC CORPORATION**  
HEAD OFFICE: MITSUBISHI DENKI BLDG., 2-2-3, MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN