for a greener tomorrow

MITSUBISHI ELECTRIC

Changes for the Better

FACTORY AUTOMATION

LVS

Low Voltage & Energy Monitoring

- SUPER AE air circuit breakers
- WS – Moulded-case Circuit breakers
- MCB – Miniature Circuit Breakers
- MS – Magnetic contactors
- MMP-T – Manual Motor Protectors
- MMI – Monitor Measuring Instruments

Global impact of Mitsubishi Electric

Through Mitsubishi Electric's vision, "Changes for the Better" are possible for a brighter future.

Changes for the Better

We bring together the best minds to create the best technologies. At Mitsubishi Electric, we understand that technology is the driving force of change in our lives. By bringing greater comfort to daily life, maximising the efficiency of businesses and keeping things running across society, we integrate technology and innovation to bring changes for the better.

Mitsubishi Electric is involved in many areas including the following

Energy and electric systems
A wide range of power and electrical products from generators to large-scale displays.

Electronic devices
A wide portfolio of cutting-edge semiconductor devices for systems and products.

Home appliance
Dependable consumer products like air conditioners and home entertainment systems.

Information and communication systems
Commercial and consumer-centric equipment, products and systems.

Industrial automation systems
Maximising productivity and efficiency with cutting-edge automation technology.

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Breakthrough technology

Over 80 years of experience

Mitsubishi Electric has been active in the low voltage switchgear (LVS) market since 1933. Ever since Mitsubishi Electric developed and manufactured the first moulded-case circuit breakers, the company has been committed to research and development in this field, making it one of the world's leading manufacturers of circuit breakers.

Innovation

Groundbreaking research and design has resulted in innovative LV switchgear, providing users with greater quality, safety and reliability. Today's LV products feature meticulously designed technology: even the casing material is used in the PA (Polymer Ablation type Auto-Puffer) to provide greater safety and high voltage breaking performance.

Meeting global norms and standards

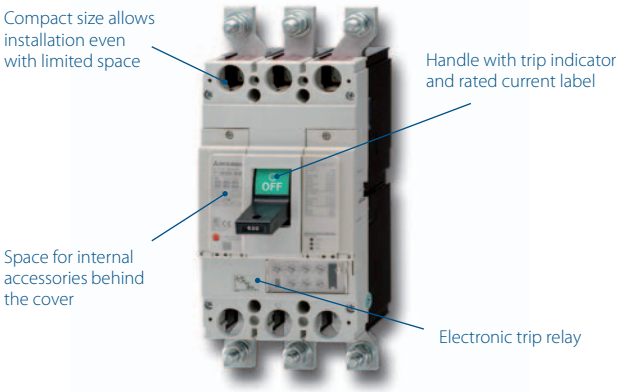
Mitsubishi Electric's low voltage switchgears meet all the standards and specifications laid down in the EU Low Voltage Directive 2006/95/EC and the Machinery Directive 98/37/EC. Needless to say, all the units carry the CE mark and are certified as conforming to UL, cUL and EAC.

Standards are at the center of our product development.

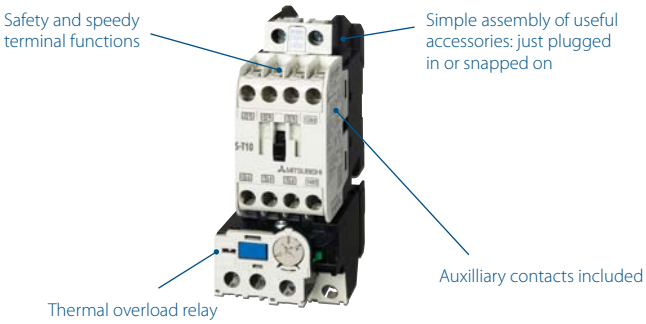
Six stoutly reasons for Mitsubishi Electric LVS

Air circuit breaker of the Super AE-SW series

Moulded-case circuit breaker of the NF-SW series



Magnetic contactor with mounted thermal overload relay of the MS series



High performance

The one class higher performance of the Mitsubishi Electric low voltage switchgears realizes superb breaking performance. Hence the safety of valuable circuits can be securely maintained.

High reliability

Reliability is provided due to high operating durability.

Global

In addition to complying with well-known international norms and standards, the low voltage switchgears are also certified by several marine approvals.

Best solution

The high flexibility of the various line-up, the plenty of accessories and the easy installation enable always the best solution for each application.

Intelligent

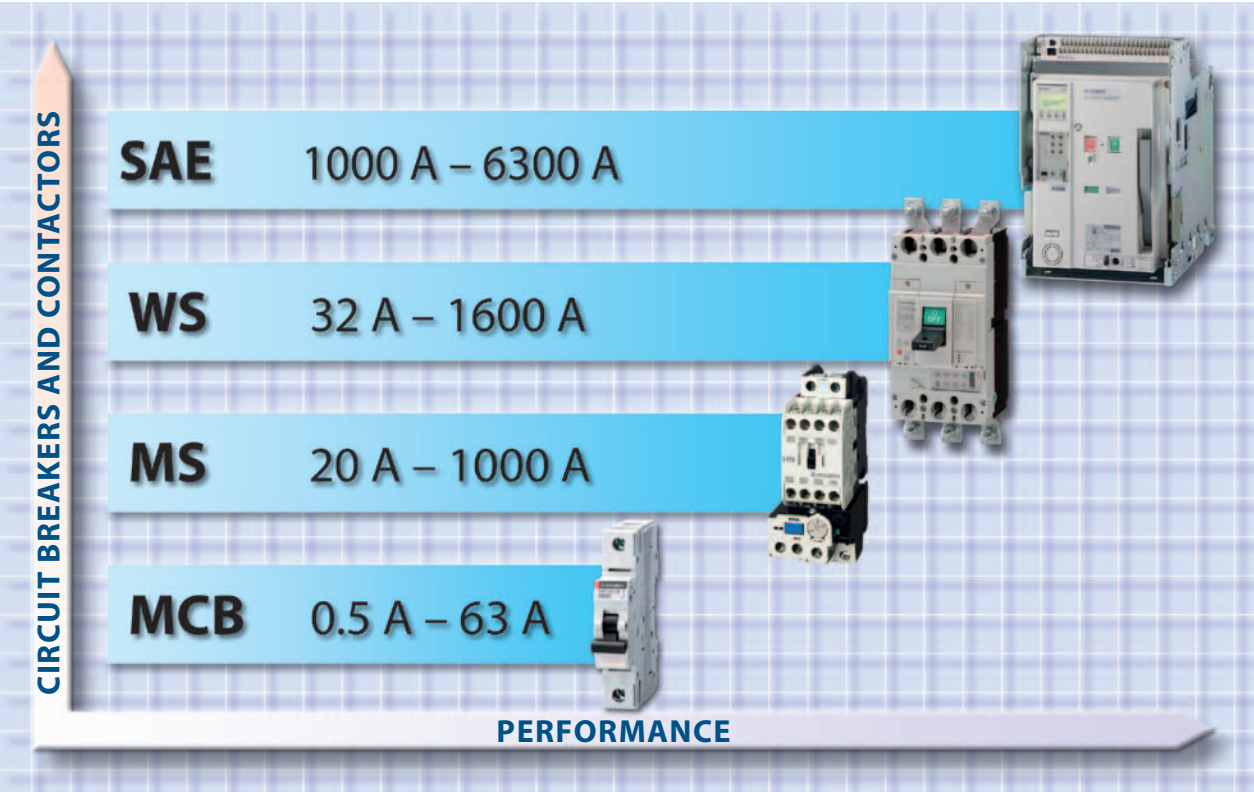
The main functions, including trip status, alarm and load current are displayed on the LCD screen of the SUPER AE and can also be output as signals.

Customer friendly

Functionality, compatibility and perfect mechanical design are the main features of the low voltage switchgears supplied by Mitsubishi Electric .

Not all features are available on all LVS.
Please check applicability.

A complete solution for line and load side

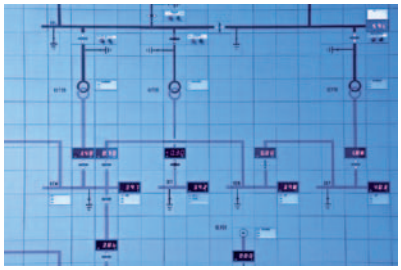


A diverse product range helps you make the right product choice.

Pioneering the future

In recent years, we have been promoting globalization and responding to rapidly expanding internationalization and efforts to protect the global environment through the development of next-generation circuit breakers and earth leakage circuit breakers, and through completion of our World Super (WS) Series product lineup.

We are pioneering a new future for circuit breakers, working to realize market globalization by responding to international needs with products that offer enhanced ease of operation and high performance, are developed with consideration for the environment in mind.



Mitsubishi Electric breakers are used worldwide in modern power distribution systems.

Mitsubishi Electric SUPER AE are virtually maintenance free

Reliable and secure switching performance even in complex high-power systems

Mitsubishi Electric offers a complete solution for line and load side distribution, ranging from air circuit breakers to moulded-case breakers and magnetic contactors.

Air circuit breakers (ACB's)

Low-voltage air circuit breakers can be used as the main circuit breakers of power distribution systems for buildings, factories, ships, and more to realize high-level circuit monitoring and friendly networking.

Mitsubishi Electric's compact Super AE units come in a broad spectrum of performance categories from 1000 to 6300 Amps. The basic unit is available as a fixed or "draw out" design, which can be augmented with options for enhanced overload control, network and energy consumption.

Molded-case circuit breakers (MCCB's)

Molded-case circuit breakers are utilized to open/close low-voltage circuits and protect wiring by automatically closing circuits when overloading or short-circuiting occurs.

Mitsubishi Electric's MCCBs of the World Super Series (WS) provide protection across the current range from 3 to 1600 Amps. Each unit is available in a fixed or slot-in design and has a range of additional options such as electronic trips.

Contactors and relays

Mitsubishi Electric contactor range is made of magnetic contactors, thermal overload relays and contactor relays for reliable motor protection.

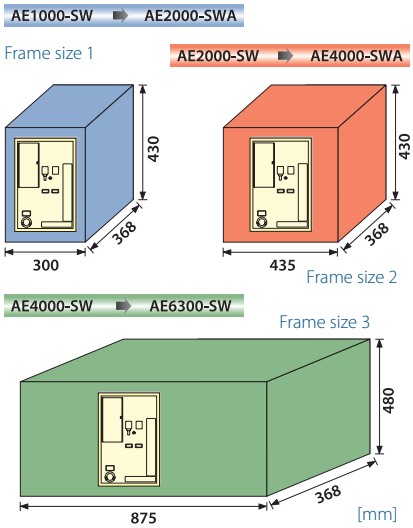
The MS range of LV switchgears is a reliable and customizable solution for load side connection. These space-efficient products are up to 25 % smaller than similar units. In addition the MS range has enhanced performance. For example, the magnetic contactors withstand voltage drops of up to 35 % while still, ensuring reliable operation.

The MS units can be customised with a wide range of options, including thermal overload relays, time delay modules, auxiliary contacts and trip indicators to suit the users specific needs.

Moulded-case circuit breakers in a compact housing

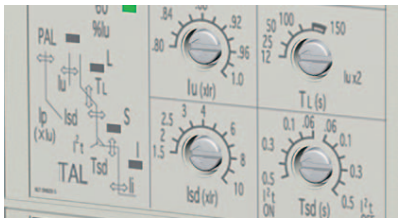
SUPER AE – Air circuit breakers

Mitsubishi Electric Air Circuit Breakers are built for the global demands of the 21st century

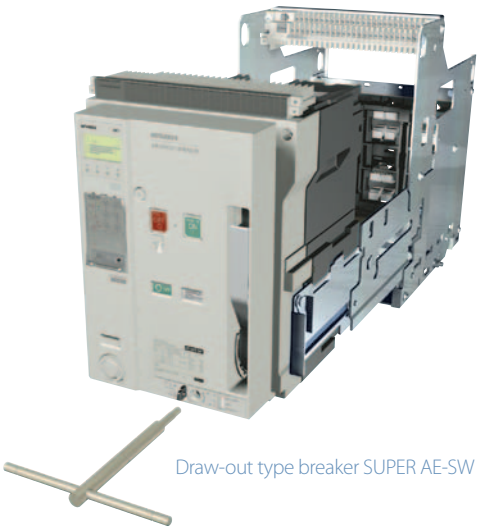


Very user-friendly design

All breakers in the series are available in both 3 and 4 pole versions with fixed or drawout configurations to suit your individual requirements. There are only three standard sizes, making planning much easier.



All parameters can be adjusted individually, ensuring that an optimum selectivity for every application is achieved.



Draw-out type breaker SUPER AE-SW

The range of air circuit breakers and load interrupter switches is complemented by a comprehensive range of accessories. In contrast to earlier models it is now possible to save space by installing some accessories (for example the UVT undervoltage trip) inside the breaker unit.

All live components in the vicinity of the control connections have IP20 protection rating.

Individually configured protection

The circuit breakers are delivered with an electronic trip relay. It is available in versions for all standard power supply voltages. Optional modules are also available for most common applications like protecting transformers, cables, motors and generators. This ensures optimum protection for long time, short time and instantaneous tripping.

In addition to options like pre-alarm, ground fault and earth leakage protection, the electronic trip relay provides complete protection against overloads and short circuits. The protection characteristic can be adjusted individually for the needs of your application.

The main functions, including trip status, alarm and load current are displayed on the LCD screen and can also be output as signals. For easy and quick recognition of alarms, the screen automatically turns red when a fault is detected.

Broad performance range

The growing demand for power naturally increases the levels of short circuit currents in power distribution systems. The SUPER AE series breakers deliver excellent protection against thermal and mechanical damage. The rated surge withstand capability (Uimp) is 12 kV. With a short circuit breaking capacity of 65–85 kA they cover the great majority of applications, providing very high-quality protection for your systems.

The small number of components and high production standards ensure a long service life. The breakers of the SUPER AE series are virtually maintenance-free.

Comprehensive communications capabilities

Together with optional network interface modules the SUPER AE can now become a fully integrated part of the total network and system concept. In addition to Profibus DP and CC-Link®, an interface module for MODBUS® is also available.

The SUPER AE's network modules enable the monitoring and control of a number of different parameters including voltage and current performance values. In addition, the networking connection can also be used to report alarm and error messages from the breaker back to a centralized control point like a PLC or a SCADA system.

In combination with an additional I/O module the breaker can be switched on and off remotely via the network. A drawout position switch can also be checked for the current drawout position via the network.

Profibus DP module

SUPER AE series at a glance

POWER RANGE
1000–6300 A

RATED INSULATION VOLTAGE
1000 V AC

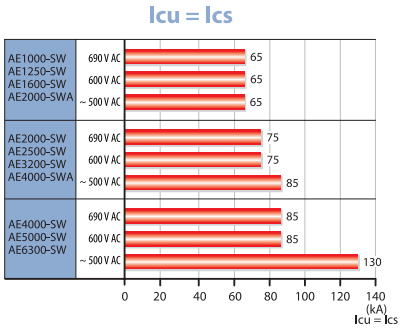
RATED OPERATION VOLTAGE
690 V AC

NUMBER OF POLES
3, 4

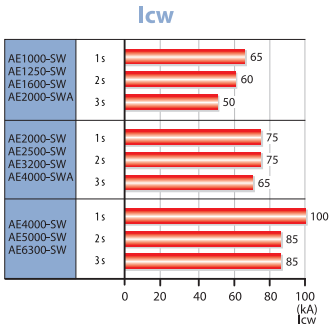
AVAILABLE TYPES
Drawout type, fixed type

NETWORK LINKS*
Profibus DP, CC-Link®, MODBUS®

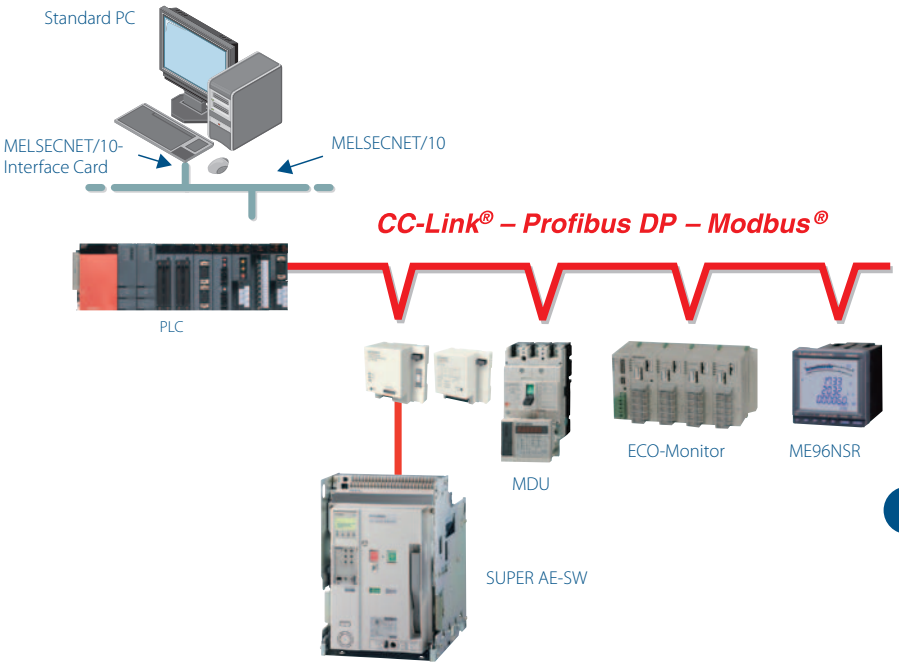
*optional



Rated short circuit breaking capacity Ics



Rated short time withstand current Icw



WS – Moulded-case circuit breakers

Distinguished and secure breaking performance where reliability is needed

Higher performance

The advanced technology of the WS series is based on a proven Mitsubishi Electric patent, and in consideration of the layout of the current leads provides excellent opening cycles of the main conductors.

The new circuit breaking technology "Expanded ISTAC" upgrades current limiting performance for a higher breaking capacity. With higher breaking capacity, lower class models can be used, thus leading to cost reduction of switch panels and machines.

Extending the conductor (reaction circuit for movable conductor) beneath the fixed conductor makes the movable conductor open faster than the conventional ISTAC mechanism. This significantly improves the current limiting performance and reduces the maximum peak current by 10 %.

Molded-case circuit breakers are utilized to open/close low-voltage circuits and protect wiring by automatically closing circuits when overloading or short-circuiting occurs.

Mitsubishi Electric is pioneering a new future for circuit breakers, working to realize market globalization by responding to international needs with products that offer enhanced ease of operation, high performance, and complying with various standards such as JIS, IEC, EN, GB, UL/CSA standards.

With its innovative breaking technology all Mitsubishi Electric breakers offer greater safety and even faster circuit-breaking speed through the use of the latest switch-off technology and innovative engineering, with an innovative electronic trip relay.

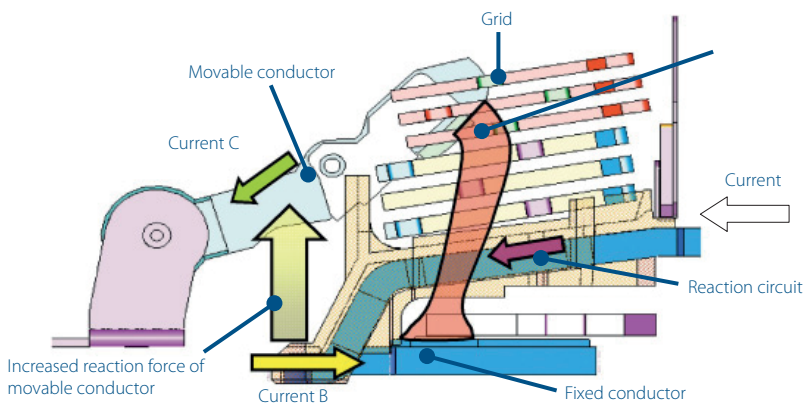
Mitsubishi Electric breakers of the WS series are available in 4 different versions with increasing breaking capacities which can be used for a wide range of applications:

NF-C economy type
Basic model with excellent cost performance. Standard products range from 30 to 250 A frames.

NF-S standard type
Standard model lineup, with products from 32 to 250 A frames

NF-H/-L high-performance type
High performance model lineup, with products from 63 –250 A frames

NF-U/-R ultra current-limiting type
Realizing the world's maximum breaker capacity of 200 kA, this high breaking capacity breaker is the optimum model for backup shutdown.



Expanded ISTAC breaking technology

Vizualization of current flow

Mitsubishi Electric electronic circuit breakers of the WS series with display can display various measurement items. This will enable energy management through permanent visualization of the current in each phase, which leads to energy saving.

The easy to read display is on the circuit breaker body and shows diverse circuit informations. With the help of this display, detailed setting can be done easily. When an alarm occurs, the display turns red, so the affected breaker can be recognized quickly.

Compact design

The thermal adjustable circuit breakers and electronic circuit breakers of the WS series are very compact in size. Comparing to the predecessor series, these breakers contribute to a simplification of design and the reduction of the panel size.

Circuit breakers fixed types, thermal adjustable types and electronic types are the same size, leading to the standardization of panel design.

Easy installation of modular cassette type accessories.

Modular and standardized accessories

The arrangement and design of pluggable accessories such as indicator and auxiliary contacts allows the user to modify the circuit in a way that saves time and space – at any time, even when built in and ready for operation. The presence of separate circuit chambers makes the system even safer.

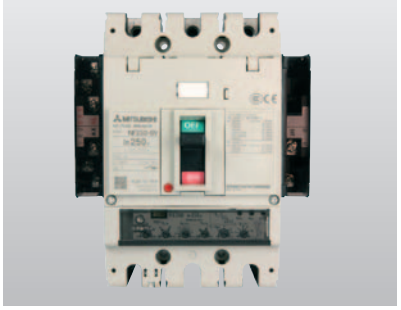
Unlike the previous models the types of internal accessories has been reduced from 3 types to 1 type. The standardization of internal accessories contributes to the reduction of stock and delivery time.

Thus cassette type accessories ensure flexibility when upgrading circuits. The cassette type accessories are available in 5 different versions and fit for breaker series from 30 up to 800 AF:

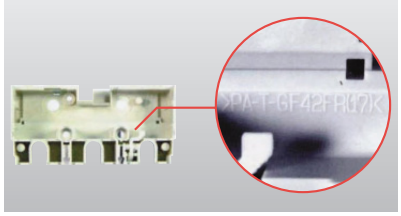
- alarm switch (AL)
- auxiliary switch (AX)
- alarm and auxiliary switch (AL+AX)
- shunt trip device (SHT)
- undervoltage trip device (UVT)

Environment friendly

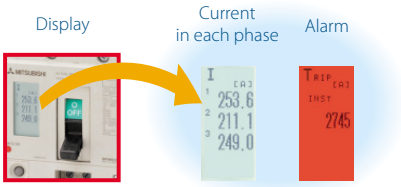
All circuit breakers of the WS series are eco-friendly designed without any hazardous substances. The circuit breakers comply with RoHS regulation. The body of the circuit breakers are made of thermo-plastic materials that are easy to recycle (some models are partially made of thermoset materials). The major plastic parts bear material identifications so that they can be recycled easily.



Breaker with accessories



Use of various recycable materials



Clear and distinctly readable display

WS series at a glance

POWER RANGE
3–1600 A

RATED INSULATION VOLTAGE
500–690 V AC

RATED OPERATION VOLTAGE
up to 690 V AC, 300 V DC

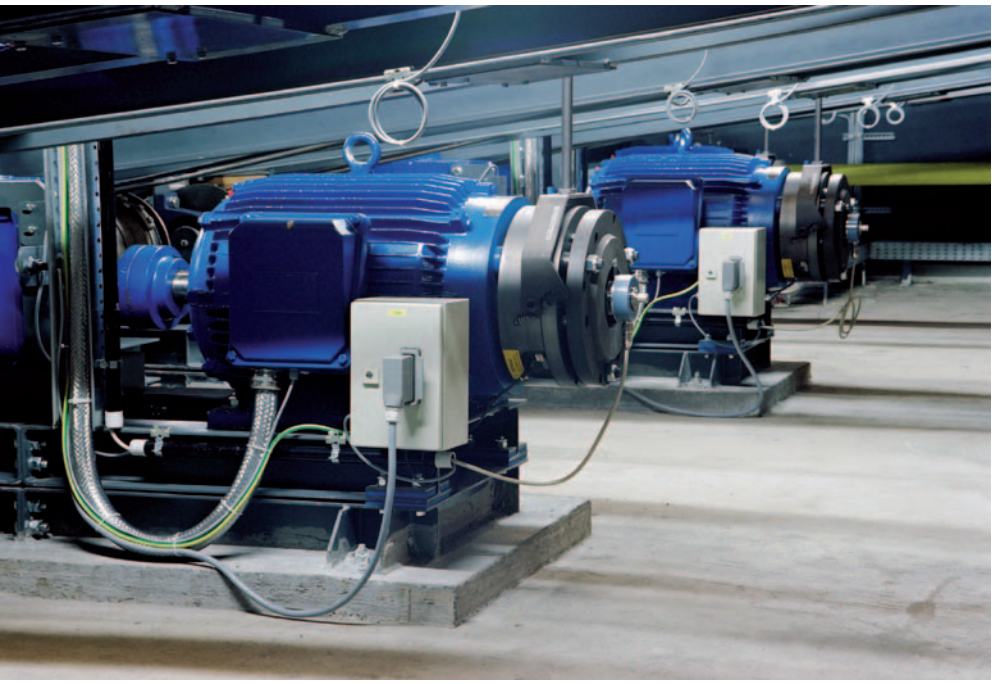
NUMBER OF POLES
3, 4

TRIPPING DEVICE
Thermal magnetic, electronic

NETWORK LINKS*
CC-Link®

*optional

MS – Magnetic contactors



Mitsubishi Electric magnetic contactors protect your investment

Incorporation of CAN terminal for simple wiring

By adopting a CAN terminal, there is no need to remove the screws. The integrated terminal screw and screw holder set in a plastic screw holder, prevent the loss of screw. When each pole is moved and the screw loosened, the screw naturally sets in the screw holder. This is Mitsubishi Electric's original patented CAN terminal.

Unified design

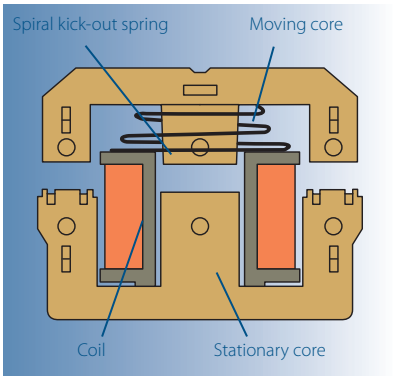
The design of the MS series is unified with a white front face brightening the inside of the panel and providing a cleaner image.

Reduced arc space

By developing a new extinguishing mechanism, the arc space has been reduced to approximately 1/3 against the previous generation. The new contactors are now significantly smaller, reducing the need for costly cubicle space and allowing the contactors to fit easily and neatly into small recesses of a machine or cabinet.

Reliable motor protection

Compact dimensions, modular expansion options and a power-saving design – those are the key characteristics of Mitsubishi Electric's low-voltage switchgear products. The MS series includes magnetic contactors, thermal overload relays and contactor relays. DIN installation rail support and standardised terminal spacing make installation and wiring particularly simple.



Efficient electromagnet thanks to advanced engineering

A selection of relays for optimum motor protection characteristics is available optionally.

MS series at a glance

POWER RANGE
20–1000 A

OPERATING VOLTAGE
280–440 V AC (50/60 Hz)

INTEGRATED AUXILIARY CONTACTS
1–4 (NO and/or NC)

OPTIONS
Auxiliary contact blocks, surge absorbers, interlocks, timers, and many more

Easy mounting and wiring

MS new series contactors, starters and relays can all be mounted on DIN rail (35 mm width). For easy wiring coil terminals of those are arranged on upper side of contactors, moreover distance between center of the rail and the coil terminals are unified to 38.5 mm.

With this new wiring technology, we have designed wiring that is simple and safe for your fingers. Even a line with ring cable sockets can now be assembled fast and without any problems. The clamping screws cannot get lost.

Simple inspection

A visual check of the circuit contacts, all can be done by removing the front cover. You can check the installation after assembly.

The new contacts have led to a considerable improvement of the life and reliability of the auxiliary contacts.

Improved magnet

Use of a spiral kick-out spring improves the dynamic balance of the moving parts, extending the core life and generally stabilizing the core movement. Through the use of modern technology, the efficiency of the magnet has been improved. The contactor can withstand a voltage drop of 35 % with the contact closed.

Improved safety

The arc blow-off has been improved for safety and space conservation. This was possible due to a new extinguishing structure, that eliminates arcing toward the front (in the direction of the control panel door) when current is cut off. This new element improved safety and potentially saves space.

Considerably accessories

A cleverly compiled programme of accessories ensures use for a very wide range of applications and requirements. Here too, very simple assembly was a key aspect: the accessory is not screwed but plugged in or snapped on.

Here are some examples of the accessory that is available for the MS series:

- Auxiliary contact blocks for front and side assembly
- Surge absorbers for coils
- Mechanical interlocks
- Pneumatic timers
- DC interface modules
- Single units for overload relays
- Connecting wire kit for reversing

Where have Mitsubishi Electric products been used?

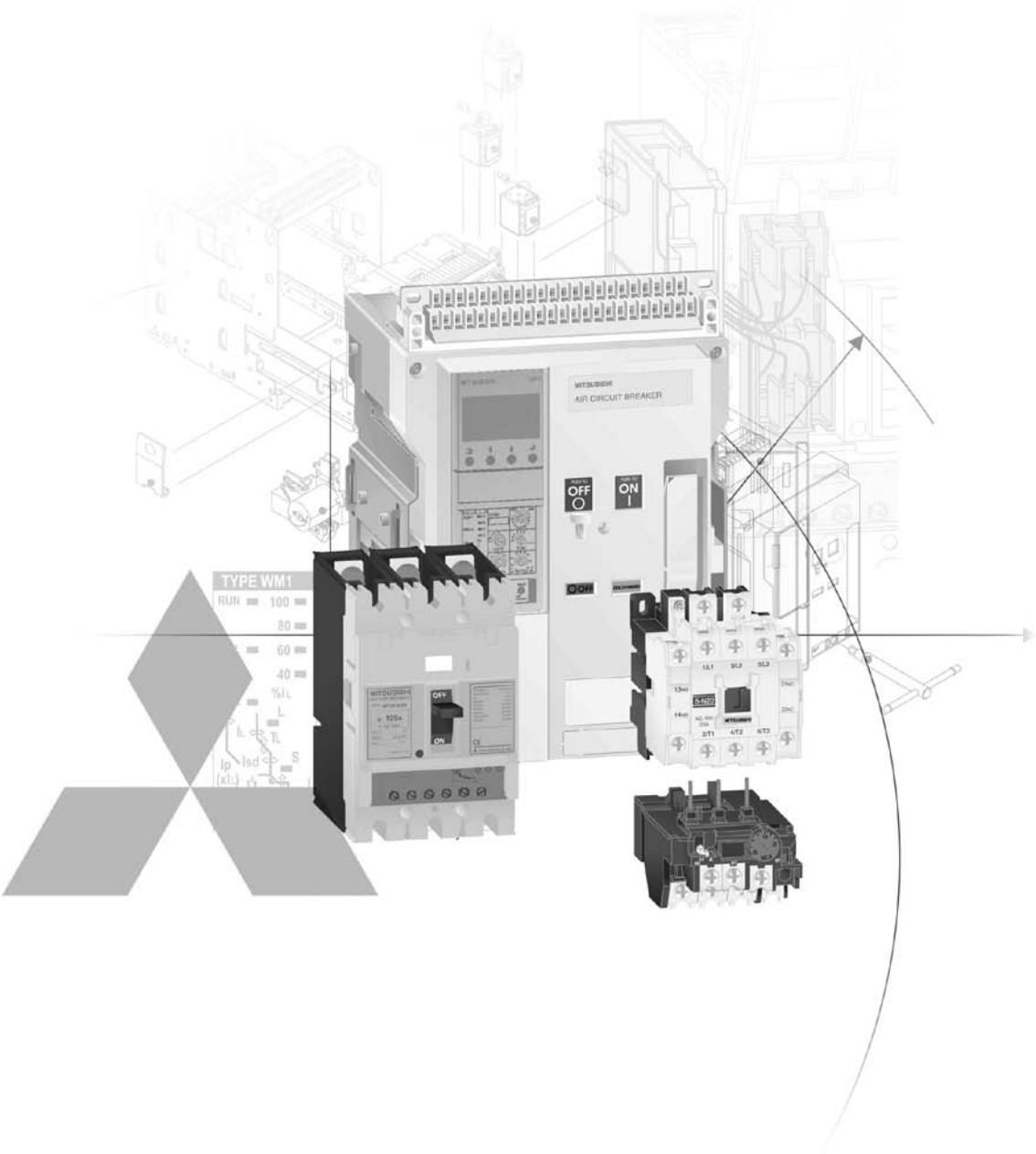
Remote management solutions include SCADA, Networking, Telemetry and Industrial Modems.

Customer applications with Mitsubishi Electric products have been wide spread from critical applications in pharmaceutical industries to sublime applications in the leisure industry.

Here are just a few examples of applications that customers have completed in the past:

- Agriculture
  - Plant watering systems
  - Plant handling systems
  - Sawmill (wood)
- Building management
  - Smoke detection monitoring
  - Ventilation and temperature control
  - Lift (elevator) control
  - Automated revolving doors
  - Telephone management
  - Energy management
  - Swimming pool management
- Construction
  - Steel bridge manufacturing
  - Tunnel boring systems
- Food and drink
  - Bread manufacturing (mixing/baking)
  - Food processing (washing/sorting/slicing/packaging)
- Leisure
  - Multiplex cinema projection
  - Animated mechatronics (museums/theme parks)
- Medical
  - Respiration machine testing
  - Sterilization
- Pharmaceutical/chemical
  - Dosing control
  - Pollution measurement systems
  - Cryogenic freezing
  - Gas chromatography
  - Packaging
- Plastics
  - Plastic welding systems
  - Energy management systems for injection molding machines
  - Loading/unloading machines
  - Blow molding test machines
  - Injection molding machines
- Automotive
- Printing
- Textiles
- Transportation
  - Sanitation on passenger ships
  - Sanitation on rail rolling stock
  - Fire tender pump management
  - Waste disposal truck management
- Utilities
  - Waste water disposal
  - Fresh water pumping
  - Clarification plants

Automotive control solutions



Technical Information Section

Further publications within the industrial automation range

Brochures

FX family

Product catalogue for programmable logic controllers and accessories for the MELSEC FX family

HMI family

Product catalogue for operator terminals, supervision software and accessories

FR family

Product catalogue for frequency inverters and accessories

MR family

Product catalogue for servo amplifiers and servo motors as well as motion controller and accessories

Q/L family

Product catalogues for programmable logic controllers and accessories for the further MELSEC PLC series

Robots family

Product catalogue for industrial robots and accessories

Automation book

Overview on all Mitsubishi Electric automation products, like frequency inverters, servo/motion, robots etc.

Further service supplies

This product catalogue is designed to give an overview of the extensive range of Mitsubishi Electric low-voltage switchgears, air-circuit breakers, moulded-case circuit breakers, magnetic contactors, thermal overload relays and contactor relays and its related accessories. If you cannot find the information you require in this catalogue, there are a number of ways you can get further details on configuration and technical issues, pricing and availability.

For technical issues visit the https://eu3a.mitsubishielectric.com website.

Our website provides a simple and fast way of accessing further technical data and up to the minute details on our products and services. Manuals and catalogues are available in several different languages and can be downloaded for free.

For technical, configuration, pricing and availability issues contact our distributors and partners.

Mitsubishi Electric partners and distributors are only too happy to help answer your technical questions or help with configuration building.
For a list of Mitsubishi Electric partners please see the back of this catalogue or alternatively take a look at the "contact us" section of our website.

About this product catalogue

This catalogue is a guide to the range of products available. For detailed configuration rules, system building, installation and configuration the associated product manuals must be read. You must satisfy yourself that any system you design with the products in this catalogue is fit for purpose, meets your requires and conforms to the product configuration rules as defined in the product manuals.

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Low voltage & energy monitoring

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Product line-up

Outline of Mitsubishi Electric circuit breakers, magnetic contactors and manual motor starters

Classification	Frame [A]	Breaking capacity [kA]	63	125	160	250	400	630	800
Miniature circuit breakers MCB (DIN) Page 101		10	BHW-T10						
Residual current circuit breakers RCCB (DIN series) Page 101		—	BVW-T						
Residual current circuit breakers RCBO with overcurrent protection Page 100		4.5							
Moulded-case circuit breakers MCCB Page 34	**NF-S**	From 36	NF63-SV	NF125-SV NF125-SGV NF125-SEV	NF160-SGV	NF250-SGV NF250-SEV NF250-SV	NF400-SEW	NF630-SEW	NF800-SEW
	NF-H/L	From 50	NF63-HV	NF125-LGV NF125-HGV NF125-HEV	NF160-LGV NF160-HGV	NF250-LGV NF250-HGV NF250-HEV	NF400-HEV	NF630-HEV	NF800-HEV
	NF-R/U	From 150		NF125-RGV NF125-UV		NF250-RGV NF250-UV	NF400-REW NF400-UEW	NF630-REW	NF800-REW NF800-UEW
Earth leakage circuit breakers ELCB Page 100	**NV-C**	From 10		NV125-CV	NV250-CV				
Air circuit breakers AE-SW Page 6		From 65							

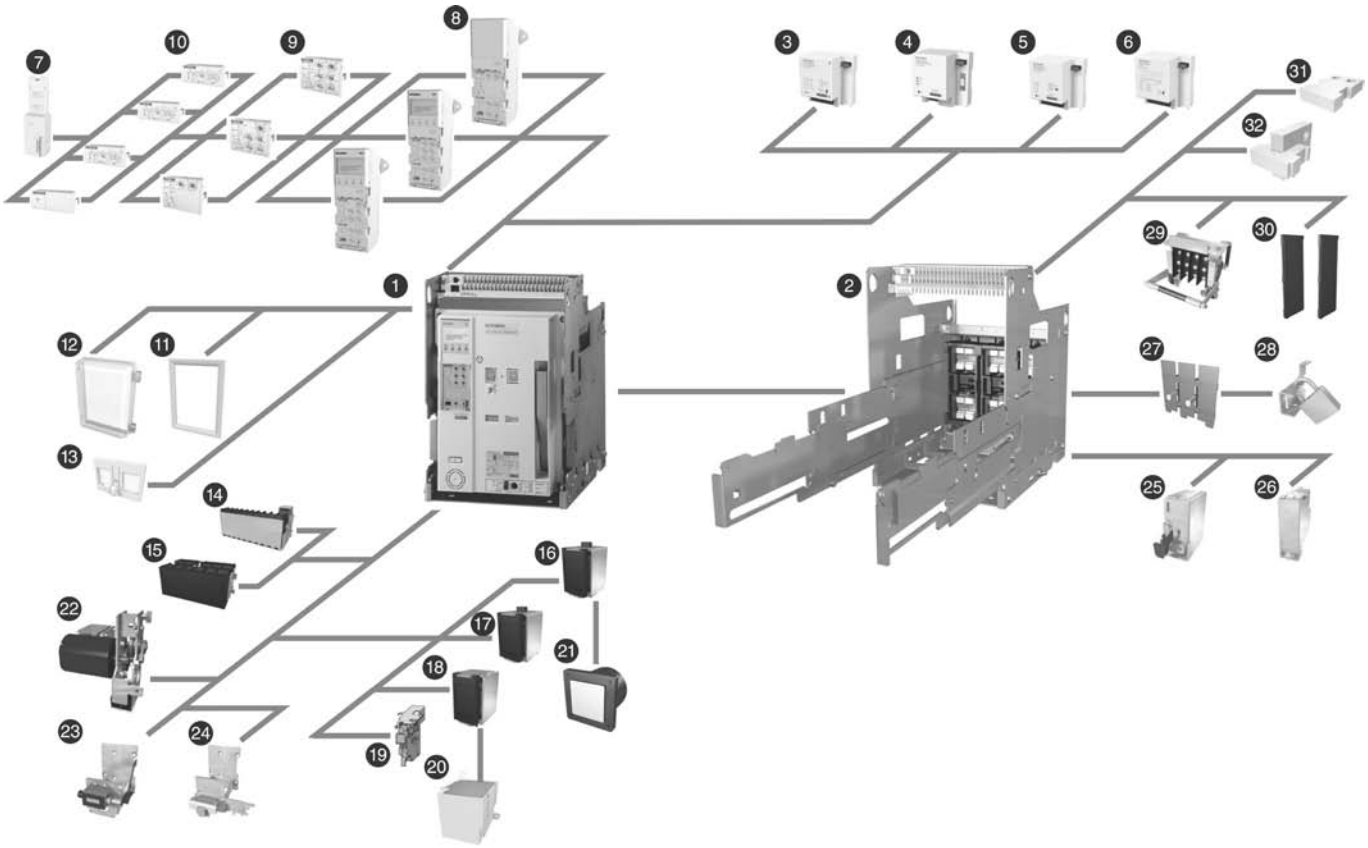
Classification	Frame [A]	11	13	18	20	25	32	35	50	65
Magnetic contactors MS-T Page 104		S-T10	S(D)-T12	SD-T20	S-T20 S(D)-T21	S-T25	S(D)-T32	S(D)-T35	S(D)-T50	S(D)-T65
Thermal overload relays TH-T Page 114		TH-T18	TH-T18	TH-T18 TH-T25	TH-T18 TH-T25	TH-T25	TH-T25	TH-T25 TH-T50	TH-T25 TH-T50	TH-T65
Motor protectors MMS Page 131		MMP-T32							—	

Classification	Frame [A]	1000	1250	1600	2000	2500	3200	4000	5000	6300
Miniature circuit breakers MCB (DIN) **Page 101**										
Residual current circuit breakers RCCB (DIN series) **Page 101**										
Residual current circuit breakers RCBO with overcurrent protection **Page 100**										
Moulded-case circuit breakers MCCB **Page 34**	**NF-S**	NF1000-SEW	NF1250-SEW	NF1600-SEW						
	NF-H/L									
	NF-R/U									
Earth leakage circuit breakers ELCB **Page 100**	**NV-C**									
Air circuit breakers AE-SW **Page 6**		AE1000-SW	AE1250-SW	AE1600-SW	AE2000-SW AE2000-SWA	AE2500-SW	AE3200-SW	AE4000-SW AE4000-SWA	AE5000-SW	AE6300-SW

Classification	Frame [A]	80	100	125	150	180	220	300	400	600	800
Magnetic contactors MS-T **Page 104**		S(D)-T80	S(D)-T100	S(D)-N120	S(D)-N150	S-N180	S(D)-N220	S(D)-N300	S(D)-N400	S(D)-N600	S(D)-N800
Thermal overload relays TH-T **Page 114**		TH-T65 TH-T100	TH-T65 TH-T100	TH-N120KP TH-N120TAKP	TH-N120KP TH-N120TAKP	TH-N220RHKP	TH-N220RHKP	TH-N400RHKP	TH-N400RHKP	TH-N600KP	TH-N600KP
Motor protectors MMS **Page 131**		—									

SUPER AE series air circuit breakers – Total product skeleton

Mitsubishi Electric offers a wide range of accessories for the air circuit breakers to serve almost all variations of applications.



Position	Name
1	Air circuit breaker
2	Cradle
3	CC-Link® Interface unit
4	Profibus DP Interface unit
5	MODBUS® Interface unit
6	I/O unit
7	Extension module
8	ETR unit
9	Main setting module
10	Optional setting module
11	Door frame (DF)

Position	Name
12	Dust cover (DUC)
13	Push button cover (BC-L)
14	Auxiliary switch standard (AX)
15	Auxiliary switch high capacity type (HAX)
16	Shunt trip device (SHT)
17	Closing coil (CC)
18	Under voltage trip device (UVT)
19	Trip coil (TC (OCR-Alarm))
20	UVT-controller (U-CON)
21	Condenser trip device (COT)
22	Motor charging device (MD)

Position	Name
23	Counter (CNT)
24	Cylinder lock (CYL)
25	Door interlock (DI)
26	Mechanical interlock (MI)
27	Safety shutters (SST)
28	Safety shutter lock (SST-LOCK)
29	Cell switch (CL)
30	Interphase Barrier (BA)
31	Horizontal terminal
32	Vertical terminal

SUPER AE series air circuit breakers – Total product skeleton

1 Type

AE1000-SW
AE1250-SW
AE1600-SW
AE2000-SWA
AE2000-SW
AE2500-SW
AE3200-SW
AE4000-SWA
AE4000-SW
AE5000-SW
AE6300-SW

2 Technical standards

IEC 60947-2
EN 60947-2 (CE)
VDE
JIS C 8201-2-1
GB 14048.2 (CCC)

Approvals

LR
GL
BV
DNV
ABS
NK

3 Connection

Drawout type
Horizontal terminal
Vertical terminal
Front terminal

Fixed type

4 Drawout type accessories

Cell switch
Shorting b-contact
Lifting hooks
Safety shutter
Safety shutter lock
Mis-insertion preventor
Test jumper

5 Electrical accessories

Auxiliary switch
Motor charging device
Closing coil
Shunt trip device
Under voltage trip device
Condenser trip device
Trip Coil Man./Aut. Reset Type

6 Mechanical accessories

Push button cover
Counter
Cylinder lock
Terminal cover
Door frame
Dust cover
Interphase barrier
Mechanical interlock
Door interlock

7 Electronic trip relay

General use
WS type

Generator protection use
WM type

On request:
Special use
WB type

Optional
G1: Ground fault protection
E1: Earth leakage protection
AP: 2nd Additional Pre-alarm
N5: Neutral pole 50 % protection

8 Relay accessories

Extension module
Display
MCR switch
Neutral CT
External ZCT
VT-W unit

9 Network

CC-Link® Interface unit
Profibus DP Interface unit
MODBUS® Interface unit
I/O unit

10 Special environment

Moisture-fungus treatment
Corrosion resist

For details on our full range including accessories contact your local distributor

Specifications

SUPER AE – WORLD SUPER SERIES			Breaker type	AE 1000- SW		AE 1250- SW		AE 1600- SW		AE 2000- SWA	
Frame size			A	1000		1250		1600		2000	
Rated insulation voltage (AC V) 50/60 Hz			U_i	1000							
Rated operating voltage (AC V) 50/60 Hz			U_e	690							
Rated impulse withstand voltage (kV)			U_{imp}	12							
Pollution degree				3							
Number of poles			P	3	4	3	4	3	4	3	4
Rated current I_n (CT rating)				1000		1250		1600		2000	
Adjustment range Rated current I_r (A)		General use (current rating adjustable 0.5 to 1.0 x I_n 0.05 step)		500-550-600-650-700-750-800-850-900-950 -1000		625-687.5-750-812.5-875-937.5-1000-1062.5-1125-1187.5-1250		800-880-960-1040-1120-1200-1280-1360-1440-1520-1600		1000-1100-1200-1300-1400-1500-1600-1700-1800-1900-2000	
		Generator protection (current rating fixed)		$400 \leq I_r \leq 1000$		$800 \leq I_r \leq 1250$		$1000 \leq I_r \leq 1600$		$1250 \leq I_r \leq 2000$	
Rated current of neutral pole			A	1000		1250		1600		2000	
IEC 60947-2, EN 60947-2, VDE, JIS C 8201-2-1	Ultimate breaking capacity I_{cu} (kA rms)		690 V AC	65		65		65		65	
			600 V AC	65		65		65		65	
			240–500 V AC	65		65		65		65	
		With MCR	690 V AC	65		65		65		65	
			600 V AC	65		65		65		65	
			240–500 V AC	65		65		65		65	
		Without instantaneous	690 V AC	25 ①		25 ①		25 ①		25 ①	
			500 V AC	25 ①		25 ①		25 ①		25 ①	
	Rated service breaking capacity Ics (kA rms) % I_{cu}										
	Rated making capacity I_{cm} (kA, peak)		690 V AC	143		143		143		143	
			600 V AC	143		143		143		143	
		240–500 V AC		143		143		143		143	
		With MCR	690 V AC	143		143		143		143	
			600 V AC	143		143		143		143	
			240–500 V AC	143		143		143		143	
		Without instantaneous	690 V AC	52.5		52.5		52.5		52.5	
			500 V AC	52.5		52.5		52.5		52.5	
Disconnector: switching capacity (6x I_r at 690V AC)				○		○		○		○	
Rated short time withstand current (kA rms) I_{cw}			1 s	65		65		65		65	
			2 s	60		60		60		60	
			3 s	50		50		50		50	
Maximum total breaking time			ms	40 ⑥		40 ⑥		40 ⑥		40 ⑥	
Closing time			ms	80		80		80		80	
Number of operating cycles (ON/OFF) ②		With rated current	500 V AC I_n	5000		5000		5000		1500	
			690 V AC I_n	5000		5000		5000		1500	
		Without rated current ④		25000		25000		25000		25000	
Connecting terminal		Horizontal terminal		○		○		○		—	
		Vertical terminal		○		○		○		○ ③	
		Front terminal		○		○		○		—	
Dimensions (HxWxD) mm		Fixed type	3-pole	410x340x290							
			4-pole	410x425x290							
		Drawout type	3-pole	430x300x368							
			4-pole	430x385x368							
Weight kg		Fixed type	3-pole	41		41		42		47	
			4-pole	51		51		52		57	
		Drawout type (with cradle)	3-pole	64		64		65		70	
			4-pole	78		78		79		84	
		Cradle only	3-pole	26		26		26		31	
			4-pole	30		30		30		35	

① The columns for "without instantaneous" are the values when the bare main body and the external relay is combined.
② The number of operating cycles without rated current also include the number of operating cycles with rated current.
③ AE4000-SW, AE5000-SW, AE6300-SW, AE2000-SWA and AE4000-SWA apply for only vertical terminal of connecting terminal.
④ This value means number of operating cycles of ACB's body not including accessories.
⑤ Products with low rating types is available.

AE 2000- SW		AE 2500- SW		AE 3200- SW		AE 4000- SWA		AE 4000- SW		AE 5000- SW		AE 6300- SW	
2000		2500		3200		4000		4000		5000		6300	
1000								1000					
690								690					
12								12					
3								3					
3	4	3	4	3	4	3	4	3	4(HN, FN) ⑦	3	4(HN, FN) ⑦	3	4(HN, FN) ⑦
2000		2500		3200		4000		4000		5000		6300	
1000-1100-1200-1300-1400-1500-1600-1700-1800-1900-2000 ⑤		1250-1375-1500-1625-1750-1875-2000-2125-2250-2375-2500		1600-1760-1920-2080-2240-2400-2560-2720-2880-3040-3200		2000-2200-2400-2600-2800-3000-3200-3400-3600-3800-4000		2000-2200-2400-2600-2800-3000-3200-3400-3600-3800-4000		2500-2750-3000-3250-3500-3750-4000-4250-4500-4750-5000		3150-3465-3780-4095-4410-4725-5040-5355-5670-5985-6300	
$800 \leq I_r \leq 2000$		$1600 \leq I_r \leq 2500$		$2000 \leq I_r \leq 3200$		$2500 \leq I_r \leq 4000$		$2500 \leq I_r \leq 4000$		$3150 \leq I_r \leq 5000$		$4000 \leq I_r \leq 6300$	
2000		2500		3200		4000		2000 (4000) ⑧		2500 (5000) ⑧		3150 (6300) ⑧	
75		75		75		75		85		85		85	
75		75		75		75		85		85		85	
85		85		85		85		130		130		130	
75		75		75		75		85		85		85	
75		75		75		75		85		85		85	
75		75		75		75		100		100		100	
45 ①		45 ①		45 ①		45 ①		65 ①		65 ①		65 ①	
45 ①		45 ①		45 ①		45 ①		65 ①		65 ①		65 ①	
100 %								100 %					
165		165		165		165		187		187		187	
165		165		165		165		187		187		187	
187		187		187		187		286		286		286	
165		165		165		165		187		187		187	
165		165		165		165		187		187		187	
165		165		165		165		220		220		220	
94.5		94.5		94.5		94.5		143		143		143	
94.5		94.5		94.5		94.5		143		143		143	
○		○		○		○		○		○		○	
75		75		75		75		100		100		100	
75		75		75		75		85		85		85	
65		65		65		65		85		85		85	
40 ⑥		40 ⑥		40 ⑥		40 ⑥		50 ⑥		50 ⑥		50 ⑥	
80		80		80		80		80		80		80	
1500		1500		1000		500		1000		1000		1000	
1500		1500		1000		500		1000		1000		1000	
20000		20000		20000		20000		10000 (3P)/5000 (4P)		10000 (3P)/5000 (4P)		10000 (3P)/5000 (4P)	
○		○		○		—		—		—		—	
○		○		○		○ ③		○ ③		○ ③		○ ③	
○		○		○		—		—		—		—	
410x475x290								414x873x290					
410x605x290								414x1003 (1133)x290 ⑧					
430x435x368						430x439x368		480x875x368					
430x565x368						430x569x368		480x1005 (1135)x368 ⑧					
60	368	61	368	63		81		160		160		160	
72	75	73	99	75		99		180 (200) ⑧		180 (200) ⑧		180 (200) ⑧	
92	78	93	103	95		108		233		233		240	
113	116	114	136	116		136		256 (279) ⑧		256 (279) ⑧		263 (286) ⑧	
35	119	35	140	35		49		118		118		125	
43	44	43	61	43		61		133 (148) ⑧		133 (148) ⑧		140 (155) ⑧	

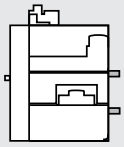
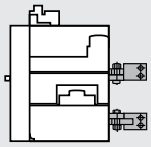
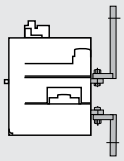
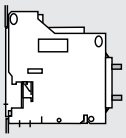
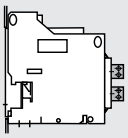
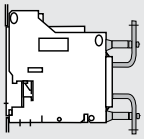
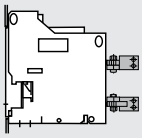
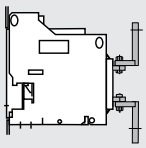
⑥ This value means the instantaneous breaking time at short-circuit interruption. As for accessories (UVT, SHT) refer to page 14 and 15.
⑦ 4 (HN) means the neutral poles current capacity is 50 % of the rated current, for 4-poles.
4 (FN) means the neutral poles current capacity is 100 % of the rated current, for 4-poles.
⑧ () shows the value for 4P FN type.

Remarks:
– All models conform the isolating function according to IEC 60947-2.
– Reverse connection is possible

Connections

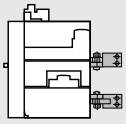
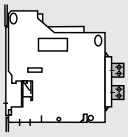
Connection arrangements

The following connecting methods are available for the **AE1000-SW – AE3200-SW.**

Connection / Mounting method	Horizontal connection Standard	Vertical connection Optional	Front connection Optional	Vertical terminal adapter Accessory	Front terminal adapter Optional
Fixed type	 (Standard)	—	—	 (FIX-VTA)	 (FIX-FTA)
Drawout type	 (Standard)	 (DR-VT)	 (DR-FT)	 (DR-VTA)	 (DR-FTA)
Remark	Standard equipment (shipping version)	Special equipment (on request)	Special equipment (on request)	Available as accessory (refer to page 17)	Optional accessory (on request)

Connection image: AE1000 – 1600-SW, 3-pole type
Standard fixed type breakers AE1000/1250/1600/2000/2500/3200-SW are also available as Drawout type. Please order the corresponding cradle with the drawout mechanism (see table on next page)

The following connecting methods are available for the **AE2000-SWA**, **AE4000-SWA** and **AE4000-SW – AE6300-SW.**

Connection / Mounting method	Vertical connection Standard
Fixed type	 (FIX-VT)
Drawout type	 (DR-VT)
Remark	Special equipment (on request)

Connection image: AE2000-SWA, 3-pole type
For AE2000-SWA, AE4000-SWA, AE4000-SW, AE5000-SW and AE6300-SW models, vertical terminal **only** is available.

Available connections

Connections / Breakers		A1000-SW	AE1250-SW	AE1600-SW	AE2000-SWA	AE2000-SW	AE2500-SW	AE3200-SW	AE4000-SWA	AE4000-SW	AE5000-SW	AE6300-SW
Fixed type (FIX)	**Horizontal**	●	●	●	—	●	●	●	—	—	—	—
	FIX-VT	—	—	—	●	—	—	—	●	●	●	●
	FIX-VTA	○	○	○	—	○	○	○	—	—	—	—
	FIX-FTA	○	○	○	—	○	○	○	—	—	—	—
Drawout type (DR)	**Horizontal**	●	●	●	—	●	●	●	—	—	—	—
	DR-VT	○	○	○	●	○	○	○	●	●	●	●
	DR-FT	○	○	○	—	○	○	○	—	—	—	—
	DR-VTA	○	○	○	—	○	○	○	—	—	—	—
	DR-FTA	○	○	○	—	○	○	○	—	—	—	—

● Standard ○ Option — Not available

Order information – Air circuit breakers

Standard series AE-SW – Fixed type

Shipping contents:
- Electronic trip relay base unit
- Power supply PW3
- 10 auxiliary contacts (5 NO, 5 NC contacts)
- Automatic reset type trip coil (TCA-AL-W)

Further elements that must be ordered:
- Main setting module for protection
- Accessories as required

Base unit equipment	Breaker	3-pole type	Art. no.	4-pole type	Art. no.
	AE1000-SW	AE1000-SW 3P Fix, ETRBASE-P3, AX10	168373	AE1000-SW 4P Fix, ETRBASE-P3, AX10	168434
	AE1250-SW	AE1250-SW 3P Fix, ETRBASE-P3, AX10	168435	AE1250-SW 4P Fix, ETRBASE-P3, AX10	168436
	AE1600-SW	AE1600-SW 3P Fix, ETRBASE-P3, AX10	168437	AE1600-SW 4P Fix, ETRBASE-P3, AX10	168438
	AE2000-SW	AE2000-SW 3P Fix, ETRBASE-P3, AX10	168443	AE2000-SW 4P Fix, ETRBASE-P3, AX10	168444
	AE2500-SW	AE2500-SW 3P Fix, ETRBASE-P3, AX10	168445	AE2500-SW 4P Fix, ETRBASE-P3, AX10	168446
	AE3200-SW	AE3200-SW 3P Fix, ETRBASE-P3, AX10	168447	AE3200-SW 4P Fix, ETRBASE-P3, AX10	168448

Cradle with the drawout mechanism

Cradle	For type	Art. no.
CRD163-W	Draw Out type AE1000-AE1600 3P	170078
CRD164-W	Draw Out type AE1000-AE1600 4P	170079
CRD323-W	Draw Out type AE2000-AE3200 3P	170080
CRD324-W	Draw Out type AE2000-AE3200 4P	170081
REC-FD-W	Drawout mechanism with drawout handle	169004

Air circuit breaker series AE-SWA

Shipping contents:
- Electronic trip relay base unit
- Power supply PW3
- 10 auxiliary contacts (5 NO, 5 NC contacts)
- Automatic reset type trip coil (TCA-AL-W)

Further elements that must be ordered:
- Main setting module for protection
- Accessories as required

Base unit equipment	Breaker	Fixed type	Art. no.	Draw-out type	Art. no.
	AE2000-SWA	AE2000-SWA 3P Fix, ETRBASE-P3, AX10	168439	AE2000-SWA 3P D/O, ETRBASE-P3, AX10	168441
	AE2000-SWA	AE2000-SWA 4P Fix, ETRBASE-P3, AX10	168440	AE2000-SWA 4P D/O, ETRBASE-P3, AX10	168442
	AE4000-SWA	AE4000-SWA 3P Fix, ETRBASE-P3, AX10	168449	AE4000-SWA 3P D/O, ETRBASE-P3, AX10	168451
	AE4000-SWA	AE4000-SWA 4P Fix, ETRBASE-P3, AX10	168450	AE4000-SWA 4P D/O, ETRBASE-P3, AX10	168452

Air circuit breaker series AE4000 – 6300-SW – Fixed/Drawout type

Shipping contents:
- Electronic trip relay base unit
- Power supply PW3
- 10 auxiliary contacts (5 NO, 5 NC contacts)
- Automatic reset type trip coil (TCA-AL-W)

Further elements that must be ordered:
- Main setting module for protection
- Accessories as required

Base unit equipment	Breaker	Fixed type 3/4-pole	Art. no.	Draw-out type 3/4-pole	Art. no.
	AE4000-SW	AE4000-SW 3P Fix, ETRBASE-P3, AX10	205144	AE4000-SW 3P D/O, ETRBASE-P3, AX10	205153
	AE5000-SW	AE5000-SW 3P Fix, ETRBASE-P3, AX10	205145	AE5000-SW 3P D/O, ETRBASE-P3, AX10	205154
	AE6300-SW	AE6300-SW 3P Fix, ETRBASE-P3, AX10	205146	AE6300-SW 3P D/O, ETRBASE-P3, AX10	205155
	AE4000-SW HN	AE4000-SW HN 4P Fix, ETRBASE-P3, AX10	205147	AE4000-SW HN 4P D/O, ETRBASE-P3, AX10	205156
	AE4000-SW FN	AE4000-SW FN 4P Fix, ETRBASE-P3, AX10	205148	AE4000-SW FN 4P D/O, ETRBASE-P3, AX10	205157
	AE5000-SW HN	AE5000-SW HN 4P Fix, ETRBASE-P3, AX10	205149	AE5000-SW HN 4P D/O, ETRBASE-P3, AX10	205158
	AE5000-SW FN	AE5000-SW FN 4P Fix, ETRBASE-P3, AX10	205150	AE5000-SW FN 4P D/O, ETRBASE-P3, AX10	205159
	AE6300-SW HN	AE6300-SW HN 4P Fix, ETRBASE-P3, AX10	205151	AE6300-SW HN 4P D/O, ETRBASE-P3, AX10	205160
	AE6300-SW FN	AE6300-SW FN 4P Fix, ETRBASE-P3, AX10	205152	AE6300-SW FN 4P D/O, ETRBASE-P3, AX10	205161

(HN) means the neutral poles current capacity is 50% of the rated current
(FN) means the neutral poles current capacity is 100% of the rated current

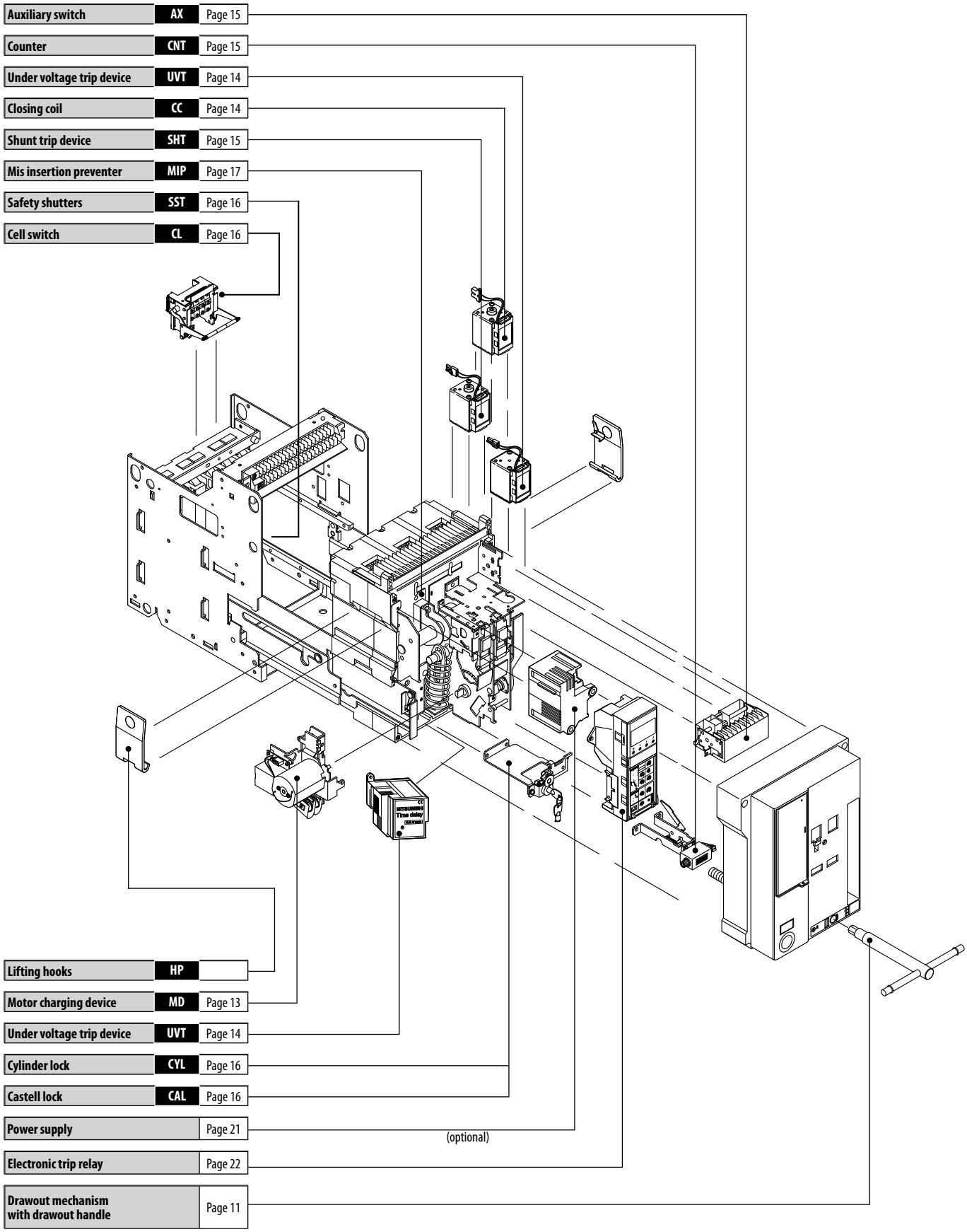
Switch-disconnector AE-SW – Fixed/Drawout type

Shipping contents:
- 10 auxiliary contacts (5 NO, 5 NC contacts)
- Switching capacity $I_{R\,x\,6}$

Further elements that must be ordered:
- Accessories as required

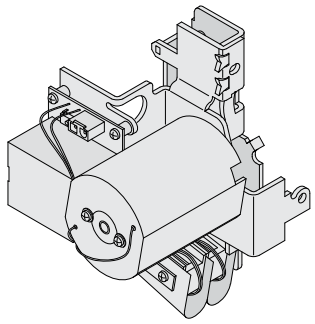
Base unit equipment	Breaker	3-pole type	Art. no.	4-pole type	Art. no.
	AE1000-SW	AE1000-SW 3P Fix, Bare, AX10	193919	AE1000-SW 4P Fix, Bare, AX10	193920
	AE1250-SW	AE1250-SW 3P Fix, Bare, AX10	193921	AE1250-SW 4P Fix, Bare, AX10	193922
	AE1600-SW	AE1600-SW 3P Fix, Bare, AX10	193923	AE1600-SW 4P Fix, Bare, AX10	193924
	AE2000-SW	AE2000-SW 3P Fix, Bare, AX10	193929	AE2000-SW 4P Fix, Bare, AX10	193930
	AE2500-SW	AE2500-SW 3P Fix, Bare, AX10	193931	AE2500-SW 4P Fix, Bare, AX10	193932
	AE3200-SW	AE3200-SW 3P Fix, Bare, AX10	193933	AE3200-SW 4P Fix, Bare, AX10	193934
	AE2000-SWA	AE2000-SWA 3P Fix, Bare, AX10	193925	AE2000-SWA 4P Fix, Bare, AX10	193926
	AE4000-SWA	AE4000-SWA 3P Fix, Bare, AX10	193935	AE4000-SWA 4P Fix, Bare, AX10	193936
	AE2000-SWA	AE2000-SWA 3P D/O, Bare, AX10	193927	AE2000-SWA 4P D/O, Bare, AX10	193928
	AE4000-SWA	AE4000-SWA 3P D/O, Bare, AX10	193937	AE4000-SWA 4P D/O, Bare, AX10	193938

Overview and mounting positions of the main accessories



Overview and description on the optional accessories

■ Motor charging device (MD)



In addition to manual operation, the closing spring can be charged automatically by an electric motor every time the breaker is closed (ON charging method).

If the closing spring is to be charged automatically whenever the breaker is opened, then this can be done through an additional auxiliary contact (AXb) (OFF charging method). As soon as charging is completed, a visual display on the front says "CHARGED".

The "CHARGED" signal is also available via the 413 (TS+) and 414 (TS-) terminals (included in the standard MD configuration).

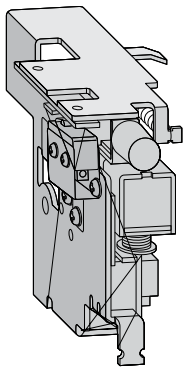
There is always the option of manual operation in an emergency. A closing coil (CC) is required for closing the breaker by remote control, and a shunt trip device (SHT) is required for opening it in this way.

This warrants the prevention of pumping, both electronically and mechanically. The circuit of the motor is separate from the ON/OFF circuit (CC, SHT).

Specifications		MD-AD125-W	MD-AD250-W	MD-AD125-4A4W-W ①	MD-AD250-4A4W-W ①	MD-DO24-W	MD-DO48-W
Rated voltage		100–125 V AC/DC	200–250 V AC/DC	100–125 V AC/DC	200–250 V AC/DC	24 V DC	48 V DC
Applicable voltage range	(V)	85–137.5	170–275	85–137.5	170–275	18–26.4	36–52.8
Applied voltage	(V)	100/125	200/250	100/125	200/250	24 V	48 V
Inrush current (peak value)	(A)	10/12	5/6	10/12 12	7/8	22	14
Steady current	(A)	3	1	4	2	6	3
Charging time	(sec)	≤5	≤5	≤5	≤5	≤5	≤5
Criterion for power requirement	(VA)	700/1000	700/1000	700/1000	700/1000	500	500
Order information	Art. no.	168514	168515	168516	168517	168518	168519

① These two models are only for the AE4000-SWA (4P) type breaker.

■ Trip coil (AL)



Automatic reset type (TCA-AL-W)

OCR alarm (AL) is provided as standard if ETR is equipped. OCR alarm (AL) is the contact (1a) of short-time operation (30 ms), being output when the breaker is tripped by the electronic trip relay.

Two types of automatic reset type (standard) and manual reset type (optional) are available. When ordering, specify either.

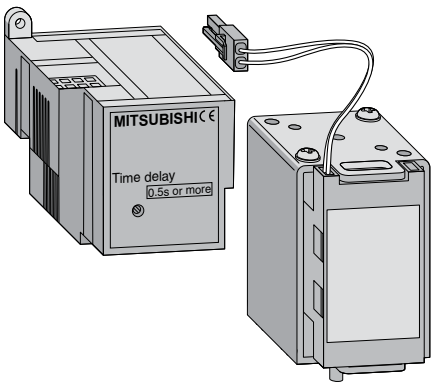
Manual reset type (TCM-AL-W)

On the manual reset type (optional), the gray manual reset button will stick out to continuously output OCR alarm (AL) if the breaker is tripped by the electronic trip relay. After tripping, the breaker can not be turned on unless the manual reset button on the front side of the breaker is pressed for resetting.

Specifications		TCA-AL-W	TCM-AL-W
Voltage	AC (V)	125/240	125/240
	DC (V)	30/125/240	30/125/240
Resistive load	AC (A)	5/3	5/3
	DC (A)	4/0.4/0.2	4/0.4/0.2
Inductive load	AC (A)	3/2	3/2
	DC (A)	3/0.4/0.2	3/0.4/0.2
Order information	Art. no.	168535 (standard)	168536

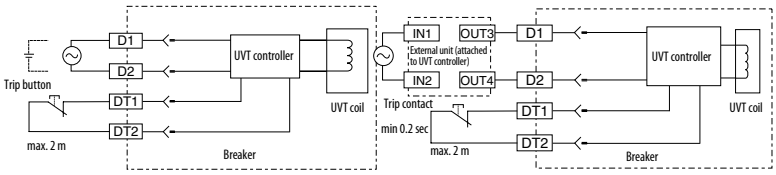
Notes:
– Though the control power supply is unnecessary to activate OCR alarm (AL), the self-holding circuit is necessary since the contact output is activated for the short time (30 ms).
– This works when tripping occurs in LTD, STD, INST, GFR or ER.
– If any continuous output of OCR alarm (AL) is necessary, use the trip indicator (TI) output contact of the electronic trip relay.

■ Undervoltage trip device (UVT)



This is the device that automatically trips the breaker when the circuit voltage drops below the nominal voltage, and comprises a UVT coil and UVT controller.

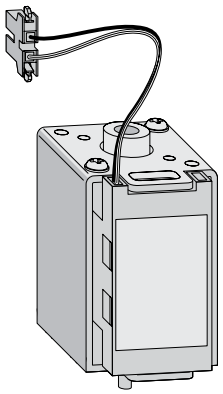
Time range for tripping time:
INST (0.2 sec or less)/0.25 sec/0.5 sec/ 0.8 sec/1.0 sec/1.5 sec/3 sec.

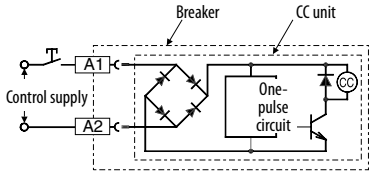


Specifications		UCON-D024B-W INST	UCON-D048B-W INST	UCON-D110B-W INST	UCON-D125B-W INST	UCON-D250B-W INST	UCON-A120B-W INST	UCON-A240B-W INST	UCON-A460B-W INST
Rated voltage	(V)	24 (DC)	48 (DC)	100–110 (DC)	120–125 (DC)	220–250 (DC)	100–120 (AC)	200–240 (AC)	380–460 (AC)
Frequency		—					50/60 Hz		
Operating time (time delay)		☐ INST (0.2 sec); ☐ 0.25 sec ; ☐ 0.5 sec ; ☐ 0.8 sec ; ☐ 1.0 sec ; ☐ 1.5 sec ; ☐ 3.0 sec							
Pick-up voltage	(V)	15.6–20.4	31.2–40.8	65–85	78–102	143–187	65–85	130–170	247–323
Drop-out voltage	(V)	10.8–16.8	21.6–33.6	45–70	54–84	99–154	45–70	90–140	171–260
Trip function		With open circuit of DT1, DT2 terminals							
Power consumption	(VA)	20							
Order information	Art. no.	203341	203342	203343	203344	203345	203346	203347	203348
Accessories		UVT coil: art. no. 168525; UCON label: art. no. 168526 (Packing unit: 10 pcs)							

Notes:
– Please order for each UCON one UVT coil, and for delay setting one UCON lable.
– In case of 380–460V AC, the external unit is attached.
– The operating time is a guarantee value when it drops from 85 % or more of rated voltage.
– Time delay should be allowed for 1.5 s between applying the voltage to the UVT and closing the breaker.
– If a remote trip function is required, remove the shorting bar (DT1–DT2) and connect a normally closed switch, rated 0.5 A at 150 V DC across them.
– Usage ambient temperature is a range of max. 40 °C to -5 °C.

■ Closing coil (CC)





Diode rectifier is not used for control source 24–48 V DC.

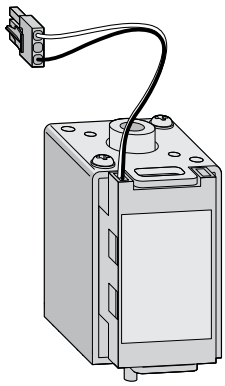
The closing coil is a device to close the breaker by remote control. Only one closing signal (about 100 msec.) is sent even when the closing coil supply is maintained ON.

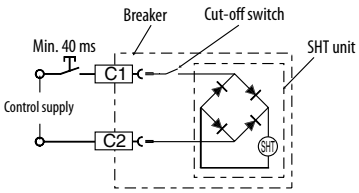
- An interlock to prevent pumping is provided electrically.
- Closing time is from the initial energization of the closing coil to the completion of the closing of the main contacts.
- As CC is one-pulse driven, it is not necessary to insert AXb for burning prevention purposes. Inserting AXb will cause anti-pumping function to be ineffective.

Specifications		CC-D048-W	CC-AD250-W
Rated voltage	(V)	24–48 DC	100–250 AC/DC
Applicable voltage range	(V)	18–52.8	75–275
Operating voltage	(V)	24/48	100/250
Inrush current	AC (A)	—	0.7/1.7 (AC 100 V 100 VA, AC 250 V 200 VA)
	DC (A)	3/6 (DC 24 V 100 W, DC 48 V 200 W)	0.8/1.8 (DC 100 V 100 W, DC 250 V 200 W)
Closing time ①	(sec)	Max. 0.08 or less	Max. 0.08 or less
Order information	Art. no.	168521	168520

① In case of double rating of rated voltage, it is the value to the lower rating.
Example: In case of DC 24 to 48, it is operating time to DC 24 V.

■ Shunt trip device (SHT)





Diode rectifier is not used for control source 24–48 V DC.

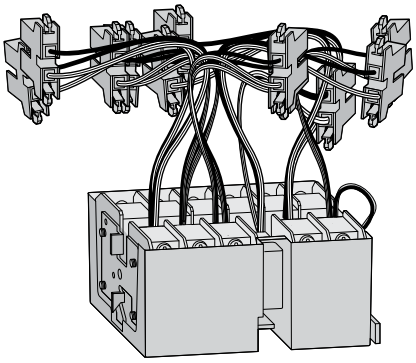
The shunt trip device is used to open the breaker by remote control.

A cut-off switch is included (AX /HAX).

Specifications		SHT-D048-W	SHT-A500-W	SHT-AD250-W
Rated voltage	(V)	24–48 DC	380–500 AC	100–250 (AC/DC)
Applicable voltage range	(V)	16.8–52.8	266–550	70–275
Operating voltage	(V)	24/48	380–500	100/250
Inrush current (peak value)	AC (A)	—	0.5/0.7 (AC 380 V 250 VA, AC 500 V 300VA)	0.4/1.4 (AC 100 V 100 VA, AC 250 V 150 VA)
	DC (A)	2.5/6.0 (DC 24 V 100 W, DC 48 V 200 W)	—	0.6/1.6 (DC 100 V 100 W, DC 250 V 200 W)
Closing time ①	(sec)	max. 0.04 or less	max. 0.04 or less	max. 0.04 or less
Order information	Art. no.	168524	168523	168522

① In case of double rating of rated voltage, it is the value to the lower rating.
Example: In case of DC 24 to 48, it is operating time to DC 24 V.

■ Auxiliary switch (AX, HAX)

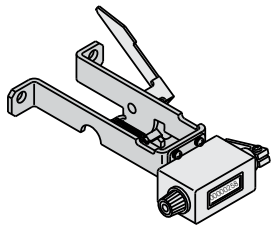


This is the contact that is used to remotely indicate the ON or OFF status of the breaker.

- The a and b contacts may turn simultaneously to ON instantaneously at the time of changing the contact; Pay attention to the contact state when designing circuits.
- The chattering time at the time of contact ON-OFF is below 0.025 sec.
- For special environment specification, the contact capacity gets deteriorated. Apply for further detail.

Specifications		AX-10-W		HAX-10-W	
Load		Resistance	Inductive	Resistance	Inductive
Contact capacity (A)	AC 460 V	5	2	5	2.5
	AC 250 V	10	10	10	10
	AC 125 V	10	10	10	10
	DC 250 V	0.3	0.3	3	1.5
	DC 125 V	0.6	0.6	10	6
	DC 30 V	10	6	10	10
Maximum number of contacts		5a5b		5a5b	
Order information	Art. no.	168962 (standard)		168961	

■ Counter (CNT)

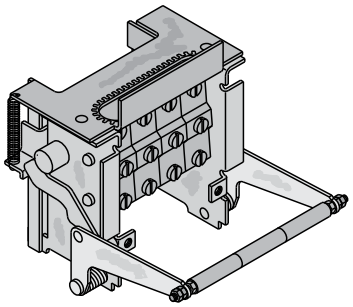


This is a mechanical counter which registers the total number of operating cycles (with 1 ON/OFF switching operation = 1 operating cycle).

The number of operating cycles is displayed on the front of the unit.

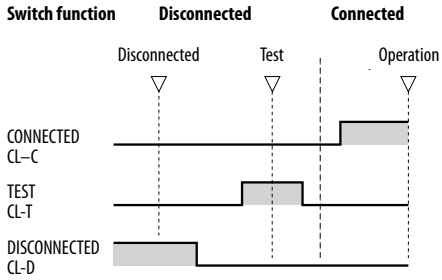
Specifications		CNT-W
Counter type		Mechanical
Display		5 digits
Order information	Art. no.	168538

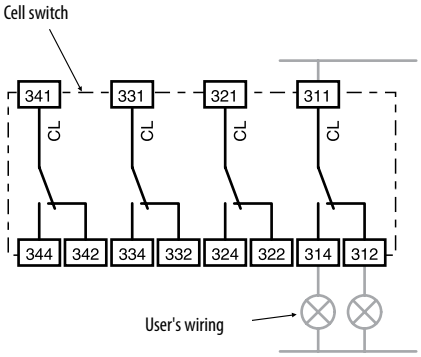
■ Cell switch (CL)



The cell switches can be set for all the relevant positions, i.e. connected, test and disconnected.

Each cell switch consists of 4 individual switches.

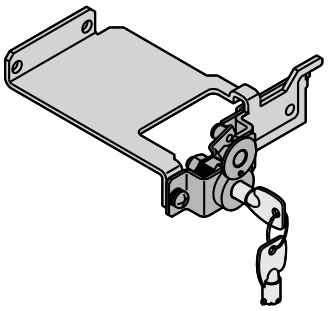




Specifications		CL-4-W		BIF-CL-W ①	
Load		Resistive	Inductive	Resistive	Inductive
Contact capacity (A)	AC 460 V	5	2.5	5	2.5
	AC 250 V	10	10	10	10
	AC 125 V	10	10	10	10
	DC 250 V	3	1.5	3	1.5
	DC 125 V	10	6	10	6
	DC 30 V	10	10	10	10
Maximum contacts		Total 4c			
Order information	Art. no.	168512		168575	

① BIF-CL only necessary for networks operation

■ Interlock device (CYL)



The interlock device locks the circuit breaker into the OFF position.

The relevant key can only be taken out in the OFF position of the circuit breaker, so that it can also be used for unlocking other breakers.

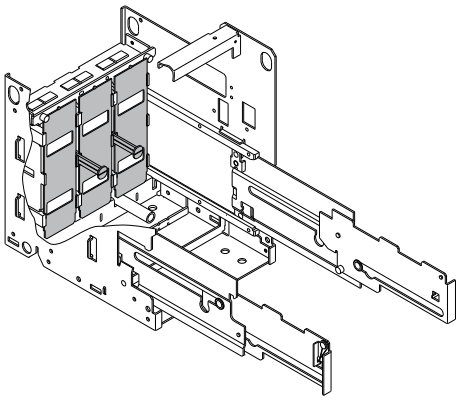
There are two locking options available:

- Cylinder lock (CYL)
- Castell lock (CAL) ①

Specifications		CYL-WK-W	CYL-WK1-W	CYL-WK2-W	CYL-WK3-W	CYL-WK4-W	CYL-NK-W
Interlock		Cylinder	Cylinder	Cylinder	Cylinder	Cylinder	Castell ①
Closing		Basic	1	2	3	4	Basic
Order information	Art. no.	168539	168540	168541	168542	168543	168544

① The closing basis for the castell lock can be designed individually. Further details on request.

■ Safety shutters (SST)



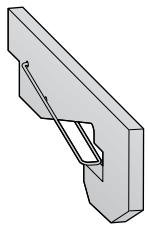
The safety shutters cover the main conductors of the cradle side (supply and load side) automatically when the circuit breaker is drawn out.

When checking the main circuit, the safety shutters on the supply and load sides can be opened independently of one another.

The safety shutters can also be locked with a mechanical locking device (SST LOCK). The padlocks have to be supplied by customer.

Specifications		SST-LOCK-W	SST-203-W	SST-204-W	SST-403-W	SST-404-W
Breaker type		Drawout				
Number of poles		3/4	3	4	3	4
Order information	Art. no.	168510	168973	168974	168975	168976

■ Mis-insertion preventor (MIP)

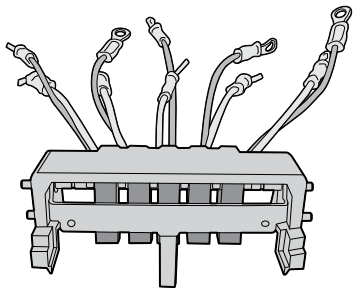


To obtain the right draw out configuration, it is extremely important that the breaker unit specifications (type, current rating, optional accessories, etc.) should match the cradle.

Mis-insertion is prevented by a combination of matching components (on the breaker and the cradle).

Specifications		MIP-W
Material		Metal
Order information	Art. no.	168547

■ Shorting b-contact (SBC)

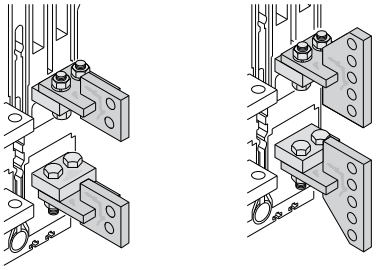


SBC-5-W

When moving the breaker from the connected to the test positions, this contact is used to short circuit auxiliary switch (Axb) thus maintaining the correct sequence of operation of the external control circuit.

Specifications		SBC-1-W	SBC-2-W	SBC-3-W	SBC-4-W	SBC-5-W
Number of contacts		1	2	3	4	5
Application (breaker)		All breakers				
Order information	Art. no.	168548	202337	202338	202339	202340

■ Vertical terminal adapter (VTA)

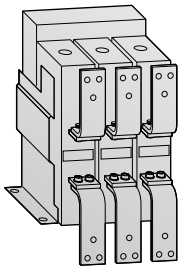


Vertical terminal adapters allow you to turn power connection by 90°.

For AE2000-SWA, AE4000-SWA, AE4000-SW, AE5000-SW and AE6300-SW models, vertical terminal only is available.

Specifications		VTA-02-W	VTA-03-W	VTA-32-W
Application (breaker)		AE1000–AE1600-SW	AE2000–2500-SW	AE3200-SW
Shipping contents	pieces	1	1	1
Order information	Art. no.	168978	168979	168980

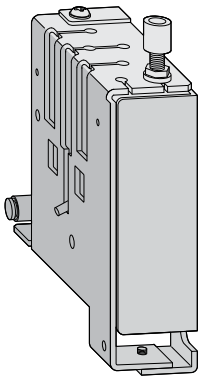
■ Front terminal adapter (FTA)



Front terminal adapters FTA allows a vertical connection for supply- and load-busbars.

Specifications		FTA-163F-W	FTA-164F-W	FTA-253F-W	FTA-254F-W	FTA-323F-W	FTA-324F-W	FTA-163D-W	FTA-164D-W	FTA-253D-W	FTA-254D-W	FTA-323D-W	FTA-324D-W
Application (breaker)		AE1000–AE1600-SW	AE1000–AE1600-SW	AE2000–AE2500-SW	AE2000–AE2500-SW	AE3200-SW	AE3200-SW	AE1000–AE1600-SW	AE1000–AE1600-SW	AE2000–AE2500-SW	AE2000–AE2500-SW	AE3200-SW	AE3200-SW
Pole		3	4	3	4	3	4	3	4	3	4	3	4
Typ		Fixed						Drawout					
Shipping contents	pieces	6	8	6	8	6	8	6	8	6	8	6	81
Order information	Art. no.	169331	169332	169333	169334	169335	169336	169337	169338	169339	169340	169341	169342

■ Mechanical interlock (MI)



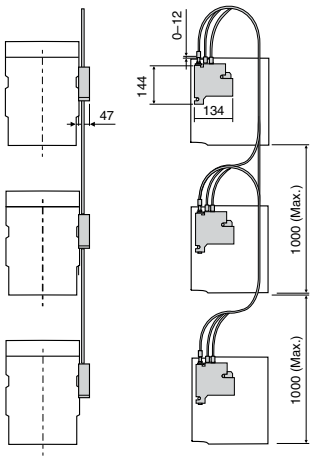
This is the device to prevent parallel charge of 2 or 3 units of breakers, and it can interlock the breakers mechanically without fail. All combinations are available among any models from AE1000-SW to AE4000-SWA.

Please apply for further details of AE4000-SW to AE6300-SW.

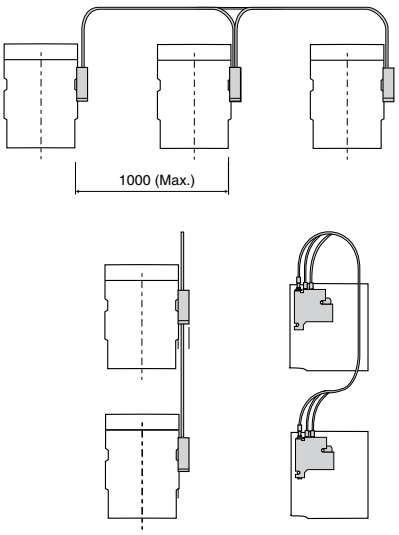
Further the interlock is possible among the different connection types or poles, such as fixed type or drawout type, 3 pole or 4 pole. In combination with electric interlock, the higher safety interlock system can be secured.

- In case of drawout type,the interlock works at "CONNECTED" position, and in another position the interlock is released, which is convenient for and easy maintenance and inspection of the breaker.
- When to turn OFF one breaker and then turn ON another breakers, please take an interval 0.5 seconds or more.
- MI for 3 breakers can not be installed to combine with Door Interlock (DI).

Vertical mounting



Horizontal mounting

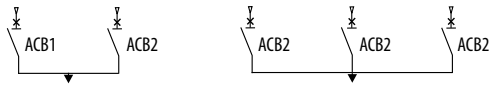


[mm]

Switching states (for 2 ACBs)

Type	①	②	③
ACB 1	○	|	○
ACB 2	○	○	|

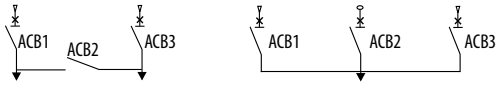
Type	①	②	③	④
ACB 1	○	|	○	○
ACB 2	○	○	|	○
ACB 3	○	○	○	|



Switching states (for 3 ACBs)

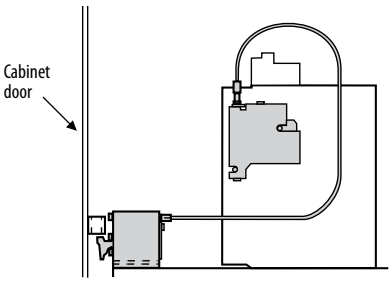
Type	①	②	③	④	⑤	⑥	⑦
ACB 1	○	|	○	○	|	|	○
ACB 2	○	○	|	○	|	○	|
ACB 3	○	○	○	|	○	|	|

Type	①	②	③	④	⑤
ACB 1	○	|	○	○	○
ACB 2	○	○	|	○	○
ACB 3	○	○	○	|	|



Specifications		MI-203F-W	MI-204F-W	MI-403F-W	MI-404F-W	MI-203D-W	MI-204D-W	MI-403D-W	MI-404D-W	MI-IW-W
Application (breaker)		AE1000–1600-SW AE2000-SWA		AE2000–3200-SW AE4000-SWA		AE1000–1600-SW AE2000-SWA		AE2000–3200-SW AE4000-SWA		Wire set for all mechanical interlock devices required for combination of 3 ACBs
Breaker type		Fixed				Drawout				
Number of poles		3	4	3	4	3	4	3	4	
Order information	Art. no.	168963	168964	168965	168966	168967	168968	168969	168970	168971

■ Door interlock (DI)



This mechanical interlock device makes it impossible to open the panel door unless the circuit breaker is not switched off.

The device has been designed for panel doors with the groove on the left (standard). Locks for grooves on the right are available on request.

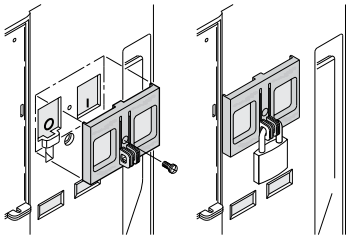
A wire-type mechanical interlock is used to allow flexibility in positioning breakers in the panel.

Note:

When using the door interlock (DI) the application of the mechanical interlock (MI) is not possible.

Specifications		DI-F-W	DI-D-W
Application (breaker)		For all breakers	For all breakers
Breaker type		Fixed	Drawout
Order information	Art. no.	168545	168546

■ Push button cover (BC-L)

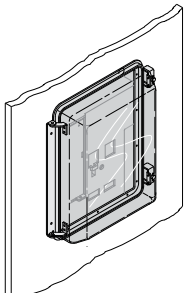


This mechanical device can be locked with a padlock or a seal (both is not included in the package) to protect the push buttons of the breaker unit against inadvertent ON/OFF operation.

The padlock has to be supplied by the customer.

Specifications		BCL-W
Material		Acrylic plate
Order information	Art. no.	168537

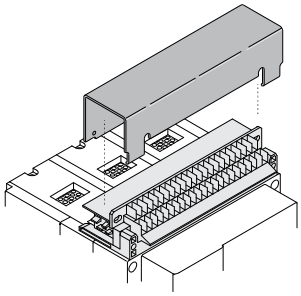
■ Dust cover (DUC)



The transparent dust cover is hinged onto the panel door. It has a screw lock and prevents dust and water entering into the circuit breaker.

Specifications		DUC-W
Protection		IP 54
Order information	Art. no.	168960

■ Terminal cover (TTC)



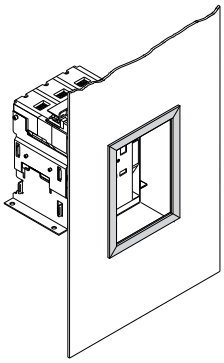
The terminal cover is a transparent cover for safety finger protection of control terminals.

The terminal cover prevents from careless touching to the live control terminals.

The TTC-F-W is included within the delivery of a fixed type AE-SW as standard.

Specifications		TTC-D-W	TTC-F-W
Application (breaker)		Dawout type	Fixed type
Protection		IP 20	IP 20
Order information	Art. no.	168549	168972 (Standard)

■ Door frame (DF)



The door frame improves the appearance, after cutting out the panel door to install the breaker.

Details on request.

Specifications		DF-W
Application (Breaker)		For all breakers
Material		Plastic
Protection		IP 20
Order information	Art. no.	168513

■ Current transformer (CT)

These current transformers (CT and sensor coil) are suitable for the main conductor and the N conductor.

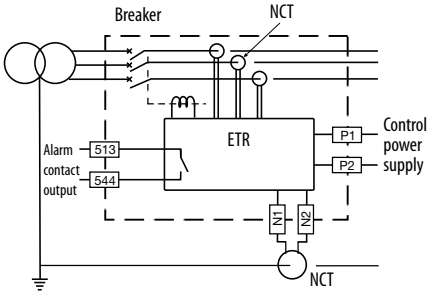
Current transformers of type CT-06□□□ serve the reduction of $I_{N\,max}$ on an AE1000.

Specifications		CT-06-W 025	CT-06-W 031	CT-06-W 050	CT-06-W 063	CT-10-W 100	CT-12-W 125	CT-16-W 160	CT-20-W 125	CT-20-W 160	CT-20-W 200	CT-25-W 250	CT-32-W 320
Application (breaker) ①		AE1000-SW	AE1000-SW	AE1000-SW	AE1000-SW	AE1000-SW	AE1250-SW	AE1600-SW	AE2000-SW	AE2000-SW	AE2000-SW	AE2500-SW	AE3200-SW
Rated current $I_{N\,max}$ ②	(A)	250	315	500	630	1000	1250	1600	1250	1600	2000	2500	3200
Order information	Art. no.	193939	193940	193941	193942	193943	193944	193945	193946	193947	193948	193949	193950

① Shipping contents includs CT and sensor coil for 1 pole. Other transformers on request.
② At 40 °C and 50/60 Hz

■ Neutral current transformer (NCT)

Block diagram with NCT function



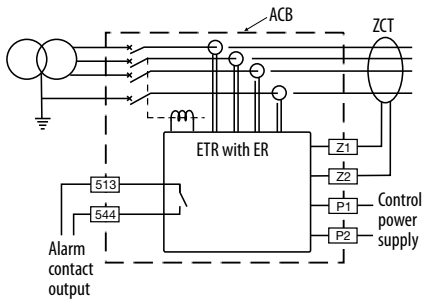
The neutral CT is used for ground fault protection when a 3 pole breaker is used on a 3 phase 4 wire system.

The ground fault protection module type G1 should be used as optional setting module.

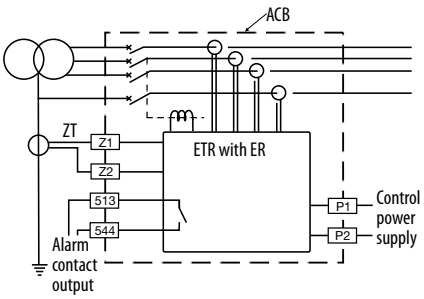
Specifications		NCT-06	NCT-10	NCT-12	NCT-16	NCT-20	NCT-25	NCT-32	NCT-40
Application (breaker)		AE630-SW	AE1000-SW	AE1250-SW AE2000-SW	AE1600-SW AE2000-SW	AE2000-SWA AE2000-SW	AE2500-SW	AE3200-SW	AE4000-SWA
Current range	(A)	630	1000	1250	1600	2000	2500	3200	4000
Order information	Art. no.	168986	168987	168988	168989	168990	168991	168992	168993

■ External current transformer (ZCT/ZT)

Transformer load circuit method (ZCT)



Tranformer ground wire method (ZT)



This option is used to detect several amperes of earth leakage when used in combination with an electronic trip relay that has the earth leakage tripping (ER) option.

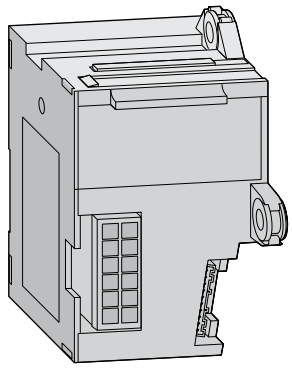
Two methods are available:

- ZCT: three-load phase conductors (and the neutral conductor in a 4-wire system) are passed through the ZCT
- ZT: The other method uses a smaller ZCT (only supply transformer ground wire passes through to earth.

Specifications		ZCT-163-W	ZCT-323-W	ZCT-324-W	ZT-15B-W	ZT-30B-W	ZT-40B-W	ZT-60B-W	ZT-80B-W	ZT-100B-W
Application		Load circuits			Transformer ground wire					
Hole diameter for wire ①	(mm)	230x60 (oval)	370x108 (oval)	500x108 (oval)	Ø 15	Ø 30	Ø 40	Ø 60	Ø 80	Ø 100
Order information	Art. no.	168994	168995	168996	168997	168998	168999	169000	169001	169002

① Further details on request.

■ Internal power supply units (PW)

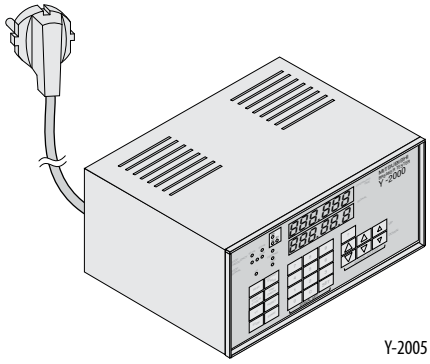


These power supplies are used for supplying the ETR base unit. They are equipped with 6 outputs (alarms and errors).

The PW3-W is included as standard power supply in the ACB's.

Specifications		PW3-W	PW4-W	PW5-W
Power supply	(V)	100–240 (AC) 100–125 (DC)	24–60 (DC)	100–240 (DC)
Output contacts		6	6	6 (SSR)
Order information	Art. no.	168985 (standard)	168562	168563

■ Field test device (Y-2005)

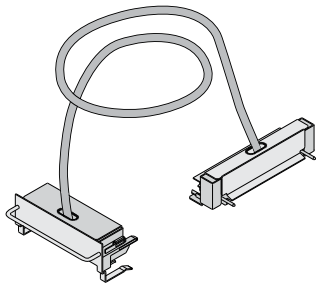


Y-2005

The electronic trip relay can be checked by this field test device when the breaker is at test or disconnect position. So it allows you to test the trip relay without the breaker being connected to the main supply. The breaker will trip when tested.

Specifications		Y-2005
Power supply		100–240 V AC, 50/60 Hz
Test functions		LTD, INST, STD, Ground fault, pre-alarm
Test current signal setting		Continuously variable (10–2500 %)
Others		Ammeter, time counter
Order information	Art. no.	233426

■ Test jumper (TJ)



With the breaker taken out of its cradle, this device enables the breaker to be electrically opened and closed, and the operating sequence to be checked.

Specifications		Test jumper
Cable length	(m)	3 ①
Order information	Art. no.	168977

① Other lengths on request

■ Interphase barriers

Connections		AE1000-SW – AE1600-SW	AE2000-SWA	AE2000-SW – AE3200-SW	AE4000-SWA
Fixed type	Horizontal (FIX)	●	×	●	×
	Vertical terminal (FIX-VT)	×	▲	×	▲
	Vertical terminal adaptor (VTA)	▲	×	▲	×
	Front terminal adaptor (FIX-FTA)	▲	×	▲	×
Drawout type	Horizontal (DR)	●	×	●	×
	Vertical terminal (DR-VT)	●	▲	▲	▲
	Front terminal (DR-FT)	—	×	▲	×
	Vertical terminal adaptor (VTA)	▲	×	▲	×
	Front terminal adaptor (DR-FTA)	▲	×	▲	×

● = Available for the insulation ▲ = Available for separating terminals × = Not existing type — = Attachment is impossible

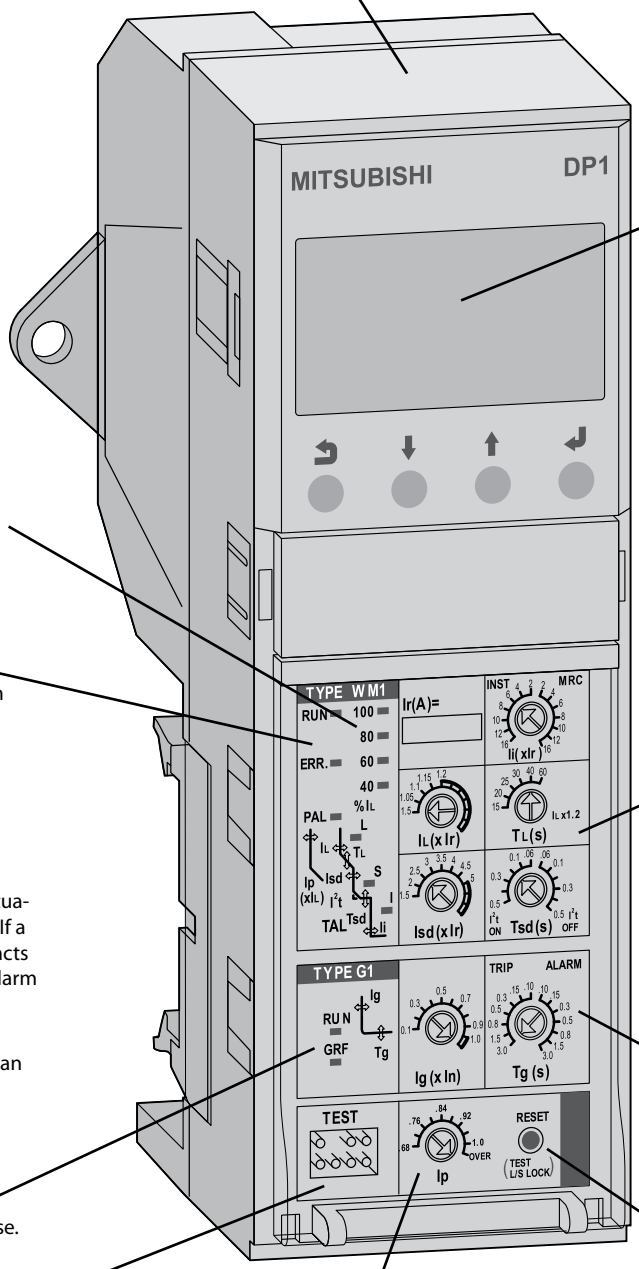
For AE4000-SW to AE6300-SW not available

Introduction and selection

Power supply module

This module provides control source for display module, trip indicator and several indicators (LEDs). (Even when the control power source is off, the function of over current protection and ground fault protection are effective.)

The power supply modules provide 6 output contacts for external use (see page 24).



Display

Several measuring data (current, voltage, power etc) and alarms can be displayed with this module. (see page 30)

Load current LED (standard)

This indicator displays the ETR situation (Run or Error)

RUN LED, ERR. LED (standard)

This indicator displays the ETR situation (Run or Error)

Main setting module

This module provides the function of over current protection. It is possible to select the two setting modules according to application (see page 24).

Neutral protection of rated current (100 %) function is standard at 4 pole breaker.

Pre-alarm (PAL) (standard)

This indicator displays the pre-alarm situation when the setting current exceeds. If a power supply module with alarm contacts is installed, the output contact of Pre-alarm is available.

* The output is reset when the electric current goes below the set level after an alarm is set off

Optional setting module (option) (figure shows G1)

Additional functions and characteristics can be selected by optional setting modules (see page 28).

Trip indicator LED (standard)

This indicator displays the trip cause.

TEST terminal (standard)

This terminal already installed as standard and is used for checking by the field test device Y-2000.

Pre-alarm current level setting dial (standard)

For setting the current level for pre-alarm. If current exceeds this level, pre-alarm is indicated.

RESET button (standard)

When push this reset button, trip indicator, and pre-alarm will be reset. And when the instantaneous test by field test device Y-2000 (optional) and push this reset button, as a result of LTD and STD function become ineffective.

Standard functions

■ OCR alarm (AL)

When it happens to trip by over current, ground fault (GFR) or Earth leakage (ER), this function issues a warning alarm.

■ Neutral pole overcurrent protection (NP)

When harmonics in load current are large, the current on neutral pole exceeding rated current may flow. Harmonics may cause some troubles.

Neutral pole overcurrent protection prevents them by operating at 100 % of rated current on neutral pole. Please see page 29 for 50 % neutral protection.

Special functions – optional

■ MCR: Making current release

Just under the breaker closing operation (from open to close), Instantaneous characteristic become effective, but after closing the breaker, instantaneous characteristic become ineffective.

When you order the MCR switch, MCR switch is built in the main body. If MCR switch is built in the main body and the adjust dial of INST/MCR on main setting module is set the MCR position, MCR function become effective (see page 29).

■ NCT

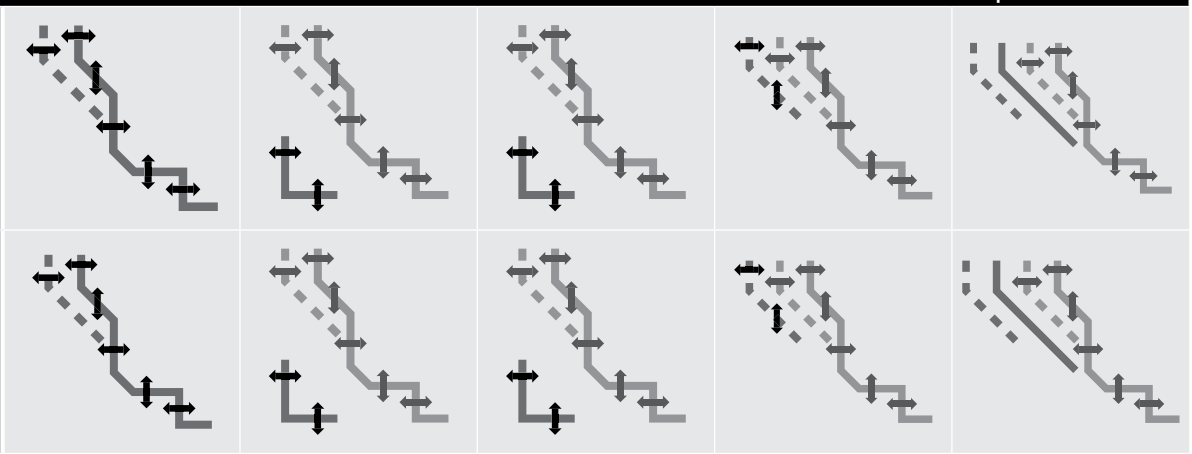
Neutral CT is required for Ground fault or Neutral pole protection, when 3 pole breaker is used for 3 phase 4 wires system. (see page 20)

■ ZCT

ZCT is required for a few amperes earth leakage protection, and is combining ER plug.
(see page 20)

Characteristic table

Overview of tripping characteristics of main setting modules in combination with optional setting modules

	General protection Main setting module only	G1 Ground fault	E1 Earth leakage	AP 2nd additional Pre-alarm	N5 Neutral pole 50 % protection
WS General use LTD+STD+INST/MCR					
WM Generator protection use LTD+STD+INST/MCR					

Note:
WB type for special use is available on request.

Power supply modules

Product overview

Type	Rating	Alarm output contacts
P3	100–240 V AC 100–125 V DC	6 output contacts
P4	24–60 V DC	6 output contacts
P5	100–240 V AC	6 output contacts (SSR)

Note:
Over current protection and ground fault protection operates without control power source.

Contact capacity (Type code P3, P4)

Voltage (V)		Resistive load cosφ = 1.0	Inductive load cosφ = 4.0 L/R = 7 ms
AC	**240**	1 A	0.5 A
	120	1 A	1 A
DC	**125**	0.1 A	0.05 A
	30	1 A	1 A

Contact capacity (Type code P5)

Voltage (V)		Normal current	Peak inrush current	ON resistance (max.)
AC	**240**	0.1 A	0.3 A	5 Ω
	120	0.1 A	0.3 A	5 Ω
DC	**125**	0.1 A	0.3 A	5 Ω
	30	0.1 A	0.3 A	5 Ω

Factory setting of 6 output contacts is as follows.

G1/E1/AP	LTD	STD/INST	PAL	TAL	ERR
Refer to lower table	Self-holding	Self-holding	Non Self-holding	Non Self-holding	Non Self-holding

Type	G1	E1	AP
TRIP side	Selfholding	Selfholding	—
ALARM side	Non Self-holding	Non Self-holding	Non Self-holding

Description:
Self-holding type: The output condition is held until it is reset.
Non self-holding type: The output is reset if it is returned to the normal condition.

CT rating table

AE1000-SW		AE1250-SW	AE1600-SW	AE2000-SWA		AE2500-SW	AE3200-SW	AE4000-SWA	AE5000-SW	AE6300-SW
1000 A		1250 A	1600 A	2000 A		2500 A	3200 A	4000 A	5000 A	6300 A
250 A	315 A			**AE2000-SW**				**AE4000-SW**		
500 A	630 A			2000 A				4000 A		
				1250 A	1600 A					

Notes:
– AE1000-SW and AE2000-SW has low rating types, too.
– As for details of ratings, refer to pages 8 and 9.

Electronic trip relay (ETR configuration overview)

Main setting module

WS1, WM1	AE1000–1600-SW, AE2000–3200-SW, AE4000-SW
WS2, WM2	AE2000-SWA, AE4000-SWA, AE5000-SW
WS3, WM3	AE6300-SW

WS : General use
WM: Generator protection use
(WB: Special use: on request)

Optional setting module

G1: Ground fault protection
N5: Neutral pole 50 % protection
E1: Earth leakage protection
AP: 2nd Additional Pre-alarm

Power supply

P3: AC 100–240 V/DC100–125 V with output contact
P4: DC 24–60 V with output contact
P5: DC 100–240 V with output contact (SSR)

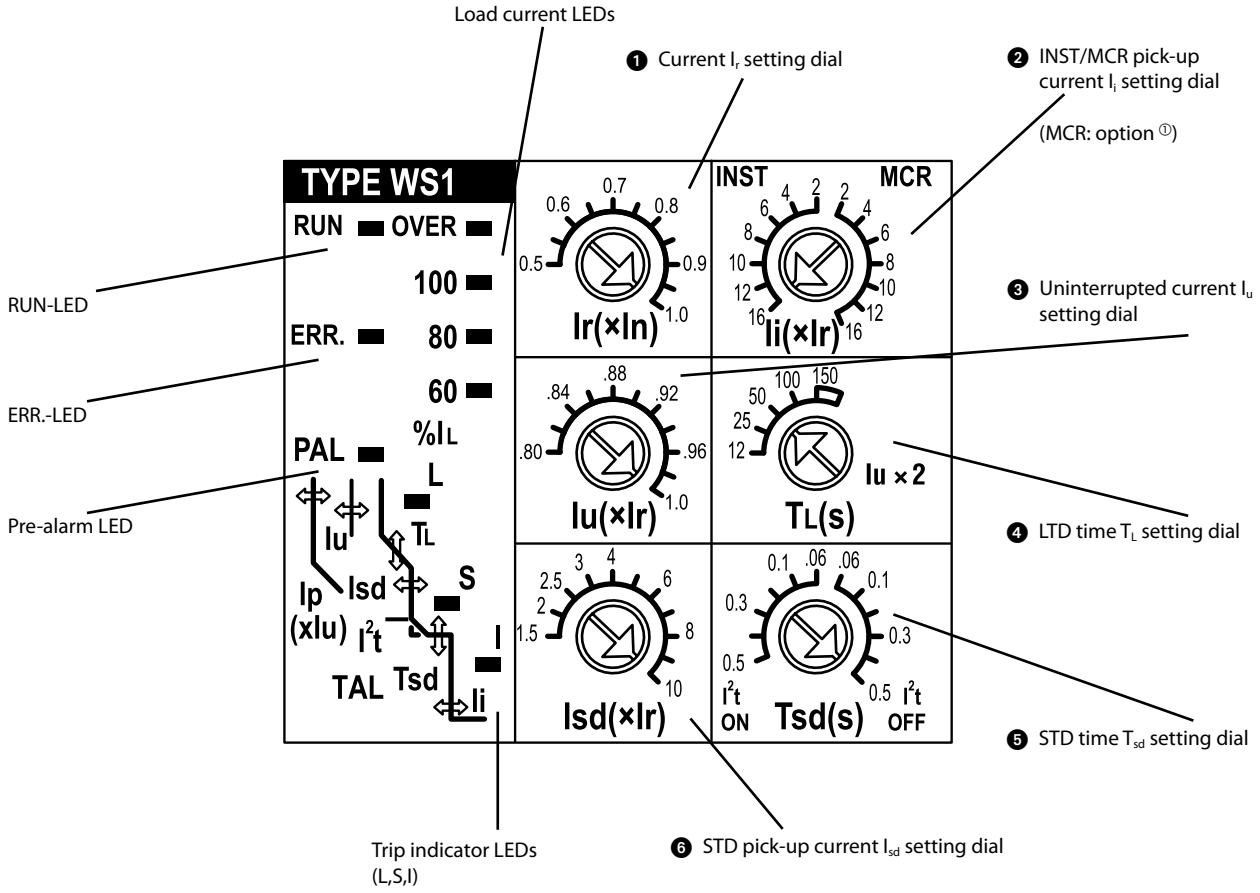
Additional function

- ■ Extension module (EX1)
  - ■ Display (DP1)
  - ■ Display onto panel board (DP2)
  - ■ VT unit
  - Network
    - ■ BIF-CC
    - ■ BIF-PR
    - ■ BIF-MD
- ■ MCR switch (MCR-SW)

The assignment of the contacts can be changed with DP1/DP2.

The output of G1/E1/AP/PAL OUT can also be changed to the self-holding type from the non self-holding type.

S types – General protection



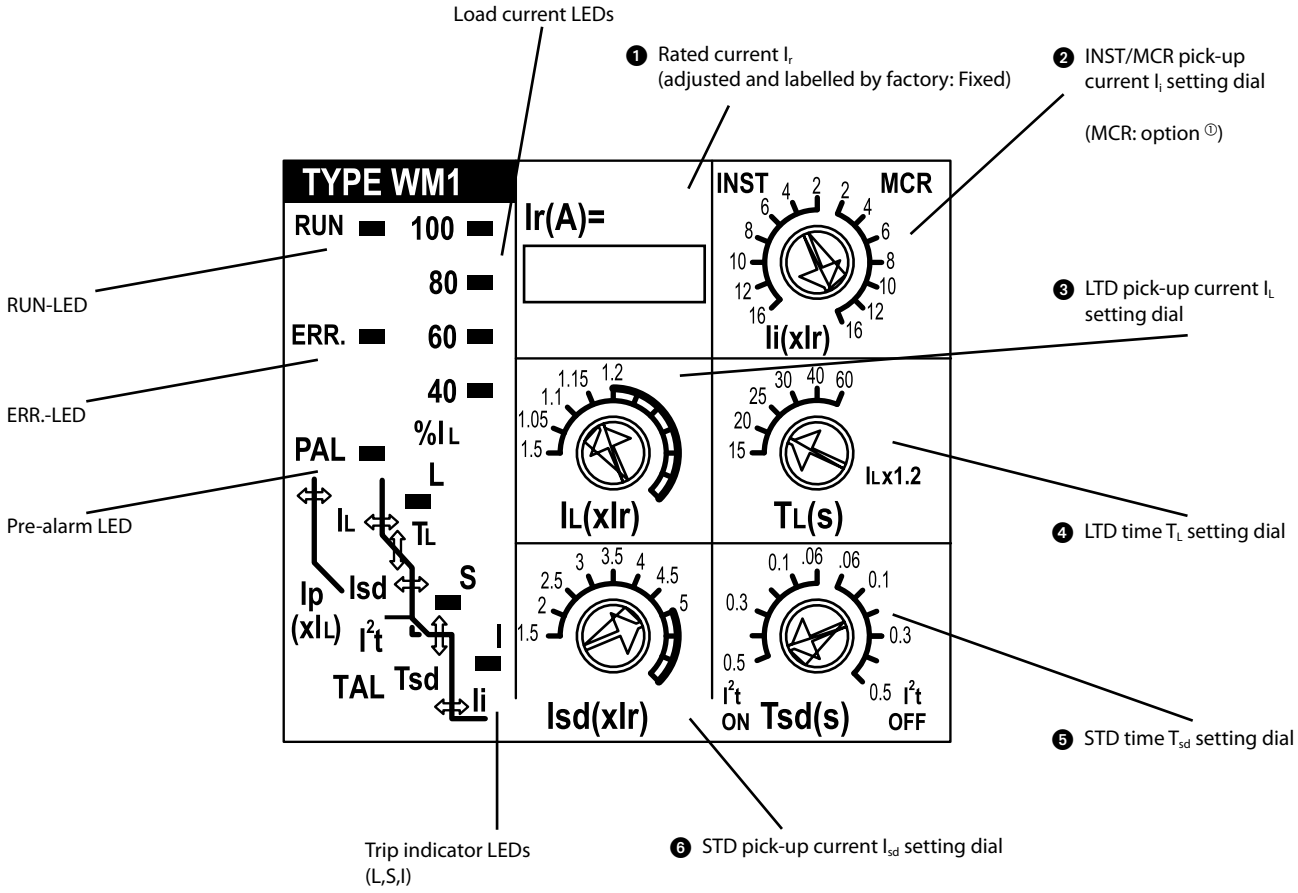
Adjustable setting range

No.	Setting item		Adjustable setting range	Accuracy	Setting for shipment
❶	Current setting	I_r	0.5–1.0 (0.05 step) x I_n (CT rating)	—	**1.0**
❸	Uninterrupted current	I_u	0.8–1.0 x I_r (0.02 step), Pick-up current: 1.15 x I_u	1.05 x I_u. . . Non Pick-up 1.25 x I_u. . . Pick-up	**1.0**
❹	LTD time	T_L	12–25–50–100–150 s at I_u x 2	±20 %	**150**
❻	STD pick-up current	I_{sd}	1.5–2–2.5–3–4–5–6–7–8–9–10 x I_r	±15 %	**10**
❺	STD time	T_{sd}	0.5–0.4–0.3–0.2–0.1–0.06 (I²t ON) – 0.06–0.1–0.2–0.3–0.4–0.5 s (I²t OFF) at I_{sd} x 1.5	±20 % This means, it operates in the range between 0.04 and 0.08 s when the time set at 0.06 s.	**0.5** (I²t ON)
❷	INST/MCR pick-up current	I_i	AE1000-SW–AE1600-SW AE2000-SW–AE3200-SW AE4000-SW — WS1: 16–12–10–8–6–4–2 (INST) – 2–4–6–8–10–12–16 x I_r (MCR) ①	±15 %	WS1: **16** (INST)
			AE2000-SWA, AE4000-SWA AE5000-SW — WS2: 12–10–8–6–4–2 (INST) – 2–4–6–8–10–12 x I_r (MCR) ①		WS2: **12** (INST)
			AE6300-SW — WS3: 10–8–6–4–2 (INST) – 2–4–6–8–10 x I_r (MCR) ①		WS3: **10** (INST)
	Pre-alarm current	I_p	Iu x 0.68–1.0 (0.04 step) – OVER	±10 %	**OVER** ②
	Pre-alarm time	T_p	1/2 T_L (after 1/2 T_L, PAL contact output turns on.)	±20 %	—

① Upper figure and table include optional MCR function.
② Pre-alarm current "OVER" setting is equal to 1.0.

Specifications		WS1-W	WS2-W	WS3-W
Main setting module S type		WS1	WS2	WS3
Order information	Art. no.	168552	168553	205180

M types – Generator protection



Adjustable setting range

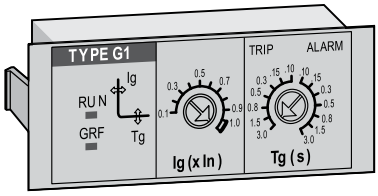
No.	Setting item		Adjustable setting range			Accuracy	Setting for shipment
❶	Current setting	I_r	0.63–1.0 x I_n (Adjust by factory: Fixed)			—	Specify when ordering
❸	ULTD pick-up current	I_L	1.0–1.05–1.1–1.15–1.2 x I_r			±5 %	**1.0**
❹	LTD time	T_L	115–20–25–30–40–60 s at I_L x 1.2			±20 %	**150**
❻	STD pick-up current	I_{sd}	1.5–2–2.5–3–3.5–4–4.5–5 x I_r			±15 %	**10**
❺	STD time	T_{sd}	0.5–0.4–0.3–0.2–0.1–0.06 (I² t ON) – 0.06–0.1–0.2–0.3–0.4–0.5 s (I² t OFF) at I_{sd} x 1.5			±20 % This means, it operates in the range between 0.04 and 0.08 s when the time set at 0.06 s.	**0.5** (I²t ON)
❷	INST/MCR pick-up current	I_i	AE1000-SW–AE1600-SW AE2000-SW–AE3200-SW AE4000-SW	WM1	16–12–10–8–6–4–2 (INST) – 2–4–6–8–10–12–16 x I_r (MCR) ①	±15 %	WM1: **16** (INST)
			AE2000-SWA, AE4000-SWA AE5000-SW	WM2	12–10–8–6–4–2 (INST) – 2–4–6–8–10–12 x I_r (MCR) ①		WM2: **12** (INST)
			AE6300-SW	WM3	10–8–6–4–2 (INST) – 2–4–6–8–10 x I_r (MCR) ①		WM3: **10** (INST)
	Pre-alarm current	I_p	I_u x 0.68–1.0 (0.04 step) – OVER			±5 %	**OVER** ②
	Pre-alarm time	T_p	1/2 T_L (after 1/2 T_L, PAL contact output turns on.)			±20 %	—

① Upper figure and table include optional MCR function.
② Pre-alarm current "OVER" setting is equal to 1.0.

Specifications		WM1-W	WM2-W	WM3-W
Main setting module S type		WM1	WM2	WM3
Order information	Art. no.	168554	168555	205181

Note: WB type for special use is available on request.

■ Ground fault protection (GFR)



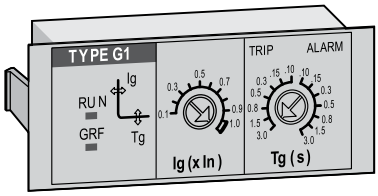
The ground fault protection (GFR) of several hundred amperes is possible.

This function can be selected for trip and alarm (no trip). Power supply is necessary for this function, even if there is not power supply, it can function at 0.2 x In or higher.

Specifications	G1-W
Optional setting module	G1 (Ground fault protection module)
Order information Art. no.	168558

Setting item		Adjustable setting range	Accuracy	Setting for shipment
GFR pick-up current	I_g	0.1–0.2–0.3–0.4–0.5–0.6–0.7–0.8–0.9–1.0 x I_n	±20 %	**1.0**
GFR time	T_g	3–1.5–0.8–0.5–0.3–0.15–<0.1 (TRIP) – <0.1–0.15–0.3–0.5–0.8–1.5–3 (ALARM) s (at 1.5 x I_g)	±20 %	**3 sec. (TRIP)**

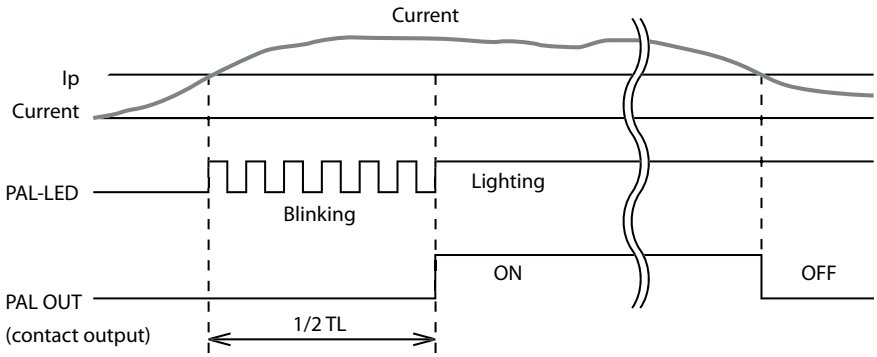
■ 2nd additional pre-alarm (AP)



The pre-alarm (1st) function already installed in standard ETR, the 2nd additional pre-alarm function can be installed as option, thereby it is possible to monitor (observer) electric circuit in more detail by 2nd additional pre-alarm function.

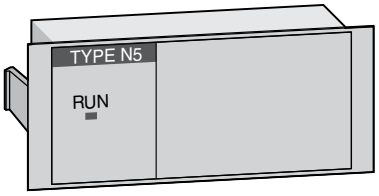
Specifications	AP-W
Optional setting module	AP (2nd pre-alarm module)
Order information Art. no.	168560

Pre-alarm timing chart



Setting item		Adjustable setting range	Accuracy	Setting for shipment
2nd additional Pre-alarm pick-up current	I_{p2}	0.5–0.6–0.7–0.8–0.84–0.88–0.92–0.96–1.0 x I_u (WS) 0.5–0.6–0.7–0.8–0.84–0.88–0.92–0.96–1.0 x I_L (WM)	±10 % (WS) ±5 % (WM)	1.0
2nd additional Pre-alarm time	T_{p2}	3–1.5–0.8–0.5–0.3–0.15–<0.1 (TRIP) – <0.1–0.15–0.3–0.5–0.8–1.5–3 (ALARM) s (at 1.5 x I_g)	±20 %	0.9 x TL

■ Neutral pole 50 % protection (N5)

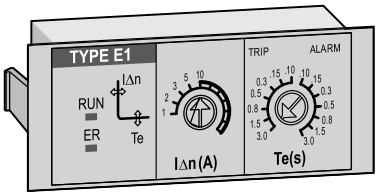


Neutral pole overcurrent protection (operating at 100 % of rated current) already installed in standard ETR.

But if you would like to operates at 50 % of rated current on neutral pole, neutral pole 50 % protection realizes it.

Specifications		N5-W
Optional setting module		N5 (Neutrale pole protection module)
Order information	Art. no.	168561

■ Earth leakage protection (ER)



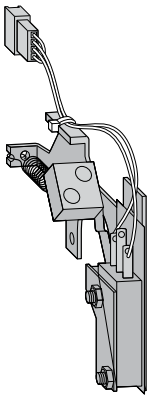
By combining the ETR with earth leakage protection (ER) and External ZCT, earth leakage protection is possible.

Earth leakage protection, earth leakage tripping and earth leakage alarm can be selected. Control supply is necessary for this function.

Specifications		E1-W
Optional setting module		E1 (Neutrale pole protection module)
Order information	Art. no.	168559

Setting item		Adjustable setting range	Accuracy	Setting for shipment
ER pick-up current	$I_{\Delta n}$	1–2–3–5–10 A	+0 % –30 %	10 A
ER time	T_e	3–1.5–0.8–0.5–0.3–0.15–<0.1 (TRIP) – <0.1–0.15–0.3–0.5–0.8–1.5–3 s (at 1.5 x I_{in}) (ALARM)	±20 %	3 s (TRIP)

■ MCR switch (MCS-W)

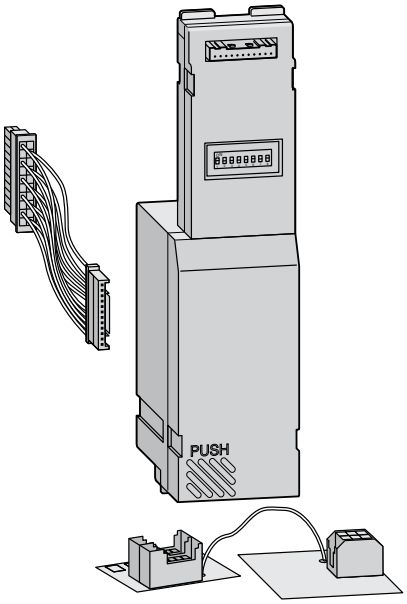


If MCR switch is built in the breaker and the dial for INST/MCR on main setting module is set to any MCR position, MCR function is operative.

MCR function: During a closing operation of the breaker, Instantaneous characteristics is operative. And it becomes inoperative when the breaker is in the closed position.

Specifications		MCS-W
Switch type		MCR
Order information	Art. no.	168570

■ Extension module (EX1)



This is the module that realizes various additional functions combining display module (DP1/DP2), interface unit (BIF-CC/ BIF-PR/ BIF-MD) and VT-W unit.

- **Various measuring elements, high measuring accuracy**

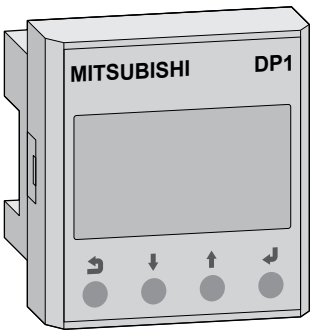
  By adopting high-performance ASIC, various measuring elements (load current, voltage, energy,harmonics, etc.) and high measuring accuracy are realized.

- **Communication function**

  2 display modules and 1 interface unit can be connected simultaneously by internal communication.

Specifications		EX1-W
Type		Extension module
Order information	Art. no.	168564

■ Display module (DP1/DP2)



This is the module that displays and sets various information, for example, measurement, trip and alarm, setting of output contacts and so on.

- **Multi display of measuring element**

  It enables to easily monitor the comparison of each measuring element by multi display (load current 4 phases multi display and voltage multi display) on one screen.

- **2-colours back light**

  If trip or alarm occurred, back light colour changes from green to red automatically.

- **Graphical display**

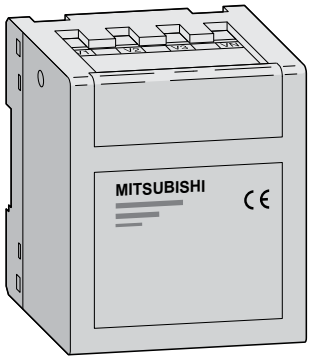
  By adopting dot matrix type LCD, graphical display such as bar graph display of load current, harmonic currents and characteristic curve are realized.

There are 2 types of this module. One is the ETR attachment type (DP1). Another is the panel attachment type (DP2) and is connected to extension terminals of control circuit by 2 m cable (5 m cable will be available on request).

Specifications		DP1-W	DP2-W
Type		Display module for ETR assembly	Display module for panel assembly
Order information	Art. no.	168565	168566

Notes:
– Extension module (EX1) is required.
– The VT-W measurement module is required to display the measured data except the electric current.

■ Measurement module (VT-W)

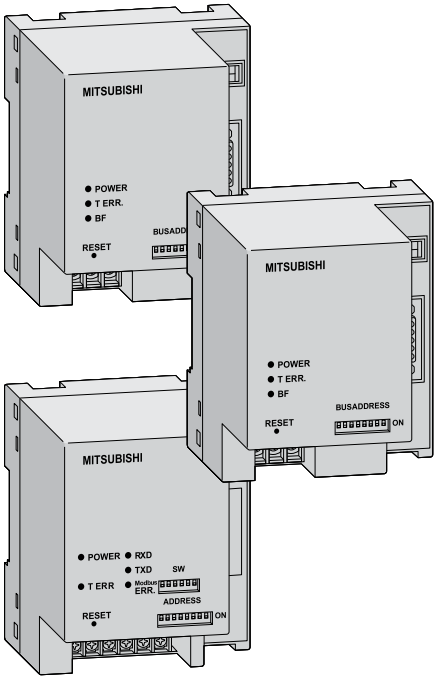


The VT-W measurement module enables to measure voltages, powers, energies, harmonic currents and etc. by connecting the ETR with Extension module (EX1).

It is to be placed separately outside the the breaker. A connection cable of 2 meters length is included.

Specifications		VT-W
Unit for		U/P/E/cos phi/earth leakage/average measuring/trip history/trip current measuring
Order information	Art. no.	168567

■ Interface unit (BIF-CC/BIF-PR/BIF-MD)



These interface units can expand the future possibility in various communication and Intelligent control.

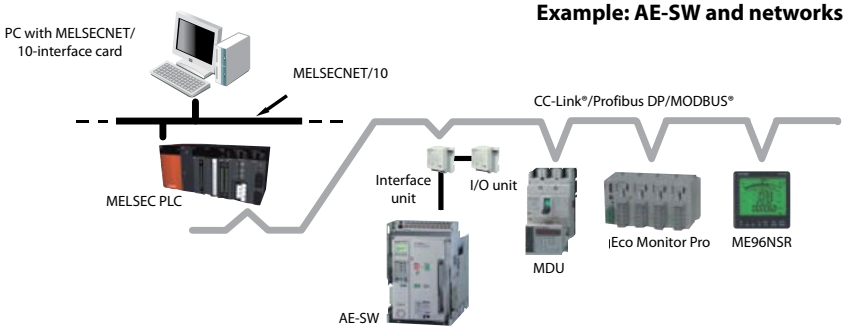
- **Applicable to various open networks.**

  These units are applicable to various open network systems such as CC-Link®, Profibus DP and MODBUS® (RS485), which can be built in easily.

- **Intelligent control by multi-data communication**

  It comes into being the Intelligent control by multi-data communication through these interface units to PLC/SCADA, which transfer the measurement information, setting values, error information and trip and alarm information.

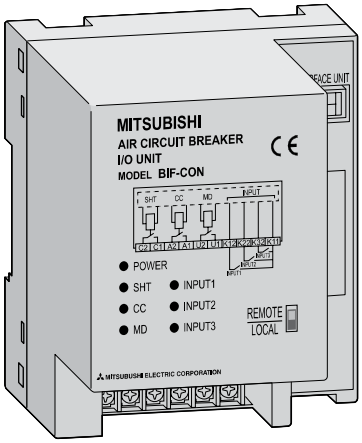
Example: AE-SW and networks



Specifications		BIF-CC-W	BIF-PR-W	BIF-MD-W
Main setting module S type		CC-Link network	Profibus DP network	Modbus network
Order information	Art. no.	168571	168572	168573

Notes:
– Extension module (EX1) is required.
– The VT-W unit is required to display the measured data except the electric current.

■ I/O unit (BIF-CON/BIF-CL)



The input & output controlling unit BIF-CON is available for the remote controlling and remote monitoring of the breaker condition through the various network systems.

With this BIF-CON in addition to the interface unit, it become possible to control the breaker remotely, like a ON or OFF operations or spring-charging. Further, by combining the drawout position switch (BIF-CL), the monitoring of drawout position become available in case of the breaker drawout type.

Function	Description	Note
Control	Breaker ON operation	1 a contact for CC
	Breaker OFF operation	1 a contact for SHT (not applicable for AC 380 – 500 V rating)
	Spring charge	1 a contact for MD
Monitor	Digital Input (DI) monitoring	In case of BIF-CC and BIF-MD, max.3 contacts monitoring are available. In case of BIF-PR, 1 contact monitoring is available.
	Breaker drawout position	Position: CONNECTED, TEST and DISCONNECTED BIF-CL is required.

Specifications		BIF-CON-W
Application		I/O unit network module
Order information	Art. no.	168574

Configuration table of ETR with EX1 and VT-W module

Combination sample	Display module + Extension module								Display module + Extension module + VT-W unit							
Type	❶ = EX1 ❷ = DP1 – ❸ = DP2 ①								❶ = EX1 ❷ = DP1 – ❸ = DP2,VT-W ①							
❶ Main setting module	WS				WM				WS				WM			
❷ Optional setting module	NP	AP	G1	E1	NP	AP	G1	E1	NP	AP	G1	E1	NP	AP	G1	E1
❸ Power supply	P3 – P5								P3 – P5							
Measurement																
Load current (±2.5 %)	○								○							
Leakage current (±15 %) ③	—	—	—	○	—	—	—	○	—	—	—	○	—	—	—	○
Voltage (±2.5 %)	—								○							
Power (active, reactive, apparent) (±2.5 %)	—								○							
Power factor (±5 %)	—								○							
Energy (active, reactive) (±2.5 %)	—								○							
Harmonics current (±2.5 %)	—								○ (3.5 ... 19th)							
Frequency (±2.5 %)	—								○							
Trip history																
LTD		○				○				○				○		
STD		○				○				○				○		
INST	○								○							
GFR	—	—	○	—	—	—	○	—	—	—	○	—	—	—	○	—
ER	—	—	—	○	—	—	—	○	—	—	—	○	—	—	—	○
UVT	○ ②								○ ②							
Alarm history																
PAL1	○								○							
PAL2	—	○	—	—	—	○	—	—	—	○	—	—	—	○	—	—
OVER	○								○							
GFR	—	—	○	—	—	—	○	—	—	—	○	—	—	—	○	—
EPAL	—	—	—	○	—	—	—	○	—	—	—	○	—	—	—	○
ER	—	—	—	○	—	—	—	○	—	—	—	○	—	—	—	○
Characteristic setting (for panel attachment model DP2 only)																
LTD		○				○				○				○		
STD		○				○				○				○		
INST	○								○							
PAL1	○								○							
PAL2	—	○	—	—	—	○	—	—	—	○	—	—	—	○	—	—
GFR	—	—	○	—	—	—	○	—	—	—	○	—	—	—	○	—
EPAL	—	—	—	●	—	—	●	—	—	—	—	●	—	—	—	●
ER	—	—	—	○	—	—	—	○	—	—	—	○	—	—	—	○
Setting																
Output contacts setting change	●								●							
Date & Time	●								●							
Demand time	●								●							
Alarm holding method	●								●							
Reset																
Trip and alarm information	●								●							
Measurement information (min. and max. values)	●								●							
ETR information																
Main/Optional setting module information	○								○							
Error information	○								○							
CT rating	○								○							
Phase line method	○								○							
Normal connection or reverse connection	○								○							

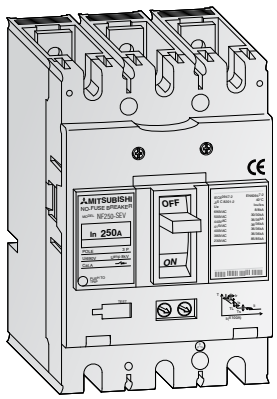
○: can be displayed by DP1/DP2 ●: can be displayed and set by DP1/DP2

① 2 units of display modules can be attached.
② Display is available only when UVT module is attached.
③ Included the accuracy of ZCT.

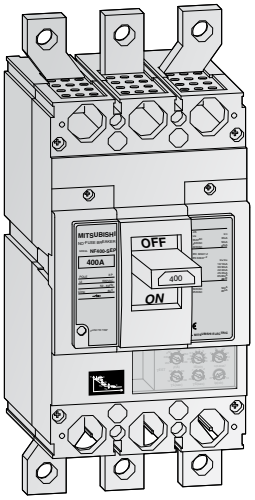
World super series – The extensive breaker series from Mitsubishi Electric

The circuits of the Mitsubishi Electric breaker series are amongst the smallest compact circuit breakers in the world with electronic overload indication of this kind.

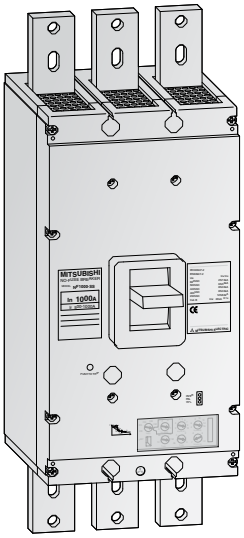
The system is based, among other things, on the well-known and proven microprocessor technology.



NF250-SEV, 3p



NF400-SEW, 3p



NF1000-SEW, 3p

WS – World super series

The WS breaker series meets national and international protection ratings according to VDE, EN, and IEC standards for industrial applications as well as for extended shipping demands.

The new tripping technology guarantees a high reliability and highest protection.

- 16 to 250 A in one model size (3- and 4-pole)
- Interchangeable relay unit (thermal type or electronic type)
- Available in fixed and plug-in versions
- Breaking capacity
- I_{cs} = 100 % I_{cu}, up to 690 V
- Additional disconnectors available

The proven world super series features technical know-how and the micro-processor technology tried and tested in longstanding experience.

The fully enclosed circuit breakers provide an increased safety and at the same time decreased switching times.

- 400 to 800 A
- 2 model sizes (3- and 4-pole)
- Electronic trip system
- Available in fixed and plug-in versions
- Additional disconnectors available

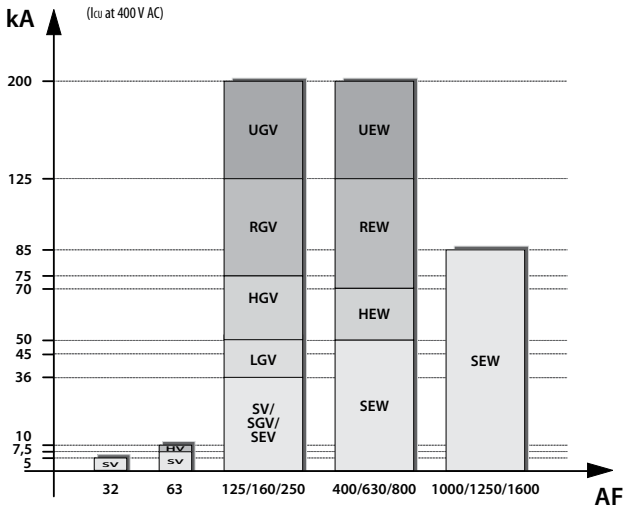
The proven standard series for a high breaking performance providing an optimum protection for transformer and generator feed in, and output breakers.

Circuit breakers can be used as section or disconnecting switch.

- 1000 to 1600 A
- 1 model size (3- and 4-pole)
- Electronic trip system
- Available in fixed versions
- Additional disconnectors available

Intelligent breaking technology for your safety

With its innovative breaking technology all Mitsubishi Electric breakers offer greater safety and even faster circuit-breaking speed through the use of the latest switch-off technology and innovative engineering, with a newly developed electronic trip relay.



Breaking performance

The complete range of moulded case circuit breakers from 3 to 1600 A.

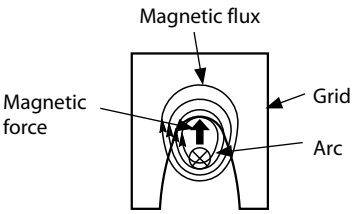
Outline

Breaking technology

With its new breaking technology the circuit breakers offer greater safety and even faster circuit-breaking speed through the use of the latest switch-off technology and innovative engineering, with a newly developed electronic trip relay.

Arc-extinguishing device

Mitsubishi Electric MCCBs feature excellent arc-extinguishing performance by virtue of the optimum combination of grid gap, shape, and material.



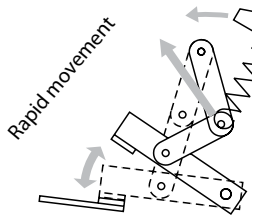
Arc extinction

Arc runner

The arc is instantaneously transferred to the arc-extinguishing chamber (see the figure above) by the arc runner, which reduces damage to contacts and improves interrupting performance.

Trip button (push to trip)

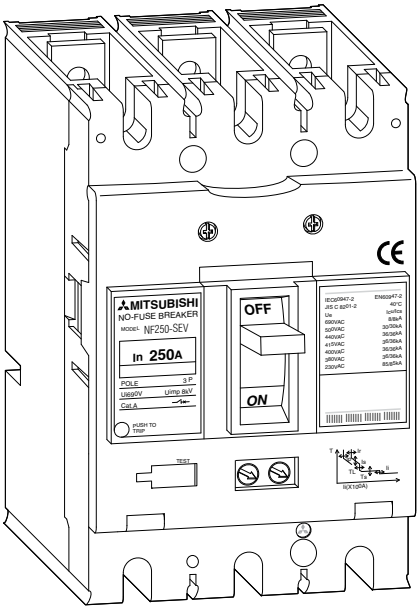
Enables tripping mechanically from outside, for confirming the operation of the accessory switches and the manual resetting function.



Switching mechanism

The contacts open and close rapidly, regardless of the moving speed of the handle, minimizing contact wear and ensuring safety.

Moulded case (cover)



Type NF250-SEV construction

Handle

- Trip indication

The automatically tripped condition is indicated by the handle in the center position between ON and OFF; the yellow or white line cannot be seen in this position.

The figure shows the handle in tripped position.

- Resetting

Resetting after tripping is performed by first moving the handle OFF position to engage the mechanism, then returning the handle to ON to reclose the circuit.

- Trip-free

Even if the handle is held at ON, the breaker will trip if an overcurrent flows.

- Contact on mechanism

Even in the worst case in which welding occurs owing to an overcurrent, the breaker will trip and the handle will maintain to ON, indicating the energizing state.

Adjustable thermal trip current value

The setting can be changed by simply turning the control dials, providing the optimum characteristics for particular road conditions.

A microcomputer and Mitsubishi Electric's original IC fulfill a new high level of safety

Safer and more reliable power

Electronic device loads, such as inverters, distort the current waveform. Mitsubishi Electric's electronic breakers use a digital detector to measure the current's effective value and minimize overload tripping errors. This enables precise protection of the circuit.

Alarm function monitors and anticipates interruptions

Our electronic moulded-case circuit breakers feature a pre-alarm system as standard. The pre-alarm outputs an alarm before the circuit breaker trip is activated. When the load current exceeds the set pre-alarm current, it outputs a pre-alarm signal (from a solid-state relay) and lights the LED.

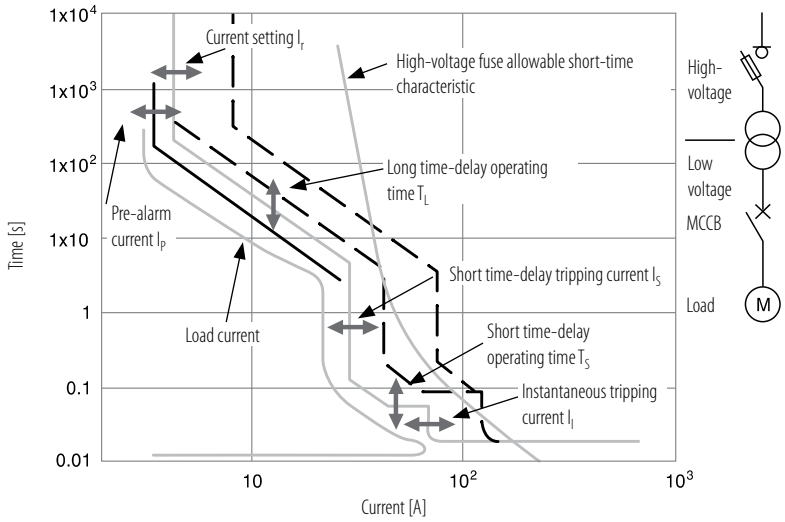
The pre-alarm module (with contact output) is optional available with electronic molded-case and earth-leakage circuit breakers (on request).

Improved protection against fluctuations in the load current

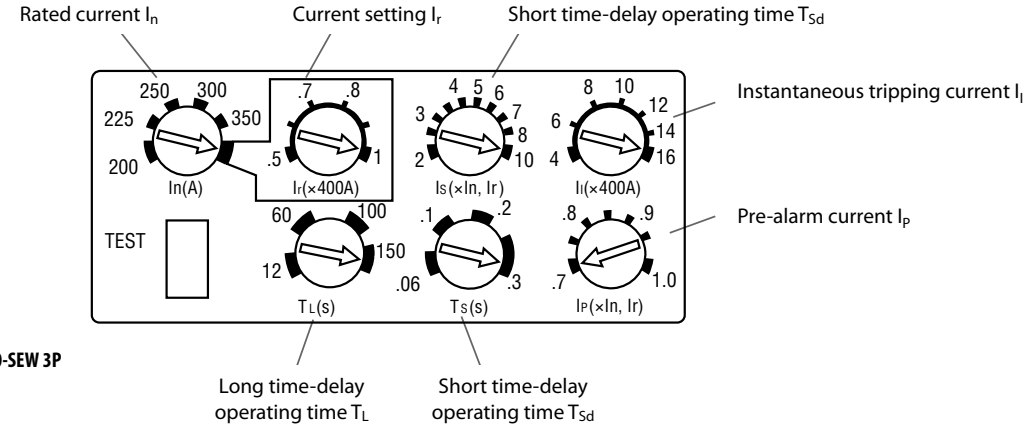
Our standard electronic trip relay offers a number of outstanding benefits.

The user has a choice of six different parameters as tripping characteristics with the multiple coordinated protection method.

Better protection can be obtained between the high-voltage fuse, OCR and the low voltage fuse.



Coordinated protection from multiple tripping characteristics



NF400-SEW 3P

Portable tester facilitates checking and maintenance

The separately sold portable tester allows the user to check the four characteristics:

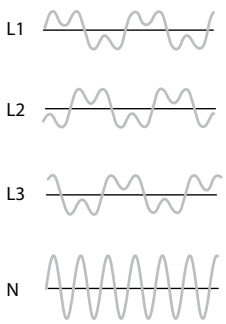
1. Long-delay tripping
2. Short-delay tripping
3. Instantaneous tripping
4. Pre-alarm characteristics

LEDs for load current, pre-alarm and over-current show the operating status.

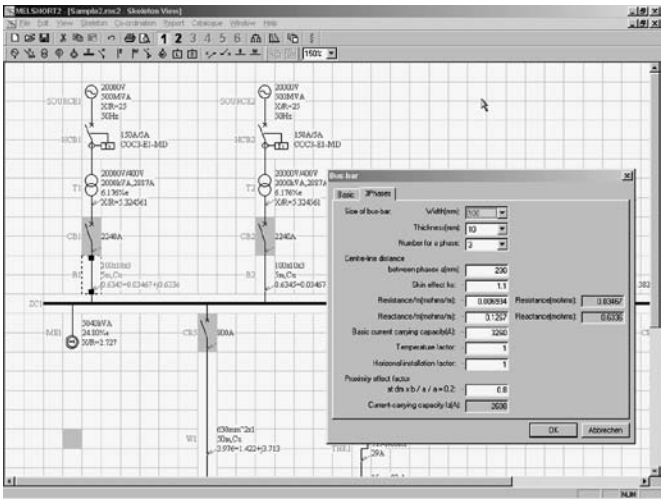
Overload protection and safety

The neutral-pole overload protection circuit is standard with 4-wire electronic moulded-case devices.

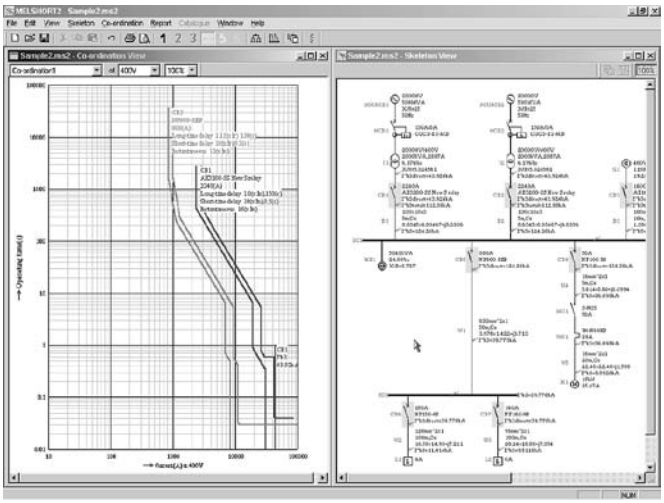
It prevents burn-out when the neutral- pole's load current is greater than the voltage pole in a 3-phase 4 wire circuit which is prone to distorted third-harmonic current flows.



■ Calculation and selection software MELSHORT2



Circuit diagram of the network to be calculated, with input field



Display of the trip curves of a circuit breaker in the network

MELSHORT2 – The new calculation software for low-voltage switchgears

MELSHORT2 is a software package that provides all the functions needed for planning and dimensioning switchgear systems.

Increasingly demanding technical specifications and accountability regulations are making switchgear configuration much more critical than it used to be. In the past, software for calculating and dimensioning switchgear was helpful – nowadays it's absolutely essential. It supports all modern international electrical engineering standards and shines with simple and reliable operation.

The program calculates the short-circuit levels and currents at all necessary points for all switchgear components, including the power supply transformer and circuit breakers, the emergency generators, the individual motor and capacitor group branch circuits and all the other power distribution circuits, down to the last circuit breaker. This makes it possible to select the ideal breaker for every task, for optimum performance and cost-efficiency.

MELSHORT2 has a comprehensive range of powerful, easy-to-use functions, including:

- Selective shutdown
- Backup protection
- Coordination with the main power supply systems
- Allowance for the start-up currents of electric motors

These functions make it possible to optimise the configuration of your switchgear equipment for the specific requirements of your applications.

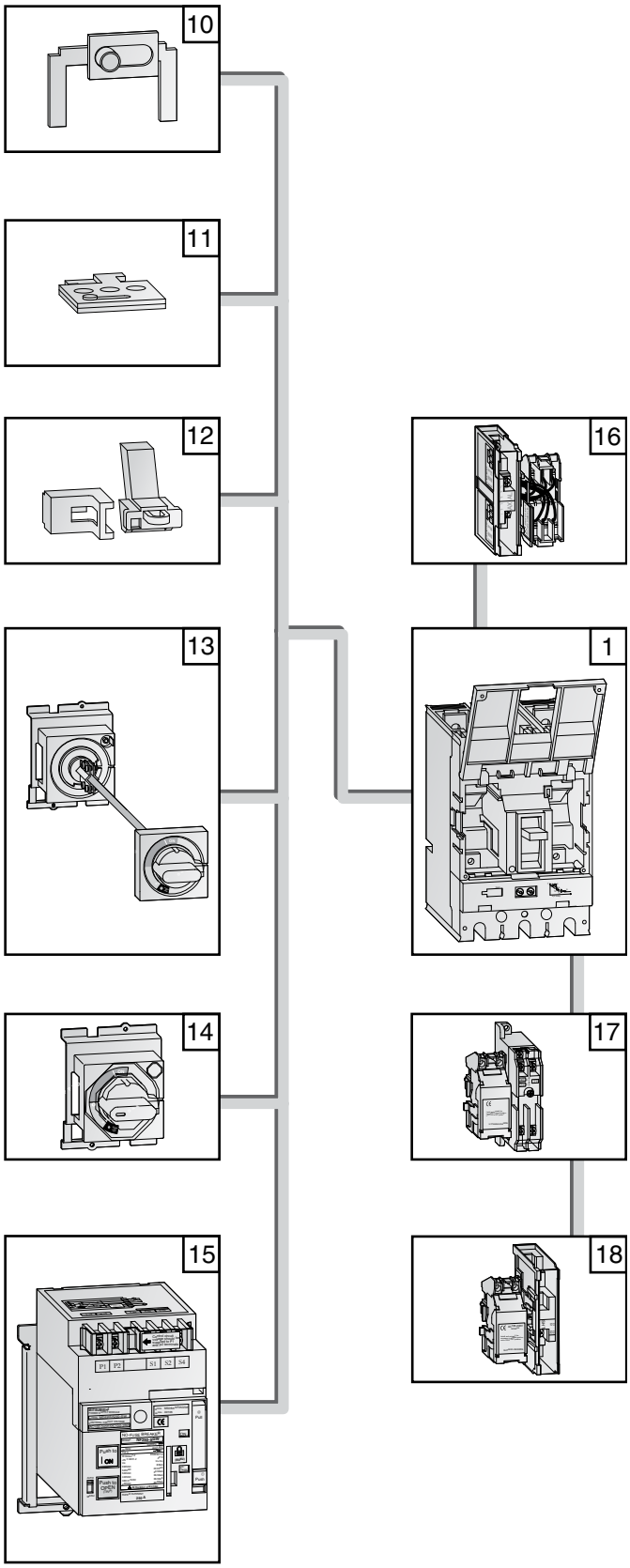
The calculated results, the hardware model suggestions and the wiring diagram with all the relevant values can be processed and used as documentation for the switchgear installation. Another welcome extra is the free Internet update service.

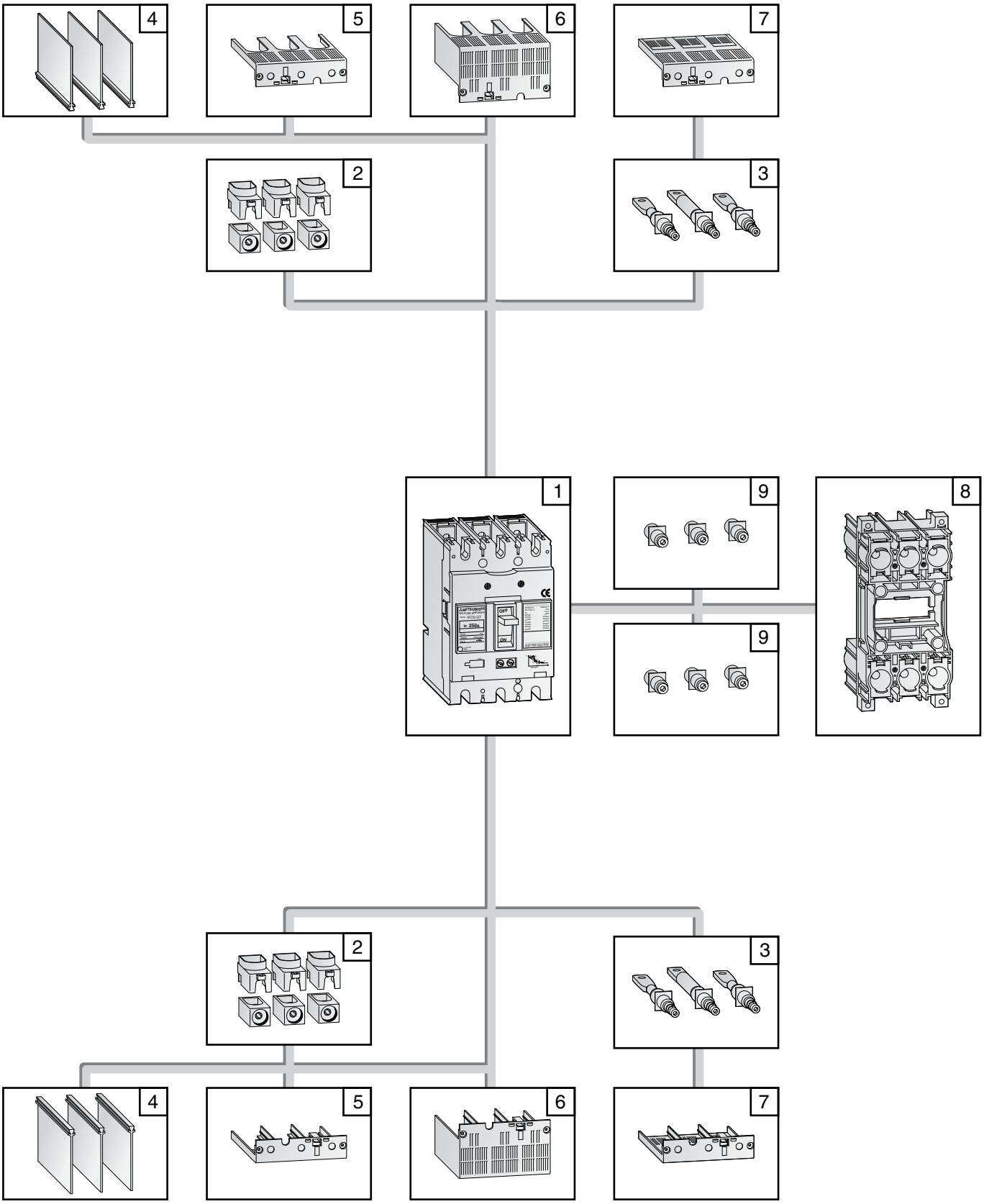
Specifications		MELSHORT2
Operating system		Windows
Disk type		CD-ROM
Order information	Art. no.	129115

Product skeleton of accessories

Mitsubishi Electric offers a wide range of accessories for the moulded-case circuit breakers and disconnectors to serve almost all variations of applications.
Detailled information on request.

1	Circuit breaker	see page 40
2	Solderless (box) terminals	see page 63
3	Rear connection studs	see page 63
4	Insulating barriers (BA-F)	see page 70
5	Small terminal covers (TC-S)	see page 69
6	Large terminal covers (TC-L)	see page 69
7	Rear terminal covers (BTC)	see page 69
8	Plug-in base (PM)	see page 63
9	Connections for plug-in	see page 63
10	Mechanical interlock (MI)	see page 70
11	OFF lock with 3 padlocks (HL)	see page 66
12	Handle lock device (LC, HLF, HLN, HLS)	see page 66
13	Variable-depth operating handle, V type	see page 64
14	Rotary operating handle, F type	see page 65
15	Electrical operating device (MDS)	see page 68
16	Alarm and auxiliary switches (AL, AX)	see page 56
17	Under voltage trip device (UVT)	see page 60
18	Shunt trip device (SHT)	see page 58

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Model overview and specifications

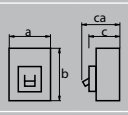
	Type/series				WS-V series					
					NF32-SV	NF63-SV	NF125-SV	NF125-SGV	NF125-SEV	NF160-SGV
S series	Rated current I_n max. [A]				32	63	125	125*	125*	160*
	Rated insulation voltage U_i [V]			AC	600	600	690	690	690	690
	Number of poles				3	3/4	3/4	3/4	3/4	3/4
	Rated breaking capacity [kA]	IEC 947-2 EN 60 947-2 VDE 0660	AC ① (50/60 Hz)	690 V	—	—	8/8	8/8	8/8	8/8
				500 V	2.5/2.5	7.5/7.5	18/18	30/30	30/30	30/30
				440 V	2.5/2.5	7.5/7.5	25/25	36/36	36/36	36/36
				400 V	**5/5**	**7.5/7.5**	**30/30**	**36/36**	**36/36**	**36/36**
	(I_{cu}/I_{cs})			230 V	7.5/7.5	15/15	30/30	85/85	85/85	85/85
	Dimensions WxHxD			[mm]	75x130x68	75/100x130x68	90/120/x130x68	105/140x165x68	105/140x165x68	105/140x165x68
	Type						**NF125-LGV**			**NF160-LGV**
L series	Rated current I_n max. [A]						125*			160*
	Rated insulation voltage U_i [V]			AC			690			690
	Number of poles						3/4			3/4
	Rated breaking capacity [kA]	IEC 947-2 EN 60 947-2 VDE 0660	AC ① (50/60 Hz)	690 V			8/8			8/8
				500 V			36/36			36/36
				440 V			**50/50**			**50/50**
				400 V			50/50			50/50
	(I_{cu}/I_{cs})			230 V			90/90			90/90
	Dimensions WxHxD			[mm]			105/140x165x68			105/140x165x68
	Type					**NF63-HV**	**NF125-HGV**		**NF125-HEV**	**NF160-HGV**
H series	Rated current I_n max. [A]					63	125*		125*	160*
	Rated insulation voltage U_i [V]			AC		690	690		690	690
	Number of poles					3/4	3/4		3/4	3/4
	Rated breaking capacity [kA]	IEC 947-2 EN 60 947-2 VDE 0660	AC ① (50/60 Hz)	690 V		2.5/2.5	10/8		10/8	10/8
				500 V		7.5/7.5	50/38		50/38	50/38
				440 V		10/8	65/65		65/65	65/65
				400 V		**10/8**	**75/75**		**75/75**	**75/75**
	(I_{cu}/I_{cs})			230 V		25/19	100/100		100/100	100/100
	Dimensions WxHxD			[mm]		75/100x130x68	105/140x165x68		105/140x165x68	105/140x165x68
	Type						**NF125-RGV**			
R series	Rated current I_n max. [A]						125*			
	Rated insulation voltage U_i [V]			AC			690			
	Number of poles						3			
	Rated breaking capacity [kA]	IEC 947-2 EN 60 947-2 VDE 0660	AC ① (50/60 Hz)	690 V			—			
				500 V			—			
				440 V			125/125			
				400 V			**150/150**			
	(I_{cu}/I_{cs})			230 V			150/150			
	Dimensions WxHxD			[mm]			105x165x68			
	Type						**NF125-UV**			
U series	Rated current I_n max. [A]						125			
	Rated insulation voltage U_i [V]			AC			690			
	Number of poles						3/4			
	Rated breaking capacity [kA]	IEC 947-2 EN 60 947-2 VDE 0660	AC ① (50/60 Hz)	690 V			10/10			
				500 V			200/200			
				440 V			200/200			
				400 V			**200/200**			
	(I_{cu}/I_{cs})			230 V			200/200			
	Dimensions WxHxD			[mm]			105/140x240x68			
	Type				**DSN32-SV**	**DSN63-SV**	**DSN125-SGV**			**DSN160-SGV**
Disconnectors	Rated current I_n max. [A]				32	63	125			160
	Rated insulation voltage U_i [V]			AC/DC	600	600	690			690
	Rated voltage U_e [V]			AC (50/60 Hz)/DC	500/250	500/250	690/300			690/300
	Number of poles				3	3/4	3/4			3/4
	Max. switching current [A] (breaking)			AC/DC	256/128	504/252	1000/500			1280/640
	Dimensions WxHxD			[mm]	75x130x68	75/120x130x68	105/140x165x68			105/140x165x68

① DC on request ② In case of solderless terminal, interrupting capacity reduces. * adjustable

WS-V series			WS series					
NF250-SV	**NF250-SGV**	**NF250-SEV**	**NF400-SEW**	**NF630-SEW**	**NF800-SEW**	**NF1000-SEW**	**NF1250-SEW**	**NF1600-SEW**
250	250*	250*	400*	630*	800*	1000*	1250*	1600*
690	690	690	690	690	690	690	690	690
3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4
8/8	8/8	8/8	10/10 ②	10/10	10/10	25/13	25/13	25/13
30/30	30/30	30/30	30/30 ②	30/30	30/30	65/33	65/33	65/33
36/36	36/36	36/36	42/42 ②	42/42	42/42	85/43	85/43	85/43
36/36	**36/36**	**36/36**	**50/50 ②**	**50/50**	**50/50**	**85/43**	**85/43**	**85/43**
85/85	85/85	85/85	85/85 ②	85/85	85/85	125/63	125/63	125/63
105/140x165x68	105/140x165x68	105/140x165x68	140/185x257x103	140/185x257x103	210/280x275x103	210/280x406x140	210/280x406x140	210/280x406x140
	NF250-LGV							
	250*							
	690							
	3/4							
	8/8							
	36/36							
	50/50							
	50/50							
	90/90							
	105/140x165x68							
	NF250-HGV	**NF250-HEV**	**NF400-HEW**	**NF630-HEW**	**NF800-HEW**			
	250*	250*	400*	630*	800*			
	690	690	690	690	690			
	3/4	3/4	3/4	3/4	3/4			
	10/8	10/8	10/10	15/15	15/15			
	50/50	50/50	50/50	50/50	50/50			
	65/65	65/65	65/65	65/65	65/65			
	75/75	**75/75**	**70/70**	**70/70**	**70/70**			
	100/100	100/100	100/100	100/100	100/100			
	105/140x165x68	105/140x165x68	140/185x257x103	140/185x257x103	210/280x275x103			
	NF250-RGV		**NF400-REW**	**NF630-REW**	**NF800-REW**			
	250*		400*	630*	800*			
	690		690	690	690			
	3		3	3	3			
	—		15/10	20/15	20/15			
	—		70/35	70/35	70/35			
	125/125		125/63	125/63	125/63			
	150/150		**125/63**	**125/63**	**125/63**			
	150/150		150/75	150/75	150/75			
	105x165x68		140x257x103	140x257x103	210x275x103			
	NF250-UV		**NF400-UEW**		**NF800-UEW**			
	250		400*		800*			
	690		690		690			
	3/4		3/4		3/4			
	15/15		35/35		35/35			
	200/200		170/170		170/170			
	200/200		200/200		200/200			
	200/200		**200/200**		**200/200**			
	200/200		200/200		200/200			
	105/140x240x68		140/280x297/322x200		210/280x322x200			
	DSN250-SGV		**DSN400-SW**	**DSN630-SW**	**DSN800-SW**	**DSN1000-SW**	**DSN1250-SW**	**DSN1600-SW**
	250		400	630	800	1000	1250	1600
	690		690	690	690	660	660	660
	690/300		690/250	690/250	690/250	660/250	660/250	660/250
	3/4		3/4	3/4	3/4	3/4	3/4	3/4
	2000/1000		3200/1600	5040/2520	6400/3200	8000/14000	10000/5000	12800/6400
	105/140x165x68		140/185x257x103	140/185x257x103	210/280x275x103	210/280x406x140	210/280x406x140	210/280x406x140

* adjustable

Specifications of moulded-case circuit breakers 3–125 A

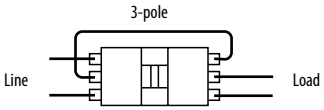
Type				NF32-SV	NF63-SV	NF63-HV	NF125-SV	NF125-SGV
Frame (A)				**32**	**63**	**63**	**125**	**125**
Rated data	**Rated current I_n** [A] at ambient temperature		40 °C	3, 4, 6, 10, 16, 20, 25, 32 Fixed	3, 4, 6, 10, 16, 20, 25, 32, 40, 50, 63 Fixed	10, 16, 20, 25, 32, 40, 50, 63 Fixed	75,80,100,125 Fixed	16–20, 20–25, 25–32, 32–40, 35–50, 45–63, 56–80, 70–100, 90–125 Adjustable
	Number of poles			3	3/4	3/4	3/4	3/4
	Rated insulation voltage U_i [V]		AC	600	600	690	690	690
	Rated breaking capacity [kA] (I_{cu}/I_{cs})	IEC/EN 60947-2 AC (50/60 Hz)	690 V	—	—	2.5/2.5	8/8	8/8
			500 V	2.5/2.5	7.5/7.5	7.5/7.5	18/18	30/30
			440 V	2.5/2.5	7.5/7.5	10/8	25/25	36/36
			400 V	**5/5**	**7.5/7.5**	**10/8**	**30/30**	**36/36**
			230 V	7.5/7.5	15/15	25/19	30/30	85/85
		DC	250 V	2.5/2.5	7.5/7.5	7.5/7.5④	20/20④	20/20④
	Utilization category			A	A	A	A	A
	Rated impulse withstand voltage U_{imp} [kV]			8	8	8	8	8
	Pollution degree			3	3	3	3	3
	Reverse connection			●	●	●	●	●
	Suitable for isolation			●	●	●	●	●
Mechanical data	**Dimensions** [mm] 		a	75	75/100	75/100	90/120	105/140
			b	130	130	130	130	165
			c	68	68	68	68	68
			ca	90	90	90	90	92
	Weight [kg]			0.65	0.75/1.0	0.75/1.0	1/1.3	1.6/2.0
	Cassette-type accessories	Alarm switch	(AL)	●	●	●	●	●
		Auxiliary switch	(AX)	●	●	●	●	●
		Shunt trip	(SHT)	●	●	●	●	●
		Under-voltage trip: Non-synchronous closing	(UVT-N)	—	—	—	—	—
		Under-voltage trip: Synchronous closing	(UVT-S)	●	●	●	●	●
	Accessories connection	With terminal block	(SLT)	●	●	●	●	●
		With internal terminal type		●	●	●	●	●
	Installation and connection	Front: Screw terminal (standard)		●	●	●	●	●
		Front: Solderless terminal		—	—	—	—	●
		Front: Busbar terminal		—	—	—	—	—
		Rear	(B)	●	●	●	●	●
		Plug-in: Rear	(PM)	●	●	●	●	—
		Plug-in: Rear front IP 20 with auto trip	(PM-IP)	—	—	—	—	●
	Built-in accessories	Pre-alarm-contact output ①	(PAL)	—	—	—	—	—
		Overcurrent trip alarm ①	(OAL)	—	—	—	—	—
External accessories	**External operating handle**	Door mounting	(V)	●	●	●	●	●
		Mounted on breaker	(R)	—	—	—	—	●
	Electrical operation device		(MDS)	—	—	—	—	●
	Handle lock device	Handle lock for use with padlock	(HL)	●	●	●	●	●
			(HL-S)	●	●	●	●	●
		Lock cover	(LC)	●	●	●	●	●
	Terminal cover	Large	(TC-L)	●	●	●	●	●
		Small	(TC-S)	●	●	●	●	●
		For rear connection	(BTC)	●	●	●	●	●
		For plug-in	(PTC)	●	●	●	●	●
	Mechanical interlock		(MI)	●	●	●	●	●
	Insulating barrier	Between phases (Standard)	(BA-F)	●	●	●	●	●
	Adapter for IEC 35 mm rail			●	●	●/—	●	—
Others	**CE marking**			Self-declaration	Self-declaration	Self-declaration	Self-declaration	Self-declaration
	CCC recognition			Recognized	Recognized	Recognized	Recognized	Recognition in process
	Automatic tripping device			Thermal-magnetic	Thermal-magnetic	Thermal-magnetic	Thermal-magnetic	Thermal-magnetic
	Trip button			Equipped	Equipped	Equipped	Equipped	Equipped

① Both PAL and OAL is not available. Only one specified. ② Others on request. ③ On request. ④ Use of 3- or 4-pole breaker for DC, see wiring diagram on the next page.
Missing specifications accord. to IEC/EN 60947-2 on request.

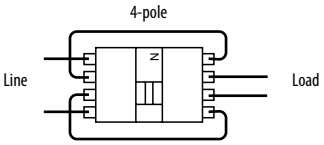
NF125-SEV	NF125-LGV	NF125-HGV	NF125-HEV	NF125-RGV	NF125-UV
125	**125**	**125**	**125**	**125**	**125**
16–32, 32–63, 63–125 Adjustable	16–20, 20–25, 25–32, 32–40, 35–50, 45–63, 56–80, 70–100, 90–125 Adjustable	16–20, 20–25, 25–32, 32–40, 35–50, 45–63, 56–80, 70–100, 90–125 Adjustable	16–32, 32–63, 63–125 Adjustable	16–20, 20–25, 25–32, 32–40, 40–50, 50–63, 63–80, 80–100, 100–125 Adjustable	15, 20, 30, 40, 50, 60, 75, 100, 125 Fixed
3/4	3/4	3/4	3/4	3	3/4
690	690	690	690	690	690
8/8	8/8	10/8	10/8	125/125	10/10
30/30	36/36	50/38	50/38	150/150	200/200
36/36	50/50	65/65	65/65	150/150	200/200
36/36	**50/50**	**75/75**	**75/75**	**150/150**	**200/200**
85/85	90/90	100/100	100/100	150/150	200/200
—	20/20④	40/40④	—	—	—
A	A	A	A	A	A
8	8	8	8	8	8
3	3	3	3	3	3
●	●	●	●	●	●
●	●	●	●	●	●
105/140	105/140	105/140	105/140	105	90/120
165	165	165	165	165	191
68	68	68	68	68	68
92	92	92	92	92	92
1.7/2.2	1.6/2.0	1.6/2.0	1.7/2.2	1.8	1.5/1.9
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
—	●	●	●	●	●
●	—	—	—	—	—
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
—	—	—	—	—	—
●	●	●	●	●	●
—	—	—	—	—	—/●
●	●	●	●	●	●/—
—	—	—	●	—	—
—	—	—	—	—	—
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
—	—	—	—	—	—
Self-declaration	Self-declaration	Self-declaration	Self-declaration	Self-declaration	Self-declaration
Recognized	Recognition in process	Recognition in process	Recognized	Recognition in process	—
Electronic	Thermal-magnetic	Thermal-magnetic	Electronic	Thermal-magnetic	Thermal-magnetic
Equipped	Equipped	Equipped	Equipped	Equipped	Equipped

Use of 3- and 4-pole breakers for DC

3-pole



4-pole



Specifications of moulded-case circuit breakers 160–250 A

Type				NF160-SGV	NF160-LGV	NF160-HGV	NF250-SV	NF250-SGV
Frame (A)				160	160	160	250	250
Rated data	Rated current I_n [A] at ambient temperature		40 °C	125–160 Adjustable	125–160 Adjustable	125–160 Adjustable	150, 160, 175, 200, 225, 250 Fixed	125–160, 140–200, 175–250 Adjustable
	Number of poles			3/4	3/4	3/4	3/4	3/4
	Rated insulation voltage U_i [V]		AC	690	690	690	690	690
	Rated breaking capacity [kA] (I_{cu}/I_{cs})	IEC/EN 60947-2 AC (50/60 Hz)	690 V	8/8	8/8	10/8	8/8	8/8
			500 V	30/30	36/36	50/38	30/30	30/30
			440 V	36/36	50/50	65/65	36/36	36/36
			400 V	**36/36**	**50/50**	**75/75**	**36/36**	**36/36**
			230 V	85/85	90/90	100/100	85/85	85/85
		DC	250 V	20/20④	20/20④	40/40④	20/20④	20/20④
	Utilization category			A	A	A	A	A
	Rated impulse withstand voltage U_{imp} [kV]			8	8	8	8	8
	Pollution degree			3	3	3	3	3
	Reverse connection			●	●	●	●	●
	Suitable for isolation			●	●	●	●	●
Mechanical data	Dimensions [mm]		a	105/140	105/140	105/140	90/120	105/140
			b	165	165	165	130	165
			c	68	68	68	68	68
			ca	92	92	92	90	92
	Weight [kg]			1.6/2.0	1.6/2.0	1.6/2.0	1/1.3	1.6/2.0
	Cassette-type accessories	Alarm switch	(AL)	●	●	●	●	●
		Auxiliary switch	(AX)	●	●	●	●	●
		Shunt trip	(SHT)	●	●	●	●	●
		Under-voltage trip: Non-synchronous closing	(UVT-N)	—	—	—	—	—
		Under-voltage trip: Synchronous closing	(UVT-S)	●	●	●	●	●
	Accessories connection	With terminal block	(SLT)	●	●	●	●	●
		With internal terminal type		●	●	●	●	●
	Installation and connection	Front: Screw terminal (standard)		●	●	●	●	●
		Front: Solderless terminal		●	●	●	—	●
		Front: Busbar terminal		—	—	—	—	—
		Rear	(B)	●	●	●	●	●
		Plug-in: Rear	(PM)	●	●	●	●	—
		Plug-in: Rear front IP 20 with auto trip	(PM-IP)	—	—	—	—	●
	Built-in accessories	Pre-alarm-contact output ①	(PAL)	—	—	—	—	—
		Overcurrent trip alarm ①	(OAL)	—	—	—	—	—
External accessories	External operating handle	Door mounting	(V)	●	●	●	●	●
		Mounted on breaker	(R)	●	●	●	—	●
	Electrical operation device		(MDS)	●	●	●	—	●
	Handle lock device	Handle lock for use with padlock	(HL)	●	●	●	●	●
			(HL-S)	●	●	●	●	●
		Lock cover	(LC)	●	●	●	●	●
	Terminal cover	Large	(TC-L)	●	●	●	●	●
		Small	(TC-S)	●	●	●	●	●
		For rear connection	(BTC)	●	●	●	●	●
		For plug-in	(PTC)	●	●	●	●	●
	Mechanical interlock		(MI)	●	●	●	●	●
	Insulating barrier	Between phases (Standard)	(BA-F)	●	●	●	●	●
	Adapter for IEC 35 mm rail			—	—	—	●	—
Others	CE marking			Self-declaration	Self-declaration	Self-declaration	Self-declaration	Self-declaration
	CCC recognition			Recognition in process	Recognition in process	Recognition in process	Recognized	Recognition in process
	Automatic tripping device			Thermal-magnetic	Thermal-magnetic	Thermal-magnetic	Thermal-magnetic	Thermal-magnetic
	Trip button			Equipped	Equipped	Equipped	Equipped	Equipped

① Both PAL and OAL is not available. Only one specified. ② Others on request. ③ On request. ④ Use of 3- or 4-pole breaker for DC, see wiring diagram on the next page.
Missing specifications accord. to IEC/EN 60947-2 on request.

NF250-SEV	NF250-LGV	NF250-HGV	NF250-HEV	NF-250-RGV	NF250-UV
250	**250**	**250**	**250**	**250**	**250**
80–160, 125–250 Adjustable	125–160, 140–200, 175–250 Adjustable	125–160, 140–200, 175–250 Adjustable	80–160, 125–250 Adjustable	125–160, 160–200, 200–250 Adjustable	125, 150, 175, 200, 225, 250 Fixed
3/4	3/4	3/4	3/4	3	3/4
690	690	690	690	690	690
8/8	8/8	10/8	10/8	—	15/15
30/30	36/36	50/38	50/38	—	200/200
36/36	50/50	65/65	65/65	125/125	200/200
36/36	**50/50**	**75/75**	**75/75**	**150 /150**	**200/200**
85/85	90/90	100/100	100/100	150/150	200/200
—	20/20④	40/40④	—	—	—
A	A	A	A	A	A
8	8	8	8	8	8
3	3	3	3	3	3
●	●	●	●	●	●
●	●	●	●	●	●
105/140	105/140	105/140	105/140	105	105/140
165	165	165	165	165	240
68	68	68	68	68	68
92	92	92	92	92	92
1.7/2.2	1.6/2.0	1.6/2.0	1.7/2.2	1.8	2.7/3.7
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
—	—	—	—	—	—
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
—	—	—	—	—	—
●	●	●	●	●	●
—	—	—	—	—	—
●	●	●	●	●	●/—
●	—	—	●	—	—
●	—	—	—	—	—
●	●	●	●	●	●
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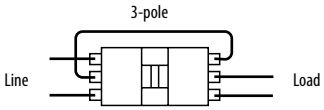
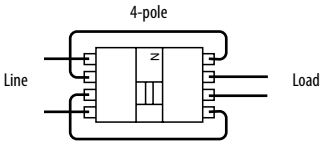
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
—	—	—	—	—	—
Self-declaration	Self-declaration	Self-declaration	Self-declaration	Self-declaration	Self-declaration
Recognized	Recognition in process	Recognition in process	Recognized	Recognition in process	—
Electronic	Thermal-magnetic	Thermal-magnetic	Electronic	Thermal-magnetic	Thermal-magnetic
Equipped	Equipped	Equipped	Equipped	Equipped	Equipped

Use of 3- and 4-pole breakers for DC

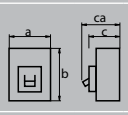
3-pole



4-pole



Specifications of moulded-case circuit breakers 400–630 A

Type				NF400-SEW	NF400-HEW	NF400-REW
Frame (A)				**400**	**400**	**400**
Rated data	**Rated current** I_n [A] at ambient temperature		40 °C	200–400 Adjustable	200–400 Adjustable	200–400 Adjustable
	Number of poles			3/4	3/4	3
	Rated insulation voltage U_i [V]		AC	690	690	690
	Rated breaking capacity [kA] (I_{cu}/I_{cs})	IEC/EN 60947-2 AC ① (50/60 Hz)	690 V	10/10 (5/5) ②	10/10	15/10
			500 V	30/30 (25/25) ②	50/50	70/35
			440 V	42/42 (36/36) ②	65/65	125/63
			400 V	**50/50 (36/36)** ②	**70/70**	**125/63**
			230 V	85/85 (65/65) ②	100/100	150/75
	Utilization category			B	B	B
	Rated short-time withstand current I_{cw} [kA/s]			5/0.25	5/0.25	5/0.25
	Rated impulse withstand voltage U_{imp} [kV]			8	8	8
	Pollution degree			3	3	3
	Reverse connection			●	●	●
	Suitable for isolation			●	●	●
Mechanical data	**Dimensions** [mm] 		a	140/185	140/185	140
			b	257	257	257
			c	103	103	103
			ca	155	155	155
	Weight [kg]			6.0/7.8	6.0/7.8	6.0
	Cassette-type accessories	Alarm switch	(AL)	●	●	●
		Auxiliary switch	(AX)	●	●	●
		Shunt trip	(SHT)	●	●	●
		Under-voltage trip: Non-synchronous closing	(UVT-N)	●	●	●
		Under-voltage trip: Synchronous closing	(UVT-S)	●	●	●
	Accessories connection	With terminal block	(SLT)	●	●	●
		With internal terminal type ③		●	●	●
	Installation and connection	Front: Busbar terminal (standard)		●	●	●
		Rear	(B)	●	●	●
		Plug-in: Rear	(PM)	●	●	●
	Built-in accessories	Pre-alarm-contact output	(PAL)	●	●	●
		Trip indicator	(TI)	●	●	●
External accessories	**External operating handle**	Door mounting	(V)	●	●	●
		Mounted on breaker	(R)	●	●	●
	Electrical operation device	Spring-charge type	(MDS)	●	●	●
	Handle lock device	Handle lock for use with padlock	(HL)	●	●	●
			(HL-S)	●	●	●
	Terminal cover	Large	(TC-L)	●	●	●
		For rear connection	(BTC)	●	●	●
	Mechanical interlock		(MI)	●	●	●
	Insulating barrier	Between phases (Standard)	(BA-F)	●	●	●
Others	**Marine approval** ④ for 3 pole breakers			LR, GL, BV, DNV, AB	LR, GL, BV, AB	LR, GL, BV, AB
	Automatic tripping device			Electronic	Electronic	Electronic
	Trip button			Equipped	Equipped	Equipped

① DC type on request. ② In case of solderless terminal, interrupting capacity reduces. ③ On request. ④ Others on request.
Missing specifications accord. to IEC/EN 60947-2 on request.

NF400-UEW	NF630-SEW	NF630-HEW	NF630-REW
400	**630**	**630**	**630**
200–400 Adjustable	300–630 Adjustable	300–630 Adjustable	300–630 Adjustable
3/4	3/4	3/4	3
690	690	690	690
35/35	10/10	35/18	20/15
170/170	30/30	50/50	70/35
200/200	42/42	65/65	125/63
200/200	**50/50**	**70/70**	**125/63**
200/200	85/85	100/100	150/75
B	B	B	B
5/0.25	7.6/0.25	7.6/0.25	7.6/0.25
8	8	8	8
3	3	3	3
●	●	●	●
●	●	●	●
140/280	140/185	140/185	140
297/322	257	257	257
200	103	103	103
252	155	155	155
16.7/26.1	6.5/8.3	6.5/8.3	6.5
●	●	●	●
●	●	●	●
●	●	●	●
●	●	●	●
●	●	●	●
●	●	●	●
●	●	●	●
●	●	●	●
●	●	●	●
●/—	●	●	●
●	●	●	●
●	●	●	●
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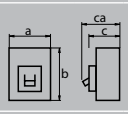
—	●	●	●
—	●	●	●
●	●	●	●
●	●	●	●
●	●	●	●
●	●	●	●
●	●	●	●
●	●	●	●
LR, GL, BV, AB	LR, GL, BV, AB	LR, GL, BV, AB	LR, GL, BV, AB
Electronic	Electronic	Electronic	Electronic
Equipped	Equipped	Equipped	Equipped

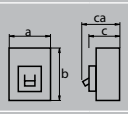
Specifications of moulded-case circuit breakers 800–1600 A

Type				NF800-SEW	NF800-HEW	NF800-REW
Frame (A)				**800**	**800**	**800**
Rated data	**Rated current I_n** [A] at ambient temperature		40 °C	400–800 Adjustable	400–800 Adjustable	400–800 Adjustable
	Number of poles			3/4	3/4	3
	Rated insulation voltage U_i [V]		AC	690	690	690
	Rated breaking capacity [kA] (I_{cu}/I_{cs})	IEC/EN 60947-2 AC ① (50/60 Hz)	690 V	10/10	15/15	—
			500 V	30/30	50/50	70/35
			440 V	42/42	65/65	125/63
			400 V	**50/50**	**70/70**	**125/63**
			230 V	85/85	100/100	150/75
	Utilization category			B	B	B
	Rated short-time withstand current I_{cw} [kA/s]			9.6/0.25	9.6/0.25	9.6/0.25
	Rated impulse withstand voltage U_{imp} [kV]			8	8	8
	Pollution degree			3	3	3
	Reverse connection			●	●	●
	Suitable for isolation			●	●	●
Mechanical data	**Dimensions** [mm] 		a	210/280	210/280	210
			b	275	275	275
			c	103	103	103
			ca	155	155	155
	Weight [kg]			10.9/14.2	10.9/14.2	10.9
	Cassette-type accessories	Alarm switch	(AL)	●	●	●
		Auxiliary switch	(AX)	●	●	●
		Shunt trip	(SHT)	●	●	●
		Under-voltage trip: Non-synchronous closing	(UVT-N)	●	●	●
		Under-voltage trip: Synchronous closing	(UVT-S)	●	●	●
	Accessories connection	With terminal block	(SLT)	●	●	●
		With internal terminal type ③		●	●	●
	Installation and connection	Front: Busbar terminal (standard)		●	●	●
		Rear	(B)	●	●	●
		Plug-in: Rear	(PM)	●	●	●
	Built-in accessories	Pre-alarm-contact output	(PAL)	●	●	●
		Trip indicator	(TI)	●	●	●
External accessories	**External operating handle**	Door mounting	(V)	●	●	●
		Mounted on breaker	(R)	●	●	●
	Electrical operation device	Spring-charge type	(MDS)	●	●	●
	Handle lock device	Handle lock for use with padlock	(HL)	●	●	●
			(HL-S)	●	●	●
	Terminal cover	Large	(TC-L)	●	●	●
		For rear connection	(BTC)	●	●	●
	Mechanical interlock		(MI)	●	●	●
	Insulating barrier	Between phases (Standard)	(BA-F)	●	●	●
Others	**Marine approval** ④ for 3 pole breakers			LR, GL, BV, DNV, AB	LR, GL, BV, AB	LR, GL, BV, AB
	Automatic tripping device			Electronic	Electronic	Electronic
	Trip button			Equipped	Equipped	Equipped

① DC type on request. ② On request. ③ Others on request. ④ Assembly by factory.
Missing Specifications accord. to IEC/EN 60947-2 on request.

NF800-UEW	NF1000-SEW	NF1250-SEW	NF1600-SEW
800	**1000**	**1250**	**1600**
400–800 Adjustable	500–1000 Adjustable	600–1250 Adjustable	800–1600 Adjustable
3/4	3/4	3/4	3/4
690	690	690	690
35/35	25/13	25/13	25/13
170/170	65/33	65/33	65/33
200/200	85/43	85/43	85/43
200/200	**85/43**	**85/43**	**85/43**
200/200	125/63	125/63	125/63
B	B	B	B
9.6/0.25	20/0.3	20/0.3	20/0.3
8	8	8	8
3	3	3	3
●	●	●	●
●	●	●	●
210/280	210/280	210/280	210/280
322	406	406	406
200	140	140	140
252	190	190	190
27.6/33.7	23.5/30.7	23.5/30.7	34.5/41.2
●	●	●	●
●	●	●	●
●	●	●	●
●	●	●	●
●	●	●	●
●	●	●	●
●	●	●	●
●	●	●	●
●	—	—	—
—	—	—	—
●	●	●	●
●	●	●	●
—	●	●	●
—	●	●	●
●	●	●	●
●	●	●	●
●	—	—	—
●	●	●	—
●	—	—	—
●	●	●	●
●	●	●	●
—	LR, GL, AB	LR, GL, AB	—
Electronic	Electronic	Electronic	Electronic
Equipped	Equipped	Equipped	Equipped

Specifications of disconnectors DSN, IEC 60947-3, EN 60947-3

Type					DSN32-SV	DSN63-SV	DSN125-SGV	DSN160-SGV	DSN250-SGV
Rated data	Rated current I_n [A]			40 °C	32	63	125	160	250
	Number of poles				3	3/4	3/4	3/4	3/4
	Rated insulation voltage U_i [V]				600	600	690	690	690
	Rated voltage U_e [V]			AC	500	500	690	690	690
				DC	250	250	300	300	300
	Rated impulse withstand voltage U_{imp} [kV]			kV	6	6	8	8	8
	Pollution degree				2	2	3	3	3
	Utilization category				AC-23A, DC-23A	AC-23A, DC-23A	AC-23A, DC-23A	AC-23A, DC-23A	AC-23A, DC-23A
	Making and braking current	Making current	AC/DC	A	320/128	630/252	1250/500	1600/640	2500/1000
			Cycles		5	5	3/5	3/5	3/5
		Breaking current	AC/DC	A	256/128	504/252	1000/500	1280/640	2000/1000
			Cycles		5	5	3/5	3/5	3/5
	Operational performance	Without current			10000	15000	50000	40000	25000
		With current (440 V/690 V)			6000/—	8000/—	30000/1000	20000/1000	10000/1000
	Short-time withstand current I_{cw}		1 s	A	1000	1000	2000	3000	4000
	Short-circuit making capacity I_{cm}		1 s	A	1500	1500	3000	4000	6000
	Max. switching current ①		AC/DC	A	192/80	378/155	750/315	960/400	1500/625
			Cycles		12	12	12	12	12
	Suitable for isolation				●	●	●	●	●
Mechanical data	Dimensions [mm] 			a	75	75/100	105/140	105/140	105/140
				b	130	130	165	165	165
				c	68	68	86	86	86
				ca	90	90	110	110	110
	Weight [kg]				0.55	0.6/0.7	2.0/2.6	2.0/2.6	2.0/2.6
	Cassette-type accessories	Alarm switch		(AL)	●	●	●	●	●
		Auxiliary switch		(AX)	●	●	●	●	●
		Shunt trip		(SHT)	●	●	●	●	●
		Undervoltage trip		(UVT)	●	●	●	●	●
	Accessories connection	With terminal block		(SLT)	●	●	●	●	●
		With internal terminal type ②			—	—	●	●	●
	Installation and connection	Front	Screw terminal		●③	●③	●③	●③	●③
			Solderless terminal		—	—	●	●	●
			Busbar terminal		●	●	●	●	●
		Rear		(B)	●	●	●	●	●
		Plug-in	Rear	(PM)	●	●	—	—	—
			Rear front IP 20 with auto trip	(PM-IP)	—	—	●	●	●
External accessories	External operating handle	Door mounting		(V)	●	●	●	●	●
		Mounted on breaker		(R)	—	—	●	●	●
	Electrical operation device			(MDS)	—	—	●	●	●
	Handle lock device	Handle lock for use with padlock		(HL)	●	●	●	●	●
				(HL-S)	●	●	●	●	●
		Lock cover		(LC)	●	●	●	●	●
	Terminal cover	Large		(TC-L)	●	●	●	●	●
		Small		(TC-S)	●	●	●/—	●/—	●
		For rear connection		(BTC)	●	●	●/—	●/—	●
	Mechanical interlock			(MI)	●	●	●	●	●
	Insulating barrier	Between phases (Standard)		(BA-F)	●	●	●	●	●
	Adapter for IEC 35 mm rail				●	●	—	—	—
	Corresponding type of circuit breaker				NF32-SV	NF63-SV	NF125-SGV	NF160-SGV	NF250-SGV

① This performance is accordance with IEC60947-2 clause 7.2.4.1. ② On request. ③ Standard. ④ Assembly by factory. ⑤ TC-N.
Missing specifications accord. to IEC/EN 60947-2 on request.

DSN400-SW	DSN630-SW	DSN800-SW	DSN1000-SW	DSN1250-SW	DSN1600-SW
400	630	800	1000	1250	1600
3/4	3/4	3/4	3/4	3/4	3/4
690	690	690	690	690	690
690	690	690	690	690	690
250	250	250	250	250	250
8	8	8	8	8	8
3	3	3	3	3	3
AC-23A, DC-23A	AC-23A, DC-23A	AC-23A, DC-23A	AC-23A, DC-23A	AC-23A, DC-23A	AC-23A, DC-23A
4000/1600	6300/2520	8000/3200	10000/4000	12500/5000	16000/6400
3/5	3/5	3/5	3/5	3/5	3/5
3200/1600	5040/2520	6400/3200	8000/4000	10000/5000	12800/6400
3/5	3/5	3/5	3/5	3/5	3/5
6000	6000	4000	3000	2500	2500
1000	1000	500	500	500	500
6000	8000	10000	12000	12000	16000
10200	13600	17000	24000	24000	32000
2400/1000	3780/1575	4800/2000	6000/2500	7500/3125	9600/4000
12	12	12	12	12	12
●	●	●	●	●	●
140/185	140/185	210/280	210/280	210/280	210/280
257	275	275	406	406	406
103	103	103	140	140	140
155	155	155	190	190	190
5.7/7.5	6.2/8.0	10.9/14.2	23.0/30.2	23.0/30.2	34.0/40.7
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
—	—	—	—	—	—
—	—	—	—	—	—
●①	●①	●①	●①	●①	●①
●	●	●	●④	●④	●④
●	●	●	●④	●④	●④
—	—	—	—	—	—
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
—	—	—	—	—	—
●	●	●	●⑤	●⑤	—
—	—	—	—	—	—
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
—	—	—	—	—	—
NF400-SW	NF630-SW	NF800-SEW	NF1000-SEW	NF1250-SEW	NF1600-SEW

Order information for moulded-case circuit breakers 3–125 A

Type	Rated current (I_n)	Art. no. 3 pole type	Art. no. 4 pole type
S series with thermal-magnetic tripping device, fixed, AC			
NF32-SV	3 A	254680	—
	4 A	254681	—
	5 A	254682	—
	6 A	254683	—
	10 A	254684	—
	15 A	254685	—
	16 A	254686	—
	20 A	254687	—
	25 A	254688	—
	30 A	254689	—
	32 A	254690	—
NF63-SV	3 A	254739	254752
	4 A	254740	254753
	5 A	254741	254754
	6 A	254742	254755
	10 A	254743	254756
	15 A	254744	254757
	16 A	254745	254758
	20 A	254746	254759
	25 A	254747	254760
	30 A	269402	254761
	32 A	254748	254762
	40 A	254749	254763
	50 A	253073	254764
	60 A	254750	254765
	63 A	254751	254766
NF125-SV	75 A	254840	254853
	80 A	254841	254854
	100 A	254842	254855
	125 A	254843	254856
NF250-SV	150 A	255077	255085
	160 A	255078	255086
	175 A	255079	255087
	200 A	255080	255088
	225 A	255081	255089
	250 A	255082	255090
H series with thermal-magnetic tripping device, fixed, AC			
NF63-HV	10 A	254778	254789
	15 A	254779	254790
	16 A	254780	254791
	20 A	254781	254792
	25 A	254782	254793
	30 A	254783	254794
	32 A	254784	254795
	40 A	254785	254796
	50 A	254786	254797
	60 A	254787	254798
	63 A	254788	254799

Type	Rated current (I_n)	Art. no. 3 pole type	Art. no. 4 pole type
S series with thermal-magnetic tripping device, AC, DC			
NF125-SGV	16–20 A	254908	254917
	20–25 A	254909	254918
	25–32 A	254910	254919
	32–40 A	254911	254920
	35–50 A	254912	254921
	45–63 A	254913	254922
	56–80 A	254914	254923
	70–100 A	254915	254924
	90–125 A	254916	254925
NF125-LGV	16–20 A	254935	254943
	20–25 A	254936	254944
	25–32 A	254937	254945
	32–40 A	254938	254946
	35–50 A	254939	254947
	45–63 A	254940	254948
	56–80 A	254941	254949
	70–100 A	254942	254950
	90–125 A	255195	254951
H series with thermal-magnetic tripping device, AC, DC			
NF125-HGV	16–20 A	254961	254970
	20–25 A	254962	254971
	25–32 A	254963	254972
	32–40 A	254964	254973
	35–50 A	254965	254974
	45–63 A	254966	254975
	56–80 A	254967	254976
	70–100 A	254968	254977
	90–125 A	254969	254978
H series with electronic tripping device, adjustable, AC			
NF125-HEV	16–32 A	255030	255033
	32–63 A	255031	255034
	63–125 A	255032	255035
R series with thermal-magnetic tripping device, AC, DC			
NF125–RGV	16–20 A	254988	—
	20–25 A	254989	—
	25–32 A	254990	—
	32–40 A	254991	—
	40–50 A	254992	—
	50–63 A	254993	—
	63–80 A	254994	—
	80–100 A	254995	—
	100–125 A	254996	—
U series with thermal-magnetic tripping device, fixed, AC, DC			
NF125-UV	15 A	255006	255015
	20 A	255007	255016
	30 A	255008	255017
	40 A	255009	255018
	50 A	255010	255019
	60 A	255011	255020
	75 A	255012	255021
	100 A	255013	255022
	125 A	255014	255023

Order information for moulded-case circuit breakers 160–250 A

Type	Rated current (I_n)	Art. no. 3 pole type	Art. no. 4 pole type
S series with thermal-magnetic tripping device, adjustable, AC, DC			
NF160-SGV	125–160 A	255040	255041
L series with thermal-magnetic tripping device, adjustable, AC, DC			
NF160-LGV	125–160 A	255043	255044
H series with thermal-magnetic tripping device, adjustable, AC, DC			
NF160-HGV	125–160 A	255046	255047
S series with thermal-magnetic tripping device, adjustable, AC, DC			
NF250-SGV	125–160 A	255118	255121
	140–200 A	255119	255122
	175–250 A	255120	255123
S series with electronic tripping device, adjustable, AC			
NF250-SEV	80–160 A	255166	255168
	125–250 A	255167	255169
L series with thermal-magnetic tripping device, adjustable, AC, DC			
NF250-LGV	125–160 A	255127	255130
	140–200 A	255128	255131
	175–250 A	255129	255132

Type	Rated current (I_n)	Art. no. 3 pole type	Art. no. 4 pole type
H series with thermal-magnetic tripping device, adjustable, AC, DC			
NF250-HGV	125–160 A	255136	255139
	140–200 A	255137	255140
	175–250 A	255138	255141
H series with electronic tripping device, adjustable, AC			
NF250-HEV	80–160 A	255170	255172
	125–250 A	255171	255173
R series with thermal-magnetic tripping device, adjustable, AC, DC			
NF250-RGV	125–160 A	255145	—
	160–200 A	255146	—
	175–250 A	255147	—
U series with thermal-magnetic tripping device, fixed, AC, DC			
NF250-UV	125 A	255154	255160
	150 A	255155	255161
	175 A	255156	255162
	200 A	255157	255163
	225 A	255158	255164
	250 A	255159	255165

Order information for moulded-case circuit breakers 400–1600 A

Type	Rated current (I_n)	Art. no. 3 pole type	Art. no. 4 pole type
S series with electronic tripping device, adjustable, AC			
NF400–SEW	200–400 A	204780	204781
NF630–SEW	300–630 A	204789	204790
NF800–SEW	400–800 A	204797	204798
H series with electronic tripping device, adjustable, AC			
NF400–HEW	200–400 A	204782	204783
NF630–HEW	300–630 A	204791	204792
NF800–HEW	400–800 A	204799	204800

Type	Rated current (I_n)	Art. no. 3 pole type	Art. no. 4 pole type
R series with electronic tripping device, adjustable, AC			
NF400–REW	200–400 A	204784	—
NF630–REW	300–630 A	204793	—
NF800–REW	400–800 A	204801	—
U series with electronic tripping device, adjustable, AC			
NF400–UEW	200–400 A	204785	204786
NF800–UEW	400–800 A	204802	204803

Order information for moulded-case circuit breakers 1000–1600 A

Type	Rated current (I_n)	Art. no. 3 pole type	Art. no. 4 pole type
SS/UR series with electronic tripping device, adjustable, AC			
NF1000–SEW	500–1000 A	204810	204811
NF1250–SEW	600–1250 A	204812	204813
NF1600–SEW	800–1600 A	204814	204815

Order information for disconnectors DSN series 32–1600 A

Type	Rated current (I_n)	Art. no. 3 pole type	Art. no. 4 pole type
Disconnectors (no tripping device)			
DSN32–SV	32 A	254669	—
DSN63–SV	63 A	254722	254723
DSN125–SGV	125 A	254897	254898
DSN160–SGV	160 A	255037	255038
DSN250–SGV	250 A	255113	255114
DSN400–SW	400 A	204778	204779
DSN630–SW	630 A	204787	204788
DSN800–SW	800 A	204794	204795
DSN1000–SW	1000 A	204804	204805
DSN1250–SW	1250 A	204806	204807
DSN1600–SW	1600 A	204808	204809

Internal accessories

Modular cassette type accessories

The new arrangement and design of pluggable accessories such as indicator and auxiliary contacts allows you to modify the circuit in a way that saves time and space – at any time, even when built in and ready for operation.

The presence of separate circuit chambers makes the system even safer.

Thus cassette type accessories ensure flexibility when upgrading circuits.

The cassette type accessories are available in several versions and fit for breaker series from 32 A up to 800 A:

- alarm switch (AL)
- auxiliary switch (AX)
- alarm and auxiliary switch (AL+AX)
- shunt trip device (SHT)
- undervoltage trip device (UVT)

with lead-wire terminal block as standard.

In addition you can choose the lead-wire version or the internal terminal type as an option.

Alarm switch (AL)

Provides for indication that the MCCB has tripped.

Auxilliary switch (AX)

Provides for indication of whether the breaker is ON or OFF.

Shunt trip (SHT)

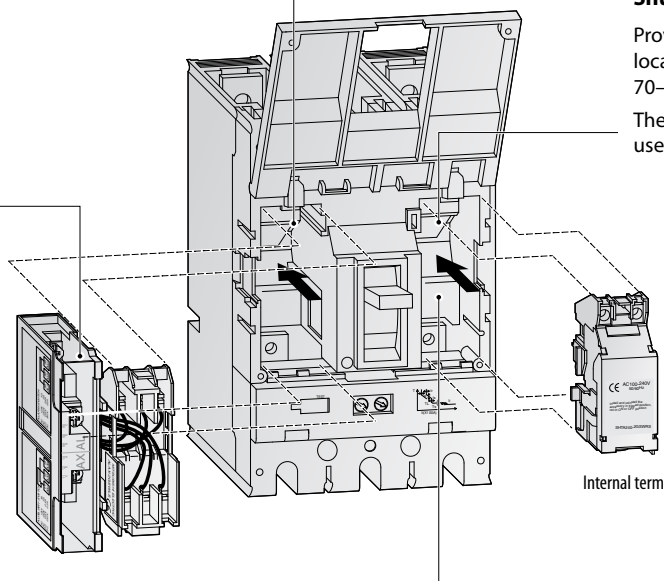
Provides for tripping from a remote location. The control voltage range is 70–100 % of rated voltage.

The shunt trip enables an MCCB to be used in combination with an ELR.

Lead-wire terminal block (SLT)

The terminal block is used for bringing out the connections of the internal accessories.

The cassette type accessories are also available as internal terminal type without terminal block. The connection cables are lead out of the breaker housing in line-side direction. So it is possible to mount several breakers easy side-by-side in a row.



Internal terminal type Example: SHT

Lead-wire terminal block
Example: ALAX

Undervoltage trip (UVT)

The tripping voltage is 35–70 % of the rated voltage. When the voltage recovers to at least 85 %, the breaker can be closed or reset.

Provides for electrical interlock, and is used where electrical machines need to be protected against voltage drop.

For the breakers of the super series, 1000 A up to 1600 A, please contact your distributor.

Overview of internal accessories

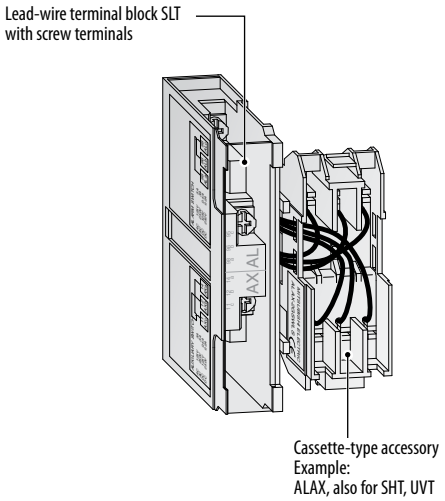
Cassette-type internal accessory	Function	Catalogue reference
AL (Alarm switch)	The alarm switch AL indicates that the breaker has tripped.	Page 56
AX (Auxiliary switch)	The auxiliary switch AX indicates whether the breaker is ON or OFF.	Page 56
SHT (Shunt trip)	The shunt trip SHT trips the breaker automatically by remote. A cut-off switch is integrated. The allowable tripping voltage is 70 % to 110 % of the rated voltage for both AC and DC.	Page 58
UVT (Undervoltage trip)	The undervoltage trip UVT trips the breaker automatically when the voltage drops. The tripping voltage is 35 % to 70 % of the rated voltage. When the voltage recovers to 85 % of the rated voltage or above, the UVT can be reset and the breaker closed.	Page 60

Connection of the control wires

For the connection of the control wires Mitsubishi Electric offers you two ways:

- Lead-wire terminal block (SLT)
- Internal terminal type for direct connection.

■ Lead-wire terminal block (SLT)



Application

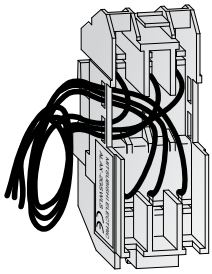
All cassette-type accessories are equipped with the Lead-wire terminal block SLT as standard.

The terminal cover for the lead-wire terminals is available for the safety of live parts.

It is available for front connection type, rear connection type and plug-In type.

- Correspondent terminals are not necessary.
- Uneven arrangement of terminal screws is adopted for easier wiring.
- Tightening check of a terminal screw is easy.
- Terminal cover of a terminal block is standard equipment (co-packed).

■ Internal terminal type for direct connection



Example:
ALAX, also for SHT, UVT

Application

Optional the cassette-type accessories are available as internal terminal type without terminal block.

The internal connected control wires can be lead out of the breaker housing in line-side direction to external terminals.

- Quick install and de-install of the internal accessories is possible without demounting the breaker.
- Mounting of several breakers side-by-side in a row is possible.
- Thus the control wires are fixed inside of the breaker housing, no special terminal cover for the screw terminals is necessary.

■ Alarm switch and auxiliary switch

(Mounted on left side)

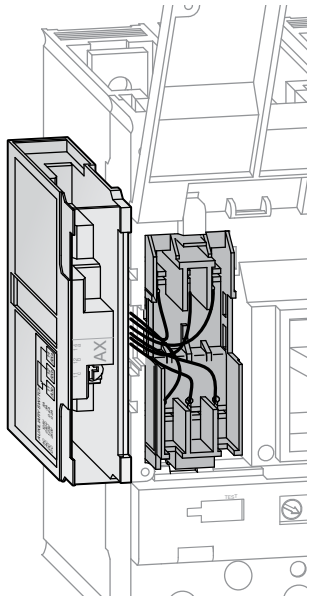


Figure shows Lead-wire terminal block type (SLT).

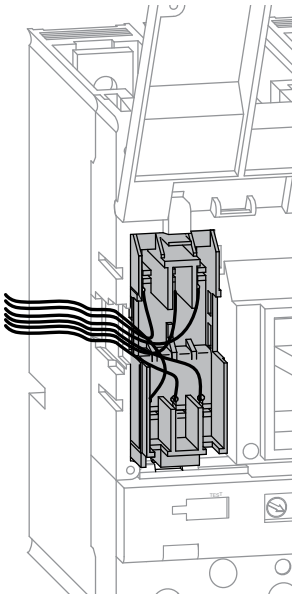


Figure shows Internal terminal type.

Application

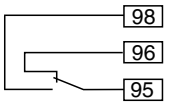
The alarm switch AL indicates that the breaker has tripped.

The auxiliary switch AX indicates whether the breaker is ON or OFF.

The alarm and auxiliary switch ALAX is a combination of the alarm switch AL and the auxiliary switch AX in one housing.

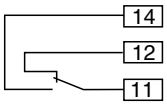
- AL, AX and ALAX standard types are for left-side mounting and equipped with lead-wire terminal block SLT.
- Internal terminal type is also available.
- Please specify, if right-side mounted type or type with flying leads is needed.

Contact plans



(1 W)

Alarm switch AL

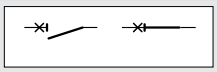
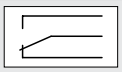
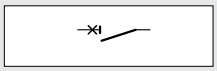


(1 W)

Auxiliary switch AX

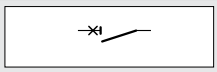
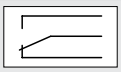
Switching operation

Alarm switch (AL) operation

Main MCCB conditions		Alarm contacts		
OFF or ON			ALa 98 (open) ALc 95 (DC+) ① ALb 96 (closed)	
Trip			ALa 98 (closed) ALc 95 (DC+) ① ALb 96 (open)	

① When DC use, polarity must be considered.

Auxiliary switch (AX) operation

Main MCCB conditions		Auxiliary contacts		
OFF or Trip			AXa 14 (open) AXc 11 (DC+) ① AXb 12 (closed)	
ON			AXa 14 (closed) AXc 11 (DC+) ① AXb 12 (open)	

AL, AX switching capacities

Type of Micro-switch for	Voltage (V AC)	Resistive loads (A)	Inductive load (A)	Voltage (V DC) ①	Resistive loads (A)	Inductive load (A)
AL/AX/ALAX-05–8	460	—	—	250	0.2	0.2
	250	3	2	125	0.4	0.4
	125	5	3	30	4	3
AL/AX/ALAX-10	460	5	2	250	0.3	0.3
	250	10	10	125	0.6	0.6
	125	10	10	30	10	6

① When DC use, polarity must be considered.

Order information for alarm switch and auxiliary switch

Type	Contacts	Breaker type	Mounted on	Art. no.
Alarm switch AL with lead-wire terminal block SLT				
AL-05SVLS	1 W	NF/DSN32–63 NF/DSN125–250	Left side	267212
AL-4SWLS	1 W	NF/DSN400–800		205763
AL2-4SWLS	2 W	NF/DSN400–800		205764
AL3-8SWLS	3 W	NF/DSN800		205765
AL-10SWL	1 W	NF/DSN1000–1600		205766
Alarm switch AL for direct connection				
AL-05SV	1 W	NF/DSN32–63 NF/DSN125–250	Left or right side	267210
Auxiliary switch AX with lead-wire terminal block SLT				
AX-05SVLS	1 W	NF/DSN32–63 NF/DSN125–250	Left side	267238
AX2-05SVLS	2 W	NF/DSN32–63 NF/DSN125–250		267246
AX-4SWLS	1 W	NF/DSN400–800		205767
AX2-4SWLS	2 W	NF/DSN400–800		205768
AX3-8SWLS	3 W	NF/DSN800 NF400-UEW 4P		205769
AX4-8SWLS	4 W	NF/DSN800 NF400-UEW 4P		205770
AX-10SWLS	1 W	NF/DSN1000–1600		205771
AX2-10SWLS	2 W	NF/DSN1000–1600		205772
AX3-10SWLS	3 W	NF/DSN1000–1600		205773
Auxiliary switch AX for direct connection				
AX-05SV	1 W	NF/DSN32–63 NF/DSN125–250	Left or right side	267236
AX2-05SV	2 W	NF/DSN32–63 NF/DSN125–250		267244

Type	Contacts AL AX	Breaker type	Mounted on	Art. no.
Alarm switch and auxiliary switch ALAX with lead-wire terminal block SLT				
ALAX-05SVLS	1 W + 1 W	NF/DSN32–63 NF/DSN125–250	Left side	267230
ALAX-4SWLS	1 W + 1 W	NF/DSN400–800 NF400-UEW 4P		205774
AL2AX2-4SWLS	2 W + 2 W	NF/DSN400–800 NF400-UEW 4P		205775
ALAX-10SWL	1 W + 1 W	NF/DSN1000–1600		205776
AL1AX2-10SWL	1 W + 2 W	NF/DSN1000–1600		205777
Alarm switch and auxiliary switch ALAX for direct connection				
ALAX-05SV	1 W + 1 W	NF/DSN32–63 NF/DSN125–250	Left or right side	267228

■ Shunt trip device SHT

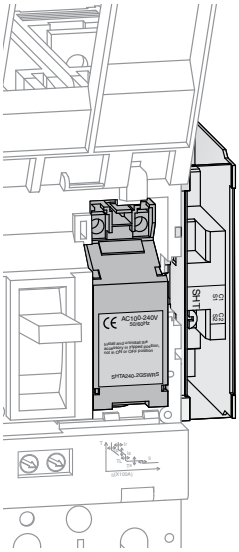


Figure shows lead-wire terminal block type (SLT).

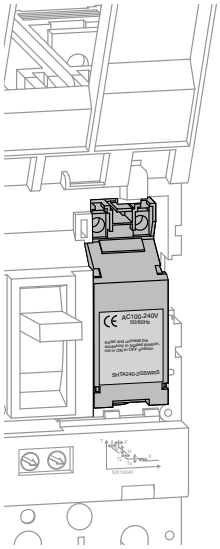


Figure shows internal terminal type.

Application

The shunt trip device SHT trips the breaker automatically by remote. A cut-off switch is integrated.

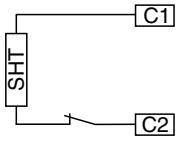
The allowable tripping voltage range is 70 % to 110 % of the rated voltage for both AC and DC.

The SHT is mounted on the right side of the breaker and equipped with lead-wire terminal block SLT as standard.

Please specify, if left-side mounted type or type with flying leads is needed (optional available).

Please consider, the shunt trip device SHT for 3-pole and 4-pole breakers is different in the length of wires based on the outline dimension of the breaker.

Contact plans



With cut-off switch

Coil ratings

MCCB type ①	Cut-off switch	Voltage (V) ②	Input ③ AC (VA)	DC (W)	Operating time (msec) ④
NF32-SV **NF63-SV** **NF63-HV**	Equipped	AC 24–48 AC 100–240 AC 380–550 (50/60 Hz) DC 100–125	120	50	≤15
NF125-SGV/SEV **NF125-HGV/HEV** **NF125-RGV/UGV** **NF160-SGV/SEV** **NF160-HGV/HEV** **NF250-SGV/SEV** **NF250-HGV/HEV** **NF250-RGV/UGV**	Equipped			60	
NF400-SEW/HEW/REW/UEW **NF630-SEW/HEW/REW** **NF800-CEW/SEW/HEW/REW/UEW**	Equipped	AC 24–48/DC 24–48 AC 100–450/DC 100–200 AC 380–550 (50/60 Hz)	100 V: 20 200 V: 50 330 V: 120 450 V: 170	100 V: 10 200 V: 35	5–15
NF1000-SEW **NF1250-SEW** **NF1600-SEW**	Equipped	AC 100–120 AC 200–240 AC 380–450 (50/60Hz) DC 100	200	70	7–15

① Also for DSN types.
② Other voltages on request
③ For the SHT operating power capacity, any voltage drop in the input electric power must not be below the allowable operating voltage range.
④ The operating time includes all the time up to the moment the main contact of the breaker disconnects after a voltage has been applied to the shunt trip devices.

Order information for shunt trip device SHT

With lead-wire terminal block SLT, mounted on right-side

For 3-pole breaker			For 4-pole breaker			
Type	Breaker type	Art. no.	Type	Breaker type	Art. no.	Rated voltage
SHTA048-05SVRS	NF/DSN32–63 NF/DSN125–250	267479	SHTA048-05SVRFS	NF/DSN32–63 NF/DSN125–250	267480	AC 24–48 V
SHTA240-05SVRS		267484	SHTA240-05SVRFS		267485	AC 100–240 V
SHTA550-05SVRS		267489	SHTA550-05SVRFS		267490	AC 380–550 V
SHTD012-05SVRS		267494	SHTD012-05SVRFS		267495	DC 12 V
SHTD036-05SVRS		267499	SHTD036-05SVRFS		267500	DC 24–36 V
SHTD048-05SVRS		267504	SHTD048-05SVRFS		267505	DC 36–48 V
SHTD125-05SVRS		267509	SHTD125-05SVRFS		267510	DC100–125 V
SHTD250-05SVRS		267514	SHTD250-05SVRFS		267515	DC220–250 V
SHT-4SWRS	NF/DSN400–800	205778	SHT-4SWRFS	NF/DSN400–630	205779	AC 100–450 V/DC 100–200 V
SHT48-4SWRS		205780	SHT48-4SWRFS		205781	AC 24–48 V/DC 24–48 V
SHTA550-4SWRS		205782	SHTA550-4SWRFS		205783	AC 380–550 V
—	—	—	SHT-8SWRFS	NF/DSN800 NF400-UEW 4P	205784	AC 100–450 V/DC100–200 V
			SHT48-8SWRFS		205785	AC 24–48 V/DC 24–48 V
			SHTA550-8SWRFS		205786	AC 380–550 V
SHTA120-10SWRS	NF/DSN1000–1600	205787	SHTA120-10SWRFS	NF/DSN1000–1600	205788	AC 100–120 V
SHTA240-10SWRS		205789	SHTA240-10SWRFS		205790	AC 200–240 V
SHTA450-10SWRS		205791	SHTA450-10SWRFS		205792	AC 380–450 V
SHTD024-10SWRS		205793	SHTD024-10SWRFS		205794	DC 24 V
SHTD110-10SWRS		205795	SHTD110-10SWRFS		205796	DC 110 V

For direct connection, mounted on right-side

For 3-/4-pole breaker			
Type	Breaker type	Rated voltage	Art. no.
SHTA048-05SVR	NF/DSN125–250	AC 24–48 V	267478
SHTA240-05SVR	NF/DSN-125/160/250xx	AC 100–240 V	267483
SHTA550-05SVR	NF/DSN-125/160/250xx	AC 380–550 V	267488
SHTD012-05SVR	NF/DSN-125/160/250xx	DC 12 V	267493
SHTD036-05SVR	NF/DSN-125/160/250xx	DC 24–36 V	267498
SHTD048-05SVR	NF/DSN-125/160/250xx	DC 36–48 V	267503
SHTD125-05SVR	NF/DSN-125/160/250xx	DC 100–125 V	267508
SHTD250-05SVR	NF/DSN-125/160/250xx	DC 220–250 V	267513

■ Undervoltage tripping device UVT

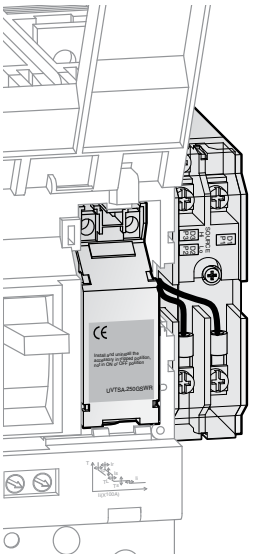


Figure shows lead-wire terminal block type (SLT).

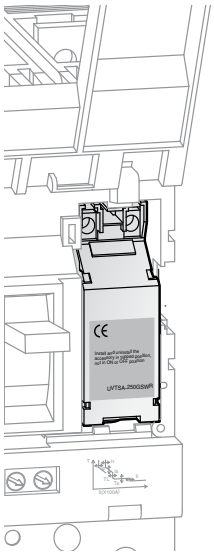


Figure shows internal terminal type.

Application

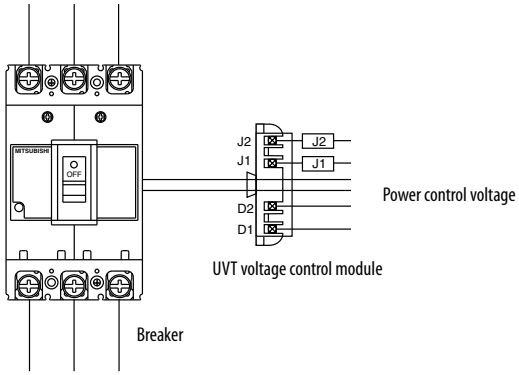
The undervoltage tripping device UVT trips the breaker automatically when the voltage drops. The tripping voltage is 35 % to 70 % of the rated voltage. When the voltage recovers to 85 % of the rated voltage or above, the UVT can be reset and the breaker closed.

The UVT is mounted on the right side of the breaker and equipped with lead-wire terminal block SLT as standard.

Please specify, if left-side mounted type or type with flying leads is needed.

Please consider, the undervoltage trip UVT for 3-pole and 4-pole breaker is different in the length of wires based on the outline dimension of the breaker.

Contact plans



Coil ratings

Breaker type ①	For synchronous closing	Voltage (V) ② Standard	Input (VA)	Operating time ③ (msec)	Making/breaking data Breaker OFF	Making/breaking data Breaker ON
NF32-SV **NF63-SV** **NF125-SGV/REV** **NF125-HGV/HEV** **NF125-RGV/UV** **NF160-SGV/REV** **NF160-HGV/HEV** **NF250-SGV/REV** **NF250-HGV/REV** **NF250-RGV/UV**	●	AC 100–120 AC 200–240 AC 220–240 AC 380–450 AC 400–440 (50/60 Hz) DC 24, DC 110	5	≤30	35–70 % U_N	min. 85 % U_N
NF400-SEW/HEW/REW/UEW **NF630-SEW/HEW/REW** **NF800-CEW/SEW/HEW/REW/UEW**	●	AC 100–110/120–130 AC 200–220/230–250 AC 380–415/440–480 (50/60 Hz) DC100/110	5	5–30 (Instantaneous type)		
NF1000-SEW **NF1250-SEW** **NF1600-SEW**	● ④	AC 100–120/200–240/380–450 AC 200–250/380–450/460–550 (50/60 Hz)	5	5–35 (Time delay type with 3 voltage inputs)		

① Also for DSN types.
② Other voltages on request.
③ The operating time is the time from the start of operating the breaker since the undervoltage trip went from voltage to no-voltage condition.
④ DC version on request.
UVTs with time delay on request.

Types of UVTs

Breaker type	No. of poles	Rated voltages AC 24 V DC 24 V	AC 48 V DC 48 V	AC 100–130 V DC 100–130 V	AC 200–220 V/ AC 230–250 V	AC 380–415 V/ AC 440–480 V	AC 500–550 V/ AC 600 V
Instantaneous trip type, with lead-wire terminal block SLT							
NF/DSN32–63 NF/DSN125–250	3	UVTSAD024-05SVRS	UVTSAD048-05SVRS	UVTSAD130-05SVRS	UVTSA250-05SVRS	UVTSA480-05SVRS	UVTSA600-05SVRS
	4	UVTSAD024-05SVRFS	UVTSAD048-05SVRFS	UVTSAD130-05SVRFS	UVTSA250-05SVRFS	UVTSA480-05SVRFS	UVTSA600-05SVRFS

Breaker type	No. of poles	Rated voltages AC 100–110 V/ AC 120–130 V	AC 200–220 V/ AC 230–250 V	AC 380–415 V/ AC 440–480 V	DC 24/48 V	DC 100/110 V
Instantaneous trip type, with lead-wire terminal block SLT						
NF/DSN400–800	3	UVTSA130-4SWS	UVTSA250-4SWS	UVTSA480-4SWS	UVTSD048-4SWS	UVTSD110-4SWS
NF/DSN400–630	4	UVTSA130-4SWRFS	UVTSA250-4SWRFS	UVTSA480-4SWRFS	UVTSD048-4SWRFS	UVTSD110-4SWRFS
NF/DSN800	4	UVTSA130-8SWRFS	UVTSA250-8SWRFS	UVTSA480-8SWRFS	UVTSD048-8SWRFS	UVTSD110-8SWRFS
NF/DSN1000–1600	3	UVTSA130-10SWRS	UVTSA250-10SWRS	UVTSA480-10SWRS	UVTND048-10SWRS	UVTND110-10SWRS
	4	UVTSA130-10SWRFS	UVTSA250-10SWRFS	UVTSA480-10SWRFS	UVTND048-10SWRFS	UVTND110-10SWRFS

Breaker type	No. of poles	Rated voltages AC 24/48 V	AC 120/240/450 V	AC 250/450/550 V	AC 450/550/690 V	DC 24/48 V	DC 100 –110 V
Short-time delay type, with lead-wire terminal block SLT, short-time delay adjustable in steps 0.1–0.3–0.5 sec							
NF/DSN32–63 NF/DSN125–250	3	UVTSA048-05SVRSU05	UVTSA450-05SVRSU05	UVTSA550-05SVRSU05	UVTSA690-05SVRSU05	UVTSD048-05SVRSU05	UVTSD110-05SVRSU05
	4	UVTSA048-05SVRFSU05	UVTSA450-05SVRFSU05	UVTSA550-05SVRFSU05	UVTSA690-05SVRFSU05	UVTSD048-05SVRFSU05	UVTSD110-05SVRFSU05

Breaker type	No. of poles	Rated voltages AC 24/48 V	AC 120/240/450 V	AC 250/450/550 V	AC 450/550/690 V	DC 24/48 V	DC 100 –110 V
Long-time delay type, with lead-wire terminal block SLT, long-time delay adjustable in steps 0.5–1.0–3.0 sec							
NF/DSN32–63 NF/DSN125–250	3	UVTSA048-05SVRSU30	UVTSA450-05SVRSU30	UVTSA550-05SVRSU30	UVTSA690-05SVRSU30	UVTSD048-05SVRSU30	UVTSD110-05SVRSU30
	4	UVTSA048-05SVRFSU30	UVTSA450-05SVRFSU30	UVTSA550-05SVRFSU30	UVTSA690-05SVRFSU30	UVTSD048-05SVRFSU30	UVTSD110-05SVRFSU30

UVTN...: non-synchronous closing type
UVTS...: synchronous closing type
Types for direct connection on request.

Order information for undervoltage tripping devices UVT

Undervoltage tripping device UVT, instantaneous trip type, synchronous and non-synchronous closing, mounted on right-side

with lead-wire terminal block SLT, for 3-pole breakers

Type	Breaker type	Rated voltage	Art. no.
UVTSAD024-05SVRS	NF/DSN32–250	AC 24 V DC 24 V	267615
UVTSAD048-05SVRS	NF/DSN32–250	AC 48 V DC 48 V	267620
UVTSAD130-05SVRS	NF/DSN32–250	AC 100–130 V DC 100–130 V	267625
UVTSA250-05SVRS	NF/DSN32–250	AC 200–220 V/ AC 230–250 V	267600
UVTSA480-05SVRS	NF/DSN32–250	AC 380–415 V/ AC 440–480 V	267605
UVTSA600-05SVRS	NF/DSN32–250	AC 500–550 V/ AC 600 V	267610
UVTSA130-4SWS	NF/DSN400–800	AC 100–110/120–130 V	205951
UVTSA250-4SWS	NF/DSN400–800	AC 200–220/230–250 V	205953
UVTSA480-4SWS	NF/DSN400–800	AC 380–415/440–480 V	205828
UVTSD048-4SWS	NF/DSN400–800	DC 24/48 V	205932
UVTSD110-4SWS	NF/DSN400–800	DC 100/110 V	205934
UVTSA130-10SWRS	NF/DSN1000–1600	AC 100–110/120–130 V	205941
UVTSA250-10SWRS	NF/DSN1000–1600	AC 200–220/230–250 V	205943
UVTSA480-10SWRS	NF/DSN1000–1600	AC 380–415/440–480 V	205945
UVTND048-10SWRS	NF/DSN1000–1600	DC 24/48 V	205947
UVTND110-10SWRS	NF/DSN1000–1600	DC 100/110 V	205949

with lead-wire terminal block SLT, for 4-pole breakers

Type	Breaker type	Rated voltage	Art. no.
UVTSAD024-05SVRFS	NF/DSN63–250	AC 24 V DC 24 V	267616
UVTSAD048-05SVRFS	NF/DSN63–250	AC 48 V DC 48 V	267621
UVTSAD130-05SVRFS	NF/DSN63–250	AC 100–130 V DC 100–130 V	267626
UVTSA250-05SVRFS	NF/DSN63–250	AC 200–220 V/ AC 230–250 V	267601
UVTSA480-05SVRFS	NF/DSN63–250	AC 380–415 V/ AC 440–480 V	267606
UVTSA600-05SVRFS	NF/DSN63–250	AC 500–550 V/ AC 600 V	267611
UVTSA130-4SWRFS	NF/DSN400–630	AC 100–110/120–130 V	205952
UVTSA250-4SWRFS	NF/DSN400–630	AC 200–220/230–250 V	205954
UVTSA480-4SWRFS	NF/DSN400–630	AC 380–415/440–480 V	205955
UVTSD048-4SWRFS	NF/DSN400–630	DC 24/48 V	205933
UVTSD110-4SWRFS	NF/DSN400–630	DC 100/110 V	205935
UVTSA130-8SWRFS	NF/DSN800	AC 100–110/120–130 V	205936
UVTSA250-8SWRFS	NF/DSN800	AC 200–220/230–250 V	205937
UVTSA480-8SWRFS	NF/DSN800	AC 380–415/440–480 V	205938
UVTSD048-8SWRFS	NF/DSN800	DC 24/48 V	205939
UVTSD110-8SWRFS	NF/DSN800	DC 100/110 V	205940
UVTSA130-10SWRFS	NF/DSN1000–1600	AC 100–110/120–130 V	205942
UVTSA240-10SWRFS	NF/DSN1000–1600	AC 200–220/230–250 V	205944
UVTSA480-10SWRFS	NF/DSN1000–1600	AC 380–415/440–480 V	205946
UVTND048-10SWRFS	NF/DSN1000–1600	DC 24/48 V	205948
UVTND110-10SWRFS	NF/DSN1000–1600	DC 100/110 V	205950

Undervoltage tripping device UVT, short-time delay type, synchronous closing, mounted on right-side

with lead-wire terminal block SLT, for 3-pole breakers

Type	Breaker type	Rated voltage	Art. no.
UVTSA048-05SVRSU05	NF/DSN32–250	AC 24/48 V	267690
UVTSA450-05SVRSU05	NF/DSN32–250	AC 120/240/450 V	267695
UVTSA550-05SVRSU05	NF/DSN32–250	AC 250/450/550 V	267700
UVTSA690-05SVRSU05	NF/DSN32–250	AC 450/550/690 V	267705
UVTSD048-05SVRSU05	NF/DSN32–250	DC 24/48 V	267710
UVTSD110-05SVRSU05	NF/DSN32–250	DC 100–110 V	267715

with lead-wire terminal block SLT, for 4-pole breakers

Type	Breaker type	Rated voltage	Art. no.
UVTSA048-05SVRFSU05	NF/DSN63–250	AC 24/48 V	267691
UVTSA450-05SVRFSU05	NF/DSN63–250	AC 120/240/450 V	267696
UVTSA550-05SVRFSU05	NF/DSN63–250	AC 250/450/550 V	267701
UVTSA690-05SVRFSU05	NF/DSN63–250	AC 450/550/690 V	267706
UVTSD048-05SVRFSU05	NF/DSN63–250	DC 24/48 V	267711
UVTSD110-05SVRFSU05	NF/DSN63–250	DC 100–110 V	267716

Undervoltage tripping device UVT, long-time delay type, synchronous closing, mounted on right-side

with lead-wire terminal block SLT, for 3-pole breakers

Type	Breaker type	Rated voltage	Art. no.
UVTSA048-05SVRSU30	NF/DSN32–250	AC 24/48 V	267720
UVTSA450-05SVRSU30	NF/DSN32–250	AC 120/240/450 V	267725
UVTSA550-05SVRSU30	NF/DSN32–250	AC 250/450/550 V	267730
UVTSA690-05SVRSU30	NF/DSN32–250	AC 450/550/690 V	267735
UVTSD048-05SVRSU30	NF/DSN32–250	DC 24/48 V	267740
UVTSD110-05SVRSU30	NF/DSN32–250	DC 100–110 V	267745

with lead-wire terminal block SLT, for 4-pole breakers

Type	Breaker type	Rated voltage	Art. no.
UVTSA048-05SVRFSU30	NF/DSN63–250	AC 24/48 V	267721
UVTSA450-05SVRFSU30	NF/DSN63–250	AC 120/240/450 V	267726
UVTSA550-05SVRFSU30	NF/DSN63–250	AC 250/450/550 V	267731
UVTSA690-05SVRFSU30	NF/DSN63–250	AC 450/550/690 V	267736
UVTSD048-05SVRFSU30	NF/DSN63–250	DC 24/48 V	267741
UVTSD110-05SVRFSU30	NF/DSN63–250	DC 100–110 V	267746

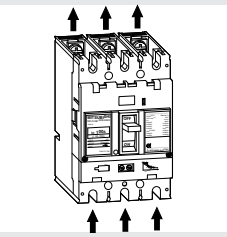
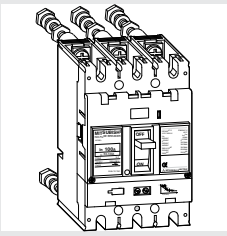
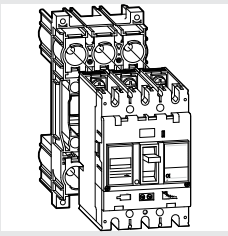
Models for direct connection on request.

Accessories for connection and installation

If no connection method is specified with the order, we deliver the standard fixed-installation type with front connection.

The front-connection model can be modified to other types (excluding plug-in) with special purchase options.

More details on request.

Connection types			
Installation	Fixed		Plug-in
Connection	Front (F)	Rear (B)	Rear (PM)
Appearance			
	Standard	Option	Option

Available terminal connections

Frame size	Front (Standard)	Rear	Solderless terminals	Plug-in
32–250 A	●	●	● ①	●
400–800 A	●	●	—	●
1000–1600 A	●	— ②	—	— ②

① Only for frame sizes 125/160/250 A ② On request, modified at factory.

■ Connection accessories

Rear studs ST

Type	No. of poles	Breaker type		Art. no.
ST-05SV3	3	NF/DSN32–250	For W75 models	267533
ST-05SV4	4			267534
ST-1SV3	3		For W90 models	267537
ST-1SV4	4			267538
ST-2SV3	3		For W105 models	267540
ST-2SV4	4			267541
ST-4SW3	3	NF/DSN400		205956
ST-4SW4	4			205957
ST-6SW3	3	NF/DSN630		205958
ST-6SW4	4			205959
ST-8SW3	3	NF/DSN800		205960
ST-8SW4	4			205961

Solderless terminals SL

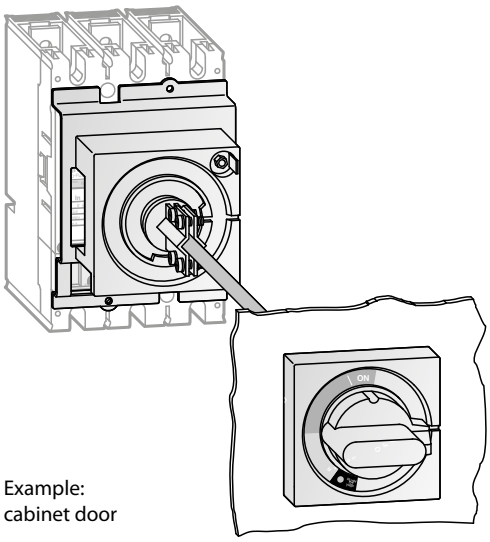
Type	No. of poles	Breaker type	Connected wire size	Art. no.
SL-1SV3L	3	For W90 models	2.5–25 mm²	267516
SL-1SV3G	3		25–70 mm²	267517
SL-1SV4L	4		2.5–25 mm²	267518
SL-1SV4G	4		25–70 mm²	267519
SL-2SV3B	3	For W105 models	2.5–16 mm²	267520
SL-2SV3L	3		14–95 mm²	267521
SL-2SV3G	3		70–125 mm²	267522
SL-2SV4B	4		2.5–16 mm²	267523
SL-2SV4L	4		14–95 mm²	267524
SL-2SV4G	4		70–125 mm²	267525
SL-2UV3B	3	NF-UV	2.5–16 mm²	267526
SL-2UV3L	3		14–95 mm²	267527
SL-2UV3G	3		70–125 mm²	267528
SL-2UV4B	4		2.5–16 mm²	267529
SL-2UV4L	4		14–95 mm²	267530
SL-2UV4G	4		70–125 mm²	267531

Plug-in sets PM

Type	No. of poles	Breaker type		Art. no.
PLT-05SV		NF/DSN32–250	For W75 models	267426
PLT-2RV		NF/DSN32–250	For W105 models	267427
PMD-05SV3	3	NF/DSN32–250	For W75 models	267429
PMD-05SV4	4	NF/DSN32–250	For W75 models	267430
PMDN-05SV3H	3	NF/DSN32–250	For W75 models	267441
PMDN-1SV3	3	NF/DSN32–250	For W90 models	267447
PMDN-1SV4	4	NF/DSN32–250	For W105 models	267448
PMDN-2SV3	3	NF/DSN32–250	For W105 models	267450
PMDN-2SV4	4	NF/DSN32–250	For W105 models	267451
PMN-05SV3H	3	NF/DSN32–250	For W75 models	267456
PMN-05SV3L	3	NF/DSN32–250	For W75 models	267457
PMN-05SV4H	4	NF/DSN32–250	For W75 models	267458
PMN-05SV4L	4	NF/DSN32–250	For W75 models	267459
PMN-1SV3	3	NF/DSN32–250	For W90 models	267461
PMN-1SV4	4	NF/DSN32–250	For W90 models	267462
PMN-2SV3	3	NF/DSN32–250	For W105 models	267464
PMN-2SV4	4	NF/DSN32–250	For W105 models	267465
PMN-2UV3	3	NF-UV	For W105 models	267467
PMDN-4SW3	3	NF/DSN400		266582
PMDN-4SW4	4			266583
PMDN-6SW3	3	NF/DSN630		277944
PMDN-6SW4	4			On request
PMDN-8SW3	3	NF/DSN800		266584
PMDN-8SW4	4			266585

W75 = Breaker width 75 mm
W90 = Breaker width 90 mm
W105 = Breaker width 105 mm
More types available on request.

■ V-type operating handles



Example:
cabinet door

Application

The V-type operating handle is used to operate the breaker which is installed in a cabinet. With the installed V-type operating handle the breaker can be locked (with up to 3 padlocks, Ø 8 mm max., padlocks are not included) in OFF position only.

The door is locked when the breaker is ON and can only be opened when the breaker is in OFF position.

The V-type operating handle is available in the following colour combinations:

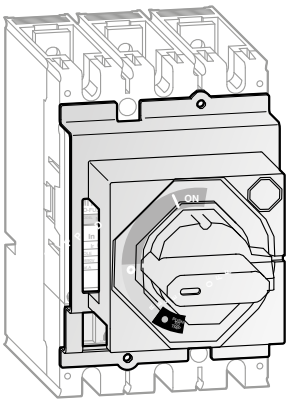
Handle and front in black/black and handle and front in red/yellow, or red/black, see also the following table.

- Protection degree IP65.
- Variable axle length.

Specifications	V-type operating handle											
	V-05SV	V-05SVE	V-1SV	V-1SVE	V-2SV	V-2SVE	V-2UV	V-2UVE	V-4S	V-4SE	V-8S	V-8SE
Breaker type	NF/DSN32-63		NF125-SV		NF/DSN125-250-SGV/SEV		NF/DSN125-250-UV		NF/DSN400-630		NF/DSN800	
Colour: handle/front	black	red/yellow	black	red/yellow	black	red/yellow	black	red/yellow	black	red/yellow	black	red/yellow
Order information Art. no.	267747	267749	267751	267753	267755	267756	267757	267758	225420	225421	225424	225425

Specifications	Adjustment unit			
	V-AD3S	V-AD5S	V-AD3L	V-AD5L
Breaker type	NF/DSN32-250		NF/DSN400-800	
Approx. length (mm)	300	500	300	500
Order information Art. no.	225426	235194	225427	235235

■ F-type operating handles



Application

The F-type operating handles are to be mounted directly on the breaker.

With the installed operating handle the breaker can be locked (with up to 3 padlocks, Ø 8 mm max., padlocks are not included) in OFF position only.

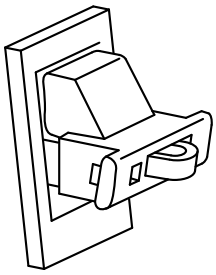
The operating handle is available in the following colour combinations:

Handle and front in black/black and handle and front in red/yellow, or red/black, see also the following table.

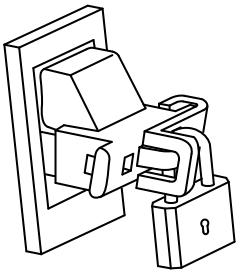
F-type operating handles

Name	Specifications	Breaker type	Art. No.
F-05SV LF DF	Operating handle Type F. OFF position lock, OFF position open, ON side of breaker is upper	NF/DSN32-63 3P / 4P	267263
F-05SV LF DF Y	Operating handle Type F. OFF position lock, OFF position open, ON side of breaker is left		267264
F-05SV LF DF Z	Operating handle Type F. OFF position lock, OFF position open, ON side of breaker is right		267265
F-05SV LF DR	Operating handle Type F. OFF position lock, RESET position open, ON side of breaker is upper		267266
F-05SV LF DR Y	Operating handle Type F. OFF position lock, RESET position open, ON side of breaker is left		267267
F-05SV LF DR Z	Operating handle Type F. OFF position lock, RESET position open, ON side of breaker is right		267268
F-05SVE LF DF	Operating handle Type F Emergency. OFF position lock, OFF position open, ON side of breaker is upper	NF/DSN32-63 3P / 4P	267287
F-05SVE LF DF Y	Operating handle Type F Emergency. OFF position lock, OFF position open, ON side of breaker is left		267288
F-05SVE LF DF Z	Operating handle Type F Emergency. OFF position lock, OFF position open, ON side of breaker is right		267289
F-05SVE LF DR	Operating handle Type F Emergency. OFF position lock, RESET position open, ON side of breaker is upper		267290
F-05SVE LF DR Y	Operating handle Type F Emergency. OFF position lock, RESET position open, ON side of breaker is left		267291
F-05SVE LF DR Z	Operating handle Type F Emergency. OFF position lock, RESET position open, ON side of breaker is right		267292
F-1SV LF DF	Operating handle Type F. OFF position lock, OFF position open, ON side of breaker is upper	NF125-SV 3P / 4P	267311
F-1SV LF DF Y	Operating handle Type F. OFF position lock, OFF position open, ON side of breaker is left		267312
F-1SV LF DF Z	Operating handle Type F. OFF position lock, OFF position open, ON side of breaker is right		267313
F-1SV LF DR	Operating handle Type F. OFF position lock, RESET position open, ON side of breaker is upper		267314
F-1SV LF DR Y	Operating handle Type F. OFF position lock, RESET position open, ON side of breaker is left		267315
F-1SV LF DR Z	Operating handle Type F. OFF position lock, RESET position open, ON side of breaker is right		267316
F-1SVE LF DF	Operating handle Type F Emergency. OFF position lock, OFF position open, ON side of breaker is upper	NF125-SV 3P / 4P	267335
F-1SVE LF DF Y	Operating handle Type F Emergency. OFF position lock, OFF position open, ON side of breaker is left		267336
F-1SVE LF DF Z	Operating handle Type F Emergency. OFF position lock, OFF position open, ON side of breaker is right		267337
F-1SVE LF DR	Operating handle Type F Emergency. OFF position lock, RESET position open, ON side of breaker is upper		267338
F-1SVE LF DR Y	Operating handle Type F Emergency. OFF position lock, RESET position open, ON side of breaker is left		267339
F-1SVE LF DR Z	Operating handle Type F Emergency. OFF position lock, RESET position open, ON side of breaker is right		267340
F-2SV LF DF	Operating handle Type F. OFF position lock, OFF position open, ON side of breaker is upper	NF/DSN125-250 3P / 4P	267359
F-2SV LF DF Y	Operating handle Type F. OFF position lock, OFF position open, ON side of breaker is left		267360
F-2SV LF DF Z	Operating handle Type F. OFF position lock, OFF position open, ON side of breaker is right		267361
F-2SV LF DR	Operating handle Type F. OFF position lock, RESET position open, ON side of breaker is upper		267362
F-2SV LF DR Y	Operating handle Type F. OFF position lock, RESET position open, ON side of breaker is left		267363
F-2SV LF DR Z	Operating handle Type F. OFF position lock, RESET position open, ON side of breaker is right		267364
F-2SVE LF DF	Operating handle Type F Emergency. OFF position lock, OFF position open, ON side of breaker is upper	NF/DSN125-250 3P / 4P All types less NF125-SV	267371
F-2SVE LF DF Y	Operating handle Type F Emergency. OFF position lock, OFF position open, ON side of breaker is left		267372
F-2SVE LF DF Z	Operating handle Type F Emergency. OFF position lock, OFF position open, ON side of breaker is right		267373
F-2SVE LF DR	Operating handle Type F Emergency. OFF position lock, RESET position open, ON side of breaker is upper		267374
F-2SVE LF DR Y	Operating handle Type F Emergency. OFF position lock, RESET position open, ON side of breaker is left		267375
F-2SVE LF DR Z	Operating handle Type F Emergency. OFF position lock, RESET position open, ON side of breaker is right		267376
F-4S LF DF	Operating handle Type F. OFF position lock, OFF position open, ON side of breaker is upper	NF/DSN400-630 3P / 4P	225402
F-4SE LF DF	Operating handle Type F Emergency. OFF position lock, OFF position open, ON side of breaker is upper		225403
F-8S LF DF	Operating handle Type F. OFF position lock, OFF position open, ON side of breaker is upper	NF/DSN800 3P / 4P	225404
F-8SE LF DF	Operating handle Type F Emergency. OFF position lock, OFF position open, ON side of breaker is upper		225405
F-RCS	Release protection for operating handle Type F	All F-types handles	267385
F10SW	Black operating handle set type F	NF/DSN1000-1600, 2P / 3P	225406
F10SW4P	Black operating handle set type F	NF/DSN1000-1600, 4P	225607

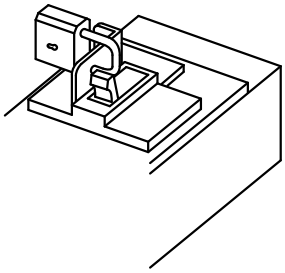
■ Handle lock devices



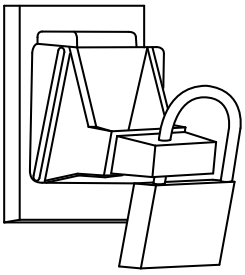
LC-05SV



HLF-05SV



HLS-2SV



HL-4SW

Application

The handle lock device HL is used to lock the handle of the breaker against switching by not-allowed persons. The function of protection is given every time.

Different types are available.

- All handle lock devices can be mounted regardless of the number of poles.
- Padlocks are not included.
- More details on request.

Handle lock device LC type

- The handle lock can be used without padlock as a lock cover.

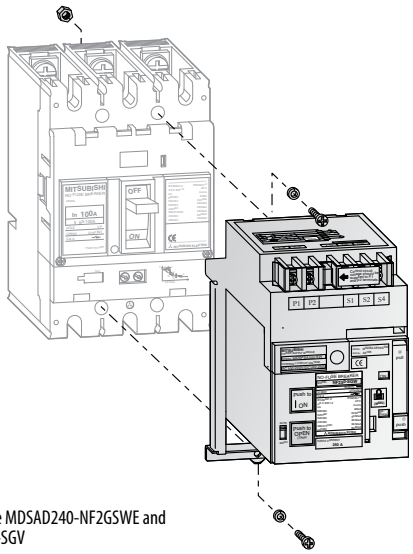
Handle lock device HL type

- The handle lock HL type can be used for 3- and 4-pole breaker types.
- The handle locks can be used without padlock as lock covers.
- The HLF types are used for OFF-lock and the HLN types are used for ON-lock.
- The handle lock HLF3 type enables the user to lock the handle with up to three padlocks against switching.
- The HLS types are used for OFF-lock only.

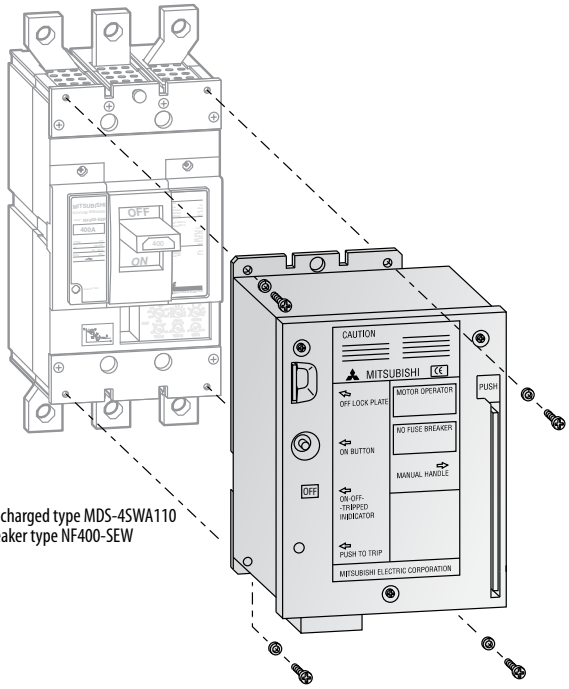
Type	Breaker type	Art. no.
LC-05SV	NF/DSN32–250	267761
HLF-05SV	NF/DSN32–250	267396
HLN-05SV	NF/DSN32–250	267397
HLS-05SW	NF/DSN32–250, W75, W90, 3P, 4P	267398
HLS-05SV2	NF/DSN32–250, W75, W90, 2P	267399
HL-4SW	NF/DSN400–800	205975
HL-10SW	NF/DSN100–1600	205976

Electrically operated breakers – Overview

Spring-charged types MDS



Spring-charged type MDSAD240-NF2GSWE and breaker type NF250-SGV



Spring-charged type MDS-4SWA110 and breaker type NF400-SEW

Specifications			MDSD.../MDSA...	MDS-4.../8...		MDS-16...	
Breaker type ①	NF-S/H series		NF125-SGV/LGV/HGV NF125-SEV/LEV/HEV	NF400-SEW/HEW/REW NF630-SEW/HEW/REW NF800-SEW/HEW/REW		NF1000-SEW NF1250-SEW NF1600-SEW	
	NF-R/U series		NF125-RGV/REV/UV NF250-RGV/REV/UV	NF400-UEW, NF800-UEW		—	
Rated operating voltage (V) (allowable voltage range 85–110 %) ②			DC 24 V Compatible with 100–240 V AC/ 100–250 V DC	AC 100/110 V, 200/220 V (AC 240 V) DC 100/110 V (DC 125 V)		AC 100/110 V, 200/220 V (AC 240 V) DC 100/110 V (DC125 V)	
Operating current (A, eff.) ③	DC	100/110 V		OFF: 1.0 (3.0)	ON: 8.0	OFF: 1.0 (3.0)	ON: 9.0
	AC	100/110 V		OFF: 1.0 (3.0)	ON: 10.0	OFF: 1.0 (3.0)	ON: 10.0
		200/200 V		OFF: 0.5 (1.5)	ON: 8.0	OFF: 0.5 (1.5)	ON: 8.0
Operating time (sec.)	ON operating		0.05–0.1 (self holding)	0.05		0.07	
	OFF operating		0.6 and less (self holding)	3 and less (self holding)		3 and less (self holding)	
	Spring charging		1.2 and less	—		—	
Transformer capacity required (VA)			150	700		700	
Endurance voltage (V)				1500		1500	

① Also usable for disconnectors DSN with 3 and 4 poles.
② The voltages in parentheses ( ) are special options and might require an external resistor. For details, consult your distributor.
③ The values in parentheses ( ) show starting current.

General precautions for motor-operated electrical MCCBs

The motor operated types should not be operated 10 times consecutively (one on/off counts as an operation).

The operating voltage should be between 85–110 % of the rated control voltage.

The current breaker position ON, OFF or TRIPPED will be shown with a special display on the motor.

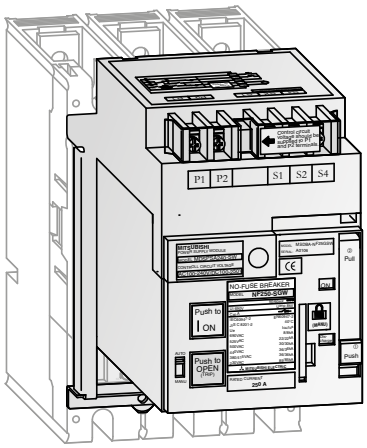
The dielectric strength of the electrical operating circuits is 1500 V. When performing a dielectric strength test simultaneously with another device at a voltage over 1500 V, the operating circuit terminal should be disconnected.

Automatic reset

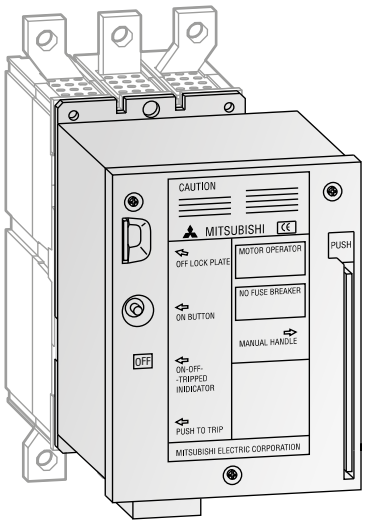
If the breaker is an auto reset type, it contains a built-in alarm switch and the off-control circuit close when the breaker is tripped. Since the breaker automatically resets itself after tripping, the power is easily restored by switching on the breaker again. With a UVT mounted, however, auto reset may not be possible. In this case, please consult your distributor.

- More details on request.

■ Spring-charged type MDS

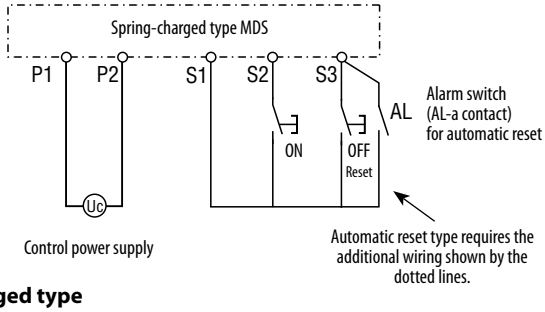


Spring-charged type
MDS.....-NF2VE
and breaker type NF250-SGV

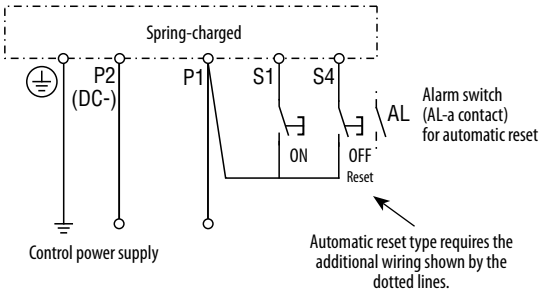


Spring-charged type
MDS-4SW.... and
breaker type NF400-SEW

Control circuit for MDS....-NF2VE



Control circuit for MDS-4/8/16S...



Spring-charged type

Electrical operation

When the ON switch is closed, the coil is releasing the latch mechanism, and the breaker is turned to ON.

When the OFF switch is closed. a relay operates to start a motor which turns the breaker OFF (RESET) and charges the spring at the same time.

Manual operation

When the ON button (on the front of the spring-charged type) is pressed, the latch mechanism is cancelled and the circuit breaker set momentarily to ON by the force of spring.

OFF operation (RESET operation)

The circuit breaker can be set to OFF (RESET) by pressing the leaf spring, pulling out the manual handle and moving it back and forth more than ten times. This charges the spring at the same time.

Cautions during electrical operation

When an electrical-operation device is mounted in a breaker or removed from an breaker, this device must be returned to the discharged state after tripping of the breaker.

A MCCB with an electrical-operation device will not trip in the OFF state "PUSH TO TRIP" is used. This does not indicate that the breaker is faulty.

Since it takes 3 sec to switch off a breaker provided with this device, if the breaker needs to be opened urgently by remote control, a breaker fitted with an SHT or UVT should be used.

The breaker is equipped with a relay for the prevention of pumping.

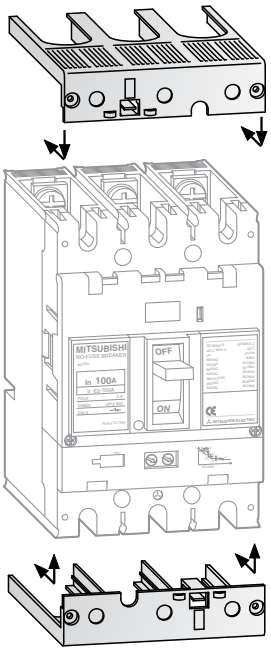
Control circuit

For breakers with automatic resetting capability, add the connection indicated by the dotted line in the diagrams.

- More details on request.
- Control power supply modules on request.

Type	Breaker type	Rated voltage	Art. no.
MDSAD240-NF1SVE	NF/DSN125–250 W90	AC 100–240 V/DC 100–250 V	267401
MDSAD240-NF2SVE	NF/DSN125–250 W105	AC 100–240 V/DC 100–250 V	267402
MDSAD240-NF2UVE	NF250-UV W105	AC 100–240 V/DC 100–250 V	267403
MDSD024-NF1SVE	NF/DSN125–250 W90	DC 24 V	267406
MDSD024-NF2SVE	NF/DSN125–250 W105	DC 24 V	267407
MDSD060-NF1SVE	NF/DSN125–250 W90	DC 48–60 V	267410
MDSD060-NF2SVE	NF/DSN125–250 W105	DC 48–60 V	267411
MDSD060-NF2UVE	NF250-UV W105	DC 48–60 V	267412
MDS-4SWA110	NF/DSN400–630	AC 100–110 V	205968
MDS-4SWA240	NF/DSN400–630	AC 230 V	205969
MDS-4SWD110	NF/DSN400–630	DC 100–110 V	205970
MDS-8SWA110	NF/DSN800	AC 100–110 V	205971
MDS-8SWA240	NF/DSN800	AC 230 V	205972
MDS-8SWD110	NF/DSN800	DC 100–110 V	205973
MDS-10SWA110	NF/DSN1000–1600	AC 100–110 V	213185
MDS-10SWA240	NF/DSN1000–1600	AC 230 V	213186
MDS-10SWD110	NF/DSN1000–1600	DC 100–110 V	213187

■ Terminal covers



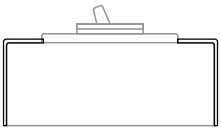
Application

The terminal covers are used to avoid exposure of charged parts.

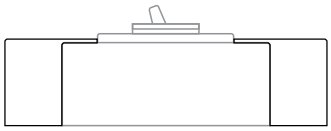
Different types are available:

- for front connection as small terminal covers TCS or large terminal covers TCL, TTC (see figures below)
- for rear connection as closed type BTC
- for plug-in as PTC
- One set includes two pieces of terminal covers.
- Colour: black, white or transparent
- More types/details on request.

Small terminal covers
TCS



Large terminal covers
TCL, TTC



Small terminal covers TCS (1 set = 2 pieces)

Type	No. of poles	Breaker type	Colour	Protection degree	Art. no.
TCS-05SV3	3	NF/DSN32–63			267552
TCS-05SV4	4				267553
TCS-1SV3	3	NF/DSN125-CV/SV			267555
TCS-1SV4	4				267556
TCS-2SV3	3	NF/DSN125–250 (All types less NF/DSN125-CV/SV)			267557
TCS-2SV4	4				267558

Large terminal covers TCL (1 set = 2 pieces)

Type	No. of poles	Breaker type	Colour	Protection degree	Art. no.
TCL-05SV3	3	NF/DSN32–63			267543
TCL-05SV4	4				267544
TCL-1SV3	3	NF/DSN125-CV/SV			267546
TCL-1SV4	4				267547
TCL-2SV3	3	NF/DSN125–250 Up to 200 A (All types less NF/DSN125-CV/SV)			267548
TCL-2SV3L	3	NF/DSN125–250 Up to 250 A (All types less NF/DSN125-CV/SV)			267549
TCL-2SV4	4	NF/DSN125–250 (All types less NF/DSN125-CV/SV)			267550
TCL-4SW3	3	NF/DSN400–630	black	IP20	205977
TCL-4SW4	4		transparent		205978
TCL-8SW3	3	NF/DSN800	transparent	IP20	205979
TCL-8SW4	4				205980
TCL-8UW3	3	NF/DSN800	transparent	IP20	205981
TCL-8UW4	4				205982
TCL-10SW3	3	NF/DSN1000–1250 (fixed with screws)	transparent	IP20	205983
TCL-10SW4	4				205984

Transparent terminal covers TTC (1 set = 2 pieces)

Type	No. of poles	Breaker type	Colour	Protection degree	Art. no.
TTC-05SV3	3	NF/DSN32–63	transparent		267560
TTC-05SV4	4				267561
TTC-1SV3	3	NF/DSN125-CV/SV			267563
TTC-1SV4	4				267564
TTC-2SV3	3	NF/DSN125–250 All types less NF/DSN125-CV/SV			267565
TTC-2SV4	4				267566

Terminal covers rear for connection studs BTC (1 set = 2 pieces)

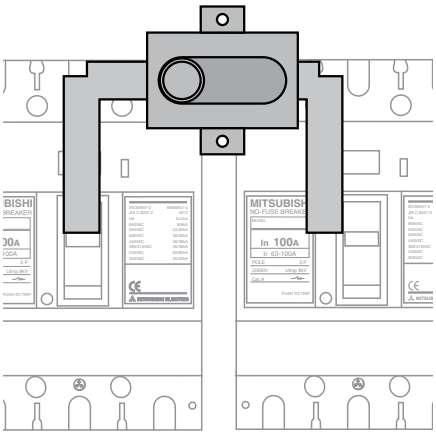
Type	No. of poles	Breaker type	Colour	Protection degree	Art. no.
BTC-05SV3	3	NF/DSN32–63			267254
BTC-05SV4	4				267255
BTC-1SV3	3	NF/DSN125-CV/SV			267257
BTC-1SV4	4				267258
BTC-2SV3	3	NF/DSN125–250 (All types less NF/DSN125-CV/SV)			267259
BTC-2SV4	4				267260
BTC-4SW3	3	NF/DSN400–630	transparent	IP20	205985
BTC-4SW4	4				205986
BTC-8SW3	3	NF/DSN800	transparent	IP20	205987
BTC-8SW4	4				205988

Terminal covers for plug-in type PTC (1 set = 2 pieces)

Type	No. of poles	Breaker type	Colour	Protection degree	Art. no.
PTC-05SV3	3	NF/DSN32–63			267469
PTC-05SV4	4				267470
PTC-1SV3	3	NF/DSN125-CV/SV			267472
PTC-1SV4	4				267473
PTC-2SV3	3	NF/DSN125–250 (All types less NF/DSN125-CV/SV)			267474
PTC-2SV4	4				267475

■ Mechanical interlock MI

(Front side installation)



Application

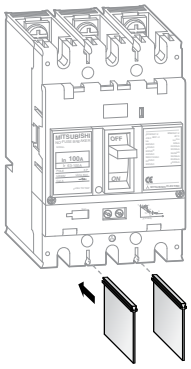
With two breakers, use a panel-mounted mechanical interlock for one-way only input. It is usable for front, rear, and plug-in types.

A breaker-mounting mechanical to mount on the breaker main unit can be made to order.

- More details on request.

Type	No. of poles	For use between two breakers of		Art. no.
MI-05SV3	3	NF/DSN32–250	For W75, W90 and W105; 3 poles. Panel mounting.	267418
MI-05SV4	4		For W75; 4 poles. Panel mounting.	267419
MI-05SVFB3	3		For W75; 3 poles. Breaker mounting.	267421
MI-1SV4	4		For W90; 4 poles. Panel mounting.	267422
MI-1SVFB3	3		For W90; 3 poles. Breaker mounting.	267423
MI-2SV4	4		For W105; 4 poles. Panel mounting.	267424
MI-2SVFB3	3		For W105; 3 poles. Breaker mounting.	267425
MI-4SW3	3	400 AF		205989
MI-4SW4	4			205990
MI-8SW3	3	630–800 AF		205991
MI-8SW4	4			205992
MI-10SW3	3	1000–1250 AF		205993
MI-10SW4	4			205994
MI-16SW3	3	1600 AF		205995
MI-16SW4	4			205996

■ Isolation barriers (standard) BAF



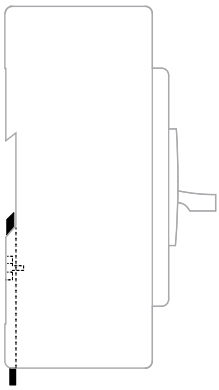
Application

The isolation barriers are used to avoid short-circuits between the terminals of the breaker due to dust or leakage current.

Every breaker is equipped with isolation barriers as standard.

Specifications		BAF-05SV	BAF-2SV
For breaker type		V series W75 type	V series W90/105 type
Connection type		For front connection	For front connection
Order information	Art. no.	267248	267249

■ IEC 35 mm rail mounting adapter



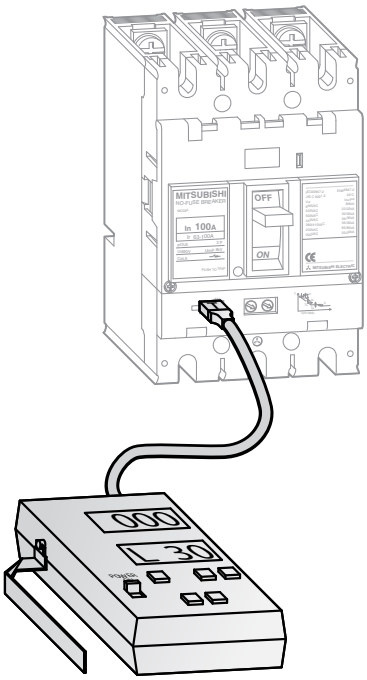
Application

The IEC 35 mm rail mounting adapter is used to mount the breaker on a IEC 35 mm mounting rail.

It is available for 3-pole breakers NF/DSN32–63.

Specifications		DIN-05SV
For 3-pole breakers		NF/DSN32–63
Order information	Art. no.	267262 (packing unit: 10 pcs)

■ Tester for electronic breakers



Application

The portable tester unit can be used to check the tripping characteristics of the electronic breakers from 125 A up to 1600 A.

- More details on request.

Specifications		Y-250	Y-350
For electronic breakers		W series 125–1600 A	V series 125–250 A
Order information	Art. no.	68181	267770

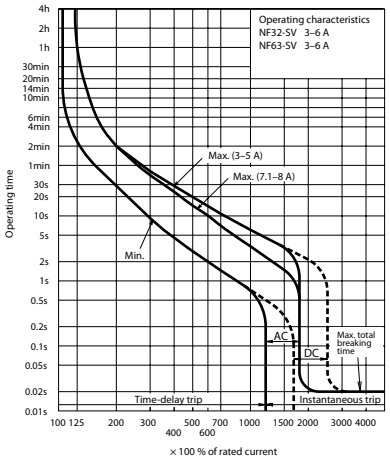
NF32-SV, NF63-SV, NF63-HV

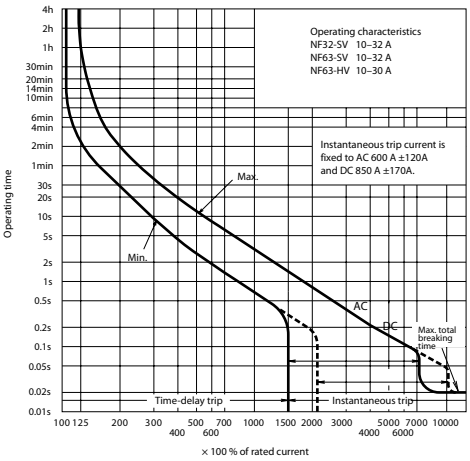
NF63-SV

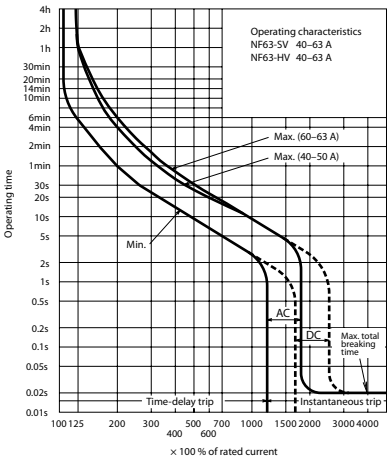
Type name				NF32-SV	NF63-SV	NF63-HV	
Rated current In [A]				3, 4, (5), 6, 10, (15), 16, 20, 25, (30), 32	3, 4, (5), 6, 10, (15), 16, 20, 25, (30), 32, 40, 50, (60), 63	10, (15), 16, 20, 25, (30), 32, 40, 50, (60), 63	
Number of poles				3	3	3	4
Rated insulation voltage U_i [V]				600	600	600	
Rated short-cuircit breaking capacity [kA]	IEC/EN 60947-2	AC	690 V	–	–	2.5/2.5	
			500 V	2.5/2.5	2.5/2.5	7.5/7.5	
			440 V	2.5/2.5	2.5/2.5	10/8	
			415 V	2.5/2.5	2.5/2.5	10/8	
			400 V	5/5	5/5	10/8	
			380 V	5/5	5/5	10/8	
			230 V	7.5/7.5	7.5/7.5	25/19	
		DC	250 V *1	2.5/2.5	2.5/2.5	7.5/7.5	
Standard attached parts (front connection)				Mounting screw: M4×0.7×55 (2 and 3P: 2pcs, 4P: 4pcs) Insulation barrier: (2P: 1pc, 3P: 2pcs, 4P: 3pcs) (*2)			

Notes: *1 Use two poles for three- and four-pole products. Not available for use with connection as shown at the bottom of page 43.
*2 Supplied with NF63-SV and NF63-HV.

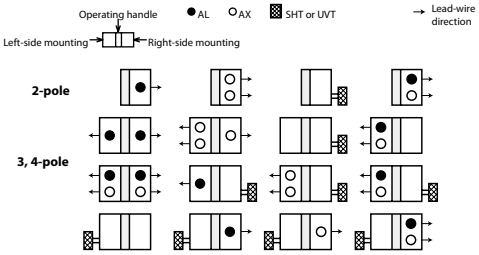
Operating characteristics



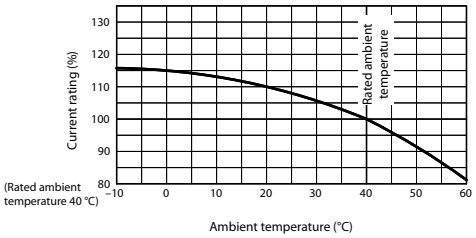




Internal accessories



Ambient compensating curve



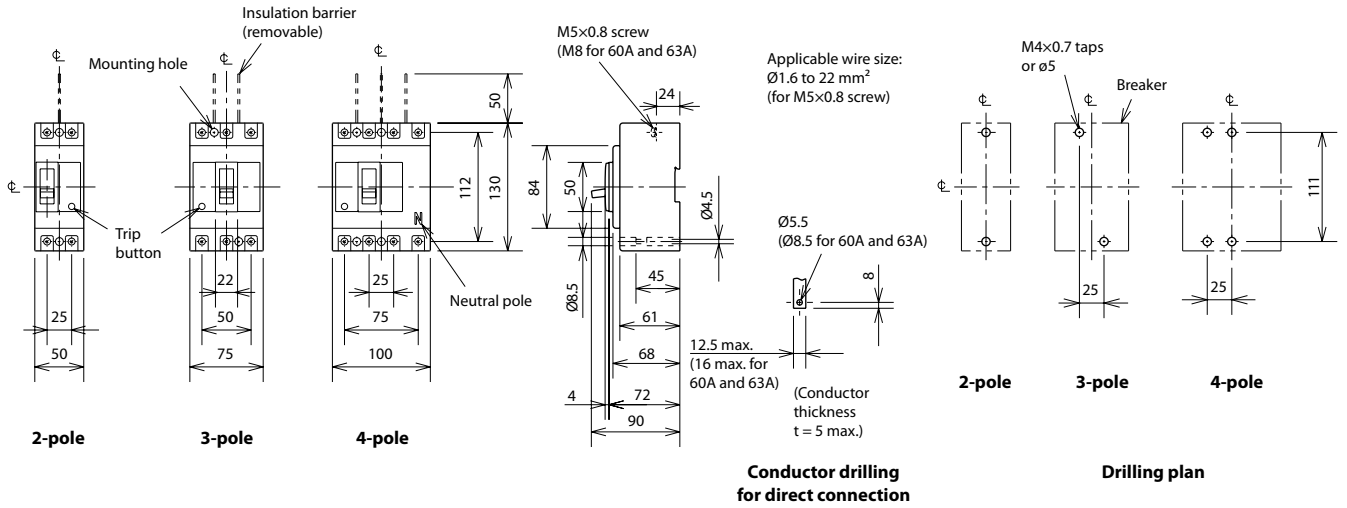
External accessories

Accessories			Type name	Reference page
Operating handle	F	3, 4P	F-05SV	65
	V	3, 4P	V-05SV	64
Handle lock device	LC		LC-05SV	66
	HL (*1)		HLF-05SV	
			HLN-05SV	
	HL-S		HLS-05SV	

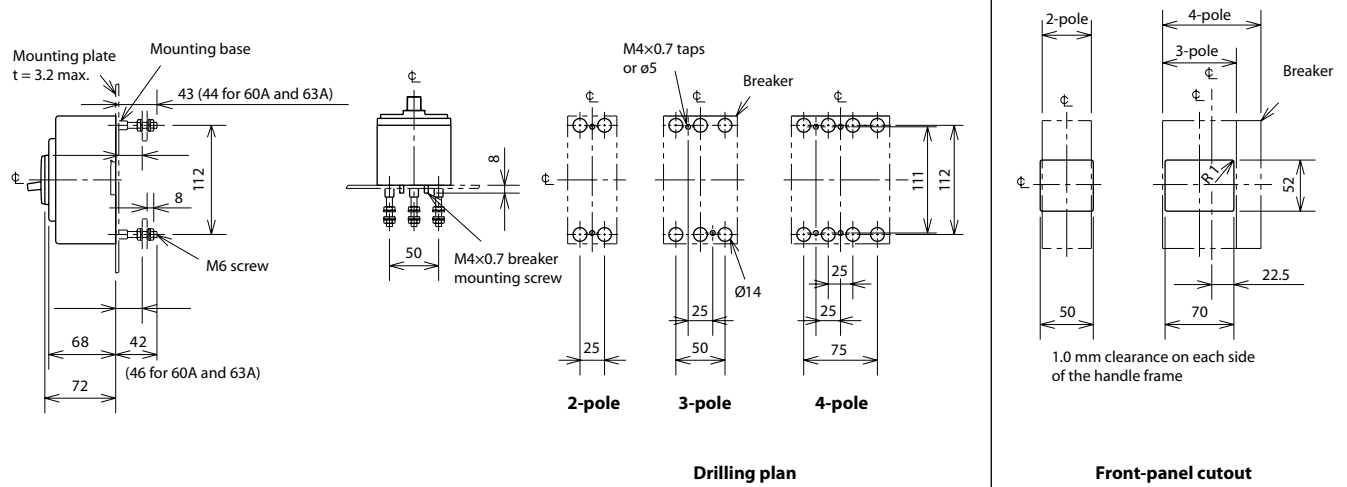
Notes *1 HLF types are used for OFF-lock and HLN types for ON-lock.
*2 Specify the working voltage. Refer to the reference page for type name.

Accessories				Type name	Reference page
Mechanical interlock		MI	3P	MI-05SV3	70
			4P	MI-05SV4	
Terminal cover	Small	TC-S	3P	TCS-05SV3	69
	Large	TC-L	3P	TCL-05SV3	
			4P	TCL-05SV4	
	Skeleton	TTC	3P	TTC-05SV3	
	Rear	BTC	3P	BTC-05SV3	
	Plug-in	PTC	3P	PTC-05SV3	
Electrical operation device				MDS (2*)	67

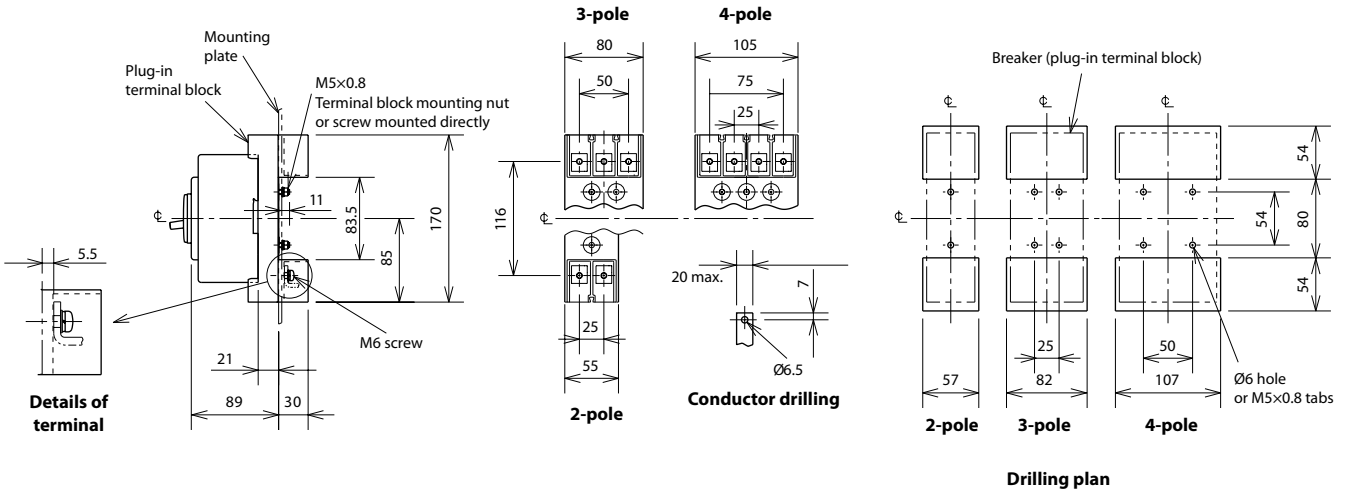
Front connection



Rear connection



Plug-in



Remark: Only two- and three-pole models are available for NF32-SV.

[mm]

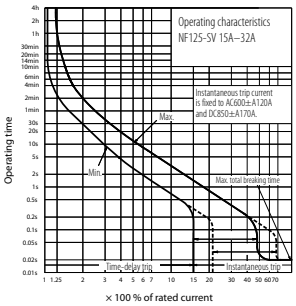
NF125-SV, NF250-SV

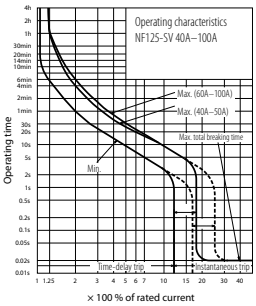
NF125-SV

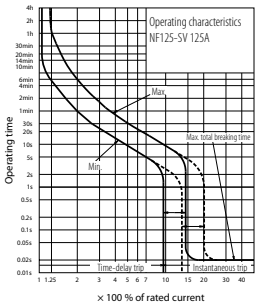
Type name				NF125-SV		NF250SV	
Rated current I_n [A]				(15), 16, 20, (30), 32, 40, 50, (60), 63, (75), 80, 100, 125		(100), 125, 150, 160, 175, 200, 225, 250	
Number of poles				3	4	3	4
Rated insulation voltage U_i [V]				690		690	
Rated short-cuircit breaking capacity [kA]	IEC/EN 60947-2	AC	690 V	8/8		8/8	
			500 V	18/18		30/30	
			440 V	25/25		36/36	
			415 V	30/30		36/36	
			400 V	30/30		36/36	
			380 V	30/30		36/36	
			230 V	50/50		85/85	
		DC	250 V *1	20/20		20/20 (300 V)	
Standard attached parts (front connection)				Mounting screw: M4×0.7×55 (2 and 3P: 2pcs, 4P: 4pcs) Insulation barrier: (2P: 1pc, 3P: 2pcs, 4P: 3pcs)			

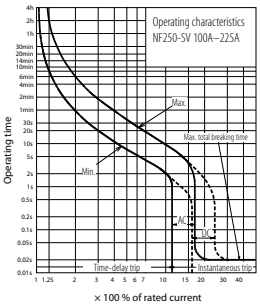
Note: *1 When wired as shown at the bottom of page 43, three-pole models can be used for up to 500 V DC, and 4-pole models for up to 600 V DC.

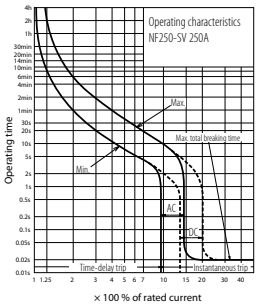
Operating characteristics



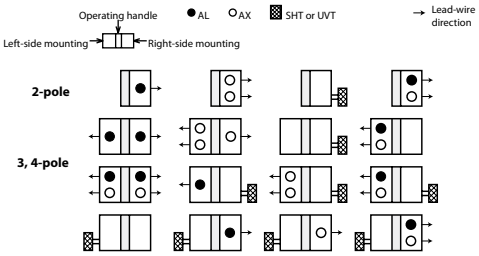




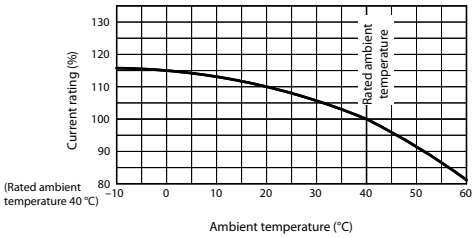




Internal accessories



Ambient compensating curve



External accessories

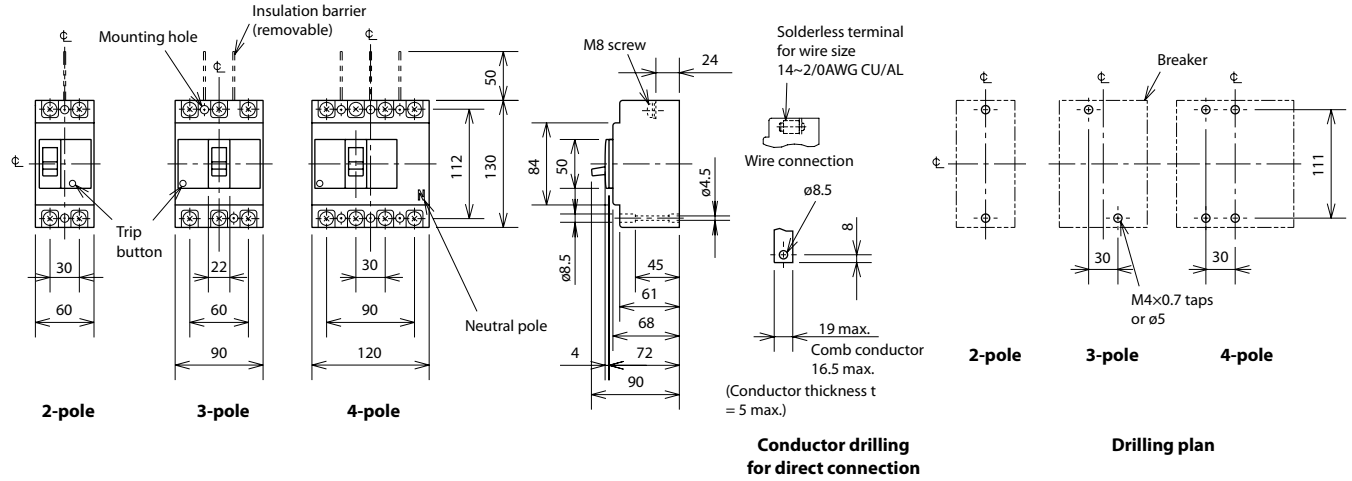
Accessories			Type name		Reference page
Suitabable breaker			NF125-SV	NF250-SV	
Operating handle	F	3, 4P	F-1SV	F-2SV	65
	V	3, 4P	V-1SV	V-2SV	64
Handle lock device	LC		LC-05SV	LC-05SV	66
	HL (*1)		HLF-05SV	HLF-05SV	
			HLN-05SV	HLN-05SV	
	HL-S		HLS-05SV	HLS-2SV	

Notes *1 HLF types are used for OFF-lock and HLN types for ON-lock.
*2 Specify the working voltage. Refer to the reference page for type name.

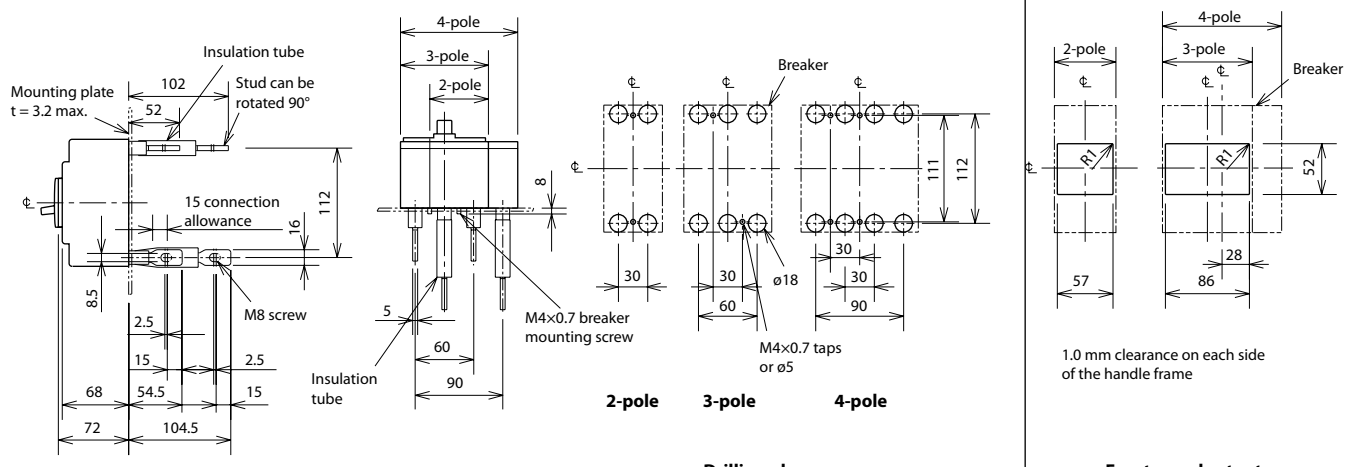
Accessories				Type name		Reference page
Suitabable breaker				NF125-SV	NF250-SV	
Mechanical interlock	MI		3P	MI-05SV3	MI-05SV3	70
			4P	MI-05SV4	MI-2SV4	
Terminal cover	Small	TC-S	3P	TCS-1SV3	TCS-2SV3	69
	Large	TC-L	3P	TCL-1SV3	TCL-2SV3	
			4P	TCL-1SV4	TCL-2SV4	
	Skeleton	TTC	3P	TTC-1SV3	TTC-2SV3	
	Rear	BTC	3P	BTC-1SV3	BTC-2SV3	
	Plug-in	PTC	3P	PTC-1SV3	PTC-2SV3	
Electrical operation device				MDS (2*)	MDS (2*)	67

NF125-SV (for NF250-SV refer to p. 77)

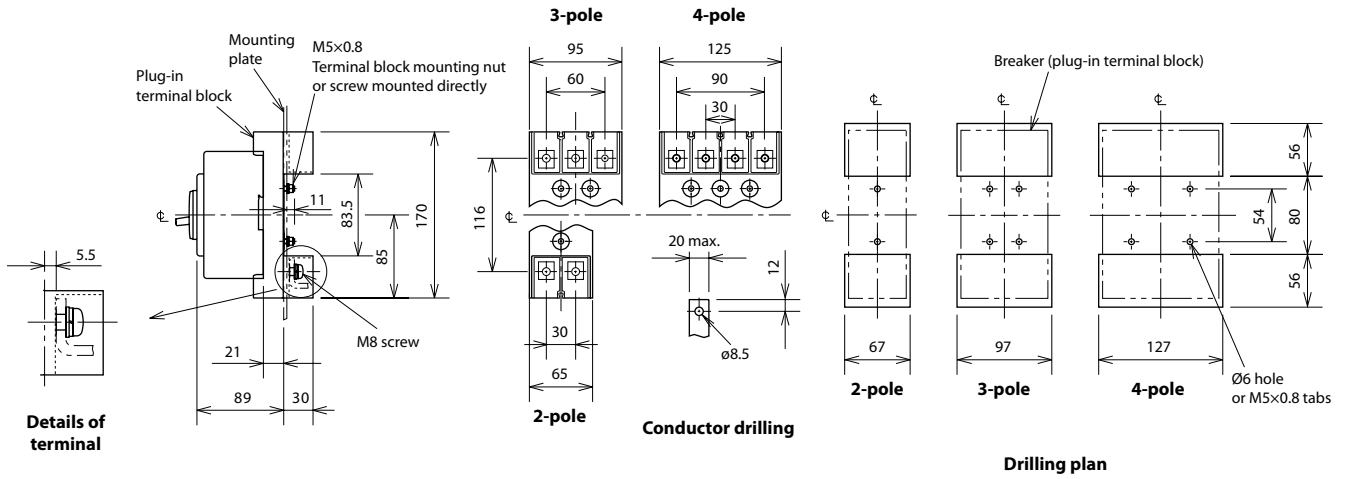
Front connection



Rear connection



Plug-in



[mm]

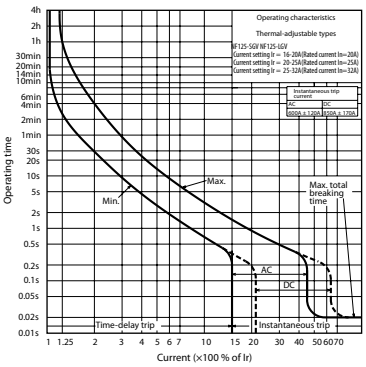
NF125-SGV, NF160-SGV, NF250-SGV, NF125-LGV, NF160-LGV, NF250-LGV

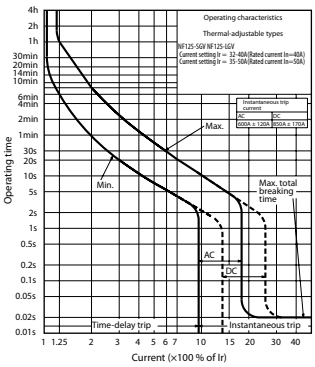
NF250-SGV

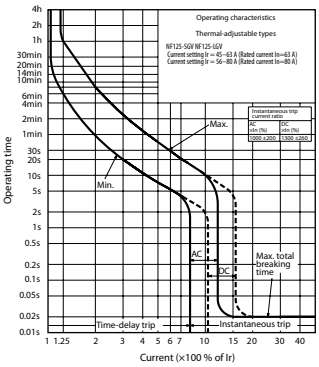
Type name			NF125-SGV	NF160-SGV	NF250-SGV	NF125-LGV	NF160-LGV	NF250-LGV
Rated current I_n [A]			16–20, 20–25, 25–32 32–40, 35–50, 45–63 56–80, 70–100, 90–125	125–160	125–160 140–200 175–250	16–20, 20–25, 25–32 32–40, 35–50, 45–63 56–80, 70–100, 90–125	125–160	125–160 140–200 175–250
Number of poles			3 4	3 4	3 4	3 4	3 4	3 4
Rated insulation voltage U_i [V]			690	690	690	690	690	690
Rated short-cuircit breaking capacity [kA] IEC/EN 60947-2 (I_{cu}/I_{cs})	AC	690 V	8/8	8/8	8/8	8/8	8/8	8/8
		500 V	30/30	30/30	30/30	36/36	36/36	36/36
		440 V	36/36	36/36	36/36	50/50	50/50	50/50
		415 V	36/36	36/36	36/36	50/50	50/50	50/50
		400 V	36/36	36/36	36/36	50/50	50/50	50/50
		380 V	36/36	36/36	36/36	50/50	50/50	50/50
		230 V	85/85	85/85	85/85	90/90	90/90	90/90
		200 V	85/85	85/85	85/85	90/90	90/90	90/90
	DC *1	300 V	20/20	20/20	20/20	20/20	20/20	20/20
Standard attached parts (front connection)			Mounting screw: M4×0.7×55 (3P: 2pcs, 4P: 4pcs) Insulation barrier: (3P: 4pcs, 4P: 6pcs)					

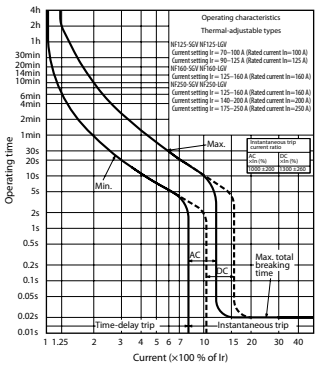
Note: *1 When wired as shown at the bottom of page 43, three-pole models can be used for up to 500 V DC, and 4-pole models for up to 600 V DC.

Operating characteristics

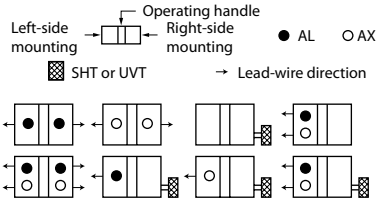




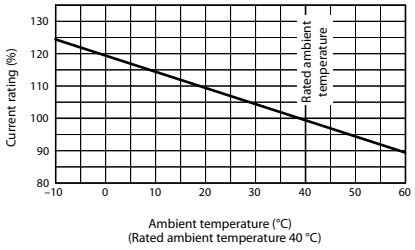




Internal accessories



Ambient compensating curve



External accessories

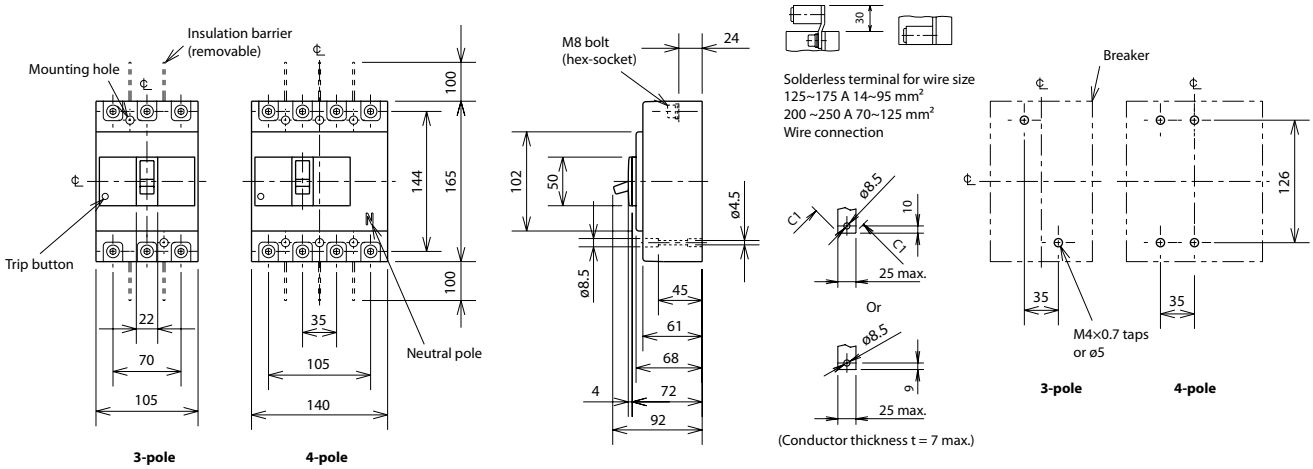
Accessories		Type name	Reference page
Operating handle	F	F-2SV	65
	V	V-2SV	64
Handle lock device	LC	LC-05SV	66
	HL (*1)	HLF-05SV	
		HLN-05SV	
	HL-S	HLS-2SV	

Notes *1 HLF types are used for OFF-lock and HLN types for ON-lock.
*2 Specify the working voltage. Refer to the reference page for type name.

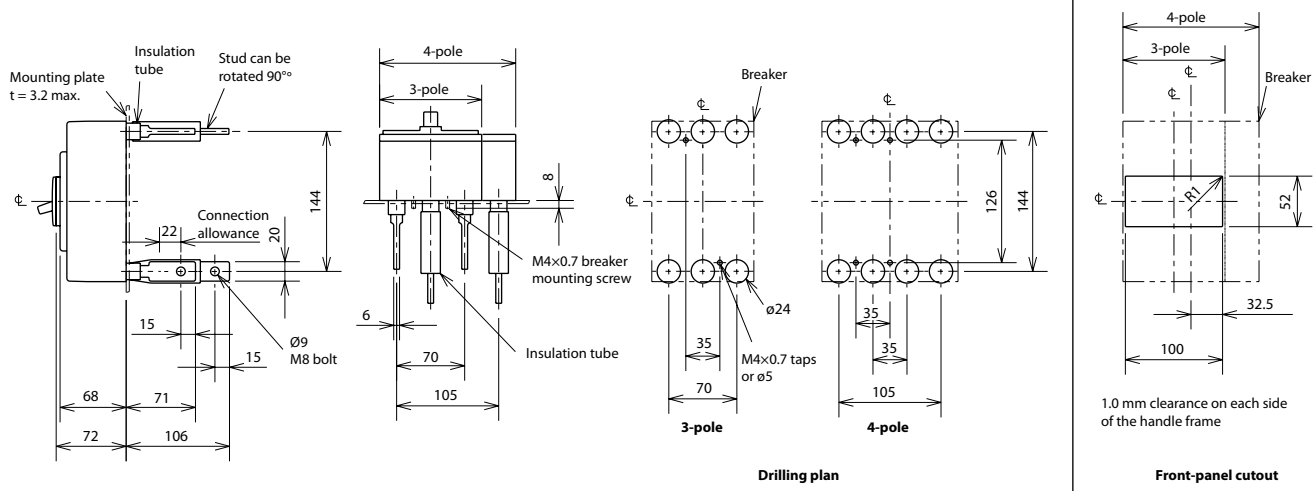
Accessories				Type name	Reference page
Mechanical interlock		MI	3P	MI-05SV3	70
			4P	MI-2SV4	
Terminal cover	Small	TC-S	3P	TCS-2SV3	69
	Large	TC-L	3P	TCL-2SV3	
				TCL-2SV3L	
			4P	TCL-2SV4	
	Skeleton	TTC	3P	TTC-2SV3	
	Rear	BTC	3P	BTC-2SV3	
	Plug-in	PTC	3P	PTC-2SV3	
Electrical operation device				MDS (*2)	67

NF125-SGV, NF160-SGV, NF250-SGV, NF125-LGV, NF160-LGV, NF250-LGV, NF250-SV

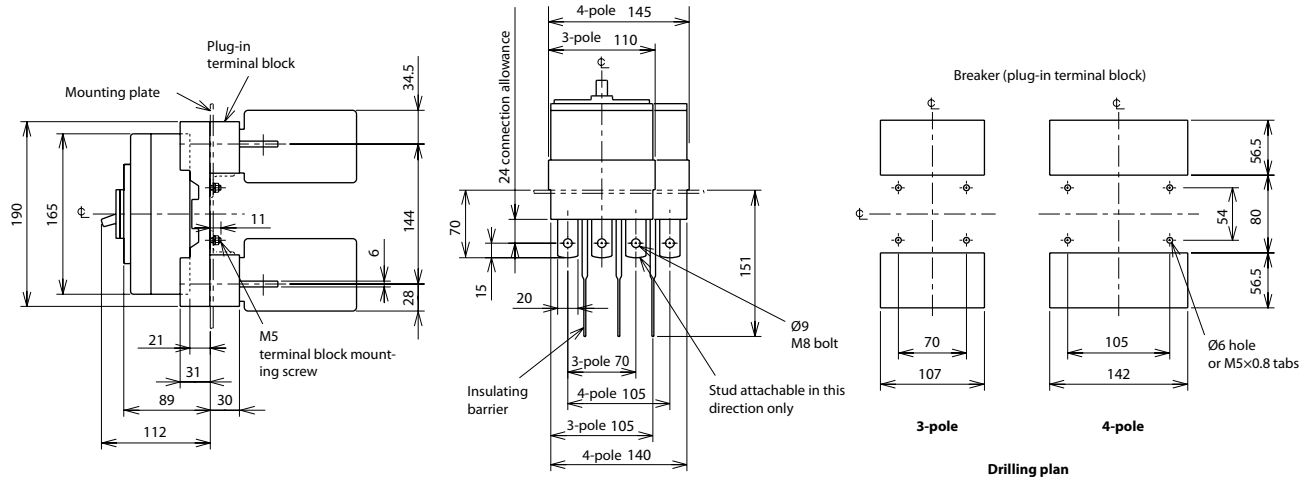
Front connection



Rear connection



Plug-in



[mm]

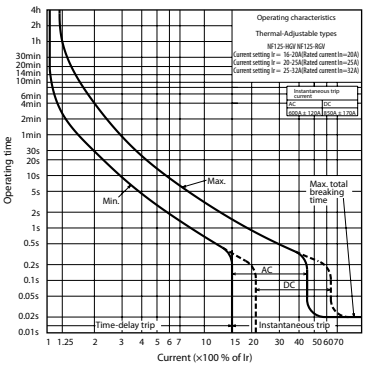
NF125-HGV, NF160-HGV, NF250-HGV, NF125-RGV, NF250-RGV

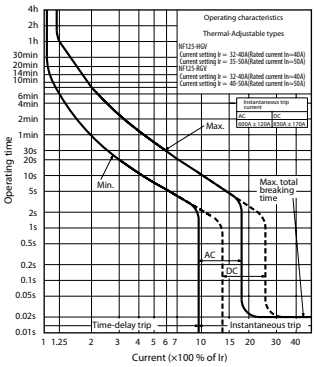
NF250-HGV

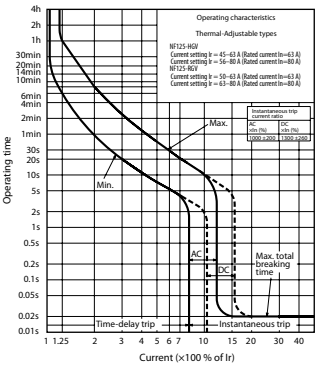
Type name				NF125-HGV	NF160-HGV	NF250-HGV	NF125-RGV	NF250-RGV
Rated current I_n [A]				16–20, 20–25, 25–32 32–40, 35–50, 45–63 56–80, 70–100, 90–125	125–160	125–160 140–200 175–250	16–20, 20–25, 25–32 32–40, 35–50, 45–63 56–80, 70–100, 90–125	125–160
Number of poles				3 4	3 4	3 4	3	3
Rated insulation voltage U_i [V]				690	690	690	690	690
Rated short-cuircit breaking capacity [kA]	IEC/EN 60947-2 (I_{cu}/I_{cs})	AC	690 V	10/8	10/8	10/8	—	—
			500 V	50/38	50/38	50/38	—	—
			440 V	65/65	65/65	65/65	125/125	125/125
			415 V	70/70	70/70	70/70	150/150	150/150
			400 V	75/75	75/75	75/75	150/150	150/150
			380 V	75/75	75/75	75/75	150/150	150/150
			230 V	100/100	100/100	100/100	150/150	150/150
			200 V	100/100	100/100	100/100	150/150	150/150
		DC *1	300 V	40/40	40/40	40/40	—	—
Standard attached parts (front connection)				Mounting screw: M4×0.7×55 (3P: 2pcs, 4P: 4pcs) Insulation barrier: (3P: 4pcs, 4P: 6pcs)				

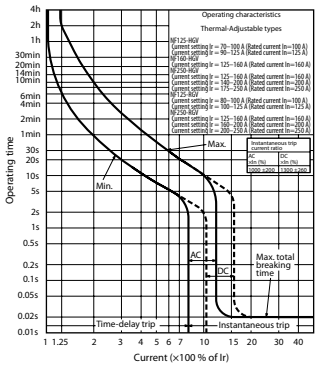
Note: *1 When wired as shown at the bottom of page 43, three-pole models can be used for up to 500 V DC, and 4-pole models for up to 600 V DC.

Operating characteristics

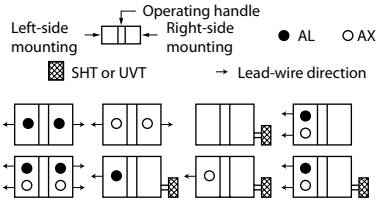




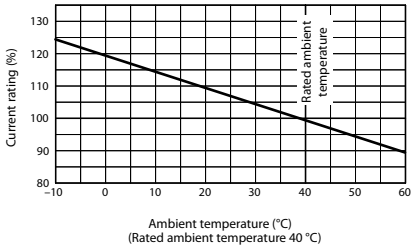




Internal accessories



Ambient compensating curve



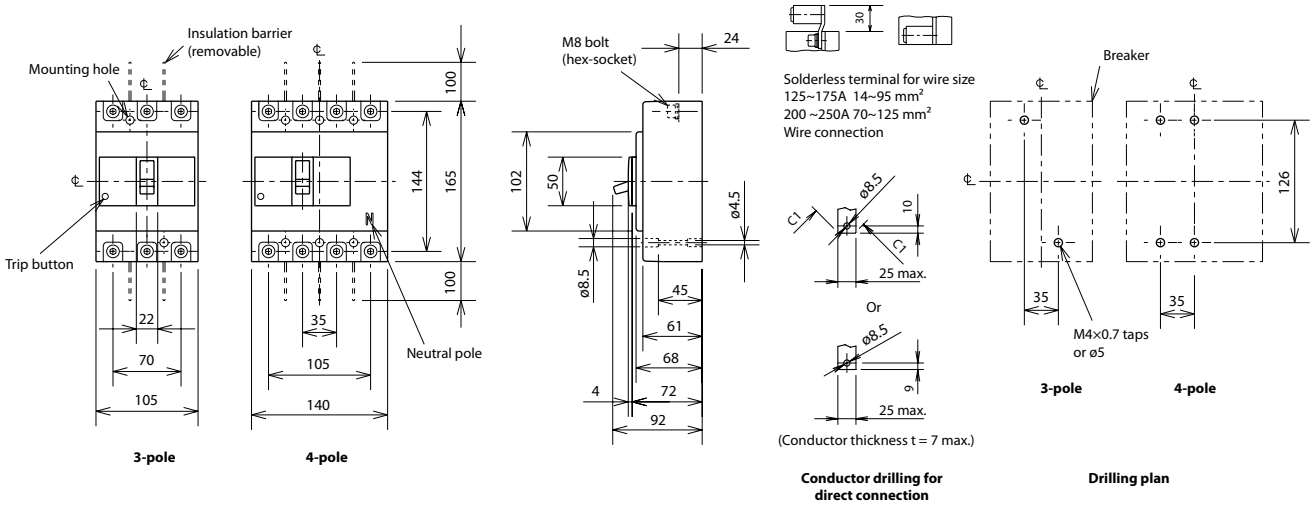
External accessories

Accessories		Type name	Reference page
Operating handle	F	F-2SV	65
	V	V-2SV	64
Handle lock device	LC	LC-05SV	66
	HL (*1)	HLF-05SV	
		HLN-05SV	
	HL-S	HLS-2SV	

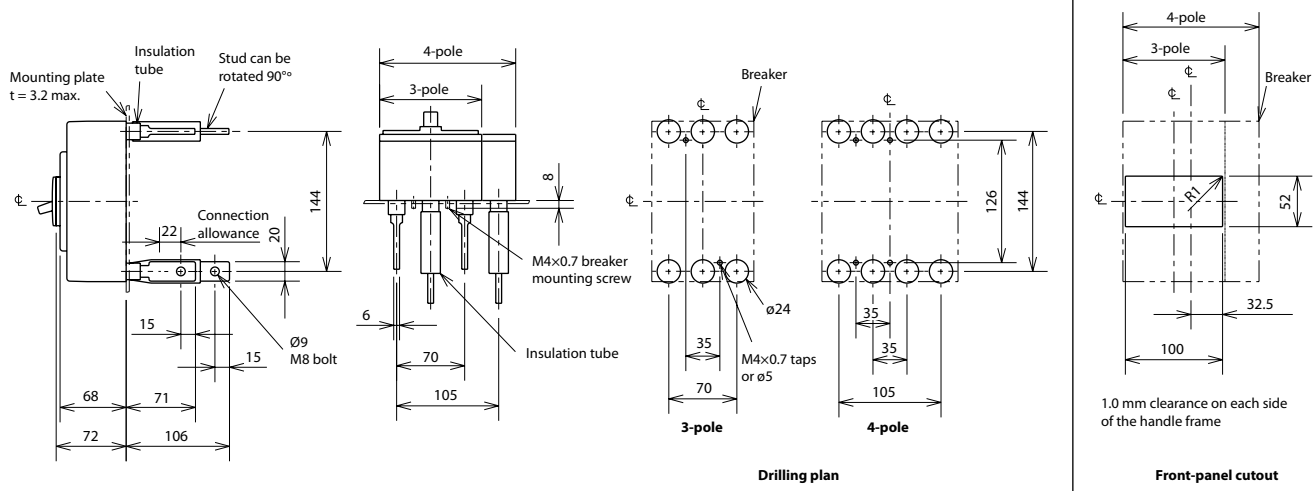
Notes *1 HLF types are used for OFF-lock and HLN types for ON-lock.
*2 Specify the working voltage. Refer to the reference page for type name.

Accessories				Type name	Reference page
Mechanical interlock		MI	3P	MI-05SV3	70
			4P	MI-2SV4	
Terminal cover	Small	TC-S	3P	TCS-2SV3	69
	Large	TC-L	3P	TCL-2SV3	
				TCL-2SV3L	
			4P	TCL-2SV4	
	Skeleton	TTC	3P	TTC-2SV3	
	Rear	BTC	3P	BTC-2SV3	
	Plug-in	PTC	3P	PTC-2SV3	
Electrical operation device				MDS (*2)	67

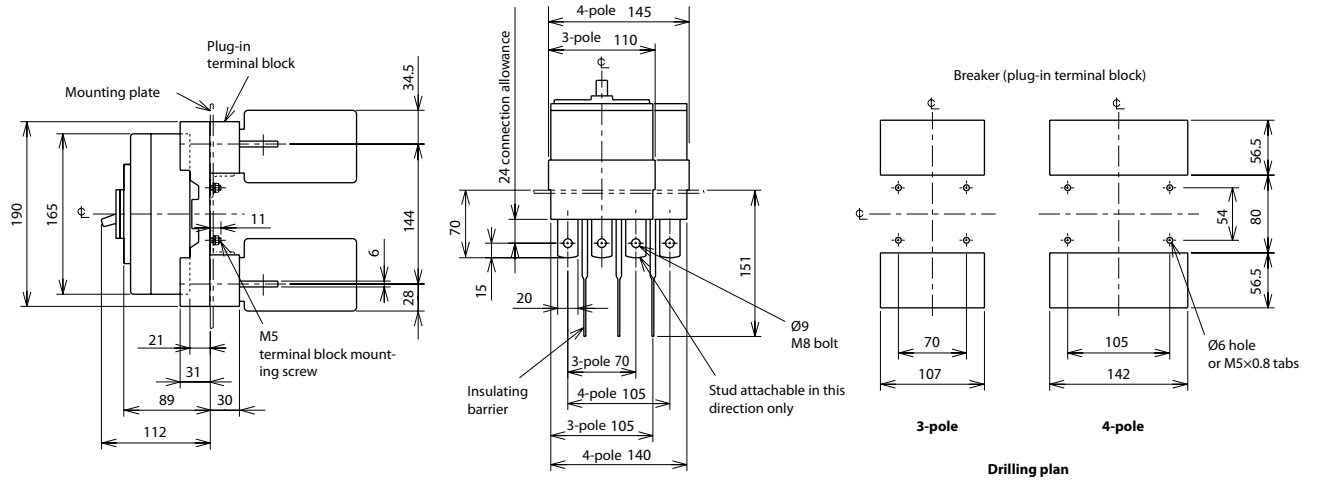
Front connection



Rear connection



Plug-in



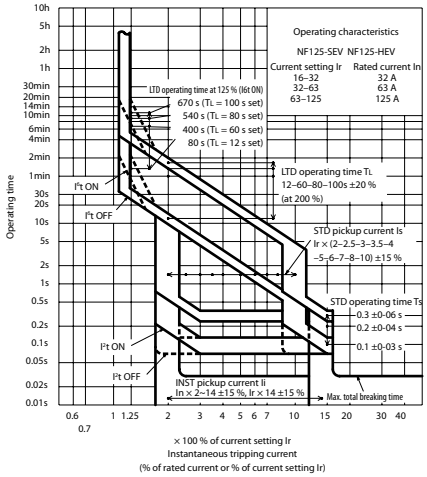
[mm]

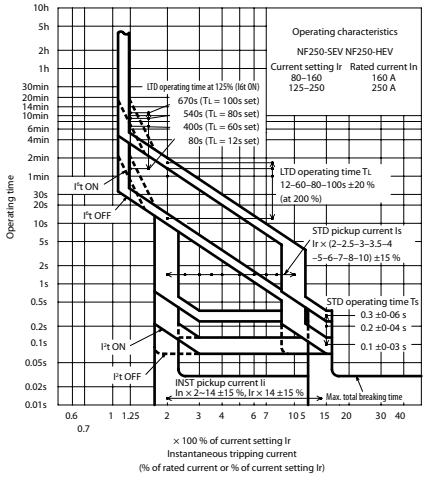
NF125-SEV, NF250-SEV, NF125-HEV, NF250-HEV

NF125-SEV

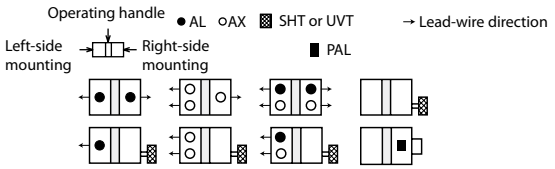
Type name				NF125-SEV	NF250-SEV	NF125-HEV	NF250-HE
Rated current I_n [A]				16–32, 32–63, 63–125	80–160, 125–250	16–32, 32–63, 63–125	80–160, 125–250
Number of poles				3 4	3 4	3 4	3 4
Rated insulation voltage U_i [V]				690	690	690	690
Rated short-cuircit breaking capacity [kA]	IEC/EN 60947-2 (I_{cu}/I_{cs})	AC	690 V	8/8	10/8	8/8	10/8
			500 V	30/30	50/38	30/30	50/38
			440 V	36/36	65/65	36/36	65/65
			415 V	36/36	70/70	36/36	70/70
			400 V	36/36	75/75	36/36	75/75
			380 V	36/36	75/75	36/36	75/75
			230 V	85/85	100/100	85/85	100/100
		DC *1	300 V	—	—	—	—
Standard attached parts (front connection)				Mounting screw: M4×0.7×55 (3P: 2pcs, 4P: 4pcs) Insulation barrier: (3P: 4pcs, 4P: 6pcs)			

Operating characteristics

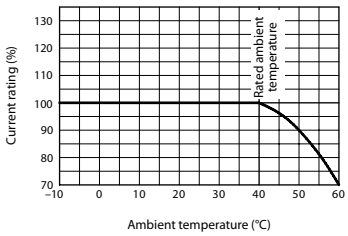




Internal accessories



Ambient compensating curve



The rated current does not have thermal characteristics. Reduce the current as shown in the curve on the left chart if the ambient temperature exceeds 40 °C

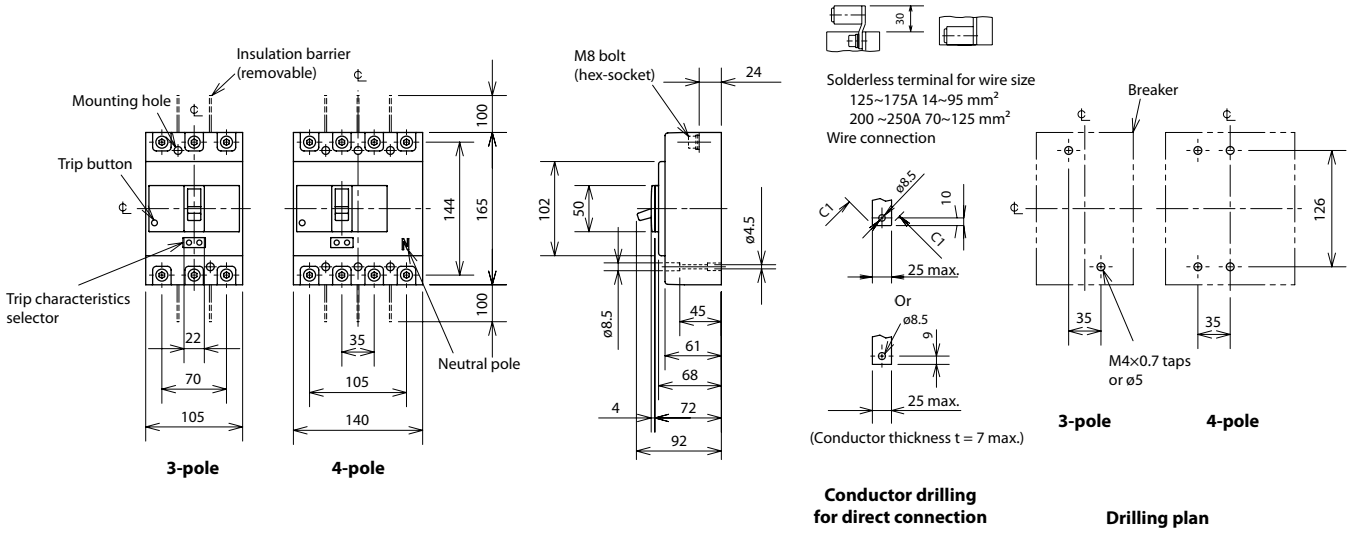
External accessories

Accessories		Type name	Reference page
Operating handle	F	F-2SV	65
	V	V-2SV	64
Handle lock device	LC	LC-05SV	66
	HL (*1)	HLF-05SV	
		HLN-05SV	
	HL-S	HLS-2SV	

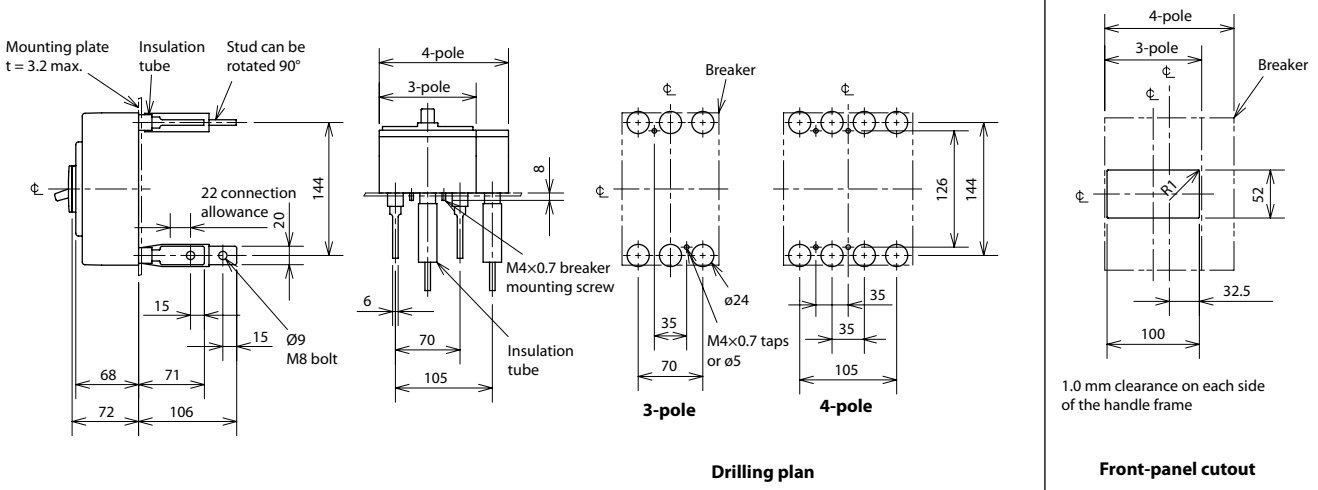
Notes *1 HLF types are used for OFF-lock and HLN types for ON-lock.
*2 Specify the working voltage. Refer to the reference page for type name.

Accessories				Type name	Reference page
Mechanical interlock		MI	3P	MI-05SV3	70
			4P	MI-2SV4	
Terminal cover	Small	TC-S	3P	TCS-2SV3	69
	Large	TC-L	3P	TCL-2SV3	
				TCL-2SV3L	
			4P	TCL-2SV4	
	Skeleton	TTC	3P	TTC-2SV3	
	Rear	BTC	3P	BTC-2SV3	
	Plug-in	PTC	3P	PTC-2SV3	
Electrical operation device				MDS (*2)	67

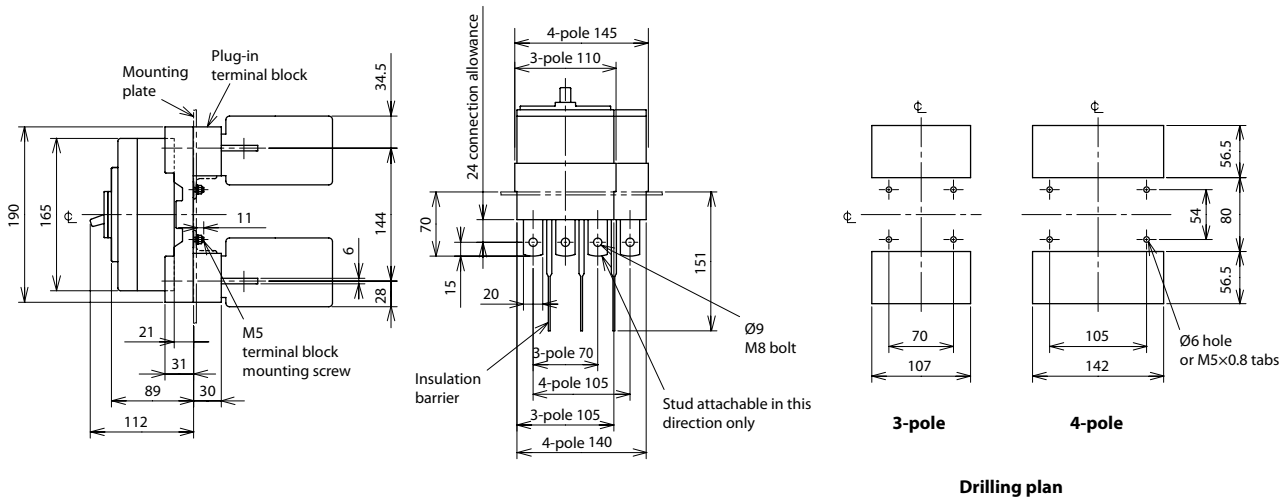
Front connection



Rear connection



Plug-in



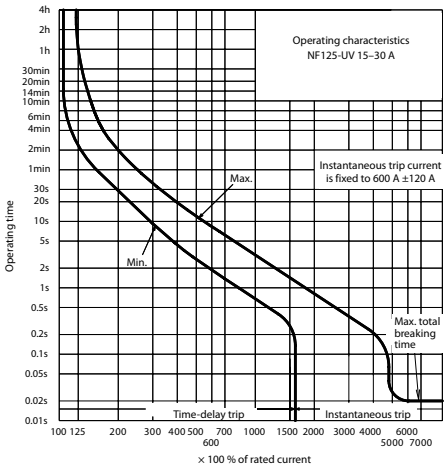
[mm]

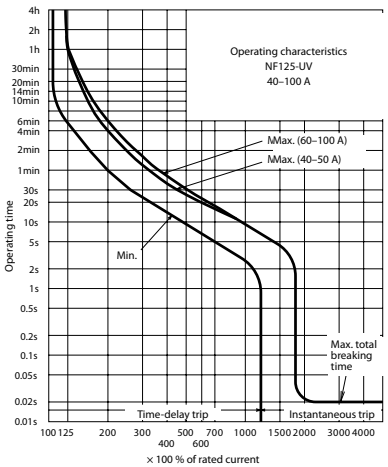
NF125-UV

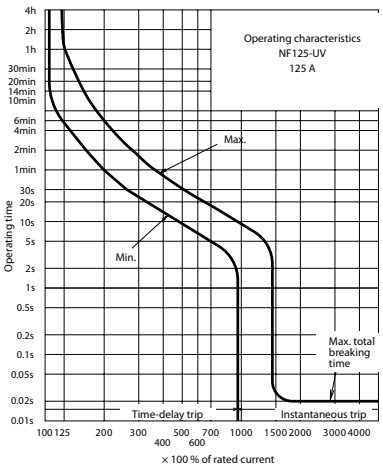
NF125-UV

Type name				NF125-UV	
Rated current I_n [A]				15, 20, 30, 40, 50, 60, 75, 100, 125	
Number of poles				3	4
Rated insulation voltage U_i [V]				690	
Rated short-cuircit breaking capacity [kA]	IEC/EN 60947-2 (I_{cu}/I_{cs})	AC	690 V	10/10	
			500 V	200/200	
			440 V	200/200	
			415 V	200/200	
			400 V	200/200	
			380 V	200/200	
			230 V	200/200	
			200 V	200/200	
		DC *1	300 V	—	
Standard attached parts (front connection)				Mounting screw: M4×0.7×55 (3P: 2pcs, 4P: 4pcs) M4×0.7×73 (3P: 2pcs) Insulation barrier: (3P: 4pcs, 4P: 6pcs)	

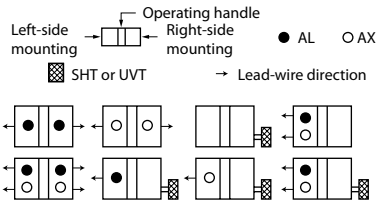
Operating characteristics



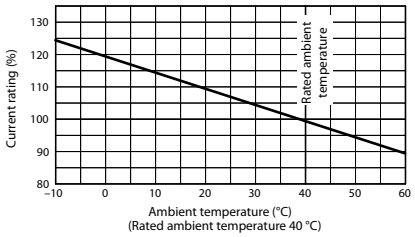




Internal accessories



Ambient compensating curve



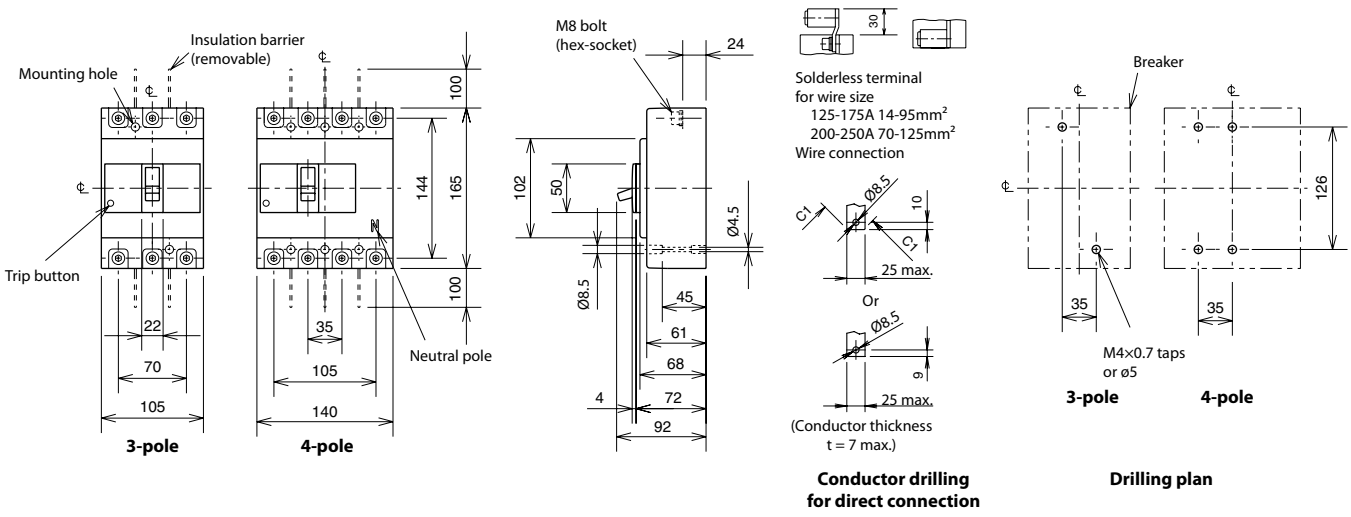
External accessories

Accessories		Type name	Reference page
Operating handle	F	F-1UV	65
	V	V-1UV	64
Handle lock device	LC	LC-05SV	66
	HL (*1)	HLF-05SV	
		HLN-05SV	
	HL-S	HLS-05SV	

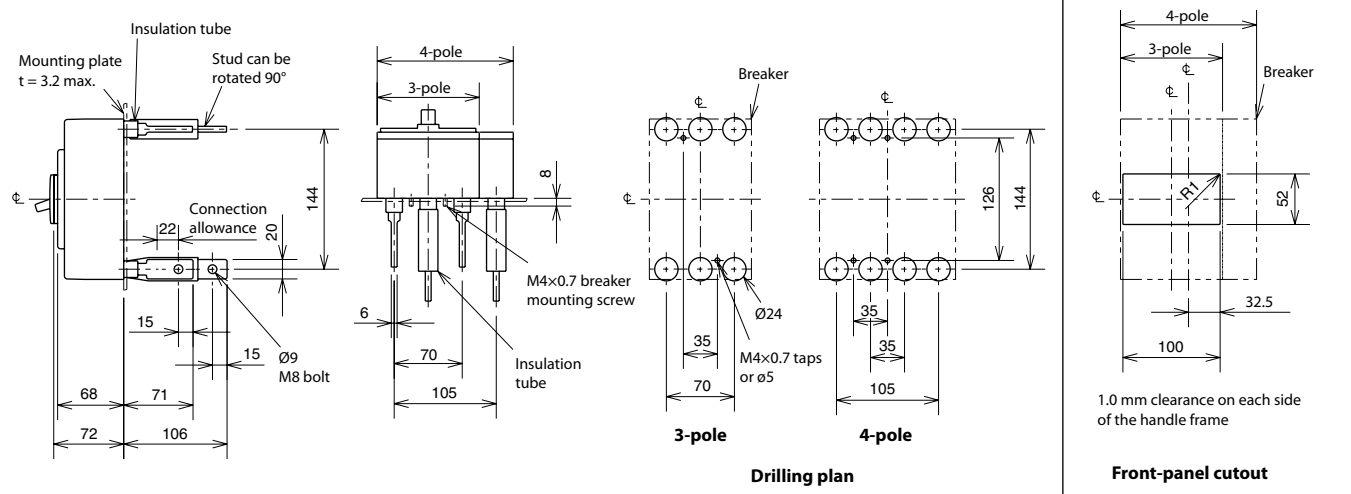
Notes *1 HLF types are used for OFF-lock and HLN types for ON-lock.
*2 Specify the working voltage. Refer to the reference page for type name.

Accessories				Type name	Reference page
Mechanical interlock		MI	3P	MI-05SV3	70
			4P	MI-05SV4	
Terminal cover	Small	TC-S	3P	TCS-1SV3	69
	Large	TC-L	3P	TCL-1SV3	
			4P	TCL-1SV4	
	Skeleton	TTC	3P	TTC-1SV3	
	Rear	BTC	3P	BTC-1SV3	
	Plug-in	PTC	3P	PTC-1SV3	
Electrical operation device				MDS (*2)	67

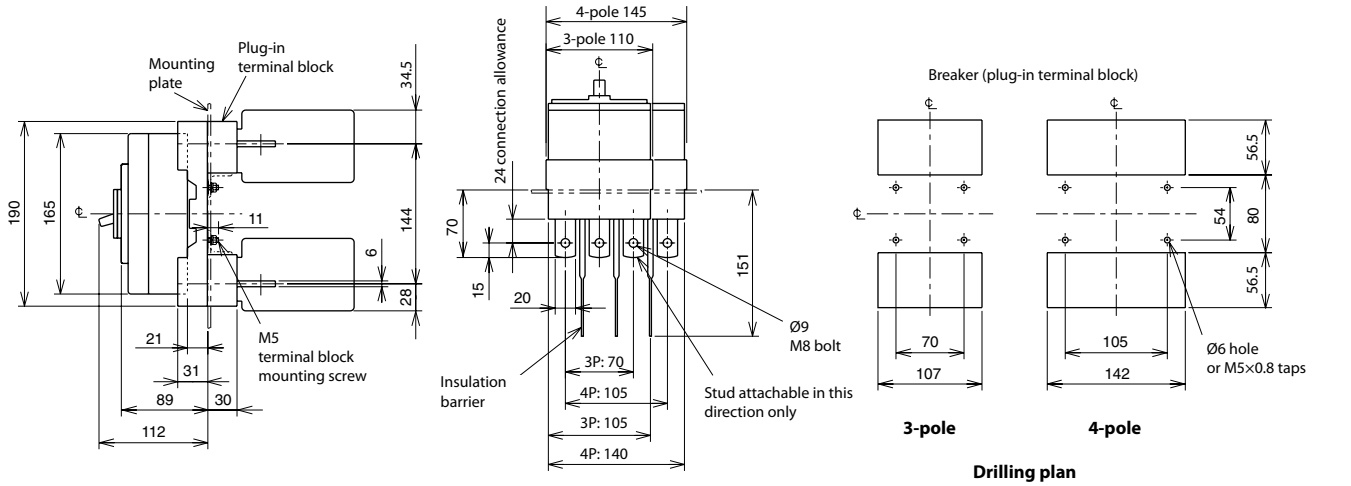
Front connection



Rear connection



Plug-in



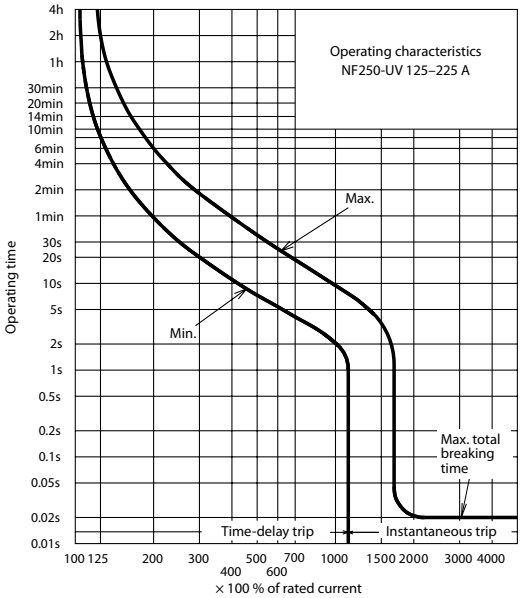
[mm]

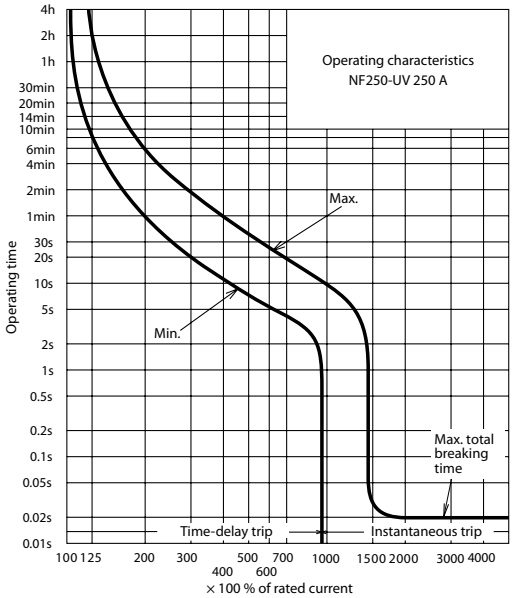
NF250-UV

NF250-UV

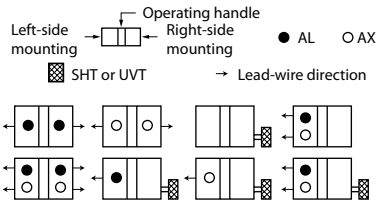
Type name				NF250-UV	
Rated current I_n [A]				125, 150, 175, 200, 225, 250	
Number of poles				3	4
Rated insulation voltage U_i [V]				690	
Rated short-cuircit breaking capacity [kA]	IEC/EN 60947-2 (I_{cu}/I_{cs})	AC	690 V	15/15	
			500 V	200/200	
			440 V	200/200	
			415 V	200/200	
			400 V	200/200	
			380 V	200/200	
			230 V	200/200	
			200 V	200/200	
		DC *1	300 V	—	
Standard attached parts (front connection)				Mounting screw: M4×0.7×55 (3P: 2pcs, 4P: 4pcs) M4×0.7×73 (3P: 2pcs) Insulation barrier: (3P: 4pcs, 4P: 6pcs)	

Operating characteristics

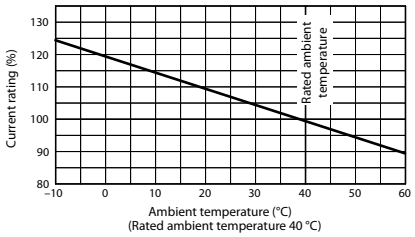




Internal accessories



Ambient compensating curve



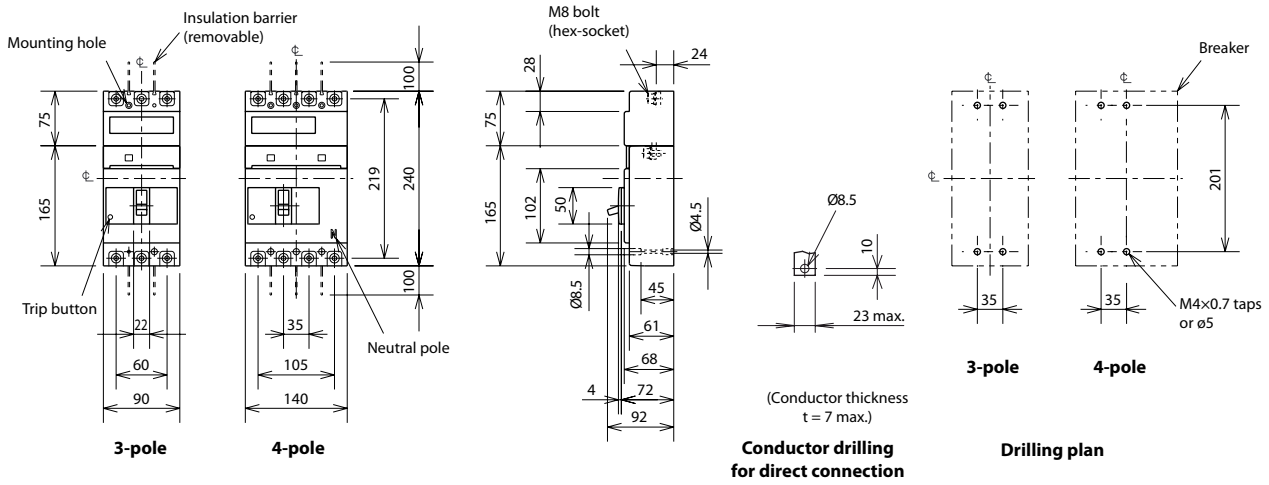
External accessories

Accessories		Type name	Reference page
Operating handle	F	F-2UV	65
	V	V-2UV	64
Handle lock device	LC	LC-05SV	66
	HL (*1)	HLF-05SV	
		HLN-05SV	
	HL-S	HLS-2SV	

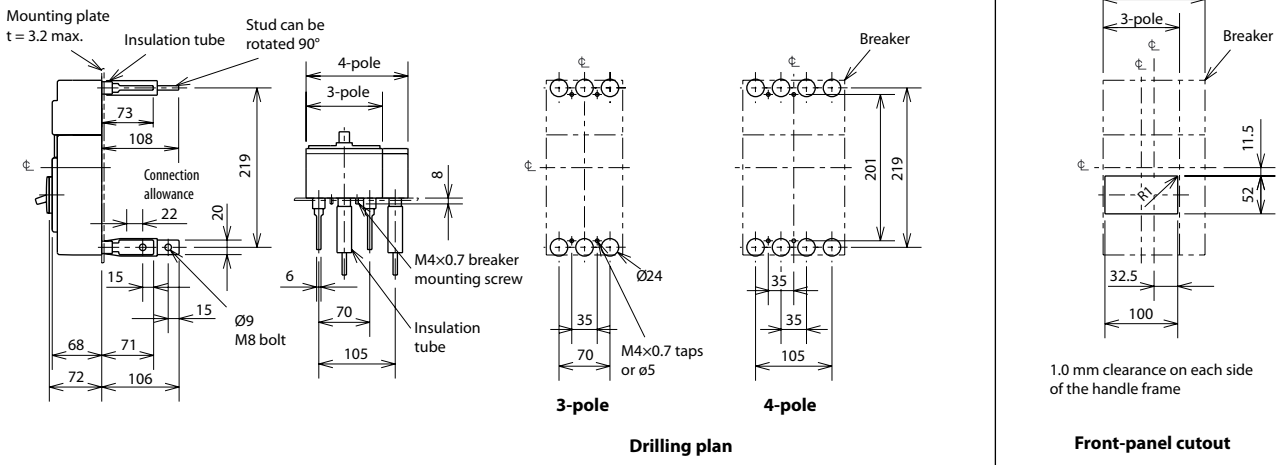
Notes *1 HLF types are used for OFF-lock and HLN types for ON-lock.
*2 Specify the working voltage. Refer to the reference page for type name.

Accessories				Type name	Reference page
Mechanical interlock		MI	3P	MI-05SV3	70
			4P	MI-05SV4	
Terminal cover	Small	TC-S	3P	TCS-2SV3	69
	Large	TC-L	3P	TCL-2SV3	
			4P	TCL-2SV4	
	Skeleton	TTC	3P	TTC-2SV3	
	Rear	BTC	3P	BTC-2SV3	
	Plug-in	PTC	3P	PTC-2SV3	
Electrical operation device				MDS (*2)	67

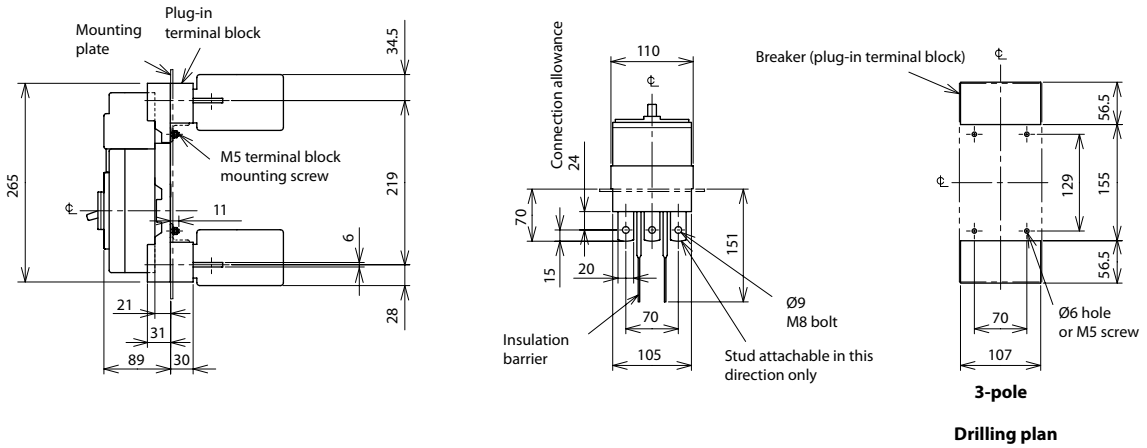
Front connection



Rear connection



Plug-in



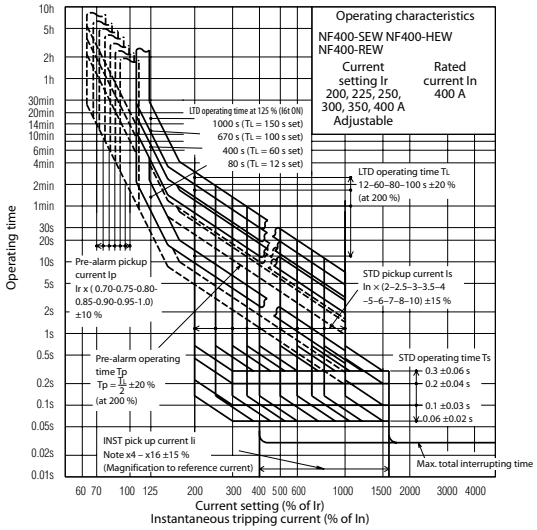
[mm]

NF400-SEW, NF400-HEW, NF400-REW

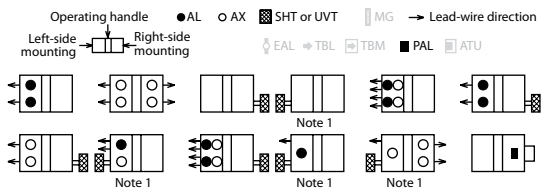
NF400-SEW

Type name				NF400-SEW	NF400-HEW	NF400-REW
Rated current I_n [A]				200, 225, 250, 300, 350, 400	200, 225, 250, 300, 350, 400	200, 225, 250, 300, 350, 400
Number of poles				3 4	3 4	3
Rated insulation voltage U_i [V]				690	690	690
Rated short-cuircit breaking capacity [kA]	IEC/EN 60947-2 (I_{cu}/I_{cs})	AC	690 V	10/10	35/18	—
			500 V	30/30	50/50	70/35
			440 V	42/42	65/65	125/63
			415 V	50/50	70/70	125/63
			400 V	50/50	70/70	125/63
			380 V	50/50	70/70	125/63
			230 V	85/85	100/100	150/75
			200 V	85/85	100/100	150/75
		DC	250 V	—	—	—
Standard attached parts (front connection)				Mounting screw: M6×72 (4pcs) Insulation barrier: (3P: 4pcs, 4P: 6pcs)		

Operating characteristics

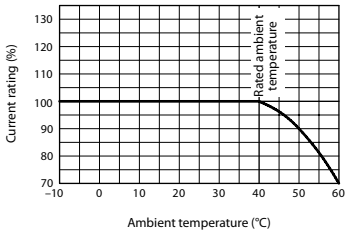


Internal accessories



Note 1: Right-side mounting is standard of SHT and UVT.
Specify separately for left-sidenting.

Ambient compensating curve



The rated current does not have thermal characteristics. Reduce the current as shown in the curve on the left chart if the ambient temperature exceeds 40°C

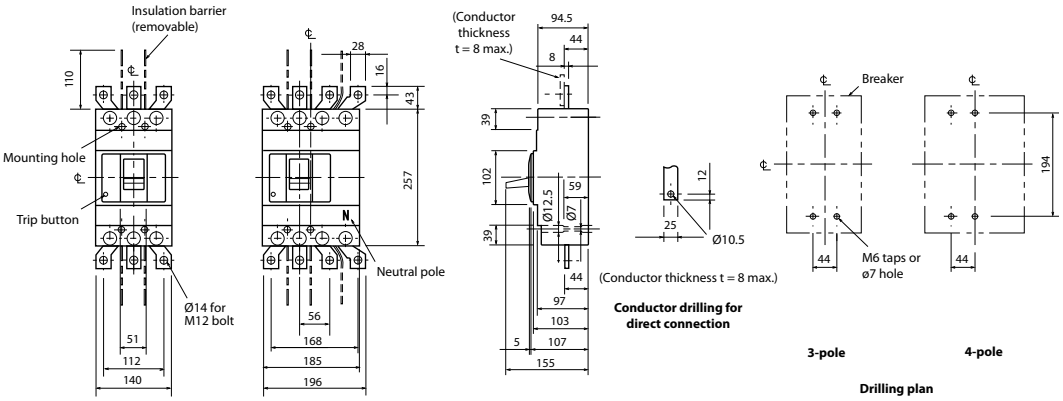
External accessories

Accessories		Type name	Reference page
Operating handle	F	F-4S	65
	V	V-4S	64
Handle lock device	HL (*1)	HLF-4SW	66
	HL-S	HLN-4SW	
		HLS-4SW	

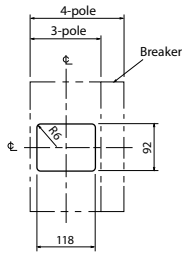
Notes *1 HLF types are used for OFF-lock and HLN types for ON-lock.
*2 Specify the working voltage. Refer to the reference page for type name.

Accessories				Type name	Reference page
Mechanical interlock	MI		3P	MI-4SW3	70
			4P	MI-4SW4	
Terminal cover	Large	TC-L	3P	TCL-4SW3	69
			4P	TCL-4SW4	
	Skeleton	TTC	3P	TTC-4SW3	
			4P	TTC-4SW4	
	Rear	BTC	3P	BTC-4SW3	
			4P	BTC-4SW4	
Electrical operation device				MDS (*2)	67

Front connection



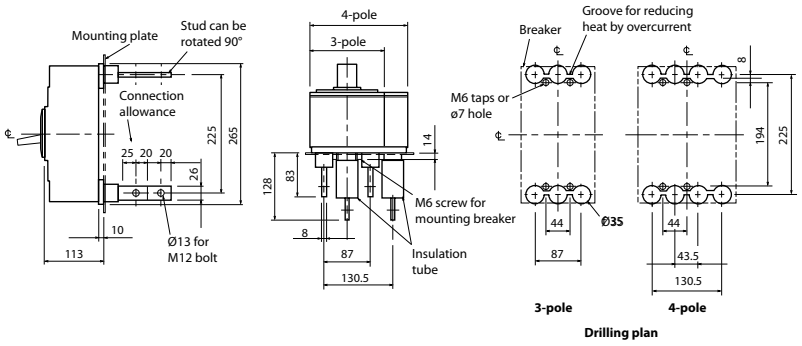
Conductor drilling for direct connection



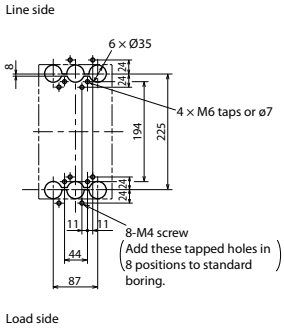
1.0 mm clearance on each side of the handle frame

Front-panel cutout

Rear connection

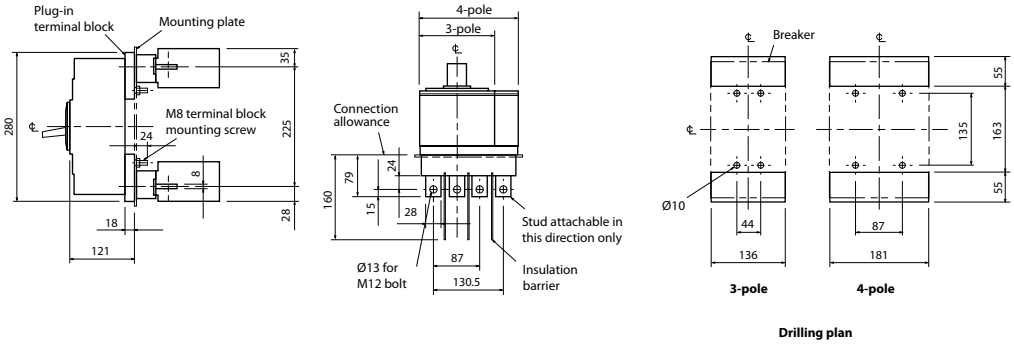


Boring dimensions for rear connection type barriers (3-pole)



Note The bore dimensional drawing shows the breaker viewed from the rear.

Plug-in



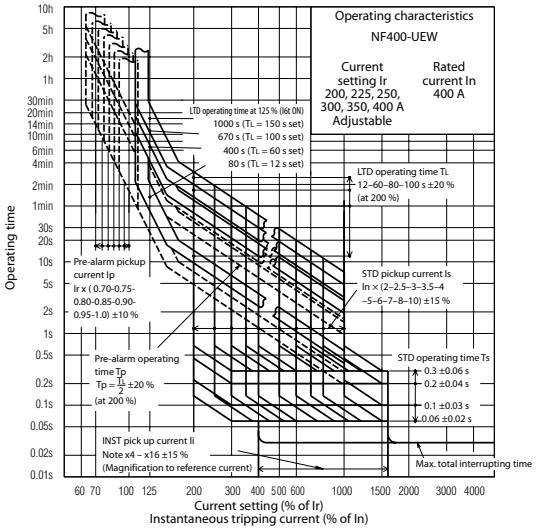
[mm]

NF400-UEW

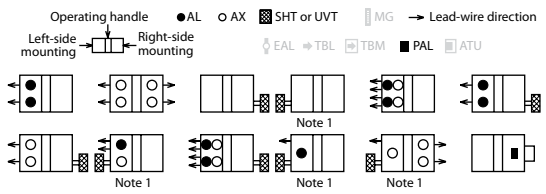
NF400-UEW

Type name				NF400-UEW
Rated current I_n [A]				200, 225, 250, 300, 350, 400
Number of poles				3
Rated insulation voltage U_i [V]				690
Rated short-cuircit breaking capacity [kA]	IEC/EN 60947-2 (I_{cu}/I_{cs})	AC	690 V	—
			500 V	170/170
			440 V	200/200
			415 V	200/200
			400 V	200/200
			380 V	200/200
			230 V	200/200
			200 V	200/200
		DC	250 V	—
Standard attached parts (front connection)				Mounting screw: M6×65 (2pcs), M6×174 (2pcs) Insulation barrier: (3P: 4pcs)

Operating characteristics

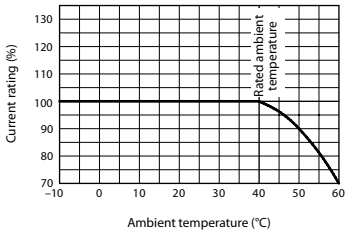


Internal accessories



Note 1: Right-side mounting is standard of SHT and UVT.
Specify separately for left-sidenting.

Ambient compensating curve



The rated current does not have thermal characteristics. Reduce the current as shown in the curve on the left chart if the ambient temperature exceeds 40°C

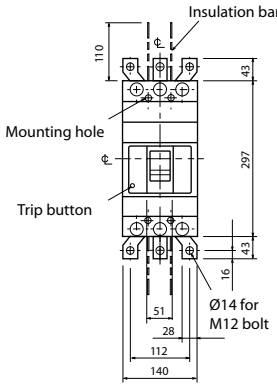
External accessories

Accessories		Type name	Reference page
Operating handle	F	F-4U	65
	V	V-4U	64
Handle lock device	HL (*1)	HLF-4SW	66
		HLN-4SW	
	HL-S	HLS-4SW	

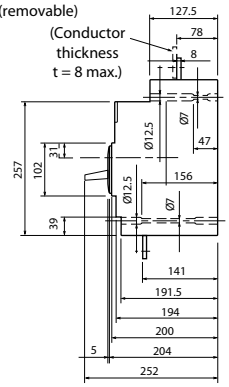
Accessories				Type name	Reference page
Mechanical interlock		MI	3P	MI-4SW3	70
Terminal cover	Large	TC-L	3P	TCL-4SW3	69
	Skeleton	TTC	3P	TTC-4SW3	
	Rear	BTC	3P	BTC-4SW3	
Electrical operation device				MDS (*2)	67

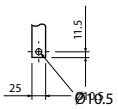
Notes *1 HLF types are used for OFF-lock and HLN types for ON-lock.
*2 Specify the working voltage. Refer to the reference page for type name.

Front connection



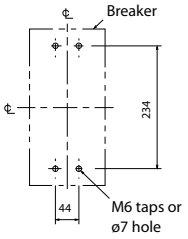
3-pole





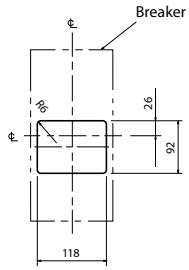
(Conductor thickness
t = 8 max.)

Conductor drilling for direct connection



3-pole

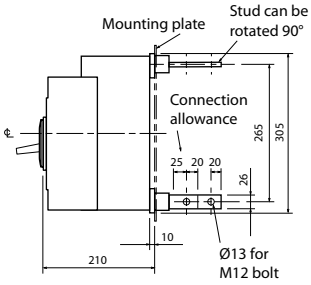
Drilling plan

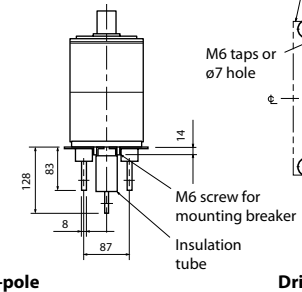


1.0 mm clearance on each side
of the handle frame

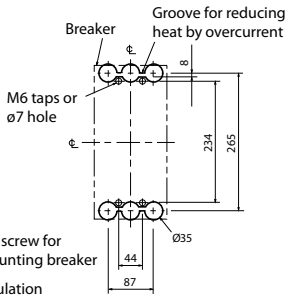
Front-panel cutout

Rear connection





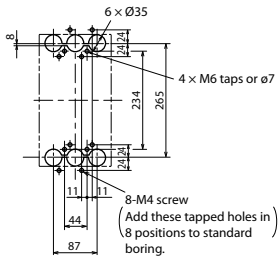
3-pole



Drilling plan

Boring dimensions for rear connection type barriers (3-pole)

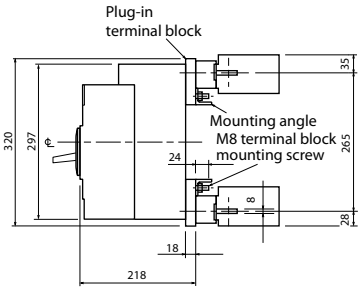
Line side



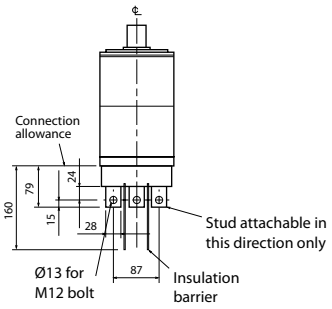
Load side

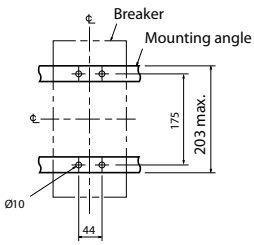
Note The bore dimensional drawing shows the breaker viewed from the rear.

Plug-in



3-pole





3-pole

Drilling plan

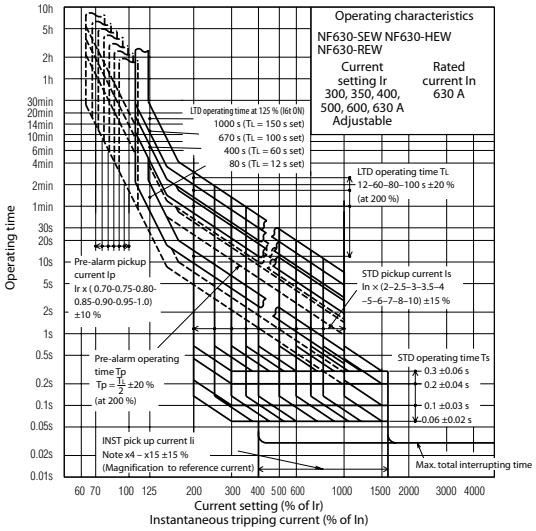
[mm]

NF630-SEW, NF630-HEW, NF630-REW

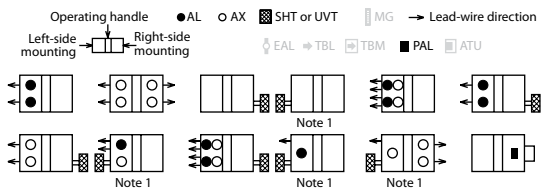
NF630-SEW

Type name				NF630-SEW	NF630-HEW	NF630-REW
Rated current I_n [A]				300, 350, 400, 500, 600, 630	300, 350, 400, 500, 600, 630	300, 350, 400 500, 600, 630
Number of poles				3 4	3 4	3
Rated insulation voltage U_i [V]				690	690	690
Rated short-cuircit breaking capacity [kA]	IEC/EN 60947-2 (I_{cu}/I_{cs})	AC	690 V	10/10	35/18	—
			500 V	30/30	50/50	70/35
			440 V	42/42	65/65	125/63
			415 V	50/50	70/70	125/63
			400 V	50/50	70/70	125/63
			380 V	50/50	70/70	125/63
			230 V	85/85	100/100	150/75
			200 V	85/85	100/100	150/75
		DC	250 V	—	—	—
Standard attached parts (front connection)				Mounting screw: M6×72 (4pcs) Insulation barrier: (3P: 4pcs, 4P: 6pcs)		

Operating characteristics

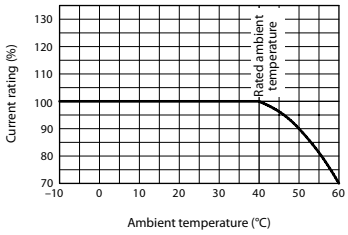


Internal accessories



Note 1: Right-side mounting is standard of SHT and UVT.
Specify separately for left-sidenting.

Ambient compensating curve



The rated current does not have thermal characteristics. Reduce the current as shown in the curve on the left chart if the ambient temperature exceeds 40 °C

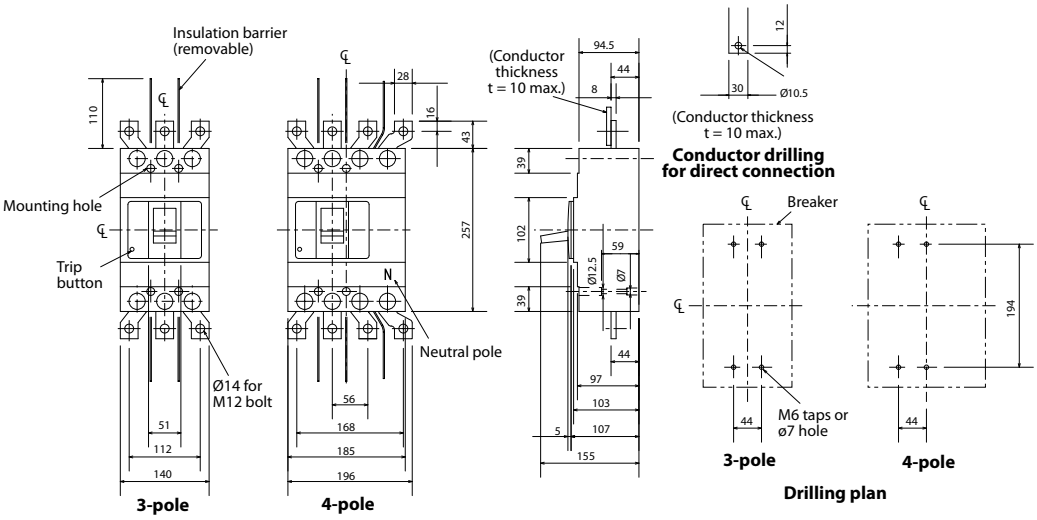
External accessories

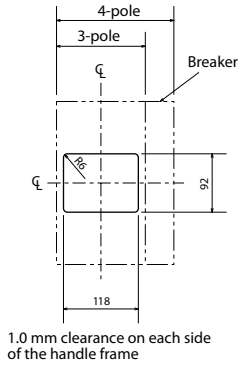
Accessories		Type name	Reference page
Operating handle	F	F-4S	65
	V	V-4S	64
Handle lock device	HL (*1)	HLF-4SW	66
	HL-S	HLS-4SW	

Notes *1 HLF types are used for OFF-lock and HLN types for ON-lock.
*2 Specify the working voltage. Refer to the reference page for type name.

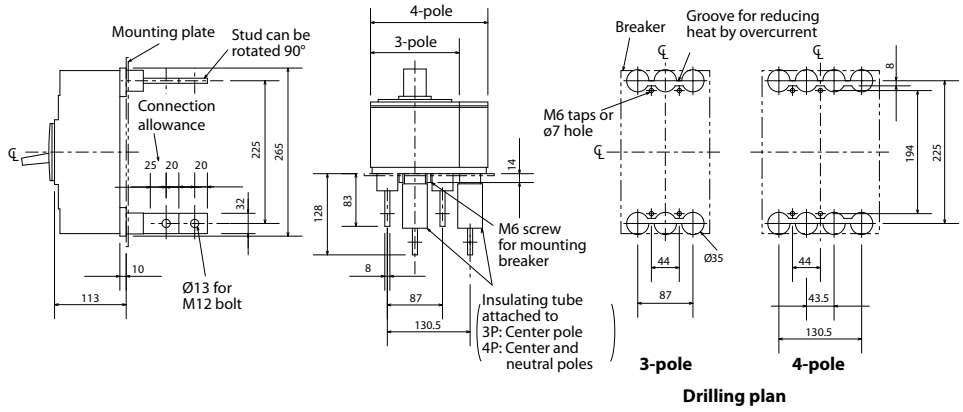
Accessories				Type name	Reference page
Mechanical interlock		MI	3P	MI-4SW3	70
			4P	MI-4SW4	
Terminal cover	Large	TC-L	3P	TCL-4SW3	69
	Skeleton	TTC	3P	TTC-4SW3	
			4P	TTC-4SW4	
	Rear	BTC	3P	BTC-4SW3	
			4P	BTC-4SW4	
Electrical operation device				MDS (*2)	67

Front connection

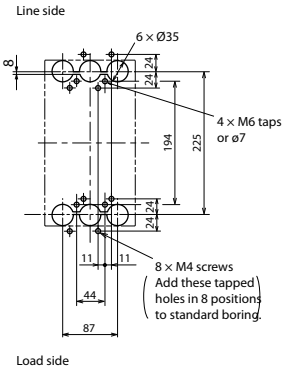




Rear connection

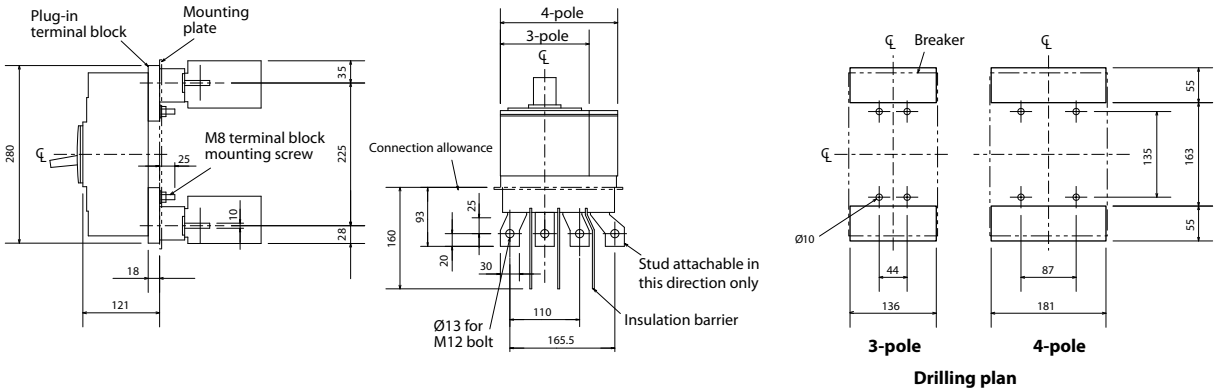


Boring dimensions for rear connection type barriers (3-pole)



Note The bore dimensional drawing shows the breaker viewed from the rear.

Plug-in



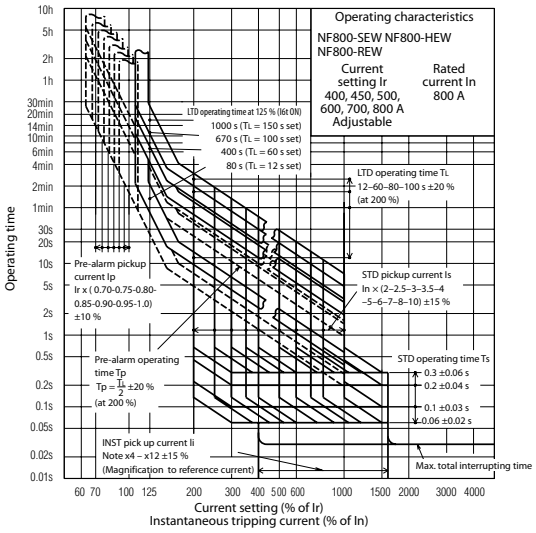
[mm]

NF800-SEW, NF800-HEW, NF800-REW

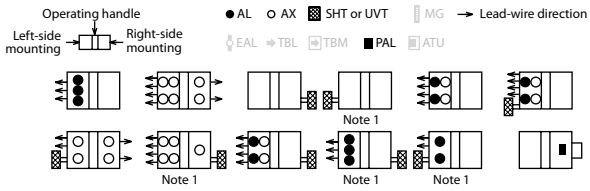
NF800-SEV

Type name				NF800-SEW	NF800-HEW	NF800-REW
Rated current I_n [A]				400, 450, 500, 600, 700, 800	400, 450, 500, 600, 700, 800	400, 450, 500, 600, 700, 800
Number of poles				3 4	3 4	3
Rated insulation voltage U_i [V]				690	690	690
Rated short-cuircit breaking capacity [kA]	IEC/EN 60947-2 (I_{cu}/I_{cs})	AC	690 V	10/10	15/15	—
			500 V	30/30	50/50	70/35
			440 V	42/42	65/65	125/63
			415 V	50/50	70/70	125/63
			400 V	50/50	70/70	125/63
			380 V	50/50	70/70	125/63
			230 V	85/85	100/100	150/75
			200 V	85/85	100/100	150/75
		DC	250 V	—	—	—
Standard attached parts (front connection)				Mounting screw: M6×35 (4pcs) Insulation barrier: (3P: 2pcs, 4P: 3pcs)		

Operating characteristics

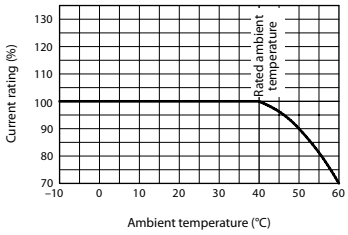


Internal accessories



Note 1: Right-side mounting is standard of SHT and UVT.
Specify separately for left-sidenting.

Ambient compensating curve



The rated current does not have thermal characteristics. Reduce the current as shown in the curve on the left chart if the ambient temperature exceeds 40 °C

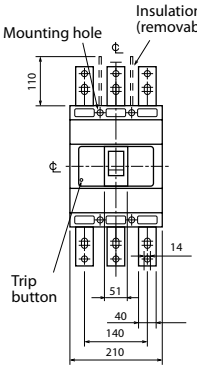
External accessories

Accessories		Type name	Reference page
Operating handle	F	F-8S	65
	V	V-8S	64
Handle lock device	HL (*1)	HLF-4SW	66
		HLN-4SW	
	HL-S	HLS-8SW	

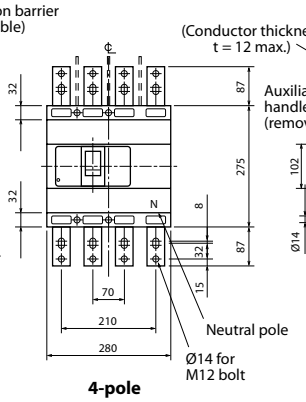
Notes *1 HLF types are used for OFF-lock and HLN types for ON-lock.
*2 Specify the working voltage. Refer to the reference page for type name.

Accessories				Type name	Reference page
Mechanical interlock		MI	3P	MI-8SW3	70
			4P	MI-8SW4	
Terminal cover	Large	TC-L	3P	TCL-8SW3	69
			4P	TCL-8SW4	
	Skeleton	TTC	3P	TTC-8SW3	
			4P	TTC-8SW4	
	Rear	BTC	3P	BTC-8SW3	
			4P	BTC-8SW4	
Electrical operation device				MDS (*2)	67

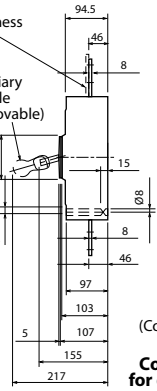
Front connection

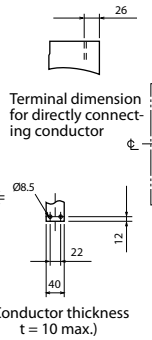


3-pole

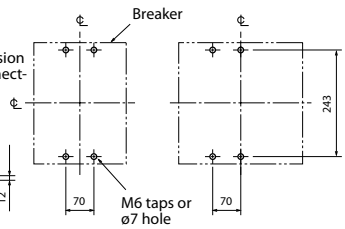


4-pole



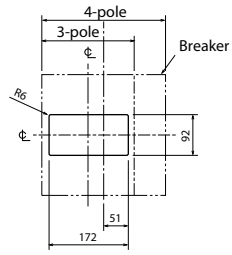


Conductor drilling for direct connection



3-pole **4-pole**

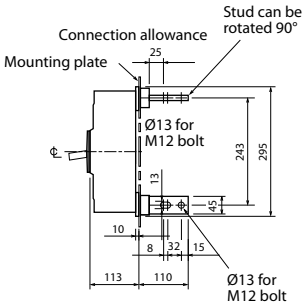
Drilling plan

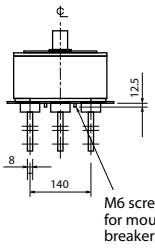


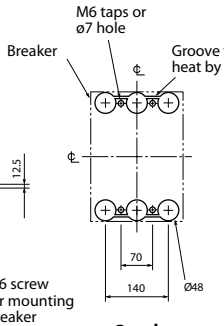
1.0 mm clearance on each side of the handle frame

Front-panel cutout

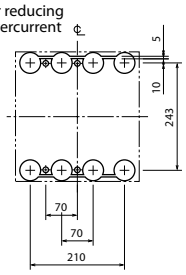
Rear connection







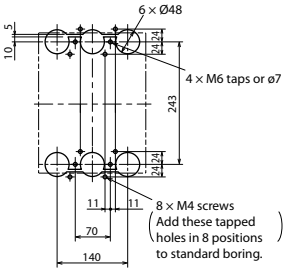
3-pole



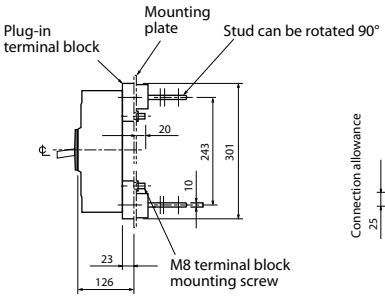
4-pole

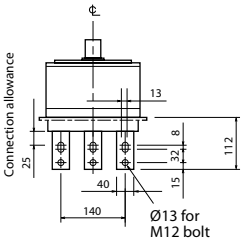
Drilling plan

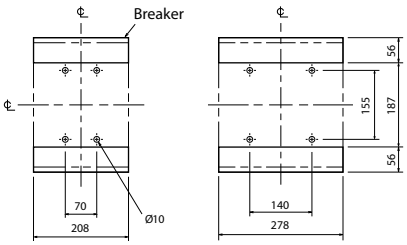
Boring dimensions for rear connection type barriers (3-pole)



Plug-in







3-pole **4-pole**

Drilling plan

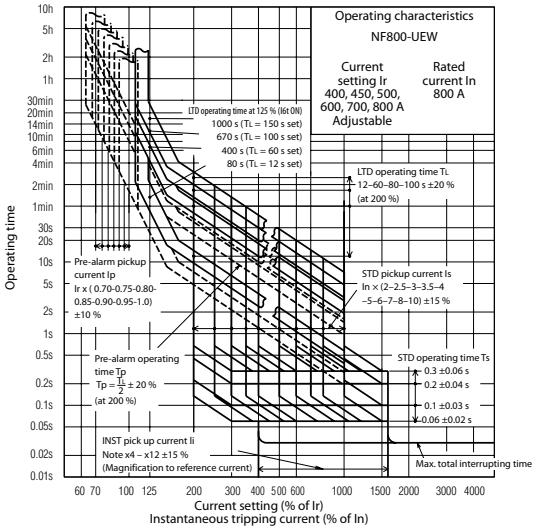
[mm]

NF800-UEW

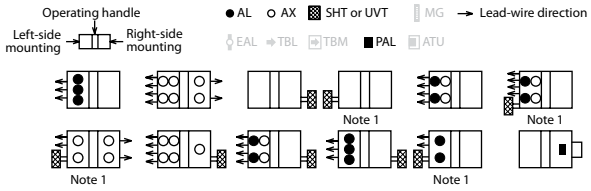
NF800-UEW

Type name				NF800-UEW
Rated current I_n [A]				400, 450, 500, 600, 700, 800
Number of poles				3 4
Rated insulation voltage U_i [V]				690
Rated short-cuircit breaking capacity [kA]	IEC/EN 60947-2 (I_{cu}/I_{cs})	AC	690 V	35/35
			500 V	170/170
			440 V	200/200
			415 V	200/200
			400 V	200/200
			380 V	200/200
			230 V	200/200
			200 V	200/200
		DC	300 V	—
Standard attached parts (front connection)				Mounting screw: 3P: M6×35, M6×132 (2pcs each) 4P: M6×35 (3pcs), M6×132 (2pcs) Insulation barrier: (3P: 2pcs, 4P: 3pcs)

Operating characteristics

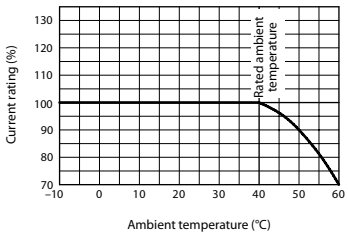


Internal accessories



Note 1: Right-side mounting is standard of SHT and UVT.
Specify separately for left-sidenting.

Ambient compensating curve



The rated current does not have thermal characteristics. Reduce the current as shown in the curve on the left chart if the ambient temperature exceeds 40 °C

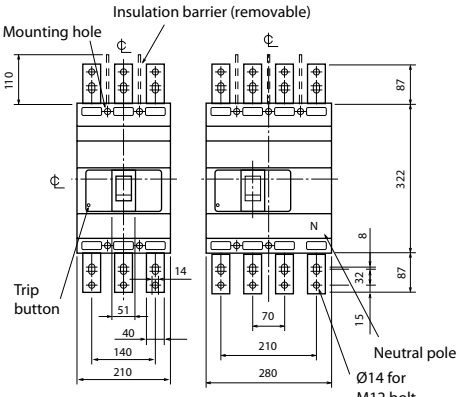
External accessories

Accessories			Type name	Reference page
Operating handle	F		F-8U	65
Handle lock device	HL		HL-4SW	66
	HL-S		HLS-8UW	
Mechanical interlock	MI	3P	MI-8SW3	70
		4P	MI-8SW4	

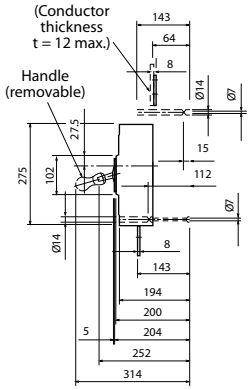
Accessories				Type name	Reference page
Terminal cover	Large	TC-L	3P	TCL-8UW3	69
			4P	TCL-8UW4	
	Rear	BTC	3P	BTC-8SW3	
			4P	BTC-8SW4	
Electrical operation device				MDS (*1)	67

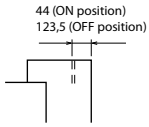
Notes *1 Specify the working voltage. Refer to the reference page for type name.

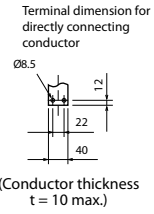
Front connection



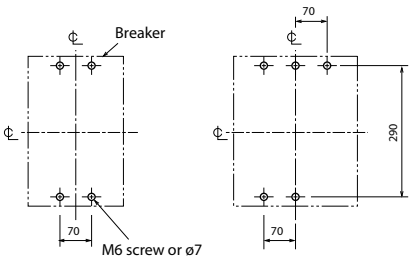
3-pole **4-pole**





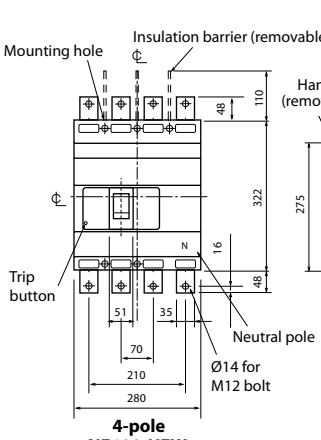


Conductor drilling for direct connection

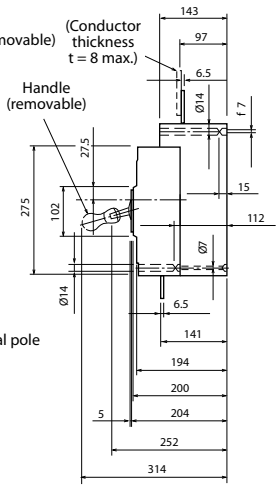


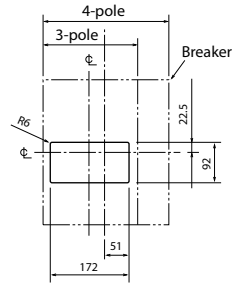
3-pole **4-pole**

Drilling plan



4-pole
NF400-UEW

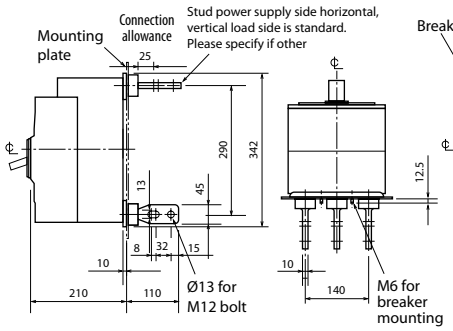


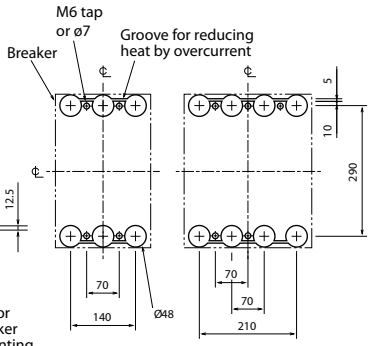


1.0mm clearance on each side of the handle frame

Front-panel cutout

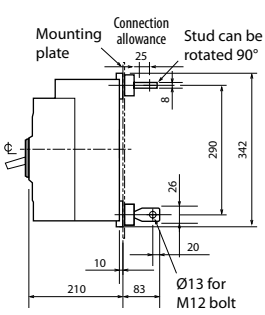
Rear connection





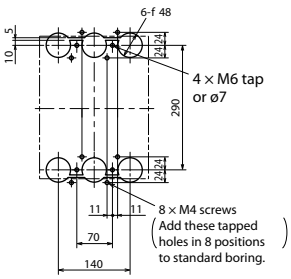
3-pole **4-pole**

Drilling plan



4-pole
NF400-UEW

Boring dimensions for rear connection type barriers (3-pole)



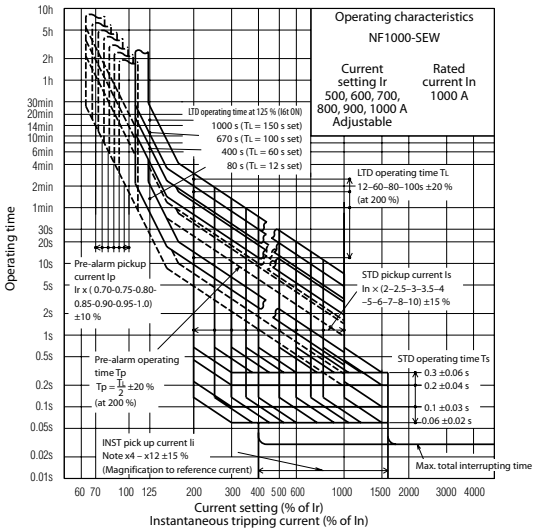
[mm]

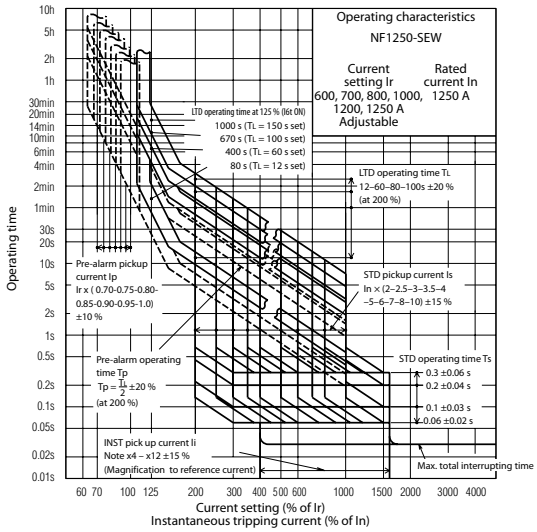
NF1000-SEW, NF1250-SEW

NF1000-SEW

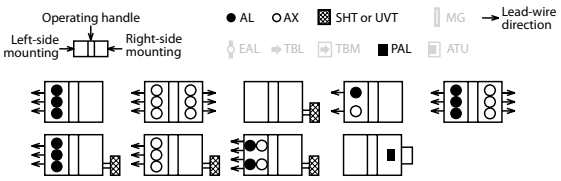
Type name				NF1000-SEW		NF1250-SEW	
Rated current I_n [A]				500, 600, 700, 800, 900, 1000		600, 700, 800, 1000, 1200, 1250	
Number of poles				3	4	3	4
Rated insulation voltage U_i [V]				690		690	
Rated short-cuircit breaking capacity [kA]	IEC/EN 60947-2 (I_{cu}/I_{cs})	AC	690 V	25/13		25/13	
			500 V	65/33		65/33	
			440 V	85/43		85/43	
			415 V	85/43		85/43	
			400 V	85/43		85/43	
			380 V	85/43		85/43	
			230 V	125/63		125/63	
			200 V	125/63		125/63	
		DC	250 V	—		—	
Standard attached parts (front connection)				Mounting screw: M8×40 (4pcs each) Insulation barrier: (3P: 2pcs, 4P: 3pcs)			

Operating characteristics

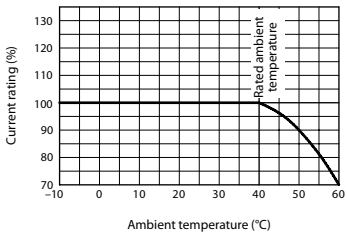




Internal accessories



Ambient compensating curve



The rated current does not have thermal characteristics. Reduce the current as shown in the curve on the left chart if the ambient temperature exceeds 40 °C

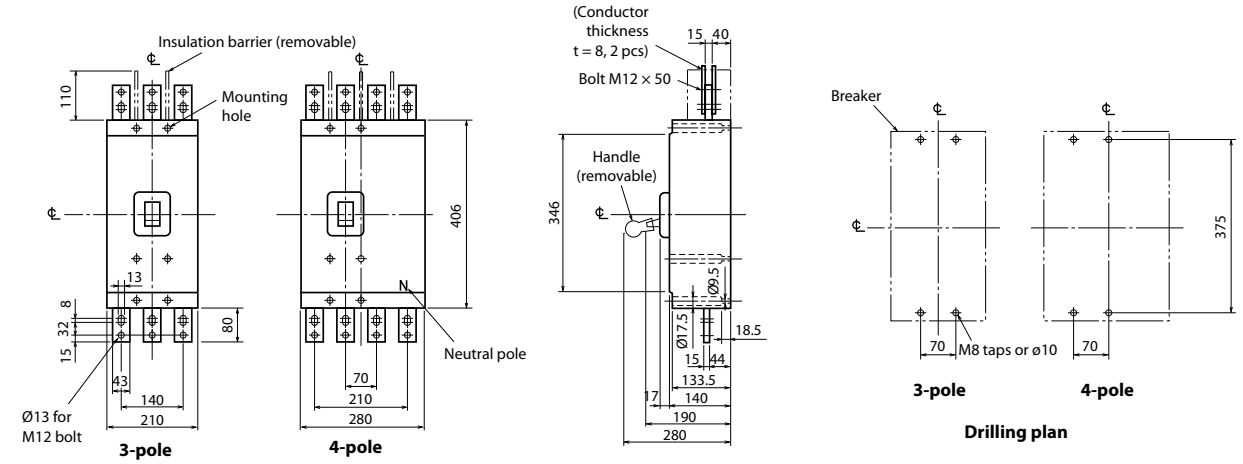
External accessories

Accessories			Type name	Reference page
Handle lock device	HL		HL (on request)	66
Mechanical interlock	MI	3P	MI-10SW3	70
		4P	MI-10SW4	

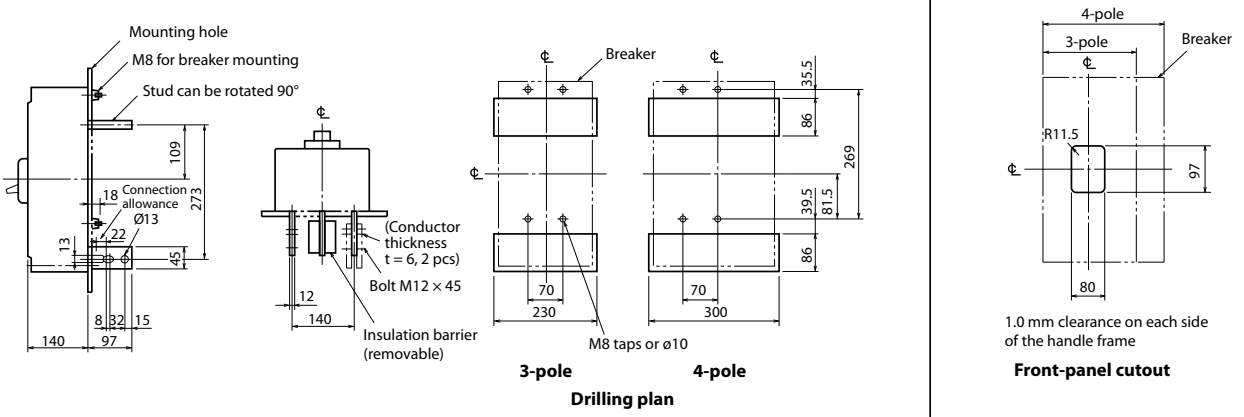
Accessories				Type name	Reference page
Terminal cover	Large	TC-L	3P	TCL-10SW3	69
			4P	TCL-10SW4	
Electrical operation device				MDS (*1)	67

Notes *1 Specify the working voltage. Refer to the reference page for type name.

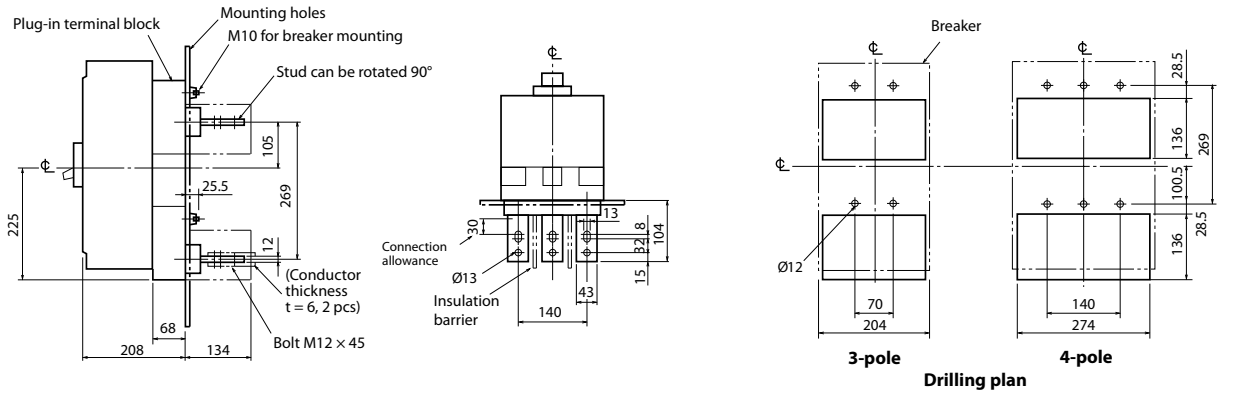
Front connection



Rear connection



Plug-in



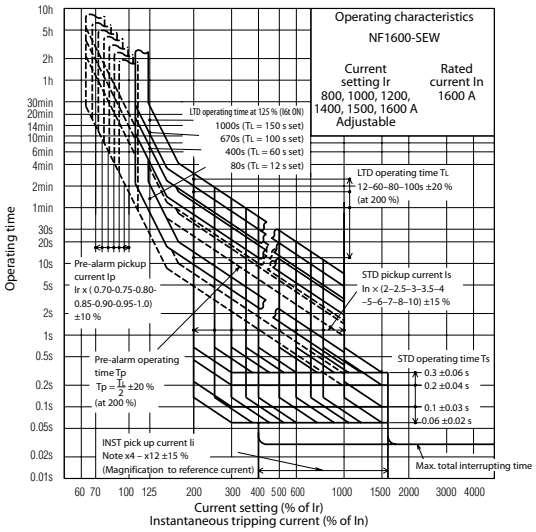
[mm]

NF1600-SEW

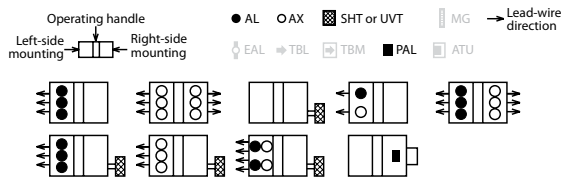
NF1600-SEW

Type name				NF1600-SEW
Rated current I_n [A]				800, 1000, 1200, 1400, 1500, 1600
Number of poles				3 4
Rated insulation voltage U_i [V]				690
Rated short-cuircit breaking capacity [kA]	IEC/EN 60947-2 (I_{cu}/I_{cs})	AC	690 V	25/13
			500 V	65/33
			440 V	85/43
			415 V	85/43
			400 V	85/43
			380 V	85/43
			230 V	125/63
			200 V	125/63
		DC	250 V	—
Standard attached parts (front connection)				Mounting screw: M8×40 (4pcs each) Insulation barrier: (3P: 2pcs, 4P: 3pcs)

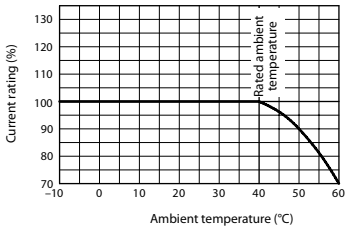
Operating characteristics



Internal accessories



Ambient compensating curve



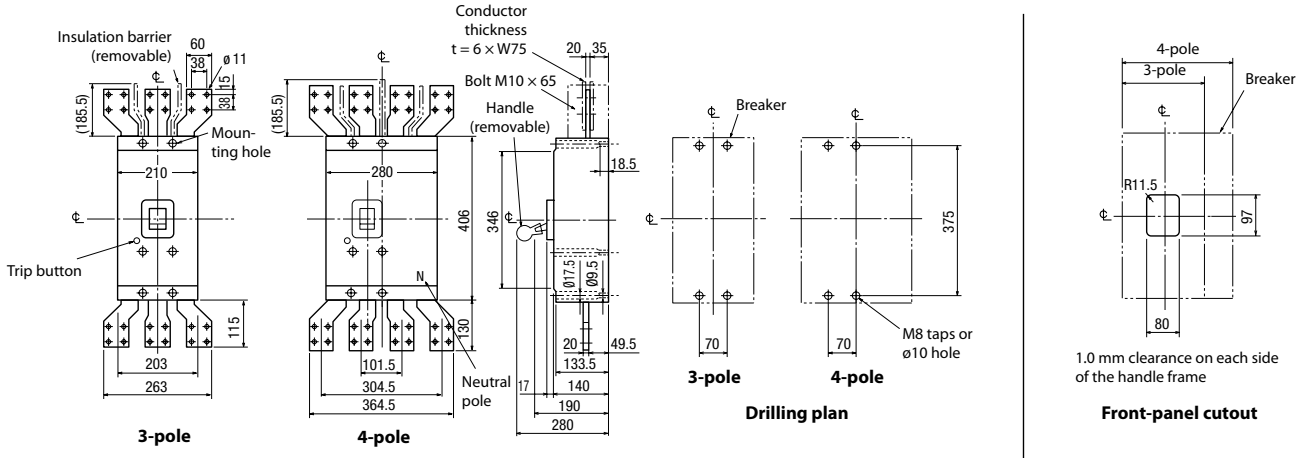
The rated current does not have thermal characteristics. Reduce the current as shown in the curve on the left chart if the ambient temperature exceeds 40 °C

External accessories

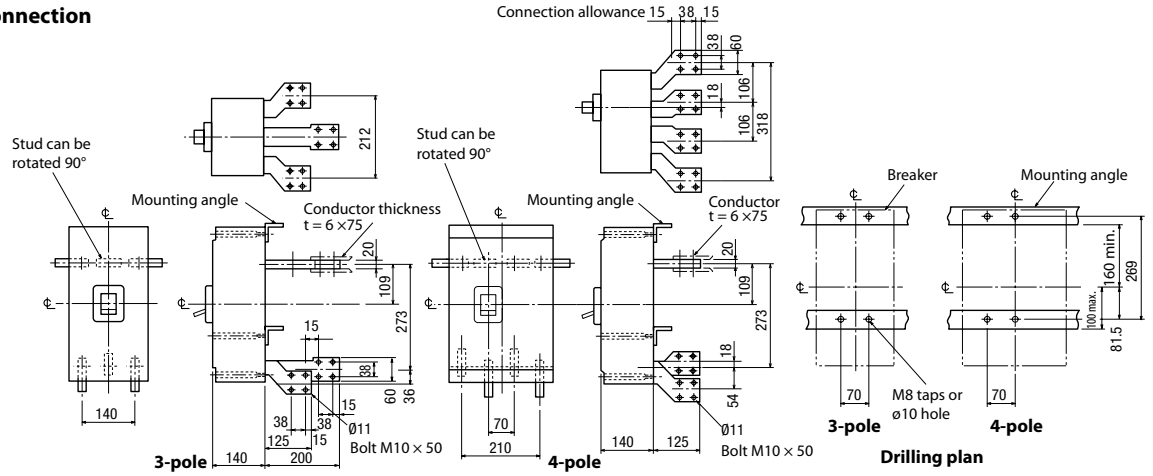
Accessories			Type name	Reference page
Handle lock device	HL		HL (on request)	66
Mechanical interlock	MI	3P	MI-16SW3	70
		4P	MI-16SW4	
Electrical operation device			MDS (*1)	67

Notes *1 Specify the working voltage. Refer to the reference page for type name.

Front connection



Rear connection



[mm]

Magnetothermic and earth leakage protection

Earth leakage circuit breakers ELCB and residual current circuit breakers with overcurrent protection RCBO

Specifications

Type		BV-DN	NV125-CV	NV250-CV
Rated current I_n [A]		10, 16, 20, 25, 32, 40	80, 100, 125	150, 175, 200, 225, 250
Number of poles		2 (1+N)	3	3
Rated voltage [V AC]		230	100–440	100–440
Rated current sensitivity [mA]		30	100/200/500 selectable	100/200/500 selectable
Max. operating time [s]		0.04	0.45/1.0/2.0 selectable	0.45/1.0/2.0 selectable
Pulsating current sensitivity		AC	A (Harmonic Surge Ready)	A (Harmonic Surge Ready)
Rated breaking capacity [kA]	230 V AC	4.5	30	36
	440 V AC	—	10	15
Number of operating cycles	Without current	20000	10000	8000
	With current	20000 (In 10, 16,20 A) 15000 (In 25 A) 10000 (In 32, 40 A)	6000	4000
Dimensions [mm]	a	36	90	105
	b	88	130	165
	c	44	68	68
	ca	70	90	92
Mass [kg]		0.19	1	1.7
Automatic tripping device		Thermal-magnetic	Thermal-magnetic	Thermal-magnetic
Based on standard		IEC61009-1	IEC60947-2	IEC60947-2
Breaker type		MCB	MCCB	MCCB
CE marking		Self-declaration	Self-declaration	TÜV approval

* All the accessories and dimensions of the NF125-SV are compatible with the NV125-CV. All the accessories and dimensions of the NF250-SGV are compatible with the NV250-CV. For internal accessories only is possible to fit it on the left side. For the available accessories please see page 54.

Order information

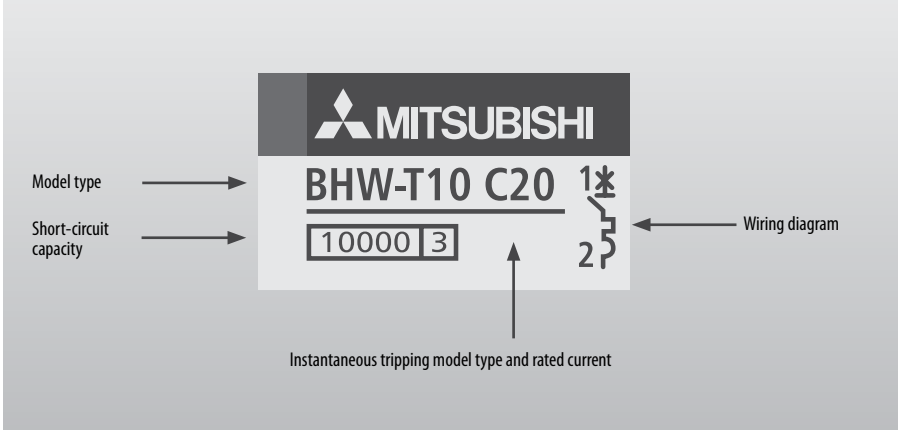
Type	2P (1P+N)	3P
RCBO (Residual current circuit breakers with overcurrent protection)		
BV-DN 1PN 10A 30MA N	248280	—
BV-DN 1PN 16A 30MA N	248283	—
BV-DN 1PN 20A 30MA N	248286	—
BV-DN 1PN 25A 30MA N	248289	—
BV-DN 1PN 32A 30MA N	248292	—
BV-DN 1PN 10A 40MA N	248295	—
ELCB (Earth leakage circuit breakers)		
NV125-CV 3P 80A 2-440V 1.2.500MA JIEN CE	—	265624
NV125-CV 3P 100A 2-440V 1.2.500MA JIEN CE	—	265625
NV125-CV 3P 125A 2-440V 1.2.500MA JIEN CE	—	265626
NV250-CV 3P 150A 2-440V 1.2.500MA JIEN CE	—	265792
NV250-CV 3P 175A 2-440V 1.2.500MA JIEN CE	—	265793
NV250-CV 3P 200A 2-440V 1.2.500MA JIEN CE	—	265794
NV250-CV 3P 225A 2-440V 1.2.500MA JIEN CE	—	265795
NV250-CV 3P 250A 2-440V 1.2.500MA JIEN CE	—	265796

DIN series

Miniature circuit breakers and residual current circuit breakers

Product line-up

Model type		No. of poles [P]	Rating	Instantaneous tripping	Voltage [V]	Short-circuit capacity [kA]	Compliance standard
MCB	BHW-T10	1, 2, 3, 4	6 to 63 A 0.5 to 63 A	Type B Type C, D	240/415 AC	10	IEC 60898-1
RCCB	BVW-T	2 (1+N), 4 (3+N)	16 to 63A	—	240/415 AC	—	IEC 61008-1



Explanation of markings (example model type: BHW-T10)

Construction features

- **State of the art design**
  Elegant appearance, cover and handle in arc shape make comfortable operation.
- **Mounting/removal**
  By means of a unique snap mechanism products can be mounted on DIN rail strip or removed even from a row of devices by lifting the clip without dismantling the whole row.
- **Dual position clip**
  Dual position plastic clip helps in easy mounting and renewal of MCBs on DIN channel.
- **Bi-connect terminals**
  Both sides of terminals are bi-connect type, giving ultimate flexibility.
- **High terminal capacity**
  Deep serrated terminals able to accommodate 35 mm² cable.

Miniature circuit breakers (MCB)

- **Trip free mechanism**
  During fault MCB trips even if handle is held in ON position.
- **Low watt loss**
  Power loss values are much lesser than IEC specified values; making it one of the most energy efficient MCB.
- **Energy limiting class: 3**
  High current limiting performance under fault conditions achieved due to ultra fast contact opening and rapid quenching of arc.
- **Circuit identification**
  Legend plates for circuit identifications and hence enhanced safety.

Residual current circuit breakers (RCCB)

- Automatically disconnect the circuit when earth fault/leakage current occurs and exceeds the rated sensitivity and also fulfill the function of isolation.
- High short-circuit current withstand capacity with backup protection fuse.
- Fire resistant plastic parts endures abnormal heating and strong impact.
- Independent of power supply and line voltage, and free from external interference, voltage fluctuation.
- Prevents nuisance tripping due to transient voltage with help of filtering device (Immunized).
- Test button "T" is provided for periodic checkup.

BHW-T10

BVW-T

Specifications

Miniature circuit breakers (MCB)

Miniature circuit breakers (MCB)									
Type		BHW-T10							
No. of poles P		1	2	3	4	1	2	3	4
Instantaneous tripping		Type B				Type C, D ①			
Rated insulation voltage U_i [V]		660				660			
Rated current I_n [A] at ambient temperature 30° C		6, 10, 16, 20, 25, 32, 40, 50, 63				0.5, 1, 2, 3, 4, 5, 6, 10, 16, 20, 25, 32, 40, 50, 62			
Rated short-circuit capacity [kA] IEC/EN 60898-1 (Icn) AC	240 V	10				10			
	240 V/ 415 V	10				10			
	415 V	—	10			—	10		
Energy limiting class ②									
Number of operating cycles	Without current								
	With current								
Type of overcurrent release		Thermal-magnetic							
Mounting		IEC 35 mm rail							
Applicable wire size		1 to 25 mm²							
Mass [kg]		0.13	0.26	0.39	0.52	0.13	0.26	0.39	0.52
Accessories (optional) ③	Auxiliary switch (AX)	●							
Terminal connection		Solderless							
Based on Standard		IEC/EN 60898-1							
CE marking		●							

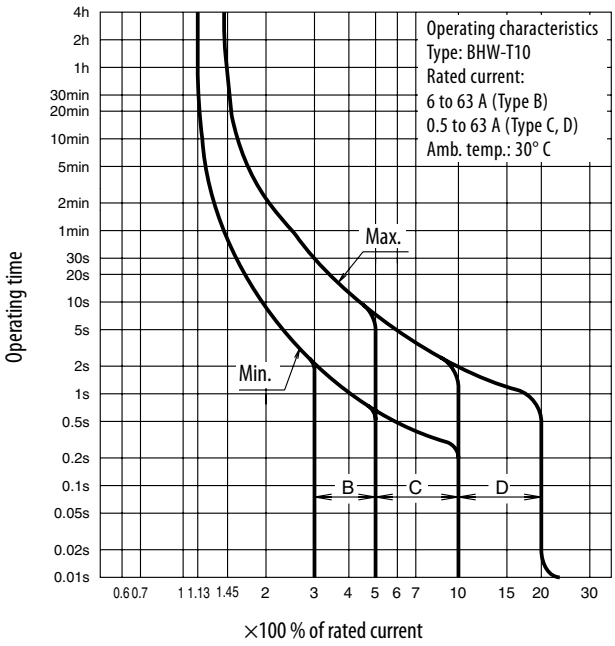
① Type C: (5 I_n <, 10 I_n), Type D: (10 I_n <, 20 I_n)
② Except for type D
③ Available soon
In case of installing breakers side by side, reduce the passing current to under 80 % of the rated current.

Residual current breakers (RCCB)

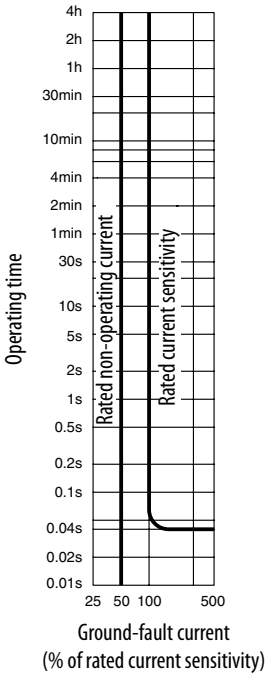
Residual current breakers (RCCB)			
Type		BVW-T	
No. of poles P		2 (1+N) ①	4 (3+N) ①
Rated current I_n [A] at ambient temperature 30° C		25, 40, 63	
Rated voltage [V AC]		240	415
Rated current sensitivity $I_{\triangle n}$ [mA]		30, 300	
Max. operating time at $I_{\triangle n}$ [s]		0.04	
Pulsating current sensitivity		Type AC	
Rated making and breaking capacity I_m [A]		500 (In 25, 40 A), 630 (In 63 A)	
Rated conditional short-circuit current I_{nc} [kA]		5	
Rated residual making and breaking capacity $I_{\triangle m}$ [A]		500 (In 25, 40 A), 630 (In 63 A)	
Rated conditional residual short-circuit current $I_{\triangle c}$ [kA]		6	
Number of operating cycles	Without current	4,000 ②	
	With current	2,000	
Type of overcurrent release		—	
Mounting		IEC 35 mm rail	
Applicable wire size		1 to 25 mm²	
Mass [kg]		0.22	0.44
Terminal connection		Solderless	
Based on standard		IEC/EN 61008-1	
CE marking		●	

① N pole is a switched neutral pole (without overcurrent release device).
② In case of ampere rating 32, 40 and 63 A, the number of operating cycles is 3,000.

Operating characteristics



Earth-leakage tripping characteristics



Ordering information

Miniature circuit breakers (MCB)

Reference ①	Codes			
Type B	**1 pole**	**2 poles**	**3 poles**	**4 poles**
BHW-T10 ☐ Type B 6 A	291889	291908	291917	291926
BHW-T10 ☐ Type B 10 A	291890	291909	291918	291927
BHW-T10 ☐ Type B 16 A	291891	291910	291919	291928
BHW-T10 ☐ Type B 20 A	291892	291911	291920	291929
BHW-T10 ☐ Type B 25 A	291893	291912	291921	291930
BHW-T10 ☐ Type B 32 A	291894	291913	291922	291931
BHW-T10 ☐ Type B 40 A	291905	291914	291923	291932
BHW-T10 ☐ Type B 50 A	291906	291915	291924	291933
BHW-T10 ☐ Type B 63 A	291907	291916	291925	291934
Type C	**1 pole**	**2 poles**	**3 poles**	**4 poles**
BHW-T10 ☐ Type C 0.5 A	291953	291968	291983	291998
BHW-T10 ☐ Type C 1 A	291954	291969	291984	291999
BHW-T10 ☐ Type C 2 A	291955	291970	291985	292000
BHW-T10 ☐ Type C 3 A	291956	291971	291986	292001
BHW-T10 ☐ Type C 4 A	291957	291972	291987	292002
BHW-T10 ☐ Type C 5 A	291958	291973	291988	292003
BHW-T10 ☐ Type C 6 A	291959	291974	291989	292004
BHW-T10 ☐ Type C 10 A	291960	291975	291990	292005
BHW-T10 ☐ Type C 16 A	291961	291976	291991	292006
BHW-T10 ☐ Type C 20 A	291962	291977	291992	292007
BHW-T10 ☐ Type C 25 A	291963	291978	291993	292008
BHW-T10 ☐ Type C 32 A	291964	291979	291994	292009
BHW-T10 ☐ Type C 40 A	291965	291980	291995	292010
BHW-T10 ☐ Type C 50 A	291966	291981	291996	292011
BHW-T10 ☐ Type C 63 A	291967	291982	291997	292012
Type D	**1 pole**	**2 poles**	**3 poles**	**4 poles**
BHW-T10 ☐ Type D 0.5 A	292043	292058	292073	292088
BHW-T10 ☐ Type D 1 A	292044	292059	292074	292089
BHW-T10 ☐ Type D 2 A	292045	292060	292075	292090
BHW-T10 ☐ Type D 3 A	292046	292061	292076	292091
BHW-T10 ☐ Type D 4 A	292047	292062	292077	292092
BHW-T10 ☐ Type D 5 A	292048	292063	292078	2920993
BHW-T10 ☐ Type D 6 A	292049	292064	292079	292094
BHW-T10 ☐ Type D 10 A	292050	292065	292080	292095
BHW-T10 ☐ Type D 16 A	292051	292066	292081	292096
BHW-T10 ☐ Type D 20 A	292052	292067	292082	292097
BHW-T10 ☐ Type D 25 A	292053	292068	292083	292098
BHW-T10 ☐ Type D 32 A	292054	292069	292084	292099
BHW-T10 ☐ Type D 40 A	292055	292070	292085	292100
BHW-T10 ☐ Type D 50 A	292056	292071	292086	292101
BHW-T10 ☐ Type D 63 A	292057	292072	292087	292102

① ☐ The white square must indicate the number of poles ⟶ 1P or 2P or 3P or 4P

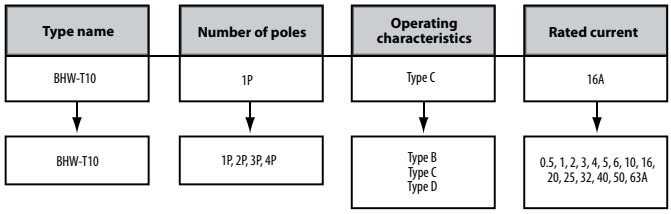
Residual current breakers (RCCB)

Reference ①	Codes	
30 mA	**2 poles**	**4 poles**
BVW-T ☐ 25A 30 mA	293548	293603
BVW-T ☐ 40A 30 mA	293550	293605
BVW-T ☐ 63A 30 mA	293551	293606
300 mA	**2 poles**	**4 poles**
BVW-T ☐ 25A 300 mA	293598	293613
BVW-T ☐ 40A 300 mA	293600	293615
BVW-T ☐ 63A 300 mA	293601	293616

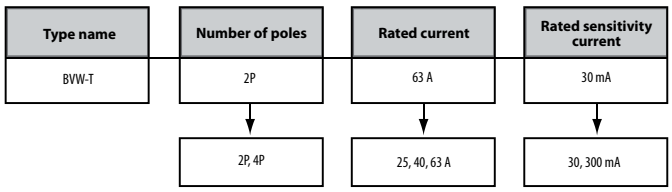
① ☐ The white square must indicate the number of poles ⟶ 2P or 4P

Reference identification

Miniature circuit breakers (MCB)



Residual Current Breakers (RCCB)

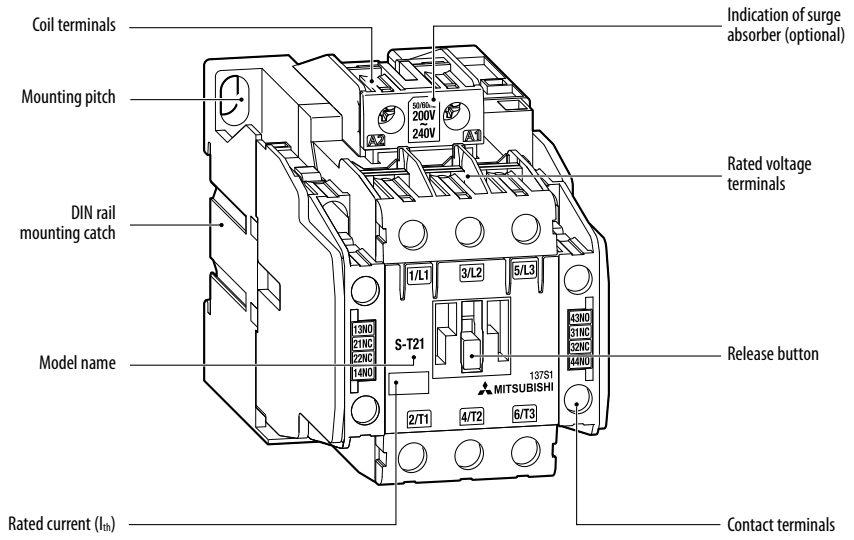


3

DIN series

General purpose contactors

General purpose contactors



The main benefits:

- Easy mounting and wiring
- Easy inspection
- Built-in surge absorber
- Safety and speedy terminal functions
- Thermo plastic improves the barrier strength
- Coil boasts lower coil consumption
- Improvement of Electromagnet (DC electromagnet with AC operation)
- Less noise nor surge from coil
- Conform to IEC947-4-1, EN-Standards
- Mounting of the contactors is described on page 123.

4

MS – Contactors & thermal overload relays

Handling of the contactors

S(D)-T10 to S(D)-T85 units can all be mounted on DIN rail (35 mm wide).

A variety of blocks and optional features are available including:

- Standard front clip-on auxiliary contact blocks (4-pole-type and 2-pole-type)
- Low-level signal front-clip-on auxiliary contact blocks
- Side clip-on auxiliary contact blocks
- Surge absorbers (varistor and CR models)
- Surge absorbers with LED operating indicators
- Mechanical interlocks

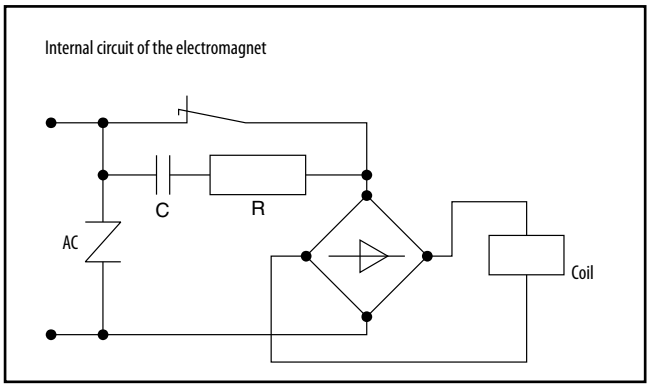
Compact arc quenching and magnet layout greatly reduces installation space.

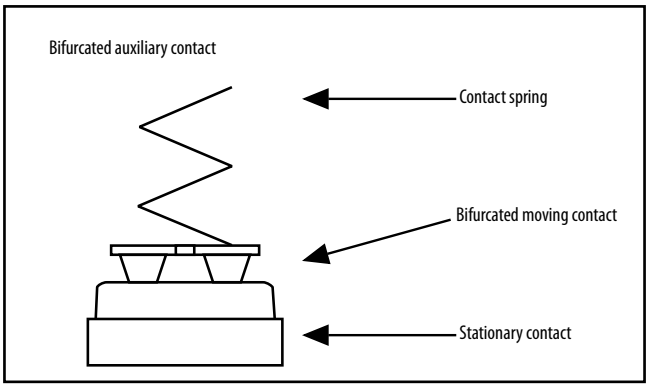
The coil rating is displayed in a location readily visible even after the unit is installed onto the panel.

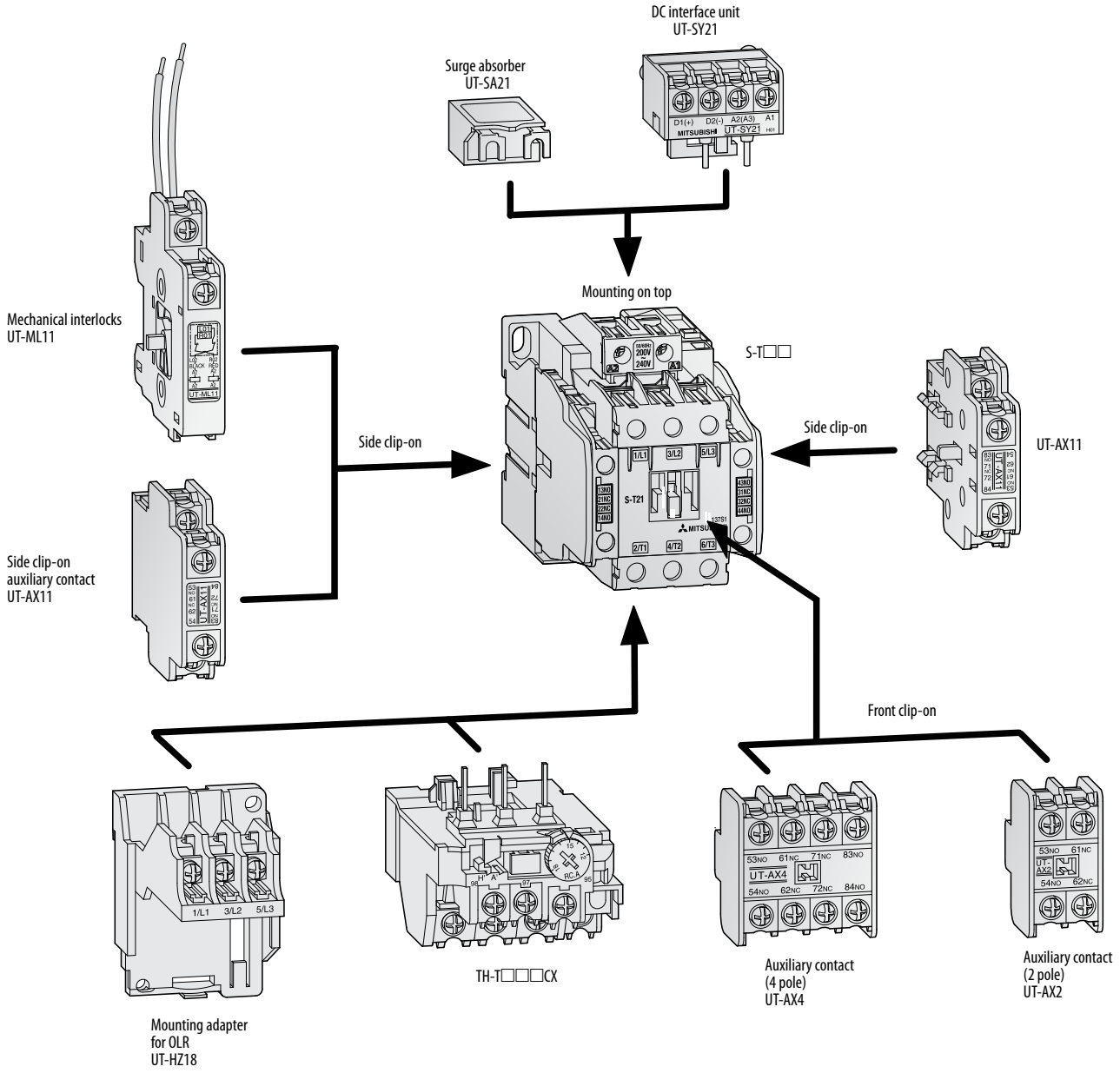
Contacts are visible when the cover is removed, allowing them to be checked easily.

Contactor coils have ultra-wide range of ratings

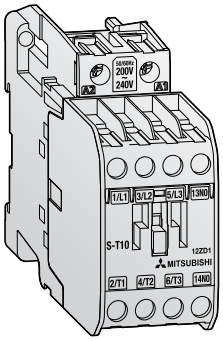
The number of coil types has been cut by two-thirds and there is no need to re-wire for different frequencies. The coil also withstands large voltage drops.

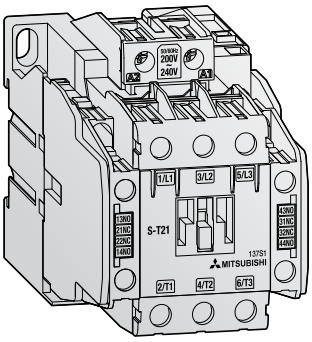





DC interface unit
UT-SY21
Surge absorber
UT-SA21
Mounting on top
Mechanical interlocks
UT-ML11
S-T□□
Side clip-on
Side clip-on
UT-AX11
Side clip-on
auxiliary contact
UT-AX11
Front clip-on
Mounting adapter
for OLR
UT-HZ18
TH-T□□□CX
Auxiliary contact
(4 pole)
UT-AX4
Auxiliary contact
(2 pole)
UT-AX2

Three-phase motor ratings IEC category AC3 for contactors								
Contactor	AC-operated	S-T10AC	S-T12AC	S-T20AC	S-T21AC	S-T25AC	S-T32AC	S-T35
	DC-operated	—	SD-T12DC	SD-T20DC	SD-T21DC	—	SD-T32DC	SD-T35
AC 380–440 V	kW	4	5.5	7.5	11	15	15	18.5
Rated continuous current Ith	A	20	20	20	32	32	32	60
Auxiliary contacts (standard)		1 NO or 1 NC	1 NO + 1 NC	1 NO + 1 NC or 2 NO	1 NO + 1 NC	2 NO + 2 NC	—	2 NO + 2 NC

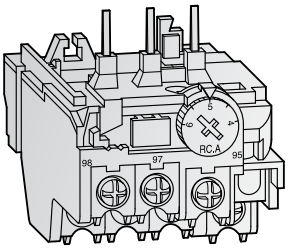


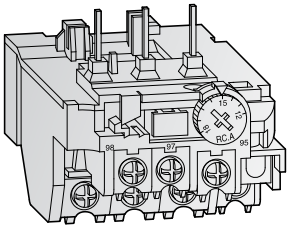


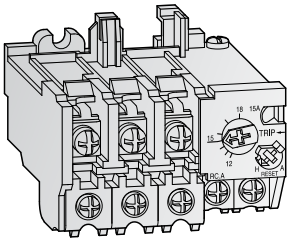
S-T10AC	S-T12AC	S-T20AC	S-T21AC	S-T25AC	S-T32AC	S-T35
—	SD-T12DC	SD-T20DC	SD-T21DC	—	SD-T32DC	SD-T35

Connecting parts	—	UN-TH21	UN-TH50

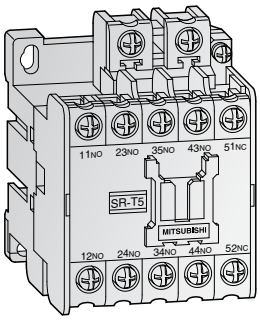
Thermal overload relays			
Type	TH-T18KP	TH-T25KP	TH-T25KP/TH-T50KP
Setting range	0.1 – 18 A	0.24 – 26 A	0.24 – 34 A



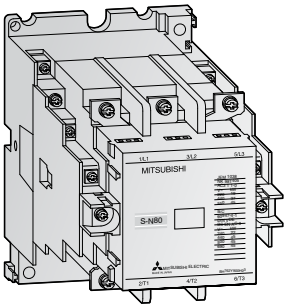


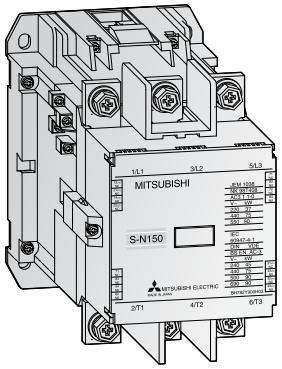


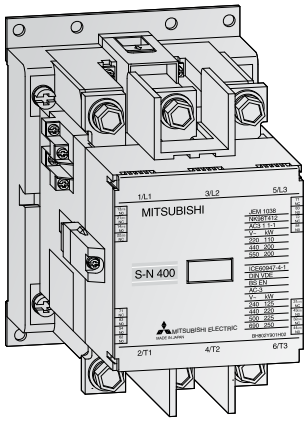
Contactor relays			
AC-operated type	SR-T5	SR-T5	SR-T5
DC-operated type	SRD-T5	SRD-T5	SRD-T5
Auxiliary contacts	5 NO	4 NO, 1 NC	3 NO, 2 NC



Three-phase motor ratings IEC category AC-3											
S-T50	S-T65	S-T80	S-T100	S-N125	S-N150	S-N180	S-N220	S-N300	S-N400	S-N600	S-N800
SD-T50	SD-T65	SD-T80	SD-T100	SD-N125	SD-N150	—	SD-N220	SD-N300	SD-N400	SD-N600	SD-N800
22	30	45	55	60	75	90	132	160	220	330	440
80	100	120	150	150	200	260	260	350	450	800	1000
2 NO + 2 NC	2 NO + 2 NC	2 NO + 2 NC	2 NO + 2 NC	2 NO + 2 NC	2 NO + 2 NC	2 NO + 2 NC	2 NO + 2 NC	2 NO + 2 NC	2 NO + 2 NC	2 NO + 2 NC	2 NO + 2 NC

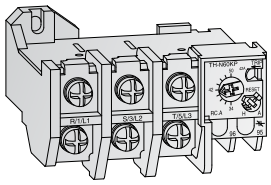


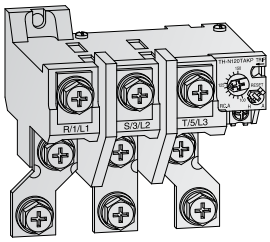


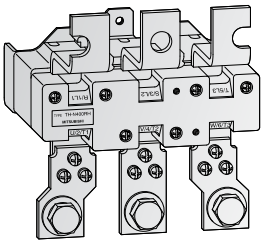


S-T50	S-T65	S-T80	S-T100	S-N125	S-N150	S-N180	S-N220	S-N300	S-N400	S-N600	S-N800
SD-T50	SD-T65	SD-T80	SD-T100	SD-N125	SD-N150	—	SD-N220	SD-N400	SD-N400	SD-N600	SD-N800
UT-TH50	BH559N350		AC operated: BH569N350 DC operated: BH569N352	BH579N355	BH589N355	BH589N355		—		—	

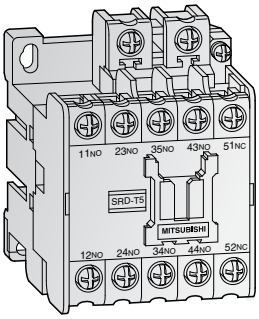
Thermal overload relays							
TH-T25KP/ TH-T50KP	TH-T65KP	TH-T65KP/ TH-T100KP	TH-T65KP/ TH-T100KP	TH-N120TAKP	TH-N220RHKP	TH-N400RHKP	TH-N600KP
0.24 – 50 A	12 – 65 A	12 – 80 A	12 – 100 A	34 – 150 A	65 – 250 A	85 – 400 A	200 – 800 A







Contactor relays			
AC-operated type	SR-T5	SR-T5	SR-T5
DC-operated type	SRD-T5	SRD-T5	SRD-T5
Auxiliary contacts	5 NO	4 NO, 1 NC	3 NO, 2 NC



Specifications			S-T10 AC□□□V 1A	S-T10 AC□□□□V 1B	S-T12 AC□□□□V 1A1B	S-T12 AC□□□□V 2A	S-T12 AC□□□□V 2B	S-T20 AC□□□□V 1A1B	S-T20 AC□□□□V 2A	S-T21 AC□□□□V 2A2B	S-T25 AC□□□□V 2A2B	S-T32 AC□□□□V
Rated data												
Applicable standard			All types: IEC60947-4-1, EN60947-4-1, JIS C8201-4-1									
Rated insulation voltage		V	All types: 690									
Rated impulse withstand voltage		kV	All types: 6									
Rated frequency		Hz	All types: 50/60									
Pollution degree			All types: 3									
Rated operational power (current) Category AC-3 (Three-phase squirrel-cage motor load, standard responsibility)	220–240 V	kW (A)	2.5 (11)	2.5 (11)	3.5 (13)	3.5 (13)	3.5 (13)	4.5 (18)	4.5 (18)	5.5 (25)	7.5 (30)	7.5 (32)
	380–440 V	kW (A)	4 (9)	4 (9)	5.5 (12)	5.5 (12)	5.5 (12)	7.5 (18)	7.5 (18)	11 (23)	15 (30)	15 (32)
	500 V	kW (A)	4 (7)	4 (7)	5.5 (9)	5.5 (9)	5.5 (9)	7.5 (17)	7.5 (17)	11 (17)	15 (24)	15 (24)
	690 V	kW (A)	4 (5)	4 (5)	5.5 (7)	5.5 (7)	5.5 (7)	7.5 (9)	7.5 (9)	7.5 (9)	11 (12)	11 (12)
Rated operational power (current) Category AC-4 (Three-phase squirrel-cage motor load, inching responsibility)	220–240 V	kW (A)	1.5 (8)	1.5 (8)	2.2 (11)	2.2 (11)	2.2 (11)	3.7 (18)	3.7 (18)	3.7 (18)	4.5 (20)	5.5 (26)
	380–440 V	kW (A)	2.2 (6)	2.2 (6)	4 (9)	4 (9)	4 (9)	5.5 (13)	5.5 (13)	5.5 (13)	7.5 (17)	11 (24)
	500 V	kW (A)	2.7 (6)	2.7 (6)	5.5 (9)	5.5 (9)	5.5 (9)	5.5 (10)	5.5 (10)	5.5 (10)	7.5 (12)	7.5 (13)
Rated operational power (current) Category AC-1 (Resistance, heater load)	100–240 V	kW (A)	20	20	20	20	20	20	20	32	32	32
	380–440 V	kW (A)	11	11	13	13	13	13	13	32	32	32
Conventional free air thermal current Ith		A	20	20	20	20	20	20	20	32	32	32
Minimum applicable load level			All types: 48 V 200 mA									
Auxiliary contact rating												
Contact arrangement	Standard		1 NO	1 NC	1 NO + 1 NC	2 NO	2 NC	1 NO + 1 NC	2 NO	2 NC	2 NO + 2 NC	—
Max. number of additional options ①	Front clip-on	pcs.	1	1	1	1	1	1	1	1	1	1
	Side clip-on	pcs.	2	2	2	2	2	2	2	2	2	2
Rated operational current (Category AC-15 : Alternating current coil load)	120 V	A	6	6	6	6	6	6	6	6	6	6
	240 V	A	3	3	3	3	3	3	3	3	3	3
Rated operational current (Category DC-13 : Direct current coil load)	24 V	A	3	3	3	3	3	3	3	3	3	3
	110 V	A	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Conventional free air thermal current Ith		A	10	10	10	10	10	10	10	10	10	10
Minimum applicable load level			All types: 20 V 3 mA									
Performance												
Mechanical durability [ten thousand times]			All types: 1,000									
Electrical durability [ten thousand times]			Please refer to the Electrical durability curve on page 113.									
Switching frequency [times/hour]	Category AC-3		1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800
	Category AC-4		300	300	300	300	300	300	300	300	300	300
	Category AC-1		1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
Coil consumption (at rated coil voltage) ③	Inrush	(VA)	45	45	45	45	45	45	45	75	75	55
	Sealed	(VA)	7	7	7	7	7	7	7	6	6	4.5
	Watts	(W)	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.4	1.8
Mechanical data												
Dimensions (WxHxD)		mm	36x75x78	36x75x78	43x75x78	43x75x78	43x75x78	43x75x78	43x75x78	63x81x81	63x81x81	43x81x81
Order information	**AC 24 V**	Art. no.	279140	279197	279204	279211	279218	279225	279232	279239	279246	279253
	AC 48 V		279141	279198	279205	279212	279219	279226	279233	279240	279247	279254
	AC 100 V		279142	279199	279206	279213	279220	279227	279234	279241	279248	279255
	AC 200 V		279143	279200	279207	279214	279221	279228	279235	279242	279249	279256
	AC 300 V		279144	279201	279208	279215	279222	279229	279236	279243	279250	279257
	AC 400 V		279195	279202	279209	279216	279223	279230	279237	279244	279251	279258
	AC 500 V		279196	279203	279210	279217	279224	279231	279238	279245	279252	279259

① The maximum number of additional options is equal to the number of auxiliary contact units UT-AX4 mounted on the main unit.
The main unit and auxiliary contact unit must be separately arranged and additionally mounted by the customer.
② Operational coil input and coil consumption are average values in case of applying 220 V 60 Hz to AC 200 V coil.

Specifications			S-T35 AC□□□V	S-T50 AC□□□V	S-T65 AC□□□V	S-T80 AC□□□V	S-T100 AC□□□V	S-N125 AC□□□V	S-N150 AC□□□V	S-N180 AC□□□V	S-N220 AC□□□V	S-N300 AC□□□V	S-N400 AC□□□V	S-N600 AC□□□V	S-N800 AC□□□V
Rated data															
Applicable standard			All types: IEC60947-4-1, EN60947-4-1, JIS C8201-4-1												
Rated insulation voltage			690							1000					
Rated impulse withstand voltage		kV	All types: 6												
Rated frequency		Hz	All types: 50/60												
Pollution degree			All types: 3												
Rated operational power (current) Category AC-3 (Three-phase squirrel-cage motor load, standard responsibility)	220–240 V	kW (A)	11(40)	15(55)	18.5(65)	22(85)	30(105)	37(125)	45(150)	55(180)	75(250)	90(300)	125(400)	190(630)	220(800)
	380–440 V	kW (A)	18.5(40)	22(48)	30(65)	45(85)	55(105)	60(120)	75(150)	90(180)	132(250)	160(300)	220(400)	330(630)	440(800)
	500 V	kW (A)	18.5(32)	25(38)	37(60)	45(75)	55(85)	60(90)	90(140)	110(180)	132(200)	160(250)	225(350)	330(500)	500(720)
	690 V	kW (A)	15(17)	22(26)	30(38)	45(52)	55(65)	60(70)	90(100)	110(120)	132(150)	200(220)	250(300)	330(420)	500(630)
Rated operational power (current) Category AC-4 (Three-phase squirrel-cage motor load, inching responsibility)	220–240 V	kW (A)	5.5(26)	7.5(35)	11(50)	15(65)	19(80)	15	18.5	22	22	37	45	65	75
	380–440 V	kW (A)	11(24)	15(32)	22(47)	30(62)	37(75)	22	30	37	45	60	75	110	130
	500 V	kW (A)	11(17)	15(24)	22(38)	30(45)	37(55)	22	37	45	55	60	90	130	150
Rated operational power (current) Category AC-1 (Resistance, heater load)	100–240 V	A	60	80	100	120	150	150	200	260	260	350	450	660	800
	380–440 V	A	60	80	100	120	150	150	200	260	260	350	450	660	800
Conventional free air thermal current Ith		A	60	80	100	120	150	150	200	260	260	350	450	800	1000
Minimum applicable load level			All types: 48 V 200 mA												
Auxiliary contact rating															
Contact arrangement	Standard		2NO+2NC	2NO+2NC	2NO+2NC	2NO+2NC	2NO+2NC	2NO+2NC	2NO+2NC	2NO+2NC	2NO+2NC	2NO+2NC	2NO+2NC	2NO+2NC	2NO+2NC
Max. number of additional options	Front clip-on	pcs.	1	1	1	1	—	—	—	—	—	—	—	—	—
	Side clip-on	pcs.	2	2	2	2	2	2	2	2	2	2	2	2	2
Rated operational current (Category AC-15 : Alternating current coil load)	120 V AC		6	6	6	6	6	6	6	6	6	6	6	6	6
	240 V AC		3	3	3	3	3	5	5	5	5	5	5	5	5
Rated operational current (Category DC-13 : Direct current coil load)	24 V DC		3	3	3	3	3	5	5	5	5	5	5	5	5
	110 V DC		0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Conventional free air thermal current Ith		[A]	10	10	16	16	16	16	16	16	16	16	16	16	16
Minimum applicable load level			All types: 20 V 3 mA												
Performance															
Mechanical durability [ten thousand times]			1000	1000	500	500	500	500	500	500	500	500	500	500	500
Electrical durability			Please refer to the Electrical durability curve on page 113.												
Switching frequency [times/hour]	Category AC-3		1800	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200
	Category AC-4		300	300	300	300	300	300	300	300	300	300	300	300	300
	Category AC-1		1200	1200	1200	1200	600	1200	1200	1200	1200	1200	1200	1200	1200
Coil consumption (at rated coil voltage)	Inrush	(VA)	110	110	115	115	210	320	320	480	480	480	480	800	800
	Sealed	(VA)	10	10	20	20	23	26	26	44	44	54	54	100	100
	Watts	(W)	3.8	3.8	2.2	2.2	2.8	3.5	3.5	5	5	7.3	7.3	15	15
Mechanical data															
Dimensions (WxHxD)		mm	75x89x91	75x89x91	88x106x106	88x106x106	100x124x127	100x150x136	120x160x145	138x204x174	138x204x174	163x243x195	163x243x195	290x310x234	290x310x234
Order Information	**AC 24 V**	Art. no.	298658	298665	298672	298679	298686	113650	113654	—	—	—	—	—	—
	AC 48 V		298661	298668	298675	298682	298689	—	—	—	—	—	—	—	—
	AC 100 V		298656	298663	298670	298677	298684	113647	113651	113656	113659	113662	113665	113668	113672
	AC 200 V		298657	298664	298671	298678	298685	113648	113652	113657	113660	113663	113666	113669	113673
	AC 300 V		298659	298666	298673	298680	298687	—	—	—	—	—	—	—	—
	AC 400 V		298660	298667	298674	298681	298688	113649	113653	113658	113661	113664	113667	113670	113674
	AC 500 V		298662	298669	298676	298683	298370	—	—	—	—	—	—	—	—

Specifications			SD-T12 DC24V 1A1B	SD-T20 DC24V 1A1B	SD-T21 DC24V 2A2B	SD-T32 DC24V
Rated data						
Applicable standard			All types: IEC60947-4-1, EN60947-4-1, JIS C8201-4-1			
Rated insulation voltage		V	All types: 690			
Rated impulse withstand voltage		kV	All types: 6			
Rated frequency		Hz	All types: 50/60			
Pollution degree			All types: 3			
Rated operational power (current) Category AC-3 (Three-phase squirrel-cage motor load, standard responsibility)	220–240 V	kW (A)	3.5 (13)	4.5 (18)	5.5 (25)	7.5 (32)
	380–440 V	kW (A)	5.5 (12)	7.5 (18)	11 (23)	15 (32)
	500 V	kW (A)	5.5 (9)	7.5 (17)	11 (17)	15 (24)
Rated operational power (current) Category AC-4 (Three-phase squirrel-cage motor load, inching responsibility)	220–240 V	kW (A)	2.2 (11)	3.7 (18)	3.7 (18)	5.5 (26)
	380–440 V	kW (A)	4 (9)	5.5 (13)	5.5 (13)	11 (24)
	500–550 V	kW (A)	5.5 (9)	5.5 (10)	5.5 (10)	7.5 (13)
Rated operational power (current) Category AC-1 (Resistance, heater load)	100–240 V	kW (A)	20	20	32	32
	380–440 V	kW (A)	13	13	32	32
Conventional free air thermal current Ith		A	20	20	32	32
Minimum applicable load level			All types: 48 V 200 mA			
Auxiliary contact rating						
Contact arrangement	Standard		1 NO + 1 NC	1 NO + 1 NC	2 NC	—
Max. number of additional options ①	Front clip-on	pcs.	1	1	1	1
	Side clip-on	pcs.	2	2	2	2
Rated operational current (Category AC-15: Alternating current coil load)	120 V	A	6	6	6	6
	240 V	A	3	3	3	3
Rated operational current (Category DC-13: Direct current coil load)	24 V	A	3	3	3	3
	110 V	A	0.6	0.6	0.6	0.6
Conventional free air thermal current Ith		A	10	10	10	10
Minimum applicable load level			All types: 20 V 3 mA			
Performance						
Mechanical durability [ten thousand times]			All types: 1,000			
Electrical durability [ten thousand times]			Please refer to the Electrical durability curve on page 113.			
Switching frequency [times/hour]	Category AC-3		1,800	1,800	1,800	1,800
	Category AC-4		300	300	300	300
	Category AC-1		1,200	1,200	1,200	1,200
Coil consumption (at rated coil voltage) ③	Inrush	VA	45	45	75	55
	Sealed	VA	7	7	6	4.5
	Watts	W	2.2	2.2	2.4	1.8
Mechanical data						
Dimensions (WxHxD)		mm	43x75x100	43x75x100	63x81x108	43x81x108
Order information	**DC 24 V**	Art. no.	287431	287519	287527	287534

① The maximum number of additional options is equal to the number of auxiliary contact units UT-AX4 mounted on the main unit.
The main unit and auxiliary contact unit must be separately arranged and additionally mounted by the customer.
② Operational coil input and coil consumption are average values in case of applying 220 V 60 Hz to AC 200 V coil.

Specifications			SD-T35 DC24V	SD-T50 DC24V	SD-T65 DC24V	SD-T80 DC24V	SD-T100 DC24V	SD-N125 DC24V	SD-N150 DC24V	SD-N220 DC24V	SD-N300 DC24V	SD-N400 DC24V	SD-N600 DC24V	SD-N800 DC24V
Rated data														
Applicable standard			All types: IEC60947-4-1, EN60947-4-1, JIS C8201-4-1											
Rated insulation voltage			690							1000				
Rated impulse withstand voltage kV			All types: 6											
Rated frequency		Hz	All types: 50/60											
Pollution degree			All types: 3											
Rated operational power (current) Category AC-3 (Three-phase squirrel-cage motor load, standard responsibility)	220–240 V	kW (A)	11(40)	15(55)	18.5(65)	22(85)	30(105)	37 (125)	45 (150)	75 (250)	90 (300)	125 (400)	190 (630)	220 (800)
	380–440 V	kW (A)	18.5(40)	22(48)	30(65)	45(85)	55(105)	60 (120)	75 (150)	132 (250)	160 (300)	220 (400)	330 (630)	440 (800)
	500 V	kW (A)	18.5(32)	25(38)	37(60)	45(75)	55(85)	60 (90)	90 (140)	132 (200)	160 (250)	25 (350)	330 (500)	500 (720)
Rated operational power (current) Category AC-4 (Three-phase squirrel-cage motor load, inching responsibility)	220–240 V	kW (A)	5.5(26)	7.5(35)	11(50)	15(65)	19(80)	15	18.5	22	37	45	65	75
	380–440 V	kW (A)	11(24)	15(32)	22(47)	30(62)	37(75)	22	30	45	60	75	110	130
	500–550 V	kW (A)	11(17)	15(24)	22(38)	30(45)	7(55)	22	37	55	60	90	130	150
Rated operational power (current) Category AC-1 (Resistance, heater load)	100–240 V	A	60	80	100	120	150	150	200	260	350	450	660	800
	380–440 V	A	60	80	100	120	150	150	200	260	350	450	660	800
Conventional free air thermal current Ith		A	60	80	100	120	150	150	200	260	350	450	800	1000
Minimum applicable load level			All types: 48 V 200 mA											
Auxiliary contact rating														
Contact arrangement	Standard		2NO+2NC	2NO+2NC	2NO+2NC	2NO+2NC	2NO+2NC	2NO+2NC	2NO+2NC	2NO+2NC	2NO+2NC	2NO+2NC	2NO+2NC	2NO+2NC
Max. number of additional options	Front clip-on	pcs.	1	1	1	1	--	--	--	--	--	--	--	--
	Side clip-on	pcs.	2	2	2	2	2	2	2	2	2	2	2	2
Rated operational current (Category AC-15: Alternating current coil load)	120 VAC		6	6	6	6	6	6	6	6	6	6	6	6
	240 VAC		3	3	3	3	3	5	5	5	5	5	5	5
Rated operational current (Category DC-13: Direct current coil load)	24 VDC		3	3	3	3	3	5	5	5	5	5	5	5
	110 VDC		0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Conventional free air thermal current Ith			10	10	16	16	16	16	16	16	16	16	16	16
Minimum applicable load level			All types: 20 V 3 mA											
Performance														
Mechanical durability [ten thousand times]			1000	1000	500	500	500	500	500	500	500	500	500	500
Electrical durability [ten thousand times]			Please refer to the Electrical durability curve on page 113.											
Switching frequency [times(hour)]	Category AC-3		1800	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200
	Category AC-4		300	300	300	300	300	300	300	300	300	300	300	300
	Category AC-1		1200	1200	1200	1200	600	1200	1200	1200	1200	1200	1200	1200
Coil consumption (at 24 V DC)	Watts	W	9	9	18	18	24	31	31	41	55	55	75	75
Mechanical data														
Dimensions (WxHxD)		mm	75x89x123	75x89x123	88x106x133	88x106x133	100x134x157	100x150x161	120x160x170	138x204x200	163x243x220	163x243x220	375x310x234	375x310x234
Order information	**DC 24 V**	Art. no.	298622	298630	298638	298646	298654	113682	113683	113684	113686	113687	113688	On request

■ Specifications – standard auxiliary contacts

Rated data of auxiliary contacts			S-N	S-T
Rated continuous current I_{th}		A	16	10
Rated operating current				
Category AC-15	AC 110 V	A	6	6
	AC 230 V	A	5	3
	AC 500 V	A	3	1.5
	AC 660 V	A	1,5	
Category DC-13	DC 24 V	A	5	3
	DC 48 V	A	3	1.5
	DC 110 V	A	0.6 (0.8 for UN-AX2CX, UN-AX4CX, UN-AX11CX)	0.6
	DC 220 V	A	0.2	0.3

For detailed description please see page 124.

■ Environmental conditions

Environmental conditions for all contactors			
Ambient temperature		°C	-25 to +55
Ambient humidity		RH	45 to 85 %
Coil voltage tolerance			0.85 to 1.1 times rated coil voltage
Vibration resistance	10–55 Hz	G	2
Shock resistance		G	5

■ Coil ratings

In case of special order:

The following tables show the devices which are additionally available.
Please contact Mitsubishi Electric for further information.

AC rated voltage – S-T10 to S-T100

Coil designation	Range 50/60 Hz [V]	Standard
AC 24 V	24	●
AC 48 V	48–50	
AC 100 V	100–127	●
AC 200 V	200–240	●
AC 300 V	260–360	
AC 400 V	380–440	●
AC 500 V	460–550	

For detailed description of the types please see page 108.

DC rated voltage – SD-N/T types

Coil designation	Range [V]	Standard
DC 12 V	12	
DC 24 V	24	●
DC 48 V	48	
DC 100 V	100	
DC 110 V	110	
DC 125 V	120–125	
DC 200 V	200	
DC 220 V	220	

For detailed description of the types please see page 110 and 111.

AC rated voltage – S-N125 to S-N800

Coil designation	Range 50/60 Hz [V]	Standard
AC 24 V ①	24	
AC 48 V ①	48–50	
AC 100 V	100–127	●
AC 200 V	200–240	●
AC 300 V	260–350	
AC 400 V	380–440	●
AC 500 V	460–550	

① Available for S-N125 to S-N150 only.
For detailed description of the types please see page 109.

■ Performance of MS series contactors

Electrical life

The electrical life of the main contacts of a contactor is determined mainly by the circuit-opening duty it will perform.

The relationship between electrical life and rated current of Mitsubishi Electric contactors under normal and jogging duties of squirrel-cage motors is shown in the figures.

In the case of a mixture of normal and jogging duties, the expected contactor life can be determined as follows:

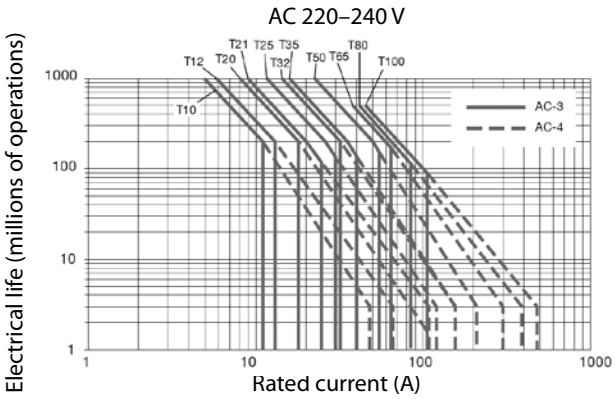
$$N = Nr/1 + \frac{\alpha}{100}\,(Nr/Ni - 1)$$

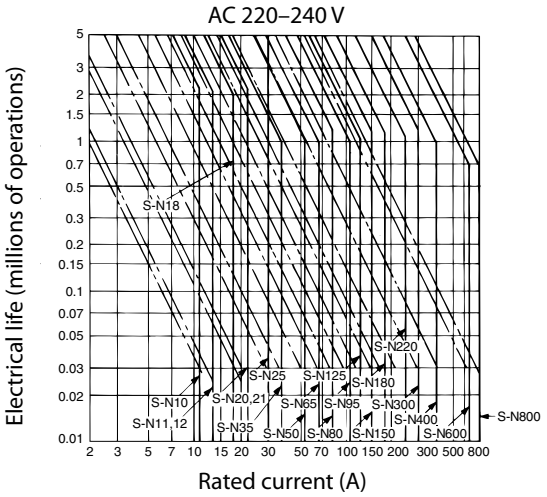
N: Life in the case of α % jogging duty

Nr: Life in the case of normal duty

Ni: Life in the case of 100 % jogging duty

α: Percentage of jogging duty

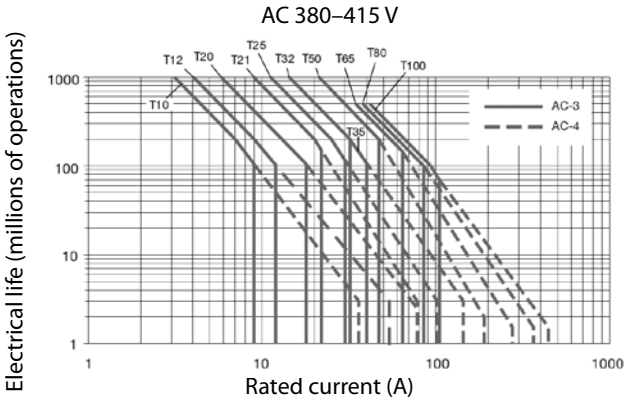


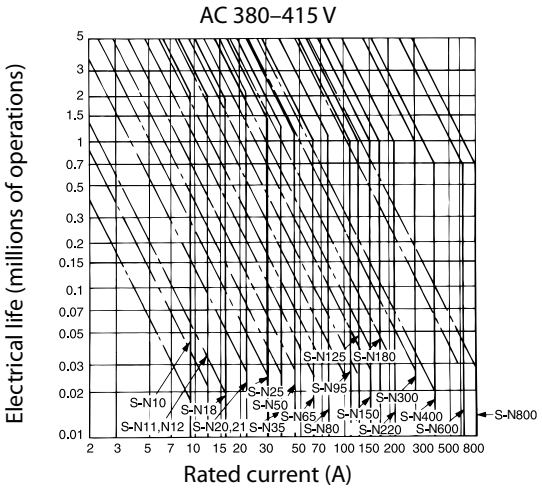


Electrical life versus rated operating current

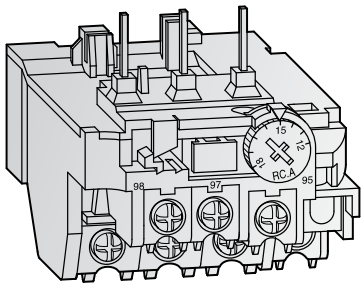
— Normal duty, 6 I_e ON, I_e OFF, on-load factor 40 %, 1200 operations/hour (AC-3)

–.– Jogging duty, 6 I_e ON, 6 I_e OFF, on-load factor 7 %, 600 operations/hour (AC-4)-S-T10 to S-N300 300 operations/hour (AC-4)-S-N400 to S-N600 150 operations/hour (AC-4)-S-N800





■ Thermal overload relays description



TH-T18KP

A selection of relays for optimum motor protection characteristics

The thermal relay line-up includes the phase failure protection type models (three-element relays).

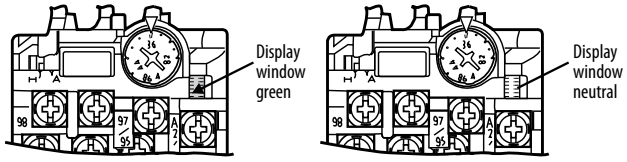
This array of protection characteristics allows you to choose the units suited to your motor protection needs.

Benefits:

- An operation indicator makes maintenance and inspection easy.
- 1 NO and 1 NC contact
- Rated current can be set easily
- Finger protection up to TH-N60KPCX
- Trip-free reset bar
- Convenient reset release (optional)

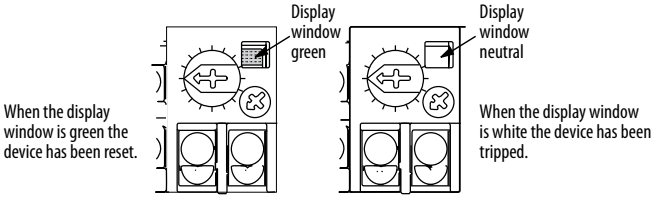
■ Display

TH-T18KP



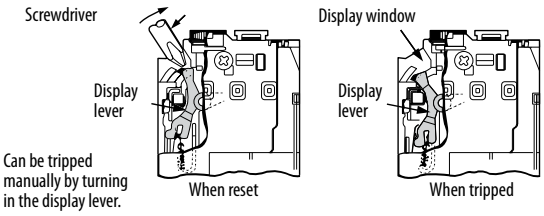
When the green of the display lever can be seen, the device has been reset.

TH-T25KP – TH-N600KP

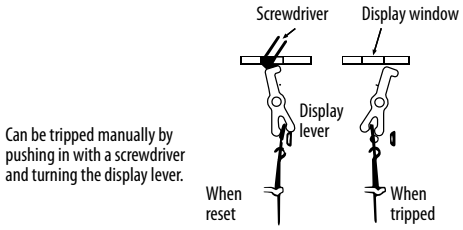


■ External trip mechanism

TH-T18KP

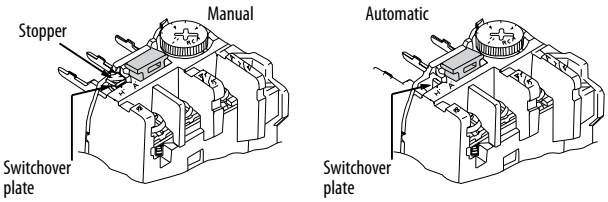


TH-T25KP – TH-N600KP



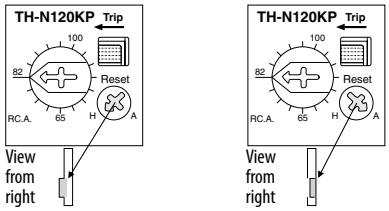
■ Switching between automatic and manual reset

TH-T18KP



Switching from manual to automatic: Break the stopper off and then, slide the switchover plate to the right (to position A) to immobilize the reset bar.
Switching from automatic to manual: Slide the switchover plate to the left (to position H).

TH-T25KP – TH-N600KP



Switching from manual to automatic: Flip the stopper on the end of the reset bar down and then, after pushing it all the way in, rotate it counterclockwise 90° (to position A).
Switching from automatic to manual: Rotate the reset bar 90° clockwise (to position H) and the reset bar will pop out

■ Specifications

Specifications				TH-T18KP □□□ A	TH-T25KP □□□ A	TH-T50KP □□□ A	TH-T65KP □□□ A	TH-T100KP □□□ A	TH-N120KP □□□ A	TH-N120TAKP □□□ A	TH-N220RHKP □□□ A	TH-N400RHKP □□□ A	TH-N600KP □□□ A ①
Rated data													
Max. setting current			A	18	26	50	65	100	100	150	220	400	800
Range of setting current			A	0.12–18	0.24–26	24–50	12–65	54–100	34–100	85–150	65–250	85–400	200–800
Rated insulation voltage			V	690	690	690	690	690	690	690	1000	1000	690
Auxiliary contacts				For all types: 1 NO + 1 NC									
Max. heater dissipation per current path		Min. setting	W	0.8	1.5	1.6	2.4	2.5	2.5	3.2	2.5	2.5	2.5
		Max. setting	W	1.8	3.0	3.2	5.5	6.0	7.1	8.6	6.0	6.0	6.0
Rated operating current of auxiliary contacts													
Category AC-15	NO contact	120 V	A	2	2	2	2	2	2	2	2	2	2
		240 V	A	1	1	1	1	1	1	1	1	1	1
		500 V	A	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	NC contact	120 V	A	2	3	3	3	3	3	3	3	3	3
		240 V	A	1	2	2	2	2	2	2	2	2	2
		500 V	A	0.5	1	0.3	1	1	1	1	1	1	1
Category DC-13		48 V	A	0.4	0.5	1	1	1	0.5	0.5	0.5	0.5	0.5
		110 V	A	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
		220 V	A	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Sizes													
Main terminal screw size		Line side	mm	—	M4	M5	M6	M6	M8	M8	—	—	M4
		Load size	mm	M3.5	M4	M5	M6	M6	M8	M8	M10	M12	M4
Max. conductor size	Main	Line side	mm^2	—	6	14			38	60	—	—	6
		Load side	mm^2	2.5	6	14			38	60	70	240	6
	Busbar	Line side	mm	—	10.2		17	17	20	20	—	—	—
		Load side	mm	7.5	10.2	13.3	17	15	20	20	25	30	—
Auxiliary contacts			mm^2	2.5	2.5	2	2	2	4	4	4	4	4
Bimetal heating				Direct	Direct	Direct	Direct	Direct	Direct	Direct	Via CTs	Via CTs	Via CTs ①
Weight			kg	0.11	0.16	0.2	0.26	0.32	0.48	0.75	2.5	2.7	0.14
Dimensions (WxHxD)			mm	45x55x76.5	63x51x69	74.3x72x83.5	89x57x83.5	89x73.5x83.5	103x67x105	112x87x105	144 x114 x180	144x160x194	63x42x83.5
Order information			Art. no.	See page 116 for order information									

① Used with current transformer (to be supplied by the customer), for further information, see table on bottom of the page.

■ Selection guide of the current transformers for TH-N600KP

For the TH-N600KP the customer has to use a transformer with specifications as described in the following table.

Specifications					
Heater designation		A	250	330	500	660
Setting range		A	200–300	260–400	400–600	520–800
Current transformer ratio			400/5A	500/5A	750/5A	1,000/5A
Current transformer capacity			at least 15 VA	at least 15 VA	at least 15 VA	at least 15 VA
Recommended Mitsubishi Electric current transformer model number	Cable		CW-15L 400/5A 15 VA	CW-15L 500/5A 15 VA	CW-15L 750/5A 15 VA	—
	Bus bar		CW-15LM 400/5A 15 VA	CW-15LM 500/5A 15 VA	CW-15LM 750/5A 15 VA	CW-40LM 1000/5A 40 VA

Order information for thermal overload relays

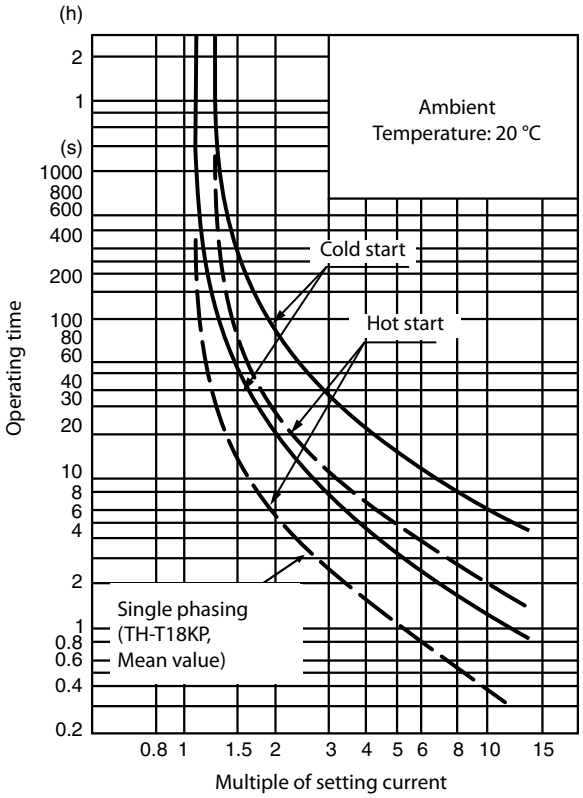
Range (A)	Heater designation	TH-T18KP □□□ A	TH-T25KP □□□ A	TH-T50KP □□□ A	TH-T65KP □□□ A	TH-T100KP □□□ A	TH-N120KP □□□ A	TH-N120TAKP □□□ A	TH-N220RHKP □□□ A	TH-N400RHKP □□□ A	TH-N600KP □□□ A ④
0.10–0.16	0.12 A	279281									
0.14–0.22	0.17 A	279282									
0.20–0.32	0.24 A	279283	279298								
0.28–0.42	0.35 A	279284	279299								
0.40–0.60	0.5 A	279285	279300								
0.55–0.85	0.7 A	279286	279301								
0.70–1.10	0.9 A	279287	279302								
1.00–1.60	1.3 A	279288	279303								
1.40–2.00	1.7 A	279289	279304								
1.70–2.50	2.1 A	279290	279305								
2.00–3.00	2.5 A	279291	279306								
2.80–4.40	3.6 A	279292	279307								
4.00–6.00	5 A	279293	279308								
5.20–8.00	6.6 A	279294	279309								
7.00–11.0	9 A	279295	279310								
9.00–13.0	11 A	279296	279311								
12.0–18.0	15 A	279297	279312		298608						
16.0–22.0	19 A		279313								
18.0–26.0	22 A				298609						
24.0–34.0	29 A			298605	298610						
30.0–40.0	35 A			298606	298611						
34.0–50.0	42 A			298607	298612		124425				
43.0–65.0	54 A				298613		124426				
54.0–80.0	67 A					298614	124427				
65.0–100	82 A					298615	124428		124432		
85.0–105	95 A										
85.0–125	105 A							124430	124433	124438	
100–150	125 A							124431 ①	124434	124439	
120–180	150 A								124435	124440	
140–220	180 A								124436 ②	124441	
170–250	210 A								124437 ②		
200–300	250 A									124442	On request
260–400	330 A									124443 ③	On request
400–600	500 A										On request
520–800	660 A										On request ④
Contactors modified with thermal overload relays correspond to motor starter combination (see also the overview on pages 106 and 107)											
Contactors – with connecting parts ⑥		S-T10, S-T12, S-T20, SD-T12 SD-T20	S-T21, S-T25 SD-T21 S-T35 SD-T35 S-T50 SD-T50	S-T35 SD-T35 S-T50 SD-T50	S-T65 SD-T65 S-T80 SD-T80 S-T100 SD-T100	S-T80 SD-T80 S-T100 SD-T100	S-N125, S-N150, SD-N125, SD-N150	S-N125, S-N150, SD-N125, SD-N150	S-N180, S-N220, SD-N220	S-N300, S-N400, SD-N300, SD-N400	S-N600, S-N800, SD-N600, SD-N800
		For connecting parts see page 130.									
Stand-alone type ⑦		●	●	—	○		○	○	○	○	○
With connecting part		UT-HZ18CX	UN-RM20	—	—	—	—	—	—	—	—

① For all -N150 only.
② For all -N220 only.
③ For all -N400 only.
④ TH-N600KP must be used with the current transformers (to be supplied by the customer), see page 115.
⑤ For all -N800 only.
⑥ For the standard operation it is important to use the thermal overload relay with one of the mentioned contactors and if necessary with a connecting part.
⑦ ● Stand-alone with finger protection
○ Stand-alone without finger protection
— Stand-alone not possible

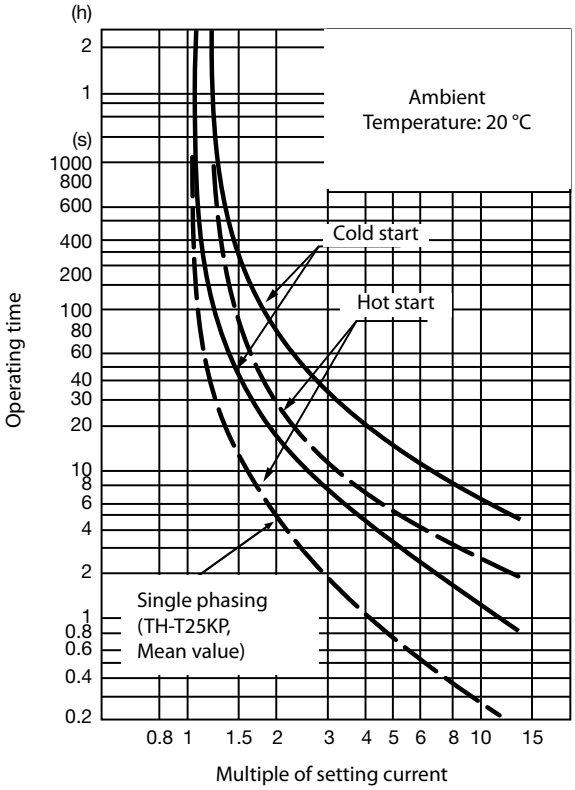
Range (A)	Heater designation	Max. fuse rating (AC 660 V) IEC 269-1 (A)			Standard wire size, (mm²) recommended	Motor capacity (three phase 50/60 Hz, based on four poles) (kW)			
		aM	gG	gM		AC 220–240 V	AC 380 V	AC 400–440 V	AC 500 V
0.10–0.16	0.12 A	0.5	0.5	—	2				
0.14–0.22	0.17 A	0.5	1	—	2				
0.20–0.32	0.24 A	1	2	—	2	0.03	0.06	0.06	0.09
0.28–0.42	0.35 A	1	2	—	2	0.05	0.09	0.09	0.12
0.40–0.60	0.5 A	1	2	—	2	0.06	0.12	0.12	0.18
0.55–0.85	0.7 A	2	4	—	2	0.09	0.18	0.18	0.25
0.70–1.10	0.9 A	2	4	—	2	0.12	0.25	0.25	0.37
1.00–1.60	1.3 A	2	4	—	2	0.18	0.37	0.37; 0.55	0.55
1.40–2.00	1.7 A	4	6	—	2	0.25	0.55	0.75	0.75
1.70–2.50	2.1 A	4	6	—	2	0.37	0.75	—	1.1
2.00–3.00	2.5 A	6	10	—	2	0.55	1.1	1.1	1.5
2.80–4.40	3.6 A	6	10	—	2	0.75	1.5	1.5	2.2
4.00–6.00	5 A	8	16	—	2	1.1	2.2	2.2	3
5.20–8.00	6.6 A	12	20	—	2	1.5	3	3; 3.7	3.7
7.00–11.0	9 A	12	20	—	2	2.2	3.7; 4	3; 3.7	5.5
9.00–13.0	11 A	16	25	32M35	2	3	5.5	5.5	7.5
12.0–18.0	15 A	20	32	32M50	3.5	3.7	7.5	7.5; 9	9
16.0–22.0	19 A	25	40	32M63	3.5	5.5	11	11	11
18.0–26.0	22 A	40	63	32M63	5.5	5.5	11	11	15
24.0–34.0	29 A	50	80	63M80	8	7.5	15	15	18.5
30.0–40.0	35 A	63	80	63M80	8	9	18.5	18.5	22
34.0–50.0	42 A	63	100	100M100	14	11	22	22	30
43.0–65.0	54 A	80	125	100M125	22	15	30	30	37
54.0–80.0	67 A	100	160	100M160	22	18.5	37	37	45
65.0–100	82 A	125	200	100M200	38	22	45	45	55
85.0–105	95 A	—	200	100M200	38	30	55	55	—
85.0–125	105 A	—	250	200M250	50	30	55	55	75
100–150	125 A	—	250	200M250	60	37	75	75	90
120–180	150 A	—	315	200M315		45	90	90	110
140–220	180 A	—	400	—		55	110	110	132
170–250	210 A	—	500	—		75	132	132	—
200–300	250 A	—	630	—		75	132; 160	132; 160	160
260–400	330 A	—	630	—		90; 110	200	200	220; 250
400–600	500 A	—	800	—		132; 160	220; 250; 300	220; 250; 300	400
520–800	660 A	—	1000	—		200; 220	400	400	500

Characteristics of thermal overload relays

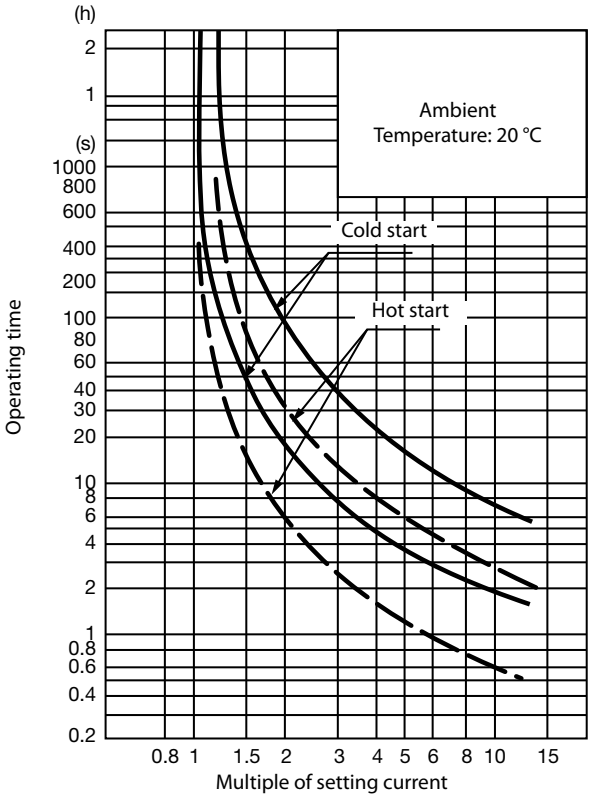
■ TH-T18KP



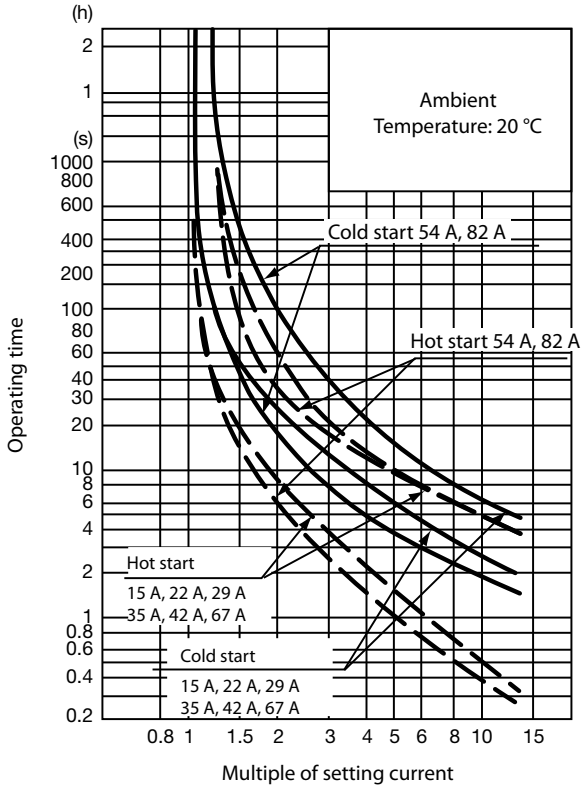
■ TH-T25KP



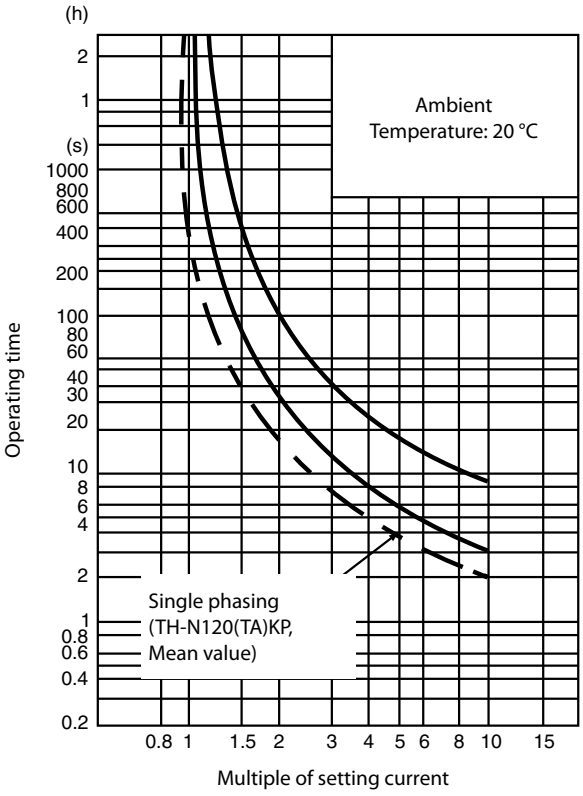
■ TH-T50KP



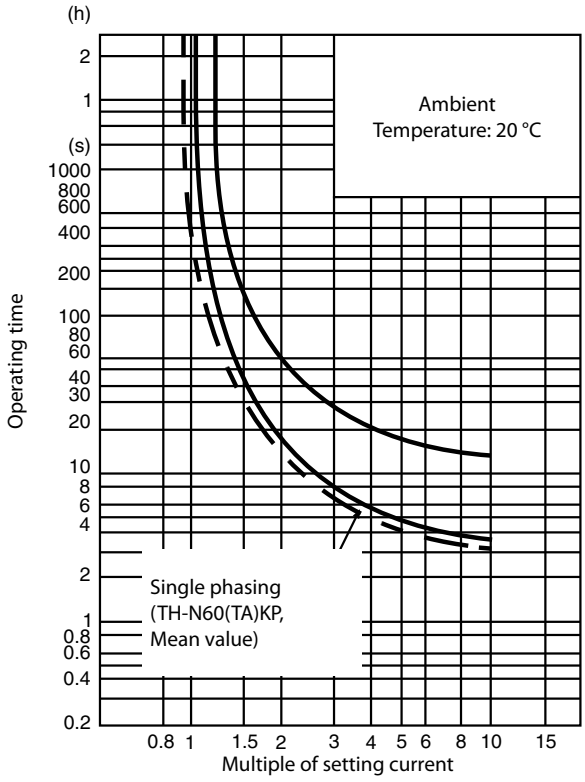
■ TH-T65KP, TH-T100KP



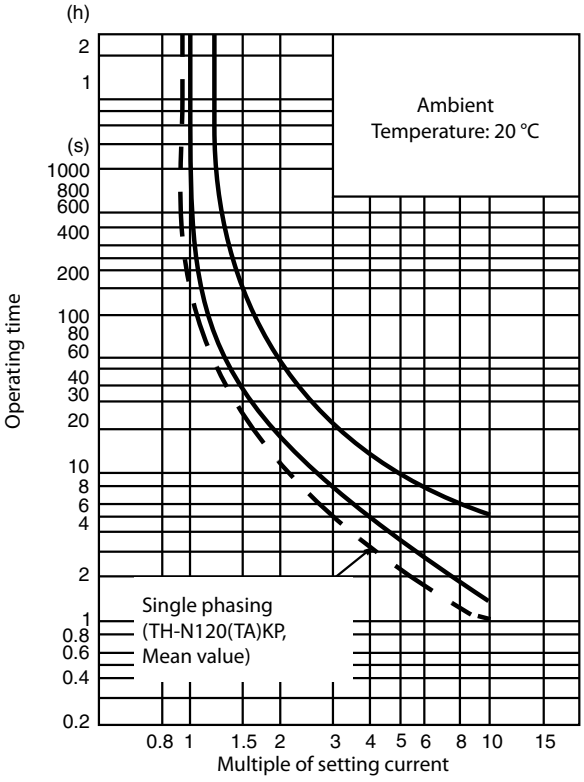
■ TH-N120KP, TH-N120TAKP



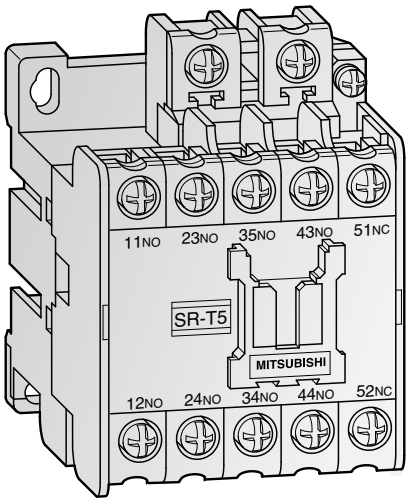
■ TH-N220RHKP, TH-N400RHKP



■ TH-N600KP



■ Contactor relay features



SR-T5

Contactor relays are designed for use in low voltage control circuit applications.

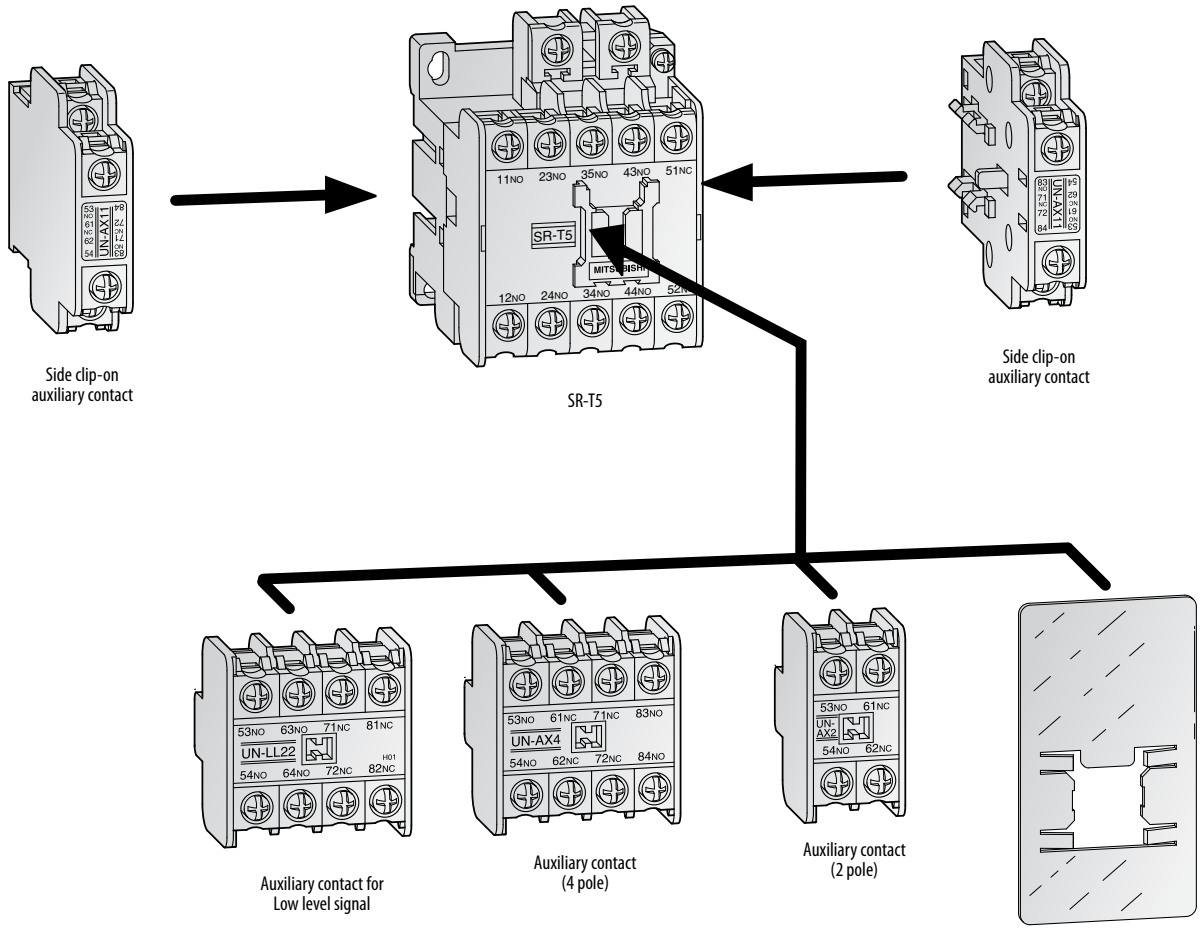
Benefits:

- High reliability: By adopting bifurcated moving contacts and by improving the shape of the contacts, contact performance has been made more reliable than ever.
- Different types as:
  Standard, big capacity or overlap contact
- Long life
- Mountable on 35 mm DIN rails
- Dust-proof construction
- Easily visible coil ratings
- Easy wiring (self-rising terminal screws)
- Various accessories common with the series S-N and S-T contactors (front and side clip-on type additional auxiliary contact blocks, surge absorbers)
- Finger protected types are available (DIN 57106/VDE 0106 Part 100) (Suffix "CX")

Our standard contactor relay version is with 4 auxiliary contacts.

With side clip-on or front clip-on a number of max. 8 auxiliary contacts is possible.

Type of auxiliary contact	Symbol		Code
Normally open	NO	=	A
Normally closed	NC	=	B



■ Specifications

Specifications			SR-T5 AC□□□V5A	SR-T5 AC□□□V4A1B	SR-T5 AC□□□V3A2B	SRD-T5 DC24V3A2B
Contact arrangement						
Contact arrangement			5 NO	4 NO + 1 NC	3 NO + 2 NC	3 NO + 2 NC
Rated data						
Rated insulation voltage		V	690	690	690	690
Rated continuous current I_{th}		A	16	16	16	16
Rated operating current; Category AC-15 (coil load)	120 V	A	6	6	6	6
	240 V	A	3	3	3	3
	440 V	A	1.5	1.5	1.5	1.5
	550 V	A	1.2	1.2	1.2	1.2
Rated operating current; Category AC-12 (coil load)	120 V	A	10	10	10	10
	240 V	A	8	8	8	8
	440 V	A	5	5	5	5
	550 V	A	5	5	5	5
Rated operating current; Category DC-13 (large coil load)	24 V	A	3	5	5	5
	48 V	A	1.5	3	3	3
	110 V	A	0.6 (2) ①	0.6 (2) ①	0.6 (2) ①	0.6 (2) ①
	220 V	A	0.3 (0.8) ①	0.3 (0.8) ①	0.3 (0.8) ①	0.3 (0.8) ①
Rated operating current; Category DC-12 (resistive load)	24 V	A	10	10	10	10
	48 V	A	8	8	8	8
	110 V	A	5 (8) ①	5 (8) ①	5 (8) ①	5 (8) ①
	220 V	A	1 (3) ①	1 (3) ①	1 (3) ①	1 (3) ①
Electrical data						
Coil consumption (at rated coil voltage)	Inrush	VA	45	45	45	—
	Sealed	VA	7	7	7	—
	Watts	W	2.2	2.2	2.2	3.3 (2.2)
Switching frequency		Oper./h	1,800	1,800	1,800	1,800
Operating time (average)	Making	ms	15	15	15	50
	Breaking	ms	10	10	10	10
Mechanical data						
Electrical life		Oper. (million)	0.5	0.5	0.5	0.5
Mechanical life			10	10	10	10
Conductor size		mm^2	1–2.5	1–2.5	1–2.5	1–2.5
Weight		kg	0.3	0.3	0.3	0.62
Dimensions (WxHxD) ②		mm	43x78x78	43x78x78	43x78x78	43x78x110
Order information	**AC24V**	Art. no.	279260	279267	279274	—
	AC48V		279261	279268	279275	—
	AC100V		279262	279269	279276	—
	AC200V		279263	279270	279277	—
	AC300V		279264	279271	279278	—
	AC400V		279265	279272	279279	—
	AC500V		279266	279273	279280	—
Order information	**DC24V**	Art. no.	—	—	—	287541

① Parenthesized rated operating current is for switching the load in 2-pole series connection.
② Dimensions on request.

■ Environmental conditions

Environmental conditions for all contactor relays			
Ambient temperature		° C	-25 to +55
Ambient humidity		RH	45 to 85 %
Coil voltage tolerance			0.85 to 1.1 times rated coil voltage
Vibration resistance	10–55 Hz	G	2
Shock resistance		G	5

■ Coil ratings

In case of special order:

The following tables show the devices which are additionally available.
Please contact Mitsubishi Electric for further information.

AC rated voltage (for SR-N)

50 Hz	60 Hz	Ordering designation	Standard
24	**24**	**AC 24 V**	●
48–50	**48–50**	**AC 48 V**	●
100	100–110	AC 100 V	
110–120	**115–120**	**AC 120 V**	●
125–127	127	AC 127 V	
200	200–220	AC 200 V	
208–220	220	AC 220 V	
220–240	**230–240**	**AC 230 V**	●
240–260	260–280	AC 260 V	
346–380	380	AC 380 V	
380–415	**400–440**	**AC 400 V**	●
415–440	460–480	AC 440 V	
500	500–550	AC 500 V	

For detailed description of the types please see page 121.

DC rated voltage (for SRD-N)

	Ordering designation	Standard
24	**AC 24 V**	●
48	AC 48 V	
100	AC 100 V	
110	AC 120 V	
120–125	AC 127 V	
200	AC 200 V	
220	AC 220 V	

For detailed description of the types please see page 121.

AC rated voltage (for SR-T)

50 Hz	60 Hz	Ordering designation	Standard
24	24	**AC 24 V**	
48–50	48–50	**AC 48 V**	
100–127	100–127	**AC 100 V**	
200–240	200–240	**AC 200 V**	
260–300	260–300	**AC 300 V**	
380–440	380–440	**AC 400 V**	
460–550	460–550	**AC 500 V**	

For detailed description of the types please see page 121.

DC rated voltage (for SRD-T)

Coil designation	Rated voltage (= Ordering designation)	Standard
DC 12 V	**DC 12 V**	
DC 24 V	**DC 24 V**	
DC 48 V	**DC 48 V**	
DC 100 V	**DC 100 V**	
DC 110 V	**DC 110 V**	
DC 120–125 V	**DC 120–125 V**	
DC 200 V	**DC 200 V**	
DC 220 V	**DC 220 V**	

For detailed description of the types please see page 121.

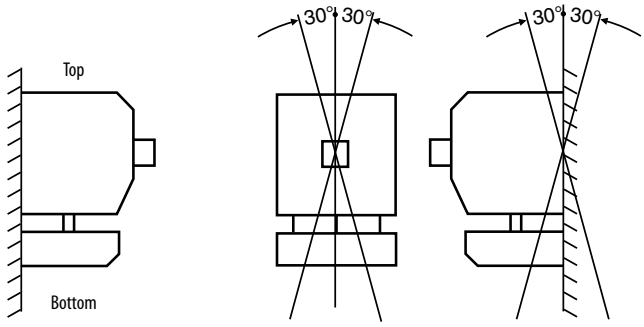
■ Mounting

Mounting attitude of contactors and contactor relays

The construction and characteristics of contactors and contactor relays require that they be installed at the correct attitude. This attitude should not be changed, as the operating characteristics will be affected.

To assure proper performance, Mitsubishi Electric contactors and contactor relays should be mounted on a vertical supporting surface with the line terminals upwards and the load terminals downwards. The supporting surface may have a maximum inclination of 30° from the vertical in any direction.

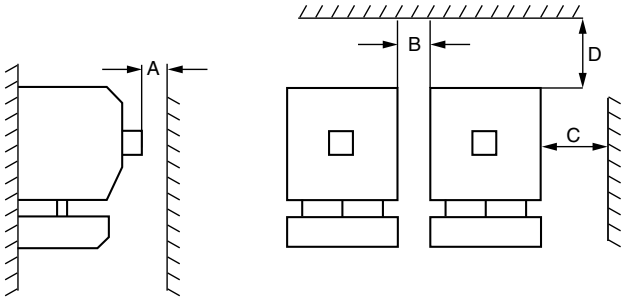
Instruction in detail also for horizontal installation on request.



Regular installation

Inclined installation

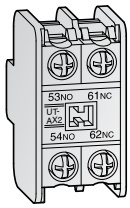
Minimal gaps for installation of contactor and contactor relays



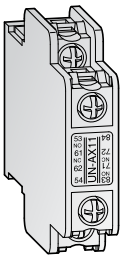
Frame size	A	B	C	D
S-T10, S-T12	5	5	10	15
S-T20, S-T21	5	5	10	15
S-T25, S-T32	5	5	10	15
S-T35	5	5	10	15
S-T50, S-T65	5	10	10	25
S-T80, S-T100	10	10	16	25
S-N125	10	12	16	25
S-N150	10	12	16	30
S-N180, S-N220	10	12	16	50
S-N300, S-N400	10	12	16	90
S-N600, S-N800	10	15	20	90

All dimensions in mm

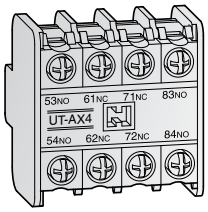
■ Auxiliary contact blocks



UT-AX2



UN-AX11



UT-AX4

Application

All contactors can be extended by additional contacts which are available as a compact module.

The auxiliary contacts are simple and safe to extend by means of front or side clips.

Type of auxiliary contact	Symbol		Code
Normally open	NO	=	A
Normally closed	NC	=	B

When ordering please check that the auxiliary contact fits for your magnetic contactor.

Auxiliary contact blocks for S-T10 to S-T50, SD-T12 to SD-T50, SR-T5, SRD-T5

Specifications		UT-AX2 2A	UT-AX2 1A1B	UT-AX2 2B	UT-AX4 4A	UT-AX4 2A2B	UT-AX4 3A1B	UT-AX11
Contact arrangement		2 NO	1 NO+ 1 NC	2 NC	4 NO	2 NO+ 2 NC	3 NO+1 NC	1 NO+ 1 NC
Order information	Art. no.	279316	279315	279317	279320	279318	279319	279314

Auxiliary contact blocks for S-T65, S-T85, SD-T65 and SD-T80

Specifications		UN-AX2CX 2A	UN-AX2CX 1A1B	UN-AX2CX 2B	UN-AX4CX 4A	UN-AX4CX 2A2B	UN-AX4CX 3A1B	UN-AX11CX
Contact arrangement		2 NO	1 NO+ 1 NC	2 NC	4 NO	2 NO+ 2 NC	3 NO+1 NC	1 NO+ 1 NC
Order information	Art. no.	52625	52626	52627	52628	52629	52630	52631

Specifications			For all types on this page
Clip-on type			Front ②③ / UT-AX11 and UN-AX11: Side
Rated cont. curr. Ith			16
Rated insulation voltage			690
Category AC-15 (coil load)	AC 110 V	A	6
	AC 230 V	A	5 (3 for UT-AX)
	AC 440 V	A	3 (1.5 for UT-AX)
Category DC-13 (large coil load)	DC 48 V	A	3
	DC 110 V	A	0.8
	DC 220 V	A	0.2
Mechanical life		oper.	10 mill.
Electrical life		oper.	0.5 mill.
Switching frequency		opr./hour	1.800
Perm. amb. temperature		°C	-25–+55
Perm. amb. humidity		RH	45–85 %
Conductor size		mm^2	1.0–2.5

① Contact reliability may be decreased if it is operated more than 1 million operations.
② Front clip-on and side clip-on should not be mounted both.
③ Maximum 1 piece of auxiliary contact block can be mounted on a contactor/relay.
④ Maximum 2 pieces of auxiliary contact blocks can be mounted on a contactor/relay.

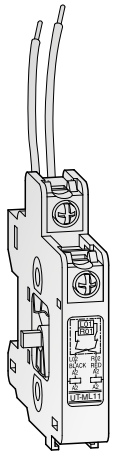
■ Auxiliary contact blocks (continued)

Auxiliary contact blocks for S-T100, S-N125 to S-N800

Specifications			UN-AX80	UN-AX150	UN-AX600
Contactors			S-T100 SD-T100 S-N125 SD-N125	S-N150 S-N180 S-N220 S-N300 S-N400 SD-N150 SD-N180 SD-N220 SD-N300 SD-N400	S-N600 S-N800 SD-N600 SD-N800
Contact arrangement			1 NO + 1 NC	1 NO + 1 NC	2 NO + 2 NC
Clip-on type			Side	Side	Side
Rated cont. curr. Ith		A	16	16	16
Rated insulation voltage		V	690	690	690
Category AC-15 (Coil load)	AC 110 V	A	6	6	6
	AC 230 V	A	5	5	5
	AC 440 V	A	3	3	3
Category DC-13 (large coil load)	DC 48 V	A	3	3	3
	DC 110 V	A	0.8	0.8	0.8
	DC 220 V	A	0.2	0.2	0.2
Mechanical life		oper.	10 mill.	10 mill.	10 mill.
Electrical life		oper.	0.5 mill.	0.5 mill.	0.5 mill.
Switching frequency		opr./hour	For all types: 1,800		
Perm. amb. temperature		°C	For all types: -25 to +55		
Perm. amb. humidity		RH	For all types: 45 % to 85 %		
Conductor size		mm²	For all types: 1.0 to 2.5		
Order information		Art. no.	113691	113702	113703

Maximum 2 pieces of auxiliary contact blocks can be mounted on a contactor/relay.

■ Mechanical interlocks



Application

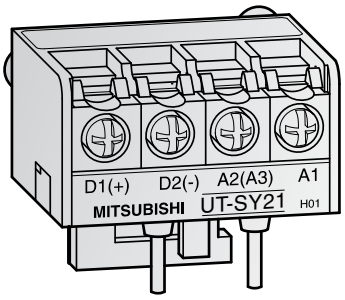
Two contactors are safely and simply secured against one another through mechanical interlocking.

The mechanical interlocks are simple and safe to mount by means of side clips.

On UT-ML11 the relevant interlock status can also be obtained through an electric query.

Specifications		UT-ML11	UT-ML20	UN-ML21	UN-ML80	UN-ML150	UN-ML220
Contactors		S-T10 S-T12 S-T20	SD-T12 SD-T20	S-T21 S-T25 S-T32 SD-T21 SD-T32 S(D)-T35 S(D)-T50 S(D)-T65 S(D)-T80	S(D)-T100 S-N125 SD-N125	S-N150 SD-N150	S-N180 S-N220 S-N300 S-N400 SD-N220 SD-N300 SD-N400
Order information	Art. no.	279321	295824	52634	124294	125992	124293

■ DC interface modules



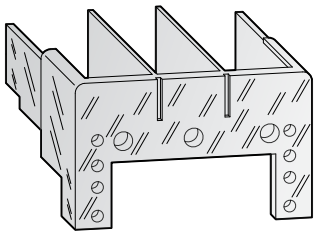
Application

Despite the low current requirements of our contactors and contactor relays, a number of PLC types with transistor outlets only allow direct control via the DC interface module.

In accordance to the used contactor it can be mounted directly on the contactor or on a separate location.

Specifications	UT -SY21	UT-SY22	UN-SY31	UN-SY32	UN-SY11	UN-SY12
Contactors	S-T10 S-T12 S-T20 S-T21 S-T25 S-T32 S-T50 SR-T5	S-T10 S-T12 S-T20 S-T21 S-T25 S-T32 S-T50 SR-T5	S-T65 S-T80	S-T65 S-T80	S-N125 S-N150 S-N180 S-N220 S-N300 S-N400	S-N125 S-N150 S-N180 S-N220 S-N300 S-N400
Output	Solid state	Relay	Solid state	Relay	Solid state	Relay
Mounting to contactor	Direct	Direct	Direct	Direct	Separate	Separate
Order information Art. no.	On request	On request	On request	On request	On request	On request

■ Terminal covers



Application

The terminal covers warrant protection against contacts being accidentally touched.

These covers are to retrofit contactors which do not have a terminal cover (like types without "CX" designation).

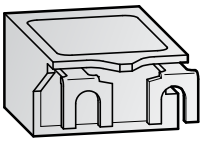
Specifications	UN-CZ500 ①	UN-CZ800 ①	UN-CZ1250 ①	UN-CZ1500 ①	UN-CZ2200 ①	UN-CZ3000 ①
Contactors	S(D)-T65 S(D)-T80	S(D)-T100	S-N125, SD-N125	S-N150, SD-N150	S-N180/N220, SD-N220	S-N300/N400, SD-N300/N400
Order information Art. no.	127116	113704	113705	113706	113707	113708

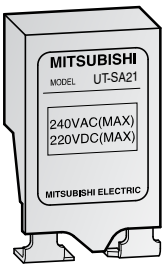
① 2 pcs. are required for one contactor .

Specifications	UN-CZ501 ②	UN-CZ801 ②	UN-CZ1251 ②	UN-CZ1501 ②	UN-CZ2201 ②	UN-CZ3001 ②
Contactor and Thermal Overheat Relay	S(D)-T65/T80, TH-T	S(D)-T100, TH-T	SD-N125, TH-N	SD-N150, TH-N	SD-N180/N220, TH-N	SD-N300/N400, TH-N
Order information Art. no.	127117	125994	125995	125996	125997	125998

② This part is only for the load side (1 piece). For the line side one UN-CZ□□0 is required.

■ Surge absorbers





Application

Surge absorbers serve the purpose of avoiding currency surges when coils are switched off.

They can be mounted safely and easily behind the terminal strips.

Contactors and relays with built-in surge absorbers, varistor-type are available on your request.

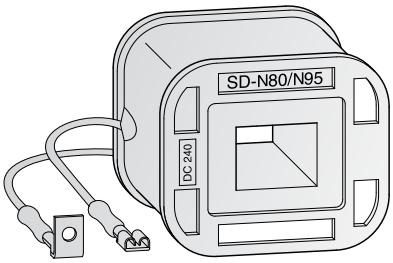
For S-T65 up to S-T100 and S-N125 up to S-N800 the surge absorber are implemented as standard.

Specifications	UT-SA21 AC□□□V	UT-SA22 AC□□□V	UT-SA23 AC□□□V	UT-SA25 AC□□□V	UT-SA13 DC□□□V
Contactors	S-T10 S-T12 S-T20 S-T21 S-T25 S-T32 S-T35 S-T50 SD-T12 SD-T20 SD-T21 SD-T32 SD-T35 SD-T50 SR-T5 SRD-T5	S-T10 S-T12 S-T20 S-T21 S-T25 S-T32 S-T35 S-T50 SD-T12 SD-T20 SD-T21 SD-T32 SD-T35 SD-T50 SR-T5 SRD-T5	S-T10 S-T12 S-T20 S-T21 S-T25 S-T32 S-T35 S-T50 SR-T5	S-T10 S-T20 S-T21 S-T25 S-T32 S-T35 S-T50 SD-T12 SD-T20 SD-T21 SD-T32 SD-T35 SD-T50 SR-T5 SRD-T5	SD-T12 SD-T20 SD-T21 SD-T32 SD-T35 SD-T50 SRD-T5
Voltage range	For AC 48 V AC 24–50 V DC 24–48 V	For AC 200 V AC 50–240 V DC 60–220 V	For AC 200 V AC 24–240 V	For AC 048 V AC 24–50 V DC 24–60 V	For DC 200 V DC 24–220 V
	For AC 200 V AC 24–240 V DC 24–220 V			For AC 200 V AC 24–240 V DC 24–220 V	
	For AC 400 V AC 24–480 V				
Varistor	●	—	—	—	—
Varistor with operating indicator (LED)	—	●	—	—	—
Varistor and CR	—	—	—	●	—
CR	—	—	●	—	●

Order information							
	AC 48 V		279322	—	—	279327	—
	AC 100 V		—	—	—	—	—
	AC 200 V	Art. no.	279323	279325	279326	279328	—
	AC 400 V		279324	—	—	—	—
	DC 200 V		—	—	—	—	On request

Note: For other voltage ranges please contact Mitsubishi Electric.

■ Replacement coils



Application

If, for technical or logistic reasons, a coil needs to be replaced, then this can be done fast and safely, as it involves very simple operations.

When ordering please check for the right voltage classification.

Changing procedure is done for

- S-T35 up to S-T100 by loosening a number of screws
- S-N125 to S-N800, SD-N125 to SD-N800 by replacing the coil cartridge.

AC-operated coils

Specifications		S-T35-COIL AC□□□□V	S-T65-COIL AC□□□□V	S-T100-COIL AC□□□□V	S-N125-COIL AC□□□□V	S-N180-COIL AC□□□□V	S-N300-COIL AC□□□□V	S-N600-COIL AC□□□□V
Contactors		S-T35 S-T50	S-T65 S-T80	S-T100	S-N125 S-N150	S-N180 S-N220	S-N300 S-N400	S-N600 S-N800
Weight	kg	0.08	0.27	0.6	0.46	0.6	0.9	2.0
Order information	AC 24 V	For article numbers of S-T coils please contact Mitsubishi Electric.			125895	—	—	—
	AC 48 V				125899	—	—	—
	AC 100 V				125893	125900	125915	125920
	AC 120 V				—	—	—	—
	AC 127 V				—	—	—	—
	AC 200 V				125894	125901	125916	125921
	AC 220 V				—	—	—	—
	AC 230 V				—	—	—	—
	AC 260 V				—	—	—	—
	AC 300 V				125896	125912	125917	125922
	AC 380 V				—	—	—	—
	AC 400 V				125897	125913	125918	125923
	AC 440 V				—	—	—	—
	AC 500 V				125898	125914	125919	125924

For information about the voltage range refer to page 122.

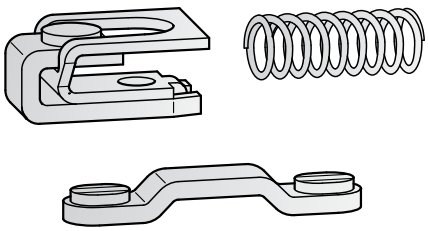
Note: For other voltage ranges please contact Mitsubishi Electric.

DC-operated coils

Specifications		SD-T35-COIL DC□□□□V	SD-T65-COIL DC□□□□V	SD-T100-COIL DC□□□□V	SD-N125-COIL DC□□□□V	SD-N220-COIL DC□□□□V	SD-N300-COIL DC□□□□V	SD-N600-COIL DC□□□□V
Contactors		SD-T35 SD-T50	SD-T65 SD-T80	SD-T100	SD-N125 SD-N150	SD-N220	SD-N300 SD-N400	SD-N600 SD-N800
Weight	kg	0.23	0.8	0.6	0.9	1.4	2.0	6.0
Order information	DC 12 V	For article numbers of SD-T coils please contact Mitsubishi Electric.			—	—	—	—
	DC 24 V				125945	125952	125959	125966
	DC 48 V				125946	125953	125960	125967
	DC 100 V				125939	125947	125954	125961
	DC 110 V				125940	125948	125955	125962
	DC 125 V				125941	125949	125956	125963
	DC 200 V				125943	125950	125957	125964
	DC 220 V				125944	125951	125958	125965

■ Replacement contact kits

Main contact kit



Application

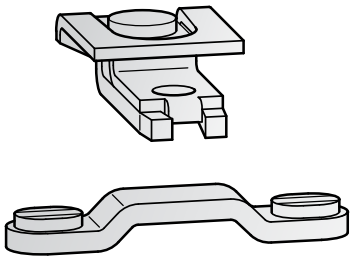
If used correctly, the contact kit does not need replacing during the lifetime stated in the documentation. However, should this still be required, then it can be done fast and without any problems, as it involves no more than a few simple operations.

The kits consist of 3 moving contacts and 6 stationary contacts.

Specifications		BHA-49N300	BHA-49N302	BHA-49N301	BHA-49N303	BH-759N300	BHA-59N301	BHA-59N300	BHA-59N302	BH-769N301	BH-769N303
Contactors		S-T35	SD-T35	S-T50	SD-T50	S-T65	SD-T65	S-T80	SD-T80	S-T100	SD-T100
Weight	kg	0.07	0.07	0.11	0.11	0.11	0.11	0.1	0.1	0.1	0.1
Order information	Art. no.	On request	On request	On request	On request	125971	On request	On request	On request	125977	125980

Specifications		BH-779N300	BH-779N301	BH-789N300	BH-799N300	BH-799N301	BH-609N300	BH-609N301	BH-619N300	BH-619N301
Contactors		S-N125	SD-N125	S-N150 SD-N150	S-N180	S-N220 SD-N220	S-N300 SD-N300	S-N400 SD-N400	S-N600 SD-N600	S-N800 SD-N800
Weight	kg	0.1	0.1	0.2	0.4	0.4	0.8	0.8	2.5	2.5
Order information	Art. no.	125981	125982	125983	125984	125985	125986	125987	125988	125989

Auxiliary contact kit



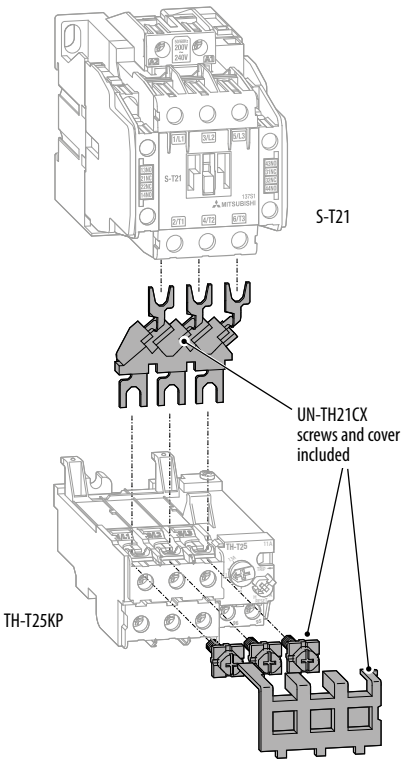
Application

If used correctly, the bifurcated moving contact warrants a maximum of contact safety and the longest possible lifetime.

Nevertheless, auxiliary contacts can be replaced safely and without any problems.

Specifications		BHA-49N304	BH-539N315	BH-579N312	UN-AX150	UN-AX600
Contactors		S-T35/50 SD-T35/50	S-T65 to S-T100 SD-T65 to SD-T100	S-N125 SD-N125	S-N150 to S-N400 SD-N150 to SD-N400	S-N600 S-N800 SD-N600 SD-N800
Kit contents	Bifurcated moving contacts	4	4	4	—	—
	Stationary contacts	8	8	8	—	—
	Contact block	—	—	—	1	1
Contact arrangement		2 NO 2 NC	2 NO 2 NC	2 NO + 2 NC	1 NO + 1 NC	2 NO + 2 NC
Weight	kg	0.03	0.02	0.02	0.04	0.1
Order information	Art. no.	On request	On request	On request	113702	113703

■ Connecting parts for contactors to thermal overload relays

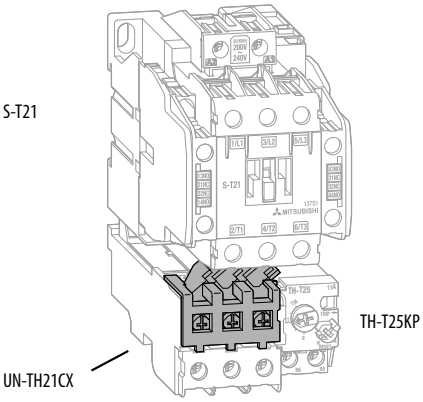


Application

For connection between the contactor and the thermal overload relay.

Connecting bars and mounting plate are included in the OLR of TH-N220RHKP and TH-N400RHKP for S-N180, S-N220, SD-N220, S-N300, SD-N300, S-N400, SD-N400.

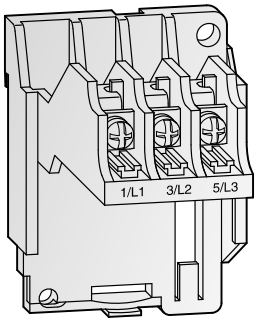
Contactor and relay mounted with connecting bar kit



Connecting bar kit

Specifications		UN-TH21CX	UT-TH50	BH559N350	BH569N350	BH569N352	BH579N355	BH589N355
Contactors		S-T21 S-T25 SD-T21	S(D)-T35 S(D)-T50	S(D)-T65 S(D)-T80 S(D)-T80	S-T100	SD-T100	S-N125 SD-N125	S-N150 SD-N150
Thermal overload relay		TH-T25KP	TH-T25KP TH-T50KP	TH-T65KP TH-T100	TH-T65KP TH-T100KP	TH-T65KP TH-T100KP	TH-N120KP, TH-N120TAKP	TH-N120KP, TH-N120TAKP
Weight	kg	0.02	0.02	0.02	0.04	0.04	0.36	0.36
Order information	Art. no.	141108	307329	126000	126001	126002	126003	126004

■ Separate mounting adapter



Application

For the stand-alone application the thermal overload relay TH-T18KP must be use with the separate mounting adapter UT-HZ18.

Specifications		UT-HZ18	UN-RM20
Thermal overload relays		TH-T18KP	TH-T25KP
Order information	Art. no.	293229	293220

Motor circuit breaker

MMP-T32 series

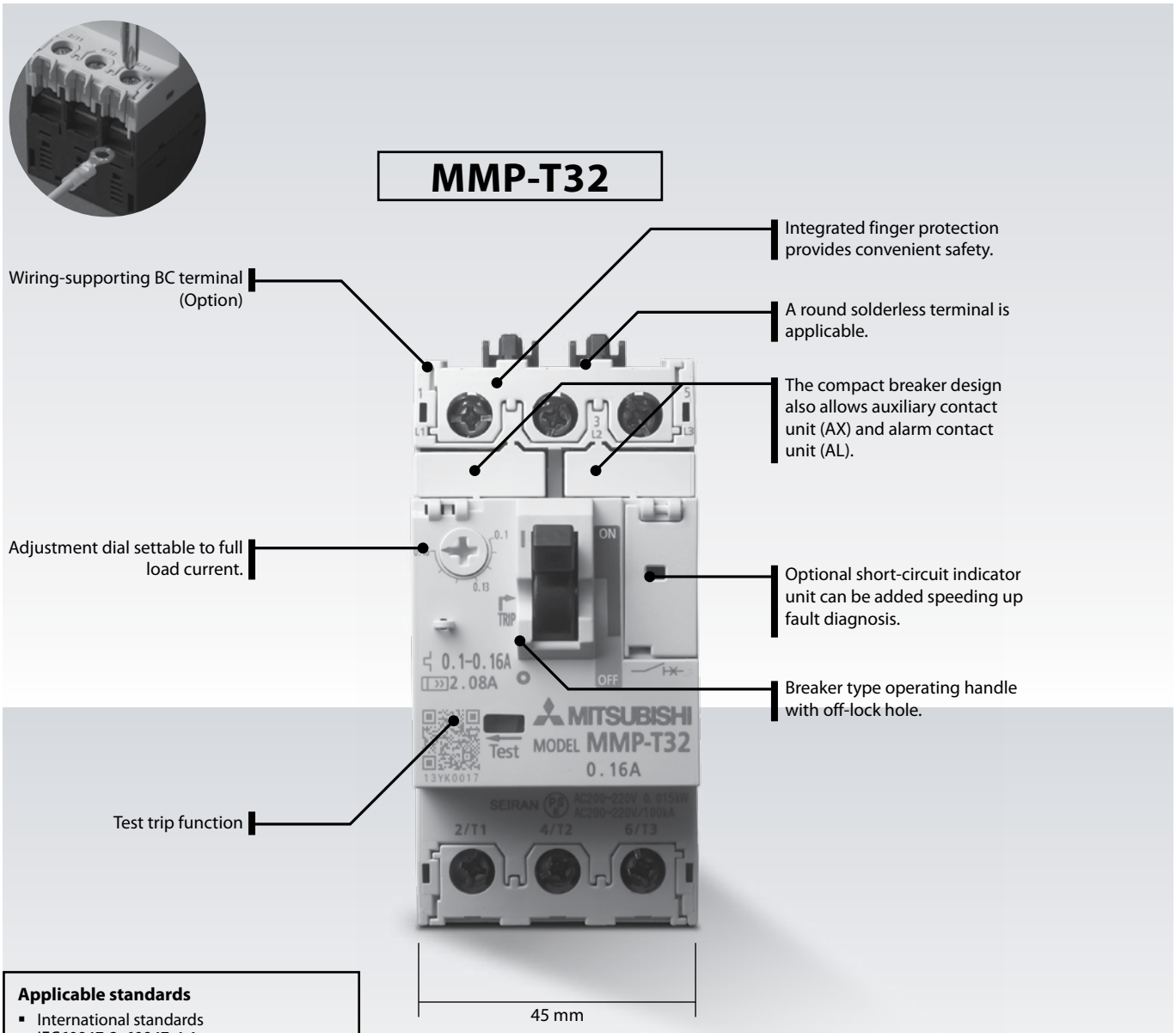
Special features:

- Self-protected manual motor controller
- Reliable protection and superior performance
- Compact design
- Smart wiring
- Safety & quality
- Global standards

Advantages of adopting this device

MMP-T32 integrates low voltage circuit breakers and thermal overload relay functions. This device is capable of protecting the motor branch circuits from overload, phase-loss and short-circuit occurrences. The MMP-T32 enables more secure wiring and motor protection than standard open type starters.

In addition to motor protection, integrating the Mitsubishi MS-T series contactor provides a smaller footprint, and the combination motor controller will help eliminate wiring and save time in panel design.



Applicable standards

- International standards
  IEC60947-2, 60947-4-1
  UL60947-4-1A, CSA C22.2 No. 60947-4-1 *1
  TUV approval CE CCC
- Domestic standards in Japan
  JIS C8201-2-1 Ann.1, 8201-4-1
  Electric applicable safety law
  (Electric articles other than specified) *1

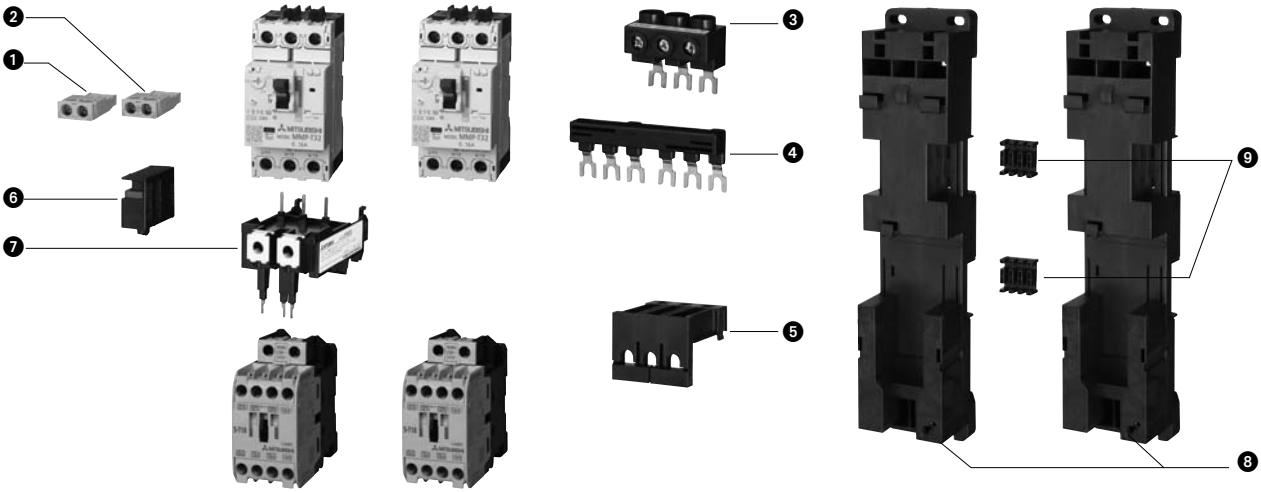
*1) MMP-T32LF is not applicable.

Specifications

Frame A			32						32					
Type name			MMP–T32						MMP–T32LF					
Standard			JIS C8201-2-1 Ann.1, JIS 8201-4-1, EN60947-2, EN60947-4-1, IEC60947-2, IEC60947-4-1, GB14048.2 UL60947-4-1A, CSAC22.2N0.60947-4-1						EN60947-2, EN60947-4-1, IEC60947-2, IEC60947-4-1, GB14048.2					
Number of poles			3											
Handle shape			Tumbler handle											
Rated current in [A]			0.1 to 32											
Rated operational voltage Ue [V]			200 to 690											
Rated frequency [Hz]			50/60											
Rated insulation voltage Ui [V]			690											
Rated impulse withstand voltage Uimp [kV]			6											
Rated short-circuit breaking capacity [kA] JIS C8201-2-1 Ann.1 IEC60947-2	Rated current Ie [A]		200/240 V		400/415 V		440/460 V		200/240 V		400/415 V		440/460 V	
	Heater designa-tion	Current setting range	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics
	0.16	0.1–0.16	100		100		100		100		100		100	
	0.25	0.16–0.25	100		100		100		100		100		100	
	0.4	0.25–0.4	100		100		100		100		100		100	
	0.63	0.4–0.63	100		100		100		100		100		100	
	1	0.63–1	100		100		100		100		100		100	
	1.6	1–1.6	100		100		100		100		100		100	
	2.5	1.6–2.5	100		100		100		100		100		100	
	4	2.5–4	100		100		100		100		100		100	
	6.3	4–6.3	100		100		100		100		100		50	50
	8	5.5–8	100		100		50	38	100		100		15	15
	10	7–10	100		100		50	38	100		100		15	15
	13	9–13	100		100		50	38	100		15	7.5	8	4
	18	12–18	100		50	38	35	27	100		15	7.5	8	4
	25	18–25	100		50	38	35	27	50		15	6	6	3
	32	24–32	100		50	38	35	27	50		10	5	6	3
Selectivity category	JIS C8201-2-1 Ann.1 IEC60947-2		Cat.A											
Utilization category	JIS C8201-4-1 IEC60947-4-1		AC-3											
Trip class (JIS C8201-4-1, IEC60947-4-1)			10											
Instantaneous release current			13 x Maximum Ie											
Durability	Mechanical [times]		100,000											
	Electrical [times]		100,000											
Phase loss sensitive			Yes											
Trip display			Yes											
Test trip function			Yes											
Auxiliary contact unit			UT-MAX (1a or 1b) AC-12: 125 V/5 A, 250 V/3 A											
Alarm contact unit			UT-MAL (1a or 1b) DC-12: 125 V/0.4 A, 250 V/0.2 A											
Short-circuit indicator unit			UT-TU											
Weight [g]			330											

Breaking capacity at 415 V	Current setting range	Model	Code
100 KA	0.1–0.16 A	MMP-T32LF-0.16A	288426
100 KA	0.16–0.25 A	MMP-T32LF-0.25A	288427
100 KA	0.25–0.4 A	MMP-T32LF-0.4A	288428
100 KA	0.4–0.63 A	MMP-T32LF-0.63A	288429
100 KA	0.6–1 A	MMP-T32LF-1.0A	288430
100 KA	1–1.6 A	MMP-T32LF-1.6A	288431
100 KA	1.6–2.5 A	MMP-T32LF-2.5A	288432
100 KA	2.5–4 A	MMP-T32LF-4.0A	288433
100 KA	4–6.3 A	MMP-T32LF-6.3A	288434
100 KA	5.5–8 A	MMP-T32LF-8A	288435
100 KA	7–10 A	MMP-T32LF-10A	288436
15 KA	9–13 A	MMP-T32LF-13A	288437
15 KA	12–18 A	MMP-T32LF-18A	288438
15 KA	18–25 A	MMP-T32LF-25A	488439
10 KA	24–32 A	MMP-T32LF-32A	288440
100 KA	9–13 A	MMP-T32-13A	288441
50 KA	12–18 A	MMP-T32-18A	288442
50 KA	18–25 A	MMP-T32-25A	288443
50 KA	24–32 A	MMP-T32-32A	288444

Options list



Number	Model	Code	Specification	Description
❶	UT-MAX 1A	288455	1a	Auxiliary contact unit with ON/OFF operation.
	UT-MAX 1B	288456	1b	
	UT-MAXLL 1A	288457	1a	Auxiliary contact unit with ON/OFF operation. (for light load)
	UT-MAXLL 1B	288458	1b	
❷	UT-MAL 1A	288451	1a	Alarm contact unit with trip operation.
	UT-MAL 1B	288452	1b	
	UT-MALLL 1A	288453	1a	Alarm contact unit with trip operation. (for light load)
	UT-MALLL 1B	288454	1b	
❸	UT-EP3	288449		A unit to connect a large size electric wires to MMP-T32.
❹	UT-2B4	288445	45 mm	A unit to supply power to two or three MMP-T32.
			Twin type	
	UT-3B4	288446	45 mm	
			Triple type	
	UT-2B5	288447	57 mm	
			Twin type	
	UT-3B5	288448	57 mm	
			Triple type	
❺	UT-CV3	288450	For MMP-T32 to fulfill with UL60947-4-1A, type E/F	Power supply-side terminal cover for UL60947-4-1A, type E/F. Kit includes terminal adapter, terminal cover and 3 screws.
❻	UT-TU	288459	For MMP-T32 to fulfill with UL60947-4-1A, type E/F	Unit has red indicator which shows only when the device is tripped due to short-circuit. This unit is required for UL60947-4-1A, Type E/F.
❼	UT-MT20	288460	For S-T10/T12/T20	Used to connect the MMP-T32 and magnetic contactor electrically and mechanically.
	UT-MT32	288461	For S-T32	
	UT-MT20D	293623	For SD-T12/T20	
	UT-MT32D	293624	For SD-T32	
❽	UT-BT20	288462	For UT-MT20	A plate to install the combination starter with MMP-T32 and magnetic contactor. Rail mounting and screw mounting are available.
	UT-BT32	288463	For UT-MT32	
	UT-BT32D	293626	For UT-MT20D/MT32D	
❾	UT-RT10	288464	For S-2xT10, SD-2xT10	Blocks for mechanical connection of two mounting base units.
	UT-RT20	288465	For S-2xT12/20, SD-2xT12/20	
	UT-RT32	288466	For S-2xT32, SD-2xT32	

Energy monitoring

Multi-measuring instrument Super-S series

Product outline

Mitsubishi Electric multi-measuring instrument SS series features high performance and crystal clear display. With simple operating functions, SS series is the best support to your measuring and monitoring systems.

Multi-measuring instrument SS series

Specifications

Type		ME96SSEA-MB, ME96SSRA-MB, ME96SSHA-MB			
Phase wire system		3-phase 4-wire, 3-phase 3-wire (3 CT, 2 CT), 1-phase 3-wire, 1-phase 2-wire (common)			
Rating	Current	AC 5 A, AC 1 A (common)			
	Voltage	3-phase 4-wire: max. AC 277/480 V 3-phase 3-wire: (DELTA) max. AC 220 V, (STAR) max. AC 440 V 1-phase 3-wire: max. AC 220/440 V 1-phase 2-wire: (DELTA) max. AC 220 V, (STAR) max. AC 440 V			
	Frequency	50–60 Hz (common)			
	Item	**Measurement item**	**ME96SSHA-MB**	**ME96SSRA-MB**	**ME96SSEA-MB**
Measurement elements	Current (A)	A1, A2, A3, AN, A_{AVG}	±0.1 %	±0.2 %	±0.5 %
	Current demand (DA)	DA1, DA2, DA3, DAN, DA_{AVG}			
	Voltage (V)	V12, V23, V31, VAVG (L-L), V1N, V2N, V3N, V_{AVG} (L-N)			
	Active power (W)	W1, W2, W3, ΣW	±0.2 %	±0.5 %	±0.5 %
	Reactive power (var)	var1, var2, var3,Σvar			—
	Apparent power (VA)	VA1, VA2, VA3, ΣVA			—
	Power factor (PF)	PF1, PF2, PF3,ΣPF	±0.2 %	±0.5 %	±0.5 %
	Frequency (Hz)	Hz	±0.1 %	±0.1 %	±0.2 %
	Active energy (Wh)	Imported, exported	Class 0.5S (IEC62053-22)	Class 0.5S (IEC62053-22)	Class 0.5S (IEC62053-22)
	Reactive energy (varh)	Imported lag, imported lead, exported lag, exported lead	Class 1S (IEC62053-24)	Class 1S (IEC62053-24)	—
	Apparent energy (VAh)	Imported + exported	±2.0 %	±2.0 %	—
	Harmonic current (HI)	Only odd number	±1.0 % (1 to 31st)	±1.0 % (1 to 19th)	±2.0 % (THD only)
	Harmonic voltage (HV)	Only odd number			
	Rolling demand (DW)	Rolling block, fixing block	±0.2 %	±0.5 %	—
	Rolling demand (Dvar)	Rolling block, fixing block	±1.0 %	±1.0 %	—
	Rolling demand (DVA)	Rolling block, fixing block	±1.0 %	±1.0 %	—
	Periodic active energy (Wh)	Periodic active energy 1, periodic active energy 2	Class 0.5S (IEC62053-22)	Class 0.5S (IEC62053-22)	—
	Operation time (h)	Operation time 1, operation time 2	(Reference)	(Reference)	(Reference)
Communication specification		MODBUS®RTU communication			
Accessible optional plug-in module (only ME96SSHA-MB, ME96SSRA-MB)	ME-4210-SS96	4-analog output, 2-pulse output, 1-digital input			
	ME-0040C-SS96	CC-Link communication, 4-digital input			
	ME-0052-SS96	5-digital input, 2-digital output			
	ME-0000BU-SS96	Logging module (SD CARD)			
	ME-0000MT-SS96	MODBUS® TCP communication			
Auxiliary power		AC 100–240 V (±15 %), DC 100–240 V (-30 % +15 %)			
Weight	kg	0.5			
Dimension (HxWxD)	mm	96x96x90			
Attachment method		Embedding attachment			
Operating temperature/humidity		-5 to +55 °C (average temperature: 35 °C or less per day), 0 to 85 % RH, non-condensing			
Storage temperature/humidity		-25 to +75 °C (average temperature: 35 °C or less per day), 0 to 85 % RH, non-condensing			
Optional part (For ME-0000BU-SS96)		SD memory card (EMU4-SD2GB) ①			

① Make sure to use the SD memory card manufactured by Mitsubishi Electric Corporation (Model EMU4-SD2GB). Using other types of the SD memory cards may cause trouble such as data destruction of the memory card or system failure.

Order information

Type	Description	Code
ME96SS□A units		
ME96SSHA-MB	Multi-measuring instrument high performance model	297417
ME96SSRA-MB	Multi-measuring instrument standard model	297418
ME96SSEA-MB	Multi-measuring instrument economic model	297419
Plug-in modules (accessories)		
ME-4210-SS96	4 Analog outputs 2 pulse outputs, 1 digital input	273873
ME-0040C-SS96	CC-Link communication, 4 digital inputs	273874
ME-0052-SS96	5 digital inputs, 2 digital outputs	273895
ME-0000BU-SS96	Data logging module for ME96 a	297421
ME-0000MT-SS96	Modbus TCP communication module for ME96 a	297420

Energy measuring unit EcoMonitorLight

Product outline

Simple & easier providing energy visualization.

Introducing the EcoMonitorLight, an energy measuring unit with an integrated display that provides easy energy visualization in order to provide ways to save energy and to comply with the Energy Saving Act in response to the need for a simple manner to figure out energy consumption.

EcoMonitorLight unit EMU4-FD1-MB

Specifications

Type		EMU4-FD1-MB	
Phase wire system		3-phase 4-wire, 3-phase 3-wire (3 CT, 2 CT), 1-phase 3-wire, 1-phase 2-wire	
Rating	Current	AC 5 A, AC 1 A	
	Voltage	3-phase 4-wire: max. AC 277/480 V; 3-phase 3-wire: (DELTA) max. AC 220 V, (STAR) max. AC 440 V 1-phase 3-wire: max. AC 220/440 V; 1-phase 2-wire: (DELTA) max. AC 220 V, (STAR) max. AC 440 V	
	Frequency	50–60 Hz (common)	
Item		**Measurement Item**	**EMU4-FD1-MB**
Measurement elements	Current (A)	A1, A2, A3, AN	±0.5 %
	Current demand (DA)	DA1, DA2, DA3, DAN	
	Voltage (V)	V12, V23, V31, V1N, V2N, V3N	
	Active power (W)	W1, W2, W3, ΣW	±0.5 %
	Reactive power (var)	var1, var2, var3, Σvar	
	Apparent power (VA)	VA1, VA2, VA3, ΣVA	
	Power factor (PF)	PF1, PF2, PF3, ΣPF	±0.5 %
	Frequency (Hz)	Hz	±1.0 %
	Active energy (Wh)	Imported, exported	±0.5 % ②
	Reactive energy (varh)	Imported lag, imported lead, exported lag, exported lead	±2.0 %
	Harmonic current (HI)		±2.5 % (1 to 15th)
	Harmonic voltage (HV)		
Communication specification		MODBUS®RTU communication	
External input	Input signal	Non-voltage form A contact, 1 input (choose the function from below)	
	Function	Setting to "pulse input": Pulse count (0–999,999 counts)	
		Setting to "contact input": Contact monitoring only Contact monitoring and energy measuring at work (when contact is on)	
External output	Output signal	Non-voltage Form A contact, 1 output (choose the function from below)	
	Function	Upper limit monitoring of current demand, Lower limit monitoring of current demand, Upper/lower limit monitoring of voltage, Upper limit monitoring of power demand, Lower limit monitoring of power demand, Upper/lower limit monitoring of power factor, Upper limit monitoring of pulse count, Lower limit monitoring of pulse count	
		Pulse output, Output item: Energy use	
Accessible optional plug-in module	EMU4-CM-C	CC-Link communication	
	EMU4-LM	Logging module (SD CARD)	
	EMU4-CM-MT	MODBUS®TCP communication	
Auxiliary power		AC 100–240 V (+10 %,-15 %) 50/60 Hz	
Weight	kg	0.3	
Dimension (HxWxD)	mm	90x75x75	
Attachment method		IEC rail mounting	
Operating temperature/humidity		-5 to +55 °C (average temperature: 35 °C or less per day), 0 to 85 % RH, non-condensing	
Storage temperature/humidity		-10 to +60 °C (average temperature: 35 °C or less per day), 0 to 85 % RH, non-condensing	
Optional part (For EMU4-LM)		SD memory card (EMU4-SD2GB) ①	

① Make sure to use the SD memory card manufactured by Mitsubishi Electric Corporation (Model EMU4-SD2GB). Using other types of the SD memory cards may cause trouble such as data destruction of the memory card or system failure.
② In case of phases are reverse order, accuracy is ± 1.0 %

Order information

Type	Description	Code
EcoMonitorLight unit		
EMU4-FD1-MB	Base unit	304059
Plug-in modules (accessories)		
EMU4-CM-C	CC-Link communication for EcoMonitorLight	292655
EMU4-LM	Data logging module for EcoMonitorLight	284752
EMU4-CM-MT	MODBUS TCP communication module for EcoMonitorLight	304060

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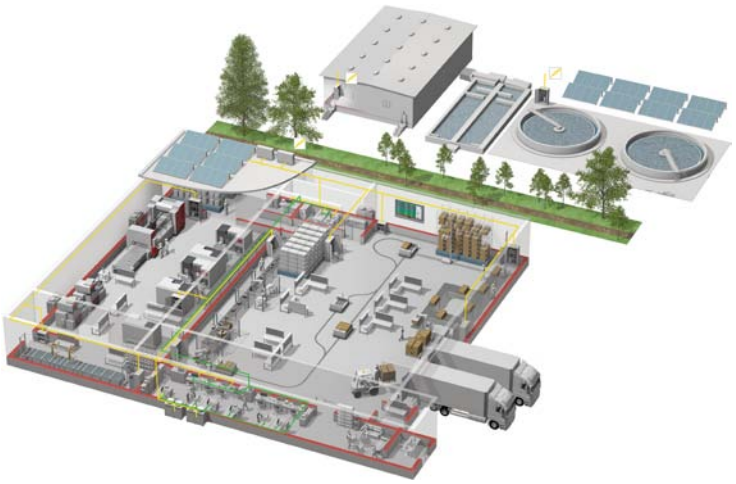
Your solution partner



Mitsubishi Electric offers a wide range of automation equipment from PLCs and HMIs to CNC and EDM machines

A name to trust

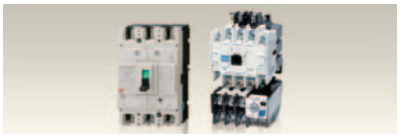
Since its beginnings in 1870, some 45 companies use the Mitsubishi name, covering a spectrum of finance, commerce and industry.

The Mitsubishi brand name is recognized around the world as a symbol of premium quality.

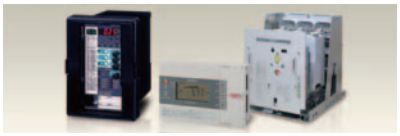
Mitsubishi Electric Corporation is active in space development, transportation, semi-conductors, energy systems, communications and information processing, audio visual equipment and home electronics, building and energy management and automation systems, and has 237 factories and laboratories worldwide in over 121 countries.

This is why you can rely on Mitsubishi Electric automation solution - because we know first hand about the need for reliable, efficient, easy-to-use automation and control in our own factories.

As one of the world's leading companies with a global turnover of over 4 trillion Yen (over $40 billion), employing over 100,000 people, Mitsubishi Electric has the resource and the commitment to deliver the ultimate in service and support as well as the best products.



Low voltage: MCCB, MCB, ACB



Medium voltage: VCB, VCC

Power monitoring, energy management

Compact and Modular Controllers

Inverters, Servos and Motors

Visualization: HMIs, Software, MES connectivity

Numerical Control (NC)

Robots: SCARA, Articulated arm

Processing machines: EDM, Lasers, IDS

Air-conditioning, Photovoltaic, EDS

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