



SMART LOW VOLTAGE SWITCHGEAR SOLUTIONS

INNOVATION THAT LEADS THE CHANGE

Mitsubishi Electric's foray in the Low Voltage Switchgears segment in India marked the beginning of a series of innovations that are now gathering tremendous industry accolades.

Mitsubishi Electric group is taking steps to strengthen its initiatives in growing market segments. Right from expanding business in India and international markets, MEI is bolstering the social infrastructure system and is developing the business by combining a wide array of technologies with expertise gained in the varied product range and other fields.

Common to all of our products and endeavours is MEQ, which stands for 'Mitsubishi Electric Quality.' MEQ promises the best experience in our products, services, partnerships and people. It lies at the very core of our business. Guided by our corporate statement, 'Changes for the Better,' we take our responsibility as a corporate citizen very seriously. Our products are developed with superior energy efficiency and the environment in mind.

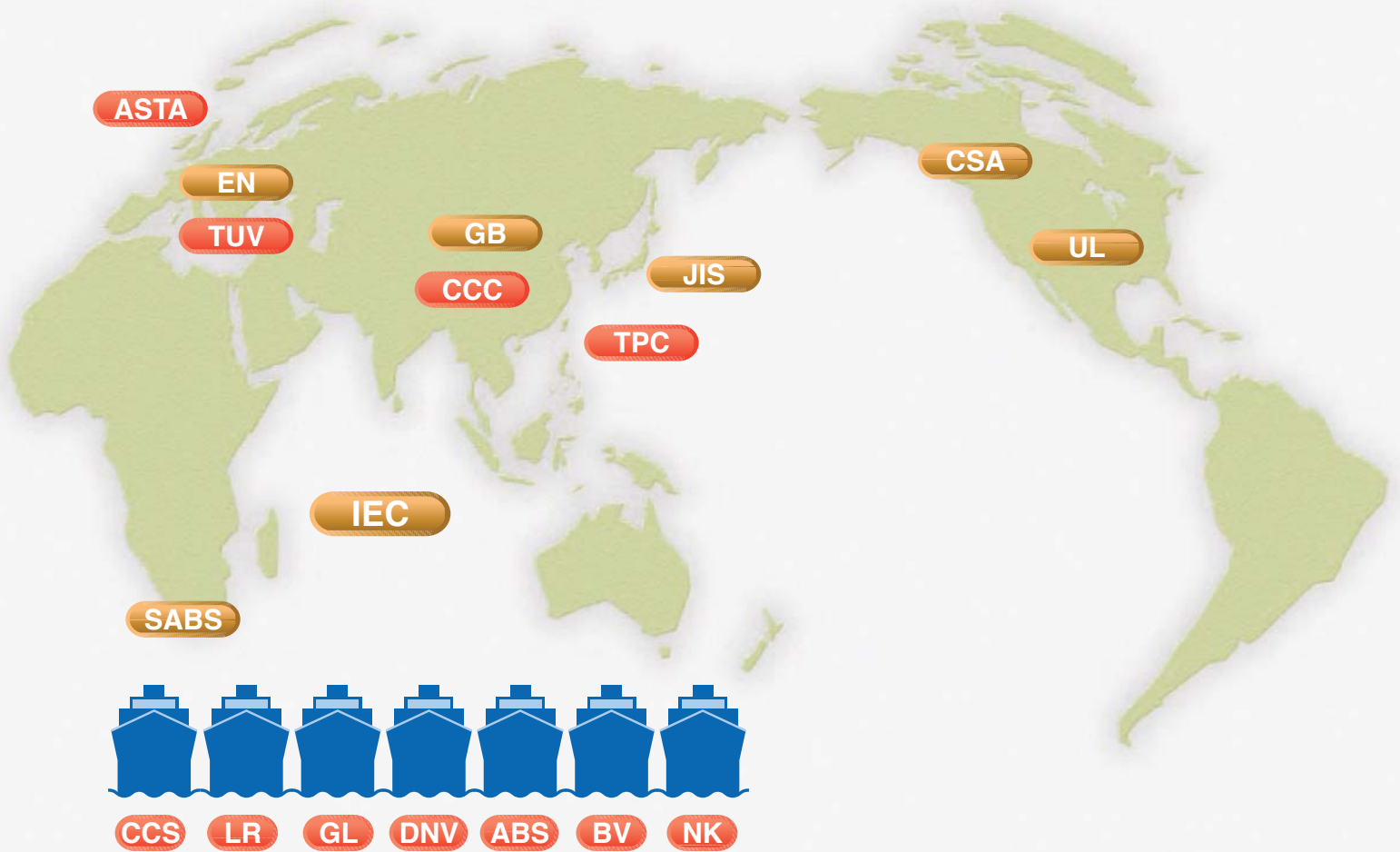
Since our operations began in India in the early 90's, Mitsubishi Electric has grown to become one of the most highly regarded companies in this country.

Mitsubishi Electric has been active in the LOW VOLTAGE SWITCHGEAR (LVS) market since 1933. Ever since Mitsubishi 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.

It is our endeavour to present you with the most delightful innovations in this catalogue, let us welcome you to learn more about the impact each product attributes, their various applications and the maximum advantage one can build on.

GLOBAL

Compliance with worldwide standards





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Six Stoutly Reasons for Mitsubishi LVS



High performance

The one class higher performance of the Mitsubishi Low Voltage Switchgears realizes superb breaking performance. Hence the safety of valuable circuits can be securely maintained.



High reliability

Safe and fault-free operation is guaranteed by various protective mechanisms and safety functions. 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.

Air Circuit Breaker of the Super AE-SW series

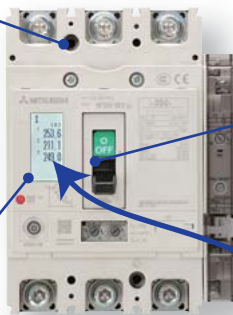




Moulded-Case Circuit Breaker of the NF-WS-V & WSS Series

Compact size allows installation even with limited space

Space for internal accessories behind the cover



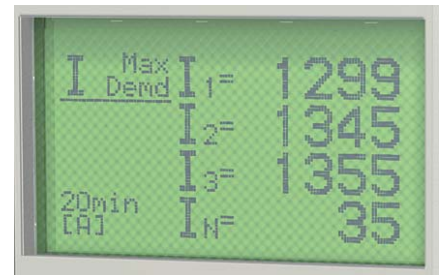
Handle with trip indicator and rated current label

Measuring display unit



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.



Motor Protection Breaker with mounted Magnetic contactor of MS-T series



Energy Saving

Mitsubishi's Low Voltage Switchgears allows measuring of data and transmission through CC-Link. This enables energy management through visualization which leads to energy saving.



Customer friendly

Functionality, compatibility and perfect mechanical design are the main features of the Low Voltage Switchgears supplied by Mitsubishi Electric.



World
Super **AE**



AIR CIRCUIT BREAKERS

GLOBAL

BEST SOLUTION

HIGH PERFORMANCE

HIGH RELIABILITY

CUSTOMER FRIENDLY





Super AE Series



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

The range of Air Circuit Breakers and load interrupter switches is complemented by a comprehensive range of accessories as it is possible to save space in the panel column since it comes with the most compact size of breaker with no derating even at 50°C.

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

Individually configured protection

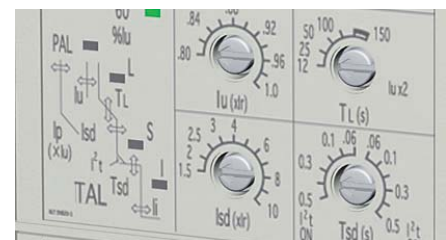
The Circuit Breakers are delivered with an electronic trip relay. It is available in versions for all standard power supply voltages. Optional modules are also available for most common applications like protecting transformers, cables, motors and generators. This ensures optimum protection for long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



Draw-out type breaker SUPER AE-SW

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.

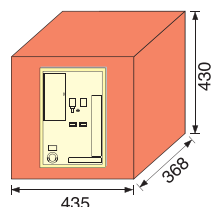
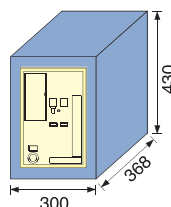


All parameters can be adjusted individually, ensuring that an optimum selectivity for every application is achieved.

AE1000-S → AE2000-SWA

Frame size 1

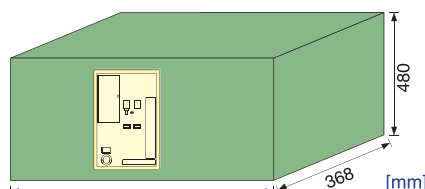
AE2000-S → AE4000-SWA



Frame size 2

AE4000-S → AE6300-SW

Frame size 3



[mm]



In addition to options like 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.

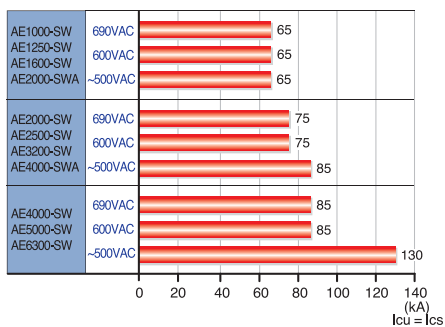
The main functions, including trip status, alarm and load current are displayed on the LCD screen and can also be output as signals. For easy and quick recognition of alarms, the screen automatically turns from green to red when a fault is detected.



Broad performance range

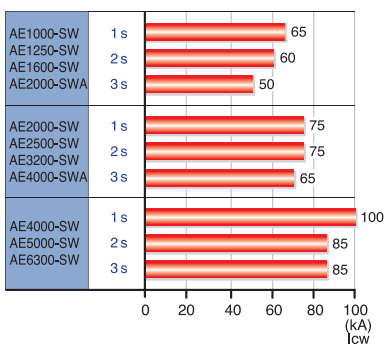
The growing demand for power naturally increases the levels of short circuit currents in power distribution systems. The SUPER AE Series Breakers deliver excellent protection against thermal and mechanical damage. The rated surge withstand capability (I_{imp}) is 12 kV. With a short circuit Service breaking capacity of 65 – 130 kA they cover the great majority of applications, providing very high-quality protection for your systems.

$I_{cu} = I_{cs}$



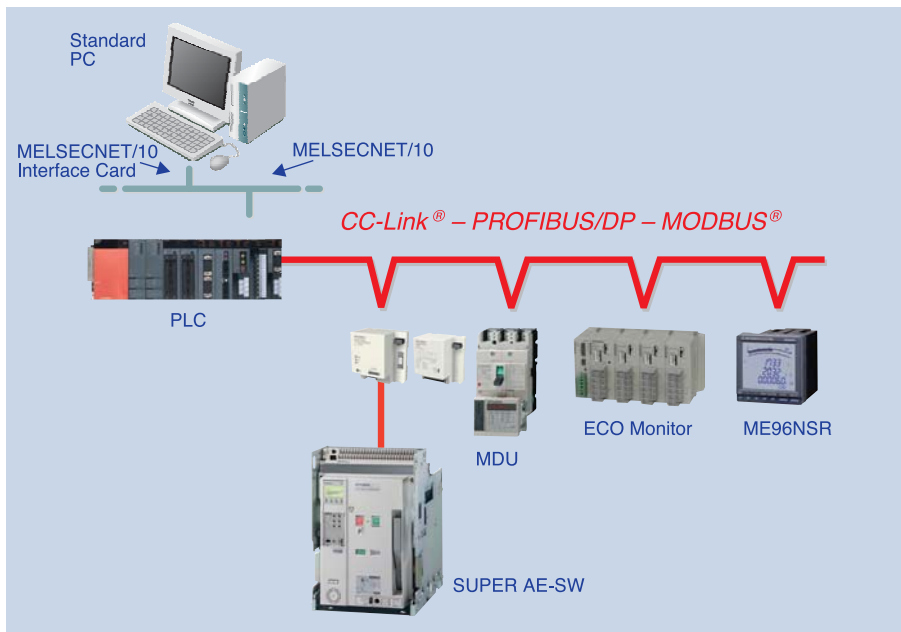
Rated short circuit Service breaking capacity I_{cs}

I_{cw}



Rated short time withstand current I_{cw}

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.



The SUPER AE in network configurations

Comprehensive communications capabilities

Together with the 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.

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.

SUPER AE series at a glance

Power range

630 – 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



Profibus/DP module

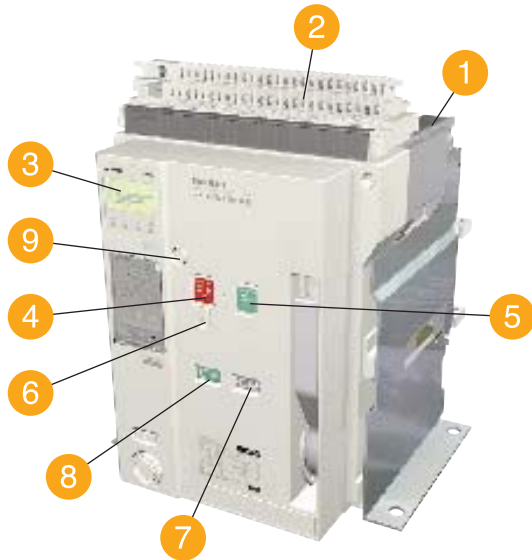
The SUPER AE's network modules enable the monitoring and control of a number of different parameters including voltage and current performance values. In addition, the networking connection can also be used to report alarm and error messages from the breaker back to a centralized control point like a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



Appearance and Product Structure

Fixed type

AE-SW Series



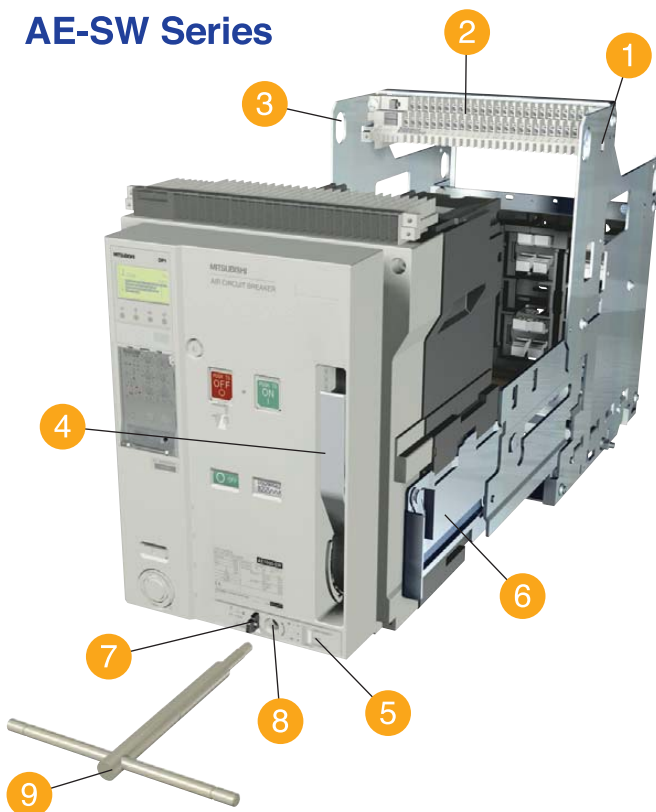
AE1600-SW 3P

- 1 Arc extinguishing chamber
- 2 Control circuit terminal block
- 3 Electronic trip relay
- 4 OFF button
- 5 ON button
- 6 Padlock hook
- 7 Charging indicator
- 8 ON/OFF indicator
- 9 Manual reset button(Optional)

In case of the fixed type, Lifting hooks (HP) are attached.

Drawout type

AE-SW Series



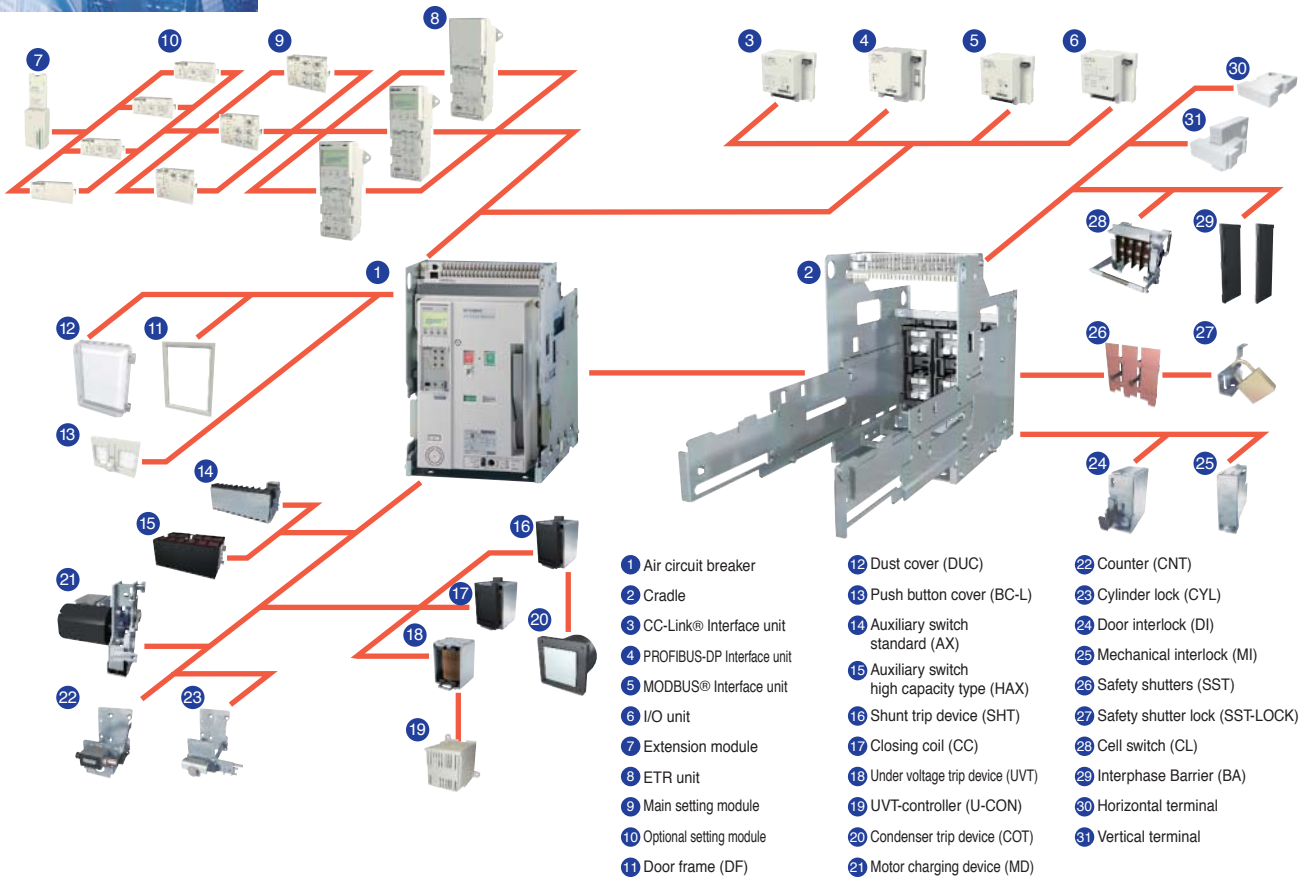
AE1600-SW 3P

- 1 Cradle
- 2 Control circuit terminal block
- 3 Lifting hole
- 4 Charging handle
- 5 Drawout position indicator
- 6 Extension rail
- 7 Position lock
- 8 Aperture for the drawout handle
- 9 Drawout handle

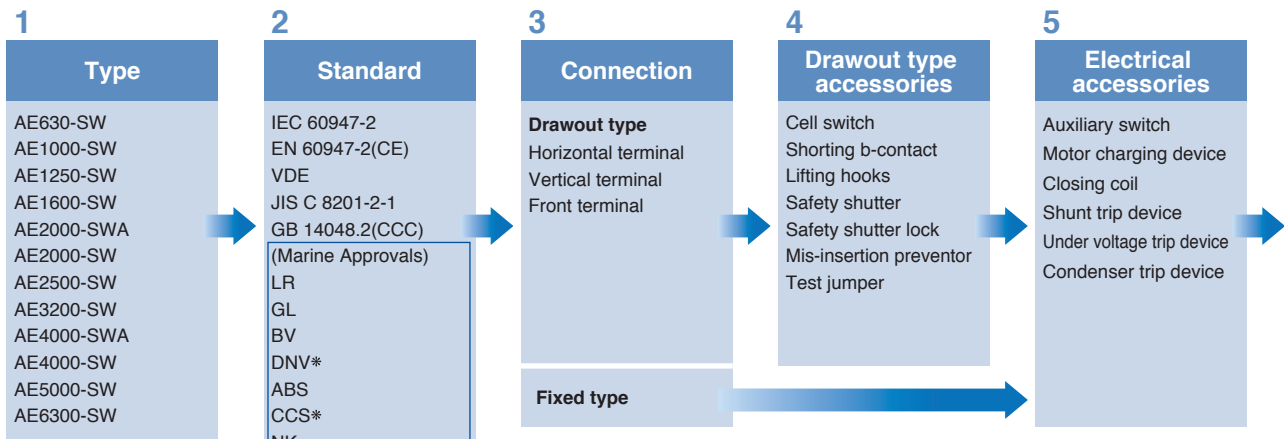
In case of the drawout type, Drawout handle is attached.



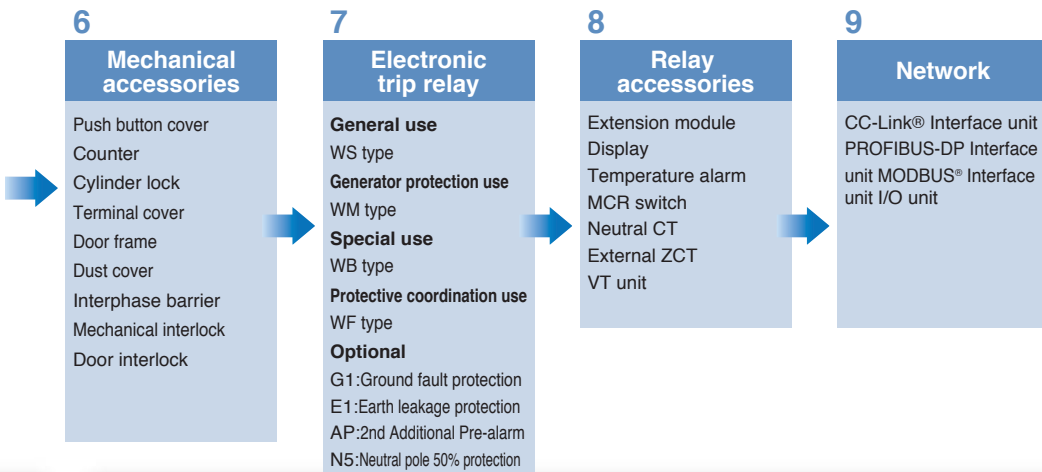
Skeleton



Product Configuration



*Except AE4000-SW~AE6300-SW





Product Features

High-Performance High-Reliability

The safety of valuable circuits can be securely maintained.

Higher short circuit protection performance by High breaking capacity

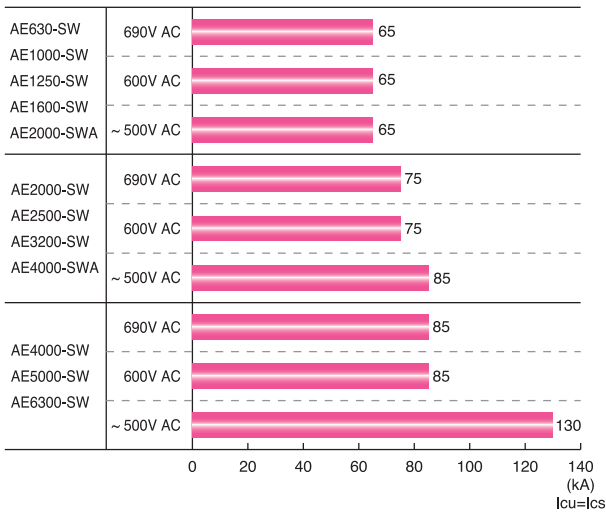
In case of 690V AC, $I_{cu} = I_{cs}$
 65 kA for AE630-SW~AE2000-SWA
 75 kA for AE2000-SW~AE4000-SWA
 85 kA for AE4000-SW~AE6300-SW

$I_{cu} = I_{cs}$ (Rated breaking capacity)

65kA
(AE630-SW~AE2000-SWA)

75kA
(AE2000-SW~AE4000-SWA)

85kA
(AE4000-SW~AE6300-SW)



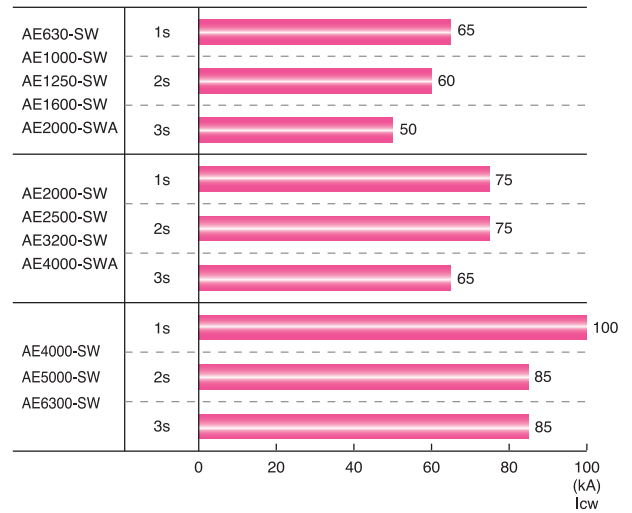
Wide coordination range by High rated short-time withstand current

I_{cw} (1s)
 75 kA for AE2000-SW~AE4000-SWA
 100 kA for AE4000-SW~AE6300-SW

I_{cw} (1s) (Rated short-time withstand current)

75kA
(AE2000-SW~AE4000-SWA)

100kA
(AE4000-SW~AE6300-SW)



Higher safety by High insulation performance

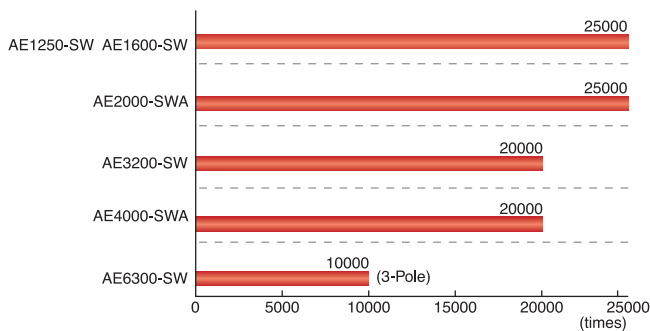
Rated impulse withstand voltage (U_{imp}) for the main circuit is 12kV.

U_{imp} (Rated impulse withstand voltage)

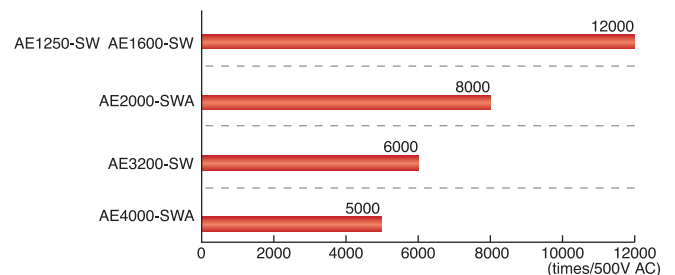
12kV
(AE-SW series)

Higher reliability by High operating durability

Mechanical



Electrical





Product Features




Best Solution

Through Flexible and Various Options, To be Built up the Suitable Functions.

Electronic Trip Relay

Main setting module ①





With interchangeable & add-on modules, flexible functions built up.

WS1 WS2 WS3	General use	WM1 WM2 WM3	Generator protection use	WB1 WB2 WB3	Special use
					
	LTD+STD+INST / MCR	LTD+STD+INST / MCR	INST / MCR		

Note : *For optimum protective coordination with upstream and/or downstream protective devices such as fuses and OCRs, WF relay (WF1/WF2/WF3) are provided.
As for the details about WF relay, please make inquiries.

Optional setting module ②

With optional setting modules, GFR, ER etc are added easily.

G1	E1	AP	N5
			
Ground fault protection (GFR)	Earth leakage (ER) ⁽¹⁾	2nd Additional Pre-alarm	Neutral pole ⁽²⁾ 50% protection

Note (1) : Combination with ZCT

(2) : With "N5" optional module, Neutral pole protection will be changed from 100% (standard) to 50%.

Power supply ③

It is necessary for Display and LEDs. (see page 19, 20.)

P1	100-240V AC·DC
P2	24-60V DC
P3	100-240V AC / 100-125V DC with output contact
P4	24-60V DC with output contact
P5	100-240V DC with output contact (SSR)

Temperature alarm (TAL)

When TAL sensor is installed in the breaker, temperature alarm is operative. When the temperature of main contact exceeds normal level, temperature alarm is indicated by LED on main setting module and also the output contact is made energize if power supply with output contact is installed. It is possible to know temperature rising which is caused by wear of main contact because TAL sensor is installed near main contact. When the temperature of main contact goes down to the normal level, temperature alarm turns off automatically.

Display module (DP1/DP2)



This is the module for display and setting of the various information like measured value, trip and alarm status, ETR status for display and output contacts setting etc...

1. Multi display of measuring element It enables to easily monitor the comparison of each measuring element with its multi display (4 phases multi display of load current and voltage) on one screen.
2. wo-color back light Under trip or alarm, back light color changes from green to red automatically, which visually shows an abnormal situation.
3. Graphical display By adopting dot matrix type LCD, graphical display such as bar graph display of load current, harmonic currents and characteristic curve is available.

There are 2 types of display module. One is the ETR attachment type (DP1). Another is the panel attachment type (DP2), which can be connected to extension terminals of control circuit with 2m cable. 2 units of display modules (DP1 and DP2) can be attached on one breaker. (As for outline dimensions of DP2, refer to page 53.)

Note;

- Extension module (EX1) is required.
- VT unit (VT) is required to display the measured data except load current.



Network

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

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

1 Applicable to various open networks.

These units are applicable to various open network systems such as CC-Link®, PROFIBUS-DP and MODBUS® (RS-485), which can be built in easily.

2 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 informations.



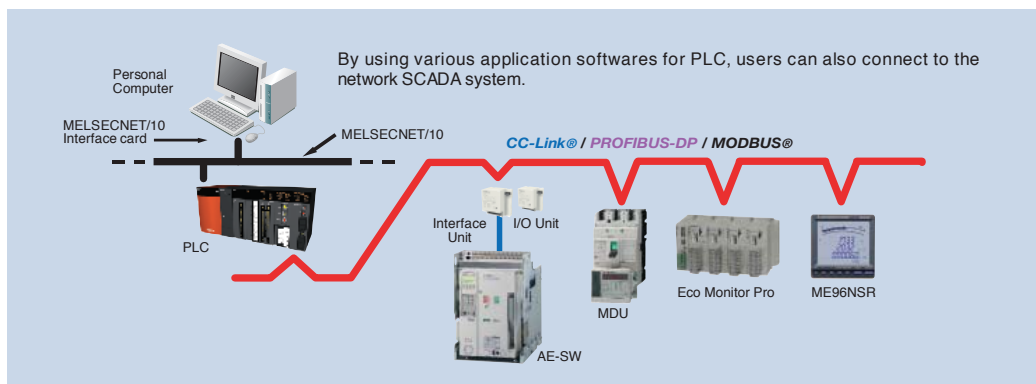
BIF-CC (CC-Link®)



BIF-PR (PROFIBUS-DP)



BIF-MD (MODBUS®(RS-485))



The length of the cable for interface unit is 2m.

Note: Some device types are excluded.

Note:

- Extension module (EX1) is required.
- VT unit (VT) is required to transmit the measured data except load current.

I/O unit (BIF-CON)

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 unit in addition to the Interface Unit, it become possible to control the breaker remotely, like a ON or OFF operations or Spring-charging.



BIF-CON

Function	Description	Note
Control	Breaker ON operation	1a contact for Closing coil (CC)
	Breaker OFF operation	1a contact for Shunt trip device (SHT) (not applicable for AC380-500V rating)
	Spring charge	1a contact for Motor charging (MD)
Monitor	Digital Input (DI) monitoring	For BIF-CC and BIF-MD, Max. 3 contacts monitoring are available. For BIF-PR, 1 contact monitoring is available.



Characteristic table

①	②	NA	G1	E1	AP	N5
		Nothing	Ground fault	Earth leakage	2nd additional Pre-alarm	Neutral pole 50% protection
WS	General use LTD+STD+ INST/MCR					
WM	Generator protection use LTD+STD+ INST/MCR					
WB	Special use INST/MCR					
WF	Protective coordination use LTD+STD+ INST/MCR					

Power supply module ③

Type	Rated Voltage (V)	Applicable Voltage range (V)	Criterion for Power requirement (VA)	Alarm output
P1	100-240 AC-DC	85-264 AC-DC	15	—
P2	24-60 DC	18-72 DC	10	—
P3	100-240 AC 100-125 DC	85-264 AC 85-138 DC	15	6 output contacts
P4	24-60 DC	18-72 DC	10	6 output contacts
P5	100-240 DC	85-264 DC	15	6 output contacts (SSR)

Note1: Over current protection and ground fault protection operates without control power source.
Note2: Factory setting of 6 output contacts is as follows.

① LTD	② STD/INST	③ G1/E1/AP	④ PAL	⑤ TAL	⑥ ERR
Self-holding	Self-holding	Refer to lower table	Automatic reset	Automatic reset	Automatic reset

ETR dial set	G1	E1	AP
TRIP side	Self-holding	Self-holding	—
ALARM side	Automatic reset	Automatic reset	Automatic reset

Self-holding:
The output is maintained until it resets.
Automatic reset:
The output will be reset if it backs to normal condition.

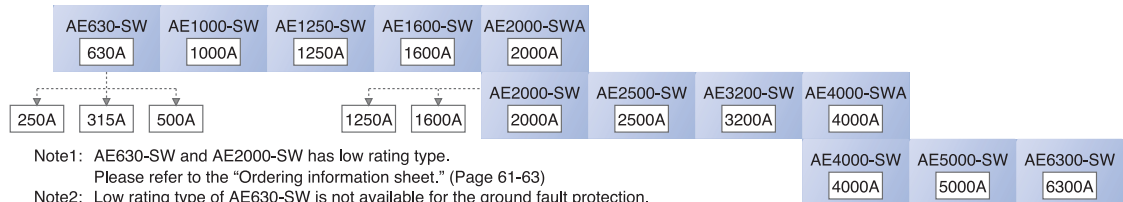
Contact capacity (Type P3 and P4)

Voltage(V)	Current (A)	
	Resistive load	Inductive load
	cosφ=1.0 cosφ=0.4 L/R=0.7	
AC	240	1
	120	1
DC	125	0.1
	30	1

Current capacity (Type P5)

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

CT rating table



Additional function

Extension module(EX1)

- Display(DP1)
- Display onto panel board(DP2)
- VT unit(VT)

Network

- BIF-CC
- BIF-PR
- BIF-MD

Wire system (when EX1 is specified)	
EX1	<input type="checkbox"/> 3φ3W
	<input type="checkbox"/> 3φ4W
	<input type="checkbox"/> Normal connection
	<input type="checkbox"/> Reverse connection



World Super

WS

Series

WSS & WSV SERIES



MOULDED-CASE CIRCUIT BREAKERS



GLOBAL

INTELLIGENT

STANDARDIZATION

HIGH QUALITY

HIGH PERFORMANCE



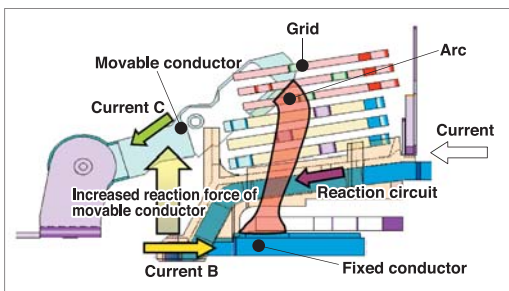
WS-V & WSS Moulded-Case Circuit Breakers



WS-V & WSS - More performance to meet the needs of the next generation

Expanded ISTAC - The patented trip technology

The new circuit breaking technology "Expanded ISTAC" has improved the current-limiting performance and upgraded the overall breaking capacity. Expansion of the conductor under the stator shortens the contact parting time of the mover as compared to the conventional ISTAC structure. The **current-limiting performance** has been improved remarkably. (The maximum peak current-limiting performance has been improved remarkably. (The maximum peak current value has been reduced by approx. 10%.)



Current Limiting Performance

Intelligent breaking technology for your safety

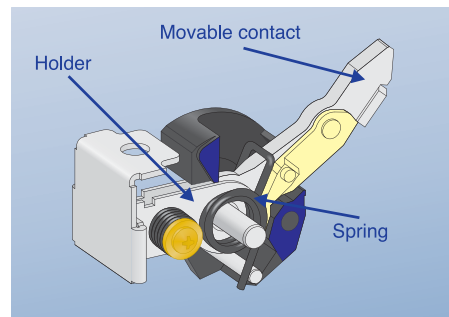
With its innovative breaking technology all Mitsubishi breakers offer greater safety and even faster circuit-breaking speed through the use of the latest switch-off technology and innovative engineering, with a newly developed **electronic trip relay**.

The circuits of the Mitsubishi WS-V & WSS 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.

The WS-V & WSS breaker 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.

Shunt-less current flow technology

The constructive design of movable and fixed conductors considerably contributes to an increased lifetime.



Constructive design for an increased lifetime

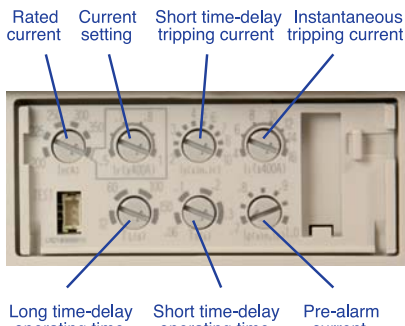


High-level flexibility

Mitsubishi Moulded-Case Circuit Breakers are available with two different kinds of trip relays to satisfy all needs.

The thermal adjustable relay features a wide thermomagnetic setting range and can be used for AC and DC without specifying when ordering both

The electronic relay provides options to set all relevant currents or time ranges. A pre-alarm function is standard equipment. The relay is particularly used where wide and precise setting ranges are required.



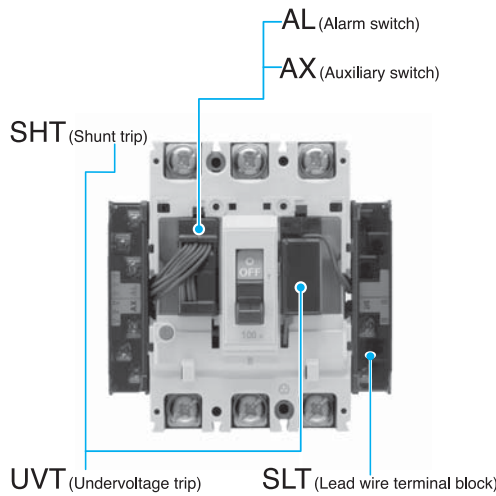
The electronic trip relay for 400-630 Amp provides high-level flexibility according to your demands

Modular accessories

The 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 standardized to fit for the breaker series from 32A upto 250A in WS-V Series and 200A upto 630A in WSS Series



The new electronic circuit breakers (with display) and MDU breakers can display various measurement items

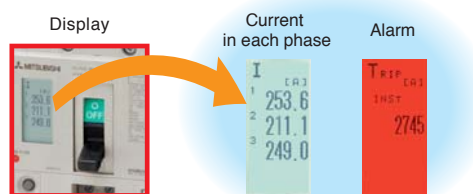
■ This will enable energy management through “visualization”, which leads to energy saving.



Electronic Circuit Breaker (with display)

Measuring Display Unit Breaker

- The display is on the circuit breaker body and shows circuit information.
- Detailed setting can be done on the display.
- The display turns red during alarms.





List of Product Models - WSS

Series	Frame A	400	630	800	1000	1250	1600
Moulded-case circuit breakers	NF-C Economy type	NF400-CW	NF400-CW	NF800-CEW			
	NF-S Standard type	NF400-S	NF630-SW	NF800-SDW	NF1000-SEW	NF1250-SEW	NF1600-SEW
		NF400-SE	NF630-SEW	NF800-SEW		NF1250-SDW	NF1600-SDW
	NF-H High-performance type	NF400-HEW	NF630-HEW	NF800-HEW			
		NF400-REW	NF630-REW	NF800-REW			
NF-U Ultra current-limiting type	NF400-UEW		NF800-UEW				
Earth-leakage circuit breakers	NV-C Economy type	NV400-CW	NV630-CW				
	NV-S Standard type	NV400-SW		NV800-SEW			
		NV400-SEW	NV630-SEW				
	NV-H High-performance type	NV400-HEW	NV630-HEW	NV800-HEW			
		NV400-REW					
NV-U Ultra current-limiting type							
Earth-leakage circuit breakers for CE flanking	NV-C Economy type	NV400-CW	NV630-CW				
	NV-S Standard type	NV400-SW	NV630-SW	NV800-SEW			
		NV400-SEW	NV630-SEW				
	NV-H High-performance type	NV400-HEW	NV630-HEW	NV800-HEW			
		NV400-REW					
NV-U Ultra current-limiting type							
Mini-protection breakers	MB Motor breaker						

List of Product Models - WS-V

Classification	Frame (A)	20 30 32	40 50 60 63	70 100 125	160	225 250
Moulded Case Circuit Breakers	NF-C Economy class	NF30-CS	NF63-CV	NF125-CV		NF250-CV
	NF-S Standard class	NF32-SV	NF63-SV	NF125-SV NF125-SEV	NF125-SGV NF125-SGV	NF160-SGV NF250-SV NF250-SEV
	NF-H/L High-performance class		NF63-HV	NF125-HV NF125-HEV	NF125-LGV NF125-HGV	NF160-LGV NF160-HGV NF250-HV NF250-LGV NF250-HEV NF250-HGV
	NF-R/U Ultra current-limiting class			NF125-RGV NF125-UV		NF250-RGV NF250-UV
Earth Leakage Circuit Breakers	NV-C Economy class		NV63-CV	NV125-CV		NV250-CV
	NV-S Standard class	NV32-SV	NV63-SV	NV125-SV NV125-SEV		NV250-SV NV250-SEV
	NV-H/R High-performance class		NV63-HV	NV125-HV NV125-HEV		NV250-HV NV250-HEV

WS-V & WSS series at a glance

Power range WS-V
3 – 250 A

Power range WSS
400 – 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

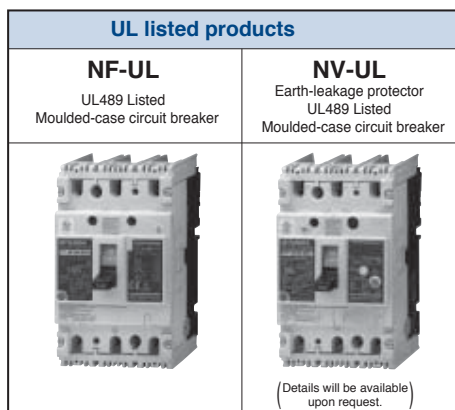
Tripping device

Thermal magnetic, Electronic

Network links*

CC-Link®

*optional





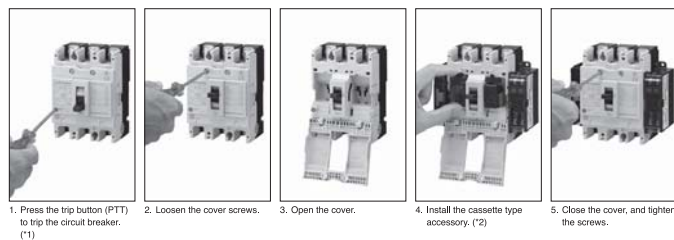
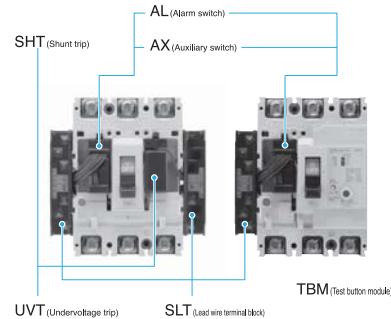
Abundant Accessories and Easy Installation

Cassette-type Internal Accessories

Giving greater flexibility when upgrading circuits, cassette-type accessories make ordering easy and enable simple, one-touch installation. The internal accessories for all major models having frame size from 30 to 800A come in cassettes.

Compatible with all breaker series

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



Pre-Alarm Module (PAL)

The pre-alarm is a function to output an alarm when the load current exceeds the preset current value. It is helpful in securing continuous power supply and preventive maintenance. It can be fitted to electronic circuit breakers.

The standard modules have SLT. Other internal accessories cannot be installed on the right pole side. A control power supply (compatible with 100 to 240 V AC and DC) is necessary. The control power supply voltage range is 85 to 246 V AC/DC, and the required volt-ampere is 5 VA.

Pre-alarm LED indication

When the load current exceeds the preset current value, the LED lamp on the pre-alarm module front panel starts blinking. When the pre-alarm output is given, the lamp stops blinking and turns on.

Pre-alarm current setting (IP setting)

The pre-alarm current can be set to the rated current $I_n \times 0.7, 0.75, 0.8, 0.85, 0.9, 0.95$ or 1.0 with the knob on the pre-alarm module front panel.

400 A frame or above

Solid state relay (SSR) output (PAL lead)

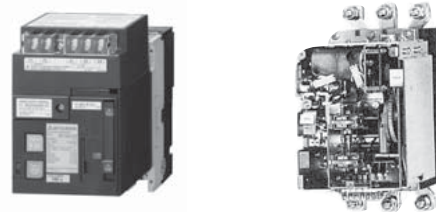
The lead wires are drawn out. On the right pole side, only internal accessories with lead wires drawn out can be installed. A control power supply is unnecessary.

External Accessories

High-speed Motor Device

Motor devices for 125-250AF are now easier to use, contributing to simple installation.

- * A spring charge mechanism has been adopted for high-speed operation. (0.05~0.1sec)
- * Installation is fast and simple, only requiring two screws.



External Handle

A safer and easy-to-operate handle has been adopted.

- * Complies with IP65 protection rating standards.
- * Isolation function achieved through combination with the breaker unit.
- * Structured to allow relay adjustments after installation as well.





Product Design Simplifies Use & Expands Applications

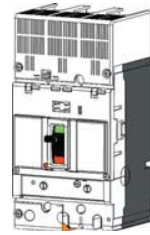
Insulating Barriers

It enhances the insulation between phases of Circuit Breaker terminals available for all models

Terminal Cover

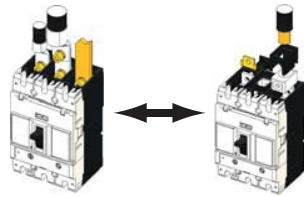
Many kinds of terminal cover like large (TCI), small (TC-S), transparent (TT-C) rear terminal covers (BT-C) are available.

* With terminal covers, a protection rating of IP40 is ensured.



Connection Flexibility

Compatible with various connection methods like screw terminal, busbar terminal, solderless terminal, bar stud & round stud.



2

IEC Rail Mounting for 32, 63AF

Installation hooks are included for 32,63AF, markedly simplifying installation work.



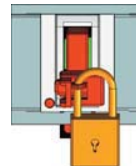
Handle Locks

ON/OFF locking is possible with the use of a padlock. Up to three padlocks may be attached.

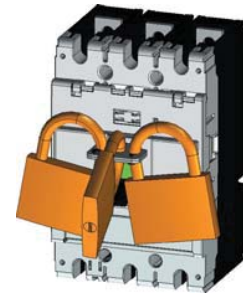
* Customers are requested to use their own padlocks.



ON lock



OFF lock



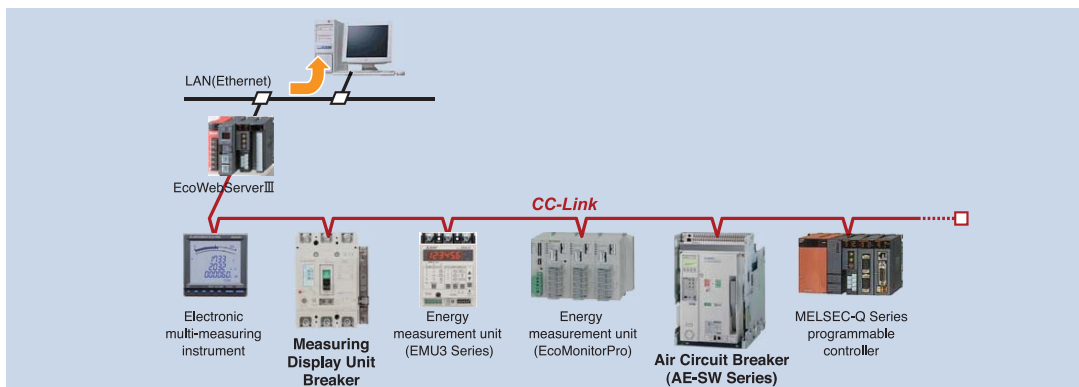
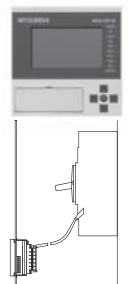
OFF lock with 3 padlocks

Intelligent - Measuring & Communicating

- MDU (Measuring Display Unit) with NF 250-800AF the circuit breakers measure and display the load current, line voltage, electric power, electric energy, harmonic current, leak current and power factor to realize detailed energy control. They support customers' energy saving control
- The measuring display unit can be installed on the body or panel.
- Compact, white measuring unit
- Measuring data can be transmitted to a PC or a PLC through **CC-Link**
- AL / AX with **CC-Link** transmission

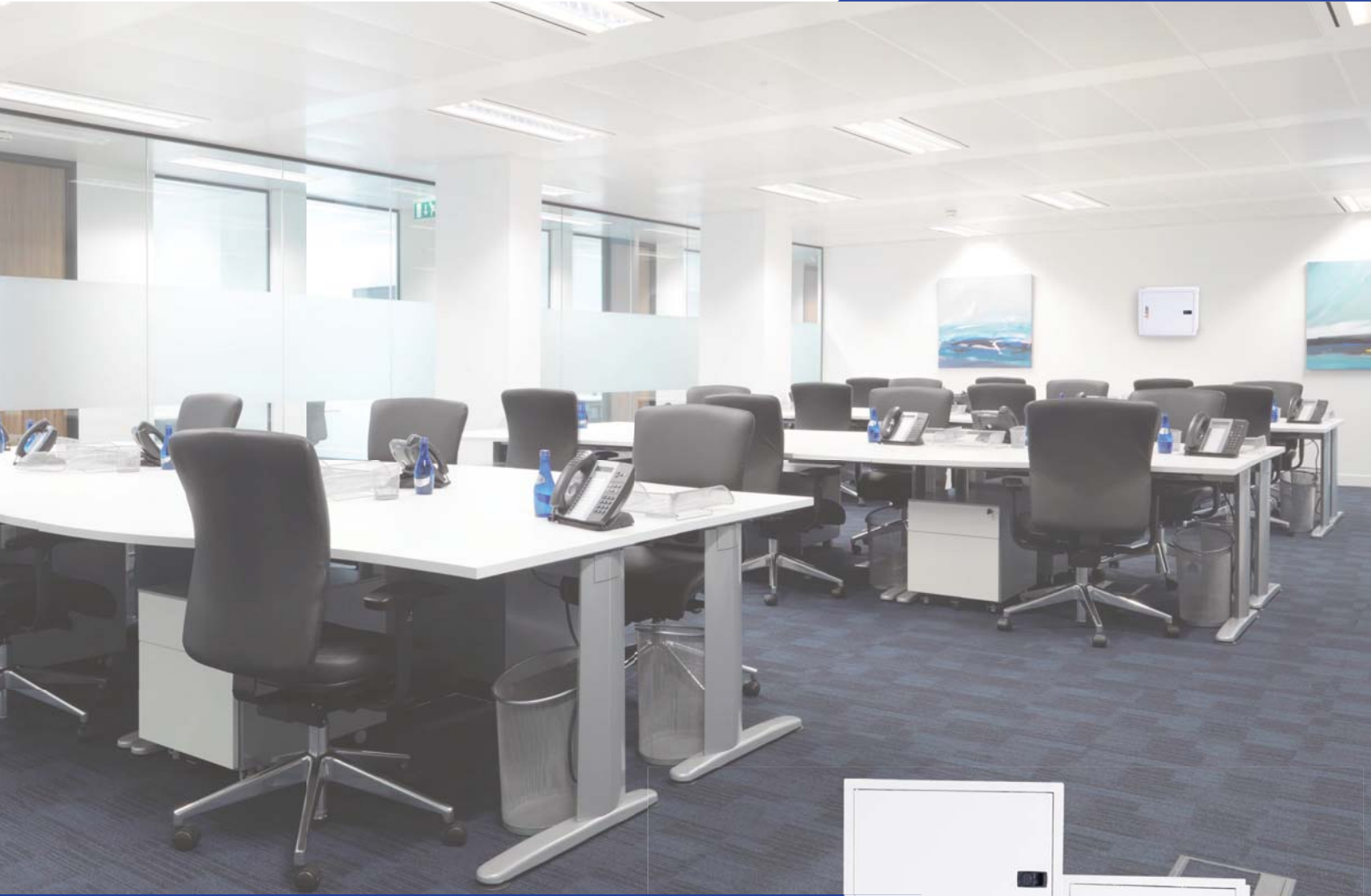
Breaker mounting

Panel mounting





DIN Series



FINAL DISTRIBUTION PRODUCTS





MCB, RCCB, Isolator Range



PRODUCT LINE-UP

Model type		No of poles (P)	Rating	Instantaneous tripping	Voltage (V)	Short-Circuit capacity (kA)	Compliance standard
MCB	BHW-T10	1, 1+N, 2, 3, 3+N, 4	6 to 63A	TYPE B	240/415AC	10	IEC 60898-1
		1, 1+N, 2, 3, 3+N, 4	0.5 to 63A	TYPE C, D	240/415AC		IEC 60898-1
RCCB	BVW-T	2(1+N), 4(3+N)	16 to 63A	–	240/415AC	–	IEC 61008-1
Isolating Switch	KBW-T	1, 2, 3, 4	25, 40, 63A	–	240/415AC	–	IEC 60947-3
		2, 3, 4	80, 100, 125A	–	240/415AC	–	IEC 60947-3

Technical Specifications

Ambient temperature range	-10 to +40:
Frequency	50/60Hz

CONSTRUCTION FEATURES

- » State of the art design
 - » Elegant appearance, cover and handle in arc shape make comfortable operation
- » Knob padlock feature
 - » MCB knob can be locked either at “ON” position or at “OFF” position to prevent unwanted operation of the product
- » 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
- » Interchangeable terminal connection
 - » The input and output can be interchanged
- » Bi-connect terminals
 - » Both the sides of terminals are bi-connect type, giving ultimate flexibility.
- » High terminal capacity
 - » Deep serrated terminals able to accommodate 35 sq mm cable
- » Tightening torque
 - » Combination head captive screw
 - » M5 screw - 3 N.m
 - » M6 screw - 3.5 N.m
- » IP 2X protection
 - » Terminals are finger touch proof to prevent electric shock by accidental touch





Distribution Boards



A Perfect Blend of Style & Precision

Mitsubishi Electric's distribution boards have been specially designed to provide excellent aesthetics for the interiors of modern day houses and are suitable for all domestic, commercial and industrial applications.

With a blend of style, flexibility and safety, the DIN series distribution boards are made up of fine quality CRCA steel for long lasting strength.

Manufactured with the help of high precision deep drawn tools (no welding involved), and treated with nine tank phosphating process these distribution boards provide perfect quality and high corrosion resistance.

Available in both flush as well as surface mounting type the DB's are fitted with an unique cassette assembly which facilitates easy removal of intermediate player and minimises the assembly time.

SALIENT FEATURES

- » Tested in compliance with IEC 61439 - 3 standards from third party and in-house test labs
- » IP 43 protection
- » Manufactured by deep drawn tools for precise dimensional accuracy, weld free process
- » Additional safety for users with help of Shrouded Neutral links, Insulated bus bar and door earthing
- » Reversible and easy mounting of door on either side of the board
- » Detachable Din rail assembly (cassette type) for ease in wiring during installation and maintenance
- » Excellent aesthetics - Pure white in colour to suit any type of interior walls, high corrosion and scratch resistance
- » Cement protection sheet provided as standard for protection during masonry work



Metallic Distribution Boards-Range

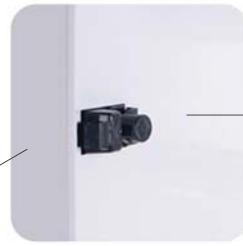
- ◆ SPN Horizontal Double Door Distribution Board - 04 way to 16 way
- ◆ TPN Horizontal Double Door Distribution Board - 04 way to 16 way
- ◆ VTPN Distribution Board with Miniature Circuit Breaker (upto 63A) as incomer - 04,08,12 way
- ◆ VTPN Distribution Board with Moulded Case Circuit Breaker (upto 250A) as incomer - 04,08,12 way
- ◆ Flexi (tier) Distribution Board 2 Row / 3 Row / 4 Row - upto 13 module per Row
- ◆ Seven segment Distribution Board - 04 way to 12 way
- ◆ Per Phase Isolation Distribution Board - 04 way to 12 way
- ◆ TPN Phase selector Distribution Board - 04 way to 12 way
- ◆ Plug and socket Distribution Board -SPN - 10A, 20A and TPN -20A, 30A
- ◆ Cable end box Distribution Board





Flushed and sliding Latch:

Aesthetically pleasing black colour auto locking sliding latch/knob



Earthing:

Door earthing to prevent shock due to current leakage
Earthing screw identified with the help of embossed impression



Safety:

Circuit identification provided on MCB's for better safety



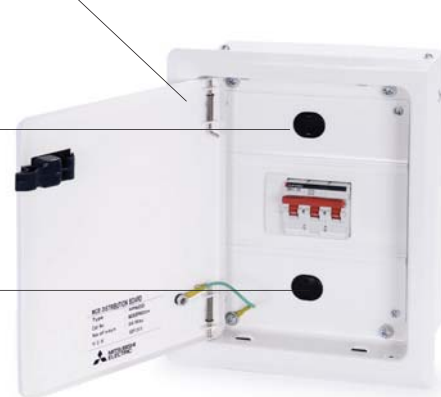
Easy Reversible mounting & removal of door / Reversible mounting of door:

Unique spring loaded hinge mechanism to easily remove the door from frame for convenient installation / maintenance.
Door can be mounted on either side hence allowing flexibility of mounting under varying site condition



Dust free and safe:

Two finger holes for lifting the plate, plugged to keep the board dust free and safe



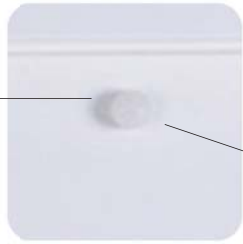
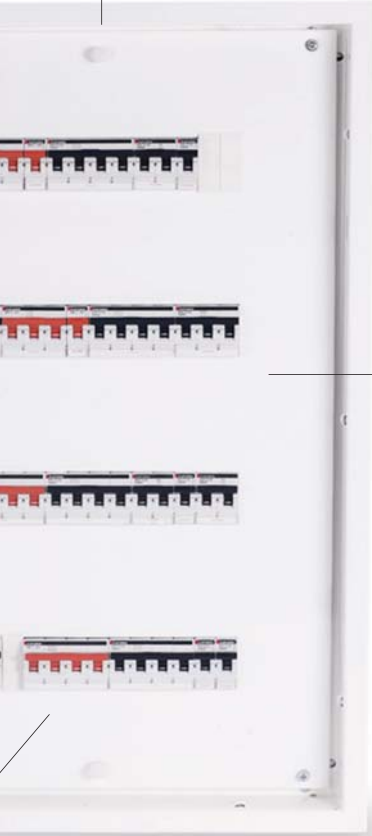
Shrouded neutral link/Insulated bus bar for better safety and protection:

Insulated bus bar and shrouded neutral terminal for enhanced safety and protection

Unique cassette type assembly:

For ease of assembly and maintenance. Removal of MCB mounted inside the DB can be done by removal of four screws, hence helping easy wiring and replacement





Knob provided for easy handling and removal of middle plate



Easy Handling:

Removeable middle plate for easy wiring, mounting and installation



Detachable gland plates:

Detachable gland plates provided on top and bottom for easy and flexible cabling / installation



Steel nut inserts:

Special deep steel nut inserts able to bear high torque, no risk of poor threading or powder deposition on threads

Side locking DIN bar

Stoppers provided at the end of DIN bar for avoiding slippage of the products

Double mounting key holes:

For easy positioning, DB's are provided with double mounted key holes

Enhanced Aesthetics:

Standard DB's are tapered on the front surface, coated with pure white scratch resistant powder to compliment the interior of house

Deep Drawn Front Frame and Door:

Construction with deep draw tool ensure there are no weld marks, increased impact resistance, high accuracy & precision.





MS-T Series

MS-N Series



Magnetic Contactors and Magnetic Starters



GLOBAL

DOWNSIZING

STANDARDIZATION

SAFETY & QUALITY

SMART WIRING



New MS-T Magnetic Contactors

10A frame model is over 16% smaller with a width of just 36mm!! from its earlier series

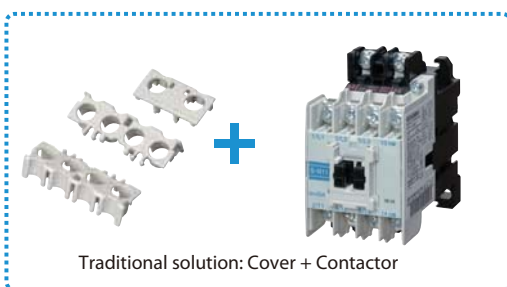
There is a saying that "every bit helps" and now with the industries smallest* general purpose Magnetic Contactor in its class, customers are able to more easily down-size their boards than ever before.*based on a survey of 10A frame class Magnetic Contactors conducted for Mitsubishi Electric September 2012

Slimline Reversing type

The new slimline design has also been applied to the mechanical interlocks used to create Reversing Magnetic Contactor configurations, helping to save even more switchboard panel space.

New integrated terminal covers

The perennial issues of remembering to order the terminal covers, fitting them correctly or loosing them in the process are challenges of the past. The integrated terminal cover system means they are always there, on the Magnetic Contactor or its Auxiliary contact, ready to be used.



Reduce your coil inventory by up to 50%

The new ST series has new wide range operating coils which mean 50% fewer variations are required to span the 24-550V voltage range compared to the previous SN series. This means a smaller stock burden for those users who hold main stock or spare parts.

A tough product for tough environments - as standard

Tropicalization treatment, anti-corrosion treatment and low temperature-response capabilities are now standard in the S-T type Magnetic Contactor range, so our customers do not need to worry about which version they are ordering.(note MSO-T and TH-T Magnetic Starters and thermal overloads have anti-corrosive treatment only)

Finger Protection

The integrated terminal covers offer various benefits not to mention added protection against electric shock through secure finger protection. This is available not only on Magnetic Contactors but also Thermal Overload relays, Contactor relays and Auxiliary Contact Units. MS-T Series complies with DIN EN 50274/VDE 0660 Teil 514 for "Finger safe (prevention of finger contact)"



Direct Operation from PLC

The MS-T Series' auxiliary contacts can operate with load as light as 20V 3mA making it suitable for direct control/operation from a PLC output.



Smart design means Smart wiring

The integrated terminal covers have an additional benefit in that they act as a guide to improve wiring efficiency but also retain the terminal screw in place: no mislaying the screw, no dropping it or having trouble reinserting it in to the terminal block just fast efficient wiring. Fast wiring terminals (model name with suffix "BC") are also available to further improve wiring efficiency, workability and hence productivity.

MS-T series at a glance

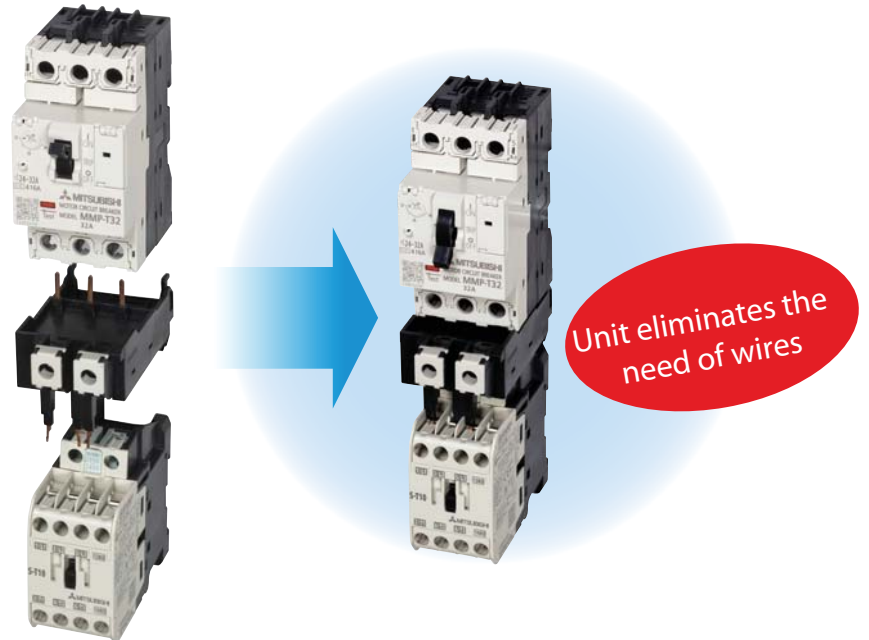
- Power range – 9A- 32A
- Integrated terminal cover
- Thermal Overload Relay – TH-T type
- Variants TH- T18
- Range – 0.1...18A
- TH- T25
- Range 0.2...26A
- Trip Case- 10A
- Available with 2 elements & with 3 elements
- Reset mode – manual , automatic, switchable.
- Applicable standard –IEC, EN, JIS/CE/UL.



New MS-T Magnetic Contactors

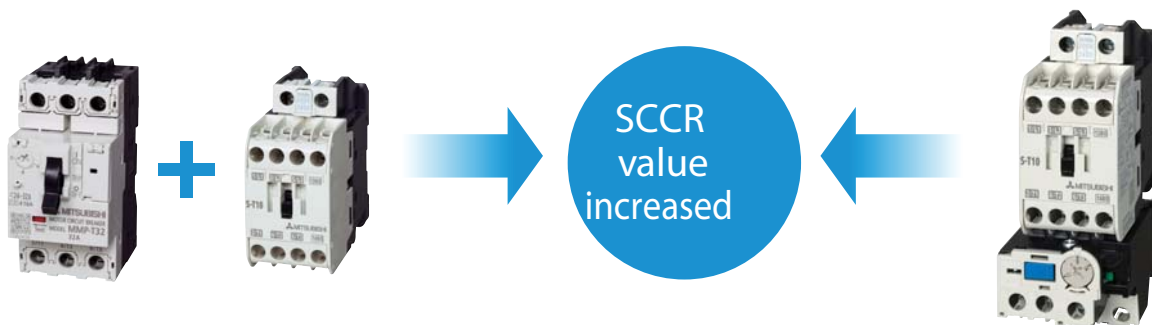
Easy branch circuit wiring with Manual Motor Circuit Breaker and optional connection conductor unit

Easy wiring is available for the new MS-T Series by using the Manual Motor Circuit Breaker and optional connection conductor unit, contributing your productivity improvement.



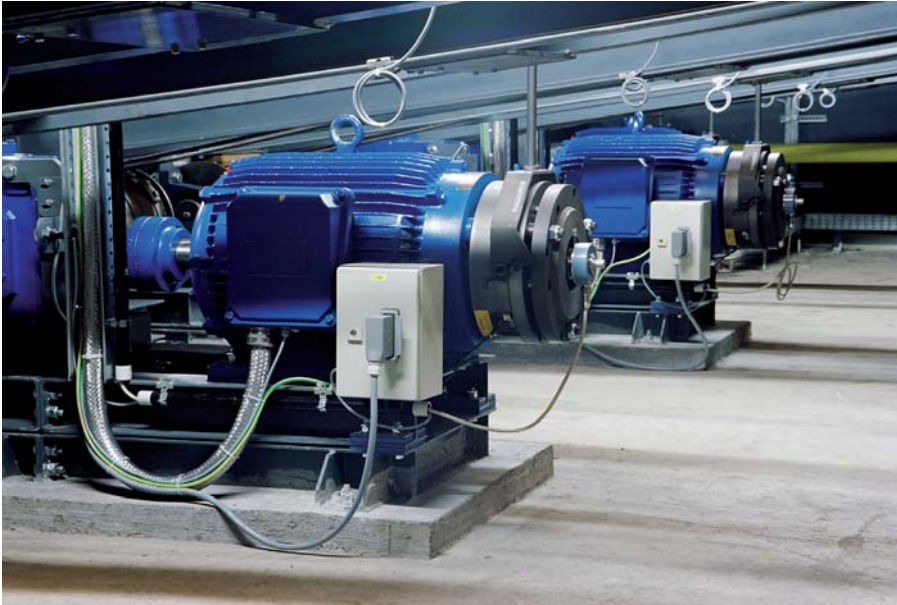
Higher SCCR value achieved by using with Manual Motor Circuit Breaker

When the MMP-T Series and the MS-T Series are used together, the higher SCCR (UL short-circuit current rating) value, can be achieved. That will be a great support for your business in North America.





MS-N-Magnetic Contactors



Mitsubishi 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's original patented CAN terminal.

Unified design

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

Reliable motor protection

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

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.

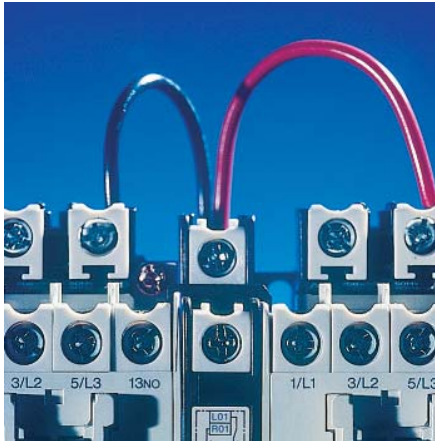




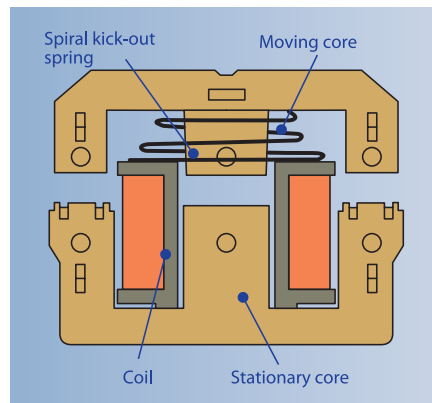
MS-N-Magnetic Contactors

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.



Easy wiring for all contactors



Efficient electromagnet thanks to advanced engineering

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-N 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

Easy mounting and wiring

MS-N 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 safety

The arc blowoff 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 improves safety and potentially saves space.

MS-N series at a glance

- Power range
9A – 800A
- 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



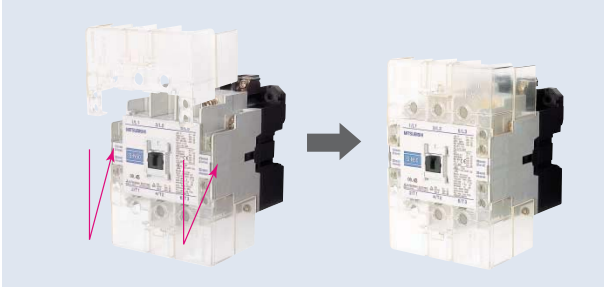
A selection of relays for optimum motor protection characteristics is available optionally.



Medium and Large-Sized Models: S-N50~S-N800

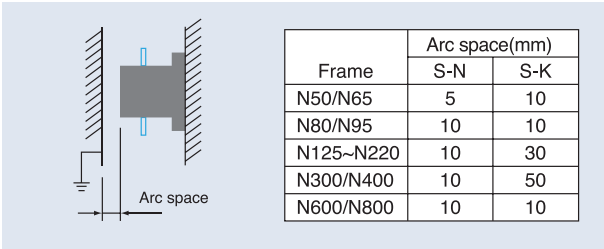
Finger Protection Compatible

An easy-to-install terminal cover, which lays importance on further safety and is compatible with finger protection, has been prepared.



The arc blowoff direction has been changed to further improve safety and space conservation

A new extinguishing structure, which eliminates the blow off of hot gas (arc) to the front (direction to door of control panel) when the current is cutoff has been incorporated.



In addition to improved safety, the freedom of panel design has been increased allowing space to be saved.

DC Electromagnet with AC Operation (Patented)

Lower Power Consumption

Coil power consumption is greatly low so MS-N Series contactors can be controlled by almost any type of relay, even small output relays of programmable controllers.

Less Noise nor Surge from Coil

When switching a coil, the energy will be desipated within internal circuit of electromagnet

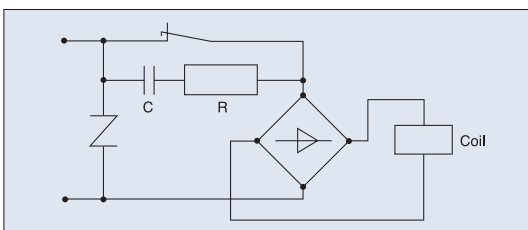
Humming Completely Eliminated

DC excitation does not cause humming so operation is quiet.

Contactors 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.

Internal circuit of the electromagnet



Match with Electronic Control for Factory Automation

One-touch surge absorber

If the magnetic relay coil is opened and closed near an electronic circuit, malfunctioning of the electronic circuit could be induced by a surge voltage. The UN-SA type surge absorber suppresses the surge voltage when this coil is opened and closed.



In addition to the general varistor type and the CR type that lays importance on suppressing the induction voltage when starting, the type with operating indicator (varistor type), and the varistor type with CR are available.

Auxiliary contact unit with low level contact

This is an auxiliary contact unit with low level contact, capable of opening and closing the low voltage and minute current of the electronic control circuit. It can be installed with one touch onto the magnetic contactor or magnetic relay that opens and closes the power of the motor, etc. The junction relay for opening and closing the low voltage and minute current is not needed, so this unit is suitable for opening and closing electronic input circuits in programmable logic controllers, etc. A compact microswitch is used for the low level contact, so the unit will not malfunction due



to fields and surge voltages from the main circuit current and coil of the magnetic contactor.

A 1NO+1NC low level contacts and 1NO+1NC standard contacts are built-in, so the opening and closing of 200VAC and 24VDC can be handled with one unit.

Interface unit

S 2 types of inputs

The long life no-contact output type (UN-SY21, SY31) and contact output type (UN-SY22, SY32) are available.

S One touch installation

The UN-SY21, SY22, SY31 and SY32 types can be mounted with one touch onto the coil terminal. Post-installation work is easy.



S Single standalone unit

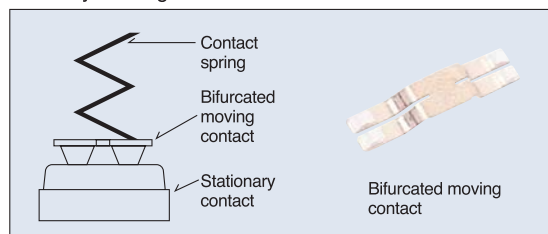
A single unit installation type (UN-SY11, SY12) is available for the S-KR11 and S-N80 to N400 magnetic contactor.

Direct installation is possible on the following units:

S-N series (Magnetic contactor) 65A frame or less
SR-N series (Magnetic relay) 4-pole, 5-pole and 8-poles types

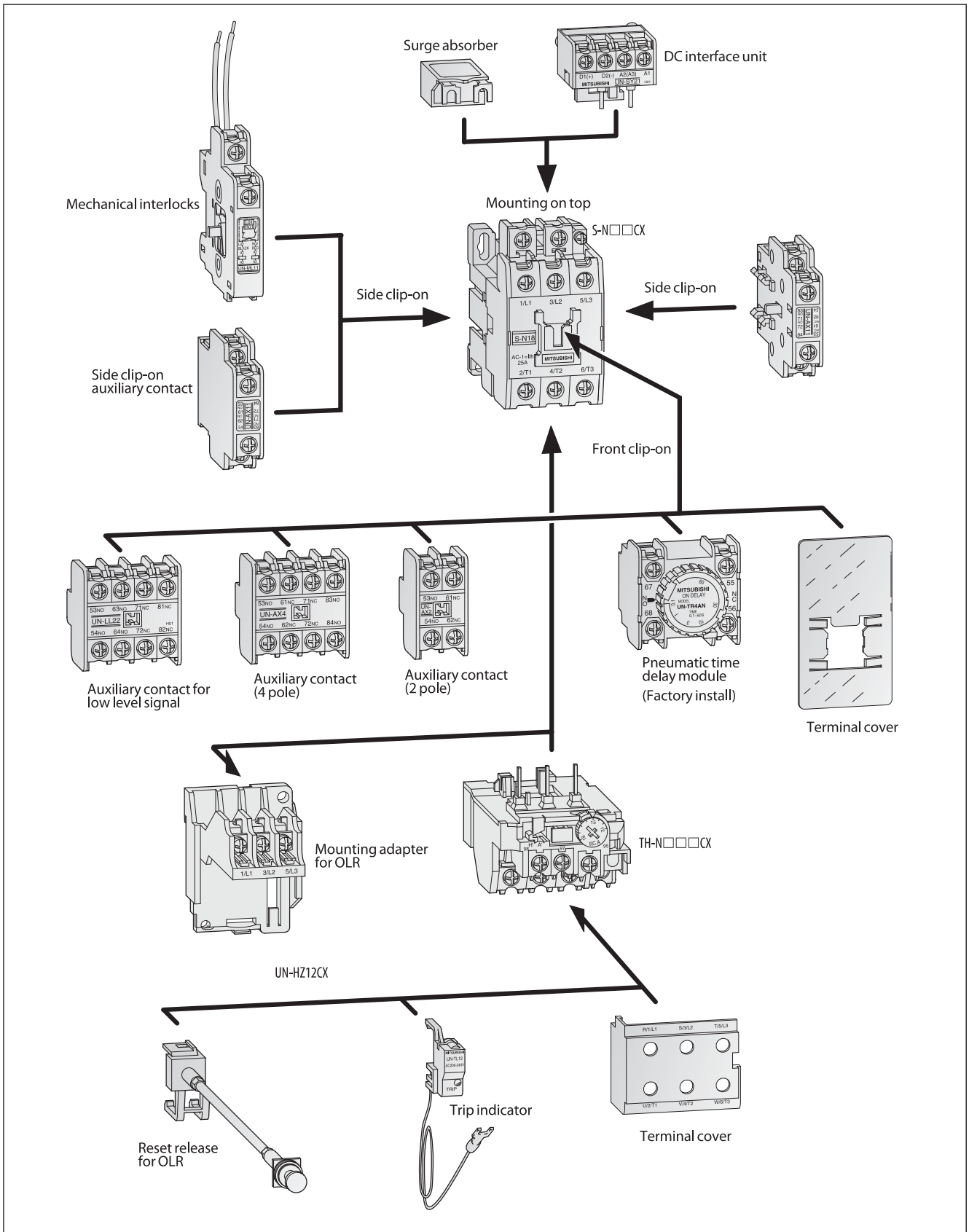
Even Greater Contact Reliability

Contact reliability has been greatly improved by the bifurcated auxiliary moving contact





MS-N Overview

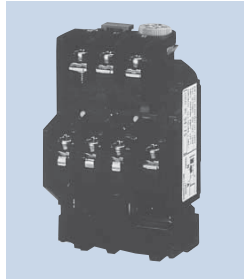




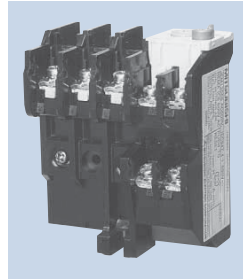
Motor Protection Relays

Thermal Overload Relays

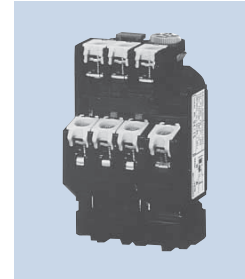
TH-N Series Thermal Overload Relays Will Make a Convenience and Safer Systems.



TH-N12



TH-N20



TH-N12CX

A Selection of Relays for Optimum Motor Protection Characteristics

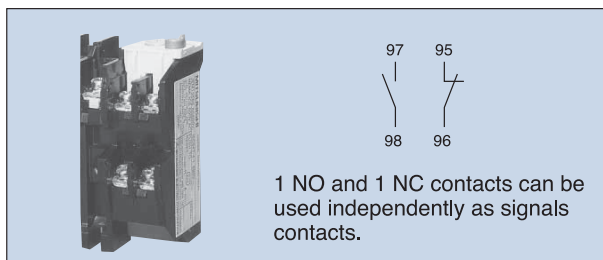
The thermal relay line-up includes two-element units as well as the phase failure protection type models (three-element relays), all with the same external dimensions.

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

Maintenance and Inspection Are Easy

An operation indicator makes maintenance and inspection easy. Checks can be performed using manual operations.

1NO and 1NC Contacts



Rated Current Can Be Set Easily

The value of the rated current is displayed on a dial. Simply adjust the dial to the full-load current of the motor and motor protection is assured.

Finger Protectors

Models with finger protectors that conform to DIN VDE 0106 Part 100 (TH-N□CX) are also available.

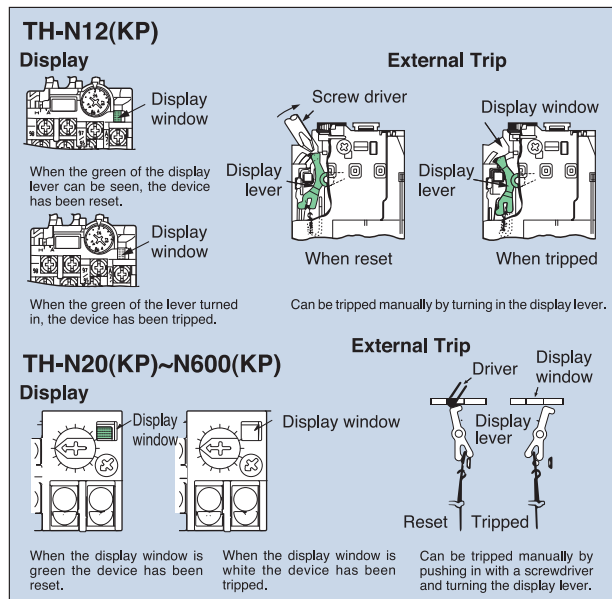
Various Accessories

- Independent mount adaptor for TH-N12(CX) : UN-HZ12(CX)
- Reset release : UN-RR□□□
- Trip indicating LED : UN-TL□□

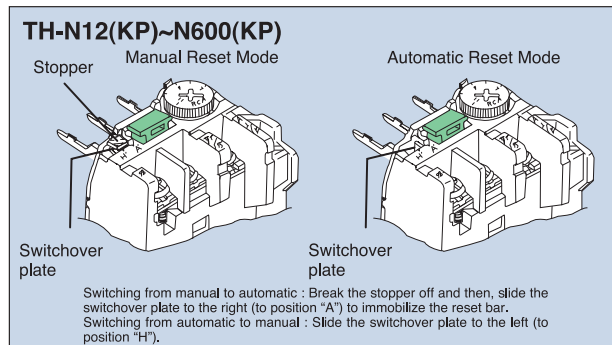
Trip-Free Reset Bar

Choose between automatic and manual reset. Also features tripfree reset bar mechanism.

• Display and External Trip Mechanism



• Switching Between Automatic and Manual Reset



TH-N20(KP)~N600(KP)



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.



Motor Protection Circuit Breaker

Key points



MMP-T32

Wiring-supporting BC terminal
(Option)

Adjustment dial settable
to full load current

Test trip function

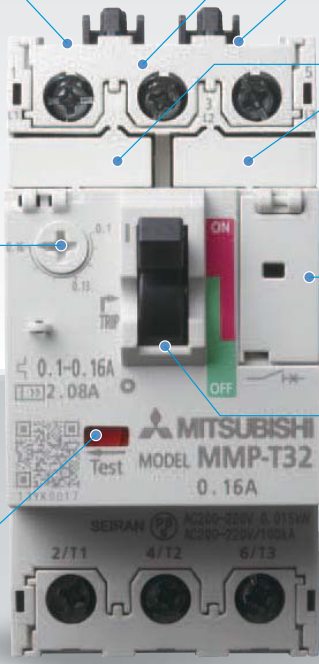
Integrated finger protection
provides convenient safety

A round solderless terminal
is applicable.

The compact breaker design
also allows Auxiliary contact
unit (AX) and alarm contact
unit (AL).

Optional short-circuit indicator
unit can be added speeding
up fault diagnosis.

Breaker type operating
handle with off-lock hole.



45mm



Specification List

Frame A			32									
Type name			MMP-T32					MMP-T32BC ¹				
Standard			JIS C8201-2-1 Ann.1, JIS 8201-4-1, EN60947-2, EN60947-4-1, IEC60947-2, IEC60947-4-1, GB14048.2									
Number of poles			3									
Handle shape			Tumbler handle									
Rated current I _n [A]			0.1 to 32									
Rated operational voltage U _e [V.]			200 to 690									
Rated frequency [Hz]			50/60									
Rated insulation voltage U _i [V]			690									
Rated impulse withstand voltage U _{imp} [kV]			6									
Rated short-circuit breaking capacity [kA]	Rated current I _e [A] ²		200/240V		400/415V		440/460V		500V		600/690V	
	Heater designation	Current setting range	I _{cu}	I _{cs}	I _{cu}	I _{cs}	I _{cu}	I _{cs}	I _{cu}	I _{cs}	I _{cu}	I _{cs}
JIS C8201-2-1 Ann.1 IEC60947-2	0.16	0.1 — 0.16	100		100		100		100		100	
	0.25	0.16 — 0.25	100		100		100		100		100	
	0.4	0.25 — 0.4	100		100		100		100		100	
	0.63	0.4 — 0.63	100		100		100		100		100	
	1	0.63 — 1	100		100		100		100		100	
	1.6	1 — 1.6	100		100		100		100		100	
	2.5	1.6 — 2.5	100		100		100		100		8	6
	4	2.5 — 4	100		100		100		100		8	6
	6.3	4 — 6.3	100		100		100		100		6	5
	8	5.5 — 8	100		100		50	38	42	32	6	5
	10	7 — 10	100		100		50	38	42	32	6	5
	13	9 — 13	100		100		50	38	42	32	6	5
	18	12 — 18	100		50	38	35	27	10	8	4	3
	25	18 — 25	100		50	38	35	27	10	8	4	3
32	24 — 32	100		50	38	35	27	10	8	4	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 × Maximum I _e									
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: 125V/5A, 250V/3A									
Alarm contact unit			UT-MAL (1a or 1b) DC-12: 125V/0.4A, 250V/0.2A									
Short-circuit indicator unit			UT-TU									
Weight [g]			330									

*1: MMP-T32BC type is based on the specification of wiring streamlining terminal.

*2: UL-compliant rated working current is described on a different page.

Applicable Standards

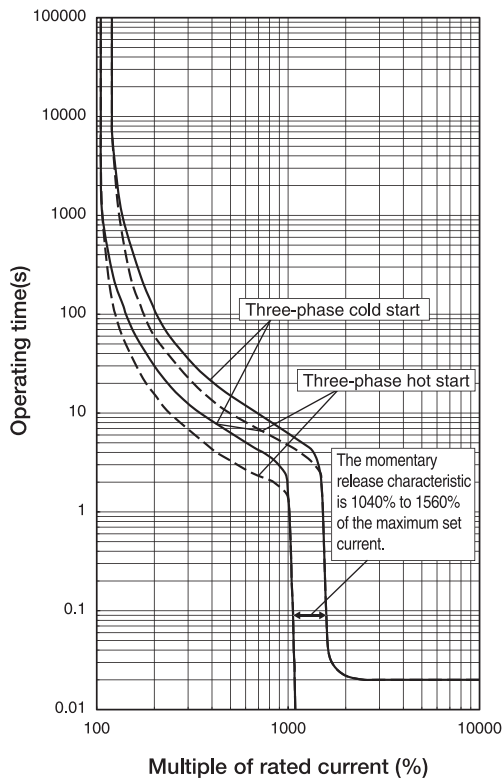
- International Standards
 - IEC60947-2, 60947-4-1
 - UL60947-4-1A, CSA C22.2 No.60947-4-1
 - TUV approval CE CCC
- Domestic Standards in Japan
 - JIS C8201-2-1 Ann.1, 8201-4-1
 - Electric Applicable Safety Law
 - (Electric articles other than specified)



Usage Environment

- (1) Ambient temperature : -10°C to 40°C
 (Applied to the outside of the control panel) Average daily atmospheric temperature: 35°C (Max.), Average yearly atmospheric temperature: 25°C (Max.)
- (2) Maximum temperature of the inside of the control panel : 55°C (Yearly average temperature of the inside of the control panel should be 40°C or less.)
 Please note that the operating characteristic may vary with the ambient temperature.
- (3) Ambient temperature : 45% to 85%RH However, dew condensation and freezing should be avoided.
- (4) Height above sea level : 2000m or less
- (5) Vibration : 10 to 55Hz, 19.6m/s^2 or less
- (6) Impact : 49m/s^2 or less
- (7) Atmosphere : Inclusion of dust, smoke, corrosive gas, moisture, salt content and the like in the atmosphere should be avoided as much as possible.
 Please note that continuing to use the device in a closed condition for a long period may cause contact failure.
 Never use the device under an atmosphere that contains flammable gas.
- (8) Storage temperature/
 Relative humidity : -30°C to 65°C 45% to 85%RH However, dew condensation and freezing should be avoided.
 The storage temperature is ambient temperature during transportation or storage and should be within the usage temperature when starting to use the device.
- * As for handling, temperature adjustment, and closely-attached installation, please read the Instruction Manual.

Operating Characteristic Curve

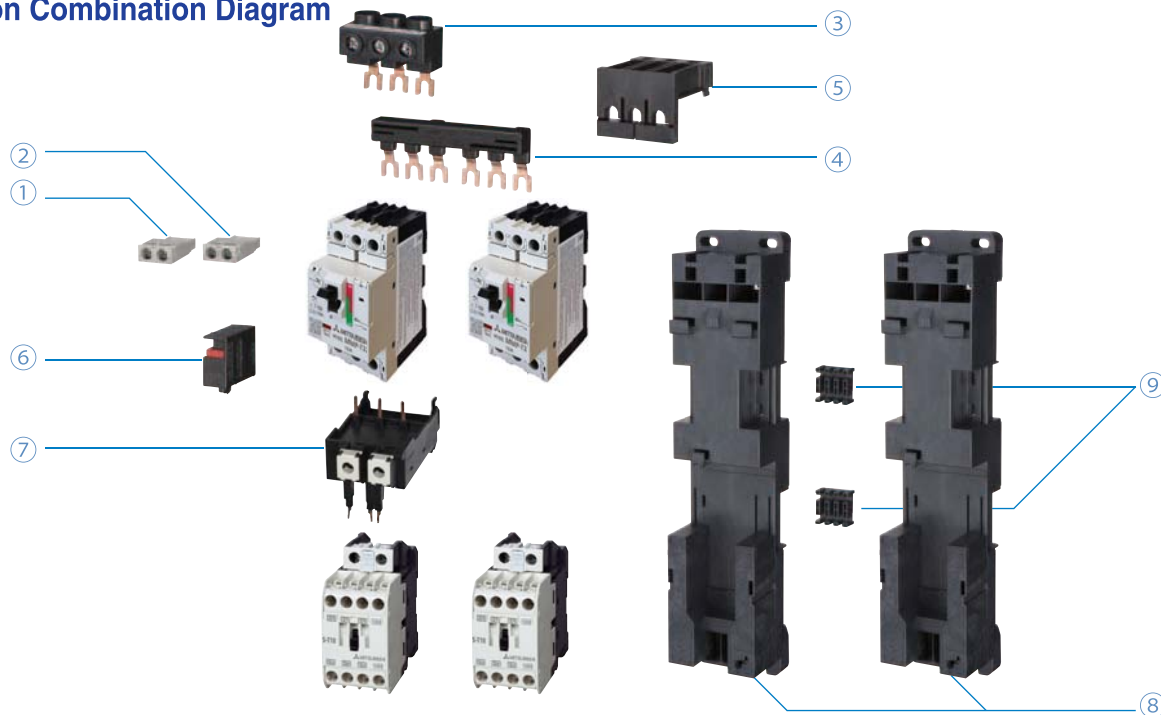




List of Options

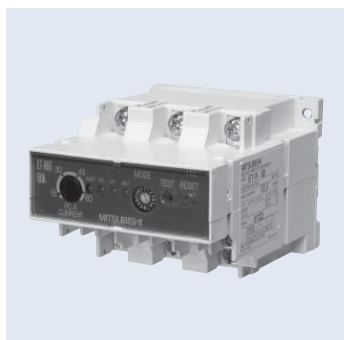
Number	Product name	Model	Specification	Description	Applied model
①	Auxiliary contact unit (to be internally installed)	UT-MAX	1a 1b	Contact of the unit operates in conjunction with ON/OFF operation of MMP-T32.	MMP-T32
		UT-MAXLL (for subtle load)	1a 1b		
②	Alarm contact unit (to be internally installed)	UT-MAL	1a 1b	Contact of the unit operates in conjunction with the trip operation of MMP-T32.	
		UT-MALLL (for subtle load)	1a 1b		
③	3 phase feed-in terminal	UT-EP3		A unit to connect the large size electric wire to MMP-T32.	
④	Bus bar	UT-2B4	45mm Twin type	A unit to supply power to two or three MMP-T32.	
		UT-3B4	45mm Triple type		
		UT-2B5	57mm Twin type		
		UT-3B5	57mm Triple type		
⑤	Line side terminal adapter kit	UT-CV3		Power supply-side terminal cover to respond to UL60947-4-1A, Type E/F. This kit consists of terminal adapter, terminal cover and 3 screws.	
⑥	Short-circuit indicator unit	UT-TU		This unit has a feature that the red indication is lit only when the device is tripped due to short-circuit. This unit is required for application to UL60947-4-1A, Type E/F.	
⑦	Connection conductor unit	UT-MT20		A unit to connect and link the MMP-T32 and Magnetic Contactor electrically and mechanically.	
		UT-MT32			
⑧	Mounting base unit	UT-BT20		A plate to install the combination starter with MMP-T32 and Magnetic Contactor combined. Rail mounting and screw mounting are available.	
		UT-BT32			
⑨	Joining block unit	UT-RT10		A set of the blocks for mechanically connecting two mounting base units.	
		UT-RT20			
		UT-RT32			

● Option Combination Diagram





Electronic Motor Protection Relays

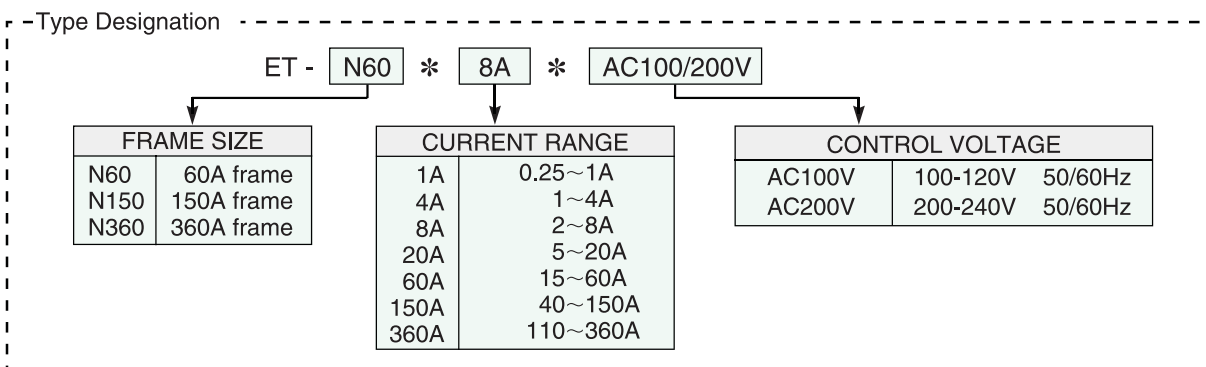


ET-N60 60A

The MITSUBISHI series ET-N relay is an excellent relay that can protect motors electrically. The series ET-N relays have the following excellent features.

Features

- Selectable Protection Mode
 - Overload (including locked rotor condition)
 - Phase failure (including current unbalance)
 - Incorrect phase sequence
- Excellent Wide Current Range
- Easy Wiring
- Easy Setting and Maintainance
- Selectable Tripping Time at 600% of setting.
 - Standard trip (7s.)
 - Quick trip (3s.)
 - Fast trip (5s.)
 - Medium trip (15s.)
 - Slow trip (30s.)
- Withstands High Overcurrent
- Fine Indication of Trip Mode
- Conformity to International Standards
- Can be mounted on 35mm rail (ET-N60)



Specifications

• Ratings and characteristics

Table 2.2.1

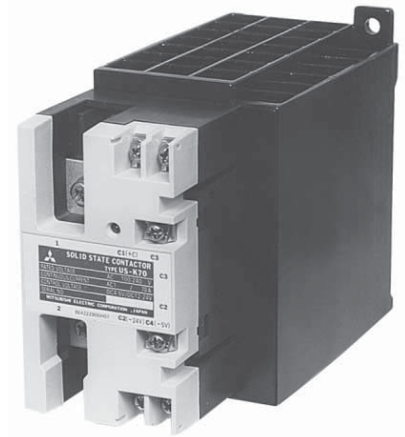
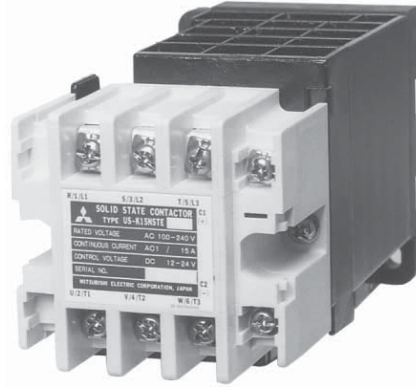
Frame size [Current range]		N60[1A]	N60[4A]	N60[8A]	N60[20A]	N60[60A]	N150[150A]	N360[360A]
Rated insulation voltage	VAC	690						
Adjustable setting range	A	0.25-1	1-4	2-8	5-20	15-60	40-150	110-360
Applicable motor capacity	200-240VAC	kW	0.03-0.2	0.2-0.75	0.4-1.5	1.5-4	3.7-11	11-37
	380-440VAC	kW	0.05-0.4	0.4-1.5	0.75-2.2	2.2-7.5	7.5-22	22-75
3-ph	200-240VAC	HP	1/16-1/4	1/4-1	1/2-2	2-5	5-15	15-50
	380-440VAC	HP	1/8-1/2	1/2-2	1-3	3-10	10-30	30-100
Rated operating current of aux. contacts	Category 120VAC	A	2					
	AC-15 240VAC	A	1					
Permissible ambient temperature/humidity	Category 24VDC	A	1					
	DC-13 110VDC	A	0.2					
Permissible ambient temperature/humidity	°C/%RH	-10 to 55/45 to 85						
Control circuit consumption	VA	7.5 (AC100V)/15 (AC200V)						
Control voltage tolerance	times	0.85 to 1.1 (rated control voltage)						
Tripping time		See Fig. 2.2.1						
Tripping condition	Overload	%	[minimum tripping current] 110 to 120 (at setting current)					
	Phase failure	%	more than 70 (at setting current) [Tripping time : 2-4 sec.]					
	Reversal phase	%	more than 70 (at setting current) [Tripping time : less than 0.5 sec.]					
Withstand voltage	VAC	2500 [1 minute]						
Shock resistance	Vibration 10-55Hz	m/s ²	19.6					
	Sine wave pulse	m/s ²	49					
Conductor size	Main terminals	mm ²	2-14			3.5-22	5.5-60	14-200
	Control terminals	mm ²	1.25-2					

Note: ET-N relay cannot be used on DC circuit



Solid State Contactors

Series **US-K**



6.1 Features

Ideal for heavy duty applications

The contactor contains no moving parts, so its reliability and long life are assured even in high cycling applications.

Silent operation

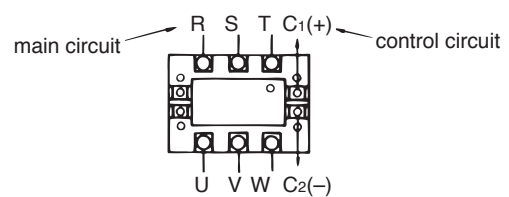
Since the contactor has no moving part, noise is eliminated.

Completely insulated power circuit

The power circuit elements are electrically insulated from the heatsink. No insulation of the heatsink is required.

Easy connection

Up-front wiring.



Built-in surge absorber

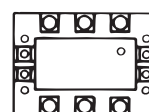
Surge absorbers are built-in for protection of the power circuit elements from line surges.

Indicator lamp shows operating condition

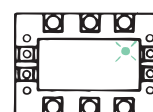
Front-mounted for clear indication of operational state.

Compact size

The contactor consists of a small size body and heatsink.



OFF state



ON state



SS
Super-S Series



MITSUBISHI ELECTRONIC MULTI-MEASURING INSTRUMENT

EXPAND LINE UP

SUCCEEDED DISPLAY FUNCTIONS

ENHANCED MEASURING FUNCTION



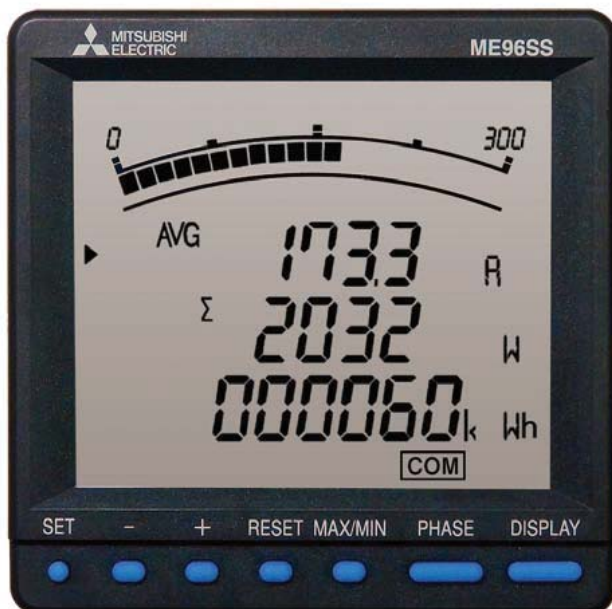


ME96 Super-S Series Features



Evolution of Electronic Multi-Measuring Instrument Super-S-Series

MITSUBISHI Electronic Multi-Measuring Instrument S Series features high performance and crystal clear display. With simple operating functions, SS Series is the best support your measuring and monitoring systems.



Variety of Complementary Features

- » Password function
- » Special primary voltage/current and special secondary voltage are settable
- » Periodic monitoring function

Impressive Monitoring Functions

- » Advanced alarm display
- » Motor starting current mark

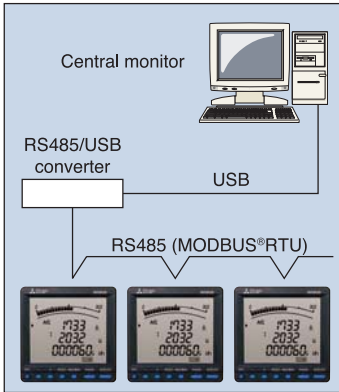
Succeeded Display Functions

- » Large bar-graph display
- » Special display
- » High-brightness backlight

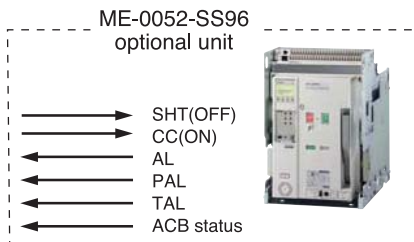


RTU System

(ME96SSH-MB/ME96SSR-MB with ME-0052-SS96 (optional plug-in module))



- » MODBUS® RTU communication system optimizes computer monitoring operations
- » Attachment of ME-0052-SS96 (optional) enables remote monitoring of the contact input signal and on/off control of the contact output signal
- » Digital input signals can be latched for over 30ms, and there is no need for external latch circuits



<MODBUS® RTU Interface Specifications>

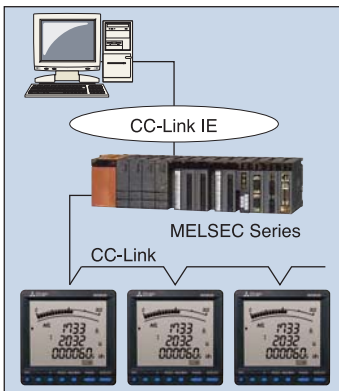
- Max. Baud rate: 38.4kbps
- Max. Connection Distance: 1,200m
- Max. Connection Units: 31

<Optional Plug-in Module ME-0052-SS96>

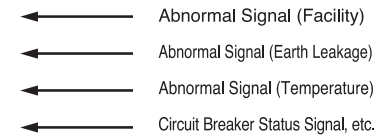
- Digital Input: 5 points (24VDC)
- Digital Output: 2 points (35VDC)

CC-Link System

(ME96SSH-MB/ME96SSR-MB with ME-0040C-SS96 (optional plug-in module))



- » Optimum transmission system for remote monitoring using Mitsubishi PLC
- » Remote monitoring of contact signal leading to less wiring, less spacing
- » Digital unit signal can be latched for over 30ms, and there is no need for external latch circuits

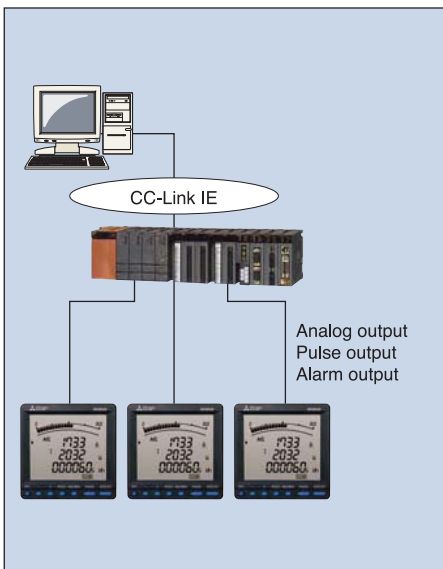


<CC-Link Interface>

- Max. Baud rate: 10Mbps
- Max. Connection Distance: 100m (10Mbps)~1,200m (156kbps)
- Max. Connection Units: 42
- Digital Input: 4 points (24VDC)

Analog/Pulse/Alarm Output System

(ME96SSH-MB/ME96SSR-MB with ME-4210-SS96 (optional plug-in module))



- » Remote monitoring of A, DA, V, W, var, VA, PF, Hz, Harmonics Current RMS value and Harmonics voltage RMS value at 4 to 20mA output (max.4 outputs)
- » Active energy, reactive energy, apparent power and periodic energy (ME96SSH-MB) can be monitored by pulse output (max.of 2 pulse)
- » Can remotely monitor upper/lower limit alarm by contact output (max.1 point)

<Analog output specifications>

- 4-20mA
- 4 outputs
- Resistance load 600Ω or less

<Pulse output specifications>

- No-voltage a contact point
- 35VDC, 0.1A
- Select output from pulse widths of 0.125, 0.5 or 1s

<Alarm output specifications>

- No-voltage a contact point
- 35VDC, 0.1A

<Digital input specifications>

- 1 point (24VDC)



Expand Line-up

Three Model Line-up



Model name	Transmission/Option specifications	Main measurement items
ME96SSH-MB (High-spec class)	MODBUS® RTU communication Plug-in module (options) <ul style="list-style-type: none"> • Analog/Pulse/Contact output/input • CC-Link communication • Digital input/output (for MODBUS® RTU communication) 	A, DA, V = ±0.1% W, var, VA, Hz = ±0.2% PF = 1.0% Wh = class 0.5s (IEC 62053-22) varh, Vah = class 2.0 (IEC 62053-23) Harmonics = 31 st -deg (max) Rolling demand
ME96SSR-MB (Standard class)	MODBUS® RTU communication Plug-in module (options) <ul style="list-style-type: none"> • Analog/Pulse/Contact output/input • CC-Link communication • Digital input/output (for MODBUS® RTU communication) 	A, DA, V = ±0.2% W, var, VA, Hz = ±0.5% PF = 2.0% Wh = class 1.0 (IEC 62053-21) varh = class 2.0 (IEC 62053-23) Harmonics = 13 th -deg (max)
ME96SSE-MB (Economy class)	MODBUS® RTU communication	A, V = ±0.5% W, Hz = ±0.5% PF = 2.0% Wh = class 1.0 (IEC 62053-21)

Optional Plug-in Modules

Model name	Analog output	Pulse/Alarm output	Contact input	Contact output	Transmission function	Used with
ME-4210-SS96	4	2	1	—	—	ME96SSH-MB ME96SSR-MB
ME-0040C-SS96	—	—	4	—	CC-Link	
ME-0052-SS96	—	—	5	2	—	

Note: Optional Plug-in Module can not be used with ME96SSE-MB.

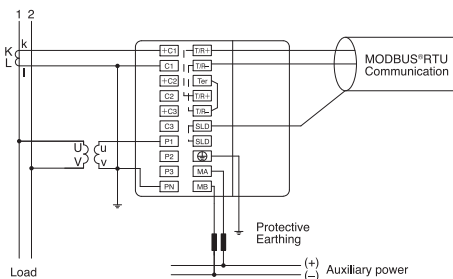
Enhanced Measuring Functions

Improved Measuring Accuracy

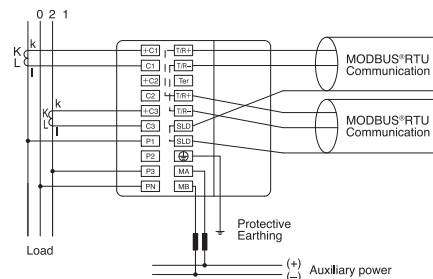
- » Measuring accuracy of items such as current, voltage and active energy has been improved.
 - Current/voltage ±0.1%
 - Active energy class 0.5s
 - Harmonics 1st to 31st

- » Functions added for measuring Single phase 2-wire and Single phase 3-wire

Single phase 2-wire

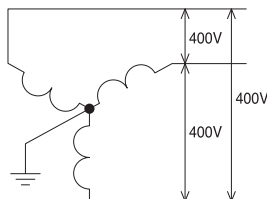


Single phase 3-wire



- » Functions added for measuring Three phase 3-wire system star circuits and 400V direct connections

Three phase 3-wire system (star circuit)





FR SERIES



INVERTER

SAVE POWER

SAVE TIME

CUT COSTS

SIMPLE OPERATION

LONG SERVICE LIFE

PRACTICAL EFFICIENT INVERTER SETUP SOFTWARE





Mitsubishi Inverter Series for HVAC Application Common

FR-D700 Series: Compact & Economical Speed control



0.4 kW - 2.2kW, 1Phase 200 V
0.4 kW – 7.5 kW, 3 Phase 400V

- General-purpose magnetic flux vector control
- Auto tuning function
- High starting torque
- Built-in Brake Unit upto 7.5 KW
- For all AC Motor micro drive speed control application
- **OEC Function for VARIABLE** Torque application
- PID for for Fan & Pump Control
- Built-in Modbus for Communication
- Ambient Temperature 50° & 150% Overload Capability
- Directly connected with GOT, got controlling & Monitor through RS485

Inverter Model No for FR-D700 Series

FR- **D740** - **120** - EC

Symbol	Voltage Class
D740	Three-Phase 400 V Class
D720S	Single-Phase 200 V Class Up to 2.2 Kw

O/P Rated Current

Displays the rated current
12.0 Amp for 5.5 Kw 400 rating
(Overload 150% 60 Sec & 200% 0.5 Sec)

FR-E700 Series: Compact & High Performance



0.4 kW - 15 kW, 3 Phase 400V

- Advanced magnetics flux vector control
- Brake sequence Control for Vertical application
- High starting torque 200%/0.5Hz
- Network Capabilities
- Ambient Temperature 50 Deg & 150% Overload Capability: CC-Link, Modbus Built in, Profibus

Inverter Model No for FR-E700 Series

FR- **E740** - **095** - EC

Symbol	Voltage Class
E740	Three-Phase 400 V Class

O/P Rated Current

- Displays the rated current
- 9.5 Amp for 3.7 Kw 400 rating
- For 150% overload 9.5 Amps Continuous
- Overload 150% 60 Sec & 200% 0.5 Sec



FR-F700 Series: Variable Torque Energy saving Drive



0.74kW - 630 kW, 3 Phase

Power saving Performance Display

The power saving effects can be displayed on the control unit with several different formats and values in kW.



- Power saving monitor (kW)
- Power saving rate (%)
- Power saving amount (kWh)
- Power saving amount value (kW)
- Power saving rate average value (%)
- Power saving charge average value (Rs.)
- Annual power saving amount (kWh)
- Annual power saving amount charge (Rs.)

Inverter Model No for FR-F700 Series

FR- **F740** - **01800** - EC

Symbol	Voltage Class
F740	Three-Phase 400 V Class

O/P Rated Current

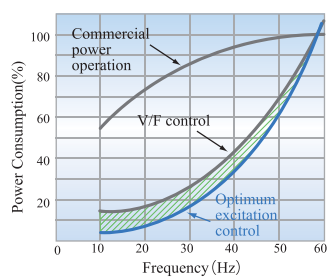
Displays the rated current
180.0 Amp
Overload 110% 60 Sec & 150% 3 Sec

More Energy Savings

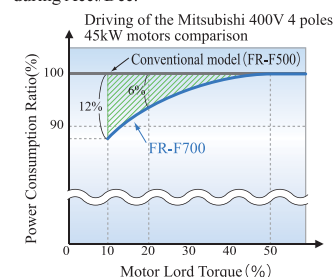
Upgrade of the Renown Optimum Excitation Control

• Achieved a higher level of energy savings during acc./dec. to say nothing of during constant speed.

Ex. of Blower Operation Characteristics



Ratio of Motor Power Consumption during Acc./Dec.



- For all AC Motor variable Torque application with advance Magnetic Flux vector control
- Sleep PID Function for energy saving
- Starting torque up to 110%, with V/F Control for Fan 7 Pumps
- Network Capabilities: Optional card For communication, CC-Link, Profibus, Profinet, Lon works
- Directly connected multiple drive with GOT, got controlling & Monitor.
- Built-in Pump controller for Cascaded Pump control.
- Commercial supply switch over function
- Built-in display having energy measurement & running cost feature

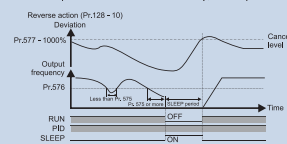
Intelligent Function

Multi-motor switching function



PID Output suspension (Sleep) function

The inverter stops operation if the output frequency after PID operation remains at less than the Pr. 576 Output interruption detection level setting for longer than the time set in Pr. 575 Output interruption detection time. This function can reduce energy consumption in the low-efficiency, low-speed range.





Mitsubishi Drive Highlighted Point

- **New Parameter Unit With battery : PU07 BB**
 - Parameter setting and copy without 440 Supply to drive
 - Up to 3 Inverter Parameter Set can be stored



FR-PU07BB

- **Fan control & Error**
 - Fan ON/OFF Control
 - Indicates FN Error In case Fan not running
 - Fan is Placed top of Inverter : Easy Replacement



Long Life and Simple Maintenance



Sturdy & Compact Design

- Ambient Temperature : 50°
- Voltage Fluctuation : 323 V to 528 V
- Compact Size : Latest Design of IGBT
- Trough Mounting arrangement : Reduce Panel size

Long life components

- The lifespan of the cooling fan and smoothing capacitors have been extended to 10 years

Life check diagnostic function

- Degrees of deterioration of these specific components can be monitored and have info displayed on the panel
- By self-diagnosis alarm is output to prevent malfunction

Components	Life Guideline	Guideline of JEMA*
Cooling fan	10 years	2 to 3 years
Main circuit smoothing capacitor	10 years	5 years
Printed board smoothing capacitor	10 years	5 years

Japanese Engineering Manufacturing Association



⚠ Safety Warning

To ensure proper use of the products listed in this catalog, please be sure to read the instruction manual prior to use.

West Zone

Pune Head Office

Emerald House, EL-3, J Block,
M.I.D.C. Bhosari, Pune-411 026, India
Phone: +91 (20) 2710-2000

Mumbai Office

305-306, 3rd Floor, "Windfall", Sahar Plaza Complex,
Next to Kohinoor Hotel, Andheri Kuria Road, J. B. Nagar,
Andheri (E.) Mumbai-400 059, India
Phone: +91 (22) 6611-6200
Fax: +91 (22) 6611-6299

Ahmedabad Office

B/4, 3rd Floor, SAFAL Profitaire, Corporate Road,
Pralhadnagar, Satellite, Ahmedabad - 380015. Gujarat, India.
Phone: +91 (79) 65120063

Vadodara Office

A-1/2, 2nd Floor, Status Plaza,
Opp Relish Resort Aksar Square,
O.P Road, Vadodara -390020, India
Phone: +91 (265) 231-4699/ 235-8137
Fax: +91 (265) 233-3307

Nagpur Office

Plot No. 8, NIIT Layout, Ravindra Nagar,
Ring Road, Nagpur - 440022, Maharashtra India.
Phone: +91 (712) 228-4020

North Zone

Gurgaon Office

2nd Floor, Tower A & B, DLF Cyber Greens,
Dlf Cyber City, DLF Phase -III, Gurgaon-122002, India
Phone: +91 (124) 463-0300 +91 (124) 673-9300
Fax: +91 (124) 463-0399 / 398

Jaipur Office

111, Ground Floor, Apex Mall, Tonk Road,
Jaipur - 571424, Rajasthan, India.
Phone: +91 (141) 4011109

Chandigarh Office

SCO- 376, Second Floor, Sector 32 D,
Chandigarh - 160036, Chandigarh, India.
Phone: +91 (172) 4601645

Indore Office

110, 1st Floor, Shagun Commercial Complex,
Plot No. 7/PU - 4, Scheme No. 54, Vijay Nagar,
Indore - 452010, Madhya Pradesh, India.
Phone: +91 (731) 6050013

Rudrapur Office

181/6, Awasthik Ring Road, Udham Singh Nagar,
Rudrapur, - 263153, Uttarakhand, India.
Phone: +91 (5944) 246899

South Zone

Bangalore Office

Prestige Emerald, 6th Floor, Municipal No. 2,
Madras Bank Road (Lavelle Road), Bangalore 560001, India
Phone: +91 (80) 4020-1600
Fax: +91 (80) 4020-1699

Chennai Office

Citilights Corporate Centre No.1, Vivekananda Road,
Srinivasa Nagar, Chepet, Chennai-600 031, Tamilnadu, India
Phone: +91 (44) 4923-2222
Fax: +91 (44) 4923-2249

Coimbatore Office

No 551A, West Lokmanya Street, DB Road,
RS Puram, Coimbatore - 641002, India
Phone: +91 (422) 438-5600

Hyderabad Office

4th Floor, Unit No.407, Ashok Bhopal Chamber S.P. Road,
Secunderabad, A.P-500 003, Andhra Pradesh, India
Phone: +91 (40) 4343-8888
Fax: +91 (40) 4343-8899

East Zone

Kolkata Office

Plot - A3, 1st Floor, Infinity Think Tank, Tower -II,
Block GP, Sector-V, Salt Lake, Kolkata - 700091,
West Bengal, India.
Phone: +91 (33) 65001375



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