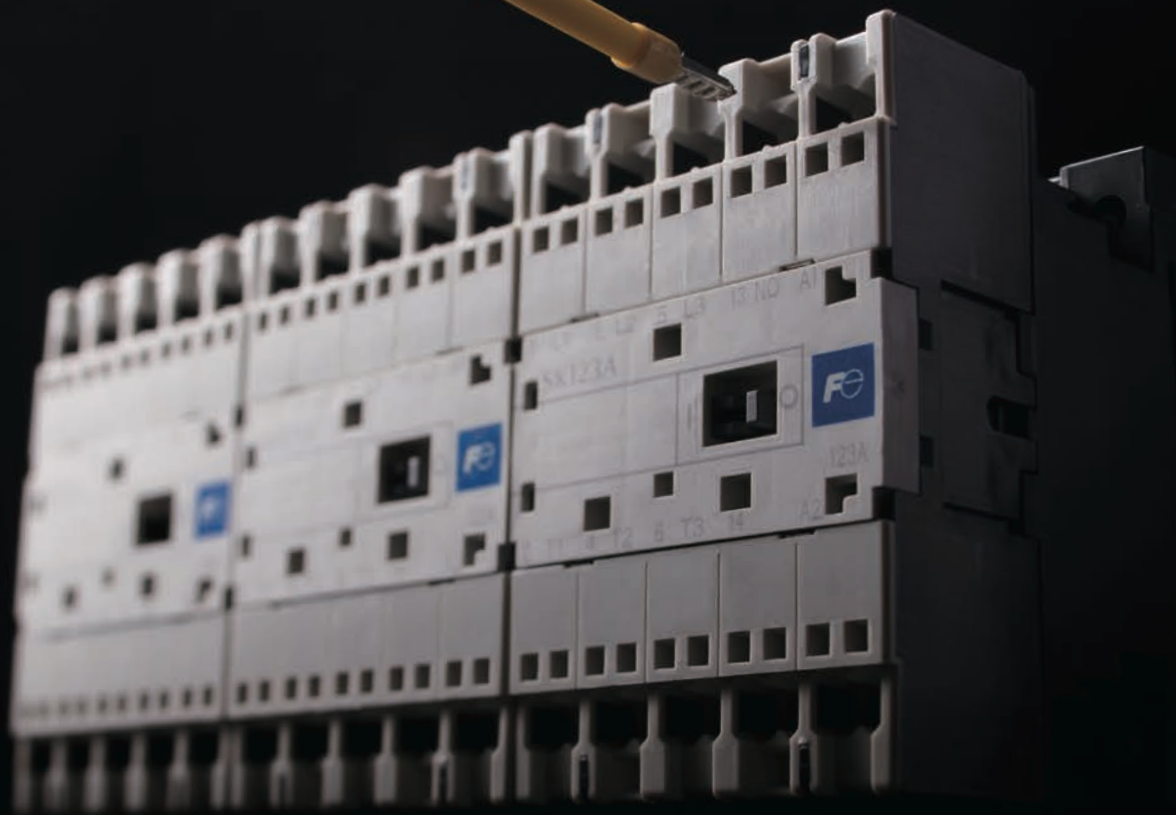


Labor-saving Devices

Push-in Terminal Products

Significantly reduced wiring work.



Managers, management departments



I want to continue providing products with unrivaled quality.



The simple work involved is not dependent on work skills, ensuring that quality is standardized.



I want to streamline manufacturing even further.



A 30% reduction on time spent on wiring means higher production volume.

Development and design departments



I want equipment (control panels) that takes vibration resistance into consideration.



There are no parts of push-in terminals where looseness can occur, eliminating the need for tightening.



I want to add functionality (added value) without increasing the size of equipment (control panels).



Wiring is performed from the front of the product, ensuring efficient use of space.



Push-in terminals are more reliable, offer better workability,
safer, and easier to maintain than screw terminals.



Maintenance and service departments

I want to keep defects (factors) to a minimum.



Eliminating the use of screws prevents equipment stoppages due to looseness caused by screws, heat or fire, or falling.

I want to reduce the length of time that workers are dispatched for installation (at time of delivery).



Fuji Electric push-in terminal products are equipped with an indicator function, allowing wiring checks to be completed by visual observation.

* Refer to P6 for details.



Production department

I want to eliminate (acceptance) inspection items to shorten delivery times.



There is no need for any screw related inspections such as tightening checks.

I want to eliminate variations in quality due to worker proficiency.



Wiring work is completed with a single action.

No particular skills are required.



Reliability

There is no need to worry about screw looseness caused by vibrations or long-term use.

Workability

Wiring work is completed simply by inserting wires.




Safety

Products do not require a terminal cover, and have an electric shock prevention construction in which live parts are not exposed (IP20).

Maintainability


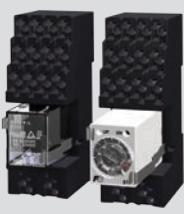
No periodic tightening is required. There is less need to dispatch workers for installation, periodic inspections, etc.

Product List

		Molded case circuit breaker	Earth leakage circuit breaker	Circuit protector	Manual motor starter
Product list					
Basic type		BW32SBGQ BW50EBGQ BW50SBGQ BW50RBGUQ	EW32SBGQ EW50EBGQ EW50SBGQ EW50RBGUQ	CP30FS-□P□□Q CP30FM-□P□□Q CP30FI-□P□□Q	For separate mounting: BM3RSQH, BM3RHQH For combination starter configuration: BM3RSQ1, BM3RSQ2, BM3RHQ1, BM3RHQ2
Number of poles		2, 3		1, 2, 3	3
Rated current value [A]		3 to 30	5 to 30	0.1 to 20 * Up to 15 A with JIS Standard	0.16 to 20
Accessory lineup		Accessory terminal block: Auxiliary switch, alarm switch, shunt trip device, undervoltage trip device		Control circuit terminals: Auxiliary/alarm contact block	Internal accessories: Auxiliary contact block, alarm contact block External accessory: Short circuit alarm contact block
Connection method		Push-in method			
Wiring indicator		Yes			
Finger protection		IP20			
Exterior (W x H x D [mm])		Body: 54 x 140 x 68 Accessory terminal block: 12.5 x 100 x 75 When mounting accessory terminal block body: 66.5 x 140 x 75		Body: 17.5 x 100 x 66.3	For separate mounting: 45 x 130 x 66 For combination starter configuration: 45 x 220 x 66
Wire diameter	Main circuit	Ferrule with insulation collar 2.0 to 6.0 mm ² 14 to 10 AWG		Ferrule with insulation collar 0.75 to 2.5 mm ² 18 to 14 AWG	Ferrule with insulation collar 0.75 to 4.0 mm ² 18 to 12 AWG
	Accessory terminal block	Ferrule with insulation collar 0.5 to 2.0 mm ² 20 to 16 AWG		Ferrule with insulation collar 0.5 to 2.0 mm ² 20 to 16 AWG	Ferrule with insulation collar 0.5 to 2.0 mm ² 20 to 16 AWG
		JIS, IEC (CE), UL, TÜV, GB (CCC)			

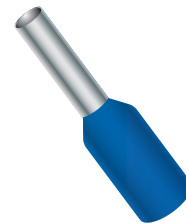
*1: Includes hold-down spring when mounted.



Magnetic contactor, magnetic starter	Socket for relay, timer
	
Magnetic contactor: SK12Q□ Magnetic starter: SK12Q□W	For relays: TP58Q, TP514Q For timers: TP88Q, TP814Q
<p style="text-align: center;">—</p>	<p style="text-align: center;">2,4</p>
<p style="text-align: center;">12</p>	2-pole products: 7 4-pole products: 5
Additional auxiliary contact block: 2 poles, 4 poles	<p style="text-align: center;">—</p>
Magnetic contactor SK12Q□: 45 x 67 x 49 Magnetic starter SK12Q□W: 45 x 140 x 65	Body: 31 x 90 x 48 When mounting relay ¹⁾ : 31 x 90 x 68 When mounting timer ¹⁾ : 31 x 90 x 85
Ferrule with insulation collar 0.5 to 2.0 mm ² 20 to 16 AWG	Ferrule with insulation collar 0.5 to 2.0 mm ² 20 to 16 AWG
Ferrule with insulation collar 0.5 to 2.0 mm ² 20 to 16 AWG	<p style="text-align: center;">—</p>
	<p style="text-align: center;">IEC (CE), UL, TÜV</p>

Parts required for push-in terminal products

Ferrule terminal



This is a compact rod shaped crimp terminal certified by DIN Standards and UL Standards.

Crimp tool



This tool is required to crimp ferrule terminals.

Removal tool



This tool is required when removing wires from the product.

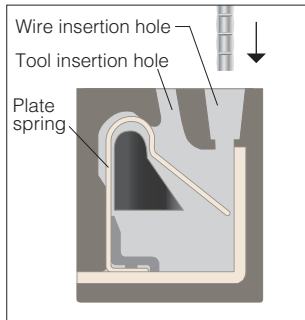
^{*} Refer to the removal method described in the upper right of P6 for details on how to use.

Note 1) This material is for products currently under development. Specifications and exterior, etc. may be subject to change.
 Note 2) This product can only be mounted on DIN rails.

Wiring Method / Reliability

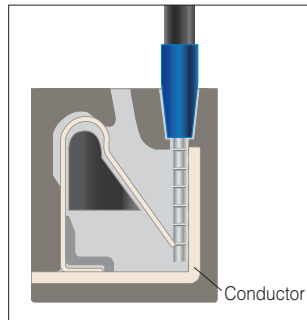
What are Push-in Terminals?

Before wire insertion



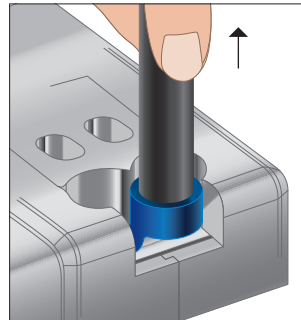
A "push-in" method that does not require a tool is employed for standardization in all models. Insertion is completed in a single action while still retaining an appropriate click sound.

Wiring diagram



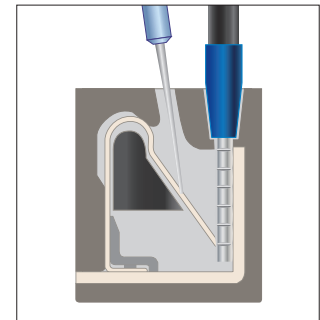
A robust plate spring had been employed to improve contact reliability, and sinking the edge of the plate spring into wires has resulted in the same level of secure wire retention as that provided by screw terminals.

Wiring check



Pull lightly to ensure that wiring is secure, including the ferrule caulking. Please note that Fuji Electric's push-in terminal products use wiring indicators that have been standardized for all models.

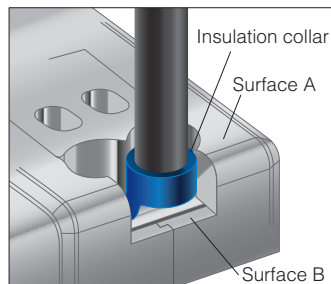
Removal



Insert the dedicated removal tool, and pull out wires with tool inserted. Remove the tool after pulling out wires.

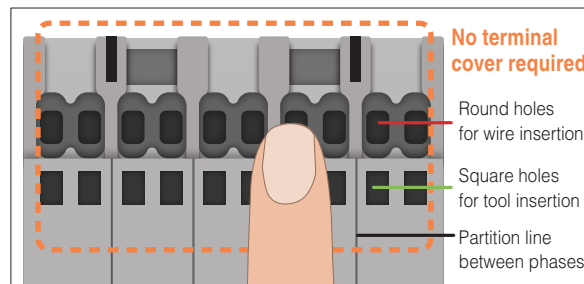
Product Functionality, Design Considering Usability

Wiring completion can be checked visibly with "wiring indicator"



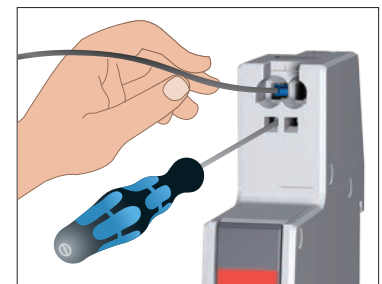
Wiring indicators are employed that have been standardized for all models. Wiring completion can be quantitatively checked at the ferrule terminal insulation collar position. (Wiring is complete if the insulation collar is visible between surfaces A and B.)

Design to prevent incorrect wiring



Round holes are used for inserting wires, and square holes are used for inserting tools and for continuity testers. This has been standardized for all models to prevent mistakes.

Mechanism taking field work into consideration



In the interests of safety and workability, the product has a mechanism used to hold the tool when it is inserted, allowing work to be carried out with both hands.

Main Tests

Tensile test



Item (example)	Standard	Test details
Tensile test	IEC60947-1	<ul style="list-style-type: none"> Wires are connected, the tension is increased gradually, and a fault check is performed.
Twisting test	IEC60947-1	<ul style="list-style-type: none"> Wires are connected and then twisted, and a check for damage or deformation is performed.
Vibration test Voltage drop test	IEC60068-2-6	<ul style="list-style-type: none"> A conductor is connected, the prescribed vibration is applied in the X-, Y-, and Z-axis directions, and a check for insulator damage, other mechanical faults is performed. There should be no looseness, insulating material deformation, cracks, or other adverse damage. Contact interruption is measured using an oscilloscope between vibration loads. Voltage drop is measured before and after testing to check for changes in the contact resistance value at contacts.

QR Code



Scan the above QR Code or refer to the FE website for details on the tests described on the left.



Q What is the push-in method?

A If the current value is comparatively small, the terminal shape is such that wires can be inserted without using a tool to open the terminal section.

Q What is the difference between push-in terminal products and screw terminal products?

A (1) Wiring work time is shortened. Work time is shortened by 30% or more if using round crimp terminals in particular. (verified by Fuji Electric)
(2) No looseness occurs due to vibrations or long-term use. A spring method is employed for the connection structure of existing products, and the specifications, performance, and applicable standards, etc. for the products themselves are expected to be the same as those for conventional screw terminal products.

Q How is wiring performed?

A Push-in type push-in terminals are employed, and wiring is completed simply by inserting the wires as described on P6.

Q Are there any restrictions on jigs or tools that can be used?

A Please use the tool sold by the terminal manufacturer.

Q Are there any restrictions on terminals to be used?

A Please use ferrule terminals.

Q Are colored (red, white, blue, etc. for power circuits) ferrules sold?

A Colors are designated according to wire thickness based on DIN Standards, and therefore cannot be freely specified. Contact the terminal manufacturer for details.

Q Where do I perform a continuity check?

A Continuity can be checked by inserting the tester lightly into a square hole as described on P6.

Q Where do I perform a tightening check with magic marker?

A As these are not screw terminals, there is no need to perform a tightening check. Products are equipped with a wiring indicator function common to all models to visually ensure that wiring has been secured. (in the case of ferrule terminals with insulation collar cap)

Q How are wires removed?

A Insert the tool into the square holes and pull out the wires as described on P6.

Q Is the push-in terminal tensile strength the same as that of screw terminal products?

A Tensile strength is the same as that for screw terminal products.
(Please watch the video.)

Q Do push-in terminals also deteriorate with age?

A Push-in terminals themselves do not deteriorate with age. It depends on usage conditions and the environment, however, push-in terminal products are designed such that the usage period (molded case circuit breakers, earth leakage circuit breakers: 15 years, circuit protectors, manual motor starters, magnetic starters, control relays, timers: 10 years) is equal to that of screw terminal products.

Safety Considerations

- Operate (keep) in the environment specified in the operating instructions and manual. High temperature, high humidity, condensation, dust, corrosive gases, oil, organic solvents, excessive vibration or shock might cause electric shock, fire, erratic operation or failure.
- For safe operation, before using the product read the instruction manual or user manual that comes with the product carefully or consult the Fuji sales representative from which you purchased the product.
- Products introduced in this catalog have not been designed or manufactured for such applications in a system or equipment that will affect human bodies or lives.
- Customers, who want to use the products introduced in this catalog for special systems or devices such as for atomic-energy control, aerospace use, medical use, passenger vehicle, and traffic control, are requested to consult with Fuji Electric FA.
- Customers are requested to prepare safety measures when they apply the products introduced in this catalog to such systems or facilities that will affect human lives or cause severe damage to property if the products become faulty.
- For safe operation, wiring should be conducted only by qualified engineers who have sufficient technical knowledge about electrical work or wiring.
- Follow the regulations of industrial wastes when the product is to be discarded.
- For further questions, please contact your Fuji sales representative or Fuji Electric FA.

 **Fuji Electric FA Components & Systems Co., Ltd.**

5-7, Nihonbashi Odemma-cho, Chuo-ku, Tokyo, 103-0011, Japan

URL <http://www.fujielectric.co.jp/fcs/eng>