



The Twin Breakers have advanced to an entirely new stage.

Conforming to IEC & local Standards

Conforming to certifications and standards in major world markets
Expanded frame sizes in G-TWIN Global Series



G-TWIN
Standard series
ELCB



G-TWIN
Global series
ELCB

Compact & High performance

Compact models with unified dimensions meeting UL489 480V and IEC 440V requirements

GLOBAL TWIN History



1990 TWIN Breaker



1992 Super TWIN



1995 Super 60



2001 α-TWIN



2006 G-TWIN

FUJI MCCB and ELCB

GLOBAL TWIN

Ecology

Lower environmental impact
Advanced green engineering and
energy-saving support
Conforming to the RoHS Directive



G-TWIN
Standard series
ELCB



G-TWIN
Global series
ELCB

Usefulness

Leading the way in
user-friendliness

Fuji Electric launched the Twin Breaker Series to world markets in 1990, in which molded case circuit breaker (MCCB) and earth leakage circuit breaker (ELCB) types were unified in external dimensions for the first time in the world. The Twin Breaker Series was highly evaluated and gained strong support, and the concept of Twin Breakers was established as Japan's de facto standards for MCCBs and ELCBs.

In 1992, Fuji Electric released the Super Twin Breaker Series, which enabled user installation of internal accessories for the first time in Japan.

In 1995, Fuji Electric released the Super 60 Series and advanced modularization via uniform external dimensions. In 2001, Fuji Electric launched the α -Twin Series to further advance the miniaturization and modularization of economic types with 100A frame or less as Japan's first multi-standard circuit breakers satisfying domestic and international standards. Since then, Fuji Electric has been making further product improvements by predicting market trends.

In recent years, market globalization has increasingly accelerated.

At the end of 2004, the Japanese Industrial Standards (JIS) were aligned with the IEC standards, and the globalization in this field has been further accelerated.

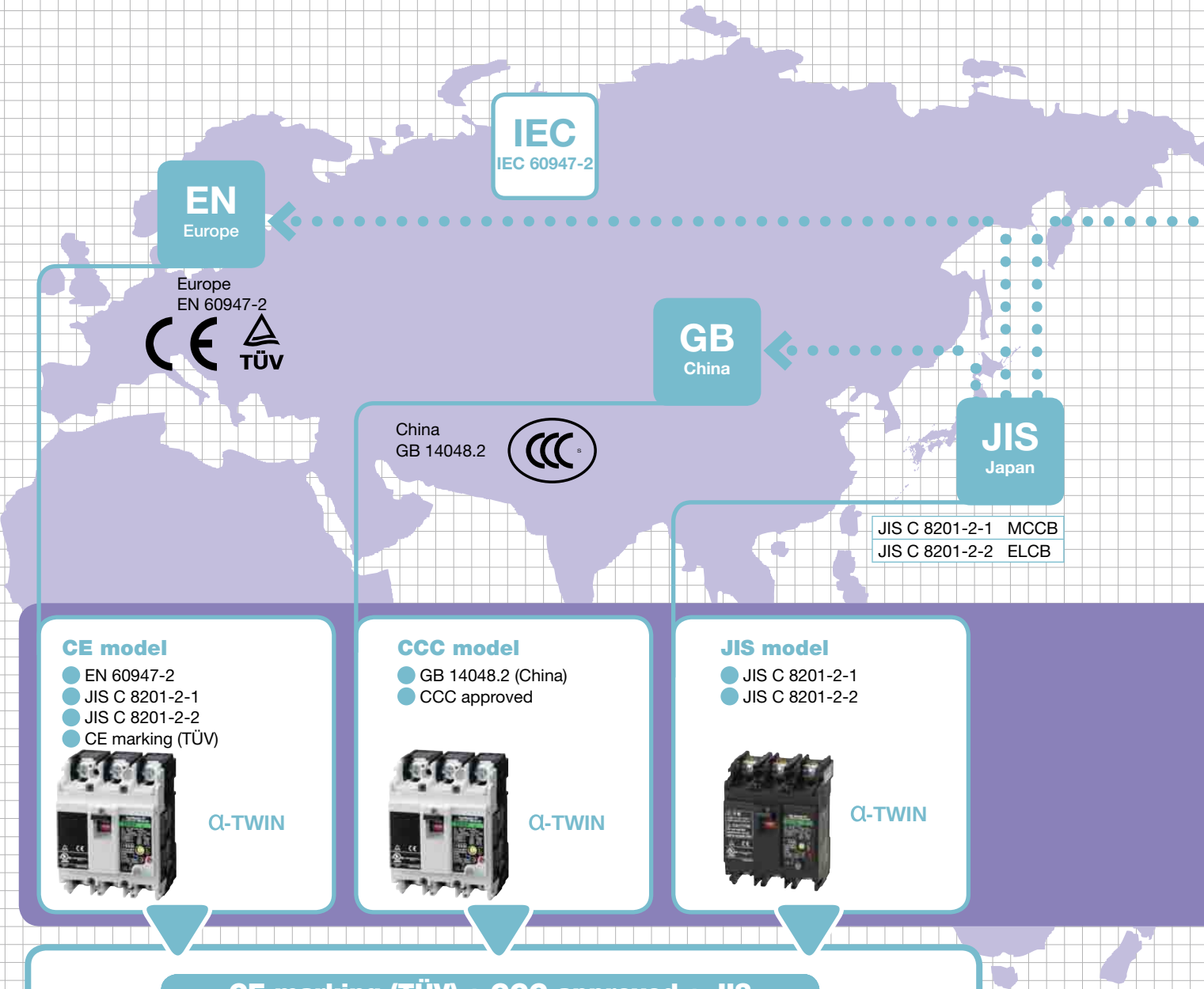
Based on the Twin Breaker Series, Fuji Electric has expanded the range of its products conforming to and approved by international standards for global markets, always advanced the innovative development of fundamental technologies in response to the market demand, and developed the G-TWIN Series of MCCBs and ELCBs.



GLOBAL-TWIN

Conforming to IEC & local Standards

The G-TWIN series is a global breaker series that satisfies all major standards.



CE marking (TÜV) + CCC approved + JIS

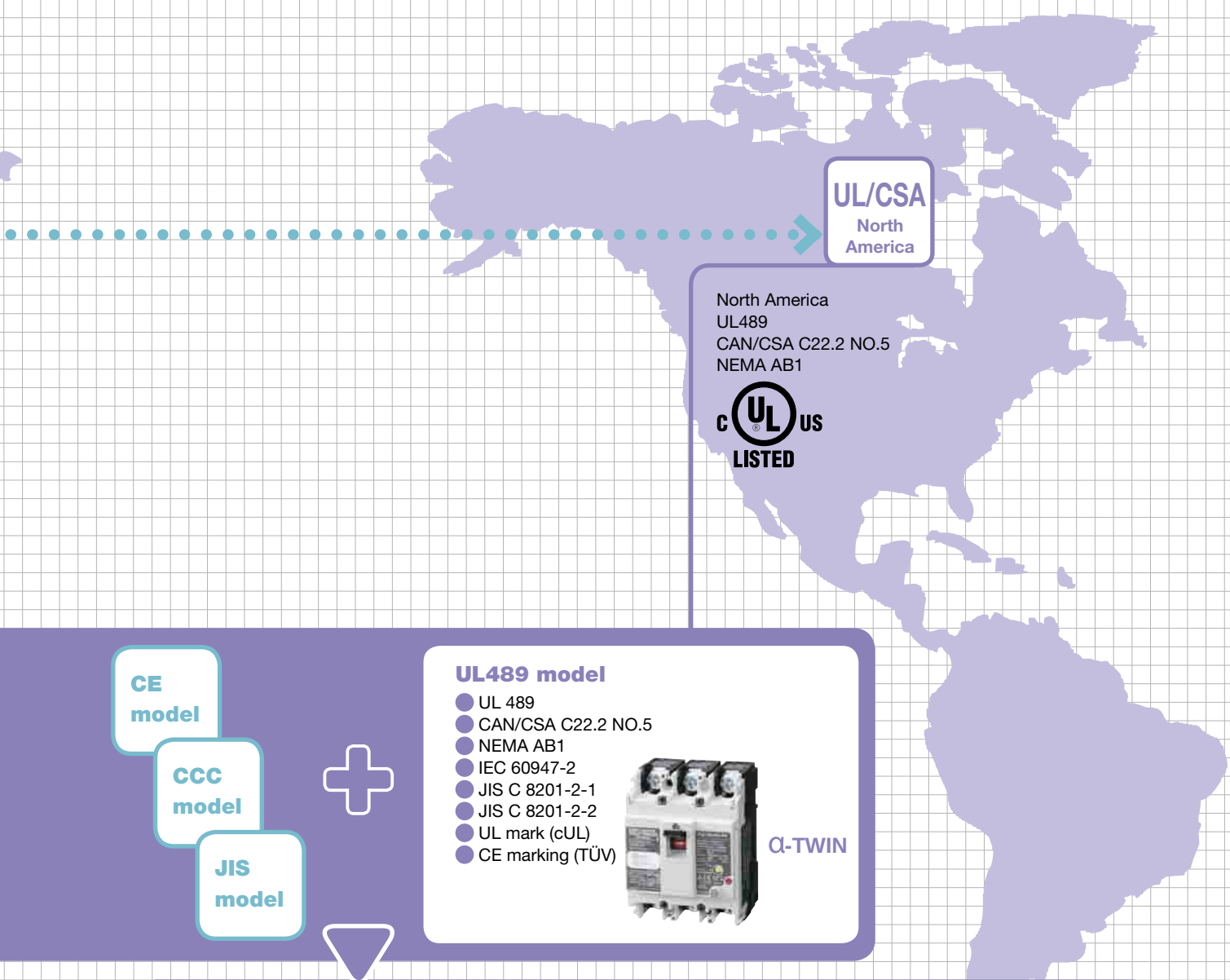
G-TWIN Standard series



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

Ampere frame size (AF)

32	50	63	100	125	160	250	400	630	800
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UL mark (cUL) + CE marking (TÜV) + CCC approved + JIS



G-TWIN Global series

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

- UL 489
- CAN/CSA C22.2 NO.5
- NEMA AB1

Ampere frame size (AF)

50	100	125	250	400	630	800
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GLOBAL-TWIN ELCB

Compact models with unified dimensions
meeting UL489 480V and IEC 440V requirements

Compact & High performance

**Compact size meeting UL489 480V requirements
& same dimensions as MCCB**

ELCB

Rated voltage 480V
(W105 x H181 x D68 mm)



**Same
dimensions**

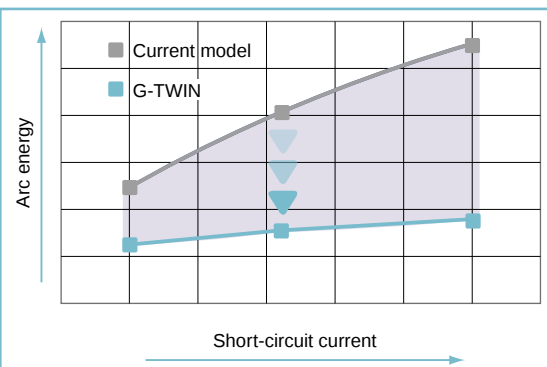


MCCB

Rated voltage 480V
(W105 x H181 x D68 mm)

Technical innovation

Arc and gas flow control technology
Effect of "ablation breaking technology"



Rated voltage 480V
BW250RAGU
(W105 x H181 x D68 mm)

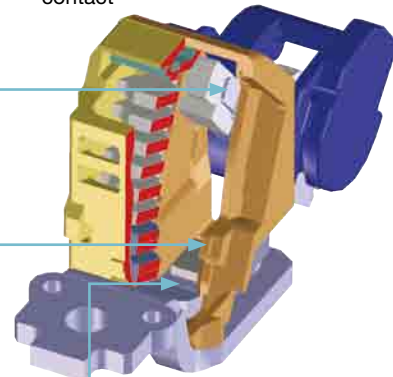
**Decrease
by
30%!**

Narrow slit resin

- Increased arc voltage due to narrow slit effect
- Increased arc voltage and high-speed moving contact opening by ablation effect
- Suppression of internal pressure rise by adjusting the narrow slit width

Moving contact cover

- Arcing prevention at the bottom of moving contact



Magnetic yoke arrangement

- An increase in the repulsion force of the moving contact at initiation of contact opening

Ecology

Advanced environmental technology Conforming to the RoHS Directive

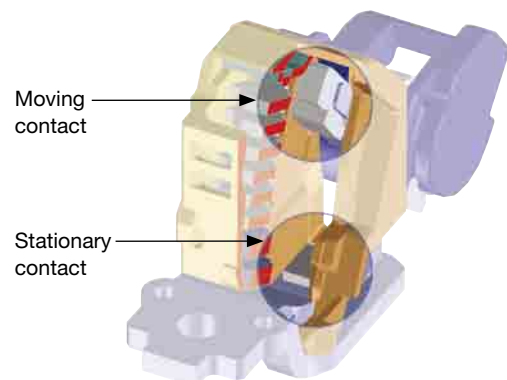
The G-TWIN Series is designed to lower environmental impact.

Recycling

- For easier recycling, all major parts are marked with the names of the materials used.

Conforming to the RoHS Directive

- Lead-free (Pb-free) solder is used.
- Free of hexavalent chromium (Cr⁶⁺-free)
(125 to 800AF)



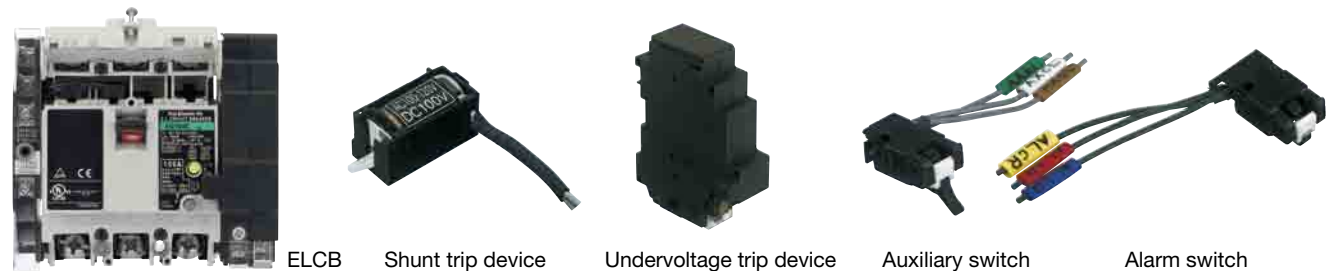
Cadmium-free contact material

Usefulness

Leading the way in user-friendliness

Unifying and reducing the types of internal accessories

- 32~100AF
- Internal and external accessories
A wider range of customer-mountable accessories



- 125~250AF
- Sharing internal accessories of 125/160/250AF breakers.

ELCB

Shunt trip device

Undervoltage trip device

Auxiliary switch

Alarm switch

Earth Alarm switch

AF	α -TWIN	G-TWIN
125	8	8
160/250	8	

- 400~800AF
- The number of types of internal accessories of 400/630/800AF has been significantly reduced.

ELCB

Shunt trip device

Undervoltage trip device

Auxiliary switch

Alarm switch

AF	α -TWIN	G-TWIN
400	26	6
630		
800		



GLOBAL-TWIN ELCB

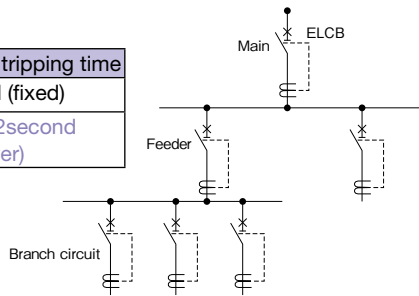
Newly developed earth leakage detection circuit

Easier protection coordination

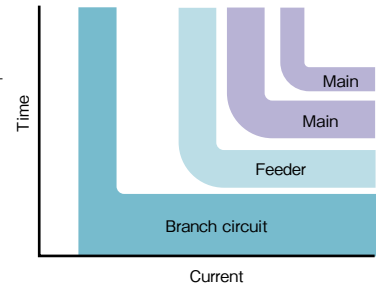
Four-step changeover switch
($I \Delta n$ and tripping time setting)

	$I \Delta n$ (Change over type)	Maximum tripping time
NEW G-TWIN	100/200/500mA	0.1second (fixed)
NEW G-TWIN	100/300/500/1000mA	0.1/0.4/1/2second (changeover)

Ground fault current protection coordination can be taken easily.



Instantaneous and Time delay type operating characteristic



New three-phase power supply circuit functions in phase-loss state

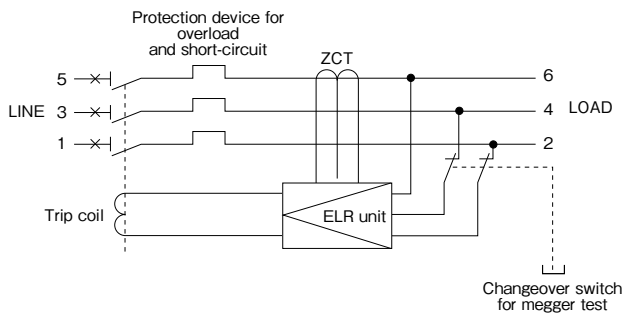
The revised IEC60947-2 stipulates that the ELCB should trip when earth-leakage occurs even in phase loss state in three-phase system. The G-TWIN Series meets this requirement.

Adoption of changeover switch for dielectric test

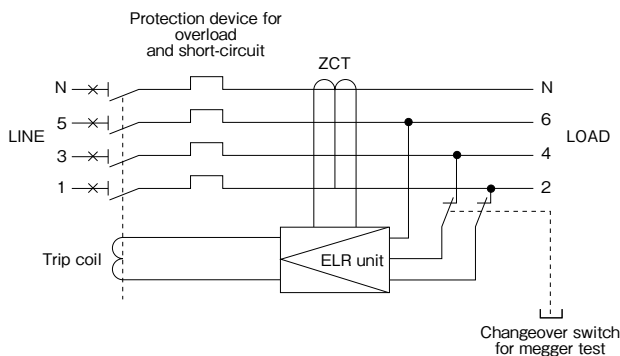
High workability can be obtained since the removal of ELCB wiring is not required at dielectric test during inspection (Adopted for 125AF or more).

ELCB internal wiring diagram

3-pole



4-pole



World first !



Why ELCB?

Purpose of ELCB installation

Prevention of hazards and damage (such as electrical shock, electrical fire, and device damage) that may occur in electrical equipment (as stipulated in IEC 60364).

GLOBAL
TWIN
ELCB

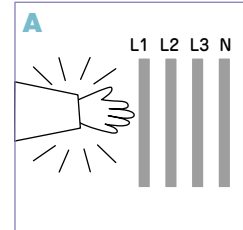
Measures of protection against electrical shock

Protection against electric shock (Protective measures are specified in IEC60364-4-41)

A. Protection against direct contact

Protection of persons from hazards (i.e., electrical shock) that may occur due to touching charged parts of electrical equipment.

Use of ELCB with rated sensitive current not exceeding 30mA is recommended as the additional protective device.

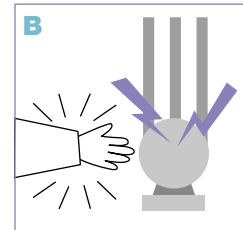


B. Protection against indirect contact

Protection of persons from electrical shock that may occur due to touching exposed conductive parts (such as metal frame of the device) when a fault occurs in electrical equipment.

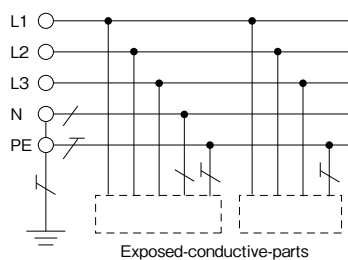
As one of the protective measures, depending on the condition in TT or TN-S system, the automatic cutoff of power supply with ELCB is specified in IEC60364-4-41.

For the details of the installation systems and how to apply ELCB, please refer to the following chart and flowchart.

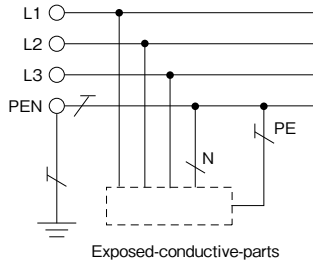


Types of installation systems in IEC 60364

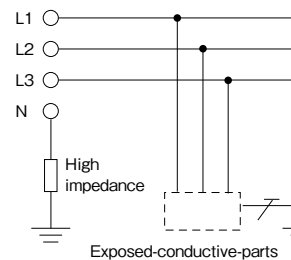
TN-S System



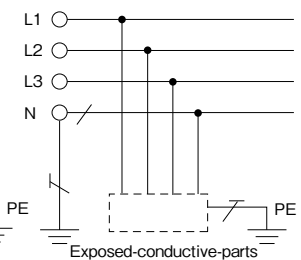
TN-C System



IT System



TT System



L1, L2, L3: Voltage poles, N: Neutral line, PE: Protective conductor

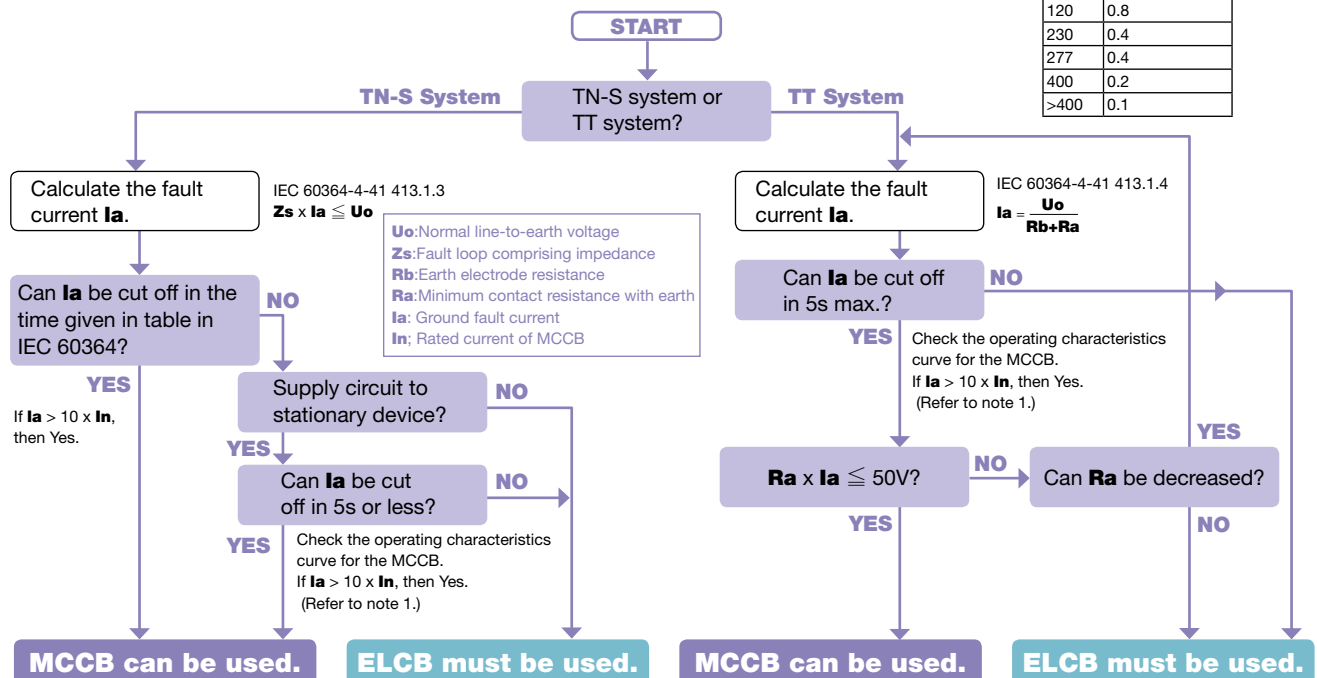
1: A TN-C system has a PEN conductor installed that combines neutral line N and protective conductor PE, and so ELCB cannot be used. (Ground faults cannot be detected.)

2: An IT system is a non-grounded system, and so ELCB cannot be used. (Ground faults cannot be detected.)

Flowchart for considering protection against indirect contact using automatic cutoff of power supply

Max. breaking time in TN system (IEC 60364, table 41A)

Uo(V)	Breaking time (s)
120	0.8
230	0.4
277	0.4
400	0.2
>400	0.1



Note 1: The formula $10 \times I_n$ is a rough guide to the current value for the overcurrent trip device to automatically cut off in 5s or less.

Earth Leakage Circuit Breakers

G-TWIN series

Type of ELCBs

■ Type of ELCBs

G-TWIN Series

Line protection	Page	Feature	Type
	07/04	- Models from 3A to 800A - ELCB and MCCB have the same dimensions. - Conforming to international standard IEC/EN(CE)/GB(CCC)/JIS - Most accessories can be installed by the user.	EW ①② A G- ③④⑤
			AF ① Breaking capacity ② Pole ③ Rated current ④ Rated sensitive current ⑤ 32 A 2P 003=3A A=15mA 50 E 3P · B=30mA 63 J 4P · C=100mA 100 S · J=Changeover type 125 R 800=800A K=Changeover type 160 H 250 400 630 800
Motor protection	Page	Feature	Type
	07/18	- Models from 0.7A to 225A - Line & Motor protection - Conforming to international standard IEC/EN(CE)/GB(CCC)/JIS	EW ①② A M- ③④⑤
			AF ① Breaking capacity ② Pole ③ Rated current ④ Rated sensitive current ⑤ 32 E 3P 0P7=0.7A B=30mA 50 J · C=100mA 63 S · J=Changeover type 100 R · K=Changeover type 125 225=225A 250
UL489 Listed	Page	Feature	Type
	07/13	- Models from 3A to 630A - Conforming to international standard UL/CSA/IEC/EN(CE)/GB(CCC)/JIS	EW ①② A G U- ③④⑤
			AF ① Breaking capacity ② Pole ③ Rated current ④ Rated sensitive current ⑤ 50 E 2P 003=3A B=30mA 100 J 3P · D=50mA 125 S · K=Changeover type 250 R · 400 H 630=630A 630

HG Series

Line protection	Page	Feature	Type
	07/88	Models from 15A to 225A	HG ①② B/ ③④
			AF ① Pole ② Rated current ③ Rated sensitive current ⑤ 5=50AF 3=3P 15=15A 30MA=30mA fixed 10=10AF : CO=Changeover type 20=225AF 225=225A

Earth Leakage Protective Relays

BRR,RRD,EL Series

	Page	Feature	Type
	07/105	- Relay and sensor-Unit type - BRR series - Relay and sensor-Separate type - RRD series - EL series	BRR ①② N (H)
			Sensor hole ① Sensitive current ② Sensor hole ① Pole ② 0= φ 10mm 1=30mA 25= φ 25mm P0=Pass-through type 1= φ 25mm 9=100mA 40= φ 40mm 2= φ 40mm 2=200mA 60= φ 60mm 4=400A 5=500mA 90= φ 90mm (Rated current) 120= φ 120mm Rated current ① Pole ② 6A=600A Z3=3Pole 8A=800A Z4=4Pole 10A=1000A 12A=1200A
			EL ①② Sensor hole ① Pole ② 25= φ 25mm P0=Pass-through type 40= φ 40mm 60= φ 60mm 90= φ 90mm 120= φ 120mm

Earth Leakage Circuit Breakers

G-TWIN series

Type of ELCBs

Rated interrupting capacity IEC60947-2		Current (A)														
Icu (kA)		3	5	10	15	32	50	63	100	125	160	250	400	630	800	
440VAC	1.5															
	2.5															
	7.5															
	10															
	18															
	30															
	36															
	50															
	70															
Rated interrupting capacity IEC60947-2		Current (A)														
Icu (kA)		0.7	1.4	10	16	32	63	90	100	125	225					
440VAC	1.5															
	2.5															
	7.5															
	10															
	18															
	30															
	50															
Rated interrupting capacity UL489		Current (A)														
(kA)		3	15	32	50	63	100	125	250	400	630	800				
480VAC	30															
	35															
	50															
	65															
240VAC	14															
	50															
	100															
Rated interrupting capacity		Current (A)														
Icu (kA)		15	30	50	60	100	125	225								
65																

Type	Diameter of sensor hole (mm)						Rated current (A)				
	10	25	40	60	90	120	400	600	800	1000	1200
BRR											
EL											
RRD											