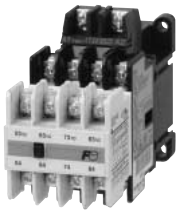
Bifurcated contacts with excellent electrical conductivity/SH-4, SH-5

■ Description

SH series industrial relays are designed to increase contact reliability and make them easy to use.
The relays' highly reliable, bifurcated contacts allow them to be used in low-level circuits of 5V, 3mA.
Various optional function units such as auxiliary contact blocks, coil surge suppression units can be added to the relays, allowing fast and field modification.


KKD06-067
SH-4/4-pole


KKD06-038
SH-4/8-pole


KKD06-039
SH-5/5-pole

■ Types and ratings

Type	SH-4						SH-5
Pole (No.of contacts)	4			8			5
Contact arrangement	4NO, 3NO+1NC, 2NO+2NC			8NO, 7NO+1NC, 6NO+2NC 5NO+3NC, 4NO+4NC			5NO, 4NO+1NC, 3NO+2NC 2NO+3NC, 1NO+4NC, 5NC
Thermal current (A)	10			10			10
Rated operational current (A)	Volts	AC-15 (ind.)	AC-12 (res.)	Volts	DC-13 (ind.)	DC-12 (res.)	
	110V AC	6	10	24V DC	3	5	
	220V AC	3	8	48V DC	1.5	3	
	440V AC	1.5	5	110V DC	0.55	2.5	
	550V AC	1.2	5	220V DC	0.27	1	
Standard operating coil voltage	100V 50Hz/100–110V 60Hz, 200V 50Hz/200–220V 60Hz, 380V–400V 50Hz/400–440V 60Hz						
Mechanical durability Electrical durability (AC-15)	10 million operations 500,000 operations (at operational current)						
Operating cycles per hour	1,800						
Ambient temperature	–5 to +50°C						

■ Ordering code system

S H 04 A A-1 22
① ② ③④ ⑤ ⑥⑦ ⑧⑨

① Product category

Description	Code
Industrial relay	S

② Series category

Description	Code
SH series	H

③④ Frame size

Frame size	Code	
	③	④
SH-4	0	4
SH-5	0	5

⑤ Version

Description	Code
Standard	A

⑥ Coil/contact specification

Description	Code
Standard	
AC operated	A
DC operated	G
With extra pick-up coil	U
Mechanical latch	
AC operated	V
DC operated	D
With single-button contact	H

⑦ Coil voltage

Coil voltage	Code
24V 50Hz/24-26V 60Hz	E
48V 50Hz/48-52V 60Hz	F
100V 50Hz/100–110V 60Hz	1
100–110V 50Hz/110–120V 60Hz	H
110–120V 50Hz/120–130V 60Hz	K
200V 50Hz/200–220V 60Hz	2
200–220V 50Hz/220–240V 60Hz	M
220–240V 50Hz/240–260V 60Hz	P
346–380V 50Hz/380–420V 60Hz	S
380–400V 50Hz/400–440V 60Hz	4
415–440V 50Hz/440–480V 60Hz	T
480–500V 50Hz/500–550V 60Hz	5
24V DC	E
48V DC	F
100V DC	1
110V DC	H
200V DC	2
220V DC	M

⑧⑨ Contact arrangement

Contact arrangement	Code	
	⑧	⑨
4NO	4	0
3NO+1NC	3	1
2NO+2NC	2	2
8NO	8	0
7NO+1NC	7	1
6NO+2NC	6	2
5NO+3NC	5	3
4NO+4NC	4	4
5NO	5	0
4NO+1NC	4	1
3NO+2NC	3	2
2NO+3NC	2	3
1NO+4NC	1	4
5NC	0	5

■ Optional units

• Front mounting
Auxiliary contact block
2 or 4-pole
Highly reliable bifurcated contact can be used in low-level circuit of 5V, 3mA.

Operation counter
This counter indicates the number of relay ON-OFF operations to ensure easy maintenance and inspection.

Terminal cover
The relay can easily be fitted with terminal covers for finger safety.

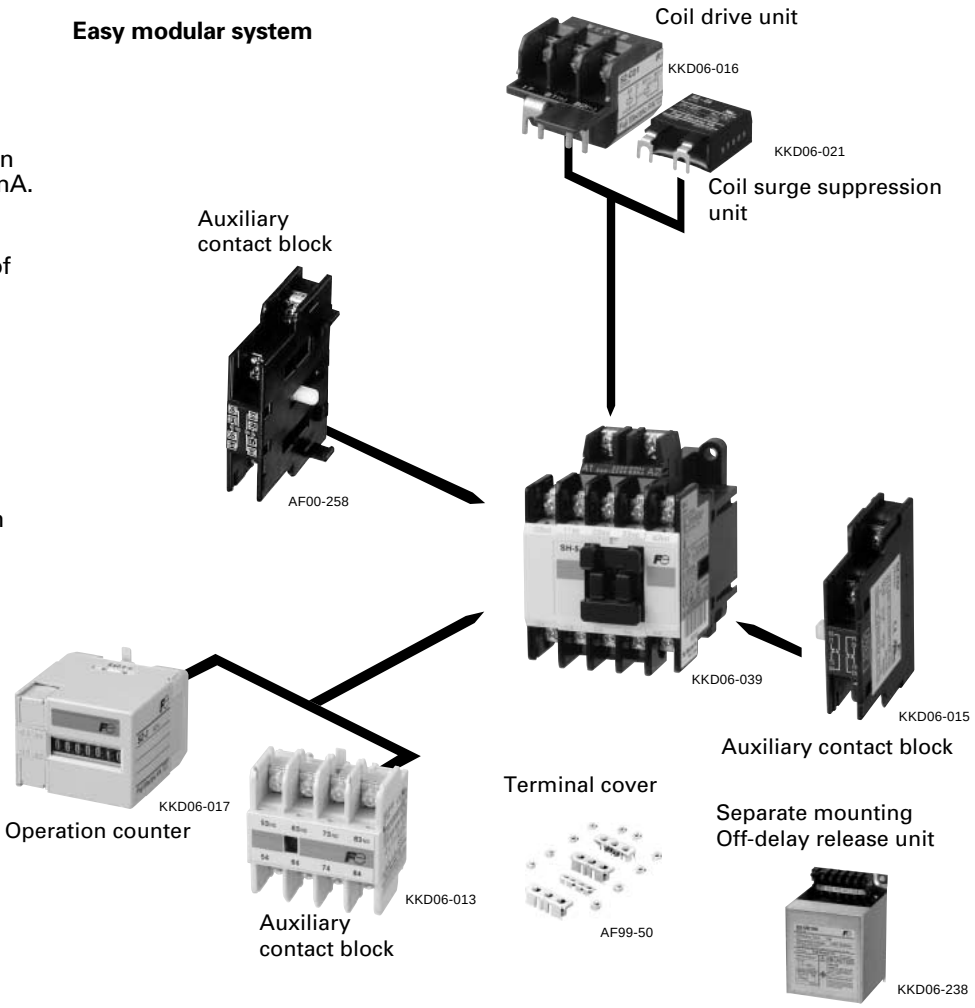
• Top mounting
Coil drive unit
This unit controls ON-OFF operation for industrial relay with output from electronic equipment.

Coil surge suppression unit
This unit absorbs coil surge voltage due to relay ON-OFF operations.

• Side mounting
Auxiliary contact block
2-pole (1NO+1NC)

• Separate mounting
Off-delay release unit
This industrial relay can be held in closed position even when the instantaneous power failure occurs.

Easy modular system



Description		Type	Ordering code
Auxiliary contact block	For SH-4, SH-5		
	Front mounting (Bifurcated)		
	4NO	**SZ-A40**	SZ1A40
	3NO+1NC	**SZ-A31**	SZ1A31
	2NO+2NC	**SZ-A22**	SZ1A22
	2NO	**SZ-A20**	SZ1A20
	1NO+1NC	**SZ-A11**	SZ1A11
	2NC	**SZ-A02**	SZ1A02
	1NO+1NC *	**SZ-A111**	SZ1A111
	2NO+2NC *	**SZ-A222**	SZ1A222
	Front mountig (Single button)		
	4NO	**SZ-A40H**	SZ1A40H
	3NO+1NC	**SZ-A31H**	SZ1A31H
	2NO+2NC	**SZ-A22H**	SZ1A22H
	Side mounting (Bifurcated)		
	1NO+1NC	**SZ-AS1**	SZ1AS1
	Side mounting (Single button)		
	1NO+1NC	**SZ-AS1H**	SZ1AS1H
Operation counter	Without alarm contact	**SZ-J**	SZ1J
	With alarm contact		
	At 1-million operations	**SZ-J1**	SZ1J1
	At 2-million operations	**SZ-J2**	SZ1J2
	At 3-million operations	**SZ-J3**	SZ1J3
	At 4-million operations	**SZ-J4**	SZ1J4
	At 5-million operations	**SZ-J5**	SZ1J5
	At 6-million operations	**SZ-J6**	SZ1J6
	At 7-million operations	**SZ-J7**	SZ1J7
	At 8-million operations	**SZ-J8**	SZ1J8

Description			Type	Ordering code
Terminal cover	For SH-4, SH-4H		**SZ-T1**	SZ1T1
	For SH-5, SH-5H		**SZ-T2**	SZ1T2
	For front mounting contact block			
	4-pole		**SZ-T5**	SZ1T5
	2-pole		**SZ-T6**	SZ1T6
	For side mounting contact block			
	1-pole		**SZ-T7**	SZ1T7
Coil drive unit	24V DC	Relay contact	**SZ-CD1**	SZ1CD1
		Solid-state contact	**SZ-03/CD2-24**	SZ103CD224
Coil surge suppression unit	Varistor	24-48V AC/DC	**SZ-Z1**	SZ1Z1
		100–250V AC/DC	**SZ-Z2**	SZ1Z2
		380–440V AC/DC	**SZ-Z3**	SZ1Z3
		24–48V AC/DC with LED	**SZ-Z6**	SZ1Z6
		100–240V AC/DC with LED	**SZ-Z7**	SZ1Z7
	C·R	24–48V AC/DC	**SZ-Z4**	SZ1Z4
		100–250V AC/DC	**SZ-Z5**	SZ1Z5
		24–48V AC/DC with LED	**SZ-Z8**	SZ1Z8
		100–240V AC/DC with LED	**SZ-Z9**	SZ1Z9
Off-delay release unit	100V AC 50/60Hz		**SZ-DE100**	SZ1DE100
	110V AC 50/60Hz		**SZ-DE110**	SZ1DE110
	200V AC 50/60Hz		**SZ-DE200**	SZ1DE200
	220V AC 50/60Hz		**SZ-DE220**	SZ1DE220
	Up to 240V AC available			
Live section cover	For SH-4, SH-4H		**SZ-JC1**	SZ1JC1
	For SH-5, SH-5H		**SZ-JC2**	SZ1JC2

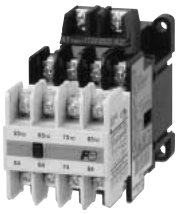
Note: * Overlapping contact

Standard type industrial relays

■ Description

They are compact and highly efficient and have a long service life, and are suited for industrial electrical control applications. Typical applications include machine tools, process lines, conveyors and automatic and semi-automatic equipment.
The maximum contact ratings are 550 volts AC and 220 volts DC. Operating coils with rating of up to 600 volts AC are available.


KKD06-067
SH-4/4-pole


KKD06-038
SH-4/8-pole


KKD06-039
SH-5/5-pole

■ Features

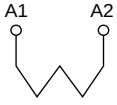
- Mounting compatible with conventional SRC50 series industrial relays
- Employing of bifurcated contact to increase high contact reliability in low-level circuit use (5V, 3mA) and single button auxiliary contact applicable for large current circuit use.
- Variety of optional function units available
  Auxiliary contact block (2 or 4-pole)
  Off-delay release unit
  Coil surge suppression unit
  Operation counter
- Snap-on 35mm IEC and DIN rail mounting available
- Meets JIS, IEC, BS, NEMA and VDE Standards
  UL, CSA,TÜV, CCC, BV and LR approved
- Terminal numbers meet IEC

■ Contact ratings

Type	Ordering code *2	Contact	Pole	Rated thermal current (A)	Make and break capacity AC (A)	Rated operational current (A)					
						AC Voltage (V)	Ind. AC-15	Res. AC-12	DC Voltage (V)	Ind. *1 DC-13	Res. DC-12
SH-4	SH04AA-■□	Bifurcated contact	4 8	10	60 30 15 12	110 220 440 550	6 3 1.5 1.2	10 8 5 5	24 48 110 220	3 1.5 0.55 0.27	5 3 2.5 1
SH-5	SH05AA-■□	Bifurcated contact	5	10	60 30 15 12	110 220 440 550	6 3 1.5 1.2	10 8 5 5	24 48 110 220	3 1.5 0.55 0.27	5 3 2.5 1
SH-4H	SH04AH-■□	Single contact	4 8	10	60 60 40 40	110 220 440 550	6 6 4 4	10 10 10 10	24 48 110 220	5 1.5 0.7 0.27	10 5 4 1
SH-5H	SH05AH-■□	Single contact	5	10	60 60 40 40	110 220 440 550	6 6 4 4	10 10 10 10	24 48 110 220	5 1.5 0.7 0.27	10 5 4 1

Notes: *1 Time constant is less than 70ms.
*2 Enter the coil voltage code in the ■ mark.
Enter the contact arrangement code in the □ mark.
• 8-pole type SH-4(H) is a combination of 4-pole type SH-4(H) and add-on auxiliary contact block SZ-A□(H).

■ Coil voltage

Type	Operating coil voltage *1	Coil voltage code *2	Operating voltage range	Wiring
SH-4 SH-5	24V 50Hz/24 to 26V 60Hz 48V 50Hz/48 to 52V 60Hz	**E** **F**	0.85 to 1.1 times coil rated voltage	
SH-4H SH-5H	100V 50Hz/100 to 110V 60Hz 110 to 120V 50Hz/120 to 130V 60Hz	**1** **K**		
	200V 50Hz/200 to 220V 60Hz 220 to 240V 50Hz/240 to 260V 60Hz	**2** **P**		
	346 to 380V 50Hz/380 to 420V 60Hz 380 to 400V 50Hz/400 to 440V 60Hz 415 to 440V 50Hz/440 to 480V 60Hz 480 to 500V 50Hz/500 to 550V 60Hz	**S** **4** **T** **5**		

Notes: *1 Other voltages between 24V and 600V AC are available on request.
*2 When ordering, specify the coil voltage code.

■ Coil characteristics

Type	Pole	Power consumption		Pick-up voltage (V)		Drop-out voltage (V)		Watt loss (W)	
		Inrush (VA)	Sealed (VA)	200V 50Hz	220V 60Hz	200V 50Hz	220V 60Hz	200V 50Hz	220V 60Hz
SH-4, 4H	4	95	9	105–125	116–136	70–98	80–110	2.7	2.8
SH-4, 4H	8	95	9	105–125	116–136	70–98	80–110	2.7	2.8
SH-5, 5H	5	95	9	105–125	116–136	70–98	80–110	2.7	2.8

Note: Coil rating 200V 50Hz/200–220V 60Hz

■ Operating characteristics

Type	Pole	Contact arrangement	Voltage (V)	Frequency (Hz)	Pick-up time(ms.)		Drop-out time(ms.)	
					NO contact ON	NC contact OFF	NO contact OFF	NC contact ON
SH-4, 4H	4	2NO+2NC	200	50	9–20	5–15	5–15	9–20
SH-4, 4H	8	4NO+4NC	200	50	9–20	5–15	5–15	9–20
SH-5, 5H	5	3NO+2NC	200	50	9–20	5–15	5–15	9–20

Note: Coil rating 200V 50Hz/200–220V 60Hz

■ Performance data (AC-15)

Type	Pole	Making current	Breaking current	Operating cycles per hour	Voltage	Life expectancy(operations)	
						Electrical	Mechanical
SH-4, 4H	4	10 Ie	1 Ie	1800	220V/440V	500,000	10 million
SH-4, 4H	8	10 Ie	1 Ie	1800	220V/440V	500,000	10 million
SH-5, 5H	5	10 Ie	1 Ie	1800	220V/440V	500,000	10 million

Note: Ie: Rated operational current (A)

■ Combination of industrial relay and auxiliary contact block

The standard type industrial relays can be used according to the combination with the auxiliary contact blocks shown below.

Industrial relay Bifurcated contacts		Add-on auxiliary contact block Front mounting						Side mounting	
Type	Contact arrangement	**SZ-A40** 4NO	**SZ-A31** 3NO+1NC	**SZ-A22** 2NO+2NC	**SZ-A20** 2NO	**SZ-A11** 1NO+1NC	**SZ-A02** 2NC	**SZ-AS1**x2 2NO+2NC	**SZ-AS1** 1NO+1NC
SH-4	4NO	8NO	7NO+1NC	6NO+2NC	6NO	5NO+1NC	4NO+2NC	6NO+2NC	5NO+1NC
	3NO+1NC	7NO+1NC	6NO+2NC	5NO+3NC	5NO+1NC	4NO+2NC	3NO+3NC	5NO+3NC	4NO+2NC
	2NO+2NC	6NO+2NC	5NO+3NC	4NO+4NC	4NO+2NC	3NO+3NC	2NO+4NC	4NO+4NC	3NO+3NC
	8NO	–	–	–	–	–	–	–	–
	7NO+1NC	–	–	–	–	–	–	–	–
	6NO+2NC	–	–	–	–	–	–	–	–
	5NO+3NC	–	–	–	–	–	–	–	–
	4NO+4NC	–	–	–	–	–	–	–	–
SH-5	5NO	9NO	8NO+1NC	7NO+2NC	7NO	6NO+1NC	5NO+2NC	7NO+2NC	6NO+1NC
	4NO+1NC	8NO+1NC	7NO+2NC	6NO+3NC	6NO+1NC	5NO+2NC	4NO+3NC	6NO+3NC	5NO+2NC
	3NO+2NC	7NO+2NC	6NO+3NC	5NO+4NC	5NO+2NC	4NO+3NC	3NO+4NC	5NO+4NC	4NO+3NC
	2NO+3NC	6NO+3NC	5NO+4NC	–	4NO+3NC	3NO+4NC	–	–	3NO+4NC
	1NO+4NC	5NO+4NC	–	–	3NO+4NC	–	–	–	–
	5NC	4NO+5NC	–	–	2NO+5NC	–	–	–	–

Industrial relay Single contact		Add-on auxiliary contact block Front mounting		
Type	Contact arrangement	**SZ-A40H** 4NO	**SZ-A31H** 3NO+1NC	**SZ-A22H** 2NO+2NC
SH-4H	4NO	8NO	7NO+1NC	6NO+2NC
	3NO+1NC	–	–	–
	2NO+2NC	–	5NO+3NC	4NO+4NC
SH-5H	5NO	9NO	8NO+1NC	7NO+2NC
	4NO+1NC	–	–	–
	3NO+2NC	–	6NO+3NC	5NO+4NC
	2NO+3NC	–	–	–
	1NO+4NC	–	–	–
	5NC	4NO+5NC	–	–

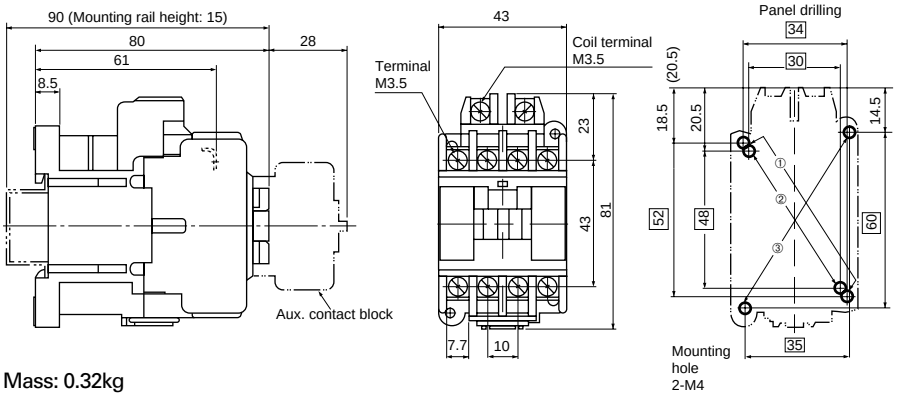
Notes:
- Both front mounting and side mounting auxiliary contact blocks cannot be mounted on a relay at a time.
- Any auxiliary contact blocks cannot be mounted on 8-pole type SH-4 and SH-4H relays.
- Side mounting contact blocks (SZ-AS1), with bifurcated contacts, can be mounted on SH-4H and SH-5H.

■ Ordering information

Specify the following:
1. Ordering code

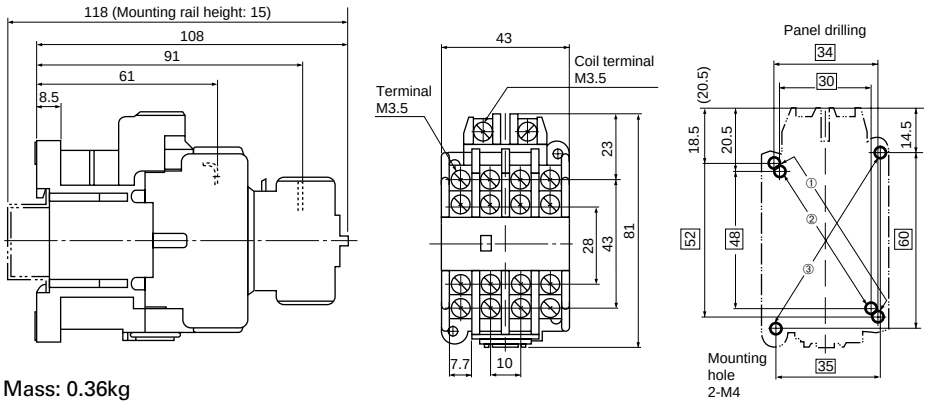
■ Dimensions, mm

SH-4, 4H/4-pole



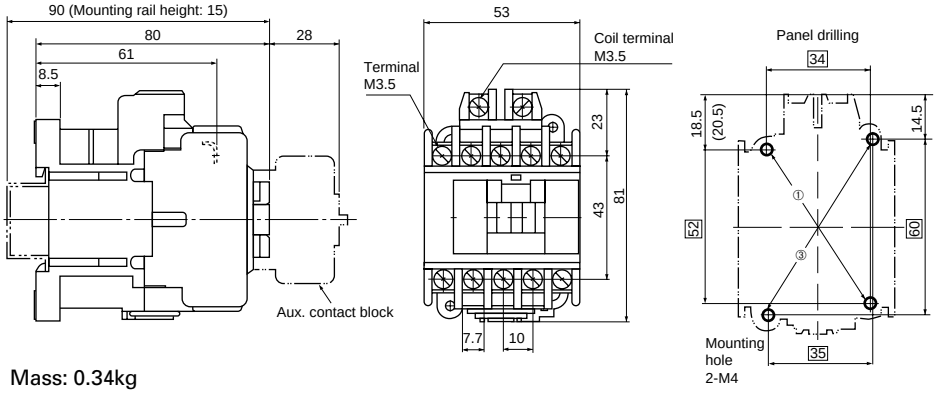
Mass: 0.32kg

SH-4, 4H/8-pole



Mass: 0.36kg

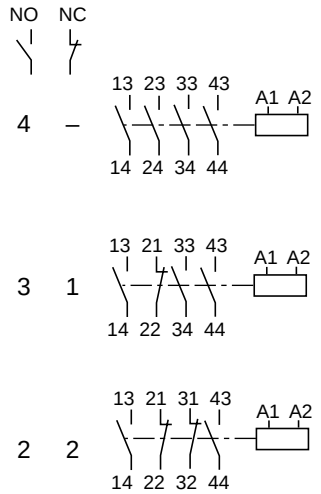
SH-5, 5H/5-pole

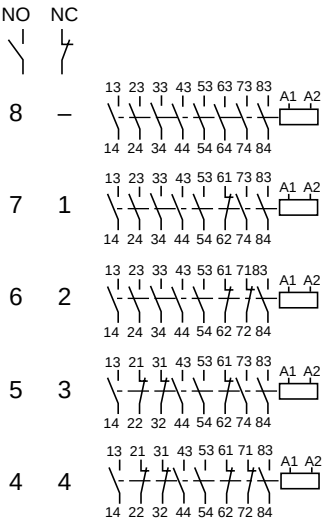


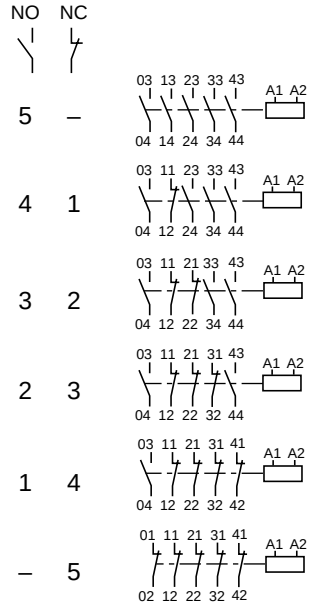
Mass: 0.34kg

Notes on panel drilling
- Use the two mounting holes on a diagonal line to mount a relay.
- Mounting holes indicated by ① and ② are compatible with those of SRC type.
- Mounting holes indicated by ③ conform to IEC Standards.

■ Contact arrangement







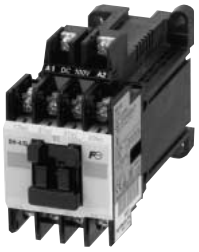
DC-operated industrial relays

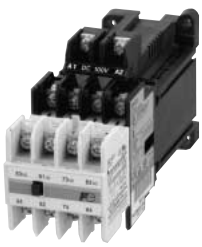
■ Description

The operating coil is a DC type instead of AC and is energized by a DC power source.
The coil ratings from 24V DC to 220V DC. The maximum contact ratings are 550V AC or 220V DC.
These relays are typically used where DC is used as a power source on switchboards. Where AC is used as a power source, sequence control is frequently lost due to the troubles such as power failure or momentary voltage drop.
In the case of DC-control, a battery power supply is frequently used because it is not susceptible to external influences. DC-operated relays are highly suitable for important control applications.

■ Features

- Employing of bifurcated contact to increase high contact reliability in low-level circuit use (5V, 3mA)
- Variety of optional function units available


KKD06-232
SH-4/G


KKD06-231
SH-4/G 8-pole


KKD06-233
SH-5/G

Auxiliary contact block (2 or 4-pole)
Coil surge suppression unit
Operation counter

- Snap-on 35mm IEC and DIN rail mountings available
- Meets JIS, IEC, BS, NEMA and VDE Standards
  UL, CSA, TÜV, CCC and BV approved
- Terminal numbers meet IEC

■ Performance data

Mechanical durability: 10 million operations
Electrical durability: 500,000 operations (at AC-15 rated operational current)
Operating cycles per hour:1800
Allowable ambient temp.:
–5° to +50°C

■ Contact ratings

Type	Ordering code *2	Pole	Rated thermal current (A)	Make and break capacity AC (A)	Rated operational current (A) AC Voltage (V)	Ind. AC-15	Res. AC-12	DC Voltage (V)	Ind. *1 DC-13	Res. DC-14
SH-4/G	SH04AG-■□	4	10	60	110	6	10	24	3	5
				30	220	3	8	48	1.5	3
				15	440	1.5	5	110	0.55	2.5
				12	550	1.2	5	220	0.27	1
		8	10	60	110	6	10	24	3	5
				30	220	3	8	48	1.5	3
				15	440	1.5	5	110	0.55	2.5
				12	550	1.2	5	220	0.27	1
SH-5/G	SH05AG-■□	5	10	60	110	6	10	24	3	5
				30	220	3	8	48	1.5	3
				15	440	1.5	5	110	0.55	2.5
				12	550	1.2	5	220	0.27	1

Notes: *1 Time constant is less than 70ms.
*2 Enter the coil voltage code in the ■ mark.
Enter the contact arrangement code in the □ mark.

■ Coil ratings

Type	Pole	Contact arrangement	Operating coil voltage (V DC)	Code	Power consumption(W)
SH-4/G	4	4NO, 3NO+1NC, 2NO+2NC	24	**E**	7
	8	8NO, 7NO+1NC, 6NO+2NC 5NO+3NC, 4NO+4NC	48	**F**	
			100	**1**	
			110	**H**	
SH-5/G	5	5NO, 4NO+1NC, 3NO+2NC 2NO+3NC, 1NO+4NC, 5NC	200	**2**	
			220	**M**	

■ Ordering information

Specify the following:
1. Ordering code

■ Combination with auxiliary contact blocks

Same as standard type.
See page 03/4.

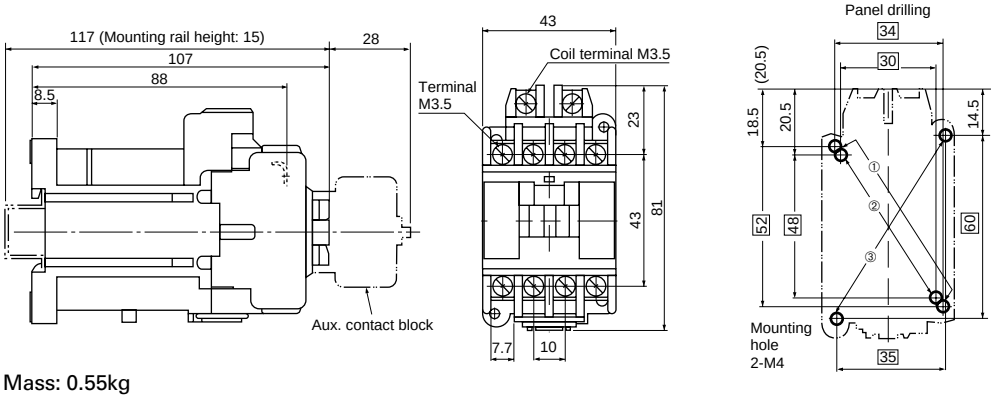
■ Operating characteristics

Type	Pole	Contact arrangement	Voltage	Pick-up time (ms.) NO contact ON	NC contact OFF	Drop-out time (ms.) NO contact OFF	NC contact ON
SH-4/G	4	2NO+2NC	100V DC	45–50	35–40	20–25	25–30
	8	4NO+4NC	100V DC	45–50	35–40	20–25	25–30
SH-5/G	5	3NO+2NC	100V DC	45–50	35–40	20–25	25–30

Note: Coil rating 100V DC

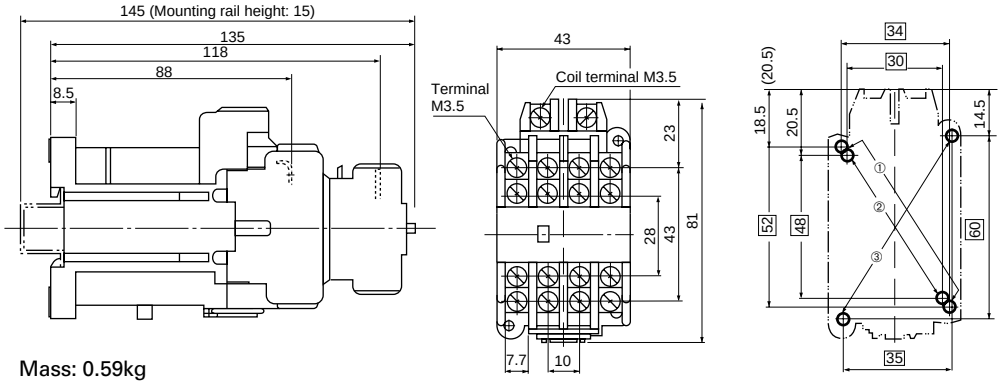
■ Dimensions, mm

SH-4/G, 4-pole



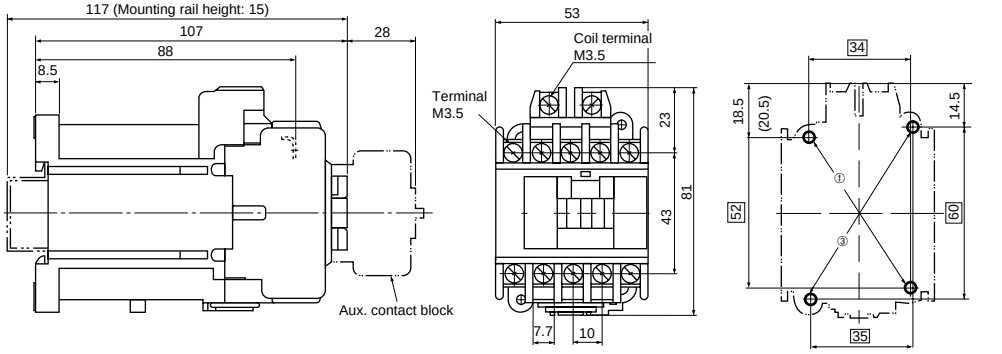
Mass: 0.55kg

SH-4/G, 8-pole



Mass: 0.59kg

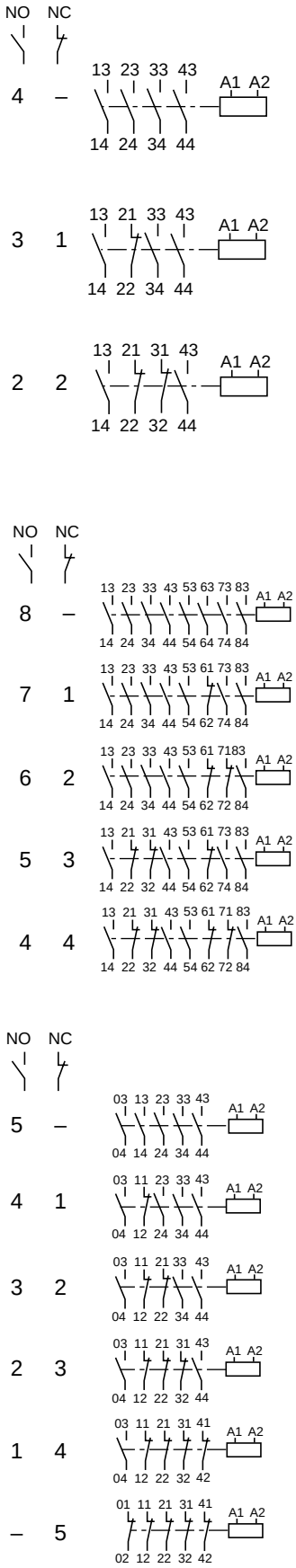
SH-5/G, 5-pole



Mass: 0.58kg

Notes on panel drilling
- Use the two mounting holes on a diagonal line to mount a relay.
- Mounting holes indicated by ① and ② are compatible with those of SRC type.
- Mounting holes indicated by ③ conform to IEC Standards.

■ Contact arrangement



UL and CSA appproved

UL file No. E44592
CSA file No. LR20479

■ Types and ratings

● AC operated

Type	Ordering code	Pole	Continuous current (A)	Rated operational current (A) AC Volts	Make	Break	DC Volts	Make	Break	Rating code AC	DC	Contact arragement	Operating coil
SH-4	SH04AA-■□	4	10	120 240 480 600	60 30 15 12	6 3 1.5 1.2	125 250	0.55 0.27	0.55 0.27	A600	Q300	4NO 3NO+1NC 2NO+2NC	Available for 24V to 600V AC 50/60Hz
		8	10	120 240 480 600	60 30 15 12	6 3 1.5 1.2	125 250	0.55 0.27	0.55 0.27	A600	Q300	8NO, 7NO+1NC 6NO+2NC 5NO+3NC 4NO+4NC	
SH-5	SH05AA-■□	5	10	120 240 480 600	60 30 15 12	6 3 1.5 1.2	125 250	0.55 0.27	0.55 0.27	A600	Q300	5NO, 4NO+1NC 3NO+2NC 2NO+3NC 1NO+4NC, 5NO	

Notes: • SH-4 type with 8-pole is a combination of SH-4 type industrial relay with 4-pole and SZ-A□ (Front mounting) type auxiliary contact block with 4-pole.
• Enter the coil voltage code in the ■ mark. *See page 03/1.*
Enter the contact arrangement code in the □ mark. *See page 03/1.*

● DC operated

Type	Ordering code	Pole	Continuous current (A)	Rated operational current (A) AC Volts	Make	Break	DC Volts	Make	Break	Rating code AC	DC	Contact arragement	Operating coil
SH-4/G	SH04AG-■□	4	10	120 240 480 600	60 30 15 12	6 3 1.5 1.2	125 250	0.55 0.27	0.55 0.27	A600	Q300	4NO 3NO+1NC 2NO+2NC	Available for 24V to 220V DC
		8	10	120 240 480 600	60 30 15 12	6 3 1.5 1.2	125 250	0.55 0.27	0.55 0.27	A600	Q300	8NO, 7NO+1NC 6NO+2NC 5NO+3NC 4NO+4NC	
SH-5/G	SH05AG-■□	5	10	120 240 480 600	60 30 15 12	6 3 1.5 1.2	125 250	0.55 0.27	0.55 0.27	A600	Q300	5NO, 4NO+1NC 3NO+2NC 2NO+3NC 1NO+4NC, 5NC	

Notes: • SH-4/G type with 8-pole is a combination of SH-4/G type industrial relay with 4-pole and SZ-A□ (Front mounting) type auxiliary contact block with 4-pole.
• Enter the coil voltage code in the ■ mark.
Enter the contact arrangement code in the □ mark.

■ Ordering information

Specify the following:
1. Ordering code

■ Dimentions

Same as standard type industrial relay.
See page 03/5 and 03/7.

■ Combination with auxiliary contact blocks

Same as standard type.
See page 03/4.

TÜV and CCC approved

TÜV license No. R9151523
CCC Certificated No. 2003010309087 168

■ Types and ratings

● AC operated, bifurcated contact

Type	Ordering code *2	Contact	Pole	Rated thermal current (A)	Make and break capacity AC (A)	Rated operational current (A) AC Voltage (V)	Ind. AC-15	Res. AC-12	DC Voltage (V)	Ind. *1 DC-13	Res. DC-12
SH-4	SH04AA-■□	Bifurcated contact	4 8	10	60 30 15 12	110 220 440 550	6 3 1.5 1.2	10 8 5 5	24 48 110 220	3 1.5 0.55 0.27	5 3 2.5 1
SH-5	SH05AA-■□	Bifurcated contact	5	10	60 30 15 12	110 220 440 550	6 3 1.5 1.2	10 8 5 5	24 48 110 220	3 1.5 0.55 0.27	5 3 2.5 1

Notes: *1 Time constant is less than 70ms.
*2 Enter the coil voltage code in the ■ mark.
Enter the contact arrangement code in the □ mark.
• 8-pole type SH-4(H) is a combination of 4-pole type SH-4(H) and add-on auxiliary contact block SZ-A□(H).

● DC operated

Type	Ordering code *2	Pole	Rated thermal current (A)	Make and break capacity AC (A)	Rated operational current (A) AC Voltage (V)	Ind. AC-15	Res. AC-12	DC Voltage (V)	Ind. *1 DC-13	Res. DC-14
SH-4/G	SH04AG-■□	4 8	10	60 30 15 12	110 220 440 550	6 3 1.5 1.2	10 8 5 5	24 48 110 220	3 1.5 0.55 0.27	5 3 2.5 1
SH-5/G	SH05AG-■□	5	10	60 30 15 12	110 220 440 550	6 3 1.5 1.2	10 8 5 5	24 48 110 220	3 1.5 0.55 0.27	5 3 2.5 1

Notes: *1 Time constant is less than 70ms.
*2 Enter the coil voltage code in the ■ mark.
Enter the contact arrangement code in the □ mark.

CCC approved

● AC operated, single contact

Type	Certificate No.
SH-4H **SH-5H**	2003010309087168

● With extra pick-up operating coil

Type	Certificate No.
SH-4/U **SH-5/U**	2003010309087168

● Auxiliary contact blocks/optional

Description	Type	Applicable type	Certificate No.
Front mounting, bifurcated	**SZ-A40** **SZ-A31** **SZ-A22** **SZ-A20** **SZ-A11** **SZ-A02**	SH-4, SH-5	Certified according to an applicable industrial type
Front mounting, single button	**SZ-A40H** **SZ-A31H** **SZ-A22H**	SH-4, SH-5	
Side mounting, bifurcated	**SZ-AS1**	SH-4, SH-5	
Side mounting, single button	**SZ-AS1H**	SH-4, SH-5	

■ Ordering information

Specify the following:
1. Ordering code
2. CCC approved

Off-delay release industrial relays

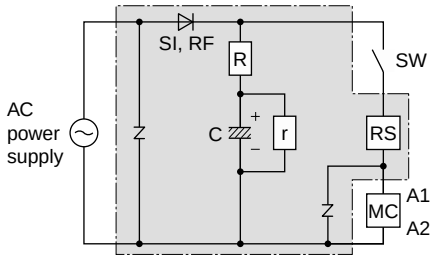
■ Description

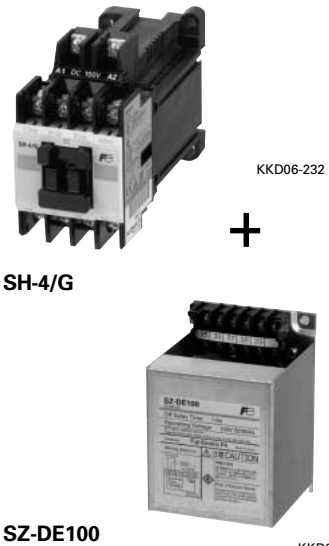
This type of control relay has a capacitor connected in parallel with the operating coil, and the contacts are released with a delay of 1 to 5 seconds after the coil has been de-energized. If a momentary voltage drop or a power failure in AC control power supply of standard type control relay takes place, the operating coils are de-energized. Reclosing of the contacts must be carried out every time. The off-delay release relay is so designed that in the event of a brief power outage the coil will not release the contacts and control sequence is maintained.

■ Operation

The power supply is fed to the rectifier which in turn charges the capacitor.
When a power failure takes place, the discharge current flows into the magnetic coil which holds the relay closed for 1 to 5 seconds. When the switch (SW) is opened the contacts will immediately open without delay.

Off-delay release unit (SZ-DE)





■ Types and ordering codes

Type Contactor	Off-delay release unit	Ordering code Contactor	Off-delay release unit	Contact arrangement	Rated thermal current (A)	Make and break capacity at AC (A)
SH-4/G	**SZ-DE100**	SH04AG-■□	**SZ1DE100**	4NO, 3NO+1NC, 2NO+2NC	10	66
	SZ-DE110		**SZ1DE110**			33
	SZ-DE200		**SZ1DE200**	8NO, 7NO+1NC, 6NO+2NC		16.5
	SZ-DE220		**SZ1DE220**	5NO+3NO, 4NO+4NC		13.2
SH-5/G	**SZ-DE100**	SH05AG-■□	**SZ1DE100**	5NO, 4NO+1NC, 3NO+2NC	10	66
	SZ-DE110		**SZ1DE110**	2NO+3NC, 1NO+4NC, 5NC		33
	SZ-DE200		**SZ1DE200**			16.5
	SZ-DE220		**SZ1DE220**			13.2

Notes: • Enter the coil voltage code in the ■ mark.
Enter the contact arrangement code in the □ mark.
• Rated operational current: Same as DC-operated type. *See page 03/6.*

■ Performance data

Type	Hold time	Operating cycles per hour	Capacitor life
SH-4/G+SZ–DE□ SH-5/G+SZ–DE□	1 to 5 sec.	600	100,000 operations

■ Operating voltage and frequency

● Magnetic coil

Type	Voltage	Code
SH-4/G SH-5/G	100V DC	**1**
	110V DC	**H**
	200V DC	**2**
	220V DC	**M**

● OFF-delay release unit

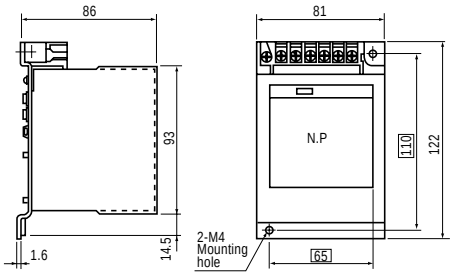
Type	Input voltage
SZ-DE100	100V AC 50/60Hz
SZ-DE110	110V AC 50/60Hz
SZ-DE200	200V AC 50/60Hz
SZ-DE220	220V AC 50/60Hz

■ Combination with auxiliary contact blocks

Same as standard type.
See page 03/4.

■ Dimensions, mm

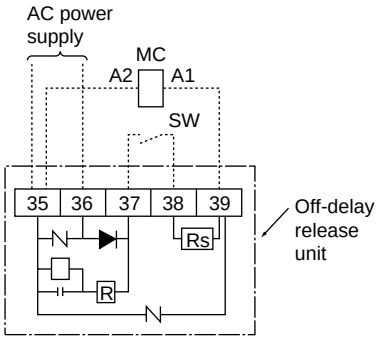
● Off-delay release unit



Mass: 0.85kg

● Industrial relay:
See page 03/7, DC-operated industrial relay

■ Wiring diagram



■ Ordering information

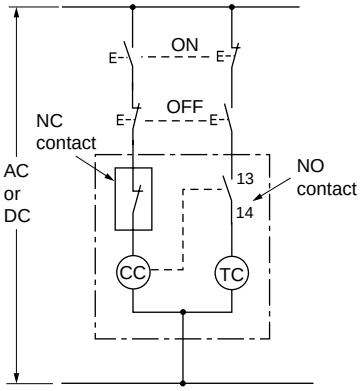
Specify the following:
1. Ordering code

Note:
When ordering, make sure that the input voltage (AC) of the OFF-delay release unit is equal to the operating voltage (DC) of the industrial relay.
Example:
SZ-DE 100V AC 50Hz+SH-5/G 100V DC
(OFF-delay release unit)+(Relay)

Mechanical latch industrial relays

■ Description

Mechanical latch relays are used where operating sequence continuity must be maintained regardless of any outside interruptions, such as power failures or momentary voltage drop.
These relays are provided with two coils.
One is a closing coil (CC) and the other is a trip coil (TC). An interlocking circuit is provided between the CC coil and TC coil. Since no coil voltage is applied during operation it is extremely economical and also quiet.



■ Operating method

• Closing

When the closing coil is energized the latch mechanism interlocks to latch and the NC contact connected in series with the closing coil opens and the coil is de-energized.

Operating notes

- When carrying out a sequence operating check make sure that the load is disconnected.
- The electrical signal time for closing and tripping should be 0.3 sec. or more.
- Both the closing and tripping coils are short time rating.
  Closing coil: Max. 30 seconds
  Trip coil: Max. 15 seconds
- Since the relay and the latch mechanisms are adjusted at the time of assembly, do not strip nor replace the contacts in the field.
- If current is applied simultaneously to both the closing and tripping circuits, the coils may be heated and damaged. An interlocking circuit is required to prevent this.

• Tripping

When the trip coil is energized the latch is released and tripping is carried out by means of the back spring. At this time the NO contact connected in series with the tripping coil opens.

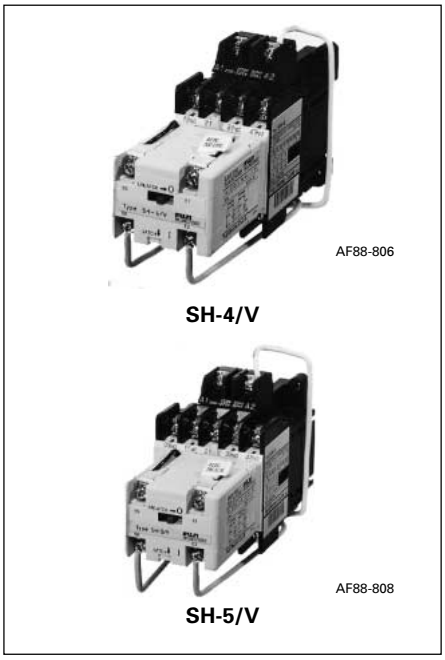
■ Performance data

- Mechanical durability: 1 million operations
- Electrical durability: 500,000 operations (at AC-15 rated operational current)
- Operating cycles per hour: 1200
- Allowable ambient temp.: –5°C to +50°C

■ Ordering information

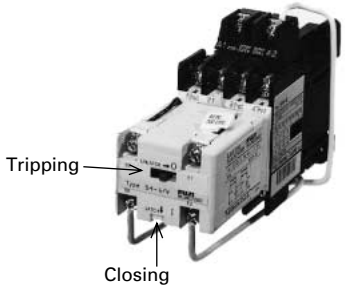
Specify the following:
1. Ordering code

Notes:
1. Mechanical latch units cannot be sold separately.
2. Do not detach mechanical latch units from relays and do not make modifications such as attaching mechanical latch units to other industrial relays.



■ Manual operating sequence

Closing: Press the button in the direction of the arrow.
Tripping: Push the lever in the direction of the arrow.



■ Types and ordering code

AC operated Type	Ordering code	DC operated Type	Ordering code	Contact arrangement	Rated thermal current (A)	Make/break capacity AC (A)
SH-4/V	SH04AV-■□	**SH-4/VG**	SH04AD-■□	3NO, 2NO+1NC, 1NO+2NC	10	60 30
				5NO+2NC, 4NO+3NC 3NO+4NC		15 12
SH-5/V	SH05AV-■□	**SH-5/VG**	SH05AD-■□	4NO, 3NO+1NC, 2NO+2NC	10	60 30 15 12

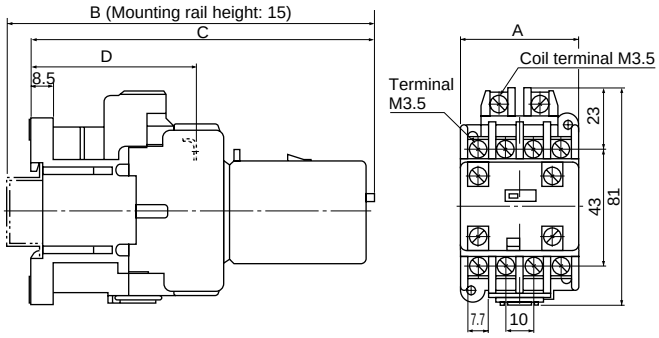
Notes: • Enter the coil voltage code in the ■ mark.
Enter the contact arrangement code in the □ mark.
• Rated operational current: Same as standard type, *see page 03/3*.

■ Coil ratings

Type	Operating coil Voltage	Code	Power consumption AC operated Closing	AC operated Tripping	DC operated Closing	DC operated Tripping	Minimum energized time	Time rating Closing	Time rating Tripping	Operating voltage range
SH-4/V SH-5/V	100V/100–110V AC 50Hz/60Hz 200V/200–220V AC 50Hz/60Hz	**1** **2**	95VA	150VA	7W	150W	0.3 sec.	30 sec.	15 sec.	0.85 to 1.1 times coil rated voltage
SH-4/VG SH-5/VG	100V DC 110V DC 200V DC 220V DC	**1** **H** **2** **M**								

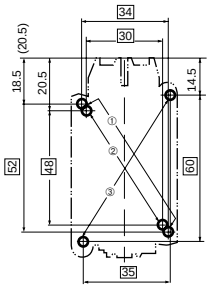
Note: Coil voltage range from 24V to 220V AC and 24V to 220V DC is available.

■ Dimensions, mm

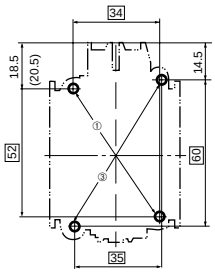


Panel drilling

SH-4/V, VG



SH-5/V, VG



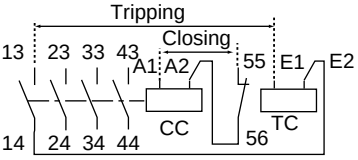
Type	No. of contact	A	B	C	D	Mass (kg)
SH-4/V	3	43	138	128	61	0.42
SH-4/V	7	67	138	128	61	0.47
SH-5/V	4	53	138	128	61	0.44
SH-4/VG	3	43	165	155	88	0.66
SH-4/VG	7	67	165	155	88	0.72
SH-5/VG	4	53	165	155	88	0.69

Note on panel drilling
- Use the two mounting holes on a diagonal line to mount a relay.
- Mounting holes indicated by ① and ② are compatible with those of SRC type.
- Mounting holes indicated by ③ conform to IEC Standards.

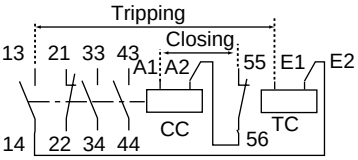
■ Wiring diagrams

SH-4/V, SH-4/VG (3-contact)

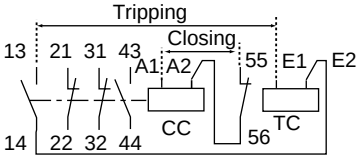
3NO



2NO+1NC

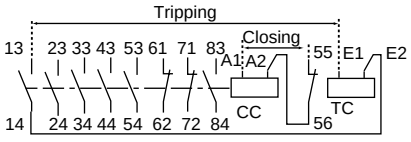


1NO+2NC

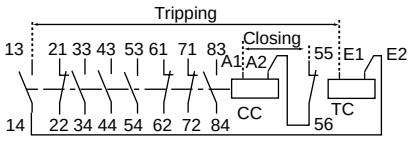


SH-4/V, SH-4/VG (7-contact)

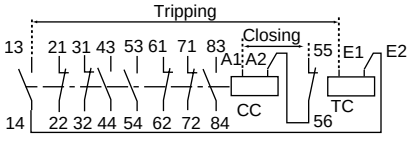
5NO+2NC



4NO+3NC

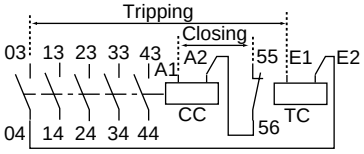


3NO+4NC

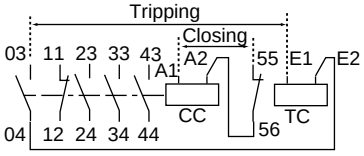


SH-5/V, SH-5/VG

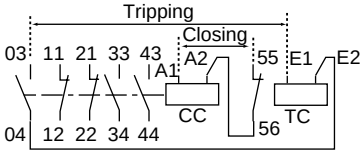
4NO



3NO+1NC



2NO+2NC



CC: Closing coil
TC: Tripping coil

■ Combination of industrial relay and auxiliary contact block

The mechanical latch industrial relays can be used according to the combination with the side mounting auxiliary contact blocks as shown on the right.

Mechanical latch industrial relay		Auxiliary contact block (Side mounting)	
Type	Contact arragement	**SZ-AS1V**x2 2NO+2NC	**SZ-AS1V** 1NO+1NC
SH-4/V	3NO	5NO+2NC	4NO+1NC
SH-4/VG	2NO+1NC	4NO+3NC	3NO+2NC
	1NO+2NC	3NO+4NC	2NO+3NC
	5NO+2NC	–	–
	4NO+3NC	–	–
	3NO+4NC	–	–
SH-5/V	4NO	6NO+2NC	5NO+1NC
SH-5/VG	3NO+1NC	5NO+3NC	4NO+2NC
	2NO+2NC	4NO+4NC	3NO+3NC

Industrial relays with extra pick-up operating coil

■ Description
Generally, ordinary control relays are designed to operate within 85–110% of the rated voltage. However, relays with extra pick-up operating coils have a wider operating range of 75–110% of their normal rated voltage. They are used where the control power source is low and occasional voltage drops can be expected. Their performance is dependable in spite of low voltage conditions. Their outer dimensions and performance are similar to the standard type relay. They have a mechanical durability of 2.5 million operations.

■ Ordering information
Specify the following:
1. Ordering code

■ Performance data
- Same as standard type. *See page 03/4.*
- Mechanical durability: 2.5 million operations

■ Dimensions
Same as standard type. *See page 03/5.*

■ Combination of contact blocks
Same as standard type. *See page 03/4.*

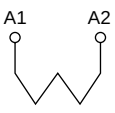
SH-4/U KKD06-067

■ Types and ordering codes

Type	Ordering code	Pole	Contact arrangement	Rated thermal current (A)	Make and break capacity AC (A)	Rated operational current (A) AC Volts (V)	Ind. AC-15	Res. AC-12	DC Volts (V)	Ind.* DC-13	Res. DC-12
SH-4/U	SH04AU-■□	4	4NO, 3NO+1NC 2NO+2NC	10	60 30 15 12	110 220 440 550	6 3 1.5 1.2	10 8 5 5	24 48 110 220	3 1.5 0.55 0.27	5 3 2.5 1
		8	8NO, 7NO+1NC 6NO+2NC, 5NO+3NC 5NO+3NC 4NO+4NC	10	60 30 15 12	110 220 440 550	6 3 1.5 1.2	10 8 5 5	24 48 110 220	3 1.5 0.55 0.27	5 3 2.5 1
SH-5/U	SH05AU-■□	5	5NO, 4NO+1NC 3NO+2NC 2NO+3NC 1NO+4NC, 5NC	10	60 30 15 12	110 220 440 550	6 3 1.5 1.2	10 8 5 5	24 48 110 220	3 1.5 0.55 0.27	5 3 2.5 1

Notes: 1. * Time constant is less than 70ms.
2. 8-pole type SH-4/U is a combination of 4-pole type SH-4/U and 4-pole auxiliary contact block SZ-A□.
3. Enter the coil voltage code in the ■ mark.
Enter the contact arrangement code in the □ mark.

■ Coil voltage

Type	Operating coil voltage	**Coil voltage code**	Wiring
SH-4/U SH-5/U	100V AC 50Hz/100–110V AC 60Hz	**1**	
	110-120V AC 50Hz/120–130V AC 60Hz	**K**	
	200V AC 50Hz/200–220V AC 60Hz	**2**	
	200-240V AC 50Hz/240–260V AC 60Hz	**P**	
	380-400V AC 50Hz/400–440V AC 60Hz	**4**	

Note: The above is the normal voltage. Other voltages between 24V and 550V AC are available on request.

■ Coil characteristics

Type	Pole	Power consumption (VA) Inrush	Sealed	Watt loss (W) 200V 50Hz	200V 60Hz	Pick-up voltage 50Hz	60Hz	Drop-out voltage 50Hz	60Hz	Operating time (ms) Coil ON→ Contact ON	Coil OFF→ Contact OFF
SH-4/U	4	120	15	4	4	93–115	102–124	58–88	66–96	9–16	6–13
	8	120	15	4	4	93–116	102–126	58–90	66–99	8–15	6–13
SH-5/U	5	120	15	4	4	93–116	102–126	58–90	66–99	9–17	6–13

Note: Coil ratings: 200V 50Hz/200–220V 60Hz
Operating time is based on 200V 50Hz

Industrial relays with newly developed quick terminals

■ Description

The product and terminal structure comply with international safety standards.
It complies with VGB4, DIN57106, and VDE0106 Teil 100 which are recommendation for preventing the exposure of charging current part.

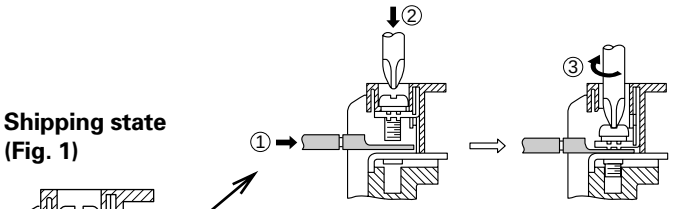
Components such fork crimp terminals, and ring crimp terminals are inserted and secured by tightening the terminal screw. See Figures 1 to 3.

■ Features

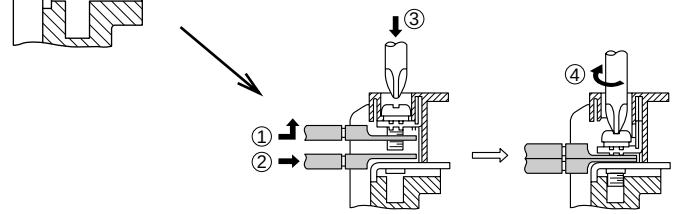
- Easy wiring
  Wiring time is at least 50% shorter than the conventional screw type terminal.
- Safety
  The finger protection feature protects the charging current part during maintenance and check (complying with EN60947-4-1, and IEC60947-4-1)
- Standard
  UL, CSA and TÜV approved

When one crimp terminal is used (Fig. 2)

Shipping state (Fig. 1)



When two crimp terminals are used (Fig. 3)



■ Types and ordering codes

Type	Ordering code	Pole	Contact arrangement	Rated thermal current (A)
SH-4Y	SH04ZA- ■40	4	4NO	10
	SH04ZA- ■31	4	3NO+1NC	10
	SH04ZA- ■22	4	2NO+2NC	10
	SH04ZA- ■80	8*	8NO	10
	SH04ZA- ■71	8*	7NO+1NC	10
	SH04ZA- ■62	8*	6NO+2NC	10
	SH04ZA- ■53	8*	5NO+3NC	10
	SH04ZA- ■44	8*	4NO+4NC	10

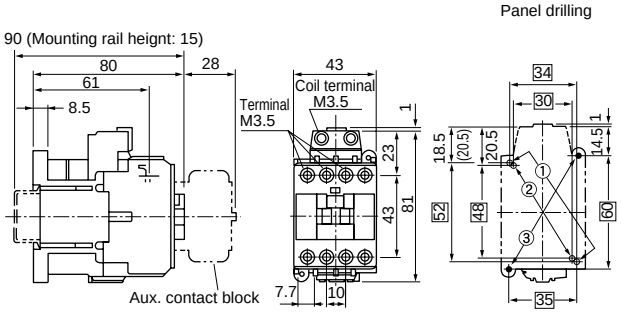
Note: * 8-pole type SH-4Y is combination of 4-pole type SH-4Y and 4-pole auxiliary contact block SZ-A■
* Enter the coil voltage code in the ■ mark.

■ Ordering information

Specify the following
1. Ordering code

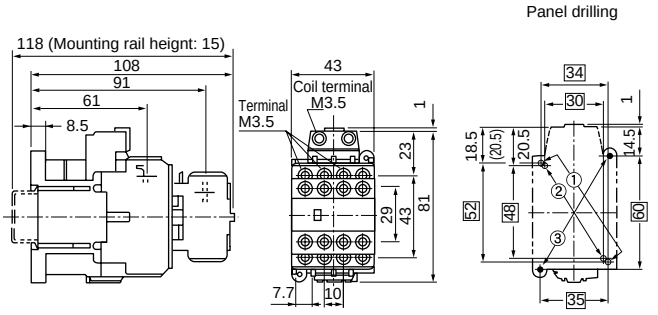
■ Dimensions, mm

SH-4Y (4-pole)



Mass: 0.32kg

SH-4Y (8-pole)



Mass: 0.36kg

■ Contact arrangement

Same as standard type.
See page 03/5.

Notes on panel drilling
- Use the two mounting holes on a diagonal line to mount a relay.
- Mounting holes indicated by ① and ② are compatible with those of SRC type.
- Mounting holes indicated by ③ conform to IEC Standards.