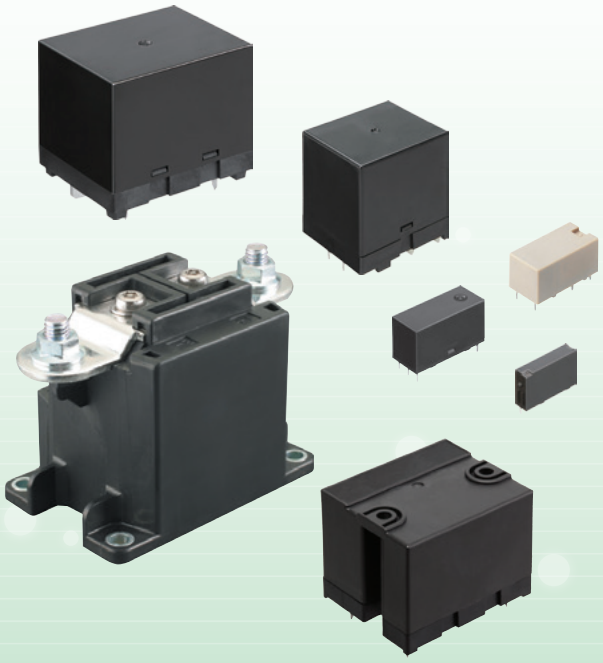
Panasonic

Mechanical relays

Power relays (Over 2A)
High-capacity DC cut off relays

SELECTION GUIDE



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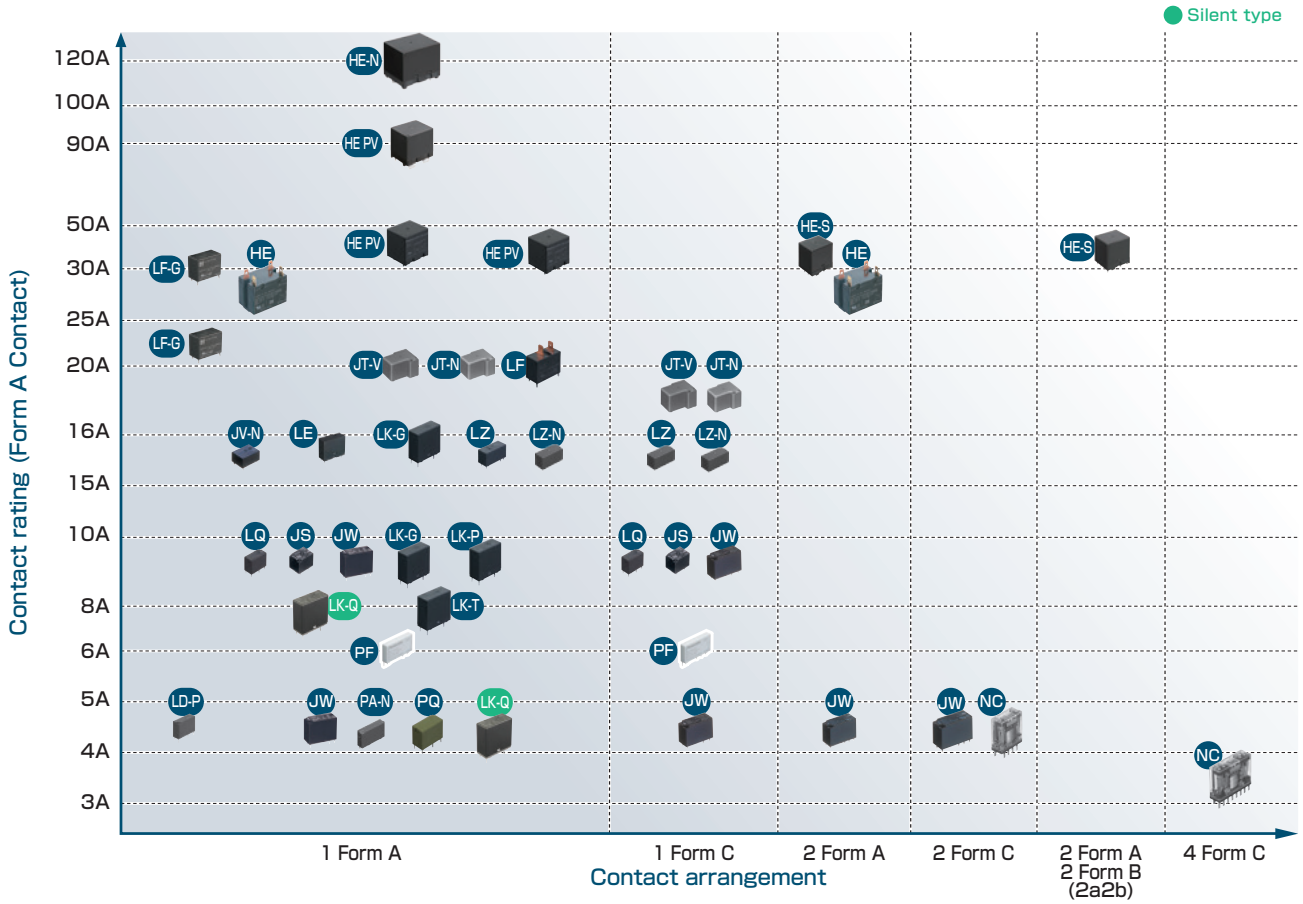
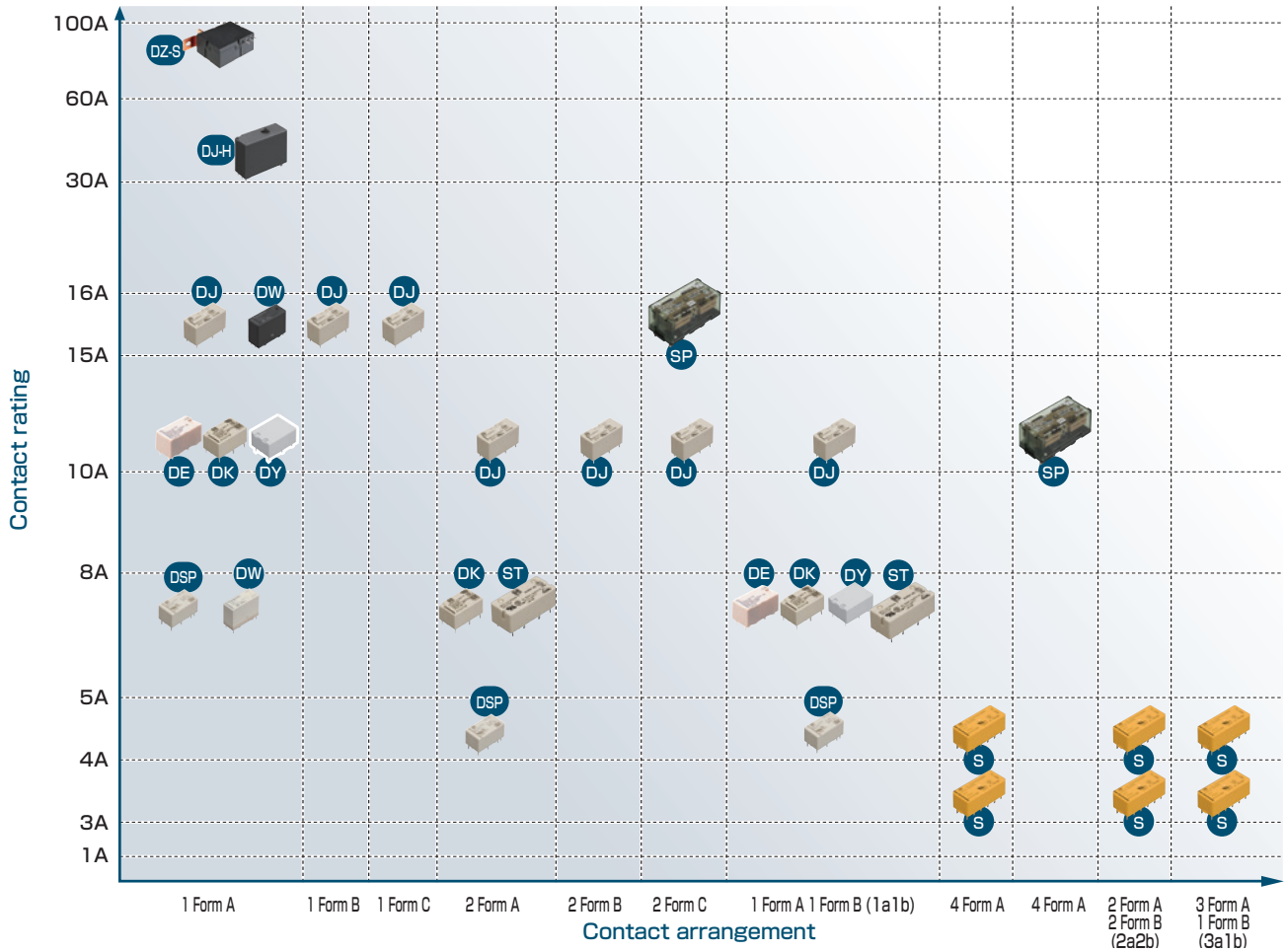
SELECTION GUIDE FOR POWER RELAYS AND HIGH-CAPACITY DC CUT OFF RELAYS

Power relays line up

Non polarized type power relays



Polarized type power relays (with latching)



DC load switching capacity (reference value)

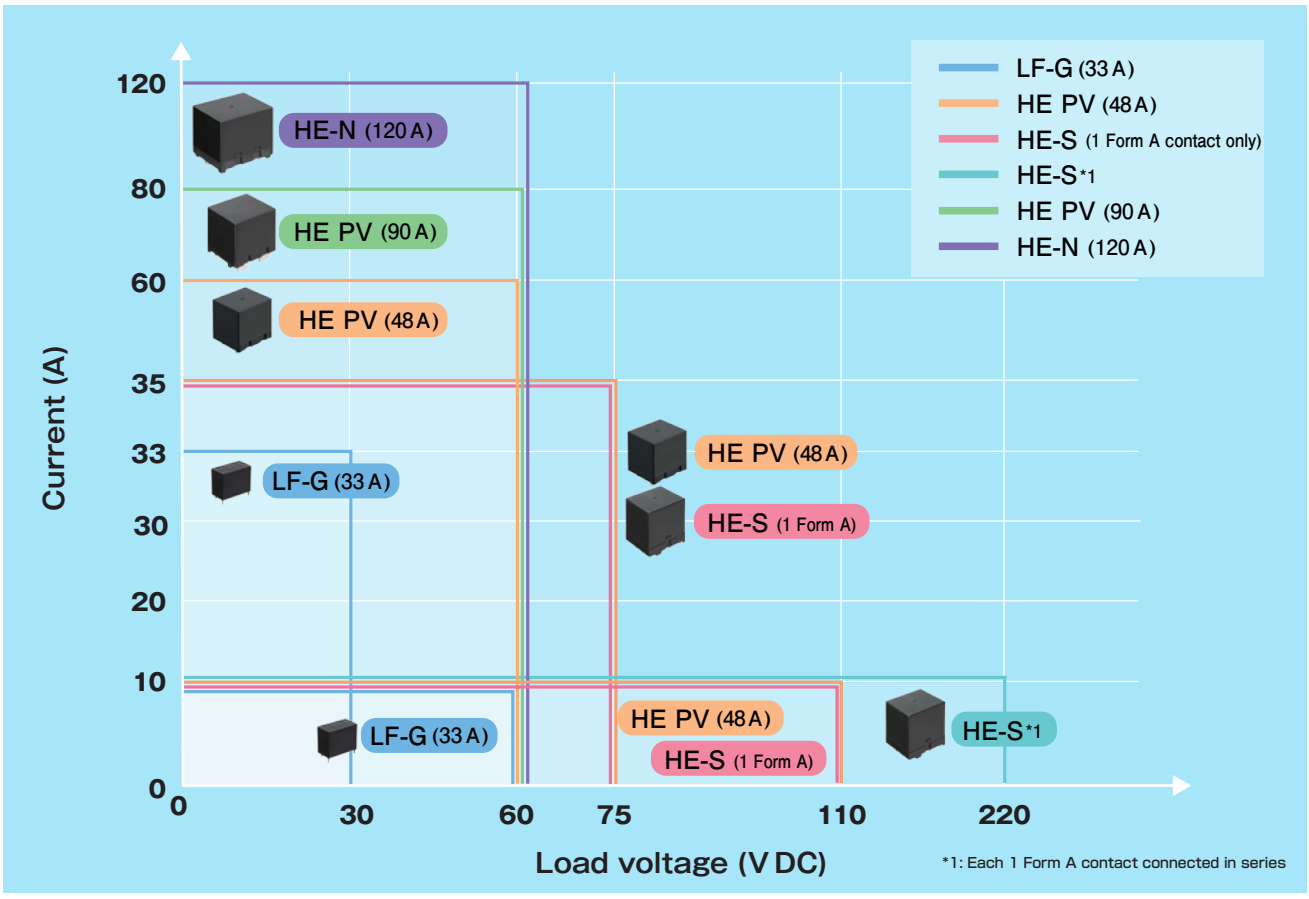
AC load relays shown below can switch DC load as following chart

Appearance	Product name	Contact	Load voltage	Current	Electrical expected life(resistive load)	Remarks
	LF-G (33A)	1 Form A	30 V DC	33 A	10^4	
			60 V DC	10 A		
	HE PV (48A)	1 Form A	60 V DC	60 A		
			75 V DC	35 A		
			110 V DC	10 A		
	HE PV (90A)	1 Form A	60 V DC	80 A		
	HE-N (120A)	1 Form A	60 V DC	120 A		
	HE-S (35A)	2 Form A	75 V DC	35 A		1 Form A contact only
			110 V DC	10 A		1 Form A contact only
			220 V DC	10 A		Each 1 Form A contact connected in series

This chart is guideline for using DC load. Please test actual condition before use.

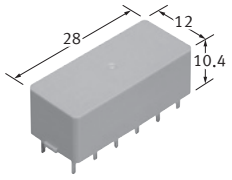
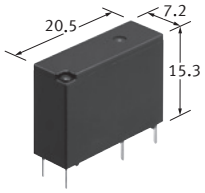
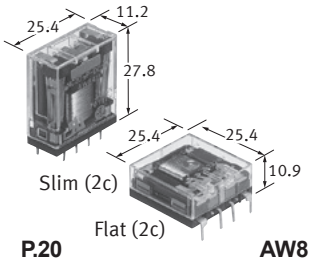
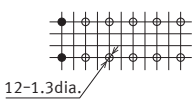
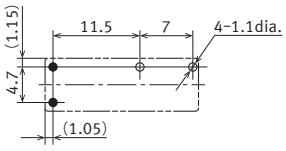
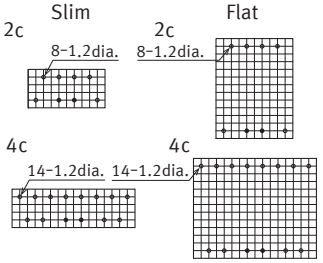
Maximum DC load switching capacity

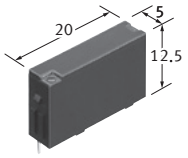
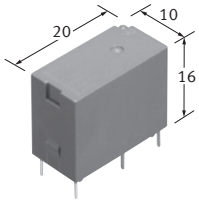
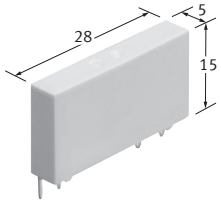
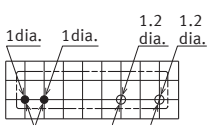
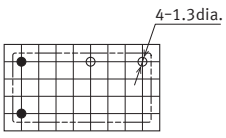
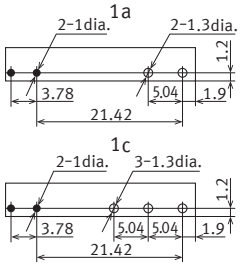
Conditions: resistive load, electrical expected life of 10^4 cycles (reference value)

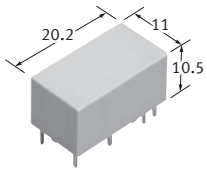
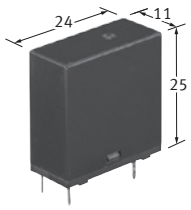
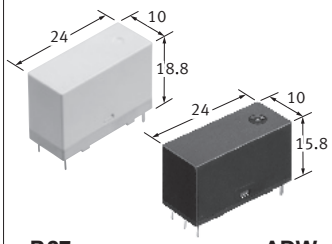
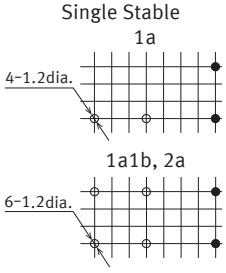
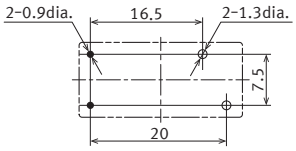
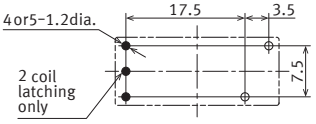


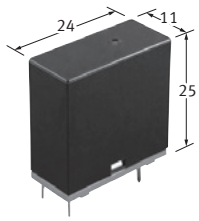
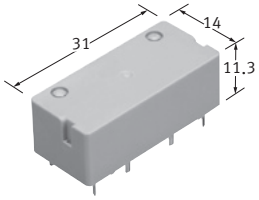
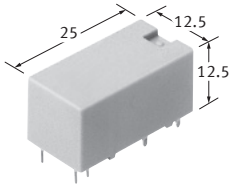
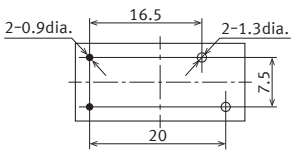
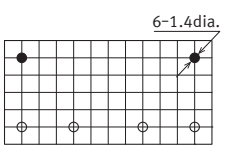
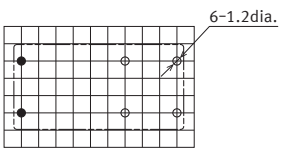
Power relays (Over 2A) selector chart

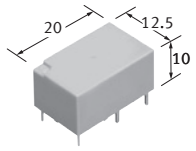
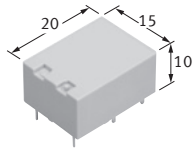
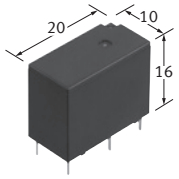
[Order of products: Max.contact rating (small to large)]

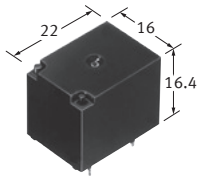
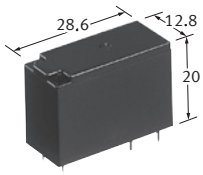
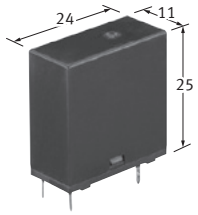
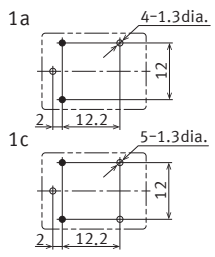
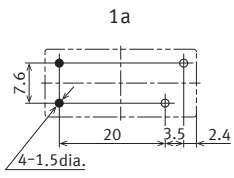
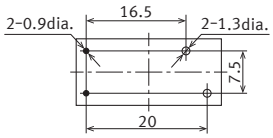
Category		Power Relays (~5 A)		
Product name		S RELAY	LD-P RELAY	NC RELAY
Type of relay (Height includes standoff unit = mm)				
Initial of part number		P.18 AG3	P.19 ALDP	P.20 AW8
Features		• 2a2b/3a1b/4a 4A polarized power relays	• 1 Form A 5A slim power relays	• Transistor drive • 2c/4c 5A slim power relays
Contact data	Contact arrangement	2a2b, 3a1b, 4a	1a	2c, 4c
	Contact shape	Twin	Single	Twin
	Contact material	Double layer contact of AgNi-$AgSnO_2$ type +Au clad	AgNi type	AgNi type +Au clad
	Contact rating (resistive)	30 A 20 A 15 A 10 A 8 A 5 A 3 A 4 A 250 V AC 3 A 30 V DC	3 A 30 V DC 5 A 277 V AC	2c: 5 A 250 V AC*1 4c: 4 A 250 V AC*1 5 A 30 V DC
	Min. switching load (reference value)	100 µA 100 mV DC	100 mA 5 V DC	100 µA 1 V DC
	Max.switching voltage	250 V AC, 48 V DC	277 V AC, 30 V DC	250 V AC, 220 V DC
Latching types availability		●	–	–
Coil data	Rated operating power	200 mW	200 mW	360 mW (2c)*2, 720 mW (4c)
	Operate [Set] voltage (initial)	Max.70% V	Max.75% V	Max.80% V
	Release [Reset] voltage (initial)	Min.10% V [Max.70% V]	Min.5% V	Min.10% V
Time Characteristics (initial)	Operate [Set] time (initial)	Max.15 ms	Max.10 ms	Max.20 ms
	Release [Reset] time (initial)	Max.10 ms [Max.15 ms]	Max.10 ms	Max.10 ms
Expected life	Mechanical life	Min.10^8	Min.5 x10^6	Min.5 x10^7
Dielectric strength (initial)	Between open contacts	750 Vrms	750 Vrms	1,000 Vrms
	Between contact sets	1,000 Vrms	–	1,000 Vrms
	Between contact and coil	1,500 Vrms	4,000 Vrms	2,000 Vrms
Surge withstand voltage (between contact and coil) (initial)		–	10,000 V	–
Ambient temperature		–55 to +65°C	–40 to +85°C	–40 to +70°C (2c)*2 –40 to +55°C (4c)
Protective construction	Dust cover	–	–	●
	Flux-resistant	–	–	–
	Sealed	●	●	●
PC board pattern (BOTTOM VIEW) ● indicates input terminal 2.54mm grid		Single Stable 		
Safety standards		UL, CSA	UL/C-UL, VDE, CQC	UL, CSA
Unit weight (Approx.)		8 g	4 g	16 g (2c), 19 g (4c: slim), 18 g (4c: Flat)
Option		Socket	–	Socket, Terminal socket
Remarks		–	–	*1: Dust cover *2: Min.48 V DC

Category		Power Relays (~10 A)		
Product name		PA-N RELAY	PQ RELAY	PF RELAY
Type of relay (Height includes standoff unit = mm)				
Initial of part number		P.22 APAN3	P.23 APQ3	P.24 APF
Features		• 1 Form A 5A Slim power relays meet IEC61010 reinforced insulation	• 1 Form A 5A small size power relays for interface	• Compliant with European standards • 1a/1c 6A Slim power relays
Contact data	Contact arrangement	1a	1a	1a, 1c
	Contact shape	Twin	Twin	Single
	Contact material	AgNi type +Au	AgNi type +Au clad	AgNi type, AgNi type +Au plated
	Contact rating (resistive)	30 A 20 A 15 A 10 A 8 A 5 A 3 A 5 A 250 V AC 5 A 30 V DC	5 A 250 V AC 5 A 30 V DC	6 A 250 V AC No Au plating type 6 A 250 V AC Au plating type
	Min. switching load (reference value)	100 µA 100m V DC	100 µA 100mV DC	100 mA 5 V DC 1 mA 1 V DC
	Max.switching voltage	250 V AC, 110 V DC (0.4 A)	250 V AC, 110 V DC (0.3 A)	250 V AC
Latching types availability		–	–	–
Coil data	Rated operating power	110 mW	200 mW	170 mW (4.5 to 24 V DC) 217 mW (48 V DC), 175 mW (60 V DC)
	Operate [Set] voltage (initial)	Max.70% V	Max.75% V	Max.70% V
	Release [Reset] voltage (initial)	Min.5% V	Min.5% V	Min.5% V
Time Characteristics (initial)	Operate [Set] time (initial)	Max.10 ms	Max.20 ms	Max.8 ms
	Release [Reset] time (initial)	Max.5 ms	Max.10 ms	Max.4 ms
Expected life	Mechanical life	2 x10^7	2 x10^7	Min.5 x10^6
Dielectric strength (initial)	Between open contacts	1,000 Vrms	1,000 Vrms	1,000 Vrms
	Between contact sets	–	–	–
	Between contact and coil	3,000 Vrms	4,000 Vrms	4,000 Vrms
Surge withstand voltage (between contact and coil) (initial)		6,000 V	8,000 V	6,000 V
Ambient temperature		–40 to +90°C	–40 to +70°C	–40 to +85°C
Protective construction	Dust cover	–	–	–
	Flux-resistant	–	–	–
	Sealed	●	●	●
PC board pattern (BOTTOM VIEW) ● indicates input terminal 2.54mm grid				
Safety standards		UL/C-UL, TÜV	UL, CSA, VDE	UL/C-UL, VDE
Unit weight (Approx.)		3 g	7 g	5 g
Option		Socket	Socket	–
Remarks		–	–	–

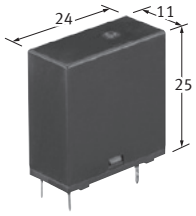
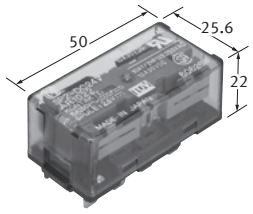
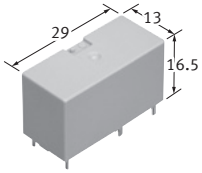
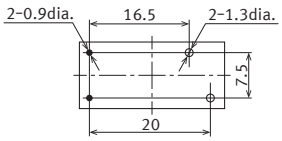
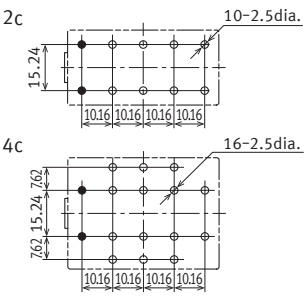
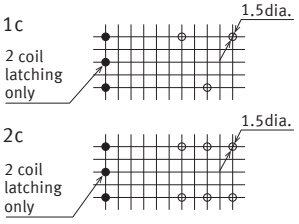
Category		Power Relays (~10 A)			
Product name		DS-P RELAY	LK-T RELAY	DW RELAY	
Type of relay (Height includes standoff unit = mm)					
Initial of part number		**P.25** **AGP**	**P.26** **ALKT**	**P.27** **ADW**	
Features		• 1a 8A (AC) 5A(DC), 1a1b/2a 5A (AC/DC) small polarized power relays	• TV-8 rated • 1 Form A 8A power relays	• 1 Form A 8A/16A (TV-8 rated)* , small polarized power relays	
Contact data	Contact arrangement	1a	1a1b, 2a	1a	1a
	Contact shape	Single		Single	Single
	Contact material	$AgSnO_2$ type +Au flashed		$AgSnO_2$ type	$AgSnO_2$ type
	Contact rating (resistive)	8 A 250 V AC 5 A 30 V AC	5 A 250 V AC 5 A 30 V AC	8 A 277 V AC	8 A 250 V AC Standard type	16 A 277 V AC* Inrush type (Low profile type)
	Min. switching load (reference value)	10 mA 5 V DC	10 mA 5 V DC	100 mA 5 V DC	100 mA 5 V DC	100 mA 5 V DC
	Max.switching voltage	250 V AC, 125 V DC (0.2 A)		277 V AC	250 V AC	277 V AC
Latching types availability		●		–	● (Latching type only)	
Coil data	Rated operating power	300 mW		250 mW	200 mW (1 coil latching) 400 mW (2 coil latching)	
	Operate [Set] voltage (initial)	Max.80% V		Max.70% V	Max.80% V	
	Release [Reset] voltage (initial)	Min.10% V [Max.80% V]		Min.10% V	Max.80% V	
Time Characteristics (initial)	Operate [Set] time (initial)	Max.10 ms		Max.15 ms	Max.15 ms	
	Release [Reset] time (initial)	Max.5 ms [Max.10 ms]		Max.5 ms	Max.15 ms	
Expected life	Mechanical life	Min.5 x10^7		Min.10^6	Min.10^6	
Dielectric strength (initial)	Between open contacts	1,000 Vrms		1,000 Vrms	1,000 Vrms	
	Between contact sets	–	2,000 Vrms	–	–	
	Between contact and coil	3,000 Vrms		4,000 Vrms	5,000 Vrms	
Surge withstand voltage (between contact and coil) (initial)		5,000 V		10,000 V	12,000 V	
Ambient temperature		–40 to +60°C (1a, 2a) –40 to +65°C (1a1b)		–40 to +70°C	–40 to +85°C (Max.8 A) –40 to +70°C (Max.8 to 16 A)	
Protective construction	Dust cover	–		–	–	
	Flux-resistant	–		●	●	
	Sealed	●		–	–	
PC board pattern (BOTTOM VIEW) ● indicates input terminal 2.54mm grid					
Safety standards		UL, CSA, TÜV		UL/C-UL, TÜV, VDE, CQC	UL/C-UL, VDE, CQC	
Unit weight (Approx.)		4.5 g		12 g	8 g (Low profile type: 7.5 g)	
Option		Socket		–	–	
Remarks		–		–	* TV-8 rated and inrush type: 16 A only	

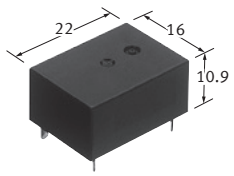
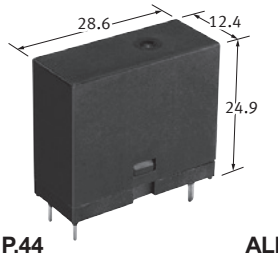
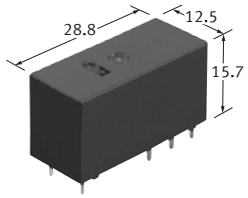
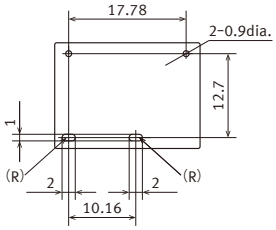
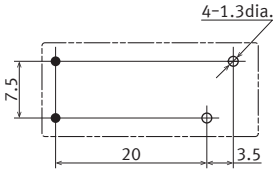
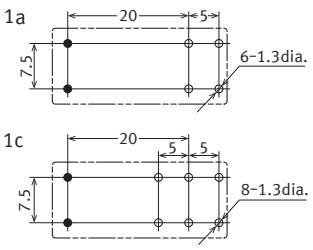
Category		Power Relays (~10 A)		
Product name		LK-Q RELAY	ST RELAY	DE RELAY
Type of relay (Height includes standoff unit = mm)				
Initial of part number		**P.29 ALKQ**	**P.30 AR2**	**P.31 ADE**
Features		• TV-5/TV-8 rated • 1 Form A 5A/8A silent type power relays	• TV-3 rated • 1a1b/2a 8A polarized power relays	• Meet European standards • 1a/2a/1a1b 10A/8A polarized power relays
Contact data	Contact arrangement	1a	1a1b, 2a	1a / 1a1b, 2a
	Contact shape	Single	Single	Single
	Contact material	$AgSnO_2$ type	$AgSnO_2$ type +Au flashed	$AgSnO_2$ type
	Contact rating (resistive)	30 A 20 A 15 A 10 A 8 A 5 A 3 A 5 A 277 V AC TV-5 8 A 277 V AC TV-8	8 A 250 V AC 5 A 30 V DC	10 A 250 V AC 10 A 30 V DC 8 A 250 V AC 8 A 30 V DC
	Min. switching load (reference value)	100 mA 5 V DC / 100 mA 5 V DC	100 mA 5 V DC	100 mA 5 V DC / 100 mA 5 V DC
	Max.switching voltage	277 V AC	250 V AC, 30 V DC	250 V AC, 30 V DC
Latching types availability		–	●	●
Coil data	Rated operating power	250 mW	Approx 240 mW	200 mW
	Operate [Set] voltage (initial)	Max.80% V	Max.80% V	Max.70% V
	Release [Reset] voltage (initial)	Min.10% V	Min.10% V [Max.80% V]	Min.10% V [Max.70% V]
Time Characteristics (initial)	Operate [Set] time (initial)	Max.15 ms	Max.15 ms	Max.10 ms
	Release [Reset] time (initial)	Max.5 ms	Max.10 ms [Max.15 ms]	Max.5 ms [Max.10 ms]
Expected life	Mechanical life	Min.10^6	Min.10^7	Min.10^7
Dielectric strength (initial)	Between open contacts	1,000 Vrms	1,200 Vrms	1,000 Vrms
	Between contact sets	–	2,000 Vrms	– / 4,000 Vrms
	Between contact and coil	4,000 Vrms	3,750 Vrms	5,000 Vrms
Surge withstand voltage (between contact and coil) (initial)		10,000 V	6,000 V	12,000 V
Ambient temperature		–40 to +70°C	–40 to +60°C	–40 to +70°C
Protective construction	Dust cover	–	–	–
	Flux-resistant	●	–	–
	Sealed	–	●	●
PC board pattern (BOTTOM VIEW) ● indicates input terminal 2.54mm grid			Single Stable 	Single Stable 
Safety standards		UL/C-UL, TÜV, CQC	UL, CSA, VDE	UL/C-UL, VDE
Unit weight (Approx.)		12 g	10 g	7 g
Option		–	Socket	–
Remarks		–	–	–

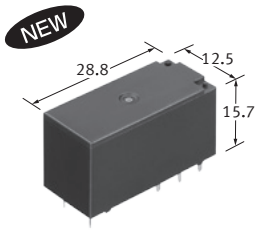
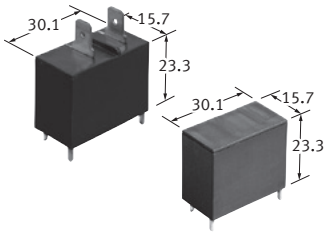
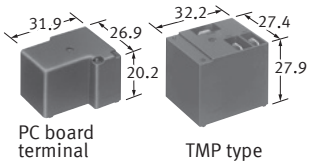
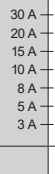
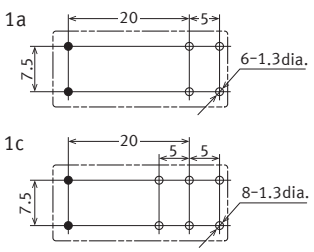
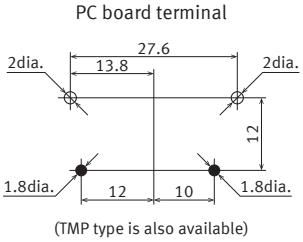
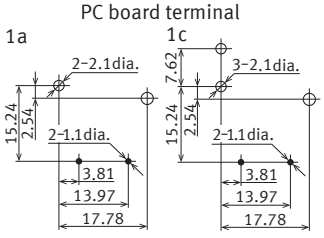
Category		Power Relays (~10 A)				
Product name		DK RELAY		DY RELAY		LQ RELAY
Type of relay (Height includes standoff unit = mm)						
Initial of part number		**P.32** **AW3**		**P.33** **ADY**		**P.34** **ALQ**
Features		• 1a 10A, 1a1b/2a 8A small polarized power relays		• 1a 10A, 1a1b 8A small polarized power relays		• 1a/1c 10A small power relays
Contact data	Contact arrangement	1a	1a1b, 2a	1a	1a1b	1a, 1c
	Contact shape	Single		Single		Single
	Contact material	$AgSnO_2$ type + Au flashed	$AgNi_2$ type + Au flashed	$AgSnO_2$ type +Au flashed		AgNi type
	Contact rating (resistive)	30 A 20 A 15 A 10 A 8 A 5 A 3 A 10 A 250 V AC 10 A 30 V DC 8 A 250 V AC 8 A 30 V DC		10 A 250 V AC 10 A 30 V DC 8 A 250 V AC 8 A 30 V DC		5 A 30 V DC 10 A 125 V AC 5 A 250 V AC Form A
	Min. switching load (reference value)	10 mA 5 V DC	10 mA 5 V DC	10 mA 5 V DC	10 mA 5 V DC	100 mA 5 V DC
	Max.switching voltage	250 V AC, 125 V DC (0.2 A)		250 V AC, 125 V DC (0.2 A)		250 V AC
Latching types availability		●		●		–
Coil data	Rated operating power	200 mW		200 mW		200 mW (1a) , 400 mW (1c)
	Operate [Set] voltage (initial)	Max.70% V		Max.70% V		Max.75% V
	Release [Reset] voltage (initial)	Min.10% V [Max.70% V]		Min.10% V [Max.70% V]		Min.5% V
Time Characteristics (initial)	Operate [Set] time (initial)	Max.10 ms		Max.10 ms		Max.20 ms
	Release [Reset] time (initial)	Max.8 ms [Max.10 ms]		Max.8 ms [Max.10 ms]		Max.20 ms (With diode)
Expected life	Mechanical life	Min.5 $x10^7$		Min.5 $x10^7$		Min.10^7
Dielectric strength (initial)	Between open contacts	1,000 Vrms		1,000 Vrms		1,000 Vrms (1a) , 750 Vrms (1c)
	Between contact sets	–	4,000 Vrms	–	4,000 Vrms	–
	Between contact and coil	4,000 Vrms		4,000 Vrms		4,000 Vrms
Surge withstand voltage (between contact and coil) (initial)		10,000 V		10,000 V		8,000 V
Ambient temperature		–40 to +65°C		–40 to +70°C		–40 to +85°C
Protective construction	Dust cover	–		–		–
	Flux-resistant	–		–		–
	Sealed	●		●		●
PC board pattern (BOTTOM VIEW) ● indicates input terminal 2.54mm grid		Single Stable 1a 2-1.1dia. 1a1b, 2a 4-1.1dia. 2-0.9dia.		Single Stable 1a 2-1.1dia. 1a1b 4-1.1dia. 2-0.9dia.		1a 4-1.3dia. 1c 5-1.3dia.
Safety standards		UL, CSA, TÜV, VDE		UL, CSA, TÜV		UL/C-UL, VDE, CQC
Unit weight (Approx.)		5 g	6 g	6 g		7 g
Option		Socket		Socket		–
Remarks		–		–		–

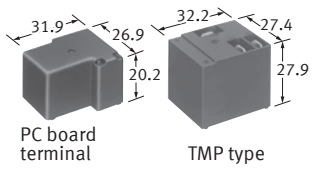
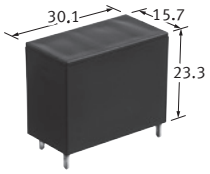
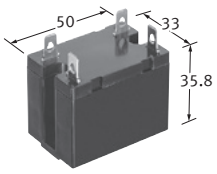
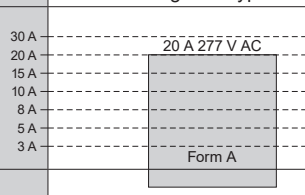
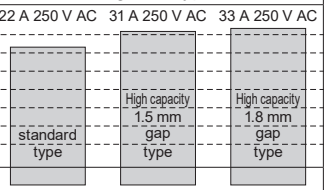
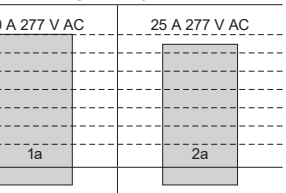
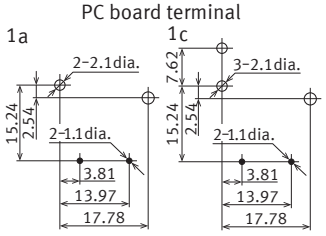
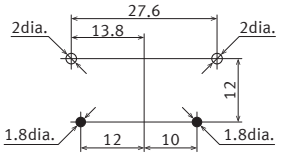
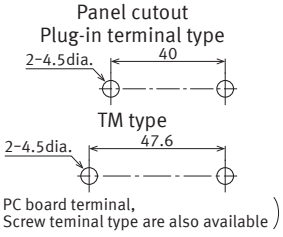
Category		Power Relays (~10 A)		
Product name		JS RELAY	JW RELAY	LK-G RELAY
Type of relay (Height includes standoff unit = mm)				
Initial of part number		P.35 AJS	P.36 AJW	P.37 ALKG
Features		• 1a/1c 10A cubic type power relays	• TV-5 rated (1a) • 1a/1c/2a/2c 5A/10A universal power relays	• TV-5 rated • 1 mm contact gap. 1 Form A 10A/16A power relays
Contact data	Contact arrangement	1a, 1c / 1a Long life	1a, 1c, 2a, 2c / 1a, 1c	1a
	Contact shape	Single	Single	Single
	Contact material	$AgSnO_2$ type	1a: $AgSnO_2$ type 1c, 2a, 2c: AgNi type	$AgSnO_2$ type
	Contact rating (resistive)	10 A 125 V AC (1a, 1c) 6 A 277 V AC (1a, 1c) 10 A 277 V AC (1a Long life)	5 A 250 V AC, 5 A 30 V DC (Standard type) 10 A 250 V AC, 10 A 30 V DC (High capacity type)	10 A 277 V AC 16 A 277 V AC
	Min. switching load (reference value)	100 mA 5 V DC	100 mA 5 V DC / 100 mA 5 V DC	100 mA 5 V DC / 100 mA 5 V DC
	Max.switching voltage	277 V AC, 100 V DC (0.5A)	250 V AC, 30 V DC	277 V AC
Latching types availability		–	–	–
Coil data	Rated operating power	360 mW	530 mW	530 mW
	Operate [Set] voltage (initial)	Max.70% V	Max.70% V	Max.75% V
	Release [Reset] voltage (initial)	Min.10% V	Min.10% V	Min.10% V
Time Characteristics (initial)	Operate [Set] time (initial)	Max.10 ms	Max.15 ms	Max.15 ms
	Release [Reset] time (initial)	Max.10 ms	Max.5 ms	Max.20 ms (with diode)
Expected life	Mechanical life	Min.10^7	Min.5 x10^6	Min.2 x10^6
Dielectric strength (initial)	Between open contacts	750 Vrms	1,000 Vrms	1,000 Vrms
	Between contact sets	–	3,000 Vrms (2a, 2c) / –	–
	Between contact and coil	1,500 Vrms	5,000 Vrms	4,000 Vrms
Surge withstand voltage (between contact and coil) (initial)		–	10,000 V	10,000 V
Ambient temperature		–40 to +70°C (Class E) –40 to +85°C (Class B) –40 to +105°C (Class F)	–40 to +60°C (Class E) –40 to +85°C (Class B)	–40 to +70°C
Protective construction	Dust cover	– / –	–	–
	Flux-resistant	● / ●	●	●
	Sealed	● / –	●	–
PC board pattern (BOTTOM VIEW) ● indicates input terminal 2.54mm grid				
Safety standards		UL, CSA, TÜV, VDE*	UL, CSA, VDE, CQC	UL/C-UL, TÜV, CQC
Unit weight (Approx.)		12 g	13 g	12 g
Option		–	Socket	–
Remarks		* For CQC, please contact our sales representative	–	–

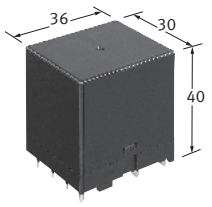
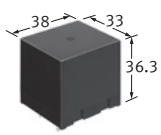
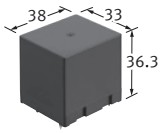
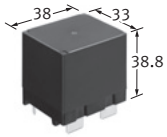
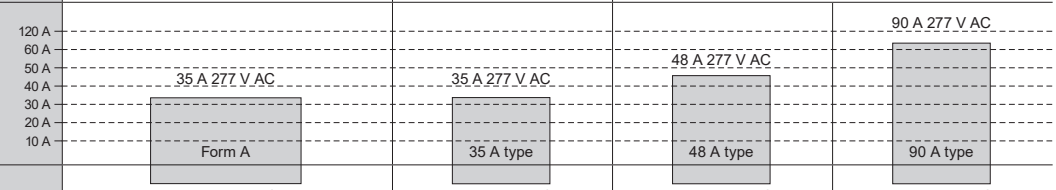
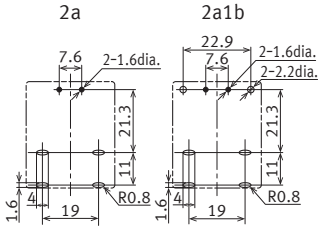
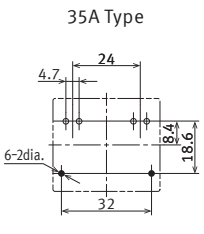
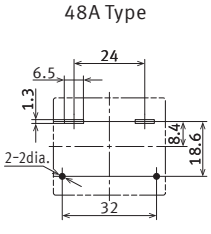
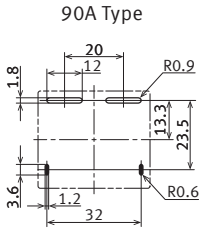
Power relays (Over 2A) selector chart

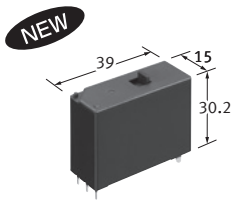
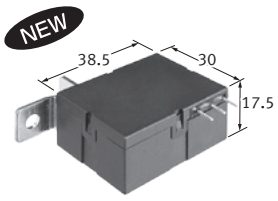
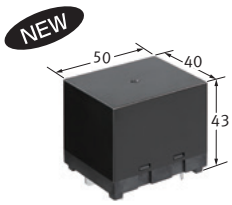
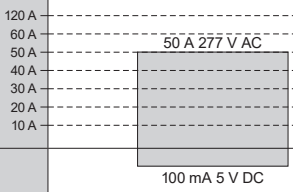
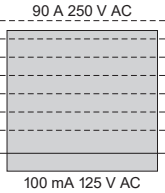
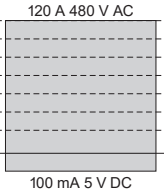
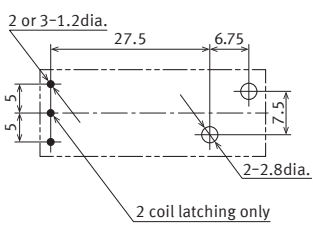
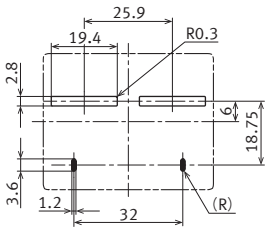
Category		Power Relays (~20 A)					
Product name		LK-P RELAY	SP RELAY		DJ RELAY		
Type of relay (Height includes standoff unit = mm)							
Initial of part number		P.38 ALKP	P.39 AR1		P.40 ADJ		
Features		• TV-5 rated • 1 Form A 10A power relays	• 2c 15A, 4c 10A polarized power relays		• 1-pole/2-pole 16A polarized power relays • Clearance and creepage distance is Min.8mm (Contact and coil)		
Contact data	Contact arrangement	1a	2c	4c	1c, 1a, 1b	1a1b, 2c, 2a, 2b	
	Contact shape	Single	Twin		Single		
	Contact material	$AgSnO_2$ type	Stationary: $AgSnO_2$ type +Au flashed Movable: $AgSnO_2$ type		$AgSnO_2$ type	$AgSnO_2$ type + Au flashed	
	Contact rating (resistive)	30 A 20 A 15 A 10 A 8 A 5 A 3 A 10 A 277 V AC 5 A 30 V DC	15 A 250 V AC 10 A 30 V DC 2c	10 A 250 V AC 10 A 30 V DC 4c	16 A 250 V AC	10 A 250 V AC	
	Min. switching load (reference value)	100 mA 5 V DC	100 mA 5 V DC	100 mA 5 V DC	100 mA 5 V DC	100 mA 5 V DC	
	Max.switching voltage	277 V AC, 30 V DC	250 V AC, 30 V DC*		250 V AC		
Latching types availability		–	●		●		
Coil data	Rated operating power	530 mW	300 mW		150 mW (1 coil latching) 250 mW (Single Stable, 2 coil latching)		
	Operate [Set] voltage (initial)	Max.70% V	Max.70% V		Max.75% V [Max.70% V]		
	Release [Reset] voltage (initial)	Min.10% V	Min.10% V [Max.70% V]		Min.10% V [Max.70% V]		
Time Characteristics (initial)	Operate [Set] time (initial)	Max.15 ms	Max.30 ms		Max.20 ms		
	Release [Reset] time (initial)	Max.5 ms	Max.20 ms [Max.30 ms]		Max.20 ms		
Expected life	Mechanical life	Min.2 x10^6	Min.5 x10^7		Min.5 x10^6		
Dielectric strength (initial)	Between open contacts	1,000 Vrms	1,500 Vrms		1,000 Vrms		
	Between contact sets	–	3,000 Vrms		–	2,000 Vrms	
	Between contact and coil	4,000 Vrms	3,000 Vrms		4,000 Vrms		
Surge withstand voltage (between contact and coil) (initial)		10,000 V	–		10,000 V		
Ambient temperature		–40 to +70°C	–50 to +60°C		–40 to +70°C		
Protective construction	Dust cover	–	●		–		
	Flux-resistant	●	–		●		
	Sealed	–	–		●		
PC board pattern (BOTTOM VIEW) ● indicates input terminal 2.54mm grid							
Safety standards		UL, CSA, TÜV, VDE, CQC	UL, CSA, TÜV		UL/C-UL, VDE, CQC		
Unit weight (Approx.)		12 g	50 g	65 g	14 g		
Option		–	Terminal socket, Mounting board		–		
Remarks		–	*48 V DC (Max.2 A)		Test button type is available		

Category		Power Relays (~20 A)		
Product name		JV-N RELAY	LE RELAY	LZ RELAY
Type of relay (Height includes standoff unit = mm)				
Initial of part number		**P.43 AJVN**	**P.44 ALE**	**P.45 ALZ**
Features		• 1 Form A 16A, low profile: 10.9 mm power relays for heater control	• TV-5 rated • 1 Form A 16A power relays for micro wave oven	• TV-5 rated • Low profile: 15.7mm height 1a/1c 16A power relays
Contact data	Contact arrangement	1a	1a	1a, 1c
	Contact shape	Single	Single	Single
	Contact material	$AgSnO_2$ type	$AgSnO_2$ type	$AgSnO_2$ type
	Contact rating (resistive)	16 A 125 V AC 10 A 277 V AC 10 A 30 V DC 30 A 20 A 15 A 10 A 8 A 5 A 3 A	16 A 277 V AC	16 A 250 V AC
	Min. switching load (reference value)	100 mA 5 V DC	100 mA 5 V DC	100 mA 5 V DC
	Max.switching voltage	277 V AC, 110 V DC (0.3 A)	277 V AC	440 V AC
Latching types availability		–	–	–
Coil data	Rated operating power	200 mW (4.5 to 48 V DC) 600 mW (100 V DC)	400 mW (Standard type) 200 mW (High sensitive type)	400 mW
	Operate [Set] voltage (initial)	Max.75% V (4.5 to 48 V DC) Max.60 V DC (100 V DC)	Max.75% V	Max.70% V
	Release [Reset] voltage (initial)	Min.5% V (4.5 to 48 V DC) Min.4 V DC (100 V DC)	Min.5% V	Min.10% V
Time Characteristics (initial)	Operate [Set] time (initial)	Max.12 ms (4.5 to 48 V DC) Min.8 ms (100 V DC)	Max.20 ms	Max.15 ms
	Release [Reset] time (initial)	Max.5 ms	Max.20 ms (Standard type) Max.25 ms (High sensitivity type)*	Max.5 ms
Expected life	Mechanical life	Min. 2 x10^7	Min.2 x10^6	Min.10^7
Dielectric strength (initial)	Between open contacts	1,000 Vrms	1,000 Vrms	1,000 Vrms
	Between contact sets	–	–	–
	Between contact and coil	2,500 Vrms	4,000 Vrms	5,000 Vrms
Surge withstand voltage (between contact and coil) (initial)		4,500 V	10,000 V	10,000 V
Ambient temperature		–40 to +70°C, –40 to +60°C (100 V DC)	–40 to +85°C	–40 to +85°C (Class B) –40 to +105°C (Class F)
Protective construction	Dust cover	–	–	–
	Flux-resistant	●	●	●
	Sealed	–	–	● *
PC board pattern (BOTTOM VIEW) ● indicates input terminal 2.54mm grid				
Safety standards		UL, CSA, TÜV	UL, CSA, VDE, CQC	UL/C-UL, VDE
Unit weight (Approx.)		8 g	15 g	12 g
Option		–	–	–
Remarks		–	* With diode	* Please contact our sales representative for details

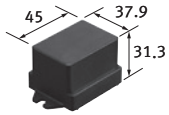
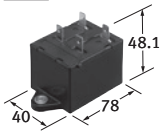
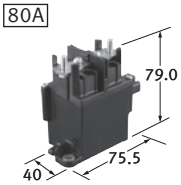
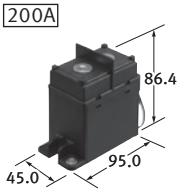
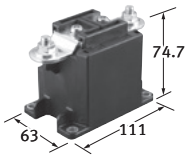
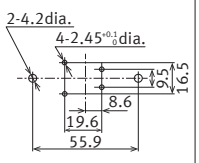
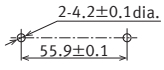
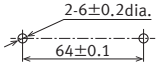
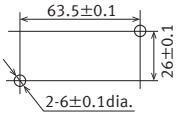
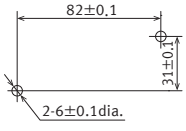
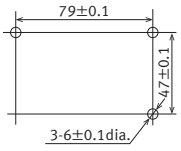
Category		Power Relays (~20 A)		
Product name		LZ-N RELAY	LF RELAY	JT-V RELAY
Type of relay (Height includes standoff unit = mm)				
Initial of part number		**P.46 ALZN**	**P.47 ALF**	**P.48 AJTV**
Features		• TV-5 rated and meet EN60335-1 GWT Low profile: 15.7mm height 1a/1c 16A power relays	• TV-8 rated • 1 Form A 20A power relays for compress or and invertor load	• Surge withstand voltage: 6KV 1a/1c (N.O.) 30A power relays(UL recognized)
Contact data	Contact arrangement	1a, 1c	1a	1a, 1c
	Contact shape	Single	Single	Single
	Contact material	$AgSnO_2$ type	$AgSnO_2$ type	$AgSnO_2$ type
	Contact rating (resistive)	 16 A 250 V AC	20 A 250 V AC	20 A 277 V AC Form A
	Min. switching load (reference value)	100 mA 5 V DC	100 mA 5 V DC	100 mA 5 V DC
	Max.switching voltage	440 V AC	250 V AC	277 V AC
Latching types availability		–	–	–
Coil data	Rated operating power	400 mW	900 mW	1 W
	Operate [Set] voltage (initial)	Max.70% V	Max.70% V	Max.75% V
	Release [Reset] voltage (initial)	Min.10% V	Min.10% V	Min.10% V
Time Characteristics (initial)	Operate [Set] time (initial)	Max.15 ms	Max.20 ms	Max.15 ms
	Release [Reset] time (initial)	Max.5 ms	Max.15 ms (With diode)	Max.10 ms
Expected life	Mechanical life	Min.10^6	Min.2 x10^6	Min.10^7
Dielectric strength (initial)	Between open contacts	1,000 Vrms	1,000 Vrms	1,200 Vrms
	Between contact sets	–	–	–
	Between contact and coil	5,000 Vrms	5,000 Vrms	3,500 Vrms
Surge withstand voltage (between contact and coil) (initial)		10,000 V	10,000 V	6,000 V
Ambient temperature		–40 to +85°C (Class B) –40 to +105°C (Class F)	–40 to +60°C	–55 to +85°C
Protective construction	Dust cover	–	–	●
	Flux-resistant	●	●	–
	Sealed	–	–	●
PC board pattern (BOTTOM VIEW) ● indicates input terminal 2.54mm grid			 (TMP type is also available)	
Safety standards		UL/C-UL, VDE	UL/C-UL, TÜV, VDE	UL/C-UL
Unit weight (Approx.)		11 g	23 g	25 g (30 g TMP type)
Option		–	–	–
Remarks		Not meeting Electrical Appliance and Material Safety Act	–	Not meeting Electrical Appliance and Material Safety Act

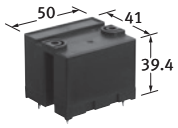
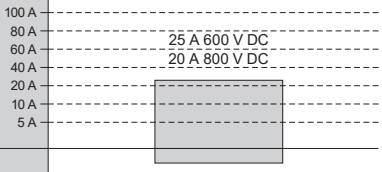
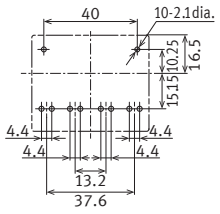
Category		Power Relays (~30 A)		
Product name		JT-N RELAY	LF-G RELAY	HE RELAY
Type of relay (Height includes standoff unit = mm)				
Initial of part number		**P.50 AJTN**	**P.51 ALFG**	**P.52 AHE**
Features		• High switching capacity 1a/1c (N.O.) 30A power relays (UL recognized)	• 1 Form A 22A/33A Compact power relays for solar inverter load	• TV-10/TV-15 rated • 1a 30A, 2a 25A power relays
Contact data	Contact arrangement	1a, 1c	1a	1a / 2a
	Contact shape	Single	Single	Single
	Contact material	$AgSnO_2$ type	$AgSnO_2$ type	$AgSnO_2$ type
	Contact rating (resistive)			
	Min. switching load (reference value)	100 mA 5 V DC	100 mA 5 V DC / 100 mA 5 V DC / 100 mA 5 V DC	100 mA 5 V DC / 100 mA 5 V DC
	Max.switching voltage	277 V AC	250 V AC	277 V AC, 30 V DC
Latching types availability		–	–	–
Coil data	Rated operating power	800 mW	1.4 W	1.7 to 2.7 VA (AC) , 1.92 W (DC)
	Operate [Set] voltage (initial)	Max.75% V	Max.70% V	Max.70% V
	Release [Reset] voltage (initial)	Min.10% V	Min.10% V	Min.15% V (AC) , Min.10% V (DC)
Time Characteristics (initial)	Operate [Set] time (initial)	Max.15 ms	Max.20 ms	Max.30 ms
	Release [Reset] time (initial)	Max.10 ms	Max.10 ms	Max.30 ms (AC) , Max.10 ms (DC)
Expected life	Mechanical life	Min.10^7	Min.10^6 (Contact gap: 1.5 mm) Min.5 x10^5 (Contact gap: 1.8 mm)	Min.5 x10^6 (AC) Min.10^7 (DC)
Dielectric strength (initial)	Between open contacts	1,200 Vrms	2,500 Vrms	2,000 Vrms
	Between contact sets	–	–	– / 4,000 Vrms
	Between contact and coil	2,500 Vrms	4,000 Vrms	5,000 Vrms
Surge withstand voltage (between contact and coil) (initial)		–	6,000 V	10,000 V
Ambient temperature		–55 to +85°C	–40 to +60°C, –40 to +85°C*	–50 to +55°C
Protective construction	Dust cover	● *	–	●
	Flux-resistant	–	●	● (PC board terminal)
	Sealed	●	–	–
PC board pattern (BOTTOM VIEW) ● indicates input terminal 2.54mm grid				
Safety standards		UL, CSA	UL/C-UL, VDE	UL, CSA, VDE, TÜV, CQC
Unit weight (Approx.)		25 g (30 g TMP type)	23 g	80 to 120 g
Option		–	–	Terminal socket
Remarks		Not meeting Electrical Appliance and Material Safety Act * Please contact our sales representative for details	Not meeting Electrical Appliance and Material Safety Act * Coil holding voltage is 45 to 85%V	–

Category		Power Relays (30 A~)			
Product name		HE-S RELAY	HE RELAY PV TYPE		
Type of relay (Height includes standoff unit = mm)			35A 	48A 	90A 
Initial of part number		P.55 AHES	P.57 AHE		
Features		• TV-8 / TV-10 rated • 2a/2a1b 35A compact power relays	• 1 Form A 35A/48A/90A compact power relays for solar inverter		
Contact data	Contact arrangement	2a, 2a1b	1a		
	Contact shape	Single	Single		
	Contact material	$AgSnO_2$ type (Form A) AgNi type +Au flashed (Form B)	$AgSnO_2$ type (35 A)	AgNi type (48 A/90 A)	
	Contact rating (resistive)				
	Min. switching load (reference value)	100 mA 5 V DC	100 mA 5 V DC	100 mA 5 V DC	100 mA 5 V DC
	Max.switching voltage	480 V AC, 110 V DC	277 V AC, 30 V DC		480 V AC
Latching types availability		–	–		
Coil data	Rated operating power	1.88 W	1.92 W		
	Operate [Set] voltage (initial)	Max.75% V	Max.70% V		
	Release [Reset] voltage (initial)	Min.5% V	Min.10% V		
Time Characteristics (initial)	Operate [Set] time (initial)	Max.30 ms	Max.30 ms		
	Release [Reset] time (initial)	Max.10 ms	Max.10 ms		
Expected life	Mechanical life	Min.5x 10^6	Min.10^7 (35 A/48 A)		Min.10^6 (90 A)
Dielectric strength (initial)	Between open contacts	2,000 Vrms (Between open Form A contacts)	2,000 Vrms		
	Between contact sets	5,000 Vrms (Between Form A contact sets)	–		
	Between contact and coil	5,000 Vrms (Between Form A contact and coil)	5,000 Vrms		
Surge withstand voltage (between contact and coil) (initial)		10,000 V (Between From A contact and coil)	10,000 V		
Ambient temperature		–40 to +55°C, –40 to +85°C*	–50 to +55°C, –50 to +85°C*		
Protective construction	Dust cover	–	–		
	Flux-resistant	●	●		
	Sealed	–	–		
PC board pattern (BOTTOM VIEW) ● indicates input terminal 2.54mm grid					
Safety standards		UL/C-UL, VDE	UL, CSA, VDE	UL/C-UL, VDE	
Unit weight (Approx.)		64 g	80 g		85 g
Option		–	–		
Remarks		* Coil holding voltage is 30 to 60%V	90 A type does not meet the Electrical Appliance and Material Safety Law * Coil holding voltage is 50 to 60%V		

Category		Power Relays (30 A~)		
Product name		DJ-H RELAY	DZ-S RELAY	HE-N RELAY
Type of relay (Height includes standoff unit = mm)				
Initial of part number		**P.58 ADJH**	**P.59 ADZS**	**P.60 AHE6**
Features		• 1 form A 50A latching relays for lighting and motor load	• Meet IEC62055-31 UC3 1 form A 90A power latching relays	• High capacity 120A 480V AC 1 Form A power relays
Contact data	Contact arrangement	1a	1a	1a
	Contact shape	Single	Single	Single
	Contact material	$AgSnO_2$ type	$AgSnO_2$ type	AgNi type
	Contact rating (resistive)			
	Min. switching load (reference value)	100 mA 5 V DC	100 mA 125 V AC	100 mA 5 V DC
	Max.switching voltage	480 V AC	276 V AC	800 V AC
Latching types availability		● (Latching only)	● (Latching only)	–
Coil data	Rated operating power	1 W (1 coil latching) 2 W (2 coil latching)	1.5 W (1 coil latching) 3 W (2 coil latching)	2.5 W
	Operate [Set] voltage (initial)	Max.75% V	Max.70% V	Max.75% V
	Release [Reset] voltage (initial)	Max.75% V	Max.70% V	Min.5% V
Time Characteristics (initial)	Operate [Set] time (initial)	Max.20 ms	Max.20 ms	Max.30 ms
	Release [Reset] time (initial)	Max.20 ms	Max.20 ms	Max.10 ms
Expected life	Mechanical life	Min.10^6	Min.10^5	Min.10^6
Dielectric strength (initial)	Between open contacts	1,500 Vrms	2,000 Vrms	2,000 Vrms
	Between contact sets	–	–	–
	Between contact and coil	4,000 Vrms	4,000 Vrms	5,000 Vrms
Surge withstand voltage (between contact and coil) (initial)		12,000 V	12,000 V	10,000 V
Ambient temperature		–40 to +85°C	–40 to +85°C	–40 to +55°C*1 –40 to +85°C*2
Protective construction	Dust cover	–	●	–
	Flux-resistant	●	–	●
	Sealed	–	–	–
PC board pattern (BOTTOM VIEW) ● indicates input terminal 2.54mm grid			–	
Safety standards		UL/C-UL, VDE	–	UL/C-UL, VDE
Unit weight (Approx.)		31 g	45 g	115 g
Option		–	–	–
Remarks		Reverse polarity type is available	IEC62055-31 UC3	*1: Coil holding voltage is 40 to 100%V (at 20°C) *2: Coil holding voltage is 50 to 60%V (at 85°C)

High-capacity DC cut off relays selector chart

Category		High-capacity DC cut off relays				
Product name		EP RELAY				
Type of relay (Height includes standoff unit = mm)		10A 	20A 	80A 	200A 	300A 
Initial of part number		P.62				AEP
Features		• High Capacity Max. 1,000 V DC Cut-off power relay				
Contact data	Contact arrangement	1a				
	Contact shape	Single				
	Contact material	Molybdenum type	Copper type alloy	Tungsten type/ Copper type alloy	Copper type alloy	Copper type alloy
	Contact rating (resistive)	200 A 120 A 100 A 80 A 60 A 20 A 10 A 10 A 400 V DC	20 A 400 V DC	80 A 400 V DC	200 A 400 V DC	300 A 400 V DC
	Min. switching load (reference value)	1 A 6 V DC	1 A 12 V DC	1 A 12 V DC	1 A 12 V DC	1 A 24 V DC
Latching types availability		–	–	–	–	–
Coil data	Rated operating power	1.24 W	3.9 W	4.2 W	6 W	Inrush: 40W (approx.0.1sec.) Stable: 4W
	Operate [Set] voltage (initial)	Max.75% V	Max.75% V	Max.75% V	Max.75% V	Max.75% V
	Release [Reset] voltage (initial)	Min.8.3% V	Min.4.17% V	Min.8.3% V	Min.8.3% V	Min.16.7% V
Time Characteristics (initial)	Operate [Set] time (initial)	Max.50 ms	Max.50 ms	Max.50 ms	Max.50 ms	Max.30 ms
	Release [Reset] time (initial)	Min.30 ms	Min.30 ms	Min.30 ms	Min.30 ms	Min.10 ms
Expected life	Mechanical life	Min.10^5	Min.2 x10^5	Min.2 x10^5	Min.2 x10^5	Min.2 x10^5
Dielectric strength (initial)	Between open contacts	2,500 Vrms	2,500 Vrms	2,500 Vrms	2,500 Vrms	2,500 Vrms
	Between contact sets	–	–	–	–	–
	Between contact and coil	2,500 Vrms	2,500 Vrms	2,500 Vrms	2,500 Vrms	2,500 Vrms
Surge withstand voltage (between contact and coil) (initial)		–	–	–	–	–
Ambient temperature		–40 to +80°C	–40 to +80°C	–40 to +80°C	–40 to +80°C	–40 to +80°C
Protective construction	Dust cover	–	–	–	–	–
	Flux-resistant	–	–	–	–	–
	Sealed	• (Capsule contact)				
PC board pattern (BOTTOM VIEW) • indicates input terminal 2.54mm grid		PC board terminal  TM type 				
Safety standards		UL/C-UL	UL	UL/C-UL	–	–
Unit weight (Approx.)		80g	180g	400g	600g	750g
Option socket		–	–	Connector with lead wire	Hexagonal bolt x2 (M6)	Connector with lead wire
Remarks		–	–	–	–	–

Category		High-capacity DC cut off relays)
Product name		HE-V RELAY
Type of relay (Height includes standoff unit = mm)		
Initial of part number		**P.65** **AHEV**
Features		• High capacity Max. 1,000 V DC, 20 A cut-off power relay
Contact data	Contact arrangement	2a
	Contact shape	Single
	Contact material	AgNi type
	Contact rating (resistive)	
	Min. switching load (reference value)	100 mA 5 V DC
Latching types availability		–
Coil data	Rated operating power	1.92 W
	Operate [Set] voltage (initial)	Max.70% V
	Release [Reset] voltage (initial)	Min.5% V
Time Characteristics (initial)	Operate [Set] time (initial)	Max.30 ms
	Release [Reset] time (initial)	Max.10 ms
Expected life	Mechanical life	Min.10^6
Dielectric strength (initial)	Between open contacts	2,000 Vrms
	Between contact sets	4,000 Vrms
	Between contact and coil	5,000 Vrms
Surge withstand voltage (between contact and coil) (initial)		10,000 V
Ambient temperature		–40 to +55°C –40 to +85°C *2
Protective construction	Dust cover	–
	Flux-resistant	●
	Sealed	–
PC board pattern (BOTTOM VIEW) ● indicates input terminal 2.54mm grid		
Safety standards		UL/C-UL, VDE
Unit weight (Approx.)		120 g
Option socket		–
Remarks		–

*1 Each 1a contact connected in series
*2 When coil holding voltage is 33 to 60% of rated coil voltage

Power relay types (Part No. and electrical life, Notes)

S relay

Contact arrangement	Rated coil voltage	Single side stable		2 coil latching		Standard packing	
		Type No.	Part No.	Type No.	Part No.	Carton	Outer carton
2 Form A 2 Form B (2a2b)	3 V DC	S2EB-3V	AG302160	S2EB-L2-3V	AG322160	50 pieces	500 pieces
	5 V DC	S2EB-5V	AG302960	S2EB-L2-5V	AG322960		
	6 V DC	S2EB-6V	AG302260	S2EB-L2-6V	AG322260		
	12 V DC	S2EB-12V	AG302360	S2EB-L2-12V	AG322360		
	24 V DC	S2EB-24V	AG302460	S2EB-L2-24V	AG322460		
	48 V DC	S2EB-48V	AG302760	S2EB-L2-48V	AG322760		
3 Form A 1 Form B (3a1b)	3 V DC	S3EB-3V	AG303160	S3EB-L2-3V	AG323160		
	5 V DC	S3EB-5V	AG303960	S3EB-L2-5V	AG323960		
	6 V DC	S3EB-6V	AG303260	S3EB-L2-6V	AG323260		
	12 V DC	S3EB-12V	AG303360	S3EB-L2-12V	AG323360		
	24 V DC	S3EB-24V	AG303460	S3EB-L2-24V	AG323460		
	48 V DC	S3EB-48V	AG303760	S3EB-L2-48V	AG323760		
4 Form A	3 V DC	S4EB-3V	AG304160	S4EB-L2-3V	AG324160		
	5 V DC	S4EB-5V	AG304960	S4EB-L2-5V	AG324960		
	6 V DC	S4EB-6V	AG304260	S4EB-L2-6V	AG324260		
	12 V DC	S4EB-12V	AG304360	S4EB-L2-12V	AG324360		
	24 V DC	S4EB-24V	AG304460	S4EB-L2-24V	AG324460		
	48 V DC	S4EB-48V	AG304760	S4EB-L2-48V	AG324760		

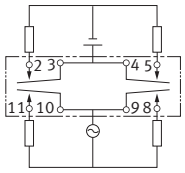
■Electrical life of S relay

Conditions: Resistive, at 20 times/min.

Type	Switching capacity	Number of operations
2 Form A 2 Form B (2a2b), 3 Form A 1 Form B (3a1b), 4 Form A	3 A 30 V DC	Min. 2×10^5
	4 A 250 V AC	Min. 10^5

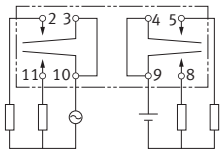
■NOTES

- Based on regulations regarding insulation distance, there is a restriction on same-channel load connections between terminals No. 2, 3 and 4,5, as well as between No. 8, 9 and 10, 11. See the figure below for an example.



●Between 2, 3 and 4, 5: same channels, therefore possible
●Between 10, 11 and 8, 9: same channels, therefore possible

good



●Between 2, 3 and 4, 5: different channels, therefore not possible
●Between 10, 11 and 8, 9: different channels, therefore not possible

No good

- Please note that when this relay (2 Form A 2 Form B (2a2b) type, 3 Form A1 Form B (3a1b) type) operates and releases,contacts a and b may go ON at thesame time.
- Regarding the set/reset pulse time of the latching type relay, it is recommended to apply rated voltage for minimum 30 ms pulse across the coil to secure the sure operation considering the ambient temperature and condition change through service life.

LD-P relay

Contact arrangement	Rated coil voltage	Part No.		Standard packing	
		Standard	Class F insulation	Carton	Outer carton
1 Form A	5 V DC	ALDP105W	ALDP1F05W	100 pieces	500 pieces
	6 V DC	ALDP106W	ALDP1F06W		
	9 V DC	ALDP109W	ALDP1F09W		
	12 V DC	ALDP112W	ALDP1F12W		
	18 V DC	ALDP118W	ALDP1F18W		
	24 V DC	ALDP124W	ALDP1F24W		

Note: The " W " at the end of the part number only appears on the inner and outer packaging. It does not appear on the relay itself. Please consult with our sales office on a tube packing type.

■Electrical life of LD-P relay

Conditions: Resistive, at 20°C, at 20 times/min.

Type	Switching capacity	Number of operations
1 Form A	5 A 125 V AC	Min. 2×10^5
	5 A 250 V AC	Min. 10^5
	3 A 30 V DC	Min. 10^5

■NOTES

●Certification

UL/C-UL and VDE certified ratings are displayed on the packaging box. (On the relay, only the certification marks are shown and not the certified ratings.Please refer to the product specification diagrams to see what is stamped.)

●Maximum Applied Voltage and Temperature Rise

Proper usage requires that the rated voltage be impressed on the coil. Note,however, that if a voltage greater than or equal to the maximum applied voltage is impressed on the coil, the coil may burn or its layers short due to the temperaturerise. Furthermore, do not exceed the usable ambient temperature range listed in the catalog.

NC relay

● Flat type (PC terminal)

Contact arrangement	Rated coil voltage	Dust cover		Sealed		Standard packing	
		Type No.	Part No.	Type No.	Part No.	Carton	Outer carton
2 Form C	3 V DC	NC2D-JP-DC3V	AW8818	NC2EBD-JP-DC3V	AW881860	20 pieces	200 pieces
	5 V DC	NC2D-JP-DC5V	AW8819	NC2EBD-JP-DC5V	AW881960		
	6 V DC	NC2D-JP-DC6V	AW8810	NC2EBD-JP-DC6V	AW881060		
	12 V DC	NC2D-JP-DC12V	AW8811	NC2EBD-JP-DC12V	AW881160		
	24 V DC	NC2D-JP-DC24V	AW8812	NC2EBD-JP-DC24V	AW881260		
	48 V DC	NC2D-JP-DC48V	AW8813	NC2EBD-JP-DC48V	AW881360		
	100 V DC	NC2D-JP-DC100V	AW8814	NC2EBD-JP-DC100V	AW881460		
4 Form C	3 V DC	NC4D-JP-DC3V	AW8848	NC4EBD-JP-DC3V	AW884860		
	5 V DC	NC4D-JP-DC5V	AW8849	NC4EBD-JP-DC5V	AW884960		
	6 V DC	NC4D-JP-DC6V	AW8840	NC4EBD-JP-DC6V	AW884060		
	12 V DC	NC4D-JP-DC12V	AW8841	NC4EBD-JP-DC12V	AW884160		
	24 V DC	NC4D-JP-DC24V	AW8842	NC4EBD-JP-DC24V	AW884260		
	48 V DC	NC4D-JP-DC48V	AW8843	NC4EBD-JP-DC48V	AW884360		
	100 V DC	NC4D-JP-DC100V	AW8844	NC4EBD-JP-DC100V	AW884460		

● Slim type (Dust cover)

Contact arrangement	Rated coil voltag	Plug-in terminal		PC terminal		Standard packing	
		Type No.	Part No.	Type No.	Part No.	Carton	Outer carton
2 Form C	3 V DC	NC2D-DC3V	AW8218	NC2D-P-DC3V	AW8418	20 pieces	200 pieces
	5 V DC	NC2D-DC5V	AW8219	NC2D-P-DC5V	AW8419		
	6 V DC	NC2D-DC6V	AW8210	NC2D-P-DC6V	AW8410		
	12 V DC	NC2D-DC12V	AW8211	NC2D-P-DC12V	AW8411		
	24 V DC	NC2D-DC24V	AW8212	NC2D-P-DC24V	AW8412		
	48 V DC	NC2D-DC48V	AW8213	NC2D-P-DC48V	AW8413		
	100 V DC	NC2D-DC100V	AW8214	NC2D-P-DC100V	AW8414		
4 Form C	3 V DC	NC4D-DC3V	AW8248	NC4D-P-DC3V	AW8448		
	5 V DC	NC4D-DC5V	AW8249	NC4D-P-DC5V	AW8449		
	6 V DC	NC4D-DC6V	AW8240	NC4D-P-DC6V	AW8440		
	12 V DC	NC4D-DC12V	AW8241	NC4D-P-DC12V	AW8441		
	24 V DC	NC4D-DC24V	AW8242	NC4D-P-DC24V	AW8442		
	48 V DC	NC4D-DC48V	AW8243	NC4D-P-DC48V	AW8443		
	100V DC	NC4D-DC100V	AW8244	NC4D-P-DC100V	AW8444		

● Slim type (Sealed)

Contact arrangement	Rated coil voltage	Plug-in terminal		PC terminal		Standard packing	
		Type No.	Part No.	Type No.	Part No.	Carton	Outer carton
2 Form C	3 V DC	NC2EBD-DC3V	AW821860	NC2EBD-P-DC3V	AW841860	20 pieces	200 pieces
	5 V DC	NC2EBD-DC5V	AW821960	NC2EBD-P-DC5V	AW841960		
	6 V DC	NC2EBD-DC6V	AW821060	NC2EBD-P-DC6V	AW841060		
	12 V DC	NC2EBD-DC12V	AW821160	NC2EBD-P-DC12V	AW841160		
	24 V DC	NC2EBD-DC24V	AW821260	NC2EBD-P-DC24V	AW841260		
	48 V DC	NC2EBD-DC48V	AW821360	NC2EBD-P-DC48V	AW841360		
	100 V DC	NC2EBD-DC100V	AW821460	NC2EBD-P-DC100V	AW841460		
4 Form C	3 V DC	NC4EBD-DC3V	AW824860	NC4EBD-P-DC3V	AW844860		
	5 V DC	NC4EBD-DC5V	AW824960	NC4EBD-P-DC5V	AW844960		
	6 V DC	NC4EBD-DC6V	AW824060	NC4EBD-P-DC6V	AW844060		
	12 V DC	NC4EBD-DC12V	AW824160	NC4EBD-P-DC12V	AW844160		
	24 V DC	NC4EBD-DC24V	AW824260	NC4EBD-P-DC24V	AW844260		
	48 V DC	NC4EBD-DC48V	AW824360	NC4EBD-P-DC48V	AW844360		
	100 V DC	NC4EBD-DC100V	AW824460	NC4EBD-P-DC100V	AW844460		

■Electrical life of NC relay

Conditions: Resistive, at 20°C, at 20 times/min.

Type		Switching capacity	Number of operations
2 Form C	Dust cover	5 A 30 V DC	Min. 5 x 10^5
		5 A 250 V AC	Min. 10^5
	Sealed	5 A 30 V DC	Min. 5 x 10^5
		3 A 250 V AC	Min. 10^5
4 Form C	Dust cover	5 A 30 V DC	Min. 5 x 10^5
		4 A 250 V AC	Min. 10^5
	Sealed	5 A 30 V DC	Min. 5 x 10^5
		2 A 250 V AC	Min. 10^5

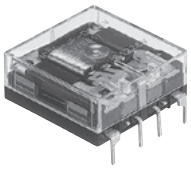
■NOTES

- Because the NC relay is polarized, thepositive “+” and negative “-” connections to the coil should be done as indicated onthe wiring diagram. If connected incorrectly, it may malfunction or fail to operate.
- While NC relays can be used with anytransmission-wave current to their operation, due to slight weakening of the force of magnetic attraction, decreased resistance to vibration and shock should be taken into account.

●When designing top and bottom view schematic diagrams, note that:

1) “Top view” wiring diagram is indicatedfor the flat series because terminals can be seen from above.

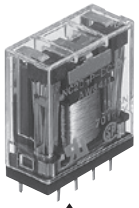
TOP VIEW



Flat series

2) “Bottom view” schematic diagram is indicated for the vertical series because terminals cannot be seen from above.

Vertical series

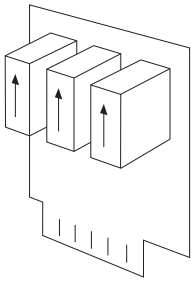


BOTTOM VIEW

●Cautions for close proximity mounting

When using slim series in close proximity, mount all relays facing the same direction. Different mounting directions may cause change in the relay characteristics because NC relays are polarized.

Same direction



PA-N relay

Contact arrangement	Rated coil voltage	Single side stable	Standard packing	
		Part No.	Carton (Tube)	Outer carton
1 Form A	3 V DC	APAN3103	25 pieces	1,000 pieces
	4.5 V DC	APAN314H		
	5 V DC	APAN3105		
	6 V DC	APAN3106		
	9 V DC	APAN3109		
	12 V DC	APAN3112		
	18 V DC	APAN3118		
	24 V DC	APAN3124		

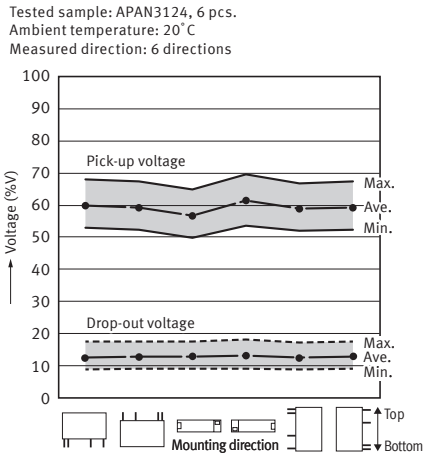
■Electrical life of PA-N relay

Conditions: Resistive, at 20 times/min.

Type	Switching capacity	Number of operations
1 Form A	3 A 250 V AC	Min. 10^5
	3 A 30 V DC	Min. 10^5
	5 A 250 V AC	Min. 5×10^4 (at 6 times/min. , ON:OFF = 1s:9s)
	5 A 30 V DC	Min. 5×10^4

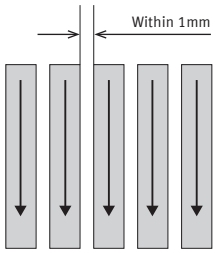
■NOTES

- If it includes ripple, the ripple factor should be less than 5%.
- Specification values for pick-up and drop-out voltages are for the relay mounting with its terminals below.

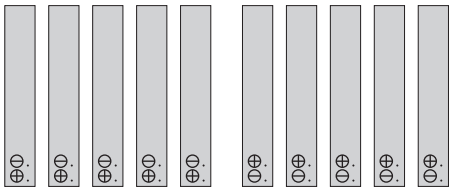


- When mounting the relays within 1 mm please notice the condition below.

1) Mount the relays in the same direction.



2) Coil terminals (Terminal No. 1 & 2) polarity should be arranged in the same direction.



PQ relay

Contact arrangement	Rated coil voltage	PC terminal		Standard packing	
		Type No.	Part No.	Carton	Outer carton
1 Form A	3 V DC	PQ1a−3V	APQ3318	100 pieces	500 pieces
	5 V DC	PQ1a−5V	APQ3319		
	6 V DC	PQ1a−6V	APQ3310		
	9 V DC	PQ1a−9V	APQ3315		
	12 V DC	PQ1a−12V	APQ3311		
	18 V DC	PQ1a−18V	APQ3316		
	24 V DC	PQ1a−24V	APQ3312		

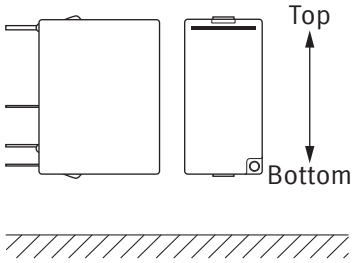
■Electrical life of PQ relay

Conditions: Resistive, at 20 times/min.

Type	Switching capacity	Number of operations
1 Form A	5 A 125 V AC	Min. 2×10^5
	5 A 250 V AC	Min. 10^5
	5 A 30 V DC	Min. 10^5

■NOTES

●Note about relay installation orientation



When installing with the relay terminals parallel to the ground, the contact terminals at the bottom and the coil terminals at the top, component friction will occur after numerous switching actions or due to vibration in the non-excitation state.
Since this may cause the relay to stop functioning when the pick-up voltage increases even if the nominal voltage is applied, please do not install using this orientation

PF relay

Contact arrangement	Rated coil voltage	Part No.		Standard packing	
		AgNi type	AgNi type/Au-plated	Carton（Tube）	Outer carton
1 Form A	4.5 V DC	APF1024H	APF1034H	20 pieces	1, 000 pieces
	5 V DC	APF10205	APF10305		
	6 V DC	APF10206	APF10306		
	9 V DC	APF10209	APF10309		
	12 V DC	APF10212	APF10312		
	18 V DC	APF10218	APF10318		
	24 V DC	APF10224	APF10324		
	48 V DC	APF10248	APF10348		
	60 V DC	APF10260	APF10360		
1 Form C	4.5 V DC	APF3024H	APF3034H		
	5 V DC	APF30205	APF30305		
	6 V DC	APF30206	APF30306		
	9 V DC	APF30209	APF30309		
	12 V DC	APF30212	APF30312		
	18 V DC	APF30218	APF30318		
	24 V DC	APF30224	APF30324		
	48 V DC	APF30248	APF30348		
	60 V DC	APF30260	APF30360		

■Electrical life of PF relay

Conditions: Resistive, at 6 times/min.

Type		Switching capacity	Number of operations
1a		6 A 250 V AC	Min. 5 x 10^4
1 Form C	N. O.	6 A 250 V AC	Min. 5 x 10^4
	N. C.	6 A 250 V AC	Min. 3 x 10^4

DS-P relay

Contact arrangement	Rated coil voltage	Single side stable		2 coil latching		Standard packing	
		Type No.	Part No.	Type No.	Part No.	Carton	Outer carton
1 Form A	3 V DC	DSP1a-DC3V	AGP2001	DSP1a-L2-DC3V	AGP2201	50 pieces	500 pieces
	5 V DC	DSP1a-DC5V	AGP2009	DSP1a-L2-DC5V	AGP2209		
	6 V DC	DSP1a-DC6V	AGP2002	DSP1a-L2-DC6V	AGP2202		
	9 V DC	DSP1a-DC9V	AGP2007	DSP1a-L2-DC9V	AGP2207		
	12 V DC	DSP1a-DC12V	AGP2003	DSP1a-L2-DC12V	AGP2203		
	24 V DC	DSP1a-DC24V	AGP2004	DSP1a-L2-DC24V	AGP2204		
1 Form A 1 Form B (1a1b)	3 V DC	DSP1-DC3V-F	AGP2011F	DSP1-L2-DC3V-F	AGP2211F		
	5 V DC	DSP1-DC5V-F	AGP2019F	DSP1-L2-DC5V-F	AGP2219F		
	6 V DC	DSP1-DC6V-F	AGP2012F	DSP1-L2-DC6V-F	AGP2212F		
	9 V DC	DSP1-DC9V-F	AGP2017F	DSP1-L2-DC9V-F	AGP2217F		
	12 V DC	DSP1-DC12V-F	AGP2013F	DSP1-L2-DC12V-F	AGP2213F		
	24 V DC	DSP1-DC24V-F	AGP2014F	DSP1-L2-DC24V-F	AGP2214F		
2 Form A	3 V DC	DSP2a-DC3V	AGP2021	DSP2a-L2-DC3V	AGP2221		
	5 V DC	DSP2a-DC5V	AGP2029	DSP2a-L2-DC5V	AGP2229		
	6 V DC	DSP2a-DC6V	AGP2022	DSP2a-L2-DC6V	AGP2222		
	9 V DC	DSP2a-DC9V	AGP2027	DSP2a-L2-DC9V	AGP2227		
	12 V DC	DSP2a-DC12V	AGP2023	DSP2a-L2-DC12V	AGP2223		
	24 V DC	DSP2a-DC24V	AGP2024	DSP2a-L2-DC24V	AGP2224		

Note: Reverse polarity types available (add suffix-R after Type No.)

■Electrical life of DSP relay

Conditions: Resistive, at 20 times/min.

Type	Switching capacity	Number of operations
1 Form A	8 A 250 V AC	Min. 10^5
	5 A 30 V DC	Min. 10^5
1 Form A 1 Form B (1a1b)	5 A 250 V AC	Min. 10^5
	5 A 30 V DC	Min. 10^5
2 Form A	5 A 250 V AC	Min. 10^5
	5 A 30 V DC	Min. 10^5

■NOTES

- When using, please be aware that the a contact and b contact sides of 1 Form A 1 Form B (1a1b) type may go on simultaneously at operate time and release time.
- Set the relay facing the terminals downward when set voltage and reset voltage are measured.

●Regarding the set / reset pulse time of the latching type relay, it is recommended to apply rated voltage for minimum 25 ms pulse across the coil to secure the sure operation considering the ambient temperature and condition change through service life.

LK-T relay

Contact arrangement	Rated coil voltage	Single side stable		Standard packing	
		Type No.	Part No.	Carton	Outer carton
1 Form A	5 V DC	LKT1aF-5V	ALKT329	100 pieces	500 pieces
	9 V DC	LKT1aF-9V	ALKT325		
	12 V DC	LKT1aF-12V	ALKT321		
	24 V DC	LKT1aF-24V	ALKT322		

Note: 3 V, 6 V and 18 V DC types are also available. Please consult our sales representatire.

■Electrical life of LK-T relay

Conditions: Resistive, at 20°C, ON:OFF = 1.5s:1.5s

Type	Switching capacity	Number of operations
1 Form A	5 A 277 V AC	Min. 10^5
	8 A 277 V AC	Min. 5×10^4

DW relay

■Standard type (8 A)

●Reflow compatible type

Contact arrangement	Rated coil voltage	Part No.		Standard packing	
		1 coil latching	2 coil latching	Carton	Outer carton
1 Form A	3 V DC	ADW1103W	ADW1203W	100 pieces	500 pieces
	5 V DC	ADW1105W	ADW1205W		
	6 V DC	ADW1106W	ADW1206W		
	9 V DC	ADW1109W	ADW1209W		
	12 V DC	ADW1112W	ADW1212W		
	24 V DC	ADW1124W	ADW1224W		

●IEC60335-1 compliant type

Contact arrangement	Rated coil voltage	Part No.		Standard packing	
		1 coil latching	2 coil latching	Carton	Outer carton
1 Form A	3 V DC	ADW1103TW	ADW1203TW	100 pieces	500 pieces
	5 V DC	ADW1105TW	ADW1205TW		
	6 V DC	ADW1106TW	ADW1206TW		
	9 V DC	ADW1109TW	ADW1209TW		
	12 V DC	ADW1112TW	ADW1212TW		
	24 V DC	ADW1124TW	ADW1224TW		

■Inrush type (16 A)

●Inrush current 100 A· IEC60335-1 compliant type

Contact arrangement	Rated coil voltage	Part No.		Standard packing	
		1 coil latching	2 coil latching	Carton	Outer carton
1 Form A	3 V DC	ADW1103HTW	ADW1203HTW	100 pieces	500 pieces
	5 V DC	ADW1105HTW	ADW1205HTW		
	6 V DC	ADW1106HTW	ADW1206HTW		
	9 V DC	ADW1109HTW	ADW1209HTW		
	12 V DC	ADW1112HTW	ADW1212HTW		
	24 V DC	ADW1124HTW	ADW1224HTW		

Note: *1. Please contact us for the reflow compatible type of inrush type (16 A, Inrush current 100 A · IEC60335-1 compliant type).

●Inrush current 100 A · Low profile type

Contact arrangement	Rated coil voltage	Part No.		Standard packing	
		1 coil latching	2 coil latching	Carton	Outer carton
1 Form A	3 V DC	ADW1103HLW	ADW1203HLW	100 pieces	500 pieces
	5 V DC	ADW1105HLW	ADW1205HLW		
	6 V DC	ADW1106HLW	ADW1206HLW		
	9 V DC	ADW1109HLW	ADW1209HLW		
	12 V DC	ADW1112HLW	ADW1212HLW		
	24 V DC	ADW1124HLW	ADW1224HLW		

■NOTES

- Carton packing is standard. Tube packing type is also available(except low profile type). Please contact us for details.
- “L” and “T” type are non-compliant reflow soldering.
- Low profile type is available (inrush type only) .
- The suffix “W” on the part number is only displayed on the inner and outer packaging. It is not displayed on the relay.

■Electrical life of DW relay

Condition: at 20 times/min.

Type	Load	Switching capacity	Number of operations
Standard type (8 A)	Resistive: All type	8 A 250 V AC	Min. 5 x 10^4
	Resistive: (IEC60335-1 compliant type)	5 A 250 V AC	Min. 10^5
Inrush type type (16 A)	Resistive	8 A 250 V AC	Min. 5 x 10^4
		16 A 277 V AC	Min. 2 x 10^4 (ON:OFF = 1s:5s)
	Tungsten	Inrush cureent 100 A 600 W 120 V AC	Min. 2.5 x 10^4 (ON:OFF = 1s:59s)

■NOTES

●Set / reset pulse time of latching type relay

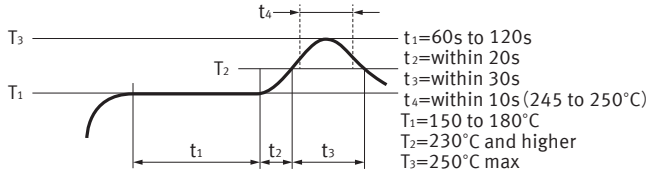
Regarding the set / reset pulse time of the latching type relay, it is recommended to apply rated coil voltage for minimum 30 ms pulse across the coil to secure the sure operation considering the ambient temperature and condition change through service life

・In case of automatic soldering, following conditions should be observed.

[Condition of I.R.S (recommended)]

Recommended condition:

Reflow; 1 time, measurement area; PCB surface where the relay is soldered



・Caution

Even if used in the recommended condition, the relay may be affected by heat stress caused by a busy layout, reflow heating process, PCB type (metal etc.) and so on. Therefore, please check the quality and reliability under the actual worst condition.

LK-Q relay

Contact arrangement	Rated coil voltage	TV-5		TV-8		Standard packing	
		Type No.	Part No.	Type No.	Part No.	Carton	Outer carton
1 Form A	5 V DC	LKQ1aF-5V-TV5	ALKQ3295	LKQ1aF-5V-TV8	ALKQ3298	100 pieces	500 pieces
	9 V DC	LKQ1aF-9V-TV5	ALKQ3255	LKQ1aF-9V-TV8	ALKQ3258		
	12 V DC	LKQ1aF-12V-TV5	ALKQ3215	LKQ1aF-12V-TV8	ALKQ3218		
	24 V DC	LKQ1aF-24V-TV5	ALKQ3225	LKQ1aF-24V-TV8	ALKQ3228		

■Electrical life of LK-Q relay

Conditions: Resistive, at 20°C, ON:OFF = 1.5s:1.5s

Type		Switching capacity	Number of operations
1 Form A	TV-5	5 A 277 V AC	Min. 10^5
	TV-8	8 A 277 V AC	Min. 5×10^4

ST relay

Contact arrangement	Rated coil voltage	Single side stable		2 coil latching		Standard packing	
		Type No.	Part No.	Type No.	Part No.	Carton	Outer carton
1 Form A 1 Form B (1a1b)	3 V DC	ST1−DC3V−F	AR2011F	ST1−L2−DC3V−F	AR2211F	50 pieces	500 pieces
	5 V DC	ST1−DC5V−F	AR2019F	ST1−L2−DC5V−F	AR2219F		
	6 V DC	ST1−DC6V−F	AR2012F	ST1−L2−DC6V−F	AR2212F		
	9 V DC	ST1−DC9V−F	AR2015F	ST1−L2−DC9V−F	AR2215F		
	12 V DC	ST1−DC12V−F	AR2013F	ST1−L2−DC12V−F	AR2213F		
	24 V DC	ST1−DC24V−F	AR2014F	ST1−L2−DC24V−F	AR2214F		
	48 V DC	ST1−DC48V−F	AR2017F	ST1−L2−DC48V−F	AR2217F		
2 Form A	3 V DC	ST2−DC3V−F	AR2021F	ST2−L2−DC3V−F	AR2221F		
	5 V DC	ST2−DC5V−F	AR2029F	ST2−L2−DC5V−F	AR2229F		
	6 V DC	ST2−DC6V−F	AR2022F	ST2−L2−DC6V−F	AR2222F		
	9 V DC	ST2−DC9V−F	AR2025F	ST2−L2−DC9V−F	AR2225F		
	12 V DC	ST2−DC12V−F	AR2023F	ST2−L2−DC12V−F	AR2223F		
	24 V DC	ST2−DC24V−F	AR2024F	ST2−L2−DC24V−F	AR2224F		
	48 V DC	ST2−DC48V−F	AR2027F	ST2−L2−DC48V−F	AR2227F		

■Electrical life of ST relay

Conditions: Resistive, ON:OFF = 1s:5s

Type	Switching capacity	Number of operations
1 Form A 1 Form B (1a1b) , 2 Form A	8 A 250 V AC	Min. 10^5

■NOTES

- When using, please be aware that the a contact and b contact sides of 1 Form A 1 Form B (1a1b) type may go on simultaneously at operate time and release time.
- Set the relay facing the terminals downward when set voltage and reset voltage are measured.

●Regarding the set / reset pulse time of the latching type relay, it is recommended to apply rated voltage for minimum 50 ms pulse across the coil to secure the sure operation considering the ambient temperature and condition change through service life.

DE relay

Contact arrangement	Rated coil voltage	Single side stable		2 coil latching		Standard packing	
		Type No.	Part No.	Type No.	Part No.	Carton	Outer carton
1 Form A	5 V DC	DE1a-5V	ADE109	DE1a-L2-5V	ADE129	20 pieces	500 pieces
	12 V DC	DE1a-12V	ADE103	DE1a-L2-12V	ADE123		
	24 V DC	DE1a-24V	ADE104	DE1a-L2-24V	ADE124		
1 Form A 1 Form B (1a1b)	5 V DC	DE1a1b-5V	ADE309	DE1a1b-L2-5V	ADE329		
	12 V DC	DE1a1b-12V	ADE303	DE1a1b-L2-12V	ADE323		
	24 V DC	DE1a1b-24V	ADE304	DE1a1b-L2-24V	ADE324		
2 Form A	5 V DC	DE2a-5V	ADE209	DE2a-L2-5V	ADE229		
	12 V DC	DE2a-12V	ADE203	DE2a-L2-12V	ADE223		
	24 V DC	DE2a-24V	ADE204	DE2a-L2-24V	ADE224		

■Electrical lifeof DE relay

Conditions: Resistive, at 20 times/min.

Type	Switching capacity	Number of operations
1 Form A	10 A 250 V AC	Min. 10^5
	10 A 30 V DC	Min. 10^5
1 Form A 1 Form B (1a1b)	8 A 250 V AC	Min. 10^5
	8 A 30 V DC	Min. 10^5
2 Form A	8 A 250 V AC	Min. 10^5
	8 A 30 V DC	Min. 5×10^4

■NOTES

- When using, please be aware that the a contact and b contact sides of 1 Form A 1 Form B (1a1b) type may go on simultaneously at operate time and release time.
- Set the relay facing the terminals downward when set voltage and reset voltage are measured.

●Regarding the set / reset pulse time of the latching type relay, it is recommended to apply rated voltage for minimum 50 ms pulse across the coil to secure the sure operation considering the ambient temperature and condition change through service life.

DK relay

Contact arrangement	Rated coil voltage	Single side stable		2 coil latching		Standard packing	
		Type No.	Part No.	Type No.	Part No.	Carton	Outer carton
1 Form A	3 V DC	DK1a-3V-F	AW3011F	DK1a-L2-3V-F	AW3211F	50 pieces	500 pieces
	5 V DC	DK1a-5V-F	AW3019F	DK1a-L2-5V-F	AW3219F		
	6 V DC	DK1a-6V-F	AW3012F	DK1a-L2-6V-F	AW3212F		
	9 V DC	DK1a-9V-F	AW3017F	DK1a-L2-9V-F	AW3217F		
	12 V DC	DK1a-12V-F	AW3013F	DK1a-L2-12V-F	AW3213F		
	24 V DC	DK1a-24V-F	AW3014F	DK1a-L2-24V-F	AW3214F		
1 Form A 1 Form B (1a1b)	3 V DC	DK1a1b-3V	AW3031	DK1a1b-L2-3V	AW3231		
	5 V DC	DK1a1b-5V	AW3039	DK1a1b-L2-5V	AW3239		
	6 V DC	DK1a1b-6V	AW3032	DK1a1b-L2-6V	AW3232		
	9 V DC	DK1a1b-9V	AW3037	DK1a1b-L2-9V	AW3237		
	12 V DC	DK1a1b-12V	AW3033	DK1a1b-L2-12V	AW3233		
	24 V DC	DK1a1b-24V	AW3034	DK1a1b-L2-24V	AW3234		
2 Form A	3 V DC	DK2a-3V	AW3021	DK2a-L2-3V	AW3221		
	5 V DC	DK2a-5V	AW3029	DK2a-L2-5V	AW3229		
	6 V DC	DK2a-6V	AW3022	DK2a-L2-6V	AW3222		
	9 V DC	DK2a-9V	AW3027	DK2a-L2-9V	AW3227		
	12 V DC	DK2a-12V	AW3023	DK2a-L2-12V	AW3223		
	24 V DC	DK2a-24V	AW3024	DK2a-L2-24V	AW3224		

■Electrical lifeof DK relay

Conditions: Resistive, at 20 times/min.

Type	Switching capacity	Number of operations
1 Form A	10 A 250 V AC	Min. 10^5
	10 A 30 V DC	Min. 10^5
1 Form A 1 Form B (1a1b), 2 Form A	8 A 250 V AC	Min. 10^5
	8 A 30 V DC	Min. 10^5

■NOTES

- When using, please be aware that the a contact and b contact sides of 1 Form A 1 Form B (1a1b) type may go on simultaneously at operate time and release time.
- Set the relay facing the terminals downward when set voltage and reset voltage are measured.

●Regarding the set / reset pulse time of the latching type relay, it is recommended to apply rated voltage for minimum 50 ms pulse across the coil to secure the sure operation considering the ambient temperature and condition change through service life.

DY relay

Contact arrangement	Rated coil voltage	Part No.		Standard packing	
		Single side stable	2 coil latching	Carton	Outer carton
1 Form A	3 V DC	ADY10003	ADY12003	50 pieces	500 pieces
	5 V DC	ADY10005	ADY12005		
	6 V DC	ADY10006	ADY12006		
	12 V DC	ADY10012	ADY12012		
	24 V DC	ADY10024	ADY12024		
1 Form A 1 Form B (1a1b)	3 V DC	ADY30003	ADY32003		
	5 V DC	ADY30005	ADY32005		
	6 V DC	ADY30006	ADY32006		
	12 V DC	ADY30012	ADY32012		
	24 V DC	ADY30024	ADY32024		

■Electrical life of DY relay

Conditions: Resistive, at 20 times/min.

Type	Switching capacity	Number of operations
1 Form A	10 A 250 V AC	Min. 10^5
	10 A 30 V DC	Min. 10^5
1 Form A 1 Form B (1a1b)	8 A 250 V AC	Min. 10^5
	8 A 30 V DC	Min. 10^5

■NOTES

- When using, please be aware that the a contact and b contact sides of 1 Form A 1 Form B (1a1b) type may go on simultaneously at operate time and release time.
- Set the relay facing the terminals downward when set voltage and reset voltage are measured.

●Regarding the set / reset pulse time of the latching type relay, it is recommended to apply rated voltage for minimum 50 ms pulse across the coil to secure the sure operation considering the ambient temperature and condition change through service life.

LQ relay

Contact arrangement	Rated coil voltage	Part No.		Standard packing	
		Class B insulation	Class F insulation	Carton	Outer carton
1 Form A	5 V DC	ALQ305	ALQ3F05	100 pieces	500 pieces
	6 V DC	ALQ306	ALQ3F06		
	9 V DC	ALQ309	ALQ3F09		
	12 V DC	ALQ312	ALQ3F12		
	18 V DC	ALQ318	ALQ3F18		
	24 V DC	ALQ324	ALQ3F24		
1 Form C	5 V DC	ALQ105	ALQ1F05		
	6 V DC	ALQ106	ALQ1F06		
	9 V DC	ALQ109	ALQ1F09		
	12 V DC	ALQ112	ALQ1F12		
	18 V DC	ALQ118	ALQ1F18		
	24 V DC	ALQ124	ALQ1F24		

■Electrical life of LQ relay

Conditions: Resistive, at 20°C, at 20 times/min. , with diode

Type		Switching capacity	Number of operations
1 Form A		5 A 30 V DC	Min. 10^5
		10 A 125 V AC	Min. 5×10^4
		5 A 250 V AC	Min. 5×10^4
1 Form C	N. O.	5 A 30 V DC	Min. 10^5
		10 A 125 V AC	Min. 5×10^4
		5 A 250 V AC	Min. 5×10^4
	N. C.	3 A 125 V AC	Min. 2×10^5
		2 A 250 V AC	Min. 2×10^5
		1 A 30 V DC	Min. 10^5

JS relay

Contact arrangement	Rated coil voltage	Sealed		Flux resistant		Standard packing	
		Type No.	Part No.	Type No.	Part No.	Carton	Outer carton
1 Form A Standard type	5 V DC	JS1a-5V-F	AJS3319F	JS1aF-5V-F	AJS3219F	100 pieces	500 pieces
	6 V DC	JS1a-6V-F	AJS3310F	JS1aF-6V-F	AJS3210F		
	9 V DC	JS1a-9V-F	AJS3315F	JS1aF-9V-F	AJS3215F		
	12 V DC	JS1a-12V-F	AJS3311F	JS1aF-12V-F	AJS3211F		
	18 V DC	JS1a-18V-F	AJS3316F	JS1aF-18V-F	AJS3216F		
	24 V DC	JS1a-24V-F	AJS3312F	JS1aF-24V-F	AJS3212F		
	48 V DC	JS1a-48V-F	AJS3313F	JS1aF-48V-F	AJS3213F		
1 Form A Long life type	5 V DC	–	–	JS1aPF-B-5V-F	AJS821981F		
	6 V DC	–	–	JS1aPF-B-6V-F	AJS821081F		
	9 V DC	–	–	JS1aPF-B-9V-F	AJS821581F		
	12 V DC	–	–	JS1aPF-B-12V-F	AJS821181F		
	18 V DC	–	–	JS1aPF-B-18V-F	AJS821681F		
	24 V DC	–	–	JS1aPF-B-24V-F	AJS821281F		
	48 V DC	–	–	JS1aPF-B-48V-F	AJS821381F		
1 Form C Standard type	5 V DC	JS1-5V-F	AJS1319F	JS1F-5V-F	AJS1219F		
	6 V DC	JS1-6V-F	AJS1310F	JS1F-6V-F	AJS1210F		
	9 V DC	JS1-9V-F	AJS1315F	JS1F-9V-F	AJS1215F		
	12 V DC	JS1-12V-F	AJS1311F	JS1F-12V-F	AJS1211F		
	18 V DC	JS1-18V-F	AJS1316F	JS1F-18V-F	AJS1216F		
	24 V DC	JS1-24V-F	AJS1312F	JS1F-24V-F	AJS1212F		
	48 V DC	JS1-48V-F	AJS1313F	JS1F-48V-F	AJS1213F		

Notes: 1. Class B and F coil insulation types available. Ex) JS1aF-B-12V-F, JS1aF-F-12V-F
2. 1 Form A long life type is Flux-resistant only (Class B insulation only).
3. EN60335-1 GWT compliant types available. When ordering, please add suffix “T”. Ex) JS1aF-B-12V-FT
4. Surge voltage 6kV types available. When ordering, please add suffix “6K” (except for Long life type and EN60335-1 GWT compliant type). Ex) JS1aF-B-12V-F-6K

■Electrical life of JS relay

Conditions: Resistive, at 20°C, at 20 times/min.

Type	Switching capacity	Number of operations
1 Form A, 1 Form C Standard type	10 A 125 V AC	Min. 10^5
	6 A 277 V AC	Min. 10^5
	5 A 30 V DC	Min. 10^5
	10 A 250 V AC*	Min. 5 x 10^4*
1 Form A Long life type	10 A 277 V AC	Min. 2 x 10^5
	5 A 30 V DC	Min. 10^5

*Only N.O. contact

JW relay

●Standard type (5 A)

Contact arrangement	Rated coil voltage	Sealed		Flux resistant		Standard packing	
		Type No.	Part No.	Type No.	Part No.	Carton	Outer carton
1 Form A	5 V DC	JW1aSN-DC5V-F	AJW1219F	JW1aHN-DC5V-F	AJW1519F	100 pieces	500 pieces
	6 V DC	JW1aSN-DC6V-F	AJW1210F	JW1aHN-DC6V-F	AJW1510F		
	9 V DC	JW1aSN-DC9V-F	AJW1215F	JW1aHN-DC9V-F	AJW1515F		
	12 V DC	JW1aSN-DC12V-F	AJW1211F	JW1aHN-DC12V-F	AJW1511F		
	24 V DC	JW1aSN-DC24V-F	AJW1212F	JW1aHN-DC24V-F	AJW1512F		
	48 V DC	JW1aSN-DC48V-F	AJW1213F	JW1aHN-DC48V-F	AJW1513F		
1 Form C	5 V DC	JW1SN-DC5V	AJW3219	JW1HN-DC5V	AJW3519		
	6 V DC	JW1SN-DC6V	AJW3210	JW1HN-DC6V	AJW3510		
	9 V DC	JW1SN-DC9V	AJW3215	JW1HN-DC9V	AJW3515		
	12 V DC	JW1SN-DC12V	AJW3211	JW1HN-DC12V	AJW3511		
	24 V DC	JW1SN-DC24V	AJW3212	JW1HN-DC24V	AJW3512		
	48 V DC	JW1SN-DC48V	AJW3213	JW1HN-DC48V	AJW3513		
2 Form A	5 V DC	JW2aSN-DC5V	AJW5219	JW2aHN-DC5V	AJW5519		
	6 V DC	JW2aSN-DC6V	AJW5210	JW2aHN-DC6V	AJW5510		
	9 V DC	JW2aSN-DC9V	AJW5215	JW2aHN-DC9V	AJW5515		
	12 V DC	JW2aSN-DC12V	AJW5211	JW2aHN-DC12V	AJW5511		
	24 V DC	JW2aSN-DC24V	AJW5212	JW2aHN-DC24V	AJW5512		
	48 V DC	JW2aSN-DC48V	AJW5213	JW2aHN-DC48V	AJW5513		
2 Form C	5 V DC	JW2SN-DC5V	AJW7219	JW2HN-DC5V	AJW7519		
	6 V DC	JW2SN-DC6V	AJW7210	JW2HN-DC6V	AJW7510		
	9 V DC	JW2SN-DC9V	AJW7215	JW2HN-DC9V	AJW7515		
	12 V DC	JW2SN-DC12V	AJW7211	JW2HN-DC12V	AJW7511		
	24 V DC	JW2SN-DC24V	AJW7212	JW2HN-DC24V	AJW7512		
	48 V DC	JW2SN-DC48V	AJW7213	JW2HN-DC48V	AJW7513		

Note: Class B coil insulation type is available. Ex) JW1aSN-B-DC12V-F

●High capacity type(10 A)

Contact arrangement	Rated coil voltage	Sealed		Flux resistant		Standard packing	
		Type No.	Part No.	Type No.	Part No.	Carton	Outer carton
1 Form A	5 V DC	JW1aFSN-DC5V-F	AJW2219F	JW1aFHN-DC5V-F	AJW2519F	100 pieces	500 pieces
	6 V DC	JW1aFSN-DC6V-F	AJW2210F	JW1aFHN-DC6V-F	AJW2510F		
	9 V DC	JW1aFSN-DC9V-F	AJW2215F	JW1aFHN-DC9V-F	AJW2515F		
	12 V DC	JW1aFSN-DC12V-F	AJW2211F	JW1aFHN-DC12V-F	AJW2511F		
	24 V DC	JW1aFSN-DC24V-F	AJW2212F	JW1aFHN-DC24V-F	AJW2512F		
	48 V DC	JW1aFSN-DC48V-F	AJW2213F	JW1aFHN-DC48V-F	AJW2513F		
1 Form C	5 V DC	JW1FSN-DC5V	AJW4219	JW1FHN-DC5V	AJW4519		
	6 V DC	JW1FSN-DC6V	AJW4210	JW1FHN-DC6V	AJW4510		
	9 V DC	JW1FSN-DC9V	AJW4215	JW1FHN-DC9V	AJW4515		
	12 V DC	JW1FSN-DC12V	AJW4211	JW1FHN-DC12V	AJW4511		
	24 V DC	JW1FSN-DC24V	AJW4212	JW1FHN-DC24V	AJW4512		
	48 V DC	JW1FSN-DC48V	AJW4213	JW1FHN-DC48V	AJW4513		

Note: Class B coil insulation type is available. Ex) JW1aFSN-B-DC12V-F

■Electrical life of JW relay

Conditions: Resistive, at 20°C, Flux resistant: at 20 times/min. • Sealed: 6 times/min.

Type	Switching capacity	Number of operations
1 Form A, 1 Form C, 2 Form A, 2 Form C (Standard)	5 A 250 V AC	Min. 10^5
	5 A 30 V DC	Min. 10^5
1 Form A, 1 Form C (High capacity)	10 A 250 V AC	Min. 10^5
	10 A 30 V DC	Min. 10^5

LK-G relay

Contact arrangement	Rated coil voltage	Part No.						Standard packing	
		10 A, 1 mm contact gap		16 A, 1 mm contact gap		16 A Standard		Carton	Outer carton
		Type No.	Part No.	Type No.	Part No.	Type No.	Part No.		
1 Form A	5 V DC	LKG1aF-5V-10-1	ALKG3291	LKG1aF-5V-16-1	ALKG8291	LKG1aF-5V-16	ALKG8290	100 pieces	500 pieces
	9 V DC	LKG1aF-9V-10-1	ALKG3251	LKG1aF-9V-16-1	ALKG8251	LKG1aF-9V-16	ALKG8250		
	12 V DC	LKG1aF-12V-10-1	ALKG3211	LKG1aF-12V-16-1	ALKG8211	LKG1aF-12V-16	ALKG8210		
	24 V DC	LKG1aF-24V-10-1	ALKG3221	LKG1aF-24V-16-1	ALKG8221	LKG1aF-24V-16	ALKG8220		

■Electrical life of LK-G relay

Conditions: Resistive, at 20°C, at 6 times/min. (ON:OFF = 1s:9s), with diode

Type	Switching capacity	Number of operations
10 A, 1 mm contact gap	10 A 277 V AC	Min. 10^5
16 A, 1 mm contact gap	16 A 277 V AC	Min. 5×10^4
16 A Standard	16 A 277 V AC	Min. 5×10^4

LK-P relay

Contact arrangement	Rated coil voltage	Part No.		Standard packing	
		Type No.	Part No.	Carton	Outer carton
1 Form A	5 V DC	LKP1aF-5V	ALKP329	100 pieces	500 pieces
	9 V DC	LKP1aF-9V	ALKP325		
	12 V DC	LKP1aF-12V	ALKP321		
	24 V DC	LKP1aF-24V	ALKP322		

■Electrical life of LK-P relay

Conditions: Resistive, at 20°C, ON:OFF = 1.5s:1.5s

Type	Switching capacity	Number of operations
1 Form A	10 A 277 V AC	Min. 10^5
	5 A 30 V DC	Min. 10^5

SP relay

Contact arrangement	Rated coil voltage	Single side stable		2 coil latching		Standard packing	
		Type No.	Part No.	Type No.	Part No.	Carton	Outer carton
2 Form C	3 V DC	SP2-DC3V	AR1028	SP2-L2-DC3V	AR1228	20 pieces	200 pieces
	5 V DC	SP2-DC5V	AR1029	SP2-L2-DC5V	AR1229		
	6 V DC	SP2-DC6V	AR1020	SP2-L2-DC6V	AR1220		
	12 V DC	SP2-DC12V	AR1021	SP2-L2-DC12V	AR1221		
	24 V DC	SP2-DC24V	AR1022	SP2-L2-DC24V	AR1222		
	48 V DC	SP2-DC48V	AR1023	SP2-L2-DC48V	AR1223		
4 Form C	3 V DC	SP4-DC3V	AR1048	SP4-L2-DC3V	AR1248	10 pieces	100 pieces
	5 V DC	SP4-DC5V	AR1049	SP4-L2-DC5V	AR1249		
	6 V DC	SP4-DC6V	AR1040	SP4-L2-DC6V	AR1240		
	12 V DC	SP4-DC12V	AR1041	SP4-L2-DC12V	AR1241		
	24 V DC	SP4-DC24V	AR1042	SP4-L2-DC24V	AR1242		
	48 V DC	SP4-DC48V	AR1043	SP4-L2-DC48V	AR1243		

■Electrical life of SP relay

Conditions: Resistive, at 20 times/min.

Type	Switching capacity	Number of operations
2 Form C	15 A 250 V AC	Min. 10^5
	10 A 30 V DC	Min. 10^5
4 Form C	10 A 250 V AC	Min. 10^5
	10 A 30 V DC	Min. 10^5

■NOTES

- Set the relay facing the terminals downward when set voltage and reset voltage are measured.
- Regarding the set/reset pulse time of the latching type relay,it is recommended to apply rated voltage for minimum 125ms pulse across the coil to secure the sure operation considering the ambient temperature and condition change through service life.

DJ relay

■StandardType (Flux resistant)

Contact arrangement	Rated coil voltage	Part No.			Standard packing	
		Single side stable	1 coil latching	2 coil latching	Carton	Outer carton
1 Form C	5 V DC	ADJ15005	ADJ11005	ADJ13005	100 pieces	500 pieces
	6 V DC	ADJ15006	ADJ11006	ADJ13006		
	12 V DC	ADJ15012	ADJ11012	ADJ13012		
	24 V DC	ADJ15024	ADJ11024	ADJ13024		
	48 V DC	ADJ15048	ADJ11048	ADJ13048		
1 Form A	5 V DC	ADJ25005	ADJ21005	ADJ23005		
	6 V DC	ADJ25006	ADJ21006	ADJ23006		
	12 V DC	ADJ25012	ADJ21012	ADJ23012		
	24 V DC	ADJ25024	ADJ21024	ADJ23024		
	48 V DC	ADJ25048	ADJ21048	ADJ23048		
1 Form B	5 V DC	ADJ35005	Please use 1 Form A	Please use 1 Form A		
	6 V DC	ADJ35006				
	12 V DC	ADJ35012				
	24 V DC	ADJ35024				
	48 V DC	ADJ35048				
1 Form A 1 Form B (1a1b)	5 V DC	ADJ45005	ADJ41005	ADJ43005		
	6 V DC	ADJ45006	ADJ41006	ADJ43006		
	12 V DC	ADJ45012	ADJ41012	ADJ43012		
	24 V DC	ADJ45024	ADJ41024	ADJ43024		
	48 V DC	ADJ45048	ADJ41048	ADJ43048		
2 Form C	5 V DC	ADJ55005	ADJ51005	ADJ53005		
	6 V DC	ADJ55006	ADJ51006	ADJ53006		
	12 V DC	ADJ55012	ADJ51012	ADJ53012		
	24 V DC	ADJ55024	ADJ51024	ADJ53024		
	48 V DC	ADJ55048	ADJ51048	ADJ53048		
2 Form A	5 V DC	ADJ65005	ADJ61005	ADJ63005		
	6 V DC	ADJ65006	ADJ61006	ADJ63006		
	12 V DC	ADJ65012	ADJ61012	ADJ63012		
	24 V DC	ADJ65024	ADJ61024	ADJ63024		
	48 V DC	ADJ65048	ADJ61048	ADJ63048		
2 Form B	5 V DC	ADJ75005	Please use 2 Form A	Please use 2 Form A		
	6 V DC	ADJ75006				
	12 V DC	ADJ75012				
	24 V DC	ADJ75024				
	48 V DC	ADJ75048				

■With a test button (Flux resistant)

Contact arrangement	Rated coil voltage	Part No.			Standard packing	
		Single side stable	1 coil latching	2 coil latching	Carton	Outer carton
1 Form C	5 V DC	ADJ15105	ADJ11105	ADJ13105	100 pieces	500 pieces
	6 V DC	ADJ15106	ADJ11106	ADJ13106		
	12 V DC	ADJ15112	ADJ11112	ADJ13112		
	24 V DC	ADJ15124	ADJ11124	ADJ13124		
	48 V DC	ADJ15148	ADJ11148	ADJ13148		
1 Form A	5 V DC	ADJ25105	ADJ21105	ADJ23105		
	6 V DC	ADJ25106	ADJ21106	ADJ23106		
	12 V DC	ADJ25112	ADJ21112	ADJ23112		
	24 V DC	ADJ25124	ADJ21124	ADJ23124		
	48 V DC	ADJ25148	ADJ21148	ADJ23148		
1 Form B	5 V DC	ADJ35105	Please use 1 Form A	Please use 1 Form A		
	6 V DC	ADJ35106				
	12 V DC	ADJ35112				
	24 V DC	ADJ35124				
	48 V DC	ADJ35148				

■Sealed

Contact arrangement	Rated coil voltage	Part No.			Standard packing	
		Single side stable	1 coil latching	2 coil latching	Carton	Outer carton
1 Form C	5 V DC	ADJ16005	ADJ12005	ADJ14005	100 pieces	500 pieces
	6 V DC	ADJ16006	ADJ12006	ADJ14006		
	12 V DC	ADJ16012	ADJ12012	ADJ14012		
	24 V DC	ADJ16024	ADJ12024	ADJ14024		
	48 V DC	ADJ16048	ADJ12048	ADJ14048		
1 Form A	5 V DC	ADJ26005	ADJ22005	ADJ24005		
	6 V DC	ADJ26006	ADJ22006	ADJ24006		
	12 V DC	ADJ26012	ADJ22012	ADJ24012		
	24 V DC	ADJ26024	ADJ22024	ADJ24024		
	48 V DC	ADJ26048	ADJ22048	ADJ24048		
1 Form B	5 V DC	ADJ36005	Please use 1 Form A	Please use 1 Form A		
	6 V DC	ADJ36006				
	12 V DC	ADJ36012				
	24 V DC	ADJ36024				
	48 V DC	ADJ36048				
1 Form A 1 Form B (1a1b)	5 V DC	ADJ46005	ADJ42005	ADJ44005		
	6 V DC	ADJ46006	ADJ42006	ADJ44006		
	12 V DC	ADJ46012	ADJ42012	ADJ44012		
	24 V DC	ADJ46024	ADJ42024	ADJ44024		
	48 V DC	ADJ46048	ADJ42048	ADJ44048		
2 Form C	5 V DC	ADJ56005	ADJ52005	ADJ54005		
	6 V DC	ADJ56006	ADJ52006	ADJ54006		
	12 V DC	ADJ56012	ADJ52012	ADJ54012		
	24 V DC	ADJ56024	ADJ52024	ADJ54024		
	48 V DC	ADJ56048	ADJ52048	ADJ54048		
2 Form A	5 V DC	ADJ66005	ADJ62005	ADJ64005		
	6 V DC	ADJ66006	ADJ62006	ADJ64006		
	12 V DC	ADJ66012	ADJ62012	ADJ64012		
	24 V DC	ADJ66024	ADJ62024	ADJ64024		
	48 V DC	ADJ66048	ADJ62048	ADJ64048		
2 Form B	5 V DC	ADJ76005	Please use 2 Form A	Please use 2 Form A		
	6 V DC	ADJ76006				
	12 V DC	ADJ76012				
	24 V DC	ADJ76024				
	48 V DC	ADJ76048				

■Electrical life of DJ relay

Conditions: Resistive, at 20 times/min.

Type	Switching capacity	Number of operations
1 Form C, 1 Form A, 1 Form B	16 A 250 V AC	Min. 10^5
1 Form A 1 Form B (1a1b), 2 Form C, 2 Form A, 2 Form B	10 A 250 V AC	Min. 10^5

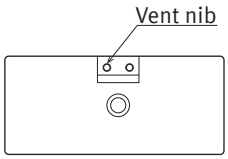
■NOTES

- When using, please be aware that the a contact and b contact sides of 1 Form A 1 Form B (1a1b) type may go on simultaneously at operate time and release time.

●Regarding the set/reset pulse time of the latching type relay,it is recommended to apply rated voltage for minimum 50 ms pulse across the coil to secure the sure operation considering the ambient temperature and condition change through service life.

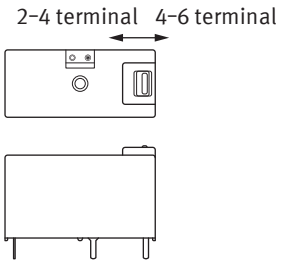
●**Electrical life (Sealed)**

In order to obtain the full rated life cycles,the relay should be properly vented by removing the vent nib after the soldering/ washing process.



●**Test button (manual lever) operation**

The relay contacts switch over as follows:



JV-N relay

Contact arrangement	Rated coil voltage	Part No.		Standard packing	
		Type No.	Part No.	Carton	Outer carton
1 Form A	4.5 V DC	JVN1aF-4.5V-F	AJVN5247F	100 pieces	1,000 pieces
	6 V DC	JVN1aF-6V-F	AJVN5240F		
	9 V DC	JVN1aF-9V-F	AJVN5245F		
	12 V DC	JVN1aF-12V-F	AJVN5241F		
	18 V DC	JVN1aF-18V-F	AJVN5246F		
	24 V DC	JVN1aF-24V-F	AJVN5242F		
	48 V DC	JVN1aF-48V-F	AJVN5243F		
	100 V DC	JVN1aF-100V-F	AJVN5244F		

■Electrical life of JV-N relay

Conditions: Resistive, at 20°C, at 20 times/min.

Type	Switching capacity	Number of operations
1 Form A	10 A 125 V AC	Min. 10^5
	10 A 30 V DC	Min. 10^5
	10 A 277 V AC	Min. 5×10^4
	16 A 125 V AC	Min. 3×10^4

LE relay

Contact arrangement	Rated coil voltage	Part No.	Standard packing	
			Carton	Outer carton
1 Form A (Standard type: 400 mW)	5 V DC	ALE1P○05	100 pieces	500 pieces
	6 V DC	ALE1P○06		
	9 V DC	ALE1P○09		
	12 V DC	ALE1P○12		
	18 V DC	ALE1P○18		
	24 V DC	ALE1P○24		
	48 V DC	ALE1P○48		
1 Form A (High sensitivity type: 200 mW)	5 V DC	ALE7P○05		
	6 V DC	ALE7P○06		
	9 V DC	ALE7P○09		
	12 V DC	ALE7P○12		
	18 V DC	ALE7P○18		
	24 V DC	ALE7P○24		
	48 V DC	ALE7P○48		

○: Input the following letter : class B:B, Class F:F

■Electrical life of LE relay

Conditions: Resistive, at 20°C, at 20 times/min.

Type	Switching capacity	Number of operations
1 Form A	16 A 250 V AC	Min. 10^5

LZ relay

Contact arrangement	Rated coil voltage	Part No.		Standard packing	
		Class B insulation	Class F insulation	Carton	Outer carton
1 Form C	5 V DC	ALZ11B05W	ALZ11F05W	100 pieces	500 pieces
	9 V DC	ALZ11B09W	ALZ11F09W		
	12 V DC	ALZ11B12W	ALZ11F12W		
	18 V DC	ALZ11B18W	ALZ11F18W		
	24 V DC	ALZ11B24W	ALZ11F24W		
1 Form A	5 V DC	ALZ51B05W	ALZ51F05W		
	9 V DC	ALZ51B09W	ALZ51F09W		
	12 V DC	ALZ51B12W	ALZ51F12W		
	18 V DC	ALZ51B18W	ALZ51F18W		
	24 V DC	ALZ51B24W	ALZ51F24W		

Note: The “W” at the end of the part number only appears on the inner and outer packaging. It does not appear on the relay itself. Please contact our sales representative on a tube packing type.

■Electrical life of LZ relay

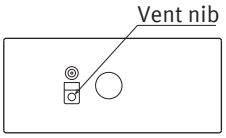
Conditions: Resistive, at 20°C, at 20 times/min.

Type		Switching capacity	Number of operations
1 Form A		16 A 250 V AC	Min. 10^5
1 Form C	N. O.	16 A 250 V AC	Min. 10^5
	N. C.	16 A 250 V AC	Min. 5×10^4

■NOTES

●Electrical life (Sealed type)

In order to obtain the full rated life cycles, the relay should be properly vented by removing the vent nib after the soldering/ washing process.



LZ-N relay

Contact arrangement	Rated coil voltage	Part No.		Standard packing	
		Class B insulation	Class F insulation	Carton	Outer carton
1 Form C	5 V DC	ALZN1B05W	ALZN1F05W	100 pieces	500 pieces
	9 V DC	ALZN1B09W	ALZN1F09W		
	12 V DC	ALZN1B12W	ALZN1F12W		
	18 V DC	ALZN1B18W	ALZN1F18W		
	24 V DC	ALZN1B24W	ALZN1F24W		
1 Form A	5 V DC	ALZN5B05W	ALZN5F05W		
	9 V DC	ALZN5B09W	ALZN5F09W		
	12 V DC	ALZN5B12W	ALZN5F12W		
	18 V DC	ALZN5B18W	ALZN5F18W		
	24 V DC	ALZN5B24W	ALZN5F24W		

Note: The “W” at the end of the part number only appears on the inner and outer packaging. It does not appear on the relay itself.

■Electrical life of LZ-N relay

Conditions: Resistive, at 20°C

Type		Switching capacity	Number of operations
1 Form A		16 A 250 V AC	Min. 10^5 (at 20 times/min., ON:OFF = 1.5s:1.5s)
1 Form C	N. O.	16 A 250 V AC	Min. 5×10^4 (at 20 times/min., ON:OFF = 1.5s:1.5s)
	N. C.	16 A 250 V AC	Min. 10^4 (at 20 times/min., ON:OFF = 1.5s:1.5s)

LF relay

Contact arrangement	Rated coil voltage	Part No.		Standard packing	
		TMP type	PC terminal	Carton	Outer carton
1 Form A	5 V DC	ALF1T05	ALF1P05	50 pieces	200 pieces
	6 V DC	ALF1T06	ALF1P06		
	9 V DC	ALF1T09	ALF1P09		
	12 V DC	ALF1T12	ALF1P12		
	18 V DC	ALF1T18	ALF1P18		
	24 V DC	ALF1T24	ALF1P24		

■Electrical life of LF relay

Condition: at 20°C

Type	Load	Switching capacity	Number of operations
1 Form A	Resistive load	20 A 250 V AC (cosφ = 1)	Min. 10^5 (at 20 times/min.)
		25A 250V AC (cosφ = 1)	Min. 10^4 (at 20 times/min.)
	Compressor load	Inrush 70 A (cosφ = 0.7) , Steady 20 A (cosφ = 0.9) 250 V AC	Min. 10^5 (at 20 times/min.)
	Invertor load	Inrush 200 A, Steady 20 A 100 V AC	Min. 3 x 10^4 (at 10 times/min.)
		Inrush 100 A, Steady 10 A 200 V AC	Min. 3 x 10^4 (at 10 times/min.)

JT-V relay

■Dust cover

●PC terminal

Contact arrangement	Rated coil voltage	Type No.	Part No.	Standard packing	
				Carton	Outer carton
1 Form A	12 V DC	JTV1aG-PA-12V	AJTV311	50 pieces	500 pieces
	18 V DC	JTV1aG-PA-18V	AJTV318		
	24 V DC	JTV1aG-PA-24V	AJTV312		
	48 V DC	JTV1aG-PA-48V	AJTV313		
1 Form C	12 V DC	JTV1G-PA-12V	AJTV321		
	18 V DC	JTV1G-PA-18V	AJTV328		
	24 V DC	JTV1G-PA-24V	AJTV322		
	48 V DC	JTV1G-PA-48V	AJTV323		

●TMP type

Contact arrangement	Rated coil voltage	Type No.	Part No.	Standard packing	
				Carton	Outer carton
1 Form A	12 V DC	JTV1aG-TMP-12V	AJTV211	50 pieces	300 pieces
	18 V DC	JTV1aG-TMP-18V	AJTV218		
	24 V DC	JTV1aG-TMP-24V	AJTV212		
	48 V DC	JTV1aG-TMP-48V	AJTV213		
1 Form C	12 V DC	JTV1G-TMP-12V	AJTV221		
	18 V DC	JTV1G-TMP-18V	AJTV228		
	24 V DC	JTV1G-TMP-24V	AJTV222		
	48 V DC	JTV1G-TMP-48V	AJTV223		

■Sealed

●PC terminal

Contact arrangement	Rated coil voltage	Type No.	Part No.	Standard packing	
				Carton	Outer carton
1 Form A	12 V DC	JTV1aS-PA-12V	AJTV351	50 pieces	500 pieces
	18 V DC	JTV1aS-PA-18V	AJTV358		
	24 V DC	JTV1aS-PA-24V	AJTV352		
	48 V DC	JTV1aS-PA-48V	AJTV353		
1 Form C	12 V DC	JTV1S-PA-12V	AJTV361		
	18 V DC	JTV1S-PA-18V	AJTV368		
	24 V DC	JTV1S-PA-24V	AJTV362		
	48 V DC	JTV1S-PA-48V	AJTV363		

●TMP type

Contact arrangement	Rated coil voltage	Type No.	Part No.	Standard packing	
				Carton	Outer carton
1 Form A	12 V DC	JTV1aS-TMP-12V	AJTV251	50 pieces	300 pieces
	18 V DC	JTV1aS-TMP-18V	AJTV258		
	24 V DC	JTV1aS-TMP-24V	AJTV252		
	48 V DC	JTV1aS-TMP-48V	AJTV253		
1 Form C	12 V DC	JTV1S-TMP-12V	AJTV261		
	18 V DC	JTV1S-TMP-18V	AJTV268		
	24 V DC	JTV1S-TMP-24V	AJTV262		
	48 V DC	JTV1S-TMP-48V	AJTV263		

■Electrical life of JT-V relay

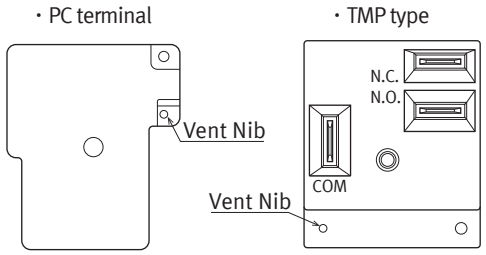
Conditions: Resistive, at 20°C, at 20 times/min.

Type		Switching capacity	Number of operations
1 Form A		20 A 277 V AC	Min. 10^5
1 Form C	N. O.	20 A 277 V AC	Min. 10^5
	N. C.	10 A 277 V AC	Min. 10^5

■NOTES

●Electrical life (Sealed type)

In order to obtain the full rated life cycles, the relay should be properly vented by removing the vent nib after the soldering/ washing process.



JT-N relay

●PC terminal

Contact arrangement	Rated coil voltage	PC terminal		Standard packing	
		Type No.	Part No.	Carton	Outer carton
1 Form A	5 V DC	JTN1aS-PA-F-DC5V	AJT3595	50 pieces	500 pieces
	6 V DC	JTN1aS-PA-F-DC6V	AJT3505		
	9 V DC	JTN1aS-PA-F-DC9V	AJT3555		
	12 V DC	JTN1aS-PA-F-DC12V	AJT3515		
	15 V DC	JTN1aS-PA-F-DC15V	AJT3575		
	18 V DC	JTN1aS-PA-F-DC18V	AJT3585		
	24 V DC	JTN1aS-PA-F-DC24V	AJT3525		
1 Form C	5 V DC	JTN1S-PA-F-DC5V	AJT3695	50 pieces	500 pieces
	6 V DC	JTN1S-PA-F-DC6V	AJT3605		
	9 V DC	JTN1S-PA-F-DC9V	AJT3655		
	12 V DC	JTN1S-PA-F-DC12V	AJT3615		
	15 V DC	JTN1S-PA-F-DC15V	AJT3675		
	18 V DC	JTN1S-PA-F-DC18V	AJT3685		
	24 V DC	JTN1S-PA-F-DC24V	AJT3625		

●TMP type

Contact arrangement	Rated coil voltage	TMP type		Standard packing	
		Type No.	Part No.	Carton	Outer carton
1 Form A	5 V DC	JTN1aS-TMP-F-DC5V	AJT2595	50 pieces	300 pieces
	6 V DC	JTN1aS-TMP-F-DC6V	AJT2505		
	9 V DC	JTN1aS-TMP-F-DC9V	AJT2555		
	12 V DC	JTN1aS-TMP-F-DC12V	AJT2515		
	15 V DC	JTN1aS-TMP-F-DC15V	AJT2575		
	18 V DC	JTN1aS-TMP-F-DC18V	AJT2585		
	24 V DC	JTN1aS-TMP-F-DC24V	AJT2525		
1 Form C	5 V DC	JTN1S-TMP-F-DC5V	AJT2695	50 pieces	300 pieces
	6 V DC	JTN1S-TMP-F-DC6V	AJT2605		
	9 V DC	JTN1S-TMP-F-DC9V	AJT2655		
	12 V DC	JTN1S-TMP-F-DC12V	AJT2615		
	15 V DC	JTN1S-TMP-F-DC15V	AJT2675		
	18 V DC	JTN1S-TMP-F-DC18V	AJT2685		
	24 V DC	JTN1S-TMP-F-DC24V	AJT2625		

■Electrical life of JT-N relay

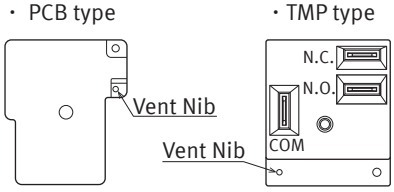
Conditions: Resistive, at 20°C, at 20 times/min.

Type		Switching capacity	Number of operations
1 Form A		20 A 277 V AC	Min. 10^5
1 Form C	N. O.	20 A 277 V AC	Min. 10^5
	N. C.	10 A 277 V AC	Min. 10^5

■NOTES

●**Electrical life (Sealed type)**

In order to obtain the full rated life cycles, the relay should be properly vented by removing the vent nib after the soldering/ washing process.



LF-G relay

Contact arrangement	Rated coil voltage	Part No.				Standard packing	
		Contact gap 1.5 mm		Contact gap 1.8 mm		Carton	Outer carton
		Standard	High capacity	Standard	High capacity		
1 Form A	9 V DC	ALFG1PF09	ALFG2PF09	ALFG1PF091	ALFG2PF091	50 pieces	200 pieces
	12 V DC	ALFG1PF12	ALFG2PF12	ALFG1PF121	ALFG2PF121		
	18 V DC	ALFG1PF18	ALFG2PF18	ALFG1PF181	ALFG2PF181		
	24 V DC	ALFG1PF24	ALFG2PF24	ALFG1PF241	ALFG2PF241		

■Electrical life of LF-G relay

Type	Contact gap	Load	Switching capacity	Number of operations
Standard	1.5 mm / 1.8 mm	Resistive	22 A 250 V AC	Min. 3 x 10^4 (at 20 times/min.)
		Destructive	22 A 250 V AC (cosφ = 0.8)	Min. 3 x 10^4 (ON:OFF = 0.1s:10s)
		Over load	35 A 250 V AC (cosφ = 0.8)	Min. 50 (ON:OFF = 0.1s:10s)
High capacity	1.5 mm	Destructive	31 A 250 V AC (cosφ = 0.8)	Min. 3 x 10^4 (ON:OFF = 0.1s:10s)
		Over load	47 A 250 V AC (cosφ = 0.8)	Min. 50 (ON:OFF = 0.1s:10s)
	1.8 mm	Destructive	33 A 250 V AC (cosφ = 0.8)	Min. 3 x 10^4 (ON:OFF = 0.1s:10s)
		Over load	50 A 250 V AC (cosφ = 0.8)	Min. 50 (ON:OFF = 0.1s:10s)

■NOTES

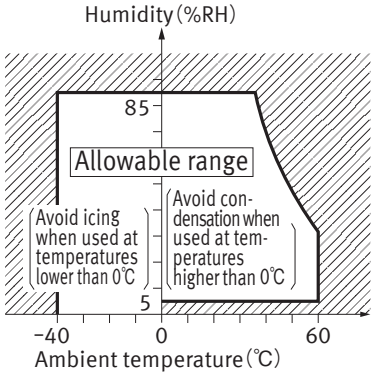
●Usage, transport and storage conditions

1) Temperature:
–40 to +60°C (When rated coil voltage applied)
–40 to +85°C (When coil holding voltage is 45% to 80% of the rated coil voltage)

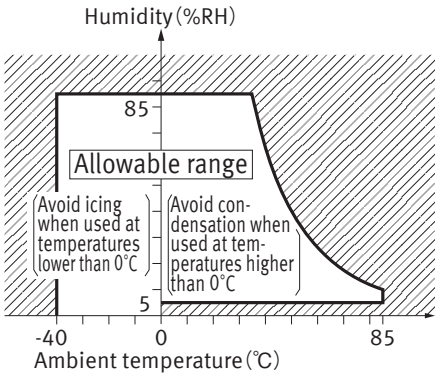
2) Humidity: 5 to 85% RH
(Avoid freezing and condensation.)
The humidity range varies with the temperature. Use within the range indicated in the graph below.

3) Atmospheric pressure: 86 to 106 kPa

Temperature and humidity range for usage, transport, and storage



-40 to +85°C (When 45% to 80%V of coil holding voltage)



HE relay

■PC terminal

Contact arrangement	Rated coil voltage	Type No.	Part No.	Standard packing	
				Carton	Outer carton
1 Form A	6 V DC	HE1aN-P-DC6V	AHE1290	25 pieces	100 pieces
	12 V DC	HE1aN-P-DC12V	AHE1291		
	24 V DC	HE1aN-P-DC24V	AHE1292		
	48 V DC	HE1aN-P-DC48V	AHE1293		
	100 V DC	HE1aN-P-DC100V	AHE1294		
	110 V DC	HE1aN-P-DC110V	AHE1296		

■Plug-in terminal

Contact arrangement	Type	Rated coil voltage	Type No.	Part No.	Standard packing	
					Carton	Outer carton
1 Form A	DC	6 V DC	HE1aN-DC6V	AHE1210	20 pieces	100 pieces
		12 V DC	HE1aN-DC12V	AHE1211		
		24 V DC	HE1aN-DC24V	AHE1212		
		48 V DC	HE1aN-DC48V	AHE1213		
		100 V DC	HE1aN-DC100V	AHE1214		
		110 V DC	HE1aN-DC110V	AHE1216		
	AC	12 V AC	HE1aN-AC12V	AHE1251		
		24 V AC	HE1aN-AC24V	AHE1252		
		48 V AC	HE1aN-AC48V	AHE1253		
		100/120 V AC	HE1aN-AC100V	AHE1254		
		200/240 V AC	HE1aN-AC200V	AHE1255		
2 Form A	DC	6 V DC	HE2aN-DC6V	AHE2210		
		12 V DC	HE2aN-DC12V	AHE2211		
		24 V DC	HE2aN-DC24V	AHE2212		
		48 V DC	HE2aN-DC48V	AHE2213		
		100 V DC	HE2aN-DC100V	AHE2214		
		110 V DC	HE2aN-DC110V	AHE2216		
	AC	12 V AC	HE2aN-AC12V	AHE2251		
		24 V AC	HE2aN-AC24V	AHE2252		
		48 V AC	HE2aN-AC48V	AHE2253		
		100/120 V AC	HE2aN-AC100V	AHE2254		
		200/240 V AC	HE2aN-AC200V	AHE2255		

■TM type

Contact arrangement	Type	Rated coil voltage	Type No.	Part No.	Standard packing	
					Carton	Outer carton
1 Form A	DC	6 V DC	HE1aN-Q-DC6V	AHE1220	20 pieces	100 pieces
		12 V DC	HE1aN-Q-DC12V	AHE1221		
		24 V DC	HE1aN-Q-DC24V	AHE1222		
		48 V DC	HE1aN-Q-DC48V	AHE1223		
		100 V DC	HE1aN-Q-DC100V	AHE1224		
		110 V DC	HE1aN-Q-DC110V	AHE1226		
	AC	12 V AC	HE1aN-Q-AC12V	AHE1261		
		24 V AC	HE1aN-Q-AC24V	AHE1262		
		48 V AC	HE1aN-Q-AC48V	AHE1263		
		100/120 V AC	HE1aN-Q-AC100V	AHE1264		
		200/240 V AC	HE1aN-Q-AC200V	AHE1265		
2 Form A	DC	6 V DC	HE2aN-Q-DC6V	AHE2220		
		12 V DC	HE2aN-Q-DC12V	AHE2221		
		24 V DC	HE2aN-Q-DC24V	AHE2222		
		48 V DC	HE2aN-Q-DC48V	AHE2223		
		100 V DC	HE2aN-Q-DC100V	AHE2224		
		110 V DC	HE2aN-Q-DC110V	AHE2226		
	AC	12 V AC	HE2aN-Q-AC12V	AHE2261		
		24 V AC	HE2aN-Q-AC24V	AHE2262		
		48 V AC	HE2aN-Q-AC48V	AHE2263		
		100/120 V AC	HE2aN-Q-AC100V	AHE2264		
		200/240 V AC	HE2aN-Q-AC200V	AHE2265		

■Screw terminal

Contact arrangement	Type	Rated coil voltage	Type No.	Part No.	Standard packing	
					Carton	Outer carton
1 Form A	DC	6 V DC	HE1aN-S-DC6V	AHE1230	10 pieces	50 pieces
		12 V DC	HE1aN-S-DC12V	AHE1231		
		24 V DC	HE1aN-S-DC24V	AHE1232		
		48 V DC	HE1aN-S-DC48V	AHE1233		
		100 V DC	HE1aN-S-DC100V	AHE1234		
		110 V DC	HE1aN-S-DC110V	AHE1236		
	AC	12 V AC	HE1aN-S-AC12V	AHE1271		
		24 V AC	HE1aN-S-AC24V	AHE1272		
		48 V AC	HE1aN-S-AC48V	AHE1273		
		100/120 V AC	HE1aN-S-AC100V	AHE1274		
		200/240 V AC	HE1aN-S-AC200V	AHE1275		
2 Form A	DC	6 V DC	HE2aN-S-DC6V	AHE2230		
		12 V DC	HE2aN-S-DC12V	AHE2231		
		24 V DC	HE2aN-S-DC24V	AHE2232		
		48 V DC	HE2aN-S-DC48V	AHE2233		
		100 V DC	HE2aN-S-DC100V	AHE2234		
		110 V DC	HE2aN-S-DC110V	AHE2236		
	AC	12 V AC	HE2aN-S-AC12V	AHE2271		
		24 V AC	HE2aN-S-AC24V	AHE2272		
		48 V AC	HE2aN-S-AC48V	AHE2273		
		100/120 V AC	HE2aN-S-AC100V	AHE2274		
		200/240 V AC	HE2aN-S-AC200V	AHE2275		

■Electrical life of HE relay

Conditions: Resistive, at 20 times/min.

Type	Switching capacity	Number of operations
1 Form A	30 A 250 V AC	Min. 2×10^5
2 Form A	20 A 250 V AC	Min. 2×10^5
	25 A 277 V AC	Min. 10^5

■NOTES

- The dust cover should not be removed since doing so may alter the characteristics.
- Avoid use under severe environmental conditions, such as high humidity, organic gas or in dust,oily locations and locations subjected to extremely frequent shock or vibrations.
- When mounting, use springwashers. Optimum fastening torque ranges from 49 to 68.6 N·m (5 to 7 kgf·cm).
- Firmly insert the receptacles so thatthere is no slack or looseness. To remove a receptacle, 19.6 to 39.2 N (2 to 4 kg) of pulling strength is required. Do not remove more than one receptacle at one time. Always remove one receptacle at a time and pull it straight outwards.
- When using the AC type, the operate ime due to the in-rush phase is 20 ms or more.
  Therefore, it is necessary for you to verify the characteristics for your actual circuit.
- When using the push-on blocks forthe screw terminal type, use crimped terminals and tighten the screw-down terminals to the torque below.

M4.5 screw	147 to 166.6 N·cm (15 to 17 kgf·cm)
M4 screw	117.6 to 137 N·cm (12 to 14 kgf·cm)
M3.5 screw	78.4 to 98 N·cm (8 to 10 kgf·cm)

HE-S relay

Contact arrangement	Rated coil voltage	Part No.		Standard packing	
		Standard type	Long life type	Carton	Outer carton
2 Form A	6 V DC	AHES3190	AHES3290	25 pieces	100 pieces
	9 V DC	AHES3195	AHES3295		
	12 V DC	AHES3191	AHES3291		
	18 V DC	AHES3192	AHES3292		
	48 V DC	AHES3193	AHES3293		
2 Form A 1 Form B (2a1b)	6 V DC	AHES4190	AHES4290		
	9 V DC	AHES4195	AHES4295		
	12 V DC	AHES4191	AHES4291		
	18 V DC	AHES4192	AHES4292		
	48 V DC	AHES4193	AHES4293		

■Electrical life of HE-S relay

Regarding N.C. contact, only the 2 Form A 1 Form B (2a1b) type applies.

●Standard type

Contact	Load	Switching capacity	Number of operations
N. O.	Resistive	20 A 277 V AC	Min.10^5 (ON:OFF = 1s:9s)
		35 A 277 V AC	Min. 3 x 10^4 (ON:OFF = 1s:9s)
	Inductive	35 A 250 V AC (cosφ = 0.8)	Min. 3 x 10^4 (ON:OFF = 0.1s:10s)
N. C.	Resistive	1 A 277 V AC	Min. 10^5 (ON:OFF = 1s:9s)
		1 A 30 V DC	Min. 10^5 (ON:OFF = 1s:9s)

●Long life type

Contact	Load	Switching capacity	Number of operations
N.O.	Resistive	20 A 277 V AC	Min. 2 x 10^5 (ON:OFF = 1s:9s)
		30 A 220 V AC	Min.10^5 (ON:OFF = 1s:9s)
		35 A 277 V AC	Min. 5 x 10^4 (ON:OFF = 1s:9s)
	Inductive	35 A 250 V AC (cosφ = 0.8)	Min. 5 x 10^4 (ON:OFF = 0.1s:10s)
N.C.	Resistive	1 A 277 V AC	Min.10^5 (ON:OFF = 1s:9s)
		1 A 30 V DC	Min.10^5 (ON:OFF = 1s:9s)

■NOTES

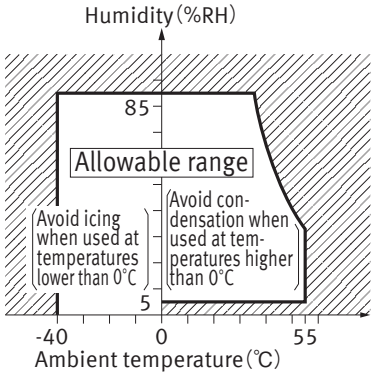
●Usage, transport and storage conditions

1) Temperature:
–40 to +55°C (When applied coil holding voltage is 30% to 110% V of rated coil voltage)
–40 to +85°C (When applied coil holding voltage is 30% to 60% V of rated coil voltage or storage)

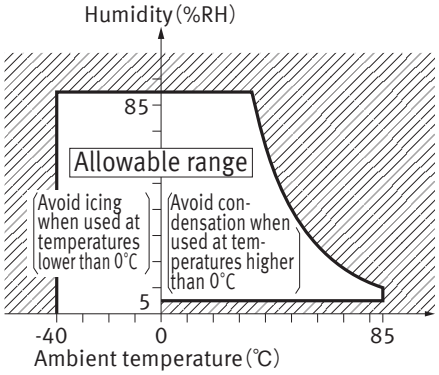
2) Humidity: 5 to 85% RH (Avoid icing and condensation)
In addition the humidity range depends on temperature. The allowable ranges are as follows;

3) Air pressure: 86 to 106 kPa

Allowable range of temperature and humidity for operation, transport and storage.
[Coil holding voltage: 30% to 110%V]



[Coil holding voltage: 30% to 60%V]



●**Solder and cleaning conditions**

Please obey the following conditions.

1) Automatic soldering

(1) Preheating

Temperature	Within 120°C (solder surface terminal portion)
Time	Within 120 s

(2) Soldering

Solder temperature	260 ±5°C
Soldering time	Within 10 s

In case of manual soldering, following conditions should be observed.

2) Manual soldering

Solder temperature	Max. 270°C	Max. 350°C
Soldering time	Within 10 s	Within 5 s

* Effects of soldering heat on the relays vary depending on the PC board. So please confirm actual soldering condition with the PC board used for assembling.

3) Do not clean this relay by immersion, since the relay is not sealed.
Also, be careful not to allow flux to overflow above the PC board or enter the inside of the relay

HE relay PV type

Type	Rated coil voltage	Type No.	Part No.	Standard packing	
				Carton	Outer carton
35 A	6 V DC	HE1aN-P-DC6V-H18	AHE4290	25 pieces	100 pieces
	9 V DC	HE1aN-P-DC9V-H18	AHE4295		
	12 V DC	HE1aN-P-DC12V-H18	AHE4291		
	24 V DC	HE1aN-P-DC24V-H18	AHE4292		
48 A	6 V DC	HE1aN-P-DC6V-Y5	AHE32X0N		
	9 V DC	HE1aN-P-DC9V-Y5	AHE32X5N		
	12 V DC	HE1aN-P-DC12V-Y5	AHE32X1N		
	24 V DC	HE1aN-P-DC24V-Y5	AHE32X2N		
90 A	6 V DC	HE1aN-W-DC6V-Y6	AHE52X0N		
	9 V DC	HE1aN-W-DC9V-Y6	AHE52X5N		
	12 V DC	HE1aN-W-DC12V-Y6	AHE52X1N		
	24 V DC	HE1aN-W-DC24V-Y6	AHE52X2N		

* 35 A 6 V, 12 V and 24 V DC type: Certified by UL,CSA (35 A 9 V type: Certified by UL,CSA and VDE)

■Electrical life of HE relay PV type

Conditions: Resistive

Type	Switching capacity	Number of operations
35 A	30 A 250 V AC	Min. 2 x 10^5 (at 20°C,at 20 times/min.)
	35 A 277 V AC	Min. 3 x 10^4 (at 85°C, ON:OFF = 1s:9s)
48 A	48 A 277 V AC	Min. 3 x 10^4 (at 85°C, ON:OFF = 1s:9s)
	48 A 30 V DC	
90 A	60 A 277 V AC	Min. 10^4 (at 85°C, ON:OFF = 1s:9s)
	80 A 277 V AC	Min. 10^4 (at 20°C, ON:OFF = 1s:9s)
	90 A 277 V AC	Min. 10^3 (at 85°C, ON:OFF = 1s:9s)

■NOTES

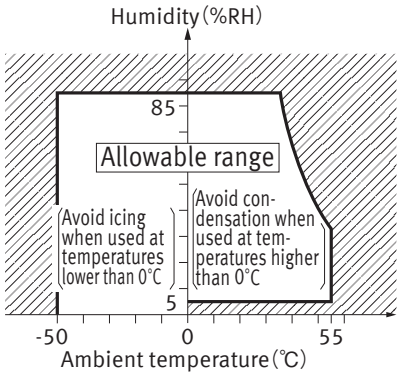
●Usage, transport and storage conditions

1) Temperature:
–50 to +55°C
–50 to +85°C
(When applied coil holding voltage is 50% to 60% of rated coil voltage)

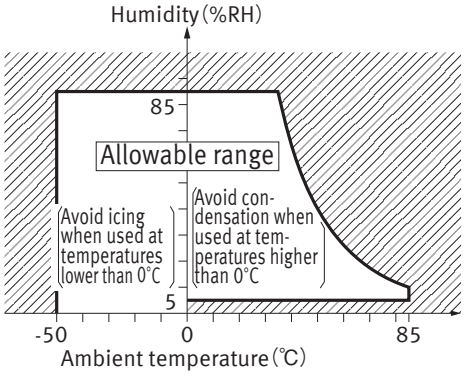
2) Humidity: 5 to 85% RH (Avoid icing and condensation)
The humidity range varies with the temperature. Use within the range indicated in the graph below.

3) Atmospheric pressure: 86 to 106 kPa

Temperature and humidity range for usage, transport, and storage



–50 to +85°C –58 to (When applied coil holding voltage is 50% to 60% of rated coil voltage)



DJ-H relay

■StandardType(Without manual switch))

Contact arrangement	Rated coil voltage	Part No.		Standard packing	
		1 coil latching	2 coil latching	Carton	Outer carton
1 Form A	5 V DC	ADJH21005	ADJH23005	50 pieces	200 pieces
	12 V DC	ADJH21012	ADJH23012		
	24 V DC	AHJD21024	ADJH23024		

* Reverse polarity type available. (1 coil latching type: ADJH220**, 2 coil latching type: ADJH240**)

■Manual switch type

Contact arrangement	Rated coil voltage	Part No.		Standard packing	
		1 coil latching	2 coil latching	Carton	Outer carton
1 Form A	5 V DC	ADJH21105	ADJH23105	50 pieces	200 pieces
	12 V DC	ADJH21112	ADJH23112		
	24 V DC	AHJD21124	ADJH23124		

* Reverse polarity type available. (1 coil latching type: ADJH221**, 2 coil latching type: ADJH241**)

■Electrical life of DJ-H relay

Condition: ON:OFF = 1s:9s

Type	Load		Switching capacity	Number of operations
1 Form A	Resistive		25 A 277 V AC	Min. 10^5
			50 A 277 V AC	Min. 10^4
	Inrush load	Tungsten	2,400 W 120 V AC	Min. 2.5×10^4 (ON:OFF = 1s:59s)
		Electronic ballast	20 A 277 V AC	Min. 6×10^3
		Capacitive (IEC 60669-1)	20 A 250 V AC 200 μF	Min. 3×10^4

■NOTES

●Regarding the set / reset pulse time of the latching type relay,it is recommended to apply rated voltage for minimum 100 ms pulse across the coil to secure the sure operation considering the ambient temperature and condition change through service life.

DZ-S relay

Contact arrangement	Rated coil voltage	Part No.		Standard packing	
		1 coil latching	2 coil latching	Carton	Outer carton
1 Form A	5 V DC	ADZS12105	ADZS22105	20 pieces	200 pieces
	12 V DC	ADZS12112	ADZS22112		
	24 V DC	ADZS12124	ADZS22124		

■Electrical life of DZ-S relay

Type	Load	Switching capacity	Number of operations
1 Form A	Resistive	90 A 250 V AC	Min. 10^4 (ON:OFF = 2s:4s)
	UC3 Class (IEC62055-31)*	90 A 276 V AC (COSφ = 1.0:5,000 cycles, COSφ = 0.5:5,000 cycles)	Min. 10^4 (ON:OFF = 10s:20s)

* Based on IEC62055-31 UC3, inductive load test was conducted after resistive load test, and expressed as total.

HE-N relay

Contact arrangement	Rated coil voltage	Type No.	Part No.	Standard packing	
				Carton	Outer carton
1 Form A	6 V DC	HE1aN-W-DC6V-Y7	AHE62X0N	10 pieces	50 pieces
	9 V DC	HE1aN-W-DC9V-Y7	AHE62X5N		
	12 V DC	HE1aN-W-DC12V-Y7	AHE62X1N		
	24 V DC	HE1aN-W-DC24V-Y7	AHE62X2N		

■Electrical life of HE-N relay

Conditions: Resistive

Type	Switching capacity	Number of operations
1 Form A	120 A 480 V AC	Min. 10^3 (at 85°C, ON:OFF = 1s:9s)
	55 A 800 V AC	Min. 10^4 (at 85°C, ON:OFF = 1s:9s)

■NOTES

●Usage, transport and storage conditions

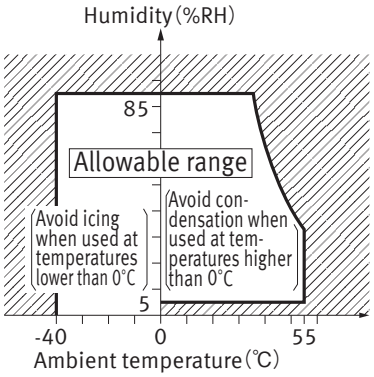
1) Ambient temperature:
–40 to +55°C
(When coil holding voltage is 40 to 100%V of rated voltage.)
–40 to +85°C
(When coil holding voltage is 50 to 60%V of rated voltage or storage.)

2) Humidity: 5 to 85%RH
(Avoid icing when using at temperatures lower than 0°C.)

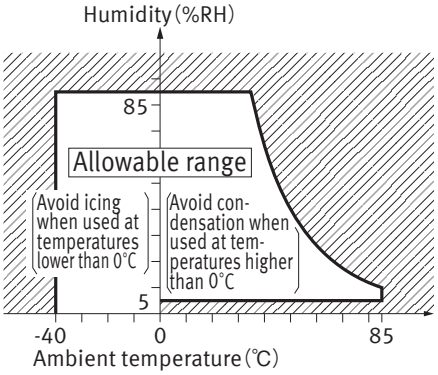
Note: In addition the humidity range depends on temperature.The allowable ranges are as shown in the figure.

Temperature and humidity range for usage, storage and transport

[Coil holding voltage 40 to 100%V]



[Coil holding voltage 50 to 60%V]



●Coil surge absorber

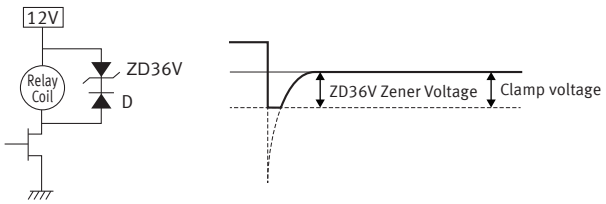
Please use a Varistor (ZNR) or Zener diode (ZD) which the clamp voltage is at least 3 times larger than the rated voltage for the purpose of the coil surge absorber.
If the clamp voltage is less than 3 times larger than the rated voltage, electrical life of the relay specified in the specifications shall not be secured because the contact release speed becomes slower.

[Example 1: When Varistor (ZNR) is use]

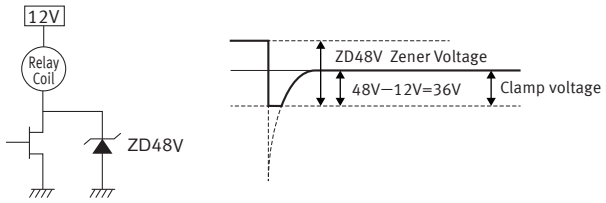
Recommended Varistor	Energy capability: Min. 1 J (However, please set up the value with consideration of the worst value in use condition.)
Varistor Voltage	Min. 300% of rated voltage (Recommended Varistor voltage is at 36 V or more when the coil rated voltage is at 12 V.)

[Example 2: When Zener diode (circuit) is use]
(Set the clamp voltage at 36 V or more when the coil 1 rated voltage is at 12 V.)

[1]



[2]



High-capacity DC cut off relay types (Part No. and electrical life, Notes)

EP relay

Contact arrangement	Type	Rated coil voltage	Part No.	Standard packing	
				Carton	Outer carton
1 Form A	10 A PC terminal	12 V DC	AEP31012	25 pieces	100 pieces
	10 A TM type		AEP51012		
	20 A TM type		AEP52012	25 pieces	50 pieces
	80 A conector type*1		AEP18012	1 pieces	20 pieces
	200 A lead wire type*2		AEP17012	1 pieces	10 pieces
	300 A conector type*1		AEP19012	1 pieces	5 pieces
	10 A PC terminal	24 V DC	AEP31024	25 pieces	100 pieces
	10 A TM type		AEP51024		
	20 A TM type		AEP52024	25 pieces	50 pieces
	80 A conector type*1		AEP18024	1 pieces	20 pieces
	200 A lead wire type*2		AEP17024	1 pieces	10 pieces
	300 A conector type*1		AEP19024	1 pieces	5 pieces
	10 A PC terminal	48 V DC	AEP31048	25 pieces	100 pieces
	10 A TM type		AEP51048		
	10 A PC terminal	100 V DC	AEP310X0		
	10 A TM type		AEP510X0		

*1. One female connector lead wire for connecting is packaged with the 80A and 300 A connector types.
-Specifications: Housing: Yazaki 7283-1020 (light gray);
Lead wire: 0.5 mm^2 dia. and 300 ±10 mm length
Lead wire coating color: Pin No. 1: white; Pin No. 2: green
*2. Two dedicated M6 bolts is packaged with the 200 A type.

■Electrical life of EP relay

Conditions: Resistive

Type	Switching capacity	Number of operations
10 A	10 A 400 V DC	Min. 7.5 x 10^4 (at 20 times/min.)*
	15 A 400 V DC	Min. 3 x 10^4 (at 20 times/min.)*
20 A	10 A 1,000 V DC	Min. 10^3 (at 6 times/min.)*
	20 A 400 V DC	Min. 3 x 10^3 (at 6 times/min.)*
80 A	30 A 400 V DC	Min. 3 x 10^4 (at 20 times/min.)*
	80 A 400 V DC	Min. 10^3 (at 20 times/min.)*
200 A	60 A 1,000 V DC	Min. 10^3 (at 6 times/min.)*
	200 A 400 V DC	Min. 3 x 10^3 (at 20 times/min.)*
300 A	50 A 400 V DC	Min. 1.5 x 10^4 (at 20 times/min.)
	300 A 400 V DC	Min. 10^3 (at 6 times/min.)

* Conditions: Varistor used for coil surge absorption. If a diode is used the life will be lower.

■NOTES

- Make sure the power is turned off when wiring.
- Incorrect wiring may cause unexpected malfunction and failure.
- The contacts of the relay are polarized. Please follow instructions in the connection schematic when connecting the contacts.
- Don't exceed maximum coil voltage. Exceeding maximum allowable coil voltage on continuous basis will damage the relay and could case failure.
- If you will be using with a load voltage that exceeds 400 V DC, please be sure to verify operation on the actual device, referring to the switching life curves (reference data).
  You must absolutely avoid continual use in which the load current exceeds the rated value. This will cause abnormal heating.
- Condensation will occur during sudden temperature changes in hot and humid environments. Caution is required, because condensation will cause a decrease in the insulation resistance between the terminals.
- Pure DC current should be applied to the coil. If it includes ripple, the ripple factor should be less than 5%. However, check the actual circuit since the characteristics may be slightly different. The power supply waveform supplied to the coil should be rectangular. Also, the 300A type has a built-in dedicated drive circuit. It may not operate normally unless the rise time is 10 ms or less
- Do not use a relay if it has been dropped.
- The rated control capacity and life are given as general guides.
  It is important to conduct sufficient tests on the actual device, because contact properties and working life will differ considerably depending on the type of load and conditions.
- Do not disassemble the relay.
  Please note that disassembling the relay will invalidate the warranty.
- Avoid mounting the relay in strong magnetic fields (near a transformer or magnet) or close to an object that radiates heat.
- Please note that if the 80 A type is used only with excessive load, the contact resistance may possibly increase.

●Expected electrical life

This relay is a DC high-voltage switch. In its final breakdown mode, it may lose the ability to provide the proper cut-off. Therefore, do not exceed the indicated switching capacity and life. (Please treat the relay as a product with limited life and replace it when necessary.)

In the event that the relay loses cut-off ability, there is a possibility that burning may spread to surrounding parts, so configure the layout so that the power is turned off within one second and from the point of view of safety, consider installing a fail-safe circuit in the device. Also, in order to avoid increased contact resistance, do not operate when there is no switching load.

- If the power is turned off and then immediately on after applying the rated voltage (current) continuously to the relay's coil and contact, the resistance of the coil will increase due to a rise in the coil temperature. This causes the pick-up voltage to rise, and possibly exceed the rated pick-up voltage. In these circumstances, take measures such as reducing the load current, limiting the duration of current flow, and applying a coil voltage higher than the rated operating voltage.
- Main contact ratings in the ratings apply to when there is a resistive load. If you are using an inductive load (L load) such that L/R > 1 ms, add surge protection in parallel with the inductive load. If this is not done, the electrical life will decrease and cut-off failure may occur. In order to prevent contact welding when using a capacitive load (C load) such as a capacitor load, please make the inrush current setting more than two times that of the nominal current. Please contact us for more information.
- Be careful that foreign matter and oils and fats kind don't stick to the main terminal parts because it is likely to cause terminal parts to give off unusual heat.
  Also, please use the following materials for connected harnesses and bus bars.

Tab terminal
(JIS C289-1999 compliant, flat type connection terminal)

10A TM type	#187, 0.5 mm board thickness
20A TM type	#250, 0.8 mm board thickness

Harness nominal cross-sectional area

Load input terminal side	10 A TM type	Min. 2 mm^2
	20 A TM type	Min. 3 mm^2
	80 A type	Min. 15 mm^2
	200 A type	Min. 60 mm^2
	300 A type	Min. 100 mm^2
Coil input terminal side	10 A TM type	Min. 0.3 mm^2
	20 A TM type	

- We recommend installing a surge protector varistor for the 10A, 20A, 80A and 200A types. Please note that when using a diode, the switching speed may decrease and cause a reduction in cut-off performance. For the 300A type, separate surge countermeasures are not required, because it contains a built-in surge absorbing element.

Recommend varistor

Amount of proof energy	Min. 1 J
Varistor voltage	1.5 to 3.0 times of rated coil voltage

- Regarding AC cutoff, although there is no contact polarity, generally it is thought that the electrical life will shorten due to cutoff in the reverse direction, compared to DC cutoff. Confirm electrical life using actual load. In the case of DC cut-off, please note the contact polarity.

- Permeation life of internal gas
  This relay uses a hermetically encased contact (capsule contact) with gas inside. The gas has a permeation life that is affected by the temperature inside the capsule contact (ambient temperature + temperature rise due to flow of electrical current). Therefore, please do not exceed the operation ambient and storage ambient temperatures given in the specifications.
- Use 40 to 70N or 50 to 80N of force as a guide to fasten the terminal connected to the 10A TM and 20A TM types. Please use caution when inserting or removing the terminal as the relay tab terminal may cause injuly. Also, unstable conductivity and abnormal terminal heating may occur; therefore, please check that there is no deformation of or foreign objects on the faston terminals (blade receptacle) you will be connecting. Use JIS C2809 (or IEC60760) certified products.

●Soldering and cleaning condition [PC board type only]

- Place the PC board mount type (10A PC board type) securely by manual soldering after attaching it using M4 screw. Don't submerge assembled board in cleaning solvent or water. Also, be careful not let flux overflow up from the PC board or adhere to the base of the relay.
  Recommended manual soldering conditions

Solder temperature	Max. 400°C
Soldering time	Within 5 s

- Lead-free solder (tin, silver and copper) is used as presolder for the terminals of the PC board mount type (10A PC board type).

- When installing the relay, always use washers to prevent the screws from loosening.
- Tighten each screw within the rated range given below. Exceeding the maximum torque may result in breakage. Mounting is possible in either direction.

Main unit mounting section

M5 screw	20 A, 80 A, 200 A, 300 A	3 to 4 N·m
M4 screw	10 A PC board type	0.98 to 1.2 N·m
	10 A TM type	1.8 to 2.7 N·m

Load side terminals

80 A	M5 bolt	3.5 to 6.5 N·m
200 A	M6 bolt	6 to 8 N·m
300 A	M8 bolt	10 to 12 N·m

●Connector type

- The warranted tensile strength of the female connector lead wire used for connection that comes with the 80A and 300A connector type when attaching it to the relay body is 98N. Avoid excessive tension as this is a cause of broken wires and damage.
  Also, insert the female connector deeply and make sure the connection is secure.

HE-V relay

Contact arrangement	Rated coil voltage	Type No.	Part No.	Standard packing	
				Carton	Outer carton
2 Form A	6 V DC	HEV2aN-P-DC6V	AHEV2290	10 pieces	50 pieces
	9 V DC	HEV2aN-P-DC9V	AHEV2295		
	12 V DC	HEV2aN-P-DC12V	AHEV2291		
	15 V DC	HEV2aN-P-DC15V	AHEV2297		
	24 V DC	HEV2aN-P-DC24V	AHEV2292		

■Electrical life of HE-V relay

●Each 1 Form A contact connected in series

Condition: at 20°C (L/R ≦1 ms), ON:OFF = 1s:9s

Load	Switching capacity	Number of operations
Resistive	20 A 600 V DC	Min. 10^4
	20 A 800 V DC	Min. 10^3
	25 A 600 V DC	Min. 6 x 10^3
Overload	20 A 1,000 V DC	Min. 10
Reverse	-20 A 400 V DC	Min. 10^3
Inrush current	40 A 800 V DC	Min. 10^3

●1 Form A contact only

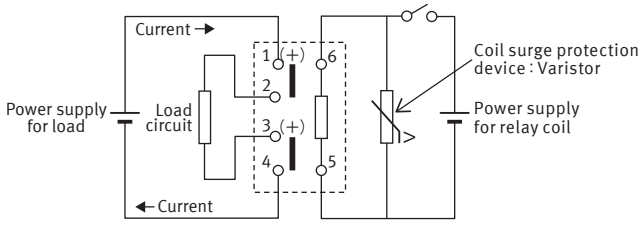
Condition: at 20°C (L/R ≦1 ms), ON:OFF = 1s:9s

Load	Switching capacity	Number of operations
Resistive	20 A 300 V DC	Min. 10^4
	20 A 400 V DC	Min. 10^3
	25 A 300 V DC	Min. 6 x 10^3
Overload	20 A 500 V DC	Min. 10
Reverse	-20 A 200 V DC	Min. 10^3
Inrush current	40 A 400 V DC	Min. 10^3

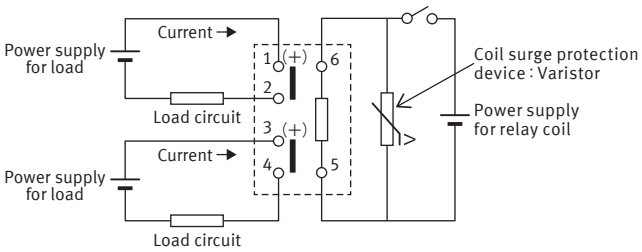
●Recommended circuit

Positive polarity of load should be connected to pin 1 and pin 3, refer to the following circuit schematics.

[Each 1 Form A contact connected in series (Bottom view)]



[1 Form A contact only (Bottom view)]



■NOTES

●Usage, transport and storage conditions

1) Temperature:
-40 to +55°C (When coilholding voltage is 33 to 110%V)
-40 to +85°C (When coilholding voltage is 33% to 60%V)

2) Humidity: 5 to 85% RH(Avoid icing and condensation.)
The humidity range varies with thetemperature.
Use within the rangeindicated in the graph.

3) Atmospheric pressure: 86 to 106 kPa
Temperature and humidity range forusage, transport, and storage

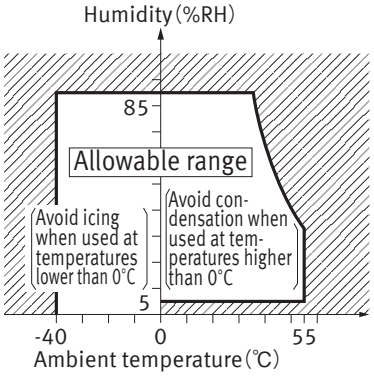
4) Condensation forms when there is a sudden change in temperature under high temperature and high humidity conditions. Condensation will cause deterioration of the relay insulation.

5) Icing
Condensation or other moisture mayfreeze on the relay when the temperatures is lower than 0°C This causes problems such as sticking of movable parts or operational time lags.

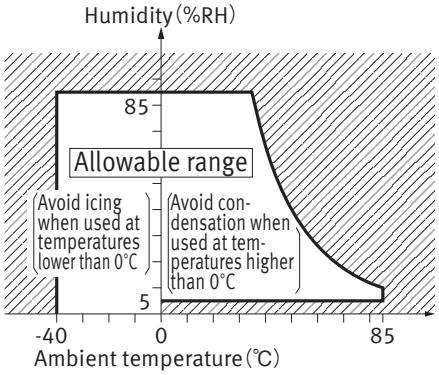
6) Low temperature, low humidity environments
The plastic becomes brittle if the relay isexposed to a low temperature, low humidity environment for long periods oftime.

Temperature and humidity range for usage, transport, and storage

[Coil holding voltage: 33 to 110%V]



[Coil holding voltage: 33 to 60%V]



●**Solder and cleaning conditions**

Please obey the following conditions.

1) Automatic soldering

(1) Preheating

Temperature	within 120°C (solder surface terminal portion)
Time	Within 120 s

(2) Soldering

Solder temperature	260 ±5°C
Soldering time	Within 10 s

2) Manual soldering

Solder temperature	Max. 260°C	Max. 350°C
Soldering time	Within 10 s	Within 3 s

Note: Effects of soldering heat on the relays vary depending on the PC board. So please confirm actual soldering condition with the PC board used for assembling.

3) Do not clean this relay by immersion, since the relay is not sealed.
Also, be careful not to allow flux to overflow above the PC board or enter the inside of the relay.

●Precations for use

- For precautions regarding use andexplanations of technical terminology,please refer to our web site.
- To ensure good operation, please keepthe voltage on the coil ends to ±5% (at 20°C) of the rated coil operation voltage. Also, please be aware that operate voltage and release voltage may change depending on the temperature and conditions of use.
- Keep the ripple rate of the nominal coil voltage below 5%. And do not have a parallel connectionwith diode for the purpose of coil surge absorber. Instead of diode, a Varistor is recommend for the absorber.

Recommended Varistor

Maximum energy	Min. 1J
Varistor voltage	1.5 to 4.0 times of rated coil voltage

- The cycle lifetime is defined under the standard test condition specified in the JIS C5442 standard (temperature 15 to 35°C , humidity 25 to 75%).Check this with the real device as it is affected by coil driving circuit, load type,activation frequency, ambient conditionsand other factors. Especially, contact terminals havepolarity. So if the contact terminals were connected with opposite pole, the electric life would be shorter.
- Minimum switching load is a guide to the lower current limit of switching under the micro load. This value can change due to the switching frequency, environmental conditions, and desired reliability level,therefore it is recommended to check this with the actual load.
- Heat, smoke, and even a fire may occur if the relay is used in conditions outside of the allowable ranges for the coil ratings, contact ratings, operating cycle lifetime, and other specifications.
  Therefore, do not use the relay if these ratings are exceeded.
- Do not use a relay if it has been dropped.
- Incorrect wiring may cause unexpected events or the generation of heat or flames.
- The relay should not be installed near strong magnetic field (transformers, magnets, etc.) and should not be installed near objects that radiate heat.
- If the several relays are mounted closely or a heat-generation object isclose to the relay, take care to check the abnormal temperature-rise and the insulation distance between the terminals outside of the relay.
- If you are using an inductive load (L load) such that L/R > 1ms, add surge protection in parallel with the inductive load. If this is not done, the electrical life will decrease and cut-off failure may occur.
- In case using a capacitive load(Cload), please take a countermeasure as pre-charging to the capacitive load so that the inrush current will not surpass 40A. The relay might have a contact welding without such countermeasure.
- This relay is a high-voltage directcurrent switch. In its final breakdown mode, it may lose the ability to provide the proper cut-off. Therefore, do not exceed the indicated switching capacity and life. (Please treat the relay as a product with limited life and replace it when necessary.) In the event that the relay loses cut-off ability, there is a possibility that burning may spread to surrounding parts, so configure the layout so that the power is turned off within one second and from the point of view of safety, consider installing a failsafe circuit in the device.
- Please carry out the design which had a enough margin in conductor width and a space between conductors in the case of a design of a printed circuit board.
- Contact terminals have polarity. So if the contact terminals were connected with opposite pole, the electric life would be shorter. There is no polarity if they are used for power distribution only.

Safety standards chart

Power relays, High-capacity DC cut off relays

Item			UL/C-UL (Recognized)				CSA (Certified)				VDE (Certified)			
			File No.	Contact rating	Cycles	Temp.	File No.	Contact rating	Cycles	Temp.	File No.	Contact rating	Cycles	Temp.
S			E43028 (UL only)	4A 250V AC 3A 30V DC 1/20HP 250V AC (FLA0.75A) 1/20HP 125V AC (FLA1.5A)	–	–	LR26550	4A 250V AC 3A 30V DC 1/20HP 250V AC 1/20HP 125V AC	–	–	–			
LD-P			E43028	6A 277A AC	5×10^4	–	CSA standard certified by C-UL				40014384	5A 250V AC (cosφ=1.0)	10^5	85°C
				5A 277V AC Resistive	10^5	85°C						5A 250V AC (cosφ=1.0) (Class F only)	5×10^4	105°C
				5A 277V AC Resistive (Class F only)	5×10^4	105°C						5A 30V DC (cosφ=1.0)	10^4	25°C
				5A 30V DC Resistive	10^5	–								
				3A 277V AC General use	12×10^4	85°C								
				Pilot Duty C300	10^5	85°C								
				Pilot Duty 0.65A 277V AC (Inrush 6.5A)	10^5	85°C								
				4A 277V AC Resistive (Class F only)	10^5	105°C								
				1 FLA/6LRA 277V AC (Class F only)	3×10^4	105°C								
NC	Dust cover type	2 Form C	E43028 (UL only)	5A 250V AC	10^5	–	LR26550	5A 250V AC	10^5	–	–			
				5A 30V DC	10^5			5A 30V DC	10^5					
				1/10HP 125, 250V AC	-			1/10HP 125, 250V AC	–					
		4 Form C		5A 30V DC	10^5			5A 30V DC	10^5					
				4A 250V AC	10^5			4A 250V AC	10^5					
				1/10HP 125, 250V AC	-			1/10HP 125, 250V AC	–					
	Sealed type	2 Form C	E43028 (UL only)	5A 30V DC	10^5		LR26550	5A 30V DC	10^5					
				3A 250V AC	10^5			3A 250V AC	10^5					
				1/20HP 125, 250V AC	-			1/20HP 125, 250V AC	–					
		4 Form C		5A 30V DC	10^5			5A 30V DC	10^5					
				2A 250V AC	10^5			2A 250V AC	10^5					
				1/20HP 125, 250V AC	-			1/20HP 125, 250V AC	–					
PA-N			E43149	5A 250V AC Resistive	5×10^4	40°C	CSA standard certified by C-UL				–			
				5A 250V AC Resistive	10^4	90°C								
				5A 30V DC General use	5×10^4	40°C								
				5A 30V DC General use	10^4	90°C								
				3A 250V AC General use	10^4	90°C								
				3A 250V AC Resistive	10^5	40°C								
				3A 30V DC General use	10^5	40°C								
				Pilot Duty B300, R300	6×10^3	40°C								
			E479891	Class I Division 2 Groups A, B, C, D Hazardous Location (ANSI/ISA 12.12.01–2015, CAN/CSA C22.2 No.213–15)										
PQ			E43028 (UL only)	5A 277V AC	–	–	LR26550	5A 277V AC	–	–	40013088	5A 250V AC (cosφ=0.4)	10^4	70°C
				5A 30V DC				5A 30V DC				5A 30V DC (0ms)		
				0.3A 110V DC				0.3A 110V DC						
				1/6HP 277V AC				1/6HP 277V AC						

TÜV (Certified)				TV rating		CQC				Standard marking
File No.	Contact rating	Cycles	Temp.	File No.	Contact rating	File No.	Contact rating	Cycles	Temp.	
–				–		–				UL/CSA
–				–		CQC 10002048611	5A 250V AC	–	–	UL/C-UL, VDE
–				–		–				UL/CSA
B18 03 13461 368	5A 250V AC (cosφ=1.0)	5×10^4	40°C	–		–				UL/CSA, TÜV
	5A 250V AC (cosφ=1.0)	10^4	90°C							
	5A 30V DC(0ms)	5×10^4	40°C							
	5A 30V DC(0ms)	10^4	90°C							
	3A 250V AC (cosφ=1.0)	10^5	40°C							
	3A 30V DC(0ms)	10^5	40°C							
–				–		–				UL/CSA, VDE

Safety standards chart

Item		UL/C-UL (Recognized)				CSA (Certified)				VDE (Certified)			
		File No.	Contact rating	Cycles	Temp.	File No.	Contact rating	Cycles	Temp.	File No.	Contact rating	Cycles	Temp.
PF		E120782	8A 277V AC General use (N.O.)	6×10^3	–	CSA standard certified by C-UL				40027672 (IEC/ EN61810-1)	8A 250V AC (cosφ=1.0) (N.O.)	2.5×10^4	25°C
			6A 277V AC General use	6×10^3	85°C						6A 250V AC (cosφ=1.0) (N.O.)	8×10^4	25°C
			6A 24V DC General use (N.O.)	6×10^3	85°C						6A 250V AC (cosφ=1.0) (N.C.)	5×10^4	25°C
			4A 277V AC General use	3×10^4	–						6A 250V AC (cosφ=1.0) (N.O.)	4×10^4	85°C
			Pilot Duty B300 (N.O.)	–	–						6A 250V AC (cosφ=1.0) (N.C.)	3×10^4	85°C
			Pilot Duty R300	–	–								
		E329383	Class I Division 2 Groups A, B, C, D Hazardous Location(ANSI/ISA 12.12.01)										
DS-P	1 Form A	E43028 (UL only)	8A 125, 250V AC	–	–	LR26550	8A 125, 250V AC	–	–	–			
			5A 30V DC R				5A 30V DC						
			1/6HP 125, 250V AC				1/6HP 125, 250V AC						
			B300				B300						
	1 Form A 1 Form B (1a1b)	E43028 (UL only)	5A 125, 250V AC			LR26550	5A 125, 250V AC						
			5A 30V DC R				5A 30V DC						
			1/6HP 125, 250V AC				1/6HP 125, 250V AC						
			30W Max. : 1A 30V DC- 0.24A 125V DC				30W Max. : 1A 30V DC- 0.24A 125V DC						
	2 Form A	E43028 (UL only)	5A 125, 250V AC			LR26550	5A 125, 250V AC						
			5A 30V DC R				5A 30V DC						
			1/10HP 125, 250V AC				1/10HP 125, 250V AC						
LK-T		E43149	8A 277V AC General use	5×10^4	–	CSA standard certified by C-UL				40014390	8A 250V AC (cosφ=1.0)	2×10^4	–
			5A 277V AC General use	10^5									
			5A 30V DC Resistive	10^5									
DW	Standard type (8A)	E43149	8A 250V AC Resistive	5×10^4	85°C	CSA standard certified by C-UL				4003225	8A 250V AC (cosφ=1.0)	5×10^4	85°C
			5A 30V DC Resistive								5A 30V DC (0ms)		
	Inrush type (16A)	E43149	16A 277V AC Resistive	5×10^4	60°C					40032254	16A 277V AC (cosφ=1.0)	5×10^4	70°C
			16A 277V AC Resistive	2×10^4	85°C						16A 277V AC (cosφ=1.0)	2×10^4	85°C
			8A 250V AC Resistive	5×10^4	85°C						8A 250V AC (cosφ=1.0)	5×10^4	85°C
			5A 347V AC Resistive (UL only)	5×10^4	85°C						5A 30V DC (0ms)	5×10^4	85°C
			5A 30V DC Resistive	5×10^4	85°C								
			1200W Tungsten 240V AC	6×10^3	50°C								
			600W Tungsten 120V AC	2.5×10^4	50°C								
			1A 277V AC Electronic ballast	1.2×10^4	40°C								
			2A 277V AC Electronic ballast	6×10^3	40°C								
			5A 120V AC Electronic ballast (2 coil latching type only)	6×10^3	70°C								
			5A 277V AC Standard ballast	6×10^3	50°C								

TÜV (Certified)				TV rating		CQC				Standard marking
File No.	Contact rating	Cycles	Temp.	File No.	Contact rating	File No.	Contact rating	Cycles	Temp.	
–				–		–				UL/CSA, VDE
B18 03 13461 370	8A 250V AC (cosφ=1.0) 5A 250V AC (cosφ=0.4) 5A 30V DC (0ms)	–	–	–		–				UL/CSA, TÜV
B18 03 13461 370	5A 250V AC (cosφ=1.0) 5A 30V DC (0ms) 3A 250V AC (cosφ=0.4)									
B18 03 13461 370	5A 250V AC (cosφ=1.0) 5A 30V DC (0ms) 3A 250V AC (cosφ=0.4)									
B013461 0379 Rev.01	8A 250V AC (cosφ=1.0)	2×10^4	–	E43149 (UL/C–UL)	TV–8	CQC 09002039706	5A 250V AC	–	–	UL/C–UL, TÜV, TV–8
–				–	–	CQC 16002150890	8A 250V AC	–	–	UL/C-UL,VDE
				E43149 (UL/C-UL)	TV-8 (240V AC) 2.5×10^4 40°C	CQC 16002150890	16A 250V AC			

Safety standards chart

Item		UL/C-UL (Recognized)				CSA (Certified)				VDE (Certified)			
		File No.	Contact rating	Cycles	Temp.	File No.	Contact rating	Cycles	Temp.	File No.	Contact rating	Cycles	Temp.
LK-Q	TV-5	E43149	10A 277V AC General use	5×10^4	–	CSA standard certified by C-UL				–			
			5A 277V AC General use	10^5									
			5A 30V DC Resistive	10^5									
	TV-8	E43149	10A 277V AC General use	5×10^4									
			8A 277V AC General use	5×10^4									
			5A 277V AC General use	10^5									
			5A 30V DC Resistive	10^5									
ST		E43028 (UL only)	8A 250V AC	–	–	LR26550	8A 250V AC	–	–	40017740	8A 250V AC (cosφ=1.0)	–	–
			5A 30V DC				5A 30V DC				5A 30V DC (0ms)		
			1/4HP 125, 250V AC				1/4HP 125, 250V AC				4A 250V AC (cosφ=0.4)		
DE	1 Form A	E120782	12A 120V AC General use	3×10^4	–	CSA standard certified by C-UL				115944	16A 250V AC (cosφ=1.0)	5×10^3	70°C
			10A 277V AC Ballast	–									
			8A 277V AC General use	3×10^4									
			8A 120V AC Lamp Load	3×10^4									
			6A 347V AC General use	3×10^4							8A 250V AC (cosφ=1.0)	15×10^4	
			2A 480V AC Resistive	10^5									
			1HP 277V AC	–									
			Pilot Duty B300, R300	–									
	1 Form A 1 Form B (1a1b)	E120782	8.5A 120V AC General use	3×10^4	–	CSA standard certified by C-UL				115944	16A 250V AC (cosφ=1.0)	5×10^3	70°C
			6A 277V AC General use	3×10^4									
			6A 120V AC Lamp Load	3×10^4									
			4.5A 347V AC General use	3×10^4									
			2A 480V AC Resistive	10^5							8A 250V AC (cosφ=1.0)	15×10^4	
			0.7HP 277V AC	–									
			Pilot Duty B300, R300	–									
	2 Form A	E120782	12A 120V AC General use	3×10^4						115944	8A 250V AC (cosφ=1.0)	15×10^4	
			10A 277V AC Ballast	–									
			8A 120V AC Lamp Load	3×10^4									
			8A 277V AC General use	3×10^4									
			6A 347V AC General use	3×10^4									
			2A 480V AC Resistive	10^5									
			1HP 277V AC	–									
			Pilot Duty B300, R300	–									
DK	1 Form A	E43028 (UL only)	10A 250V AC	–	–	1817976	10A 250V AC	–	–	VDE approved type is available. Please contact our sales representative.			
			10A 30V DC				10A 30V DC						
			1/3HP 125, 250V AC				1/3HP 125, 250V AC						
	1 Form A 1 Form B (1a1b), 2 Form A	E43028 (UL only)	8A 250V AC			1817976	8A 250V AC						
			8A 30V DC				8A 30V DC						
			1/4HP 125, 250V AC				1/4HP 125, 250V AC						

TÜV (Certified)				TV rating		CQC				Standard marking
File No.	Contact rating	Cycles	Temp.	File No.	Contact rating	File No.	Contact rating	Cycles	Temp.	
B013461 0379 Rev. 01	5A 250V AC (cosφ=1.0)	10^5	–	E43149 (UL/C-UL)	TV-5	CQC 09002039706	5A 250V AC	–	–	UL/C-UL, TÜV, TV-5
B013461 0379 Rev. 01	8A 250V AC (cosφ=1.0)	2×10^4		E43149 (UL/C-UL)	TV-8	CQC 09002039706	8A 250V AC			UL/C-UL, TÜV, TV-8
–				E43028 (UL) LR26550 (CSA)	TV-3	–				UL/CSA, VDE
–				–		–				UL/CSA, VDE
–				–		–				UL/CSA, VDE
B 18 03 13461 371	10A 250V AC (cosφ=1.0) 10A 30V DC (0ms) 5A 250V AC (cosφ=0.4)	–	–	–		–				UL/CSA, TÜV
B 18 03 13461 371	8A 250V AC (cosφ=1.0) 8A 30V DC(0ms) 4A 250V AC (cosφ=0.4)									

Item			UL/C-UL (Recognized)				CSA (Certified)				VDE (Certified)			
			File No.	Contact rating	Cycles	Temp.	File No.	Contact rating	Cycles	Temp.	File No.	Contact rating	Cycles	Temp.
DY	1 Form A		E43028	10A 250V AC 1/3 HP 125, 250V AC 10A 30V DC	–	–	LR26550	10A 250V AC 1/3 HP 125, 250V AC 10A 30V DC	–	–	–			
	1 Form A 1 Form B (1a1b)		E43028	8A 250V AC 1/4 HP 125, 250V AC 8A 30V DC			LR26550	8A 250V AC 1/4 HP 125, 250V AC 8A 30V DC						
LQ	1 Form A		E43028	10A 125V AC General use	5×10^4	40°C	CSA standard certified by C-UL				40032836	10A 250V AC (cosφ=1.0)	10^4	85°C
				10A 125V AC (Carry Only)	5×10^4	85°C						10A 250V AC (cosφ=0.4)	10^4	
				5A 277V AC General use	10^5	40°C						5A 250V AC (cosφ=1.0)	5×10^4	
				5A 240V AC General use	6×10^3	105°C						5A 30V DC (0ms)	10^4	
				5A 30V DC General use	10^5	40°C								
				4A 125V AC Resistive	10^5	105°C								
				2A 120V AC Tungsten	6×10^3	105°C								
				4FLA/4LRA 277V AC	10^5	105°C								
				1/6HP 277V AC	10^3	40°C								
				1/6HP 125V AC	10^3	40°C								
				Pilot Duty 1A 125V AC	10^5	105°C								
	1 Form C	N. O.	E43028	10A 125V AC General use	5×10^4	40°C					40032836	10A 250V AC (cosφ=1.0)	10^4	85°C
				5A 277V AC General use	10^5	40°C						10A 250V AC (cosφ=0.4)	10^4	
				5A 240V AC Resistive	10^5	80°C						5A 250V AC (cosφ=1.0)	5×10^4	
				5A 30V DC General use	10^5	40°C						5A 30V DC (0ms)	10^4	
				4FLA/4LRA 277V AC	10^5	105°C								
				3FLA/18LRA 240V AC	10^5	85°C								
				1/6HP 277V AC	10^3	40°C								
				1/6HP 125V AC	10^3	40°C								
		N. C.	E43028	3A 240V AC Resistive	10^5	80°C					40032836	3A 250V AC (cosφ=1.4)	10^4	85°C
				3A 125V AC General use	10^5	85°C								
				2A 277V AC General use	10^5	85°C								
				2A 30V DC Resistive	10^5	40°C								
				1A 30V DC General use	10^5	85°C								

TÜV (Certified)				TV rating		CQC				Standard marking
File No.	Contact rating	Cycles	Temp.	File No.	Contact rating	File No.	Contact rating	Cycles	Temp.	
B 18 03 13461 366	10A 250V AC (cosφ=1.0) 10A 30V DC (0ms) 8A 250V AC (cosφ=1.0) 8A 30V DC (0ms)	–	–	–		–				UL/C-UL, TÜV
–				–		CQC 14002108384	5A 250V AC	–	–	UL/C-UL, VDE
						CQC 14002108384	5A 250V AC			
						CQC 14002108384	2A 250V AC			

Item			UL/C-UL (Recognized)				CSA (Certified)				VDE (Certified)			
			File No.	Contact rating	Cycles	Temp.	File No.	Contact rating	Cycles	Temp.	File No.	Contact rating	Cycles	Temp.
JS	Standard type		E43028	12A 125V AC	10^5	70°C	LR26550	12A 125V AC	10^5	–	40011475	10A 125V AC (cosφ=1.0)	10^4	70°C
				10A 125V AC (N.C.)	–	–		10A 125V AC				6A 250V AC (cosφ=1.0)	10^5	
				10A 125V AC (N.O.)	10^5	85°C		6A 277V AC						
				6A 277V AC	10^5	–		5A 30V DC						
				5A 30V DC	10^5	–		1/8HP 125V AC						
				1/8HP 125V AC	10^5	–		1/8HP 277V AC						
				1/8HP 277V AC	10^4	–								
				1/3HP 277V AC (N.O.)	10^5	75°C								
				4FLA/4LRA 240V AC (N.O.)	10^5	105°C								
				2FLA/4LRA 240V AC (N.C.)	3×10^4	105°C								
JW	Standard type	1 Form A	E43028	5A 277V AC	–	–	LR26550	5A 277V AC	–	–	40013854	5A 250V AC (cosφ=1.0)	–	–
				5A 30V DC				5A 30V DC				3A 250V AC (cosφ=0.4)		
				1/8HP 250V AC				1/8HP 250V AC						
				1/8HP 125V AC				1/8HP 125V AC						
		1 Form C	E43028	5A 277V AC			LR26550	5A 277V AC			40013854	5A 250V AC (cosφ=1.0)		
				5A 30V DC				5A 30V DC				5A 30V DC (0ms)		
				1/8HP 250V AC				1/8HP 250V AC				3A 250V AC (cosφ=0.4)		
				1/8HP 125V AC				1/8HP 125V AC						
		2 Form A	E43028	5A 277V AC			LR26550	5A 277V AC			40013854	5A 250V AC (cosφ=1.0)		
				5A 30V DC				5A 30V DC				5A 30V DC (0ms)		
				1/8HP 250V AC				1/8HP 250V AC				3A 250V AC (cosφ=0.4)		
				1/8HP 125V AC				1/8HP 125V AC						
		2 Form C	E43028	5A 277V AC			LR26550	5A 277V AC			40013854	5A 250V AC (cosφ=1.0)		
				5A 30V DC				5A 30V DC				5A 30V DC (0ms)		
				1/8HP 250V AC				1/8HP 250V AC				3A 250V AC (cosφ=0.4)		
				1/8HP 125V AC				1/8HP 125V AC						
	High capacity type	1 Form A	E43028	10A 277V AC			LR26550	10A 277V AC			40013854	10A 250V AC (cosφ=1.0)		
				10A 30V DC				10A 30V DC				7A 250V AC (cosφ=0.4)		
				1/3HP 250V AC				1/3HP 250V AC						
				1/3HP 125V AC				1/3HP 125V AC						
		1 Form C	E43028	10A 277V AC			LR26550	10A 277V AC			40013854	10A 250V AC (cosφ=1.0)		
				10A 30V DC				10A 30V DC				10A 30V DC (0ms)		
				1/3HP 250V AC				1/3HP 250V AC				7A 250V AC (cosφ=0.4)		
				1/3HP 125V AC				1/3HP 125V AC						

TÜV (Certified)				TV rating		CQC				Standard marking
File No.	Contact rating	Cycles	Temp.	File No.	Contact rating	File No.	Contact rating	Cycles	Temp.	
B 18 03 13461 377	10A 125V AC (cosφ=1.0) 6A 250V AC (cosφ=1.0)	10^5	–	–		CQC 10002041728	10A 25V AC (N. O.) 6A 250V AC (N. C.)	– –	– –	UL/CSA, VDE, TÜV
–				–		CQC 10002041727	5A 250V AC 5A 250V AC 5A 250V AC 5A 250V AC 10A 250V AC 10A 250V AC	–	–	UL/CSA, VDE

Safety standards chart

Item		UL/C-UL (Recognized)				CSA (Certified)				VDE (Certified)			
		File No.	Contact rating	Cycles	Temp.	File No.	Contact rating	Cycles	Temp.	File No.	Contact rating	Cycles	Temp.
LK-G	10 A	E43149	10A 277V AC General use 10A 40V DC Resistive 5A 30V DC Resistive	10^5	–	CSA standard certified by C-UL				–			
	16 A	E43149	16A 125V AC General use 10A 40V DC Resistive 5A 30V DC Resistive	10^5	–								
LK-P		E43149	10A 277V AC General use 5A 30V DC Resistive	10^5	–	LR26550	10A 277V AC 5A 30V DC	10^5	–	40014390	10A 250V AC (cosφ=1.0) 10A 30V DC (0ms)	10^5	–
SP	2 Form C	E43028 (UL only)	15A 250V AC 10A 30V DC 1/2HP 125, 250V AC	–	–	LR26550	15A 250V AC 10A 30V DC 1/2HP 125, 250V AC	–	–	–			
	4 Form C	E43028 (UL only)	10A 250V AC 10A 30V DC 1/3HP 125, 250V AC	–	–	LR26550	10A 250V AC 10A 30V DC 1/3HP 125, 250V AC	–	–				
DJ	1 pole	E43149	20A 277V AC Resistive (1a only) 16A 277V AC Resistive	2×10^4 5×10^4	40°C	CSA standard certified by C-UL				40009736	20A 230V AC (cosφ=1.0) (1a only) 16A 250V AC (cosφ=1.0)	–	–
	2 pole	E43149	10A 277V AC Resistive	10^5						40009736	10A 250V AC (cosφ=1.0)		
JV-N		E43028	16A 277V AC 16A 125V AC 10A 30V DC 0.3A 110V DC 1/10HP 277V AC 1/10HP 125V AC	–	–	LR26550	16A 277V AC 16A 125V AC 10A 30V DC 0.3A 110V DC 1/10HP 277V AC 1/10HP 125V AC	–	–	–			
LE		E43149	18A 125V AC 16A 277V AC 16A 30V DC	–	–	LR26550	18A 125V AC 16A 277V AC 16A 30V DC	–	–	40009159	16A 250V AC (cosφ=1.0) 16A 30V DC	–	–
LZ		E43149	16A 277V AC 16A 30V DC 15A 240V AC Resistive (N.O.) 34.8LRA/7.2FLA 120V AC 15LRA/3FLA 120V AC 10LRA/3FLA 240V AC	3×10^4 3×10^4 10^5 – 3×10^4 3×10^4	– – 105°C – 50°C 50°C	CSA standard certified by C-UL				40000380	16A 250V AC (cosφ=1.0)	–	–

TÜV (Certified)				TV rating		CQC				Standard marking
File No.	Contact rating	Cycles	Temp.	File No.	Contact rating	File No.	Contact rating	Cycles	Temp.	
B013461 0379 Rev. 01	10A 250V AC (cosφ=1.0) 10A 30V DC (0ms)	10^5	–	E43149 (UL/C–UL)	TV–5	CQC 09002039706	10A 250V AC	–	–	UL/C–UL, TÜV, TV–5
B013461 0379 Rev. 01	16A 250V AC (cosφ=1.0) 16A 30V DC (0ms)	10^5 10^5 (1mm Gap) 5×10^4 (standard)	–	E43149 (UL/C–UL)		CQC 09002039706	16A 250V AC			UL/C–UL, TÜV, TV–5
B013461 0379 Rev. 01	10A 250V AC (cosφ=1.0) 5A 30V DC (0ms)	10^5	–	E43149 (UL) LR26550 (CSA)	TV–5	CQC 09002039706	10A 250V AC	–	–	TÜV, UL/CSA, TV–5
B18 03 13461 381 B18 03 13461 381	15A 250V AC (cosφ=1.0) 10A 30V DC 10A 250V AC (cosφ=1.0) 10A 30V DC	–	–	–		–				UL/CSA, TÜV
–				–		CQC 10002042641 CQC 10002042641	16A 250V AC 10A 250V AC	–	–	UL/C–UL, VDE
B18 03 13461 373	16A 250V AC (cosφ=1.0) 16A 250V AC (cosφ=0.4) 10A 30V DC (0ms)	10^4	–	–		CQC 16002157033	10A 250V AC	–	–	UL/CSA, TÜV
–	–	–	–	E43149 (UL) LR26550 (CSA)	TV–5	CQC 09002039708	16A 250V AC	–	–	UL, CSA, VDE
–				E43149 (UL)	TV–5	–				UL/C–UL, VDE

Item			UL/C-UL (Recognized)				CSA (Certified)				VDE (Certified)			
			File No.	Contact rating	Cycles	Temp.	File No.	Contact rating	Cycles	Temp.	File No.	Contact rating	Cycles	Temp.
LZ-N	1 Form A Class B insulation		E43149	20A 277V AC General use	6×10^3	40°C	CSA standard certified by C-UL				40047387	16A 250V AC (cosφ=1.0)	10^5	25°C
				16A 277V AC Resistive	10^5	85°C						16A 250V AC (cosφ=1.0)	5×10^4	85°C
				34.8 LRA/7.2 FLA 120V AC Definite purpose	2×10^5	50°C						13A 250V AC (cosφ=1.0)	10^5	85°C
				50 LRA/10 FLA 250V AC see conditions of acceptability	3×10^4	70°C						–	–	–
				1/2 HP 240V AC	10^5	40°C						–	–	–
	1 Form A Class F insulation		E43149	25A 277V AC Resistive (Carry only)	10^5	105°C					40047387	16A 250V AC (cosφ=1.0)	10^5	25°C
				20A 277V AC General use	6×10^3	40°C						16A 250V AC (cosφ=1.0)	5×10^4	85°C
				17A 277V AC Resistive	10^5	105°C						16A 250V AC (cosφ=1.0)	3×10^4	105°C
				16A 277V AC Resistive	10^5	85°C						13A 250V AC (cosφ=1.0)	10^5	85°C
				16A 277V AC Resistive	3×10^4	105°C						10A 250V AC (cosφ=1.0)	10^5	105°C
				34.8 LRA/7.2 FLA 120V AC Definite purpose	2×10^5	50°C						–	–	–
				50 LRA/10 FLA 250V AC see conditions of acceptability	3×10^4	70°C						–	–	–
				1/2 HP 240V AC	10^5	40°C						–	–	–
	1 Form C Class B insulation	N. O.	E43149	20A 277V AC General use	6×10^3	40°C					40047387	16A 250V AC (cosφ=1.0)	10^5	25°C
				16A 277V AC Resistive	10^5	85°C						16A 250V AC (cosφ=1.0)	5×10^4	85°C
				34.8 LRA/7.2 FLA 120V AC Definite purpose	2×10^5	50°C						13A 250V AC (cosφ=1.0)	10^5	85°C
				50 LRA/10 FLA 250V AC see conditions of acceptability	3×10^4	70°C						–	–	–
				1/2 HP 240V AC	10^5	40°C						–	–	–
		N. C.	E43149	16A 277V AC Resistive	10^4	40°C						16A 250V AC (cosφ=1.0)	10^4	25°C
				16A 277V AC Resistive	6×10^3	85°C						–	–	–
				34.8 LRA/7.2 FLA 120V AC Definite purpose	2×10^5	50°C						–	–	–
	1 Form C Class F insulation	N. O.	E43149	20A 277V AC General use	6×10^3	40°C					40047387	16A 250V AC (cosφ=1.0)	10^5	25°C
				16A 277V AC Resistive	10^5	85°C						16A 250V AC (cosφ=1.0)	5×10^4	85°C
				16A 277V AC Resistive	3×10^4	105°C						16A 250V AC (cosφ=1.0)	3×10^4	105°C
				13A 277V AC Resistive	10^5	85°C						13A 250V AC (cosφ=1.0)	10^5	85°C
				10A 277V AC Resistive	10^5	105°C						10A 250V AC (cosφ=1.0)	10^5	105°C
				34.8 LRA/7.2 FLA 120V AC Definite purpose	2×10^5	50°C						–	–	–
				50 LRA/10 FLA 250V AC see conditions of acceptability	3×10^4	70°C						–	–	–
				1/2 HP 240V AC	10^5	40°C						–	–	–
		N. C.	E43149	16A 277V AC Resistive	10^4	40°C						16A 250V AC (cosφ=1.0)	10^4	25°C
				16A 277V AC Resistive	6×10^3	85°C						–	–	–
				16A 277V AC Resistive (Carry only)	10^5	105°C						–	–	–
				34.8 LRA/7.2 FLA 120V AC Definite purpose	2×10^5	50°C						–	–	–

TÜV (Certified)				TV rating		CQC				Standard marking
File No.	Contact rating	Cycles	Temp.	File No.	Contact rating	File No.	Contact rating	Cycles	Temp.	
–				E43149 (UL)	TV-5	–				UL/C-UL, VDE

Safety standards chart

Item			UL/C-UL (Recognized)				CSA (Certified)				VDE (Certified)			
			File No.	Contact rating	Cycles	Temp.	File No.	Contact rating	Cycles	Temp.	File No.	Contact rating	Cycles	Temp.
LF			E43028	25A 277V AC Resistive 20A 277V AC Resistive	–	–	CSA standard certified by C-UL				40009169	20A 250V AC (cosφ=1.0) 10A 250V AC (cosφ=0.4)	–	–
JT-V	1 Form A		E43028	30A 277V AC	6×10^3	–	CSA standard certified by C-UL				–			
				20A 277V AC	10^5									
	1 Form C		E43028	30A 277V AC (N.O.)	6×10^3									
				20A 277V AC (N.O.)	10^5									
				10A 277V AC (N.C.)	6×10^3									
JT-N	1 Form A		E43028	30A 277V AC	—	–	LR26550	10A 277V AC	–	–	–			
	1 Form C	N. O.	E43028	20A 277V AC			LR26550	10A 277V AC						
		N. C.	E43028	10A 277V AC			LR26550	10A 277V AC						
LF-G	Standard type		E43028	22A 277V AC General use	3×10^4	85°C	CSA standard certified by C-UL				40023067	22A 250V AC (cosφ=0.8)	3×10^4	85°C
				22A 30V DC Resistive		–								
	High capacity type	Contact Gap 1.5 mm	E43028	31A 277V AC General use	3×10^4	85°C					40023067	31A 250V AC (cosφ=0.8)		
		Contact Gap 1.8 mm		33A 277V AC General use								33A 250V AC (cosφ=0.8)		
HE	1 Form A		E43028	30A 277V AC	10^5	–	LR26550	30A 277V AC	10^5	–	40006681 *1	30A 250V AC (cosφ=1.0)	10^5	25°C
				30A 30V DC				30A 30V DC				30A 250V AC (cosφ=0.4)		
				3HP 250V AC				3HP 250V AC				5A 110V DC (0ms)		
				1.5HP 125V AC				1.5HP 125V AC						
	2 Form A		E43028	25A 277V AC	10^5	–	LR26550	25A 277V AC	10^5	–	40006681 *1	25A 250V AC (cosφ=1.0)	10^5	25°C
				25A 30V DC				25A 30V DC				25A 250V AC (cosφ=0.4)		
				2HP 250V AC		–		2HP 250V AC				5A 110V DC (0ms)		
				1HP 125V AC				1HP 125V AC						
				1.5HP 120V AC	3×10^4	–								
				3HP 277V AC	3×10^4									

*1. VDE certified type is available. Please contact our sales representative.

TÜV (Certified)				TV rating		CQC				Standard marking
File No.	Contact rating	Cycles	Temp.	File No.	Contact rating	File No.	Contact rating	Cycles	Temp.	
B18 03 13461 374	20A 250V AC (cosφ=1.0)	–	–	E43028 (UL)	TV–8	–				C–UL, TÜV, VDE
–				–		–				UL/C-UL
–				–		–				UL, CSA
–				–		–				UL/C–UL, VDE
B18 03 13461 369	30A 250V AC (cosφ=1.0) 30A 250V AC (cosφ=0.4) 8A 110V DC (0ms)	–	–	E43028 (UL)	TV–15	CQC 13002100110	30A 250V AC	10^4	55°C	UL/CSA, TV–15, TÜV
B18 03 13461 369	25A 250V AC (cosφ=1.0) 25A 250V AC (cosφ=0.4) 8A 110V DC (0ms)			E43028 (UL)	TV–10		20A 250V AC			UL/CSA, TV–10, TÜV

Safety standards chart

Item			UL/C-UL (Recognized)				CSA (Certified)				VDE (Certified)			
			File No.	Contact rating	Cycles	Temp.	File No.	Contact rating	Cycles	Temp.	File No.	Contact rating	Cycles	Temp.
HE-S	Standard type	2 Form A, 2 Form A 1 Form B (N. O.)	E43149	35A 277V AC Resistive	3×10^4	85°C	CSA standard certified by C-UL				40042442	20A 250V AC cosφ=1	8×10^4	85°C
				20A 277V AC Resistive	10^5							AC-7a: 35A 263V AC cosφ=0.8	3×10^4	
				15A 480V AC Resistive	10^5							AC-3: 12A 230V AC cosφ=0.65		
				–	–							AC-3: 8A 480V AC cosφ=0.65		
				–	–							AC-7a: 52.5A 263V AC cosφ=0.8	50	
		2 Form A 1 Form B (N. C.)		1A 277V AC Resistive	10^5							DC–13: 1A 24V DC L/R=48ms	8×10^4	
				1A 30V DC Resistive								1A 30V DC L/R=0ms		
	Long Life type	2 Form A, 2 Form A 1 Form B (N. O.)	E43149	35A 277V AC Resistive	5×10^4						40042442	20A 250V AC cosφ=1	8×10^4	
				20A 277V AC Resistive (UL only)	2×10^5							AC-7a: 35A 263V AC cosφ=0.8	3×10^4	
				15A 480V AC Resistive	10^5							AC-3: 12A 230V AC cosφ=0.65		
				–	–							AC-3: 8A 480V AC cosφ=0.65		
				–	–							AC-7a: 52.5A 263V AC cosφ=0.8	50	
		2 Form A 1 Form B (N. C.)		1A 277V AC Resistive	10^5							DC-13: 1A 24V DC L/R=48ms	8×10^4	
				1A 30V DC Resistive								1A 30V DC L/R=0ms		
HE-PV	90 A		E43028	80A 300V AC General use	10^4	–	CSA standard certified by C-UL				40006681	135A 250V AC (cosφ=0.8)	50	85°C
												90A 300V AC (cosφ=1)	10^3	85°C
				80A 300V AC General use	6×10^3	85°C						90A 250V AC (cosφ=0.8)	10^3	85°C
												80A 250V AC (cosφ=1)	10^4	25°C
												80A 250V AC (cosφ=0.8)	10^4	85°C
	48 A		E43028	60A 277V AC General use	10^4	60°C					40006681	72A 250V AC (cosφ=0.8)	50	85°C
												60A 250V AC (cosφ=0.8)	10^4	
				48A 277V AC General use	3×10^4	85°C						50A 20V DC (0ms)	3×10^4	
												48A 250V AC (cosφ=0)	3×10^4	
	35 A		E43028	35A 277V AC	10^4	–	LR26550	35A 277V AC	10^4	–	40006681 *2	35A 250V AC (cosφ=1)	5×10^4	80°C
				30A 277V AC	10^5			30A 277V AC	10^5	–				
				30A 30V DC	10^5			30A 30V AC						
				3HP 250V AC	10^5			3HP 250V AC						
				1.5HP 125V AC	10^5			1.5HP 125V AC						

*2. 9 V coil type only.

<table>
<tr><th colspan="4">TÜV (Certified)</th><th colspan="2">TV rating</th><th colspan="4">CQC</th><th rowspan="2">Standard marking</th></tr>
<tr><th>File No.</th><th>Contact rating</th><th>Cycles</th><th>Temp.</th><th>File No.</th><th>Contact rating</th><th>File No.</th><th>Contact rating</th><th>Cycles</th><th>Temp.</th></tr>
<tr><td rowspan="4" colspan="4">–</td><td>E43149</td><td>TV–8</td><td rowspan="4" colspan="4">–</td><td rowspan="4">UL/CSA, VDE</td></tr>
<tr><td colspan="2">–</td></tr>
<tr><td>E43149</td><td>TV–10</td></tr>
<tr><td colspan="2">–</td></tr>
<tr><td rowspan="2" colspan="4">–</td><td>–</td><td>–</td><td rowspan="2" colspan="4">–</td><td>UL/C–UL, VDE</td></tr>
<tr><td>E43028</td><td>TV–15</td><td>UL/CSA, TV–15</td></tr>
</table>

Item		UL/C-UL (Recognized)				CSA (Certified)				VDE (Certified)			
		File No.	Contact rating	Cycles	Temp.	File No.	Contact rating	Cycles	Temp.	File No.	Contact rating	Cycles	Temp.
DJ-H		E43149	50A 277V AC Resistive	10^4	85°C	–				40045659	50A 250V AC (cosφ=1.0)	10^4	85°C
			40A 347V AC Resistive	$2×10^4$	40°C						25A 250V AC (cosφ=1.0)	$9×10^4$	40°C
			30A 480V AC Resistive	$2×10^4$	40°C								
			20A 277V AC Electronic ballast	$6×10^3$	85°C								
			20A 347V AC Electronic ballast	$6×10^3$	40°C								
			20A 277V AC Standard ballast	$3×10^4$	85°C								
			15A 347V AC Standard ballast	$3×10^4$	85°C						20A 250V AC Capacitor 200 µF (IEC/ EN60669-1 compliant)	$5×10^3$	
			5540W 277V AC Tungsten	$2.5×10^4$	40°C								
			1.5HP 120V AC	$3×10^4$	40°C								
			3HP 240V AC	$3×10^4$	40°C								
HE-N		E43028	Making and Breaking 55A Carrying 120A 600V AC General Use	$6×10^3$	85°C	CSA standard certified by C-UL				40006681	120A 800V AC (cosφ=1.0)	10^3	85°C
			Making and Breaking 55A Carrying 133A 600V AC General Use	$6×10^3$	85°C						–		
EP	10 A	E43149	10A 400V DC, 10A 277V AC Resistive	$6×10^3$	–	CSA standard certified by C-UL				–			
	20 A	E43149 (UL only)	20A 400V DC, 20A 277V AC Resistive (UL only)										
	80 A	E43149	80A 400V DC, 80A 277V AC Resistive										
	300 A	E43149	300A 277V AC Resistive										
HE-V	2 Form A	E43028	25A 600V DC Same polarity only	$6×10^3$	85°C	CSA standard certified by C-UL				40006681	20A 1000V DC	10	85°C
			20A 600V DC Same polarity only	10^4							20A 800V DC	10^3	
											20A 600V DC	10^4	

TÜV (Certified)				TV rating		CQC				Standard marking
File No.	Contact rating	Cycles	Temp.	File No.	Contact rating	File No.	Contact rating	Cycles	Temp.	
–				–		–				UL/C-UL, VDE
–				–		–				UL/C-UL, VDE
–				–		–				–
–				–		–				UL/C-UL, VDE

Products conforming to EN/IEC standards

Product classification	Product name	Applied standards	3rd party certifiying body	File No.
Power relay (Over 2A)	LD−P	EN61810−1	VDE	Nr. 40014384
	LK−T		VDE	Nr. 40014390
			TÜV	Nr. B 013461 0379 Rev.01
	PA−N		TÜV	Nr. B 18 03 13461 368
	PQ		VDE	Nr. 40013088
	PF		VDE	Nr. 40027672
	DS-P		TÜV	Nr. B 18 03 13461 370
	DW		VDE	Nr. 40032254
	LK−Q		TÜV	Nr. B 013461 0379 Rev.01
	ST		VDE	Nr. 40017740
	DE		VDE	Nr. 115944
	DK		TÜV	Nr. B 18 03 13461 371
	LQ		VDE	Nr. 40032836
	JS (Standard type)		VDE	Nr. 40011475
			TÜV	Nr. B 18 03 13461 377
	JW		VDE	Nr. 40013854
	LK−G		TÜV	Nr. B 013461 0379 Rev.01
	LK−P		VDE	Nr. 40014390
			TÜV	Nr. B 013461 0379 Rev.01
	SP		TÜV	Nr. B 18 03 13461 381
	DJ		VDE	Nr. 40009736
	JV−N		TÜV	Nr. B 18 03 13461 373
	LE		VDE	Nr. 40009159
	LZ		VDE	Nr. 40000380
	LZ-N		VDE	Nr. 40047387
	LF		VDE	Nr. 40009169
			TÜV	Nr. B 18 03 13461 374
	LF−G		VDE	Nr. 40023067
	HE		VDE	Nr. 40006681
			TÜV	Nr. B 18 03 13461 369
	HE PV type		VDE	Nr. 40006681
	HE−S		VDE	Nr. 40042442
	HE−V		VDE	Nr. 40006681
	HE-N		VDE	Nr. 40006681
	DJ-H		VDE	Nr. 40045659

■UL Coil Insulation

Coil Insulation	Relay
UL-B	LE, LQ, LZ, LZ-N, JS, JW
UL-F	LD-P, LE, LF-G, LQ, LZ, LZ-N, JS, JT-V, JT-N, PA-N

■TV rating

TV rating	Steady(A)	Inrush(A)	Relay
TV-3	3	51	ST
TV-5	5	78	LE, LZ, LZ-N, LK-G, LK-P, JW, LK-Q
TV-8	8	117	DW (Inrush type), LF, LK-T, LK-Q, HE-S (STD type Form A contact)
TV-10	10	141	HE (2a), HE-S (Long life type Form A contact)
TV-15	15	191	HE (1a), HE PV (35A)

■Surge withstand voltage between contact and coil

Surge withstand voltage	Relay
5,000 V	DS-P
6,000 V	ST, PF, JT-V, LF-G, PA-N
8,000 V	LQ, PQ
10,000 V	LF, LE, LD-P, LK-G, LK-P, LK-T, LZ, LZ-N, LK-Q, JW, HE, HE PV, DJ, DK, DY, HE-S, HE-N
12,000 V	DE, DW, DJ-H, DZ-S

■Terminal socket

SP, NC, HE

■Socket

S, ST, NC, PA-N, PQ, DK, DS-P, JW

GUIDELINES FOR POWER, HIGH-CAPACITY DC CUT OFF AND SAFETY RELAYS USAGE

■For cautions for use, please read "GUIDELINES FOR RELAY USAGE".
https://industrial.panasonic.com/ac/e/control/relay/cautions_use/index.jsp

Precautions for Coil Input

■Long term current carrying

A circuit that will be carrying a current continuously for long periods without relay switching operation. (circuits for emergency lamps, alarm devices and error inspection that, for example, revert only during malfunction and output warnings with form B contacts)
Continuous, long-term current to the coil will facilitate deterioration of coil insulation and characteristics due to heating of the coil itself. For circuits such as these, please use a magnetic-hold type latching relay. If you need to use a single stable relay, use a sealed type relay that is not easily affected by ambient conditions and make a failsafe circuit design that considers the possibility of contact failure or disconnection.

■DC Coil operating power

Steady state DC current should be applied to the coil. The wave form should be rectangular. If it includes ripple, the ripple factor should be less than 5%.
However, please check with the actual circuit since the electrical characteristics may vary. The rated coil voltage should be applied to the coil and the set/reset pulse time of latching type relay differs for each relays, please refer to the relay's individual specifications.

■Coil connection

When connecting coils of polarized relays, please check coil polarity (+,-) at the internal connection diagram (Schematic). If any wrong connection is made, it may cause unexpected malfunction, like abnormal heat, fire and so on, and circuit do not work. Avoid impressing voltages to the set coil and reset coil at the same time.

■Maximum allowable voltage and temperature rise

Proper usage requires that the rated coil voltage be impressed on the coil. Note, however, that if a voltage greater than or equal to the maximum continuous voltage is impressed on the coil, the coil may burn or its layers short due to the temperature rise. Furthermore, do not exceed the usable ambient temperature range listed in the catalog.

■Operate voltage change due to coil temperature rise

In DC relays, after continuous passage of current in the coil, if the current is turned OFF, then immediately turned ON again, due to the temperature rise in the coil, the pick-up voltage will become somewhat higher. Also, it will be the same as using it in a higher temperature atmosphere. The resistance/temperature relationship for copper wire is about 0.4% for 1°C, and with this ratio the coil resistance increases. That is, in order to operate of the relay, it is necessary that the voltage be higher than the pick-up voltage and the pick-up voltage rises in accordance with the increase in the resistance value. However, for some polarized relays, this rate of change is considerably smaller.

Ambient Environment

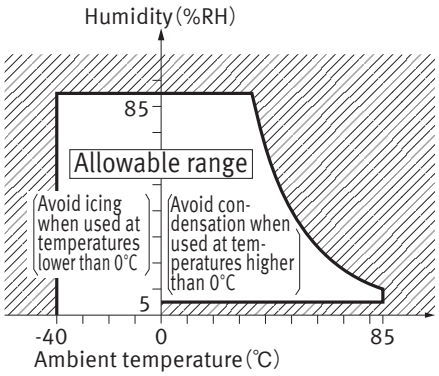
■Usage, Transport, and Storage Conditions

During usage, storage, or transportation, avoid locations subjected to direct sunlight and maintain normal temperature, humidity and pressure conditions.

●Temperature/Humidity/Pressure

When transporting or storing relays while they are tube packaged, there are cases the temperature may differ from the allowable range. In this case be sure to check the individual specifications. Also allowable humidity level is influenced by temperature, please check charts shown below and use relays within mentioned conditions. (Allowable temperature values differ for each relays, please refer to the relay's individual specifications.)

1) Temperature:
The tolerance temperature range differs for each relays, please refer to the relay's individual specifications
2) Humidity: 5 to 85 % RH
3) Pressure: 86 to 106 kPa



●Dew condensation

Condensation occurs when the ambient temperature drops suddenly from a high temperature and humidity, or the relay is suddenly transferred from a low ambient temperature to a high temperature and humidity. Condensation causes the failures like insulation deterioration, wire disconnection and rust etc. Panasonic Corporation does not guarantee the failures caused by condensation.
The heat conduction by the equipment may accelerate the cooling of device itself, and the condensation may occur.
Please conduct product evaluations in the worst condition of the actual usage. (Special attention should be paid when high temperature heating parts are close to the device. Also please consider the condensation may occur inside of the device.)

●Icing

Condensation or other moisture may freeze on relays when the temperature become lower than 0°C.This icing causes the sticking of movable portion, the operation delay and the contact conduction failure etc. Panasonic Corporation does not guarantee the failures caused by the icing.
The heat conduction by the equipment may accelerate the cooling of relay itself and the icing may occur. Please conduct product evaluations in the worst condition of the actual usage.

●Low temperature and low humidity

The plastic becomes brittle if the switch is exposed to a low temperature, low humidity environment for long periods of time.

●High temperature and high humidity

Storage for extended periods of time (including transportation periods) at high temperature or high humidity levels or in atmospheres with organic gases or sulfide gases may cause a sulfide film or oxide film to form on the surfaces of the contacts and/or it may interfere with the functions. Check out the atmosphere in which the units are to be stored and transported.

●Package

In terms of the packing format used, make every effort to keep the effects of moisture, organic gases and sulfide gases to the absolute minimum.

●Silicon

When a source of silicone substances (silicone rubber, silicone oil, silicone coating materials and silicone filling materials etc.) is used around the relay, the silicone gas (low molecular siloxane etc.) may be produced.

This silicone gas may penetrate into the inside of the relay. When the relay is kept and used in this condition, silicone compound may adhere to the relay contacts which may cause the contact failure. Do not use any sources of silicone gas around the relay (Including plastic seal types).

●NOx Generation

When relay is used in an atmosphere high in humidity to switch a load which easily produces an arc, the NOx created by the arc and the water absorbed from outside the relay combine to produce nitric acid.

This corrodes the internal metal parts and adversely affects operation.

Avoid use at an ambient humidity of 85%RH or higher (at 20°C). If use at high humidity is unavoidable, please contact our sales representative.

Others

■Cleaning

- Although the environmentally sealed type relay (plastic sealed type, etc.) can be cleaned, avoid immersing the relay into cold liquid (such as cleaning solvent) immediately after soldering. Doing so may deteriorate the sealing performance.
- Cleaning with the boiling method is recommended(The temperature of cleaning liquid should be 40°C or lower). Avoid ultrasonic cleaning on relays. Use of ultrasonic cleaning may cause breaks in the coil or slight sticking of the contacts due to ultrasonic energy.

Please refer to **"the latest product specifications"** when designing your product.
•Requests to customers:
https://industrial.panasonic.com/ac/e/salespolicies/

Please contact .....

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