

# **Mechanical Relays**

Power Relays (Over 2 A) /
High-capacity DC cut off Relays /
Signal Relays (2 A or less) /
Microwave Devices / Safety Relays

**SELECTION GUIDE** 

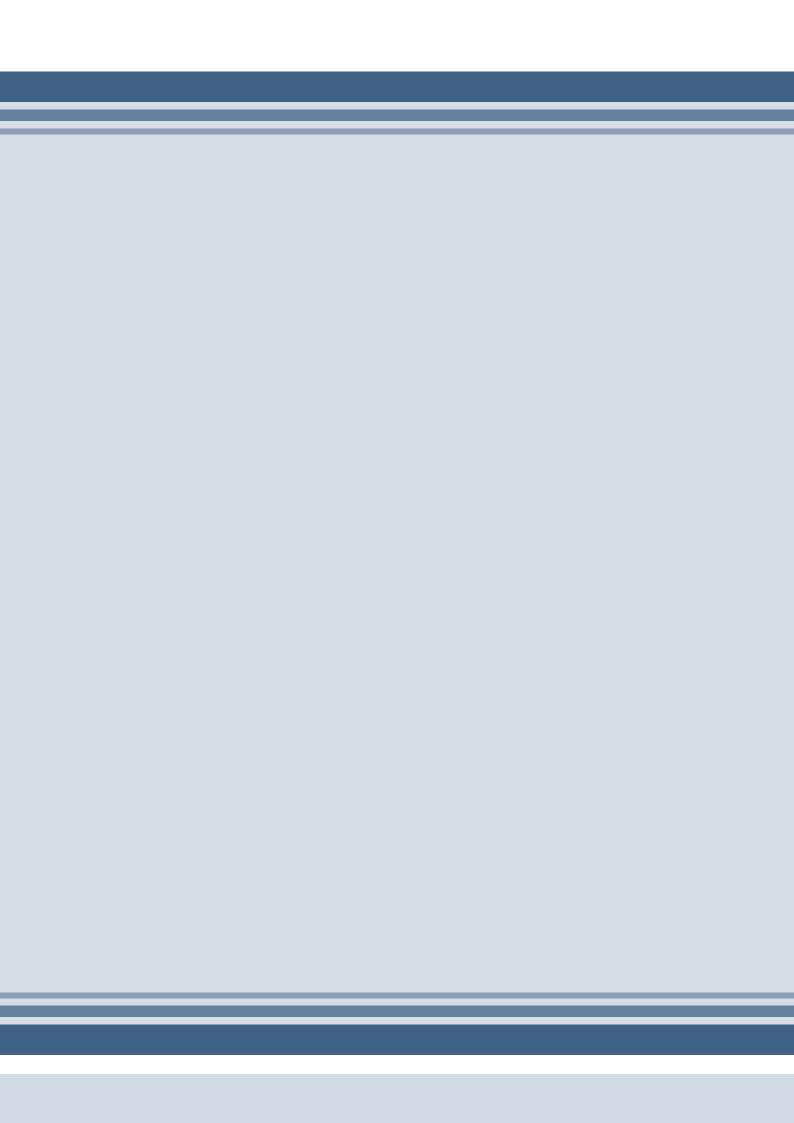
# IN Better Solution









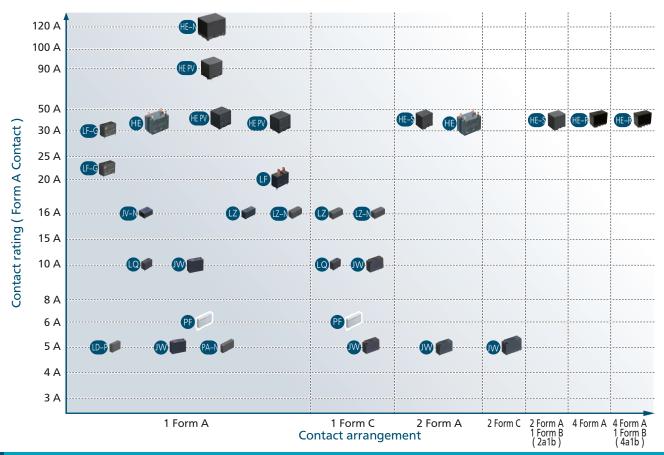


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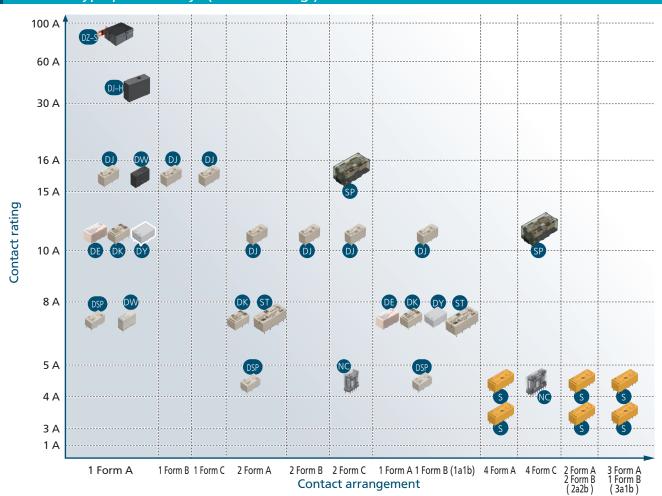
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## Power relays line up

## Non polarized type power relays



#### Polarized type power relays ( with latching )



## DC load switching capacity (reference value)

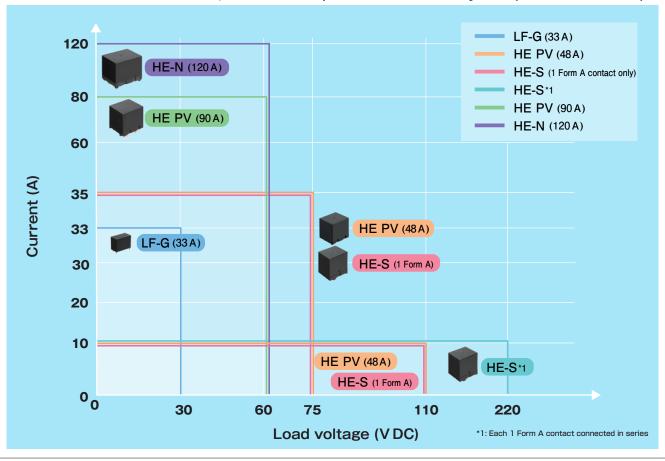
#### AC load relays shown below can switch DC load as following chart

Appearance	Product name	Contact	Load voltage	Current	Electrical expected life(resistive load)	Remarks
	LF-G (33A)	1 Form A	30 V DC	33 A		_
	LIE DV (49A)	1 Form A	75 V DC	35 A		
	HE PV (48A)	I FOIII A	110 V DC	10 A		_
	HE PV (90A)	1 Form A	60 V DC	80 A	10⁴	_
11	HE-N (120A)	1 Form A	60 V DC	120 A		_
			75 V DC	35 A		1 Form A contact only
	HE-S (35A)	2 Form A	110 V DC	10 A		1 Form A contact only
			220 V DC	10 A		Each 1 Form A contact connected in series

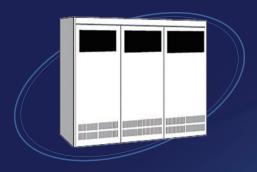
This chart is guideline for using DC load. Please test actual condition before use.

#### Maximum DC load switching capacity

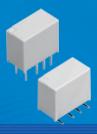
■ Conditions: resistive load, electrical expected life of 10<sup>4</sup> cycles (reference value)



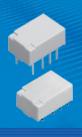
# Wide variety of signal relays leading on the global market with high



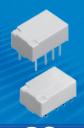
# **Communication Network Equipment**







GQ







- Botton surface area 5.7 × 10.6 mm²
- Compact slim body
- High sensitivity 100 mW type
- Low profile: 5.2 mm
  - Compact flat body High sensitivity 100 mW type
- controlled 3.5 A
- High contact capacity
- High dielectric strength

# **OA Equipment / Thermostat**



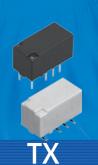


# performance and quality

Signal Relays



## Security

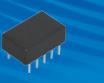








TX-D





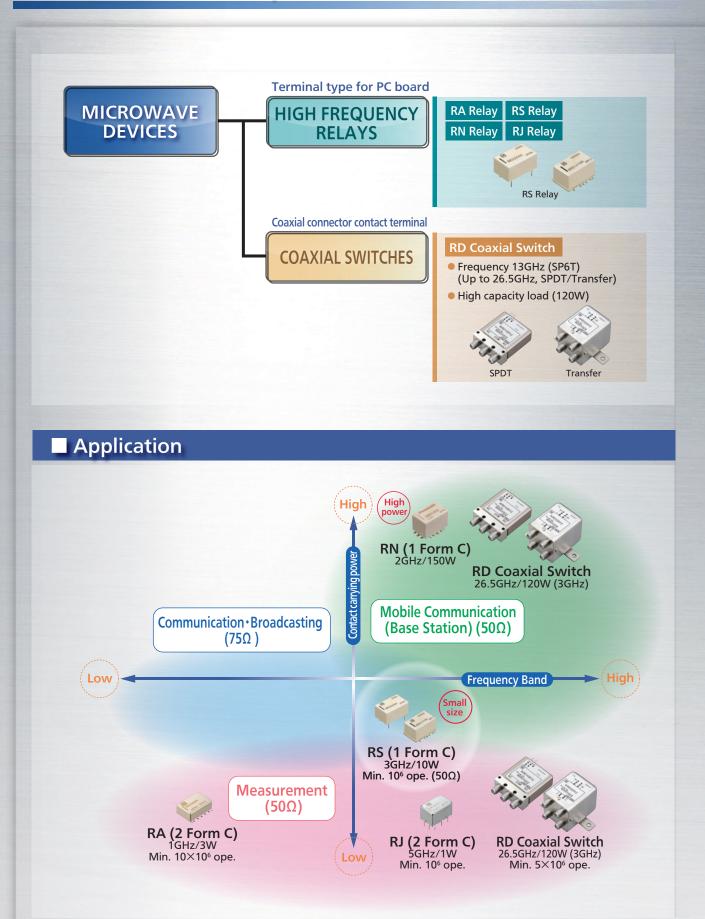


- Controlled 7.5 A inrush current possible
- High sensitivity 50 mW type
- Surge Withstand voltage 6,000 V
- Low profile : 5 mm
- Low profile: 5.6 mm
- High switching capacity: 2 A

# Precision / Industrial Equipment

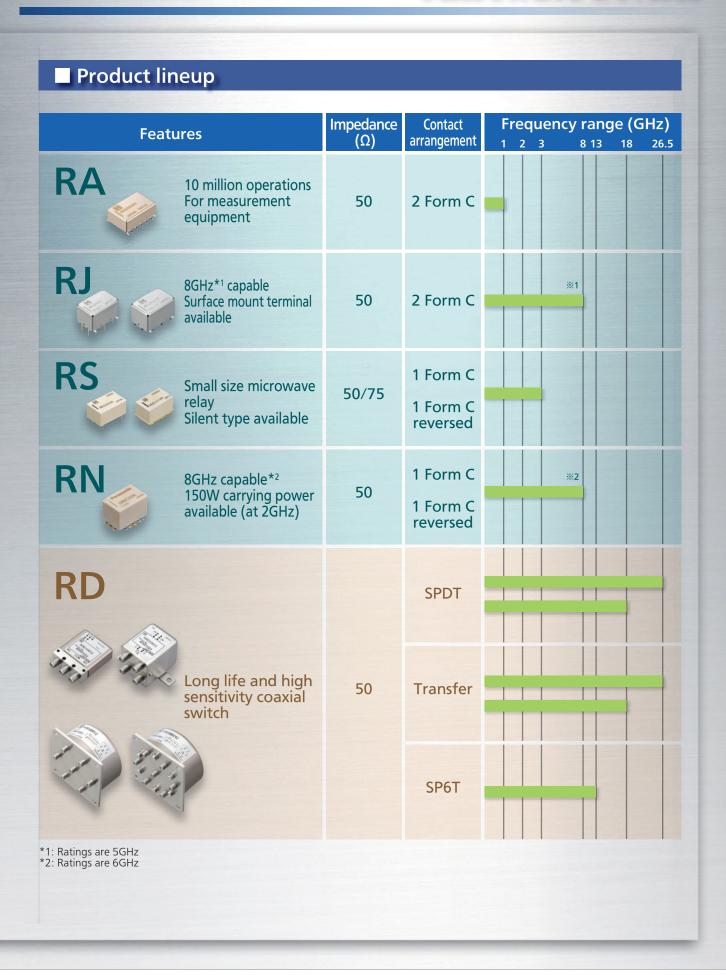


# Our Superior Microwave Devices Product Lineup



# Support for Wide Range of Frequencies

## Microwave Devices

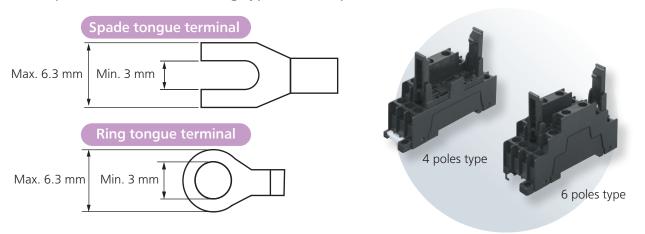


# Lineup of Safety relays and Accessories



## Accessories

DIN rail terminal sockets are available Spade and ring tongue terminal compatible Compatible with the following types of wire-pressed terminals

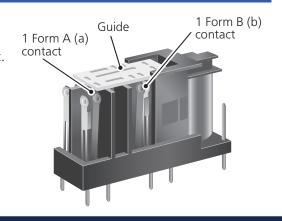


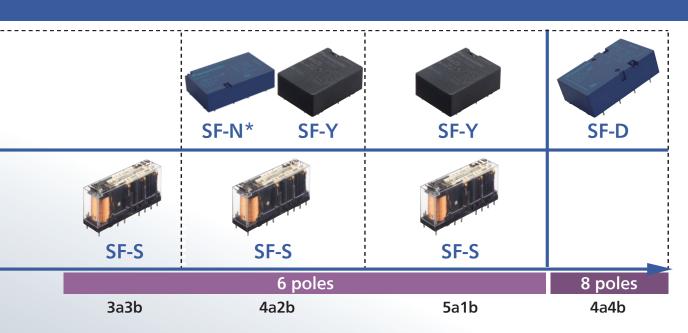
## ■ Forcibly guided contact structure

#### Complies with safety standard (IEC/EN61810-3)

Equipped with forcibly guided contact structure that enables detection of contact welding and construction of safety circuit.

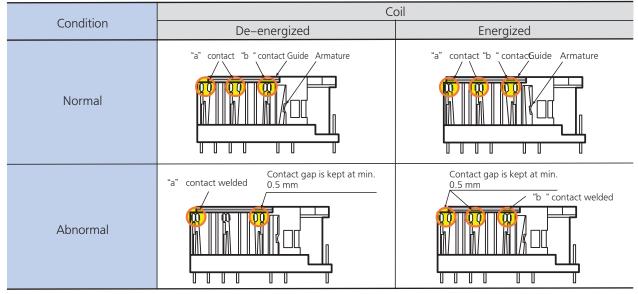
- Designed so that contacts 1 Form A (a) and 1 Form B (b) will not close at the same time.
- Designed with at least 0.5 mm space between contacts.





\*SF-N is available for production only in Europe

### (Example) – SF Relay Slim type 4a2b –



#### Other contact gaps when contacts are welded

		State of other contacts							
		3–4 ( b contact )	5–6 ( b contact )	7–8 ( a contact )	9–10 ( a contact )	11–12 ( a contact )	13–14 ( a contact )		
	3-4 ( b contact )	_		>0.5	>0.5	>0.5	>0.5		
Welded	5–6 ( b contact )		_	>0.5	>0.5	>0.5	>0.5		
contact	7–8 ( a contact )	>0.5	>0.5	_					
No.	9–10 ( a contact )	>0.5	>0.5		_				
	11–12 ( a contact )	>0.5	>0.5			_			
	13–14 ( a contact )	>0.5	>0.5						

>0.5: contact gap is kept at min. 0.5 mm .020 inch Empty cells: either ON or OFF  $\,-\,$ : welded contact

Note: The table above shows the state of the other contacts. In case of form a contact weld the coil applied voltage is "Non–energized". In case of form b contact weld the coil applied voltage is nominal ( energized ).

Note: Contact gaps are shown at the initial state.

If the contact transfer is caused by load switching, it is necessary to check the actual loading.

# Schematic (BOTTOM VIEW) Standard

# Power Relays (Over 2A) selector chart

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

	Cotomo		[Order of products: Max.contact rating (small to large)]  Power Relays (~5 A)					
Product na	Category	S RELAYS	Power Relays (~5 A)  LD-P RELAYS	NC RELAYS				
Type of relay (Height includes standoff unit = mm)  Initial of part number		28 12 10.4 AG3	20.2	25.4 11.2 27.8 Slim (2 Form C) 10.9 Flat (2 Form C)				
milial of part number			ALDP	• Transistor drive				
Features		2 Form A 2 Form B/3 Form A     1 Form B/4 Form A     4A polarized power relays	Compliant with IEC/EN60335-1/ EN60079-15 (VDE approved)     1 Form A 5A slim power relays	• 2 Form C/4 Form C 5A slim power relays				
	Contact arrangement	2 Form A 2 Form B, 3 Form A 1 Form B, 4 Form A	1 Form A	2 Form C, 4 Form C				
	Contact shape	Twin	Single	Twin				
	Contact material	Double layer contact of AgNi-AgSnO₂ type +Au clad	AgNi type	AgNi type +Au clad				
Contact data	20 A - 20 A - 15 A - Contact rating 10 A - (resistive) 8 A - 5 A - 3 A -	4 A 250 V AC 3 A 30 V DC	5 A 277 V AC 3 A 30 V DC	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 ty	pes availability	•	-	260 mM / 2 Farma 20142				
Coil data	Rated operating power	200 mW	200 mW	360 mW (2 Form C)*2, 720 mW (4 Form C)*2				
00.11 44.14	Operate [Set] voltage (initial)  Release [Reset] voltage (initial)	Max.70% V Min.10% V [Max.70% V]	Max.75% V Min.5% V	Max.80% V Min.10% V				
Time	Operate [Set] time (initial)	Max.15 ms	Max.10 ms	Max.20 ms				
Characteristics (initial)	Release [Reset] time (initial)	Max.10 ms [Max.15 ms]	Max.10 ms (with diode)	Max.10 ms				
Expected life	Mechanical life (ope.)	Min.100 x10 <sup>6</sup>	Min.5 x10 <sup>6</sup>	Min.50 x10 <sup>6</sup>				
Dielectric	Between open contacts	750 V rms for 1 min	750 V rms for 1 min	1,000 V rms for 1 min				
strength	Between contact sets	1,000 V rms for 1 min	-	1,000 V rms for 1 min				
(initial)	Between contact and coil	1,500 V rms for 1 min	4,000 V rms for 1 min	2,000 V rms for 1 min				
	stand voltage contact and coil) (initial)	-	10,000 V	_				
Ambient te		-55 to +65°C	-40 to +85°C	-40 to +70°C (2 Form C)*2 -40 to +55°C (4 Form C)				
Protective	Dust cover	-	-	•				
construction	Flux-resistant Sealed	-	-	-				
PC board pattern (BOTTOM VIEW)  • indicates input terminal 2.54mm grid		Single side stable	(1.05) 11.5 7.0 4-\phi1.1	Slim Flat 2 Form C 8-φ1.2  4 Form C 14-φ1.2  4 Form C 14-φ1.2  14-φ1.2				
Safety star	ndards	UL, CSA	UL/C-UL, VDE, CQC (Excluding Class F insulation )	UL, CSA				
Unit weight	t (Approx.)	8 g	4 g	16 g (2 Form C), 19 g (4 Form C: slim), 18 g (4 Form C: Flat)				
Option		Socket	-	Socket, Terminal socket				
Remarks		-	-	*1: Dust cover *2: Max.48 V DC				

	Category	Power Relays (~5 A)	Power Re	elays (~10 A)	
Product na		PA-N RELAYS	PF RELAYS	DS-P RELAYS	
Type of relay (Height includes standoff unit = mm)		20 5 12.5	28	20.2	
Initial of pa	art number	APAN3	APF	AGP	
Features		1 Form A 5A Slim power relays meet IEC61010 reinforced insulation	Compliant with European standards     1 Form A/1 Form C 6A Slim powerelays		
	Contact arrangement	1 Form A	1 Form A, 1 Form C	1 Form A 1 Form B, 2 Form A	
	Contact shape	Twin	Single	Single	
	Contact material	AgNi type +Au	AgNi type, AgNi type +Au plated	AgSnO₂ type +Au flashed	
Contact data	30 A 20 A Contact rating 15 A (resistive) 8 A 5 A 3 A	5 A 250 V AC 5 A 30 V DC	6 A 250 V AC 6 A 250 V AC  No Au plating type type	8 A 250 V AC 5 A 30 V DC 5 A 30 V DC 5 A 30 V DC	
	Min. switching load (reference value)	100 μA 100m V DC	100 mA 5 V DC 1 mA 1 V DC	10 mA 5 V DC 10 mA 5 V DC	
	Max.switching voltage	250 V AC, 110 V DC (0.4 A)	250 V AC	250 V AC, 125 V DC (0.2 A)	
Latching ty	pes availability	-	-	•	
Coil data	Rated operating power	110 mW	170 mW (4.5 to 24 V DC) 217 mW (48 V DC), 175 mW (60 V DC	300 mW	
Coll data	Operate [Set] voltage (initial)		Max.70% V	Max.80% V	
	Release [Reset] voltage (initial)		Min.5% V	Min.10% V [Max.80% V]	
Time Characteristics	Operate [Set] time (initial)	Max.10 ms	Max.8 ms	Max.10 ms	
(initial)	Release [Reset] time (initial)	Max.5 ms	Max.4 ms	Max.5 ms [Max.10 ms]	
Expected life	Mechanical life (ope.)	Min.20×10 <sup>6</sup>	Min.5 x10 <sup>6</sup>	Min.50 x10 <sup>6</sup>	
Dielectric	Between open contacts	1,000 V rms for 1 min	1,000 V rms for 1 min	1,000 V rms for 1 min	
strength (initial)	Between contact sets	-	-	- 2,000 V rms for 1 min	
<u> </u>	Between contact and coil	3,000 V rms for 1 min	4,000 V rms for 1 min	3,000 V rms for 1 min	
	stand voltage contact and coil) (initial)	6,000 V	6,000 V	5,000 V	
Ambient te	mperature	-40 to +90°C	-40 to +85°C	-40 to +60°C (1 Form A, 2 Form A) -40 to +65°C (1 Form A 1 Form B)	
Protective	Dust cover	-	-	-	
construction	Flux-resistant	-	-	-	
Sealed		•	•	•	
PC board pattern (BOTTOM VIEW)  ■ indicates input terminal 2.54mm grid		φ1 φ1 φ1.2 φ1.2	1 Form A $2-\phi 1.3$ $3.78$ $5.04$ $1.9$ $1 Form C$ $2-\phi 1$ $3-\phi 1.3$ $1 Form C$ $2-\phi 1$ $3-\phi 1.3$ $21.42$ $21.42$ $21.42$ $21.42$	1 Form A  6-φ1.2  2 coil latching only  1 Form A 1 Form B, 2 Form A  8-φ1.2  2 coil latching only	
Safety star	ndards	UL/C-UL, VDE	UL/C-UL, VDE	UL/C-UL, VDE	
	t (Approx.)	3 g	5 g	4.5 g	
Option		Socket	-	Socket	
Remarks		-	-	-	

	Catana			Deute: Delevis ( 40.4)		
Product na	Category	DW RE	ΕΙ ΔΥς	Power Relays (~10 A) ST RELAYS	DE RELAYS	
Type of rel		10 18.8 15.8		31 14 11.3 11.3	25 12.5 12.5	
Initial of pa	art number		ADW	AR2	ADE	
Features		• 1 Form A 8A/16 small polarize	A (TV-8 rated)* , d power relays	TV-3 rated Torm A 1 Form B/2 Form A 8A polarized power relays	Meet European standards     Form A/2 Form A/1 Form A 1 Form B     10A/8A polarized power relays	
	Contact arrangement	1 Fo		1 Form A 1 Form B, 2 Form A	1 Form A 1 Form B, 2 Form A	
	Contact shape	Sin	<u> </u>	Single	Single	
	Contact material	AgSnC	D <sub>2</sub> type	AgSnO₂ type +Au flashed	AgSnO₂ type	
Contact data	30 A - 20 A - 20 A - 15 A - 16 A - 17	8 A 250 V AC Standard type	16 A 277 V AC*	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		250 V AC	277 V AC	250 V AC, 30 V DC	250 V AC, 30 V DC	
Latching ty	pes availability	(Latching type only)		•	•	
Cail data	Rated operating power	200 mW (1 coil latching) 400 mW (2 coil latching)		Approx 240 mW	200 mW	
Coil data	Operate [Set] voltage (initial)	Max.80% V		Max.80% V	Max.70% V	
	Release [Reset] voltage (initial)	Max.80% V		Min.10% V [Max.80% V]	Min.10% V [Max.70% V]	
Time	Operate [Set] time (initial)	Max.15 ms Max.15 ms		Max.15 ms	Max.10 ms	
Characteristics (initial)	Release [Reset] time (initial)			Max.10 ms [Max.15 ms]	Max.5 ms [Max.10 ms]	
Expected life	Mechanical life (ope.)	Min		Min.10 x10 <sup>6</sup>	Min.10 x10 <sup>6</sup>	
Dielectric	Between open contacts	1,000 V rm		1,200 V rms for 1 min	1,000 V rms for 1 min	
strength	Between contact sets	-		2,000 V rms for 1 min	- 4,000 V rms for 1 min	
(initial)	Between contact and coil	5,000 V rms for 1 min		3,750 V rms for 1 min	5,000 V rms for 1 min	
	stand voltage contact and coil) (initial)	12,000 V		6,000 V	12,000 V	
Ambient te			(Max.8 to 16 A)	-40 to +60°C	-40 to +70°C	
Protective	Dust cover	-	-	-	-	
construction	Flux-resistant	•		-	-	
	Sealed	-	-	• Single side stable 6-φ1.4	•	
PC board pattern (BOTTOM VIEW)  ● indicates input terminal 2.54mm grid		4 or 5-φ1.2  2 coil latching only	3.5	2 coil latching 8-\phi 1.4	Single side stable 6-φ1.2	
Safety star	ndards	UL/C-UL, \	/DE, CQC	UL, CSA, VDE	UL/C-UL, VDE	
Unit weigh	t (Approx.)	8 g (Low profi	le type: 7.5 g)	10 g	7 g	
Option		-	-	Socket	_	
Remarks		* TV-8 rated and inrush type: 16 A only		_	-	

	Category	Power Relays (~10 A)					
Product na		DK RE	I AYS		RELAYS	LQ RELAYS	
Type of rela		20 12.5		20 15 10		20 10 16	
Initial of part number			AW3	ľ	ADY	1	ALQ
Features		• 1 Form A 10A		• 1 Form A 10A, 1 Form A 1 Form B 8A small polarized power relays		Compliant with IEC/EN603     /EN60079-15 (VDE approv     1 Form A/1 Form C     10A small power relays	
	Contact arrangement	1 Form A	1 Form A 1 Form B, 2 Form A	1 Form A	1 Form A 1 Form B	1 Form A, 1 Form C	;
	Contact shape	Sin		;	Single	Single	
	Contact material	AgSnO₂ type + Au flashed	AgNi type + Au flashed	AgSnO₂ ty	/pe +Au flashed	AgNi type	
Contact data	30 A - 20 A - 15 A - 16 A - 16 A - 17 A - 18	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	10 A 125 V AC 5 A 250 V AC 5 A 30 V DC	
	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, 30 V DC	
Latching ty	oes availability	•		•		-	
	Rated operating power	200 mW		2	00 mW	200 mW (1 Form A ), 400 mW (1	Form C)
Coil data	Operate [Set] voltage (initial)	Max.70% V		Max.70% V		Max.75% V	
	Release [Reset] voltage (initial)	Min.10% V [Max.70% V]			V [Max.70% V]	Min.5% V	
Time Characteristics (initial)	Operate [Set] time (initial)  Release [Reset] time (initial)	Max.10 ms  Max.8 ms [Max.10 ms]		Max.10 ms  Max.8 ms [Max.10 ms]		Max.20 ms  Max.20 ms (With diode)	
Expected life	Mechanical life (ope.)	Min.50 x10 <sup>6</sup>		Mir	n.50 x10 <sup>6</sup>	Min.10 x10 <sup>6</sup>	
Dielectric	Between open contacts	1,000 V rms for 1 min		1,000 V rms for 1 min		1,000 V rms for 1 min (1 Fo 750 V rms for 1 min (1 Fo	
strength (initial)	Between contact sets	-	4,000 V rms for 1 min	- 4,000 V rms for 1 min		-	
	Between contact and coil	4,000 V rms	s for 1 min	4,000 V rms for 1 min		4,000 V rms for 1 min	
	stand voltage ontact and coil) (initial)	10,000 V		10,000 V		8,000 V	
Ambient ter	nperature	-40 to +65°C		-40 to +70°C		-40 to +85°C	
Don't a ation	Dust cover	_	-			-	
Protective construction	Flux-resistant	_	-		_	-	
PC board pattern (BOTTOM VIEW)  • indicates input terminal 2.54mm grid		1 Form A 2 coil latching only 3-φ0.9  1 Form A 2 coil latching only 1 Form B, 2 Form A 3-φ0.9		1 Form A 2 coil latching only 3-φ0.9  1 Form A 2 coil latching only 1 Form B 3-φ0.9		1 Form C	φ1.3 - 51.3
Safety stan	dards	UL, CSA, (VDE: s	pecial order only)	UL.	CSA, VDE	UL/C-UL, VDE, CQC	
Unit weight		5 g	6 g		6 g	7 g	
Option		Soc			Socket		
Remarks		-	-		-	*1 Form A type is compatible for the bottom surface	e except

	Category	Power Relays (~10 A)		Power Rel	ays (~20 A)		
Product na		JW RELAYS	SP RE		DJ RELAYS		
Type of relay (Height includes standoff unit = mm)		28.6	25.6		29 13 16.5		
Initial of pa	rt number	AJW		AR1		ADJ	
Features		TV-5 rated (1a)*  Torm A/1 Form C/2 Form A/ Form C 5A/10A universal power relays				olarized power relays creepage distance ntact and coil)	
	Contact arrangement	1 Form A, 1 Form C, 2 Form A, 2 Form C 1 Form C	2 Form C	4 Form C	1 Form C, 1 Form A, 1 Form B	1 Form A 1 Form B, 2 Form C, 2 Form A, 2 Form B	
	Contact shape	Single	Tv	vin	Sir	igle	
	Contact material	1 Form A: AgSnO₂ type 1 Form C, 2 Form A, 2 Form C: AgNi type	Stationary: AgSnC Movable: AgSnO <sub>2</sub>	2 type +Au flashed type	AgSnO₂ type	AgSnO <sub>2</sub> type + Au flashed	
Contact data	30 A 20 A - 20 A - 20 A - 15 A (resistive) 8 A - 5 A - 3 A - 3 A - 3	10 A 250 V AC 10 A 30 V DC 5 A 250 V AC 5 A 30 V DC 5 A 30 V DC Standard High capacity type type	15 A 250 V AC 10 A 30 V DC	10 A 250 V AC 10 A 30 V DC	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	100 mA 5 V DC	
Latabia a ta	Max.switching voltage	250 V AC, 30 V DC	250 V AC, 30 V DC		250 V AC		
Latening ty	pes availability  Rated operating power	530 mW	300	300 mW		tching) stable, 2 coil latching)	
Coil data	Operate [Set] voltage (initial)	Max.70% V	Max.7	70% V		[Max.70% V]	
	Release [Reset] voltage (initial)	Min.10% V	Min.10% V [	Max.70% V]	Min.10% V [Max.70% V]		
Time	Operate [Set] time (initial)	Max.15 ms	Max.50 ms Max.20 ms [Max.50 ms]		Max.20 ms Max.20 ms		
Characteristics (initial)	Release [Reset] time (initial)	Max.5 ms					
Expected life	Mechanical life (ope.)	Min.5 x10 <sup>6</sup>	Min.50 x10 <sup>6</sup>		Min.5 x10 <sup>6</sup>		
Dielectric	Between open contacts	1,000 V rms for 1 min	1,500 V rms for 1 min		1,000 V rms for 1 min		
strength	Between contact sets	3,000 V rms for 1 min (2 poles) —	3,000 V rm	s for 1 min	-	2,000 V rms for 1 min	
(initial)	Between contact and coil	5,000 V rms for 1 min	3,000 V rms for 1 min		4,000 V rms for 1 min		
	stand voltage ontact and coil) (initial)	10,000 V	-		10,000 V		
Ambient ter	mperature	-40 to +60°C (Class E) -40 to +85°C (Class B)	−50 to +60°C		-40 to +70°C		
Protective	Dust cover	-		•			
construction	Flux-resistant Sealed	•	-	-	•		
PC board pattern (BOTTOM VIEW)  • indicates input terminal 2.54mm grid		1 Form A	2 Form C	10-φ2.5 1016 1016 16-φ2.5	1 Form C 2 coil latching only 2 Form C 2 coil	φ1.5 φ1.5 φ1.5	
Safety stan	dards		797	1016 1016 1016		latching only	
Unit weight		13 g	50 g	65 g	UL/C-UL, VDE, CQC		
Option	(pr.o)	Socket		Mounting board	,	· ອ -	
Remarks		* Please contact our sales representative for details	-		Test button type is available  * Please contact our sales representative for details		

Initial of part Features	es standoff unit = mm)	JV-N RELAYS	.9	1 00	ver Relays (~2 LZ RELAYS	.5		Z-N RELAYS	5
Type of relay (Height include: Initial of part Features	es standoff unit = mm)	22 16	.9		28.8	.5			5
Features	number		22 16 10.9		28.8 12.5 15.7			28.8	15.7
С			AJVN			ALZ			ALZN
_		1 Form A 16A, low profile power relays for heater contact.		1 Form A/	e: 15.7mm heiզ 1 Form C 16A բ	ower relays	<b>GWT Low</b>	d and meet EN6 profile: 15.7mm I Form C 16A p	n height
	Contact arrangement	1 Form A		1 F	orm A, 1 Forn	n C	1 F	orm A, 1 Form	С
C	Contact shape	Single			Single			Single	
С	Contact material	AgSnO <sub>2</sub> type 16 A 125 V AC 10 A 277 V AC			AgSnO <sub>2</sub> type			AgSnO <sub>2</sub> type	
	20 A	10 A 30 V DC			10 A 230 V AC			10 A 250 V AC	
N	3A- Ain. switching load								
(r	reference value)	100 mA 5 V DC		100 mA 5 V DC			100 mA 5 V DC	-	
M	Max.switching voltage	277 V AC, 110 V DC (0	440 V AC		440 V AC				
Latching type	es availability	-		-			_		
R	Rated operating power	200 mW (4.5 to 48 V DC) 600 mW (100 V DC)			400 mW			400 mW	
Coil data O	Operate [Set] voltage (initial)	Max.75% V (4.5 to 48 V DC) Max.60 V DC (100 V DC)			Max.70% V			Max.70% V	
R	Release [Reset] voltage (initial)	Min.5% V (4.5 to 48 V DC) Min.4 V DC (100 V DC)			Min.10% V			Min.10% V	
Time O Characteristics	Operate [Set] time (initial)	Max.12 ms (4.5 to 48 V Min.8 ms (100 V DC)	/ DC)	Max.15 ms		Max.15 ms			
	Release [Reset] time (initial)	Max.5 ms		Max.5 ms		Max.5 ms			
ille	Nechanical life (ope.)	Min. 20 x10 <sup>6</sup>			Min.10 x10 <sup>6</sup>			Min.10 <sup>6</sup>	
Dielectric	Between open contacts	1,000 V rms for 1 m	nin	1,000 V rms for 1 min		1,000 V rms for 1 min			
0	Between contact sets			-		-			
(initial) B	Between contact and coil	2,500 V rms for 1 m	nin	5,000 V rms for 1 min		5,000 V rms for 1 min			
Surge withsta (between con	and voltage ntact and coil) (initial)	4,500 V		10,000 V			10,000 V		
Ambient temp	·	-40 to +70°C, -40 to +60°C (	(100 V DC)		-40 to +85°C (Class B) -40 to +105°C (Class F)			o +85°C (Class o +105°C (Class	
Protective	Oust cover	-			_		-		
construction F	lux-resistant	•			•			•	
S	Sealed	_			• *			_	
PC board pattern (BOTTOM VIEW)  • indicates input terminal		17.78 2-\phi0.9		1 Form C *	20 20 5 6	6-φ1.3 8-φ1.3	1 Form A	20 5 5	6-φ1.3
Safety standa	ards	UL, CSA, VDE			UL/C-UL, VDE		UL/C-UL, VDE		
Unit weight (A		8 g -			12 g		11 g		
Option Remarks		-		* Please contact our sales representative for details					

	Category	Power Relays (~20 A)	Power Rela	ays (~30 A)		
Product na	me	LF RELAYS	LF-G RELAYS	HE RELAYS		
Type of rela (Height inclu	a <b>y</b> ides standoff unit = mm)	30.1 23.3 30.1 15.7 23.3	30.1	33 35.8		
Initial of part number		ALF	ALFG	AHE		
Features		TV-8 rated     1 Form A 20A power relays for compress or and invertor load	1 Form A 22A/33A Compact power relays for solar inverter load	• TV-10/TV-15 rated • 1 Form A 30A, 2 Form A 25A power relays		
	Contact arrangement	1 Form A	1 Form A	1 Form A 2 Form A		
	Contact shape	Single	Single	Single		
	Contact material	AgSnO <sub>2</sub> type	AgSnO <sub>2</sub> type	AgSnO <sub>2</sub> type		
Contact data	30 A - 20 A - 20 A - Contact rating 15 A (resistive) 8 A - 5 A - 3 A - 3 A -	20 A 250 V AC	22 A 250 V AC 31 A 250 V AC 33 A 250 V AC    High capacity	30 A 277 V AC 25 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 100 mA 5 V DC		
	Max.switching voltage	250 V AC	250 V AC	277 V AC, 30 V DC		
Latching ty	pes availability	-	-			
	Rated operating power	900 mW	1.4 W	1.7 to 2.7 VA (AC) , 1.92 W (DC)		
Coil data	Operate [Set] voltage (initial)	Max.70% 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	Operate [Set] time (initial)	Max.20 ms	Max.20 ms	Max.30 ms		
Characteristics (initial)	Release [Reset] time (initial)	Max.15 ms (With diode)	Max.10 ms	Max.30 ms (AC) , Max.10 ms (DC)  Min.5 x 10 <sup>6</sup> (AC)  Min.10 x 10 <sup>6</sup> (DC)		
Expected life	Mechanical life (ope.)	Min.2 x 10 <sup>6</sup>	Min.10 <sup>6</sup> (Contact gap: 1.5 mm) Min.500 x 10 <sup>3</sup> (Contact gap: 1.8 mm)			
Dielectric	Between open contacts	1,000 V rms for 1 min	2,500 V rms for 1 min	2,000 V rms for 1 min		
strength	Between contact sets	-	-	- 4,000 V rms for 1 min		
(initial)	Between contact and coil	5,000 V rms for 1 min	4,000 V rms for 1 min	5,000 V rms for 1 min		
	stand voltage contact and coil) (initial)	10,000 V	6,000 V	10,000 V		
Ambient ter		-40 to +60°C	-40 to +60°C, -40 to +85°C*	−50 to +55°C		
	Dust cover	-	-	•		
Protective	Flux-resistant	•	•	(PC board terminal)		
construction	Sealed	_	_	_		
PC board pattern (BOTTOM VIEW)  • indicates input terminal		PC board terminal $\frac{27.6}{13.8}$ $\frac{\phi^2}{13.8}$ $\frac{12}{10}$ $\frac{10}{\phi^{1.8}}$ (TMP type is also available)	φ2 13.8 φ2 φ2 φ1.8 12 10 φ1.8	Panel cutout Plug-in terminal type  2-\phi 4.5  TM type  2-\phi 4.5  47.6  PC board terminal, Screw teminal type are also available		
Safety stan	ndards	UL/C-UL, VDE	UL/C-UL, VDE	UL, CSA, VDE, CQC		
Unit weight	t (Approx.)	23 g	23 g	80 to 120 g		
Option		-	-	Terminal socket		
Remarks		_	* Coil holding voltage is 45 to 85%V	-		

Type of relay (Height includes standoff unit = mm)  Tripid of relay (Height includes standoff unit = mm)  Tripid of relay (Height includes standoff unit = mm)  Tripid of part number  AHES  Features  -17/47/17/57 pated  -2 Form A 1 Form B 49A compact power relays 1 -2 Form A 1 Form B 49A compact power relays 4 -1 Form A 35A/48A/90A compact power relays for inverter  Contact shape  Contact material  Ag\$10-type (Form B) Ag\$10		Category		Power Relays (3)	) A~)			
Type of relay (resign reduces standorf unit = mm)  Initial of part number  AHES  Contact material  Contact stape  Contact stape  Contact material  Agin type - Aut standed (Form B)  Agin type (Form A)  Agin type - Aut standed (Form B)  Agin type (ABANDIA)  Agin type - Aut standed (Form B)  Agin type (ABANDIA)  Agin type - Aut standed (Form B)  Agin type - Aut standed (Form	Product na		HE-S RELAYS					
Type of relay (height nictudes stanooff unit = mm)  AHES  AHES  - TV-8 / TV-40 rated - 2 Form A1 Form B 40A - compact power relays for inverter  Contact stange  Contact stange  Contact material  Ag8n0.bype (Form A) Ag9n0.bype	1 Toduct Ha		HE-O RELATO		TIL KLLATOT V TIT L			
T-V-8 / TV-10 rated				38-33	38-> 33	90A 38-33 38.8		
- 2 Form A 2 Form A 1 Form B 40A compact power relays for inverter power power relays for inverter power power power relays for inverter power power relays for inverter power power relays for inverter power p	Initial of pa	art number	AHES			AHE		
Contact shape	Features		• 2 Form A/2 Form A 1 Form B 40A	• 1 Form A 35A/-	elays for inverter			
Contact material  AgSnO: type (75 A)  AgN type (48 A/90 A)  AgN type (49 A/90 A)  AgN ty		Contact arrangement	2 Form A, 2 Form A 1 Form B		1 Form A			
Contact rating (resistive)  Contact rating (resistive)  Min. switching load (reference value)  Min. switching votage  Min. switching votage  Max. switching votage  Ago V DC  Max. switching votage  Max. switching votage  Ago V DC  Max. switching load (reference value)  Max. switching votage  Ago V DC  Max. switching load (reference value)  Max. switching votage  Ago V DC  Max. switching load (reference value)  Max. switching votage  Ago V DC  Max. switching load (reference value)  Max. switching votage  Ago V DC  Max. switching load (reference value)  Max. switching votage  Ago V DC  Max. switching load (reference value)  Max. switching votage  Ago V DC  Max. switching load (reference value)  Max. switching votage  Ago V DC  Max. switching load (reference value)  Max. switching load (reference value)  Max. switching votage  Ago V DC  Max. switching load (reference value)  Max. switching load (reference value)  Max. switching load (reference value)  Max. switching votage  Ago V AC  Ago V		Contact shape	<u> </u>		Single			
Contact rating (resistive)    Max.   Min. switching load (resistive)   Max.   Min.   M		Contact material	AgSnO₂ type (Form A) AgNi type +Au flashed (Form B)	AgSnO <sub>2</sub> type (35 A)	AgNi type	(48 A/90 A)		
Min. switching load (reference value)  Max.switching voltage  480 V AC, 110 V DC  490 V AC, 48 V DC  490 V A		Contact rating 50 A - (resistive) 30 A - 20 A -		35 A 48 V DC	48 A 48 V DC	60 A 490 V AC		
Max.switching voltage								
Rated operating power  Coil data  Rated operating power  1.88 W  1.92		,	480 V AC. 110 V DC	490 V AC. 48 V DC		490 V AC		
Rated operating power	Latching ty		·					
Release [Reset] voltage (initial) Time Charaderistics Charaderisti			1.88 W					
Release [Reset] voltage (initial) Time Charaderistics Charaderisti	Coil data		Max.75% V	Max.70% V				
Characteristics (Initiatial)  Expected life  Mechanical life (ope.)  Min. 5 x 10 <sup>4</sup> Min. 10 x 10 <sup>4</sup> (35 A/48 A)  Min. 10 x 10 <sup>4</sup> (3			Min.5% V	Min.10% V				
Characteristics (Initiatial)  Expected life  Mechanical life (ope.)  Min. 5 x 10 <sup>4</sup> Min. 10 x 10 <sup>4</sup> (35 A/48 A)  Min. 10 x 10 <sup>4</sup> (3	Time	/	Max.30 ms					
Dielectric strength  Between open contacts  2,000 V ms for 1 min (Between pen Form A contact sets)  Between contact sets  5,000 V ms for 1 min (Between Form A contact sets)  Between contact and coil  5,000 V ms for 1 min (Between Form A contact sets)  Between contact and coil  10,000 V (Between Form A contact sets)  10,000 V from for 1 min	(initial)		Max.10 ms					
Between contact sets Between contact sets Some withstand voltage (between contact and coil)  Surge withstand voltage (between contact and coil)  Injunt voltage  Injunt		,		Min.10 x 10		Min.10 <sup>6</sup> (90 A)		
Surge withstand voltage (between contact and coil   10,000 V (Between Form A contact and coil   10,000 V   1			1 1		2,000 V rms for 1 min			
Surge withstand voltage (between contact and coil)  Ambient temperature  -40 to 70°C (Max. carrying current 40 A) -40 to 85°C (Max. carrying current 35 A, transport and storage) *  Protective construction  Dust cover Flux-resistant Sealed  -  2 Form A 2 Form A 1 Form B  2 Form A 2 Form A 1 Form B  2 Form A 2 Form A 1 Form B  35A Type  48A Type  90A Type  90A Type  10,000 V (Between From A contact and coil)  10,000 V  48A Type  90A Type  90A Type  10,000 V  10,00				-				
Comparison   Continue   Continu			5,000 V rms for 1 min (Between Form A contact and coil)		5,000 V rms for 1 min			
Ambient temperature  -40 to 85°C (Max. carrying current 35 A, transport and storage) *  -50 to +55°C, -50 to +85°C*  -50 to +55°C, -			,		10,000 V			
Protective construction    Flux-resistant	Ambient te	mperature	-40 to 85°C (Max. carrying current		50 to +55°C, -50 to +85°C	C* 		
Safety standards  UL/C-UL, VDE, CQC  UL, CSA, VDE  UL/C-UL, VDE  Unit weight (Approx.)  * When using at 55°C or higher, the coil  * When using at 55°C or higher, the coil  * Coil helding voltage is 50 to 600/V/c.  * When using at 55°C or higher, the coil  * Coil helding voltage is 50 to 600/V/c.  * Coil helding voltage is 50 to 600/V/c.	Protective		-					
2 Form A 2 Form A 1 Form B  2 Form A 2 Form A 1 Form B  35A Type  48A Type  90A Type  48A Type  90A Type  48A Type  90A Type  48A Type  48A Type  90A Type  48A Type  48A Type  90A Type  48A Type								
Unit weight (Approx.)  64 g  80 g  85 g  Option  -  * When using at 55°C or higher, the coil  * Coil helding veltage is 50 to 60%//			2 Form A 2 Form A 1 Form B  2.2.9  7.6  2-\phi_1.6  2-\phi_2.6  2-\phi_2.2  2-	4.7 24 6.5 24 6.5 6.5 6.5 6.5 6.5 6.5 6.5 6.5 6.5 6.5		20 R0.9 R0.9 R0.9 R0.6		
Option – – – – – – – – – – – – – – – – – – –	Safety standards							
* When using at 55°C or higher, the coil  * Coil holding voltage is 50 to 600/V		t (Approx.)		80	· -	85 g		
Remarks When using at 55°C or higher, the coil holding voltage should be 30 to 60% V. *Coil holding voltage is 50 to 60%V	Option				<del>-</del>			
	Remarks		holding voltage should be 30 to 60% V.	* Coil holding voltage is	50 to 60%V			

	Category	Power Relays (30 A~)						
Product na		DJ-H RELAYS	DZ-S RELAYS	HE-N RELAYS				
Type of relay (Height includes standoff unit = mm)		39 15 30.2	38.5 30 17.5	50 40 43				
Initial of part number Features		ADJH	ADZS	AHE6				
		• 1 Form A 50A latching relays for lighting and motor load	Meet IEC62055-31 UC3     Form A 90A power latching relays	High capacity 120A 490V AC     Form A power relays				
	Contact arrangement	1 Form A	1 Form A	1 Form A				
	Contact shape	Single	Single	Single				
	Contact material	AgSnO₂ type	AgSnO₂ type	AgNi type				
Contact data	120 A - 60 A - 60 A - Contact rating 50 A - (resistive) 30 A - 20 A - 10 A -	50 A 277 V AC	90 A 276 V AC	120 A 490 V AC				
	Min. switching load	100 mA 5 V DC	100 mA 125 V AC	100 mA 5 V DC				
	(reference value)							
Latching ty	Max.switching voltage	480 V AC  • (Latching only)	276 V AC  • (Latching only)	800 V AC				
Latching types availability  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				
Coil data	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	Operate [Set] time (initial)	Max.20 ms	Max.20 ms	Max.30 ms				
Characteristics (initial)	Release [Reset] time (initial)	Max.20 ms	Max.20 ms	Max.10 ms				
Expected life	Mechanical life (ope.)	Min.10 <sup>6</sup>	Min.100 x 10 <sup>3</sup>	Min.10 <sup>6</sup>				
Dielectric	Between open contacts	1,500 V rms for 1 min	2,000 V rms for 1 min	2,000 V rms for 1 min				
strength	Between contact sets	-	-	-				
(initial)	Between contact and coil	4,000 V rms for 1 min	4,000 V rms for 1 min	5,000 V rms for 1 min				
Surge with: (between c	stand voltage contact and coil) (initial)	12,000 V	12,000 V	10,000 V				
Ambient te		-40 to +85°C	-40 to +85°C	-40 to +55°C*1 -40 to +85°C*2				
Protective	Dust cover	-	•	-				
construction	Flux-resistant Sealed	-	-	-				
PC board pattern (BOTTOM VIEW)  • indicates input terminal		2 or 3-\phi1.2 27.5 6.75 2-\phi2.8 2 coil latching only	-	25.9 19.4 RO.3 PO 1.2 RO.3 RO.3 RO.3 RO.3 RO.3				
Safety standards		UL/C-UL, VDE	_	UL/C-UL, VDE				
Unit weight		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)				

	Category	Power Relays (30 A~)	
Product na	me	HE-R RELAYS	
Type of relay (Height includes standoff unit = mm)		58.0 35.0 47.0 58.0 35.0 4 Form A 1 Form B AHER	
initial of pa	art number	Aner	
Features		Compact size 4 Form A and 1 Form B 40A power relays for EVSE and industrial equipment	
	Contact arrangement	4 Form A, 4 Form A 1 Form B	
	Contact shape	Single	
	Contact material	Form A contact: AgSnO <sub>2</sub> type Form B contact: Au plated AgNi type	
Contact data	120 A - 60 A - 60 A - 50 A - 70 A - 7	40 A 480 V AC (Form A)	
	Min. switching load (reference value)	Form A contact: 100 mA 24 V DC Form B contact: 10 mA 5 V DC	
	Max.switching voltage	480 V AC	
Latching ty	pes availability	-	
	Rated operating power	4 W	
Coil data	Operate [Set] voltage (initial)	Max. 75% V	
	Release [Reset] voltage (initial)	Max. 5% V	
Time Characteristics	Operate [Set] time (initial)	Max. 50 ms	
(initial)	Release [Reset] time (initial)	Max. 30 ms	
Expected life	Mechanical life (ope.)	Min. 100 x 10 <sup>3</sup>	
Dielectric	Between open contacts	2,000 Vrms for 1 min (Between open Form A contacts)	
strength (initial)	Between contact sets	5,000 V rms for 1 min (Between Form A contact sets)	
	Between contact and coil	5,000 V rms for 1 min (Between Form A contact and coil)	
	stand voltage contact and coil) (initial)	10,000 V (Between From A contact and coil)	
Ambient te	mperature	–40 to 55°C, –40 to 85°C *	
Protective	Dust cover	-	
construction	Flux-resistant Sealed	•	
PC board pattern (BOTTOM VIEW)  • indicates input terminal		RO.5 12.9 13.5 13.5 RO.8 RO.8 RO.5 RO.8 RO.5 RO.8 RO.5 RO.8 RO.5 RO.8 RO.8 RO.8 RO.8 RO.8 RO.8 RO.8 RO.8	
Safety star	ndards	UL/C-UL, VDE	
Unit weight		approx. 180 g	
Option		-	
Remarks		* Coil holding voltage is 35 to 50% V	

# High-capacity DC cut off Relays selector chart

Category		High-capacity DC cut off relays	
Product na	ame	HE-V RELAYS	
Type of relay (Height includes standoff unit = mm)		39.4	
Initial of pa	art number	AHEV	
Features		• High capacity Max. 1,000 V DC, 20 A cut-off power relay	
	Contact arrangement	2 Form A	
	Contact shape	Single	
	Contact material	AgNi type	
Contact data	100 A - 80 A - 60 A - 60 A - (resistive) 20 A - 10 A - 5 A -	25 A 600 V DC 20 A 800 V DC	
	Min. switching load (reference value)	100 mA 5 V DC	
Latching ty	pes availability	<del>-</del>	
	Rated operating power	1.92 W	
Coil data	Operate [Set] voltage (initial)	Max. 70% V	
	Release [Reset] voltage (initial)	Min. 5% V	
Time	Operate [Set] time (initial)	Max. 30 ms	
Characteristics (initial)	Release [Reset] time (initial)	Max. 10 ms	
Expected life	Mechanical life (ope.)	Min. 10 <sup>6</sup>	
Dielectric	Between open contacts	2,000 V rms for 1 min	
strength	Between contact sets	4,000 V rms for 1 min	
(initial)	Between contact and coil	5,000 V rms for 1 min	
	stand voltage contact and coil) (initial)	10,000 V	
Ambient te	emperature	−40 to +55°C −40 to +85°C *²	
Description 11	Dust cover	-	
Protective construction	Flux-resistant	•	
	Sealed	-	
PC board pattern (BOTTOM VIEW)  ● indicates input terminal		40 10-\$2.1 \$50 \( \text{10} \)  4.4 \( \text{13.2} \)  37.6	
Safety star	ndards	UL/C-UL, VDE	
Unit weigh		120 g	
Option soc		-	
Remarks		*1: Each 1 Form A contact connected in series	
Tomarks		*2: When coil holding voltage is 33 to 60% of rated coil voltage	

# Signal Relays (2 A or less) selector chart

Category Signal Relays ( 2 .				
Product nar		GN RELAYS	GQ RELAYS	GQ RELAYS ( TH type )
Type of relay ( Height includes standoff unit: mm )		10.6 5.7	10.6 7.2 15.2 10.6 7.2 15.4	10.6 7.2 J5.2 7.2 J5.4
Initial of pa	rt number	AGN2	AGQ2	AGQ2
Features		High sensitivity 100 mW type     2 Form C and 1 A Compact,     Slim body type relays	High sensitivity 100 mW type     2 Form C and 1 A Compact flat body type relays	Small size controlled 3.5 A inrush current possible     2.4 V coil voltage type newly available DC battery operation
	Contact arrangement	2 Form C	2 Form C	2 Form C
	Contact shape	Crossbar Twin	Crossbar Twin	Crossbar Twin
	Contact material	Stationary: AgPd + Au–clad Movable : AgPd	Stationary: AgPd + Au–clad Movable : AgPd	AgNi + Au-plating
Contact data	Contact rating 3 A – ( resistive ) 2 A – 1 A – Min. switching load	1 A 30 V DC		2 A 30 V DC
	( reference value )	10 μA 10 mV DC	10 μA 10 mV DC	10 μA 10 mV DC
Latching type	pes availability	•	•	•
Coil data	Rated coil voltage  Rated operating power	1.5, 3, 4.5, 6, 9, 12, 24 V DC  Single side stable: 140 mW ( 1.5 to 12 V DC ), 230 mW ( 24 V DC )  Latching type & High sensitivity: 100 mW ( 1.5 to 12 V DC ), 120 mW ( 24 V DC )	1.5, 3, 4.5, 6, 9, 12, 24 V DC  Single side stable:  140 mW ( 1.5 to 12 V DC ),  230 mW ( 24 V DC )  Latching type & High sensitivity:  100 mW ( 1.5 to 12 V DC ),  120 mW ( 24 V DC )	1.5, 2.4, 3, 4.5, 6, 9, 12, 24 V DC  Single side stable:  140 mW ( 1.5 to 12 V DC ),  230 mW ( 24 V DC )  Latching type:  100 mW ( 1.5 to 12 V DC ),  120 mW ( 24 V DC )
	Operate [ Set ] voltage ( initial )	Max. 75% V, Max. 80% V ( High sensitivity )	Max. 75% V, Max. 80% V ( High sensitivity )	Max. 75 % V [ Max. 75 % V ]
	Release [ Reset ] voltage ( initial )	Min. 10% V [ Max. 75% V ]	Min. 10% V [ Max. 75% V ]	Min. 10 % V [ Max. 75 % V ]
Time characteristics	Operate [ Set ] time ( initial )	Max. 4 ms	Max. 4 ms	Max. 4 ms
(initial)	Release [ Reset ] time ( initial )	Max. 4 ms	Max. 4 ms	Max. 4 ms
Expected life	Mechanical life ( ope. )	Min. 50 × 10 <sup>6</sup>	Min. 50 × 10 <sup>6</sup>	Min. 50 × 10 <sup>6</sup>
Dielectric	Between open contacts	750 Vrms for 1 min	750 Vrms for 1 min	750 Vrms for 1 min
strength	Between contact and coil	1,500 Vrms for 1 min	1,500 Vrms for 1 min	1,500 Vrms for 1 min
(initial)	Between contact sets	1,000 Vrms for 1 min	1,000 Vrms for 1 min	1,000 Vrms for 1 min
Surge withstand	Between open contacts	1,500 V 10 × 160 μs ( FCC Part 68 )	1,500 V 10 × 160 μs ( FCC Part 68 )	1,500 V ( 10 × 160 μs ) ( FCC Part 68 )
voltage ( initial )	Between contact and coil	2,500 V 2 × 10 μs	2,500 V 2 × 10 μs	2,500 V 2 $ imes$ 10 $\mu s$ ( Telcordia )
Ambient te	mperature	-40 to $+85$ ℃/ -40 to $+70$ ℃ ( High sensitivity )	$-40 \text{ to } +85 ^{\circ}\text{C}/$ $-40 \text{ to } +70 ^{\circ}\text{C} \text{ ( High sensitivity )}$	-40 to +85 ℃
Protective	Dust cover	_	_	_
construction	Flux-resistant Sealed	-	_	_
PC board pattern ( BOTTOM VIEW )  • indicates input terminal		PC board terminal  3.22.2 2.2  0.85  PC board terminal  3.22.2 2.2  Surface-mount terminal  A type  (TOP VIEW)	3.2 2.2 2.2  PC board terminal  3.2 2.2 2.2  John January Company Comp	3.2 2.2 2.2  PC board terminal  3.2 2.2 2.2  0.8  Surface-mount terminal  A type (TOP VIEW)
Safety stand	dards	UL/C–UL, BSI	UL/C-UL, BSI	UL/C–UL, BSI
Unit weight		1 g	1 g	1 g
Option		_	_	_
Remarks		_	_	_

D 1 1	Category	TV DELAYC	Signal Relays ( 2 A or less )	TV C DELAYC
Type of relay ( Height includes standoff unit: mm )		TX RELAYS  7,4  8.2  15  7,4  8.4	TX RELAYS ( TH type )	TX-S RELAYS  7.4 8.2 15 7.4 8.4
Initial of part number		ATX2	ATX2	ATXS2
Features		2, 000 V rms dielectric strength     2 Form C and 2 A relays	Controlled 7.5 A inrush current possible     2 Form C Compact body type relays	<ul> <li>High sensitivity 50 mW type</li> <li>2 Form C and 1 A Compact body type relays</li> </ul>
Contact data	Contact arrangement  Contact shape  Contact material  4 A -  Contact rating 3 A - ( resistive ) 2 A - 1 A -	2 Form C Crossbar Twin Standard: Ag + Au–clad Standard  2 A 30 V DC	2 Form C Crossbar Twin Ag + Au-plating	2 Form C Crossbar Twin Standard: Ag + Au–clad
	Min. switching load ( reference value )	10 μA 10 mV DC	10 μA 10 mV DC	10 μA 10 mV DC
Latching ty	pes availability	•	•	•
	Rated coil voltage	1.5, 3, 4.5, 5, 6, 9, 12, 24, 48 V DC ( 48 V ; Only single side stable type )	1.5, 2.4, 3, 4.5, 5, 6, 9, 12, 24, 48 V DC ( 48 V; Only single side stable type, 2.4 V; Only latching type )	1.5, 3, 4.5, 6, 9, 12, 24 V DC
Coil data	Rated operating power	Single side stable: 140 mW ( 1.5 to 24 V DC ), 270 mW ( 48 V DC ) Latching type: 200 mW ( 1.5 to 24 V DC )	Single side stable: 140 mW ( 1.5 to 24 V DC ), 270 mW ( 48 V DC ) Latching type: 140 mW ( 1.5 to 24 V DC )	Single side stable: 50 mW ( 1.5 to 12V DC ), 70 mW ( 24 V DC ) Latching type: 70 mW ( 1.5 to 12V DC ), 150 mW ( 24 V DC )
	Operate [ Set ] voltage ( initial ) Release [ Reset ] voltage ( initial )	Max. 75% V Min. 10% V [ Max. 75% V ]	Max. 75% V Min. 10% V [ Max. 75% V ]	Max. 80% V Min. 10% V [ Max. 80% V ]
Time	Operate [ Set ] time ( initial )	Max. 4 ms	Max. 4 ms	Max. 5 ms
characteristics (initial)	Release [ Reset ] time ( initial )	Max. 4 ms	Max. 4 ms	Max. 5 ms
Expected life	Mechanical life ( ope. )	Min. 100 × 10 <sup>6</sup>	Min. 100 × 10 <sup>6</sup>	Min. 50 × 10 <sup>6</sup>
Dielectric strength (initial)	Between open contacts Between contact and coil Between contact sets	1,000 Vrms for 1 min 2,000 Vrms for 1 min 1,000 Vrms for 1 min	1,000 Vrms for 1 min 2,000 Vrms for 1 min 1,000 Vrms for 1 min	750 Vrms for 1 min 1,800 Vrms for 1 min 1,000 Vrms for 1 min
Surge withstand	Between open contacts	1,500 V 10 × 160 μs (FCC Part 68)	1,500 V 10 × 160 μs (FCC Part 68)	1,500 V 10 × 160 μs (FCC Part 68)
voltage ( initial )	Between contact and coil	2,500 V 2 × 10 μs	2,500 V 2 × 10 μs	2,500 V 2 × 10 μs
Ambient te	emperature	-40 to +85 °C (1.5 to 24 V DC)/ -40 to +70 °C (48 V DC)	-40 to +85 °C (1.5 to 24 V DC)/ -40 to +70 °C (48 V DC)	-40 to +70 ℃
Protective	Dust cover	_	_	
construction	Flux-resistant	_	_	
	Sealed	5.08 2.54 2.54  pt board terminal 5.08 2.54 2.54	5.08 2.54 2.54 pt board terminal 5.08 2.54 2.54	5.08 2.54 2.54  pt board terminal 5.08 2.54 2.54
	attern ( BOTTOM VIEW ) s input terminal	Surface-mount terminal SA type Single side stable (TOP VIEW)	Surface-mount terminal SA type Single side stable (TOP VIEW)	Surface-mount terminal SA type Single side stable (TOP VIEW)
• indicates	s input terminal	Surface-mount terminal SA type Single side stable (TOP VIEW)	Surface-mount terminal SA type Single side stable (TOP VIEW)	Surface-mount terminal SA type Single side stable (TOP VIEW)
• indicates	s input terminal	Surface-mount terminal SA type Single side stable	Surface-mount terminal SA type Single side stable	Surface-mount terminal SA type Single side stable
• indicates	s input terminal	Surface-mount terminal SA type Single side stable (TOP VIEW)  UL/C-UL, BSI	Surface-mount terminal SA type Single side stable (TOP VIEW)  UL/C-UL, BSI	Surface-mount terminal SA type Single side stable (TOP VIEW)  UL/C-UL, BSI

	Catanami		Circal Dalace (2 A avilage)	
Product nai	Category	TX-D RELAYS	Signal Relays ( 2 A or less )  TQ RELAYS*	TQ RELAYS ( SMD )
Type of rela		15 7.4 8.2 15 7.4 8.4	14 9 15 15	14 9 [5.6
Initial of part number		ATXD2	ATQ	ATQ
Features		6,000 V Surge withstand voltage type     2 Form A, 2 A and High dielectric strength type relays	• 5 mm Low profile • 2 Form C, 1 A type relays	5.6 mm Low profile     2 Form C 2 A Surface-mount type relays
	Contact arrangement	2 Form C	2 Form C	2 Form C
	Contact shape	Crossbar Twin	Crossbar Twin	Crossbar Twin
	Contact material	Standard: Ag + Au-clad	Ag + Au-clad	AgNi + Au-clad
Contact data	Contact rating 3 A — ( resistive ) 2 A — 1 A —	2 A 30 V DC	1 A 30 V DC	2 A 30 V DC
	Min. switching load ( reference value )	10 μA 10 mV DC	10 μA 10 mV DC	10 μA 10 mV DC
Latching ty	pes availability	•	•	•
	Rated coil voltage	1.5, 3, 4.5, 6, 9, 12, 24 V DC	3, 4.5, 5, 6, 9, 12, 24, 48 V DC ( 48 V ; Only single side stable type )	1.5, 3, 4.5, 5, 6, 9, 12, 24, 48 V DC ( 48 V; Only single side stable type )
Coil data	Rated operating power	2 Form C Single side stable: 200 mW ( 1.5 to 12 V DC ), 230 mW ( 24 V DC ) 2 Form C Latching type: 150 mW ( 1.5 to 12 V DC ), 170 mW ( 24 V DC )	2 Form C Single side stable: 140 mW ( 3 to 12 V DC ) 200 mW ( 24 V DC ), 300 mW ( 48 V DC )	Single side stable: 140 mW ( 1.5 to 12 V DC ) 200 mW ( 24 V DC ), 300 mW ( 48 V DC )
	Operate [ Set ] voltage ( initial )	Max. 75% V	Max. 75% V	Max. 75% V
	Release [ Reset ] voltage ( initial )	Min. 10% V [ Max. 75% V ]	Min. 10% V [ Max. 75% V ]	Min. 10% V [ Max. 75% V ]
Time	Operate [ Set ] time ( initial )	Max. 4 ms	Max. 3 ms	Max. 4 ms
characteristics (initial)	Release [ Reset ] time ( initial )	Max. 4 ms	Max. 3 ms	Max. 4 ms
Expected life	Mechanical life ( ope. )	Min. 100 × 10 <sup>6</sup>	Min. 100 × 10 <sup>6</sup>	Min. 100 × 10 <sup>6</sup>
Dielectric	Between open contacts	1,000 Vrms for 1 min	750 Vrms for 1 min	1,000 Vrms for 1 min
strength	Between contact and coil	3,000 Vrms for 1 min	1,000 Vrms for 1 min	1,500 Vrms for 1 min
( initial )	Between contact sets	1,000 Vrms for 1 min	1,000 Vrms for 1 min	1,500 Vrms for 1 min
Surge withstand	Between open contacts	1,500 V 10 × 160 μs ( FCC Part 68 )	1,500 V 10 × 160 μs ( FCC Part68 )	1,500 V 10 × 160 μs ( FCC Part 68 )
voltage ( initial )	Between contact and coil	6,000 V 1.2 × 50 μs	_	2,500 V 2 × 10 μs
Ambient te	mperature	-40 to +85℃	-40 to +70 ℃	-40 to $+85$ °C (1 A or less for use over 70 °C)
Protective	Dust cover	_	_	_
construction	Flux-resistant Sealed	_	_	_
PC board pattern ( BOTTOM VIEW )  • indicates input terminal		PC board terminal  5.08 2.54 2.54  PC board terminal  5.08 2.54 2.54  Surface-mount terminal SA type Single side stable (TOP VIEW)	2.54 10.16  otherwise PC board terminal	Surface-mount SA type (TOP VIEW)
Safety stan	dards	UL/C-UL, BSI	UL/C-UL	UL/C-UL
	t ( Approx. )	2 g	1.5 g	2 g
Option				_
Remarks		MBB contact available	MBB contact available	_

<sup>\*</sup> Standard PC board terminal and self-clinching terminal.

Catagory Signal Polays (2 A or loss)		
Product nar	Category	Signal Relays ( 2 A or less )  DS RELAYS
Type of relay ( Height includes standoff unit: mm )		15 9.9 9.9
Initial of pa	rt number	AG2
Features		High sensitivity 200 mW type     1 Form C, 2 A type relays
	Contact arrangement	1 Form C
	Contact shape	Twin
Contact data	Contact material  4 A Contact rating 3 A ( resistive ) 2 A 1 A	Ag + Au-clad
	Min. switching load ( reference value )	10 μA 10 mV DC
Latching typ	pes availability	•
Coil data	Rated coil voltage  Rated operating power	1.5, 3, 5, 6, 9, 12, 24, 48 V DC Single side stable: 400 mW ( Standard ), 200 mW ( High sensitivity ) Latching type: 360 mW ( Standard ), 180 mW ( High sensitivity )
	Operate [ Set ] voltage ( initial )	Max. 70% V, Max. 80% V ( High sensitivity )
	Release [ Reset ] voltage ( initial )	Min. 10% V [ Max. 70% V , Max. 80% V ( High sensitivity ) ]
Time characteristics	Operate [ Set ] time ( initial )	Max. 10 ms
(initial)	Release [ Reset ] time ( initial )	Max. 5 ms [ Max. 10 ms ]  Min. $100 \times 10^6$ ( Single side stable ),
Expected life	Mechanical life ( ope. )  Between open contacts	Min. $10 \times 10^6$ ( 2 coil latching ) 1,000 Vrms for 1 min ( Standard ),
Dielectric strength (initial)	Between contact and coil	500 Vrms for 1 min ( High sensitivity ) 1,500 Vrms for 1 min ( Standard ), 1,000 Vrms for 1min ( High sensitivity )
( II II II ai )	Between contact sets	-
Surge withstand	Between open contacts	-
voltage ( initial )	Between contact and coil	-
Ambient te	mperature	-40 to +70 °C
Protective	Dust cover	-
construction	Flux–resistant Sealed	_
PC board pattern ( BOTTOM VIEW )  ● indicates input terminal		φ0.9  PC board terminal Single side stable
Safety stand	dards	UL, CSA
Unit weight		3 g
Option	. (pp. c )	
Remarks		_

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# **Microwave Devices Selector Chart**

	Catanan		Minus De '	
Category Product name		RΔ RFI ΔVS	Microwave Devices  RA RELAYS RJ RELAYS RS REL	
Type of relay (Height includes standoff unit = mm)		14.7 9.7 15.9	14.0 9.0 18.2 14.0 9.0 18.2	14.0 8.6 14.0 8.6 17.2 8.6
Initial of pa	rt number	ARA	ARJ	ARS
Features		1 GHz capable, 3 W carrying power ( at 1 GHz ), 50 Ω impedance and 2 Form C relays	8 GHz max. capable, 1 W carrying power ( at 5 GHz ), 50 Ω impedance and 2 Form C relays	3 GHz capable, 10 W carrying power ( at 3 GHz ), 50 W/75 $\Omega$ impedance and 1 Form C relays
Contact data	Contact arrangement Contact material	2 Form C Ag alloy / Au–clad Ag alloy 3 W ( at 1 GHz )	2 Form C Au	1 Form C Au 10 W ( at 3 GHz )
	Contact input power pes availability	3 W (at 1 GHz)	1 W ( at 5 GHz )	10 W (at 3 GHz )
	Rated coil voltage	1.5, 3, 4.5, 5, 6, 9, 12, 24, 48 V DC ( 48 V: Only single side stable )	3, 4.5, 12, 24 V DC	3, 4.5, 9, 12, 24 V DC
Coil data	Rated operating power	140 mW ( 1.5 to 12 V ) 200 mW ( 24 V ) 300 mW ( 48 V )	( Single ) 200 mW ( -L2 ) 150 mW	( Single ) 200 mW ( -L ) 200 mW ( -L2 ) 400 mW
	Operate [ Set ] voltage ( initial )	Max. 75 % V	Max. 75 % V	Max. 75 % V
0	Release [ Reset ] voltage ( initial )	Min. 10 % V	Min. 10 % V	Min. 10 % V
	Set ] time ( initial )	Max. 4 ms ( about 2 ms ) Max. 4 ms ( about 1 ms )	Max. 5 ms Max. 5 ms	Max. 10 ms Max. 6 ms
	Mechanical life	Min. 100×10 <sup>6</sup>	Min. 10×10 <sup>6</sup>	Min. 5×10 <sup>6</sup>
Expected	Electrical life	Min. 10×10 <sup>6</sup>	Min. 10 <sup>6</sup>	Min. 300×10³ ( 75 Ω ) Min. 10° ( 50 Ω )
Surge withstand voltage (initial)	Between open contacts	750 V rms for 1 min	500 V rms for 1 min	500 V rms for 1 min
Sur withs volt (ini	Between contact and coil	1,000 V rms for 1 min	500 V rms for 1 min	1,000 V rms for 1 min
Ambient te	emperature	–40 to +85 ℃	–30 to +70 ℃	–40 to +70 °C –40 to +60 °C ( silent )
ctive	Dust cover Flux–resistant	_	_	_
Protective construction	Sealed	-	_	_
	Height (Height includes standoff unit = mm)	5.9	8.2	8
Dimensions	Bottom ( mm )	14.7 6	Q 14.0	© 14.0 → © © © © © © © © © © © © © © © © © ©
PC board pattern ( TOP VIEW ) ■ indicates input terminal		14.0 2.54 0.3 2.00 12.40 14.90 For glue-pad	1.50 13.50 11.40 10.40 1.10 8.89 0.80 0.90 12.10 1.70   Relay terminals Ground. Note that soldering is required. The necessity of solder based on effect of heat when soldering. Ground. Note that some extra work is required due to the effect of lifting when soldering.	50 Ω type  13.46  E layout  6-1.10  6-8.66  3.30  2.0  3.30  1.27  75 Ω type  13.46  10.16  6.86  3.30  2.0  3.30  2.0  3.20  3.20  1.27
Safety stan		-	_	-
	t ( Approx. )	2 g	3 g	2 g
Option		_	_	
Remarks		_	_	Reverse contact type available.

	Catagory	N 4:	to Davisas
Product na	Category	RN RELAYS	re Devices  RD COAXIAL SWITCHES
Type of rela		IVIN IVLLATIO	IND COANIAL SWITCHES
(Height includes standoff unit = mm)		9.6	
Initial of pa	art number	ARN	ARD
Features		8 GHz max. capable, 150 W carrying power ( at 2 GHz ), compact SMD type, 50 Ω impedance and 1 Form C relays	26.5 GHz max. coaxial switches coming in SPDT, Transfer, and SP6T types
act	Contact arrangement	1 Form C	SPDT, Transfer, SP6T
Contact data	Contact material	Au	Au
	Contact input power	Max. 150 W ( at 2 GHz )	Max. 120 W ( at 3 GHz )
Latching ty	pes availability	•	•
ata	Rated coil voltage	4.5, 12, 24 V DC	4.5, 5, 12, 24 V DC (4.5 V: Excepting Latching with TTL driver , 5 V: Latching with TTL driver )
Coil data	Rated operating power	( Single ) 320 mW ( -L2 ) 400 mW	( SPDT, SP6T ) 840 mW ( Transfer ) 1,540 mW
	Operate [ Set ] voltage ( initial )	Max. 75 % V	_
	Release [ Reset ] voltage ( initial )	Min. 10 % V	
	Set ] time ( initial )	Max. 5 ms	Max. 15 ms ( SPDT ) Max. 20 ms ( Transfer, SP6T )
	eset ] time ( initial )	Max. 5 ms	_
ected	Mechanical life	Min. 10 <sup>6</sup>	Min. 5 × 10 <sup>6</sup>
Expected life	Electrical life	Min. 10³	Min. 5 × 10 <sup>6</sup> ( SPDT )
Surge ithstand voltage (initial)	Between open contacts	500 V rms for 1 min	500 V rms for 1 min
S - Between contact and con		500 V rms for 1 min	500 V rms for 1 min
	emperature	–40 to +85 ℃	–55 to +85 ℃
Dust cover Flux-resistant Sealed		-	_
		_	<del>-</del>
	Height (Height includes standoff unit = mm)	10	_
Dimensions	Bottom ( mm )	9 6 14.6 →	-
PC board pattern ( TOP VIEW ) ■ indicates input terminal		14-90 5.00 5.00 5.00 4-0.80 8.89 4-0.80	_
Safety stan		-	<del>-</del>
Option	t ( Approx. )	2.5 g	
Remarks		Reverse contact type available.	
NCITIONS		heverse contact type available.	l .

# Safety Relays Selector Chart

Category Safety Relays							
Product name		SF-M F	RELAYS		S Slim type	SF-Y I	RELAYS
Type of relay (Height includes standoff unit = mm)		33.0	14.0	40 13 24	50 13	31 28.6	28.6
	of part number	Flat type safety re	ASFM0	4 poles	6 poles AG1S	Compact Relay Fa	AG1Y0
Featu	ıres	(1 Form A 1Form	n B´)	Slim type safety re		Guided Contacts	
	Contact arrangement	1 Form A			rm A 1 Form B, 3 Form A 3 Form B	4 poles: 2 Form A 2 For 6 poles: 4 Form A 2 For	m B, 5 Form A 1 Form B
	Contact shape	Sing RT II : Au flashe			ngle		gle
tdata	Contact material	RTIII: Au flashe	ed AgSnO <sub>2</sub> type	Au flashed ,	AgSnO2 type	Au flashed	AgNi type
Contactdata	Contact rating chart $\begin{array}{ccc} 30.0 & -2.0 & $	N.C. contact 4 A 250 V AC 4 A 30 V DC	N.O. contact 6 A 250 V AC 6 A 30 V DC		50 V AC 0 V DC	6 A 25 6 A 3	
	Minimum ( For Reference )	1 mA 10 V DC	1 mA 10 V DC	1 mA	5 V DC	10 mA	10 V DC
Latch	ing types availability	- - - -		42.24	- 40.1/DC	F 42 46 40	21 241/56
Coil data	Nominal coil voltage Rated operating power	3, 5, 12, 16, 18 270 mW ( Wł 100 mW ( Wł		360 mW	48 V DC 500 mW		, 21, 24 V DC mW
Ö	Operate [ Set ] voltage ( initial )	Max.		Max.	75 % V	Max.	75 % V
	Release [ Reset ] voltage ( initial )	Min. 1	0 % V	Min. 10 % V		Min. 15 % V	
Time characteristics	Operate [ Set ] time ( initial )	Max. 1	15 ms	Max. 20 ms		Max. 20 ms	
charact	Release [ Reset ] time ( initial )	Max. 10 ms		Max.	20 ms	Max.	10 ms
Expected life	Mechanical life ( ope. )	Min. 10×10 <sup>6</sup>		Min. 1	0×10 <sup>6</sup>	Min. 1	0×10 <sup>6</sup>
ength (	Between open contacts 1,500 Vri		s for 1 min	1,500 Vrm	ns for 1 min	1,500 Vrm	s for 1 min
Dielectric strength (initial)	Between contact and coil	NC contact (3–4 terminal) – coil; 2,500 Vrms for 1 min	NO contact (5–6 terminal ) – coil; 4,000 Vrms for 1 min	4,000 Vrm	ns for 1 min	NC contact (5–6 terminal) – coil; 2,500 Vrms for 1 min	NO contact (7–8 terminal ) – coil 4,000 Vrms for 1 min
	withstandvoltage ( initial ) een contact and coil	-	-		_		_
Ambi	ent temperature	–40 to	+85 ℃	-40 to	) +85 ℃	-40 to	+70 ℃
ive	Dust cover	_	-		_		_
Protectiv constructi	Flux-resistant	● ( R	TII)	(	•		
P. 10	Sealed	● ( R	TIII )		_	● ( R7	TIII ) *1
sion	height ( mm ) Including Standoff	7.	8	2	24		1.5
External dimension	Bottom ( mm )	4	33	50 ( 6 poles ) 40 ( 4 poles )		9.80	39
(BOT	ested PC board pattern TOM VIEW ) iil terminal	6.25 13.7 07 14 14	<b></b> >	4 r 2 13.97 1 7(1.83) 75.	10-\( \phi 1.4 \) 11.43 15.08 15.08 14-\( \phi 1.4 \) 11.43 08 15.08 15.08 15.08 15.08 poles	6.25 10.5 6.25 7.6 590 4 poles	6.25 10.5 6.25 8.00 1.
Safet	y standards	UL/C-U	JL, TÜV	UL/C-UL, Kore	ean S, TÜV, CQC	UL/C-	UL, TÜV
	weight (Approx.)	6.5	g	20 g	23 g	19 g	23 g
Optio		_			l terminal socket		_
Rema	arks	table 2	-	VVITN LED Indicat	ion type available		_

<sup>\*1:</sup> According to EN 61810–1:2015, table 2

Category		Cafatty	Relays
Produ	uct name	SF RELAYS	SF RELAYS Double Contact Type
Туре	of relay t includes standoff unit = mm)	53.3 25 116.5	53.3 25 53.3 33 116.5
Initial	l of part number	AG103	2 Form A 2 Form B 4 Form A 4 Form B AG10
Featu	ures	Flat type safety relays	Flat type safety relays ( double contact )
	Contact arrangement Contact shape	3 Form A 1 Form B Single	2 Form A 2 Form B 4 Form A 4 Form B  Double Contact
Contactdata	Contact material  30 A 20 A 15 A Maximum 10 A ( $\cos \phi = 1$ ) 8 A 5 A 3 A	Au flashed AgSnO2 type  6 A 250 V AC 6 A 30 V DC	Au flashed AgSnO2 type  6 A 250 V AC 6 A 30 V DC
	Minimum ( For Reference )	100 mA 5 V DC	100 mA 5 V DC
Latch	ning types availability	_	_
Coil data	Nominal coil voltage Rated operating power	5, 12, 24, 48, 60 V DC 500 mW	5, 12, 24, 48, 60 V DC 500 mW
	Operate [ Set ] voltage ( initial )  Release [ Reset ] voltage ( initial )	Max. 80 % V Min. 10 % V	Max. 75 % V Min. 10 % V
Time characteristics	Operate [ Set ] time ( initial )  Release [ Reset ] time ( initial )	Max. 30 ms Max. 15 ms	Max. 30 ms Max. 15 ms
Expected chilife ch	Mechanical life ( ope. )	Min. 10×10 <sup>6</sup>	Min. 10×10 <sup>6</sup>
	Between open contacts	2,500 Vrms for 1 min	1,300 Vrms for 1 min
Dielectricstrength (initial)	Between contact and coil	2,500 Vrms for 1 min	2,500 Vrms for 1 min
Surge	withstandvoltage (initial) reen contact and coil	-	-
Ambi	ient temperature	–40 to +70 ℃	–40 to +70 ℃
ive	Dust cover	_	_
Protective construction	Flux-resistant	_	_
Pro	Sealed	•	•
on	height ( mm ) Including Standoff	16.5	16.5
External dimension	Bottom ( mm )	53.3 SN	(4 form A 4 form B) (2 form A 2 form B) (2 form A 2 form B)
Suggested PC board pattern (BOTTOM VIEW)  •: coil terminal		2.54 10-\$\phi 1.4 holes  3 Form A 1 Form B	2.54 10-φ1.4 holes  2 Form A 2 Form B  2.54 18-φ1.4 holes  4 Form A 4 Form B
Safet	y standards	UL/C–UL, TÜV	UL/C–UL, TÜV
Unit	weight (Approx.)	38 g	38 g 47 g
Optio		_	-
Remarks		_	_

## **Characteristics**

#### ■ UL Coil Insulation

Coil Insulation	Relay
UL-B	LQ, LZ, LZ–N, JW
UL-F	LD-P, LF-G, LQ, LZ, LZ-N,HE,HE-PV, HE-N , HE-S, HE-V

#### ■ TV rated

TV rated	Relay
TV-2	-
TV-3	ST, LQ ( 1 Form A ) *
TV-4	-
TV-5	LZ, LZ–N, JW
TV-8	DW (Inrush type), LF, HE–S (STD type N.O.)
TV-10	HE ( 2 Form A ), HE–S ( Long life type N.O. )
TV-15	HE ( 1 Form A ), HE–PV ( 35 A )

<sup>\*</sup> For TV-3 type, please contact our sales representative for details.

### ■ Surge voltage between contact and coil

Surge voltage	Relay	
5,000 V	DS-P	
6,000 V	ST, PF, LF–G, PA–N	
8,000 V	LQ	
10,000 V	LF, LD-P,LZ, LZ-N, JW, HE, HE-PV, HE-N, HE-S, HE-V, DJ, DK, DY, HE-R	
12,000 V	DE, DW	

#### ■ High frequency characteristics

Relay	Arrangement	Isolation	Insertion loss
RD COAXIAL SWITCH	SPDT Transfer SP6T	Min. 80 dB ( 1 to 4 GHz ) SPDT Min. 60 dB ( 12.4 to 18 GHz ) Transfer Min. 80 dB ( 1 to 4 GHz ) SP6T	Max. 0.2 dB ( 1 to 4 GHz ) SPDT Max. 0.5 dB ( 12.4 to 18 GHz ) Transfer Max. 0.2 dB ( 1 to 4 GHz ) SP6T
RN RELAY	1 Form C	Min. 30 dB ( 3 to 6 GHz )	Max. 0.5 dB ( 3 to 6 GHz )
RJ RELAY	2 Form C	Min. 30 dB ( 5 GHz ) ( Between contact sets )	Max. 0.5 dB ( 5 GHz )
RA RELAY	2 Form C	Min. 30 dB ( 1 GHz ) ( Between contact sets )	Max. 0.3 dB ( 1 GHz )
RS RELAY	1 Form C	Min. 30 dB ( 3 GHz ) 50 $\Omega$ Surface–mount terminal Min. 35 dB ( 3 GHz ) 75 $\Omega$ PC board terminal	Max. 0.5 dB ( 3 GHz ) 50 $\Omega$ Surface-mount terminal Max. 0.35 dB ( 3 GHz ) 75 $\Omega$ PC board terminal

#### ■ Terminal socket

SP, NC, HE, SFS

#### ■ Socket

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

#### ■ LED operation indication type

**SAFETY STANDARDS** Each standard may be updated at any time, so please check our Website for the latest information.

https://www3.panasonic.biz/ac/e/service/export/information/standards/relay/index.jsp?c=search

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