

Specification List Table

Magnetic Starters/Magnetic Contactors (AC operated)

Frame			T10	T12	T20	T21		
Applicable standard			JIS C8201-4-1, IEC60947-4-1, EN60947-4-1, GB14048.4					
Model name	Magnetic Contactors (Without Thermal Overload Relays, Open type)		Non-Reversing	S-T10	S-T12	S-T20	S-T21	
			Reversing	S-2×T10	S-2×T12	S-2×T20	S-2×T21	
	Magnetic Starters (With standard 2-element, With Thermal Overload Relays)	Enclosed	Non-Reversing	MS-T10	MS-T12	—	MS-T21	
			Reversing	—	—	—	MS-2×T21	
		Open type	Non-Reversing	MSO-T10	MSO-T12	MSO-T20	MSO-T21	
			Reversing	MSO-2×T10	MSO-2×T12	MSO-2×T20	MSO-2×T21	
	Combined Thermal Overload Relays		TH-T18				TH-T25	
	Magnetic Starters (With 3-element type Thermal Overload Relays)	Open type	Non-Reversing	MSO-T10KP	MSO-T12KP	MSO-T20KP	MSO-T21KP	
			Reversing	MSO-2×T10KP	MSO-2×T12KP	MSO-2×T20KP	MSO-2×T21KP	
		Combined Thermal Overload Relays		TH-T18KP				TH-T25KP
Main contact rating	Rated insulation voltage [V]		690					
	Rated impulse withstand voltage [kV]		6					
	Rated frequency [Hz]		50/60					
	Pollution degree		3					
	Rated operational current / power Category AC-3 (Note 1) (Three-phase squirrel-cage motor load standard responsibility) (Note 2) [kW/A]		220 to 240VAC	2.5/11 [2.2/11]	3.5/13 [2.7/13]	4.5/18 [3.7/18]	5.5/25 [4/20]	
			380 to 440VAC	4/9 [2.7/7]	5.5/12 [4/9]	7.5/18 [7.5/18]	11/23 [7.5/20]	
			500VAC	4/7 [2.7/6]	5.5/9 [5.5/9]	7.5/17 [7.5/17]	11/17 [7.5/17]	
			690VAC	4/5	5.5/7	7.5/9	7.5/9	
	Rated operational current / power Category AC-4 (Three-phase squirrel-cage motor load inching responsibility) [kW/A]		220 to 240VAC	1.5/8	2.2/11	3.7/18		
			380 to 440VAC	2.2/6	4/9	5.5/13		
500VAC			2.7/6	5.5/9	5.5/10			
Rated operational current / power Category AC-1 (Resistance, heater load)		100 to 240VAC	20			32		
		380 to 440VAC	11	13	32			
Conventional free air thermal current Ith [A]		20				32		
Minimum applicable load level		48V 200mA						
Auxiliary contact rating	Contact arrangement	Standard accessory		Non-Reversing	1a	1a1b	2a2b	
				Reversing (Note 4, Note 6)	1a×2+2b	1a1b×2+2b	2a2b×2	
		Special accessory		Non-Reversing	1b	2a	—	
				Reversing (Note 4, Note 6)	1b×2+2b	2a×2+2b	—	
		Max. number of additional options (Note 5)	Front clip-on	Non-Reversing	1			
				Reversing	2			
	Side clip-on	Non-Reversing	2					
		Reversing	2					
	Rated operational current (Category AC-15 : Alternating current coil load)		120VAC	6				
			240VAC	3				
Rated operational current (Category DC-13 : Direct current coil load)		24VDC	3					
		110VDC	0.6					
Conventional free air thermal current Ith [A]		10						
Minimum applicable load level		20V 3mA						
Performance	Mechanical durability [ten thousand times]		1000					
	Electrical durability [ten thousand times]		Category AC-3		200 (Note 9)			
			Category AC-4		3 (Note 9)			
			Category AC-1		50			
	Switching frequency [time/hour]		Category AC-3		1800			
Category AC-4			300					
Category AC-1			1200					
Characteristic	Coil consumption (Note 7)		Inrush [VA]	45		75		
			Sealed [VA]	7		7		
	Power consumption (Note 7) [W]		2.2					
Outside dimensions	Magnetic Contactors (without Thermal Overload Relays) (Width x Height x Depth) [mm]		Non-Reversing	36×75×78	43×75×78	63×81×81		
			Reversing	82×85×78	97×85×78	136×81×81		
	Open type Magnetic Starters (Width x Height x Depth) [mm]		Non-Reversing	45×115×79				
			Reversing	90×125×79	97×125×79	136×138×82		
	Enclosed Magnetic Starters (Width x Height x Depth) [mm]		Non-Reversing	76×165×97.5				
			Reversing	—				
IEC 35mm rail mounting			Possible (excluding Enclosed Magnetic Starters)					

Note 1: The figure in the square brackets indicates the rated current shown on the rating plate of the product at which the category AC-3 opening/closing durability is 2,000,000 times (1,000,000 times for the T20 380V). Refer to the electric durability curve for the life performance.

Note 2: The content within () of rated capacity and rated operational current is applied to the Magnetic Contactor.

Note 3: The T10 to T50 types can be manufactured with a coil surge absorber-mounted type (□-□SA type). The UT-SA21 type can be mounted.

Note 4: +2b of T10 and T12 auxiliary contact arrangements in Reversing type represents b contact built in the UT-ML11 interlock unit.

Note 5: The main unit and auxiliary contact block must be prepared separately and additionally mounted by the user.

Note 6: For auxiliary contact arrangement in Reversing type, X2 is displayed as combined auxiliary contact arrangement of two Magnetic Contactors. Please specify the contact arrangement for which two main units are combined must be designated. <Designation example> In case of 1b x 2 + 2b: 2B

Note 7: Operational coil input and coil consumption are average values in case of applying 220V60Hz to AC200V coil.

Note 8: Refer to pages 36 for the mountable options.

Note 9: 1,000,000 times for T20 AC-3 Class 380V or higher, and 15,000 times for AC-4 Class. 15,000 times for T35 to T100 AC-4 Class 380V or higher.

T25	T32	T35	T50	T65	T80	T100
JIS C8201-4-1, IEC60947-4-1, EN60947-4-1, GB14048.4						
S-T25	S-T32	S-T35	S-T50	S-T65	S-T80	S-T100
S-2×T25	S-2×T32	S-2×T35	S-2×T50	S-2×T65	S-2×T80	S-2×T100
MS-2×T25	—	MS-T35	MS-T50	MS-T65	MS-T80	MS-T100
MS-T25	—	MS-2XT35	MS-2XT50	MS-2XT65	MS-2XT80	MS-2XT100
MSO-T25	—	MSO-T35	MSO-T50	MSO-T65	MSO-T80	MSO-T100
MSO-2×T25	—	MSO-2×T35	MSO-2×T50	MSO-2×T65	MSO-2×T80	MSO-2×T100
TH-T25	—	TH-T25/T50	TH-T25/T50	TH-T65	TH-T65/T100	TH-T65/T100
MSO-T25KP	—	MSO-T35KP	MSO-T50KP	MSO-T65KP	MSO-T80KP	MSO-T100KP
MSO-2×T25KP	—	MSO-2×T35KP	MSO-2×T50KP	MSO-2×T65KP	MSO-2×T80KP	MSO-2×T100KP
TH-T25KP	—	TH-T25/T50KP	TH-T25/T50KP	TH-T65KP	TH-T65/T100KP	TH-T65/T100KP
690						
6						
50/60						
3						
7.5/30(26) [5.5/26]	7.5/32 [7.5/32]	11/40 [7.5/35]	15/55 [11/50]	18.5/65 [15/65]	22/85 [19/80]	30/105 [22/100]
15/30(26) [11/25]	15/32 [15/32]	18.5/40 [15/32]	22/48 [22/48]	30/65 [30/65]	45/85 [37/80]	55/105 [45/93]
15/24 [11/20]	15/24 [11/20]	18.5/32 [15/26]	25/38 [22/38]	37/60 [30/45]	45/75 [45/75]	55/85 [45/75]
11/12	11/12	15/17	22/26	30/38	45/52	55/65
4.5/20	5.5/26	5.5/26	7.5/35	11/50	15/65	19/80
7.5/17	11/24	11/24	15/32	22/47	30/62	37/75
7.5/12	7.5/13	11/17	15/24	22/38	30/45	37/55
32	—	60	80	100	120	150
32	—	60	80	100	120	150
32	—	60	80	100	120	150
48V 200mA						
2a2b	—	2a2b	2a2b	2a2b	2a2b	2a2b
2a2b×2	2a2b×2	2a2b×2	2a2b×2	2a2b×2	2a2b×2	2a2b×2
—	—	—	—	—	—	—
—	—	—	—	—	—	—
1						
2	—	2			—	—
2	—	2			—	—
6						
3						
3						
0.6						
10						
20V 3mA						
1000					500	
200				100		
3 (Note 9)						
50						
1800			1200			
300						
1200						600
75	55	110	110	115	115	210
7	4.5	10	10	20	20	23
2.4	1.8	3.8	3.8	2.2	2.2	2.8
63×81×81	43×81×81	75×89×91		88×106×106	88×106×106	100×124×127
136×81×81	96×81×111	160×114×97		216×115×112	216×115×112	270×140×137
63×128×82	—	75×157.5×91		90×158×106	90×174.5×106	100×196×127
136×138×82	—	160×179×97		216×169×112	216×185.5×112	270×213×137
—	—	135×231×126		160×282×145		190×317×163
—	—	300×247×130		320×282×140		410×347×154
Possible (excluding Enclosed Magnetic Starters)						

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Applicable standard			JIS C8201-4-1, IEC60947-4-1, EN60947-4-1, GB14048.4			
Model name	Magnetic Contactors (Without Thermal Overload Relays, Open type)	Non-Reversing	SD-T12	SD-T20	SD-T21	
		Reversing	SD-2×T12	SD-2×T20	SD-2×T21	
	Magnetic Starters (With standard 2-element, With Thermal Overload Relays)	Open type	Non-Reversing	MSOD-T12	MSOD-T20	MSOD-T21
		Combined Thermal Overload Relays	Reversing	MSOD-2×T12	MSOD-2×T20	MSOD-2×T21
	Magnetic Starters (With 3-element type Thermal Overload Relays)	Open type	Non-Reversing	TH-T18		TH-T25
			Reversing	TH-T18KP		TH-T25KP
Combined Thermal Overload Relays			TH-T18KP		TH-T25KP	
Main contact rating	Rated insulation voltage [V]		690			
	Rated impulse withstand voltage [kV]		6			
	Rated frequency [Hz]		50/60			
	Pollution degree		3			
	Rated operational current / power Category AC-3 (Note 1) (Three-phase squirrel-cage motor load standard responsibility) (Note 2) [kW/A]	220 to 240VAC	3.5/13 [2.7/13]	4.5/18 [3.7/18]	5.5/25 [4/20]	
		380 to 440VAC	5.5/12 [4/9]	7.5/18 [7.5/18]	11/23 [7.5/20]	
		500VAC	5.5/9 [5.5/9]	7.5/17 [7.5/17]	11/17 [7.5/17]	
	Rated operational current / power Category AC-4 (Three-phase squirrel-cage motor load inching responsibility) [kW/A]	220 to 240VAC	2.2/11	3.7/18		
		380 to 440VAC	4/9	5.5/13		
		500VAC	5.5/9	5.5/10		
Rated operational current / power Category AC-1 (Resistance, heater load)	100 to 240VAC	20	32			
	380 to 440VAC	13	32			
Conventional free air thermal current Ith [A]		20	32			
Minimum applicable load level		48V 200mA				
Auxiliary contact rating	Contact arrangement	Standard accessory	Non-Reversing	1a1b	2a2b	
			Reversing (Note 4, Note 6)	1a1b×2+2b	2a2b×2	
		Special accessory	Non-Reversing	2a	—	
			Reversing (Note 4, Note 6)	2a×2+2b	—	
	Max. number of additional options (Note 5)	H/O (head on)	Non-Reversing	1		
			Reversing	2		
		S/O (side on)	Non-Reversing	2		
			Reversing	2		
	Rated operational current (Category AC-15 : Alternating current coil load)		120VAC	6		
			240VAC	3		
Rated operational current (Category AC-15 : Alternating current coil load)		24VDC	3			
		110VDC	0.6			
Conventional free air thermal current Ith [A]		10				
Minimum applicable load level		20V 3mA				
Performance	Mechanical durability [ten thousand times]		1000			
	Electrical durability [ten thousand times]	Category AC-3	200 (Note 9)			
		Category AC-4	3 (Note 9)			
		Category AC-1	50			
	Switching frequency [time/hour]	Category AC-3	1800			
Category AC-4		300				
Category AC-1		1200				
Characteristic	Power consumption (Note 7) [W]		3.3 (2.2)	2.4		
Outside dimensions	Magnetic Contactors (without Thermal Overload Relays) (Width x Height x Depth) [mm]	Non-Reversing	43×75×100		63×81×108	
		Reversing	97×85×100		136×81×108	
	Open type Magnetic Starters (Width x Height x Depth) [mm]	Non-Reversing	45×115×101		63×128×109	
		Reversing	97×125×101		136×138×115	
IEC 35mm rail mounting			Possible			

Note 1: The figure in the square brackets indicates the rated current shown on the rating plate of the product at which the category AC-3 opening/closing durability is 2,000,000 times (1,000,000 times for the T20 380V). Refer to the electric durability curve for the life performance.

Note 2: The content within () of rated capacity and rated operational current is applied to the Magnetic Starter.

Note 3: Coil surge absorber-mounted type (□-□ SA type) is also manufactured. UT-SA21 type is mounted.

Note 4: +2b of T10 and T12 auxiliary contact arrangements in Reversing type represents b contact built in the UT-ML11 interlock unit.

Note 5: The main unit and auxiliary contact block must be prepared separately and additionally mounted by the user.

Note 6: For auxiliary contact arrangement in Reversing type, X2 is displayed as combined auxiliary contact arrangement of two Magnetic Contactors. Please specify the contact arrangement for which two main units are combined must be designated. <Designation example> In case of 1b x 2 + 2b: 2B

Note 7: The above table shows the reference characteristics for a DC100V coil. The values in () for SD-T12 to T32 indicate the reference characteristics for the DC12V and DC24V coils.

Note 8: Refer to pages 36 for the mountable options.

Note 9: 1,000,000 times for T20 AC-3 Class 380V or higher, and 15,000 times for T35 to T100 AC-4 Class 380V or higher.



T32	T35	T50	T65	T80	T100
JIS C8201-4-1, IEC60947-4-1, EN60947-4-1, GB14048.4					
SD-T32	SD-T35	SD-T50	SD-T65	SD-T80	SD-T100
SD-2×T32	SD-2×T35	SD-2×T50	SD-2×T65	SD-2×T80	SD-2×T100
—	MSOD-T35	MSOD-T50	MSOD-T65	MSOD-T80	MSOD-T100
—	MSOD-2×T35	MSOD-2×T50	MSOD-2×T65	MSOD-2×T80	MSOD-2×T100
—	TH-T25/T50	TH-T25/T50	TH-T65	TH-T65/T100	TH-T65/T100
—	MSOD-T35KP	MSOD-T50KP	MSOD-T65KP	MSOD-T80KP	MSOD-T100KP
—	MSOD-2×T35KP	MSOD-2×T50KP	MSOD-2×T65KP	MSOD-2×T80KP	MSOD-2×T100KP
—	TH-T25/T50KP	TH-T25/T50KP	TH-T65KP	TH-T65/T100KP	TH-T65/T100KP
690					
6					
50/60					
3					
7.5/32 [7.5/32]	11/40 [7.5/35]	15/55 [11/50]	18.5/65 [15/65]	22/85 [19/80]	30/105 [22/100]
15/32 [15/32]	18.5/40 [15/32]	22/48 [22/48]	30/65 [30/65]	45/85 [37/80]	55/105 [45/93]
15/24 [11/20]	18.5/32 [15/26]	25/38 [22/38]	37/60 [30/45]	45/75 [45/75]	55/85 [45/75]
5.5/26	5.5/26	7.5/35	11/50	15/65	19/80
11/24	11/24	15/32	22/47	30/62	37/75
7.5/13	11/17	15/24	22/38	30/45	37/55
32	60	80	100	120	150
32	60	80	100	120	150
32	60	80	100	120	150
48V 200mA					
—	2a2b	2a2b	2a2b	2a2b	2a2b
2a2b×2	2a2b×2	2a2b×2	2a2b×2	2a2b×2	2a2b×2
—	—	—	—	—	—
—	—	—	—	—	—
1					
—					2
2					
—					2
6					
3					
3					
0.6					
10					
20V 3mA					
1000			500		
200			100		
3(Note 9)					
50					
1800		1200			
300					
					600
1.8	9	9	18	18	24
43×81×108	75×89×123		88×106×133	88×106×133	100×134×157
96×81×138	160×114×129		216×115×139	216×115×139	270×147×167
—	75×157.5×123		90×160×133	90×176.5×133	100×206×157
—	160×179×129		216×169×139	216×185.5×139	270×213×167
Possible					

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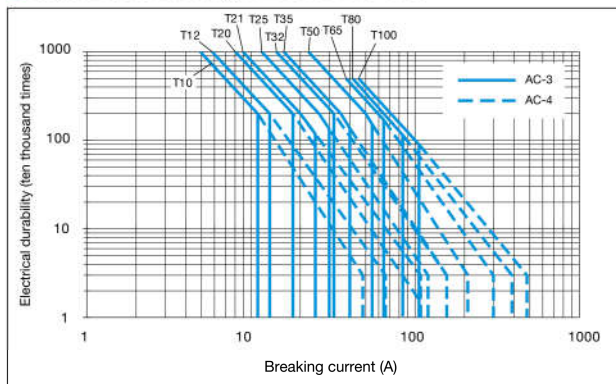
	Frame	T10	T12	T20	T21	T25	T32	T35	T50	T65	T80	T100
Making capacity Category AC-3 [A]	220 to 240VAC	110	130	180	250	300	320	400	550	650	850	1050
	380 to 440VAC	90	120	180	230	300	320	400	500	650	850	1050
	500VAC	70	90	170	170	240	240	320	380	600	750	850
Breaking capacity Category AC-4 [A]	220 to 240VAC	88	104	144	200	240	256	320	440	520	680	840
	380 to 440VAC	72	96	144	184	240	256	320	400	520	680	840
	500VAC	56	72	136	136	192	192	256	304	480	600	680

Coordination with short-circuit protective devices

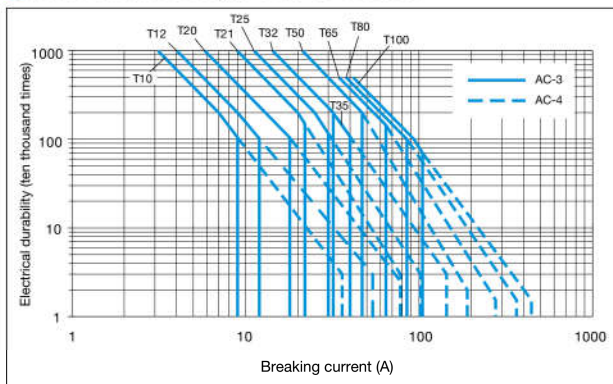
Magnetic Contactors model		T10	T12	T20	T21	T25	T32	T35	T50	T65	T80	T100	SR-T5/T9
Type1	Short-circuit protective device rating * Fuse gG (IEC60269-1/2)	40A			80A			100A			125A	160A	—
	Main circuit												
	Auxiliary circuit	10A											

Electrical Durability Curve

Main circuit voltage 220 to 240VAC



Main circuit voltage 380 to 440VAC



Coil Ratings

Coil types and ratings (Alternating voltage operation type)

For S-T10 to T100 types For SR-T5 and T9 types

Coil designation	Rated voltage [V] 50Hz/60Hz	Marking on the equipment
AC24V	24	
AC48V	48-50	
AC100V	100-127	
AC200V	200-240	
AC300V	260-300	
AC400V	380-440	
AC500V	460-550	

Note 1 : Even when the single rating (example: 200V60Hz) is specified for an order, the above rating voltage is indicated on the product.
 Note 2 : Even when the single rating (example: 200V60Hz) is specified for an order, the above rating voltage is indicated on the product.

For S-T10SA to T50SA types For SR-T5SA and T9SA types

Coil designation	Rated voltage [V] 50Hz/60Hz	Coil indication	Varistor voltage [V]
AC24V	24		
AC48V	48-50		
AC100V	100-127		
AC200V	200-240		
AC300V	260-300		
AC400V	380-440		

Note 1 : Add "SA" to the end of the type name to order the operation coil surge absorber mounting type (varistor).
 Example: S-T10SA AC100V
 Note 2 : Even when the single rating (example: 200V60Hz) is specified for an order, the above rating voltage is indicated on the product.

Coil types and ratings (DC operated type)

- For SD-T12 to T100 types
For SRD-T5 and T9 types

Coil designation	Rated voltage	Coil indication
DC12V	DC12V	Rated voltage
DC24V	DC24V	
DC48V	DC48V	
DC100V	DC100V	
DC110V	DC110V	
DC125V	DC120-DC125V	
DC200V	DC200V	
DC220V	DC220V	

Note 1: The operating coil terminal has a polarity (excluding T35 to T100 types). Connect the positive side to terminal number A1 (+) and the negative side to A2 (-).

Note 2: If the operation power supply is a rectifier, open and close the coil on the DC side.

- For SD-T12SA to T50SA types
For SRD-T5SA and T9SA types

Coil designation	Rated voltage	Coil indication	Varistor voltage [V]
DC12V	DC12V	Rated voltage	47
DC24V	DC24V		47
DC48V	DC48V		120
DC100V	DC100V		470
DC110V	DC110V		470
DC125V	DC120-125V		470
DC200V	DC200V		470
DC220V	DC220V		470

Note 1: If the type with surge absorber for operation coil (varistor) is required, add "SA" to the end of the model when placing your order. Example: SD-T21SA 100VDC

Note 2: The operating coil terminal has a polarity (excluding T35SA to T50SA types). Connect the positive side to terminal number A1 (+) and the negative side to A2 (-).

Note 3: Variations other than the above cannot be manufactured.

Contact Reliability

Contact reliability of main and auxiliary contacts

The minimum working voltage and current of the main and auxiliary contacts of the S-T type Magnetic Contactors and the contact of the SR-T type Contactor Relays vary depending on the allowable failure rate. Apply the following diagrams.

■ The contact reliability reduces when a contact is connected in series or when the current is applied and broken at the time of opening and closing the contact. Prescribe remedies such as connecting the contact in parallel (providing redundancy).

■ If a reliability higher than the contact reliability given in Diagram 1 to Diagram 4 is required, the contacts must be connected in parallel (redundant).

- Magnetic Contactors

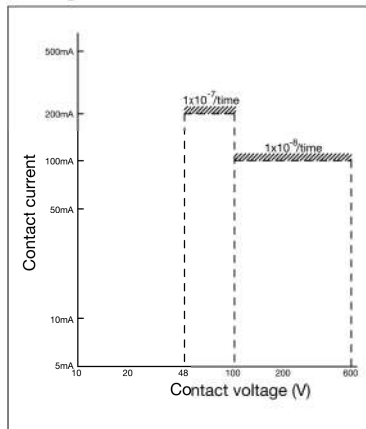


Diagram 1. S(D)-T main contact

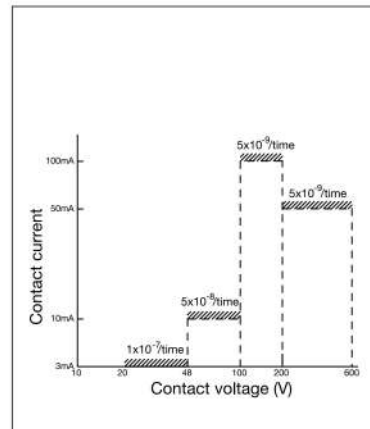


Diagram 2 S(D)-T, UT-AX11 auxiliary contacts

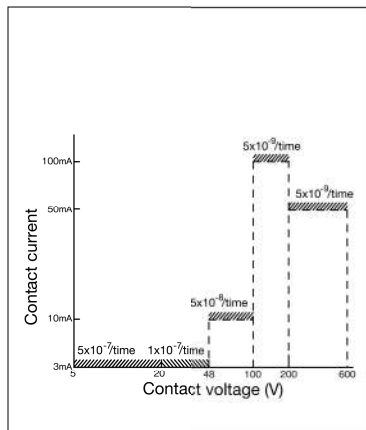


Diagram 3 UT-AX2/4 auxiliary contact

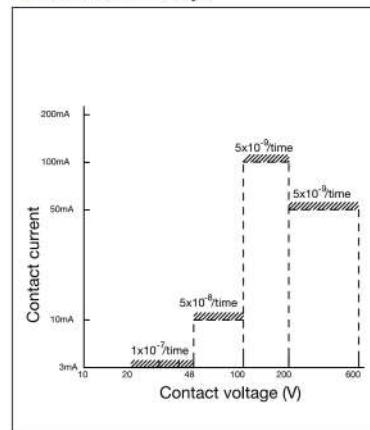


Diagram 4. SR(D)-T5, T9

Note 1: The contact reliability indicates the failure rate λ 60 (the number of failures/the number of opening and closing operations, per contact) at 60% reliability standard.

This reliability is applied when the product is in use under a clean atmosphere in the standard specification environment (Refer to page 14).

Note 2: The contact resistance of the contacts may change due to economical corrosion and that may affect the contacts in the case of a light load.

It is recommended that regular inspections to be conducted, with load opening and closing performed several times in the inspection, and that consideration be provided on the system side.