4. RELAYS

Series **SR-N**

4.1 Contactor Relays

SR-N4

The MITSUBISHI series SR-N contactor relays are specially designed for use in low voltage control circuit applications. Series SR-N have many superior features.

Features

- High reliability: By adopting bifurcated moving contacts and by improving the shape of the contacts, contact performance has been made more reliable than ever.
- Long life
- Can be mounted on 35mm rail
- Dust-proof construction
- Easily visible coil ratings
- Easy wiring (self-rising terminal screws)
- Various accessories common with the series S-N contactors
(Head-and side clip-on type additional aux. contact blocks, surge absorbers, safety covers)
- Finger protected types are available (DIN 57106/VDE 0106 Part 100)

Type Designation

- **Standard types**

SR – N4 LC ∗ AC200V ∗ 2A2B

CONTROL TYPE	
SR	AC operated
SRD	DC operated
SRL[1]	AC & Latched
SRLD[1]	DC & Latched

TYPE	
∗	Standard type
JH	Big capacity type
LC	With overlap contact type
CX[3]	With finger protection cover

COIL VOLTAGE[2]
See Table 4.1.1(2)

CONTACT ARRANGEMENT (CODE)
See Table 4.1.1(1)

Notes: 1. For latched type relays, JH and LC types cannot be available.
2. When ordering the latched type relays, please specify the closing coil and tripping coil voltage.
ex: SRL-N4 ∗MC-AC200V∗MT-AC100V∗4A
closing coil tripping coil
3. Only suffix "CX" is admitted to make any combination with other tabulated suffixes.

Note: Mark ∗ indicates a blank space.

4.1.1 Specifications

Rating and characteristics

Table 4.1.1 (1)

Type				SR- SRD-	N4 (CX)	N4JH (CX)	N4LC (CX)
Available contact arrangements (code)					4NO (4A) 3NO+1NC (3A1B) 2NO+2NC (2A2B)	4NO (4A) 2NO+2NC (2A2B)	4NO (4A) 2NO+2NC (2A2B)
Rated insulation voltage				V	660		
Conventional free air thermal current			Ith	A	16	20	16
Rated operating current	Category AC-15 (coil load)	110VAC 230VAC 440VAC 550VAC		A A A A	6 5 3 3	10 10 5 4	6 (3)[2] 5 (3)[2] 3 (3)[2] 3 (3)[2]
	Category AC-12 (resistive load)	110VAC 230VAC 440VAC 550VAC		A A A A	16 12 5 5	20 16 10 10	16 12 5 5
	Category DC-13 (large coil load)	24VDC 48VDC 110VDC 220VDC		A A A A	5 3 0.8(2)[1] 0.2(0.8)[1]		3 2 0.5 0.1
	Category DC-14	24VDC 48VDC 110VDC 220VDC		A A A A	8 3 2(4)[1] 0.4(1)[1]		5 2 1 0.2
	Category DC-12 (resistive load)	24VDC 48VDC 110VDC 220VDC		A A A A	10 8 5(8)[1] 1(3)[1]		8 5 3 0.5
Mechanical life Electrical life				Operations Operations	10 million (latched type 1 million) 0.5 million		
Permissible ambient temperature/humidity				°C/%RH	-25 to +55/45 to 85		
Coil consumption	Ac-operated	Inrush Sealed Watts		VA VA W	60 10 3		
	DC-operated	Watts		W	7		
Coil voltage tolerance				times	0.85 to 1.1 (rated coil voltage)		
Operating time (average)		Make Break		ms ms	15 (AC operated) 10 (AC operated)		50 (DC operated) 10 (DC operated)
Switching frequency				operations /hour	1,800		
Vibration resistance Shock resistance	10-55Hz 10 msec. half sine wave			m/s² m/s²	19.6 49		
Conductor size				mm²	1.0 to 2.5		

Notes: 1. Parenthesized rated operating current is for switching the load in 2-pole series connection.
2. Parenthesized rated operating current is for switching of NC contact.

Coil voltage

Table 4.1.1 (2)

Coil designation	Rated voltage (AC)		Coil designation	Rated voltage (AC)		Coil designation	Rated voltage (DC)
	50Hz	60Hz		50Hz	60Hz		
AC12V	12V	12V	AC220V	208-220V	220V	DC24V	24VDC
AC24V	24V	24V	AC230V	220-240V	230-240V	DC48V	48VDC
AC48V	48-50V	48-50V	AC260V	240-260V	260-280V	DC100V	100VDC
AC100V	100V	100-110V	AC380V	346-380V	380V	DC110V	110VDC
AC120V	110-120V	115-120V	AC400V	380-415V	400-440V	DC125V	120-125VDC
AC127V	125-127V	127V	AC440V	415-440V	460-480V	DC200V	200VDC
AC200V	200V	200-220V	AC500V	500V	500-550V	DC220V	220VDC

Note: AC operated coils are the same as those of S-N10 etc., and DC operated coils are the same as those of SD-N11 etc.

4.1.2 Auxiliary Contact Blocks

Type Designation

● Front clip-on types

UN-AX [4] [CX] ＊ [2A2B]

POLES	
4	4 pole
2	2 pole

FINGER PROTECTION	
None	Not provided
CX	Provided

CONTACT ARRANGEMENTS
See Table 4.1.2(1)

[FOR LOW SIGNAL LEVEL] UN-LL22 [CX]

FINGER PROTECTION	
None	Not provided
CX	Provided

● Side clip-on types

UN-AX11 [CX]

FINGER PROTECTION	
None	Not provided
CX	Provided

Note: Mark ＊ indicates a blank space.

■ Ratings and characteristics

Table 4.1.2 (1)

Type			UN-	AX2 (CX)	AX4 (CX)	AX11(CX)	LL22 (CX)	
Applicable contact arrangements				2NO 1NO+1NC 2NC	4NO 3NO+1NC 2NO+2NC	INO+INC	1NO+1NC [Standard]	1NO+1NC[1] [Low level]
Rated insulation voltage			V	690				250
Conventional free air thermal current			Ith A	16				1
Rated operating current	Category AC-15 (coil load)	110VAC 220VAC 440VAC	A A A	6 5 3				240VAC 20mA (COSφ≧0.95) 48VDC 100mA (L/R≦1msec) Minimum operating current 5VDC 5mA
	Category DC-13 (large coil load)	48VDC 110VDC 220VDC	A A A	3 0.8 0.2				
Mechanical life Electrical life			operations operations	10 million 0.5 million			2.5 million 0.5 million	
Permissible ambient temperature/humidity			°C/%RH	–25 to +55/45 to 85				
Switching frequency			operations /hour	1,800				
Conductor size			mm²	1.0 to 2.5				

Note: 1. Contact reliability may be decreased if it is operated more than 1 million operations

■ Selection guide & contact arrangements

Table 4.1.2 (2)

Front clip-on types	**UN-AX2 2A** 2NO 53 63 54 64	**UN-AX2 1A1B** 1NO+1NC 51 63 52 64	**UN-AX2 2B** 2NC 51 61 52 62
	UN-AX4 4A 4NO 53 63 73 83 54 64 74 84	**UN-AX4 3A1B** 3NO+1NC 53 61 73 83 54 62 74 84	**UN-AX4 2A2B** 2NO+2NC 53 61 71 83 54 62 72 84
Side clip-on types	**UN-AX11** 1NO+INC 53 61 54 62 When mount on left side 83 71 84 72 When mount on right side		

UN-LL22

53 63 71 81 54 64 72 82

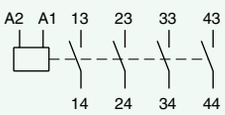
standard (1NO+1NC)

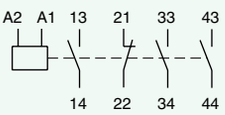
low level 1NO+1NC

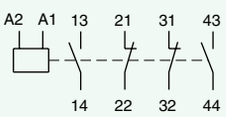
Note: Front clip-on types and side clip-on contact block should not be mounted both.

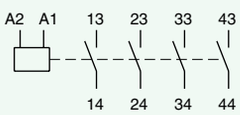
4.1.3 Contact Arrangements of Contactor Relay

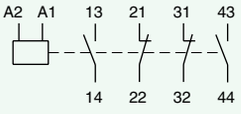
Table 4.1.3

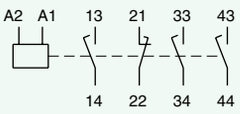
<table>
<tr><td colspan="3">With standard contacts</td></tr>
<tr><td>4NO
 

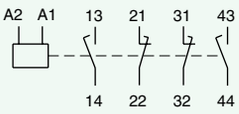
SR-N4(CX)AC·····V 4A
SRD-N4(CX)DC·····V 4A</td><td>3NO
+
1NC
 

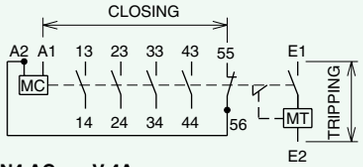
SR-N4(CX)AC·····V 3A1B
SRD-N4(CX)DC·····V 3A1B</td><td>2NO
+
2NC
 

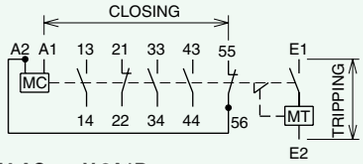
SR-N4(CX)AC·····V 2A2B
SRD-N4(CX)DC·····V 2A2B</td></tr>
<tr><td colspan="3">With big capacity contacts</td></tr>
<tr><td>4NO
 

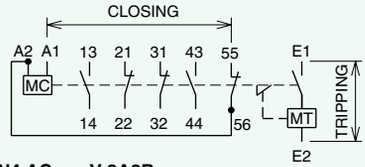
SR-N4JH(CX)AC·····V 4A
SRD-N4JH(CX)DC·····V 4A</td><td></td><td>2NO
+
2NC
 

SR-N4JH(CX)AC·····V 2A2B
SRD-N4JH(CX)DC·····V 2A2B</td></tr>
<tr><td colspan="3">With late break contacts</td></tr>
<tr><td></td><td>3NO
+
1NC
(late break)
 

SR-N4LC(CX)AC·····V 3A1B
SRD-N4LC(CX)DC·····V 3A1B</td><td>2NO
+
2NC
(late break)
 

SR-N4LC(CX)AC·····V 2A2B
SRD-N4LC(CX)DC·····V 2A2B</td></tr>
<tr><td colspan="3">With mechanical latching</td></tr>
<tr><td>4NO
 

SRL-N4 AC·····V 4A
SRLD-N4 DC·····V 4A</td><td>3NO
+
1NC
 

SRL-N4 AC·····V 3A1B
SRLD-N4 DC·····V 3A1B</td><td>2NO
+
2NC
 

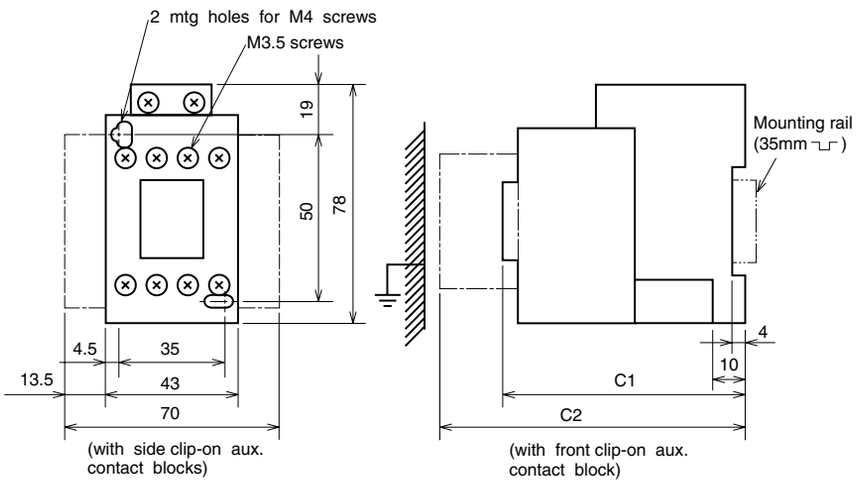
SRL-N4 AC·····V 2A2B
SRLD-N4 DC·····V 2A2B</td></tr>
</table>

4.1.4 Spare Coils & Accessories

Spare coils and accessories are common with the series S-N contactors.

- Spare coils ..... See Table 1.8.1(except for Type SRL(D)latched relays)
- Surge absorbers(suppressors) ..... See Table 1.8.6

4.1.5 Outline Dimensions



● Key to Dimensions

Model	C1	C2	Mass (kg)
SR-N4(CX)	78	106	0.3
SRD-N4(CX)	110	138	0.62
SRL-N4(CX) SRLD-N4(CX)	134	–	0.45

Note: Front clip-on and side clip-on contact block should not be mounted both.

4.2 Voltage Detection Relays

SRE-AA

The MITSUBISHI series SRE relays are specially designed for voltage sensing.The type SRE-A is specially designed for the detection of undervoltage or overvoltage conditions.The type SRE-K is particularly useful for the switching of automatic transfer panels.The type SRE-K can detect undervoltage by simply connecting to the power-source terminals.

Features

- High sensibility
- High reliability
- Easy wiring
- High surge tolerance
- Wide detective voltage range

Type Designation

SRE-A AU – 050 D

OPERATION VOLTAGE	
A	100-110/200-220VAC
AU	115-120/230-240VAC

DETECTABLE VOLTAGE RANGE
See Table 4.2.1

DETECTABLE CURRENT TYPE	
D	DC
A	AC

SRE-K T – AC120V

SETTING VOLTAGE	
*	Drop-out voltage
T	Pick-up voltage

OPERATION VOLTAGE
See Table 4.2.1

Specifications

Selection table

Table 4.2.1

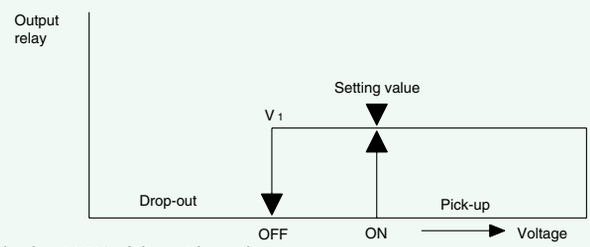
Type		Detectable voltage range	Permissible input voltage (continuous)	Input impedance	Operation voltage
SRE-AA SRE-AAU	0P5D	0.1-0.5VDC	± 100VDC	20KΩ	Type SRE-AA 100-110V 200-220V 50/60Hz Type SRE-AAU 115-120V 230-240V 50/60Hz
	1P5D	0.3-1.5VDC	± 100VDC	50KΩ	
	005D	1- 5VDC	± 150VDC	100KΩ	
	015D	3-15VDC	± 150VDC	100KΩ	
	050D	10-50VDC	± 200VDC	500KΩ	
	150D	30-150VDC	± 300VDC	800KΩ	
	250D	50-250VDC	± 300VDC	800KΩ	
	015A	3-15VAC	150VAC	100KΩ	
	050A	10-50VAC	200VAC	500KΩ	
	150A	30-150VAC	300VAC	800KΩ	
	250A	50-250VAC	300VAC	800KΩ	
SRE-K	AC100V	75-105VAC	120VAC	Input 1.8VA	100-110V,50/60Hz
	AC120V	90-125VAC	132VAC		115-120V,50/60Hz
	AC200V	150-210VAC	240VAC		200-220V,50/60Hz
	AC240V	180-250VAC	264VAC		230-240V,50/60Hz
	DC 12V	9-12.5VDC	14VDC	Input 1.7W	12VDC
	DC 24V	18-25VDC	28VDC		24VDC
	DC100V	75-105VDC	120VDC		100VDC
SRE-KT	AC100V	80-115VAC	120VAC	Input 1.8VA	100-110V,50/60Hz
	AC120V	95-130VAC	132VAC		115-120V,50/60Hz
	AC200V	160-230VAC	240VAC		200-220V,50/60Hz
	AC240V	190-260VAC	264VAC		230-240V,50/60Hz
	DC 12V	10-14VDC	14VDC	Input 1.7W	12VDC
	DC 24V	20-28VDC	28VDC		24VDC
	DC100V	80-115VDC	120VDC		100VDC

Note: The type SRE-A □D, for DC detection can be used for full-wave rectification voltage.

Operating Condition

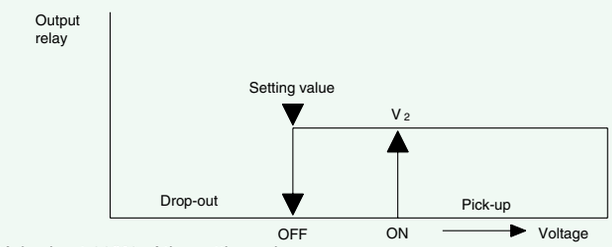
Fig 4.2.1

YPE:SRE-AA/AAU,SRE-KT



V_1 is about 90% of the setting value.

TYPE:SRE-K



V_2 is about 110% of the setting value.