

# Contactors and Thermal Relays

## Series 3SC8 & 3SR8

### Applications and functions for AC contactor 3SC8

- Used for controlling 3-phase motors and generally for controlling power circuits.
- Used for many other applications such as isolation, capacitor switching and lighting.

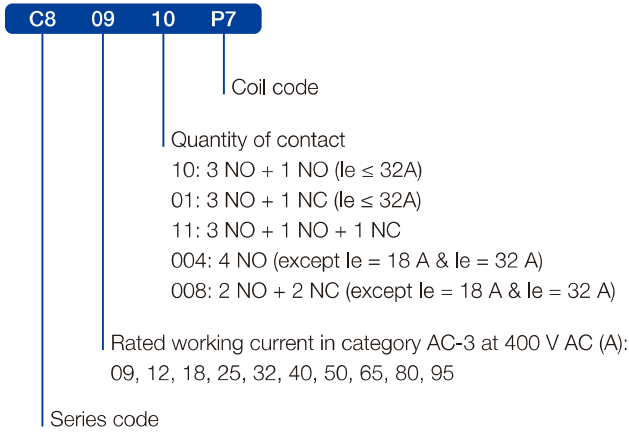
### Applications and functions for thermal relay 3SR8

- Protecting the loads from overload and phase failure
- Implementing short-circuit protection by means of a fuse or circuit breaker.
- Used for the protection of motors.

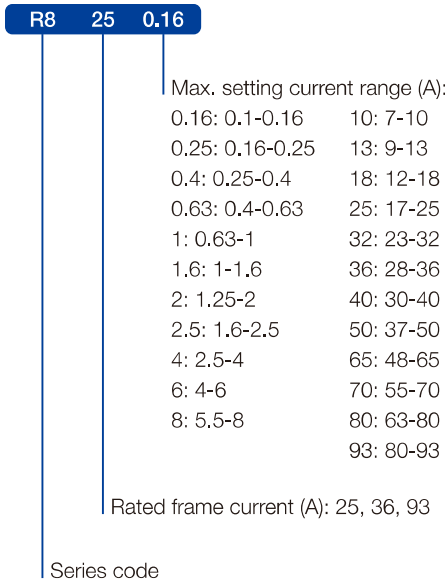
3

### Instruction of type code

- For contactor



- For thermal relay



### Technical specifications for type 3SC8

Type		3SC8-09	3SC8-12	3SC8-18	3SC8-25	3SC8-32	3SC8-40	3SC8-50	3SC8-65	3SC8-80	3SC8-95	
Standard		IEC 60947-4-1										
Number of poles		3, 4	3, 4	3	3, 4	3	3, 4	3, 4	3, 4	3, 4	3, 4	
Rated operational current I <sub>e</sub> (A)	380 V	In AC-3	9	12	18	25	32	40	50	65	80	95
		In AC-4	3,5	5	7,7	8,5	12	18,5	24	28	37	44
	660 V	In AC-3	6,6	8,9	12	18	21	34	39	42	49	55
		In AC-4	1,5	2	3,8	4,4	7,5	9	12	14	17,3	21,3
	440 V	In AC-1	20	25	32	40	50	60	80	80	110	125
Rated operational voltage U <sub>e</sub> (V)	Up to	690										
Frequency limits of the operational current (time/h)		25-400										
Rated conventional thermal current I <sub>th</sub> (A)		25	25	32	40	50	60	80	80	125	125	
Rated insulation voltage U <sub>i</sub> (V)		690										
Rated impulse withstand voltage U <sub>imp</sub> (kV)		8										
Rated frequency (Hz)		50/60										
Rated making capacity (A)	400 V	10 x I <sub>e</sub> AC-3 or 12 x I <sub>e</sub> AC-4										
Rated breaking capacity (A)	400 V	8 x I <sub>e</sub> AC-3 or 10 x I <sub>e</sub> AC-4										
Rated operational power in category AC-3 (kW)	220/230/240 V	2,2	3	4	5,5	7,5	11	15	18,5	22	25	
	380/400 V	4	5,5	7,5	11	15	18,5	22	30	37	45	
	660/690 V	5,5	7,5	10	15	18,5	30	33	37	45	45	
Fuse protection against short-circuit (A)	Without thermal overload relay, Gg fuse Type 1	20	25	32	40	50	63	80	80	125	160	
		Type 2	20	20	25	32	40	50	63	80	150	150
	With thermal overload relay	see specification and ordering data of 3SR8, for aM or gG fuse ratings corresponding to the associated thermal overload relay										
Average impedance per pole (mΩ)		2,5	2,5	2,5	2	2	1,5	1,5	1,5	0,8	0,8	
Add-on auxiliary contact blocks	Front	3SC8-A1 and 3SC8-A1D										
	Side	3SC8-A1C										
	Front time delay	3SC8-A2										
	Front dust and damp protected	■										
Reversing contactor type		3SC8-DN										
Associated thermal overload relays		3SR8-25					3SR8-36	3SR8-93				
Operation cycles (times/hour)	Electrical AC-3	1200	1200	1200	1200	600	600	600	600	600	600	
	Electrical AC-4	300	300	300	300	300	300	300	300	300	300	
	Mechanical	3600	3600	3600	3600	3600	3600	3600	3600	3600	3600	
Electrical life (X 10 <sup>3</sup> times)	AC-3	1000	1000	1000	1000	800	800	600	600	600	600	
	AC-4	200	200	200	200	200	150	150	150	100	100	
Mechanical life (X 10 <sup>6</sup> times)		10	10	10	10	8	8	8	8	6	6	
Matching fuse model		RT16-20	RT16-20	RT16-32	RT16-40	RT16-50	RT16-63	RT16-80	RT16-80	RT16-100	RT16-125	
Tightening torque (N · m) Connection		1,2	1,2	1,7	2,0	2,5	5	5	5	9	9	
Cabling cross section (CU)	Flexible cable with cold-pressed 2 socket (mm <sup>2</sup> )	1/2,5	1/2,5	1/4	1/4	1,5/4	2,5/10	2,5/10	2,5/10	4/16	4/16	
	Flexible cable without cold-pressed 2 socket (mm <sup>2</sup> )	1/4	1/4	1,5/6	1,5/6	2,5/10	2,5/16	2,5/16	2,5/16	4/25	4/25	
	Inflexible 2 cable (mm <sup>2</sup> )	1/4	1,5/4	1,5/6	1,5/6	1,5/10	2,5/25	2,5/25	2,5/25	4/50	4/50	
Screw size		M3,5	M3,5	M3,5	M4	M4	M8	M8	M8	M10	M10	
Degree of protection		IP20										
Ambient air temperature (°C)		-5 to +40, max. 95 % humidity										
Storage temperature (°C)		-40 ~ +75										
Maximum operating altitude (meters)		2000										
Flame resistance	Conforming to UL 94	V1										

# Contactors and Thermal Relays

## Series 3SC8 & 3SR8

3

### Technical specifications for auxiliary contacts incorporated in the contactor 3SC8

- Standard: IEC 60947-5-1
- Number of auxiliary contacts: 2, 4
- Mounting type: Front, side
- Conventional heating current (A): 10
- Rated operational voltage U<sub>e</sub> (V): Up to 690
- Rated insulation voltage U<sub>i</sub> (V): 690
- Conventional thermal current I<sub>th</sub> (A): 10
- Minimum switching capacity I<sub>min</sub> (mA): 5
- Short circuit protection (A): gG fuse: 10 A
- Rated making capacity (A): 140

### Technical specifications for time delay contact incorporated in the contactor 3SC8

- Standard: IEC 60255-5
- Number of contacts: 2
- Mounting type: Front
- Delay time type making time delay, breaking time delay
- Timing ranges: 0.1-3, 0.1-30, 10-180
- Repeat accuracy: ± 3 % (10 ms minimum)
- Reset time
  - During time delay period (ms): 150
  - After time delay period (ms): 50
- Conventional heating current (A): 10
- Rated operational voltage U<sub>e</sub> (V): Up to 690
- Rated insulation voltage U<sub>i</sub> (V): 250
- Conventional thermal current I<sub>th</sub> (A): 10

### Technical specifications for coil incorporated in contactor 3SC8

Type		3SC8-09	3SC8-12	3SC8-18	3SC8-25	3SC8-32	3SC8-40	3SC8-50	3SC8-65	3SC8-80	3SC8-95
Coil consumption	Pick-up (VA)	70	70	70	100	100	245	245	245	245	245
	Holding (VA)	50 Hz, 60 Hz	9,0	9,0	9,0	10	10	30	30	30	30
		50/60 Hz	10	10	10	11	11	32	32	32	32
Power (W)		2~3,5	2~3,5	2~3,5	3~4	3~4	6~10	6~10	6~10	6~10	6~10


### Coil voltage of contactor 3SC8

Coil voltage U <sub>s</sub> (V)	12	20	24	32	36	42	48	60	100	110	115	120	127	208	220	230	240	265	380	400	415	440	480	500	550	600	550/600 600/660	660/690
50 Hz	J5	-	B5	C5	-	D5	E5	-	-	F5	FE5	G5	FC5	LE5	M5	P5	U5	-	Q5	V5	N5	R5	T5	S5	SC5	X5	-	Y5
60 Hz	-	-	B6	-	-	-	E6	-	-	F6	-	-	-	-	M6	-	U6	-	Q6	-	-	R6	-	-	-	-	-	Y6
50/60 Hz	J7	Z7	B7	C7	CC7	D7	E7	EE7	K7	F7	FE7	-	FC7	-	M7	P7	U7	W7	Q7	V7	N7	R7	-	S7	-	X7	Y7	

### Technical specifications for assembled thermal relay of type 3SR8


Type	3SR8-D13	3SR8-D23	3SR8-D33
Standard	IEC 60947-4-1		
Tripping class	10 A		
Rated working current I <sub>e</sub> (A)	25	36	93
Setting range (A)	0,1-25	23-36	23-93
Rated insulation voltage U <sub>i</sub> (V)	690		
Rated impulse withstand voltage U <sub>imp</sub> (kV)	6		
Signalling Trip indicator	Trip indicator		
Tightening torque (N·m)	0,8		
Degree of protection	IP20		
Ambient air temperature (°C)	-5 to +40, max. 95 % humidity		
Storage temperature (°C)	-40 ~ +75		
Maximum operating altitude (meters)	2000		
Flame resistance	V1		
Mounting	Directly under the contactor		

### Selection and ordering data

	Standard control circuit voltages (V AC)	Rated frequency (Hz)	Rated operational current in category AC-3 400 V (A)	Number of poles		Instantaneous auxiliary contacts		230 V 50/60 Hz	
				↓	↓	↓	↓	Type code	Order code
	230	50/60	9	3	-	1	-	C8N 0910P7	27432
				3	-	-	1	C8N 0901P7	27431
				3	-	1	1	C8N 09004P7	27433
				4	-	-	-	C8N 0911P7	27451
				2	2	-	-	C8N 09008P7	27452
				3	-	1	-	C8N 1210P7	27435
			12	3	-	-	1	C8N 1201P7	27434
				3	-	1	1	C8N 12004P7	27436
				4	-	-	-	C8N 1211P7	27453
				2	2	-	-	C8N 12008P7	27454
				3	-	1	-	C8N 1810P7	27438
				3	-	-	1	C8N 2511P7	27437
18	3	-	1	1	C8N 3211P7	27439			
	3	-	1	-	C8N 1801P7	27441			
	3	-	-	1	C8N 1811P7	27440			
	3	-	1	1	C8N 2510P7	27442			
	4	-	-	-	C8N 2501P7	27455			
	2	2	-	-	C8N 25004P7	27456			
32	3	-	1	-	C8N 25008P7	27444			
	3	-	-	1	C8N 3210P7	27443			
	3	-	1	1	C8N 3201P7	27445			
	3	-	1	1	C8N 4011P7	27446			
	4	-	-	-	C8N 40004P7	27457			
	2	2	-	-	C8N 40008P7	27458			
50	3	-	1	1	C8N 5011P7	27447			
	4	-	-	-	C8N 50004P7	27459			
	2	2	-	-	C8N 50008P7	27460			
	3	-	1	1	C8N 6511P7	27448			
	4	-	-	-	C8N 65004P7	27461			
	2	2	-	-	C8N 65008P7	27462			
80	3	-	1	1	C8N 8011P7	27449			
	4	-	-	-	C8N 80004P7	27463			
	2	2	-	-	C8N 80008P7	27464			
	3	-	1	1	C8N 9511P7	27450			
	4	-	-	-	C8N 95004P7	27465			
	2	2	-	-	C8N 95008P7	27466			

Please contact us for other coil voltage and frequency listed in "coil voltage of contactor" on page 4-3

### 3SC8-DN reversing contactors

	Rated operating current 400 V AC-3 (A)	Standard power ratings of 3 phase motors 50-60 Hz AC-3					Poles	230 V 50 Hz	
		220 V (KW)	380 V 400 V (KW)	415 V (KW)	440 V (KW)	660 V 690 V (KW)		Type code	Order code
	9	2,2	4	4	4	5,5	3	C8 DN9P5	15913
	12	3	5,5	5,5	5,5	7,5	3	C8 DN12P5	15914
	18	4	7,5	9	9	10	3	C8 DN18P5	15915
	25	5,5	11	11	11	15	3	C8 DN25P5	15916
	32	7,5	15	15	15	18,5	3	C8 DN32P5	15917
	40	11	18,5	22	22	30	3	C8 DN40P5	15918
	50	15	22	25	30	33	3	C8 DN50P5	15919
	65	18,5	30	37	37	37	3	C8 DN65P5	15920
	80	22	37	45	45	45	3	C8 DN80P5	15921
	95	25	45	45	45	45	3	C8 DN95P5	15922

Please contact us for other coil voltage and frequency listed in "coil voltage of contactor" on page 4-3

# Contactors and Thermal Relays

## Series 3SC8 & 3SR8

### Selection and ordering data

#### Coil for contactor 3SC8

	Standard control circuit voltage (V AC)	Rated frequency (Hz)	Voltage code	Type code	Order code
<b>3SC8X-D2</b> for AC contactor 3SC8-9...18	Suitable for contactors with auxiliary contact 1NO or 1NC				
	24	50/60	B7	C8X-D2B7	17359
	48	50/60	E7	C8X-D2E7	25323
	110	50/60	F7	C8X-D2F7	32043
	127	50/60	FC7	C8X-D2FC7	32046
	220	50/60	M7	C8X-D2M7	17362
	230	50/60	P7	C8X-D2P7	32049
	240	50/60	U7	C8X-D2U7	32052
	380	50/60	Q7	C8X-D2Q7	32055
	400	50/60	V7	C8X-D2V7	27278
	440	50/60	R7	C8X-D2R7	32058
	Suitable for contactors with auxiliary contact 1NO+1NC				
	24	50/60	B7	C8X-D2NB7	14101
	48	50/60	E7	C8X-D2NE7	14102
	110	50/60	F7	C8X-D2NF7	14103
	127	50/60	FC7	C8X-D2NFC7	14104
	220	50/60	M7	C8X-D2NM7	14105
	230	50/60	P7	C8X-D2NP7	14106
	240	50/60	U7	C8X-D2NU7	14107
	380	50/60	Q7	C8X-D2NQ7	14108
	400	50/60	V7	C8X-D2NV7	14109
	440	50/60	R7	C8X-D2NR7	14110
<b>3SC8X-D4</b> for AC contactor 3SC8-25...32	Suitable for contactors with auxiliary contact 1NO or 1NC				
	24	50/60	B7	C8X-D4B7	17360
	48	50/60	E7	C8X-D4E7	25324
	110	50/60	F7	C8X-D4F7	32044
	127	50/60	FC7	C8X-D4FC7	32047
	220	50/60	M7	C8X-D4M7	17363
	230	50/60	P7	C8X-D4P7	32050
	240	50/60	U7	C8X-D4U7	32053
	380	50/60	Q7	C8X-D4Q7	32056
	400	50/60	V7	C8X-D4V7	27279
	440	50/60	R7	C8X-D4R7	32059
	Suitable for contactors with auxiliary contact 1NO+1NC				
	24	50/60	B7	C8X-D4NB7	14111
	48	50/60	E7	C8X-D4NE7	14112
	110	50/60	F7	C8X-D4NF7	14113
	127	50/60	FC7	C8X-D4NFC7	14114
	220	50/60	M7	C8X-D4NM7	14115
	230	50/60	P7	C8X-D4NP7	14116
	240	50/60	U7	C8X-D4NU7	14117
	380	50/60	Q7	C8X-D4NQ7	14118
	400	50/60	V7	C8X-D4NV7	14119
	440	50/60	R7	C8X-D4NR7	14120
<b>3SC8X-D6</b> for AC contactor 3SC8-40...95	Suitable for contactors with auxiliary contact 1NO or 1NC				
	24	50/60	B7	C8X-D6B7	17361
	48	50/60	E7	C8X-D6E7	25325
	110	50/60	F7	C8X-D6F7	32045
	127	50/60	FC7	C8X-D6FC7	32048
	220	50/60	M7	C8X-D6M7	17364
	230	50/60	P7	C8X-D6P7	32051
	240	50/60	U7	C8X-D6U7	32054
	380	50/60	Q7	C8X-D6Q7	32057
	400	50/60	V7	C8X-D6V7	27280
	440	50/60	R7	C8X-D6R7	32060

Please contact us for other coil voltages.



### Auxiliary contact

- Instruction of type code

C8	A1	02
Series code		
Model code		
A1: Front type A1C: Side type A1D: Front type		
Code of auxiliary contact		
02: 2NC		
11: 1NO+1NC		
20: 2NO		
04: 4NC		
13: 1NO+3NC		
22: 2NO+2NC		
31: 3NO+1NC		
40: 4NO		

### Time-delay auxiliary contact

- Instruction of type code



C8	A2	T0
Series code		
Delay type		
A2: Making time-delay A3: Breaking time-delay		
Delay scope		
T0: 0.1-30 s (A2)		
T2: 0.1-30 s (A2)		
T4: 10-180 s (A2)		
R0: 0.1-30 s (A3)		
R2: 0.1-30 s (A3)		
R4: 10-180 s (A3)		

### Selection and ordering data

#### Auxiliary contact blocks

Mounting type	Auxiliary contacts		Type code	Order code
				
Front	0	2	C8 A1/02	29578
	1	1	C8 A1/11	29579
	2	0	C8 A1/20	29580
Front	0	4	C8 A1/04	29581
	1	3	C8 A1/13	29582
	2	2	C8 A1/22	29583
	3	1	C8 A1/31	29584
	4	0	C8 A1/40	29585
Front	1	0	C8 A1D/10	29587
	0	1	C8 A1D/01	29588
Side	1	1	C8 A1C	29586

#### Time-delay auxiliary contact

Delay type	Auxiliary contacts		Delay scope	Type code	Order code
					
making time-delay	1	1	0.1~3 s	C8 A2/T0	29589
			0.1~30 s	C8 A2/T2	29590
			10~180 s	C8 A2/T4	29591
breaking time-delay			0.1~3 s	C8 A3/R0	29592
			0.1~30 s	C8 A3/R2	29593
			10~180 s	C8 A3/R4	29594

#### Mechanical interlock

Matched contactor	Type code	Order code
3SC8-40...95	3SC8-A4D	29596

# Contactors and Thermal Relays

## Series 3SC8 & 3SR8

### Selection and ordering data

#### Series 3SR8

3



Rated frame current (A)	Current setting range (A)	Matched fuse type		Matched AC contactor	Type code	Order code
		aM (A)	gG (A)			
25	0.1~0.16	0.25	2	3SC8-09	R8 25/0.16	22875
	0.16~0.25	0.25	2	3SC8-09	R8 25/0.25	22876
	0.25~0.4	1	2	3SC8-09	R8 25/0.40	22877
	0.4~0.63	1	2	3SC8-09	R8 25/0.63	22878
	0.63~1	2	4	3SC8-09	R8 25/1	22879
	1~1.6	2	4	3SC8-09	R8 25/1.6	22880
	1.25~2	4	6	3SC8-09	R8 25/2	22881
	1.6~2.5	4	6	3SC8-09	R8 25/2.5	22882
	2.5~4	6	10	3SC8-09	R8 25/4	22883
	4~6	8	16	3SC8-09	R8 25/6	22884
	5.5~8	12	20	3SC8-09	R8 25/8	22885
	7~10	12	20	3SC8-12	R8 25/10	22886
	9~13	16	25	3SC8-12	R8 25/13	22887
	12~18	20	35	3SC8-18	R8 25/18	22888
17~25	25	50	3SC8-25	R8 25/25	22889	
36	23~32	40	63	3SC8-32	R8 36/32	22890
	28~36	40	80	3SC8-32	R8 36/36	22891
93	23~32	40	63	3SC8-40	R8 93/32	22892
	30~40	40	100	3SC8-40	R8 93/40	22893
	37~50	63	100	3SC8-50	R8 93/50	22894
	48~65	63	100	3SC8-65	R8 93/65	22895
	55~70	80	125	3SC8-80	R8 93/70	22896
	63~80	80	125	3SC8-80	R8 93/80	22897
	80~93	100	160	3SC8-95	R8 93/93	22898

#### Mounting block



#### Matched relay

	Type code	Order code
R8 25	C8 A7D1064	15971
R8 36	C8 A7D2064	15972
R8 93	C8 A7D3064	15973



Derivative products of AC contactor





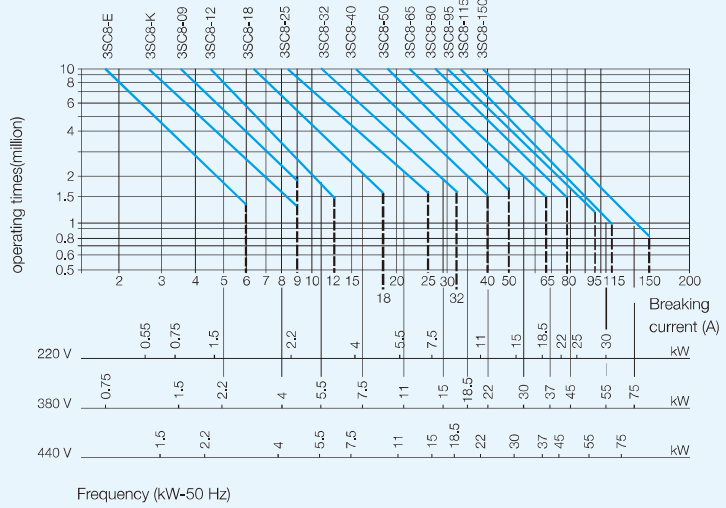
# Contactors and Thermal Relays

## Series 3SC8 & 3SR8

### Electrical life curve for AC contactor 3SC8

For breaking control when AC-3 type work, ( $U_e \leq 440$  V)  
The breaking current is equal to rated making current.

Notes:  
Asynchronous,  $P = 5.5$  kW,  
 $U_e = 400$  V,  $I_e = 11$  A,  $I_c = I_e = 11$  A  
motor or asynchronous,  $P = 5.5$  kW,  
 $U_e = 415$  V,  $I_e = 11$  A,  $I_c = I_e = 11$  A  
For 30 million electrical life.

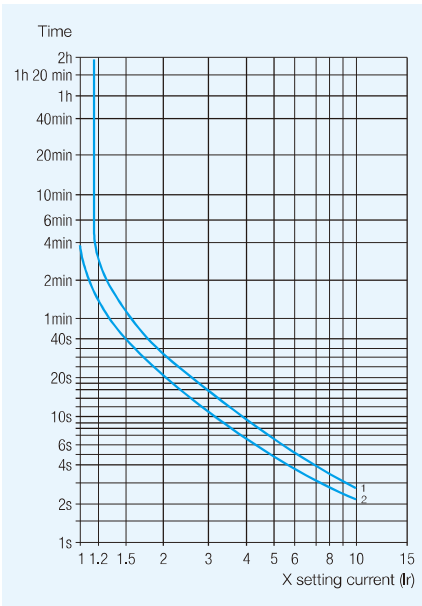


3

### Action characteristics for thermal relay 3SR8

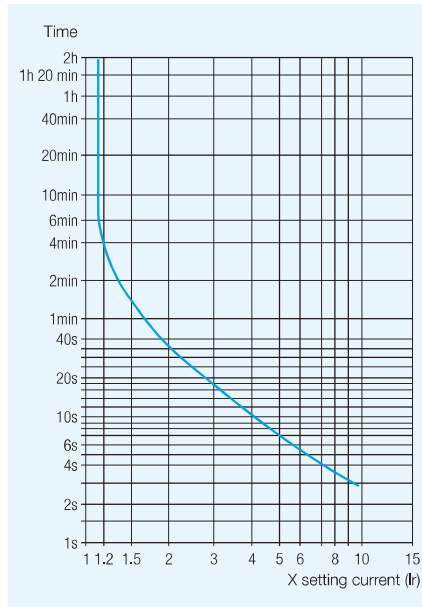
Average operating time related to multiples of the current setting (Class 10 A)

Balanced 3-phase operation, from cold state

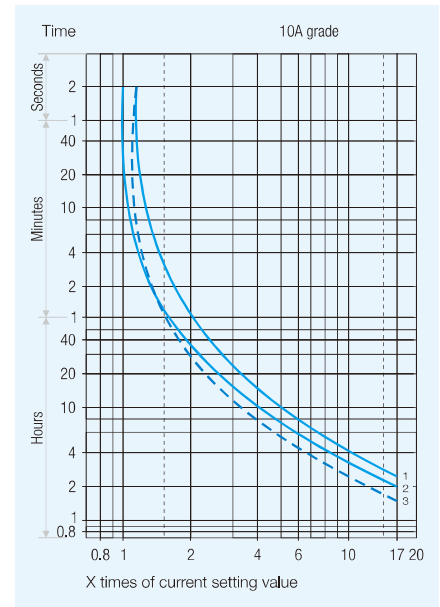


1 Setting: at lower end of scale  
2 Setting: at upper end of scale

Balanced operation with 2 phases only, from cold state

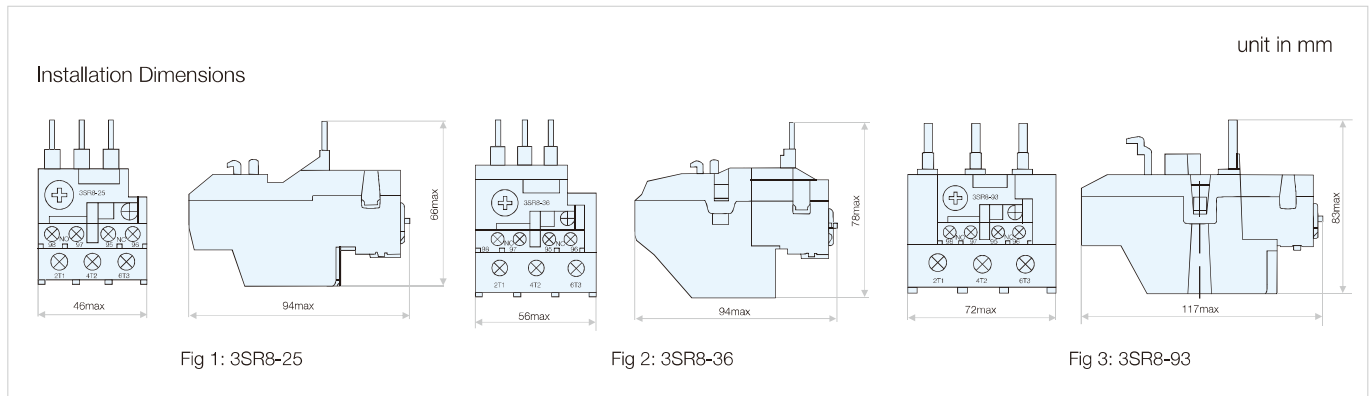
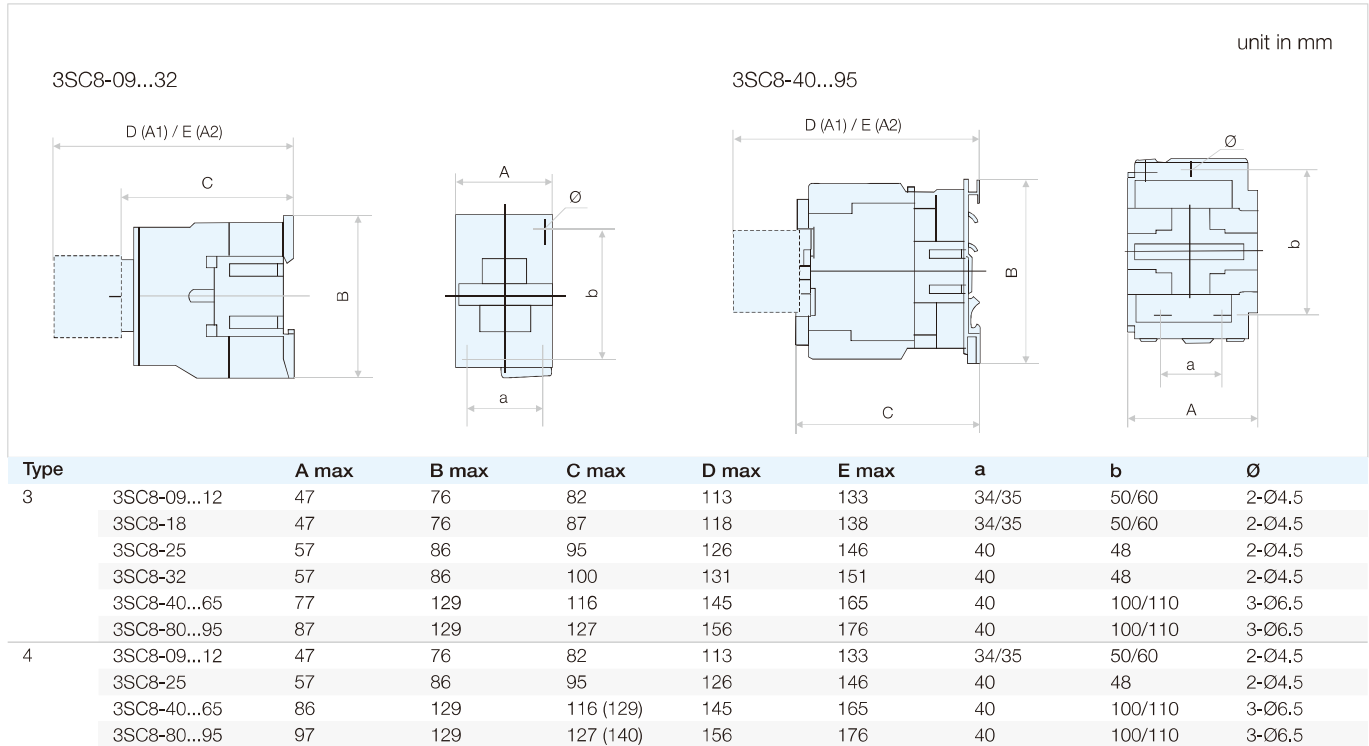


### Tripping curve for thermal relay 3SR8



1. Equilibrium running, 3 phase, start from cold state
2. Equilibrium running, 2 phase, start from cold state
3. Equilibrium running, 3 phase, after long period of setting current (hot state)

## Outline and installation dimensions



## Operating principle diagram of overload relay

