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# Modular Contactors

Rated Current	Heating Power AC1 at		Type	coil voltage	Pack pcs.	Weight kg/pc.	Wiring Diagram
	1-phase	3-phase					
<b>AC1</b>	1-phase	3-phase					
<b>400V</b>	230V	400V		24V 50/60Hz			
<b>A</b>	kW	kW		220-240V 50Hz, 230-264V 60Hz			
				24V 50/60Hz, 24V DC			
				220-240V 50/60Hz, 220V DC			

## One-pole 1 module (17,5mm), AC-operated (low noise)



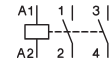
<b>20</b>	4,6	-	<b>R20-10 24</b>	12	0,12
<b>20</b>	4,6	-	<b>R20-10 230</b>	12	0,12



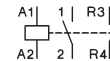
## Two-pole 1 module (17,5mm), AC-operated (low noise)



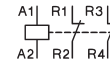
<b>20</b>	4,6	-	<b>R20-20 24</b>	12	0,12
<b>20</b>	4,6	-	<b>R20-20 230</b>	12	0,12



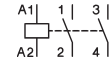
<b>20</b>	4,6	-	<b>R20-11 24</b>	12	0,12
<b>20</b>	4,6	-	<b>R20-11 230</b>	12	0,12



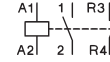
<b>20</b>	4,6	-	<b>R20-02 24</b>	12	0,12
<b>20</b>	4,6	-	<b>R20-02 230</b>	12	0,12



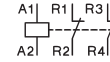
<b>25</b>	5,5	-	<b>R25-20 24</b>	12	0,14
<b>25</b>	5,5	-	<b>R25-20 230</b>	12	0,14



<b>25</b>	5,5	-	<b>R25-11 24</b>	12	0,14
<b>25</b>	5,5	-	<b>R25-11 230</b>	12	0,14



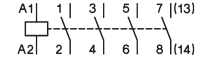
<b>25</b>	5,5	-	<b>R25-02 24</b>	12	0,14
<b>25</b>	5,5	-	<b>R25-02 230</b>	12	0,14



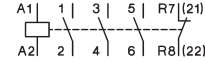
## Four-pole 2 modules (35mm) <sup>1)</sup>, AC-operated (low noise)



<b>25</b>	5,7	17	<b>R25-40 24</b>	6	0,21
<b>25</b>	5,7	17	<b>R25-40 230</b>	6	0,21



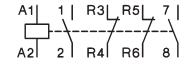
<b>25</b>	5,7	17	<b>R25-31 24</b>	6	0,21
<b>25</b>	5,7	17	<b>R25-31 230</b>	6	0,21



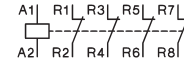
<b>25</b>	5,7	17	<b>R25-13 24</b>	6	0,21
<b>25</b>	5,7	17	<b>R25-13 230</b>	6	0,21



<b>25</b>	5,7	-	<b>R25-22 24</b>	6	0,21
<b>25</b>	5,7	-	<b>R25-22 230</b>	6	0,21



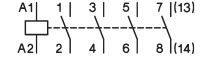
<b>25</b>	5,7	17	<b>R25-04 24</b>	6	0,21
<b>25</b>	5,7	17	<b>R25-04 230</b>	6	0,21



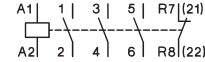
## Four-pole 2 modules(35mm), AC/DC-operated <sup>1)</sup>, (hum free)



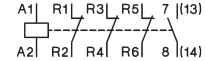
<b>25</b>	5,7	17	<b>R25-40 24VM</b>	6	0,22
<b>25</b>	5,7	17	<b>R25-40 230VM</b>	6	0,22



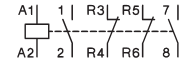
<b>25</b>	5,7	17	<b>R25-31 24VM</b>	6	0,22
<b>25</b>	5,7	17	<b>R25-31 230VM</b>	6	0,22



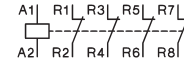
<b>25</b>	5,7	17	<b>R25-13 24VM</b>	6	0,22
<b>25</b>	5,7	17	<b>R25-13 230VM</b>	6	0,22



<b>25</b>	5,7	-	<b>R25-22 24VM</b>	6	0,22
<b>25</b>	5,7	-	<b>R25-22 230VM</b>	6	0,22



<b>25</b>	5,7	17	<b>R25-04 24VM</b>	6	0,22
<b>25</b>	5,7	17	<b>R25-04 230VM</b>	6	0,22



1) Sealable with Sealing Cover P721, available aux. contact block RH11(see page 135)  
 2) Sealable with Sealing Cover P721, available aux. contact block RH11-1(see page 135)

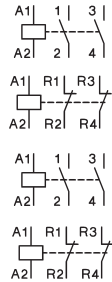
# Modular Contactors

<b>Rated Current</b>	Heating Power AC1 at	<b>Type</b>	coil voltage	
<b>400V</b>	1-phase 230V	<b>24</b>	24V 50/60Hz	
<b>A</b>	3-phase 400V	<b>230</b>	220-240V 50Hz, 230-264V 60Hz	
	kW	↓	Pack pcs.	Weight kg/pc.
				Wiring Diagram

## Two-pole 2 modules (35mm), AC-operated (low noise)



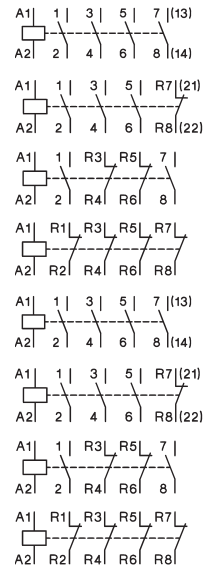
<b>40</b>	9	-	<b>R40-20 24</b>	6	0,23
<b>40</b>	9	-	<b>R40-20 230</b>	6	0,23
<b>40</b>	9	-	<b>R40-02 24</b>	6	0,23
<b>40</b>	9	-	<b>R40-02 230</b>	6	0,23
<b>63</b>	14,3	-	<b>R63-20 24</b>	6	0,23
<b>63</b>	14,3	-	<b>R63-20 230</b>	6	0,23
<b>63</b>	14,3	-	<b>R63-02 24</b>	6	0,23
<b>63</b>	14,3	-	<b>R63-02 230</b>	6	0,23



## Four-pole 3 modules (52,5mm)<sup>1)</sup>, AC-operated (low noise)



<b>40</b>	9	27,5	<b>R40-40 24</b>	4	0,35
<b>40</b>	9	27,5	<b>R40-40 230</b>	4	0,35
<b>40</b>	9	27,5	<b>R40-31 24</b>	4	0,35
<b>40</b>	9	27,5	<b>R40-31 230</b>	4	0,35
<b>40</b>	9	-	<b>R40-22 24</b>	4	0,35
<b>40</b>	9	-	<b>R40-22 230</b>	4	0,35
<b>40</b>	9	27,5	<b>R40-04 24</b>	4	0,35
<b>40</b>	9	27,5	<b>R40-04 230</b>	4	0,35
<b>63</b>	14,3	43	<b>R63-40 24</b>	4	0,36
<b>63</b>	14,3	43	<b>R63-40 230</b>	4	0,36
<b>63</b>	14,3	43	<b>R63-31 24</b>	4	0,36
<b>63</b>	14,3	43	<b>R63-31 230</b>	4	0,36
<b>63</b>	14,3	-	<b>R63-22 24</b>	4	0,36
<b>63</b>	14,3	-	<b>R63-22 230</b>	4	0,36
<b>63</b>	14,3	43	<b>R63-04 24</b>	4	0,36
<b>63</b>	14,3	43	<b>R63-04 230</b>	4	0,36



## Auxiliary Contact Block 1/2 module (8,8mm) for contactor R25, R40, R63 (4p.) max. 1 piece for contactor R40 and R63 (2p.) max. 1 piece



<b>Rated current</b>	AC15	AC15	AC1		<b>Type</b>	Pack pcs.	Weight kg/pc.	<b>Wiring Diagram</b>
<b>230V</b>	400V	400V		for contactor				
<b>A</b>	A	A						
<b>3</b>	2	10	R25 <sup>2)</sup> , R40, R63		<b>RH11</b>	3	0,026	
<b>3</b>	2	10	R25-..VM		<b>RH11-1</b>	3	0,026	

## Accessories



<b>RC-unit</b>	2x for R20.. to R63.. for 12V to 250V AC 220nF / 100 Ohm not for R25-..VM	<b>RC-R 230</b>	2	0,05
<b>Spacing piece</b>	1/2 module (8,8mm) for R20.. to R63.. for ambient temperature >40°C	<b>P730</b>	10	0,012
<b>Sealing cover</b>	for R25.. (4p.)	<b>P721</b>	10	0,002
<b>Sealing cover</b>	for R40.., R63..	<b>P690</b>	10	0,003

1) Sealable with Sealing Cover P690, available aux. contact block RH11  
 2) AC-operated R25-..., 4-pole

## Modular Contactors

### Switching of lamps

Lamp Type	Power W	Current A	Capacitors µF	Max. lamps per pole at 230V 50Hz and max. 60°C				
				R20..	R25..	R40..	R63..	
<b>Incandescent lamps</b>	60	0,27	-	36	50	92	129	
	100	0,45	-	21	30	55	77	
	200	0,91	-	10	15	27	38	
	300	1,36	-	7	10	19	26	
	500	2,27	-	4	6	11	16	
	1000	4,5	-	2	3	6	8	
<b>Fluorescent lamps</b> uncompensated or serial compensated	11	0,16	1,3	60	75	210	310	
	18	0,37	2,7	25	30	90	140	
	24	0,35	2,5	25	30	90	140	
	36	0,43	3,4	20	25	70	140	
	58	0,67	5,3	14	17	45	70	
	65	0,67	5,3	13	16	40	65	
	85	0,8	5,3	11	14	35	60	
	<b>Fluorescent lamps</b> dual-connection	11	0,07	-	2 x 100	2 x 110	2 x 220	2 x 250
18		0,11	-	2 x 50	2 x 55	2 x 130	2 x 200	
24		0,14	-	2 x 40	2 x 44	2 x 110	2 x 160	
36		0,22	-	2 x 30	2 x 33	2 x 70	2 x 100	
58		0,35	-	2 x 20	2 x 22	2 x 45	2 x 70	
65		0,35	-	2 x 15	2 x 16	2 x 40	2 x 60	
85		0,47	-	2 x 10	2 x 11	2 x 30	2 x 40	
<b>Fluorescent lamps</b> parallel compensated		11	0,09	2	33	43	67	107
	18	0,13	2	25	32	50	80	
	24	0,16	3	25	32	50	80	
	36	0,27	4	22	32	50	80	
	58	0,45	7	14	18	36	46	
	65	0,5	7	14	18	36	46	
	85	0,6	8	12	16	33	44	
	<b>Fluorescent lamps</b> with electronic fluorescent lamp ballast	18	0,09	-	40	40	100	150
36		0,16	-	20	20	52	75	
58		0,25	-	15	15	30	55	
80		0,4	-	7	10	20	30	
2 x 18		0,17	-	20	20	50	60	
2 x 28		0,25	-	15	15	37	45	
2 x 36		0,32	-	10	10	25	30	
2 x 58		0,49	-	7	7	15	20	
2 x 80		0,7	-	4	4	8	10	
<b>Transformers</b> for metal halid low voltage lamps		20	0,09	-	40	52	110	174
	50	0,22	-	20	24	50	80	
	75	0,33	-	13	16	35	54	
	100	0,43	-	10	12	27	43	
	150	0,65	-	7	9	19	29	
	200	0,87	-	5	5	14	23	
	300	1,3	-	3	4	9	14	
	<b>Mercury-vapour lamps</b> (high-pressure lamps), uncompensated e. g. HQL, HPL	50	0,61	-	16	21	38	55
80		0,8	-	12	16	29	40	
125		1,15	-	8	11	20	28	
250		2,15	-	4	6	11	15	
400		3,25	-	3	4	7	10	
700		5,4	-	1	2	4	6	
1000		7,5	-	1	1	3	4	
<b>Mercury-vapour lamps</b> (high-pressure lamps), compensated e. g. HQL, HPL		50	0,28	7	14	18	36	50
		80	0,41	8	12	16	31	44
		125	0,65	10	10	13	25	35
	250	1,22	18	5	7	14	19	
	400	1,95	25	4	5	10	14	
	700	3,45	45	2	3	6	8	
	1000	4,8	60	1	2	4	6	

# Modular Contactors

## Switching of lamps

Lamp Type	Power W	Current A	Capacitors μF	Max. lamps per pole at 230V 50Hz and max. 60°C				
				R20..	R25..	R40..	R63..	
<b>Metal halide lamps</b> uncompensated e. g. HQI, HPI, CDM	35	0,53	-	22	24	57	65	
	70	1	-	12	14	30	35	
	150	1,8	-	6	8	17	18	
	250	3	-	4	5	10	12	
	400	3,5	-	3	4	8	10	
	1000	9,5	-	1	1	3	4	
	2000	16,5	-	-	-	2	2	
	400V per pole	2000	10,5	-	-	2	2	
		3500	18	-	-	1	1	
	<b>Metal halide lamps</b> compensated e. g. HQI, HPI, CDM	35	0,25	6	16	21	42	58
70		0,45	12	8	11	21	29	
150		0,75	20	5	7	13	18	
250		1,5	33	3	4	9	11	
400		2,1	35	2	4	9	10	
1000		5,8	95	1	1	3	4	
2000		11,5	148	-	-	2	2	
400V per pole		2000	6,6	58	-	-	3	4
		3500	11,6	100	-	-	2	3
<b>Metal halide lamps</b> with electronic fluorescent with electronic fluorescent lamp ballast (e. g.: PCI) 50-125 x I <sub>nlamp</sub> for 0,6ms		20	0,1	integrated	9	9	18	20
	28	0,15	integrated	-	-	-	18	
	35	0,2	integrated	6	6	11	13	
	70	0,36	integrated	5	5	10	12	
	150	0,7	integrated	4	4	8	10	
<b>Sodium-vapour lamps</b> (low pressure lamps), uncompensated	35	1,5	-	7	9	22	30	
	55	1,5	-	7	9	22	30	
	90	2,4	-	4	6	13	19	
	135	3,3	-	3	4	10	14	
	150	3,3	-	3	4	10	14	
	180	3,3	-	3	4	10	14	
	200	3,3	-	3	4	10	14	
<b>Sodium-vapour lamps</b> (low pressure lamps), compensated	35	0,31	20	5	6	15	18	
	55	0,42	20	5	6	15	18	
	90	0,63	30	3	4	10	12	
	135	0,94	45	2	3	7	8	
	150	1	40	2	3	8	9	
	180	1,16	40	2	3	8	9	
	200	1,32	25	-	-	10	12	
<b>Sodium-vapour lamps</b> (high pressure lamps), uncompensated	150	1,8	-	5	8	17	22	
	250	3	-	4	5	10	13	
	330	3,7	-	3	4	8	10	
	400	4,7	-	2	3	6	8	
	1000	10,3	-	1	1	3	4	
<b>Sodium-vapour lamps</b> (high pressure lamps), compensated	150	0,83	20	5	7	20	25	
	250	1,5	33	3	4	12	15	
	330	2	40	2	3	10	13	
	400	2,4	48	2	2	8	12	
	1000	6,3	106	1	1	4	6	
<b>Sodium-vapour lamps</b> (high pressure lamps) with serial electronic (e. g.: PCI) 50-125 x I <sub>nlamp</sub> for 0,6ms	20	0,1	integrated	9	9	18	20	
	35	0,2	integrated	6	6	11	13	
	70	0,36	integrated	5	5	10	12	
	150	0,7	integrated	4	4	8	10	
<b>LED-Lamps</b> consider the inrush current of the lamp ballast and the cosφ of the lamp	max. inrush current of contactor [A]			195A	233A	424A	565A	
	$\frac{\text{inrush current of contactor}}{\text{inrush current of lamp/EVG}} =$			max. lamps per pole at 230V 50Hz and max. 60°C ( $I_{nLED} \leq I_n$ )				

# Modular Contactors

Data according to IEC60 947-4-1, IEC 60947-5-1, VDE 0660-5-1

Type	2-pole				4-pole				
	R20	R25	R40	R63	R25	R40	R63	RH11	
<b>Main Contacts</b> <sup>4) 5) 6)</sup>									
<b>Rated insulation voltage <math>U_i</math></b> <sup>1)</sup>	V~	<b>440</b>	<b>440</b>	<b>440</b>	<b>440</b>	<b>440</b>	<b>440</b>	<b>440</b>	
Rated operation voltage $U_e$	V~	440	440	440	440	440	440	440	
<b>Frequency of operations z</b> AC1, AC3	1/h	300	300	600	600	300	600	600	
<b>Mechanical life</b>	S x 10 <sup>6</sup>	1	1	1	1	1	1	1	
<b>Utilization category AC1 / AC7a</b>									
<b>Switching of resistive load</b>									
Rated operational current $I_e$ (= $I_{th}$ ) open at 60°C	A	20	25	40	63	25	40	63	-
<b>Contact life</b>	S x 10 <sup>6</sup>	0,1	0,1	0,1	0,1	0,1	0,1	0,1	-
<b>Minimum Switch Voltage</b>	V/mA	24/100	24/100	24/100	24/100	24/100	24/100	24/100	17/5
<b>Short time current</b> 10s-current	A	72	72	216	240	72	216	240	-
<b>Power loss</b> per pole at $I_e$ /AC1	W	2	3	3	7	2	3	7	0,5
<b>Utilization category AC2 and AC3 / AC7b</b>									
<b>Switching of three-phase motors</b>									
Rated operational current $I_e$	A	-	-	-	-	9	27	30	-
Rated operational power of three-phase motors									
50-60Hz	220V kW	-	-	-	-	2,2	7,5	8	-
	230-240V kW	-	-	-	-	2,5	8	8,5	-
	380-415V kW	-	-	-	-	4	12,5	15	-
2-pole motors	230V kW	1,1 <sup>2)</sup>	1,3	2,6	5	-	-	-	-
<b>Contact life</b>	S x 10 <sup>6</sup>	0,15	0,15	0,15	0,15	0,15	0,15	0,15	-
<b>Power consumption of coils</b>									
AC operated									
	inrush VA	7 - 9	7 - 9			20 - 25	33 - 45	33 - 45	-
	sealed VA	2,2 - 4,2	2,2 - 4,2	5 - 7	5 - 7	4 - 6	6 - 8	6 - 8	-
	W	0,8 - 1,6	0,8 - 1,6			1,5 - 2,5	2,6	2,6	-
AC and DC-operated	W	-	-			3 - 4	-	-	-
<b>Operation range of coils</b>									
in multiples of control voltage $U_c$ (-40° – +40°C)		0,85 - 1,1	0,85 - 1,1	0,85 - 1,1	0,85 - 1,1	0,85 - 1,1	0,85 - 1,1	0,85 - 1,1	-

1) Suitable for: earthed-neutral systems, overvoltage category I to III, pollution degree 3 (standard-industry):  $U_{imp} = 4kV$ .

2) AC7b motor 2-pole 230V 1,1kW

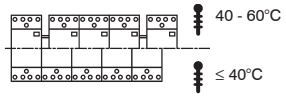
4) Rated frequency 50/60Hz

5) Max. occ. switching overvoltage <4kV

6) Duty cycle: 100%

# Modular Contactors

Data according to IEC60 947-4-1, IEC 60947-5-1, VDE 0660-5-1

Type	R20	R25 (2p.)	R25 (4p.)	R25-..VM	R40 (2p./4p.)	R63 (2p./4p.)	RH11
<b>Maximum ambient temperature</b>							
Operation	open °C		-40 to + 60				
	enclosed °C		-40 to + 40				
Storage			-50 to + 90				
<b>Short circuit protection</b>							
max. fuse Coordination-type "1"gL (gG) A	35	35	35	35	63	80	-
Rated short circuit current "r" kA	3	3	3	3	3	3	-
"Iq" kA	3	3	10	10	10	10	-
<b>Switching time</b> at control voltage $U_s \pm 10\%$							
make time ms	7 - 16	7 - 16	9 - 15	17 - 24	11 - 15	11 - 15	-
release time ms	6 - 12	6 - 12	4 - 8	17 - 23	6 - 13	6 - 13	-
arc duration ms	10 - 15	10 - 15	10 - 15	10 - 15	10 - 15	10 - 15	-
<b>Cable cross-sections</b>							
Main connector solid or stranded mm <sup>2</sup>	1,5 - 10	1,5 - 10	1,5 - 10	1,5 - 10	2,5 - 25	2,5 - 25	0,5 - 2,5 <sup>3)</sup>
flexible mm <sup>2</sup>	1,5 - 6	1,5 - 6	1,5 - 6	1,5 - 6	2,5 - 16	2,5 - 16	0,5 - 2,5 <sup>3)</sup>
flexible with multicore cable end mm <sup>2</sup>	1,5 - 6	1,5 - 6	1,5 - 6	1,5 - 6	2,5 - 16	2,5 - 16	0,5 - 1,5
Clamps per pole	1	1	1	1	1	1	2
Magnetic coil solid or stranded mm <sup>2</sup>	0,75 - 2,5	0,75 - 2,5	0,75 - 2,5	0,75 - 2,5	0,75 - 2,5	0,75 - 2,5	-
flexible mm <sup>2</sup>	0,5 - 2,5	0,5 - 2,5	0,5 - 2,5	0,5 - 2,5	0,5 - 2,5	0,5 - 2,5	-
flexible with multicore cable end mm <sup>2</sup>	0,5 - 1,5	0,5 - 2,5	0,5 - 1,5	0,5 - 1,5	0,5 - 1,5	0,5 - 1,5	-
Clamps per pole	1	1	1	1	1	1	-
<b>Auxiliary Contacts</b> <sup>4) 5) 6)</sup>							
Rated insulation voltage $U_i$ <sup>1)</sup> V AC	-	-	440	440	440	440	440
Thermal rated current $I_{th}$ 40°C A	-	-	25	25	40	63	10
Ambient temperature 60°C A	-	-	25	25	40	63	6
<b>Utilization category AC15</b>							
Rated operational current $I_e$ 220-240V A	-	-	3	3	3	3	3
380-415V A	-	-	2	2	2	2	2
440V A	-	-	1,6	1,6	1,6	1,6	1,6
<b>Utilization category DC13</b>							
Rated operational current $I_e$ 24-60V A	-	-	2	2	2	2	2
110V A	-	-	0,4	0,4	0,4	0,4	0,4
per pole 220V A	-	-	0,1	0,1	0,1	0,1	0,1
<b>Short circuit protection</b>							
short-circuit current 1kA, contact welding not accepted							
max. fuse size gL (gG) A	-	-	10	10	10	10	10

## Data according to UL508

Main Contacts (cULus)	Type	R20	R25 (2p.)	R25 (4p.)	R40 (2p./4p.)	R63 (2p./4p.)	RH11
Rated operational current "General Use"	A	20	25	25	40	63	10
Rated operational power of three-phase motors at 60Hz (3ph)	110-120V hp	-	-	1	2	3	-
	200-208V hp	-	-	2	5	7½	-
	220-240V hp	-	-	3	7½	10	-
	265-277V hp	-	-	3	7½	10	-
Rated operational power of AC motors at 60Hz (1ph)	110-120V hp	½	½	½	1	1½	-
	200-208V hp	1	1	1	2	3	-
	220-240V hp	1½	1 ½	1½	3	5	-
	265-277V hp	1½	2	2	3	5	-
Fuses	A	40	40	40	80	80	-
Suitable for use on a capability of delivering not more than	rms A	5000	5000	5000	5000	5000	-
	V	300	300	300	300	300	300
Rated operation voltage	V~	300	300	300	300	300	300
<b>Auxiliary Contacts (cULus)</b>	heavy pilot duty AC	-	-	-	-	-	C300

1) Suitable for: earthed-neutral systems, overvoltage category I to III, pollution degree 3 (standard-industry):  $U_{mp} = 4kV$ .

3) Maximum cable cross-section with prepared conductor

4) Rated frequency 50/60Hz

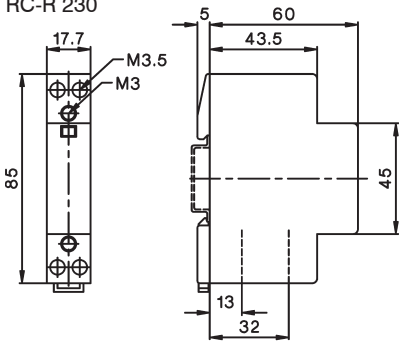
5) Max. occ. switching overvoltage <4kV

6) Duty cycle: 100%

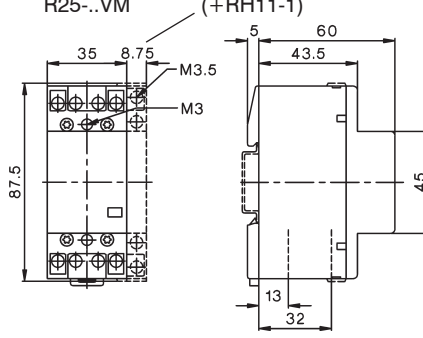
# Modular Contactors

## Dimensions

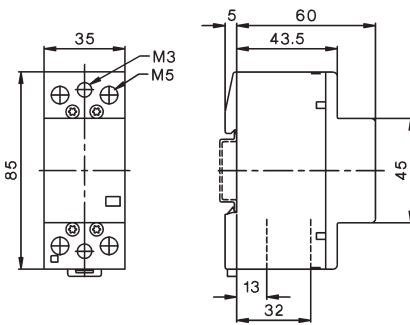
R20-..., R25-... (2-pole)  
RC-R 230



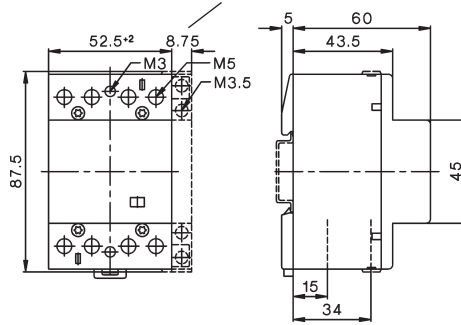
R25-... (4-pole) (+RH11)  
R25-...VM (+RH11-1)



R40-... (2-pole)  
R63-... (2-pole)



R40-... (4-pole) (+RH11)  
R63-... (4-pole) (+RH11)



Aux. contact block  
RH11, RH11-1

