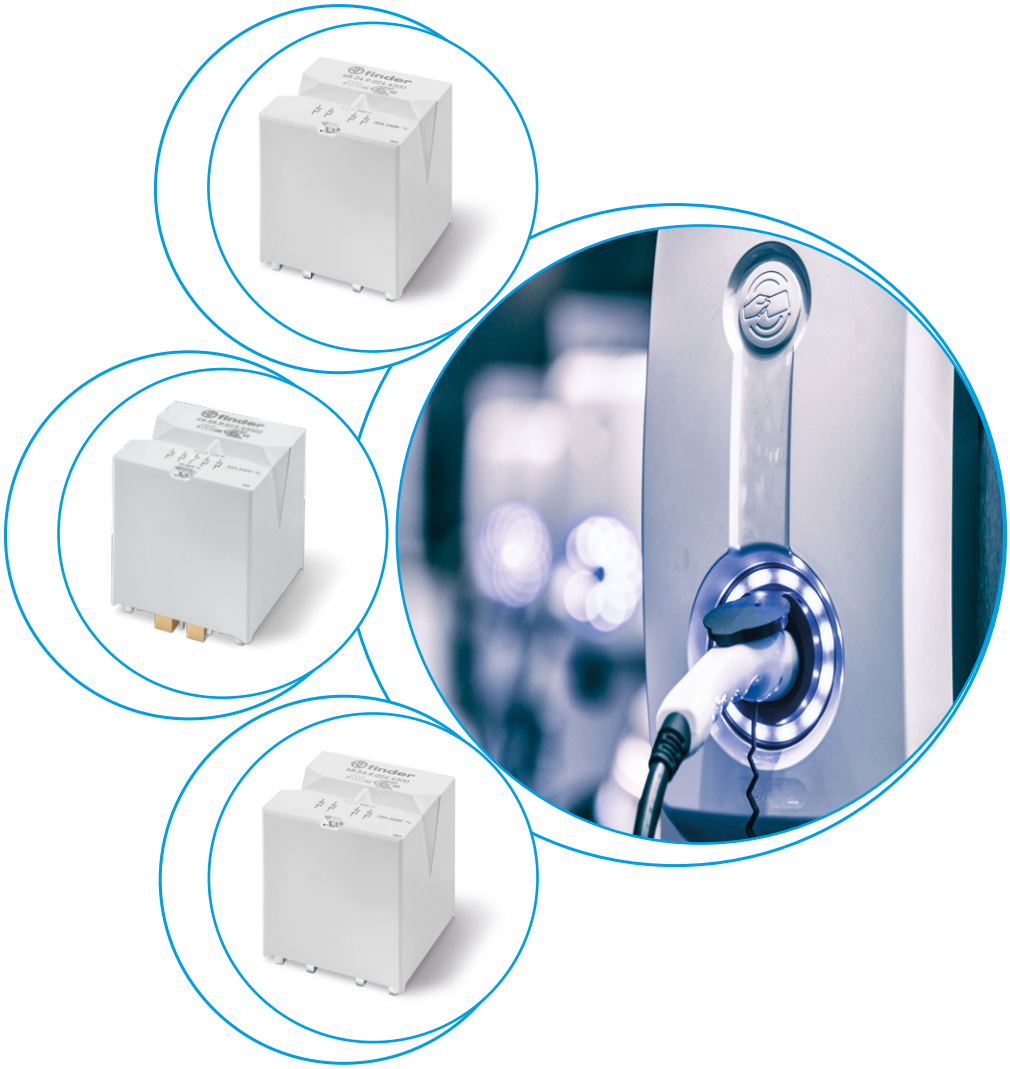
finder
RELAYING INNOVATION

68
SERIES

High Power relays

- Power generators
- Back-up generators
- Pump control
- Disabled lift
- Inverter
- Charging Stations

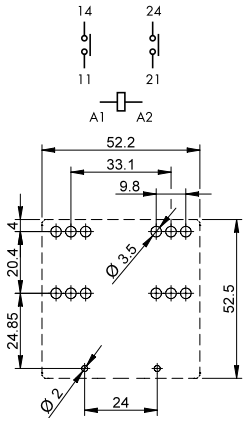
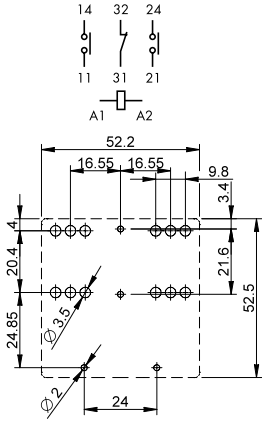


Printed circuit mount - 3.6 mm contact gap
Relays for applications with high power

Type 68.22-4300
- 2 NO 100 A

Type 68.23-4300
- 2 NO 100 A
- 1 NC 3 A (feedback)

- Contact gap ≥ 3.6 mm (according to VDE 0126-1-1, EN 62109-1, EN 62109-2)
- DC coils, with only 700 mW holding power
- Reinforced insulation between coil and contacts
- Suitable for use at ambient temperatures up to 85 °C
- Meets the EN 60335-1 requirements of resistance to heat and fire (GWIT 775 °C and GWFI 850 °C)
- Mirror contact (type 68.23) according to EN 60947-4-1 Annex F
- Cadmium free contact materials

		68.22-4300	**68.23-4300**
			
		• 2 NO • Contact gap 3.6 mm • PCB mount	• 2 NO/1 NC • Contact gap 3.6 mm • PCB mount
			
For outline drawing see page 9		Copper side view	Copper side view
Contact specification			
Contact configuration		2 NO	2 NO/1 NC
Contact gap	mm	≥ 3.6	≥ 3.6
Rated current/ Maximum peak current (for 1 ms)	A	100/300	100/300
Feedback contact configuration		—	1 NC
Rated current NC contact	A	—	3
Rated voltage/ Maximum switching voltage	V AC	400/690	400/690
Rated load AC1 (per pole)	VA	32 000	32 000
Rated load AC7a (per pole)	VA	40 000	40 000
Rated load AC15 (per pole @ 230 V AC)	VA	4600	4600
Single-phase motor rating (230 V AC)	kW	3.5	3.5
Single-phase motor rating (480 V AC)	kW	7	7
Breaking capacity DC1: 24/110/220 V	A	100/5/1.2	100/5/1.2
Minimum switching load NO contacts	mW (V/mA)	1000 (10/10)	1000 (10/10)
Minimum switching load NC contact	mW (V/mA)	—	100 (10/5)
Standard NO contact material		$AgSnO_2$	$AgSnO_2$
Standard NC feedback contact material		—	AgNi + Au
Coil specification			
Nominal voltage (U_N)	V DC	12 - 24	12 - 24
Rated power	W	2.9	2.9
Operating range (–40…+70°C)	DC	(0.90 …1.1)U_N	(0.90 …1.1)U_N
Energy-saving mode (–40…+85)°C			
Operating range for 1 s		(0.95…2.5)U_N	(0.95…2.5)U_N
Holding voltage	DC	0.5 U_N	0.5 U_N
Minimum holding power	W	0.7	0.7
Must drop-out voltage	DC	0.05 U_N	0.05 U_N
Technical data			
Mechanical life	cycles	$1 \cdot 10^6$	$1 \cdot 10^6$
Electrical life at rated load AC7a	cycles	$30 \cdot 10^3$	$30 \cdot 10^3$
Operate/release time	ms	25/3	25/6
Ambient temperature range (energy-saving mode)	°C	–40…+70 (–40…+85)	–40…+70 (–40…+85)
Environmental protection		RT II	RT II
Approvals (according to type)		EAC cULus	EAC cULus

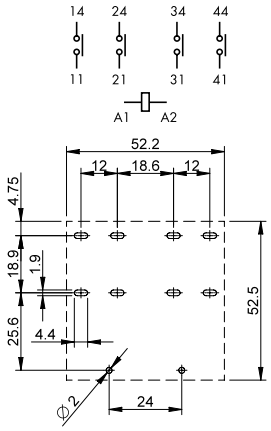
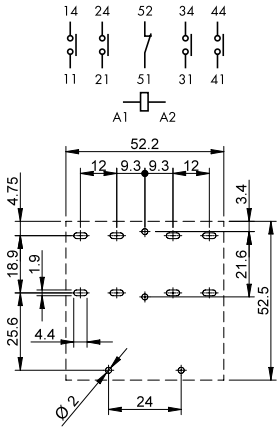
A

Printed circuit mount - 3.6 mm contact gap
Relays for applications with high power

Type 68.24-4300
- 4 NO 40 A

Type 68.25-4300
- 4 NO 40 A
- 1 NC 3 A (feedback)

- Contact gap ≥ 3.6 mm (according to VDE 0126-1-1, EN 62109-1, EN 62109-2)
- DC coils, with only 700 mW holding power
- Reinforced insulation between coil and contacts
- Suitable for use at ambient temperatures up to 85 °C
- Meets the EN 60335-1 requirements of resistance to heat and fire (GWIT 775 °C and GWFI 850 °C)
- Mirror contact (type 68.25) according to EN 60947-4-1 Annex F
- Cadmium free contact materials

		68.24-4300	**68.25-4300**
			
		• 4 NO • Contact gap 3.6 mm • PCB mount	• 4 NO/1 NC • Contact gap 3.6 mm • PCB mount
			
For outline drawing see page 9		Copper side view	Copper side view
Contact specification			
Contact configuration		4 NO	4 NO/1 NC
Contact gap	mm	≥ 3.6	≥ 3.6
Rated current/ Maximum peak current (for 1 ms)	A	40/300	40/300
Feedback contact configuration		—	1 NC
Rated current NC contact	A	—	3
Rated voltage/ Maximum switching voltage	V AC	250/400	250/400
Rated load AC1/AC7a (per pole)	VA	10 000	10 000
Rated load AC15 (per pole @ 230 V AC)	VA	2300	2300
Single-phase motor rating (230 V AC)	kW	2.2	2.2
Three-phase motor rating (480 V AC)	kW	11	11
Breaking capacity DC1: 24/110/220 V	A	40/4/1	40/4/1
Minimum switching load NO contacts	mW (V/mA)	1000 (10/10)	1000 (10/10)
Minimum switching load NC contacts	mW (V/mA)	—	100 (10/5)
Standard NO contact material		$AgSnO_2$	$AgSnO_2$
Standard NC feedback contact material		—	AgNi + Au
Coil specification			
Nominal voltage (U_N)	V DC	12 - 24	12 - 24
Rated power	W	2.9	2.9
Operating range (–40…+70°C)	DC	(0.90 …1.1)U_N	(0.90 …1.1)U_N
Energy-saving mode (–40…+85)°C Operating range for 1 s		(0.95…2.5)U_N	(0.95…2.5)U_N
Holding voltage	DC	0.5 U_N	0.5 U_N
Minimum holding power	W	0.7	0.7
Must drop-out voltage	DC	0.05 U_N	0.05 U_N
Technical data			
Mechanical life	cycles	$1 \cdot 10^6$	$1 \cdot 10^6$
Electrical life at rated load AC7a	cycles	$30 \cdot 10^3$	$30 \cdot 10^3$
Operate/release time	ms	25/3	25/6
Ambient temperature range (energy-saving mode)	°C	–40…+70 (–40…+85)	–40…+70 (–40…+85)
Environmental protection		RT II	RT II
Approvals (according to type)		EAC cULus	EAC cULus

Printed circuit mount - 3.6 mm contact gap Relays for applications with high power Compliant with IEC 62955, for electric vehicles charging stations, for short circuit capability

Type 68.54-4300
- 4 NO 32 A conform to IEC 62955

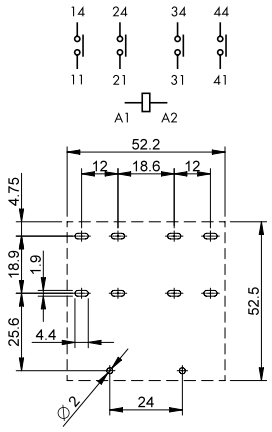
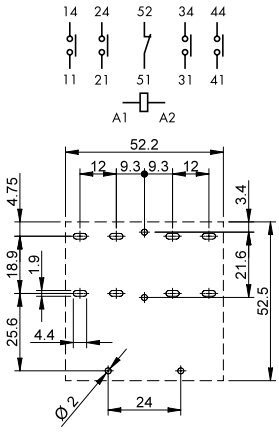
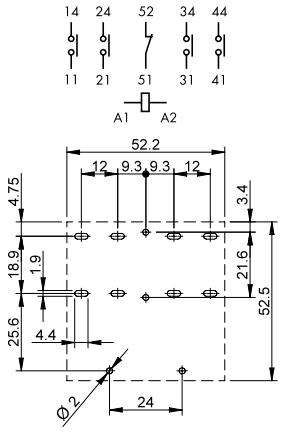
Type 68.55-4300
- 4 NO 32 A conform to IEC 62955
- 1 NC 3 A as feedback

Type 68.55-4300S
- Clearance and creapage distances between NO and NC 8 mm
- 4 NO 32 A conform to IEC 62955
- 1 NC 3 A conform to IEC 62955

- Thermal current up to 40 A
- Contact gap ≥ 3.6 mm (according to VDE 0126-1-1, EN 62109-1, EN 62109-2)
- DC coils, with only 700 mW holding power
- Reinforced insulation between coil and contacts
- Suitable for use at ambient temperatures up to 85 °C
- Meets the EN 60335-1 requirements of resistance to heat and fire (GWIT 775 °C and GWFI 850 °C)
- Mirror contact (type 68.55) according to EN 60947-4-1 Annex F
- Cadmium free contact materials

* PCB design suggestion and outline drawing see page 10

For outline drawing see page 9

	68.54-4300	68.55-4300	NEW 68.55-4300S
			
	• 4 NO • Contact gap 3.6 mm • PCB mount	• 4 NO/1 NC • Contact gap 3.6 mm • PCB mount	• 4 NO/1 NC (IEC 62955) • Contact gap 3.6 mm • PCB mount
			
	Copper side view	Copper side view	Copper side view*

Contact specification				
Contact configuration		4 NO	4 NO/1 NC	4 NO/1 NC
Contact gap	mm	≥ 3.6	≥ 3.6	≥ 3.6
Rated current/ Maximum peak current (for 1 ms)	A	32/300	32/300	32/300
Thermal current NO contact	A	40	40	40
Feedback contact configuration		—	1 NC	1 NC
Rated current NC contact	A	—	3	3
Rated voltage/ Maximum switching voltage	V AC	250/400	250/400	250/400
Rated load AC1/AC7a (per pole)	VA	8000	8000	8000
Rated load AC15 (per pole @ 230 V AC)	VA	1840	1840	1840
Single-phase motor rating (230 V AC)	kW	2.2	2.2	2.2
Three-phase motor rating (480 V AC)	kW	11	11	11
Breaking capacity DC1: 24/110/220 V	A	32/4/1	32/4/1	32/4/1
Minimum switching load NO contacts	mW (V/mA)	1000 (10/10)	1000 (10/10)	1000 (10/10)
Minimum switching load NC contacts	mW (V/mA)	—	100 (10/5)	100 (10/5)
Standard NO contact material		$AgSnO_2$	$AgSnO_2$	$AgSnO_2$
Standard NC feedback contact material		—	AgNi + Au	AgNi + Au
Coil specification				
Nominal voltage (U_N)	V DC	12 - 24	12 - 24	12 - 24
Rated power	W	2.9	2.9	2.9
Operating range (–40…+70°C)	DC	$(0.90 \ldots 1.1)U_N$	$(0.90 \ldots 1.1)U_N$	$(0.90 \ldots 1.1)U_N$
Energy-saving mode (–40…+85)°C				
Operating range for 1 s		$(0.95 \ldots 2.5)U_N$	$(0.95 \ldots 2.5)U_N$	$(0.95 \ldots 2.5)U_N$
Holding voltage	DC	$0.5\ U_N$	$0.5\ U_N$	$0.5\ U_N$
Minimum holding power	W	0.7	0.7	0.7
Must drop-out voltage	DC	$0.05\ U_N$	$0.05\ U_N$	$0.05\ U_N$
Technical data				
Mechanical life	cycles	$1 \cdot 10^6$	$1 \cdot 10^6$	$1 \cdot 10^6$
Electrical life at rated load AC7a	cycles	$50 \cdot 10^3$	$50 \cdot 10^3$	$50 \cdot 10^3$
Operate/release time	ms	25/3	25/6	25/6
Ambient temperature range (energy-saving mode)	°C	–40…+70 (–40…+85)	–40…+70 (–40…+85)	–40…+70 (–40…+85)
Environmental protection		RT II	RT II	RT II
Approvals (according to type)		EAC 15 cULus	EAC 15 cULus	EAC 15 cULus

Ordering information

Example: 68 series, power relay for printed circuit, 2 NO contacts, 12 V DC coil.

6	8	.	2	2	.	9	.	0	1	2	.	4	3	0	0	
												A	B	C	D	

Series

Type
2 = PCB terminals,
1.5 mm gap between PCB and relay base
5 = PCB terminals,
compliant with IEC 62955

No. of poles
2 = 2 pole NO 100 A
3 = 2 pole NO 100 A + 1 pole NC 3 A
4 = 4 pole NO 40 A (32 A for 68.54)
5 = 4 pole NO 40 A (32 A for 68.55) + 1 pole NC 3 A

Coil version
9 = DC

Coil voltage
See coil specifications

A: Contact material
4 = Standard $AgSnO_2$

B: Contact circuit
3 = NO, ≥ 3.6 mm contact gap

C: Options
0 = None

D: Special versions
0 = Standard

S = Conform to IEC 62955
Clearance and creepage distances between NO and NC 8 mm
(only 68.55-4300S)

Technical data

Insulation according to EN 61810-1			**68.22**	**68.23/24/25/54/55**
Nominal voltage of supply system		V AC	230/400 3-phase	230/400 3-phase
Rated insulation voltage		V AC	400	400
Pollution degree			3	3
Overvoltage category			III	III
Rated impulse voltage		kV (1.2/50 µs)	4	4
Insulation between coil and contact set				
Type of Insulation			Reinforced	Reinforced
Dielectric strength		V AC	5000	5000
Insulation between adjacent contacts				
Type of Insulation			Reinforced	Basic
Dielectric strength		V AC	4000	2500
Insulation between open contacts				
Type of disconnection			Full-disconnection	Full-disconnection
Dielectric strength		V AC	2500	2500
Insulation between coil terminals				
Rated impulse voltage (surge) differential mode (according to EN 61000-4-5)		kV (1.2/50 µs)	4	
Other data				
Bounce time: NO/NC		ms	2/2	
Vibration resistance (10…150)Hz: NO		g	9	
Shock resistance		g	30	
Power lost to the environment	without contact current	W	2.9	
	with rated current	W	13	
Test procedure			B (single mounting)	
Recommended distance between relays mounted on PCB in case of group mounting		mm	≥ 20	

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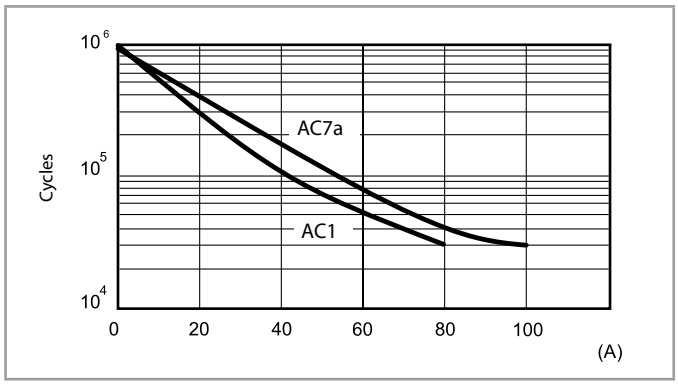
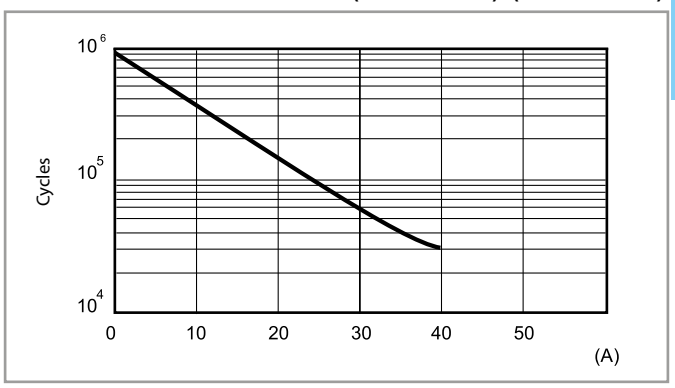
Contact specification

F 68 - Electrical life v contact current (68.22/23)

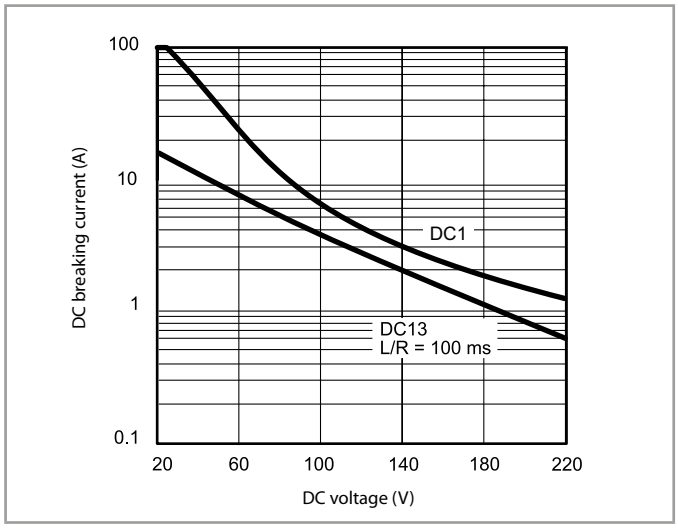


F 68-1 - Electrical life v contact current (AC1/AC7a load) - (68.24/25/54/55)



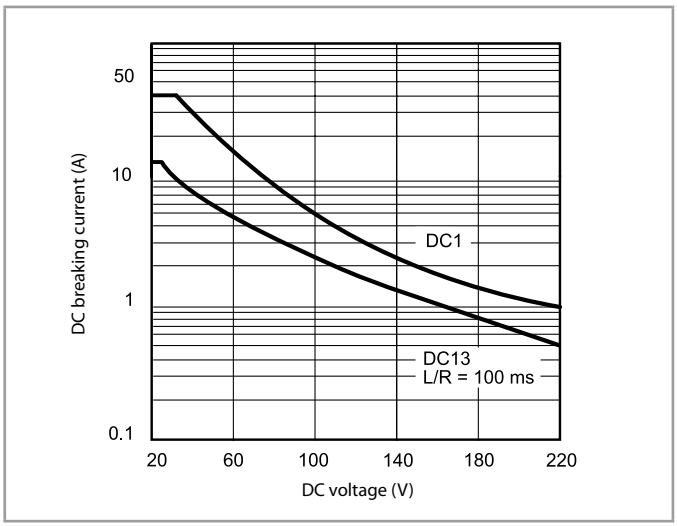
NOTE: For ambient temperatures between 70 and 85 ° C, the electrical life is reduced by 30%.

H 68-1 - Maximum DC breaking capacity (68.22/23)



When switching a resistive (DC1) or inductive (DC13) load having voltage and current values under the corresponding curve, an electrical life of > 30 000 cycles can be expected.

H 68-2 - Maximum DC breaking capacity (68.24/25/54/55)



When switching a resistive (DC1) or inductive (DC13) load having voltage and current values under the corresponding curve, an electrical life of > 30 000 cycles can be expected.

NOTE: The heating and electrical endurance tests have been performed on relays soldered on PC boards having the following characteristics: double side, copper thickness >105 µm, contact tracks width 40 to 45 mm, total cross section about 10 mm^2

Short circuit technical data

Short circuit protection according to EN 60947-4-1		**68.22/23**	**68.24/25/54/55**	
Rated conditional short circuit current	kA	5	5	3
Back-up fuse for motor load	A	63 aM	40 aM	50 gG
Short circuit capability according to IEC 62955		**68.54/55**		
Test sequence E: 9.11.2.3 a) + 9.11.2.3 c)	I_N	32 A		
230 /400 V AC	I_{NC} / I_{DC}	3 kA		
	I_P	1.85 kA		
	I^2t	4.5 kA^{2}s		
Test sequence F: 9.11.2.3 b) + 9.11.2.2	I_m	500 A		
230 /400 V AC				

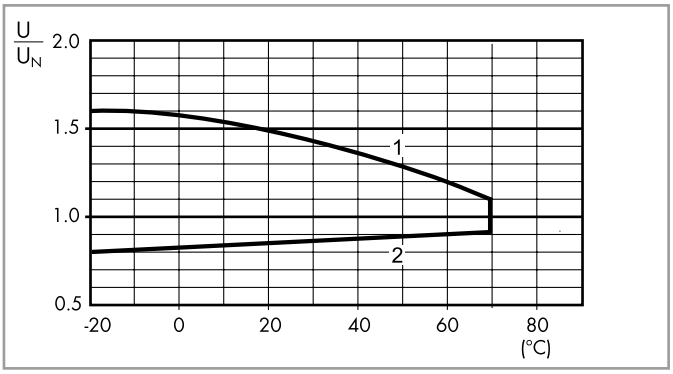
Coil specifications

A

DC coil data

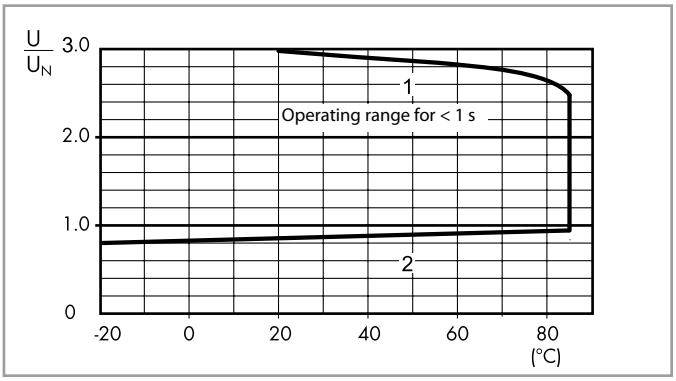
Nominal voltage	Coil code	Operating range (@ 70 °C max)		Holding voltage	Resistance	Rated coil consumption I at U_N
U_N		U_{min}	U_{max}	U_h	R	I_N
V		V	V	V	Ω	mA
12	**9**.012	10.8	13.2	6.0	50	240
24	**9**.024	21.6	26.4	12.0	200	120

R 68-1 - Operating range v ambient temperature,
with standard (continuous) coil energization (–40…+70)°C



1 - Max. permitted coil voltage.
2 - Min. pick-up voltage with coil at ambient temperature.

R 68-2 - Operating range v ambient temperature,
in energy saving mode (–40…+85)°C

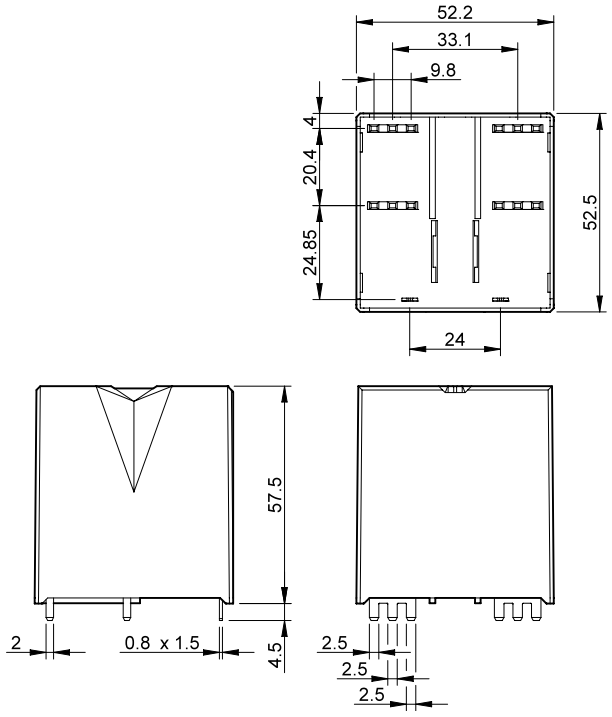


1 - Max. permitted coil voltage.
2 - Min. pick-up voltage with coil at ambient temperature.

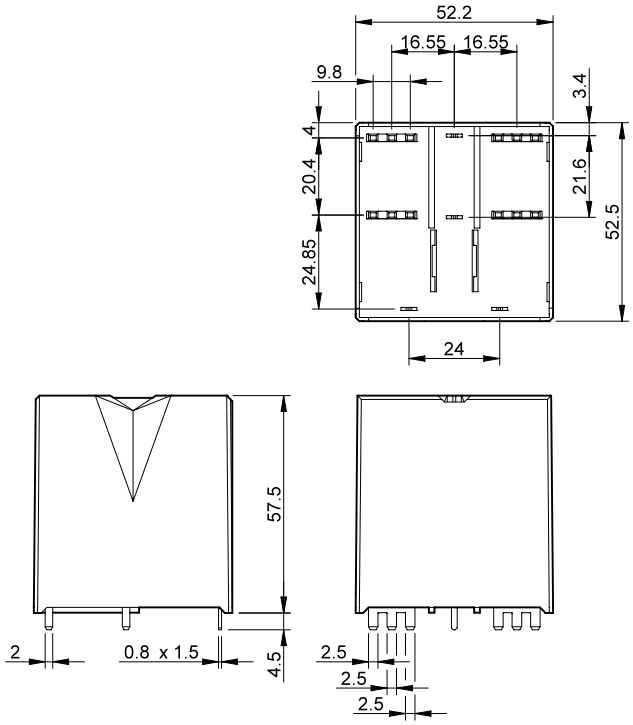
Energy saving mode
In some applications, such as photovoltaic inverters, it may be necessary to minimize the overall relay power dissipation and to permit use at higher ambient temperature levels (up to 85 °C). This can be achieved by initially applying a coil voltage within the Energy saving mode Operating range (see diagram to the left) and then rapidly (< 1 s) reducing the coil voltage to a level within the Holding voltage range. The lower the Holding voltage, the lower is the continuous power dissipation of the coil (0.7 W minimum).
Coil voltages as high as 2.5 U_N may be used, when necessary, to reduce the contact operate time.

Outline drawings

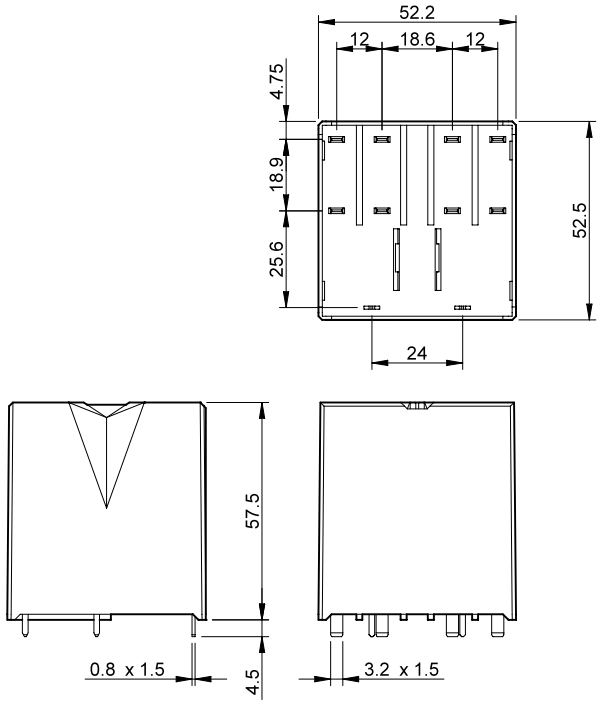
Type 68.22



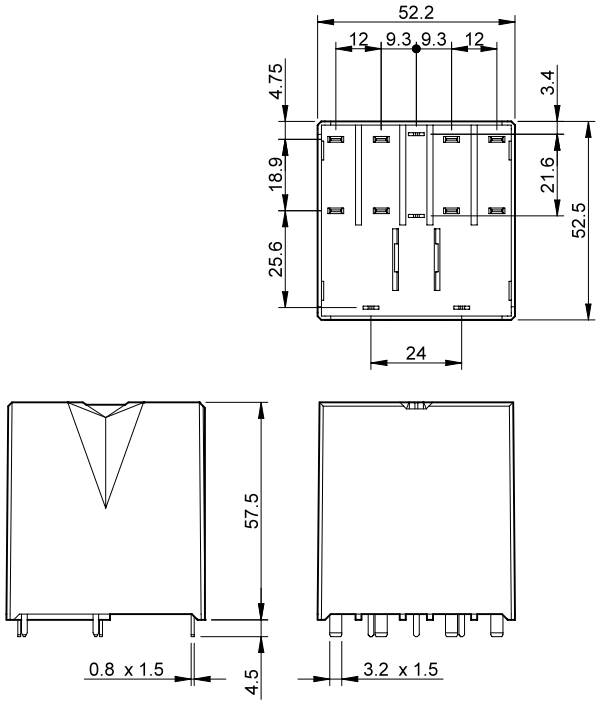
Type 68.23



Type 68.24/54



Type 68.25/55

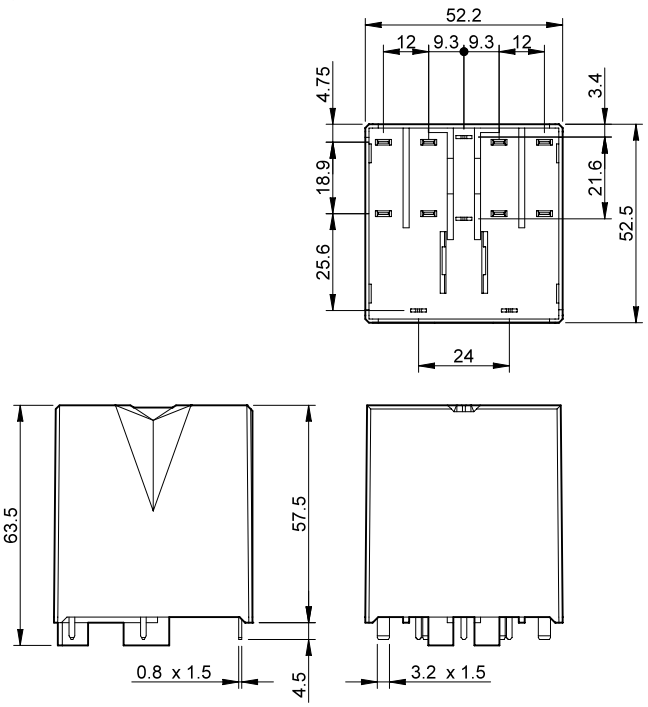


Outline drawings

A

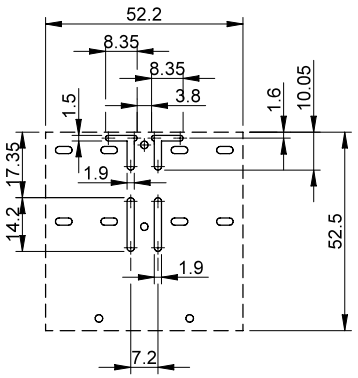
Relay outline drawings

Type 68.55-4300S



PCB milling suggestion

Type 68.55-4300S



Please see general technical information

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