DM87
industrial relays

DM87N sensitive

- Cadmium - free contacts • Height 15,7 mm
- 5000 V / 10 mm reinforced insulation
- For PCB and plug-in sockets
- Accessories: sockets and modules
- **AC and DC coils - standard (DM87N, DM87L, DM87P), DC coils - sensitive (DM87N sensitive)**
- Recyclable packing
- Recognitions, certificates, directives: RoHS,

Contacts			
Contact number & arrangement		1C/O, 1NO	
Contact material		**AgNi**, AgNi/Au 5 um, $AgSnO_2$	
Max. switching voltage	AC/DC	400 V / 300 V	
Min. switching voltage		5 V AgNi, 5 V AgNi/Au 5 um, 10 V $AgSnO_2$	
Rated load	AC1	12 A / 250 V AC standard version	10 A / 250 V AC sensitive version
	DC1	12 A / 24 V DC standard version	10 A / 24 V DC sensitive version
Min. switching current		5 mA AgNi, 2 mA AgNi/Au 5 um, 10 mA $AgSnO_2$	
Max. inrush current		25 A $AgSnO_2$ standard version	20 A $AgSnO_2$ sensitive version
Rated current		12 A standard version	10 A sensitive version
Max. breaking capacity	AC1	3 000 VA standard version	2 500 VA sensitive version
Min. breaking capacity		0.3 W AgNi, 0.05 W AgNi/Au 5 um, 1 W $AgSnO_2$	
Resistance		≤ 100 mΩ	
Max. operating frequency			
• at rated load	AC1	600 cycles/hour	
• no load		72 000 cycles/hour	
Coil			
Rated voltage	50/60 Hz AC	12...240 V standard version	
	DC	3...110 V standard version	5...48 V sensitive version
Must release voltage		AC: ≥ 0.15 U_n	DC: ≥ 0.1 U_n
Operating range of supply voltage		see Tables 1, 3 and Fig. 5, 7 standard version see Table 2 and Fig. 6 sensitive version	
Rated power consumption	AC	0,75 VA standard version	
	DC	0.4...0.48 W standard version	0.25 W sensitive version
Insulation			
Insulation category		C250 / B400	
Insulation rated voltage		400 V AC	
Rated surge voltage		4 000 V AC	
Overvoltage category		III IEC 61810-5 (PN-IEC 664-1)	
Insulation pollution degree		3	
Dielectric strength			
• coil - contact		5 000 V AC	
• contact - contact		1 000 V AC	
Contact - coil distance			
• clearance		≥ 10 mm	
• creepage		≥ 10 mm	
General data			
Operating time (typical value)		7 ms	
Release time (typical value)		3 ms	
Electrical life			
• resistive AC1		> 10^5 12 A, 250 V AC standard version > 1,7 x 10^5 10 A, 250 V AC sensitive version	
• cosϕ		see Fig. 2	
• L/R=40 ms		> 10^5 0,15 A, 220 V DC	
Mechanical life (cycles)		> 3 x 10^7	
Dimensions (L x W x H)		29 x 12.7 x 15.7 mm	
Weight		14 g	
Ambient temperature • storage		-40...+85 °C	
• operating		AC: -40...+70 °C DC: -40...+85 °C	
Cover protection category		IP 40 or IP 67	
Environmental protection		RTII IEC 61810-7	
Shock resistance		30 g	
Vibration resistance		10 g 10...150 Hz	
Solder bath temperature		max. 270 °C	
Soldering time		max. 5 s	

Standard contact materials are marked with bold type.

Coil data - standard DC voltage version — Table 1

Coil code	Rated voltage V DC	Coil resistance ±10% at 20 °C Ω	Coil operating range at 20 °C V DC	
			min.	max.
1003	3	22	2.1	7.6
1005	5	60	3.5	12.7
1006	6	90	4.2	15.3
1009	9	200	6.3	22.9
1012	12	360	8.4	30.6
1018	18	710	12.6	45.9
1024	**24**	**1 440**	**16.8**	**61.2**
1036	36	3 140	25.2	91.8
1048	48	5 700	33.6	122.4
1060	60	7 500	42.0	153.0
1110	110	25 200	77.0	280.0

Standard coil rated voltages marked with bold type.

Coil data - sensitive DC voltage version (only for DM87N) — Table 2

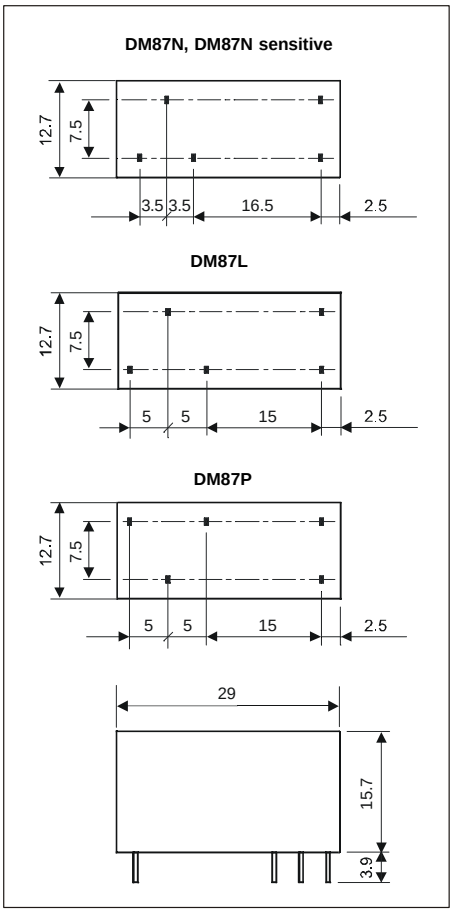
Coil code	Rated voltage V DC	Coil resistance ±10% at 20 °C Ω	Coil operating range at 20 °C V DC	
			min.	max.
S005	5	102	3.75	15.0
S006	6	144	4.50	18.0
S009	9	330	6.75	27.0
S010	10	400	7.50	30.0
S012	12	580	9.00	36.0
S018	18	1 300	13.50	54.0
S024	24	2 300	18.00	72.0
S048	48	9 340	36.00	144.0

Coil data - AC 50/60 Hz voltage version — Table 3

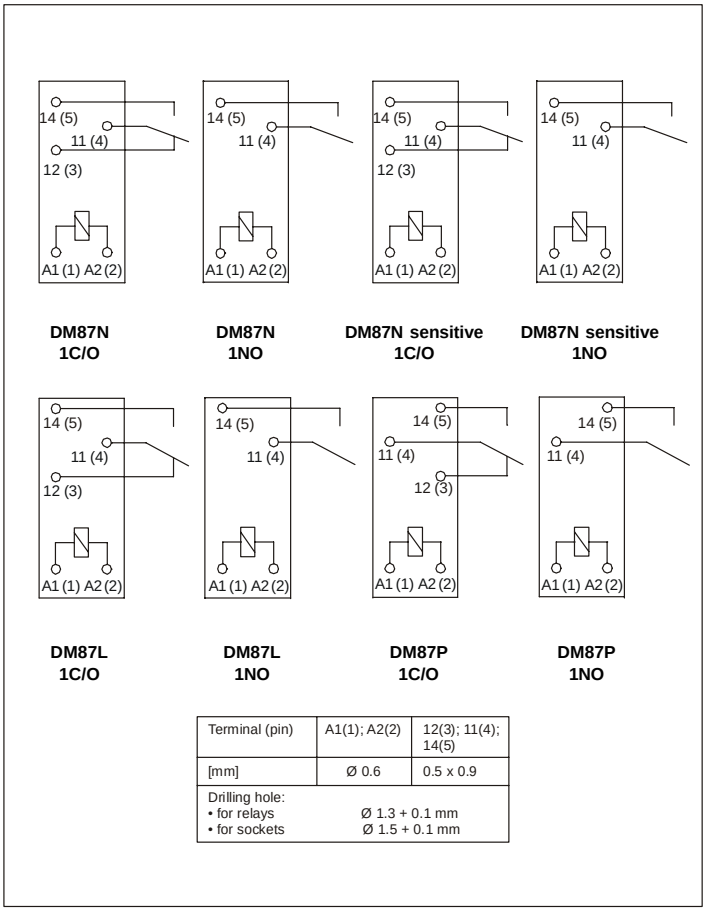
Coil code	Rated voltage V AC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range at 20 °C V AC - 50 Hz	
				min.	max.
5012	12	100	±10%	9.6	13.2
5024	**24**	**400**	**±10%**	**19.2**	**28.8**
5048	48	1 550	±10%	38.4	57.6
5060	60	2 600	±10%	48.0	72.0
5110	110	8 900	±10%	88.0	132.0
5115	115	9 600	±10%	92.0	138.0
5120	120	10 200	±10%	96.0	144.0
5220	220	35 500	±10%	176.0	264.0
5230	**230**	**38 500**	**±10%**	**184.0**	**276.0**
5240	240	42 500	±15%	192.0	288.0

Standard coil rated voltages marked with bold type.

Dimensions



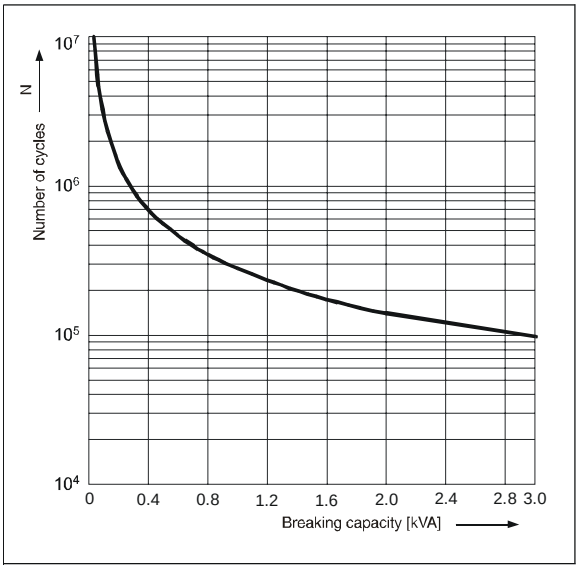
Connections diagram (pin side view)



Terminal (pin)	A1(1); A2(2)	12(3); 11(4); 14(5)
[mm]	Ø 0.6	0.5 x 0.9
Drilling hole: • for relays • for sockets	Ø 1.3 + 0.1 mm Ø 1.5 + 0.1 mm	

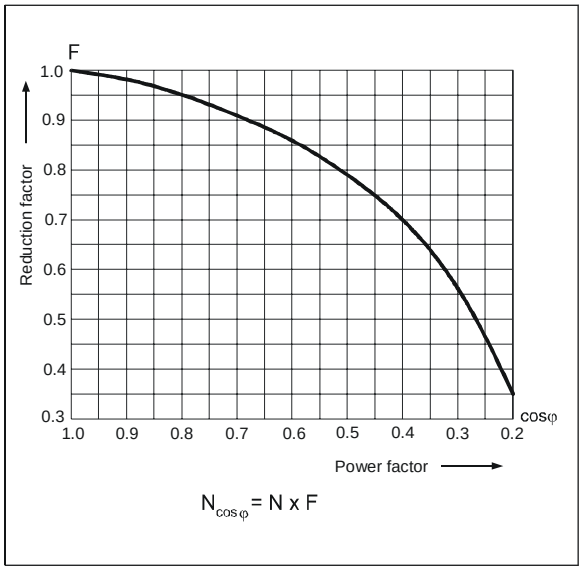
Electrical life at AC resistive load. Maximum switching frequency at rated load

Fig. 1

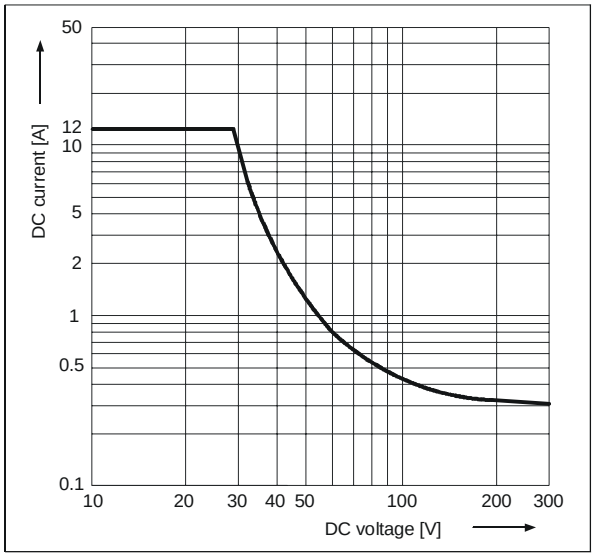


Electrical life reduction factor at AC inductive load

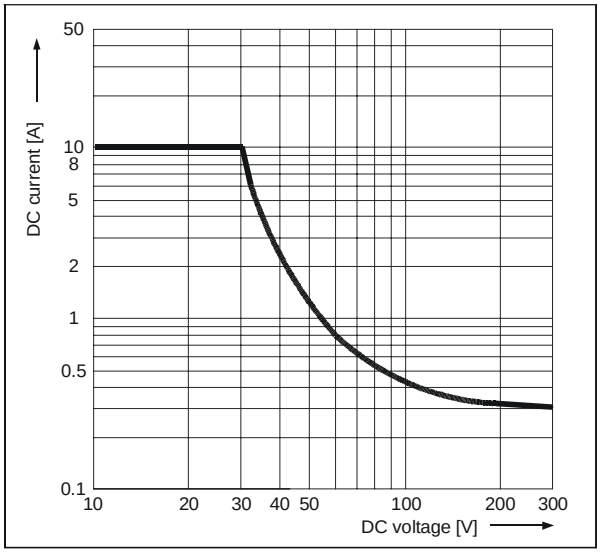
Fig. 2



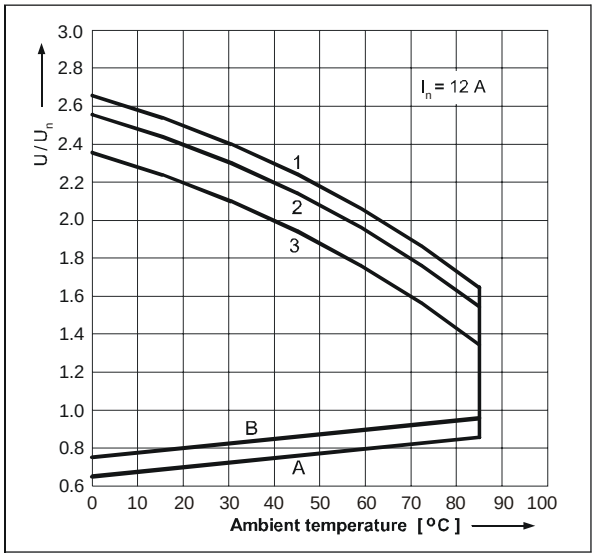
Max. DC resistive load breaking capacity - standard version Fig. 3



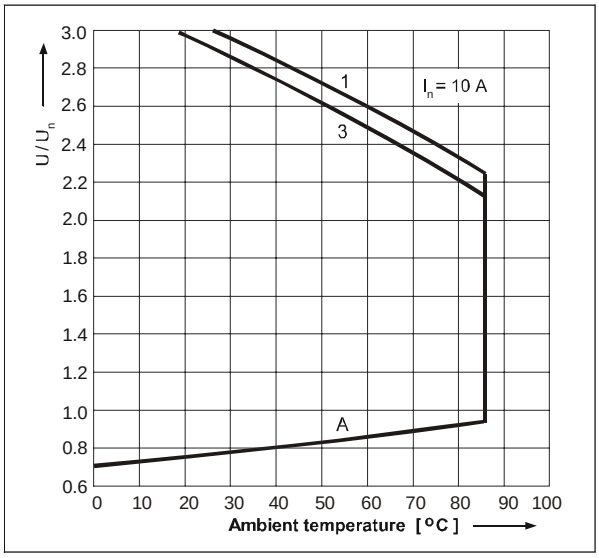
Max. DC resistive load breaking capacity - sensitive version Fig. 4



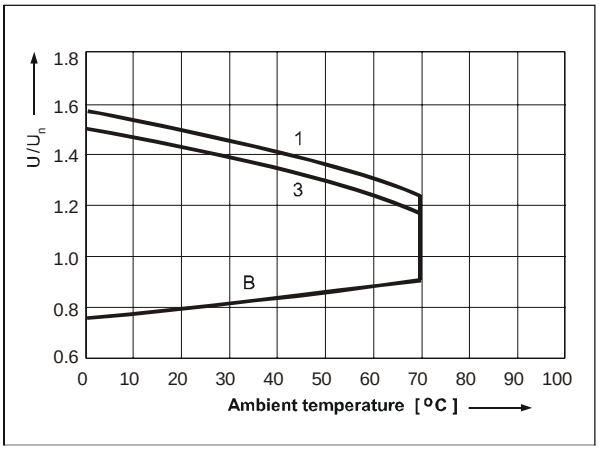
Coil operating range - DC - standard version Fig. 5



Coil operating range - DC - sensitive version Fig. 6



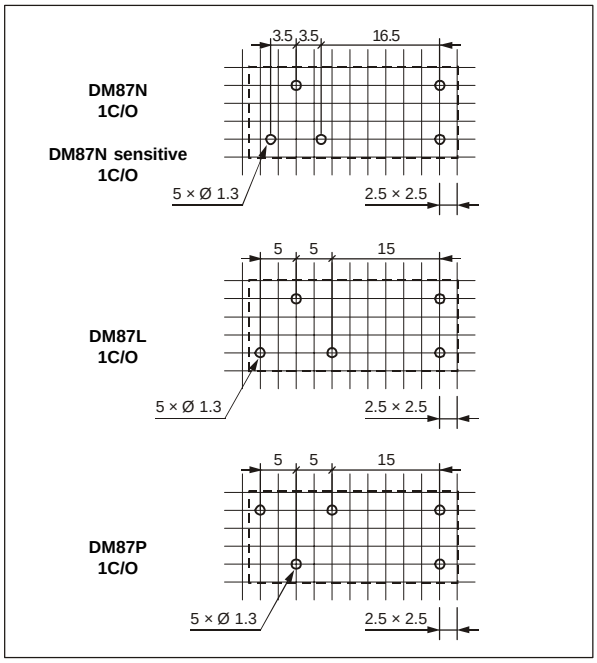
Coil operating range - AC 50 Hz Fig. 7



Description of Fig. 5, 6 and 7

A - relations between make voltage and ambient temperature at no load on contacts. Coil temperature and ambient temperature are equal before coil energizing. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
B - relations between make voltage and ambient temperature after initial coil heating up with 1,1 U_n, at continues load of I_n on contacts. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
1, 2, 3 - values on Y axis represent allowed overvoltage on coil at certain ambient temperature and contact load:
1 - no load
2 - 50% of rated load
3 - rated load

Mounting openings raster
(solder side view)

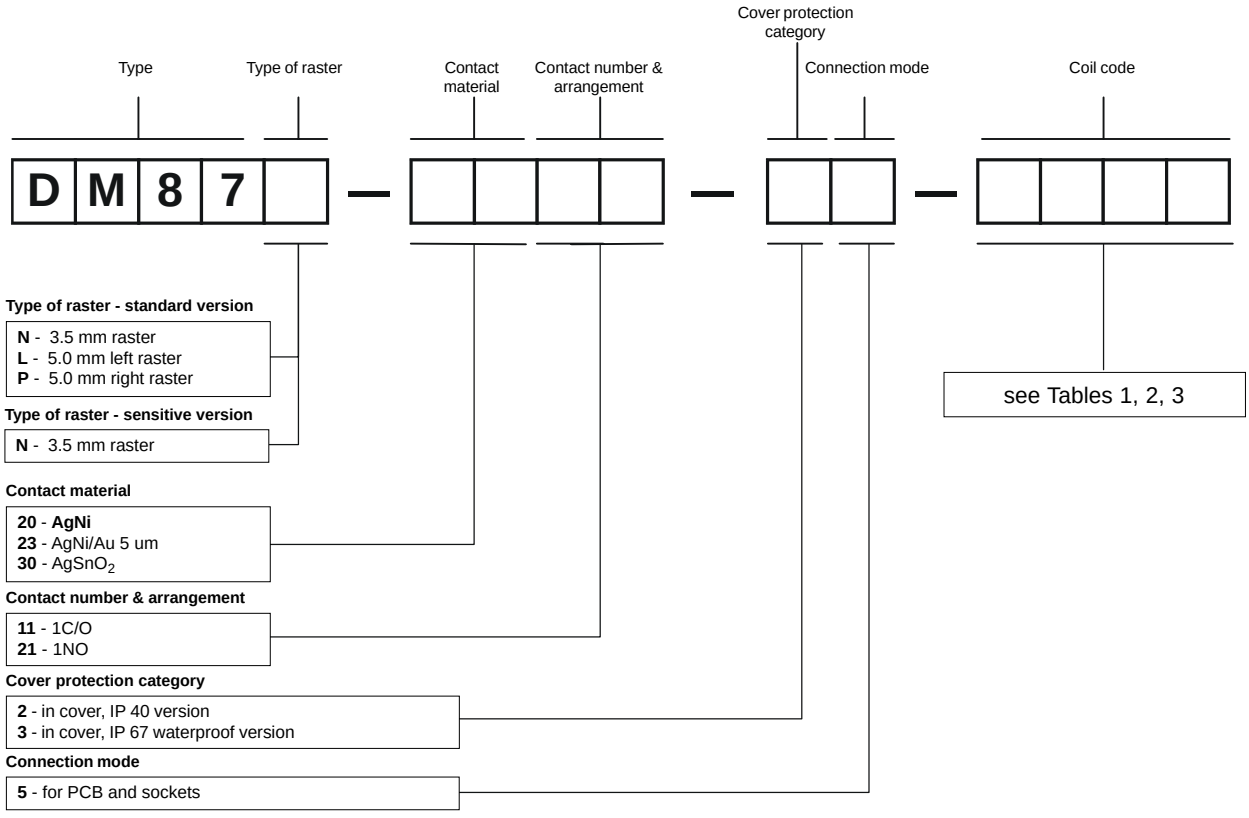


Mounting

Relays **DM87N, DM87N sensitive** are designed for: • direct PCB mounting • screw terminals plug-in sockets **DZT92** and **DZM92** with clip **DZT80-0040**, 35 mm DIN rail mount, EN 50022 or on panel mounting. Signalling / protecting modules **type DM...** are available with sockets (see page 240) • plug-in sockets for PCB mounting **DC35** with clip **DH16-2**.

Relays **DM87L, DM87P** are designed for: • direct PCB mounting • screw terminals plug-in sockets **DZT80** and **DZM80** with clip **DZT80-0040**, 35 mm DIN rail mount, EN 50022 or on panel mounting. Signalling / protecting modules **type DM...** are available with sockets
• plug-in sockets for PCB mounting **DW80** and **DC50** with clip **DH16-2**.

Ordering codes



Examples of ordering codes:

DM87N - 2011 - 25 - 1012 relay **DM87**, 3,5 mm raster, contact material AgNi, with one changeover contact, in cover IP 40, for PCB and sockets, voltage version 12 V DC