






- 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),**

- Recyclable packing
- Recognitions, certificates, directives: RoHS,   

### Contacts

Contact number & arrangement		1C/O, 1NO
Contact material		<b>AgNi</b> , AgNi/Au 5 um, AgSnO <sub>2</sub>
Max. switching voltage	AC/DC	400 V / 300 V
Min. switching voltage		5 V AgNi, 5 V AgNi/Au 5 um, 10 V AgSnO <sub>2</sub>
Rated load	AC1 DC1	12 A / 250 V AC 12 A / 24 V DC
Min. switching current		5 mA AgNi, 2 mA AgNi/Au 5 um, 10 mA AgSnO <sub>2</sub>
Max. inrush current		25 A AgSnO <sub>2</sub>
Rated current		12 A
Max. breaking capacity	AC1	3000 VA
Min. breaking capacity		0.3 W AgNi, 0.05 W AgNi/Au 5 um, 1 W AgSnO <sub>2</sub>
Resistance		≤ 100 mΩ
Max. operating frequency		
• at rated load	AC1	600 cycles/hour
• no load		72000 cycles/hour

### Coil

Rated voltage	50/60 Hz AC DC	12...240 V 3...110 V
Must release voltage		AC: ≥ 0.15 U <sub>n</sub> DC: ≥ 0.1 U <sub>n</sub>
Operating range of supply voltage		see Tables 1 & 2, Figs 2 & 3
Rated power consumption	AC DC	0,75 VA 0.4...0.48 W

### Insulation

Insulation category		C250 / B400
Insulation rated voltage		400 V AC
Rated surge voltage		4000 V AC
Overtoltage category		III IEC 61810-5 (PN-IEC 664-1)
Insulation pollution degree		3
Dielectric strength		
• coil - contact		5000 V AC
• contact - contact		1000 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 <sup>5</sup> 12 A, 250 V AC standard version
• cos φ		see Fig. 2
• L/R=40 ms		> 10 <sup>5</sup> 0,15 A, 220 V DC
Mechanical life (cycles)		> 3 x 10 <sup>7</sup>
Dimensions (L x W x H)		29 x 12.7 x 15.7 mm
Weight		14 g
Ambient temperature	• storage • operating	-40...+85°C AC: -40...+70°C    DC: -40...+85°C
Cover protection category		IP40 or IP67
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 - 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
<b>1024</b>	<b>24</b>	<b>1 440</b>	<b>16.8</b>	<b>61.2</b>
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

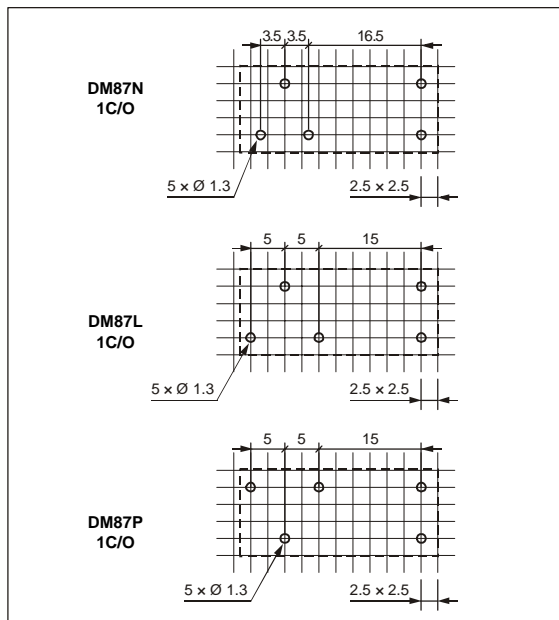
Coil data - AC 50/60 Hz voltage version

Table 2

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
<b>5024</b>	<b>24</b>	<b>400</b>	<b>±10%</b>	<b>19.2</b>	<b>28.8</b>
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
<b>5230</b>	<b>230</b>	<b>38 500</b>	<b>±10%</b>	<b>184.0</b>	<b>276.0</b>
5240	240	42 500	±15%	192.0	288.0

Standard coil voltages marked with bold type.

### Mounting - PCB Layout (solder side view)



### Mounting

Relays DM87N are designed for:

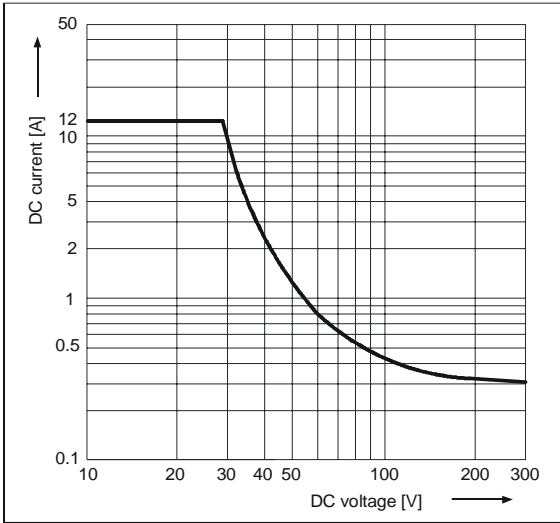
- direct PCB mounting.
- mounting via PCB plug-in sockets, D14F-1Z-A1 or D14F-1Z-A2 and clip JH-15MS-A
- mounting using 35mm DIN rail screw terminal sockets, D14F-1Z-C2, D14F-1Z-C3, D14F-1Z-C4, D14F-1Z-C5 and clip JH15PS.
- Indicator/protection modules type DM...are available for use with D14F-1Z DIN rail sockets.

Relays DM87L and DM87P are designed for:

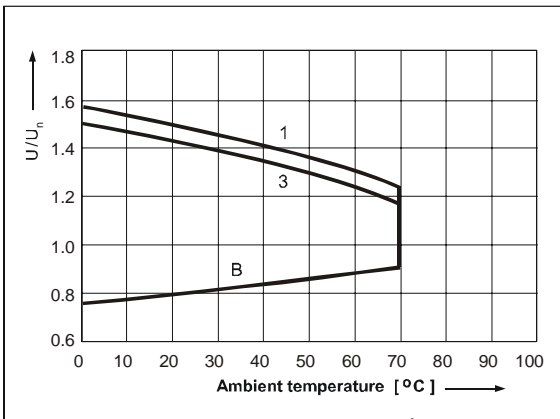
- direct PCB mounting.
- mounting via PCB plug-in sockets, D14F-2Z-A1 or D14F-2Z-A2 and clip JH-15MS-A.
- mounting using 35mm DIN rail screw terminal sockets, D14F-2Z-C2, D14F-2Z-C3-N, D14F-2Z-C4, D14F-2Z-C5 and clip JH-15PS.
- Indicator/protection modules type DM...are available for use with D14F-2Z DIN rail sockets.



Max. DC resistive load breaking capacity Fig. 1



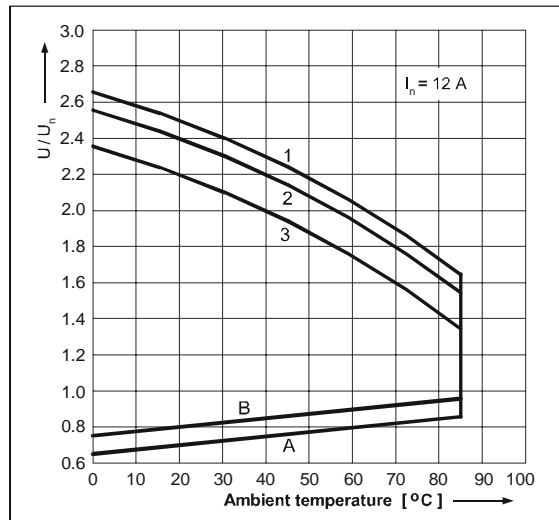
Coil operating range - AC 50 Hz Fig. 2



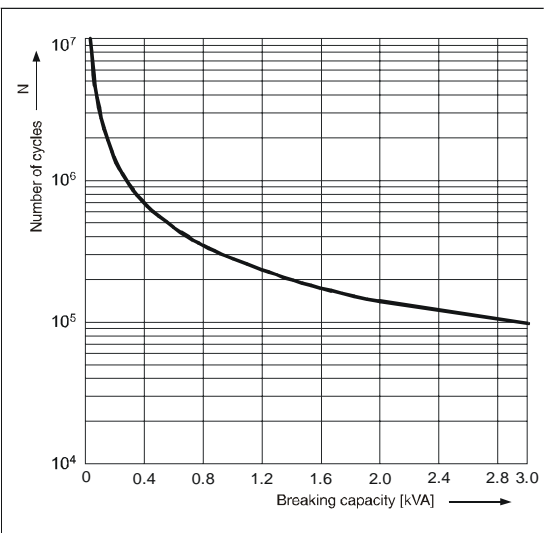
Key for Figs. 2 & 3

**A** - relation 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** - relation between make voltage and ambient temperature after initial coil heating up with 1,1 U<sub>n</sub>, at continues load of I<sub>n</sub> 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

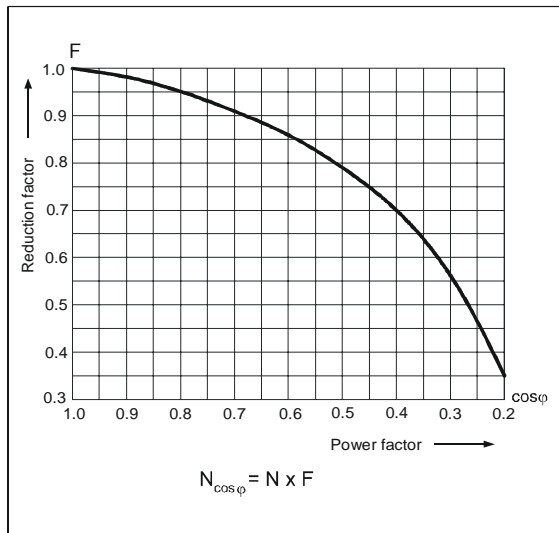
Coil operating range - DC Fig. 3



Electrical life at AC resistive load. Maximum switching frequency at rated load Fig. 4



Electrical life reduction factor at AC inductive load Fig. 5



Specifications are subject to change without notice. E&OE.