



# Mini contactor relays, contactor relay, contactors

Continual operation requires high operational reliability in the components used. The DILM contactor achieves the best lifespan values in AC-3 applications and is ideal for heavy AC-4 jogging.

## Mini contactor relay DILE..., contactor relays, contactors up to 12 A AC-3 at 400 V

- Compact dimensions for the highest packing densities
- Extended performance range up to 5.5 kW at 400 V

## AC and DC contactor system DILM..., contactor relays, 3 pole contactors up to 170 A AC-3 at 400 V, 4 pole contactors up to 200 A AC-1

- Easier engineering through identical construction sizes for AC- and DC-operated contactors
- Energy savings and higher packing density in control panel due to minimized heat dissipation
- High wiring security through doubled box terminals
- Less coupler relays: direct actuation from the PLC for contactors up to 32 A
- Easy engineering through integrated suppressor circuits for DC
- Uniform accessories for 3- and 4-pole contactors
- Mechanical interlock double conductor run mountable without additional separation gap
- Direct fieldbus connection through the communication system SmartWire-DT®, through plug-in type protective module

## High rated contactors - contactors up to 1600 A AC-3 at 400 V, contactors up to 2600 A AC-1

- Compact dimensions with high switching power
- Direct actuation from the PLC saves coupler relays
- Easy engineering through wide range coils
- Cost and energy savings for control panel ventilation due to reduced heat dissipation
- Long lifespan through vacuum technology from 580 A



### Eaton after sales service


Testing switching devices in compliance with regulations applicable to this technology  
→ See catalog



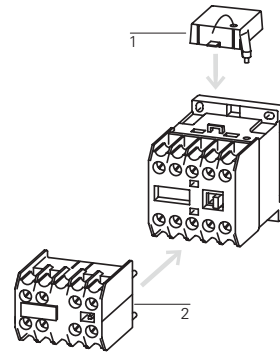
### SmartWire-DT®

The DIL product range offers contact elements which can be connected to the SmartWire-DT® communication system. → Protective modules, Page 62

AC operation		DC operation		Std. pack	Notes
Part no.	Price	Part no.	Price		
Article no.	See price list	Article no.	See price list		

<b>DILER-40(230V50Hz)</b> 051759	<b>DILER-40-G(24VDC)</b> 010223	5 off	
<b>DILER-31(230V50Hz)</b> 051768	<b>DILER-31-G(24VDC)</b> 010157		
<b>DILER-22(230V50Hz)</b> 051777	<b>DILER-22-G(24VDC)</b> 010042		

With screw terminals:



**Accessories**

- 1 Suppressor
- 2 Auxiliary contact modules
- Further actuating voltages

**Page**

- 8
- 6
- 66

# 1.1

## Mini contactor relays

### Auxiliary contact modules

1

Screw terminals



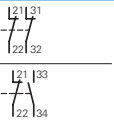








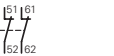


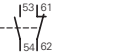





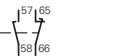


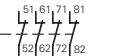


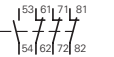


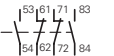








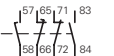


### DILE Auxiliary contact modules

	Contact				Rated operational current		Conventional thermal current $I_{th}$ A	Distinctive number/type of combinations with basic device		
	N/O = normally open contact	S <sub>F</sub> = NO early-make	NC = normally closed contact	Ö <sub>S</sub> = NC late-break	AC-15 220 V 230 V 240 V	380 V 400 V 415 V		DILER-40(-G)	DILER-31(-G)	DILER-22
2 pole	–	–	2 NC	–	4	2	10	–	–	–
	1 N/O	–	1 NC	–	4	2	10	–	–	–
4 pole	2 N/O	–	2 NC	–	4	2	10	–	–	–
2 pole	–	–	2 NC	–	4	2	10	42E	33	24
	1 N/O	–	1 NC	–	4	2	10	51E	42	33
	2 N/O	–	–	–	4	2	10	60E	51	42
	–	1 S <sub>F</sub>	–	1 Ö <sub>S</sub>	4	2	10	51	42	33
4 pole	–	–	4 NC	–	4	2	10	44E	35	26
	1 N/O	–	3 NC	–	4	2	10	53E	44	35
	2 N/O	–	2 NC	–	4	2	10	62E	53	44
	3 N/O	–	1 NC	–	4	2	10	71E	62	53
	4 N/O	–	–	–	4	2	10	80E	71	62
	1 N/O	1 S <sub>F</sub>	1 NC	1 Ö <sub>S</sub>	4	2	10	62	53	44

#### Information relevant for export to North America



Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No.14-05; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	012528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified

Circuit symbol	Can be combined with contactor	Part no. Article no.	Price See price list	Std. pack	Notes	
		<b>02DILEM</b> 010064	5 off	 	With interlocked opposing contacts	<p>The following applies to ...DILEM auxiliary contacts:</p> <ul style="list-style-type: none"> <li>• Contacts to EN 50012</li> </ul> <p>The following applies to ...DILE auxiliary contacts:</p> <ul style="list-style-type: none"> <li>• Contacts to EN 50005</li> </ul> <p>Contacts according to EN50012 are to be preferred. Type E combinations comply with EN 50011 and are to be given preference.</p> <p>No interlocked opposing contacts in NO early-makes and NC late-breaks.</p>
		<b>11DILEM</b> 010080	5 off	 	With interlocked opposing contacts	
		<b>22DILEM</b> 010112	5 off	 	With interlocked opposing contacts	
		<b>02DILE</b> 010240	5 off	 	With interlocked opposing contacts	
		<b>11DILE</b> 010224	5 off	 	With interlocked opposing contacts	
		<b>20DILE</b> 010208	5 off	 	With interlocked opposing contacts	
		<b>11DDILE</b> 049824	5 off	 	–	
		<b>04DILE</b> 010256	5 off	 	With interlocked opposing contacts	
		<b>13DILE</b> 002397	5 off	 	With interlocked opposing contacts	
		<b>22DILE</b> 010288	5 off	 	With interlocked opposing contacts	
		<b>31DILE</b> 048912	5 off	 	With interlocked opposing contacts	
		<b>40DILE</b> 010304	5 off	 	With interlocked opposing contacts	
		<b>22DDILE</b> 049823	5 off	 	–	

# 1.1

## Mini contactor relays, contactor relays

Actuating voltages

### 1 Ordering

#### DILER, DILEEM

AC	DILER-40(...)	DILER-31(...)	DILER-22(...)	DILEEM-10(...)	DILEEM-01(...)
	Article no. <sup>1)</sup>	Article no. <sup>1)</sup>	Article no. <sup>1)</sup>	Article no. <sup>1)</sup>	Article no. <sup>1)</sup>
<b>Standard voltages</b>	See price list	See price list	See price list	See price list	See price list
<b>24V 50Hz</b>	010094	010251	010344	051604	051629
<b>48V 50Hz</b>	010190	010044	010201	051603	051628
<b>240V 50Hz</b>	010478	010300	010138	051602	051627
<b>115V 60Hz</b>	010270	010204	010211	051598	051624
<b>42V 50Hz, 48V 60Hz</b>	–	–	–	051612	051637
<b>110V 50Hz, 120V 60Hz</b>	051756	051765	051774	051611	051636
<b>190V 50Hz, 220V 60Hz</b>	051757	051766	051775	051610	051635
<b>220V 50Hz, 240V 60Hz</b>	051758	051767	051776	051609	051634
<b>230V 50Hz, 240V 60Hz</b>	051759	051768	051777	051608	051633
<b>380V 50Hz, 440V 60Hz</b>	051760	051769	051778	051607	051632
<b>400V 50Hz, 440V 60Hz</b>	051761	051770	051779	051606	051631
<b>415V 50Hz, 480V 60Hz</b>	051762	051771	051780	051605	051630
<b>24V 50/60Hz</b>	021924	021594	021704	051596	051621
<b>42V 50/60Hz</b>	033459	029869	029433	051595	051620
<b>110V 50/60Hz</b>	021961	021624	021871	051592	051618
<b>230V 50/60Hz</b>	052725	052509	052508	056674	058771

#### DILER, DILEEM

DC	DILER-40-G(...)	DILER-31-G(...)	DILER-22-G(...)	DILEEM-10-G(...)	DILEEM-01-G(...)
	Article no. <sup>1)</sup>	Article no. <sup>1)</sup>	Article no. <sup>1)</sup>	Article no. <sup>1)</sup>	Article no. <sup>1)</sup>
<b>Standard voltages</b>	See price list	See price list	See price list	See price list	See price list
<b>12V DC</b>	079711	079761	080728	051644	051649
<b>24V DC</b>	010223	010157	010042	051643	051650
<b>48V DC</b>	010255	010205	010346	051642	051648
<b>110V DC</b>	010287	010253	010043	051640	051646
<b>220V DC</b>	010303	010269	010091	051639	051645

#### Notes

<sup>1)</sup> To obtain the article number for ordering, read under selected part number and actuating voltage from the table.  
Devices with dual-voltage coils are to be ordered under a single article number.

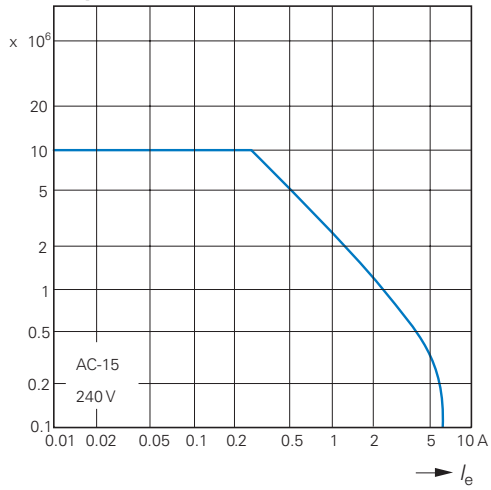
# 1.1

## Mini contactor relays, contactor relays

### Electrical lifespan

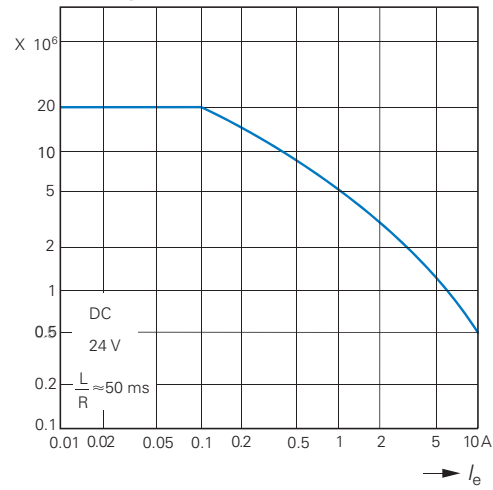
#### 1 DILA (AC-15)

Component lifespan (operations)  
 $I_e$  = Rated operational current



#### DILA DC<sup>1)</sup>

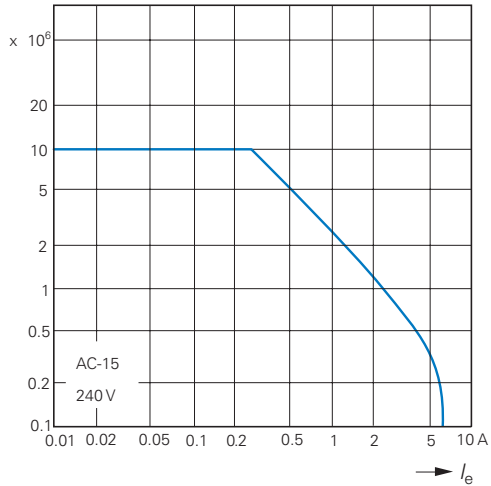
Component lifespan (operations)  
 $I_e$  = Rated operational current



<sup>1)</sup> Three contacts in series

#### DILER (AC-15)

Component lifespan (operations)  
 $I_e$  = Rated operational current



Technical data

DILER, DILA

			DILA	DILA...XHI	DILER	DILE...
<b>General</b>						
Standards			IEC/EN 60947, VDE 0660, UL, CSA			
Lifespan, mechanical						
AC operated	Operations	x 10 <sup>6</sup>	20	10	10	10
DC operated	Operations	x 10 <sup>6</sup>	20	10	20	20
Maximum operating frequency						
Maximum operating frequency	Operations/h		9000	9000	9000	9000
Climatic proofing						
			Damp heat, constant, to IEC 60068-2-78; Damp heat, cyclic, to IEC 60068-2-30			
Ambient temperature						
Open		°C	-25...60	-25...60	-25...50	-25...50
Enclosed		°C	-25...40	-25...40	-25...40	-25...40
Ambient temperature for storage		°C	-40 - 80	-40 - 80		
Mounting position						
						Any, except vertically with terminals A1/A2 below
Mechanical shock resistance (IEC/EN 60068-2-27)						
Half-sinusoidal shock 10 ms						
Basic devices with auxiliary contact module						
		g	7	7	10	10
	N/O	g	7	7	10	10
	NC	g	5	5	8	8
Protection type						
			IP20	IP20	IP20	IP20
Protection against direct contact when actuated from front (EN 50274)						
			Finger- and back-of-hand proof			
Weight						
AC operated		kg	0.23	0.05	0.17	–
DC operated		kg	0.28	0.05	0.2	–
Terminal capacity						
Screw terminals						
	Solid	mm <sup>2</sup>	1 x (0.75 - 4) 2 x (0.75 - 2.5)	1 x (0.75 - 4) 2 x (0.75 - 2.5)	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)
	Flexible with ferrule	mm <sup>2</sup>	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)	1 x (0.75 - 1.5) 2 x (0.75 - 1.5)	1 x (0.75 - 1.5) 2 x (0.75 - 1.5)
	Solid or stranded	AWG	18 - 14	18 - 14	18 - 14	18 - 14
	Terminal screw		M3.5	M3.5	M3.5	M3.5
	Pozidriv screwdriver	Size	2	2	2	2
	Flat-blade screwdriver	mm	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6
	Max. tightening torque	Nm	1.2	1.2	1.2	1.2
Spring-loaded terminals						
	Solid	mm <sup>2</sup>	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)	1 x (1 - 2.5) 2 x (1 - 2.5)	1 x (1 - 2.5) 2 x (1 - 2.5)
	Flexible with ferrule	mm <sup>2</sup>	1 x (0.75 - 1.5) 2 x (0.75 - 1.5)	1 x (0.75 - 1.5) 2 x (0.75 - 1.5)	1 x (1 - 2.5) 2 x (1 - 2.5)	1 x (1 - 2.5) 2 x (1 - 2.5)
	Flexible without ferrule DIN 46228	mm <sup>2</sup>	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)	1 x (0.75 - 1.5) 2 x (0.75 - 1.5)	–	–
	Solid or stranded	AWG	18 - 14	18 - 14	1 x (16 - 14) 2 x (16 - 14)	1 x (16 - 14) 2 x (16 - 14)
	Flat-blade screwdriver	mm	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5

# 1.1 Mini contactor relays, contactor relays

## 1 DILER, DILA

			DILA	DILA...XHI	DILER	DILE...
<b>Contacts</b>						
Interlocked opposing contacts to EN 60947-4-1, Annex L, including auxiliary contact module			Yes	Yes	Yes	Yes
Rated impulse withstand voltage	$U_{imp}$	V AC	6000	6000	6000	6000
Overvoltage category/degree of pollution			III/3	III/3	III/3	III/3
Rated insulation voltage	$U_i$	V AC	690	690	690	690
Rated operating voltage	$U_e$	V AC	690	500	600	600
Safe isolation according to EN 61140						
Between coil and auxiliary contacts			V AC	400	300	300
Between the auxiliary contacts			V AC	400	300	300
Rated operational current						
AC-15						
220/240 V	$I_e$	A	4	4	6	4
380/415 V	$I_e$	A	4	4	3	2
500 V	$I_e$	A	1.5	1.5	1.5	1.5
DC <sup>1)</sup>						
L/R $\leq$ 15 ms						
Contacts in series:						
1	24 V	A	10	10	2.5	2.5
1	60 V	A	6	6	–	–
2	60 V	A	10	10	2.5	2.5
1	110 V	A	3	3	–	–
3	110 V	A	6	6	1.5	1.5
1	220 V	A	1	1	–	–
3	220 V	A	5	5	0.5	0.5
L/R $\leq$ 50 ms						
Contacts in series:						
3	24 V	A	4	2.5	–	–
3	60 V	A	4	1	–	–
3	110 V	A	2	0.5	–	–
3	220 V	A	1	0.25	–	–
DC-13 (6xP)						
Contacts in series:						
3	24 V	A	2.5	2.5	–	–
3	60 V	A	1	1	–	–
3	110 V	A	0.5	0.5	–	–
3	220 V	A	0.25	0.25	–	–
Control circuit reliability (at $U_e = 24$ V DC, $U_{min} = 17$ V, $I_{min} = 5.4$ mA)			Fault probability	$\lambda$	<10 <sup>-8</sup> , < one failure in 100 million operations	
Conventional thermal current			$I_{th}$	A	16	10
Short-circuit strength without welding						
Maximum overcurrent protection device						
220/240 V		PKZM0	4	–	4	4
380/415 V		PKZM0	4	–	4	4
Short-circuit protection rating maximum fuse <sup>2)</sup>						
500 V		A gG/gL	10	10	6	6
500 V		A fast	–	–	10	10
Current heat loss at load of $I_{th}$						
AC operated			W	0.3	0.2	0.2
DC operated			W	0.3	0.3	0.3

### Notes

<sup>1)</sup> Switch-on and switch-off conditions based on DC-13, time constant as specified

<sup>2)</sup> See characteristic curve "Fuses" for time/current characteristics (please enquire)



## DILER, DILA

1

			DILA	DILA...XHI	DILER	DILE...	
<b>Magnet systems</b>							
Voltage tolerance							
AC operated							
	Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz	Pick-up	$x U_c$	0.8...1.1	–	0.8...1.1	–
	Dual-frequency coil 50/60 Hz	Pick-up	$x U_c$	0.8...1.1	–	0.85...1.1	–
DC operated <sup>1)</sup>							
	Starting voltage	Pick-up	$x U_c$	0.8...1.1	–	0.85...1.3	–
	At 24 V: without auxiliary contact module (40 °C)	Pick-up	$x U_c$	0.7 - 1.3	–	0.7 - 1.3	–
Power consumption							
	50 Hz	Pick-up	VA	24	–	25	–
	50 Hz	Sealing	VA	3.4	–	4.6	–
	50 Hz	Sealing	W	1.2	–	1.3	–
	60 Hz	Pick-up	VA	30	–	25	–
	60 Hz	Sealing	VA	4.4	–	4.6	–
	60 Hz	Sealing	W	1.4	–	1.3	–
	50/60 Hz	Pick-up	VA	27 25	–	30 29	–
	50/60 Hz	Sealing	VA	4.2 3.3	–	5.4 3.9	–
	50/60 Hz	Sealing	W	1.4 1.2	–	1.6 1.1	–
	DC operated	Pick-up = sealing	W	3	–	2.6	–
Duty factor			% DF	100	–	100	–
Changeover times at 100 % $U_c$ (recommended values)							
	AC operated closing delay		ms	15 - 21	–	14 - 21	–
	AC operated normally open contact opening delay		ms	9 - 18	–	8 - 18	–
	AC operated with auxiliary contact module, max. closing delay		ms	–	–	45	45
	DC operated closing delay		ms	31	–	26 - 35	–
	DC operated normally open contact opening delay		ms	12	–	15 - 25	–
	DC operated with auxiliary contact module, max. closing delay		ms	–	–	70	70

## Notes

<sup>1)</sup> Smoothed DC, three-phase bridge rectifier or smoothed two-phase bridge rectifier

# 1.1

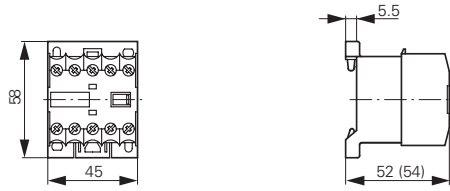
## Contactors

Minicontactor relay, contactor combination

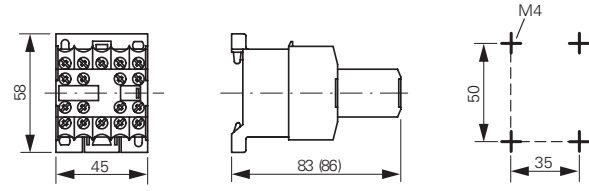
### Dimensions

#### 1 Mini contactor relays

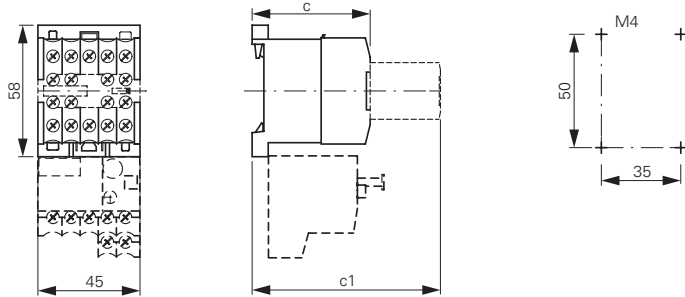
DILER-...(-C)  
DILER-...-G(-C)



DILER-...(-C) + ...DILE(-C)  
DILER-...-G(-C) + ...DILE(-C)



DILEEM-..., DILEM-...(-C), DILEM-12-...  
DILEEM-...-G, DILEM-...-G(-C), DILEM-12-...-G



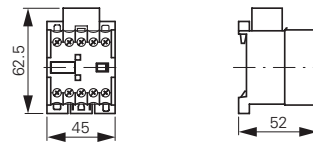
Part no.	c	c1
DILE(E)M-...(-G)	52	83
DILE(E)M-...-G(-C)	54	86

DILER-... + HDILE  
DILER-...-G + HDILE

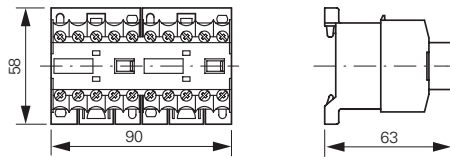


### Suppressor circuit

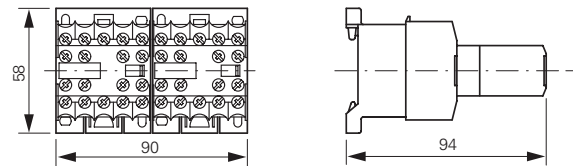
RCDILE...  
VGDILE



2DILE-... + MVDILE  
2DILE-...-G + MVDILE

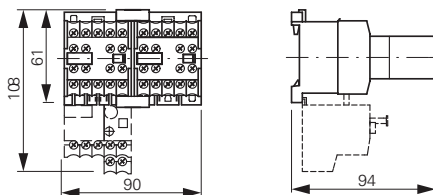


2DILE-... + MVDILE + ...DILE  
2DILE-...-G + MVDILE + ...DILE



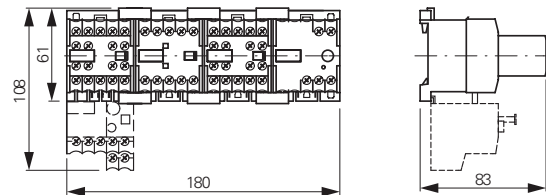
### Star-delta contactors

DIULEM

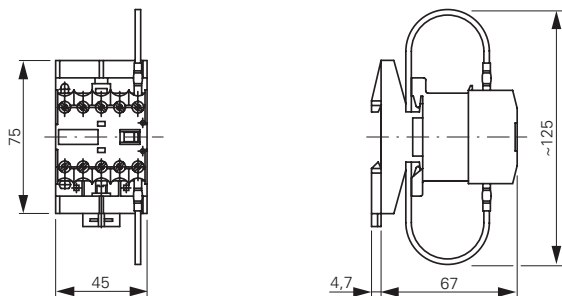


### Star-delta contactors

SDAINLEM



DILER-... + TDDILE24



### Parallel connector

P1DILEM

