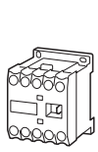
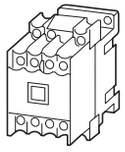
Industrial Control Relays, Electronic Timing Relays
Overview

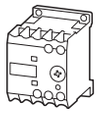
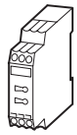
Industrial Control Relays

AC and DC operated

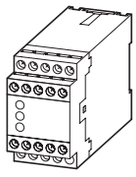
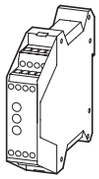



Electronic Timing Relays

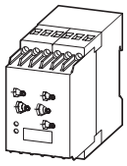
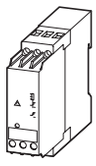
AC and DC operated

Electronic Safety Relay

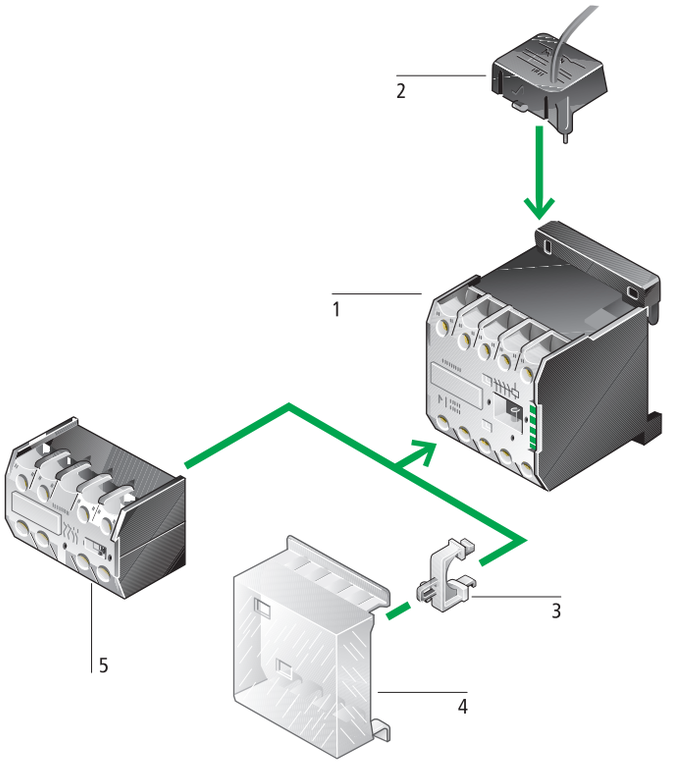



Measuring and monitoring relays

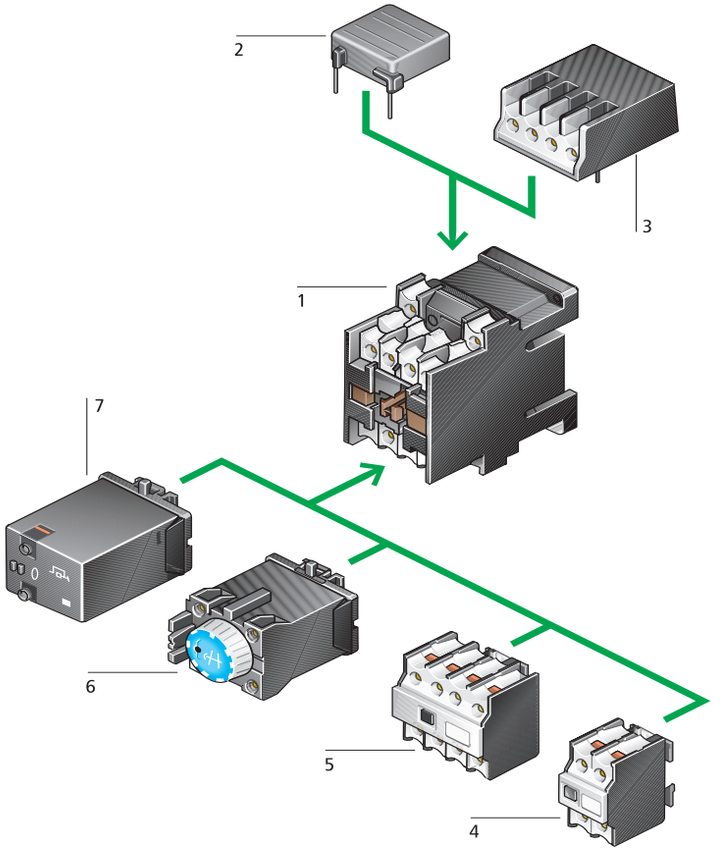



Industrial Control Relays, Electronic Timing Relays
System Overview

DIL ER



DIL R



Industrial Control Relays, Electronic Timing Relays
System Overview

DIL ER Industrial Control Relays

Basic devices 1
- World-wide approvals: UL, CSA, IEC/EN 60 947, CE
- AC and DC operated versions
- Maximum number of contacts: 8
- Pilot duty: A 600 / P 300
- Positively driven contacts to ZH 1/457 (N.O. and N.C. contacts can never be closed simultaneously)
- Modular system of accessories and contacts
- DIN rail or panel mounted
- Finger-safe design
- Captive, self-lifting screw clamp terminals

→ Page 02/004

Suppressors 2
- All industrial control relays with DC operated coils have an integral suppressor circuit
- Suppressors for industrial control relays with AC operated coils

→ Page 02/024

Tamper-proof cover 3, 4
- Snap-fitting onto device
- Can be sealed to prevent tampering

→ Page 02/025

Auxiliary contact modules 5
- Available in 2 and 4 pole versions
- Pilot duty: A 600 / P 300
- Positively driven contacts to ZH 1/457 (N.O. and N.C. contacts can never be closed simultaneously)
- Overlapping contacts
- Finger-safe design
- Captive, self-lifting screw clamp terminals

→ Page 02/004

DIL R Industrial Control Relays

Basic device 1
- World-wide approvals: UL, CSA, IEC/EN 60 947, CE
- AC and DC operated versions
- Coils available in special voltages
- Maximum number of contacts: 8
- Pilot duty: A 600 / P 300
- Positively driven contacts to ZH 1/457 (N.O. and N.C. contacts can never be closed simultaneously)
- Modular system of accessories and contacts
- DIN rail or panel mounted
- Finger-safe design
- Captive, self-lifting screw clamp terminal

→ Page 02/0008

Suppressors 2
- RC suppressor
- Varistor suppressor
- Free-wheel diode suppressor

→ Page 02/024

Interface module 3
- Used to energize coils from low level 24V DC power source
- With or without built-in surge suppressor
- Custom plug-fit into coil terminals
- Individually mounted module available

→ Page 02/024

Auxiliary contact modules 4, 5
- Available in 2 and 4 pole versions
- Pilot duty: A 600 / P 300
- Positively driven contacts to ZH 1/457 (N.O. and N.C. contacts can never be closed simultaneously)
- Overlapping contacts
- Finger-safe design
- Captive, self-lifting screw clamp terminal

→ Page 02/008

Pneumatic timer modules 6
- Available in ON-delay and OFF-delay versions
- 1 N.O. and 1 N.C. timed contacts
- Each with 2 timing ranges, convertible from: 0.2 - 30 sec. to 20 - 180 sec.

→ Page 02/008

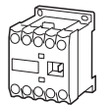
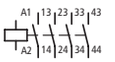
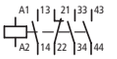
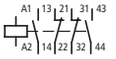
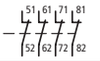
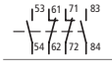
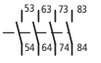
Mechanical latching module 7
- To maintain energized position of contacts in the event of a power loss to the relay coil

→ Page 02/008

DIL ER Industrial Control Relays

Basic Relay, Auxiliary Contact Modules

UL / CSA / IEC / CE

	Contact Arrangement		IEC rated operational current I_e at AC-15 220V 230V 240V	UL/CSA Pilot Duty Rating					AC operated **Type** Article No.	**Price** see price list
	N.O. = normally open N.C. = normally closed		A		Circuit symbol	Contact code number and version[3]			Coil voltages shown in (...) For other coil voltages, see page 02/030	
Basic relays with positively driven contacts[1]										
	4 N.O.	–	6	A 600 P 300		40E	–	–	**DILER-40(120V60Hz)** 051756	
	3 N.O.	1 N.C.				–	31E	–	**DILER-31(120V60Hz)** 051765	
	2 N.O.	2 N.C.				–	–	22E	**DILER-22(120V60Hz)** 051774	
Auxiliary contact modules with positively driven contacts[1]										
2-pole 	–	2 N.C.	4	A 600 P 300		42E	33	24	**02DILE** 010240	
	1 N.O.	1 N.C.				51E	42	33	**11DILE** 010224	
	2 N.O.	–				60E	51	42	**20DILE** 010208	
	1 N.O. [2]	1 N.C. [2]				51	42	33	**11DDILE** 049824	
4-pole	–	4 N.C.	4	A 600 P 300		44E	35	26	**04DILE** 010256	
	1 N.O.	3 N.C.				53E	44	35	**13DILE** 002397	
	2 N.O.	2 N.C.				62E	53	44	**22DILE** 010288	
	3 N.O.	1 N.C.				71E	62	53	**31DILE** 048912	
	4 N.O.	–				80E	71	62	**40DILE** 010304	
	2 N.O. [2]	2 N.C. [2]				62	53	44	**22DDILE** 049823	

Notes

[1] Positively driven contacts (ZH 1/457 Specification): Standard N.O. and N.C. contacts can never be closed simultaneously. By definition, overlapping contacts, i.e. EM (Early Make) and LB (Late Break) cannot be positively driven.

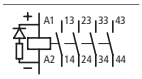
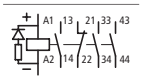
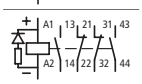
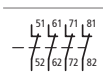
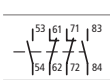
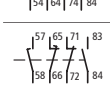
[2] 1 early-make contact
1 late-break contact

[3] Refer to explanation in Notes column

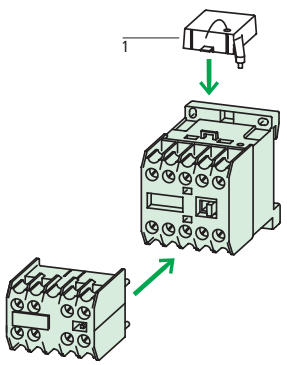
DIL ER Industrial Control Relays

Basic Relay, Auxiliary Contact Modules

UL / CSA / IEC / CE

Circuit symbol	Contact code number and version [3]			DC operated Type Article No. Coil voltages shown in (...) For other coil voltages, see page 02/030	Price see price list	
	40E			**DILER-40-G(24VDC)** 010223		Contact numbers to EN 50 011 Terminal markings: coils to EN 50 005 **DC coils**: Supplied standard with a resistor/diode combination surge suppressor. Coil power consumption: 2.6 W
		31E		**DILER-31-G(24VDC)** 010157		
			22E	**DILER-22-G(24VDC)** 010042		
	42E	33	–	**02DILE** 010240		Auxiliary contact modules (up to 4 contacts) clip on top of DIL ER.
	51E	42	–	**11DILE** 010224		
	60E	51	–	**20DILE** 010208		
	51	42	–	**11DDILE** 049824		
	44E	35	–	**04DILE** 010256		
	53E	44	–	**13DILE** 002397		
	62E	53	–	**22DILE** 010288		
	71E	62	–	**31DILE** 048912		
	80E	71	–	**40DILE** 010304		
	62	53	–	**22DDILE** 049823		

Notes



Accessories	Page
1 Suppressor	02/024
Other accessories	02/024

Contact Code Number:

The contact code number provides useful information of the relay. It refers to the total number of N.O. contacts (1st digit) and N.C. contacts (2nd digit) found on the device. Adding both digits will result in the total number of contacts.

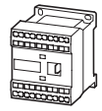
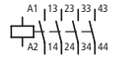
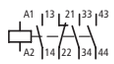
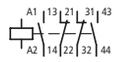
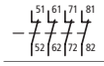
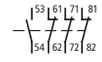
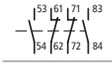
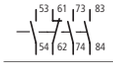
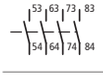
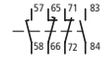
Example:
DILER-40 + 04DIL E =
4 N.O. + **4** N.C. contacts, for a total of 8 eight contacts.

Some contact combinations are preferred when used in configurations conforming to European Norms (EN Standards). These are denoted by the letter "E" in the contact code number and are in accordance with DIN EN 50 011. All other combinations without the letter "E" are in accordance with DIN EN 50 005. In the example above, the combination of **DILER-40 +04DILE** yields a relay with Type E configuration (44E).

DIL ER Industrial Control Relays

UL / CSA / IEC / CE

Basic Relay, Auxiliary Contact Modules, with cage clamp

Contact arrangement N.O. = normally open N.C. = normally closed		IEC rated operational current I_e at AC-15 220 V 230 V 240 V	 380 V 400 V 415 V	UL/CSA Pilot Duty Rating		Contact code number and version [3]			**AC operated** **Type** Article No.	**Price** see price list
N.O.	N.C.	A	A		Circuit symbol					
Basic relays with positively driven contacts										
 4	–	6	3	A 600 P 300		40E	–	–	**DILER40-C(120V60HZ)** 231841	
3	1					–	31E	–	**DILER31-C(120V60HZ)** 231818	
2	2					–	–	22E	**DILER22-C(120V60HZ)** 231793	
Auxiliary contact modules with positively driven contacts [1]										
2-pole  1	1	4	2	A 600 P 300		51E	42	33	**11DILE-C** 230257	
4-pole –	4	4	2	A 600 P 300		44E	35	26	**04DILE-C** 230258	
1	3					53E	44	35	**13DILE-C** 230259	
2	2					62E	53	44	**22DILE-C** 230260	
3	1					71E	62	53	**31DILE-C** 230262	
4	–					80E	71	62	**40DILE-C** 230263	
2 [2]	2 [2]					62	53	44	**22DDILE-C** 230264	

Notes

[1] Positively driven contacts (ZH 1/457 Specification): Standard N.O. and N.C. contacts can never be closed simultaneously. By definition, overlapping contacts, i.e. EM (Early Make) and LB (Late Break) cannot be positively driven.

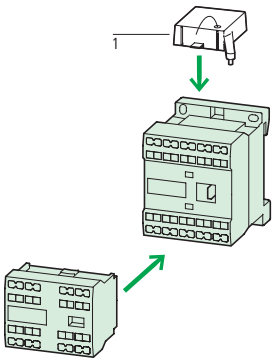
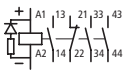
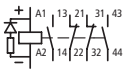
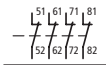
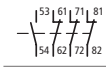
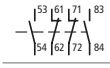
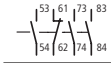
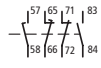
[2] 1 early-make contact
1 late-break contact

[3] Refer to explanation in Notes column

DIL ER Industrial Control Relays

UL / CSA / IEC / CE

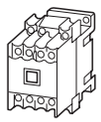
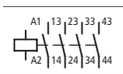
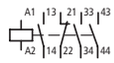
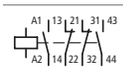
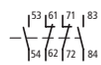
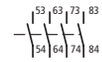
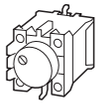
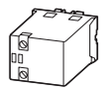
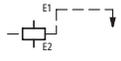
Basic Relay, Auxiliary Contact Modules, with cage clamp

Circuit symbol	Contact code number and version [3]			DC operated Type Article No.	Price see price list		Notes
	40E			**DILER-40-G-C(24VDC)** 230241		Other operating voltages → page 02/032 Contact numbers to EN 50 011 Terminal markings: coils to EN 50 005 DC Coils: supplied standard with a resistor/diode combination surge suppressor. Coil power consumtion: 2.6W	
		31E		**DILER-31-G-C(24VDC)** 230179			
			22E	**DILER-22-G-C(24VDC)** 230177			
	51E	42	–	**11DILE-C** 230257		Auxiliary contact modules (up to four contacts) clip on top of the DIL ER.	Contact Code Number: The contact code number provides useful information of the relay. It refers to the total number of N.O. contacts (1st digit) and N.C. contacts (2nd digit) found on the device. Adding both digits will result in the total number of contacts. Example: **DILER-40 + 04DIL E** = **4** N.O. + **4** N.C. contacts, for a total of 8 eight contacts. Some contact combinations are preferred when used in configurations conforming to European Norms (EN Standards). These are denoted by the letter "E" in the contact code number and are in accordance with DIN EN 50 011. All other combinations without the letter "E" are in accordance with DIN EN 50 005. In the example above, the combination of **DILER-40 +04DILE** yields a relay with Type E configuration (44E). **Accessories** **Page** Suppressor 02/024
	44E	35	–	**04DILE-C** 230258			
	53E	44	–	**13DILE-C** 230259			
	62E	53	–	**22DILE-C** 230260			
	71E	62	–	**31DILE-C** 230262			
	80E	71	–	**40DILE-C** 230263			
	62	53	–	**22DDILE-C** 230264			

DIL R Industrial Control Relays

UL / CSA / IEC / CE

Basic Relay, Modules

	Contacts		IEC rated operational current I_e at AC-15 220V 230V 240V	UL/CSA Pilot Duty Rating	Circuit symbol	Contact code number and version[2]			AC operated Type	Price
									Article No.	see price list
	N.O. = normally open N.C. = normally closed		A						Coil voltages shown in (...) For other coil voltages, see page 02/030	
Basic relays with positively driven contacts[1]										
	4 N.O.	–	6	A 600 P 300		40E	–	–	**DILR40(120V60Hz)** 043753	
	3 N.O.	1 N.C.				–	31E	–	**DILR31(120V60Hz)** 043765	
	2 N.O.	2 N.C.				–	–	22E	**DILR22(120V60Hz)** 043777	
Auxiliary contact modules with positively driven contacts[1]										
2-pole 	–	2 N.C.	6	A 600 P 300		42E	33	24	**02DIL** 098145	
	1 N.O.	1 N.C.				51E	42	33	**11DIL** 010345	
	2 N.O.	–				60E	51	42	**20DIL** 012718	
4-pole 	–	4 N.C.	6	A 600 P 300		44E	35	26	**04DIL** 015091	
	1 N.O.	3 N.C.				53E	44	35	**13DIL** 017464	
	2 N.O.	2 N.C.				62E	53	44	**22DIL** 019837	
	3 N.O.	1 N.C.				71E	62	53	**31DIL** 010752	
	4 N.O.	–				80E	71	62	**40DIL** 022210	
Pneumatic timer module, convertible time ranges of : 0.2 – 30 s and 20 – 180 s										
ON-delayed 	1 N.O.	1 N.C.	4	A 300		51	42	33	**TPE11DIL** 002279	
OFF-delayed	1 N.O.	1 N.C.	4	A 300		51	42	33	**TPD11DIL** 002280	
Mechanical latching module										
						40E	31E	22E	**VDIL(120V60HZ)** 043822	

Notes

[1] Positively driven contacts (ZH 1/457 Specification): Standard N.O. and N.C. contacts can never be closed simultaneously. By definition, overlapping contacts, i.e. EM (Early Make) and LB (Late Break) cannot be positively driven.

[2] Refer to explanation in Notes column

DIL R Industrial Control Relays

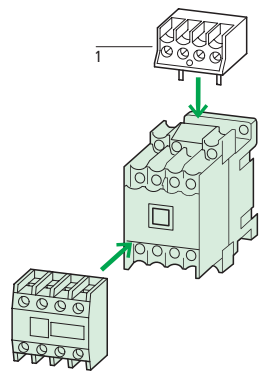
Basic Relay, Modules

UL / CSA / IEC / CE

DC operated

Type	Price	
Article No.	see price list	
Coil voltages shown in (...) For other coil voltages, see page 02/030		
DILR40-G (24VDC) 048537		The DILR40(-G) is supplied without a front plate, HDIL00M, to facilitate mounting of auxiliary contact modules.
DILR31-G (24VDC) 048532		DILR31(-G) and DILR22(-G) are supplied withh a front plate that can be easily removed to add auxiliary contact modules.
DILR22-G (24VDC) 048526		
02DIL 098145		
11DIL 010345		
20DIL 012718		
04DIL 015091		
13DIL 017464		
22DIL 019837		
31DIL 010752		
40DIL 022210		
TPE11DIL 002279		
TPD11DIL 002280		
V-GDIL(24VDC) 048562		Maximum impulse duration for DC energization: 200ms

Notes



Accessories	Page
1 Interface module	02/024
Other accessories	02/024

Contact Code Number:

The contact code number provides useful information of the relay. It refers to the total number of N.O. contacts (1st digit) and N.C. contacts (2nd digit) found on the device. Adding both digits will result in the total number of contacts.

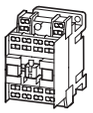
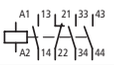
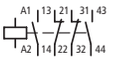
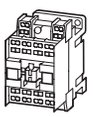
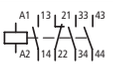
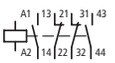
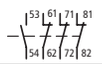
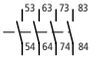
Example:
DILR40 + 04DIL =
4 N.O. + **4** N.C. contacts, for a total of eight contacts.

Some contact combinations are preferred when used in configurations conforming to European Norms (EN Standards). These are denoted by the letter "E" in the contact code number and are in accordance with DIN EN 50 011. All other combinations without the letter "E" are in accordance with DIN EN 50 005. In the example above, the combination of **DILR40 + 04DIL** yields a relay with Type E configuration (44E).

DIL R Industrial Control Relays

Basic Relay, Modules, with cage clamp

UL / CSA / IEC / CE

Contact arrangement N.O. = normally open N.C. = normally closed		Rated operational current I_e at AC-15 220 V 230 V 240 V	380 V 400 V 415 V	UL/CSA Pilot Duty Rating				AC operated Type Article No.	Price see price list
N.O.	N.C.	A	A		Circuit symbol	Contact code number and version [2]			
Basic relays with positively driven contacts									
									
4	–	6	4	16		40 E	–	–	**DILR40-C(120V60HZ)** 231917
3	1					–	31 E	–	**DILR31-C(120V60HZ)** 231897
2	2					–	–	22 E	**DILR22-C(120V60HZ)** 231862
Basic relays with positively driven contacts and integrated suppressor									
									
4	–	6	4	16		40 E	–	–	**DILR40-C(120V60HZ-Z)** 232037
3	1					–	31 E	–	**DILR31-C(120V60HZ-Z)** 232029
2	2					–	–	22 E	**DILR22-C120V60HZ-Z)** 232023
Auxiliary contact modules with positively driven contacts [1]									
4-pole									
									
–	4	6	4	16		44 E	35	26	**04DIL-C** 230282
1	3					53 E	44	35	**13DIL-C** 230284
2	2					62 E	53	44	**22DIL-C** 230286
3	1					71 E	62	53	**31DIL-C** 230289
4	–					80 E	71	62	**40DIL-C** 230290

Notes

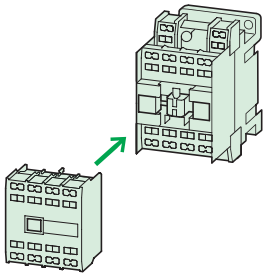
[1] Positively driven contacts (ZH 1/457 Specification): Standard N.O. and N.C. contacts can never be closed simultaneously. By definition, overlapping contacts, i.e. EM (Early Make) and LB (Late Break) cannot be positively driven.

[2] Refer to explanation in Notes column

DIL R Industrial Control Relays
Basic Relay, Modules, with cage clamp

UL / CSA / IEC / CE

DC operated Type	Price Article No.		Notes
DILR40-G-C(24VDC) 230254	see price list	Other operating voltages → page 02/030 Contact numbers to EN 50 011 Terminal markings: coils to EN 50 005	
DILR31-G-C(24VDC) 230252			
DILR22-G-C(24VDC) 230248			
DILR40-G-C(24VDC-Z) 232044		Other operating voltages → page 02/030 Contact numbers to EN 50 011 Terminal markings: coils to EN 50 005	
DILR31-G-C(24VDC-Z) 232032			
DILR22-G-C(24VDC-Z) 232026			
04DIL-C 230282			
13DIL-C 230284			
22DIL-C 230286			
31DIL-C 230289			
40DIL-C 230290			



Contact Code Number:

The contact code number provides useful information of the relay. It refers to the total number of N.O. contacts (1st digit) and N.C. contacts (2nd digit) found on the device. Adding both digits will result in the total number of contacts.

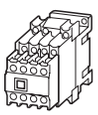
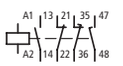
Example:
DILER-40 + 04DIL E =
4 N.O. + **4** N.C. contacts, for a total of 8 eight contacts.

Some contact combinations are preferred when used in configurations conforming to European Norms (EN Standards). These are denoted by the letter "E" in the contact code number and are in accordance with DIN EN 50 011. All other combinations without the letter "E" are in accordance with DIN EN 50 005. In the example above, the combination of **DILER-40 +04DILE** yields a relay with Type E configuration (44E).

DIL R Industrial Control Relays

UL / CSA / IEC / CE

Complete Units

	Contacts		IEC rated operational current I_e at AC-15 220V 230V 240V	UL/CSA Pilot Duty Rating			AC operated Type Article No.	Price see price list
	N.O. = normally open N.C. = normally closed		A		Circuit symbol	Contact code number	Coil voltages shown in (...) For other coil voltages, see page 02/030	
Complete units with 1 early-make contact, 1 late-break contact								
	2 N.O.	2 N.C.	6	A 600 P 300		22	**DILR22D(120V60Hz)** 043789	
	4 N.O.	4 N.C.				44	**DILR44D(120V60Hz)** 043800	
	5 N.O.	3 N.C.				53	**DILR53D(120V60Hz)** 043811	

DIL R Industrial Control Relays

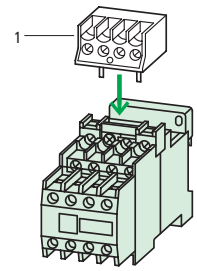
UL / CSA / IEC / CE

Complete Units

DC operated

Type	Price	
Article No.	see price list	
Coil voltages shown in (...) For other coil voltages, see page 02/030		
DILR22D-G(24VDC) 048542		DILR22D supplied with front plate
DILR44D-G(24VDC) 048547		
DILR53D-G(24VDC) 048552		

Notes



Accessories	Page
1 Interface module	02/024
Other accessories	02/024

Contact Code Number:

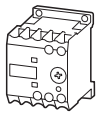
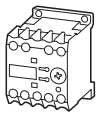
The contact code number provides useful iformation of the relay. It refers to the total number of N.O. contacts (1st digit) and N.C. contacts (2nd digit) found on the device. Adding both digits will result in the total number of contacts.

Example:
DILR22D =
2 N.O. + **2** N.C. contacts, for a total of 4 contacts.

The "D" shown following the contact code number refers to the fact 1 N.O. contact is an early-make contact and 1 N.C. is a late-break contact.

DIL ET Electronic Timing Relays

UL / CSA / IEC / CE

	IEC rated operational current I_e at AC-15 220V 230V 240V	UL/CSA Pilot Duty Rating	Time range	24 – 240 V, 50/60 Hz, AC 24 – 240 V, DC Type Article No.	Price see price list
	A				
Timing relay, ON-delayed					
	3	B 300	1,5 – 30 s	**DILET11-30-A** 048878	
	3	B 300	0,05 – 1 s 0,15 – 3 s 0,5 – 10 s 3 – 60 s 0,15 – 3 min 0,5 – 10 min 3 – 60 min 0,15 – 3 h 0,5 – 10 h 3 – 60 h	**DILET11-M-A** 048886	
Multi-function relay with connection for remote potentiometer					
	3	B 300	0,05 – 1 s 0,15 – 3 s 0,5 – 10 s 3 – 60 s 0,15 – 3 min 0,5 – 10 min 3 – 60 min 0,15 – 3 h 0,5 – 10 h 3 – 60 h	**DILET70-A** 048893	

Setting example (2 ways)

Using the chart:

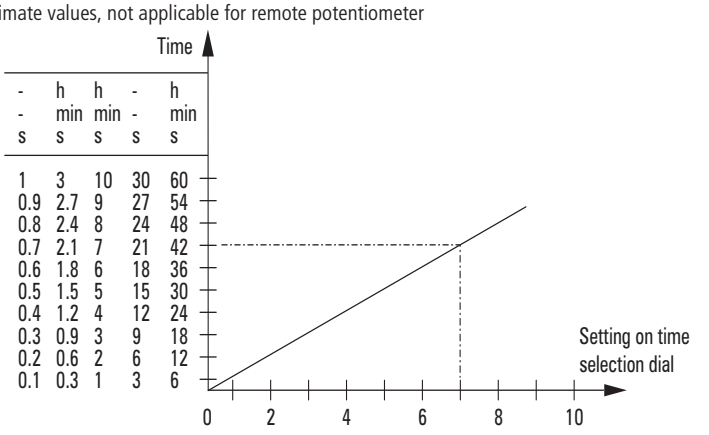
Time range selected 60 min
Time required 42 min
Setting required on time selection dial 7

Calculating the setting:

$$\frac{\text{time required x 10}}{\text{timing range selected}} = \text{setting on time selection dial}$$

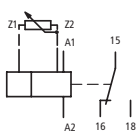
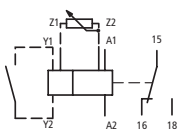
$$\frac{42 \text{ min x } 10}{60 \text{ min}} = 7$$

Timing chart
Approximate values, not applicable for remote potentiometer



DIL ET Electronic Timing Relays

UL / CSA / IEC / CE

Available functions[1]	Terminal markings
11	 Dry contact **Do not** apply voltage!
11	
11, 21, 42, 81	
12, 16, 22, 82	

Notes

[1] DIL ET 11 supplied with this function as standard

Notes

One Device for All Voltage Ratings !
The DIL ET timing relays operate reliably when actuated by DC and AC voltage levels in the range indicated in the table below. There is no need to specify 'coil' voltages or stock coils.

Type suffix	Actuating voltage printed on unit	
	V DC	V AC
-A	24 – 240	24 – 240, 50/60 Hz
	Voltage tolerance range:	
	V DC	V AC
-A	16.8 – 288	20.4 – 264

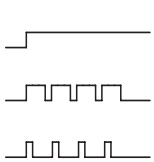
Allowable cable length:

	Connection to Y1/Y2 Z1/Z2
Unshielded conductors AWG 14 ... 18	250 m
Conductors in same conduit or cable duct as 50/60 Hz power conductors	50 m

Accessories:	**Page**
Tamper-proof cover	02/025
Remote potentiometer	02/026

Flow diagrams

LED indication

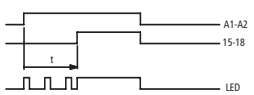


Time t not running, Contact 15 – 18 closed

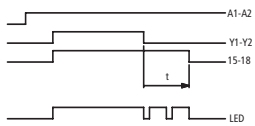
Time t running, Contact 15 – 18 closed

Time t running, Contact 15 – 18 open

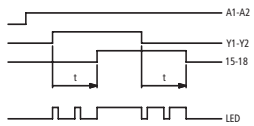
11 ON-delayed



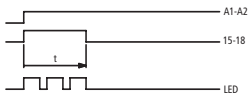
12 OFF-delayed



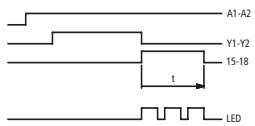
16 ON and OFF-delayed



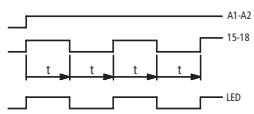
21 Fleeting contact on energization



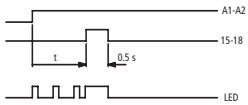
22 Fleeting contact on de-energization



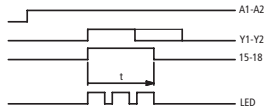
42 Flashing



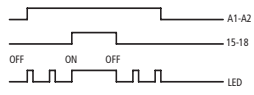
81 Pulse generating



82 Pulse shaping

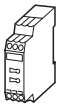
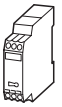
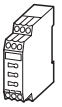


ON-OFF function



ETR 4 Electronic Timing Relays

UL / CSA / IEC / CE

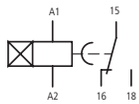
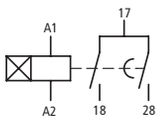
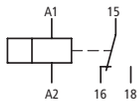
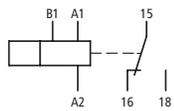
	IEC rated operational current I_e at AC-15 220V 230V 240V A	UL/CSA Pilot Duty Rating	Time range	**24 – 240 V, 50/60 Hz, AC** **24 – 240 V, DC** **Type** Article No.	**Price** see price list
Timing relay, ON-delayed					
	3	B 300	0,05 – 1 s 0,15 – 3 s 0,5 – 10 s 1,5 – 30 s 5 – 100 s 15 – 300 s 1,5 – 30 min 15 – 300 min 1,5 – 30 h 5 – 100 h	**ETR4-11-A** 031882	
Star-delta timing relay					
	3	B 300	3 – 60 s	**ETR4-51-A** 031884	
Multi-function relay					
	3	B 300	0,05 – 1 s 0,15 – 3 s 0,5 – 10 s 1,5 – 30 s 5 – 100 s 15 – 300 s 1,5 – 30 min 15 – 300 min 1,5 – 30 h 5 – 100 h	**ETR4-69-A** 031891	

The Entire Family of ETR 4 Timing Relays Feature Many Advantages:

- Micro-processor controlled for high repeat accuracy
- Very high noise immunity, designed for industrial application
- LED's to signal state of output contacts and running status
- Easy setting of timing ranges and functions
- Simple to install and wire
- One device covers all AC and DC voltages across a broad range: Simplifies and minimizes inventories

ETR 4 Electronic Timing Relays

UL / CSA / IEC / CE

Available function [1]	Terminal markings	Available function [1]	Terminal markings
11			
51			
11, 21, 42, 81		12, 16, 22, 82	

Notes

[1] ETR 4-11 and ETR 4-51 supplied with stated function as standard

Notes

One Device for All Voltage Ratings !
The ETR 4 timing relays operate reliably when actuated by DC and AC voltage levels in the range indicated in the table below. There is no need to specify 'coil' voltages or stock coils.

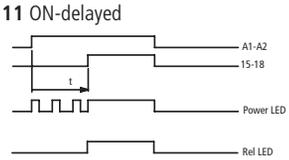
Type suffix	Actuating voltage printed on unit	
	V DC	V AC
-A	24 – 240	24 – 240, 50/60 Hz
	Voltage tolerance range:	
	V DC	V AC
-A	16,8 – 288	20,4 – 264

Allowable cable length:

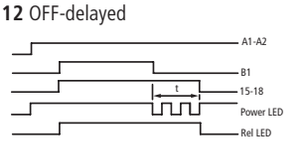
	Connection to B1
Unshielded conductors AWG 14 ... 18	250 m
Conductors in same conduit or cable duct as 50/60 Hz power conductors	50 m

Accessories	**Page**
Panel mount adapter	02/026

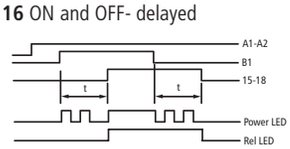
11 ON-delayed



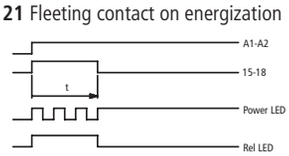
12 OFF-delayed



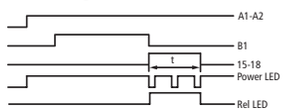
16 ON and OFF- delayed



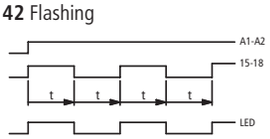
21 Fleeting contact on energization



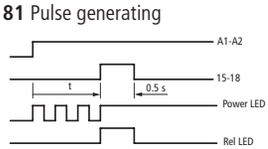
22 Fleeting contact on de-energization



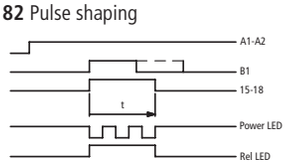
42 Flashing



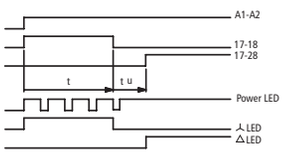
81 Pulse generating



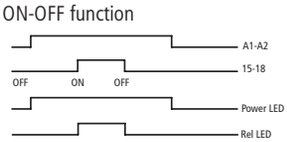
82 Pulse shaping



51 Star-delta

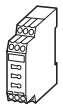


ON-OFF function



ETR 4 Electronic Timing Relays

UL / CSA / IEC / CE

	IEC rated operational current I_e at AC-15 220V 230V 240V A	UL/CSA Pilot Duty Rating	Time range	24 – 240 V, 50/60 Hz, AC 24 – 240 V, DC **Type** Article No.	**Price** see price list
Multi-function relay With two changeover contacts and connection for remote potentiometer. Can be converted to two timed contacts or one non-delayed contact and one timed contact.					
	3	B 300	0,05 – 1 s 0,15 – 3 s 0,5 – 10 s 1,5 – 30 s 5 – 100 s 15 – 300 s 1,5 – 30 min 15 – 300 min 1,5 – 30 h 5 – 100 h	**ETR4-70-A** 031888	

Notes

One Device for All Voltage Ratings !
The ETR 4 timing relays operate reliably when actuated by DC and AC voltage levels in the range indicated in the table below. There is no need to specify 'coil' voltages or stock coils.

Type suffix	Actuating voltage printed on unit	
	V DC	V AC
-A	24 – 240	24 – 240, 50/60 Hz
	Voltage tolerance range	
	V DC	V AC
	16.8 – 288	20.4 – 264

Allowable cable lengths:

	Connection to B1 Z1/Z2
Unshielded conductors AWG 14 ... 18	250 m
Conductors in same conduit or cable duct as 50/60Hz power conductors	50 m

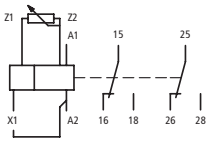
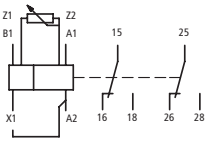
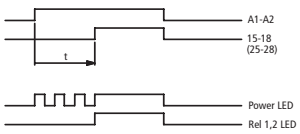
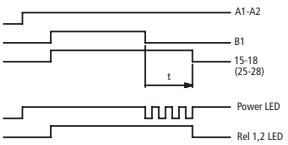
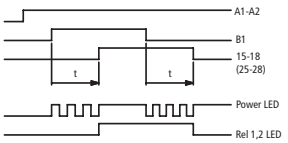
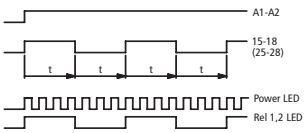
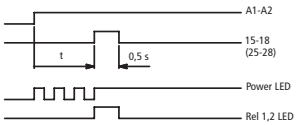
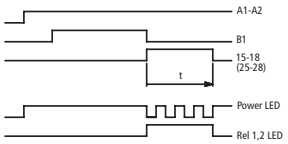
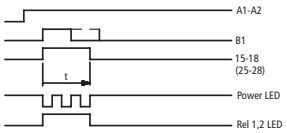
Accessories	**Page**
Panel mount adapter	02/026
Remote potentiometer	02/026

ETR 4 Electronic Timing Relays

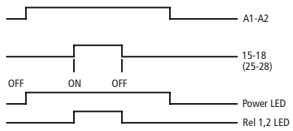
UL / CSA / IEC / CE

A2/X1 linked

→ 2 timed contacts

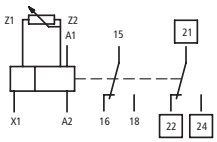
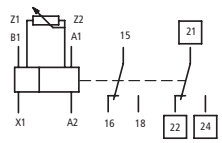
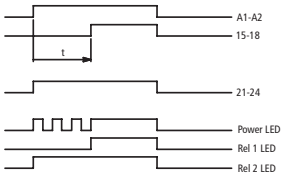
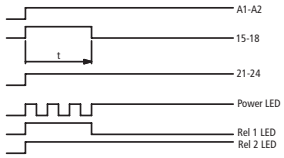
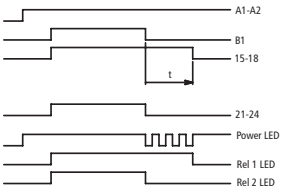
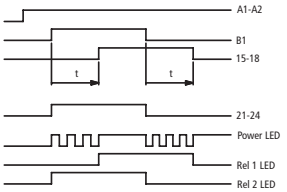
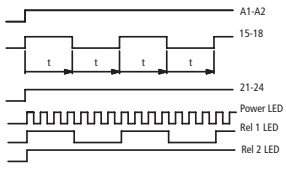
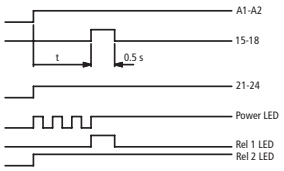
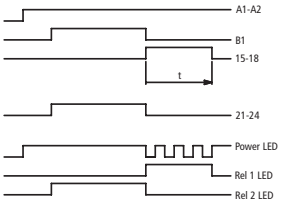
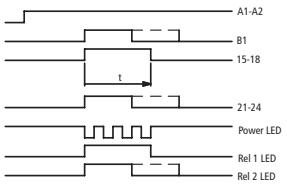
Available functions	Connection diagrams	Available functions	Connection diagrams
11, 21, 42, 81 ON – OFF		12, 16, 22, 82 ON – OFF	
11 ON-delayed	**21** Fleeting contact on energization	**12** OFF-delayed	**16** ON and OFF-delayed
			
42 Flashing	**81**Pulse generating	**22** Fleeting contact on de-energization	**82** Pulse shaping
			

ON-OFF function

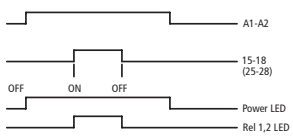


A2/X1 not linked

→ 1 non-delayed and 1 timed contact

Available functions	Connection diagrams	Available functions	Connection diagrams
11, 21, 42, 81 ON – OFF		12, 16, 22, 82 ON - OFF	
11 ON-delayed	**21** Fleeting contact on energization	**12** OFF-delayed	**16** ON and OFF-delayed
			
42 Flashing	**81** Pulse generating	**22** Fleeting contact on de-energization	**82** Pulse shaping
			

ON-OFF function



ESR Electronic Safety Relays
Description

Fields of application

Electronic safety relays are used for monitoring safety control circuits. The requirements for electrical equipment of machines are defined in accordance with IEC/EN 60 204. The machine user must assess the risk of the machine in accordance with EN 954-1, and implement a control system which meets the requirements for the relevant safety category 1, 2, 3, or 4.

Construction

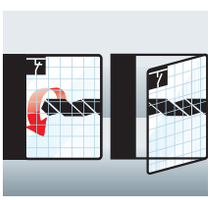
The electronic safety relay consists of a power section, the electronics and two redundant relays with interlocked opposing contacts for the enabling and signalling paths.

Product range overview

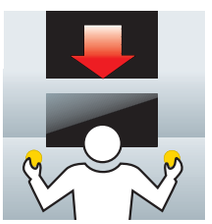
The range includes relays for:

Emergency-Stop circuits

Monitoring of safety mats and safety bumpers



Monitoring of protective guards



Monitoring of two-hand controls

Contact expansion modules with and without time delay are also available.

Safety category

ESR electronic safety relays are approved by the workplace liability associations and comply with safety category 3 or 4. The safety category of a control system results from its combination with the external circuitry, for which the machine user is responsible.
The electronic safety relays are tolerant of one fault, in other words, a single fault in the safety circuit does not result in a dangerous state. EN 954-1 excludes the possibility of two independent faults occurring at the same time.

Stop category

IEC/EN 60 204-1 stipulates two relevant stop categories for stopping in the event of an emergency:

- STOP category 0: Stopping by means of immediate disconnection of power from the machine.
- STOP category 1: Controlled stopping, with power available to the machine, in order to achieve termination of machine movement. Power is not removed until the stop is achieved.

The safety relays for Emergency-Stop applications and non-delayed expansion modules are suitable for Stop category 0. Delayed contact expansion modules meet the requirements of Stop category 1.

Function

In fault-free operation, following the starting command, the safety circuits are monitored by the electronics, and the enabling paths are activated via the relay. Following the switch Off command, and also in the event of a fault (earth fault, faulty insulation, wire breakage, etc.), the enabling paths are blocked immediately (STOP category 0) or with a time delay (STOP category 1), and the motor is disconnected from the mains supply. In redundant safety circuits, a short-circuit does not result in danger, so only when the circuit is re-energized is the fault detected and starting prevented.

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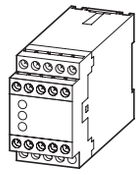
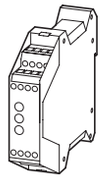
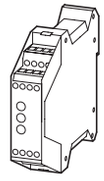
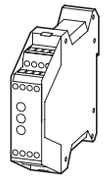
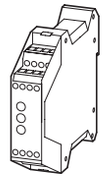
Single/dual channel design

Safety relays for stopping in the event of an emergency and for monitoring of protective guards are available for single- and dual channel applications. The single channel construction enables earth-fault monitoring of the safety circuit. For the dual channel application, the Emergency-Stop circuit or the protective guard circuit is constructed as a redundant circuit. In this way monitoring for short-circuits and wire insulation faults is also implemented.

Furthermore, the device can be used with or without reset monitoring. The device is started and the enabling paths switched only as a result of the falling edge of the On button being detected. An application for the device without restart monitoring is for example, monitoring protective doors for an automatic restart.

ESR Electronic Safety Relays
Basic Units, Contact Expansion Module

	Actuating voltage U_c		Relay safety category to EN 954-1	Enabling path to IEC/EN 60 204 Stop category 0	Stop category 1	Signalling contact	Type Article No.	Price see price list
Safety relay for Emergency-Stop and protective-door monitoring[1)]								
	230 V 50/60 Hz	Dual-channel	4	3	-	1	**ESR3-NO-31(230V)** 214615	
	24 V DC 50/60 Hz	Single-channel	3	3	-	1	**ESR4-NO-31** 214612	
	24 V DC 50/60 Hz	Dual-channel	4	2	-	1	**ESR4-NO-21** 214613	
	24 V DC	Dual-channel Off-delayed 0.15 - 3 s	3[4)] / 4[5)]	2	1	-	**ESR4-NV3-30** 214616	
	24 V DC	Dual-channel Off-delayed 1.5 - 30 s	3[4)] / 4[5)]	2	1	-	**ESR4-NV30-30** [6)] 214617	
	24 V DC	Dual-channel delayed 1.5 - 30 s [8)]	3[4)] / 4[5)]	2	1	-	**ESR4-NT30-30** [7)] 225011	
Safety relay for safety mat monitoring[1)]								
	24 V DC	Dual-channel	4	2	-	1	**ESR4-NM-21** 214619	
Two-hand control relay[1)] [9)]								
	24 V DC 50/60 Hz	Dual-channel	4	2	-	1	**ESR4-NZ-21** 214620	
Contact expansion modules[1)]								
	24 V DC 50/60 Hz	non-delayed	4[2)]	4[3)]	-	2	**ESR4-NE-42** 214614	
	24 V DC	delayed t_A = 3 s	4[2)]	-	4	2	**ESR4-VE3-42** 214618	

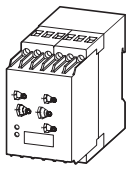
Notes

1) Additional information and switching examples → Safety Application Guide TB0-009GB
2) The basic unit determines the maximum safety category
3) The basic unit determines the maximum stop category
4) Delayed contacts
5) Non-delayed contacts
6) Suitable for AT0-...MT-ZBZ safety position switches with mechanical securing action.
7) Suitable for AT0-...FT-ZBZ safety position switches with mechanical securing action
8) Contact closes following Emergency-Stop actuation, on-delayed
9) Suitable for applications to EN 574, Type III C

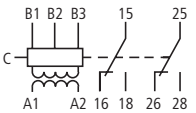
EMR4 Measuring and Monitoring Relays

Current monitors, phase sequence relays, phase monitors, phase imbalance monitors

EMR4-I... current monitoring relay, single phase

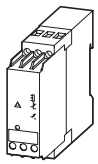


- Switching hysteresis adjustable 5 – 30 %
- Pickup delay 0,1 – 30 s
- EMR4...-A: monitoring of an upper or lower limit
- EMR4...-B: monitoring of an upper limit
- Expansion of monitoring range with current transformer

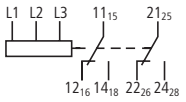


Description	Current monitoring range *I*~/*I*=	Supply voltage	Type Article No.	Price see price list
	3 – 30 mA 10 – 100 mA 0,1 – 1 A	24 – 240 V AC/DC	**EMR4-I1-2-A** 221781	
	0,3 – 1,5 A 1 – 5 A 3 – 15 A	24 – 240 V AC/DC	**EMR4-I15-2-A** 221782	
		220 – 240 V AC	**EMR4-I15-2-B** 221783	

EMR4-F... phase sequence relays

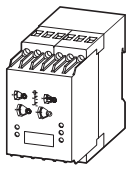


- Monitoring of AC circuits for phase sequence and phase failure (< 0,6 × U_e)
- Supply voltage = monitored voltage

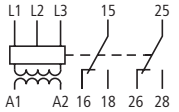


Description	Monitoring voltage	Supply voltage	Type Article No.	Price see price list
	200 – 500 V AC	200 – 500 V AC	**EMR4-F500-2** 221784	

EMR4-W... phase monitor relays

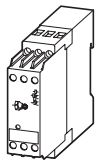


- Monitoring of AC circuits for phase sequence, over -and undervoltage, and phase failure (< 0,6 × U_e)
- 3-phase window voltage monitoring
- Pickup delay or off-delay can be selected (0,1 – 10 s)

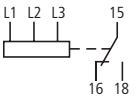


Description	Monitored voltage adjustable between	Supply voltage	Type Article No.	Price see price list
	U_{min} 300 – 380 V AC U_{max} 420 – 500 V AC	160 – 300 V AC	**EMR4-W500-2-C** 221785	
		300 – 500 V AC	**EMR4-W500-2-D** 221786	
	U_{min} 350 – 430 V AC U_{max} 500 – 580 V AC	300 – 500 V AC	**EMR4-W580-2-D** 221787	

EMR4-A... phase imbalance monitoring relay

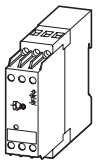
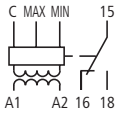
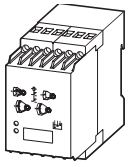
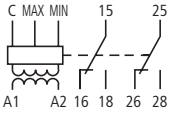


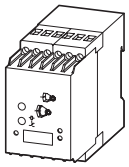
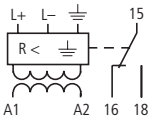
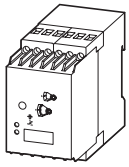
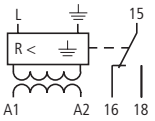
- Monitoring of AC circuits for imbalance of phases
- Recognition of phase failure even with 95% voltage feedback of the motor
- Pickup delay 0.5 s
- Adjustable imbalance threshold of 5 – 15 %
- Phase sequence recognition
- Supply voltage = monitored voltage

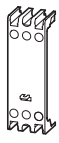
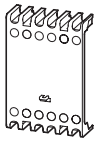


Description	Monitoring voltage	Supply voltage	Type Article No.	Price see price list
	380 – 415 V 50 Hz	380 – 415 V 50 Hz	**EMR4-A400-1** 221788	

EMR4 Measuring and Monitoring Relays
Level monitoring relays, insulating monitoring relays, sealable shrouds

	Description	Input sensitivity	Contact symbol	Supply voltage	**Type** Article No.	**Price** see price list
EMR4-N... level monitoring relays						
	• Monitoring of conductive liquid levels • Monitoring mixture proportions of conductive liquids • can be set for dry run protection or overflow protection	5 – 100 kΩ		220 – 240 V AC	**EMR4-N100-1-B** 221789	
	• Monitoring of conductive liquid levels • Monitoring mixture proportions of conductive liquids • Selectable on or off delay 0,5 – 10 s	250 Ω – 500 kΩ		220 – 240 V AC	**EMR4-N500-2-B** 221790	
		250 Ω – 500 kΩ		24 – 240 V AC/DC	**EMR4-N500-2-A** 221791	

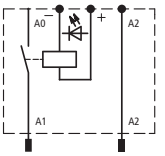
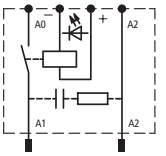
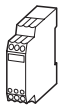
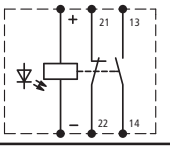
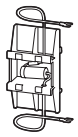
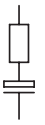
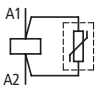
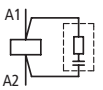
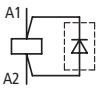
	Description	Range of dielectric resistance	Contact symbol	Supply voltage	**Type** Article No.	**Price** see price list
EMR4-R... insulation monitoring relays						
	• Monitoring of insulation resistance in ungrounded DC circuits • Selector switch for load current or zero-load current • Test and reset • Status indication via LED	10 – 110 kΩ		24 – 240 V AC/DC	**EMR4-RDC-1-A** 221792	
	• Monitoring of insulation resistance between ungrounded AC circuits and ground conductor • Tripping function stored in memory • Insulation monitoring in single-phase and three-phase AC circuits • Test via test button and remote control • Status indication via LED to VDE 0413 part 2	1 – 110 kΩ		24 – 240 V AC/DC	**EMR4-RAC-1-A** 221793	

		Module width			**Type** Article No.	**Price** see price list
Sealable shroud EMR4-PH...						
		22.5 mm			**EMR4-PH22** 221795	
		45 mm			**EMR4-PH45** 221794	

Accessories

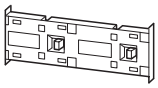
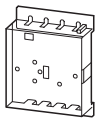
Interface Modules, Suppressors

UL / CSA / IEC / CE

	Output Pilot duty rating AC A	DC A	Actuating voltage actuating current V DC/mA		For use with relays	Type Article No.	Price see price list	
Interface modules, plug-in type								
	B 300	R 300	24/11		DIL R..	**VS1DIL** 055480		For energizing of relays and contactors from low level 24V DC inputs. The VS 1 and VS 2 plug directly into the DIL R coil terminals, whereas the ETS4-VS 3 mounts separetly on a DIN rail and is suitable for all relays. In cases where the rated coil current of a device exceeds 2A, use a DIL ER-G as an interface relay. The output on VS2DIL and the input on ETS4-VS3 are equipped with an internal suppressor circuit.
With integral suppressor circuit 	B 300	R 300	24/11		DIL R..	**VS2DIL** 057853		
Amplifier module for separate mounting								
	B 300		24/25		As required	**ETS4-VS3** 083094		
Drop-out delay mechanism								
			24/–		DIL E...	**TDDILE24** 090200		Lengthens the drop-out time of an electro-magnet. For use with DILER(M) with DC operated coil only. Drop-out delay with auxiliary contacts: 100ms, without: 130 ms
Suppressors								
Varistor suppressors 			24 – 48 V		DIL E...	**VGDILE48** 010320		For AC operated 50-60 Hz relays only. DC operated devices have built-in surge suppressors.
			110 – 250 V			**VGDILE250** 010336		
			380 – 415 V			**VGDILE415** 010463		
			24 – 48 V		DIL E...-C	**VGDILE48-C** 230265		
			110 – 250 V			**VGDILE250-C** 230266		
			12 – 24 V		DIL R...	**VGBDIL24** 076837		For AC operated 50-60 Hz and DC operated relays .
			24 – 48 V			**VGBDIL48** 071609		
			110 – 250 V			**VGBDIL250** 071610		
			380 – 415 V			**VGBDIL415** 071611		
RC suppressors			24 – 48 V		DIL E...	**RCDILE48** 044264		For AC operated 50-60 Hz relays
			110 – 250 V		DIL E...	**RCDILE250** 046320		
			24 – 48 V		DIL E...-C	**RCDILE48-C** 230267		
			110 – 250 V			**RCDILE250-C** 230268		
			24 – 48 V		DIL R...	**RCBDIL48** 067345		
			110 – 250 V			**RCBDIL250** 069718		
			380 – 415			**RCBDIL415** 072091		
Free-wheel diode suppressor			12 – 250 V		DIL R...	**FDBDIL** 074464		For DC operated relays Longer drop-out delay of coil should be taken into consideration

Accessories

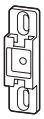
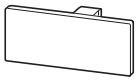
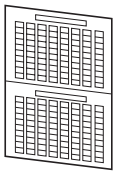
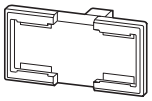
UL / CSA / IEC / CE

		For use with	Type Article No.	Price see price list	
Spacers					
	Provides a mechanical link between groups of components to better secure them when mounted and wired together in an assembly.	DIL E... DIL ET...	**V0DILE** 026634		No spacing between devices
		DIL R... ETR4	**V0DIL** 010772		No spacing between devices
		DIL R... ETR4	**V5/15DIL** 013145		5 mm device spacing 15 mm device spacing when using mechanical interlock
Mechanical Interlock					
		DIL E...	**MVDILE** 010113		To mechanically interlock two AC or DC operated devices mounted either horizontally or vertically. No spacing between devices. Mechanical lifespan 2.5 million operations Additional auxiliary contact mounting is possible
Paralleling bridge					
	for parallel connection of auxiliary contacts	DIL E... ...DIL E DIL R ...DIL	**BT480** [1] 052785		Not insulated Standard quantity: 100
Connection tabs for fast-on connectors DIN 46 244					
	For auxiliary contacts and coil connections	DIL E... DIL ET... DIL R...	**BT483** [1] 059904		Use connectors with insulated sleeves Standard quantity: 100
Tamper-proof cover					
	Transparent	DIL E... DIL ET...	**HDILE** 010482		Cover snap-fits onto the device and can be sealed to prevent tampering. IP 40 envionmental rating. Cover may also be drilled to provide access to the DIL ET timer adjustment dial.
		TPE TPD	**PL-DILT** 036073		Cover is fastened via a screw. Sealable to prevent access.

[1] must be ordered in standard quantity.

Accessories

UL / CSA / IEC / CE

		For use with	Type Article No.	Price see price list	
Remote potentiometer IP 66					
	10 kΩ 0.5 W max.	DIL ET... ETR4-70	**M22-R10K** 229491		Titanium colored front ring
	10 kΩ 0.5 W max.	DIL ET... ETR4-70	**M22S-R10K** 232233		Black front ring
Panel mounting adapter					
		ETR4	**CS-TE** 095853		For panel mounting of ETR 4 timing relays
Component labelling system					
Clip-in label plate 	8 x 10 mm	...DIL	**KG10** [1] 022256		Clips into 2-pole auxiliary contact modules Standard quantity: 500
	8 x 20 mm	...DIL E, DIL ER ...DIL, DIL R	**KG20** [1] 091075		Clips into 4-pole auxiliary contact modules and basic units Standard quantity: 500
Label plate with mounting stud 	8 x 17.5 mm Color: white	DIL...	**XGKS-Z** [1] 207508		For use with Moeller equipment with corresponding mounting hole Standard quantity: 500
Sheet of labels 	7.5 x 17 mm Color: yellow HKS 3 (≈RAL 1018)	XGKS, XGKS-Z, KG 20 For inscription using laser printer, inkjet printer, plotter, marker pen, photocopier	**XGKE-GE** [2] 207517		Standard quantity: pad of 25 sheets 240 labels persheet, self-adhesive Price per sheet
Adapter with mounting stud 	Color: RAL 7035, light grey	DIL...	**XGKA-Z** [1] 207513		To secure XGKS on Moeller equipment with the corresponding mounting hole Standard quantity: 250

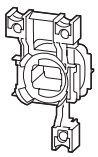
Notes

[1] Must be ordered in standard quantity
[2] Consult Moeller Electric for inscription software

Industrial Control Relays

Accessories, Contact Travel Diagrams

UL / CSA / IEC / CE

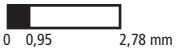
		For use with	Type Article No.	List Price see price list	
Individual coils					
	AC voltage	DIL R	**J-DIL00M(...)**		See page 02/031 for available coil voltages
	DC voltage	DIL R	**G-DIL00M(...)**		Specify coil voltage when ordering

The diagrams show the closing and opening travel of the relays and auxiliary contacts at no-load.
Tolerances are not taken into consideration.

DIL ER-AC

normally open contact

normally closed contact



DIL ER-DC

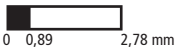
normally open contact

normally closed contact

...DIL E

normally open contact

normally closed contact



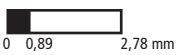
...D DIL E

early make contact

late break contact

normally open contact

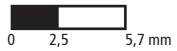
normally closed contact



DIL R

normally open contact

normally closed contact

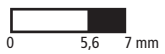


early make contact

late break contact

...DIL

normally open contact

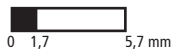


normally closed contact

TP... 11 DIL

normally open contact

normally closed contact

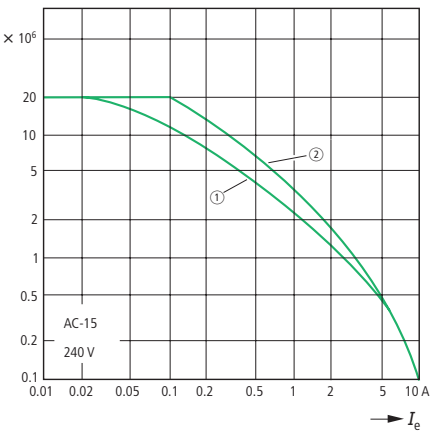


DIL Industrial Control Relays, DIL ET Electronic Timing Relays
Characteristics

DIL R (AC-15)

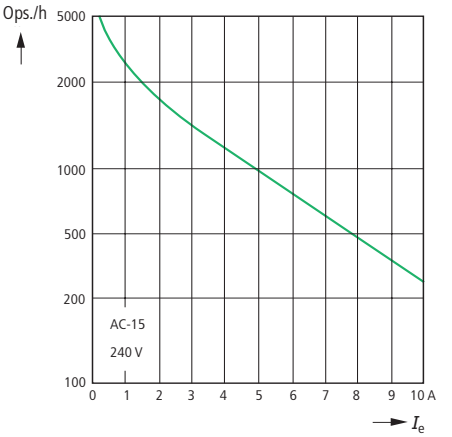
Component lifespan (operations)
I_e = Rated operational current

① = normally open
② = normally closed



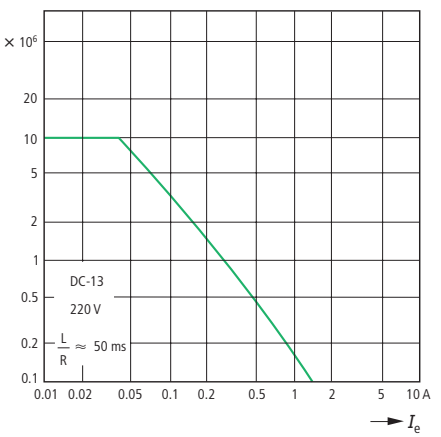
DIL R (AC-15)

Max. switching frequency (approx.)
I_e = Rated operational current



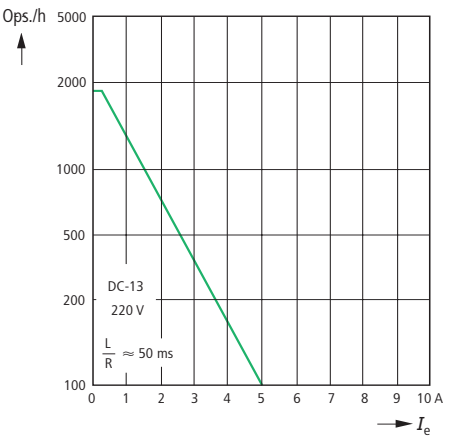
DIL R (DC-13[1])

Component lifespan (operations)
I_e = Rated operational current



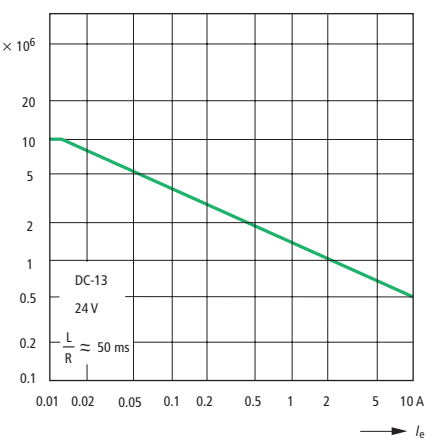
DIL R (DC-13[1])

Max.switching frequency (approx.)
I_e = Rated operational current



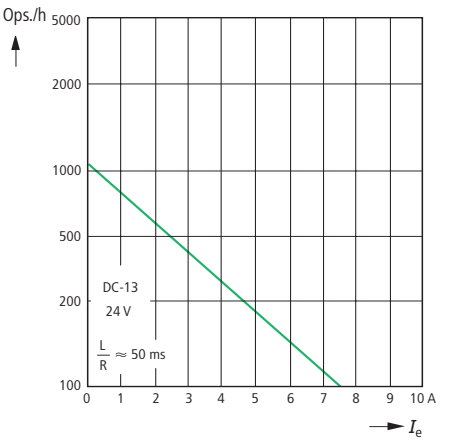
DIL R (DC-13[1])

Component lifespan (operations)
I_e = Rated operational current



DIL R (DC-13[1])

Max. switching frequency (approx.)
I_e = Rated operational current



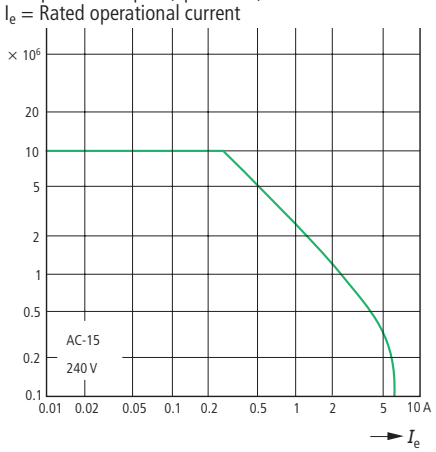
Notes

1) Make and break conditions to DC-13, time constant as stated.

DIL Industrial Control Relays, DIL ET Electronic Timing Relays
Characteristics

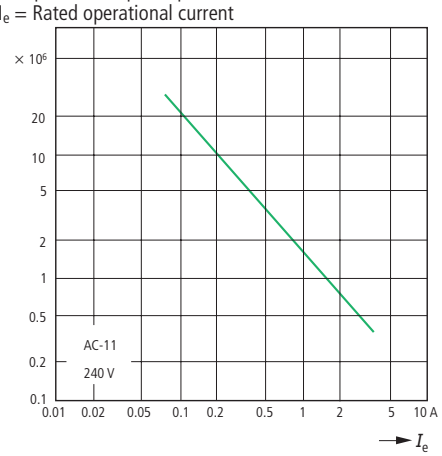
DIL ER (AC-15)

Component lifespan (operations)
I_e = Rated operational current



DIL ET (AC-11)

Component lifespan (operations)
I_e = Rated operational current



DIL ER and DIL R Industrial Control Relays

UL / CSA / IEC / CE

Coil Voltages

AC	DILER-40(...)	DILER-31(...)	DILER-22(...)	DILR40(...)	DILR31(...)	DILR22(...)
	Article No. [1]	Article No. [1]	Article No. [1]	Article No. [1]	Article No. [1]	Article No. [1]
Standard voltages	Price see price list	Price see price list	Price see price list	Price see price list	Price see price list	Price see price list
12V50Hz	066169	066170	066171	–	–	–
24V50Hz	010094	010251	010344	025066	029810	077267
48V50Hz	010190	010044	010201	055915	058286	091505
240V50Hz	010478	010300	010138	017947	022691	017943
24V60Hz	010110	010267	010497	027439	032183	084386
110V60Hz	010254	010172	010265	–	–	–
115V60Hz	010272	010204	010211	096255	010826	093878
208V60Hz	–	–	–	210275	210261	210257
600V60Hz	–	–	–	210276	210262	210258
42V50Hz, 48V60Hz	051755	051764	051773	043752	043764	043776
110V50Hz, 120V60Hz	051756	051765	051774	043753	043765	043777
190V50Hz, 220V60Hz	051757	051766	051775	043754	043766	043778
220V50Hz, 240V60Hz	051758	051767	051776	043755	043767	043779
230V50Hz, 240V60Hz	051759	051768	051777	043756	043768	043780
380V50Hz, 440V60Hz	051760	051769	051778	043757	043769	043781
400V50Hz, 440V60Hz	051761	051770	051779	043758	043770	043782
415V50Hz, 480V60Hz	051762	051771	051780	043759	043771	043783
24V50/60Hz	021924	021594	021704	022693	027437	058284
42V50/60Hz	033459	029869	029433	039304	044048	060657
110V50/60Hz	021961	021624	021871	091509	096253	065403
230V50/60Hz	052725	052509	052508	052762	052761	052726
Non-standard voltage other than the standard voltages listed above [2]	–	–	–	Price see price list	Price see price list	Price see price list
(...V50HZ) (12–600V)	–	–	–	986763	991507	934554
(...**V60HZ)** (12–600V)	–	–	–	989136	993880	936927

DC	DILER-40-G(...)	DILER-31-G(...)	DILER-22-G(...)	DILR 40-G(...)	DILR31-G(...)	DILR22-G(...)
	Article No. [1]	Article No. [1]	Article No. [1]	Article No. [1]	Article No. [1]	Article No. [1]
Standard voltages	Price see price list	Price see price list	Price see price list	Price see price list	Price see price list	Price see price list
12V DC	079711	079761	080728	–	–	–
24V DC	010223	010157	010042	048537	048532	048526
48V DC	010255	010205	010346	048538	048533	048527
60V DC	010271	010221	010499	048539	048534	048528
110V DC	010287	010253	010043	048535	048530	048529
220V DC	010303	010269	010091	048536	048531	048525
Non-standard voltages other than the standard voltages listed above [2]	–	–	–	Price see price list	Price see price list	Price see price list
(...VDC) (12–250V)	–	–	–	915590	915591	915592

Notes

[1] To obtain the article number for ordering, read under selected type and coil voltage from the table above

[2] For non-standard voltages, state the coil voltage selected from the range (...-...V)

DIL R Complete Units, Mechanical Latching Module, Individual Coil

UL / CSA / IEC / CE

Coil Voltages

AC	DILR22D(...)	DILR44D(...)	DIL R 53D(...)	V DIL(...)	J-DIL 00 M(...)
	Article No. [1]	Article No. [1]	Article No. [1]	Article No. [1]	Article No. [1]
Standard voltages	Price see price list	Price see price list	Price see price list	Price see price list	Price see price list
24V50Hz	013207	072533	055923	053536	000079
48V50Hz	041683	010836	084399	055493	066693
240V50Hz	096261	065414	044058	053115	023809
24V60Hz	015580	074906	058296	053659	099744
115V60Hz	084396	053549	032193	052241	043837
208V60Hz	100102	210263	210265	100297	210267
600V60Hz	210260	210264	210266	–	210268
42V50Hz, 48V60Hz	043788	043799	043810	043821	043829
110V50Hz, 120V60Hz	043789	043800	043811	043822	043830
190V50Hz, 220V60Hz	043790	043801	043812	043823	043831
220V50Hz, 240V60Hz	043791	043802	043813	043824	043832
230V50Hz, 240V60Hz	043792	043803	043814	043825	043833
380V50Hz, 440V60Hz	043793	043804	043815	–	043834
400V50Hz, 440V60Hz	043794	043805	043816	–	043835
415V50Hz, 480V60Hz	043795	043806	043817	–	043836
24V50/60Hz	010834	070160	048804	053217	002452
42V50/60Hz	027445	086771	070161	055218	011944
110V50/60Hz	079650	048803	027447	051165	085506
230V50/60Hz	052760	052838	052961	054487	051352
Non-standard voltages other than the standard voltages listed above [2]	Price see price list	Price see price list	Price see price list	Price see price list	Price see price list
(...V50Hz) (12–415V)	–	–	–	903184	–
(...V50Hz) (12–600V)	974904	944057	922701	–	910098
(...V60Hz) (12–415V)	–	–	–	903183	–
(...V60Hz) (12–600V)	977277	946430	925074	–	910099

DC	DILR22D-G(...)	DILR44D-G(...)	DILR53D-G(...)	V-GDIL(...)	G-DIL00M(...)
	Article No. [1]	Article No. [1]	Article No. [1]	Article No. [1]	Article No. [1]
Standard voltages	Price see price list	Price see price list	Price see price list	Price see price list	Price see price list
24VDC	048542	048547	048552	048562	048557
48VDC	048543	048548	048553	048563	048558
60VDC	048544	048549	048554	048564	048559
110VDC	045840	048545	048550	048560	048555
220VDC	048541	048546	048551	048561	048556
Non-standard voltages other than the standard voltages listed above [2]	Price see price list	Price see price list	Price see price list	Price see price list	Price see price list
(...VDC) (12–250V)	915578	915579	915580	915545	910110

Notes

[1] To obtain the article number for ordering, read under selected type and coil voltage from the table above

[2] For non-standard voltages, state the coil voltage selected from the range (...-...V) shown

DIL ER and DIL R Industrial Control Relays

UL / CSA / IEC / CE

Coil Voltages for Relays with Cage Clamp Terminals

AC	DILER-40-C(...)	DILER-31-C(...)	DILER-22-C(...)	DILR40-C(...)	DILR31-C(...)	DILR22-C(...)
	Article No. [1]	Article No. [1]	Article No. [1]	Article No. [1]	Article No. [1]	Article No. [1]
Standard voltages	Price see price list	Price see price list	Price see price list	Price see price list	Price see price list	Price see price list
12V50Hz	231833	231808	231785	–	–	–
24V50Hz	231834	231811	231786	231911	231889	231856
48V50Hz	231835	231812	231787	231912	231890	231857
240V50Hz	231836	231813	231788	231913	231891	231858
24V60Hz	231837	231814	231789	231914	231892	231859
110V60Hz	231838	231815	231790	–	–	–
115V60Hz	231839	231816	231791	231915	231894	231860
42V50Hz, 48V60Hz	231840	231817	231792	231916	231896	231861
110V50Hz, 120V60Hz	231841	231818	231793	231917	231897	231862
190V50Hz, 220V60Hz	231842	231819	231794	231918	231898	231863
220V50Hz, 240V60Hz	231843	231820	231795	231919	231899	231864
230V50Hz, 240V60Hz	230239	230178	230176	230253	230250	230247
380V50Hz, 440V60Hz	231844	231821	231796	231920	231900	231865
400V50Hz, 440V60Hz	231845	231822	231797	231921	231901	231866
415V50Hz, 480V60Hz	231846	231823	231798	231922	231902	231867
24V50/60Hz	231847	231824	231799	231923	231903	231868
42V50/60Hz	231848	231825	231800	231924	231904	231869
110V50/60Hz	231849	231826	231801	231925	231905	231870
230V50/60Hz	231850	231827	231802	231926	231906	231871

DC	DILER-40-G-C(...)	DILER-31-G-C(...)	DILER-22-G-C(...)	DILR 40-G-C(...)	DILR31-G-C(...)	DILR22-G-C(...)
	Article No. [1]	Article No. [1]	Article No. [1]	Article No. [1]	Article No. [1]	Article No. [1]
Standard voltages	Price see price list	Price see price list	Price see price list	Price see price list	Price see price list	Price see price list
12V DC	231851	231828	231803	–	–	–
24V DC	230241	230179	230177	230254	230252	230248
48V DC	231852	231829	231804	231927	231907	231872
60V DC	231853	231830	231805	231928	231908	231873
110V DC	231854	231831	231806	231929	231909	231874
220V DC	231855	231832	231807	231930	231910	231875

Notes

[1] To obtain the article number for ordering, read under selected type and coil voltage from the table above.

DIL R Relays with Integrated Suppressor Circuit, Individual Coil

UL / CSA / IEC / CE

Coil Voltages for Units with Cage Clamp Terminals

AC	DILR40-C(...-Z)	DILR31-C(...-Z)	DILR22-C(...Z)	J-DIL 00 M-C(...)	J-DIL 00 M-C(...-Z)
	Article No. [1]	Article No. [1]	Article No. [1]	Article No. [1]	Article No. [1]
Standard voltages	Price see price list	Price see price list	Price see price list	Price see price list	Price see price list
24V50Hz	232033	232027	232021	232045	232070
48V50Hz	-	-	-	232046	-
240V50Hz	-	-	-	232047	-
24V60Hz	-	-	-	232049	-
115V60Hz	-	-	-	232050	-
42V50Hz, 48V60Hz	232035	232028	232022	232051	232071
110V50Hz, 120V60Hz	232037	232029	232023	232052	232072
190V50Hz, 220V60Hz	-	-	-	232053	-
220V50Hz, 240V60Hz	-	-	-	232054	-
230V50Hz, 240V60Hz	232039	232030	232024	232055	232073
380V50Hz, 440V60Hz	-	-	-	232056	-
400V50Hz, 440V60Hz	-	-	-	232057	-
415V50Hz, 480V60Hz	-	-	-	232058	-
24V50/60Hz	-	-	-	232059	-
42V50/60Hz	-	-	-	232060	-
110V50/60Hz	-	-	-	232061	-
230V50/60Hz	232041	232031	232025	232062	232074

DC	DILR40-G-C(...-Z)	DILR31-G-C(...-Z)	DILR22-G-C(...-Z)	G-DIL00M-C(...)	G-DIL00M-C(...-Z)
	Article No. [1]	Article No. [1]	Article No. [1]	Article No. [1]	Article No. [1]
Standard voltages	Price see price list	Price see price list	Price see price list	Price see price list	Price see price list
24VDC	232044	2320232	232026	232065	232075
48VDC	-	-	-	232066	-
60VDC	-	-	-	232067	-
110VDC	-	-	-	232068	-
220VDC	-	-	-	232069	-

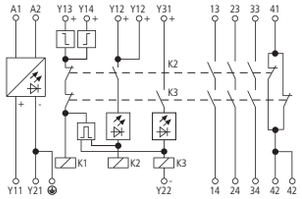
Notes

[1] To obtain the article number for ordering, read under selected type and coil voltage from the table above.

Circuit and Flow Chart Diagrams
Safety Relays ESR

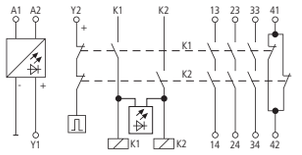
Safety relay for Emergency-Off and guard door monitoring

ESR3-NO-31



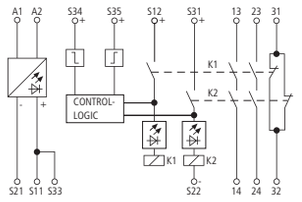
① A1/A2 supply voltage, LED power
② Y12, Y13 Emergency-Off
③ Y13 Reset (with reset button monitoring)
④ K2, K3, 13/14, 23/24, 33/34, LED K2, LED K3
⑤ 41/42

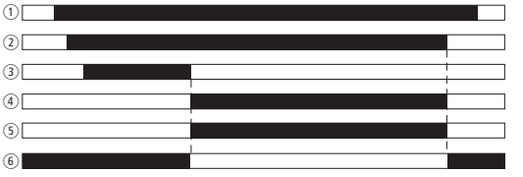
ESR4-NO-31



① A1/A2 supply voltage, LED power
② A2 supply voltage
③ Y2 Reset
④ K1, K2, LED K1/K2
⑤ 13/14, 23/24, 33/34
⑥ 41/42

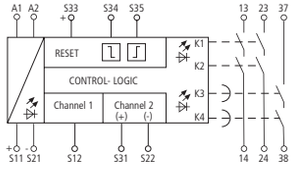
ESR4-NO-21

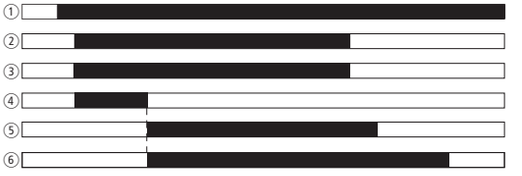




① A1/A2 supply voltage, LED power
② S21/S22 Emergency-Off
③ S34 Reset (with reset button monitoring)
④ K1, LED K1
⑤ K2, LED K2, 13/14, 23/24
⑥ 31/32

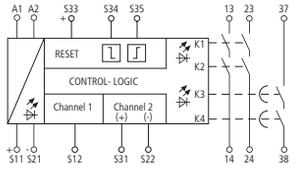
ESR4-NV3(30)-30





① A1/A2 supply voltage, LED power
② S12 Emergency-Off (Channel 1)
③ S31/S22 Emergency-Off (Channel 2)
④ S34 Reset (with reset button monitoring)
⑤ 13/14, 23/24, LED K1/K2
⑥ 37/38, LED K3/K4

ESR4-NT30-30

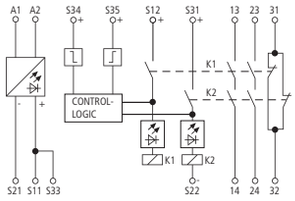


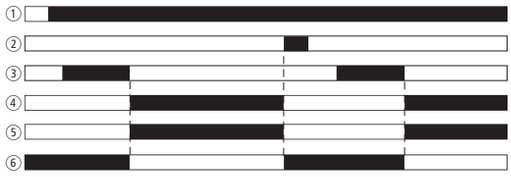
① A1/A2 supply voltage, LED power
② S12 Emergency-Off (Channel 1)
③ S31/S22 NOT-AUS (Channel 2)
④ S34 Reset (with reset button monitoring)
⑤ 13/14, 23/24, LED K1/K2
⑥ 37/38, LED K3/K4

Circuit and Flow Chart Diagrams
Safety Relays ESR

Safety relay for safety mat monitoring

ESR4-NM-21

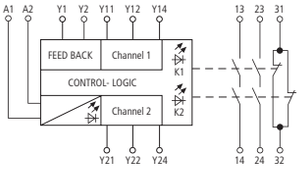




① A1/A2 voltage supply, LED power
② S11/S21, S12/S22 contact mat
③ S34 Reset (with reset button monitoring)
④ K1, LED K1
⑤ K2, LED K2, 13/14, 23/24
⑥ 31/32

Two-hand control relay

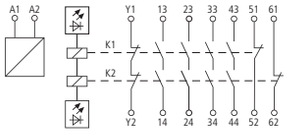
ESR4-NZ-21



① A1/A2 voltage supply, LED Power
② Positioning piece S1
③ Positioning piece S2
④ K1, LED K1
⑤ K2, LED K2
⑥ < 0.5 s monitoring
⑦ Y1/Y2 Feed Back
⑧ 13/14, 23/24
⑨ 31/32

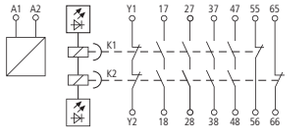
Contact expansions

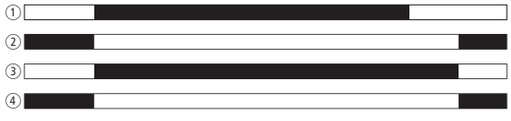
ESR4-NE-42



① A1/A2 voltage supply
② Y1, Y2 feedback loop
③ 13/14, 23/24, 33/34, 43/44, LED K1, LED K2
④ 51/52, 61/62

ESR4-VE3-42



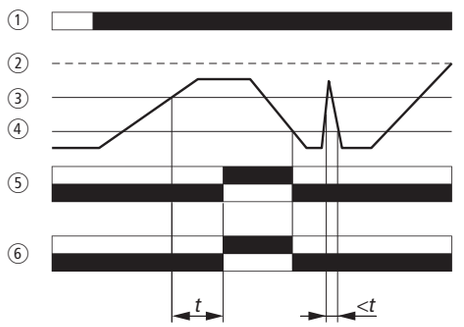


① A1/A2 voltage supply
② Y1, Y2 feedback loop
③ 17/18, 27/28, 37/38, 47/48, LED K1, LED K2
④ 55/56, 65/66

Flow Chart Diagrams

EMR4 measuring and monitoring relays

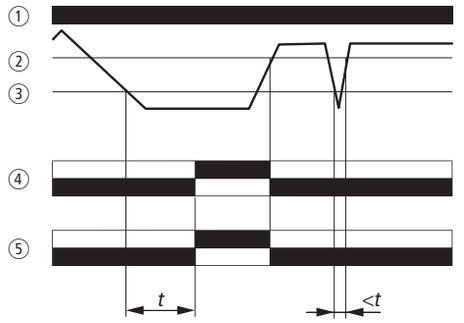
EMR4-I... current monitoring relays



Function at over-current OC

① supply voltage A1-A2
② Hysteresis (release value) under-current UC
③ measured current
④ Hysteresis (release value) over-current OC
⑤ make contact 1: 15-18, 15-16
⑥ make contact 2: 25-28, 25-26

measuring cycle = 80 ms
t = (0,05 – 1 s; 1,5 – 30 s)
pick-up delay

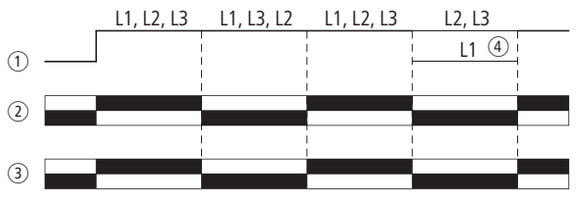


Function at under-current UC

① voltage supply A1-A2
② Hysteresis (release value) under-current UC
③ pick-up value measured current
④ make contact 1: 15-18, 15-16
⑤ make contact 2: 25-28, 25-26

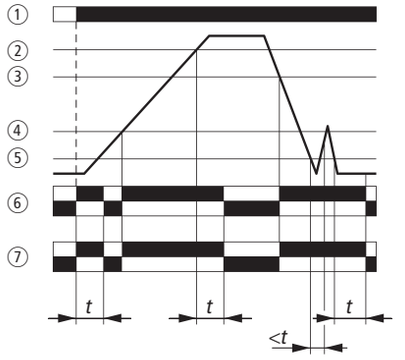
measuring cycle = 80 ms
t = (0,05 – 1 s; 1,5 – 30 s)
pick-up delay

EMR4-F... phase sequence relay



① measured voltage, 3 phase AC supply L1, L2, L3
② make contact 1: 11-14, 11-12
③ make contact 2: 21-24, 21-22
④ phase failure 100 %

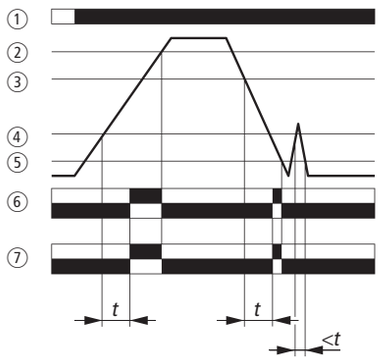
EMR4-W... phase monitoring relay



Pick-up delayed fault indication ☒

① voltage supply A1-A2
② U_{max}
③ Hysteresis – 5 %
④ Hysteresis + 5 %
⑤ U_{min}
⑥ make contact 1: 15-18, 15-16
⑦ make contact 2: 25-28, 25-26

t = Pick-up delay time only valid for monitoring over/under voltage



Return-delayed fault indication: function ■

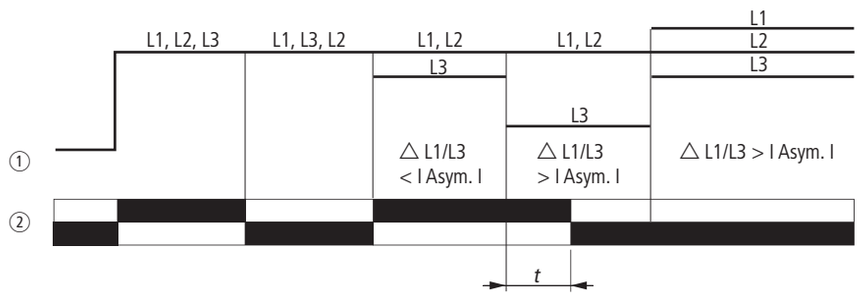
① voltage supply A1-A2
② U_{max}
③ Hysteresis – 5 %
④ Hysteresis + 5 %
⑤ U_{min}
⑥ make contact 1: 15-18, 15-16
⑦ make contact 2: 25-28, 25-26

t = Pick-up delay time only valid for monitoring over/under voltage

Flow Chart Diagrams

EMR4 measuring and moitoring relays

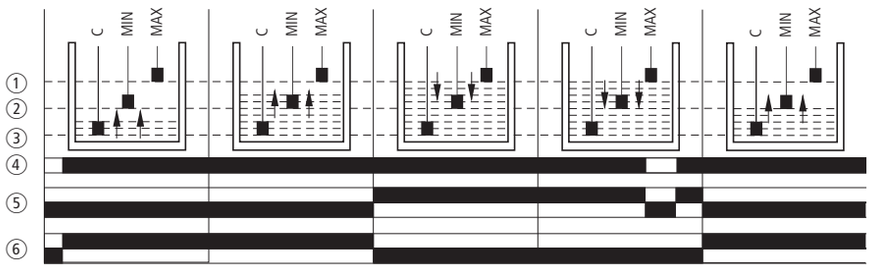
EMR4-A... phase imbalance monitoring relay



① level L1, L2, L3
② make contact 1: 15-18, 15-16

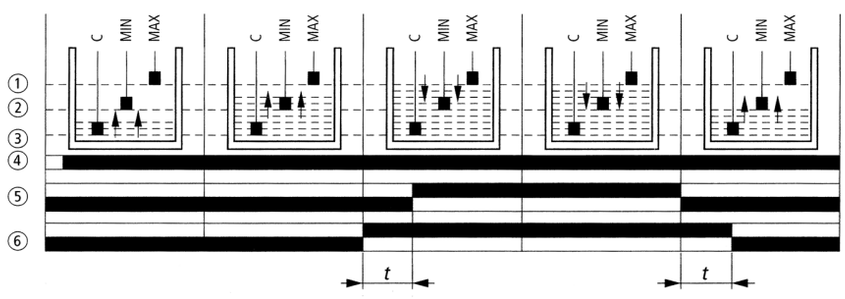
t =Pick-up delay time only actuated during assymetry, preset at 500 ms

EMR4-N100... level monitoring relay



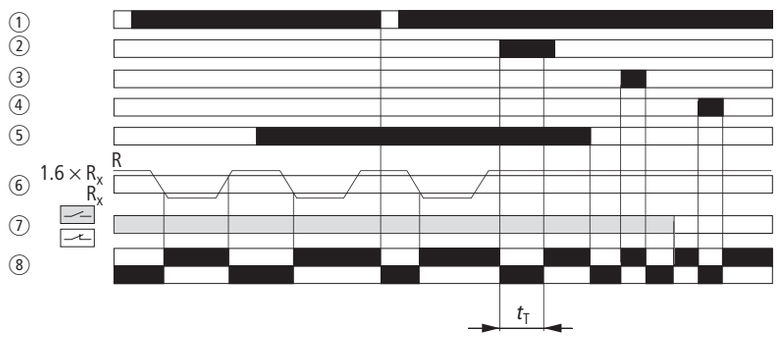
① max. level
② min. level
③ refernece electrode C
④ supply voltage A1-A2
⑤ function dry run protection „DOWN": 11-14, 11-12
⑥ function overflow protection „UP": 11-14, 11-12

EMR4-N500... level monitoring relay



① max. level
② min. level
③ reference electrode C
④ supply voltage A1-A2
⑤ function pick-up delay ⊠ 15-18, 25-28, 15-16, 25-26
⑥ function drop-out delay ■ 15-18, 25-28, 15-16, 25-26

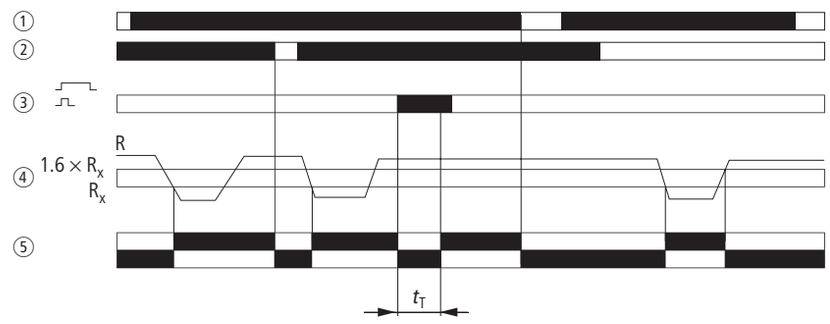
EMR4-RDC... insulation monitoring relay



① supply voltage A1-A2
② front button: reset L+ and L–/test L+
③ front button: test L– remote connection S3-S4: test L–
④ remote connection S3-S1: test L+
⑤ remote connection S3-S2: reset,
⑥ insulation resistance *R* of the circuit, set response value R_x
⑦ front switch ⊏: load current, ⊏: no load current
⑧ Make contact: 15-18, 15-16

t_T = Test time approx. 1 s

EMR4-RAC... insulation monitoring relay



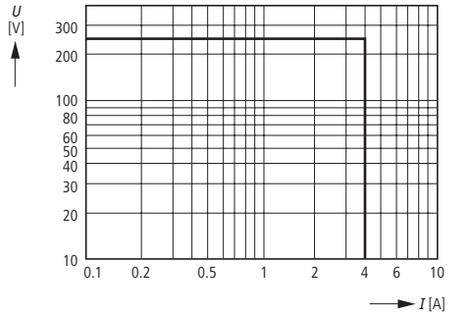
① supply voltage A1-A2
② remote connection S1-S2: storing, reset,
③ front button: reset, test remote connection S1-⏚: reset, test
④ insulation resistance of the circuit set response value – R_x
⑤ make contact: 15-18, 15-16

t_T = test time > approx. 300 ms

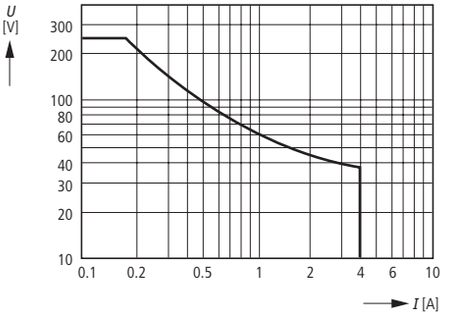
Tripping Characteristics
EMR4 measuring and monitoring relays

Load limit curves, module size 22,5 mm

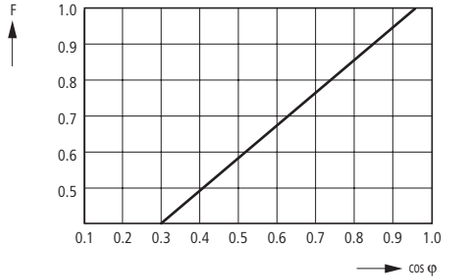
AC load (resistive)



DC load (resistive)

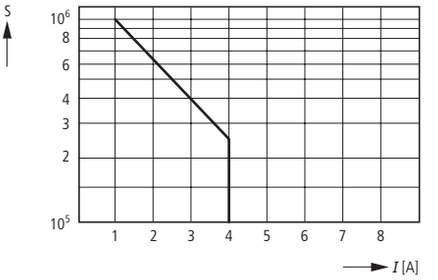


Reduction factor at inductive AC load



reduction factor F
at inductive load

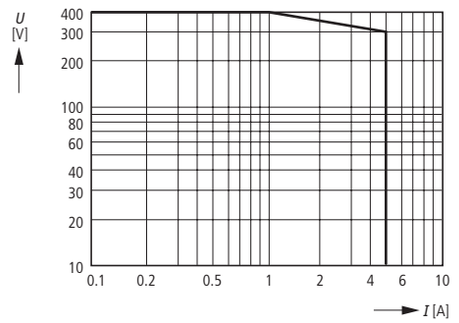
Contact lifespan



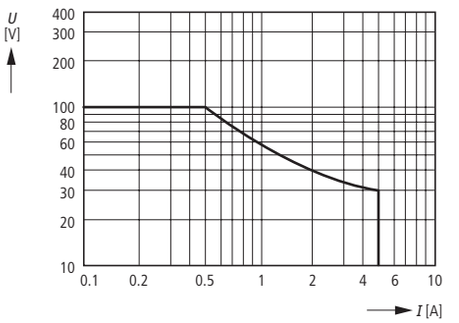
contact lifespan
operations S
220 V 50 Hz AC-1
360 operations/h

Load limit curves: module size 45 mm

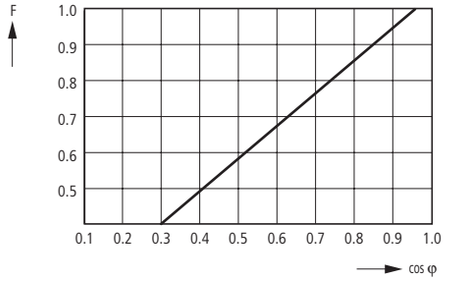
AC load (resistive)



DC load (resistive)

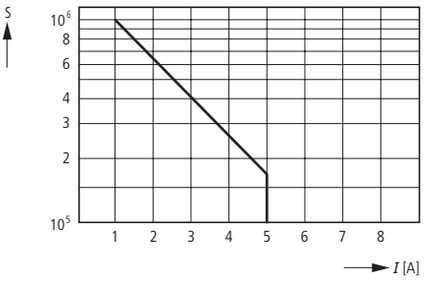


Reduction factor at inductive AC load



reduction factor F
at inductive load

Contact lifespan



contact lifespan
operations S
220 V 50 Hz AC-1
360 operations/h

Overload capability of EMR4-I...

	Current measuring range	Input resistance R_i	Terminal assignment/ measurement input	Continuous overload capability	Overload capability for t < 1 s
EMR4-I1...	3...30 mA 10...100 mA 0,1...1 A	33 Ω 10 Ω 1 Ω	B1-C B2-C B3-C	50 mA 150 mA 1,5 A	300 mA 1 A 10 A
EMR4-I15...	0,3...1,5 A 1...5 A 3...15 A	0,06 Ω 0,018 Ω 0,006 Ω	B1-C B2-C B3-C	2 A 7 A 20 A	15 A 50 A 100 A

Notes

DIL ER, DIL R Industrial Control Relays
Technical Data

				DIL ER(-C) ... DIL E(-C)	DIL R(-C) ... DIL(-C)
General					
Standards				UL, CSA, IEC/EN 60 947, VDE 0660, CE	
Mechanical lifespan					
AC operated	Operations		$\times 10^6$	10	20
DC operated	Operations		$\times 10^6$	20	20
Max. switching frequency, mechanical			Ops./h	9000	7000
Climatic proofing				Damp heat, constant to IEC 60 068-2-3 Damp heat, cyclical to IEC 60 068-2-30	
Ambient temperature					
open	min./max.		°C	–25/+50	–25/+50
enclosed	min./max.		°C	–25/+40	–25/+40
Mounting position				as required, except vertical with A1/A2 at bottom	as required, except hanging upside down
Mechanical shock resistance					
Sinusoidal impulse 10 ms					
Basic device	N.O./N.C. contact		g	10/8	–
Basic device with auxiliary contact module	N.O./N.C. contact		g	10/8	–
Sinusoidal impulse 20 ms					
Basic device	N.O./N.C. contact		g	–	10/6
Basic device with auxiliary contact module	N.O./N.C. contact		g	–	10/6
Degree of protection				IP 20	IP 20 (DIL R) IP 00 (... DIL)
Finger-safe, back of hand safe to VDE 0106, part 100				yes	
Dimensions				→ page 02/059	→ page 02/060
Weight					
AC operated			kg	0.17	→ page 14/020
DC operated			kg	0.2	→ page 14/020
Terminal capacity					
solid			mm^2	1 × (0.75 – 2.5)	1 × (0.75 – 4)
			mm^2	2 × (0.75 – 2.5)	2 × (0.75 – 4)
flexible with ferrule to DIN 46 228			mm^2	1 × (0.75 – 1.5)	1 × (0.75 – 2.5)
			mm^2	2 × (0.75 – 1.5)	2 × (0.75 – 2.5)
solid or stranded	min.		AWG	18	18
	max.		AWG	14	12
Terminal screw				M3.5	M3.5
Pozidriv screwdriver	size			2	2
Standard screwdriver			mm	0.8 × 5.5	0.8 × 5.5
			mm	1 × 6	1 × 6
Tightening torque	max.		Nm	1.2	1.2
Cage clamp terminals					
solid			mm^2	1 × (1.0 – 2.5)	1 × (1.0 – 2.5)
			mm^2	2 × (1.0 – 2.5)	2 × (1.0 – 2.5)
flexible with ferrule to DIN 46 228			mm^2	1 × (1.0 – 2.5)	1 × (1.0 – 2.5)
			mm^2	2 × (1.0 – 2.5)	2 × (1.0 – 2.5)
Standard screwdriver			mm	0.6 × 3.5	0.6 × 3.5

DIL ER, DIL R Industrial Control Relay
Technical Data

				DIL ER(-C) ... DIL E(-C)	DIL R(-C) ... DIL(-C)
Contacts, IEC Data (EN 60 947)					
Positively driven contacts to ZH 1/457, including auxiliary contact module				yes	yes
Rated impulse withstand voltage U_{imp}			V	6000	6000
Overvoltage category / pollution degree				III/3	III/3
Rated insulation voltage U_i			V AC	690	690
Rated operational voltage U_e			V AC	600	500
Safe isolation to IEC 536 between coil and auxiliary contacts, and between the auxiliary contacts			V AC	300	440
Rated operational current I_e					
AC-15	220/240 V		A	6 (4)[1]	6
	380/415 V		A	3 (2)[1]	4
	500 V		A	1.5	1.5
DC-13[2]					
Above 110V and at L/R > 15ms: it is essential that an arc-quenching device (RC suppressor) be used in parallel with the contacts. C: 1µF, R: 0.5 Ω in series					
L/R ≤15 ms: e.g. contactor coils, solenoid valves, DC motors					
Contacts in series					
1	24 V		A	2.5	10
2 (1)	60 V		A	2.5	10 (6)
3 (1)	110 V		A	1.5	6 (3)
3 (1)	220 V		A	0.5	5 (1)
L/R ≤ 50 ms: e.g. magnetic clutches, solenoid brakes					
Contacts in series					
2	24 V		A	–	6
2	60 V		A	–	6
3 (1)	110 V		A	–	3 (1.5)
3 (1)	220 V		A	–	2 (1)
Control circuit reliability U_e = 24 V					
U_{min} = 17 V, I_{min} = 5.4 mA	Fault probability		H_F	< 10^{-8}, < 1 fault in 100 million operations	
Conv. thermal current I_{th}			A	10	16
Component lifespan U_e 240 V					
AC-15				→ page 02/029	→ page 02/028
DC-13					
L/R 50 ms: 2 contacts in series at I_e 0.5 A	operations		× 10^6	0.15	→ page 02/028
Short-circuit rating when taken directly from mains or transformer > 1000 VA; without welding					
Max. overcurrent protective device (fuseless)	220/240 V		PKZM 0	4	4
	380/415 V		PKZM 0	4	2.4
	220/230 V		FAZ-C	–	4
Maximum fuse	500 V		A gL/gG	6	16
	500 V		A fast	10	–
Current heat loss at I_{th}					
per contact	AC operated		W	0.2	0.8
	DC operated		W	0.3	0.8
Contacts, UL/CSA data					
Pilot duty				A 600, P 300	A 600, P 300

Notes

[1] Auxiliary contact module

[2] Make and break conditions to DC-13, time constant as stated

DIL ER, DIL R Industrial Control Relays
Technical Data

				DIL ER(-C) ... DIL E(-C)	DIL R(-C) ... DIL(-C)
Magnet systems					
Voltage tolerance (U_C = rated control voltage)					
AC operated					
Single voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz					
	Pick-up		× U_c	0.8 - 1.1	0.8 - 1.1
Dual-frequency coil ... V, 50/60 Hz	Pick-up		× U_c	0.85 - 1.1	0.85 - 1.1
DC operated [1]	Pick-up		× U_c	0.85 - 1.3	0.85 - 1.1
without auxiliary contact module	Pick-up		× U_c	0.7 - 1.3	–
Power consumption					
AC operated					
Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz					
	Pull-in		VA/W	25/22	67/52
	Sealing		VA/W	4.6/1.3	8.5/2.5
Dual-frequency coil					
... V, 50/60 Hz at 50 Hz	Pull-in		VA/W	30/26	–
	Sealing		VA/W	5.4/1.6	–
... V, 50/60 Hz at 60 Hz	Pull-in		VA/W	29/24	–
	Sealing		VA/W	3.9/1.1	–
DC operated	Pull-in = sealing		W	2.6	9.5
Duty factor			% DF	100	100
Switching times at 100 % U (approximate values)					
AC operated	closing time		ms	14 – 21	22
N.O. contact	opening time		ms	8 – 18	14
with auxiliary contact module	max. closing time		ms	45	–
DC operated	closing time		ms	26 – 35	38
N.O. contact	opening time		ms	15 – 25	9
with auxiliary contact module	max. closing time		ms	70	–

Notes [1] Smoothed DC or three-phase bridge rectifier required

TP Timer Modules, V Latching Modules, VS Interface Modules
Technical Data

				TPE11DIL TPD11DIL	VDIL	VS1DIL VS2DIL	ETS4-VS3
General							
Standards				UL, CSA, IEC/EN 60 947, VDE 0660, CE			
Mechanical lifespan							
AC operated	operations		× 10^6	1	5	–	–
DC operated	operations		× 10^6	1	1	10	30
Max. operating frequency, mechanical							
AC operated			Ops./h	3600	1500	–	–
DC operated			Ops./h	3600	1500	9000	72000
Climatic proofing				Damp heat, constant, to IEC 60 068-2-3 Damp heat, cyclical, to IEC 60 068-2-30			
Ambient temperature							
open	min./max.		°C	–25/+50	–25/+50	–25/+50	–25/+60
enclosed	min./max.		°C	–25/+40	–25/+40	–25/+40	–25/+45
Mounting position				as required, except hanging upside down [1]	as required	as required	as required
Mechanical shock resistance (sinusoidal shock 20ms)							
	N.O./N.C. contact		g	10/6	–	10/–	10/–
	mechanical latching		g	–	20	–	–
Degree of protection				IP 00	IP 00	IP 00	IP 20
Finger safe, back of hand safe to VDE 0106, part 100				yes			
Dimensions				→ page 02/060	→ page 02/059	→ page 02/059	→ page 02/060
Weight			kg	0.08	0.1	0.04 (VS1) 0.05 (VS2)	0.09
Terminal capacity							
solid			mm^2	1 × (0.5 – 2.5)	1 × (0.5 – 2.5)	1 × (0.75 – 4)	1 × (0.75 – 2.5)
			mm^2	2 × (0.5 – 2.5)	2 × (0.5 – 2.5)	2 × (0.75 – 4)	2 x (0.75 – 1.5)[2]
flexible with ferrule to DIN 46 228			mm^2	1 × (0.5 – 1.5)	1 × (0.5 – 1.5)	1 × (0.75 – 2.5)	1 × (0.75 – 2.5)
			mm^2	2 × (0.5 – 0.75)	2 × (0.5 – 0.75)	2 × (0.75 – 2.5)	2 × (0.75 – 1.5)[2]
solid or stranded	min.		AWG	18	18	18	18
	max.		AWG	14	14	12	14
Terminal screw				M3	M3	M3.5	M3,5
Pozidriv screwdriver			size	2	2	2	2
Standard screwdriver			mm	0.8 × 5.5	0.8 × 5.5	0.8 × 5.5	0.8 × 5.5
			mm	1 × 6	1 × 6	1 × 6	1 × 6
Tightening torque	max.		Nm	1.2	1.2	1.2	1.2

Notes

[1] DIL R ... -G + TPD11 DIL, do not mount vertically

[2] Use equal cross-sections

TP Timer Modules, V Latching Modules, VS Interface Modules
Technical Data

				TPE11DIL TPD11DIL	VDIL	VS1DIL VS2DIL	ETS4-VS3
Contacts, IEC Data (EN 60 947)							
Positively driven contacts to ZH 1/457, including auxiliary contact module				yes	–	–	–
Rated impulse withstand voltage U_{imp}			V	6000	8000	4000	6000
Overvoltage category / pollution degree				III/3	III/3	III/2	III/3
Rated insulation voltage U_i			V AC	690	690	440	440
Rated operational voltage U_e			V AC	500	415	415	440
Rated operational current I_e							
AC-15	220/240 V		A	4	–	1.5	2
	380/415 V		A	4	–	1	2
DC-13 [1]							
Above 110V and at L/R >15 ms: it is essential that an arc-quenching device (RC suppressor) be used in parallel with the contacts. C: 1 µF, R: 0,5 Ω in series							
L/R ≤ 15 ms: e.g. contactor coils, solenoid valves, DC motors							
Contacts in series							
1	24 V		A	10	–	1	2.6
1	60 V		A	6	–	1	1.0
1	110 V		A	3	–	1	0.6
1	220 V		A	1	–	1	0.2
L/R ≤ 50 ms: e.g. magnetic clutches, solenoid brakes							
Contact in series							
1	24 V		A	4	–	0.5	2.0
1	60 V		A	4	–	0,5	0,6
1	110 V		A	1	–	0.5	0.08
1	220 V		A	0.5		0.5	0.08
L/R ≤ 300 ms							
1	24 V		A	–	–	0.2	0.6
1	60 V		A	–	–	0.2	0.2
1	110 V		A	–	–	0.2	0.08
1	220 V		A	–	–	0.2	0.03
Control circuit reliability U_e = 24 V, U_{min} = 17 V, I_{min} = 5,4 mA		Fault probability	H_F	< 10^{-8}, < 1 fault in 100 million operations			
Conv. thermal current I_{th}			A	10	–	8	6
Component lifespan at I_e 0.1 A/1.2 A							
AC-15	230 V	operations	× 10^6	–	–	8/–	7/1
DC-13	230 V	operations	× 10^6	–	–	0.85/–	–
Short-circuit rating when taken directly from mains or transformer > 1000VA; without welding							
Max. overcurrent protective device, (fuseless)	220/240 V		PKZM 0	2.5	–	–	–
	380/415 V		PKZM 0	1.6	–	–	–
Maximum fuse	500 V		A gL/gG	6	–	–	–
			A fast	–	–	4	4
Current heat loss at I_{th}							
per contact		max.	W	0.3	–	–	–
Contacts, UL/CSA Data							
Pilot duty				A 300	–	B 300 / R 300	B 300

Notes

[1] Making and breaking conditions to DC-13, L/R, time constant as stated

TP Timer Modules, V Latching Modules, VS Interface Modules
Technical Data

			TPE11DIL TPD11DIL	VDIL	VS1DIL VS2DIL	ETS4-VS3
Magnet systems						
Voltage tolerance						
AC operated						
Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz	unlatching	× U_c	–	–	0,8 – 1.1	–
Dual-voltage coil ... V, 50/60 Hz	unlatching	× U_c	–	–	0.8 – 1.1	–
DC operated [1]	pick-up	× U_c	–	–	0.75 – 1.25	0.85 – 1.2
	unlatching	× U_c	–	0.85 – 1.1	–	–
Power consumption						
AC operated						
Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz	pull-in	VA/W	–	13/12	–	–
	sealing	VA/W	–	5/2	–	–
DC operated	pull-in = sealing	W	–	26	0.27	0.6
Duty factor		% DF	100	100 at AC 200 ms at DC	100	100
Switching times 100 % U (approximate values)						
DC operated	closing delay	ms	–	–	6	7
	opening delay	ms	–	–	2.5	3
Minimum command time						
AC operated 50 Hz	latching	ms	–	35	–	–
	unlatching	ms	–	25	–	–
DC operated	latching	ms	–	45	–	–
	unlatching	ms	–	25	–	–
Repetition accuracy		%	< 3	–	–	–
Time deviation in relation to ambient temperature based on 20 °C		%/K	0.2	–	–	–
Long-time deviation		%	15	–	–	–
Recovery time (after 100% time delay)		ms	20	–	–	–
Mechanical lifespan	coil 50/60 Hz		at 50Hz, approximately 30% less than shown under "General Technical Data"			

Notes [1] smoothed DC or three-phase bridge rectifier

DIL ET, ETR 4 Timing Relays
Technical Data

				DIL ET-A	ETR 4-A
General					
Standards				CSA, UL, IEC/EN 60 255, VDE 0435, IEC/EN 60 947, CE	
Mechanical lifespan					
AC operated		operations	× 10^6	30	30
DC operated		operations	× 10^6	30	30
Climatic proofing				Damp heat, constant, to IEC 60 068-2-3 Damp heat, cyclical, to IEC 60 068-2-30	
Ambient temperature					
open		min./max.	°C	–20/+60	–25/+60
enclosed		min./max.	°C	–20/+45	–20/+45
Mounting position				as required	as required
Mechanical shock resistance (sinusoidal shock 20 ms)		N.O. contact	g	4	4
Degree of protection		terminals		IP 20	IP 20
Dimensions				→ page 02/060	→ page 02/059
Weight			kg	0.09	0.1
Terminal capacity			AWG	14 ... 18	14 ... 18
Contacts, IEC Data (EN 60 947)					
Rated impulse withstand voltage U_{imp}			V AC	6000	6000
Overvoltage category / pollution degree				III/2	III/3
Rated insulation voltage U_i			V AC	600	600
Rated operational voltage U_e			V AC	440	440
Safe isolation to IEC 536 between coil and auxiliary contacts, and between the auxiliary contacts			V AC	250	250
Making capacity					
AC-14	cos φ = 0,3	440 V	A	48	48
AC-15	cos φ = 0,3	220 V	A	50	50
DC-11	L/R ≤ 40 ms		× I_e	1.1	1.1
Breaking capacity					
AC-14	cos φ = 0,3	440 V	A	3	3
AC-15	cos φ = 0,3	220 V	A	3	3
DC-11	L/R ≤ 40 ms		× I_e	1.1	1.1
Rated operational current I_e					
AC-14		440 V	A	3	3
AC-15		220 V	A	3	3
DC-11[1] Above 110V and at L/R > 15 ms: it is essential that an arc-quenching device (RC suppressor) be used in parallel with the contacts. C: 1 µF, R: 0,5 Ω in series					
L/R ≤ 15 ms: e.g. contactor coils, solenoid valves, DC motors					
24 V			A	1.5	1.5
L/R ≤ 50 ms:			A	1.2	1.2
Conventional free air thermal current I_{th}			A	6	6
Short-circuit rating[2] without welding					
Maximum fuse			A gL/gG	6	6
Contacts, UL/CSA Data					
Pilot duty				B 300	B 300

Notes

[1] Making and breaking conditions to DC-11, L/R time constant as stated

[2] When taken directly from mains or transformer > 1000 VA

DIL ET, ETR 4 Timing Relays
Technical Data

			DIL ET-A	ETR 4-A
Magnet system				
Voltage tolerance				
AC operated 50/60 Hz				
	pick-up		→ page 02/015	→ page 02/017
DC operated when taken directly from mains or transformer > 1000 VA				
	pick-up		→ page 02/015	→ page 02/017
Power consumption				
AC operated 50/60 Hz				
	pull-in	VA	2	2
	sealing	VA	2	2
DC operated				
	pull-in	W	1,8	1,8
	sealing	W	1,8	1,8
Duty factor		% DF	100	100
Max. operating frequency		Ops./h	4000	4000
Min. command time	AC/DC	ms	50/30	50/30
Voltage variation		% ΔU	0.01	0.01
Variation due to temperature fluctuation based on 20 °C			0.025	0.025
Repetition accuracy		%	0.1	0.1
Recovery time (after 100% time delay)		ms	70	70
Contact changeover time t_u		ms	–	4 (50)[1)]

Notes [1)] ETR 4-51

ESR Electronic Safety Relays
Technical Data

				ESR3-NO-31	ESR4-NO-31	ESR4-NO-21
General						
Standards				UL, CSA, IEC/EN 60 947, VDE 0660, IEC/EN 60 255, CE		
Mechanical lifespan		operations	× 6	10	10	10
Max. operating frequency			Ops./h	3600	3600	3600
Climatic proofing				Damp heat DIN 50 016: 24 hour cycle, 23 °C, 83% relative humidity, 40 °C, 92% relative humidity		
Ambient temperature		min./max.	°C	–25/+55	–25/+55	–25/+55
Storage temperature		min./max.	°C	–25/+70	–25/+70	–25/+70
Mounting position				as required	as required	as required
Vibration resistance			g	5, to IEC/EN 60 068-2-6, frequency: 10 – 55 Hz, amplitude: 0,35 mm		
Degree of protection						
	Enclosure			IP 40	IP 40	IP 40
	Terminals			IP 20	IP 20	IP 20
Protection against direct contact from the front when actuated by perpendicular test finger (IEC 536)				finger and back-of-hand proof		
Dimensions				page 02/061	page 02/061	page 02/061
Weight			kg	0.36	0.2	0.2
Terminal capacity						
	flexible with ferrule		mm^2	1 × (0.5 – 1.5) 2 × (0.5 – 1.5)	1 × (0.25 – 2.5) 2 × (0.25 – 0.5)	1 × (0.25 – 2.5) 2 × (0.25 – 0.5)
	solid		mm^2	1 × (0.75 – 2.5) 2 × (0.75 – 2.5)	1 × (0.14 – 2.5) 2 × (0.14 – 0.75)	1 × (0.14 – 2.5) 2 × (0.14 – 0.75)
	solid or stranded		AWG	-	18 - 16	18 - 16
Terminal screws						
	Pozidriv screwdriver		size	2	–	–
	Standard screwdriver		mm	–	0,6 × 3,5	0,6 × 3,5
Tightening torque			Nm	1	0,6	0,6
Main circuits						
Rated impulse withstand voltage U_{imp}			V AC	4000	4000	4000
Overvoltage category / pollution degree		outside		III/3	III/3	III/ 3
		inside		III/2	III/2	III/2
Rated insulation voltage U_i			V AC	300	300	300
Rated operational voltage U_e			V AC/DC	230	230	230
Rated operational current I_e						
	AC-15	230 V	A	6	6	6
	DC-13	24 V (360 Ops/h)	A	6	6	6
		24 V (3600 Ops/h)	A	3	3	3
Max. summation current of all poles			A	18	12	12
Short-circuit protection						
	Fuse		gG/gL A	6	6	6

ESR Electronic Timing Relays
Technical Data

ESR4-NV3(30)-30 ESR4-NT30-30	ESR4-NM-21	ESR4-NZ-21	ESR4-NE-42	ESR4-VE3-42
UL, CSA, IEC/EN 60 947, VDE 0660, IEC/EN 60 255, CE				
10	10	10	10	10
3600	3600	3600	3600	3600
Damp heat 24 DIN 50 016: 24 hour cycle, 23 °C, 83% relative humidity, 40 °C, 92% relative humidity				
–25/+55	–25/+55	–25/+55	–25/+55	–25/+55
–25/+70	–25/+70	–25/+70	–25/+70	–25/+70
as required	as required	as required	as required	as required
5, to IEC/EN 60 068-2-6, frequency: 10 – 55 Hz, amplitude: 0,35 mm				
IP 40	IP 40	IP 40	IP 40	IP 40
IP 20	IP 20	IP 20	IP 20	IP 20
finger and back-of-hand proof				
page 02/061	page 02/061	page 02/061	page 02/061	page 02/061
0.2	0.2	0.2	0.2	0.2
1 × (0.25 – 2.5) 2 × (0.25 – 0.5)	1 × (0.25 – 2.5) 2 × (0.25 – 0.5)	1 × (0.25 – 2.5) 2 × (0.25 – 0.5)	1 × (0.25 – 2.5) 2 × (0.25 – 0.5)	1 × (0.25 – 2.5) 2 × (0.25 – 0.5)
1 × (0.14 – 2.5) 2 × (0.14 – 0.75)	1 × (0.14 – 2.5) 2 × (0..14 – 0.75)	1 × (0.14 – 2.5) 2 × (0..14 – 0.75)	1 × (0.14 – 2.5) 2 × (0.14 – 0.75)	1 × (0.14 – 2.5) 2 × (0.14 – 0.75)
18 - 16	18 - 16	18 - 16	18 - 16	18 - 16
–	–	–	–	–
0.6 × 3.5	0.6 × 3.5	0.6 × 3.5	0.6 × 3.5	0.6 × 3.5
0.6	0.6	0.6	0.6	0.6
4000	4000	4000	4000	4000
III/3	III/3	III/3	III/3	III/3
III/2	III/2	III/2	III/2	III/2
300	300	300	300	300
230	230	230	230	230
6	6	6	6	6
6	6	6	6	6
3	3	3	3	3
12	12	12	12	12
6	6	6	6	6

ESR Electronic Safety Relays
Technical Data

				ESR3-NO-31	ESR4-NO-31	ESR4-NO-21
Magnet system						
Actuating voltage U_c			V AC	230	24	24
			V DC	–	24	24
Voltage tolerance		pick-up	× U_c	0.85 – 1.1	0.85 – 1.1	0.85 – 1.1
Power consumption						
	AC operated 50/60 Hz		VA/W	3.2/2.5	2.4/1.4	3.5/2.1
	DC operated		W	–	1.3	1.5
Control circuit						
Rated output voltage			V DC	≤ 24	≤ 24	≤ 24
No-load voltage			V DC	≤ 40	–	–
Rated current			mA	40	40	50
Max. ohmic resistance of conductor			Ω	70	70	70
Short-circuit current			A	1	1.4	2.2
Protection				short-circuit protected transformer	PTC resistor	PTC resistor
Response time			ms	–	2000	2000
Recovery time			ms	–	3000	3000
Inputs						
Rated current			mA	Y13, Y14: 40 Y12, Y31: 15	Y2: 40	S12: 30 S31, S22: 20
Response time t_{A1} (with reset monitoring)			ms	80	–	80
Response time t_{A1} (without reset monitoring)			ms	500	50	60
Reset time t_R/t_{R1}			ms	50/100	40	40/100
Min. contact closing time t_M			ms	50	50	50
Recovery time t_W			ms	500	< 50	500
Synchronous monitoring time t_S			ms	–	–	–
EMC						
Emitted interference				to EN 50 081-1 and EN 50 081-2		
Noise immunity				to EN 50 082-2		

ESR Electronic Timing Relays
Technical Data

ESR4-NV3(30)-30 ESR4-NT30-30	ESR4-NM-21	ESR4-NZ-21	ESR4-NE-42	ESR4-VE3-42
–	–	24	24	–
24	24	24	24	24
0.85 – 1.1	0.85 – 1.1	0.85 – 1.1	0.85 – 1.1	0.85 – 1.1
–	–	2.7/1.6	2.7/1.5	–
2.5	2.7	1.5	1.0	1.0
≤ 24	≤ 24	≤ 24	–	–
–	–	–	–	–
50	50	60	–	–
70	70	70	–	–
2.2	0.1	1	–	–
PTC resistor	Electronic protection	PTC resistor	–	–
2000	5	2000	–	–
3000	5	3000	–	–
S12, S22, S31: 25 S34, S35: 40	S12: 30 S31, S22: 20	Y2: 60 Y11, Y21: 60	–	–
30	80	–	–	–
200	60	40	25	25
25/adjustable	40/100	< 50	15	–
200	50	–	–	–
500	500	< 250	–	–
–	–	< 500	–	–
to EN 50 081-1 and EN 50 081-2				
to EN 50 082-2				

Notes

EMR4-I Current Monitoring Relays
Technical Data

			EMR4-I1-2-A	EMR4-I15-2-A	EMR4-I15-2-B
General					
Standards			IEC/EN 60 255-6, EN 61 557, UL , CSA, GL		
Mechanical lifespan	operations	×10⁶	30	30	30
Climatic proofing			Damp heat, cyclical to IEC 60 068-2-30: 24-h cycle, 55 °C, 93 % relative humidty, 96 h		
Ambient temperature	min./max.	°C	–25/+65	–25/+65	–25/+65
Storage temperature	min./max.	°C	–40/+85	–40/+85	–40/+85
Mounting possition			as required	as required	as required
Mechanical shock resistance		g	10	10	10
Degree of protection	terminals		IP20	IP20	IP20
Dimensions			→ page 02/061	→ page 02/061	→ page 02/061
Weight	ca.	kg	0,3	0,3	0,3
Terminal capacity					
flexible with ferrule		mm²	2 × 2,5	2 × 2,5	2 × 2,5
solid		mm²	2 × 2,5	2 × 2,5	2 × 2,5
Standard screwdriver		mm	5,5 × 0,8	5,5 × 0,8	5,5 × 0,8
Tightening torque		Nm	0,5 – 0,8	0,5 – 0,8	0,5 – 0,8
Mounting			Snap-on to DIN rail to EN 50 022		
Contacts					
Rated impulse withstand voltage U_{imp}		V AC	4000	4000	4000
Overvoltage category / pollution degree			III/3	III/3	III/3
Rated insulation voltage U_i		V AC	400	400	400
Voltage supply					
Supply voltages		V AC/DC	24 – 240	24 – 240	–
		V AC	–	–	220 – 240
Voltage pick-up range		× U_c	0,85 – 1,1	0,85 – 1,1	0,85 – 1,1
Power consumption		VA	2	2	2
Rated frequency		Hz	50 – 60	50 – 60	50 – 60
Duty factor		% DF	100	100	100
Time circuit					
On-delay	adjustable	s	0,05 – 1 and 1,5 – 30	0,05 – 1 and 1,5 – 30	0,05 – 1 and 1,5 – 30
Time fault in supply voltage		%	≦ 0,5	≦ 0,5	≦ 0,5
Time fault in temperature range		%/°C	≦ 0,06	≦ 0,06	≦ 0,06
Measuring circuits					
Input	B1-C	A	0,003 – 0,03	0,3 – 1,5	0,3 – 1,5
	B2-C	A	0,01 – 0,1	1 – 5	1 – 5
	B3-C	A	0,1 – 1	3 – 15	3 – 15
Hysteresis		%	5 – 30	5 – 30	5 – 30
Max. measuring cycle		ms	80	80	80
Termperature fault		%/°C	≦ 0,06	≦ 0,06	≦ 0,06
Fault in supply voltage		%	≦ 0,5	≦ 0,5	≦ 0,5
Status indication					
Supply voltage	LED		green	green	green
Output relay energized	LED		yellow	yellow	yellow
Current circuits relay outputs					
Rated operational voltage U_e		V AC	400	400	400
Rated operational current I_e AC-12	at 230 V	A	5	5	5
Rated operational current I_e AC-15	at 230 V	A	3	3	3
Rated operational current I_e DC-12	at 24 V	A	5	5	5
Rated operational current I_e DC-13	at 24 V	A	2,5	2,5	2,5
Max. electrical lifespan (AC-12/230 V/5 A)	operations	× 10⁶	0,1	0,1	0,1
Short-circuit resistance, max. fuse	fast/gL	A	5	5	5
EMC					
EMC compatibility			IEC/EN 61 000-6-2		
ESD			IEC/EN 61 000-4-2 Level 3		
HF immunity			IEC/EN 61 000-4-3 Level 3		
Burst			IEC/EN 61 000-4-4 Level 3		
Surge			IEC/EN 61 000-4-5 Level 4		
HF conducted			IEC/EN 61 000-4-6 Level 3		

EMR4-F Phase Sequence Relays
Technical Data

			EMR4-F500-2
General			
Standards			IEC/EN 60 255-6, EN 61 557, UL , CSA, GL
Mechanical lifespan	operations	$\times 10^6$	30
Climatic proofing			Damp heat, cyclical to IEC 60 068-2-30: 24-h cycle, 55 °C, 93 % relative humidity, 96 h
Ambient temperature	min./max.	°C	–20/+60
Storage temperature	min./max.	°C	–40/+80
Mounting position			as required
Mechanical shock resistance		g	10
Degree of protection	terminals		IP20
Dimensions			→ page 02/061
Weight	ca.	kg	0,15
Terminal capacity			
flexible with ferrule		mm^2	2 × 2,5
solid		mm^2	2 × 2,5
Standard screwdriver		mm	5,5 × 0,8
Tightening torque		Nm	0,5 – 0,8
Mounting			Snap-on to DIN rail to EN 50 022
Contacts			
Rated impulse withstand voltage U_{imp}		V AC	4000
Overvoltage category / pollution degree			III/3
Rated insulation voltage U_i		V AC	400
Voltage supply			
Supply voltage	L1, L2, L3	V AC	200 – 500
Voltage pick-up range		× U_c	0,85 – 1,1
Power consumption		VA	15
Rated frequency		Hz	50 – 60
Duty factor		% DF	100
Measuring circuits			
Monitoring voltage U_N	L1, L2, L3	V AC	200 – 500
Frequency		Hz	50 – 60
Max. measuring cycle.		ms	500
Termperature fault		%/°C	≦ 0,06
Fault within the supply voltage tolerance		%	≦ 0,5
Status indication			
Output relay energized	LED		yellow
Current circuits relay outputs			
Rated operational voltage U_e		V AC	500
Rated operational current I_e AC-12	at 230 V	A	4
Rated operational current I_e AC-15	at 230 V	A	3
Rated operational current I_e DC-12	at 24 V	A	4
Rated operational current I_e DC-13	at 24 V	A	2
Max. electrical lifespan (AC-12/230 V/4 A)	No. of operations	× 10^6	0,3
Short-circuit resistance, fuse	fast/gL	A	10
EMC			
EMC compatibility			IEC/EN 61 000-6-2
ESD			IEC/EN 61 000-4-2 Level 3
HF immunity			IEC/EN 61 000-4-3 Level 3
Burst			IEC/EN 61 000-4-4 Level 3
Surge			IEC/EN 61 000-4-5 Level 4
HF conducted			IEC/EN 61 000-4-6 Level 3

EMR4-W Phase Monitoring Relays
Technical Data

				EMR4-W500-2-C	EMR4-W500-2-D	EMR4-W580-2-D
General						
Standards				IEC/EN 60 255-6, EN 61 557, UL , CSA, GL		
Mechanical lifespan		operations	× 10^6	30	30	30
Climatic proofing				Damp heat, cyclical to IEC 60 068-2-30: 24-h cycle, 55 °C, 93 % relative humidity, 96 h		
Ambient temperature		min./max.	°C	–25/+65	–25/+65	–25/+65
Storage temperature		min./max.	°C	–40/+85	–40/+85	–40/+85
Mounting position				as required	as required	as required
Mechnical shock resistance			g	10	10	10
Degree of protection		terminals		IP20	IP20	IP20
Dimensions				→ page 02/061	→ page 02/061	→ page 02/061
Weight		approx.	kg	0,3	0,3	0,3
Terminal capacity						
flexible with ferrule			mm^2	2 × 2,5	2 × 2,5	2 × 2,5
solid			mm^2	2 × 2,5	2 × 2,5	2 × 2,5
Standard screwdriver			mm	5,5 × 0,8	5,5 × 0,8	5,5 × 0,8
Tightening torque			Nm	0,5 – 0,8	0,5 – 0,8	0,5 – 0,8
Mounting				Snap-on to DIN rail to EN 50 022		
Contacts						
Rated impulse withstand voltage U_{imp}			V AC	4000	4000	4000
Overvoltage category / Degree of pollution				III/3	III/3	III/3
Rated insulation voltage U_i			V AC	400	400	400
Voltage supply						
Supply voltage			V AC	160 – 300	300 – 500	300 – 500
Voltage pick-up range			× U_c	0,85 – 1,1	0,85 – 1,1	0,85 – 1,1
Power consumption			VA	3	3	3
Rated frequency			Hz	50 – 60	50 – 60	50 – 60
Duty factor			% DF	100	100	100
Time circuit						
On-delay time		adjustable	s	0,1 – 10	0,1 – 10	0,1 – 10
Drop-out delay time		adjustable	s	0,1 – 10	0,1 – 10	0,1 – 10
Time fault in supply voltage			%	≦ 0,5	≦ 0,5	≦ 0,5
Time fault in temperature range			%/°C	≦ 0,06	≦ 0,06	≦ 0,06
Measuring circuits						
Adjustable pick-up value for over/undervoltage		U_{min}/U_{max}	V AC	300 – 380/420 – 500	300 – 380/420 – 500	350 – 430/500 – 580
Hysteresis			%	5	5	5
Max. measuring cycle			ms	80	80	80
Temperature fault			%/°C	≦ 0,06	≦ 0,06	≦ 0,06
Fault within supply voltage			%	≦ 0,5	≦ 0,5	≦ 0,5
Status indication						
Suppl voltage		LED		green	green	green
Output relay energized		LED		yellow	yellow	yellow
Overvoltage	> U	LED		red	red	red
Undervoltage	< U	LED		red	red	red
Phase failure, phase sequence fault	P	LED		red	red	red
Current circuits relay outputs						
Rated operational voltage U_e			V AC	500	500	500
Rated operational current I_e AC-12		at 230 V	A	5	5	5
Rated operational current I_e AC-15		at 230 V	A	3	3	3
Rated operational current I_e DC-12		at 24 V	A	5	5	5
Rated operational current I_e DC-13		at 24 V	A	2,5	2,5	2,5
Max. electrical lifespan (AC-12/230 V/5 A)		No. of operations	× 10^6	0,1	0,1	0,1
Short-circuit protection, fuse		fast/gL	A	5	5	5
EMC						
EMC				IEC/EN 61 000-6-2		
EMC compatibility				IEC/EN 61 000-4-2Level 3		
ESD				IEC/EN 61 000-4-3 Level 3		
HF immunity				IEC/EN 61 000-4-4 Level 3		
Surge				IEC/EN 61 000-4-5 Level 4		
HF conducted				IEC/EN 61 000-4-6 Level 3		

EMR4-A Phase Imbalance Monitoring Relays
Technical Data

			EMR4-A400-1
General			
Standards			IEC/EN 60 255-6, EN 61 557, UL , CSA, GL
Mechanical liifespan	operations	× 10^6	30
Climatic proofing			Damp heat, cyclical to IEC 60 068-2-30: 24-h cycle, 55 °C, 93 % relative humidity, 96 h
Ambient temperature	min./max.	°C	–20/+60
Storage temperature	min./max.	°C	–40/+80
Mounting position			as required
Mechanical shock resistance		g	10
Degree of protection	terminals		IP20
Dimensions			→ page 02/061
Weight	ca.	kg	0,3
Terminal capacity			
flexible with ferrule		mm^2	2 × 2,5
solid		mm^2	2 × 2,5
Standard screwdriver		mm	5,5 × 0,8
Tightening torque		Nm	0,5 – 0,8
Mounting			Snap-on to DIN rail to EN 50 022
Contacts			
Rated impulse withstand voltage U_{imp}		V AC	4000
Overvoltage category / Degree of pollution			III/3
Rated insulation voltage U_i		V AC	400
Voltage supply			
Supply voltage	50 Hz	V AC	380 – 415
Voltage pick-up range		× U_c	0,8 – 1,2
Power consumption		VA	15
Rated frequency		Hz	50
Duty factor		% DF	100
Time circuit			
Pick-up delay, asymmetry indication		ms	500
Time fault in supply voltage		%	≦ 0,5
Time fault in temperature range		%/°C	≦ 0,06
Measuring circuits			
Monitoring voltage U_N	L1, L2, L3	V AC	380 – 415
Frequency		Hz	50
Adjustable asymmetry		%	5 – 15
Switching hysteresis		%	20
Temperature fault		%/°C	≦ 0,06
Fault within the supply voltage tolerance		%	≦ 0,5
Status indication			
Output relay energized	LED		yellow
Current circuits relay outputs			
Rated operational voltage U_e		V AC	500
Rated operational current I_e AC-12	at 230 V	A	4
Rated operational current I_e AC-15	at 230 V	A	3
Rated operational current I_e DC-12	at 24 V	A	4
Rated operational current I_e DC-13	at 24 V	A	2
Max. electrical lifespan (AC-12/230 V/4 A)	No. of operations	× 10^6	0,3
Short-circuit protection, fuse	fast/gL	A	10
EMC			
EMC compatibility			IEC/EN 61 000-6-2
ESD			IEC/EN 61 000-4-2 Level 3
HF immunity			IEC/EN 61 000-4-3 Level 3
Burst			IEC/EN 61 000-4-4 Level 3
Surge			IEC/EN 61 000-4-5 Level 4
HF conducted			IEC/EN 61 000-4-6 Level 3

EMR4-N Level Monitoring Relay
Technical Data

			EMR4-N100-1-B	EMR4-N500-2-B	EMR4-N500-2-A
General					
Standards			IEC/EN 60 255-6, EN 61 557, UL , CSA, GL		
Mechanical lifespan	operations	× 10^6	30	30	30
Climatic proofing			Damp heat, cyclical to IEC 60 068-2-30: 24-h cycle, 55 °C, 93 % relative humidity, 96 h		
Ambient temperature	min./max.	°C	–20/+60	–25/+65	–25/+65
Storage temperature	min./max.	°C	–40/+80	–40/+85	–40/+85
Mounting position			as required	as required	as required
Mechanical shock resistance		g	10	10	10
Degree of protection	terminals		IP20	IP20	IP20
Dimensions			→ page 02/061	→ page 02/061	→ page 02/061
Weight	ca.	kg	0,15	0,3	0,3
Terminal capacity					
flexible with ferrule		mm^2	2 × 2,5	2 × 2,5	2 × 2,5
solid		mm^2	2 × 2,5	2 × 2,5	2 × 2,5
Standard screwdriver		mm	5,5 × 0,8	5,5 × 0,8	5,5 × 0,8
Tightening torque		Nm	0,5 – 0,8	0,5 – 0,8	0,5 – 0,8
Mouting			Snap-on to DIN rail to EN 50 022		
Contacts					
Rated impulse withstand voltage U_{imp}		V AC	4000	4000	4000
Overvoltage category / Degree of pollution			III/3	III/3	III/3
Rated insulation voltage U_i		V AC	400	400	400
Voltage supply					
Supply voltage		V AC	220 – 240	220 – 240	–
		V AC/DC	–	–	24 – 240
Voltage pick-up range		× U_c	0,85 – 1,1	0,85 – 1,1	0,85 – 1,1
Power consumption		VA/W	2,5	3	2
Rated frequency		Hz	50 – 60	50 – 60	50 – 60 DC
Duty factor		%	100	100	100
Time circuit					
On-delay or off-delay time	adjustable	s	–	0,1 – 10	0,1 – 10
Measuring circuit					
Electrode inputs	B1		mass-related electrode	mass-related electrode	mass-related electrode
	B2		Max. distance	Max. distance	Max. distance
	B3		Min. distance	Min. distance	Min. distance
Pick-up sensitivity		kΩ	5 – 100	0,25 – 500	0,25 – 500
Max. voltage of electrodes		V AC	30	20	20
Off-delay value		kΩ	1,5 – 2,3	–	–
Electrode current max.		mA	1	–	–
Max. cable capacity		nF	10	–	–
Max. cable length		m	100	–	–
On-delay	approx.	ms	250	–	–
Status indication					
Voltage supply	LED		green	green	green
Output relay energized	LED		yellow	yellow	yellow
Current circuits relay outputs					
Rated operational voltage U_e		V AC	250	400	400
Rated operational current I_e AC-12	at 230 V	A	4	5	5
Rated operational current I_e AC-15	at 230 V	A	3	3	3
Rated operational current I_e DC-12	at 24 V	A	4	5	5
Rated operational current I_e DC-13	at 24 V	A	2	2,5	2,5
Max. electrical lifespan (AC-12/230 V/5 A)	operations	× 10^6	0,3	0,1	0,1
Short-circuit protection, fuse	fast/gL	A	10	5	5
EMC					
EMC compatibility			IEC/EN 61 000-6-2		
ESD			IEC/EN 61 000-4-2Level 3		
HF immunity			IEC/EN 61 000-4-3 Level 3		
Burst			IEC/EN 61 000-4-4 Level 3		
Surge			IEC/EN 61 000-4-5 Level 4		
HF conducted			IEC/EN 61 000-4-6 Level 3		

EMR4-R Insulation Monitoring Relays
Technical Data

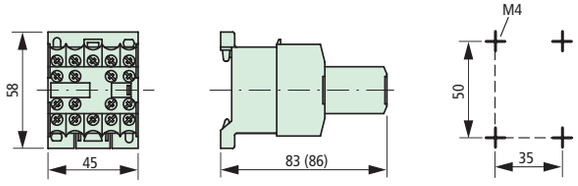
			EMR4-RDC-1-A	EMR4-RAC-1-A
General				
Standards			IEC/EN 60 255-6, EN 61 557, UL , CSA, GL	
Mechanical lifespan	operations	× 10^6	30	30
Climatic proofing			Damp heat, cyclical to IEC 60 068-2-30: 24-h cycle, 55 °C, 93 % relative humidity, 96 h	
Ambient temperature	min./max.	°C	–25/+65	–25/+65
Storage temperature	min./max.	°C	–40/+85	–40/+85
Mounting position			as required	as required
Mechanical shock resistance		g	10	10
Degree of protection	terminals		IP20	IP20
Dimensions			→ page 02/061	→ page 02/061
Weight	ca.	kg	0,3	0,3
Terminal capacity				
flexible with ferrule		mm^2	2 × 2,5	2 × 2,5
solid		mm^2	2 × 2,5	2 × 2,5
Standard screwdriver		mm	5,5 × 0,8	5,5 × 0,8
Tightening torque		Nm	0,5 – 0,8	0,5 – 0,8
Mounting			Snap-on to DIN rail to EN 50 022	
Contacts				
Rated impulse withstand voltage U_{imp}		V AC	4000	4000
Overvoltage category / Degree of pollution			III/3	III/3
Rated insulation voltage U_i		V AC	400	400
Voltage supply				
Supply voltage		V AC/DC	24 – 240	24 – 240
Voltage pick-up range		× U_c	0,85 – 1,1	0,85 – 1,1
Power consumption		VA	5,5	4,5
Rated frequency	AC	Hz	50 – 60	50 – 60
Duty factor		% DF	100	100
Time circuit				
Time delay	at $R_{isolation}$	s	< 1	< 1
	× pick-up value	s	< 0,9	< 0,9
Measuring circuits				
Input			L+, L–, PE	L, PE
Pick-up value		kΩ	10 – 110	1 – 11, 10 – 110
Min. AC inner resistance		kΩ	–	100
Min. DC inner resistance		kΩ	–	100
Min. inner resistance		kΩ	57	–
Test resistance		kΩ	–	0,82
Max. insulation voltage		V	300 DC	415 AC
Max. measuring voltage (EMR4-RAC-1-A = Measuring DC voltage)		V DC	24 – 240	≦ 30
Max. cable length for delete and test button		m	10	10
Status indication				
Supply voltage	LED		green	green
Fault	LED		yellow	red
Fault at L+	LED		red	red
Fault at L–	LED		red	red
Relay output contacts				
Rated operational voltage U_e		V AC	400	320
Rated operational current I_e AC-12	at 230 V	A	5	5
Rated operational current I_e AC-15	at 230 V	A	3	3
Rated operational current I_e DC-12	at 24 V	A	5	3
Rated operational current I_e DC-13	at 24 V	A	2,5	2,5
Max. electrical lifespan AC-12/230 V/5 A)	operations	× 10^6	0,1	0,1
Short-circuit protection, max. fuse	fast/gL	A	5	5
EMC				
EMC compatibility			IEC/EN 61 000-6-2	IEC/EN 61 000-6-2
ESD			IEC/EN 61 000-4-2 Level 3	IEC/EN 61 000-4-2 Level 3
HF immunity			IEC/EN 61 000-4-3 Level 3	IEC/EN 61 000-4-3 Level 3
Burst			IEC/EN 61 000-4-4 Level 3	IEC/EN 61 000-4-4 Level 3
Surge			IEC/EN 61 000-4-5 Level 4	IEC/EN 61 000-4-5 Level 4
HF conducted			IEC/EN 61 000-4-6 Level 3	IEC/EN 61 000-4-6 Level 3

DIL ER, DIL R Industrial Control Relays
Dimensions

DIL ER control relays

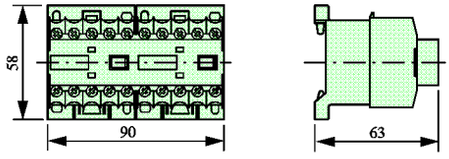
DIL ER-...(-C)
DIL ER-...-G(-C)

DIL ER-...(-C) + ...DIL E(-C)
DIL ER-...-G(-C) + ...DIL E(-C)

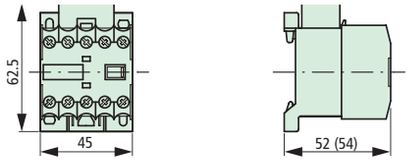


DIL ER-... + H DIL E
DIL ER-...-G + H DIL E

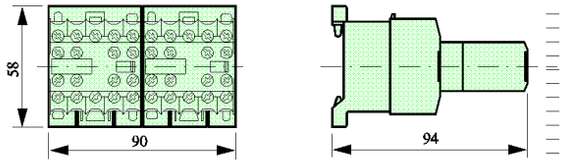
2 DIL ER-... + MV DIL E
2 DIL ER-...-G + MV DIL E



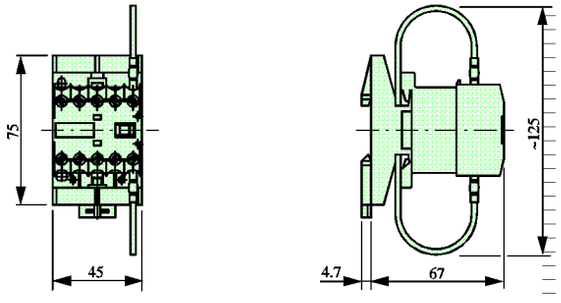
DIL ER-...(-C) + RC DIL E(-C)
DIL ER-...-G(-C) + VG DIL E(-C)



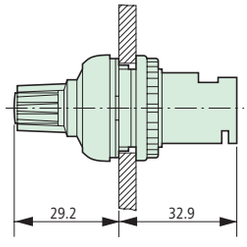
2 DIL ER-... + MV DIL E + ...DIL E
2 DIL ER-...-G + MV DIL E + ...DIL E



DIL ER-... + TD DIL E 24

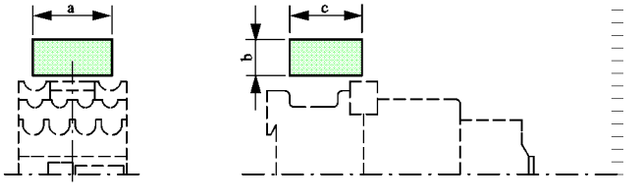


Potentiometer
M22(S)-R10K



Suppressors, Interface Modules

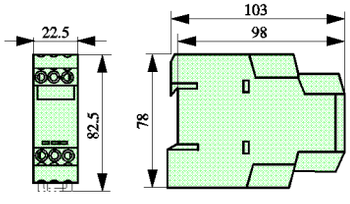
RC B DIL,
FD B DIL
VG B DIL
VS 1(2) DIL



	RC B DIL	FD B DIL	VG B DIL	VS 1 DIL	VS 2 DIL
a	33	33	33	45	45
b	15	15	15	26	26
c	30	30	30	55	55

Electronic Timing Relays

ETR 4-11...
ETR 4-51...
ETR 4-69...
ETR 4-70...



DIL R Control Relays, DIL ET, ETR 4 Electronic Timing Relays

Dimensions

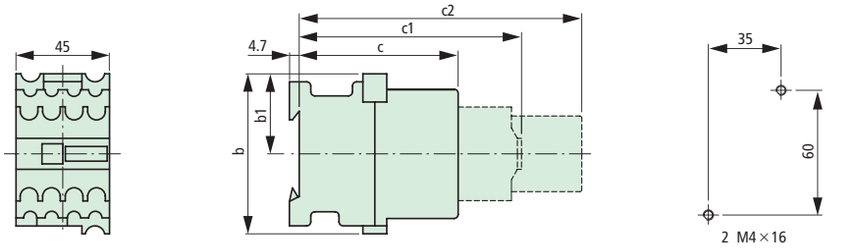
Control Relays

DIL R 22(-G)
DIL R 22D(-G)
DIL R 31(-G)
DIL R 40(-G)

DIL R 22(-G) + ...DIL
DIL R 31(-G) + ...DIL
DIL R 40(-G) + ...DIL
DIL R 44D(-G)
DIL R 53D(-G)

DIL R 22(-G) + TPE (TPD) 11 DIL
DIL R 31(-G) + TPE (TPD) 11 DIL
DIL R 40(-G) + TPE (TPD) 11 DIL

DIL R 22(-G) + V (-G) DIL
DIL R 31(-G) + V (-G) DIL
DIL R 40(-G) + V (-G) DIL



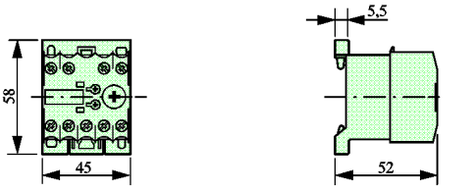
	DIL R ... DILR22D	-G -G	DIL R ...+...DIL DIL R 44D DIL R 53D	(-G) (-G) (-G)	DIL R ...+TPE11 DIL DIL R ...+TPD11 DIL	(-G) (-G)	DIL R...+V DIL	(-G) (-G) (-G)	DILR...-C	-G-C	DILR...-C+...DIL-C	-G-C
c (w H DIL)	76.5	101.5	–	–	–	–		–	–	–	–	–
c (w/o H DIL)	74	99	–	–	–	–	–	–	74	99	–	–
c1	–	–	107	132	–	–	–	–	–	–	107	132
c2	–	–	–	–	136	161	137	162	–	–	–	–
b	77	77	77	77	77	77	77	77	83	83	83	83
b1	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5	41.5	41.5	41.5	41.5

c1 = with ...DIL auxiliary contact module or
DIL R...D (-G) complete unit

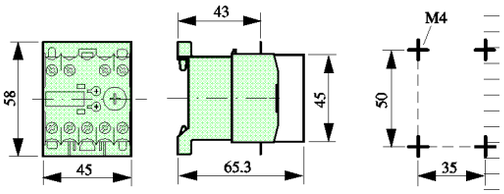
c2 = with V (-G) DIL mechanical latching module or with TP...11
DIL pneumatic timer module

Electronic Timing Relays

DIL ET...



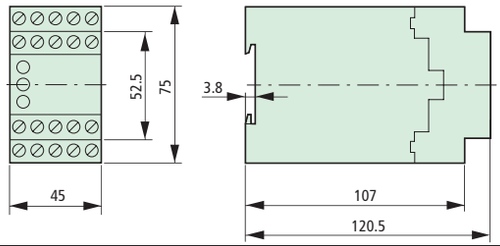
DIL ET... + H DIL E



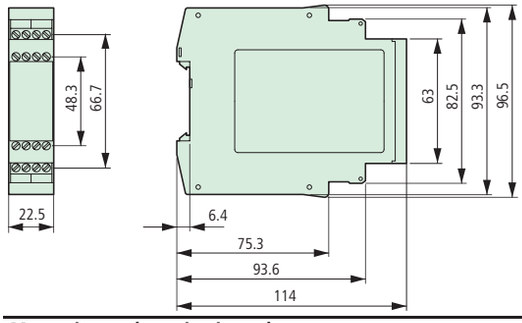
ESR Electronic Safety Relays, EMR4 Measuring and Monitoring Relays

Dimensions

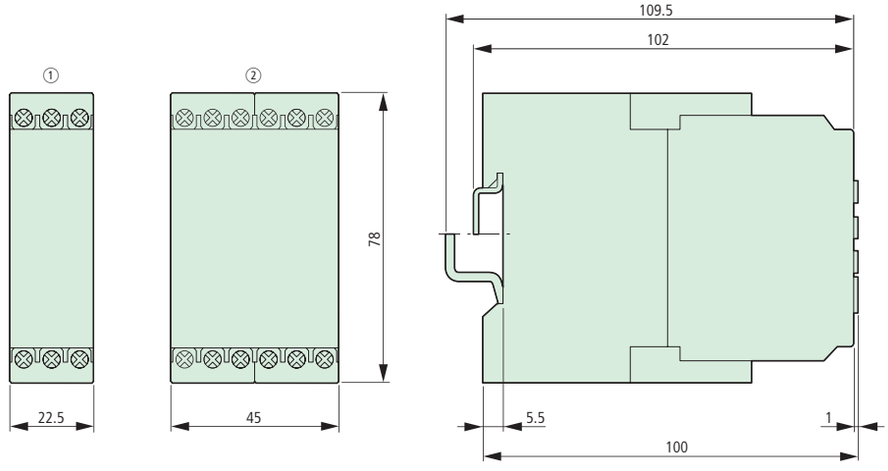
Elektronische Sicherheitsrelais
ESR3-NO-31(230 V)



ESR4-NO-31
ESR4-NO-21
ESR4-NM-21
ESR4-NZ-21
ESR4-NV3(30)-30
ESR4-NT30-30
ESR4-NE-42
ESR4-VE3-42



Measuring and monitoring relays
EMR4-...



	①	②
EMR4-I1-2-A		●
EMR4-I15-2-A		●
EMR4-I15-2-B		●
EMR4-F500-2	●	
EMR4-W500-2-C		●
EMR4-W500-2-D		●
EMR4-W580-2-C		●
EMR4-A400-1	●	
EMR4-N100-1-B	●	
EMR4-N500-2-B		●
EMR4-N500-1-A		●
EMR4-RDC-1-A		●
EMR4-RAC-1-A		●

Plombierhaube
EMR4-PH...