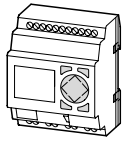


# Control Relays, Contactor Relays, Electronic Timing Relays, Electronic Safety Relays, Measuring and Monitoring Relays Overview



## Control relays

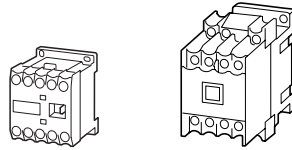
AC and DC operated



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## Contactor relays

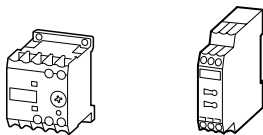
AC and DC operated



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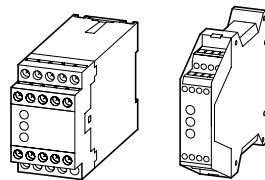
## Electronic timing relays

AC and DC operated



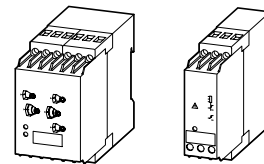
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## Electronic safety relays



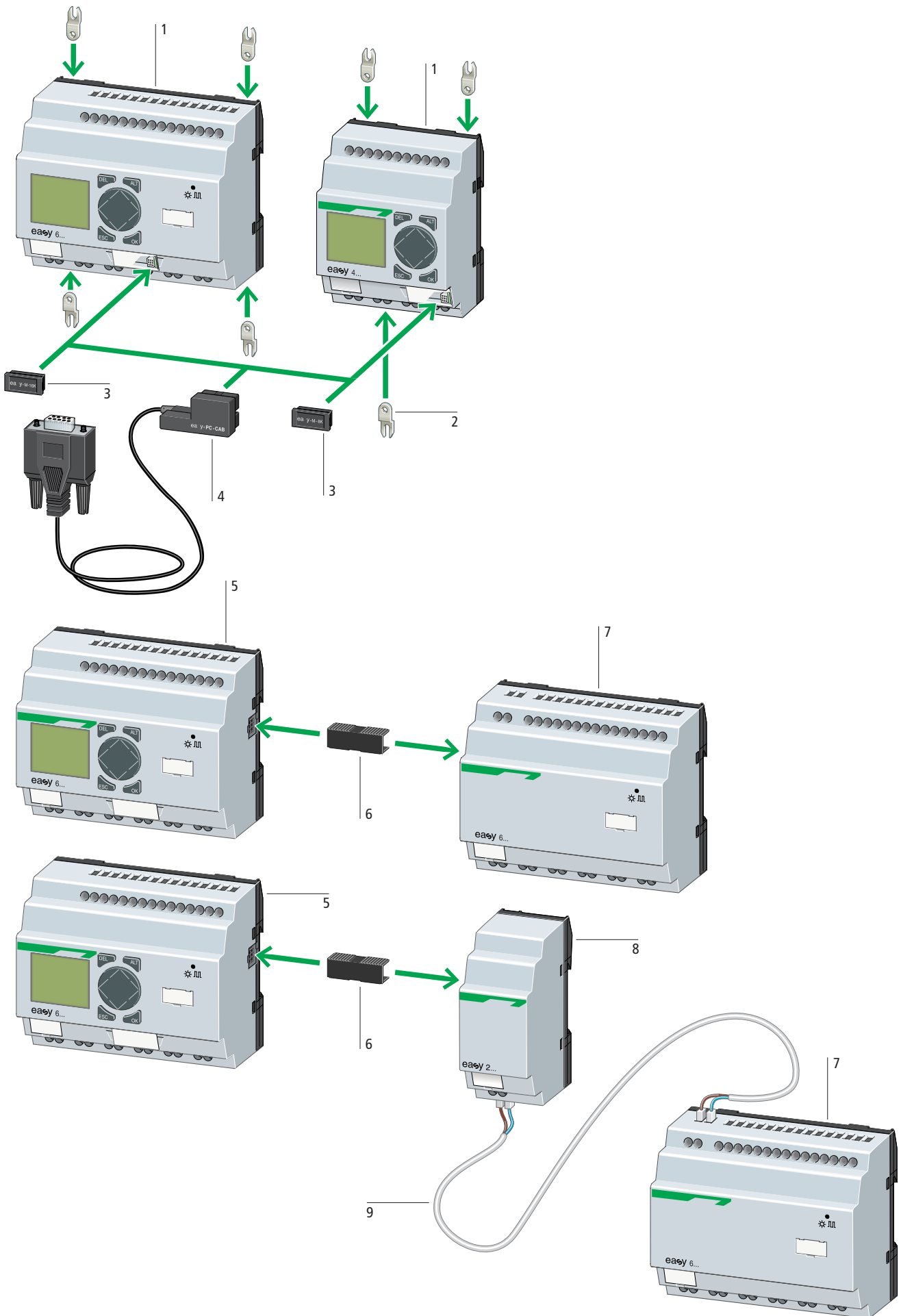
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## "Easy" Control Relays System Overview



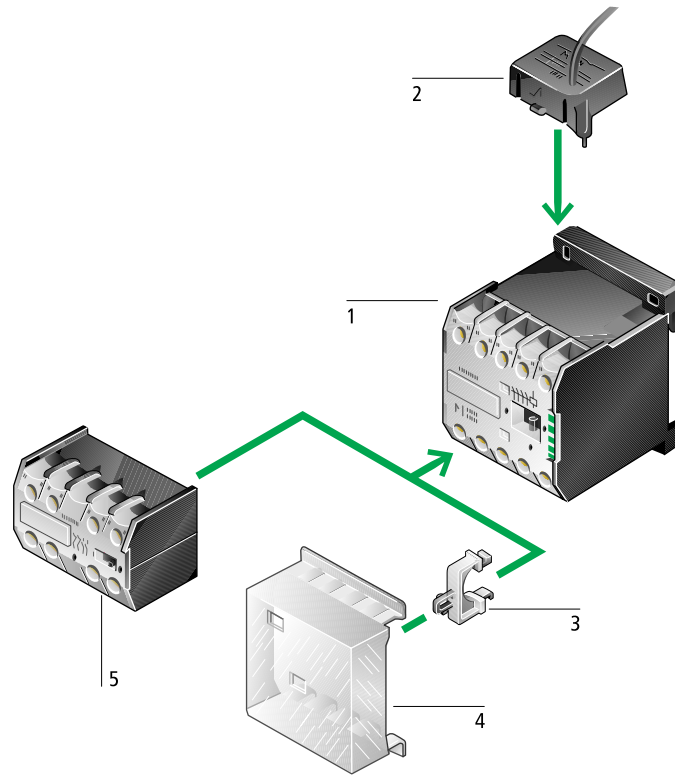
## "Easy" Control Relays

### System Overview

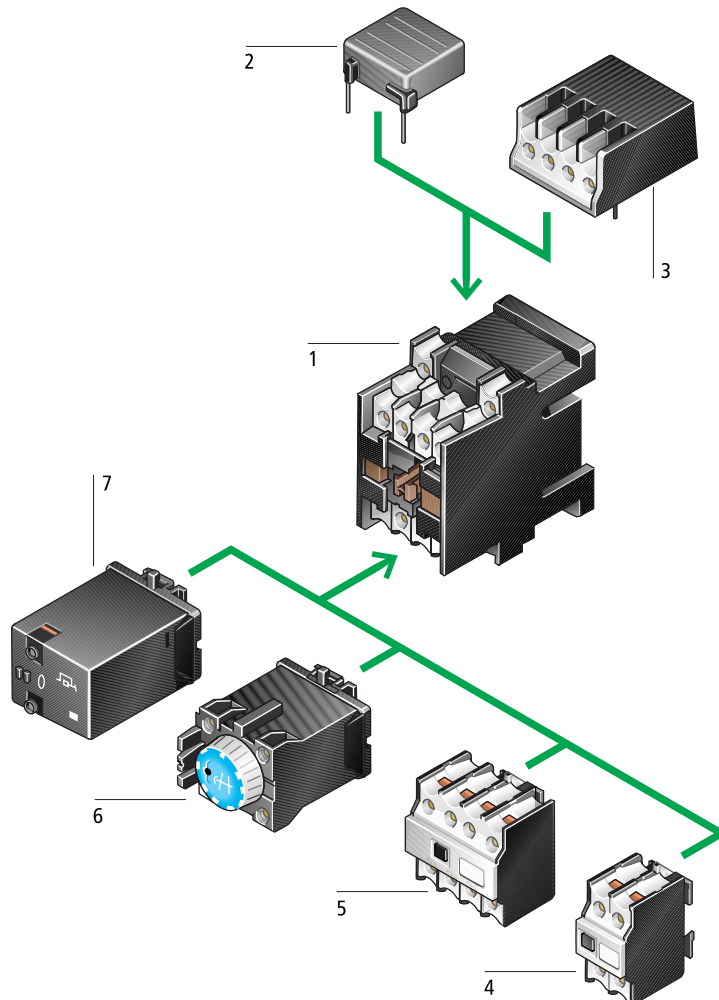
<b>Basic units</b> 1	<b>Basic units, expandable EASY619/621</b> 5	<b>Distinguishing features of the EASY control relay</b> <ul style="list-style-type: none"> <li>• Wide operational temperature range –25 °C to +55 °C</li> <li>• Standard front dimension for fitting into service distribution boards, 18 mm standard slot</li> <li>• Electronic "wiring" by keystroke, LCD (4 lines of 12 characters) and keypad or via software from the PC</li> <li>• Zero-voltage safe internal and external circuit configuration storage in EEPROM memory</li> <li>• 3 contacts (make or break contacts) in series plus one coil in each current path</li> <li>• Series and parallel connection</li> <li>• 41 current paths / lines of logic EASY412</li> <li>• 121 current paths / lines of logic EASY600</li> <li>• Integral password protection for circuit configuration and relay value presets</li> <li>• Current flow display for circuit configuration testing (LCD Types)</li> <li>• Selection option from ten different menu languages (EASY600) and five different menu languages (EASY412) D, GB, F, I, E, (P, NL, S, PL, TR)</li> </ul>
AC or DC operated	AC or DC operated	
Power supply AC 100 (115) – 240 V, 50/60 Hz DC 24 V DC DA 12 V DC	Power supply AC 100 – 240 V, 50/60 Hz DC 24 V DC	
8 or 12 digital inputs (2 inputs usable as analog inputs [DC/DA variants only])	12 digital inputs (2 inputs usable as analog inputs [DC variants only])	
4 or 6 relay outputs (max. 10 A)	6 relay outputs (max. 10 A)	
4 or 8 transistor outputs	8 transistor outputs	
LCD display, X variants without LCD	LCD display, X variants without LCD	
Screw fixing and snap fitting	Screw fixing and snap fitting	
Screw terminals	Screw terminals	
→ Page 04/006	→ Page 04/008	
<b>Fixing brackets</b> 2	<b>EASY-LINK-DS data plug</b> 6	<b>Functions</b> <ul style="list-style-type: none"> <li>• 8 timing relays 0.01 s to 99 h 59 min <ul style="list-style-type: none"> <li>– On-delay</li> <li>– On-delay with random switching</li> <li>– Off-delay</li> <li>– Off-delay with random switching</li> <li>– Pulse shaping</li> <li>– Flashing</li> </ul> </li> <li>• 8 up- and down-counter relays, 0000 to 9999</li> <li>• 4 weekly timers (4 channels per timer, one On/Off point per channel, optional on Types with clock)</li> <li>• 8 analog value comparators, range 0 – 10 V (EASY...-D...-... Types only)</li> <li>• 8 lines of text, can be freely edited (EASY600 with display)</li> <li>• 16 auxiliary relays (EASY412), up to 32 auxiliary relays (EASY600)</li> <li>• Retentive actual values EASY412-D... <ul style="list-style-type: none"> <li>– 4 markers</li> <li>– 1 timing relay</li> <li>– 1 counter</li> </ul> </li> <li>• Retentive actual values EASY600 <ul style="list-style-type: none"> <li>– 12 markers</li> <li>– 2 timing relays</li> <li>– 4 counters, e.g. as hours-run meters</li> </ul> </li> </ul>
For optional screw fixing, 3 brackets per relay for EASY4... minimum of 3 brackets per relay for EASY6...	For connecting the basic unit with the expansion unit	
→ Page 04/008	→ Page 04/006	
<b>External memory card</b> 3	<b>Expansion unit</b> 7	
For safe storage of the circuit configuration and all parameters	I/O expansion	
→ Page 04/008	AC or DC operated	
<b>Connection cable</b> 4	Power supply: AC 100 – 240 V, 50/60 Hz DC 24 V DC	
Safe isolation between "easy" and PC	12 digital inputs	
→ Page 04/008	6 relay outputs (max. 10 A)	
	8 transistor outputs	
	Screw fixing and snap fitting	
	Screw terminals	
	→ Page 04/006	
	<b>Networking / Bus interfaces</b>	
	EASY204-DP PROFIBUS-DP slave connection	
	EASY205-ASI AS-Interface slave connection	
	→ Page 04/008	
	<b>Coupling unit</b> 8	
	→ Page 04/007	
	<b>Connection cable</b> 9	
	e.g. NYM 3 × 1.5 mm <sup>2</sup>	
	→ Page 04/008	

# Contactor Relays, Electronic Timing Relays System Overview

DILR



DILR

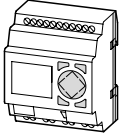
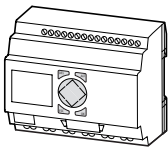


Relays  
Contactor Relays



## "Easy" Control Relays

## Basic Units

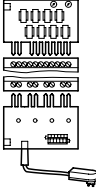
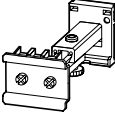
		Description	Type Article no.	Price See Price List	Std. pack
<b>Basic units</b>					
	24 V DC, retentive	<ul style="list-style-type: none"> <li>• 8 digital inputs (2 inputs usable as analog inputs)</li> <li>• 4 relay outputs</li> <li>• LCD display</li> <li>• Operating buttons</li> <li>• Screw terminals</li> </ul>	<b>EASY412-DC-R</b> 202403		1 off
		Features same as EASY 412-DC-R plus built-in timer/time switch	<b>EASY412-DC-RC</b> 202404		
		Features same as EASY412-DC-RC, without keypad and LCD display	<b>EASY412-DC-RCX</b> 221596		
		<ul style="list-style-type: none"> <li>• 8 digital inputs (2 inputs usable as analog inputs)</li> <li>• 4 transistor outputs</li> <li>• LCD display</li> <li>• Operating buttons</li> <li>• Screw terminals</li> <li>• Time switch/Timer</li> </ul>	<b>EASY412-DC-TC</b> 207808		
		Features same as EASY412-DC-TC, without keypad and LCD display	<b>EASY412-DC-TCX</b> 212307		
		<ul style="list-style-type: none"> <li>• 12 digital inputs (2 inputs usable as analog inputs)</li> <li>• 6 relay outputs</li> <li>• LCD display</li> <li>• Operating buttons</li> <li>• Screw terminals</li> <li>• Time switch/Timer</li> </ul>	<b>EASY618-DC-RC</b> 224472		
		<ul style="list-style-type: none"> <li>• 12 digital inputs (2 inputs usable as analog inputs)</li> <li>• 6 relay outputs</li> <li>• LCD display</li> <li>• Operating buttons</li> <li>• Screw terminals</li> <li>• Time switch/Timer</li> <li>• Can be expanded using EASY expansion units</li> </ul>	<b>EASY619-DC-RC</b> 224473		
		Features same as EASY412-DC-RC, without keypad and LCD display	<b>EASY619-DC-RCX</b> 224474		
		<ul style="list-style-type: none"> <li>• 12 digital inputs (2 inputs usable as analog inputs)</li> <li>• 8 transistor outputs</li> <li>• LCD display</li> <li>• Operating buttons</li> <li>• Screw terminals</li> <li>• Time switch/Timer</li> </ul>	<b>EASY620-DC-TC</b> 212309		
		<ul style="list-style-type: none"> <li>• 12 digital inputs (2 inputs usable as analog inputs)</li> <li>• 8 transistor outputs</li> <li>• LCD display</li> <li>• Operating buttons</li> <li>• Screw terminals</li> <li>• Time switch/Timer</li> <li>• Can be expanded using EASY expansion units</li> </ul>	<b>EASY621-DC-TC</b> 218719		
Features same as EASY412-DC-TC, without keypad and LCD display	<b>EASY621-DC-TCX</b> 212311				
	12 V DC, retentive	<ul style="list-style-type: none"> <li>• 8 digital inputs (2 inputs usable as analog inputs)</li> <li>• 4 relay outputs</li> <li>• LCD display</li> <li>• Operating buttons</li> <li>• Screw terminals</li> <li>• Time switch/Timer</li> </ul>	<b>EASY412-DA-RC</b> 224471		

**"Easy" Control Relays**

## Basic Units, Expansion Units, Accessories

Description		Type Article no.	Price See Price List	Std. pack
<b>Basic units</b>				
115/230 V AC	<ul style="list-style-type: none"> <li>• 8 digital inputs, 115/230 V AC</li> <li>• 4 relay outputs</li> <li>• LCD display</li> <li>• Operating buttons</li> <li>• Screw terminals</li> </ul>	EASY412-AC-R 202405		1 off
	Features same as EASY 412-AC-R, plus timer	EASY412-AC-RC 202406		
	Features same as EASY412-AC-RC, without keypad and LCD display	EASY412-AC-RCX 212308		
115/230 V AC, retentive	<ul style="list-style-type: none"> <li>• 12 digital inputs, 115/230 V AC</li> <li>• 6 relay outputs</li> <li>• LCD display</li> <li>• Operating buttons</li> <li>• Screw terminals</li> <li>• Time switch/Timer</li> </ul>	EASY618-AC-RC 212310		
	<ul style="list-style-type: none"> <li>• 12 digital inputs, 115/230 V AC</li> <li>• 6 relay outputs</li> <li>• LCD display</li> <li>• Operating buttons</li> <li>• Screw terminals</li> <li>• Time switch/Timer</li> <li>• Can be expanded using EASY expansion units</li> </ul>	EASY619-AC-RC 218721		
	Features same as EASY619-AC-RC, without keypad and LCD display	EASY619-AC-RCX 212312		
<b>Expansion units</b>				
24 V DC	<ul style="list-style-type: none"> <li>• 12 digital inputs</li> <li>• 8 transistor outputs</li> <li>• With connector</li> </ul>	EASY620-DC-TE 212313		1 off
115/230 V AC	<ul style="list-style-type: none"> <li>• 12 digital inputs, 115/230 V AC</li> <li>• 6 relay outputs</li> <li>• With connector</li> </ul>	EASY618-AC-RE 212314		
Coupling unit	<ul style="list-style-type: none"> <li>• Coupling unit for connecting to an EASY619/621 basic unit</li> <li>• Terminals for remote expansion, up to 30 m to/from the expansion unit</li> <li>• With connector</li> </ul>	EASY200-EASY 212315		
<b>Expansion units for networking</b>				
AS-Interface	<ul style="list-style-type: none"> <li>• Linked directly to EASY619/621</li> <li>• AS-Interface connection</li> <li>• Slave</li> <li>• 4 inputs, 4 outputs, 4 parameter bits</li> <li>• Addresses available: 0 to 31</li> <li>• With connector</li> </ul>	EASY205-ASI 221598		1 off
PROFIBUS DP	<ul style="list-style-type: none"> <li>• Linked directly to EASY619/621</li> <li>• PROFIBUS-DP slave</li> <li>• Addresses available: 0 to 126</li> <li>• With connector</li> </ul>	EASY204-DP 212316		1 off
<b>Accessories for DP</b>				
PROFIBUS DP bus connector plug	9-pole (pins), comes as a kit without cable, for connection of the data cable	ZB4-209-DS2 206982		1 off
PROFIBUS DP bus connector plug	<ul style="list-style-type: none"> <li>• Metallised insulated housing</li> <li>• Maximum transfer rate 12 MBit/s</li> <li>• Built-in switch (accessible from the outside) for the bus termination resistances</li> <li>• Terminal block for two cables, optionally with straight or 90° angled cable entry</li> <li>• Suitable for EASY204-DP</li> </ul>	ZB4-209-DS3 217820		
PROFIBUS DP data cable	Twisted pair cable, 2 × 0.64 mm <sup>2</sup> , length: 100 m	ZB4-900-KB1 206983		

## "Easy" Control Relays Networking, Accessories

	Description	Type Article no.	Price See Price List	Std. pack
<b>Accessories</b>				
Software	CD, menu selection from 6 languages Installation under WIN 95, 98, WIN NT 4.0 Service Pack 3 and above	<b>EASY-SOFT</b> 202407		1 off
Memory card	8K memory card for storing the entire circuit configuration for EASY412	<b>EASY-M-8K</b> 202408		
	16K memory card for storing the entire circuit configuration for EASY6..	<b>EASY-M-16K</b> 212317		
Connection cable	Length: 2 m, for connection to 9-pole serial PC interface with interface electronics	<b>EASY-PC-CAB</b> 202409		
Input-output simulator 	Simulator with power supply unit, 115/230 V AC/output 24 V DC, suitable/ designed for EASY412-DC...	<b>EASY412-DC-SIM</b> 212318		
	Same as EASY412-DC-SIM, with 120 V AC plug-in power supply unit/ 24 V DC output, plug suitable for North America	<b>EASY412-DC-SIM-NA</b> 222566		
Fixing bracket	For screw fixing onto mounting plate: 3 brackets per EASY4..., 3 brackets per EASY6..., 2 brackets per EASY2...	<b>ZB4-101-GF1</b> 061360		9 off
Coupling piece	Spare link between basic unit and expansion units	<b>EASY-LINK-DS</b> 221607		1 off
Telescopic adapter 	With 45 mm EN 50 022 top-hat rail, for equalization of the mounting depth of rear mounted devices in CI-K... enclosures and cabinets. Steplessly adjustable via scales, from 75 – 115 mm. For screw and snap fixing (also suitable for PKZM0, FAZ, FIP, ETR, EMR4 etc.)	<b>M22-TA</b> 226161		10 off
		Switched-mode power supply unit	Primary-switched mode, regulated • Rated input voltage 50/60 HZ: 115/230 V AC • Rated output voltage: 24 V DC • Rated output current: 1.25 A	<b>EASY400-POW</b> 212319

## "Easy" Control Relays

### Documentation

Description	Type Article no.	Price See Price List	Std. pack
<b>Documentation</b>			
Manual for the "Easy" control relay			
German	AWB2528-1304-D 205375		1 off
English	AWB2528-1304-GB 205481		
French	AWB2528-1304-F 205482		
Italian	AWB2528-1304-I 205483		
Spanish	AWB2528-1304-E 205484		
Brief introduction to the "Easy" control relay			
German	AWB2528-1316-D 205376		1 off
English	AWB2528-1316-GB 205485		
French	AWB2528-1316-F 205486		
Italian	AWB2528-1316-I 205487		
Spanish	AWB2528-1316-E 205488		

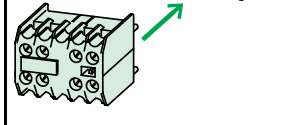
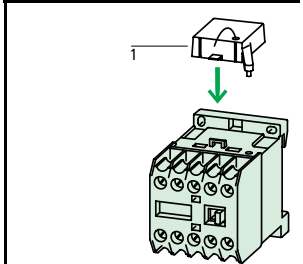
**DILER Mini Contactor Relays**  
Basic Units, Modules

Contacts		Rated operational current $I_e$		Conv. therm. current $I_{th}$	Circuit symbol	Distinctive number and version of combination			AC operation		Std. pack	
M = Make B = Break	A	A	A			Type	Article no.	Price	See Price List			
<b>Basic units with interlocked opposing contacts</b>												
4 M	-	6	3	10		40E	-	-	<b>DILER-40(230V50HZ)</b> 051759		5 off	
3 M	1 B					-	31E	-	<b>DILER-31(230V50HZ)</b> 051768			
2 M	2 B					-	-	22E	<b>DILER-22(230V50HZ)</b> 051777			
<b>Auxiliary contact modules with interlocked opposing contacts<sup>1)</sup></b>												
2-pole		-	2 B	4	2	10		42E	33	24	<b>02DILE</b> 010240	5 off
	1 M	1 B						51E	42	33	<b>11DILE</b> 010224	
	2 M	-						60E	51	42	<b>20DILE</b> 010208	
	1 M <sup>2)</sup>	1 B <sup>2)</sup>						51	42	33	<b>11DDILE</b> 049824	
4-pole		-	4 B	4	2	10		44E	35	26	<b>04DILE</b> 010256	5 off
	1 M	3 B						53E	44	35	<b>13DILE</b> 002397	
	2 M	2 B						62E	53	44	<b>22DILE</b> 010288	
	3 M	1 B						71E	62	53	<b>31DILE</b> 048912	
	4 M	-						80E	71	62	<b>40DILE</b> 010304	
	2 M <sup>2)</sup>	2 B <sup>2)</sup>						62	53	44	<b>22DDILE</b> 049823	

Notes  
<sup>1)</sup> Not with early-make contacts or late-break contacts  
<sup>2)</sup> 1 early-make contact  
 1 late-break contact

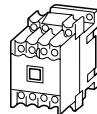

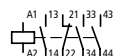
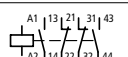
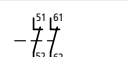
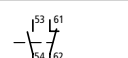
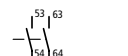
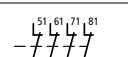
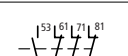
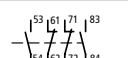

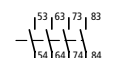
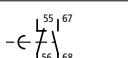

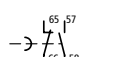
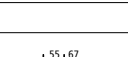

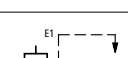
**DILER Mini Contactor Relays**  
Basic Units, Modules

Circuit symbol		Distinctive number and version of combination		DC operation		Std. pack	Notes
Type	Article no.	Price	See Price List				
	40E			<b>DILER-40-G(24VDC)</b> 010223		5 off	Other actuating voltages → Page 04/030 Contact numbers to EN 50 011 Coil terminal markings to EN 50 005 With DC operation: integral resistor/diode combination Coil rating: 2.6 W
	31E			<b>DILER-31-G(24VDC)</b> 010157			
	22E			<b>DILER-22-G(24VDC)</b> 010042			
	42E	33	-	<b>02DILE</b> 010240		5 off	Version E combinations correspond to EN 50 011 and are to be preferred; other combinations correspond to EN 50 005.
	51E	42	-	<b>11DILE</b> 010224			
	60E	51	-	<b>20DILE</b> 010208			
	51	42	-	<b>11DDILE</b> 049824			
	44E	35	-	<b>04DILE</b> 010256		5 off	
	53E	44	-	<b>13DILE</b> 002397			
	62E	53	-	<b>22DILE</b> 010288			
	71E	62	-	<b>31DILE</b> 048912			
	80E	71	-	<b>40DILE</b> 010304			
	62	53	-	<b>22DDILE</b> 049823			



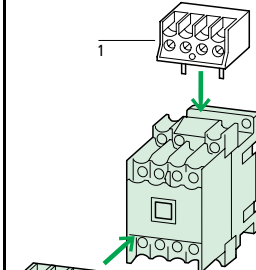
Accessories	Page
1 Suppressor	04/026
Other accessories	04/026

**DILR Contactor Relays**  
Basic Units, Modules

										AC operation		
Contacts	Rated operational current $I_e$		Conv. therm. current $I_{th}$	Circuit symbol	Distinctive number and version of combination			Type	Price	Std. pack		
	AC-15	380 V			400 V	415 V	Article no.	See Price List				
M = Make B = Break	A	A	A									
<b>Basic units with interlocked opposing contacts</b>												
	4 M	-	6	4	16		40 E	-	-	<b>DILR40(230V50HZ)</b> 043756		1 off
	3 M	1 B					-	31 E	-	<b>DILR31(230V50HZ)</b> 043768		
	2 M	2 B					-	-	22 E	<b>DILR22(230V50HZ)</b> 043780		
<b>Auxiliary contact modules with interlocked opposing contacts</b>												
2-pole	-	2 B	6	4	16		42 E	33	24	<b>02DIL</b> 098145		5 off
	1 M	1 B					51 E	42	33	<b>11DIL</b> 010345		
	2 M	-					60 E	51	42	<b>20DIL</b> 012718		
4-pole	-	4 B	6	4	16		44 E	35	26	<b>04DIL</b> 015091		5 off
	1 M	3 B					53 E	44	35	<b>13DIL</b> 017464		
	2 M	2 B					62 E	53	44	<b>22DIL</b> 019837		
	3 M	1 B					71 E	62	53	<b>31DIL</b> 010752		
	4 M	-					80 E	71	62	<b>40DIL</b> 022210		
<b>Pneumatic timer modules, time ranges of 0.2 – 30 s and 20 – 180 s</b>												
On-delayed	1 M	1 B	4	4	10		51	42	33	<b>TPE11DIL</b> 002279		1 off
Off-delayed	1 M	1 B	4	4	10		51	42	33	<b>TPD11DIL</b> 002280		
With TÜV <sup>1)</sup> approval to VDE 0116, for furnaces												
On-delayed	1 M	1 B	4	4	10		51	42	33	<b>TPEH11DIL</b> 046924		
Off-delayed	1 M	1 B	4	4	10		51	42	33	<b>TPDH11DIL</b> 046925		
<b>Mechanical latching module</b>												
							40 E	31 E	22 E	<b>VDIL(230V50HZ)</b> 043825		1 off

<sup>1)</sup> TÜV = German Technical Supervisory Association

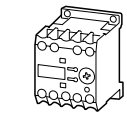
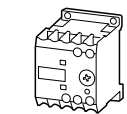
**DILR Contactor Relays**  
Basic Units, Modules

DC operation										
Type	Price	Std. pack	Notes							
Article no.	See Price List									
<b>DILR40-G(24VDC)</b> 048537		1 off	Other actuating voltages → Page 04/030							
<b>DILR31-G(24VDC)</b> 048532			Contact numbers to EN 50 011 Coil terminal markings to EN 50 005							
<b>DILR22-G(24VDC)</b> 048526			DILR40: supplied without front plate Front plate → Page 05/047							
<b>02DIL</b> 098145		5 off	Version E combinations correspond to EN 50 011 and are to be preferred; other combinations correspond to EN 50 005	<table border="1"> <thead> <tr> <th>Accessories</th> <th>Page</th> </tr> </thead> <tbody> <tr> <td>1 Amplifier module</td> <td>04/026</td> </tr> <tr> <td>Other accessories</td> <td>04/026</td> </tr> </tbody> </table>	Accessories	Page	1 Amplifier module	04/026	Other accessories	04/026
Accessories	Page									
1 Amplifier module	04/026									
Other accessories	04/026									
<b>11DIL</b> 010345										
<b>20DIL</b> 012718										
<b>04DIL</b> 015091		5 off								
<b>13DIL</b> 017464										
<b>22DIL</b> 019837										
<b>31DIL</b> 010752										
<b>40DIL</b> 022210										
<b>TPE11DIL</b> 002279		1 off	Version E combinations correspond to EN 50 011 and are to be preferred; other combinations correspond to EN 50 005							
<b>TPD11DIL</b> 002280										
<b>TPEH11DIL</b> 046924										
<b>TPDH11DIL</b> 046925										
<b>V-GDIL(24VDC)</b> 048562		1 off								



DILET Electronic Timing Relays

Rated operational current $I_e$ AC-11 220V 380V 230V 400V 240V 440V	Conv. therm. current $I_{th}$	Time range	24 – 240 V, 50/60 Hz, AC 24 – 240 V, DC		346 – 440V, 50/60 Hz, AC		Std.
			Type Article no.	Price See Price List	Type Article no.	Price See Price List	
A	A	A					
<b>Timing relays, On-delayed</b>							
3	3	6	1.5 – 30 s	DILET11-30-A 048878		DILET11-30-W 048904	1 off
3	3	6	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		DILET11-M-W 048891	1 off
<b>Multi-function relay with connection for remote potentiometer</b>							
3	3	6	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		DILET70-W 048899	1 off



**Setting example**  
 Time range of timing relay 60 min  
 Time required 42 min  
 Setting required on time scale 7

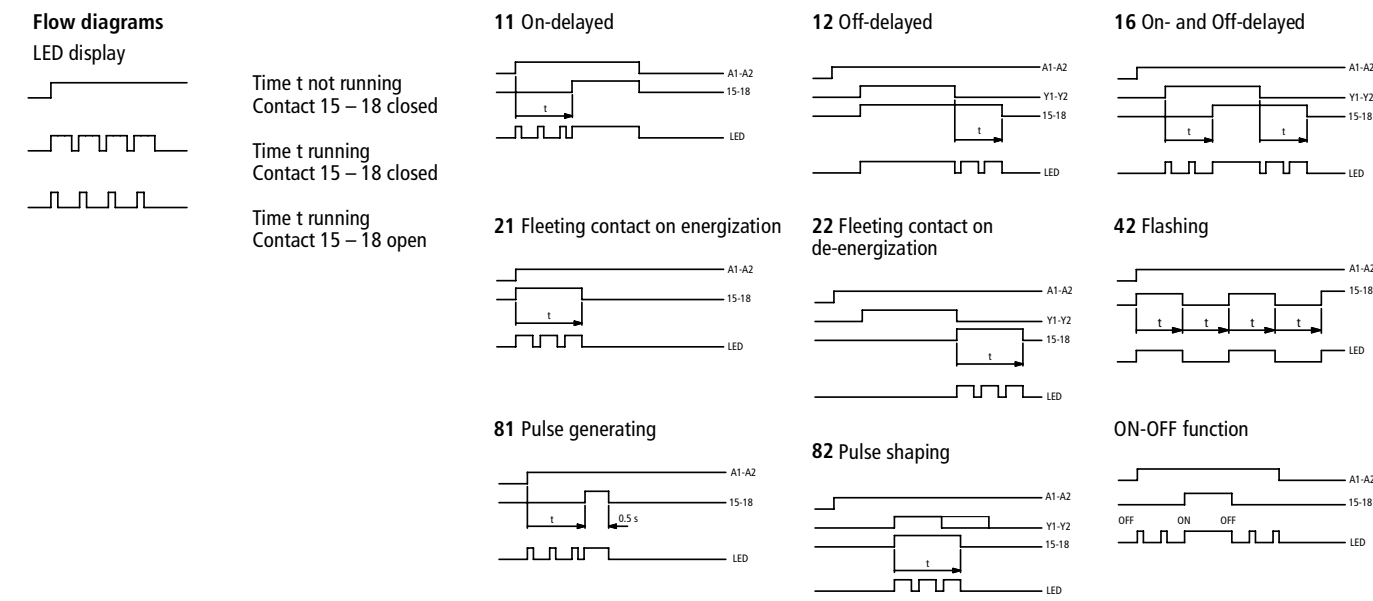
Calculated as follows:  
 $\frac{\text{Time required} \times 10}{\text{Time range of timing relay}} = \text{Setting on time scale}$

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

DILET Electronic Timing Relays

Available functions <sup>1)</sup>	Terminal markings to EN 50 042	Notes																								
		Potential-free contact Do not apply voltage!																								
11		<table border="1"> <thead> <tr> <th>Type suffix</th> <th colspan="2">Actuating voltage printed on unit</th> </tr> <tr> <td></td> <th>V DC</th> <th>V AC</th> </tr> </thead> <tbody> <tr> <td>-A</td> <td>24 – 240</td> <td>24 – 240, 50/60 Hz</td> </tr> <tr> <td>-W</td> <td>–</td> <td>346 – 440 50/60 Hz</td> </tr> <tr> <td colspan="3">Voltage tolerance:</td> </tr> <tr> <td></td> <th>V DC</th> <th>V AC</th> </tr> <tr> <td>-A</td> <td>16.8 – 288</td> <td>20.4 – 264</td> </tr> <tr> <td>-W</td> <td>–</td> <td>294.1 – 484</td> </tr> </tbody> </table>	Type suffix	Actuating voltage printed on unit			V DC	V AC	-A	24 – 240	24 – 240, 50/60 Hz	-W	–	346 – 440 50/60 Hz	Voltage tolerance:				V DC	V AC	-A	16.8 – 288	20.4 – 264	-W	–	294.1 – 484
Type suffix	Actuating voltage printed on unit																									
	V DC	V AC																								
-A	24 – 240	24 – 240, 50/60 Hz																								
-W	–	346 – 440 50/60 Hz																								
Voltage tolerance:																										
	V DC	V AC																								
-A	16.8 – 288	20.4 – 264																								
-W	–	294.1 – 484																								
11																										
11, 21, 42, 81		Admissible cable length: Cable, unscreened Cable cross-section 0.5 – 1.5 mm <sup>2</sup> Two-core cable 250 m Two-core cable in same cable duct as mains cable 50 m Connection to Y1/Y2 Z1/Z2																								
12, 16, 22, 82		Accessories: Sealable shroud 04/027 Remote potentiometer 04/028																								

**Notes** <sup>1)</sup> DILET11 supplied with stated function as standard



ETR4 Electronic Timing Relays

Rated operational current $I_e$ AC-15 220V 230V 240V	380V 400V 440V	Conv. therm. current $I_{th}$	Time range	24 – 240 V, 50/60 Hz, AC		346 – 440 V, 50/60 Hz		Std. pack
				Type	Price	Type	Price	
A	A	A		Article no.	See Price List	Article no.	See Price List	
<b>Timing relays, On-delayed</b>								
3	3	6	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		ETR4-11-W 031883		1 off
<b>Star-delta timing relays</b>								
3	3	6	3 – 60 s	ETR4-51-A 031884		ETR4-51-W 031885		1 off
<b>Multi-function relay</b>								
3	3	6	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		ETR4-69-W 031887		1 off

ETR4 Electronic Timing Relays

Available functions <sup>1)</sup>	Terminal markings to EN 50 042	Available functions <sup>1)</sup>	Terminal markings to EN 50 042
11			
51			
11, 21, 42, 81		12, 16, 22, 82	

Type suffix	Actuating voltage printed on unit	
	V DC	V AC
-A	24 – 240	24 – 240, 50/60 Hz
-W	–	346 – 440 50/60 Hz
Voltage tolerance:		
	V DC	V AC
-A	16.8 – 288	20.4 – 264
-W	–	294.1 – 484

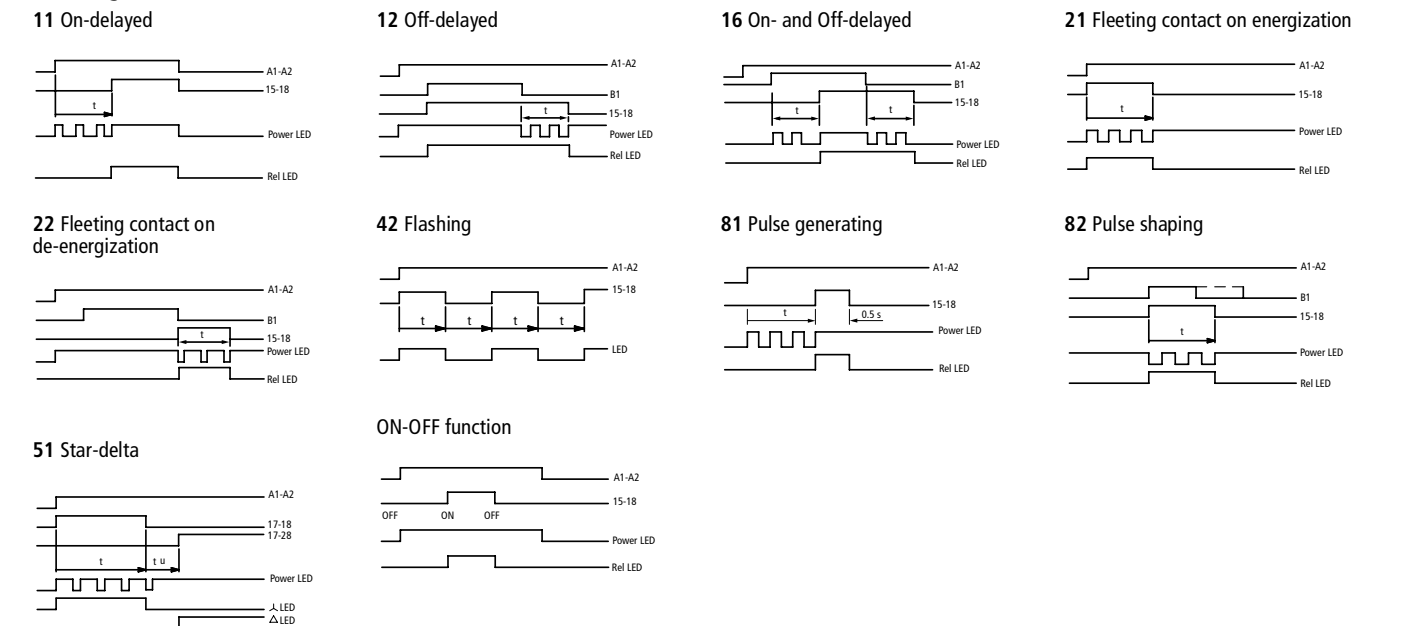
Admissible cable length:	
Cable, unscreened Cable cross-section 0.5 – 1.5 mm <sup>2</sup>	Connection to B1
Two-core cable	250 m
Two-core cable in same cable duct as mains cable 50/60 Hz	50 m

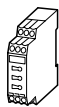
Accessories:	Page
Screw adapter	04/028

Notes <sup>1)</sup> ETR4-11 and ETR4-51 supplied with stated function as standard

Flow diagrams



## ETR4 Electronic Timing Relays

Rated operational current $I_e$			Conv. therm. current $I_{th}$	Time range	Type Article no.	Price See Price List	Std. pack	Notes
AC-11								
220 V	380 V							
230 V	400 V							
240 V	440 V							
A	A		A					
<b>Multi-function relay</b>								
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	3	6	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	<b>ETR4-70-A</b> 031888		1 off	
Type suffix		Actuating voltage printed on unit						
		V DC	V AC					
-A	24 – 240	24 – 240,	50/60 Hz					
		Voltage tolerance:						
		V DC	V AC					
		16.8 – 288	20.4 – 264					
Admissible cable length:								
Cable, unscreened		Connection to						
Cable cross-section		B1						
0.5 – 1.5 mm <sup>2</sup>		Z1/Z2						
Two-core cable		250 m						
Two-core cable in same cable duct as mains cable		50 m						
50/60 Hz								
<b>Accessories</b>		<b>Page</b>						
Screw adapter		04/027						
Remote potentiometer		04/028						

# ETR4 Electronic Timing Relays

## ETR4-70 Flow Diagrams

A2/X1 linked

→ Two timed contacts

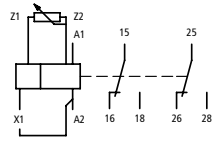
Available functions

Terminal markings to EN 50 042

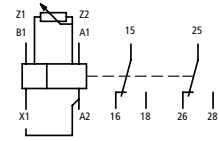
Available functions

Terminal markings to EN 50 042

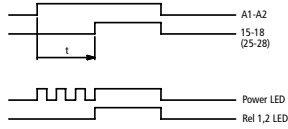
11, 21, 42, 81  
ON – OFF



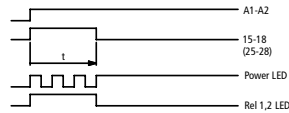
12, 16, 22, 82  
ON – OFF



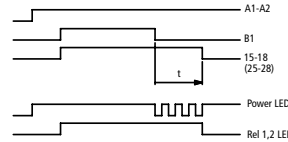
11 On-delayed



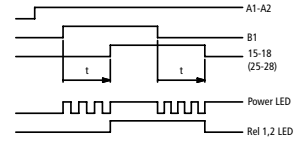
21 Fleeting contact on energization



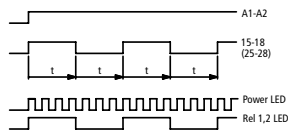
12 Off-delayed



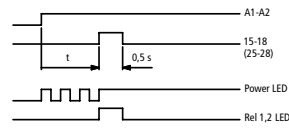
16 On- and Off-delayed



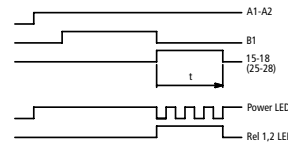
42 Flashing



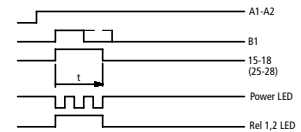
81 Pulse generating



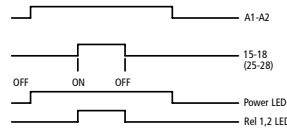
22 Fleeting contact on de-energization



82 Pulse shaping



ON-OFF function



A2/X1 not linked

→ One non-delayed contact and one timed contact

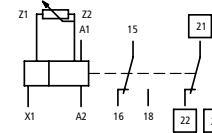
Available functions

Terminal markings to EN 50 042

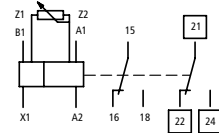
Available functions

Terminal markings to EN 50 042

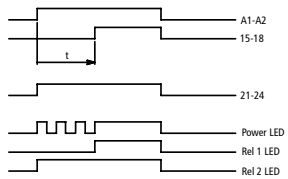
11, 21, 42, 81  
ON – OFF



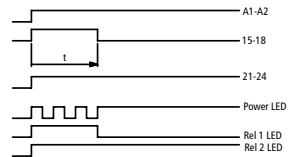
12, 16, 22, 82  
ON - OFF



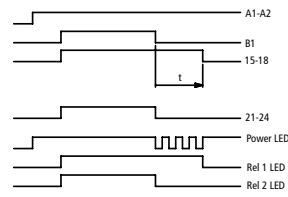
11 On-delayed



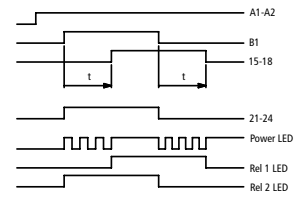
21 Fleeting contact on energization



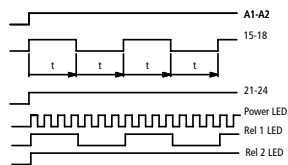
12 Off-delayed



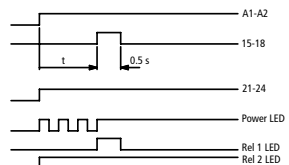
16 On- and Off-delayed



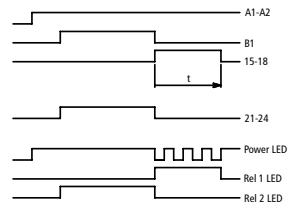
42 Flashing



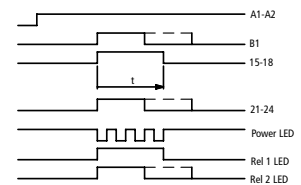
81 Pulse generating



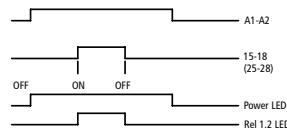
22 Fleeting contact on de-energization



82 Pulse shaping



ON-OFF function



## ESR Electronic Safety Relays Engineering

### Applications

Electronic safety relays are used for monitoring safety-related control systems. The requirements for the electrical equipment of machines are specified in IEC/EN 60 204. EN 954-1 stipulates that machine users must carry out a risk assessment of machines and implement a control system that meets the requirements of safety categories 1, 2, 3, or 4.

### Construction

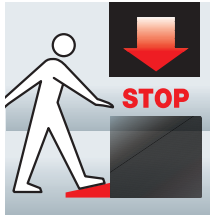
The electronic safety relays consist of a power section, the electronics and two redundant relays with interlocked opposing contacts for the enabling- and signalling paths.

### Product range overview

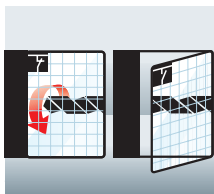
The range includes relays for:



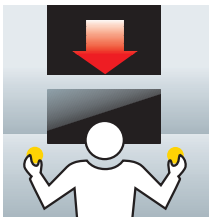
Emergency-Stop circuits



Monitoring of contact mats/safety mats, and safety bumpers



Protective guard monitoring



Monitoring of two-hand controls

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

### Safety category

The ESR electronic safety relays are approved by employers' liability associations and meet the requirements of safety category 3 or 4. The safety category of the control system is determined by the combination with the external circuitry, for which the machine operator is responsible. The electronic safety relays are single-fault proof, i.e. one fault in the safety circuit does not cause hazardous conditions. 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 removal of the power supply to the machine actuators.
- Stop category 1: controlled stopping with power available to the machine actuators to achieve the stop. Power is not removed until the stop is achieved.

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

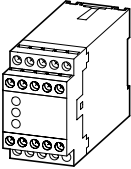

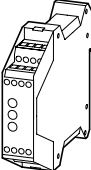





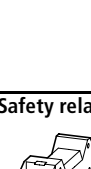

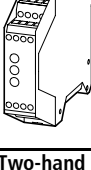

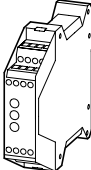

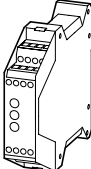

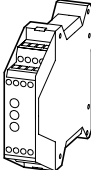

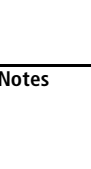

### Function

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 power supply. Since a short circuit in the redundant safety circuit does not cause a hazardous condition, the fault is not detected until the system is reset, when switching On is prevented.

### Single/dual-channel construction

Safety relays for stopping in the event of an emergency and for monitoring of protective guards are available for single-channel and dual-channel applications. The single-channel construction enables earth-fault monitoring to be implemented for the safety circuit. The dual-channel application provides a redundant Emergency-Stop or protective guard monitoring circuit. This allows monitoring for short circuits and cable insulation faults to be implemented additionally. The device can also be used with or without reset monitoring. In this way, the device is not started and enabling paths switched until the falling edge of the On push-button has been detected. An application for the device without reset monitoring is for example, for monitoring protective doors for an automatic restart.

**ESR Electronic Safety Relays**  
Basic Units, Contact Expansion Modules

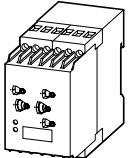
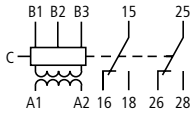
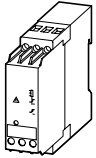
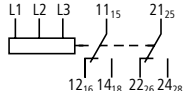
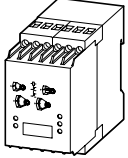
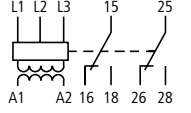
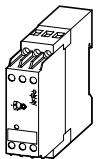
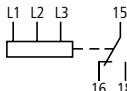
	Actuating voltage $U_c$		Safety category to EN 954-1	Enabling path to IEC/EN 60 204	Stop category 0 1	Type Article no.	Price See Price List	Std. pack
<b>Safety relays for Emergency-Stop and protective door monitoring<sup>1)</sup></b>								
	230 V 50/60 Hz	Dual-channel	4	3	–	ESR3-NO-31(230V) 214615		1 off
								
	24 V DC 50/60 Hz	Single-channel	3	3	–	ESR4-NO-31 214612		
								
	24 V DC 50/60 Hz	Dual-channel	4	2	–	SR4-NO-21 214613		
								
	24 V DC	Dual-channel Off-delayed 0.15 – 3 s	3 <sup>4)</sup> /4 <sup>5)</sup>	2	1	ESR4-NV3-30 214616		
								
	24 V DC	Dual-channel Off-delayed 1.5 – 30 s	3 <sup>4)</sup> /4 <sup>5)</sup>	2	1	ESR4-NV30-30 <sup>6)</sup> 214617		
								
	24 V DC	Dual-channel delayed 1.5 – 30 s <sup>8)</sup>	3 <sup>4)</sup> /4 <sup>5)</sup>	2	1	ESR4-NT30-30 <sup>7)</sup> 225011		
								
<b>Safety relay for contact mat monitoring<sup>1)</sup></b>								
	24 V DC	Dual-channel	4	2	–	ESR4-NM-21 214619		1 off
								
<b>Two-hand relay<sup>1) 9)</sup></b>								
	24 V DC 50/60 Hz	Dual-channel	4	2	–	ESR4-NZ-21 214620		1 off
								
<b>Contact expansion modules<sup>1)</sup></b>								
	24 V DC 50/60 Hz	Non-delayed	4 <sup>2)</sup>	4 <sup>3)</sup>	–	ESR4-NE-42 214614		1 off
								
	24 V DC	Off-delayed $t_A = 3$ s	4 <sup>2)</sup>	–	4	ESR4-VE3-42 214618		1 off
								

**Notes**

- 1) For more information and examples of circuits → Safety Manual: TB0-009
- 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

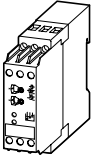
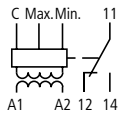
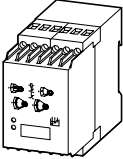
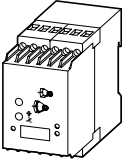
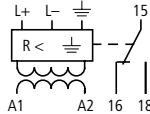
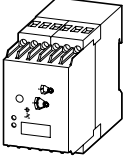
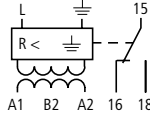

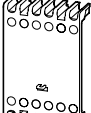
## EMR4 Measuring and Monitoring Relays

Current Monitoring Relays, Phase Sequence Relays, Phase Monitoring Relays, Phase Imbalance Monitoring Relays


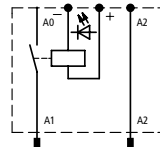

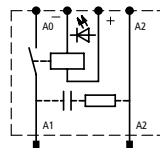
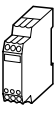
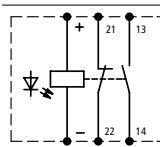
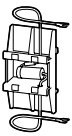








Description	Adjustable current measuring range $I \sim I =$	Circuit symbol	Supply voltage	Type Article no.	Price See Price List	Std. pack
<b>EMR4-I... current monitoring relays</b>						
 <ul style="list-style-type: none"> <li>Switching hysteresis adjustable from 5 – 30 %</li> <li>Response delay 0.05 – 30 s</li> <li>Supply voltage LED: green</li> <li>Status indication via LEDs</li> <li>EMR4...-A: monitors one upper or lower limit</li> <li>EMR4...-B: monitors one upper limit</li> </ul>	3 – 30 mA 10 – 100 mA 0.1 – 1 A		24 – 240 V AC/DC	<b>EMR4-I1-2-A</b> 221781		1 off
	0.3 – 1.5 A 1 – 5 A 3 – 15 A		24 – 240 V AC/DC	<b>EMR4-I15-2-A</b> 221782		
			220 – 240 V AC	<b>EMR4-I15-2-B</b> 221783		
<b>EMR4-F... phase sequence relays</b>						
 <ul style="list-style-type: none"> <li>Monitors three-phase systems for phase sequence and phase failure (<math>&lt; 0.6 \times U_e</math>)</li> <li>Status indication via LEDs</li> <li>Supply voltage = voltage being monitored</li> </ul>	200 – 500 V AC		200 – 500 V AC	<b>EMR4-F500-2</b> 221784		1 off
<b>EMR4-W... phase monitoring relays</b>						
 <ul style="list-style-type: none"> <li>Monitors three-phase systems for phase sequence, over- and undervoltage and phase failure (<math>&lt; 0.6 \times U_e</math>)</li> <li>3-phase voltage monitoring within a range</li> <li>Status indication via LEDs</li> <li>Selectable On-delay or Off-delay between 0.1 – 10 s</li> </ul>	$U_{\min}$ 300 – 380 V AC $U_{\max}$ 420 – 500 V AC		160 – 300 V AC	<b>EMR4-W500-2-C</b> 221785		1 off
			300 – 500 V AC	<b>EMR4-W500-2-D</b> 221786		
	$U_{\min}$ 350 – 430 V AC $U_{\max}$ 500 – 580 V AC		300 – 500 V AC	<b>EMR4-W580-2-D</b> 221787		
<b>EMR4-A... phase imbalance monitoring relays</b>						
 <ul style="list-style-type: none"> <li>Monitors three-phase systems for phase imbalance</li> <li>Detects phase failure even at 95 % regeneration of the failed phase</li> <li>Response delay: 0.5 s</li> <li>Switching threshold adjustable from 5 – 15 % imbalance</li> <li>Status indication via LEDs</li> <li>Phase sequence detection</li> <li>Supply voltage = voltage being monitored</li> </ul>	380 – 415 V 50 Hz		380 – 415 V 50 Hz	<b>EMR4-A400-1</b> 221788		1 off

**EMR4 Measuring and Monitoring Relays**

Level Monitoring Relays, Insulation Monitoring Relays, Sealable Shrouds

Description	Response sensitivity range	Circuit symbol	Supply voltage	Type	Price	Std. pack
				Article no.	See Price List	
<b>EMR4-N... liquid level monitoring relays</b>						
 <ul style="list-style-type: none"> <li>Monitors the level of conductive liquids</li> <li>Monitors the ratio of mixtures of conductive liquids</li> <li>Status indication via LEDs</li> <li>Dual-voltage protection against running dry or overflow</li> </ul>	5 – 100 kΩ		220 – 240 V AC	<b>EMR4-N100-1-B</b>		1 off
				221789		
 <ul style="list-style-type: none"> <li>Monitors the level of conductive liquids</li> <li>Monitors the ratio of mixtures of conductive liquids</li> <li>Status indication via LEDs</li> <li>Selectable On-delay or Off-delay between 0.5 – 10 s</li> </ul>	250 Ω – 500 kΩ		220 – 240 V AC	<b>EMR4-N500-2-B</b>		
	250 Ω – 500 kΩ		24 – 240 V AC/DC	<b>EMR4-N500-2-A</b>		
				221790		
				221791		
<b>EMR4-R... insulation monitoring relays</b>						
 <ul style="list-style-type: none"> <li>Monitors the insulation resistance in non-earthed DC supply systems</li> <li>Selector switch between open-circuit or closed-circuit principle</li> <li>With test and reset facilities</li> <li>Status indication via LEDs</li> </ul>	10 – 110 kΩ		24 – 240 V AC/DC	<b>EMR4-RDC-1-A</b>		1 off
				221792		
 <ul style="list-style-type: none"> <li>Monitors the insulation resistance between non-earthed AC supply systems and protective conductor/earth</li> <li>Tripping function memory</li> <li>Insulation monitoring in 1- and 3-phase AC supply systems</li> <li>Test via local test button or remote test/operation</li> <li>Status indication via LEDs to VDE 0413 Part 2</li> </ul>	10 – 110 kΩ		24 – 240 V AC/DC	<b>EMR4-RAC-1-A</b>		1 off
				221793		
				Type	Price	Std. pack
Mounting width				Article no.	See Price List	
<b>EMR4-PH... sealable shroud</b>						
	22.5 mm			<b>EMR4-PH22</b>		1 off
				221795		
	45 mm			<b>EMR4-PH45</b>		1 off
				221794		




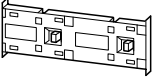


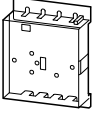

## Mini Contactor Relays, Contactor Relays Accessories

	Rated operational current $I_e$	Actuating voltage $U_j$ / actuating current $I$	For use with contactor relays	Type Article no.	Price See Price List	Std. pack		
	AC-15 240/415 V	DC <sup>1)</sup> 220 V						
	A	A	V DC/mA					
<b>Amplifier modules, plug-in type</b>								
	1.5/1	0.2	24/11		DILR..	<b>VS1DIL</b> 055480	1 off	VS1DIL and VS2DIL amplifier modules can be mounted directly. Contactor coils with rated operational currents > 2 A must be energized via the DILER-G mini contactor relay. Overvoltage limitation: The output on VS2DIL and the input on ETS4-VS3 are equipped with an integral suppressor circuit.
With integral suppressor circuit 	1.5/1	0.2	24/11		DILR..	<b>VS2DIL</b> 057853	1 off	
<b>Amplifier module for separate mounting</b> 	3/3	0.03	24/25		As required	<b>ETS4-VS3</b> 083094	1 off	
<b>Off-delay mechanism</b>								
		24/-		DILE...	<b>TDDILE24</b> 090200	1 off	For use with DILER(M) with DC operated coil only. Off-delay: with auxiliary contact approx. 100 ms, without auxiliary contact approx. 130 ms.	
<b>Suppressors</b>								
Varistor suppressor 		24 – 48 V		DILE...	<b>VGDILE48</b> 010320	10 off	For use with AC operated 50–60 Hz contactor relays only. The suppressor is fitted as standard in DC operated contactor relays	
		110 – 250 V			<b>VGDILE250</b> 010336			
		380 – 415 V			<b>VGDILE415</b> 010463			
		12 – 24 V		DILR...	<b>VGBDIL24</b> 076837	10 off	For AC operated 50–60 Hz and DC operated contactor relays	
		24 – 48 V			<b>VGBDIL48</b> 071609			
		110 – 250 V			<b>VGBDIL250</b> 071610			
		380 – 415 V			<b>VGBDIL415</b> 071611			
RC suppressors 		24 – 48 V		DILE...	<b>RCDILE48</b> 044264	1 off	For AC operated 50–60 Hz contactor relays Note drop-out delay	
		110 – 250 V		DILE...	<b>RCDILE250</b> 046320			
		24 – 48 V		DILR...	<b>RCBDIL48</b> 067345			
		110 – 250 V			<b>RCBDIL250</b> 069718			
		380 – 415 V			<b>RCBDIL415</b> 072091			
Free-wheel diode suppressors 		12 – 250 V		DILR...	<b>FDBDIL</b> 074464	10 off	For DC operated contactor relays Note drop-out delay	

### Notes





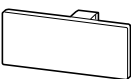
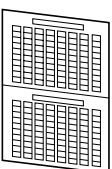
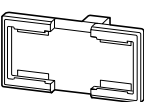
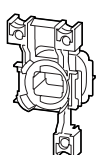
<sup>1)</sup> Making and breaking conditions:  
VS1DIL, VS2DIL and ETS4-VS3 to DC-13, L/R 300 ms.

## Mini Contactor Relays, Contactor Relays, Electronic Timing Relays Accessories

		For use with contactor relays or timing relays	Type Article no.	Price See Price List	Std. pack	
<b>Spacers</b>						
	For arranging contactor relays and timing relays in combinations	DILE... DILET...	<b>VODILE</b> 026634		50 off	0 mm distance between relays
		DILR... ETR4	<b>VODIL</b> 010772		20 off	0 mm distance between relays
		DILR... ETR4	<b>V5/15DIL</b> 013145		10 off	5 mm distance between relays 15 mm distance between relays for mechanical interlock between both relays
<b>Mechanical interlock</b>						
		DILE...	<b>MVDILE</b> 010113		5 off	For two AC or DC operated contactor relays, mounted vertically or horizontally. Distance between contactor relays 0 mm, mechanical lifespan $2.5 \times 10^6$ operations. Additional auxiliary contact modules can be fitted. → Page 04/012
<b>Paralleling link</b>						
	For auxiliary contacts	DILE... ...DILE DILR ...DIL	<b>BT480</b> 052785		100 off	Not proof against accidental contact to IEC 536
<b>Blade terminal DIN 46 244</b>						
	For auxiliary contact and coil connections	DILE... DILET... DILR...	<b>BT483</b> 059904		100 off	Use insulated ferrules
<b>Sealable shrouds</b>						
	Transparent	DILE... DILET...	<b>HDILE</b> 010482		1 off	Snap fitting on contactor relay. For use with open-type contactor relays or in service distribution boards. IP40 degree of protection from front. Can be drilled for the setting dials of the timing relay.
		TPE(H) TPD(H)	<b>PL-DILT</b> 036073		5 off	For screw fixing on timer module, and subsequent sealing

## Mini Contactor Relays, Contactor Relays, Electronic Timing Relays

## Accessories

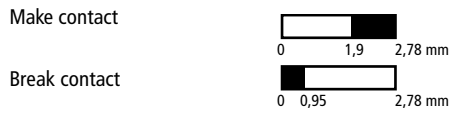
		For use with contactor relays or timing relays	Type Article no.	Price See Price List	Std. pack	
<b>Remote potentiometer, IP54</b>						
	10 kΩ linear 0.25 W max.	DILET... ETR4-70	<b>RR-10</b> 031344		1 off	
<b>Screw adapter</b>						
		ETR4	<b>CS-TE</b> 095853		1 off	For screw fixing of ETR4 timing relays
<b>Component labelling system</b>						
Label	8 × 10 mm	...DIL	<b>KG10</b> 022256		500 off	Clips into 2-pole auxiliary contact modules
						
	8 × 20 mm	...DILE, DILER ...DIL, DILR	<b>KG20</b> 091075		500 off	Clips into 4-pole auxiliary contact modules and basic units
						
Label plate with fixing stud	8 × 17.5 mm Colour: white	DIL...	<b>XGKS-Z</b> 207508		500 off	For use with Moeller equipment with the corresponding mounting hole
						
Sheet of labels	7.5 × 17 mm  Colour: yellow HKS 3 (≈RAL 1018)	XGKS, XGKS-Z KG20  For inscription using laser printer, plotter, transparency- printer, photocopier	<b>XGKE-GE</b> 207517		25 off	1 off = 1 sheet 240 labels per sheet  1 sheet = DIN A4, can be split into two DIN A5 sheets
						
Adapter with fixing stud	Colour: RAL 7035, light grey	DIL...	<b>XGKA-Z</b> 207513		250 off	To secure XGKS on Moeller equipment with the corresponding mounting hole
						
<b>Individual coils</b>						
	AC	DILR	<b>J-DIL00M(230V50HZ)</b> 043833		1 off	Other actuating voltages → Page 04/031
	DC	DILR	<b>G-DIL00M(24VDC)</b> 048557		1 off	

# Mini Contactor Relays, Contactor relays

## Contact Travel Diagrams

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

### DILER-AC



### DILER-DC



### ...DILE



### ...DDILE



### DILR



### ...DIL



### TP...11DIL



## DILER Mini Contactor Relays, DILR Contactor Relays

### Actuating Voltages

AC	DILER-40(...)	DILER-31(...)	DILER-22(...)	DILR40(...)	DILR31(...)	DILR22(...)
	Article no. <sup>1)</sup>	Article no. <sup>1)</sup>	Article no. <sup>1)</sup>	Article no. <sup>1)</sup>	Article no. <sup>1)</sup>	Article no. <sup>1)</sup>
<b>Standard voltages</b>	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	010270	010204	010211	096255	010826	093878
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 voltages (i.e. voltages other than the standard voltages listed above) <sup>2)</sup>	–	–	–	Price See Price List	Price See Price List	Price See Price List
...V50Hz(12–600V)	–	–	–	986763	991507	934554
...V60Hz(12–600V)	–	–	–	989136	993880	936927
<b>DC</b>	<b>DILER-40-G(...)</b>	<b>DILER-31-G(...)</b>	<b>DILER-22-G(...)</b>	<b>DILR40-G(...)</b>	<b>DILR31-G(...)</b>	<b>DILR22-G(...)</b>
	Article no. <sup>1)</sup>	Article no. <sup>1)</sup>	Article no. <sup>1)</sup>	Article no. <sup>1)</sup>	Article no. <sup>1)</sup>	Article no. <sup>1)</sup>
<b>Standard voltages</b>	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 (i.e. voltages other than the standard voltages listed above) <sup>2)</sup>	–	–	–	Price See Price List	Price See Price List	Price See Price List
...VDC(12–250V)	–	–	–	915590	915591	915592

#### Notes

<sup>1)</sup> To obtain the article number for ordering, read under selected type and actuating voltage from the table above.

<sup>2)</sup> For non-standard voltages, state the actuating voltage selected from the range (...–...V) shown.

## DILR Complete Units, VDIL Mechanical Latching Module, J-DIL Individual Coil Actuating Voltages

AC	DILR22D(...)	DILR44D(...)	DILR53D(...)	VDIL(...)	J-DIL00M(...) Individual coil
	Article no. <sup>1)</sup>	Article no. <sup>1)</sup>	Article no. <sup>1)</sup>	Article no. <sup>1)</sup>	Article no. <sup>1)</sup>
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	023809
240V50Hz	096261	065414	044058	053115	066693
24V60Hz	015580	074906	058296	053659	099744
115V60Hz	084396	053549	032193	052241	043837
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 (i.e. voltages other than the standard voltages listed above) <sup>2)</sup>	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. <sup>1)</sup>	Article no. <sup>1)</sup>	Article no. <sup>1)</sup>	Article no. <sup>1)</sup>	Article no. <sup>1)</sup>
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	048540	048545	048550	048560	048555
220VDC	048541	048546	048551	048561	048556
Non-standard voltages (i.e. voltages other than the standard voltages listed above) <sup>2)</sup>	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

<sup>1)</sup> To obtain the article number for ordering, read under selected type and actuating voltage from the table above.

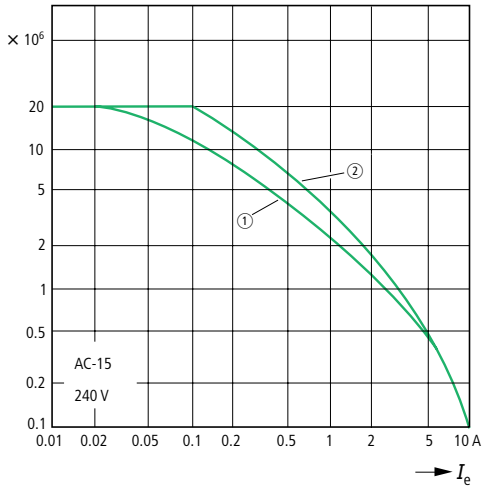
<sup>2)</sup> For non-standard voltages, state the actuating voltage selected from the range (...–...V) shown.

# DIL Contactor Relays, DILET Electronic Timing Relays Tripping Characteristics

Relays  
Contactor Relays

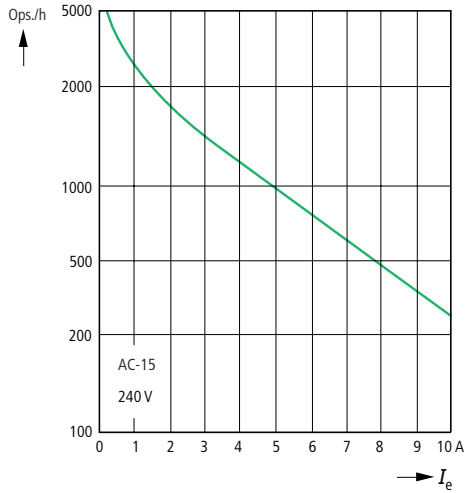
## DILR (AC-15)

Component lifespan (operations)  $I_e$  = Rated operational current  
 ① = Make contact  
 ② = Break contact



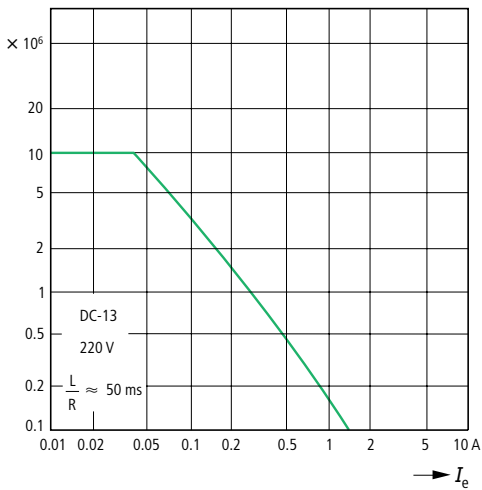
## DILR(AC-15)

Max. operating frequency (approx.)  
 $I_e$  = Rated operational current



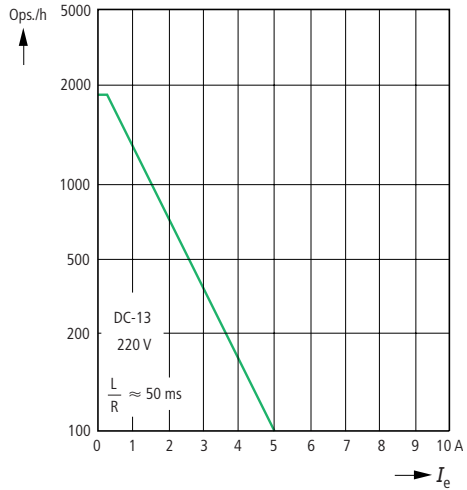
## DILR(DC-13<sup>1)</sup>)

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



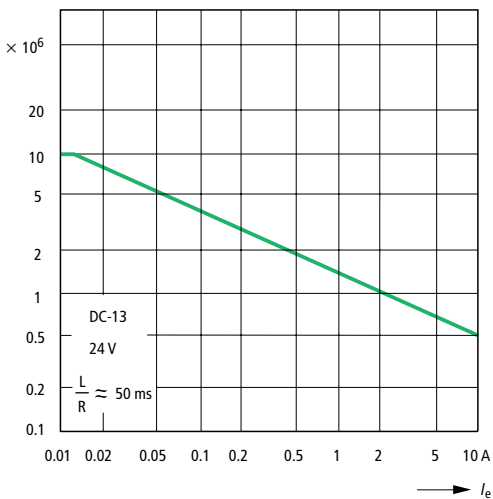
## DILR(DC-13<sup>1)</sup>)

Max. operating frequency (approx.)  
 $I_e$  = Rated operational current



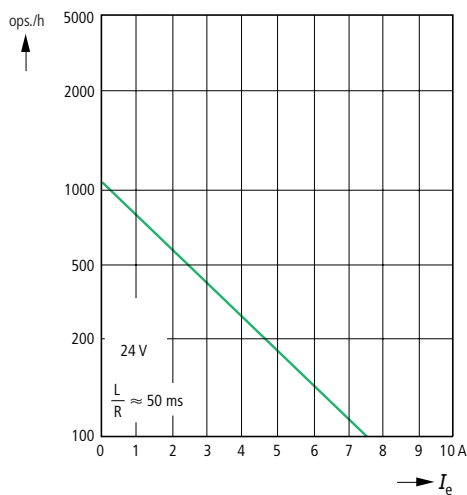
## DILR(DC-13<sup>1)</sup>)

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



## DILR(DC-13<sup>1)</sup>)

Max. operating frequency (approx.)  
 $I_e$  = Rated operational current



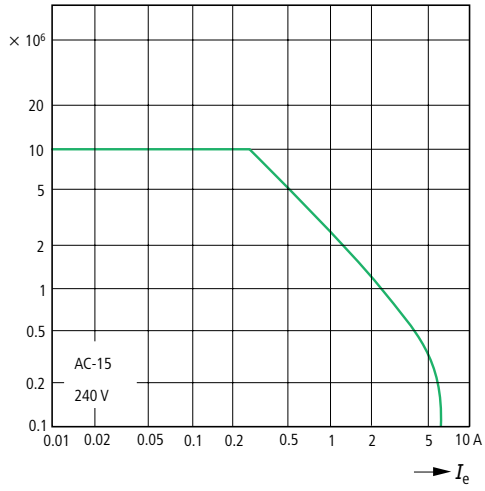
### Notes

<sup>1)</sup> Making and breaking conditions to DC-13, time constant as stated.

# DIL Contactor Relays, DILET Electronic Timing Relays Tripping Characteristics

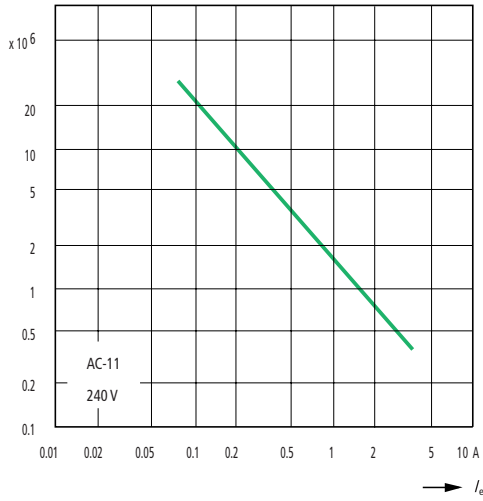
## DILER(AC-15)

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



## DILET(AC-11)

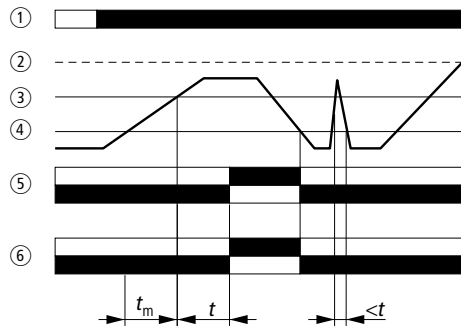
Component lifespan (operations)  
 $I_e$  = Rated operational current



# EMR4 Measuring and Monitoring Relays

## Tripping Characteristics

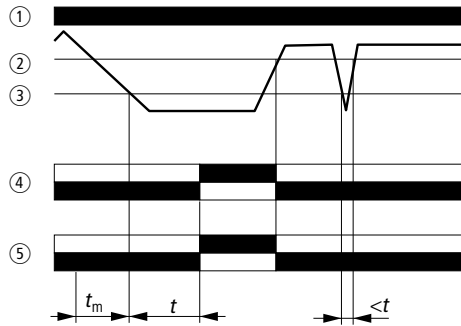
### EMR4-I... current monitoring relays



#### Function at overcurrent, OC

- ① Supply voltage on A1-A2
- ② Hysteresis (reset value) undercurrent, UC
- ③ Response threshold for measuring the current
- ④ Hysteresis (reset value) overcurrent, OC
- ⑤ Timed contact 1: 15-18, 15-16
- ⑥ Timed contact 2: 25-28, 25-26

$t_m = 80$  ms, measuring cycle  
 $t = (0.05 - 1$  s;  $1.5 - 30$  s)  
 On-delay

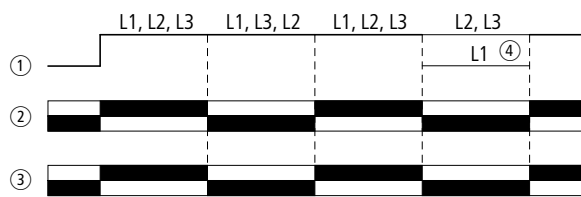


#### Function at undercurrent, UC

- ① Supply voltage on A1-A2
- ② Hysteresis (reset value) undercurrent, UC
- ③ Response threshold for measuring the current
- ④ Timed contact 1: 15-18, 15-16
- ⑤ Timed contact 2: 25-28, 25-26

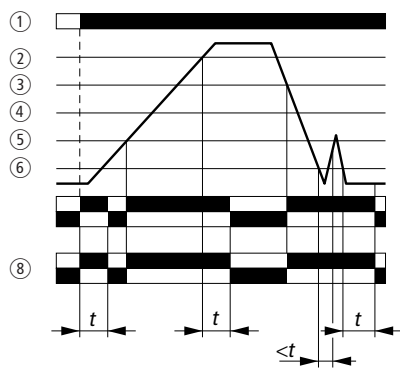
$t_m = 80$  ms, measuring cycle  
 $t = (0.05 - 1$  s;  $1.5 - 30$  s)  
 On-delay

### EMR4-F... phase sequence relay



- ① Voltage being monitored, three-phase system, L1, L2, L3
- ② Timed contact 1: 11-14, 11-12
- ③ Timed contact 2: 21-24, 21-22
- ④ Phase failure 100 %

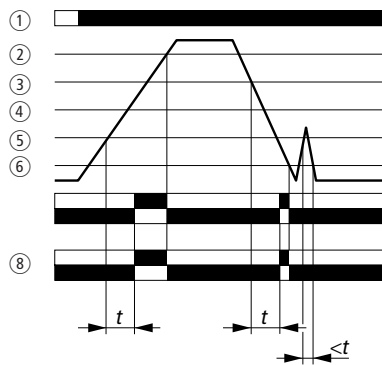
### EMR4-W... phase monitoring relay



#### On-delayed fault indication: function ☒

- ① Supply voltage on A1-A2
- ②  $> U$
- ③ Hysteresis + 5 %
- ④ Monitored voltage (rated voltage) L1, L2, L3
- ⑤ Hysteresis - 5 %
- ⑥  $< U$
- ⑦ Timed contact 1: 15-18, 15-16
- ⑧ Timed contact 2: 25-28, 25-26

$t$  = Delay time applies only to overvoltage/undervoltage monitoring



#### Off-delayed fault indication: function ■

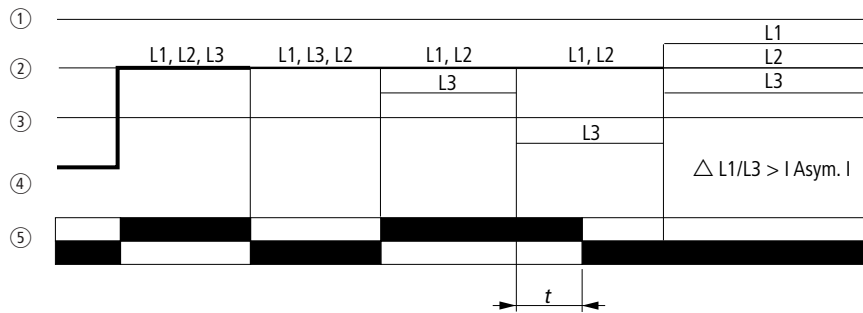
- ① Supply voltage on A1-A2
- ②  $> U$
- ③ Hysteresis + 5 %
- ④ Monitored voltage (rated voltage) L1, L2, L3
- ⑤ Hysteresis - 5 %
- ⑥  $< U$
- ⑦ Timed contact 1: 15-18, 15-16
- ⑧ Timed contact 2: 25-28, 25-26

$t$  = Delay time applies only to overvoltage/undervoltage monitoring

# EMR4 Measuring and Monitoring Relays

## Tripping Characteristics

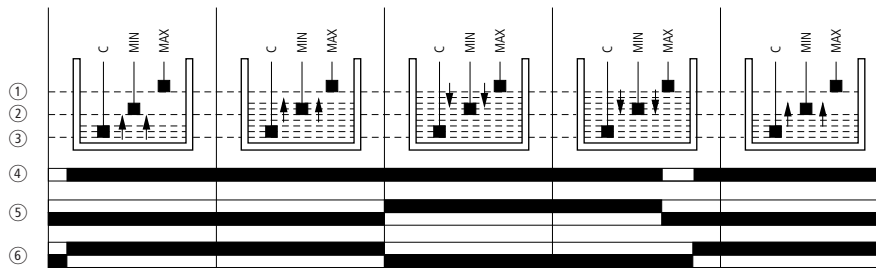
### EMR4-A... phase imbalance monitoring relay



- ① Adjustable imbalance threshold 5 – 15 %
- ② Monitoring voltage L1, L2, L3 and supply voltage  $U_{rated}$
- ③ Adjustable imbalance threshold 5 – 15 %
- ④ Level L1, L2, L3
- ⑤ Monitoring contact/Timed contact 1: 15-18, 15-16

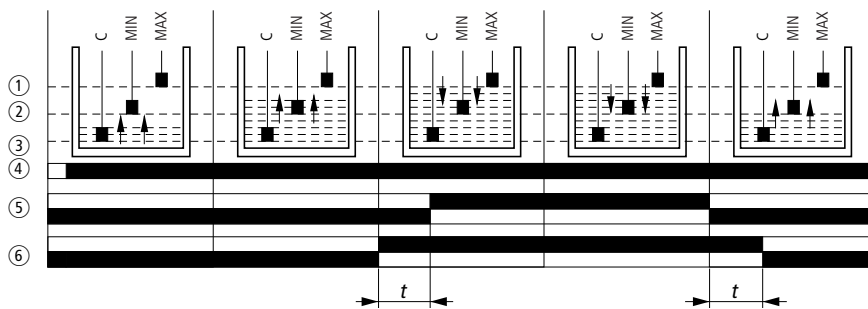
$t$  = Delay time applies only with phase imbalance, 500 ms fixed setting

### EMR4-N100... liquid level monitoring relay



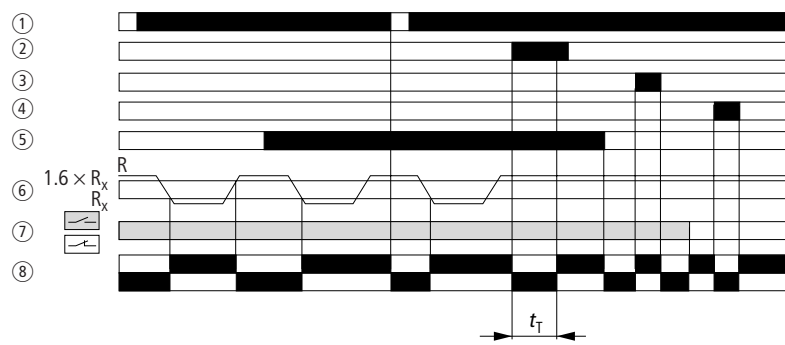
- ① Maximum filling level
- ② Minimum filling level
- ③ Reference sensor C
- ④ Supply voltage on A1-A2
- ⑤ Relay contact function: Drain "DOWN": 11-14, 11-12
- ⑥ Relay contact function: Fill "UP": 11-14, 11-12

### EMR4-N500... liquid level monitoring relay



- ① Maximum filling level
- ② Minimum filling level
- ③ Reference sensor C
- ④ Supply voltage on A1-A2
- ⑤ On-delay function 15-18, 25-28, 15-16, 25-26
- ⑥ Off-delay function 15-18, 25-28, 15-16, 25-26

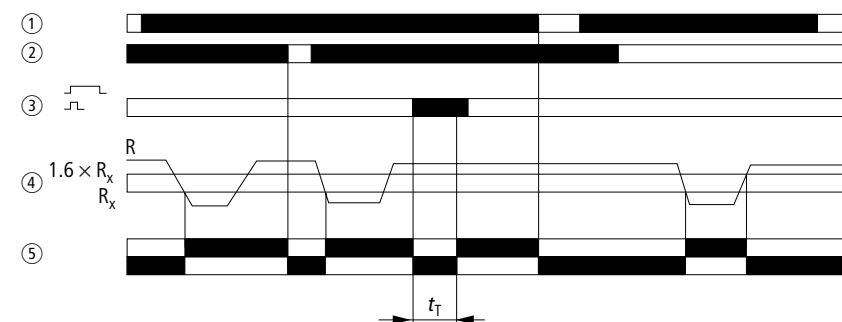
### EMR4-RDC... insulation monitoring relay



- ① Supply voltage on A1-A2
- ② Front actuator – reset L+ and L-/test L+, reset test L+
- ③ Front actuator – test L-  
Remote connection – test L-, test L-, S3-S4
- ④ Remote connection – test L+, S3-S1
- ⑤ Remote connection – save, reset, S3/S2
- ⑥ Insulation resistance  $R$  of the supply system, Set response value  $R_x$ , L+(L-)/ $\neq$
- ⑦ Front switch – function:  
: Open circuit arrangement/make circuit,  
: Closed-circuit arrangement/break circuit
- ⑧ Timed contact: 15-18, 15-16

$t_T$  = Test duration approx. 1 s

### EMR4-RAC... insulation monitoring relay



- ① Supply voltage on A1-A2
- ② Remote connection – save, reset, S1/S2
- ③ Front actuator, Test/Reset – reset, test Remote connection S1/ $\neq$  – reset, test
- ④ Insulation resistance of the supply system Set response value –  $R_x$
- ⑤ Timed contact: 15-18, 15-16

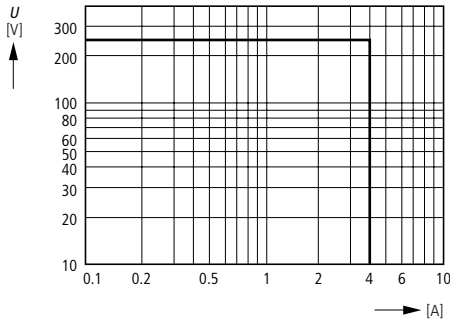
$t_T$  = Test duration > approx. 300 ms

# EMR4 Measuring and Monitoring Relays

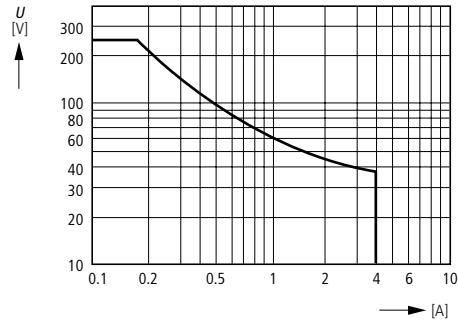
## Tripping Characteristics

### Load limit curves, range 22.5 mm

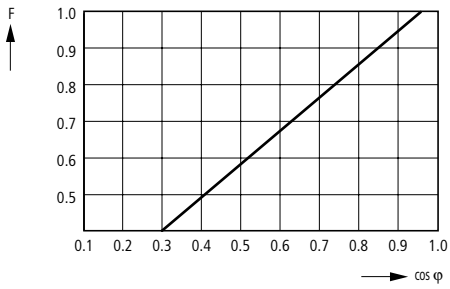
#### AC load (resistive)



#### DC load (resistive)

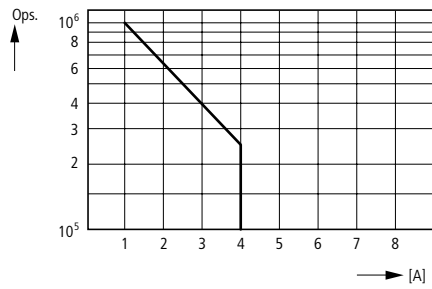


#### Derating factor at inductive AC load



Derating factor F at inductive load

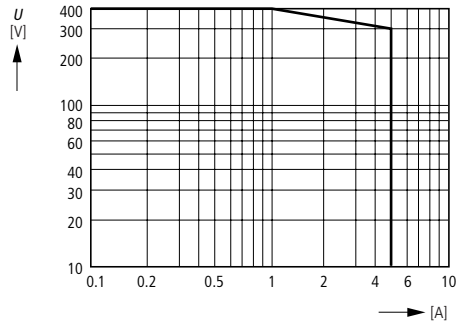
#### Contact life



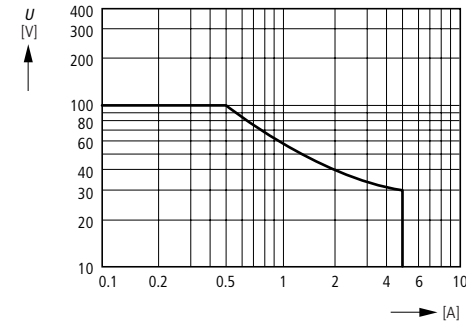
Contact life  
Switching operations Ops.  
220 V 50 Hz AC-1  
360 contact sequences/h

### Load limit curves, range 45 mm

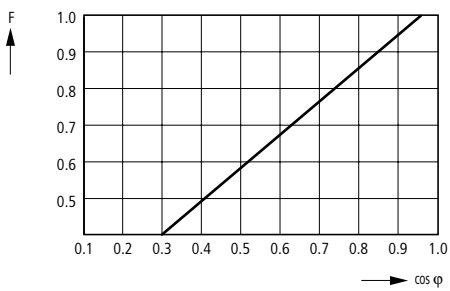
#### AC load (resistive)



#### DC load (resistive)

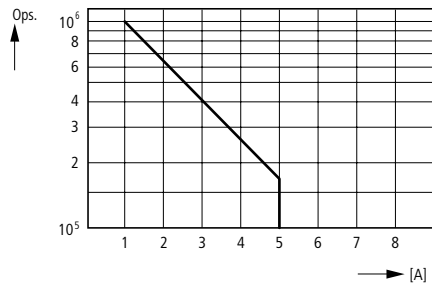


#### Derating factor at inductive AC load



Derating factor F at inductive load

#### Contact life



Contact life  
Switching operations Ops.  
220 V 50 Hz AC-1  
360 contact sequences/h

**"Easy" Control Relays**

## Technical Data

			EASY200-EASY	EASY412-...	EASY6...-...
<b>General technical data</b>					
Standards			EN 55 011, EN 55 022, IEC/EN 61 000-4, IEC 60 068-2-6, IEC 60 068-2-27		
Dimensions					
W × H × D	mm		35.5 × 90 × 53 (2 space units)	71.5 × 90 × 53 (4 space units)	107.5 × 90 × 53 (6 space units)
Weight	kg		0.07	0.2	0.3
Mounting			On EN 50 022 top-hat rail, 35 mm, or screw fixing, using ZB4-101-GF1 fixing brackets (accessories)		
<b>Terminal capacity</b>					
Solid	Min./Max.	mm <sup>2</sup>	0.2/4 (AWG 22 – 12)		
Flexible with ferrule	Min./Max.	mm <sup>2</sup>	0.2/2.5 (AWG 22 – 12)		
Width of standard screwdriver		mm	3.5 × 0.8	3.5 × 0.8	3.5 × 0.8
Tightening torque		Nm	0.6	0.6	0.6
<b>Ambient climatic conditions</b>					
Operational ambient temperature: horizontal / vertical installation		°C	–25/+55, low temperatures to IEC 60 068-2-1, high temperatures to IEC 60 068-2-2		
Condensation			Prevent condensation by suitable measures		
LCD display (clearly legible)		°C	0/+55		
Storage/transport temperature		°C	–40/+70		
Relative humidity, non-condensing (IEC 60 068-2-30)		%	5 – 95		
Air pressure (operation)		hPa	795 – 1080		
<b>Corrosion resistance</b>					
IEC 60 068-2-42	4 days SO <sub>2</sub>	cm <sup>3</sup> /m <sup>3</sup>	10	10	10
IEC 60 068-2-43	4 days H <sub>2</sub> S	cm <sup>3</sup> /m <sup>3</sup>	1	1	1
<b>Ambient conditions, mechanical</b>					
Pollution degree			2	2	2
Degree of protection (EN 50 178, IEC 60 529, VBG 4)			IP20	IP20	IP20
<b>Vibration resistance to IEC 60 068-2-6</b>					
Constant amplitude 0.15 mm		Hz	10 – 57	10 – 57	10 – 57
Constant acceleration, 2 g		Hz	57 – 150	57 – 150	57 – 150
Mechanical shock resistance (half-sinusoidal shock 15 g/11 ms) to IEC 60 068-2-32		Impacts	18	18	18
Drop to IEC 60 068-2-31		drop height	50	50	50
Free fall, packaged (IEC 60 068-2-32)		m	1	1	1
<b>Electromagnetic compatibility (EMC)</b>					
<b>Electrostatic discharge (IEC/EN 61 000-4-2, severity level 3, ESD)</b>					
Air discharge		kV	8	8	8
Contact discharge		kV	6	6	6
Electromagnetic fields (IEC/EN 61 000-4-3, RFI)		V/m	10	10	10
<b>Radio interference suppression</b>					
Burst pulses (IEC/EN 61 000-4-4, Level 3)			EN 55 011 Class B, EN 55 022 Class B		
Supply cables		kV	2	2	2
Signal lines		kV	2	2	2
High-energy pulses (surge) EASY-AC (IEC/EN 61 000-4-5)		kV	2 (supply cable, balanced)		
High-energy pulses (surge) EASY-DC (IEC/EN 61 000-4-5, severity level 2)		kV	0.5 (supply cable, balanced)		
Immunity to line-conducted interference to IEC EN 61 000-4-6		V	10	10	10
<b>Dielectric strength</b>					
Clearance in air and creepage distances dimensioned to			EN 50 178, UL 508, CSA C22.2, No 142		
Dielectric strength			EN 50 178	EN 50 178	EN 50 178
<b>Back-up/accuracy of real-time clock (only on EASY...C)</b>					
<b>Clock battery back-up</b>					
at 25 °C		h	–	Normally 64	Normally 64
at 40 °C		h	–	Normally 24	Normally 24
Accuracy of the real-time clock		s/day	–	Normally ± 5 (~ ± 0.5 h/year)	Normally ± 5 (± 0.5 h/year)
<b>Repetition accuracy of timing relays</b>					
Accuracy of timing relays (of values)		%	–	± 1	± 1
<b>Resolution</b>					
Range "s"		ms	–	10	10
Range "M:S"		s	–	1	1
Range "H:M"		min	–	1	1
<b>Retentive memory</b>					
Write cycles of the retentive memory			–	≥ 100 000	≥ 100 000

## "Easy" Control Relays

## Technical Data

		EASY412-AC-...	EASY61...-AC-R...
<b>Power supply</b>			
Rated operational voltage	V AC	110/115/120/230/240 (+10/-15 %)	100/110/115/120/230/240 (+10/-15 %)
Admissible range	V AC	90 – 264	85 – 264
Frequency, rated value, tolerance	Hz	50/60 (± 5 %)	50/60 (± 5 %)
<b>Input current</b>			
at 115/120 V AC 60 Hz	mA	Normally 40	Normally 70
at 230/240 V AC 50 Hz	mA	Normally 20	Normally 35
Voltage dips (IEC/EN 61 131-2)	ms	20	20
<b>Heat dissipation</b>			
at 115/120 V AC	VA	Normally 5	Normally 10
at 230/240 V AC	VA	Normally 5	Normally 10

		EASY412-DC-...	EASY412-DA-RC	EASY6...-DC-...
<b>Power supply</b>				
Rated operational voltage	V DC	24 (-15/+20 %)	12 (-15/+30 %)	24 (-15/+20 %)
Admissible range	V DC	20.4 – 28.8	10.2 – 15.6	20.4 – 28.8
Residual ripple	%	≤ 5	±5	≤ 5
Input current at 24 VDC	mA	Normally 80	Normally 140	Normally 140
Voltage dips (IEC/EN 61 131-2)	ms	10	10	10
Heat dissipation at 24 V DC	W	Normally 2	Normally 2	Normally 5

		EASY412-AC-...	EASY618/619-AC-R...
<b>Digital inputs 115/230 V AC</b>			
Number		8	12
Status display		LCD display (if provided)	LCD display (if provided)
<b>Potential isolation</b>			
From power supply		No	No
Between digital inputs		No	No
From the outputs		Yes	Yes
<b>Rated voltage L (sinusoidal)</b>			
at signal "0"	V AC	0 – 40	0 – 40
at signal "1"	V AC	79 – 264	79 – 264
Rated frequency	Hz	50/60	50/60
Input current at signal "1" R1 to R12, I1 to I6 (EASY6... also I9 to I12)	mA	6 × 0.5 (at 230 V AC 50 Hz) 6 × 0.25 (at 115 V AC 60 Hz)	10 (12) × 0.5 (at 230 V AC 50 Hz) 10 (12) × 0.25 (at 115 V AC 60 Hz)
Input current at signal "1" I7, I8	mA	2 × 6 (at 230 V AC 50 Hz) 2 × 4 (at 115 V AC 60 Hz)	2 × 6 (at 230 V AC 50 Hz) 2 × 4 (at 115 V AC 60 Hz)
<b>Delay time I1 to I6/I9 to I12 From 0 to 1 and from 1 to 0</b>			
Debounce ON	50/60 Hz	ms	80/66 <sup>2</sup> / <sub>3</sub>
Debounce OFF	50/60 Hz	ms	20/16 <sup>2</sup> / <sub>3</sub>
<b>Delay time I7, I8 from 1 to 0</b>			
Debounce ON	50/60 Hz	ms	160/150
Debounce OFF	50/60 Hz	ms	100/100
<b>Delay time I7, I8 from 0 to 1</b>			
Debounce ON	50/60 Hz	ms	80/66 <sup>2</sup> / <sub>3</sub>
Debounce OFF	50/60 Hz	ms	20/16 <sup>2</sup> / <sub>3</sub>
<b>Max. admissible cable length (per input)</b>			
R1 to R12, I1 to I6 (with EASY 6... also I9 to I12)	m	Normally 40	Normally 40
I7, I8	m	Normally 100	Normally 100

**“Easy” Control Relays**  
 Technical Data

		EASY412-DC-...	EASY412-DA-RC	EASY6...-DC...
<b>Digital inputs 24 V DC</b>				
Quantity, of which 2 inputs (I7, I8) can be used as analog inputs		8	8	12 (on basic unit)
Status display		LCD display (if provided)	LCD display (if provided)	LCD display (if provided)
Potential isolation				
From power supply		No	No	No
Between digital inputs		No	No	No
From the outputs		Yes	Yes	Yes
Rated operational voltage	V DC	24	12	24
at signal “0”	V DC	< 5.0 (I1 – I8)	< 4.0 (I1 – I8)	< 5.0 (I1 – I12, R1 – R12)
at signal “1”	V DC	> 15.0 (I1 – I6) > 8.0 (I7 – I8)	> 8.0 (I1 – I8)	> 15.0 (I1 – I6, I9 – I12, R1 – R12) > 8.0 (I7 – I8)
Input current at signal “1” R1 to R12, I1 to I6 (EASY620/621 also I9 to I12)	mA	3.3 (at 24 V DC)	3.3 (at 12 V DC)	3.3 (at 24 V DC)
Input current at signal “1” (I7, I8)	mA	2.2 (at 24 V DC)	1.1 (at 12 V DC)	2.2 (at 24 V DC)
Delay time from 0 to 1				
Debounce On	ms	20	20	20
Debounce Off	ms	Normally 0.25 (I1 – I6)	Normally 0.30 (I1 – I6) Normally 0.35 (I7, I8)	Normally 0.25 (I1 – I6, I9 – I12)
Delay time from 1 to 0				
Debounce On	ms	20	20	20
Debounce Off	ms	Normally 0.4 (I1 – I6) Normally 0.2 (I7, I8)	Normally 0.30 (I1 – I6) Normally 0.15 (I7, I8)	Normally 0.4 (I1 – I6, I9 – I12) Normally 0.2 (I7, I8)
Cable length (unscreened)	m	100	100	100

		EASY412-D...	EASY6...-DC...
<b>Analog inputs</b>			
Number		2	2
Potential isolation			
From power supply		No	No
From the digital inputs		No	No
From the outputs		Yes	Yes
Input type		DC voltage	DC voltage
Signal range	V DC	0 – 10	0 – 10
Resolution, analog	V	0.1	0.1
Resolution, digital		0.1	0.1
Input impedance	kΩ	11.2	11.2
Accuracy of actual value			
Two EASY devices	%	± 3	± 3
Within a single device	%	± 2 (I7, I8) ± 0.12 V	± 2 (I7, I8) ± 0.12 V
Conversion time, analog/digital	ms	Input delay On: 20 Debounce Off: every cycle	Input delay ON: 20 Debounce OFF: every cycle
Input current	mA	< 1	< 1
Cable length (unscreened)	m	30	30

## "Easy" Control Relays

## Technical Data

		EASY412-...-R...	EASY618/619-...-R...
<b>Relay outputs</b>			
Number		4	6
in groups of		1	1
Parallel connection of outputs to increase performance		Not admissible	Not admissible
Protection for one output relay		Miniature circuit-breaker B16 or 8 A fuse (slow)	
Potential isolation from mains supply, inputs		Yes	Yes
Safe isolation	V AC	300	300
Basic insulation	V AC	600	600
Lifespan, mechanical operations	$\times 10^6$	10	10
<b>Relay contacts</b>			
Conventional thermal current (10 A UL)	A	8	8
Recommended for load: 12 V AC/DC	mA	> 500	> 500
Protection against short circuit, $\cos \varphi = 1$ , characteristic B16 at 600 A	A	16	16
Protection against short circuit, $\cos \varphi = 0.5 - 0.7$ , characteristic B16 at 900 A	A	16	16
Rated impulse withstand voltage $U_{imp}$ contact to coil	kV	6	6
Rated insulation voltage $U_i$	V AC	250	250
Rated operational voltage $U_e$	V AC	250	250
Safe isolation to EN 50 178 between coil and contact	V AC	300	300
Safe isolation to EN 50 178 between two contacts	V AC	300	300
<b>Making capacity</b>			
AC-15 250 V AC, 3 A (600 Ops/h)	Operations	300 000	300 000
DC-13 L/R $\leq 150$ ms 24 V DC, 1 A (500 Ops/h)	Operations	200 000	200 000
<b>Breaking capacity</b>			
AC-15 250 V AC, 3 A (600 Ops/h)	Operations	300 000	300 000
DC-13 L/R $\leq 150$ ms 24 V DC, 1 A (500 Ops/h)	Operations	200 000	200 000
<b>Filament lamp load</b>			
1000 W at 230/240 V AC	Operations	25 000	25 000
500 W at 115/120 V AC	Operations	25 000	25 000
<b>Fluorescent tubes</b>			
10 $\times$ 58 W at 230/240 V AC			
With upstream electrical device	Operations	25 000	25 000
Uncompensated	Operations	25 000	25 000
1 $\times$ 58 W at 230/240 V AC			
Conventional, compensated	Operations	25 000	25 000
<b>Operating frequency, relays</b>			
Mechanical operations	$\times 10^6$	10	10
Mechanical switching frequency	Hz	10	10
Resistive load/ lamp load	Hz	2	2
Inductive load	Hz	0.5	0.5
<b>UL/CSA</b>			
Uninterrupted current at 240 V AC/24 V DC	A	10/8	10/8
<b>AC</b>			
Control Circuit Rating Codes (utilization category)		B 300 Light Pilot Duty	B 300 Light Pilot Duty
Max. rated operational voltage	V AC	300	300
Max. thermal uninterrupted current at B 300	A	5	5
Max. Make/Break at B 300	VA	3600/360	3600/360
<b>DC</b>			
Control Circuit Rating Codes (utilization category)		R 300 Light Pilot Duty	R 300 Light Pilot Duty
Max. rated operational voltage	V DC	300	300
Max. thermal uninterrupted current at B 300	A	1	1
Max. Make/Break at R 300	VA	28/28	28/28

## "Easy" Control Relays

### Technical Data

		EASY412-DC-T...	EASY6...-DC-T...
<b>Transistor outputs</b>			
Number		4	8
Rated operational voltage $U_e$	V DC	24	24
Admissible range	V DC	20.4 – 28.8	20.4 – 28.8
Residual ripple	%	≤ 5	≤ 5
<b>Supply current</b>			
at "0" signal	Normally/max.	mA	9/16
at "1" signal	Normally/max.	mA	12/22
Protection against polarity reversal		Yes	Yes
Potential isolation from power supply, inputs		Yes	Yes
Rated current $I_e$ at "1" signal, DC	max.	A	0.5
Lamp load without $R_v$		W	5
Residual current at signal "0", per channel		mA	< 1.0
<b>Max. output voltage</b>			
at signal "0" with external load < 10 MΩ	V DC	2.5	2.5
at signal "1", $I_e = 0.5$ A	V DC	$U = U_e - 1$ V	$U = U_e - 1$ V
<b>Short-circuit protection</b>			
		Yes (detected via diagnostics input I16, I15; R15, R16)	
Short-circuit tripping current for $R_a \leq 10$ mΩ	A	$0.7 \leq I_e \leq 2$	$0.7 \leq I_e \leq 2$
Max. total short-circuit current	A	8	16
Peak short-circuit current	A	16	32
Thermal cutout		Yes	Yes
Max. operating frequency at constant resistive load (depending on circuit configuration and load), $R_L < 100$ kΩ	Ops./h	40 000	40 000
Parallel connection of outputs with resistive load; inductive load with external suppression circuit, combination within a group		Group 1: Q1 to Q4	Group 1: Q1 to Q4, S1 to S4 Group 2: Q5 to Q8, S5 to S8
Quantity of outputs	max.	4	4
Total maximum current	A	2.0	2.0
Status display of the outputs		LCD display (if provided)	LCD display (if provided)

### Approvals

Currently UL/CSA approved; others in preparation:

EASY200-EASY  
EASY412-DC-R  
EASY412-DC-RC  
EASY412-DC-TC  
EASY412-DC-TCX  
EASY412-AC-R  
EASY412-AC-RC  
EASY412-AC-RCX  
EASY618-DC-RC  
EASY618-AC-RC  
EASY618-AC-RE  
EASY619-DC-RC  
EASY619-DC-RCX  
EASY619-AC-RC  
EASY619-AC-RCX  
EASY620-DC-TC  
EASY620-DC-TE  
EASY621-DC-TC  
EASY621-DC-TCX

Oscillation test to EN 61 373 for railway applications, passed

EASY412-DC-RC  
EASY412-DC-TC  
EASY618-DC-RC  
EASY620-DC-TC

### Notes

For more detailed Technical Data → AWB2528-1304-GB

## "Easy" Control Relays

## Technical Data

			EASY205-ASI	EASY204-DP
<b>General technical data</b>				
Standards			EN 55 011, EN 55 022, IEC/EN 61 000-4..., IEC 60 068-2-27, EN 50 295	EN 55 011, EN 55 022, IEC/EN 61 000-4, IEC 60 068-2-27, IEC 61 158
Dimensions	mm		35.5 × 90 × 53	35.5 × 90 × 53
Weight	kg		0.12	0.15
Mounting			On EN 50 022 top-hat rail, 35 mm, or screw fixing, using ZB4-101-GF1 fixing brackets (accessories)	
<b>Ambient climatic conditions</b>				
Operational ambient temperature: horizontal/vertical installation				
Cold to IEC 60 068-2-1	°C		-25/+55	-25/+55
Heat to IEC 60 068-2-2				
Condensation				
			Prevent condensation by suitable measures	Prevent condensation by suitable measures
Storage/transport temperature	°C		-40/+70	-40/+70
Relative humidity				
IEC 60 068-2-30, non-condensing	%		5 – 95	5 – 95
Air pressure (operation)	hPa		795 – 1080	795 – 1080
Corrosion resistance				
IEC 60 068-2-42	4 days SO <sub>2</sub>	cm <sup>3</sup> /m <sup>3</sup>	10	10
IEC 60 068-2-43	4 days H <sub>2</sub> S	cm <sup>3</sup> /m <sup>3</sup>	1	1
<b>Ambient conditions, mechanical</b>				
Pollution degree				
			2	2
Degree of protection				
EN 50 178, IEC 60 529 VBG 4			IP20	IP20
Vibration resistance to IEC 60 068-2-6				
Constant amplitude 0.15 mm	Hz		10 – 57	10 – 57
Constant acceleration, 2 g	Hz		57 – 150	57 – 150
Mechanical shock resistance (half-sinusoidal shock 15 g/11 ms)				
to IEC 60 068-2-27	Impacts		18	18
Drop				
to IEC 60 068-2-31	drop height	mm	50	50
Free fall, packaged				
to IEC 60 068-2-32	m		1	1
<b>Electromagnetic compatibility (EMC)</b>				
Electrostatic discharge to IEC/EN 61 000-4-2, severity level 3				
Air discharge	kV		8	8
Contact discharge	kV		6	6
Electromagnetic fields				
to IEC/EN 61 000-4-3	field strength	V/m	10	10
Radio interference suppression				
to EN 55011, EN 55022			Limit value Class B	Limit value Class B
Burst pulses				
to IEC/EN 61 000-4-4, severity level 3	kV		2 (AS-Interface cables)	2 (power supply-, signal cables)
High-energy pulses (surge) EASY...-DC...				
to IEC/EN 61 000-4-5, severity level 2	kV		–	0.5 (supply cable, balanced)
Immunity to line-conducted interference				
to IEC/EN 61 000-4-6	V		10	10
<b>Dielectric strength</b>				
Clearance in air and creepage distances dimensioned to			EN 50 178, UL 508, CSA C22.2 No 142	EN 50 178, UL 508, CSA C22.2 No 142
Dielectric strength			EN 50 178	EN 50 178
<b>Terminal capacity</b>				
Solid	Min./Max.	mm <sup>2</sup>	0.2/4 (AWG 22 – 12)	0.2/4 (AWG 22 – 12)
Flexible with ferrule	Min./Max.	mm <sup>2</sup>	0.2/2.5 (AWG 22 – 12)	0.2/4 (AWG 22 – 12)
Width of standard screwdriver			3.5 × 0.8	3.5 × 0.8
Tightening torque			0.6	0.6

## "Easy" Control Relays

### Technical Data

		EASY205-ASI	EASY204-DP
<b>Power supply</b>			
Rated operational voltage	V DC	26.5 – 31.6	24 (–15/+20 %)
Total power consumption (from yellow AS-Interface cable)	mA	30	–
Admissible range	V DC	–	20.4 – 28.8
Residual ripple	%	–	< 5
Input current at 24 VDC	mA	–	Normally 200
Voltage dips (IEC/EN 61 131-2)	ms	–	10
Heat dissipation at 24 V DC	W	–	Normally 4.8
<b>Protection against polarity reversal</b>			
AS-Interface protected against polarity reversal		Yes	–
AS-Interface profile cable		7F (hex)	–
Slave addresses		0. 1 – 31	–
Addressing unit interface		3.5 mm socket	–
Power supply			Yes
<b>LED displays</b>			
		Power: green	Power LED (POW): green
		Com-Error: red	PROFIBUS-DP LED (BUS): red
<b>Logic links</b>			
EASY600 contact/coil ↔ AS-Interface		S1 → Input 0 S2 → Input 1 S3 → Input 2 S4 → Input 3 R1 ← Output 0 R2 ← Output 1 R3 ← Output 2 R4 ← Output 3 R5 ← PARAMETEROUTPUT 0 R6 ← PARAMETEROUTPUT 1 R7 ← PARAMETEROUTPUT 2 R8 ← PARAMETEROUTPUT 3	
<b>PROFIBUS-DP</b>			
Connection device		–	SUB-D 9-pole, socket
Potential isolation		–	Bus to power supply Bus and power supply to EASY basic unit (safe isolation)
Function		–	PROFIBUS-DP slave
Interface		–	RS 485
Bus protocol		–	PROFIBUS-DP
Baud rates		–	Automatic search up to 12 MBd
Bus termination resistors		–	Can be connected via plug
Bus addresses		–	1 – 126, can be addressed via EASY basic unit with display or via EASY-SOFT
<b>Services</b>			
Cyclical		–	All data R1 – R12, S1 – S8
Acyclical		–	Read/write, real-time, day, summer time/winter time. All parameters of the "Easy" function relay

**"Easy" Control Relays**

## Technical Data

				EASY400-POW
<b>General technical data</b>				
Standards				EN 55 011, EN 55 022, IEC/EN 61 000-4, IEC 60 068-2-27,
Dimensions				71.5 × 90 × 53
Weight		kg		0.25
Mounting position				Horizontal and vertical on top-hat rail or fixing brackets
Mounting				On EN 50 022 top-hat rail, 35 mm, or screw fixing, using ZB4-101-GF1 fixing brackets (accessories)
<b>Ambient climatic conditions</b>				
Operational ambient temperature: horizontal/vertical installation				
Cold to IEC 60 068-2-1		°C		-25/+55
Heat to IEC 60 068-2-2				
Condensation				Prevent condensation by suitable measures
Storage/transport temperature		°C		-40/+70
Relative humidity				
IEC 60 068-2-30, non-condensing		%		5 – 95
Air pressure (operation)		hPa		795 – 1080
Corrosion resistance				
IEC 60 068-2-42	4 days SO <sub>2</sub>	cm <sup>3</sup> /m <sup>3</sup>		10
IEC 60 068-2-43	4 days H <sub>2</sub> S	cm <sup>3</sup> /m <sup>3</sup>		1
Max. altitude above sea level; above this, note derating		m		2000
<b>Ambient conditions, mechanical</b>				
Pollution degree				2
Degree of protection				
EN 50 178, IEC 60 529, VBG 4				IP20
Vibration resistance to IEC 60 068-2-6				
Constant amplitude 0.15 mm				Hz 10 – 57
Constant acceleration, 2 g				Hz 57 – 150
Mechanical shock resistance (half-sinusoidal shock 15 g/11 ms)				
to IEC 60 068-2-27				Impacts 18
Drop				
to IEC 60 068-2-31 drop height				mm 50
Free fall, packaged				
to IEC 60 068-2-32				m 1
<b>Electromagnetic compatibility (EMC)</b>				
Radio interference suppression				
EN 55011, EN 55022, EN 50 081-2				Limit value Class B
Electrostatic discharge (IEC/EN 61 000-4-2, severity level 3, ESD)				
Air discharge				kV 8
Contact discharge				kV 6
Electromagnetic fields (RFI)				
to IEC/EN 61 000-4-3 field strength				V/m 10
Burst pulses				
to IEC/EN 61 000-4-4, severity level 3				kV 2
High-energy pulses (surge)				
to IEC/EN 61 000-4-5, supply cable balanced				kV 2
High-energy pulses (surge)				
to IEC/EN 61 000-4-5, severity level 2, output cable balanced				kV 0.5
Immunity to line-conducted interference				
to IEC/EN 61 000-4-6				V 10
Surge voltage				
to IEC/EN 60 947				kV 4.9

**"Easy" Control Relays**

## Technical Data

			EASY400-POW
<b>Dielectric strength, potential isolation</b>			
Clearance in air and creepage distances dimensioned to			to EN 50 178
Dielectric strength			to EN 50 178
Protection class $U_{out}$ against $U_{in}$			Class II to IEC 60 536
Potential isolation primary/secondary			Yes, SELV to VDE 0100 Part 410, IEC 60 364-4-41, HD 384.4.41 S2
<b>Terminal capacity</b>			
Solid	Min./Max.	mm <sup>2</sup>	0.2/4 (AWG 22 – 12)
Flexible with ferrule	Min./Max.	mm <sup>2</sup>	0.2/2.5 (AWG 22 – 12)
Width of standard screwdriver		mm	3.5 × 0.8
Tightening torque		Nm	0.6
<b>Input voltage</b>			
Rated input voltage		V AC	100/120/230/240 (–15/+10 %)
Voltage range		V AC	85 – 264
Frequency range		Hz	47 – 63
Input current nominal value	115/230 V	Approx. A	0.3/0.15
Inrush current at 25°C	230 V	A	< 5
Power failure bridging	115/230 V	ms	>10/>20
Fuse	115/230 V	A	2/1 slow
Protective switch, min.			FAZ-C1 or FAZ-B6
<b>Rating data</b>			
Efficiency		%	≧ 87
Power consumption		W	Normally 35
Heat dissipation		W	Normally 5
<b>Input current</b>			
Input current	115/230 V AC	A	0.3/0.15
<b>Output voltage</b>			
Rated value		V DC	24
Tolerance range		%	± 2
Switching peaks (peak to peak)		mV	< 240
Influence of input voltage	115 – 230 V	%	± 1
Influence at 25 – 100 % load fluctuation		%	± 2
<b>Output current</b>			
Output current		A	0 – 1.25
Effectiveness of current limitation		A	> 1.25
Reduction of output voltage after current limitation		V	< 18
Overload proof			Yes, by current limitation
Proof against sustained short circuit			Yes, "hiccup mode", approx. 10 Hz
<b>Special load conditions</b>			
Lamp load, cold	24 V DC	W	10
Base load present		W	5
Behaviour at Emergency-Stop in 24 V DC circuit, disconnection by contactor (contactor load, no damage)		W	30
<b>Displays</b>			
Indication of output voltage (LED, continuous green light = OK)		V DC	24

## DILER, DILR Contactor Relays

## Technical Data

				DILER ...DILE	DILR ...DIL
<b>General technical data</b>					
Standards				IEC/EN 60 947, VDE 0660, UL, CSA	
Lifespan, mechanical					
AC operated					
Operations		$\times 10^6$	10	20	
DC operated					
Operations		$\times 10^6$	20	20	
Maximum operating frequency, mechanical				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 suspended
Mechanical shock resistance					
Half-sinusoidal shock, 10 ms					
Basic unit	Make/break contact	g	10/8	-	
Basic unit with auxiliary contact module	Make/break contact	g	10/8	-	
Half-sinusoidal shock, 20 ms					
Basic unit	Make/break contact	g	-	10/6	
Basic unit with auxiliary contact module	Make/break contact	g	-	10/6	
Degree of protection				IP20	IP20 (DILR) IP00 (...DIL)
Protection against direct contact from the front when actuated by a perpendicular test finger (IEC 536)				Finger and back-of-hand proof	
Dimensions				→ Page 04/065	→ Page 04/066
Weight					
AC operated				0.17	→ Page 15/022
DC operated				0.2	→ Page 15/022
Terminal capacity					
Solid					
		mm <sup>2</sup>	1 × (0.75 – 2.5)	1 × (0.75 – 4)	
		mm <sup>2</sup>	2 × (0.75 – 2.5)	2 × (0.75 – 4)	
Flexible with ferrule to DIN 46 228					
		mm <sup>2</sup>	1 × (0.75 – 1.5)	1 × (0.75 – 2.5)	
		mm <sup>2</sup>	2 × (0.75 – 1.5)	2 × (0.75 – 2.5)	
Solid or stranded					
Min.		AWG	18	18	
Max.		AWG	14	10	
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	

## DILER, DILR Contactor Relays

## Technical Data

			DILER ...DILE	DILR ...DIL
<b>Contacts</b>				
Interlocked opposing contacts to ZH 1/457, including auxiliary contact module			Yes	Yes
Rated impulse withstand voltage $U_{imp}$			V	6000
Overvoltage category/pollution degree			III/3	III/3
Rated insulation voltage $U_i$			V AC	690
Rated operational voltage $U_e$			V AC	600
Safe isolation to IEC 536 between coil and auxiliary contacts, and between the auxiliary contacts			V AC	300
<b>Rated operational current <math>I_e</math></b>				
AC-15	220/240 V	A	6 (4) <sup>1)</sup>	6
	380/415 V	A	3 (2) <sup>1)</sup>	4
	500 V	A	1.5	1.5
DC-13 <sup>2)</sup>				
Above 110 V 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 $\mu$ F, R: 0.5 $\Omega$ in series				
L/R $\leq$ 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 $\leq$ 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 at $U_e = 24$ V				
$U_{min} = 17$ V, $I_{min} = 5.4$ mA	Fault probability		$H_f$	< $10^{-8}$ , < 1 failure in 100 million operations
Conventional thermal current $I_{th}$			A	10
Component lifespan at $U_e = 240$ V				
AC-15			→ Page 04/032	
DC-13			→ Page 04/032	
L/R = 50 ms: 2 contacts in series at $I_e = 0.5$ A	Operations	$\times 10^6$	0.15	→ Page 04/032
Short-circuit rating without welding when supplied directly from mains or transformer > 1000 VA				
Maximum overcurrent protective device	220/240 V	PKZM0	4	4
	380/415 V	PKZM0	4	2.4
	220/230 V	FAZ-C	–	4
Maximum fuse <sup>3)</sup>	500 V	gG/gL A	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

## Notes

<sup>1)</sup> Auxiliary contact module

<sup>2)</sup> Making and breaking conditions to DC-13, time constant as stated

<sup>3)</sup> See transparent overlay 'Fuses' for time/current characteristics (please enquire)

## DILER, DILR Contactor Relays

## Technical Data

		DILER ...DILE	DILR ...DIL
<b>Magnet systems</b>			
Voltage tolerance			
AC operated			
Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz			
Pick-up	$\times U_c$	0.8 – 1.1	0.8 – 1.1
Dual-frequency coil ... V, 50/60 Hz			
Pick-up	$\times U_c$	0.85 – 1.1	0.85 – 1.1
DC operated <sup>1)</sup>			
Pick-up	$\times U_c$	0.85 – 1.3	0.85 – 1.1
Without auxiliary contact module			
Pick-up	$\times U_c$	0.7 – 1.3	–
Power consumption			
AC operated			
Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz			
Pick-up	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			
Pick-up	VA/W	30/26	–
Sealing	VA/W	5.4/1.6	–
... V, 50/60 Hz at 60 Hz			
Pick-up	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 delay	ms	14 – 21	22
Make contact			
Opening delay	ms	8 – 18	14
With auxiliary contact module			
Max. closing delay	ms	45	–
DC operated			
Closing delay	ms	26 – 35	38
Make contact			
Opening delay	ms	15 – 25	9
With auxiliary contact module			
Max. closing delay	ms	70	–

## Notes

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

## TP Timer Modules, V Latching Module, VS Amplifier modules

### Technical Data

		TPE(H)11DIL TPD(H)11DIL	VDIL	VS1DIL VS2DIL	ETS4-VS3
<b>General technical data</b>					
Standards		IEC/EN 60 947, VDE 0660, UL, CSA			
Lifespan, mechanical					
AC operated					
Operations	× 10 <sup>6</sup>	1	5	–	–
DC operated					
Operations	× 10 <sup>6</sup>	1	1	10	30
Maximum operating frequency, mechanical					
AC operated	Ops./h	3600 (100) <sup>1)</sup>	1500	–	–
DC operated	Ops./h	3600 (100) <sup>1)</sup>	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
Min./Max.	°C	(–10/+50) <sup>1)</sup>			
Enclosed					
Min./Max.	°C	–25/+40	–25/+40	–25/+40	–25/+45
Min./Max.	°C	(–10/+40) <sup>1)</sup>			
Mounting position		As required, except suspended <sup>2)</sup>	As required	As required	As required
Mechanical shock resistance (half-sinusoidal shock, 20 ms)					
Make/break contact	g	10/6	–	10/–	10/–
Mechanical latching	g	–	20	–	–
Degree of protection		IP00	IP00	IP00	IP20
Protection against direct contact from the front when actuated by a perpendicular test finger (IEC 536)		Finger and back-of-hand proof	Finger and back-of-hand proof	Finger and back-of-hand proof	Finger and back-of-hand proof
Dimensions		→ Page 04/066	→ Page 04/066	→ Page 04/066	→ Page 04/066
Weight	kg	0.08	0.1	0.04 (VS1) 0.05 (VS2)	0.09
Terminal capacity					
Solid					
	mm <sup>2</sup>	1 × (0.5 – 2.5)	1 × (0.5 – 2.5)	1 × (0.75 – 4)	1 × (0.75 – 2.5)
	mm <sup>2</sup>	2 × (0.5 – 2.5)	2 × (0.5 – 2.5)	2 × (0.75 – 4)	2 × (0.75 – 1.5) <sup>3)</sup>
Flexible with ferrule to DIN 46 228					
	mm <sup>2</sup>	1 × (0.5 – 1.5)	1 × (0.5 – 1.5)	1 × (0.75 – 2.5)	1 × (0.75 – 2.5)
	mm <sup>2</sup>	2 × (0.5 – 0.75)	2 × (0.5 – 0.75)	2 × (0.75 – 2.5)	2 × (0.75 – 1.5) <sup>3)</sup>
Solid or stranded					
Min.	AWG	18	18	18	16
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) TPEH11DIL, TPDH11DIL

2) DILR ... -G + TPD(H)11DIL: do not mount vertically

3) Use equal cross-sections only

## TP Timer Modules, V Latching Module, VS Amplifier modules

## Technical Data

		TPE(H)11DIL TPD(H)11DIL	VDIL	VS1DIL VS2DIL	ETS4-VS3	
<b>Contacts</b>						
Interlocked opposing 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 <sup>1)</sup>						
Above 110 V 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 $\mu$ F, R: 0.5 $\Omega$ in series						
L/R $\leq$ 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 $\leq$ 50 ms: e.g. magnetic clutches, solenoid brakes						
Contacts 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 $\leq$ 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 at $U_e = 24$ V, $U_{min} = 17$ V, $I_{min} = 5.4$ mA						
Fault probability		$H_f$	< $10^{-8}$ , < 1 failure in 100 million operations			
Conventional thermal current $I_{th}$		A	10	–	8	6
Component lifespan at $I_e = 0.1$ A/1.2 A						
AC-15						
230 V	Operations	$\times 10^6$	–	–	8/–	7/1
DC-13						
230 V	Operations	$\times 10^6$	–	–	0.85/–	–
Short-circuit rating without welding when supplied directly from mains or transformer > 1000 VA						
Maximum overcurrent protective device						
220/240 V	PKZM0	2.5	–	–	–	–
380/415 V	PKZM0	1.6	–	–	–	–
Maximum fuse <sup>2)</sup>						
500 V	A gG/gL	6	–	–	–	–
	A fast	–	–	4	–	4
Current heat loss at $I_{th}$						
Per contact, max.	W	0.3	–	–	–	–

## Notes

<sup>1)</sup> Making and breaking conditions to DC-13, time constant as stated

<sup>2)</sup> See transparent overlay 'Fuses' for time/current characteristics (please enquire)

## TP Timer Modules, V Latching Module, VS Amplifier modules

## Technical Data

			TPE(H)11DIL TPD(H)11DIL	VDIL	VS1DIL VS2DIL	ETS4-VS3
<b>Magnet systems</b>						
Voltage tolerance						
AC operated						
Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz	Unlatching	$\times U_c$	–	–	0.8 – 1.1	–
Dual-frequency coil ... V, 50/60 Hz	Unlatching	$\times U_c$	–	–	0.8 – 1.1	–
DC operated <sup>1)</sup>						
	Pick-up	$\times U_c$	–	–	0.75 – 1.25	0.85 – 1.2
	Unlatching	$\times U_c$	–	0.85 – 1.1	–	–
Power consumption						
AC operated						
Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz	Pick-up	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 at 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 (5) <sup>2)</sup>	–	–	–
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	–	–	–
Lifespan, mechanical						
	Coil 50/60 Hz		At 50 Hz, approximately 30% less than shown under "General technical data"			

## Notes

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

<sup>2)</sup> TPEH11DIL, TPDH11DIL

## DILET, ETR4 Electronic Timing Relays

## Technical Data

				DILET-A	DILET-W	ETR4-A	ETR4-W	
<b>General technical data</b>								
Standards				IEC/EN 60 255, VDE 0435, IEC/EN 60 947, UL , CSA				
Lifespan, mechanical								
AC operated	Operations	$\times 10^6$		30	30	30	30	
DC operated	Operations	$\times 10^6$		30	30	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.	$^{\circ}\text{C}$		-20/+60	-20/+60	-25/+60	-25/+60	
Enclosed	Min./Max.	$^{\circ}\text{C}$		-20/+45	-20/+45	-20/+45	-20/+45	
Mounting position				As required				
Mechanical shock resistance (half-sinusoidal shock, 20 ms)				Make contact	g	4	4	4
Degree of protection				Terminals				
Dimensions				$\rightarrow$ Page 04/066				
Weight				kg				
Terminal capacity				$\rightarrow$ Page 04/046 (as DILER)				
<b>Contacts</b>								
Rated impulse withstand voltage $U_{\text{imp}}$				V AC				
				6000	6000	6000	6000	
Overvoltage category/pollution degree				III/2				
				III/2	III/2	III/3	III/3	
Rated insulation voltage $U_i$				V AC				
				600	600	600	600	
Rated operational voltage $U_e$				V AC				
				440	440	440	440	
Safe isolation to IEC 536 between coil and auxiliary contacts, and between the auxiliary contacts				V AC				
				250	250	250	250	
Making capacity								
AC-14	$\cos \varphi = 0.3$	440 V	A	48	48	48	48	
AC-15	$\cos \varphi = 0.3$	220 V	A	50	50	50	50	
DC-11	$L/R \leq 40 \text{ ms}$		$\times I_e$	1.1	1.1	1.1	1.1	
Breaking capacity								
AC-14	$\cos \varphi = 0.3$	440 V	A	3	3	3	3	
AC-15	$\cos \varphi = 0.3$	220 V	A	3	3	3	3	
DC-11	$L/R \leq 40 \text{ ms}$		$\times I_e$	1.1	1.1	1.1	1.1	
Rated operational current $I_e$								
AC-14	440 V		A	3	3	3	3	
AC-15	220 V		A	3	3	3	3	
DC-11 <sup>1)</sup> Above 110 V and at $L/R > 15 \text{ ms}$ : it is essential that an arc-quenching device (RC suppressor) be used in parallel with the contacts. C: 1 $\mu\text{F}$ , R: 0.5 $\Omega$ in series								
$L/R \leq 15 \text{ ms}$ : e.g. contactor coils, solenoid valves, DC motors								
	24 V		A	1.5	1.5	1.5	1.5	
$L/R \leq 50 \text{ ms}$ :								
			A	1.2	1.2	1.2	1.2	
Conventional thermal current $I_{\text{th}}$				A				
				6	6	6	6	
Short-circuit rating <sup>2)</sup> without welding								
Maximum fuse				A gG/gL				
				6	6	6	6	

## Notes

<sup>1)</sup> Making and breaking conditions to DC-13, time constant as stated

<sup>2)</sup> When supplied directly from mains or transformer > 1000 VA

## DILET, ETR4 Electronic Timing Relays

### Technical Data

		DILET-A	DILET-W	ETR4-A	ETR4-W
<b>Magnet systems</b>					
Voltage tolerance					
AC operated 50/60 Hz					
Pick-up		→ Page 04/017	→ Page 04/017	→ Page 04/019	→ Page 04/019
DC operated <sup>1)</sup> when supplied directly from mains or transformer > 1000 VA					
Pick-up		→ Page 04/017	→ Page 04/017	→ Page 04/019	→ Page 04/019
Power consumption					
AC operated 50/60 Hz					
Pick-up	VA/W	2/-	0.5/-	2/-	0.5/-
Sealing	VA/W	2/-	0.5/-	2/-	0.5/-
DC operated					
Pick-up	W	1.8	-	1.8	-
Sealing	W	1.8	-	1.8	-
Duty factor	% DF	100	100	100	100
Maximum operating frequency	Ops./h	4000	4000	4000	4000
Minimum command time					
AC/DC	ms	50/30	50/-	50/30	50/-
Voltage variation	% $\Delta U$	0.01	0.01	0.01	0.01
Variation due to temperature fluctuation based on +20 °C		0.025	0.025	0.025	0.025
Repetition accuracy (deviation)	%	0.1	0.1	0.1	0.1
Recovery time (after 100% time delay)	ms	70	70	70	70
Contact changeover time $t_u$	ms	-	-	4 (50) <sup>2)</sup>	4 (50) <sup>2)</sup>

**Notes**<sup>1)</sup> Not DILET...-W<sup>2)</sup> ETR4-51

## ESR Electronic Safety Relays

## Technical Data

				ESR3-NO-31	ESR4-NO-31	ESR4-NO-21
<b>General technical data</b>						
Standards				IEC/EN 60 947, VDE 0660, IEC/EN 60 255, UL, CSA		
Lifespan, mechanical	Operations	$\times 10^6$		10	10	10
Maximum operating frequency		Ops./h		3600	3600	3600
Climatic proofing				Damp heat to 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		
Degree of protection				5, to IEC/EN 60 068-2-6, frequency: 10 – 55 Hz, amplitude: 0.35 mm		
Enclosure				IP40	IP40	IP40
Terminals				IP20	IP20	IP20
Protection against direct contact from the front when actuated by a perpendicular test finger (IEC 536)				Finger and back-of-hand proof		
Dimensions				→ Page 04/067	→ Page 04/067	→ Page 04/067
Weight				kg	0.36	0.2
Terminal capacity						
Flexible with ferrule				mm <sup>2</sup>	1 × (0.5 – 1.5) 2 × (0.5 – 1.5)	1 × (0.25 – 2.5) 2 × (0.25 – 0.5)
Solid				mm <sup>2</sup>	1 × (0.75 – 2.5) 2 × (0.75 – 2.5)	1 × (0.14 – 2.5) 2 × (0.14 – 0.75)
Terminal screw						
Pozidriv screwdriver				Size	2	–
Standard screwdriver				mm	–	0.6 × 3.5
Tightening torque				Nm	1	0.6
<b>Main contacts</b>						
Rated impulse withstand voltage $U_{imp}$				V AC	4000	4000
Overvoltage category/pollution degree						
outside					III/3	III/3
inside					III/2	III/2
Rated insulation voltage $U_i$				V AC	300	300
Rated operational voltage $U_e$				V AC/DC	230	230
Rated operational current $I_e$						
AC-15				230 V	A	6
DC-13				24 V (360 Ops./h)	A	6
				24 V (3600 Ops./h)	A	3
Max. summation current of all poles				A	18	12
Short-circuit protection						
Fuse				gG/gL A	6	6

## ESR Electronic Safety Relays

## Technical Data

ESR4-NV3(30)-30 ESR4-NT30-30	ESR4-NM-21	ESR4-NZ-21	ESR4-NE-42	ESR4-VE3-42
IEC/EN 60 947, VDE 0660, IEC/EN 60 255, UL, CSA				
10	10	10	10	10
3600	3600	3600	3600	3600
Damp heat to 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				
IP40	IP40	IP40	IP40	IP40
IP20	IP20	IP20	IP20	IP20
Finger and back-of-hand proof				
→ Page 04/067	→ Page 04/067	→ Page 04/067	→ Page 04/067	→ Page 04/067
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)
–	–	–	–	–
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
<b>Magnet system</b>					
Actuating voltage $U_c$		V AC	230	24	24
		V DC	–	24	24
Voltage tolerance	Pick-up	$\times U_c$	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
<b>Control circuit</b>					
Rated output voltage		V DC	$\leq 24$	$\leq 24$	$\leq 24$
No-load voltage		V DC	$\leq 40$	–	–
Rated current		mA	40	40	50
Short-circuit current		A	1	1.4	2.2
Protection			Short-circuit proof transformer	PTC resistor	PTC resistor
Response time		ms	–	2000	2000
Recovery time		ms	–	3000	3000
<b>Inputs</b>					
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
Minimum contact closing time $t_M$		ms	50	50	50
Recovery time $t_W$		ms	500	< 50	500
Synchronous monitoring time $t_S$		ms	–	–	–
<b>EMC</b>					
Emitted interference			To EN 50 081-1 and EN 50 081-2		
Noise immunity			To EN 50 082-2		

## ESR Electronic Safety 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	–	–
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				

## EMR4-I Current Monitoring

## Technical Data

				EMR4-I1-2-A	EMR4-I15-2-A	EMR4-I15-2-B
<b>General technical data</b>						
Standards				IEC/EN 60 255-6, EN 61 557, UL , CSA, GL		
Lifespan, mechanical	Operations	$\times 10^6$	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 range	Min./Max.	°C	-25/+65	-25/+65	-25/+65	
Storage temperature	Min./Max.	°C	-40/+85	-40/+85	-40/+85	
Mounting position				As required		
Mechanical shock resistance				g		
Degree of protection	Terminals		IP20	IP20	IP20	
Dimensions				→ Page 04/067		
Weight	Approx.	kg	0.3	0.3	0.3	
Terminal capacity						
Flexible with ferrule				mm <sup>2</sup>		
Solid				mm <sup>2</sup>		
Standard screwdriver				mm		
Tightening torque				Nm		
Fixing				Snap fitting on top-hat rail to EN 50 022		
<b>Contacts</b>						
Rated impulse withstand voltage $U_{imp}$				V AC		
				4000		
Overvoltage category/pollution degree				III/3		
Rated insulation voltage $U_i$				V AC		
				400		
<b>Power supply</b>						
Supply voltage				V AC/DC		
				24 – 240		
				V AC		
				–		
Voltage tolerance				$\times U_c$		
				0.85 – 1.1		
Power consumption				VA		
				2		
Rated frequency				Hz		
				50 – 60		
Duty factor				% DF		
				100		
<b>Timing cycle</b>						
Response delay time	Adjustable	s	0.05 – 1 and 1.5 – 30	0.05 – 1 and 1.5 – 30	0.05 – 1 and 1.5 – 30	
Time error within supply voltage				%		
				$\leq 0.5$		
Time error within temperature range				%/°C		
				$\leq 0.06$		
<b>Measuring circuits</b>						
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		
Max. measuring cycle				ms		
				80		
Temperature error				%/°C		
				$\leq 0.06$		
Error within supply voltage				%		
				$\leq 0.5$		
<b>Status indication</b>						
Supply voltage	LED		Green	Green	Green	
Output relay energized	LED		Yellow	Yellow	Yellow	
<b>Relay output contacts</b>						
Rated operational voltage $U_e$				V AC		
				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	
Maximum electrical lifespan (AC-12/230 V/5 A)	Operations	$\times 10^6$	0.1	0.1	0.1	
Short-circuit rating, max. fuse	Fast/gL	A	5	5	5	
Load limit curves				→ Page 04/036		
<b>EMC</b>						
Electromagnetic compatibility				IEC/EN 61 000-6-2		
ESD				IEC/EN 61 000-4-2 Level 3		
HF immunity to radiation				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 immunity to line-conducted interference				IEC/EN 61 000-4-6 Level 3		

## EMR4-F Phase Sequence Relays

## Technical Data

				EMR4-F500-2
<b>General technical data</b>				
Standards				IEC/EN 60 255-6, EN 61 557, UL , CSA, GL
Lifespan, mechanical	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 range	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 04/067
Weight	Approx.	kg		0.15
Terminal capacity				
Flexible with ferrule		mm <sup>2</sup>		2 × 2.5
Solid		mm <sup>2</sup>		2 × 2.5
Standard screwdriver		mm		5.5 × 0.8
Tightening torque		Nm		0.5 – 0.8
Fixing				Snap fitting on top-hat rail to EN 50 022
<b>Contacts</b>				
Rated impulse withstand voltage $U_{imp}$		V AC		4000
Overvoltage category/pollution degree				III/3
Rated insulation voltage $U_i$		V AC		400
<b>Power supply</b>				
Supply voltage	L1, L2, L3	V AC		200 – 500
Voltage tolerance		$\times U_c$		0.85 – 1.1
Power consumption		VA		15
Rated frequency		Hz		50 – 60
Duty factor		%		100
<b>Measuring circuits</b>				
Voltage to be monitored $U_N$	L1, L2, L3	V AC		200 – 500
Frequency		Hz		50 – 60
Max. measuring cycle		ms		500
Temperature error		%/°C		≤ 0.06
Error within the supply voltage tolerance		%		≤ 0.5
<b>Status indication</b>				
Output relay energized	LED			Yellow
<b>Relay output contacts</b>				
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
Maximum lifespan, electrical (AC-12/230 V/4 A)	Operations	$\times 10^6$		0.3
Short-circuit rating, max. fuse	Fast/gL	A		10
Load limit curves				→ Page 04/036
<b>EMC</b>				
Electromagnetic compatibility				IEC/EN 61 000-6-2
ESD				IEC/EN 61 000-4-2 Level 3
HF immunity to radiation				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 immunity to line-conducted interference				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
<b>General technical data</b>						
Standards				IEC/EN 60 255-6, EN 61 557, UL , CSA, GL		
Lifespan, mechanical	Operations	$\times 10^6$	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 range	Min./Max.	°C	-25/+65	-25/+65	-25/+65	
Storage temperature	Min./Max.	°C	-40/+85	-40/+85	-40/+85	
Mounting position				As required		
Mechanical shock resistance				g		
Degree of protection	Terminals		IP20	IP20	IP20	
Dimensions				→ Page 04/067		
Weight	Approx.	kg	0.3	0.3	0.3	
Terminal capacity						
Flexible with ferrule				mm <sup>2</sup>		
Solid				mm <sup>2</sup>		
Standard screwdriver				mm		
Tightening torque				Nm		
Fixing				Snap fitting on top-hat rail to EN 50 022		
<b>Contacts</b>						
Rated impulse withstand voltage $U_{imp}$				V AC		
				4000		
Overvoltage category/pollution degree				III/3		
Rated insulation voltage $U_i$				V AC		
				400		
<b>Power supply</b>						
Supply voltage				V AC		
				160 – 300		
Voltage tolerance				$\times U_c$		
				0.85 – 1.1		
Power consumption				VA		
				3		
Rated frequency				Hz		
				50 – 60		
Duty factor				%		
				100		
<b>Timing cycle</b>						
Response delay time	Adjustable	s	0.1 – 10	0.1 – 10	0.1 – 10	
Off delay time	Adjustable	s	0.1 – 10	0.1 – 10	0.1 – 10	
Time error within supply voltage		%	$\leq 0.5$	$\leq 0.5$	$\leq 0.5$	
Time error within temperature range		%/°C	$\leq 0.06$	$\leq 0.06$	$\leq 0.06$	
<b>Measuring circuits</b>						
Response range adjustable for over and undervoltage	$U_{min}/U_{max}$	V AC	300 – 380/420 – 500	300 – 380/420 – 500	350 – 430/500 – 580	
Hysteresis				%		
				5		
Max. measuring cycle				ms		
				80		
Temperature error				%/°C		
				$\leq 0.06$		
Error within supply voltage				%		
				$\leq 0.5$		
<b>Status indication</b>						
Supply 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 error	P	LED	Red	Red	Red	
<b>Relay output contacts</b>						
Rated operational voltage $U_e$				V AC		
				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	
Maximum electrical lifespan (AC-12/230 V/5 A)	Operations	$\times 10^6$	0.1	0.1	0.1	
Short-circuit rating, max. fuse	Fast/gL	A	5	5	5	
Load limit curves				→ Page 04/036		
<b>EMC</b>						
Electromagnetic compatibility				IEC/EN 61 000-6-2		
ESD				IEC/EN 61 000-4-2 Level 3		
HF immunity to radiation				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 immunity to line-conducted interference				IEC/EN 61 000-4-6 Level 3		

## EMR4-A Phase Imbalance Monitoring Relay

## Technical Data

				EMR4-A400-1
<b>General technical data</b>				
Standards				IEC/EN 60 255-6, EN 61 557, UL, CSA, GL
Lifespan, mechanical	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 range	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 04/067
Weight	Approx.	kg		0.3
<b>Terminal capacity</b>				
Flexible with ferrule		mm <sup>2</sup>		2 × 2.5
Solid		mm <sup>2</sup>		2 × 2.5
Standard screwdriver		mm		5.5 × 0.8
Tightening torque		Nm		0.5 – 0.8
Fixing				Snap fitting on top-hat rail to EN 50 022
<b>Contacts</b>				
Rated impulse withstand voltage $U_{imp}$		V AC		4000
Overtoltage category/pollution degree				III/3
Rated insulation voltage $U_i$		V AC		400
<b>Power supply</b>				
Supply voltage	50 Hz	V AC		380 – 415
Voltage tolerance		$\times U_c$		0.8 – 1.2
Power consumption		VA		15
Rated frequency		Hz		50
Duty factor		%		100
<b>Timing cycle</b>				
Response delay, indication of phase imbalance		ms		500
Time error within supply voltage		%		≤ 0.5
Time error within temperature range		%/°C		≤ 0.06
<b>Measuring circuits</b>				
Monitoring voltage/Voltage to be monitored $U_N$	L1, L2, L3	V AC		380 – 415
Frequency		Hz		50
Phase imbalance level adjustable		%		5 – 15
Switching hysteresis		%		20
Temperature error		%/°C		≤ 0.06
Error/Deviation within the supply voltage tolerance		%		≤ 0.5
<b>Status indication</b>				
Output relay energized	LED			Yellow
<b>Relay output contacts</b>				
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
Maximum lifespan, electrical (AC-12/230 V/4 A)	Operations	$\times 10^6$		0.3
Short-circuit rating, max. fuse	Fast/gL	A		10
Load limit curves				→ Page 04/036
<b>EMC</b>				
Electromagnetic compatibility				IEC/EN 61 000-6-2
ESD				IEC/EN 61 000-4-2 Level 3
HF immunity to radiation				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 immunity to line-conducted interference				IEC/EN 61 000-4-6 Level 3

## EMR4-N Liquid Level Monitoring Relays

## Technical Data

				EMR4-N100-1-B	EMR4-N500-2-B	EMR4-N500-2-A		
General technical data								
Standards				IEC/EN 60 255-6, EN 61 557, UL , CSA, GL				
Lifespan, mechanical	Operations	$\times 10^6$		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 range	Min./Max.	°C		-20/+60	-25/+65	-25/+65		
Storage temperature	Min./Max.	°C		-40/+80	-40/+85	-40/+85		
Mounting position				As required				
Mechanical shock resistance				g				
Degree of protection				IP20				
Dimensions				→ Page 04/067				
Weight	Approx.	kg		0.15	0.3	0.3		
Terminal capacity								
Flexible with ferrule				mm <sup>2</sup>				
Solid				mm <sup>2</sup>				
Standard screwdriver				mm				
Tightening torque				Nm				
Fixing				Snap fitting on top-hat rail to EN 50 022				
<b>Contacts</b>								
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	
<b>Power supply</b>								
Supply voltage				V AC	220 – 240	220 – 240	–	
				V AC/DC	–	–	24 – 240	
Voltage tolerance				$\times U_c$	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	
<b>Timing cycle</b>								
On or Off delay time	Adjustable	s		–	0.1 – 10	0.1 – 10		
<b>Measuring circuit</b>								
Sensor inputs				B1	Earth reference sensor	Earth reference sensor	Earth reference sensor	
				B2	Maximum level	Maximum level	Maximum level	
				B3	Minimum level	Minimum level	Minimum level	
Response sensitivity range				k $\Omega$	5 – 100	0.25 – 500	0.25 – 500	
Maximum sensor voltage				V AC	30	20	20	
Reset range				k $\Omega$	1.5 – 2.3	–	–	
Maximum sensor current				mA	1	–	–	
Maximum cable capacity				nF	10	–	–	
Maximum cable length				m	100	–	–	
Response delay	approx.	ms		250	–	–		
<b>Status indication</b>								
Supply voltage				LED	Green	Green	Green	
Output relay energized				LED	Yellow	Yellow	Yellow	
<b>Relay output contacts</b>								
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
Maximum lifespan, electrical (AC-12/230 V/5 A)				Operations	$\times 10^6$	0.3	0.1	0.1
Short-circuit rating, max. fuse				Fast/gL	A	10	5	5
Load limit curves					→ Page 04/036	→ Page 04/036	→ Page 04/036	
<b>EMC</b>								
Electromagnetic compatibility					IEC/EN 61 000-6-2			
ESD					IEC/EN 61 000-4-2 Level 3			
HF immunity to radiation					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 immunity to line-conducted interference					IEC/EN 61 000-4-6 Level 3			

## EMR4-R Insulation Monitoring Relays

## Technical Data

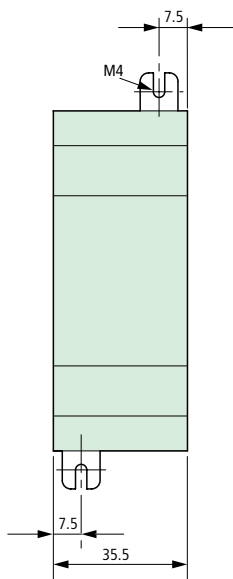
			EMR4-RDC-1-A	EMR4-RAC-1-A
<b>General technical data</b>				
Standards			IEC/EN 60 255-6, EN 61 557, UL , CSA, GL	
Lifespan, mechanical	Operations	$\times 10^6$	30	30
Climatic proofing			Damp heat cyclical to IEC 60 068-2-30: 24 h cycle, 55 °C, 93 % relative humidity 96 h	
Ambient temperature range	Min./Max.	°C	-25/+65	-25/+65
Storage temperature	Min./Max.	°C	-40/+85	-40/+85
Mounting position			As required	
Mechanical shock resistance			10	
Degree of protection	Terminals		IP20	IP20
Dimensions			→ Page 04/067	
Weight	Approx.	kg	0.3	0.3
Terminal capacity				
Flexible with ferrule		mm <sup>2</sup>	2 × 2.5	2 × 2.5
Solid		mm <sup>2</sup>	2 × 2.5	2 × 2.5
Standard screwdriver			5.5 × 0.8	
Tightening torque			Nm 0.5 – 0.8	
Fixing			Snap fitting on top-hat rail to EN 50 022	
<b>Contacts</b>				
Rated impulse withstand voltage $U_{imp}$			V AC 4000	
Overvoltage category/pollution degree			III/3	
Rated insulation voltage $U_i$			V AC 400	
<b>Power supply</b>				
Supply voltage			V AC/DC 24 – 240	
Voltage tolerance			$\times U_c$ 0.85 – 1.1	
Power consumption			VA 5.5	
Rated frequency	AC	Hz	50 – 60	50 – 60
Duty factor			% 100	
<b>Timing cycle</b>				
Delay time	At $R_{insulation}$	s	< 1	< 1
	$\times$ response value	s	< 0.9	< 0.9
<b>Measuring circuits</b>				
Input			L+, L-, PE	
Response range			k $\Omega$ 10 – 110	
Minimum internal resistance of alternating current			k $\Omega$ –	
Minimum internal resistance of direct current			k $\Omega$ –	
Minimum internal resistance			k $\Omega$ 57	
Test resistance			k $\Omega$ –	
Maximum insulation voltage			V 300 DC	
Maximum voltage being monitored/test voltage (EMR4-RAC-1-A = DC voltage being monitored/test voltage)			V DC 24 – 240	
Cable length for cancellation- and test button, maximum			m 10	
<b>Status indication</b>				
Supply voltage	LED		Green	Green
Faults	LED		Yellow	Red
Fault at L+	LED		Red	Red
Fault at L-	LED		Red	Red
<b>Relay output contacts</b>				
Rated operational voltage $U_e$			V AC 400	
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
Maximum lifespan, electrical (AC-12/230 V/5 A)	Operations	$\times 10^6$	0.1	0.1
Short-circuit rating, max. fuse	Fast/gL	A	5	5
Load limit curves			→ Page 04/036	
<b>EMC</b>				
Electromagnetic compatibility			IEC/EN 61 000-6-2	
ESD			IEC/EN 61 000-4-2 Level 3	
HF immunity to radiation			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 immunity to line-conducted interference			IEC/EN 61 000-4-6 Level 3	

## "Easy" Control Relays

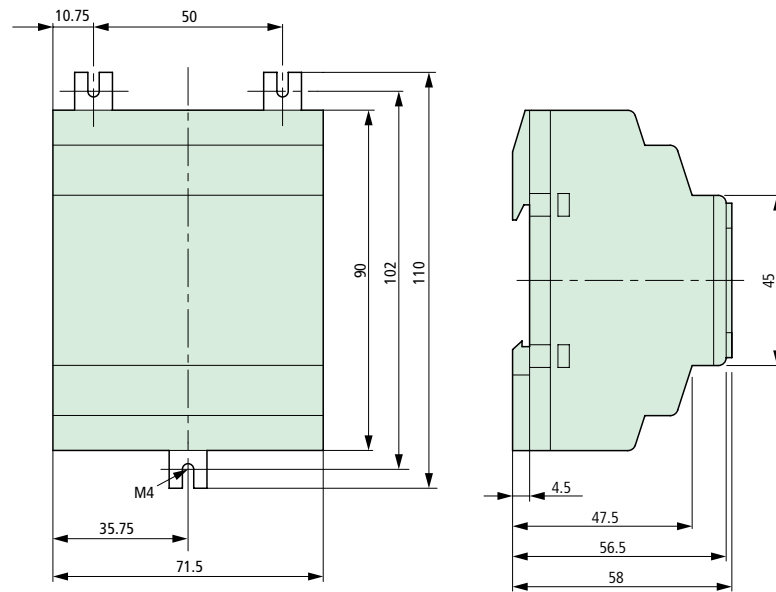
### Dimensions

Control relay

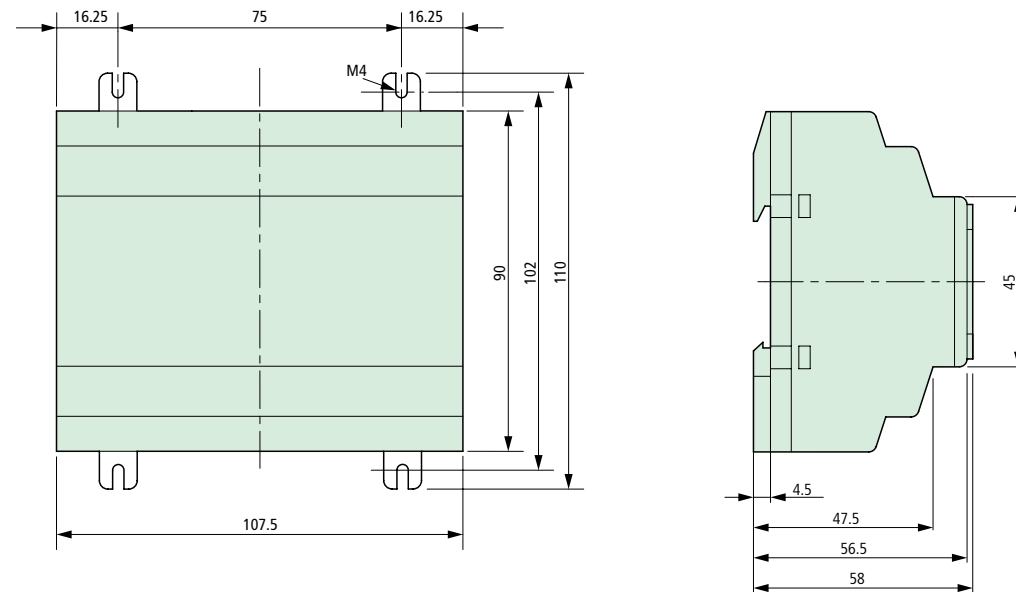
EASY2...



EASY4...



EASY6...



# DILER Mini Contactor Relays

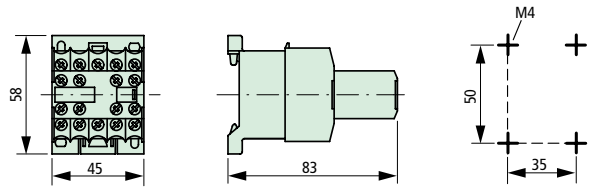
## Dimensions

### Mini contactor relays

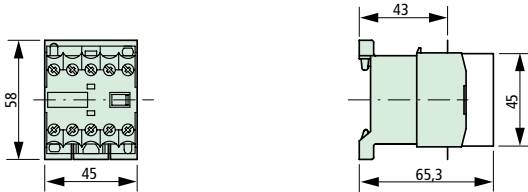
DILER-...  
DILER-...-G



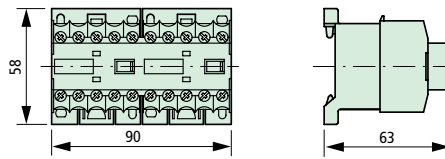
DILER-... + ...DILE  
DILER-...-G + ...DILE



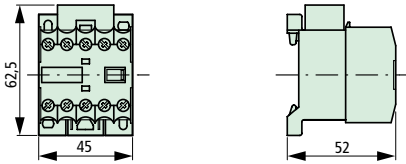
DILER-... + HDILE  
DILER-...-G + HDILE



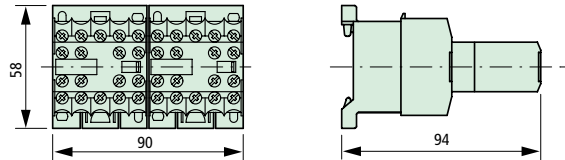
2DILER-... + MVDILE  
2DILER-...-G + MVDILE



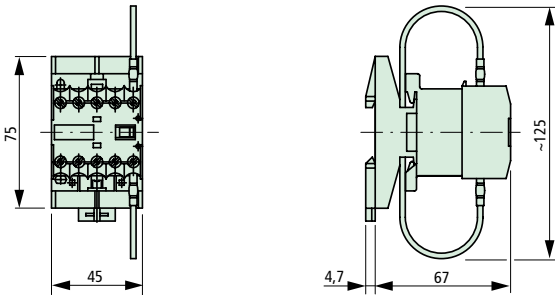
DILER-... + RCDILE  
DILER-...-G + VGDILE



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

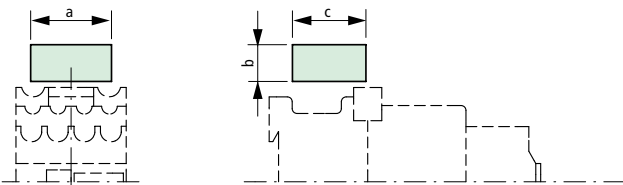


DILER-... + TDDILE24



### Suppressors, amplifier modules

RCBDIL,  
FDBDIL  
VGBDIL  
VS1(2)DIL



	RCBDIL	FDBDIL	VGBDIL	VS1DIL	VS2DIL
a	33	33	33	45	45
b	15	15	15	26	26
c	30	30	30	55	55

# DILR Contactor Relays, DILET, ETR4 Electronic Timing- and Special-Purpose Relays

## Dimensions

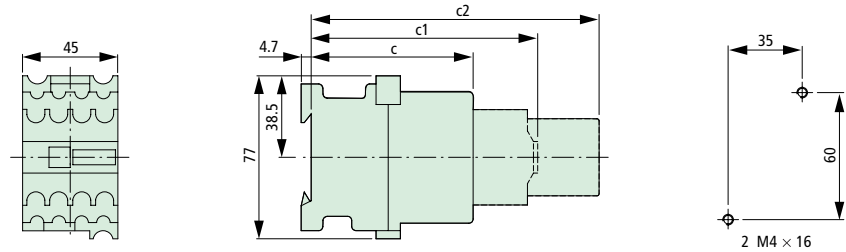
### Contactors relays

DILR22(-G)  
DILR22D(-G)  
DILR31(-G)  
DILR40(-G)

DILR22(-G) + ...DIL  
DILR31(-G) + ...DIL  
DILR40(-G) + ...DIL  
DILR44D(-G)  
DILR53D(-G)

DILR22(-G) + TPE(TPD)11DIL  
DILR31(-G) + TPE(TPD)11DIL  
DILR40(-G) + TPE(TPD)11DIL

DILR22(-G) + V(-G) DIL  
DILR31(-G) + V(-G) DIL  
DILR40(-G) + V(-G) DIL



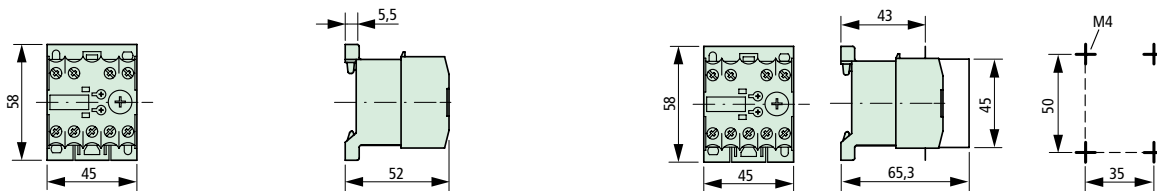
	DILR22 (-G)	DILR22+...DIL (-G)	DILR22+TPE11DIL (-G)	DILR22+VDIL (-G)
	DILR31 (-G)	DILR31+...DIL (-G)	DILR22+TPD11DIL (-G)	DILR31+VDIL (-G)
	DILR40 (-G)	DILR40+...DIL (-G)	DILR31+TPE11DIL (-G)	DILR40+VDIL (-G)
	DILR22D (-G)	DILR44D (-G)	DILR31+TPD11DIL (-G)	
		DILR53D (-G)	DILR40+TPE11DIL (-G)	
			DILR40+TPD11DIL (-G)	
c (with HDIL)	76.5	(101.5)	-	-
c (without HDIL)	74	(99)	-	-
c1	-	107	(132)	-
c2	-	-	136	161

c1 = With ...DIL auxiliary contact module or DILR...D(-G) complete unit  
c2 = With V(-G)DIL mechanical latching module or with TP...11DIL pneumatic timer module

### Electronic timing relays

DILET...

DILET... + HDILE

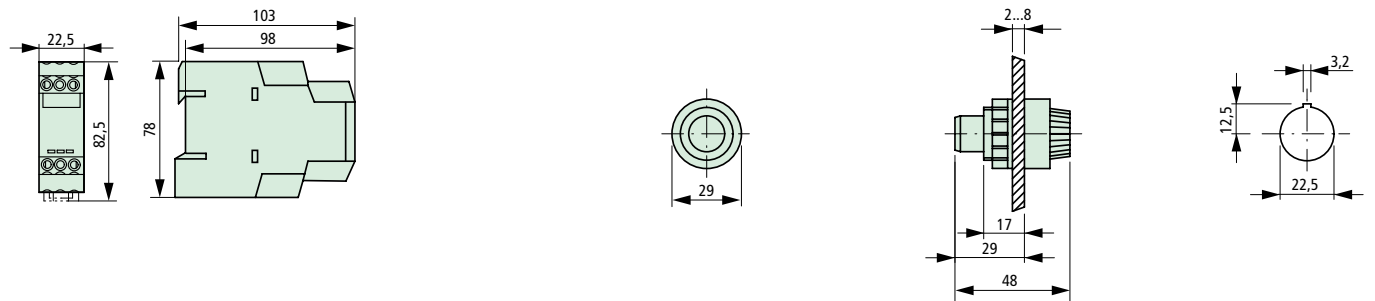


### Electronic timing relays

ETR4-11...  
ETR4-51...  
ETR4-69...  
ETR4-70...

### Remote potentiometer

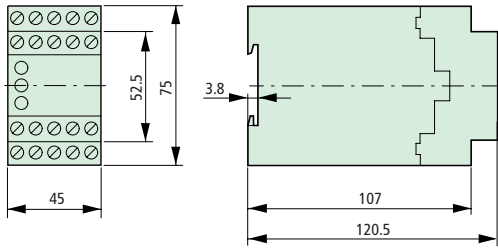
RR-10



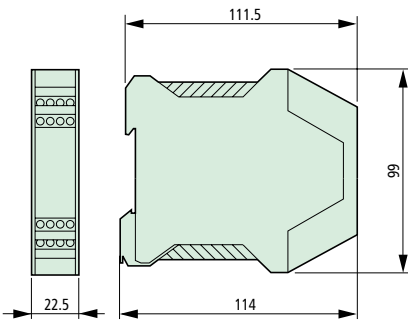
# ESR Electronic Safety Relays, EMR4 Measuring and Monitoring Relays

## Dimensions

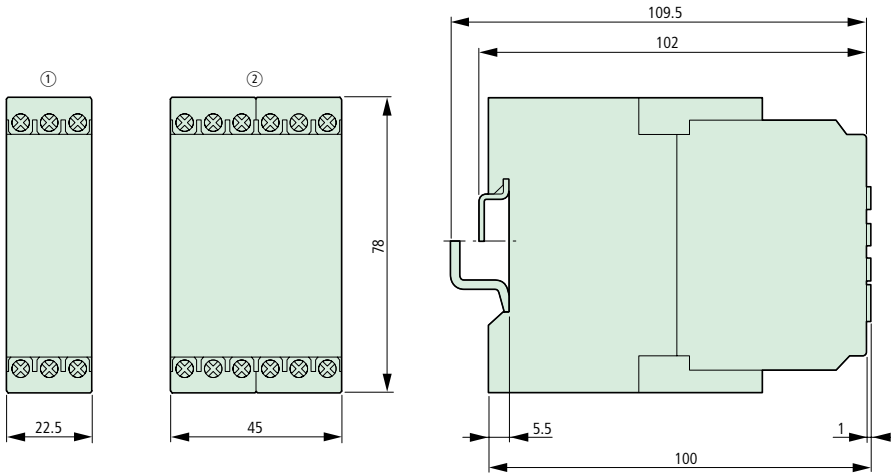
### Electronic safety relays ESR3-NO-31(230 V)



- 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		●

### Sealable shroud EMR4-PH...

