

## EMR4-I Current Monitoring Relays

### Technical Data

			EMR4-I11-2-A	EMR4-I115-2-A	EMR4-I115-2-B
<b>General</b>					
Standards			IEC/EN 60 255-6, EN 61 557, UL , CSA, GL		
Mechanical lifespan	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	min./max.	°C	-25/+65	-25/+65	-25/+65
Storage temperature	min./max.	°C	-40/+85	-40/+85	-40/+85
Mounting position			as required	as required	as required
Mechanical shock resistance		g	10	10	10
Degree of protection	terminals		IP20	IP20	IP20
Dimensions			→ page 02/061	→ page 02/061	→ page 02/061
Weight	ca.	kg	0,3	0,3	0,3
Terminal capacity					
flexible with ferrule		mm <sup>2</sup>	2 × 2,5	2 × 2,5	2 × 2,5
solid		mm <sup>2</sup>	2 × 2,5	2 × 2,5	2 × 2,5
Standard screwdriver		mm	5,5 × 0,8	5,5 × 0,8	5,5 × 0,8
Tightening torque		Nm	0,5 – 0,8	0,5 – 0,8	0,5 – 0,8
Mounting			Snap-on to DIN rail to EN 50 022		
<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>Voltage supply</b>					
Supply voltages		V AC/DC	24 – 240	24 – 240	–
		V AC	–	–	220 – 240
Voltage pick-up range		$\times U_c$	0,85 – 1,1	0,85 – 1,1	0,85 – 1,1
Power consumption		VA	2	2	2
Rated frequency		Hz	50 – 60	50 – 60	50 – 60
Duty factor		% DF	100	100	100
<b>Time circuit</b>					
On-delay	adjustable	s	0,05 – 1 and 1,5 – 30	0,05 – 1 and 1,5 – 30	0,05 – 1 and 1,5 – 30
Time fault in supply voltage		%	$\leq 0,5$	$\leq 0,5$	$\leq 0,5$
Time fault in temperature range		%/°C	$\leq 0,06$	$\leq 0,06$	$\leq 0,06$
<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	5 – 30	5 – 30
Max. measuring cycle		ms	80	80	80
Temperature fault		%/°C	$\leq 0,06$	$\leq 0,06$	$\leq 0,06$
Fault in supply voltage		%	$\leq 0,5$	$\leq 0,5$	$\leq 0,5$
<b>Status indication</b>					
Supply voltage	LED		green	green	green
Output relay energized	LED		yellow	yellow	yellow
<b>Current circuits relay outputs</b>					
Rated operational voltage $U_e$		V AC	400	400	400
Rated operational current $I_e$ AC-12	at 230 V	A	5	5	5
Rated operational current $I_e$ AC-15	at 230 V	A	3	3	3
Rated operational current $I_e$ DC-12	at 24 V	A	5	5	5
Rated operational current $I_e$ DC-13	at 24 V	A	2,5	2,5	2,5
Max. electrical lifespan (AC-12/230 V/5 A)	operations	$\times 10^6$	0,1	0,1	0,1
Short-circuit resistance, max. fuse	fast/gL	A	5	5	5
<b>EMC</b>					
EMC compatibility			IEC/EN 61 000-6-2		
ESD			IEC/EN 61 000-4-2 Level 3		
HF immunity			IEC/EN 61 000-4-3 Level 3		
Burst			IEC/EN 61 000-4-4 Level 3		
Surge			IEC/EN 61 000-4-5 Level 4		
HF conducted			IEC/EN 61 000-4-6 Level 3		

## EMR4-F Phase Sequence Relays

### Technical Data

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

## EMR4-W Phase Monitoring Relays

### Technical Data

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

## EMR4-A Phase Imbalance Monitoring Relays

### Technical Data

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

## EMR4-N Level Monitoring Relay

### Technical Data

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

## EMR4-R Insulation Monitoring Relays

### Technical Data

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