Optimum protection for smooth operation – measuring and monitoring relays EMR4

Measuring and monitoring relays are required for the most varied range of applications. EMR4 range measuring and monitoring relays cover a wide range of applications: Current monitors for universal use, phase monitors for monitoring destruction/damage protection for individual system sections, phase sequence relays monitoring the rotating field, unbalance relays for reliable phase loss detection, multifunctional three-phase monitors, asymmetric phase monitoring relays in a single device, level monitoring relays for monitoring fill levels and earth-leakage monitors for enhanced operational safety. All relays are devices for world markets to IEC/EN 60947 and UL/CSA approval. Many relays feature multi-voltage coils. This simplifies stock keeping and enhances the flexibility when reacting to customer requirements.

Level monitoring relays ensure defined mixing ratios of many diverse liquids, whether in the petrochemical or the food industry. Two electrodes monitor the maximum and minimum filling levels, while a third electrode is used as earth.

EN 60 204, the European Standard for "Safety of Machines", stipulates that insulation monitors should be used to increase operational safety by monitoring auxiliary circuits for earth faults. Insulation monitoring relays EMR4-R demonstrate their full potential here.

They signal an earth fault via a changeover contact and enable the fault to be cleared without the user experiencing costly downtimes. And, there is yet another safety feature: a Test button, with which the integrity of the function can be checked at any time.

Phase monitor EMR4-W – destruction/damage protection for individual system sections

The phase monitor EMR4-W in addition to the monitoring the rotary field, also monitors the level of the applied voltage – i.e. monitoring destruction/damage protection of individual system sections. A dial allows easy setting of the required voltage for both the minimum undervoltage and maximum overvoltage within a defined window.

Both on-delayed and off-delayed functions are possible.
The on-delayed setting enables short overvoltages or voltage dips to be bridged.

The relay picks up if the phase sequence and the voltage are correct. After it has dropped out, the device does not pick up again until the voltage goes over a 5 % hysteresis.

Earth-leakage monitor EMR4-R – for increased operating safety

The EN 60204 „Safety of machinery" stipulates that auxiliary circuits must be protected with earth-leakage monitors in order to increase operating safety. The earth-leakage monitors EMR4-R are primarily used for this purpose, as well as in areas for medical applications with similar requirements.
A changeover contact indicates an earth fault and therefore allows faults to be rectified without the need for expensive downtimes.
The devices can be provided with an optional fault memory that requires a fault to be acknowledged after it has been rectified. A test button is provided to test the functioning of the device at any time.

One device is available for both AC and DC circuits, thus enabling the entire range of control voltages to be covered. The DC devices feature a multi-voltage coil to provide both AC and DC supply as required.

Phase sequence relay EMR4-F500-2 – compact rotary field monitoring

The phase sequence relay EMR4-F500-2 with its compact 22.5 mm width is used for monitoring the clockwise rotation of movable motors for which the phase sequence is important, such as with pumps, saws, drilling machines. This means additional space in the control panel thanks to the narrow width and protection against damage by means of phase sequence.

Current monitor EMR4-I – for universal use

The current monitors EMR4-I are suitable for both AC and DC monitoring tasks. The selectable lower or upper tripping limit means that they can be used for the underload or overload monitoring of pumps and drilling machines. They are available in two versions, each with three measuring ranges (30/100/1000 mA, 1.5/5/15 A). The multi-voltage coil allows these relays to be used for a wide range of applications. The second changeover contact is provided for direct status indication.

Unbalance relay EMR4-A – reliable phase loss detection

The unbalance relay EMR4-A with its 22.5 mm module width is the ideal protective device for phase loss protection. The detection of phase loss on the basis of phase shift means that reliable phase loss detection is ensured and overloads are prevented, even when large amounts of energy are regenerated to the motor. The relay can be used for protecting motors with a rated voltage of 380 V – 415 V at 50 Hz.

Level relay EMR4-N – increased safety with open-circuit protection

The level relays EMR4-N are used primarily to protect pumps from running dry or for the control of liquid levels.
They operate by means of sensors which measure conductivity, with one sensor monitoring the maximum level and one sensor the minimum. A third sensor is used for the chassis potential. The 22.5 mm wide EMR4-N100 device is suitable for conductive liquids, and is provided with a switch to select between Level control and Dry run protection as required. This offers increased safety thanks to the open-circuit design used in both cases.

Multi-functional three-phase monitor – compact rotary field monitoring with various functions

With the multi-functional three-phase monitors the phase parameters, phase sequence, phase loss, phase unbalance, overvoltage and undervoltage are detected.
Depending on the device version, the adjustable threshold value for asymmetry is in the range between 2-15%, and the threshold values for undervoltage and overvoltage are adjustable or fixed. The various possibilities and setting values can be taken from the table opposite. The EMR4-AWN... is a new version which features the "with neutral conductor monitoring" function.

	EMR4-F500-2	EMR4-W500-2-C	EMR4-W500-2-D	EMR4-W580-2-D	EMR4-A400-1	EMR4-I1-2-A	EMR4-I15-2-A	EMR4-I15-2-B	EMR4-N100-1-B	EMR4-N500-2-B	EMR4-N500-2-A	EMR4-RAC-1-A	EMR4-RDC-1-A	EMR4-AW300-1-C	EMR4-AW500-1-D	EMR4-AWN170-1-E	EMR4-AWN280-1-F	EMR4-W300-1-C	EMR4-W500-1-D	EMR4-W380-1	EMR4-W400-1	EMR4-A300-1-C	EMR4-A500-1-D
Phase sequence	•	•	•	•	•									•	•	•	•	•	•	•	•	•	•
Phase failure														•	•	•	•	•	•	•	•	•	•
U<0.6xUe	•	•	•	•																			
U<0.95xUe					•																		
Unbalance																							
2-15%														•	•	•	•					•	•
5-15%					•																		
Monitoring voltage (measured voltage)																							
200-500 V AC (= supply voltage)	•																						
380-415 V AC (= supply voltage)		•																					
160-300 V AC (= supply voltage)														•				•				•	
300-500 V AC (= supply voltage)															•				•				•
90-170 V AC (= supply voltage)*																•							
180-280 V AC (= supply voltage)*																	•						
380 V AC (= supply voltage)																				•			
400 V AC (= supply voltage)																					•		
Undervoltage																							
Measurement range min. 160-220 V AC														•				•					
Measurement range min. 300-380 V AC		•	•												•				•				
Measurement range min. 350-430 V AC				•																			
Measurement range min. 90-120 V AC*																•							
Measurement range min. 180-220 V AC*																	•						
342 V AC fixed																				•			
360 V AC fixed																					•		
Overvoltage																							
Measurement range min. 220-300 V AC														•				•					
Measurement range min. 420-500 V AC		•	•												•				•				
Measurement range min. 500-480 V AC				•																			
Measurement range min. 120-170 V AC*																•							
Measurement range min 240-280 V AC*																	•						
418 V AC fixed																				•			
440 V AC fixed																					•		
Current measurement range																							
0.003-1 A					•																		
0.3-15 A						•	•																
Monitoring																							
Adjustable upper and lower threshold					•	•																	
Adjustable upper threshold							•																
Sensitivity (level)																							
5-100 kOhm									•														
250 Ohm - 500 kOhm										•	•												
Insulation resistance																							
in DC networks													•										
10-110 kOhm													•										
in AC networks												•											
1-110 kOhm												•											
Supply voltage																							
24-240 V AC/DC						•	•				•	•	•										
220-240 V AC								•	•	•													
200-500 V AC	•																						
380-415 V AC					•																		
160-330 V AC		•																					
300-500 V AC			•	•											•				•				•
160-300 V AC														•				•				•	
90-170 V AC*																•							
180-280 V AC*																	•						
380 V AC																				•			
400 V AC																					•		
Features																							
Width																							
22.5 mm	•				•				•			•	•	•	•	•	•	•	•	•	•	•	•
45 mm		•	•	•		•	•	•		•	•												
On-delay																							
0.5 s				•																			
0.1-30 s					•	•	•																
On or off delay (selective;)																							
0.1-10 s		•	•	•										•	•	•	•	•	•	•	•	•	•
0.5-10 s										•	•												
Status display via LED	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Contacts																							
1 changeover contact					•				•			•	•										
2 changeover contact	•	•	•	•		•	•	•		•	•			•	•	•	•	•	•	•	•	•	•
Accessories																							
Sealable shroud	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Note																							
* With neutral conductor monitoring Measurement/setting between phase and neutral pole																•	•						