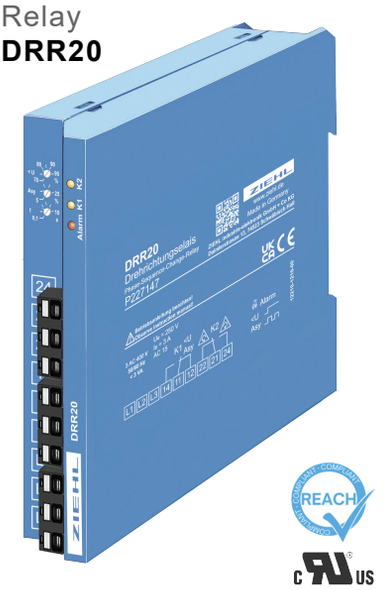
Phase sequence change Relay DRR20

with integrated monitoring of undervoltage and asymmetry

Phase-Sequence-Change Relay
DRR20



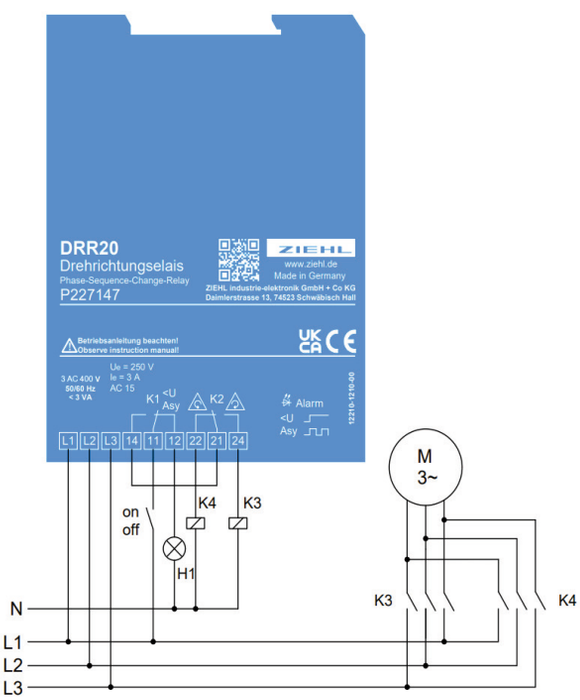
Part number: **P227147**

Phase sequence change relays DRR20 measure the sequence of the phases and switch – if necessary the rotation of the field. At the output (connect relays K1 and K2 in series in this application) two contactors are connected. The contactor at the normally-open contact of K2 switches the phases 1:1without changing them, the second (at normally-closed contact) changes 2 phases.

When switching on with phase-sequence ok, relay K2 picks up. With wrong phase-sequence it remains released. After K2 has switched, K1 picks up. K1 also releases first. This makes sure, that no wrong contactor can be picked up under any condition.
Additionally the DRR20 monitors the three phases for asymmetry and undervoltage. If the limits are exceeded, the K1 switches off (respectively doesn't pick up) and protects the connected motor from damage.
The device can also be used as a monitor for undervoltage, asymmetry or phase-sequence.

Applications are machines and equipment that is operated at variable locations, e.g. at building sites. Pumps, compressors and vacuum-cleaners always run correctly and they are protected from damage by undervoltage or asymmetry.

- automatic change of wrong phase-sequence when connected falsely (2 contactors afforded)
- running backward of motors is avoided
- no switching on at asymmetry or undervoltage
- relay K2 picks up when phase-sequence is correct
- relay K1 picks up (after K2) when symmetry and voltage is correct
- 3 LEDs for state of relays and errors
- measuring-voltage 3 AC 400 V
- limit asymmetry adjustable 5…25 %
- limit undervoltage adjustable 70…95 %
- alarm-delay adjustable 0,1…10 s (undervoltage and asymmetry)
- no supply-voltage required



Technical Data

Rated supply voltage Us:	**3 AC 400V 50/60Hz**
Tolerance	0,7 Us … 1,2 Us
Power consumption	< 3 VA
Switching point:	
Undervoltage adjustable	from approx. 70 … 95%, factory setting from approx. 85%
Adjustable asymmetry	from approx. 5 … 25%, set ex works approx. 15%
Trigger delay adjustable	0.1 ... 10 s, factory setting at approx. 2 s
Actuation time	Approx. 0.2 s after phase return
Hysteresis	Approx. 2%

Output relay K1, K2	**2 x 1 changeover contact:**
Switching voltage	max. AC 400V
Switching current	max. 6A
Switching capacity max. AC cos φ = 1	2000 VA (ohmic load)
Switching capacity max. DC (ohmic)	120W at DC 24V
Nominal operating current i e for changers	3A AC-15, 250V; 2A DC-13, 24V
Mechanical contact lifespan	$3x10^7$ switching cycles
Electrical contact lifespan	$1x10^5$ switching cycles at 240V / 6A $1x10^6$ switching cycles at 240V / 2A
Reduction factor at cos φ = 0.3	0.5

EMC-tests	
Emission	EN 61000-6-3 Class B
Immunity	EN 61000-6-2 industrial environment
Electrical fast transient/Burst	EN 61000-4-4 ±4 kV Pulse 5/50 ns, f = 5 kHz, t = 15 ms, T = 300 ms
SURGE immunity	IEC 61000-4-5 ±2 kV
Electrostatic discarge	IEC 61000-4-2 ± 6 kV contact discharge, ± 8 kV over air

Reliability - failure rate	**EN 61709 / SN29500**		
Ambient conditions	Local operation in dry rooms		
Operation time 24/7/365	8760 h/a		
Tu = Tref (component not in operation)	Tu = 40 °C	Tu = 60 °C	Tu = 80 °C
Failure rate (FIT)	815 FIT	1557 FIT	3160 FIT
	100 (140) years	73 years	36 years

Installation conditions	
Permissible ambient temperature	- 20 °C ... + 60 °C
Permissible storage temperature	- 20 °C ... + 70 °C
Installation height	≤ 2000 m over N.N.
Climatic conditions	5-85% rel. F, no condensation
Permissible wiring temperature	-5 °C ... +60 °C
Vibration resistance EN 60068-2-6	2 ... 25 Hz ±1,6 mm 25 ... 150 Hz 5 g

Contact termination	**Push-In spring-type terminal**
Protection class terminals	IP20
Actuation type	Push-Button
Number of levels	1
Solid conductor	1 x 0,14 mm^2 ... 1,5 mm^2 / AWG 28 ... 16
Fine-stranded conductor	1 x 0,14 mm^2 ... 1,5 mm^2 / AWG 26 ... 14
Fine-stranded with insulated ferrule	1 x 0,25 mm^2 ... 0,75 mm^2
Fine-stranded with uninsulated ferrule	1 x 0,25 mm^2 ... 1,5 mm^2
Strip length	8 ... 9 mm / 0.31 ... 0.35 inches

Housing	**Type K**
Dimensions (W x H x D)	22,5 x 75 x 115 mm
Width	1 M
Protection class housing	IP40
IK-Code	IK06 (1 J impact energy)
Mounting	Snap mounting on 35 mm standard rail EN60715 or M4 screws (additional bar not included)
Mounting position	any
Weight	app. 150 g

Subject to technical changes