

## 3 PHASE UNDER VOLTAGE CONTROL RELAY WITH PHASE SEQUENCE DETECTION

Type: PNDA & PNDI (4 wire system)

### FEATURES

- Accurate under voltage detection of each phase against neutral
- Phase sequence detection inhibit the relay with wrong sequence
- Adjustable Sensitivity from -5 to -25% of nominal voltage
- Adjustable differential from -5 to -80% of under voltage offset from nominal. Voltage range 0,25 to 20% of under voltage
- Time delay - on and off - individually adjustable
- One unit for three mains voltages
- 6 LEDs indicate the state of input, phase sequence, timing function and relay

### Description:

The 3 phase 4 wire voltage relays are designed for applications where the three phases need to be individually monitored for under voltage against neutral and correct phase sequence. The PNDA and PNDI contain a standard timing function. In addition the PNDI offers a true time delay on drop out even at total power failure. The relay works in "fail safe" mode and need no external power supply.

### Operation:

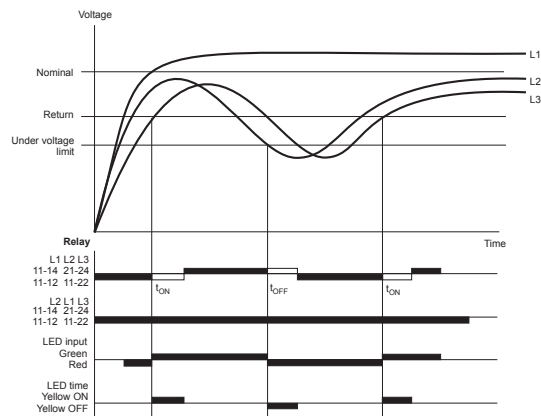
Under normal phase conditions the relay is energized - contacts 11-14 and 21-24 closed - and the green "input" LED and the yellow "relay" LED are switched on.

If one or more phase voltages are below the preset under voltage value, the red "input" LED will be switched on and stay on until all three phase voltages are above the set value plus the preset differential, given by a percentage of the under voltage offset from the nominal value.

If the state of the relay is not corresponding to the input signal, the yellow LED indicating delay "ON" or "OFF" will be on until the relay changes state and corresponds to the input.

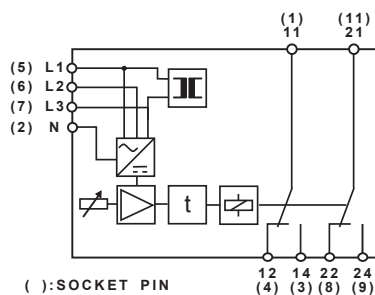
In case of wrong phase sequence the relay will not be energized and the red "inversed phase sequence" LED will be on indicating the fault.

### FUNCTION DIAGRAM

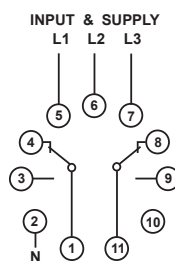


### CONNECTION DIAGRAM

Rail mounting



Socket mounting\*



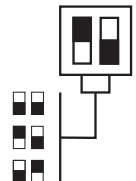
\*CE up to 230V phase to phase voltage

### PROGRAMMABLE FEATURES

Nominal Voltage Settings  
Phase to phase

Type	Type	Type	Type
110 V	230 V	400 V	460 V
100 V	220 V	380 V	440 V
110 V	230 V	400 V	460 V
115 V	240 V	415 V	480 V

Actuator



## SPECIFICATIONS

### INPUT

Phase to phase voltage	Type B110:	100, 110 and 115
Selectable by dipswitch	Type B230:	220, 230 and 240
	Type B400:	380, 400 and 415
	Type B460:	440, 460 and 480
Input resistance	B110	130 k
	B230	280 k
	B400	500 k
	B460	580 k
Frequency range		45 to 440 Hz
Under voltage, Range		- 5 to - 25 %
Differential, Range		5 to 80% of under voltage offset

### PERFORMANCE PARAMETERS

#### TIMING

Response time	Approx. 500 msec. with limited under voltage
	Approx. 100 msec. with total phase loss
Time range during run	Separate On and Off delay
	0 - 10 sec. adjustable
True time delay	PNDI > 6 sec. at total phase loss

#### ELECTRICAL

Nominal accuracy	all phases $\pm 2\%$
Limit accuracy	all phases $\pm 2\%$
Repeat accuracy	all phases $\pm 0,5\%$

Temp. dependence	Typ. $\pm 0.02\% / ^\circ\text{C}$
Supply dependence	Typ. $\pm 0.01\% / \% \Delta U_N$

### OUTPUT

Relay, 2 C/O	
Contact rating	6 A, 250 VAC, 1500 W
Mechanical life	30 Million operations

### SUPPLY

AC voltage internal from L1 and L3	
AC supply range	110 V (From 75 to 127 V)
with transformer	230 V (From 165 to 264 V)
Standard voltage	400 V (From 285 to 457 V)
	460 V (From 330 to 528 V)
AC frequency range	45 to 440 Hz
Power consumption	4 VA, 2 W

### GENERAL

Temperature range	- 25 °C to + 55 °C ambient	
Humidity	Up to 90 % RH non-condensing	
Dielectric test voltage	Coil to relay contacts	4000 VAC
	Pole to pole	2500 VAC
	11-12-14 to 21-22-24	
Weight	0.22 kg	



International Standards	
EMC directive 89/336:	EN50081 - Emission
	EN50082 - Immunity
Low voltage directive 73/23:	EN60255 - Electrical Relays

## ORDERING INFORMATION

### EXAMPLE:

**TYPE**  
3 Phase voltage control relay

### INPUT AND SUPPLY VOLTAGE

100, 110 and 115 VAC  
220, 230 and 240 VAC  
380, 400 and 415 VAC  
440, 460 and 480 VAC

### ADJUSTMENT

Trimpot and dipswitch adj.

### HOUSING

Rail mounting  
Socket mounting

### SIZE

35 mm.

### CODE

Code End  
Extended code

