

PVZ-OPTO4

Description

The PVZ-OPTO4 opto coupler array was carefully designed for the specific application of interfacing a disturbance recorder to a protection scheme, where the inputs to the opto coupler array from the protection scheme is either 110VDC or 220VDC and the outputs of the opto coupler array to the disturbance recorder is 24VDC, $\frac{1}{32}$ W. (Like the SIEMENS P531 fault recorder.)

The design parameters important in this application have been optimised, specifically transient withstand capability, noise immunity, pick-up time and drop-off time.

The input voltage of the array must be specified when ordering, as two versions are available, one for 110VDC inputs and one for 220VDC inputs.

The PVZ-OPTO4 contains four opto coupler channels. In order to fit four channels into a single ASEA relay housing while maintaining the clearance necessary for the type testing specification, channels 1 to 3 are not electrically separate from each other, but has a single negative input for all three positive inputs.

The fourth input (channel 4) is electrically completely separate from channels 1 to 3. (See *Typical Application*)

Four indication LEDs are provided, indicating the on/off status of each channel.

Should you have any questions or require any assistance with the application, installation or operation of the unit, please phone me personally on 082-600-2786 at any time. Any comments would be greatly appreciated and can be directed on email to myself at pvz@sdgtech.co.za.

Timing and voltage level specifications

Symbol	Parameter	Test Condition	Typical (Tested)	Units
V_{off}	Opto coupler is completely off for $V_{\text{in}} < V_{\text{off}}$ (See Note1)	$P_{\text{load}} = \frac{1}{32}$ W	/220: 140 /110: 68	[V]
V_{on}	Opto coupler is completely on for $V_{\text{in}} > V_{\text{on}}$ (See Note2)	$P_{\text{load}} = \frac{1}{32}$ W	/220: 146 /110: 72	[V]
$T_{\text{p/u}}$	Pick up time (See Note3)	$P_{\text{load}} = \frac{1}{32}$ W	75	[μ s]
$T_{\text{d/o}}$	Drop off time (See Note4)	$P_{\text{load}} = \frac{1}{32}$ W	800	[μ s]
P_{input}	Load presented to the 110/220VDC input signal (See Note 5)	$V_{\text{in}} = 220\text{V}$ $V_{\text{in}} = 110\text{V}$	0.514 0.275	[W] [W]
$V_{\text{in(max)}}$	Maximum voltage of the 24V wetting supply (See Note6)		46	[V]

Note1: The opto coupler is deemed completely off when 20V/24V is dropped across the opto coupler, therefore the voltage remaining on the fault recorder input is only 4V, definitely not enough to pick up the fault recorder input.

Note2: The opto coupler is deemed completely on when 4V/24V is dropped across the opto coupler, therefore the voltage on the fault recorder input is 20V, definitely enough to pick up the fault recorder input.

Note3: $T_{\text{p/u}}$ is defined as the time from the moment when a step signal $V_{\text{in}} = 110\text{V}/220\text{V}$ is applied to the input of the opto coupler until the moment the opto coupler is completely on. (See Note2)

Note4: $T_{\text{d/o}}$ is defined as the time from the moment the V_{in} is dropped from 110V/220V to 0V, until the moment the opto coupler is completely off. (See Note1)

Note5: Each 220V input dissipates 0.5W, therefore if all 4 inputs of the array is picked up at once, the 220V DC supply will be loaded with 2W in the case of a PVZ-OPTO4-220/24. (1.1W in the case of a PVZ-OPTO4-110/24)

Note6: A higher voltage than 24V will not damage the opto coupler outputs, as each output is individually protected by a clamping device, limiting the voltage to 56V. Positive transients on the 24V wetting supply will therefore be limited to 56V. This should be avoided, however, as the clamping device will let current flow through and therefore may cause the fault recorder input to pick up if the transient contains adequate energy. This should not normally be a problem, but if such big spikes are present on the 24V wetting supply, it may be removed by connecting a clamping device between the 24V and 0V of the wettings supply, preferably at the location of the opto coupler array, if both 24V and 0V are available there.

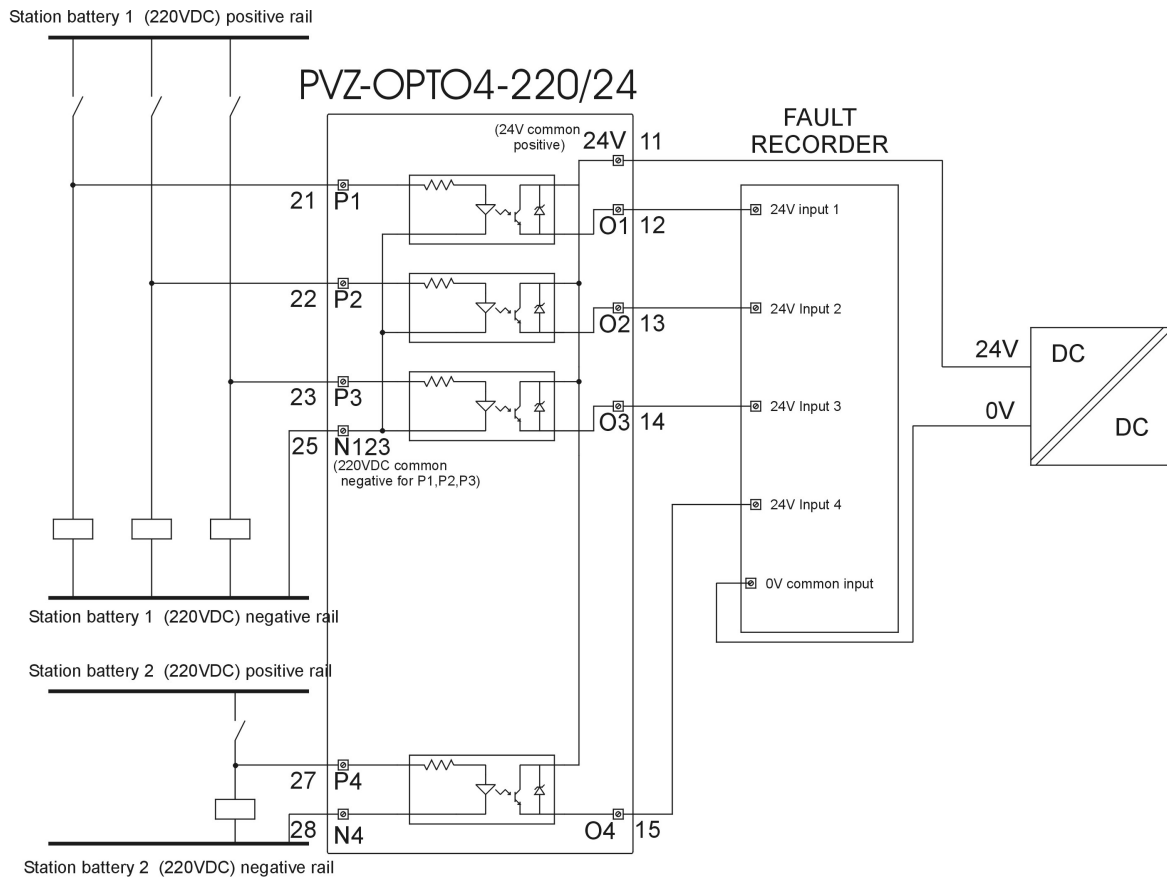
Similarly, negative transients will be clamped to $-0.7V$. If the connections to the output of the opto coupler array are therefore swapped, the opto coupler output will not be damaged, but the fault recorder input will be picked up continuously.

Other specifications

Transient withstand capability:

- 2.5kV, 2.5J, IEC255-5 differential pulse
- 7.5kV, 2.5J, IEC255-5 common mode pulse

Typical Application



As illustrated by this application drawing, the PVZ-OPTO4 may be applied across an inductive coil, due to its very high transient withstand capability, where other opto couplers may be damaged by the inductive kickback when the current is interrupted.

Ordering information

Input voltage	Part number
220VDC	PVZ-OPTO4-220/24
110VDC	PVZ-OPTO4-110/24