



VEBKO ONLINE HELP

51V Function Test in Siemens 7SD82 Relay

Category	tester
Section	Testing of relays protection functions
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1 Imported Content

In Siemens 7SD82 relay, this function can be used in function groups with three-phase voltage and current, and two inverse time stages depending on voltage and constant time with specific undervoltage conditions are considered by default.

In this test, the first stage of both categories is used. Note that in the "51V" function test, the fault detection or non-detection is done according to the voltage and current level of the test, which is "Voltage-Controlled" and "Voltage-Restrained", used as a generator differential protection support and in power systems to coordinate high current relays. In this test, as if is seen the characteristic curve is Voltage-Restrained.

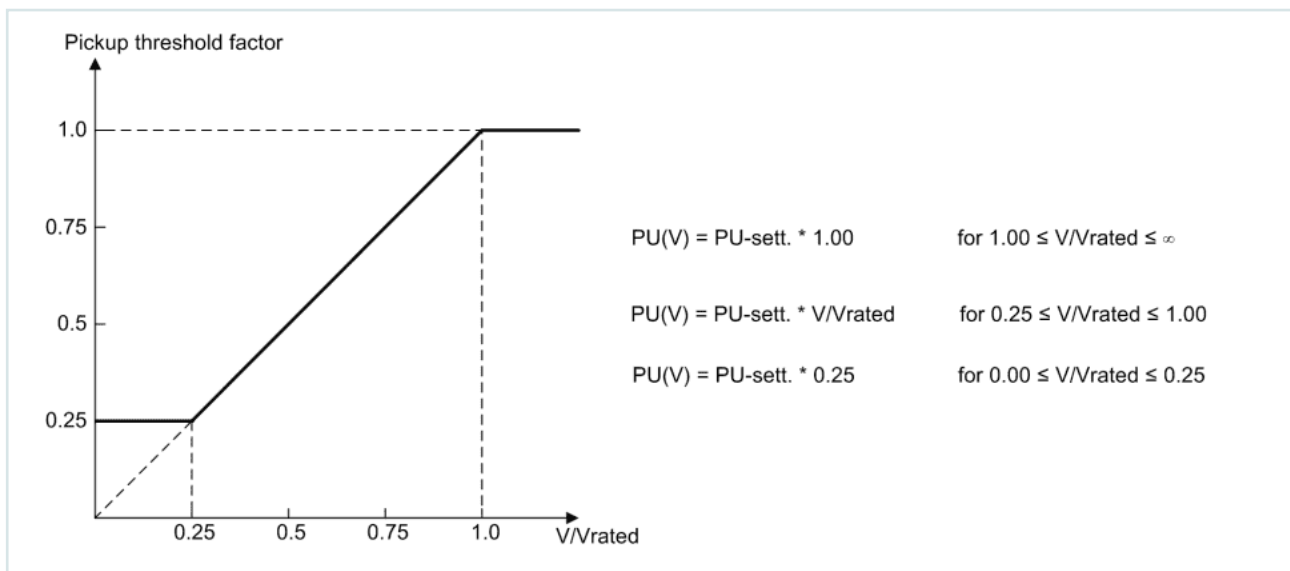


Figure 1

In the V/V_{rated} range between 0.25 and 1, the diagram is linear, which the pickup current value is directly proportional to the voltage increase. In this regard, V is the phase-to-phase voltage measured, V_{rated} , rated voltage, $PU\text{ sett}$ setting of pickup threshold and $PU(V)$ pickup threshold applied, according to voltage. The control voltage for each current phase is according to the table:

Current	Controlling Voltage
I_A	V_{AB}
I_B	V_{BC}
I_C	V_{CA}

Figure 2

The settings in the 7SD82 relay for this protection stage are performed according to the image:

21.2051.11491.1	Mode:	on	
21.2051.11491.2	Operate & flt.rec. blocked:	no	
21.2051.11491.8	Method of measurement:	fundamental comp.	
21.2051.11491.3	Threshold:	1.000	A
21.2051.11491.101	Type of character. curve:	ANSI definite inverse	
21.2051.11491.102	Reset:	instantaneous	
21.2051.11491.103	Time dial:	1.00	

Figure 3

If harmonics is to be included in the measurements related to this stage, select RMS Value option in the Method of Measurement section. Otherwise, in order to skip harmonics and transient conditions, select Fundamental Com, which is Siemens' suggested option.

The 1.5amp current setting value is also a good option for most applications. The current threshold parameter for lines is up to 10% and for transformers and engines up to about 20% higher than the maximum of the expected load, adjusted. In the characteristic section, select the curve according to the IEC and ANSI standards. Here the 1amp setting is used.

to reset parameter, you can also select the instant reset option or reset by modeling the movement of disk relays. The Time Dial option also allows moving the characteristic in the direction of the time axis.

The next stage in considering the undervoltage function conditions is also set as follow so that if there are sufficient voltage conditions, the activation of the function is seen.

21.2051.16951.1	Mode:	on	
21.2051.16951.2	Operate & flt.rec. blocked:	no	
21.2051.16951.3	Threshold:	1.350	A
21.2051.16951.6	Operate delay:	3.00	s
21.2051.16951.10	Blk. by meas.-volt. failure:	yes	
21.2051.16951.101	State of V-seal-in:	off	
21.2051.16951.102	V-seal-in threshold:	46.200	V
21.2051.16951.104	Duration of V-seal-in time:	4.00	s

Figure 4

After applying the settings on the relay and specifying the required contacts in the configuration section, it is time to test the function. Keep in mind that due to curve performance, either use the pickup contact or consider the time required in the Max Fault Time section for the 51V function performance.

In the AMT VIStarting room, to test the relay, first enter its information in the "Test Object" window. In the "Device" block, information such as the relay's name, serial number, relay operation location, "CT" and "PT" specifications are entered. Also, to enter the settings of this function, you need to double-click on the "VI Starting" block from the tree chart, and in the "VI Starting Parameters" page, enter the settings needed to display in the "VI Starting Characteristic" characteristic curve.

In the Tolerances section, you can also enter the percentage of acceptable fault to perform the test. By confirming the entered settings, it is time to perform Shot Test, Check Test and Search Test. In the "Shot Test" tab you select the type of fault and points to test and after the test is performed, you can see the evaluation results. In "Check Test", the upper and lower tolerances of the relay displayed as dashes in "VI Starting Characteristic" are tested and evaluated.

Note that the plotted "Check Line" should have cross at least one of the tolerance lines of the characteristic curve. Search Test is the last test performed on the "VI Starting" characteristic curve. The purpose of this test is to find the characteristic curve line. The "Search Line" method is the same as "Check Line". By performing the test, the software by testing several points on the search line to the characteristic curve interpolation and determine the exact location of the characteristic curve. Keep in mind that due to the required voltage level, by referring to the test object Parameters and then the Device block, you may need to increase the final voltage limit or V max

When the test ends and saves the file, simply select parameters to open the report setting window to get the result as an output file by selecting the parameters that need to be entered in the final report.

[jg1]51V function test in SIEMENS