

EUROPROT +

Definite time undervoltage protection function

PROTECT
HUNGARY

Document ID: PP-13-21404

Budapest, January 2017

Version information

Version	Date	Modification	Compiled by
1.0	2011-03-26	First edition	Póka
1.1	2017-01-11	MV application notes added, reset ratio added, min. delay time added, binary status signal titles updated, formatting	Erdős

Definite time undervoltage protection function

The definite time undervoltage protection function measures three voltages. The measured values of the characteristic quantity are the RMS values of the basic Fourier components of the phase voltages. In medium voltage applications these are changed to phase-to-phase voltages.

The Fourier calculation inputs are the sampled values of the three phase voltages (UL1, UL2, UL3), and the outputs are the basic Fourier components of the analyzed voltages (UL1Four, UL2Four, UL3Four). They are not part of the TUV27 function; they belong to the preparatory phase. The phase-to-phase voltages (if used) are also calculated here.

The function generates start signals for the phases individually. The general start signal is generated if the voltage is below the preset starting level parameter setting value and above the defined blocking level.

The function generates a trip command only if the definite time delay has expired and the parameter selection requires a trip command as well.

The operation mode can be chosen by the type selection parameter. The function can be disabled, and can be set to "1 out of 3", "2 out of 3", and "All".

The overvoltage protection function has a binary input signal, which serves the purpose of disabling the function. The conditions of disabling are defined by the user, applying the graphic equation editor.

Technical data

Function	Value	Accuracy
Pick-up starting accuracy		$< \pm 0,5 \%$
Blocking voltage		$< \pm 1,5 \%$
Reset time U< → Un U< → 0	50 ms 40 ms	
Operate time accuracy		$< \pm 20 \text{ ms}$
Minimum operate time	50 ms	

Parameters

Enumerated parameters

Parameter name	Title	Selection range	Default
Parameter for type selection			
TUV27_Oper_EPar_	Operation	Off, 1 out of 3, 2 out of 3, All	Off

Integer parameter

Parameter name	Title	Unit	Min	Max	Step	Default
Starting voltage level setting						
TUV27_StVol_IPar_	Start Voltage	%	30	130	1	90
Blocking voltage level setting						
TUV27_BlkJVol_IPar_	Block Voltage	%	0	20	1	10

Floating point parameter

Parameter name	Title	Unit	Min	Max	Step	Default
After starting the function drops off if the measured voltage is above the start voltage with at least this percentage.						
TUV27_ResetRatio_FPar_	Reset Ratio	%	1	10	1	5

Boolean parameter

Parameter name	Title	Default
Enabling start signal only:		
TUV27_StOnly_BPar_	Start Signal Only	FALSE

Timer parameters

Parameter name	Title	Unit	Min	Max	Step	Default
Time delay of the undervoltage protection function.						
TUV27_Delay_TPar_	Time Delay	ms	50	60000	1	100

Binary input status signals

Binary input status signal	Title	Explanation
TUV27_BlkJGrO_	BlkJ	Output status of a graphic equation defined by the user to disable the definite time undervoltage protection function.

Binary output status signals

Binary output status signal	Title	Explanation
TUV27_StL1_GrI_	StL1	Start in phase L1*
TUV27_StL2_GrI_	StL2	Start in phase L2*
TUV27_StL3_GrI_	StL3	Start in phase L3*
TUV27_GenSt_GrI_	GenSt	General start signal
TUV27_GenTr_GrI_	GenTr	General trip command

*In case of phase-to-phase voltages, these are changed to L12, L23, L31 respectively.