

Selection table for Vamp protection relays

VTEN013 / 23.02.2011

Protection and measurement				Feeder protection							Machine protection							Arc protection													
				VAMP 40	VAMP 50	VAMP 51	VAMP 52	VAMP 55	VAMP 230	VAMP 245	VAMP 255	VAMP 267	VAMP 269	VAMP 40	VAMP 52	VAMP 210	VAMP 230	VAMP 245	VAMP 255	VAMP 267	VAMP 265 M	VAMP 265	VAMP 120	VAMP 121	VAMP 221	VAMP 321					
Short circuit	IEEE Device No.	IEC Symbol	Protection function/measurement	50/51	3I >	Three-phase non-directional overcurrent, low-set stage, definite or inverse time	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x									
				50/51	3I >>	Three-phase non-directional overcurrent, high-set stage, definite time	x	x	x	x		x	x	x	x	x															
				50/51	3I' >	Three-phase non-directional overcurrent, high-set stage, definite or inverse time (secondary side)																			x	x					
				50/51	3I' >>	Three-phase non-directional overcurrent, high-set stage, definite time (secondary side)																			x	x					
				50/51	3I >>>	Three-phase non-directional overcurrent, high-set stage, definite time	x	x	x	x		x	x	x	x	x															
				67 or 50/51	3I > →	Three-phase directional or non dir. o/c, low-set stage, definite or inverse time								x	x	x	x														
				67 or 50/51	3I >> →	Three-phase directional or non dir. o/c, high-set stage, definite or inverse time								x	x	x	x														
				67 or 50/51	3I >>> →	Three-phase directional or non dir. o/c, high-set stage, definite time								x	x	x	x														
				67 or 50/51	3I >>>> →	Three-phase directional or non dir. o/c, high-set stage, definite time								x	x	x	x														
				21/21N	Z <<	Distance protection, 5 zones polygonal characteristic																									
				Earth-fault	IEEE Device No.	IEC Symbol	Protection function/measurement	50N/51N	I ₀ >/ SEF	Non-directional earth-fault, low-set stage, sensitive, definite or inverse time	x	x	x	x		x	x	x	x	x											
								50N/51N	I ₀ >>	Non-directional earth-fault, high-set stage, definite time	x	x	x	x		x	x	x	x	x											
								50N/51N	I ₀ >>>	Non-directional earth-fault, high-set stage, definite time	x	x	x	x		x	x	x	x	x											
								50N/51N	I ₀ >>>>	Non-directional earth-fault, high-set stage, definite time	x	x	x	x		x	x	x	x	x											
								67NT	I ₀ >	Intermittent transient earth-fault protection	x							x	x	x	x										
67N or 50N/51N	I ₀ >/ SEF	Directional or non dir. earth-fault, low-set stage, sensitive, definite or inverse time	x											x	x	x	x														
67N or 50N/51N	I ₀ >>	Directional or non dir. earth-fault, high-set stage, definite or inverse time	x											x	x	x	x														
59N	U ₀ >	Residual overvoltage, low-set stage	x											x	x	x	x														
59N	U ₀ >>	Residual overvoltage, high-set stage	x											x	x	x	x														
50N/51N	REF	Restricted earth fault (application)	x					x	x	x				x	x	x	x														
Overload	IEEE Device No.	IEC Symbol	Protection function/measurement	49M	T >	Three-phase thermal overload (motors & generators)																									
				49F	T >	Three-phase thermal overload (feeders & cables)	x	x	x	x		x	x	x	x																
Voltage	IEEE Device No.	IEC Symbol	Protection function/measurement	59	1U >/ 3U >	One-/Three-phase overvoltage, low-set stage	1			1	3	3		3	3	3															
				59	1U >>/ 3U >>	One-/Three-phase overvoltage, high-set stage	1			1	3	3		3	3	3															
				59	1U >>>/ 3U >>>	One-/Three-phase overvoltage, high-set stage	1			1	3	3		3	3	3															
				27	1U </ 3U <	One-/Three-phase undervoltage, low-set stage	1			1	3	3		3	3	3															
				27	1U <</ 3U <<	One-/Three-phase undervoltage, high-set stage	1			1	3	3		3	3	3															
				27	1U <<</ 3U <<<	One-/Three-phase undervoltage, instantaneous stage	1			1	3	3		3	3	3															
				27P	U ₁ <	1st positive sequence undervoltage stage for generator applications								x																	
				27P	U ₂ <	2nd positive sequence undervoltage stage for generator applications								x																	
47	U ₂ >	Negative sequence overvoltage								x	x																				
Arc protection	IEEE Device No.	IEC Symbol	Protection function/measurement	50ARC/50NARC	3 I ₀ >/ I ₀ >, L >	Electrical arc protection stage; point sensors; optional	x	x	x	x		x	x	x	x	x															
				50ARC/50NARC	3 I ₀ >/ I ₀ >, L >	Electrical arc protection with point sensor; I/O units																									
				50ARC/50NARC	3 I ₀ >/ I ₀ >, L >	Electrical arc protection with fiber or current sensor I/O units																									
Other functions	IEEE Device No.	IEC Symbol	Protection function/measurement	79	O → I	Auto-reclosure	x																								
				68		Inrush and cold load detection	x	x	x	x		x	x	x	x	x															
				46	I ₂ / I ₁ >	Current unbalance protection (in feeder mode)	x	x	x	x		x	x	x	x	x															
				46	I ₂ >	Current unbalance protection (in motor mode)																									
				46	I ₂ ' >	Phase unbalance protection (secondary side)																									
				47	I ₂ >>	Phase sequence / incorrect phase sequence protection																									
				48	I _{st} >	Stall protection																									
				37	3I <	Loss of load / under current protection	x																								
				86		Latched trip	x	x	x	x		x	x	x	x	x															
				87	3Δ I >	Three-phase biased differential stage, low-set stage, 2nd harmonic blocking																									
				87	3Δ I >>	Three-phase differential stage, high-set stage																									
				66	N >	Frequent start protection																									
				64F3	U ₀ >	100 % stator earth fault protection																									
				40	Q <	Underexcitation protection																									
				40	X <, X <<	Loss of excitation protection																									
				32	P <, P <<	One-/Three-phase reverse power and underpower protection	1							3		3	3	3													
				24	U _r >	Volts/hertz overexcitation protection																									
				51F2	I ₂ >	Second harmonic O/C stage	x	x	x	x																					
				50BF	CBFP	Circuit breaker failure protection	x	x	x	x																					
				81H/81L	f >, f >><<	Overfrequency and underfrequency protection																									
				81L	f <, f <<	Underfrequency protection																									
				81R	df/dt	Rate of change of frequency (ROCOF) protection																									
				21	Z <, Z <<	Under-impedance protection, circle characteristic																									
				51V	I ₁ >	Voltage restrained or controlled overcurrent protection																									
				25	Δf, ΔU, Δ ₀	Synchrocheck																									
99	DR	Disturbance recorder	8 Programmable stages	x																											
				x	x	x	x		x	x	x	x																			
Type of measurement																															
Primary current	IEC Symbol	Protection function/measurement	3I	Three-phase current	x	x	x	x		x	x	x	x	x																	
			3 d I >	Three-phase differential current																											
			3I ₀	Zero sequence current	x	x	x	x		x	x	x	x	x																	
			I ₂	Current unbalance	x	x	x	x		x	x	x	x	x																	
			IL	Average and maximum demand current	x	x	x	x		x	x	x	x	x																	
			Primary voltage	IEC Symbol	Protection function/measurement	U/3U	One-/Three-phase and line voltages	1			1	3	3	3	3	3															
						U ₀	Zero sequence voltage	x																							
						U _r /U ₁	Relative voltage unbalance																								
			Short-circuit fault reactance	IEC Symbol	Protection function/measurement	X _{fault}	Short-circuit fault reactance																								
						f	System frequency	x	x	x	x		x	x	x	x															
			Power	IEC Symbol	Protection function/measurement	P	Active power	(x)																							
						Q	Reactive power	(x)																							
						S	Apparent power	(x)																							
						E ₊ , E ₋	Active Energy, exported / imported	(x)																							
			Energy	IEC Symbol	Protection function/measurement	E _{q+} , E _{q-}	Reactive Energy, exported / imported	(x)																							
PF	Power factor	(x)																													
Harmonics	IEC Symbol	Protection function/measurement	I	2nd to 15th and THD of phase currents	x	x	x	x		x	x	x	x																		
			U	2nd to 15th and THD of measured voltages																											
Voltage sags / swells	IEC Symbol	Protection function/measurement	U	Voltage sags / swells																											
			AO	Any measured or calculated value, freely scalable, Optional																											
Analog mA output, 1 channel	IEC Symbol	Protection function/measurement	AO	Any measured or calculated value, freely scalable, Optional																											
			AO	Any measured or calculated value, freely scalable, Optional																											
				(x): Based on one-phase voltage measurement																											
Control																															
Digital inputs		Number of digital inputs (max)		2	7	7	7	7	8	8	20	28	28	2	7	6	8	8	20	28	6	8	1								
Output relays		Number of trip relays (max)		4	5	5	5	5	2	2	4	8	8	4	5	2	2	2	4	8	2	2	2	1	4	4					
		Number of alarm relays		1	1	1																									