VAMP 210

GENERATOR PROTECTION RELAY

- Complete generator protection
- Optimized for generators up to ~100 MW
- Versatile earth fault protection
- Event handling and fault registration
- Disturbance recorder
- Various communication protocols including SPA Bus, Profibus, Modbus, Modbus TCP, IEC 61850, IEC 60 870-5-101, IEC 60 870-5-103, DNP 3.0, TCP/IP

Main technical data/ VAMP 210

Auxiliary voltage, Uaux	40…265 V ac / dc
	(optionally 18…36 V dc)
Rated phase current In	1 A or 5 A
- current measuring range	0…50 x In
Rated neutral current Ion	1 A or 5 A
- current measuring range	0…5 x In
Thermal Withstand	4 x In (continuous)
	100 x In (for 1 s)
Rated voltage Un	50 – 120 V (configurable)
- voltage measuring range	0 – 160 V (100 / 110 V)
Voltage withstand (continuous)	250 V
Rated frequency fn	45…65 Hz
- frequency measuring range	16…75 Hz
Digital inputs	6 pcs
- internal operating voltage	+48 V dc
Trip contacts	2 pcs
Alarm contacts	5 pcs

Tests and environment

Emission	EN 55022
Immunity	IEC 60255-22-1,
	IEC 60255-11,
	EN 61000-4-6,
	EN 61000-4-5,
	EN 6100-4-4,
	EN 61000-4-3,
	EN 6100-4-2
Insulation test	IEC 60255-5
Surge voltage	IEC 60255-5
Vibration shock	IEC 60255-21-1
Operating temperature	-10…+55° C
Relative humidity	<95 %, no condensation
allowed	
Degree of protection (IEC 60529)	IP54, flush mounted
Weight	4,2 kg
Dimension (w x h x d)	209 x 155 x 225 mm

Protection stages
Current protection

Overcurrent protection	I>, I>>, I>>>	50/51
Voltage restrained/		
controlled overcurrent protection	Iv>	51V
Directional overcurrent protection		
	Idir>, Idir>>, Idir>>>, Idir>>>>	67
Current unbalance protection	I2>	46

Residual current protection
Earth fault protection

	I0>, I0>>, I0>>>, I0>>>>	50N/51N
Directional earth fault protection	I0φ >, I0φ >>	67N

Zero sequence voltage protection

Zero sequence voltage protection	U0> , U0>>	59N
100% stator earth fault protection	U0f3<	64F3

Voltage protection

Overvoltage protection	U>, U>>, U>>>	59
Undervoltage protection	U<, U<<, U<<<	27
Positive sequence undervoltage protection		
	U1< , U1 <<	27P

Power protection stages

Thermal overload protection	T>	49
Underexcitation protection	Q<	40
Overexcitation protection	Uf>	24
Reverse power protection	P<, P<<	32
Underimpedance	Z<, Z<<	21
Under excitation protection	Q<	40
Underreactance protection		
(lost of excitation)	X<, X<<	21/40

Frequency protection stages

Over- and Underfrequency		
protection	f><, f>><	81H/81L
Underfrequency protection	f<, f<<	81L
Rage of change of frequency		
(ROCOF) protection	df/dt	81R

Programmable stage

Programmable stage	Prg1…8

Arc protection (option)

Arc fault protection	Arc I>	50ARC>
Arc fault protection	Arc I01>, Arc I02>	50NARC>

Other

Disturbance recorder	All analogue channels
	and binary inputs / outputs

Circuit breaker failure protection	CBFP	50BF
Trip circuit supervision	TCS	
CT / VT supervision		60

Measuring; RMS and	IL1, IL2, IL3, I0 ,Io2, min, max, average
fundamental	Ua, Ub, Uc, U12, U23, U31, U0, min, max, f

Calculation	P, Q, S, min, max, average, by phase
	E+, E-, Eq+, Eq-, total, trip, pulse output
	Power factor
	PQ diagram(1 cosφ, tanφ, I0, I2/I1, U0, U2/U1

Power quality	Harmonics from phase currents:
	THD, harmonics 2nd to 15th by phase
	Harmonics from phase voltages:
	THD, harmonics 2nd to 15th by phase
	Voltage interrupts / voltage sags and swells
	Disturbance recorder
	Demand values

Transducer	Four mA outputs for any relevant signals

Note: (1 with VAMPSET software

Communication protocols	IEC 61850
	IEC 60 870-5-101
	IEC 60 870-5-103
	Transparent TCP/IP
	Modbus TCP
	Modbus RTU
	Profibus DP
	SPA
	DNP 3.0

Vaasa Electronics Group

VAMP

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