VAMP 57

Multipurpose feeder and motor protection relay

The VAMP 57 feeder manager has been developed to cover basic protection needs for OEMs, utilities and industrial applications. Thanks to its cost-effective and flexible design, the VAMP 57 provides an excellent alternative for various protection applications.

User-friendliness has always been a feature of VAMP products, and the VAMP 57 is no exception.

The rapid setting and download/upload is achieved with the unique VAMPSET setting software which dramatically improves usability.

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Life Is On Schneider Electric

Feeder and motor protection

The VAMP 57 comprises dedicated circuit breaker control push buttons.

VAMP 57 at a glance

Robust hardware

- User selectable Ethernet, RS485 or RS232 based communication interface
- Designed for demanding industrial conditions

Common technology for cost efficiency

- Powerful CPU supporting IEC 61850
- Thanks to four setting groups adaptation to various protection schemes is convenient

User-friendly and high functionality

- Common firmware platform with other VAMP range protection devices
- Standard USB connection (type B) for setting software (VAMPSET)

Modern Human Machine Interface (HMI)

- Clear LCD display for alarms and events
- Single line diagram mimic with control, indication and live measurements
- Programmable function keys and LEDs
- Circuit breaker ON / OFF control

Superior protection

The VAMP 57 protection relay family is based on proven technology concepts developed in close cooperation with customers. VAMP products have been designed around user-friendliness, a feature which is proven in our customer reports day after day.

The VAMP 57 feeder manager has been developed to cover basic protection needs for OEMs, utilities and industrial applications. Thanks to its cost-effective and flexible design, the VAMP 57 provides an excellent alternative for various protection applications.

VAMP 57 combines further protection functions such as directional earth fault for feeder and motor protection.

User friendly HMI interface

Ease of use

A great deal of effort has gone into the design of the operational aspects of the new products.

Unicode support allows the menu text and settings to be translated by user into various international languages including for example Russian and Chinese. The informative human machine interface shows all of the required information for the user with support of customised legend texts.

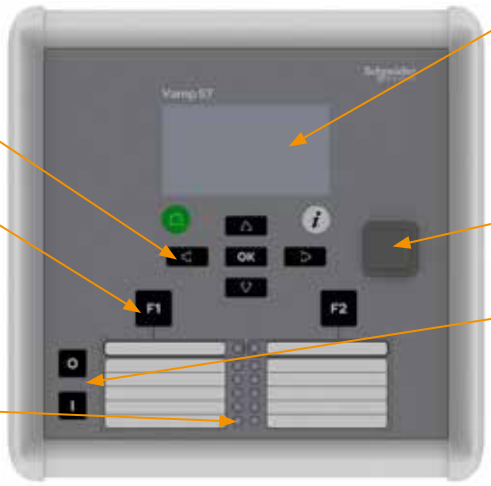
The VAMP 57 protection relay concept has been extended with a number of features that make installation and testing of the relays even more efficient and user-friendly.

HMI interface of VAMP 57

Navigation push buttons

Function buttons with:
- User configurable legend texts
- Object control
- Protection setting group selection
- Freely programmable

Programmable LEDs
- User configurable legend texts
- 12 LEDs, 2 fixed (power, self-diagnostic) and 8 freely programmable (2 for push buttons)



128 x 64 LCD dot matrix display
- Single line diagram and freely assignable analogue values
- Unicode language support

Local port
- USB interface

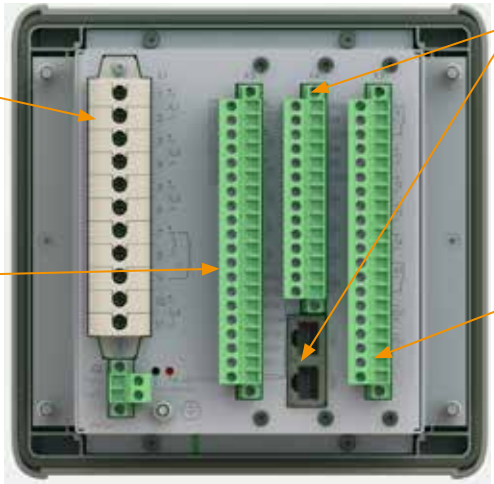
Control buttons
- Direct or select-execute CB control
- Possibility for password protection

The template for user legend texts is a part of the product documentation.

The texts are printed on a transparent film allowing customisation of the relay.

Analog interface
- 4 x CT
- 1 x U
- Auxiliary power supply

Analog interface and DI / DO
- Presence of this module is order code dependent
- 3 x U
- 3 x trip relay
- 6 x DI



Combined DI and communication interface card
- 8 x DI
- Remote port: RS485 or Ethernet (RJ-45 redundant)

Inputs and outputs
- 2 x DI
- 4 x trip relay
- 1 x alarm relay

Ring-lug terminals
for X1 and X5 slots are specified with type designation code: 4 = 1A/5A & 1U (100/110V), X1 and X5 ring lugs

Communication

Wide range of protocols including IEC 61850

VAMP is an expert in communication with vast experience in interfacing different system integrators, SCADA, RTUs, PLCs and gateways using a large number of supported protocols. Flexible adaptation of the communication protocols together with powerful and easy to use software tools are the key to successful integration.

IEC 61850

The IEC 61850 protocol can be used to read or write static data or to receive events sent spontaneously from the relay. In addition, the interface allows peer-to-peer communication between the relays, known as GOOSE. The IEC 61850 interface is configured with familiar, user-friendly VAMPSET software.

The IEC 61850 datamodel, data-sets, report control blocks and GOOSE communication are configured according to the requirements of the system configuration. VAMPSET is also used to produce ICD files, which may be needed for the substation integration.

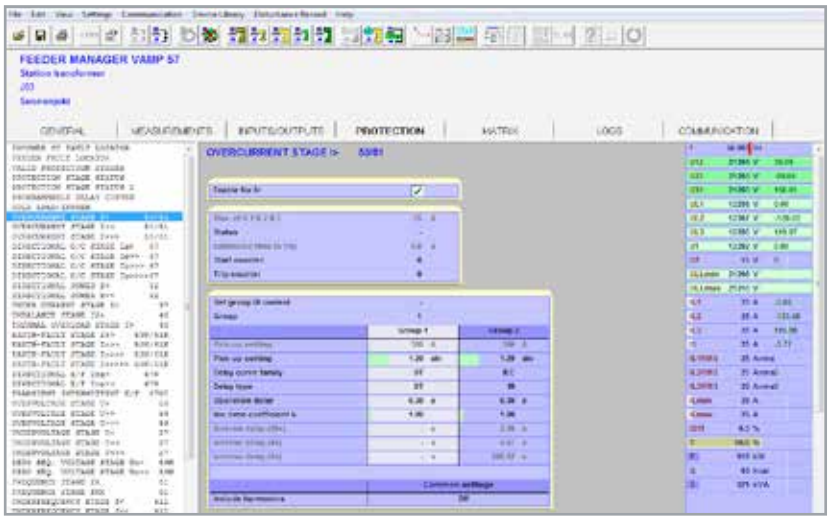
VAMP 57 Communication protocols	
• IEC 60870-5-101	• IEC 61850
• IEC 60870-5-103	• Human-Machine-Communication, display
• Modbus TCP	• Human-Machine-Communication, PC
• Modbus RTU	• Ethernet IP
• DNP 3.0	• Profibus DP
• SPA-bus communication	

Order code digit	B = RS-485 + 8DI	C = 2xRJ45 + 8DI	D = 2xLC + 8DI	E = RJ+232+8DI with IRIG-B	F = LC+232+8DI with IRIG-B
Communication	Two-wire RS485 serial	Double Ethernet (RSTP) RJ45	Double Ethernet (RSTP) LC	RS232 and Ethernet RJ-45	RS232 and Ethernet LC
Protocols	IEC60870-5-101, IEC 60870-5-103, Modbus RTU and SPA	IEC 61850 IEC 60870-5-101, Modbus TCP, DNP 3.0 and Ethernet IP		IEC 61850, Modbus TCP, DNP 3.0, IEC60870-5-101, IEC 60870-5-103, Modbus RTU and SPA	
Other				IRIG-B input and External I/O communication	
I/O	8 x DI				

VAMPSET

Setting and Configuration Tool

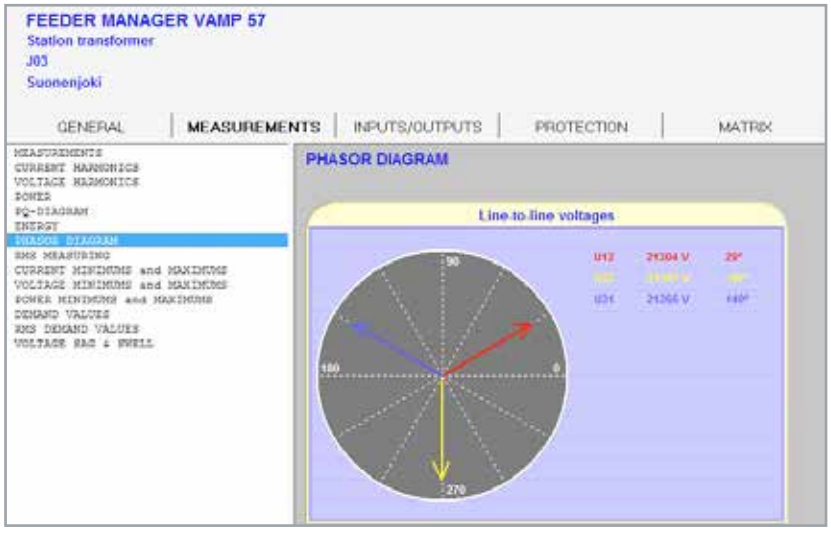
VAMPSET is a user-friendly, free-of-charge relay management software for setting parameters and configuring VAMP relays. Via the VAMPSET software, relay parameters, configurations and recorded data can be exchanged between PC and VAMP relays. Supporting the COMTRADE format, VAMPSET also incorporates tools for analysing relay events, waveforms and trends from data recorded by the relays, e.g. during a network fault situation.



Relay's setting views are organised to several folders in the VAMPSET setting tool views in order to conveniently find right data for parameterisation of the IED. The setting tool displays on-line measurements in each folder view.

The VAMPSET software is future-proof, supporting future updates and new VAMP products.

Standard USB communication cable can be used.



The phase sequences for currents and voltages can be read on-line from the clear and explicit phasor diagram screen for easy commissioning of the relay .

Measurements and condition monitoring

The VAMP 57 offers a complete set of measurement functions to replace the conventional metering functions of switchgear and controlgear installations. The measurement functions cover phase, line and residual currents, current imbalance, system frequency and harmonics from phase currents. Condition monitoring continuously monitors trip circuits, breaker wear and current transformers.

Type of measurement	IEC Symbol	Protection function / measurement
Primary current	3I	Three-phase current
	I0	Zero sequence current
	I1	Positive sequence current
	I2	Negative sequence current
	I2 / I1	Ratio of negative and positive current
	IL	Average and maximum demand current
Primary voltage	3U	Phase-to-earth, phase-to-phase voltages
	U0	Zero sequence voltage
	U1	Positive sequence voltage
	U2	Negative sequence voltage
	U2 / U1	Ratio of negative and positive voltage
	Xfault	Short-circuit fault reactance, Fault location
	Xfault	Earth-fault reactance, Fault location
Frequency	f	System frequency
Power	P	Active power
	Prms	RMS Active power
	Q	Reactive power
	Qrms	RMS Reactive power
	S	Apparent power
	Srms	RMS Apparent power
	E+, E-	Active Energy, exported / imported
	Eq+, Eq-	Reactive Energy, exported / imported
	CosPhi	Cosine Phi
	TanPhi	Tan Phi
		Power Angle
	PF	Power factor
		Phasor diagram view of voltages
		Phasor diagram view of currents
Harmonics	I	2nd to 15th harmonics and THD of currents
	U	2nd to 15th harmonics and THD of voltages
		Condition monitoring CB wear
		Condition monitoring CT supervision
		Trip Circuit Supervision (TCS)
		Voltage interruptions
Voltage sags/swells	U	Voltage sags / swells
	▭>	Disturbance recorder

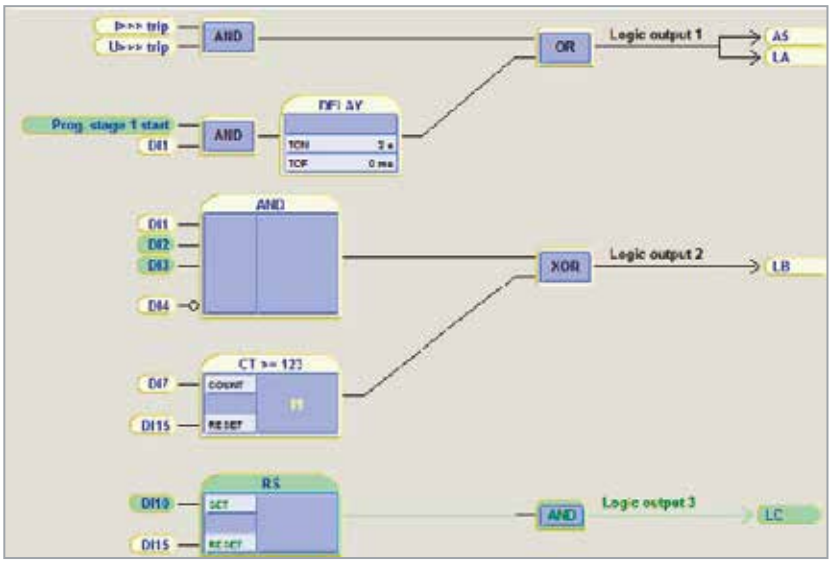
Protection stages

Coming now, VAMP 57 feeder and motor protection relay includes necessary protection functions and control features for basic feeder and motor protection applications

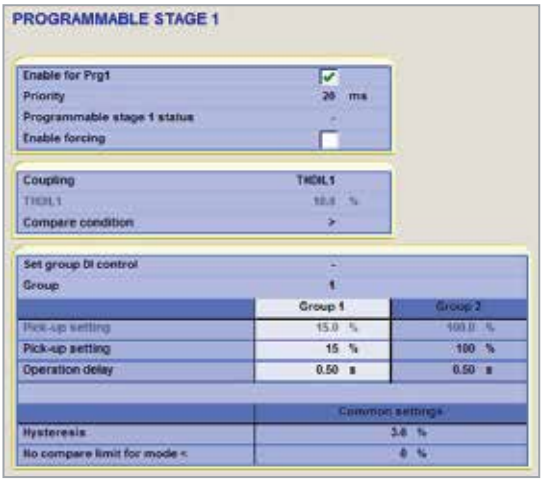
				Voltage option B 4 x U		Voltage option A 1 x U	
Type of fault.	IEEE Device No.	IEC Symbol	Protection function / measurement	Feeder Protection	Motor Protection	Feeder Protection	Motor Protection
Short circuit	50/51	3I >, 3I >>, 3I >>>	Overcurrent	●	●	●	●
Earth-fault	50N/51N	I_0 >, I_0 >> I_0 >>>, I_0 >>>>, I_0 >>>>>	Earth-fault	●	●	●	●
	67	Iφ>, Iφ>>, Iφ>>>, Iφ>>>>	Directional overcurrent	●	●		
	67N	$I_{0\varphi}$>, $I_{0\varphi}$>>, $I_{0\varphi}$>>>	Directional earth fault	●	●	●	●
	67NI	I0INT >U	Intermittent transient earth fault	●		●	
	46	I2 / I1 >	Current unbalance	●		●	
Motor	46	I2 >	Current unbalance		●		●
	47	I2 >>	Incorrect phase sequence		●		●
	48	IST >>	Stall		●		●
	66	N>	Frequent start		●		●
	37	I<	Undercurrent	●	●	●	●
Overload	49	T>	Thermal overload	●	●	●	●
Voltage	59N	U0>, U0>>	Zero sequence voltage	●	●	●	●
	59	U>, U>>, U>>>	Overvoltage	●	●		
	27	U<, U<<, U<<<	Undervoltage	●	●		
Frequency	81H/81L	f ><, f >><<	Overfrequency and underfrequency	●	●		
	81L	f <, f <<	Underfrequency	●	●		
	81R	df/dt	Rate of change of frequancy	●	●		
	68F2	If2 >	Magnetizing inrush	●	●	●	●
Capacitor	60NC	DIc >	Capacitor bank unbalance protection	●	●	●	●
	59C	Uc >	Capacitor overvoltage protection	●		●	
Other	68F5	If5 >	Over excitation	●	●	●	●
	32	P<, P<<	Reverse power	●	●		
	79		Auto reclose function	●		●	
	50BF	CBFP	Circuit-breaker failure	●	●	●	●
	25		Synchrocheck	●	●		
	86		Latched trip	●	●	●	●
	99	Prg1-8	Programmable stages	●	●	●	●

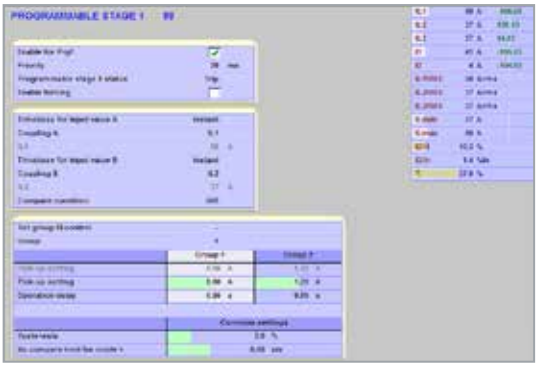
Programmable stages

There are now eight stages available to use with various applications. Each stage can monitor any analogue (measured or calculated) signal and issue start and trip signals. Programmable stages extend the protection functionality of the manager series to a new level. For example, if four stages of frequency are not enough, with programmable stages, the maximum of 12 can be reached. Other examples are using the stages to issue an alarm when there are a lot of harmonics (THD) or indicating reverse power condition.



Programmable logic: The logic editor has colours to enable viewing of active statuses. Furthermore, each input status can be also seen on-line in VAMPSET view .



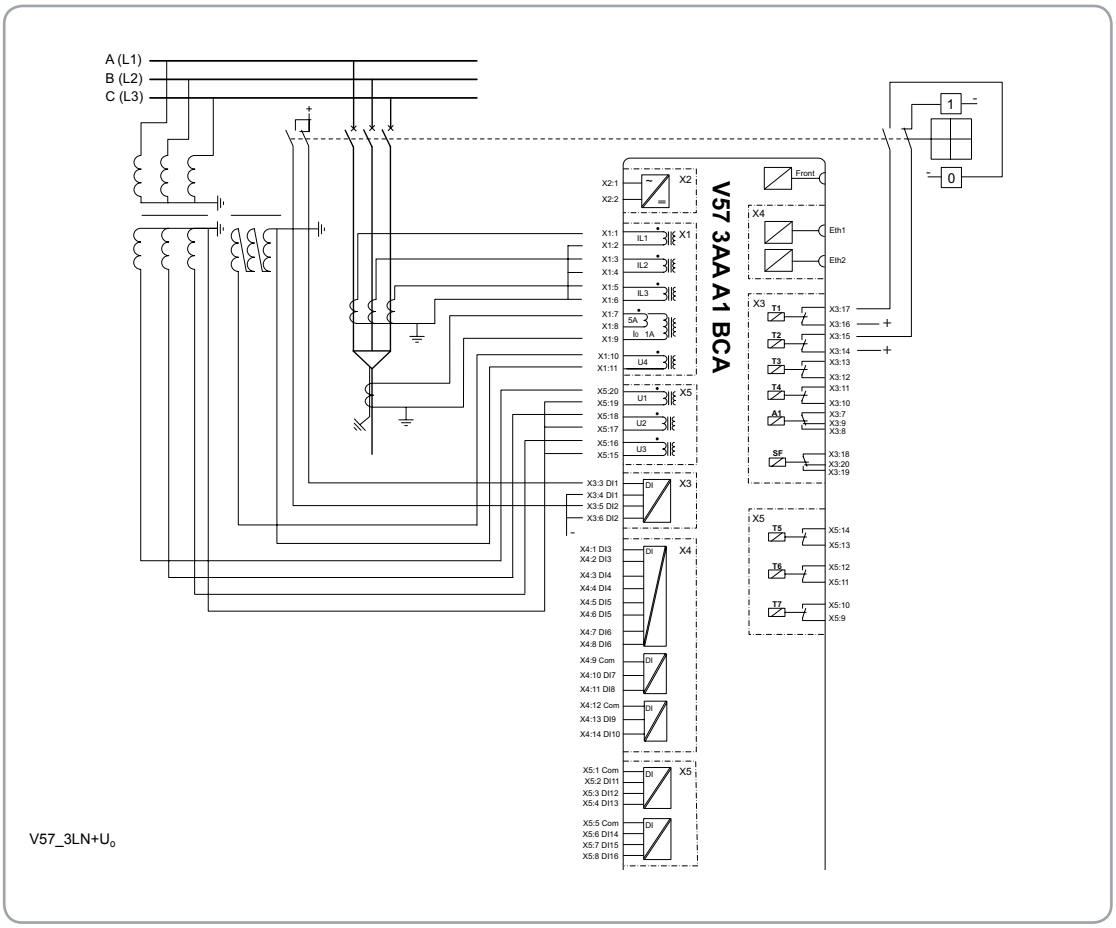


Programmable stage has a possibility to compare two freely selectable signals between each other. Using this feature the user can create comparison function using relay's own measured or calculated signals. One or both of the signals can be connected to comparison function over GOOSE.

Connections

Connection diagram: 3LN + Uo

Voltage scaling mode	3LN + Uo
Voltages measured by VTs	UL1, UL2, UL3, Uo
Values calculated	U12, U23, U31, U1, U2, U2/U1, f
Protection functions not available	ANSI 25



Inputs / Outputs

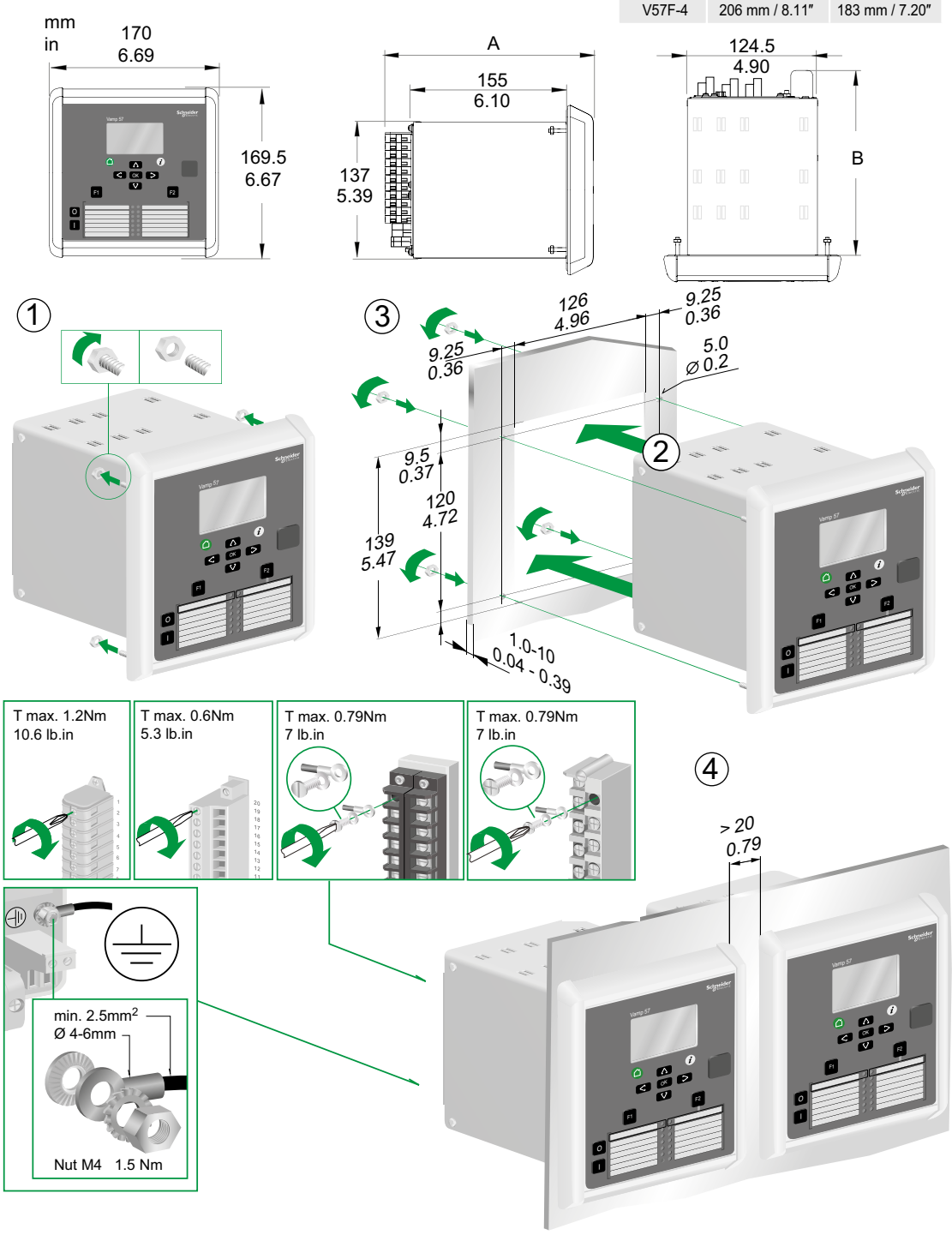
The VAMP 57 hosts various optional modules in order to upgrade the relay functionality from basic to more advanced applications.

	V57F-xxxAxBxA	V57F-xxxAxAxA
Analog inputs	3 x I 1 x Io 4 x U	3 x I 1 x Io 1 x U
Digital inputs	16	10
Trip relays	7	4
Signal relays	1	1
Self-diagnostic	1	1
Front port	USB	
Optional rear port	RS232 / RS485 / Ethernet	

Dimensional drawings

Panel mounting VAMP 57

	A	B
V57F-3	205 mm / 8.07"	182 mm / 7.17"
V57F-4	206 mm / 8.11"	183 mm / 7.20"



Order codes

V 57 ☐-☐☐☐☐☐☐☐☐☐-☐

Application

F = Feeder / Motor, 4xI, 1xU, 2DI, 5DO

Phase currents & voltage input, X1

3 = 1 A / 5 A & 1U (100 / 110V)

4 = 1 A / 5 A & 1U (100 / 110V), X1 and X5 ring lugs

Earth-fault current input , X1

A = 1 A / 5 A

B = 0,2 A / 1 A

Nominal Supply Voltage [V] , X2

A = Power A 48 - 230 V (range: 40 - 265 V ac/dc)

B = Power B 24V (range: 18 - 36 V dc)

Future option

A = None

DI nominal voltage (V)

1 = 24 V ac/dc

2 = 110 V ac/dc

3 = 220 V ac/dc

Voltage measurements + I/O , X5

A = None

B = 3U (100 / 110 V) + 6DI + 3DO

I/O with comms , X4

B = RS485 + 8DI

C = 2 x RJ-45 + 8DI

D = 2 x LC + 8DI

E = RJ + 232 + 8DI with IRIG-B

F = LC + 232 + 8DI with IRIG-B

Future option

A = Future

Other

C = Conformal coating

Note: For exact DI, DO and AI amount see table on page 10

Accessories

Order code	Description	Note
VX052-3	USB programming cable (Vampset)	Cable length 3 m
V57PSC	V57 Panel Seal Cover	
VX082	V57 (RS232) - VSE(D9)	Cable length 2.5 m
VX083	V57 (RS232) - Remote / Extension / IRIG-B (3xD9)	Cable length 2.5 m
VX084	V57 (RS232) - VPA 3CG Profibus adapter cable	Cable length 3 m
VSE001PP	Fiber optic module (plastic - plastic)	Max. distance 30 m
VSE001GG	Fiber optic module (glass - glass)	Max. distance 1 km
VPA3CG	Profibus DP fieldbus option adapter	

Main technical data

Auxiliary voltage	
Voltage range	40-265 V ac/dc
Measuring circuit	
Rated phase current I_N	1 A / 5 A
Current measuring range	0.005-50 x I_N
Rated neutral current I_{0N}	1 A or 5 A
Current measuring range	0.003-10 x I_N
Thermal withstand	4 x I_N (continuous) 100 x I_N (for 1 s)
Rated frequency f_N	50 / 60 Hz (45-65 Hz)
Rated voltage Un	**100 V (configurable for VT secondaries 50-120 V)**
Voltage measuring range	0-160 V (100 V/110 V)
Continuous voltage withstand	250 V
Burden	< 0.5 V A
Digital inputs	
Digital inputs (external voltage max 265 V)	16
Nominal operation voltage DI1 – DI16	1: 24-230 V ac/dc (max. 265 V ac/dc)
	2: 110-230 V ac/dc (max. 265 V ac/dc)
	3: 220-230 V ac/dc (max. 265 V ac/dc)
Typical switching treshold	1: 12 V ac/dc
	2: 75 V ac/dc
	3: 155 V ac/dc
Outputs	
Rated voltage	250 V ac/dc
Continuous carry	5 A
Trip contacts	7
Signal contacts	1

Main technical data

Disturbance tests

	Standard & Test class / level	Test value
Emission	IEC/EN 60255-26 (ed3)	
Conducted	EN 55022, Class A & IEC 60255-25 & CISPR 22	0.15-80 MHz
Emitted	EN 55011, Class A & IEC 60255-25 & CISPR 11	30 - 1 000 MHz
Immunity	IEC/EN 60255-26 (ed3)	
1Mhz damped oscillatory wave	IEC/EN 61000-4-18 & IEC 60255-22-1	± 2.5 kVp CM, ± 2.5 kVp DM
Static discharge (ESD)	IEC/EN 61000-4-2 Level 4 & IEC 60255-22-2	± 8 kV contact, ±15 kV air
Fast transients (EFT)	IEC/EN 61000-4-4 Level 4 & IEC 60255-22-4	± 4kV, 5/50 ns, 5 kHz
Surge	IEC/EN 61000-4-5 Level 3 & IEC 60255-22-5	± 2 kV, 1.2/50 ms, CM ± 1 kV, 1.2/50 ms, DM
Conducted HF field	IEC/EN 61000-4-6 Level 3 & IEC 60255-22-6	0.15 - 80 MHz, 10 Vemf
Emitted HF field	IEC/EN 61000-4-3 Level 3 & IEC 60255-22-3	80-2700 MHz, 10 V/m
Voltage alternative component	IEC/EN 61000-4-17	15 % of operating voltage (DC) / 10 min
Voltage dips	IEC/EN 61000-4-29 & IEC/EN 61000-4-11	30 %/ 1 s, 60 %/0.1 s, 100 % / 0.05 s
Voltage short interruptions	IEC/EN 61000-4-29 & IEC/EN 61000-4-11	30 %/10 ms, 100%/10 ms, 60 %/100 ms 100 %/5000 ms
Power-frequency magnetic field	IEC/EN 61000-4-8	300 A/m (continuous), 1000 A/m 1-3 s
Pulse magnetic field	IEC/EN 61000-4-9 Level 5	1000 A/m, 1.2/50 µs

Electrical safety tests

	Standard & Test class / level	Test value
Impulse voltage withstand	IEC/EN 60255-27 & EN 60255-5, Class III	5 kV, 1.2/50 µs, 0.5 J, communication 1 kV
Dielectric test	IEC/EN 60255-27 & EN 60255-5, Class III	2 kV, 50 Hz, communication 0,5 kV
Insulation resistance	IEC/EN 60255-27 & EN 60255-5	
Protective bonding resistance	IEC/EN 60255-27	
Power supply burden	IEC/EN 60255-1	

Mechanical tests

	Standard & Test class / level	Test value
Device in operation		
Vibrations	IEC 60255-21-1, Class II/ IEC 60068-2-6, Fc	1 Gn, 10 Hz – 150 HZ
Shocks	IEC 60255-21-2, Class II/ IEC 60068-2-27, Ea	10 Gn/11 ms
Seismic	IEC 60255-21-3 Method A, Class II	2 G horizontal / 1 G vertical , 1 Hz-35 Hz
Device de-energized		
Vibrations	IEC 60255-21-1, Class II/ IEC 60068-2-6, Fc	2 Gn, 10 Hz – 150 HZ
Shocks	IEC 60255-21-2, Class II/ IEC 60068-2-27, Ea	30Gn/11 ms
Bump	IEC 60255-21-2, Class II/ IEC 60068-2-27, Ea	20 Gn/16 ms

Environmental tests

	Standard & Test class / level	Test value
Device in operation		
Dry heat	EN/IEC 60068-2-2, Bd	+65°C (149°F)
Cold	EN/IEC 60068-2-1, Ad	-40°C (-40°F)
Damp heat, cyclic	EN / IEC 60068-2-30, Db	• From 25°C (77°F) to 55°C (131°F) • From 93% RH to 98% RH • Testing duration: 6 days
Damp heat, static	EN/IEC 60068-2-78, Cab	• 40°C (104°F) • 93% RH • Testing duration: 10 days
Device in storage		
Dry heat	EN / IEC 60068-2-2, Bb	+70°C (158°F)
Cold	EN / IEC 60068-2-1, Ad	-40°C (-40°F)

Environmental conditions

	Standard & Test class / level
Ambient temperature, in-service	-40 to 65°C (-40 to 149°F)
Ambient temperature, storage	-40 to 70°C (-40 to 158°F)
Relative humidity	< 95%, no condensation allowed
Maximum operating altitude	2000 m (6561.68 ft)

Casing

	Standard & Test class / level
Degree of protection (IEC 60529)	IP54 Front panel, IP20 rear side
Dimensions (W* x H* x D)	170 x 170 x 205 / 6.69 x 6.69 x 8.07 in
Weight	2.5 kg (5.519 lb)

* dimension of collar

Package

	Standard & Test class / level
Dimensions (W x H x D)	260 x 210 x 300 mm / 10.23 x 8.26 x 11.81 in
Weight (Terminal, Package and Manual)	3.2 kg (7.054 lb)

The VAMP 57 is designed with user-friendliness in mind.

Device Track record

- Schneider Electric's VAMP range specialises in protection relays, arc flash protection and measuring and monitoring units for power systems.
- VAMP's medium-voltage and sub-transmission protection relays are used in numerous applications, from overhead line feeders and substations to power plants and industrial power system. Many of them have unique integrated arc flash fault protection functionality to enhance the safety of both people and property and has made VAMP a leading range in arc flash protection worldwide. VAMP products meet the latest international standards and regulations.

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