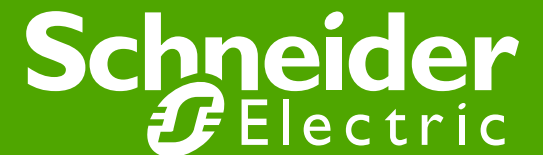# Schneider Electric Infrastructure Ltd

Numerical Relays IED Portfolio

Samson
IED Sales South India
Mob-No – 0 99520 99442

Schneider *Electric*

Schneider MiCOM Numerical Protection IED's

Schneider Electric

MiCOM - Pxxx
Protection Solutions - Platforms

MiCOM Px4x
Advanced & Versatile

MiCOM Px3x Advanced

P139 with Bay Control

MiCOM Px2x Standard

MiCOM Px1x Basic

MiCOM Px10 - Basic Protections

Feeder Protection P111, P114 and P115 (Self Powered Relays) , P116 Dual Powered relay

Motor Protection P211

MiCOM P111Enh

MiCOM Px20 - Standard Protections

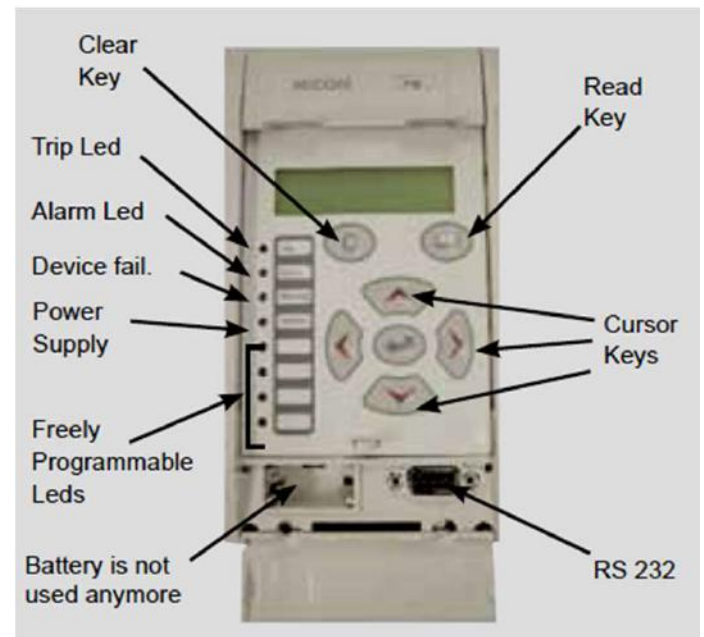Feeder Non Dir P121, P122, P123.

Directional P125, P126, P127

Motor P220, P225

Line Differential P521

Bus bar P721, P723

Breaker Failure P821

Voltage and Frequency P921, P922, P923

Clear Key

Read Key

Trip Led

Alarm Led

Device fail.

Power Supply

Cursor Keys

Freely Programmable Leds

Battery is not used anymore

RS 232

MiCOM - Px30 Advanced Protections & Control

Feeder P130C, P132, P139 (Mimic display)

Distance P430C, P433, P435, P437 (Main 2)

Line differential P530C, P532

Transformer P630C, P631, P632, P633, P634c

Railway P138, P436, P438, P638

MiCOM Px40 - Advanced Protections

Feeder P141, P142, P143, P145

Motor P241, P242, P243

Generator P341 Islanding, P342, P343, P344, P345

Distance P441, P442, P443, P444, P445

Line Diff P541, P542, P543, P544, P545, P546,P547

Transformer P642, P643, P645

Bus bar P741, P743, P746

Circuit breaker P841

Schneider VAMP Numerical Protection IED's

➢ **NTPC approved.**
➢ **Supplied more than 1000 relays in PSPCL (2017)**
➢ **Supplied more than 500 relays in Andhra and Telengana Utlities**
➢ **Supplied in HVPNL, JKPDD, APEPDCL, TSSPDCL**
➢ **3300 Units sold in FY2016**

Schneider Electric

Vamp

Feeder / Motor / Gen / Trafo 87G/ Mtr 87G/ Arc Solutions

Vamp 210 / 265:
Gtr / Trafo/Mtr Diff
Fixed I/o's

Vamp 257:
Fdr / Mtr Manager
Flexi I/o's

Vamp 230/255:
Fdr / Mtr Manager
Fixed I/o's

Vamp 57:
Fdr /Mtr Manager

Vamp 55:
Full Voltage solution
V, F, Synccheck, ROCOF

Vamp 52:
(50/51) + 1ph VT
Fdr / Mtr

Vamp 50:
Current based

Schneider VAMP 5x Numerical Protection IED's

➢ **VAMP 5x**

Schneider Electric
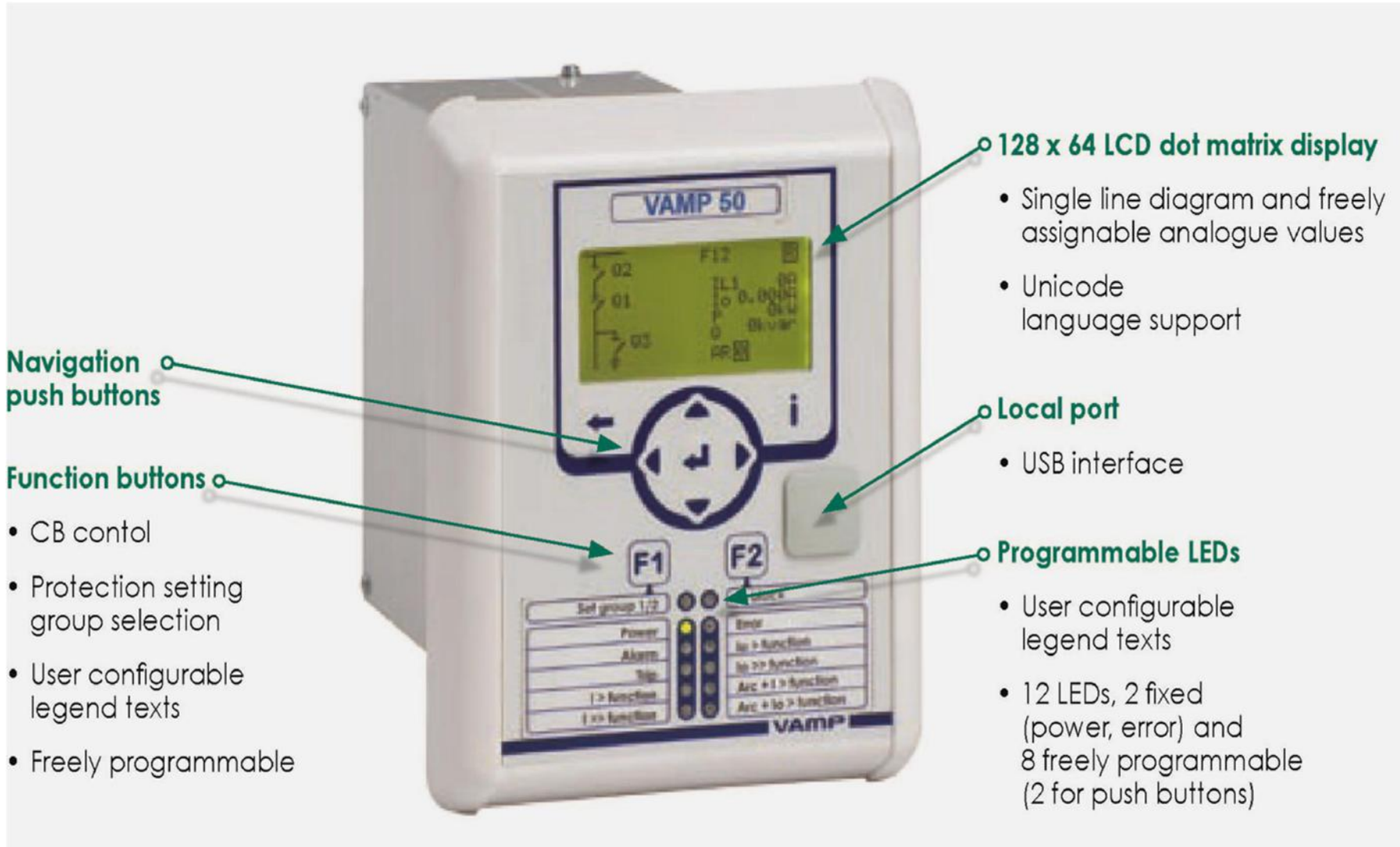
Features

- Big display with MIMIC
- USB configuration port
- Self-adaptive I/O options - easy to add at site
- Self-adaptive communication options – easy to add at site
- Mechanical dimensions enable easy retrofit
- Proven firmware based on other VAMP products
- Excellent cost / functionality ration
- Optional arc flash protection
- Native IEC 61850
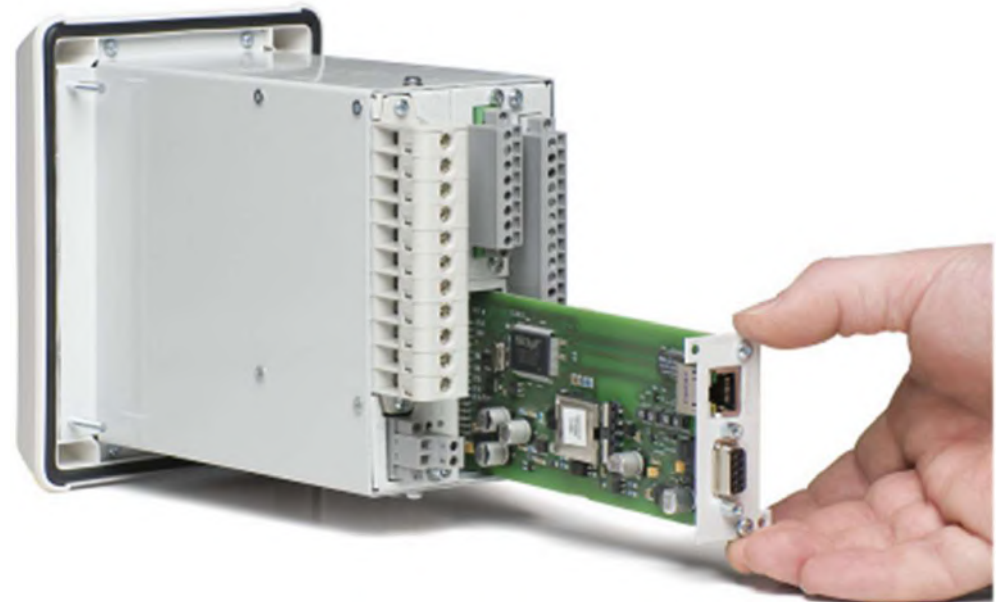
Human Machine Interface

128 x 64 LCD dot matrix display

- Single line diagram and freely assignable analogue values
- Unicode language support

Navigation push buttons

Function buttons

- CB contol
- Protection setting group selection
- User configurable legend texts
- Freely programmable

Local port

- USB interface

Programmable LEDs

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

Vamp 50, 52, 55

Hardware / Relay	VAMP 50	VAMP 52	VAMP 55
Analog inputs	3 x I 1 x Io	3 x I 1 x Io 1 x U	4 x U
Digital inputs	2 (6)	2 (6)	2 (6)
Trip relays	4 (5)	4 (5)	4 (5)
Control relays	2	2	2
mA output	Option	Option	Option
Arc protection	Option	Option	Option
Front port	USB	USB	USB
Optional rear port	RS 485 RS 232 Fibre Ethternet	RS 485 RS 232 Fibre Ethternet	RS 485 RS 232 Fibre Ethternet
Ext RTD input mod	Option	Option	Option

Vamp 57

Cost optimized, Value for Feature relay

Feeder and Motor Applications

Hardware	VAMP 57 Directional	VAMP 57 Non-Dir
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
Alarm Relay	1	1
Watchdog	1	1
Front port	USB	USB
Optional rear port	RS485 or	RS485 or
Ethernet Rear port	Dual RJ45 copper port	Dual RJ45 copper port

VAMP 57

– a feeder and motor protection relay

Key customer benefits

> Just few type designations – easy to select
> Advanced circuit breaker, disconnector and earth switch controlling
> Bay mimic and control
> IEC 61850 with powerful GOOSE
> User friendly multilingual HMI
> Free of cost VAMPSET configuration and setting tool with USB connection for parameterization and IEC 61850 configuration
> Text pocket for customized alarm channel legend
> QR code registration enable additional warranty

Basic description

> Feeder and motor protection relay
> One relay for basic and advanced applications in utilities and industry

Main characteristic and option list

> VAMP 57 has all necessary feeder and motor protection functions for industrial and utility applications. Synchrochec and auto-reclosing extend automatic network control
> User-defined programmable stages and logic extend protection and controlling schemes
> Power quality measurements and disturbance recorder enable capture of quick network phenomena
> Storage for 2000 events and 12 disturbance recordings
> Extensive range of communication protocols including IEC61850 and Modbus TCP
> Service temperature range from -40 to +65 degrees Celsius

Technical characteristics

- Protection functions for feeder or motor protection
- 4 x current measurements
- 4 x voltage measurements
- 8 output relays (1 alarm, 7 trips)
- 16 digital inputs
- Alternatively ring-lugs for current, voltage and selected DI/DO terminals
- Communication interfaces
  - Ethernet 2xRJ45 or 2 x LC or 2-wire RS-485
- Comm. protocols: IEC 61850, IEC 60870-5-101, IEC 60870-5-103, Modbus TCP, Modbus RTU, DNP 3.0, SPA-bus

- Aux power 40 – 265 V ac/dc
- Display, logic and MIMIC
- IP54 protection degree (front)
- Service temperature -40 to +65 degrees Celsius

Ring-lugs for current, voltage and selected DI/DO terminals

Ring lugs for
- 3 X IL, 1 x Io, 4xU
- 6xDI, 3xDO

Terminal number	X1	X5
Ring lug width (mm) and screw size	8.0, M3.5	7.0, M3.5
Maximum wiring screw tightening torque Nm (lb-in)	0.79 (7)	0.79 (7)
Maximum connector retention screw tightening torque Nm (lb-in)		0.34 (3)

Screw clamp connectors for current, voltage and DI/DO connection

All terminals are screw clamp type
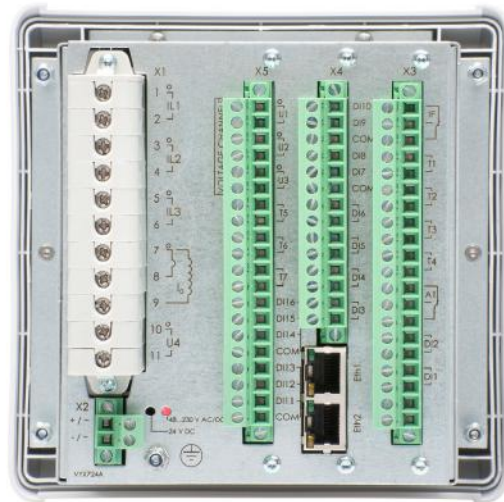
Terminal number	X1	X2 - X5
Maximum wire dimension, mm^2 (AWG)	4.0 (11-12)	2.5 (13-14)
Terminal type	Fixed	MSTB2.5-5.08
Maximum wiring screw tightening torque Nm (lb-in)	1.2 (10.6)	0.6 (5.3)
Maximum connector retention screw tightening torque Nm (lb-in)	Fixed	0.34 (3)

Reduced HW and protection functionality

Voltage measurements + I/O, X5

A = None

B = 3U (100/110V) + 6DI + 3DO
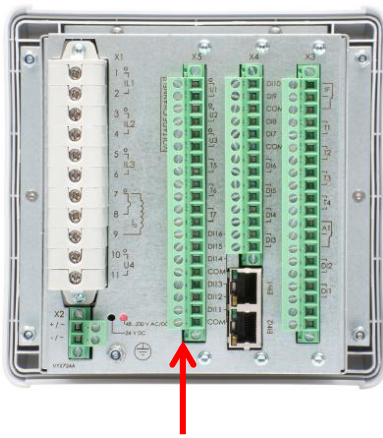
V57F-xxxAxBxA
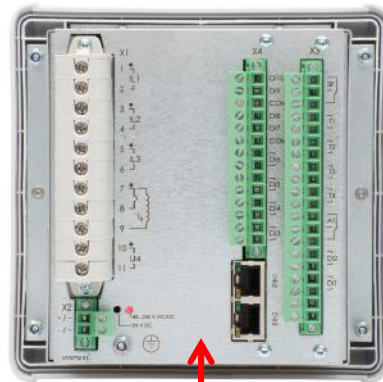
V57F-xxxAxAxA

	VAMP 57	
	V57F-xxxAxBxA	V57F-xxxAxAxA
Analog inputs	3 x I 1 x I$_o$ 4 x U	3 x I 1 x I$_o$ 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	RS485 / Ethernet	

Communication options

B = RS485
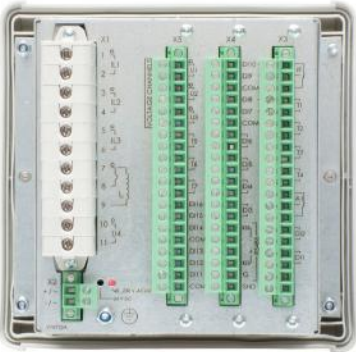
2 wire RS485 with internal terminating resistor selection

C = 2 x RJ45 Ethernet
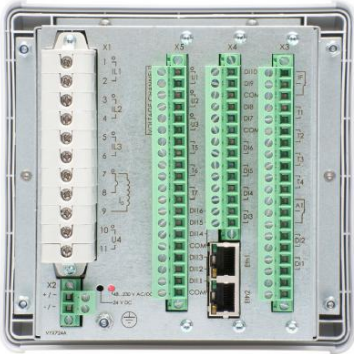
2 Ethernet RJ45 connectors for daisy-chain or loop configuration using RSTP protocol

D = 2 x LC Ethernet

2 Ethernet fibre interface for daisy-chain or loop configuration using RSTP protocol

Protection functions

IEEE Device No.	IEC Symbol	Protection function / measurement	Feeder Protection	Motor Protection	Feeder Protection	Motor Protection
50/51	3I >, 3I >>, 3I >>>	Overcurrent	●	●	●	●
50N/51N	I0 >, I0 >> I0 >>>, I0 >>>>	Earth-fault	●	●	●	●
67	Iφ>, Iφ>>, Iφ>>>, Iφ>>>>	Directional overcurrent	●	●		
67N	I0φ>, I0φ>>	Directional earth fault	●	●	●	●
67NI	I0INT >U	Intermittent transient earth fault	●		●	
46	I2 / I1 >	Current unbalance	●		●	
46	I2 >	Current unbalance		●		●
47	I2 >>	Incorrect phase sequence		●		●
48	IST >>	Stall		●		●
66	N>	Frequent start		●		●
37	I<	Undercurrent	●	●	●	●
49	T>	Thermal overload	●	●	●	●

Protection functions

IEEE Device No.	IEC Symbol	Protection function / measurement	Feeder Protection	Motor Protection	Feeder Protection	Motor Protection
59N	$U_0>$, $U_0>>$	Zero sequence voltage	●	●	●	●
59	$U>$, $U>>$, $U>>>$	Overvoltage	●	●		
27	$U<$, $U<<$, $U<<<$	Undervoltage	●	●		
81H/81L	$f><$, $f>><<$	Overfrequency and underfrequency	●	●		
81L	$f<$, $f<<$	Underfrequency	●	●		
81R	df/dt	Rate of change of frequency	●	●		
68F2	$I_{f2}>$	Magnetizing inrush	●	●	●	●
60NC	$\Delta I_c>$	Capacitor bank unbalance protection	●	●	●	●
59C	$U_c>$	Capacitor overvoltage protection	●		●	
68F5	$I_{f5}>$	Over excitation	●	●	●	●
32	$P<$, $P<<$	Reverse power	●	●		
79		Auto reclose function	●		●	
50BF	CBFP	Circuit-breaker failure	●	●	●	●
25		Synchrocheck	●	●		
86		Latched trip	●	●	●	●
99	Pgr1-8	Programmable stages	●	●	●	●

Measurements

Type of measurement	IEC Symbol	Protection function / measurement
Primary current	3I	Three-phase current
	I_0	Zero sequence current
	I_1	Positive sequence current
	I_2	Negative sequence current
	I_2 / I_1	Ratio of negative and positive current
	IL	Average and maximum demand current
Primary voltage	3U	Phase-to-earth, phase-to-phase voltages
	U_0	Zero sequence voltage
	U_1	Positive sequence voltage
	U_2	Negative sequence voltage
	U_2 / U_1	Ratio of negative and positive voltage
	Xfault	Short-circuit fault reactance, Fault location
	Xfault	Earth-fault reactance, Fault location
Frequency	f	System frequency

Type of measurement	IEC Symbol	Protection function / measurement
Power	P	Active power
	P_{rms}	RMS Active power
	Q	Reactive power
	Q_{rms}	RMS Reactive power
	S	Apparent power
	S_{rms}	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

Note: Measurements who require phase voltages are not available in "voltage A" variant

Communication protocols

Protocol	Ethernet	RS485
IEC 61850	x	
IEC 60870-5-103		x
IEC 60870-5-101	x	x
Modbus TCP	x	
Modbus RTU		x
DNP 3.0	x	x
SPA		x

Schneider VAMP 2xx Numerical Protection IED's

➢ **VAMP 2xx**

Schneider Electric

Vamp 2xx Features

- Comprehensive IED type selection of protection, measurement, power quality and control functions as standard

- Logic functions

- Customer designed mimic

- Alarm annunciation functions

- Support for local and remote operation

Local HMI

LCD display (128x64)

Protection function indications non-volatile storage

Freely programmable alarm indications

Local communication port (available in rear panel also)

Key pad
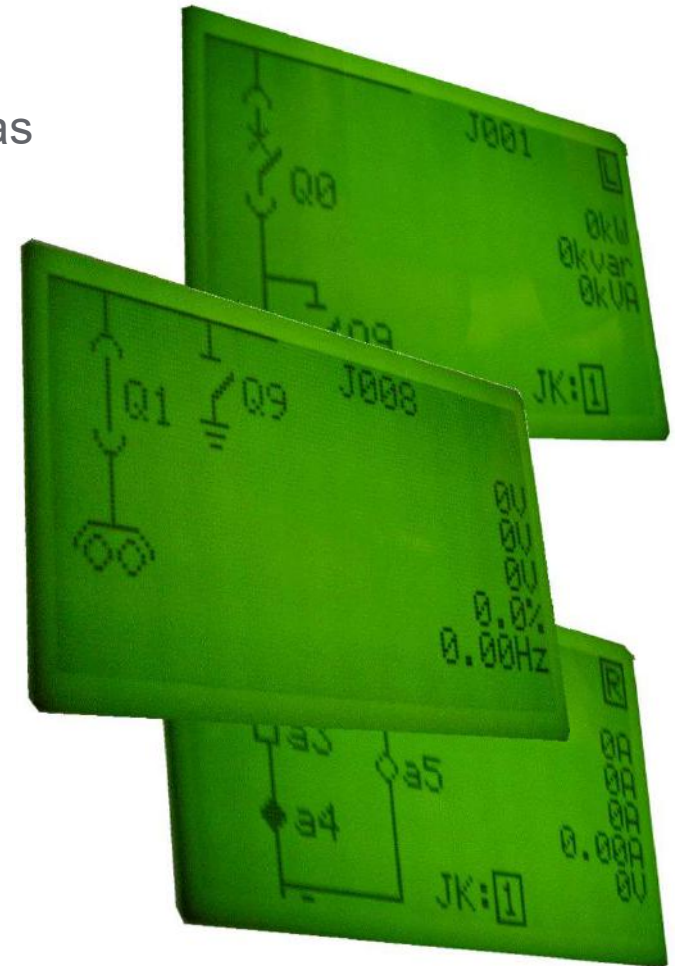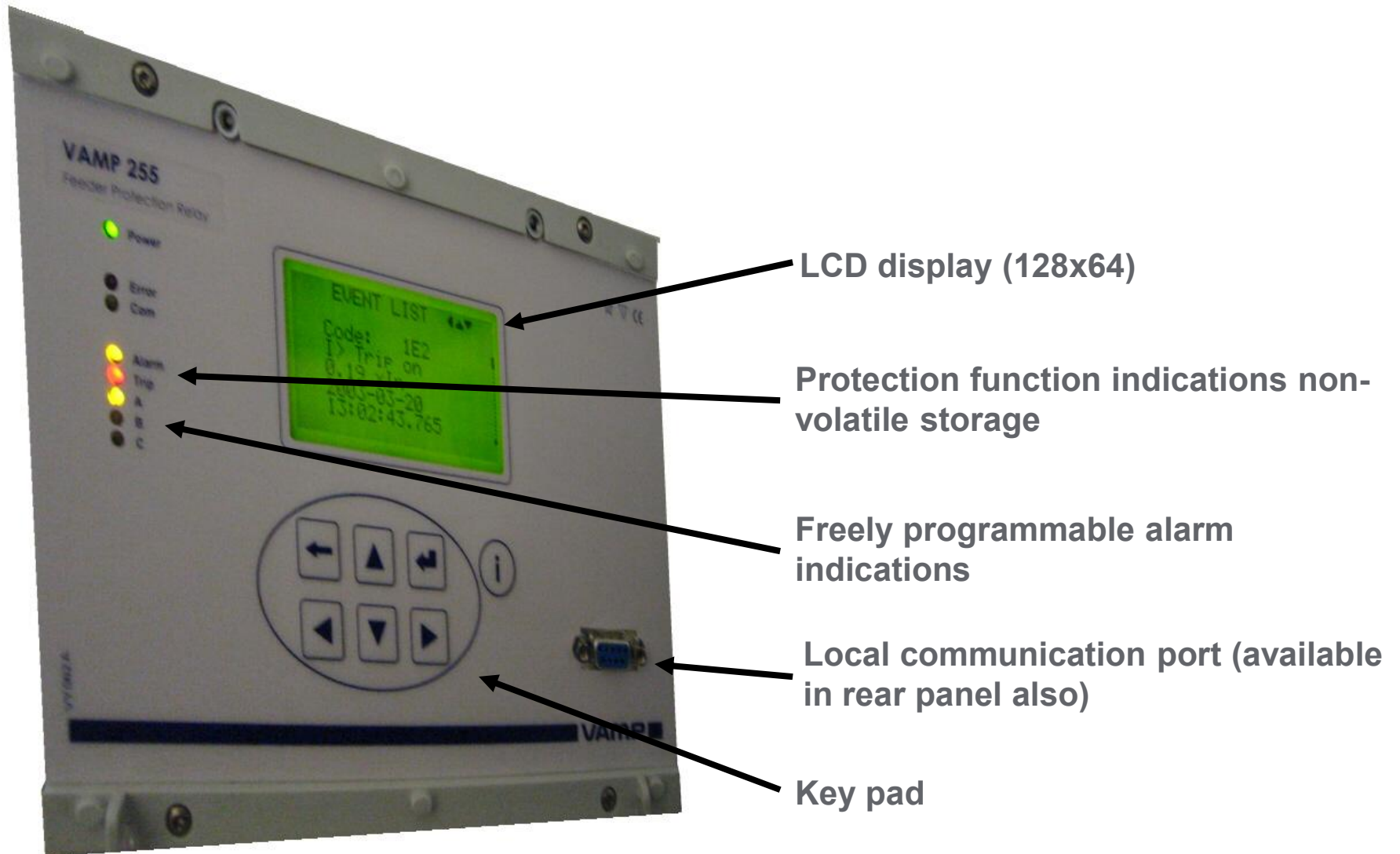
VAMP relay series
VAMP 230/255/257 – motor, feeder IED

- More inputs and outputs
- Good communication possibilities
- Arc-option, 15 ms

Applications:	-Feeder protection -Motor protection -Capacitor bank protection
3 x I (IN = 5A)	0.05...50 x I_N (45 – 65 Hz)
2 x I_0 (I_N = 5/1/0.2)	0.003...10 x I_N (45 – 65 Hz)
3 x U (U_N = 100 V)	0.5...160 V (45 – 65 Hz)
U_{AUX}	40...265 $V_{AC/DC}$ 18...36 V_{DC}
6...32 x DI	DI1...6 wet +48 V_{DC} contacts DI7...32: A: 24 V_{DC} / 110 V_{AC} B: 110 V_{DC} / 220 V_{AC} C: 220 V_{DC}
5...19 x trip contacts (T1-T19)	Making 250$V_{AC/DC}$
6 alarm contacts (A1-A5 & IRF)	Change-over 250$V_{AC/DC}$
(4 x mA output)	0 – 20 mA (step < 6 µA)

Communication ports	1 x local RS-232 front 2 x RS-232 COM ports back
Optional external ports	-Ethernet (RJ-45) -Ethernet (LC/ST fiber) -Profibus -Serial fiber interface (PP/GG/PG/GP) -RS-485 -RTD interface
Communication protocols	-External I/O -IEC-101 -IEC-103 -Modbus -Profibus DP -Spabus -Ethernet IP -Modbus TCP -DNP 3.0 -IEC-61850

VAMP relay series
VAMP 259 line diff, distance

- More inputs and outputs
- Good communication possibilities
- 4 voltage measurement channels
- Arc-option, 15 ms

| Applications:	-Line protection
3 x I (IN = 5A)	$0.05...50 \times I_N$ (45 – 65 Hz)
1 x I_0 (I_N = 5/1)	$0.003...10 \times I_N$ (45 – 65 Hz)
4 x U (U_N = 100 V)	0.5...160 V (45 – 65 Hz)
U_{AUX}	$40...265$ $V_{AC/DC}$ $18...36$ V_{DC}
18...32 x DI	DI1...6 wet +48 V_{DC} contacts DI7...32: A: 24 V_{DC} / 110 V_{AC} B: 110 V_{DC} / 220 V_{AC} C: 220 V_{DC}
5...19 x trip contacts (T1-T19)	Making 250$V_{AC/DC}$
6 alarm contacts (A1-A5 & IRF)	Change-over 250$V_{AC/DC}$

| Communication ports	1 x local RS-232 front 2 x RS-232 COM ports back
Optional external ports	-Ethernet (RJ-45) -Ethernet (LC/ST fiber) -Profibus -Serial fiber interface (PP/GG/PG/GP) -RS-485 -RTD interface
Communication protocols	-ANSI 85 -External I/O -IEC-101 -IEC-103 -Modbus -Profibus DP -Spabus -Ethernet IP -Modbus TCP -DNP 3.0 -IEC-61850

VAMP relay series
VAMP 210 – generator protection

- Good communication possibilities
- Arc-option, 15 ms

Applications:	-Generator protection
3 x I (IN = 5A)	$0.05...50 \times I_N$ (45 – 65 Hz)
2 x I_0 (I_N = 5/1/0.2)	$0.003...10 \times I_N$ (45 – 65 Hz)
3 x U (U_N = 100 V)	0.5...160 V (45 – 65 Hz)
U_{AUX}	40...265 $V_{AC/DC}$ 18...36 V_{DC}
6 x DI	DI1...6 wet +48 V_{DC} contacts
4 x trip contacts (T1-T4)	Making 250$V_{AC/DC}$
6 alarm contacts (A1-A5 & IRF)	Change-over 250$V_{AC/DC}$
(4 x mA output)	0 – 20 mA (step < 6 µA)

Communication ports	1 x local RS-232 front 2 x RS-232 COM ports back
Optional external ports	-Ethernet (RJ-45) -Ethernet (LC/ST fiber) -Profibus -Serial fiber interface (PP/GG/PG/GP) -RS-485 -RTD interface
Communication protocols	-External I/O -IEC-101 -IEC-103 -Modbus -Profibus DP -Spabus -Ethernet IP -Modbus TCP -DNP 3.0 -IEC-61850

VAMP relay series
VAMP 265 – transformer and machine

- Good communication possibilities
- Arc-option, 15 ms

Applications:	-Transformer/Motor differential protection
6 x I (IN = 5A)	$0.05...50 \times I_N$ (45 – 65 Hz)
2 x I_0 (I_N = 5/1/0.2)	$0.003...10 \times I_N$ (45 – 65 Hz)
U_{AUX}	$40...265 \ V_{AC/DC}$ $18...36 \ V_{DC}$
6 x DI	DI1...6 wet +48 V_{DC} contacts
4 x trip contacts (T1-T4)	Making 250$V_{AC/DC}$
6 alarm contacts (A1-A5 & IRF)	Change-over 250$V_{AC/DC}$
(4 x mA output)	0 – 20 mA (step < 6 µA)

Communication ports	1 x local RS-232 front 2 x RS-232 COM ports back
Optional external ports	-Ethernet (RJ-45) -Ethernet (LC/ST fiber) -Profibus -Serial fiber interface (PP/GG/PG/GP) -RS-485 -RTD interface
Communication protocols	-External I/O -IEC-101 -IEC-103 -Modbus -Profibus DP -Spabus -Ethernet IP -Modbus TCP -DNP 3.0 -IEC-61850

VAMP relay series
VAMP 260 – measuring and monitoring

- Good communication possibilities
- Can be connected to protection circuitry

Applications:	-Power Monitoring Unit
3 x I (IN = 5A)	$0.05...10 \times I_N$ (45 – 65 Hz)
3 x U (U_N = 100 V)	0.5...260 V (45 – 65 Hz)
U_{AUX}	40...265 $V_{AC/DC}$ 18...36 V_{DC}
6 x DI	DI1...6 wet +48 V_{DC} contacts
4 x trip contacts (T1-T4)	Making 250$V_{AC/DC}$
6 alarm contacts (A1-A5 & IRF)	Change-over 250$V_{AC/DC}$
(4 x mA output)	0 – 20 mA (step < 6 µA)

Communication ports	1 x local RS-232 front 2 x RS-232 COM ports back
Optional external ports	-Ethernet (RJ-45) -Ethernet (LC/ST fiber) -Profibus -Serial fiber interface (PP/GG/PG/GP) -RS-485 -RTD interface
Communication protocols	-External I/O -IEC-101 -IEC-103 -Modbus -Profibus DP -Spabus -Ethernet IP -Modbus TCP -DNP 3.0 -IEC-61850

VAMP relay series
Programmable mimic display and logic

- User configurable real time mimic with freely selectable measurements
- Pop-up screen for events, reclosing and synchro-check information
- Internal logic for up to 20 output nodes
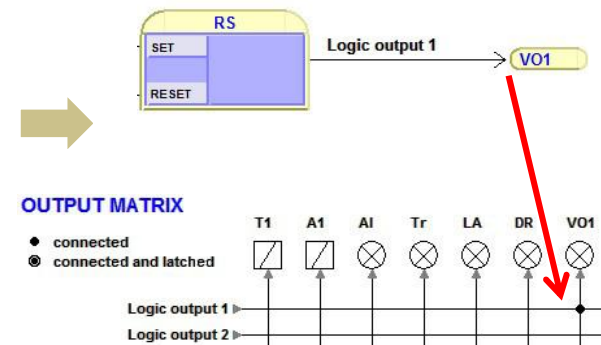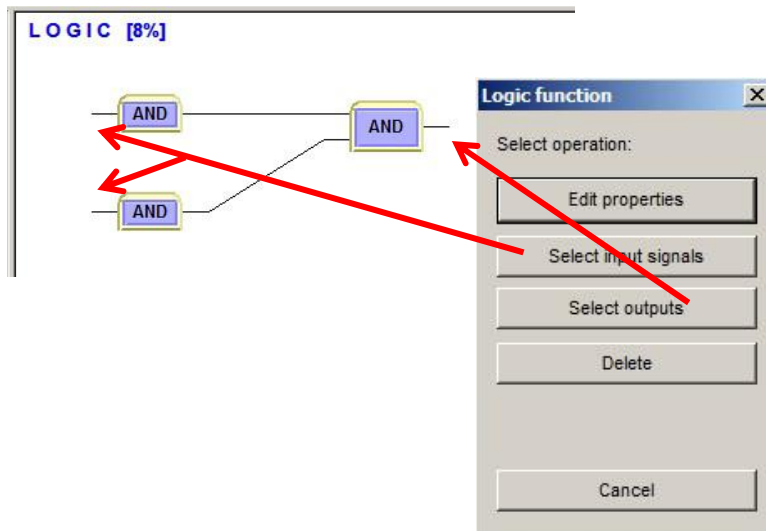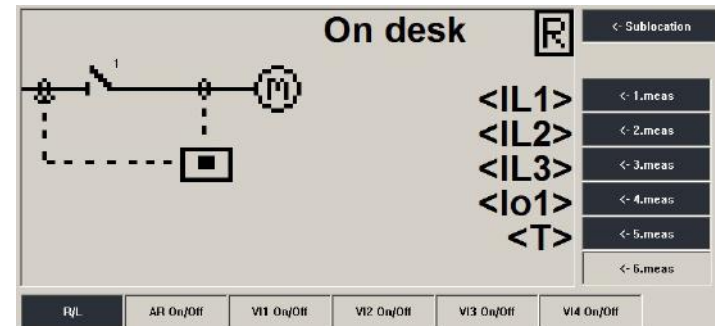
VAMP relay series
Fault data and event recording

- Stored in non-volatile memory
- Capacitor back-up for 7 days
- No maintenance required as for solutions with battery back-up

- Disturbance recorder
- Waveform or trend mode possible
- 32 samples/cycle max sampling rate
- Upload to VAMPSET DR analyzing tool
- Output in standard COMTRADE format
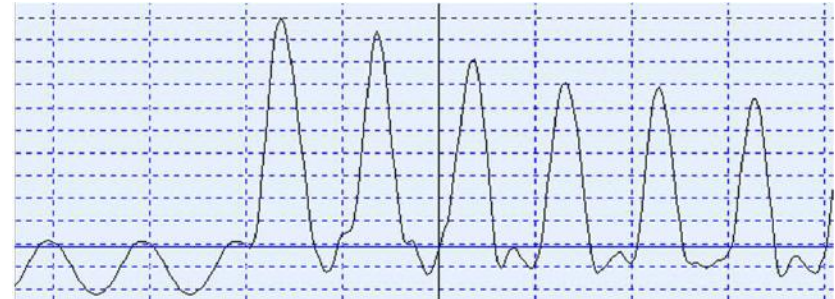
Inrush current captured in waveform mode (32, 16 or 8 samples/cycle)
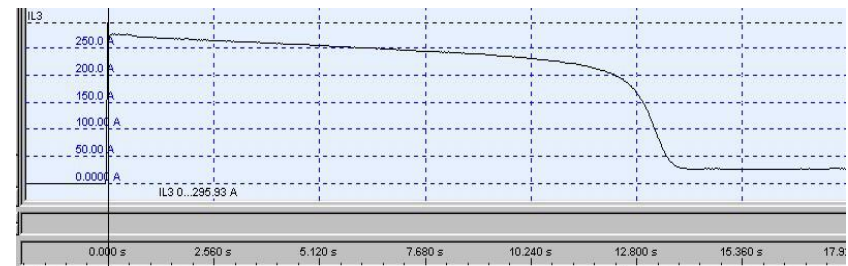
Start current of an induction motor captured in trend mode (e.g. 10 ms, 20 ms, 200 ms)

VAMP relay series
Virtual measurement and fault data injection

- Possibility to create virtual current and voltage injection with harmonics and phase shift
- Possible to do disturbance recorder playbacks

Schneider VAMP 300 Numerical Protection IED's

- ➢ **VAMP 300**

Schneider Electric

VAMP 300 IED

Functionality

- Vamp 300 IED features a modular design that allows user-defined **conventional protection** and **arc flash protection** solutions both in new and existing power distribution systems.

- New improved integrated arc protection with binary input and output channels provide possibility to build arc system between the IEDs.

- With point sensors a fast operation time within 2 milliseconds is achieved. Using fiber loop sensor the tripping time is even faster
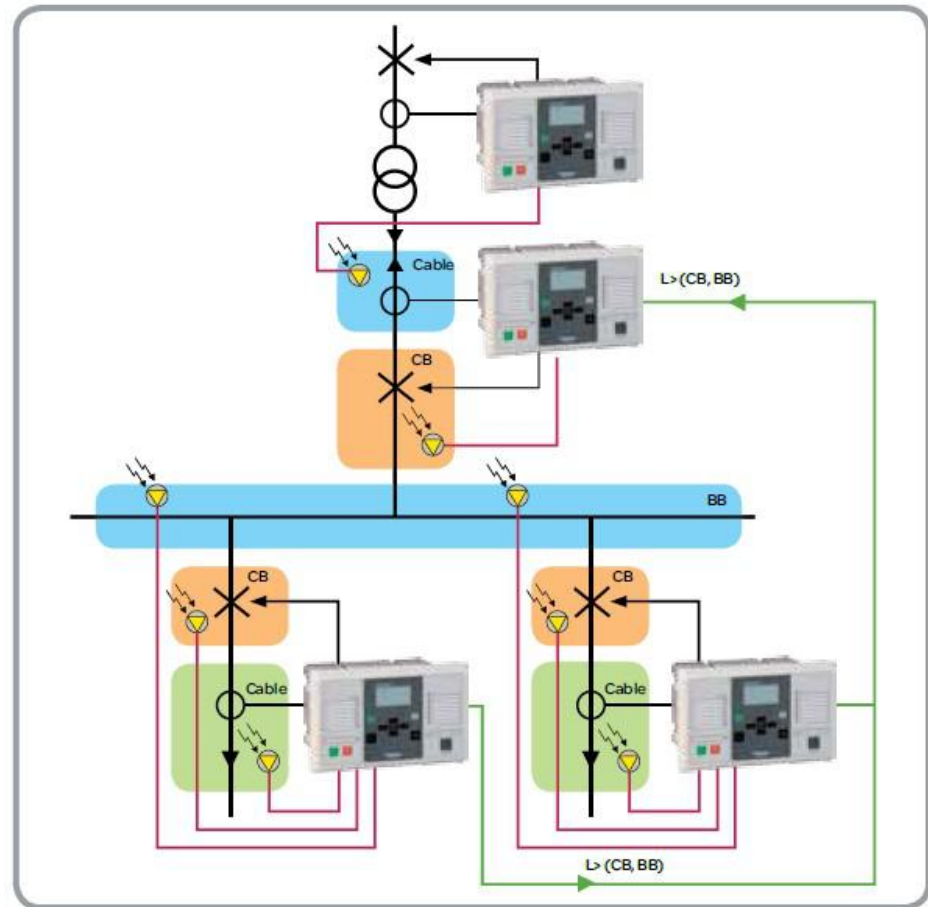
VAMP 300 IED

Functionality

- New password protected and easy to use push buttons for breaker controlling.

- IED customization with alarm channel legend texts

- Each DI is independent, i.e. each channel has its own + and – terminals

- VAMP 300 IED has wide selection of communication protocols, including IEC 61850, Profibus DP, Modbus TCP, Modbus RTU, DNP 3.0, DeviceNet, IEC 60870-5-101, 60870-5-103 and SPA-Bus.

Power LED and seven programmable LEDs
CANCEL push-button
LCD
INFO push-button
Error LED and seven dual color programmable LEDs
Vamp 300
Object control buttons
Navigation push-buttons
Local port
Function push-buttons and LEDs showing their status
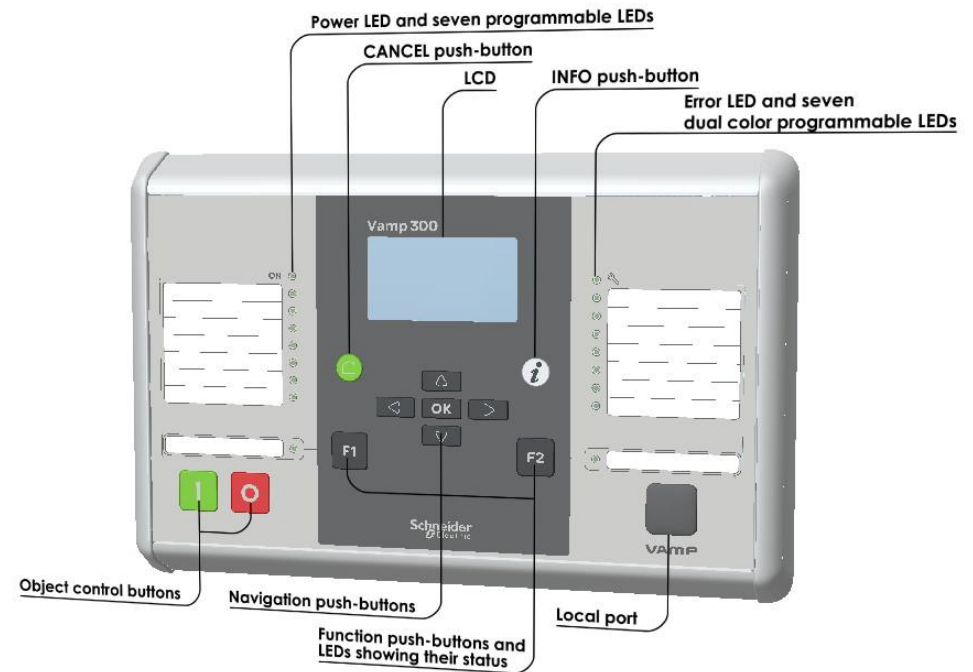
VAMP 300 – a modular IED for utilities and industry

- **Basic description**
  - Modular IED for feeder (F) and motor (M) protection and control

- **Main characteristic and option list**
  - VAMP 300 F has all necessary feeder protection for industrial and utility applications for power distribution networks. Synchrochec and auto-reclosing extend automatic network control
  - VAMP 300 M is designed for small and medium sized motors up-to 10 MW. External RTD module increases motor status information
  - Both models have optional interface for connection of 2, 4 or 6 **arc flash point sensors** or 1 **fibre loop** and 4 arc flash point sensors
  - Power quality measurements and disturbance recorder enable capture of quick network phenomena
  - Extensive range of communication protocols from IEC61850, Profibus DP to Modbus TCP

- **Key customer benefits**
  - Selectable amount of DI / DO output combinations up to i.e. 40DI or 22DO
  - Integrated arc flash protection interface
  - Bay mimic and control
  - Flexible and simple to use solution
  - User friendly multilingual HMI
  - Free of cost VAMPSET configuration and setting tool with USB connection
  - Text pocket for customized alarm legend

● Overall differentiation factor

- ● Modern casing with commonly used case dimension enable simple retrofit to many applications
- ● Arc protection sensor (point and fiber) interfaces
- ● Extensive amount of various communication protocols

● Competitive advantages & top 3 technical benchmark

Technical benchmark	VAMP 300 F and 300 M
Operator Interface	64*128 bit LCD with mimic diagram Free-of-charge VAMPSET setting tool Possibility for password secured control
Specific applications	Arc protection, Can support also arc protection scheme made by central units, supports up-grading of existing arc flash protection systems RTD interfaces with external module
Protection	Supports all commonly used protection functions for LV and MV feeders and motors
Communication	IEC 61850, tested against Pacis by SE's system integration test laboratory in India, Kema certificate for IEC 61850 Ed.1 IEC 60870-5-101/-103; Profibus, ModbusTCP, Modbus RTU, DNP3. DeviceNet,

VAMP 300 IED

HW functionality comparison between V200 and V300

Function	V200	V300	Comment
Arc flash zones	1	8	
Number of arc point sensor channels	2	2, 4, or 6	
Number of arc sensor loop channels	-	1	
Operation time of arc flash protection	14 ms	2 ms	
Display	128x64 LCD matrix	128x64 LCD matrix	
Display optionally	-	128x128 LCD matrix	Order option "B", sell date June, 2014
Object (CB) control	Use of matrix display and key buttons	Dedicated control buttons for one object and matrix display & key buttons for the rest	
Function keys	-	2 freely programmable with user legend text pocket	
Alarm display	5 programmable LEDs	14 programmable multi-colour LEDs with legend text pocket	V200 requires VAM 16D alarm panel

VAMP 300 IED

HW functionality comparison between V200 and V300

Function	V200	V300	Comment
Analogue signal channels	5 x I 3 x U	5 x I 4 x U	V300 enable better flexibility for VT connections
DI	6, 18, 20, 22 or 30	0 ... 40	By order option, this number of DI / DO not at a same time
DO	7, 9, 13, 19	5 ... 22	
Setting tool interface	RS-232	USB	
IP degree	IP30	IP54	V200 optionally to IP54

VAMP 300 IED

Virtual measurement and fault data injection

- Possibility to create virtual current and voltage injection with harmonics and phase shift
- Possible to do disturbance recorder playback

VAMP 300 IED

Fault data and event recording

- Stored in non-volatile memory
- Capacitor back-up for 7 days
- No maintenance required as for solutions with battery back-up

- Disturbance recorder
- Waveform or average mode possible
- 32 samples/cycle max sampling rate
- Upload to VAMPSET DR analyzing tool
- Output in standard COMTRADE format
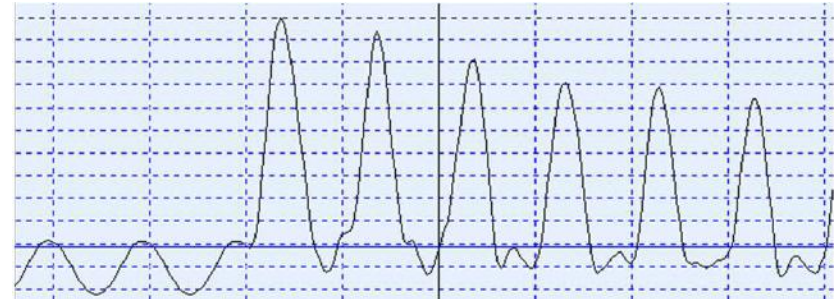
Inrush current captured in waveform mode (32, 16 or 8 samples/cycle)
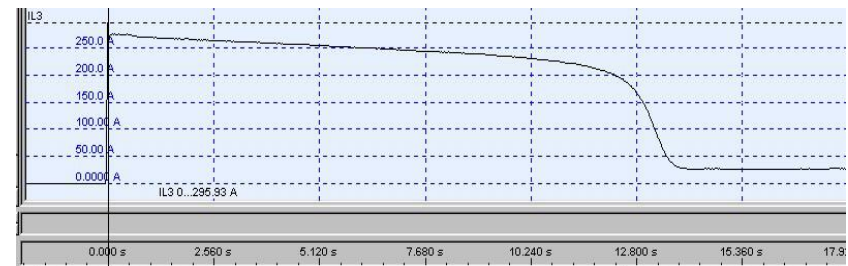
Start current of an induction motor captured in trend mode (e.g. 10 ms, 20 ms, 200 ms)

VAMP 300 IED

Programmable mimic display and logic

- User configurable real time mimic with freely selectable measurements
- Pop-up screen for events, reclosing and synchro-check information
- Internal logic for up to 31 gates and 20 output nodes
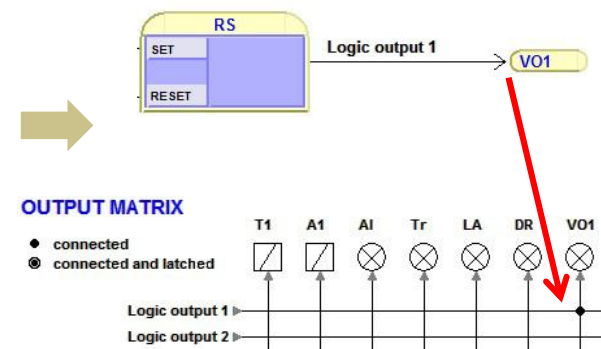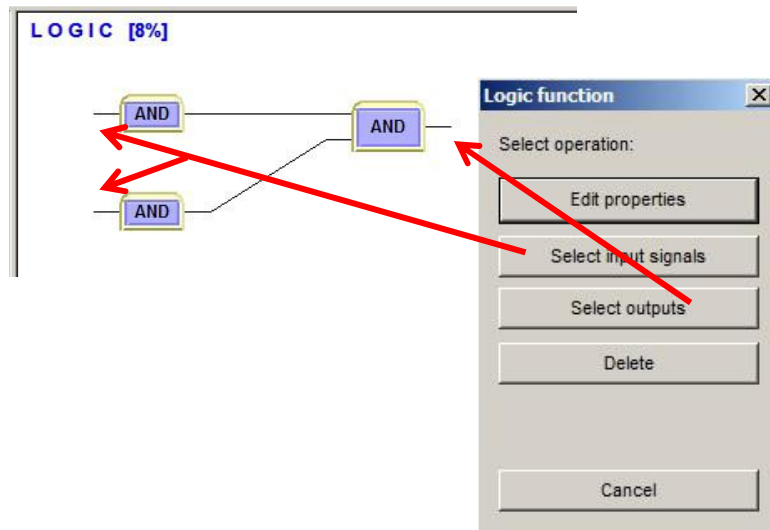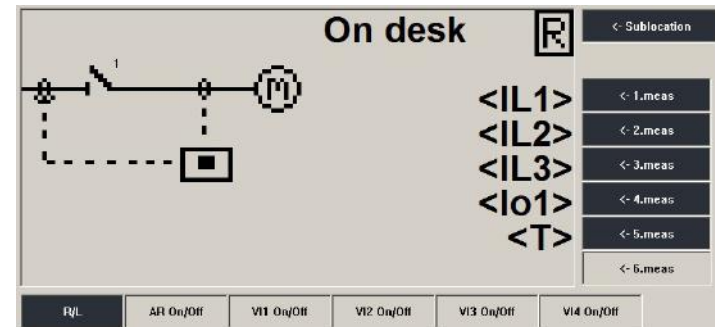
VAMP 300 IED

Technical data

Applications:	-Feeder protection -Motor protection
3 x I (In = 1/5A), measuring range	$0.05...50$ x I_N (45 – 65 Hz)
1...4 x U (U_N = 100 V), measuring range	$0.5...160$ V (45 – 65 Hz)
I_0 (I_N = 5 / 1 / 0,2A)	$0.003...10$ x I_N (45 – 65 Hz)
U_{AUX}	110 (-20%) - 240 (+10%) V ac/dc 24 - 48 ±20% V dc
0...40 x DI	1: 24 V_{DC} 2: 110 $V_{DC}/_{AC}$ 3: 220 $V_{DC/AC}$
5...21 x trip contacts (T1-Tx)	Making 250$V_{AC/DC}$
2 alarm contacts (A1 & IRF)	Change-over 250$V_{AC/DC}$
Arc option	-2 point sensors + 3 x BI/BO channels or -1 fibre sensors + 2 x fibre BI/BO - 4 x point sensors

Communication ports	1 x local USB front 0-2 COM port(s) back
Internal communication interfaces	-RS-232 -Ethernet (RJ-45) -Ethernet (LC fiber)
External communication interfaces type VSExxx	-RS-485 -DeviceNet -Serial fiber (GG/PP/GP/PG) -Profibus
Communication protocols	-IEC-101 -IEC-103 -Modbus -Profibus DP -Spabus -Ethernet IP -Modbus TCP -DNP 3.0 -IEC-61850 Ed.1 -DeviceNet

VAMP 300 IED

Protection functions

Protection	A = 3L + U + Io (5/1A)		B = 3L+4U+Io (5/1A) C = 3L+4U+2Io (5+1A) D = 3L+4U+2Io (1+0.2A)	
	Feeder	Motor	Feeder	Motor
Arc protection (option)				✓
Phase overcurrent (50/51)	✓	✓	✓	✓
Directional phase overcurrent (67)			✓	✓
Cold load pick-up	✓	✓	✓	✓
Thermal overload (49)	✓	✓	✓	✓
Earth fault (50N/51N)	✓	✓	✓	✓
Directional earth fault (67N)	✓	✓	✓	✓
Intermittent earth fault (67N-IEF)	✓		✓	
Undervoltage (27)	S	S	✓	✓
Overvoltage (59)	S	S	✓	✓
Neutral voltage (59N)	✓	✓	✓	✓
Phase undercurrent (37)		✓		✓
Unbalance (46)	✓	✓	✓	✓
Phase sequence (47)		✓		✓
Directional power (32)			✓	✓
E cessive starts (48)		✓		✓
Successive starts (66)		✓		✓
Magnetising inrush (68F2)	✓		✓	✓
Frequency (81H/81L)			✓	✓
Synchrocheck (25)			✓	
Rate of change of frequency (81R)			✓	✓
Recloser (79)	✓		✓	
Breaker failure (50BF)	✓	✓	✓	✓
Programmable stage 1-8 (99)	✓	✓	✓	✓

S = single phase

VAMP 300 IED

Arc protection option

B = 3BIO+2Arc (3 x BI/BO, 2 x Arc sensor, T2, T3, T4)

Card location: Slot 2

Pin No.	Symbol	Description
20	T4	Trip relay 4 for arc protection
19	T4	Trip relay 4 for arc protection
18	T3	Trip relay 3 for arc protection
17	T3	Trip relay 3 for arc protection
16	T2	Trip relay 2 for arc protection
15	T2	Trip relay 2 for arc protection
14	BI3	Binary input 3
13	BI3	Binary input 3
12	BI2	Binary input 2
11	BI2	Binary input 2
10	BI1	Binary input 1
9	BI1	Binary input 1
8	BO COMMON	Binary output 1...3 common GND
7	BO3	Binary output 3, +30 V dc
6	BO2	Binary output 2, +30 V dc
5	BO1	Binary output 1, +30 V dc
4	Sen 2 -	Arc sensor channel 2 negative terminal
3	Sen 2 +	Arc sensor channel 2 positive terminal
2	Sen 1 -	Arc sensor channel 1 negative terminal
1	Sen 1 +	Arc sensor channel 1 positive terminal

VYX459D

Trip outputs controlled by arc matrix

Binary inputs (BI) and binary outputs (BO) for high speed transfer of current and light information between different Vamp devices over copper cabling

Connection for arc point sensors type VA1DA-x or VA1EH-x

VAMP 300 IED

Arc protection option

C = F2BIO+1Arc (Fibre 2 x BI/BO, 1 x Arc loop sensor, T2, T3, T4)

Card location: Slot 2

Connector / Pin No.	Symbol	Description
1:6	T4	Trip relay 4 for arc protection (normal open)
1:5	T4	Trip relay 4 for arc protection (normal open)
1:4	T3	Trip relay 3 for arc protection (normal open)
1:3	T3	Trip relay 3 for arc protection (normal open)
1:2	T2	Trip relay 2 for arc protection (normal open)
1:1	T2	Trip relay 2 for arc protection (normal open)
2	BI2	Fibre binary input 2
3	BI1	Fibre binary input 1
4	BO2	Fibre binary output 2
5	BO1	Fibre binary output 1
6	Arc sensor 1	Arc sensor 1 Rx
7	Arc sensor 1	Arc sensor 1 Tx

Trip outputs controlled by arc matrix

Binary inputs (BI) and binary outputs (BO) for high speed transfer of current and light information between different Vamp devices of fibre optic cabling

Connection for fibre arc sensors type ARC-SLm

VAMP 300 IED

Arc protection option

D = 4Arc (4 x Arc sensor)

Card location: Slot 6

VYX463E

Pin No.	Symbol	Description
8	Sen 6 -	Arc sensor 6 negative terminal
7	Sen 6 +	Arc sensor 6 positive terminal
6	Sen 5 -	Arc sensor 5 negative terminal
5	Sen 5 +	Arc sensor 5 positive terminal
4	Sen 4 -	Arc sensor 4 negative terminal
3	Sen 4 +	Arc sensor 4 positive terminal
2	Sen 3 -	Arc sensor 3 negative terminal
1	Sen 3 +	Arc sensor 3 positive terminal

Connection for arc point sensors type VA1DA-x or VA1EH-x

VAMP 300 IED

HW options

F = Feeder
M = Motor
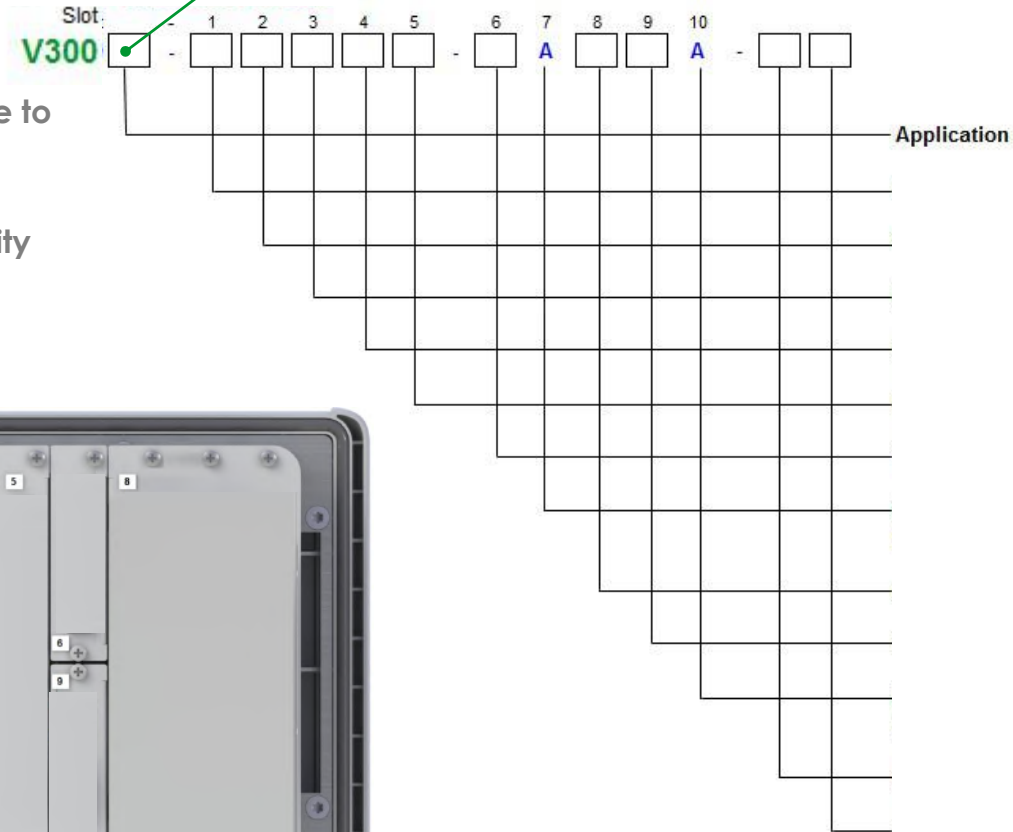
Factory pre-sets the firmware to a desired mode

Protection function availability follows this selection
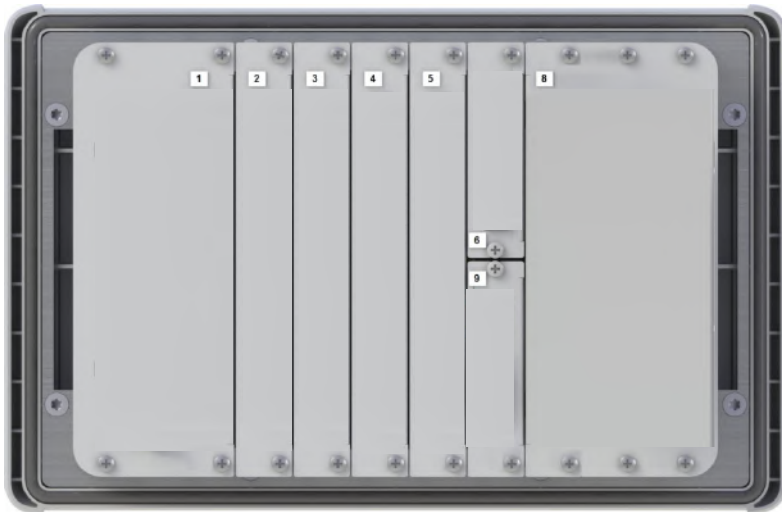
VAMP 300 IED

HW options

C = Power C 110 - 240 (80 ..
265Vac/dc, 5 x DO
heavy duty, A1, SF)

D = Power D 24 - 48 (18 ..
60Vdc, 5 x DO heavy
duty, A1, SF)
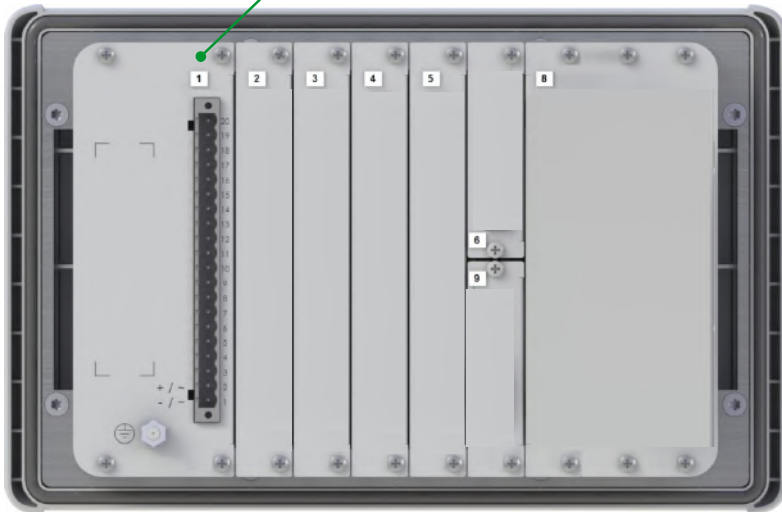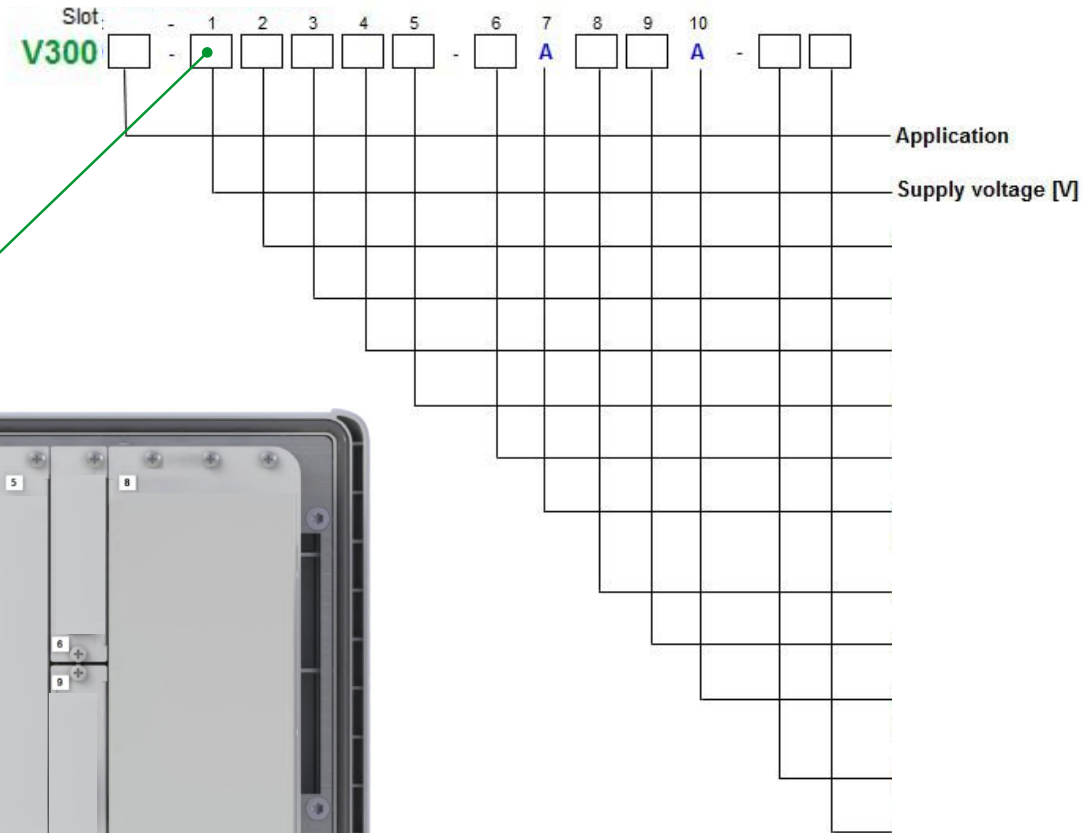
VAMP 300 IED

HW options

- A = None
- B = 3xBI/BO, 2xArc sensor, T2, T3, T4 or
- C = 2xBI/BO Fibre, 1 Arc sensor loop, T2, T3, T4 or
- G = 6 x DI + 4 x DO
- I = 10 x DI
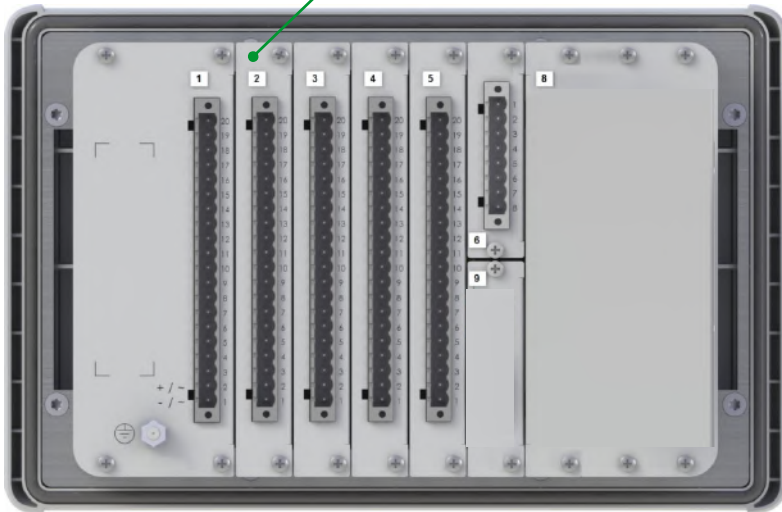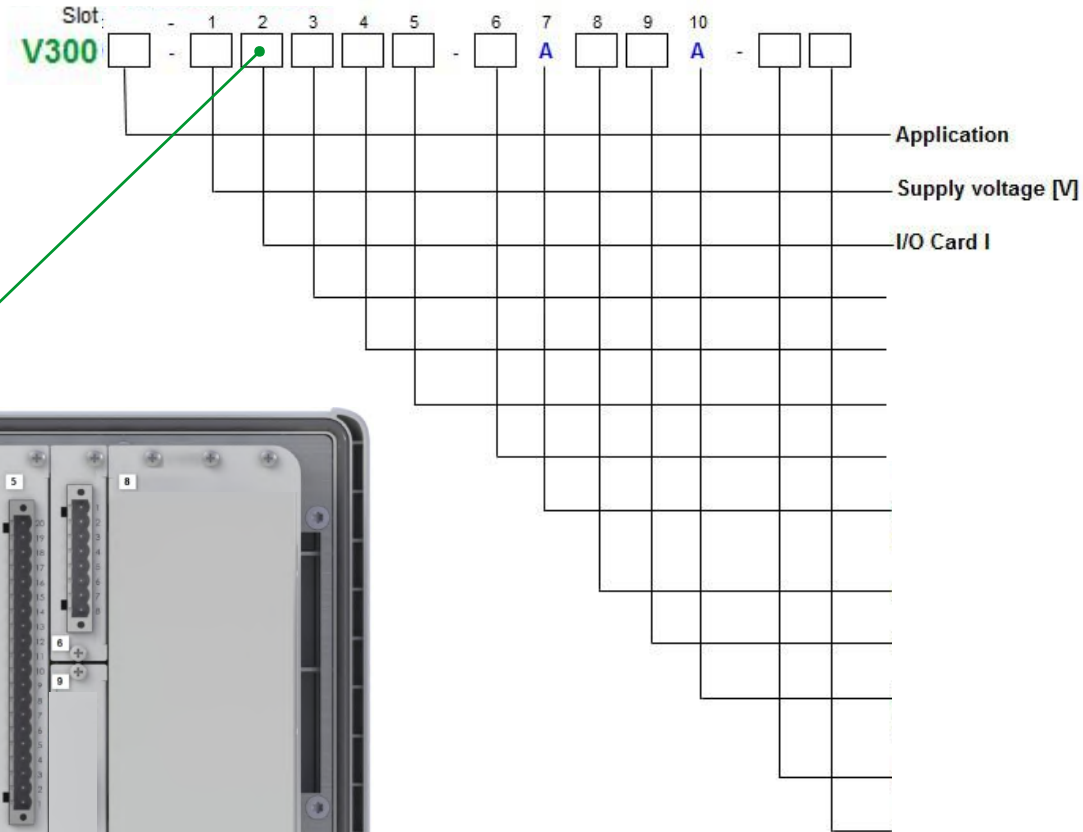
VAMP 300 IED

HW options

- A = None
- G = 6 x DI + 4 x DO
- I = 10 x DI
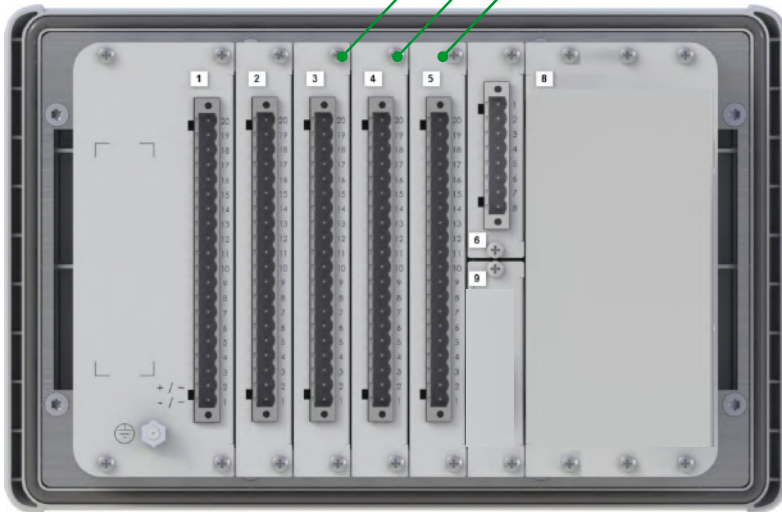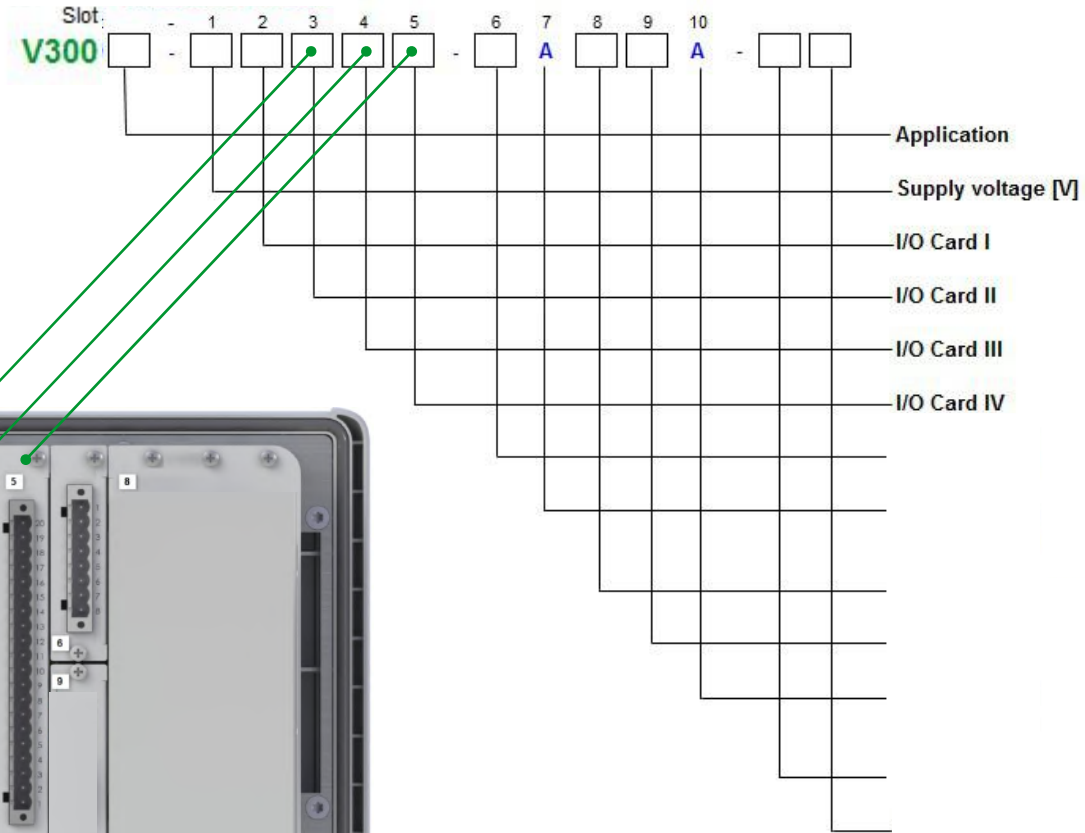
VAMP 300 IED

HW options

- D = 2IGBT (2 x IGBT High Speed Outputs), This card reserves slot 4 also
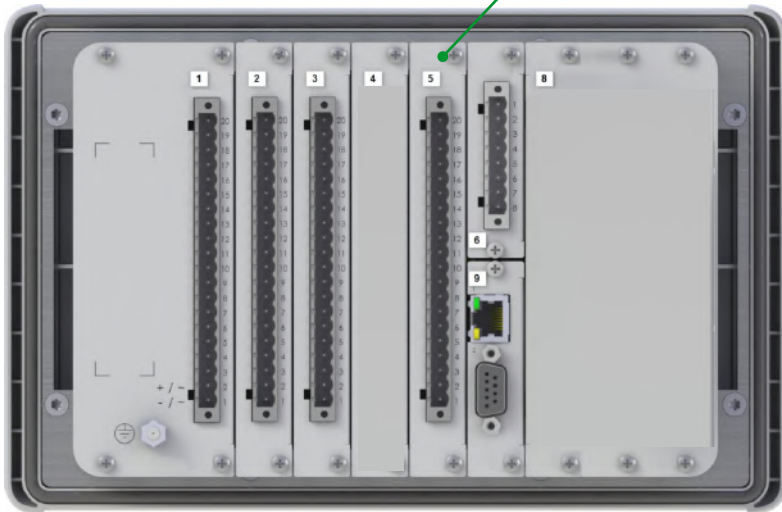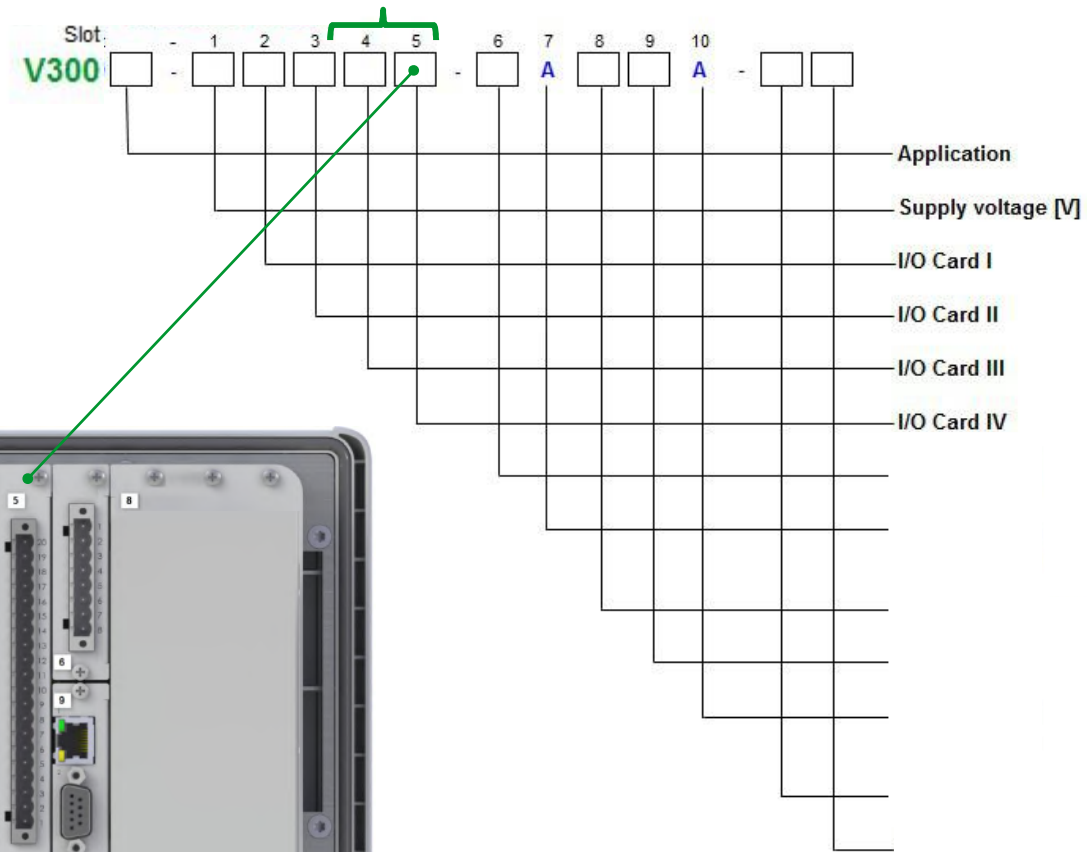
VAMP 300 IED

HW options

• A = None
• D= 4 x Arc sensor

VAMP 300 IED

HW options

Slot: -   1   2   3   4   5   -   6   7   8   9   10   -

V300

- Application
- Supply voltage [V]
- I/O Card I
- I/O Card II
- I/O Card III
- I/O Card IV
- Option card I
- Future option
- **A** = None
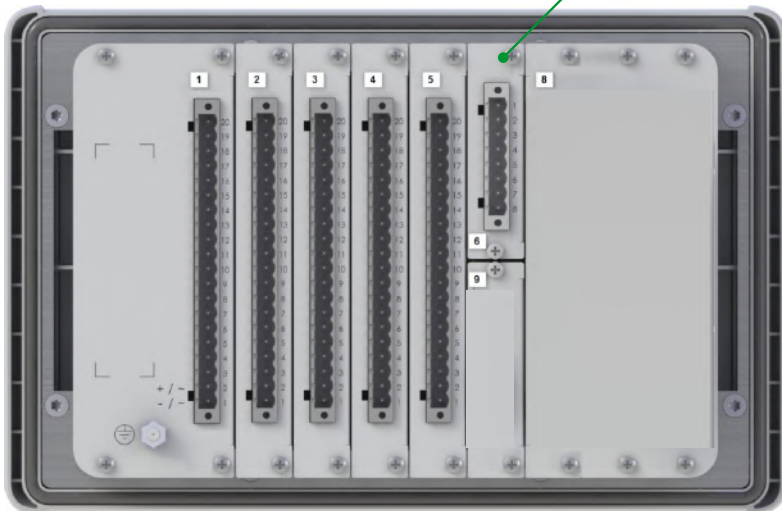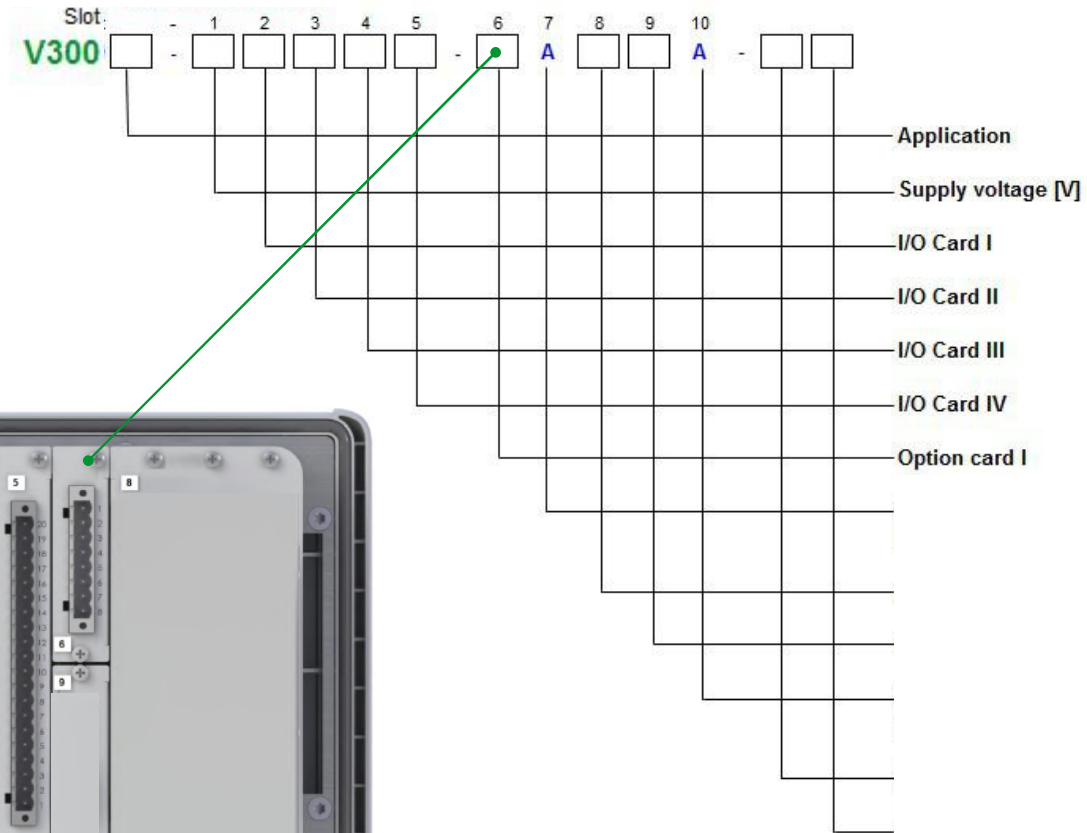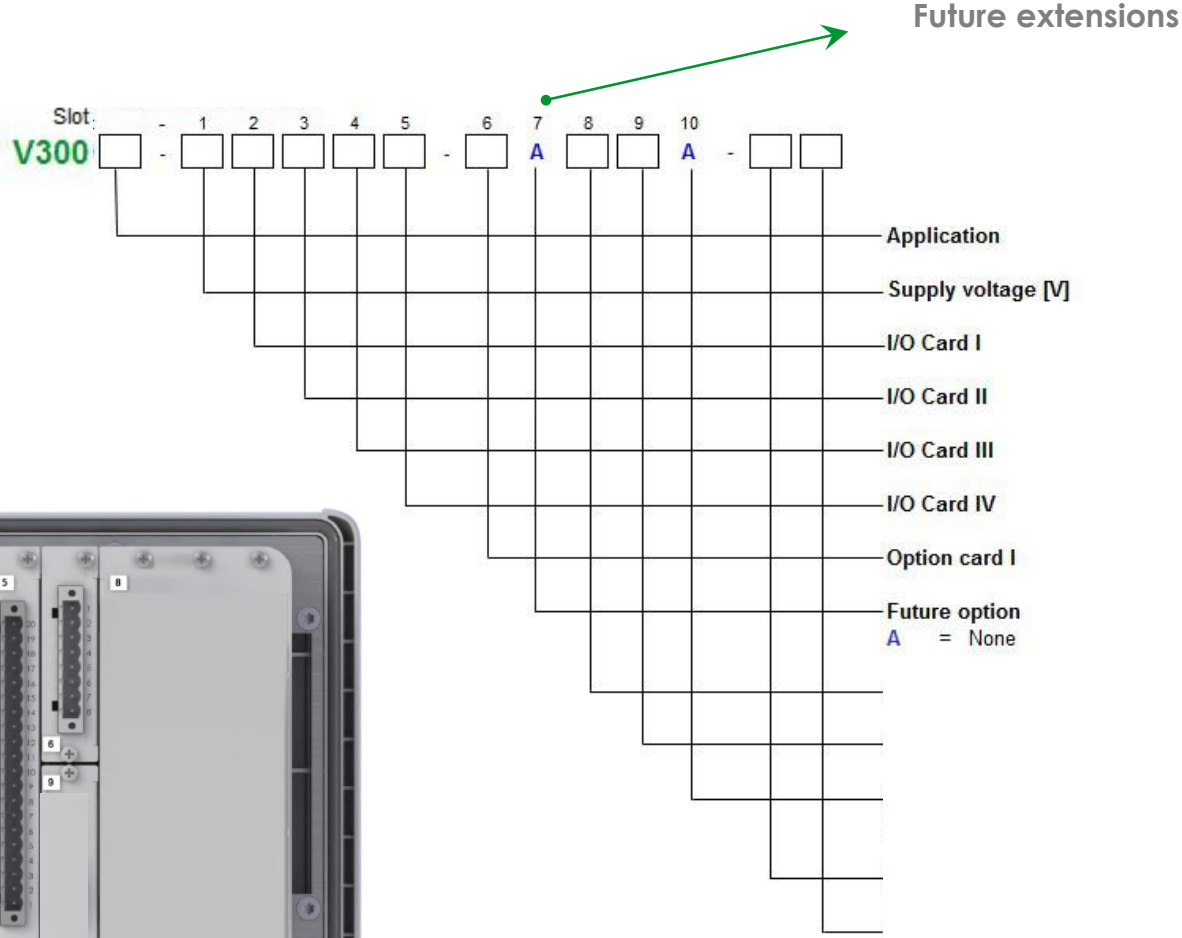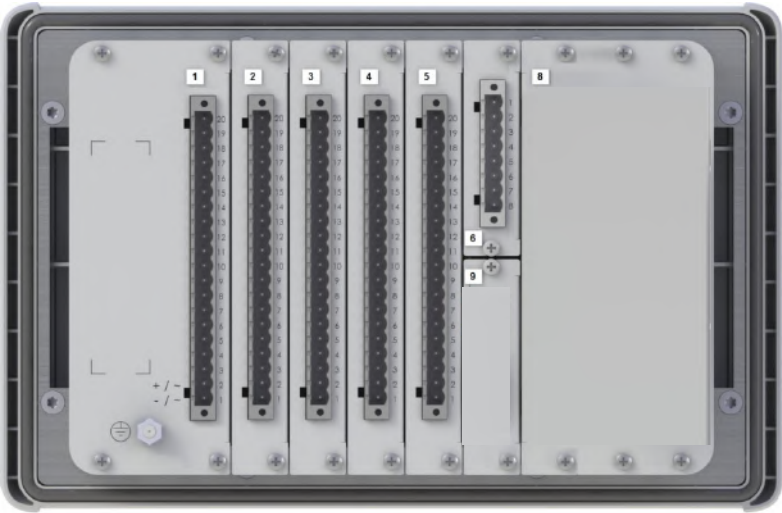
VAMP 300 IED

HW options

- A = 3I + U + Io (5A/1A)
- B = 3I + 4U + Io (5A/1A)
- C = 3I + 4U + 2Io (5A + 1A)
- D = 3I + 4U + 2Io (1A + 0,2A)
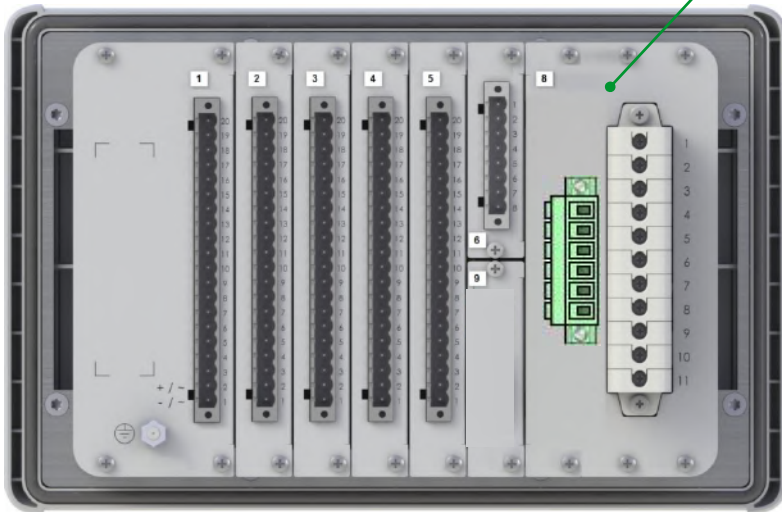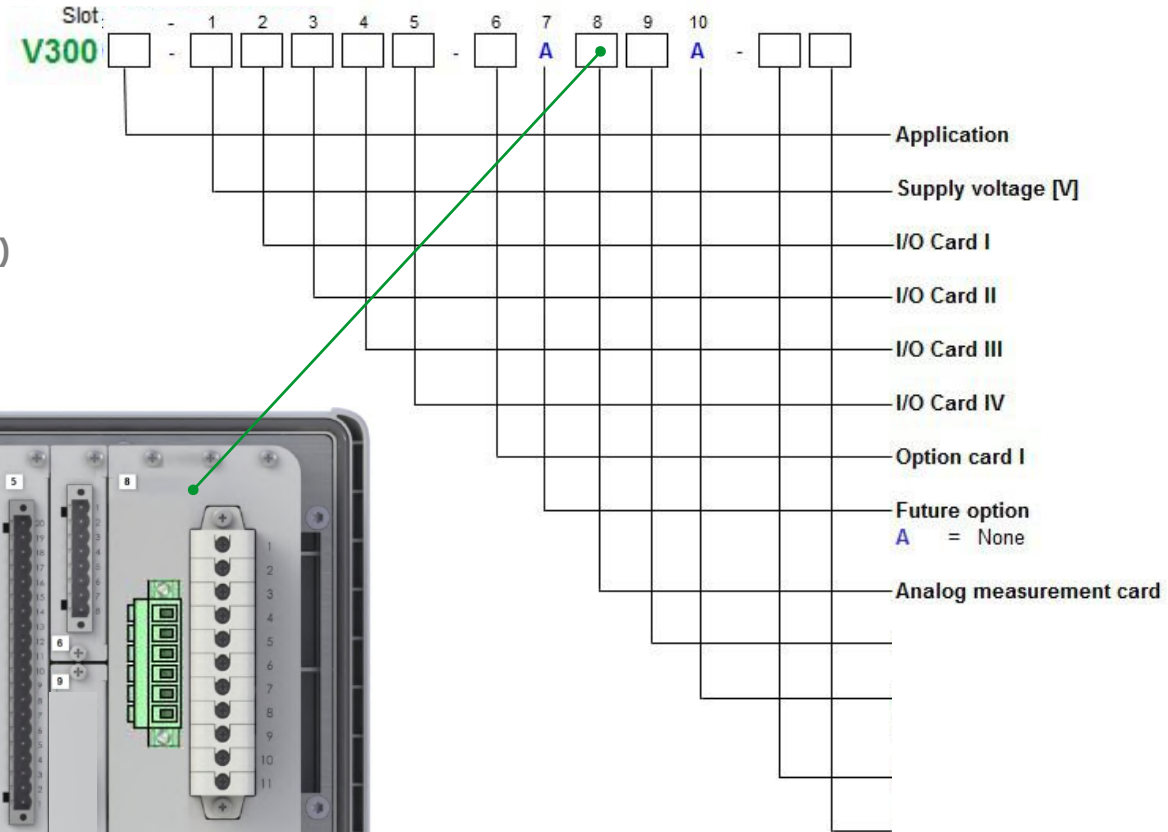
VAMP 300 IED

HW options

- **A = None**
- **B = RS232 interface**
- **C = RS232 + RJ45 100 Mbps**
  Ethernet interface
- **D = RS232 + LC 100 Mbps**
  Ethernet fiber interface

Slot: - 1 2 3 4 5 - 6 7 8 9 10 -
V300 A A -

- Application
- Supply voltage [V]
- I/O Card I
- I/O Card II
- I/O Card III
- I/O Card IV
- Option card I
- Future option
  A = None
- Analog measurement card
- Communication interface I
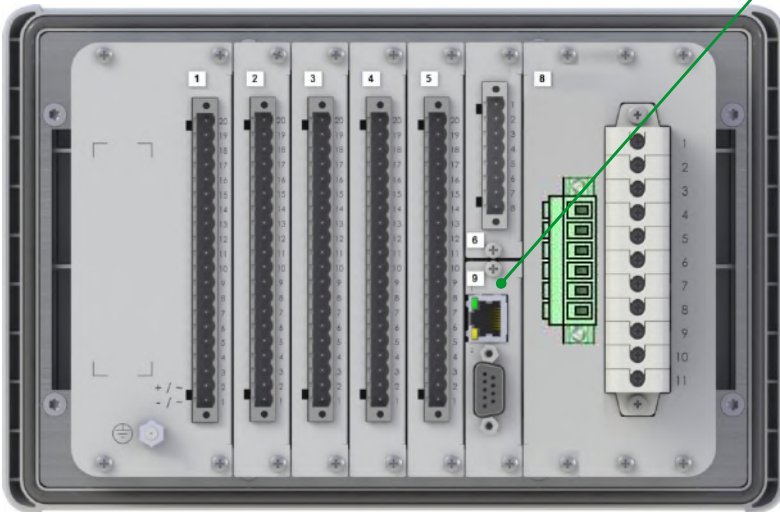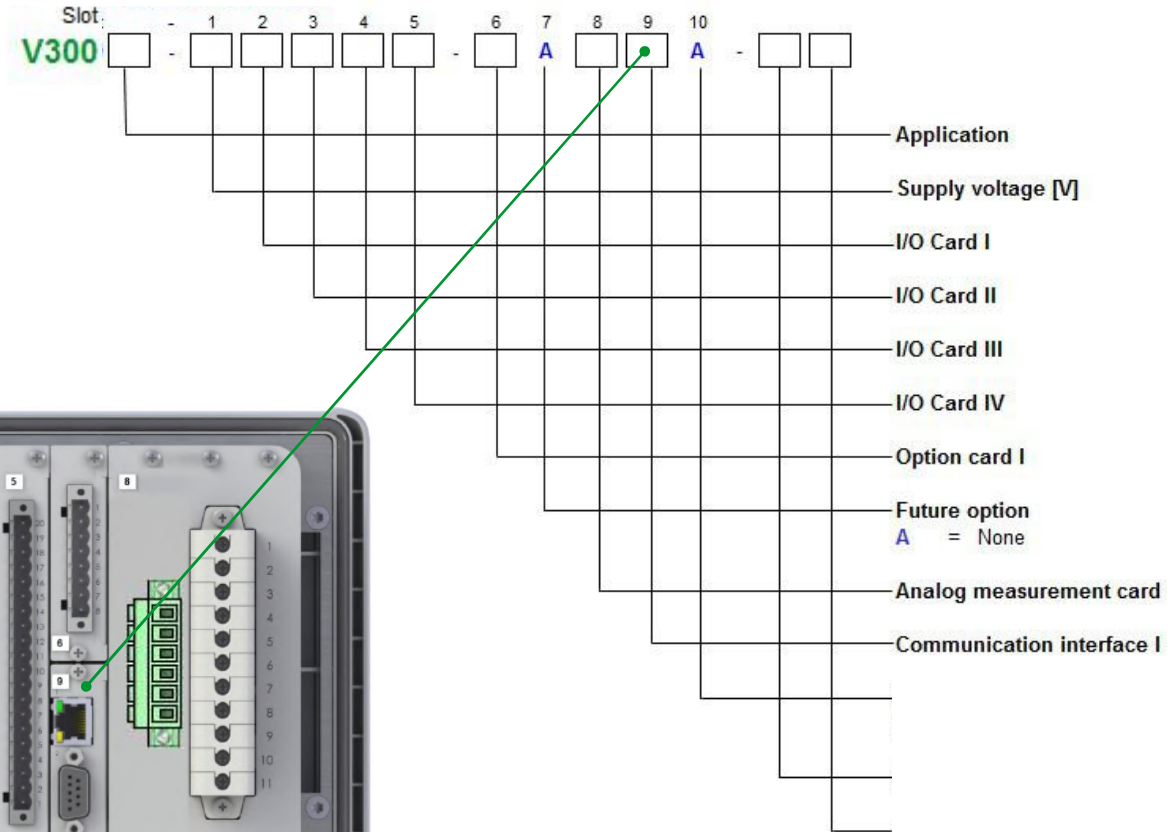
VAMP 300 IED

HW options

• **A = 128 x 64 LCD matrix**
• **B = further use**

Slot: 1 2 3 4 5 6 7 8 9 10

V300

Application
Supply voltage [V]
I/O Card I
I/O Card II
I/O Card III
I/O Card IV
Option card I
Future option
A = None
Analog measurement card
Communication interface I
Future option
A = None
Display type
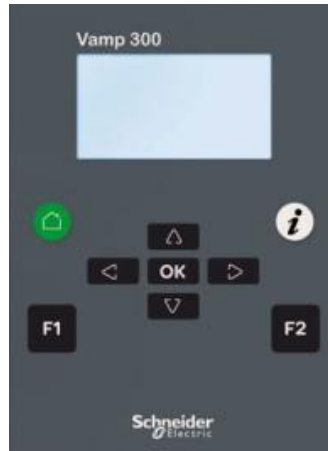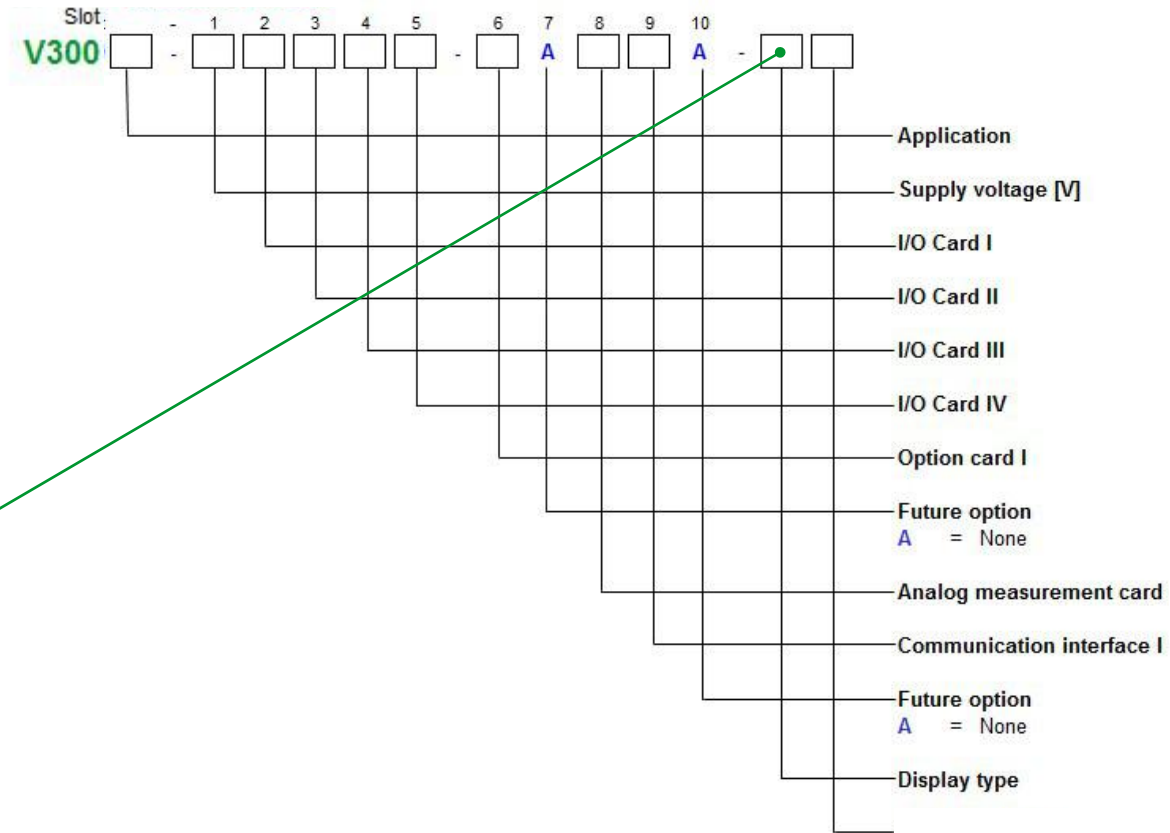
VAMP 300 IED

HW options

Digital input activation voltage level:

- 1 = 24V$_{DC}$
- 2 = 110V$_{DC/AC}$
- 3 = 220V$_{DC/AC}$

Slot: -   1   2   3   4   5   6   7   8   9   10

V300

- Application
- Supply voltage [V]
- I/O Card I
- I/O Card II
- I/O Card III
- I/O Card IV
- Option card I
- Future option
  A = None
- Analog measurement card
- Communication interface I
- Future option
  A = None
- Display type
- DI treshold voltage
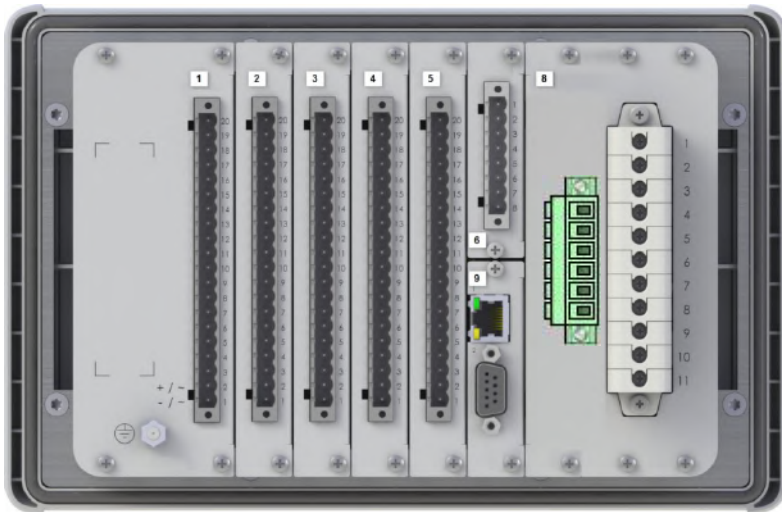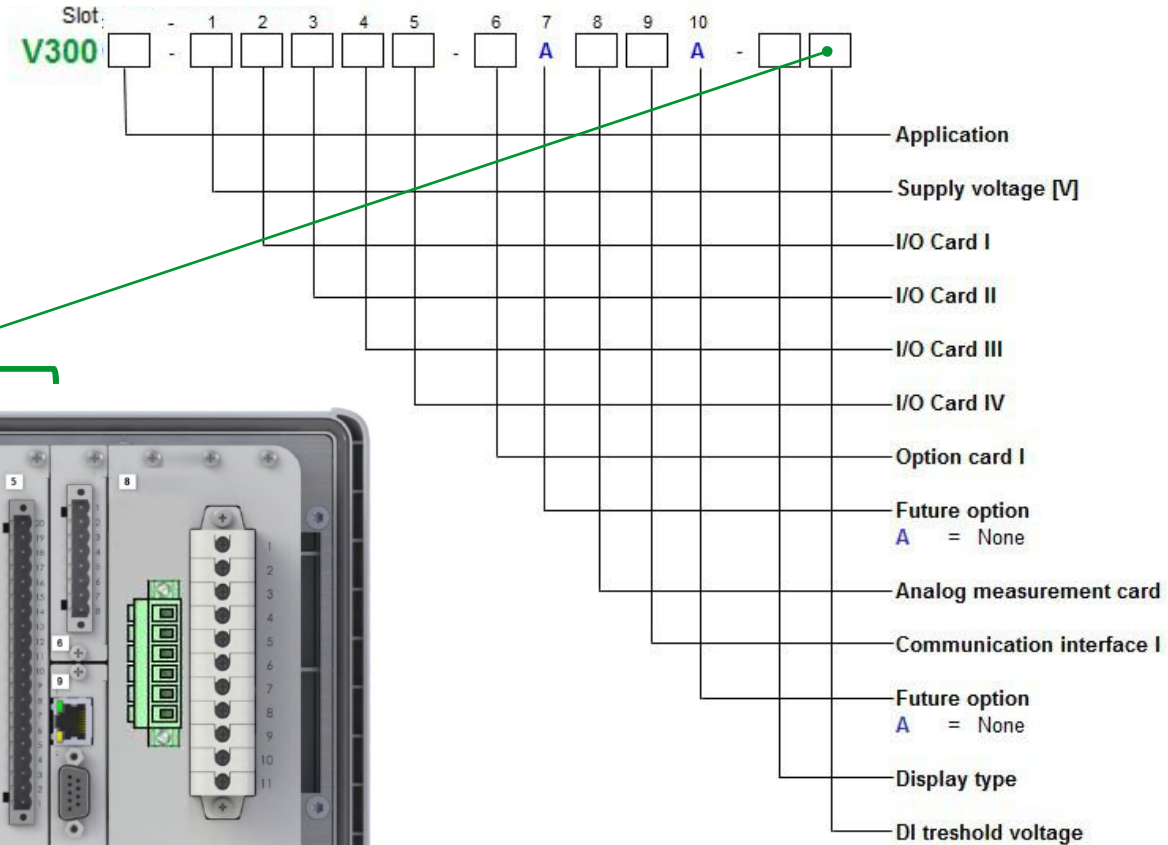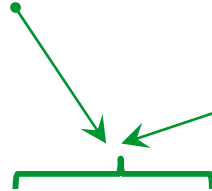
VAMP 300 IED

Hardware available Nov, 2013

Slot V300 [ ] - 1 2 3 4 5 - 6 7 A 8 9 A 10 - [ ] [ ]

Application
- F = Feeder (Slot 8: HW = A, B, C or D) **Vamp 300 feeder IED**
- M = Motor (Slot 8: HW = A, B, C or D) **Vamp 300 motor IED**

Supply voltage [V]
- C = Power C 110 – 240 (80 .. 265Vac/dc, 5 x DO heavy duty, A1, SF)
- D = Power D 24 – 48 (18 .. 60Vdc, 5 x DO heavy duty, A1, SF)

I/O Card I
- A = None
- B = 3BIO+2Arc (3 x BI/BO, 2 x Arc point sensor, T2, T3, T4)
- C = F2BIO+1Arc (Fibre 2 x BI/BO, 1 x Arc loop sensor, T2, T3, T4)
- G = 6DI+4DO (6 x DI, 4 x DO)
- I = 10DI (10 x DI)

I/O Card II
- A = None
- G = 6DI+4DO (6 x DI, 4 x DO)
- I = 10DI (10 x DI)

I/O Card III
- A = None
- G = 6DI+4DO (6 x DI, 4 x DO)
- I = 10DI (10 x DI)

I/O Card IV
- A = None
- D = 2IGBT (2 x IGBT High speed outputs)
- G = 6DI+4DO (6 x DI, 4 x DO)
- I = 10DI (10 x DI)

Option card I
- A = None
- D = 4Arc (4 x Arc sensor)

Future option
- A = None

Analog measurement card (See application)
- A = 3L+U+Io (5/1A)
- B = 3L+4U+Io (5/1A)
- C = 3L+4U+2Io (5+1A)
- D = 3L+4U+2Io (1+0.2A)

Communication interface I
- A = None
- B = RS232
- C = RS232+RJ (RS232 + Ethernet RJ-45 100 Mbs)
- D = RS232+LC (RS232 + Ethernet LC 100 Mbs)

Future option
- A = None

Display type
- A = 128x64 (128 x 64 LCD matrix)

DI nominal voltage
- 1 = 24 VDC / 110 VAC
- 2 = 110 VDC / 220 VAC
- 3 = 220 VDC

VAMP 300 IED

Accessories list

Order Code	Explanation	Note
VX052–3	USB programming cable (Vampset)	Cable length 3m
VX067	VAMP 300/321 split cable for COM1-2 and COM 3-4 ports	Cable length 3m
VSE001PP	Fiber optic module (plastic – plastic)	Max. distance 1km
VSE001GG	Fiber optic module (glass – glass)	Max. distance 1km
VSE001GP	Fiber optic Interface Module (glass – plastic)	Max. distance 1km
VSE001PG	Fiber optic Interface Module (plastic – glass)	Max. distance 1km
VSE002	RS485 module	
VSE009	DeviceNet module	
VPA3CG	Profibus DP fieldbus option board	
VX072	VAMP 300/321 profibus cable	Cable length 3m
VA 1DA–6	Arc Sensor	Cable length 6m
VA 1DA–20	Arc Sensor	Cable length 20m
VA 1DA–6s	Arc Sensor, shielded	Cable length 6m
VA 1DA–20s	Arc Sensor, shielded	Cable length 20m
VA 1EH–6	Arc Sensor (Pipe type)	Cable length 6m
VA 1EH–20	Arc Sensor (Pipe type)	Cable length 20m
ARC SLm–x	Fiber sensor, 8 000 lx	x = fiber lenght (1
VIO 12 AB	RTD input module, 12pcs RTD inputs, RS 485 Communication (24–230 Vac/dc)	
VIO 12 AC	RTD and mA output/input module, 12pcs RTD inputs, PTC, mA inputs/outputs, RS232, RS485 and Optical Tx/Rx Communication (24 Vdc)	
VIO 12 AD	RTD/mA Module, 12pcs RTD inputs, PTC, mA inputs/outputs, RS232, RS485 and Optical Tx/Rx Communication (48–230 Vac/dc)	
VYX695	Projection for 300-serie	Height 45 mm

Note 1. Fibre lengths 1, 5, 10, 15, 20, 25, 30, 35, 40, 50, 60 or 70 m

Schneider VAMP ARC Numerical Protection IED's

➢ **VAMP ARC PROTECTION**

Schneider Electric

VAMP 321 arc flash protection

A central unit for arc flash protection

Technical presentation and features

Schneider Electric

VAMP 321 - features

New central unit for arc flash protection

General
- A new design based on long experience in arc protection systems since 1994
- Developed in cooperation with customers user friendliness in mind
- Based on the proven VAMP 221 arc protection system and technology from the VAMP 200 series IEDs
- Modular design enable long service life forward and backward
- Optimized to mid and high-end arc protection systems
- Relies the same VAM I/O units as VAMP 221 system.

VAMP 321 - features

New central unit for arc flash protection

General

- Supports existing VAM I/O units, cabling and sensors used for VAMP 221
- Retrofit possible
- Two* arc sensors interfaces for the central unit for
    - Sensors connected in the central unit enables incoming cable termination (light only) compartment protection

*) Optionally
    Ten (10) point sensors
    One (1) fibre loop and eight (8) point sensors
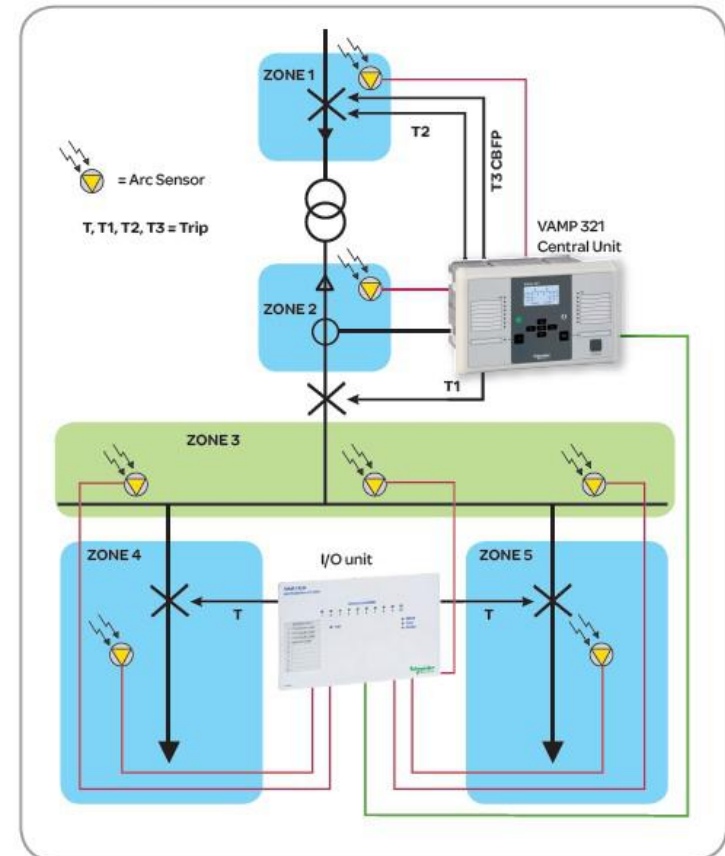
VAMP 321 - features

Features

HMI

- 128x64 or 128x128 (* LCD display

- 16 programmable two-colour , red and green led alarms with user configurable legend texts

- Two programmable function keys with a password control possibility

- USB interface for PC setup

- Keypad

*) This option will be released at later stage

VAMP 321 - features

Features

LCD dot matrix display for

- Single line mimic
- Arc flash protection event-buffering
- Measurements I, U, THD, phasors, etc.
- System status view
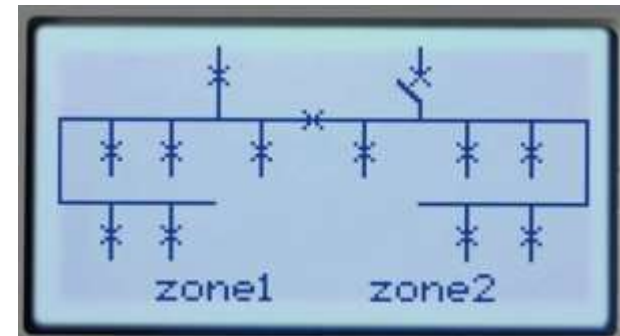
VAMP 321 - features

Features

Function keys
- Used for operator control commands for the system such as
  - Object control
  - Stage blocking
  - System reset
  - System installation

- Function keys have a password control

- Text pocket for customized text
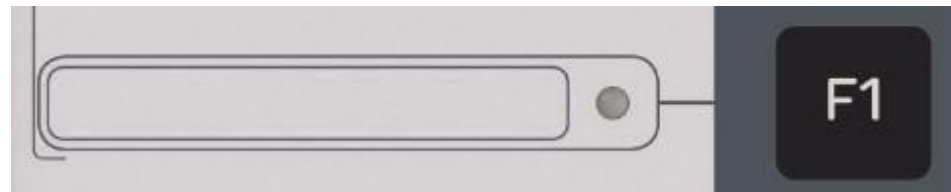
VAMP 321 - features

Features

Programmable two-colour led alarms
- User configurable channel texts slide in the text pocket
- Allow indication of arc system status, channel, zone, latch, object status, etc.
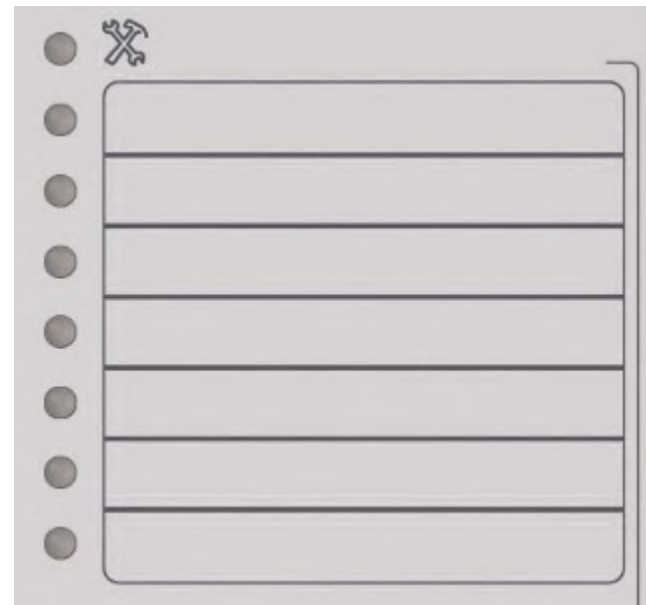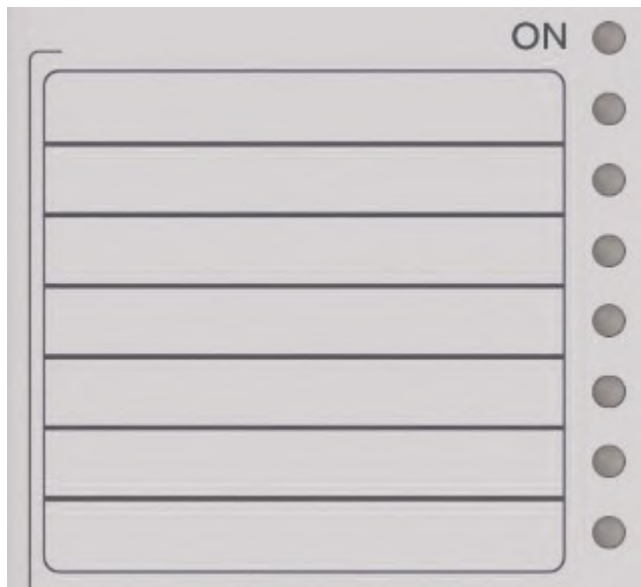
VAMP 321 - features

Protection stages

- I> & L>   current and light
- Io> & L>   residual current & light
- L>   light only
- Programmable stages, 8 pcs
    - To each stage linked signals could be

Programmable stages

IL1, IL2, IL3	Phase currents
Io	Residual current input Io
U12, U23, U31	Line-to-line voltages
UL1, UL2, UL3	Phase-to-ground voltages
Uo	Zero-sequence voltage
F	Frequency
IoCalc	Phasor sum $I_{L1} + I_{L2} + I_{L3}$
I1	Positive sequence current
I2	Negative sequence current
I2/I1	Relative negative sequence current
I2/In	Negative sequence current in pu
U1	Positive sequence voltage
U2	Negative sequence voltage
U2/U1	Relative negative sequence voltage
IL	Average ($I_{L1} + I_{L2} + I_{L3}$)/3
Uphase	Average of UL1, UL2, UL3
Uline	Average of U12, U23, U32
THDIL1	Total harmonic distortion of I_{L1}
THDIL2	Total harmonic distortion of I_{L2}
THDIL3	Total harmonic distortion of I_{L3}
THDUa	Total harmonic distortion of input U_a
IL1rms	IL1 RMS for average sampling
IL2rms	IL2 RMS for average sampling
IL3rms	IL3 RMS for average sampling
ILmin	Minimum of IL1, IL2, IL3
ILmax	Maximum of IL1, IL2, IL3
ULLmin	Maximum of U12, U23, U32
ULLmax	Average of U12, U23, U32
ULNmin	Minimum of UL1, UL2, UL3
ULNmax	Maximum of UL1, UL2, UL3
Ucomm	Common mode voltage of Uo input
Io1rms	RMS current of input Io

VAMP 321 - features

High speed binary inputs / outputs, BI/BO

Conventional inputs and outputs with Basic I/O option

- BI   3 pc's, rated voltage +18 .. 265 V dc, rated burden 5 mA

- BO   3 pc's, rated voltage + 30 V dc, maximum load 20 mA

- Used e.g. for transfer and receipt of light (L>) and current (I>) over copper wiring

Fibre inputs and outputs with Fibre I/O option

- BI   2 pc's, Single mode fibre, max link 2 km

- BO   2 pc's, Single mode fibre, max link 2 km

- Used e.g. for transfer and receipt of light (L>) and current (I>) over fibre

VAMP 321 - features

Configuration and commissioning using VAMPSET

VAMPSET for system configuration
- Similar look and feel as with other VAMP relays
- Arc specific settings menus

Settings		
I>int. pick-up setting	600	A
I>int. pick-up setting	1.20	xIn
Io>int. pick-up setting	60	A
Io>int. pick-up setting	1.20	xIn
Communication mode	Master	
Install arc sensors & I/O units	-	
Installation state	Ready	
Release latches	-	
Clear I/O units' registers	-	
Forward I>int. to I>ext.	☐	
Forward Io>int. to I>ext.	☐	

Arc Stages			
Stage	Stage Enabled	Trip delay [ms]	State
1	On	0	0
2	On	0	0
3	On	0	0
4	Off	0	0
5	Off	0	0
6	Off	0	0
7	Off	0	0
8	Off	0	0

VAMP 321 - features

VAMPSET

Schneider Electric

Configuration and commissioning using VAMPSET

Arc flash protection status and information
- Arc protection specific informative menus
- Can be used to help commissioning and testing

Current measurement states

Measurement	State
I>int.	0
Io>int.	0
I>ext.	0

Zones

Zone	State
1	0
2	0
3	0
4	0

Installed arc sensors

Sensor	Arc sensor status

Installed I/O units

I/O unit Address	Zone / I>ext.	Connected sensors	Activated sensors	Sensor error	Clear registers
0	Zone 1	(10)1,2,3,4,5,6,7,8,9,10	-	-	-

VAMP 321 - features

Configuration and commissioning using VAMPSET

VAMPSET

Schneider Electric

ARC PROTECTION

Settings

I>int. pick-up setting	600	A
I>int. pick-up setting	1.20	xIn
Io>int. pick-up setting	60	A
Io>int. pick-up setting	1.20	xIn
Communication mode	Master	
Install arc sensors & I/O units	-	
Installation state	Ready	
Release latches	-	
Clear I/O units' registers	-	
Forward I>int. to I>ext.		
Forward Io>int. to I>ext.		

Arc Stages

Stage	Stage Enabled	Trip delay [ms]	State
1	On	0	0
2	On	0	0
3	On	0	0
4	Off	0	0
5	Off	0	0
6	Off	0	0
7	Off	0	0
8	Off	0	0

Install of the system

Send internal current (I> or Io>) to external units (VAM 4C)

Eight (8) independent arc protection stages, which can be configured to be L> or L>&I>

Current settings for internal measurements

Selection for master unit in multi-central unit systems

Release all latched stages

Clear I/O unit's registers

Independent adjustable time delay for all stages. Useful in delayed arc applications

VAMP 321 - features

VAMPSET

Schneider Electric

Configuration and commissioning using VAMPSET

Arc current matrix setting view

- Specify the source of current for arc stages

Stage selection
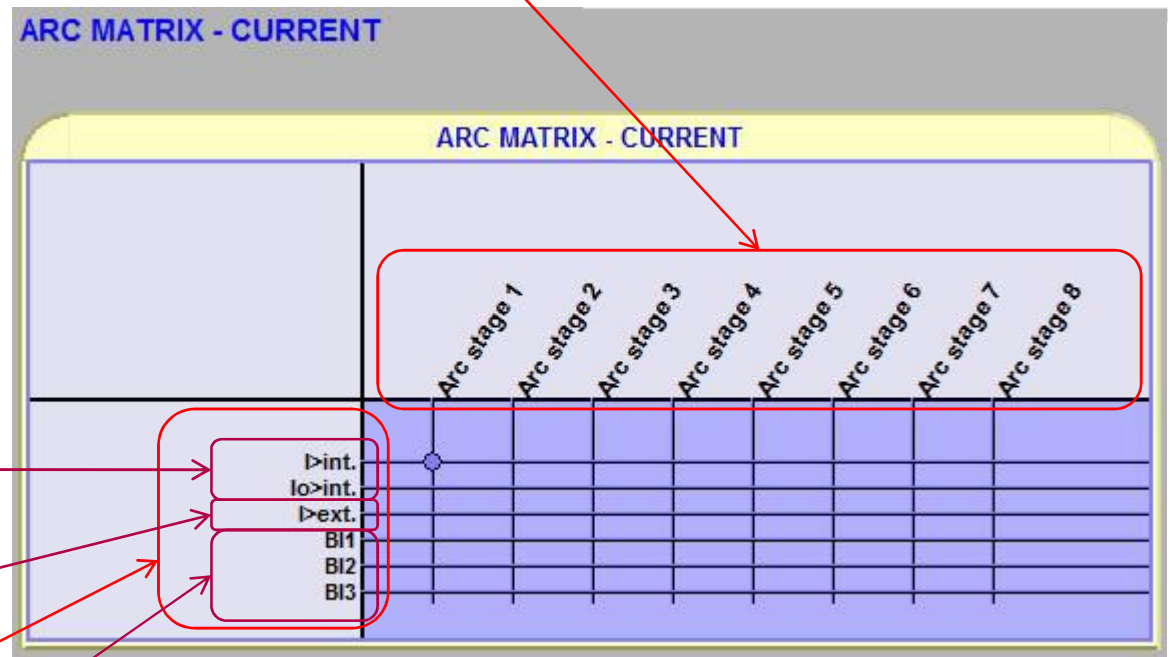
Internal current (Phase currents or neutral current)

External current (I/O units or other central units)

Current source selection

High-speed binary inputs

ARC MATRIX - CURRENT

Arc stage 1, Arc stage 2, Arc stage 3, Arc stage 4, Arc stage 5, Arc stage 6, Arc stage 7, Arc stage 8

I>int.
Io>int.
I>ext.
BI1
BI2
BI3

VAMP 321 - features

Configuration and commissioning using VAMPSET

VAMPSET

Schneider Electric

Arc output setting view
- Link the arc stages to outputs

Output to internal high-speed binary outputs

Output to internal output relays

Output to high speed trip outputs

ARC MATRIX - OUTPUT

ARC MATRIX - OUTPUT

T1 T2 T3 T4 A1 BO1 BO2 BO3 Zone 1 Zone 2 Zone 3 Zone 4 Pext. HSO1 HSO2

Latch for stage output

Latched
Arc stage 1
Arc stage 2
Arc stage 3
Arc stage 4
Arc stage 5
Arc stage 6
Arc stage 7
Arc stage 8

Stage outputs
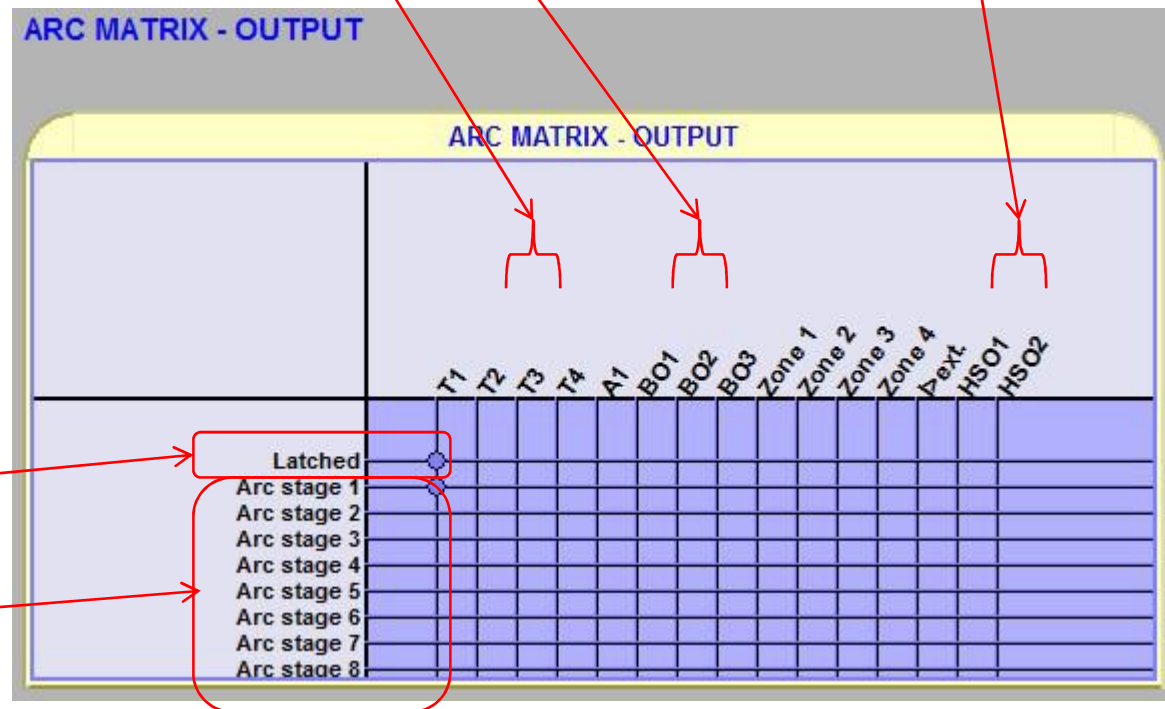
VAMP 321 - features

Correlation between matrix views

Note ! If no light or current source has been selected, stage operates as "light only" L> or "current only" I> principle
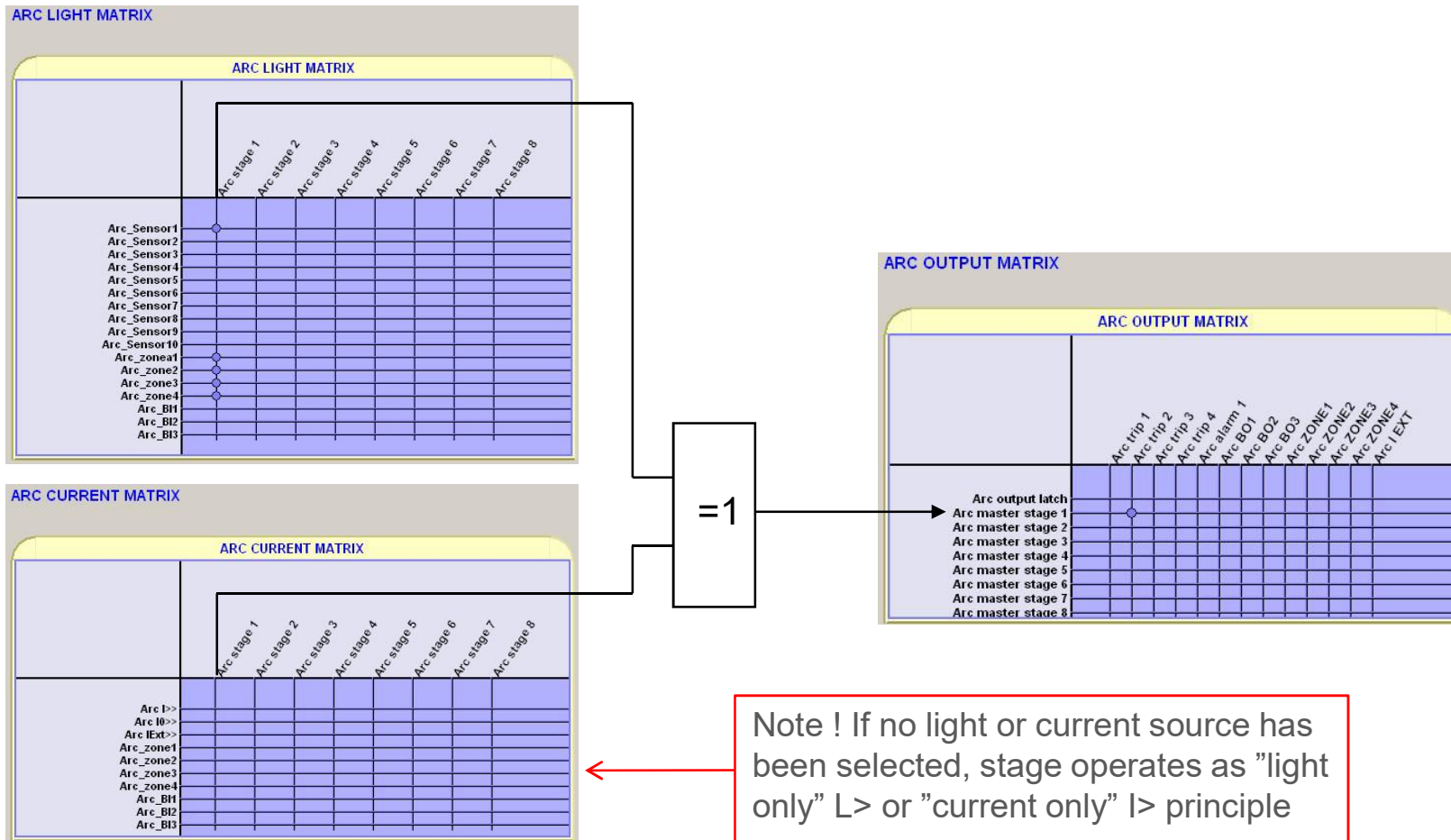
VAMP 321 - features

Features

Programmable stages for further performance

- Detection of harmonics in the power distribution
  - Used for alarming and triggering disturbance recorder
  - Pre-conditional cable termination fault detection

VAMP 321 - features

Disturbance recorder

- Gives additional data to the fault evaluation
- Triggering from arc protection signals, BI, DI, logic, programmable stage, etc.
- Enable predictive fault clearance together with programmable stage
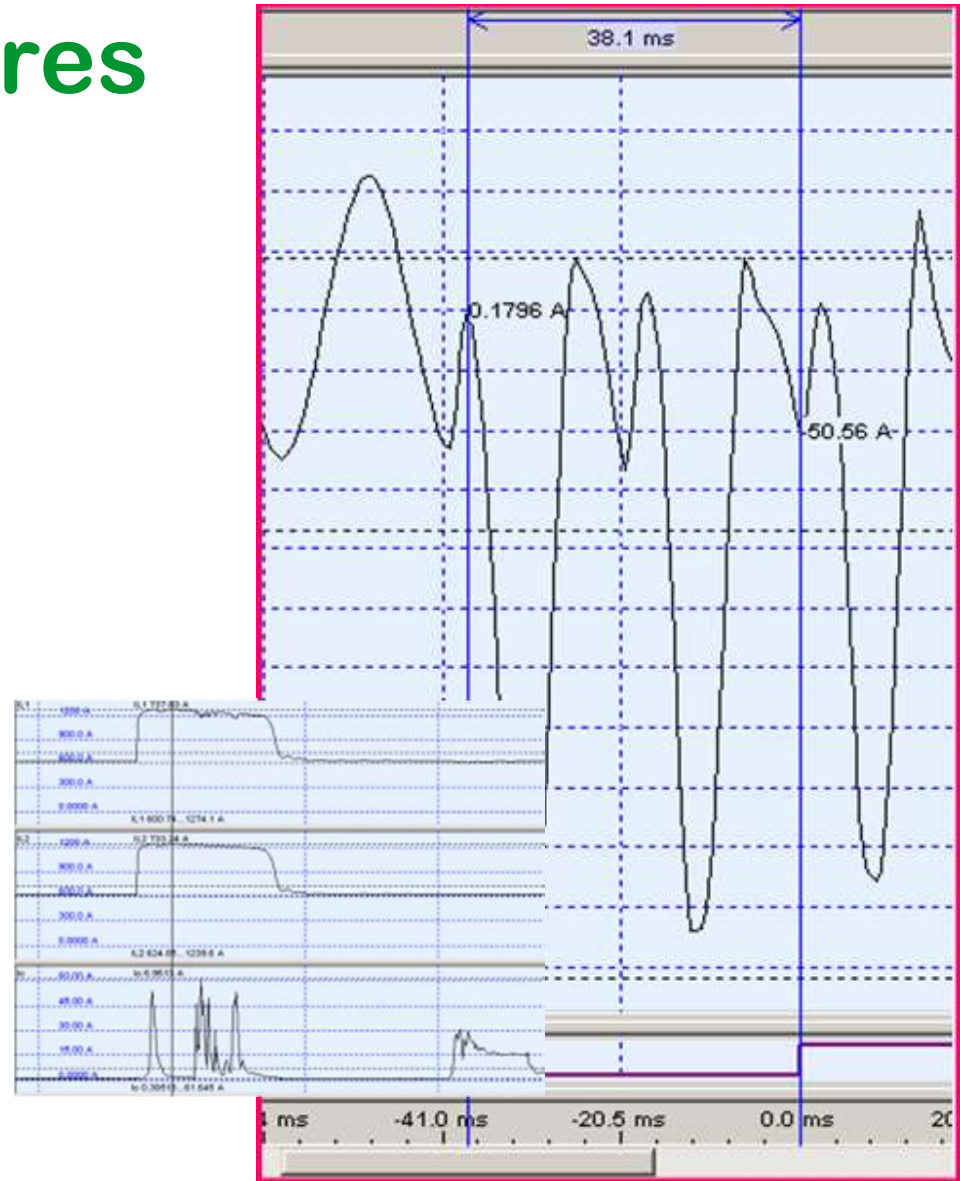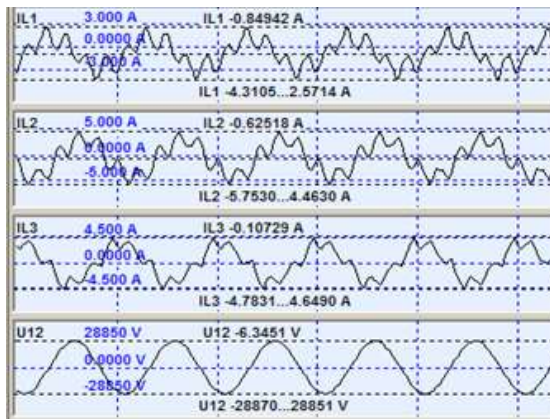
VAMP 321 - features

IP 54 casing (front)

- Robust cast aluminium case
- Adjustable fixtures
- Flexible installation

VAMP 321 - features

Mounting
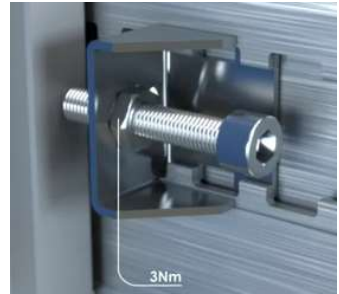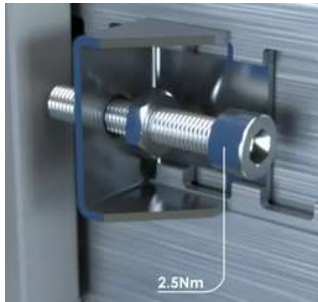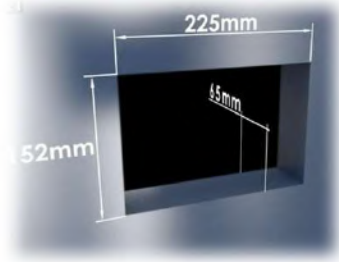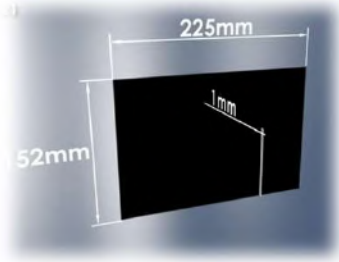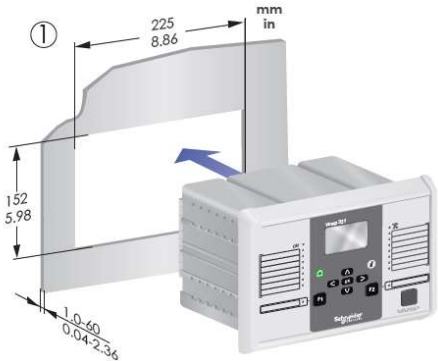
VAMP 321 - features

Application

Fault in the cable termination will be tripped on light only criteria trough T2 of VAMP 321.

Fault in the cable termination or current tranformer will be tripped on light only criteria trough T2 upstream.

Fault in the bus bar will be tripped on light & current criteria trough T1. Should the CB fail to operate a circuit breaker failure protection CBFP trips upstream breaker via T3.

Possible fault in the outgoing feeder is tripped by T1 contact of the VAMP 321 and simultaneously through output of VAM I/O unit
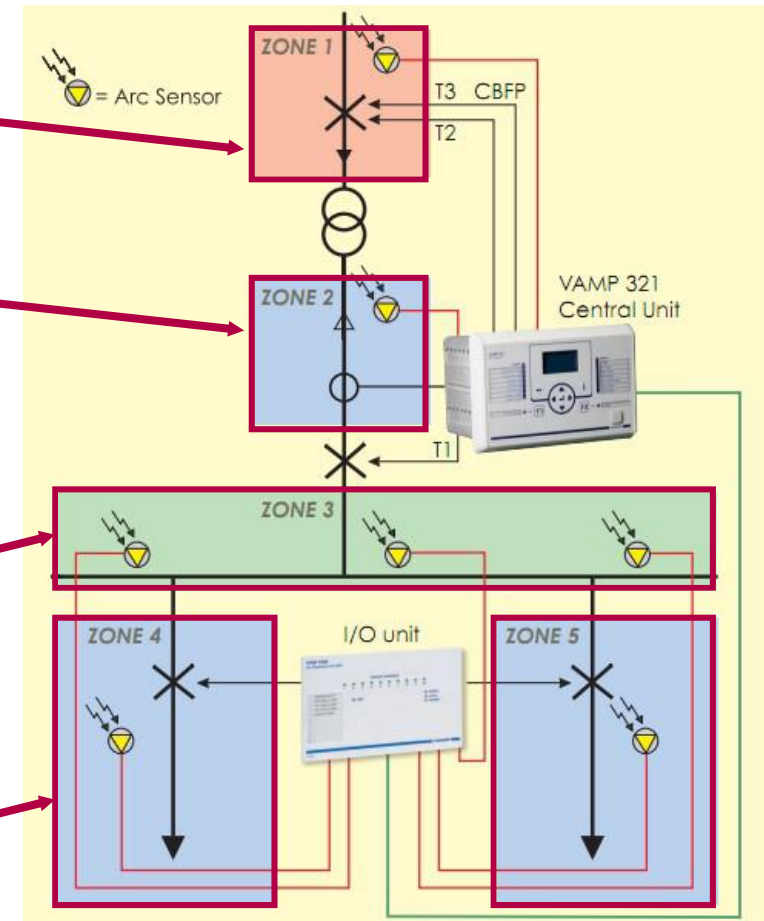
VAMP 321 - features

Fully modular design

VAMP 321 - features
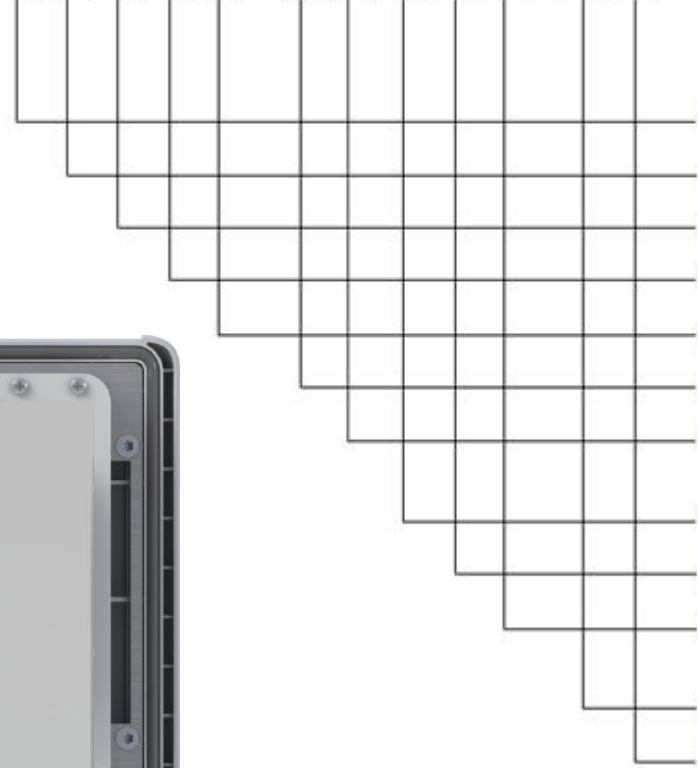
Fully modular design – power supply

VAMP 321 ORDERING CODE
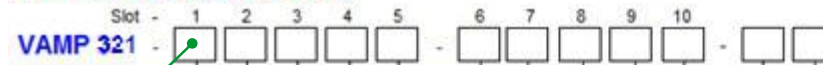
-80…265V$_{AC}$/$_{DC}$ **with 1 output relay, 1 alarm contact and SF relay**

-18…48V$_{DC}$ **with 1 output relay, 1 alarm contact and SF relay** (Q2/2013)
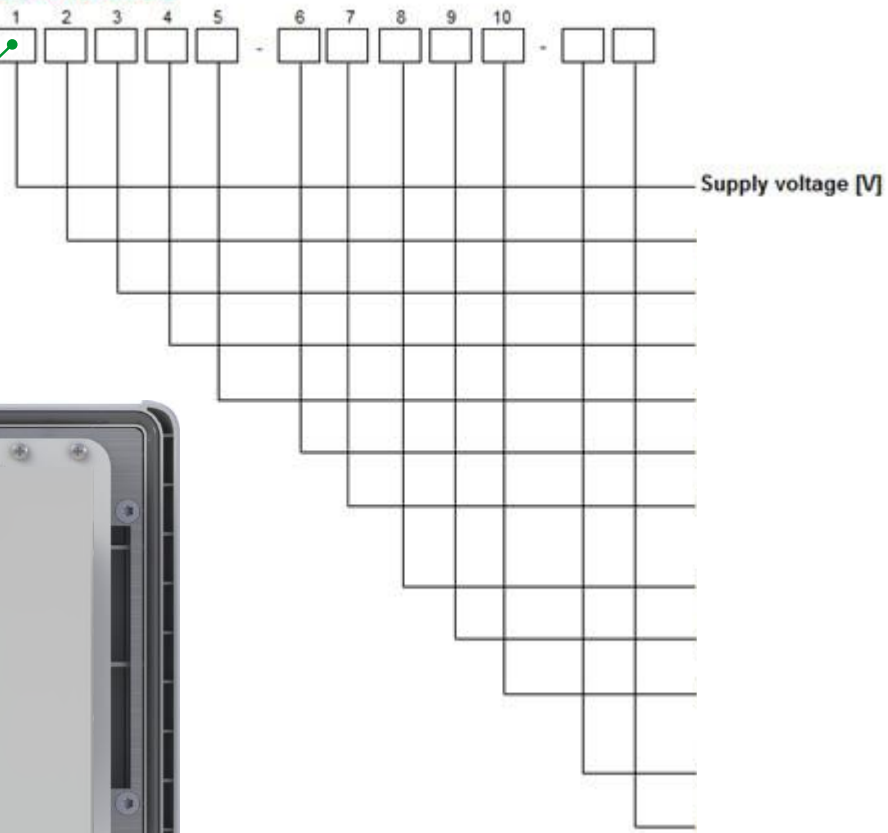
Supply voltage [V]

VAMP 321 - features

Fully modular design – BIO and sensor interface

-3 x BI/BO + 2 x point sensor + 3 x DO

-Fiber 2 x BI/BO + 1 x loop sensor + 3 x DO (Q1/2013)

-3 x point sensor + 1 x loop sensor + BI + BO + HSO (Q2/2013)

VAMP 321 - features
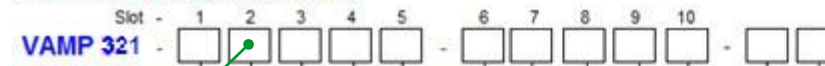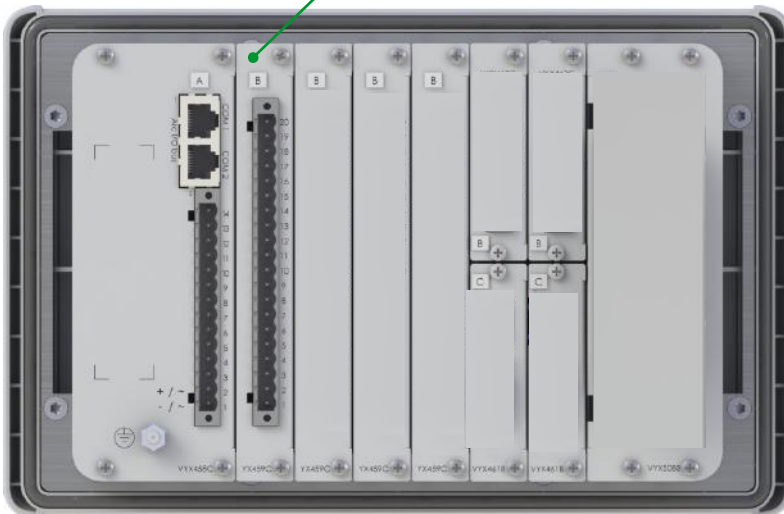
Fully modular design – DI / DO interface

-6 x DI 4 x DO

VAMP 321 - features
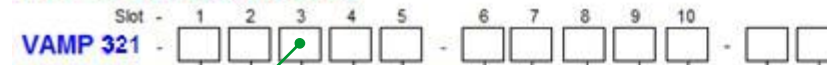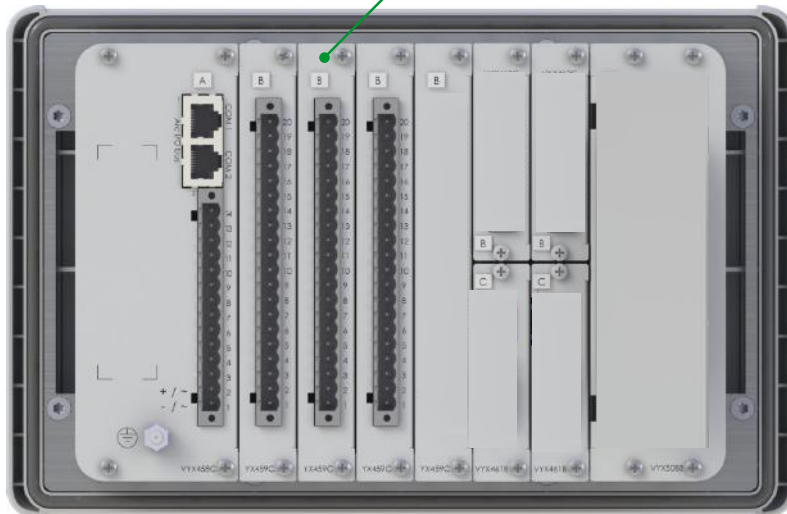
Fully modular design – high speed output and DI/DO interface

-2 x IGBT high speed ouput (excludes I/O card III, slot 4)

VAMP 321 ORDERING CODE

Slot - 1 2 3 4 5 - 6 7 8 9 10 -

VAMP 321 -

- Supply voltage [V]
- I/O Card I
- I/O Card II
- I/O Card III
- I/O Card IV

VAMP 321 - features

Fully modular design – point sensor interface

-4 x point sensor

VAMP 321 - features

Fully modular design – point sensor interface

-4 x point sensor
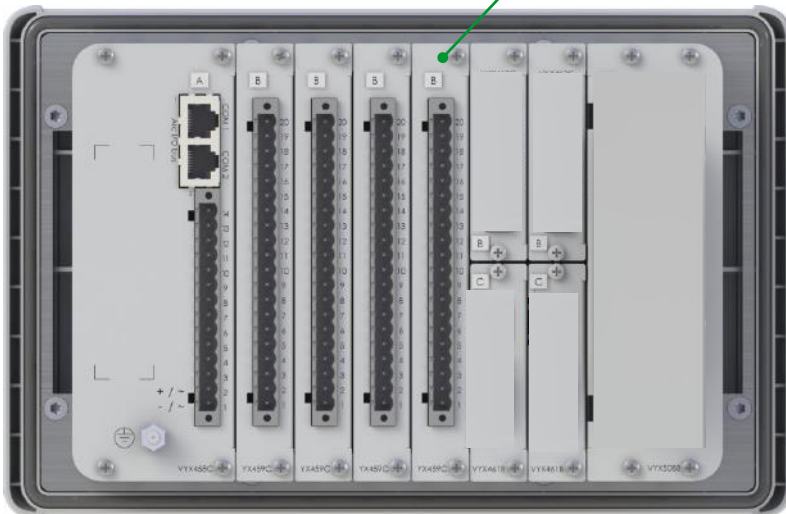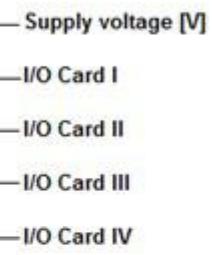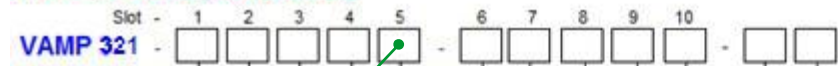
VAMP 321 - features

Fully modular design – CT and VT interface

-3 x I + 3I$_0$ + U

VAMP 321 - features
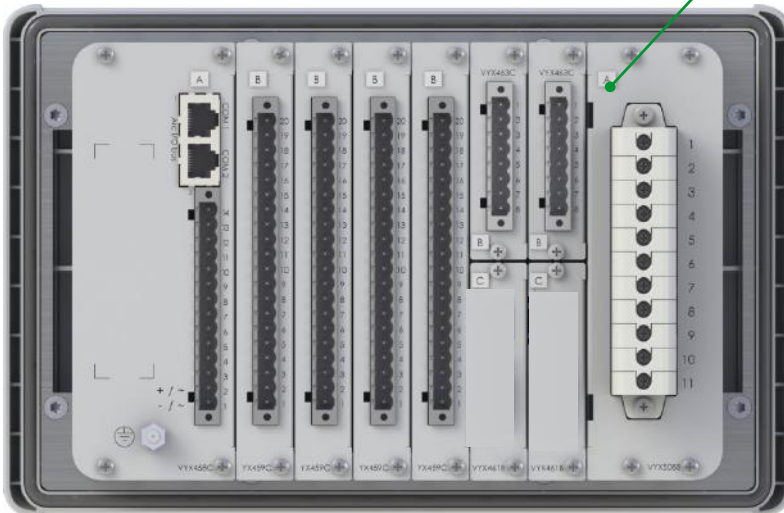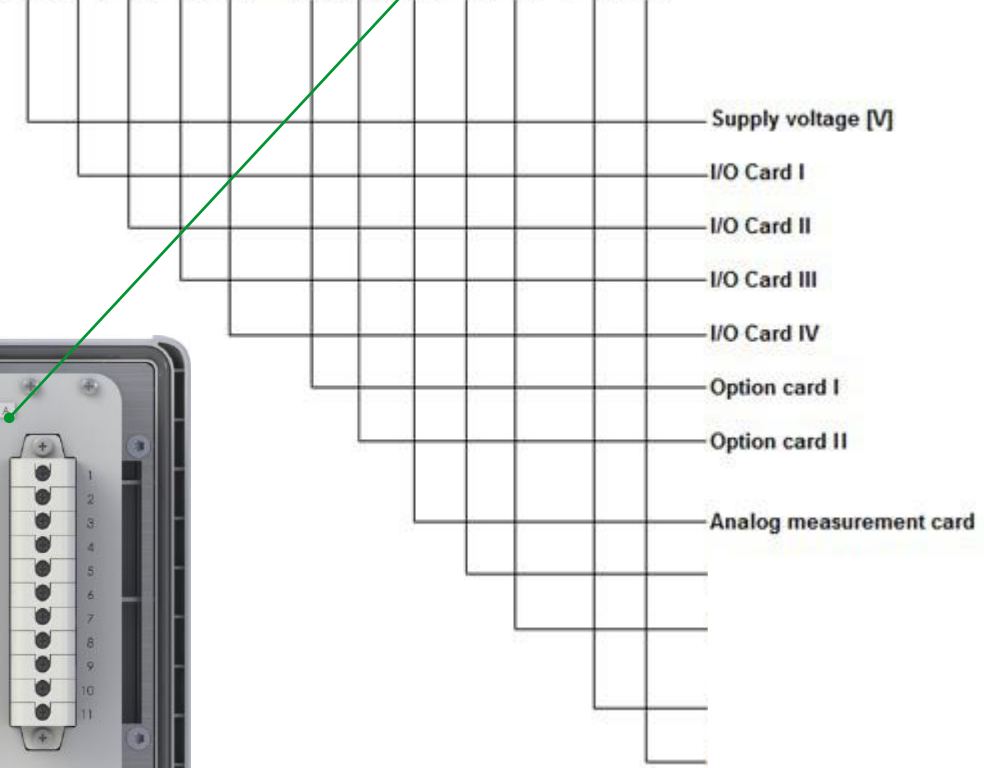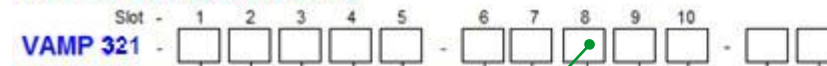
Fully modular design – communication interface I

- RS232 interface
- RS232 + RJ45 ethernet interface
- RS232 + LC ethernet fiber interface

VAMP 321 - features
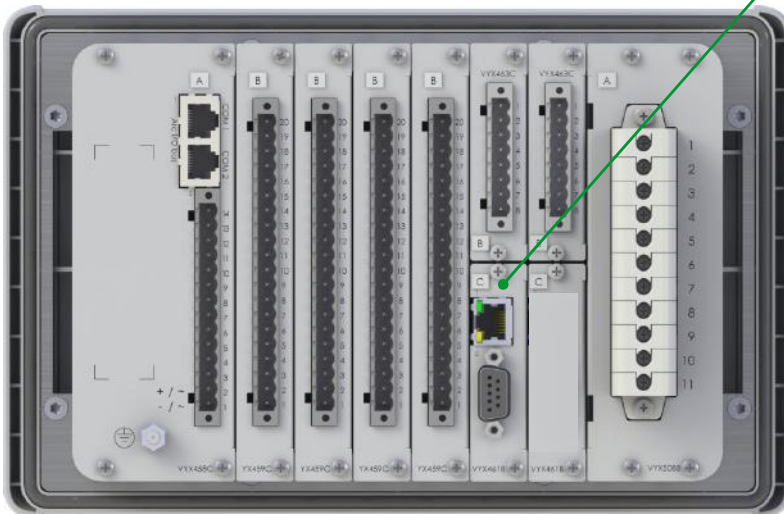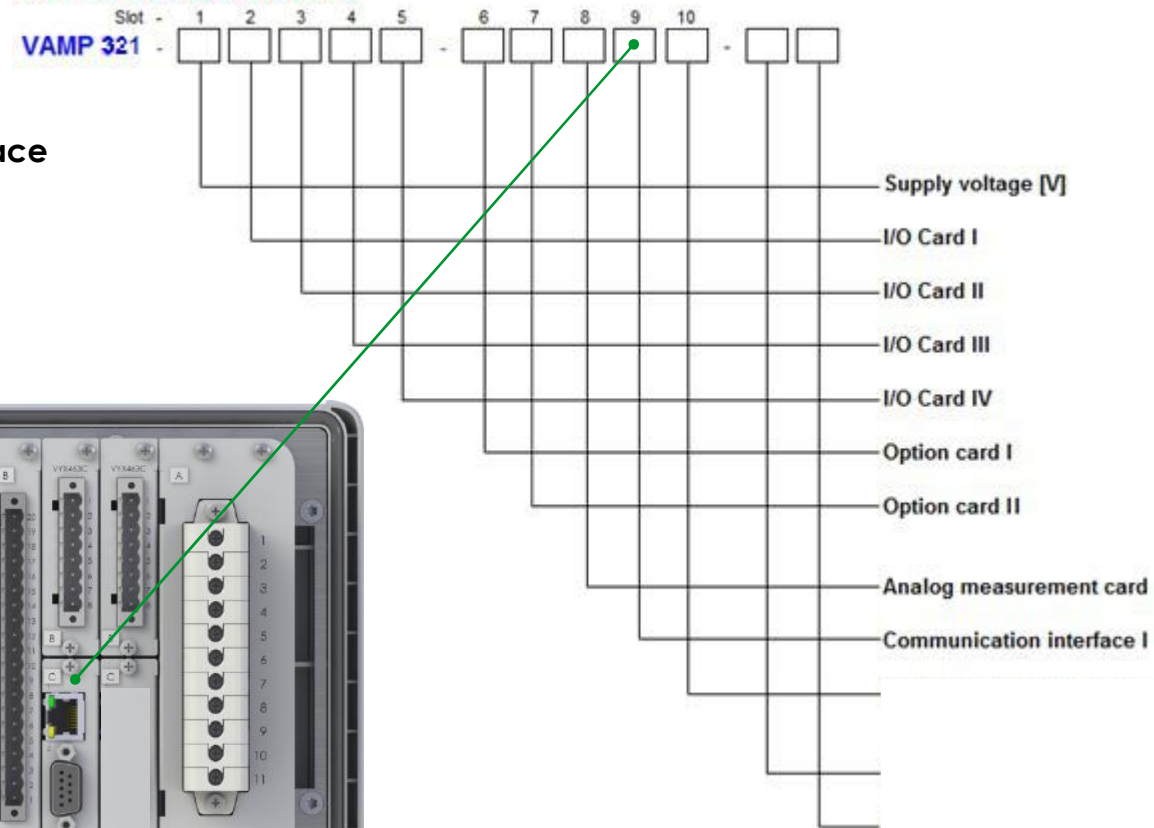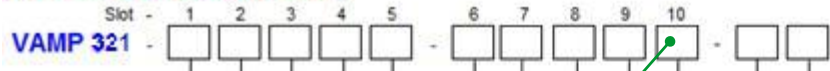
Fully modular design – communication interface II

-RS232 interface
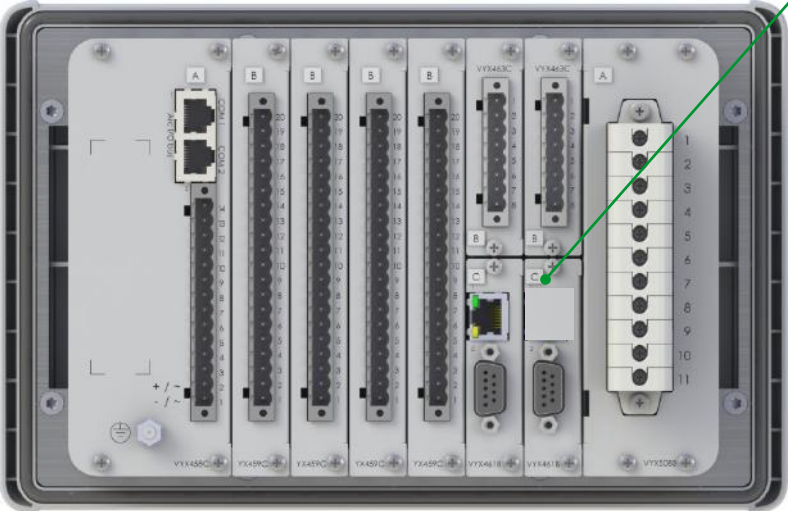
VAMP 321 - features

Fully modular design – display variants

128 x 64 LCD
or
128 x 128 LCD
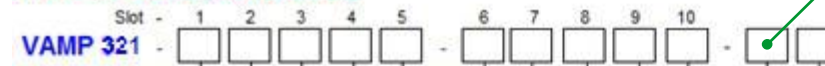
-Default 128 x 64 LCD display
-Optional 128 x 128 LCD display

VAMP 321 ORDERING CODE

Slot - 1 2 3 4 5   6 7 8 9 10

VAMP 321 - ☐☐☐☐☐ - ☐☐☐☐☐ - ☐☐

- Supply voltage [V]
- I/O Card I
- I/O Card II
- I/O Card III
- I/O Card IV
- Option card I
- Option card II
- Analog measurement card
- Communication interface I
- Communication interface II
- Display type

VAMP 321 - features

Fully modular design – treshold for DI interface

128 x 64 LCD
or
128 x 128 LCD

Digital input activation nominal voltage level

-24V$_{DC}$/110V$_{AC}$
-110V$_{DC}$/220V$_{AC}$
-220V$_{AC}$

VAMP 321 ORDERING CODE

Slot - 1 2 3 4 5   6 7 8 9 10

VAMP 321 -

- Supply voltage [V]
- I/O Card I
- I/O Card II
- I/O Card III
- I/O Card IV
- Option card I
- Option card II
- Analog measurement card
- Communication interface I
- Communication interface II
- Display type
- DI treshold voltage
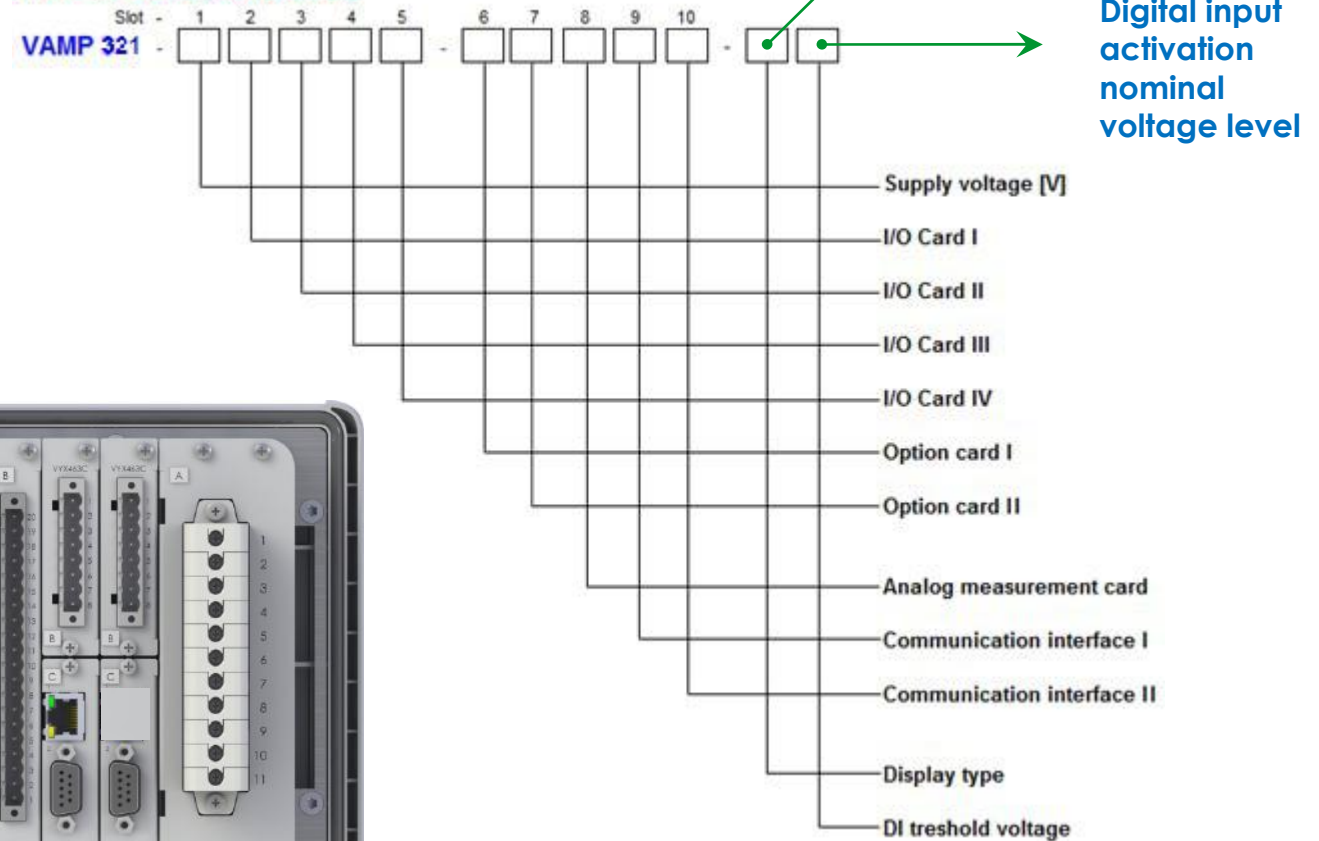
Arc and overcurrent signal flow

- Arc light information from VAM10L and / or VAM 3L
- Overcurrent information from VAM 4C
- ARC / overcurrent information from / to other central unit
- ARC information from / to VAMP protection relay
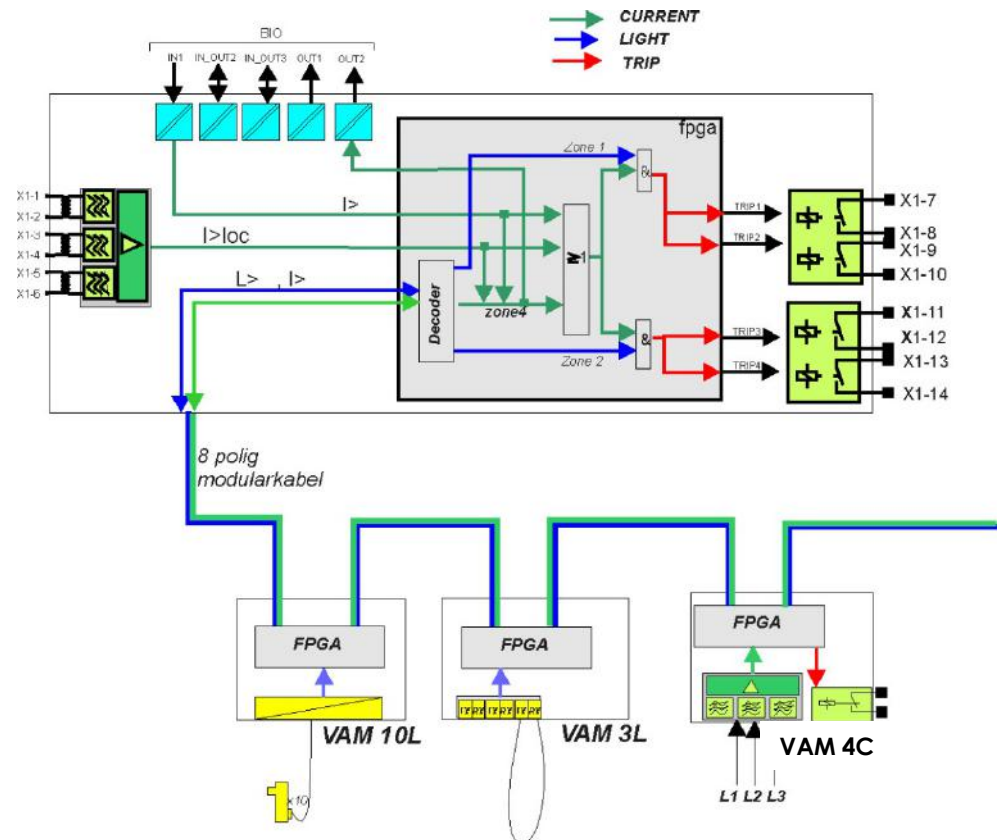
I/O unit VAM 10L

- I/O unit address selectable with dip switch
- Ten (10) point sensors
- One portable pinch sensor
- One trip output
- 2 modular cable connections for interfacing with a central and other I/O units
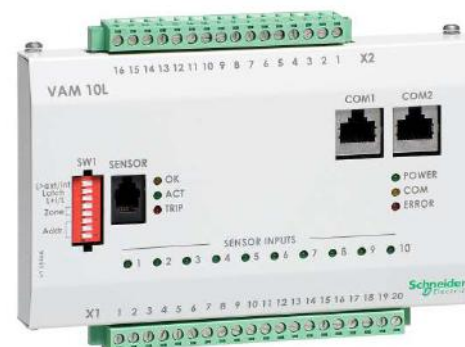
I/O unit VAM 3L

- I/O unit address selectable with dip switch
- Three (3) sensor loop connections
- One portable pinch sensor
- One trip output
- Two (2) modular cable connections for interfacing with a central and other I/O units

I/O unit VAM 4C

- I/O unit address selectable with dip switch
- Three (3) phase current measurement or two phase and neutral current
- Current pick-up setting by potentiometer
- One trip output
- Two (2) modular cable connections for interfacing with a central and other I/O units
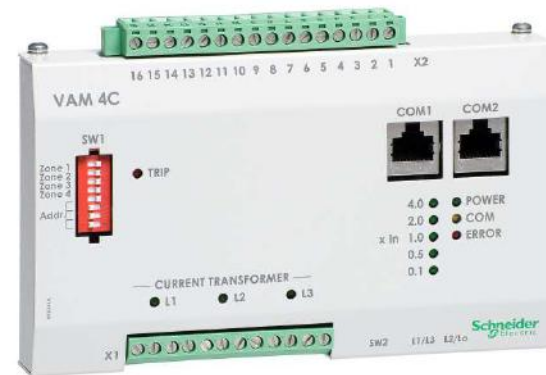
I/O units VAM 10L, VAM 3L and VAM 4C

- Zone-addressing:
  - address 0…7 = zone 1
  - address 8…15 = zone 2
  - address 16…23 = zone 3
  - address 24…31 = zone 4
  - address 32...39 = current I/O unit
- Self supervision
- Indication (blinking) if sensor fault
- Indication if activated (steady)

I/O units VAM 10L, VAM 3L and VAM 4C

- Channel activation in 200us
- Error led (red) if faulty
- Indication of self supervision fault to central unit
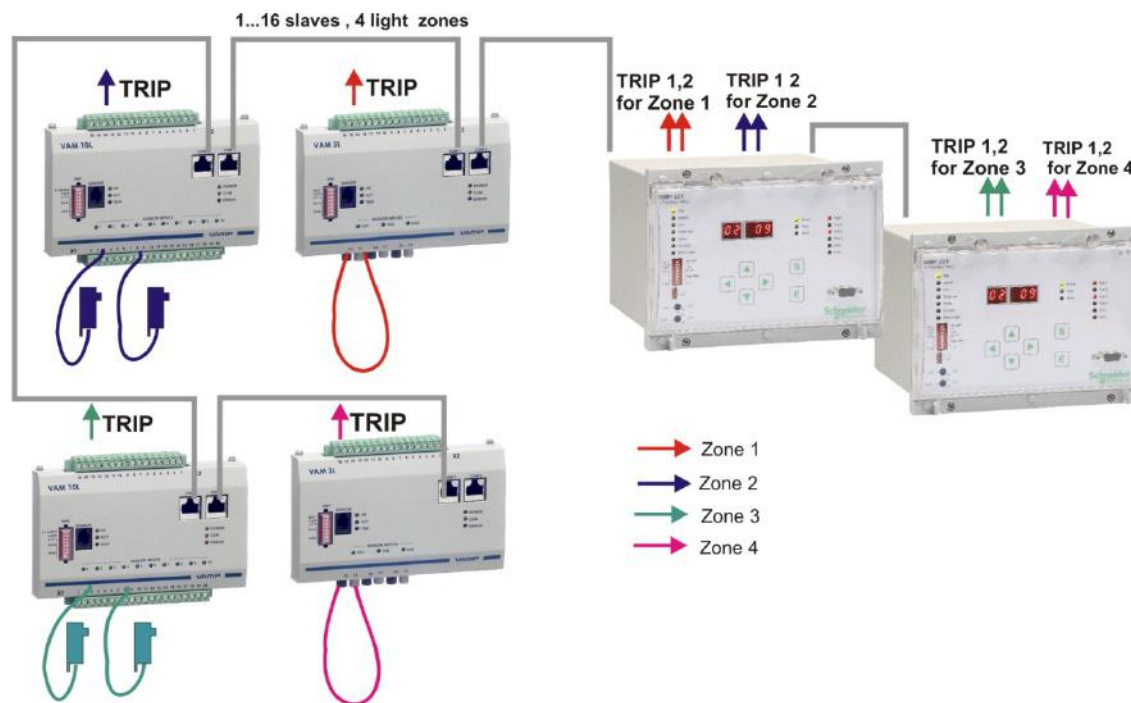
Arc sensors

- Energy taken from I/O unit
  - Power supply 12V , current drain < 2,5 mA
  - Electronics continuously supervised
- Sensitivity about 8000 LUX
- Light spectrum 300 – 1500 nm
- The light is converted to a current pulse
- Activation current 20 mA

VA 1DA6 or VA 1DA20

VA 1EH6 or VA 1EH20

Arc sensors

- Activation sector 360 degrees (VA1DA)
- Six (6) meter or twenty (20) meter pair cable
- Testing possible with a strong light or camera flash
- 4kV isolation to auxiliary power
- 2kV to ground
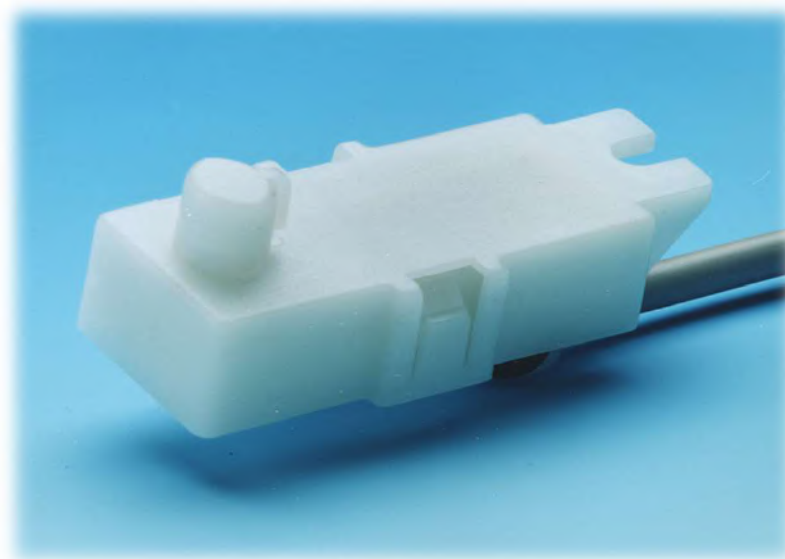
VA 1DA6 or VA 1DA20

Mounting plates

- Standard plates for VA1DA type sensors for surface mounting
- L and Z profiles
- fix and bend to proper angle

VYX 001

VYX 002

Fiber sensors Arc-SLm

- Robust glass fiber construction
- Activation sector 360 degrees
- Sensitive to wide light spectrum (300 ….1500nm)
- Commissioning with strong flash
- Fixed light sensitivity (8000lux)
- Lengths available 1…70m
- Complete self supervision with "closed loop" principle

Portable sensor

- sensitivity about 8000 LUX
- snap-in connector
- further enhance the safety during maintenance

VA 1DP

Arc flash protection system

- Selective ARC protection system
- Indication of activation
- Developed in accordance with protection relay standards
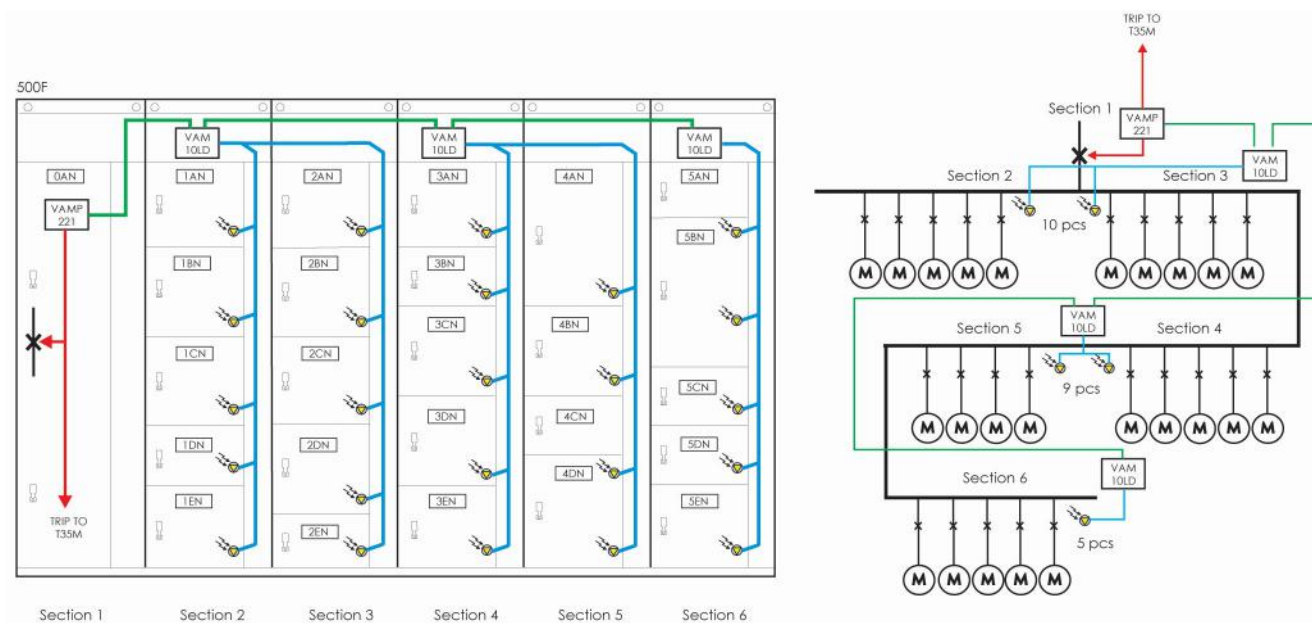
Full Selectivity
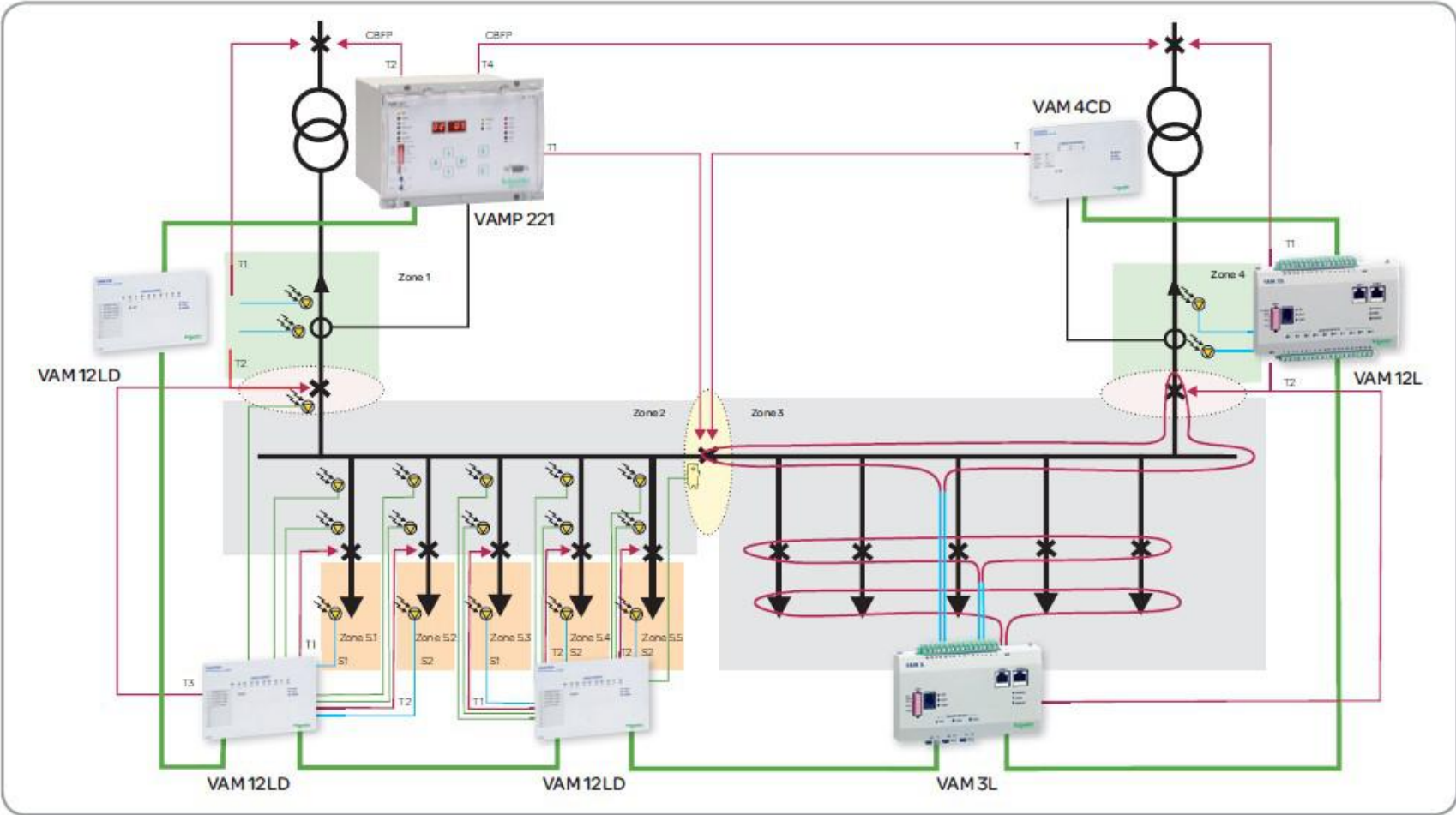
Sharing arc light and overcurrent

- Between central units
- Between central units and VAMP protection relays
- Between I/O and central units
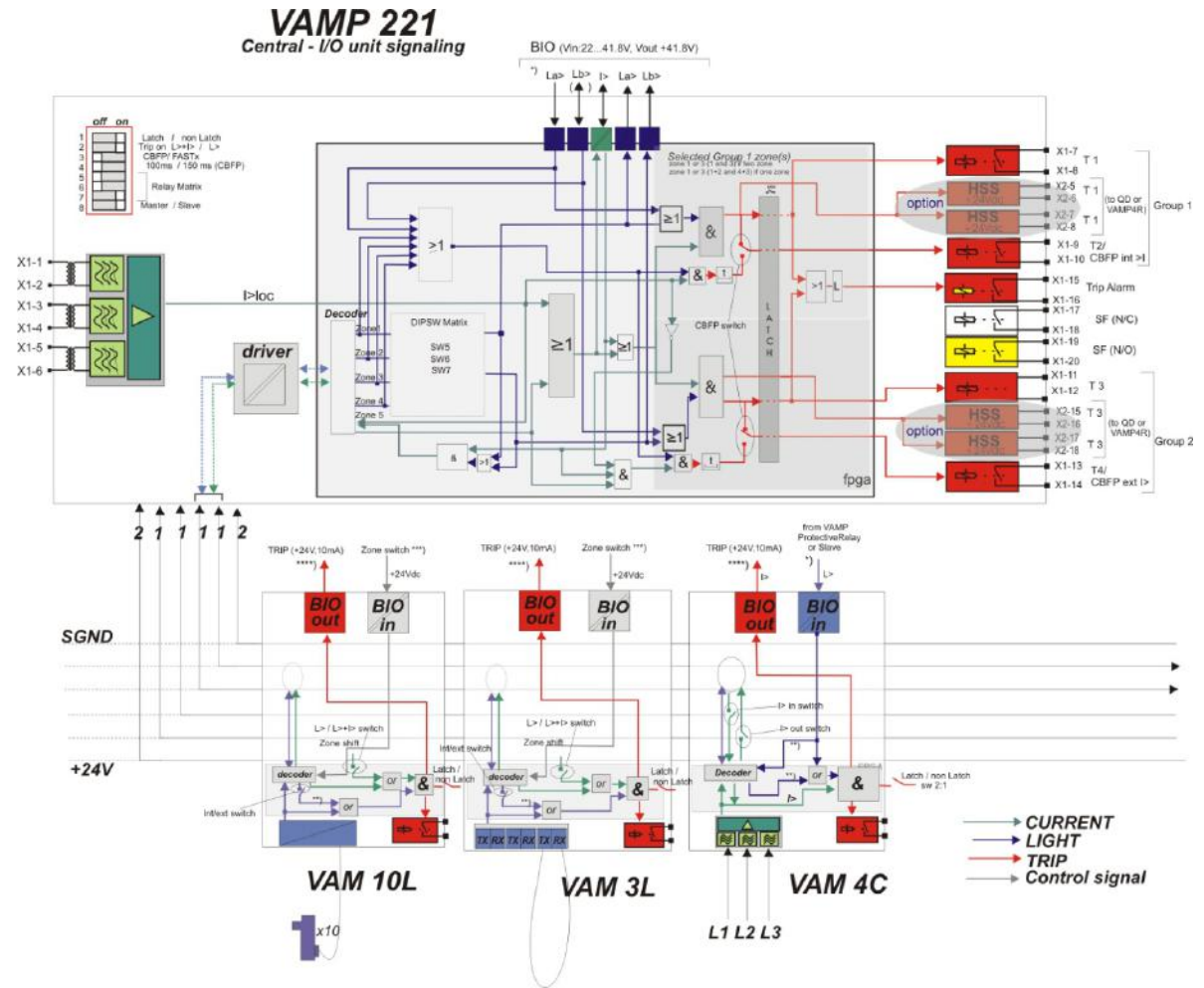
Sharing arc information

- Between VAMP 221 central units and current measuring VAMP relays equipped with an optional arc detection modules

- Allows more current measuring points in the application

- Extended selectivity
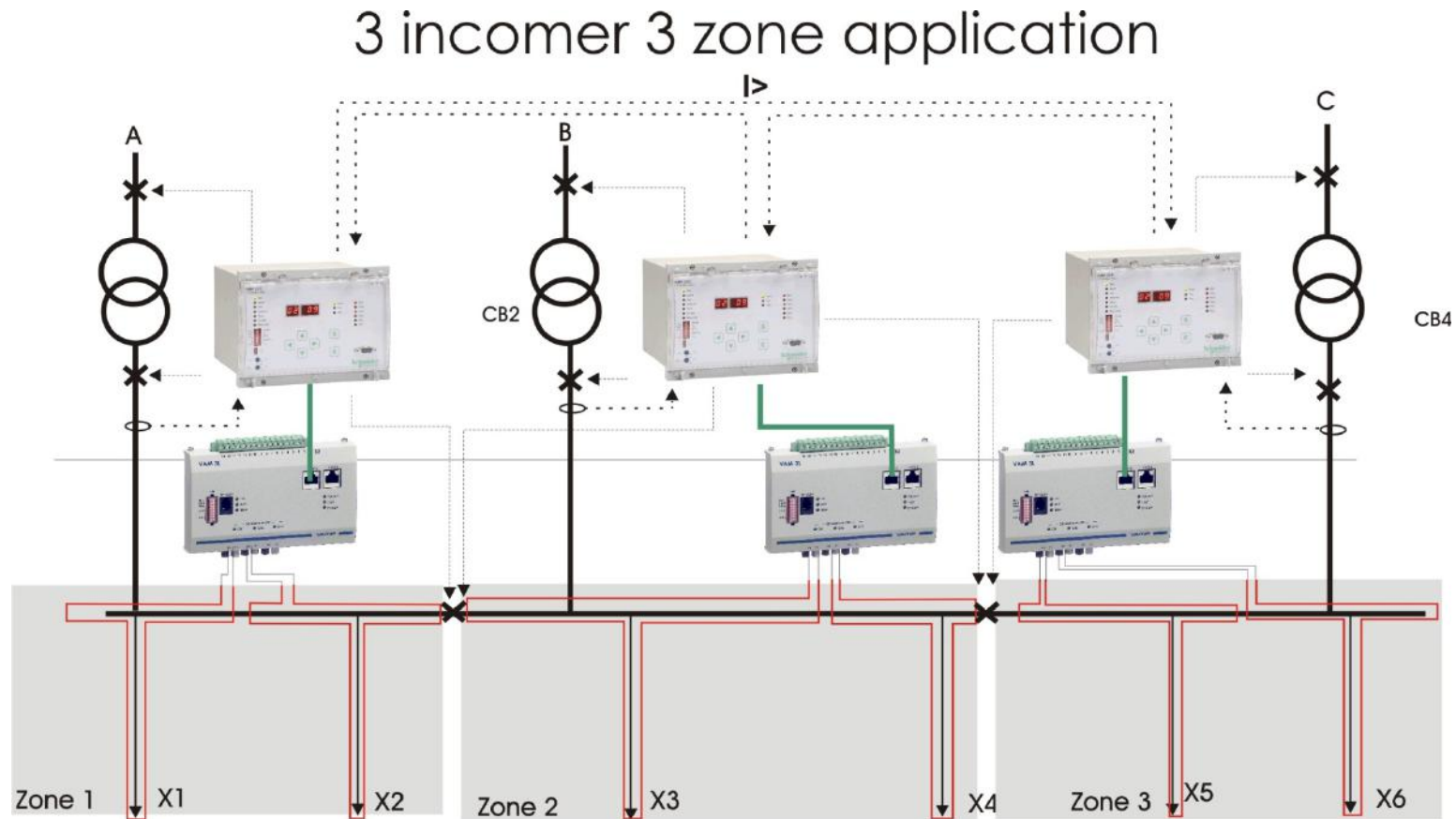 - arc protection in the feeder relay takes care of the cable compartment
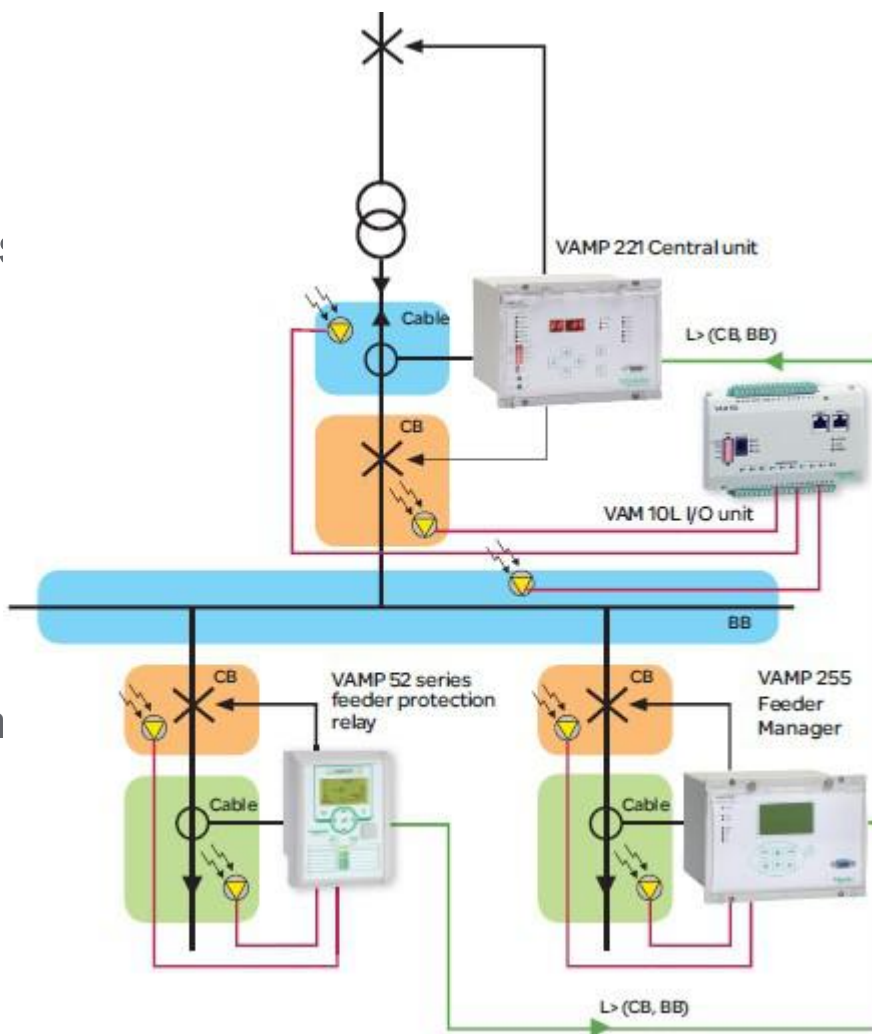
Zone approach

- Overcurrent information is shared between the central units
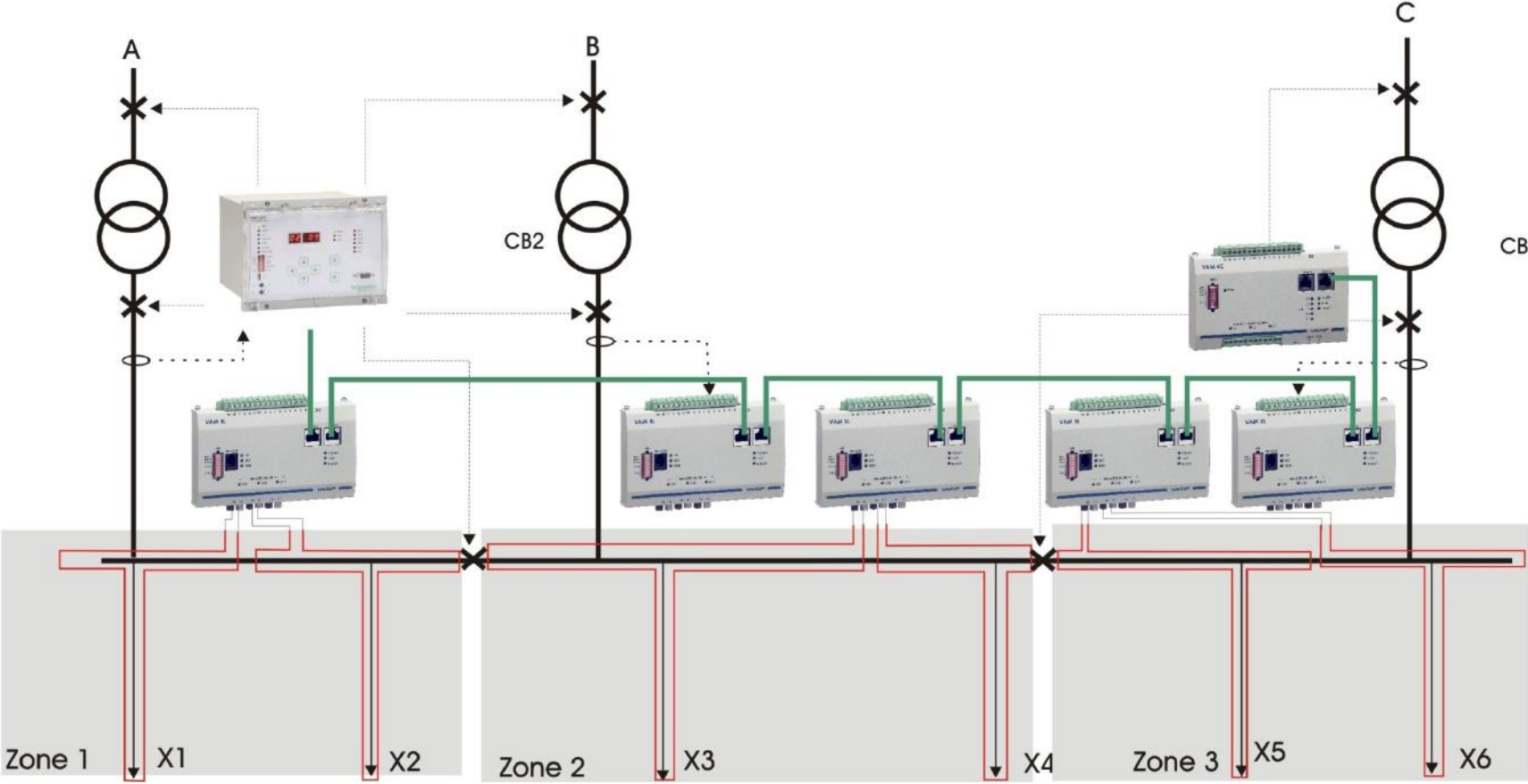- Feeder relays equips each outgoing feeder with individual arc protection
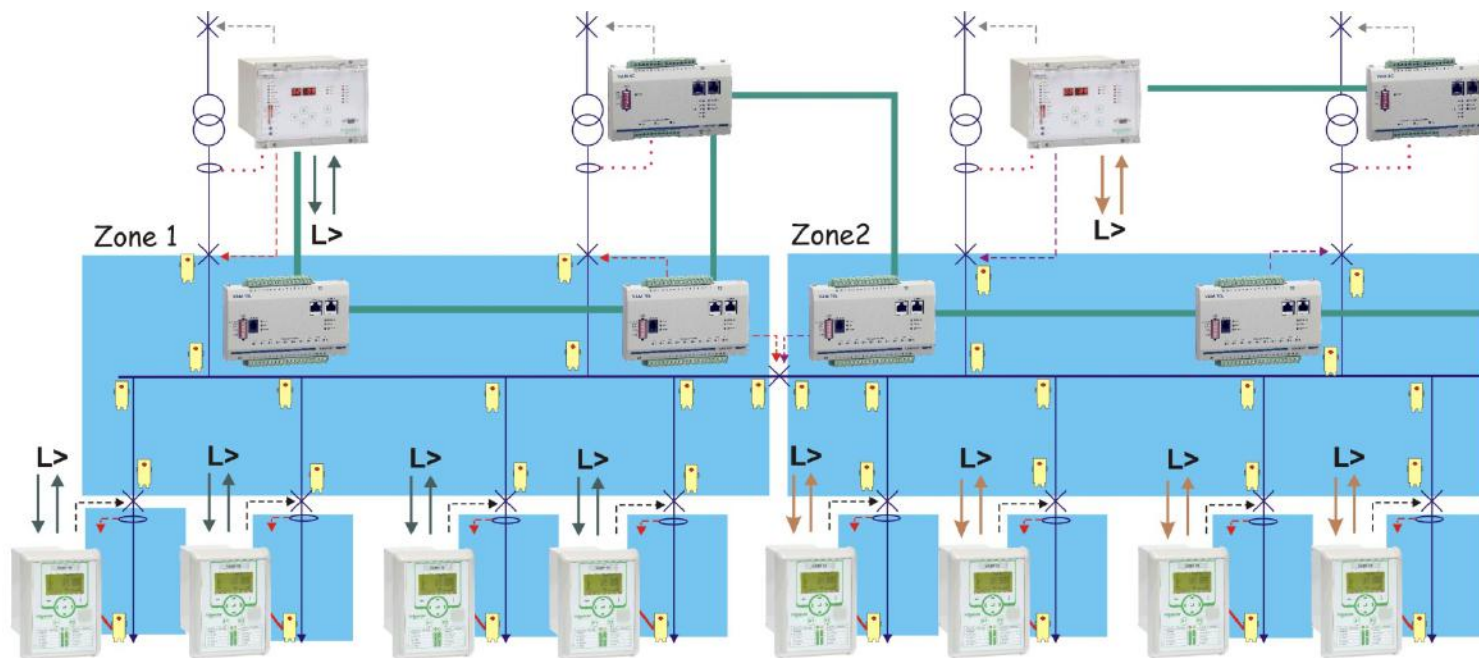
Three central units share currents

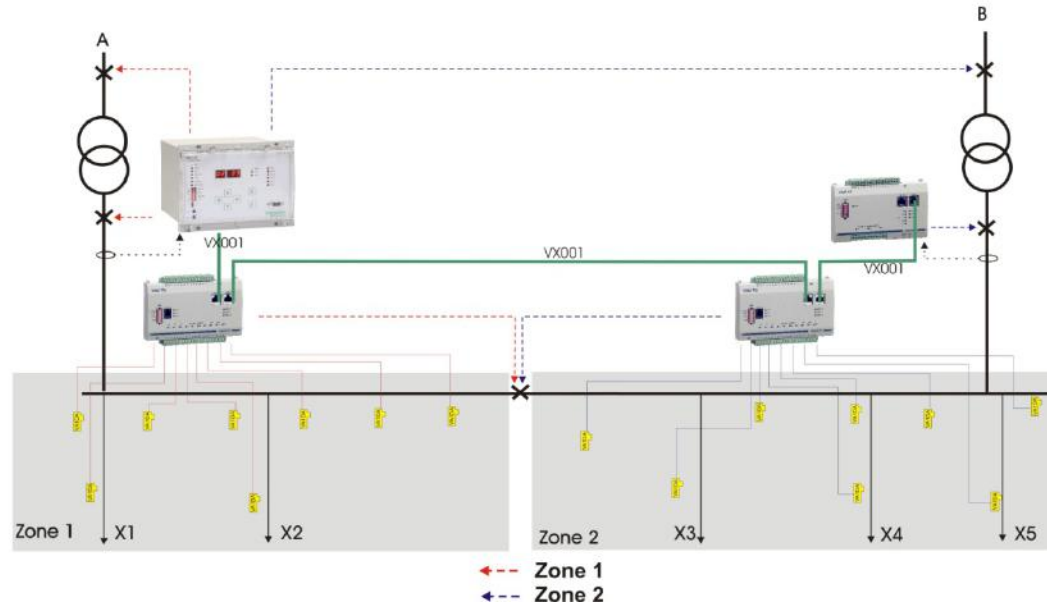3 incomer 3 zone application

Full Selectivity with fiber solution

Example

- LV switchgear at power plant

- Two zone application

- Various current measuring locations

- I/O units trip CBs also

Schneider SEPAM Numerical Protection IED's

Schneider Electric

SEPAM

a range of solutions for all applications

Sepam series 80:
intelligent solutions
for custom applications with
IEC61850

Sepam series 60:
high-performing solutions
for custom applications with IEC61850

Sepam series 40:
high-performing solutions
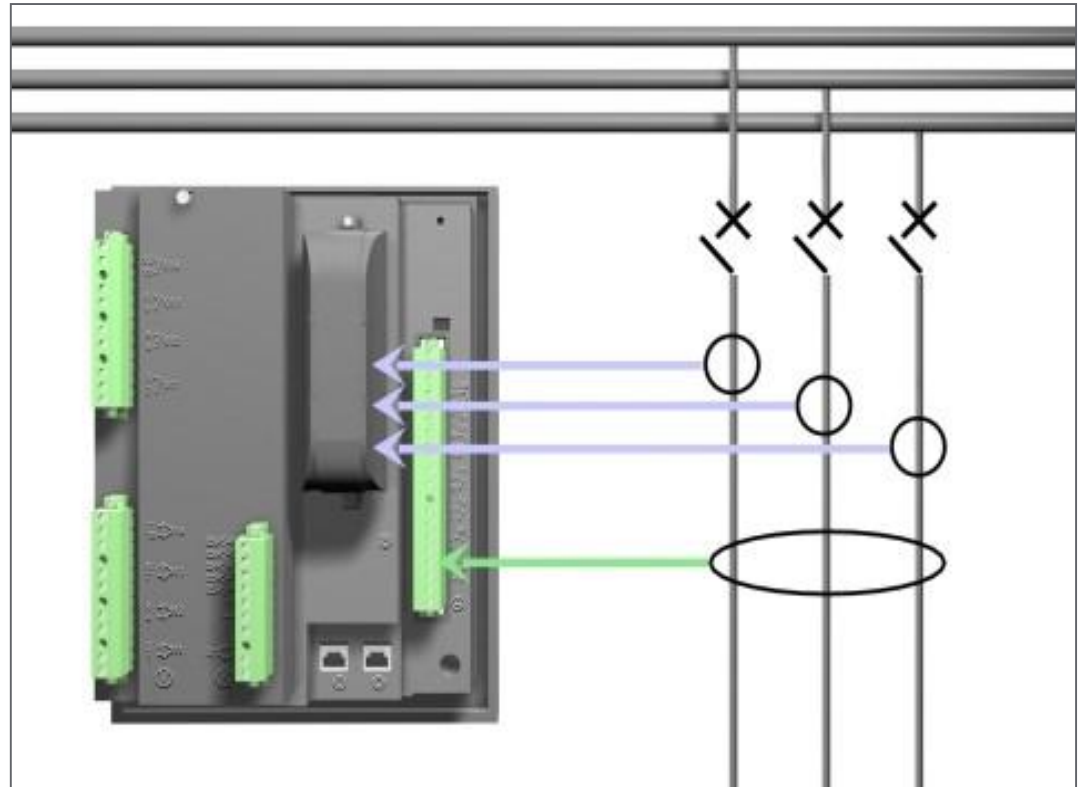for demanding applications

Sepam series 20:
simple solutions
for usual applications

Sepam series 10:
designed for buildings
and Utilities

Sepam series 20

- Current or voltage metering according to the application

- 10 logic inputs / 8 relay outputs

- 1 communication port

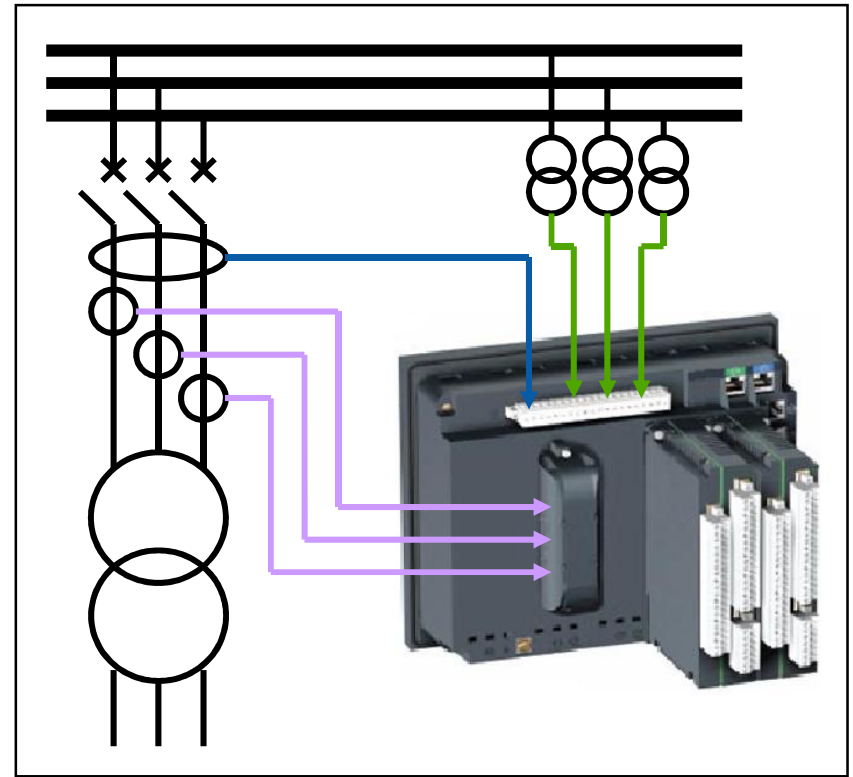- 8 temperature sensor inputs

Sepam series 40

- Current and voltage metering for all applications:
  - all measurements available
  - directional protection functions

- 10 logic inputs / 8 relay outputs

- logic equation editor

- 1 communication port

- 16 temperature sensor inputs
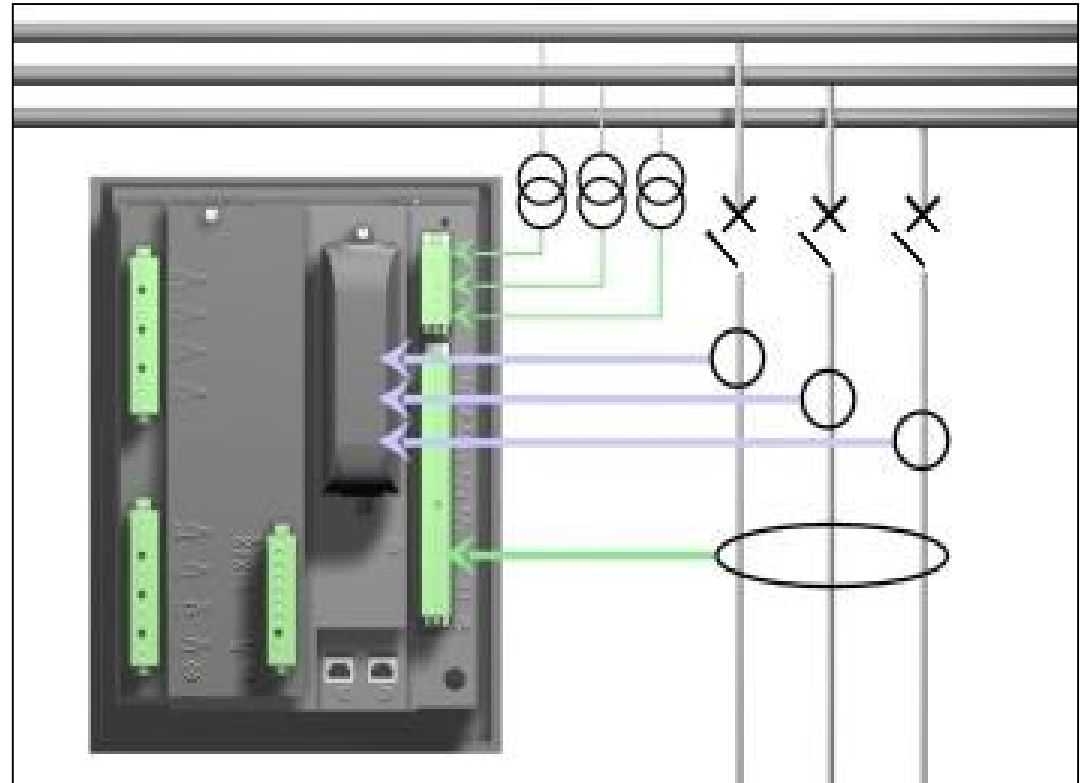
Sepam series 60

- Current and voltage metering for all applications :
  - all measurements available
  - directional protection functions
- 28 logic inputs / 16 relay outputs
- Logic equation editor
- 1 communication port
- 16 temperature sensor inputs
- Memory cartridge and backups

- Local control via mimic-based UMI
- Synchro-check
- Automatic transfer

Sepam series 80

- Multiple metering:
  - all measurements available
  - directional and differential protection functions
- 42 logic inputs / 23 relay outputs
- logic equation editor
- 2 communication port
- 16 temperature sensor inputs
- Memory cartridge and backups

- Local control via mimic-based UMI
- Optional Logipam programming software
- Synchro-check
- Automatic transfer
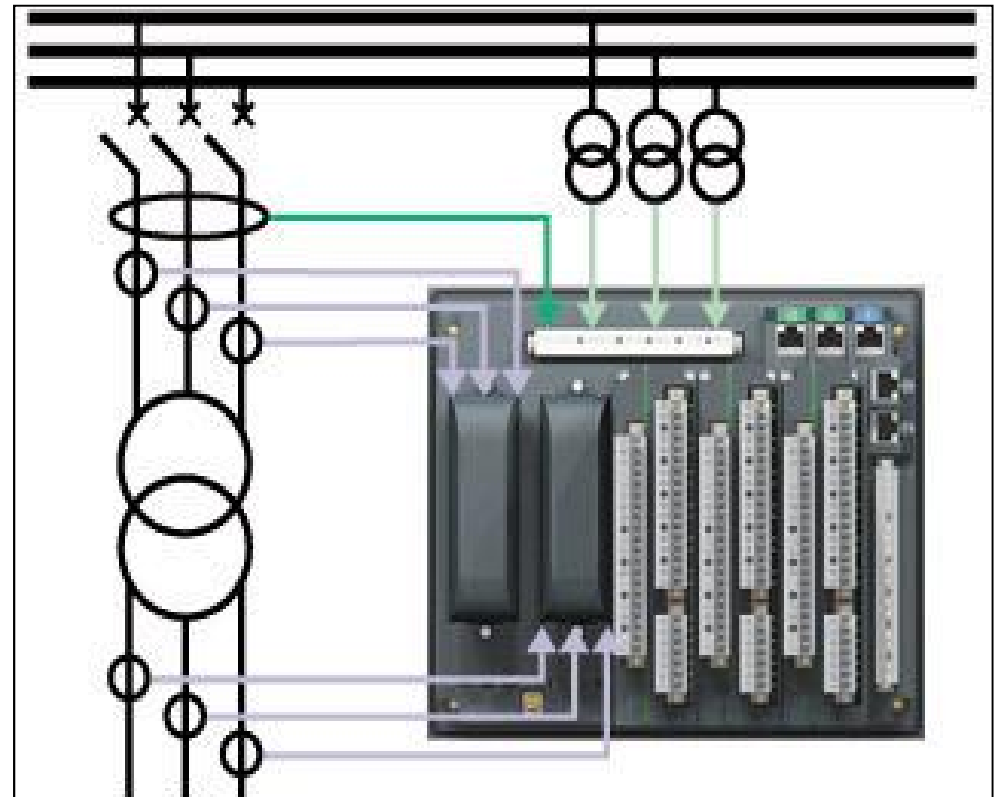
Know the customer requirement

- *Auxiliary power supply - either DC or AC (Most requirements are for DC)*

- *Required Protection functions with ANSI codes. (Major criteria to decide relay application)*

- *Bigger Scheme requires SLD to find the zones based on CT's.*

- *Number of Digital Inputs and outputs – Needs to be decided based on Scheme requirement*

- *SCADA Communication Protocol and Physical Interface*
  RJ-45 and FO – IEC61850
  RJ-45 – Modbus TCP/IP
  RS485 – Modbus RTU, IEC103, Courier, K-bus, spa bus, Profibus