EcoStruxure™
Innovation At Every Level

PowerLogic™ P1

Catalog 2023

Network Protection Relays

se.com/PowerLogic

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General Contents

PowerLogic™ P1
Range Description

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PowerLogic™ P1 Range Description

Take PowerLogic™ Protection Relays Further with EcoStruxure™

EcoStruxure, Schneider Electric's IoT-enabled, open and interoperable architecture and platform, brings together Connected Products, Edge Control, and Apps, Analytics & Services. EcoStruxure connected products deliver enhanced value around safety, reliability, efficiency, sustainability, and connectivity.

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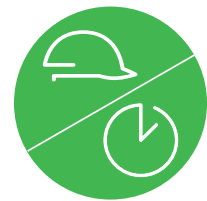EcoStruxure systems deployed since 2007 with the support of our 9,000 system integrators

EcoStruxure ready

Efficient asset management
Help boost your efficiency and participate to reduce downtime using predictive maintenance tools

24/7 connectivity
Make better informed decisions with real-time data that's available everywhere, anytime

Enhanced safety
Advanced features designed-in based on well-known designs, experience and technology

EcoStruxure™
Innovation At Every Level

EcoStruxure™ Architecture

	Building	Data Center	Industry	Infrastructure

End to End Cybersecurity	Cloud and/or On Premise	Apps, Analytics & Services
		Edge Control
		Connected Products

EcoStruxure Power EcoStruxure Building EcoStruxure IT EcoStruxure Machine EcoStruxure Plant EcoStruxure Grid

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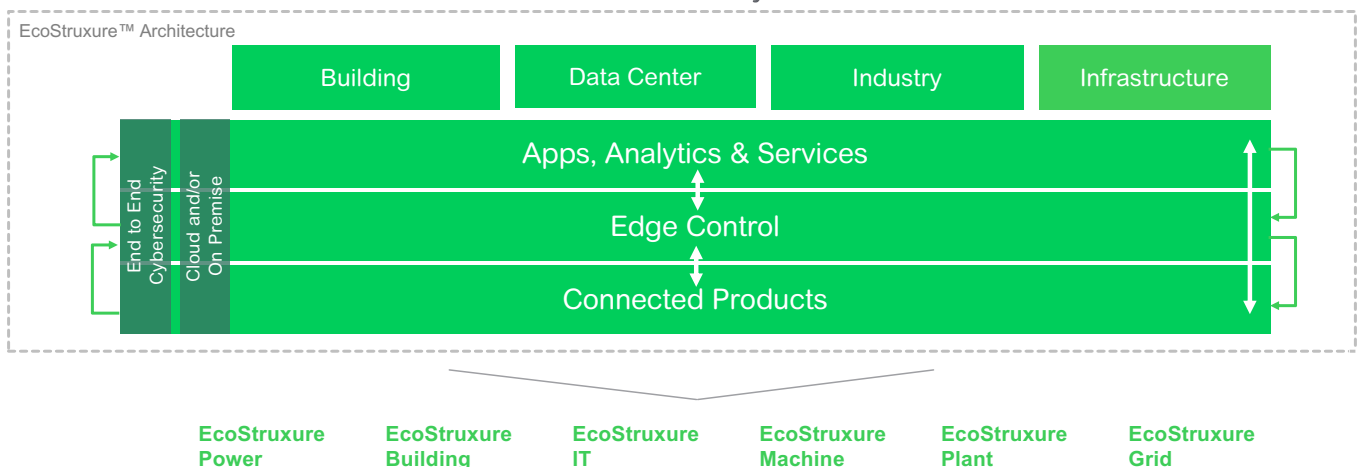
PowerLogic™ P1 at a Glance

Built on over a century of experience in medium-voltage protection relays, the new PowerLogic P1 is designed to meet your customers' needs for electrical protection, connectivity and everyday ease-of-use.

PowerLogic P1 is designed to be an effective solution for simple applications like overcurrent, earth-fault, voltage and frequency. Suited for basic distribution applications in commercial and industrial buildings, industrial settings or distribution utilities or as LV applications when ANSI functions are required. Ideal for back-up protection in new installations or in retrofit applications when replacing legacy relays. Reduce time and costs with simple installation, setting and configuration.

Get more benefits with digital, reliable and efficient PowerLogic P1:

- Single function voltage or current protection
- Incomer, feeder or transformer applications
- Simple to order, install and operate

Simple, reliable, and easy-to-use protection relays

Overview
Effective Relay for Basic Application

ANSI or IEC

Ideal for industrial buildings, distribution utilities and LV applications
(if ANSI functions are needed)

CE markings as per Directive 93/98/CEE

ISO/EHS/OHSAS certified manufacturing facility reinforces product quality and reliability. Independent lab reports available for CE.

Schneider Electric commits to disclose reliable, comprehensive information on the environmental impacts of our products.

More info on page 56.

	P1F	P1V
Features and options		
Current	3CT + 1CT	–
Voltage	1VT (option)	3VT or 4VT*
Overcurrent protection	✔	–
Directional earth-fault protection	✔*	–
Voltage protection	–	✔
Frequency protection	–	✔*
Inputs	up to 8	up to 6
Outputs	up to 8	up to 8
Programmable LEDs	6	6
CB control keys	✔	✔
Communications	USB* & RS485*	USB* & RS485*
Records	✔*	✔*
Display	LCD 32 x 2	LCD 32 x 2

* Depending on the model

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Selection Guide

by Protection Functions

Protection functions	ANSI code	PowerLogic P1F							PowerLogic P1V		
		P1F1L	P1F1L+	P1F1N	P1F1B	P1F1A	P1F1E	P1F1E+	P1V1L	P1V1N	P1V1A
Undervoltage	27	-	-	-	-	-	-	-	3	3	3
Positive sequence undervoltage	27P	-	-	-	-	-	-	-	-	-	2
Negative sequence overcurrent	46	-	-	-	-	-	1	1	-	-	-
Cur. unbalance, broken conductor	46BC	-	-	-	-	-	1	1	-	-	-
Negative sequence overvoltage	47	-	-	-	-	-	-	-	-	2	2
Thermal overload	49	-	-	1	1	1	1	1	-	-	-
Phase overcurrent	50/51	3	3	3	3	3	3	3	-	-	-
Earth fault overcurrent	50N/51N	2	2	2	2	2	3	-	-	-	-
Breaker failure	50BF	1	1	1	1	1	1	1	-	-	-
Switch On To Fault (SOTF)	50HS	-	-	-	1	1	1	1	-	-	-
Overvoltage	59	-	-	-	-	-	-	-	3	3	3
Neutral voltage displacement	59N	-	-	-	-	-	-	-	-	3	3
Derived Vo sequence overvoltage	59N	-	-	-	-	-	-	-	3	3	3
VT supervision	60FL	-	-	-	-	-	-	-	-	1	1
Directional earth-fault o/c	67N/21Y*	-	-	-	-	-	-	2	-	-	-
Magnetizing inrush detection	68F2	-	-	-	-	1	1	1	-	-	-
Auto-recloser	79	-	-	-	-	-	4	4	-	-	-
Over or under frequency	81	-	-	-	-	-	-	-	-	-	6
Lockout	86	1	1	1	1	1	1	1	1	1	1
Cold load pick-up		1	1	1	1	1	1	1	-	-	-
Blocking logic		-	-	-	1	1	1	1	-	1	1
IDMT curves		21	21	21	21	21	21	21	15	15	15
Setting groups		2	2	2	2	2	2	2	2	2	2

* E/F Protection can be set as directional E/F protection or admittance protection

Selection Guide
by Characteristics

		PowerLogic P1F							PowerLogic P1V		
Hardware		**P1F1L**	**P1F1L+**	**P1F1N**	**P1F1B**	**P1F1A**	**P1F1E**	**P1F1E+**	**P1V1L**	**P1V1N**	**P1V1A**
Phase current inputs		3	3	3	3	3	3	3	-	-	-
Residual current inputs		1	1	1	1	1	1	1	-	-	-
Phase voltage inputs		-	-	-	-	-	-	-	3	3	3
Neutral voltage inputs		-	-	-	-	-	-	1	-	1	1
Digital inputs		-	-	-	4	4	8	8	-	2	6
Digital outputs		3+WD	3+WD	5+WD	3+WD	7+WD	5+WD	5+WD	3+WD	5+WD	7+WD
USB front port		-	-	1	1	1	1	1	-	1	1
RS485 rear port		-	1	1	1	1	1	1	-	1	1
Control functions											
Local/remote function		-	●	●	●	●	●	●	-	●	●
Local control with I/O keys		●	●	●	●	●	●	●	●	●	●
Remote control with RS485		-	●	●	●	●	●	●	-	●	●
Remote control with digital inputs		-	-	-	●	●	●	●	-	-	●
Time Synchronization with digital input		-	-	-	-	-	●	●	-	-	●
Measurement											
RMS current values		●	●	●	●	●	●	●	-	-	-
Fundamental voltage values		-	-	-	-	-	-	-	-	-	●
Frequency		●	●	●	●	●	●	●	-	-	●
Positive sequence of voltage		-	-	-	-	-	-	-	-	-	●
Negative sequence of voltage		-	-	-	-	-	-	-	-	●	●
Thermal overload		-	-	●	●	●	●	●	-	-	-
Inrush current ratio		-	-	-	-	●	●	●	-	-	-
Positive sequence of current IS1		-	-	-	-	-	●	●	-	-	-
Negative sequence of current IS2		-	-	-	-	-	●	●	-	-	-
Relative IS2/IS1		-	-	-	-	-	●	●	-	-	-
Phase Peak Demand Current Values		●	●	●	●	●	●	●	-	-	-
Logs and Records											
Tripping context record		20	20	20	20	20	20	20	20	20	20
Sequence of event record		-	200	200	200	200	200	200	-	200	200
Disturbance record		-	-	-	-	4 s	4 s	3 s	-	-	4 s
Monitoring functions											
Trip circuit supervision (ANSI 74)		-	-	-	1	1	1	1	-	-	-
Basic circuit breaker monitoring		-	-	-	-	1	1	1	-	-	1
Counters		-	-	-	-	1	1	1	-	-	1
Self-supervision (WD)		●	●	●	●	●	●	●	●	●	●

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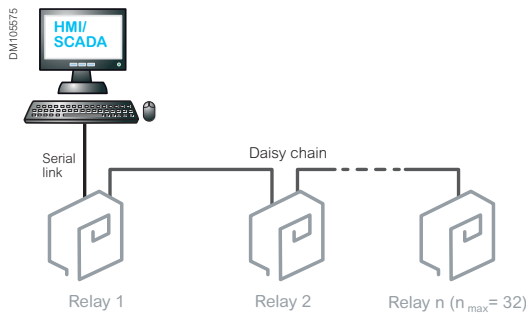
Communication

## Connection to SCADA using Serial Line

This architecture allows you to connect HMI/SCADA to a set of PowerLogic protection relays using a multi-drop serial communication link with client-server communication.

Available protocols:

- Modbus RTU
- IEC 60870-5-103

Time synchronization protocol:

- Minute pulse

Connection to SCADA using serial lines and legacy protocols

This architecture allows you to connect HMI/SCADA to a set of PowerLogic protection relays using a multi-drop serial communication link with client-server communication protocols such as Modbus-RTU or IEC 61870-5-103.

The RS485 serial communication port of the PowerLogic protection relay enables simple daisy chaining suited for 2-wire. A termination module is plugged into the last connection.

Data Exchanged Between PowerLogic™ P1F/P1V and SCADA

Protocol	Modbus	IEC 60870-5-103
Real time data		
Measurement	●	●
Alarms and status	●	●
Controls	●	●
Time-stamped events	●	●
Historical data		
Disturbance records	●	-
Sequence of event record files	●	-
Setting management		
Setting group change	●	●
Settings	●	-
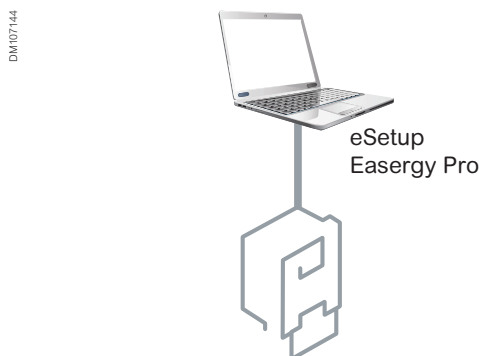
Engineering System

eSetup Easergy Pro

eSetup Easergy Pro (or PowerLogic Studio) can be connected to a single PowerLogic protection relay on the front USB port.

eSetup Easergy Set allows you to prepare the configuration of the relay without having any physical relay. For this purpose, eSetup Easergy Pro provides the latest version of the configuration description file directly from the web.

Serial link
Daisy chain
HMI/SCADA
Relay 1
Relay 2
Relay n (n_{max} = 32)

eSetup Easergy Pro

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PowerLogic™ P1
Product Description

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PowerLogic™ P1 Product Description

PowerLogic™ P1

Presentation

The PowerLogic P1 relays are suitable for the applications where overcurrent and/or earth-fault and voltage protection are required.

PowerLogic P1F and P1V models can be applied to medium and low voltage electrical systems.

PowerLogic relays provide features for easy adaptation to different applications and operation conditions. The P1F and P1V models can be fully configured manually, without using setting software.

Alternatively, eSetup Easergy Pro (or PowerLogic Studio) setting software allows configuration parameters to be modified for a specific application via the USB port.

IEC 60870-5-103 and Modbus RTU integrated communication protocols are available for flexible integration into most substation control or DCS systems.

Close and trip commands can be executed via functional key on the front panel, default menu window, DCS/SCADA system (RS485) or configured binary input.

Three level password gives proper access rights for secure maintenance of the relay.

As a device housed in a small sized flush-mountable case, the P1V and P1F models can be easily installed in all modern, dimension-focused switchgear panels , up to IP54 ingress protection degree.

The relay can be also considered as a cost-effective answer to retrofit demands of older substations.

In P1F we have, for overcurrent protection functionality, selectable measuring criteria: True RMS and/or fundamental frequency (Fourier) current measurements allow to increase selectivity and adapt to the application.

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PowerLogic™ P1F Description
General Overview

Main Features

The following functions are generally available in all devices:

- Operate in 1, 2, or 3-phase arrangement.
- Two setting groups, selected from the relay menu, binary input or SCADA/DCS.
- Flush mounted case.
- Fundamental and True RMS (within a frequency range from 10Hz to 1kHz) phase current value measurement.
- 9 button keypad to input settings, configure the relay and close and trip command and display (graphical).
- Fault record for most recent trips.

The P1F protection relays are comprised of a suite of protection functions as well as auxiliaries. Each function can be individually configured or disabled to suit every kind of application.

All available functions, including protection, automation, communication, LEDs, inputs and outputs, are easily programmable through the user-friendly human machine interface and/or the eSetup Easergy Pro software interface.

The graphical LCD provides the user with key information (faults, measurements, settings, etc.). The menus have a pull-down structure for easy use and quick access to any data. User can switch HMI language directly through the front panel.

8 LEDs (6 freely configurable) indicate the correct operation of the relay as well as other information regarding the protection of the electrical system.

The hardware architecture and software algorithms have been designed to operate on very short failure detection times. Tripping occurs typically within 40 ms.

Application

PowerLogic P1F numerical overcurrent protection relay provides an optimized solution. Typical applications are:

- Utility and industrial substation fitted with cost-optimized MV switchboards
- Retrofit relays of old technology, particularly during installation of DCS systems
- Transformers, incomers, bus couplers, overhead lines and underground cables on MV systems
- Neutral system protection (insulated, solid and resistance earthed)
- LV substations.

Customer benefits

Easy to use
Help to economize your time and money

Flexible
Help to optimize your investment

Reliable
Help to reduce risk and power outage
Strive for sustainability

IEEE device no.	PowerLogic™ P1F functions	Model L & L+	Model N	Model B	Model A	Model E	Model E+
49	Thermal overload (true RMS) 2 independent thresholds (Alarm, Trip)		●	●	●	●	●
50BF	Circuit breaker failure	●	●	●	●	●	●
50/51	Three-phase non directional overcurrent 3 independent thresholds (21 groups of IDMT curves)	●	●	●	●	●	●
	Switch on to fault (SOTF)			●	●	●	●
	Inrush blocking (2nd harmonic)				●	●	●
	Selective relay scheme logic					●	●
	Blocking logic			●	●	●	●
	Cold Load Pick-Up	●	●	●	●	●	●
50N/51N	Phase-earth non directional overcurrent 2 independent thresholds (21 groups of IDMT curves)	●	●	●	●	●	●
67N/21Y(1)	Directional earth-fault protection (2 stages)						●
46	Negative phase sequence overcurrent					●	●
46BC	Broken conductor detection (I2 / I1)					●	●
79	Auto reclose (4 shots)					●	●
86	Output relay latching	●	●	●	●	●	●
	Binary inputs	0	0	4	4	8	8
	Output relays	3	5	3	7	5	5
	Watchdog contact	1	1	1	1	1	1
	Phase current inputs (0.1-40 In)	3	3	3	3	3	3
	Neutral current input (0.01-2 IN or 0.05-12 IN)	1	1	1	1	1	1
	Neutral voltage input (5-130V)						1
	Circuit breaker supervision				●	●	●
	Trip circuit supervision				●	●	●
	Event recording	● (2)	200	200	200	200	200
	Fault recording	20	20	20	20	20	20
	Disturbance recording				4 s	4 s	3 s
	CB condition monitoring and Counters				●	●	●
	Setting groups	2	2	2	2	2	2
	Time synchronization (via binary input)					●	●
	LCD display	back-lit	back-lit	back-lit	back-lit	back-lit	back-lit
	Mini-USB front port		●	●	●	●	●
	Powering thru mini-USB front port		●	●	●	●	●
	Remote communication (RS485)	● (2)	Modbus / IEC103	Modbus / IEC103	Modbus / IEC103	Modbus / IEC103	Modbus / IEC103
	Measurements	●	●	●	●	●	●
	CB control via front keys / RS485 / Binary input	● / - / -	● / - / -	● / ● / ●	● / ● / ●	● / ● / ●	● / ● / ●

(1) E/F Protection can be set as directional E/F protection or admittance protection

(2) If the relay is equipped with RS485

Thermal Overload (49)

The protection of transformers and cables must consider their particular thermal characteristics.

PowerLogic P1F relays include a thermal replica element based on the true RMS value of the current, up to the 10th harmonic. Alarm and Trip overload thresholds and time constant are programmable to match application requirement.

Functions	Setting range		
	min.	max.	Steps
[49] Thermal overload (Models N, B, A, E and E+)			
Therm. OL ?	Disabled, Enabled		
Itherm	0.1 In	3.0 In	0.01 In
Te (heating)	1 mn	200 mn	1 mn
Tr (cooling)	1 mn	999 mn	1 mn
Theta Trip	50%	200%	1%
Theta Reset Ratio	20%	99%	1%
Theta Alarm ?	Disabled, Enabled		
Theta Alarm	20%	200%	1%

Circuit Breaker Failure (50BF)

The circuit breaker failure protection function verifies the effective opening of the CB using a dedicated undercurrent threshold.

The circuit breaker failure function can be activated by the trip of an internal protection function and/or an external command through the relevant digital input. The circuit breaker failure protection function can also be used to trip upstream circuit breakers.

Functions	Setting range		
	min.	max.	Steps
[50BF] Circuit breaker failure			
CB Fail ?	Disabled, Retrip, Alarm		
CB Fail Time tBF	0.1 s	10 s	0.01 s
I< CBF	0.1 In	2 In	0.01 In
High sensitivity current setting (0.01-2Ien)			
IN< CBF	0.1 Ien	2 Ien	0.01 Ien
Low sensitivity current setting (0.05-12Ien)			
IN< CBF	0.1 Ien	2 Ien	0.01 Ien

PowerLogic™ P1F Description
Protection Function - Setting Ranges

Three-Phase Overcurrent (50/51) & Earth Fault Overcurrent (50N/51N)

Three independent stages are available both for phase and earth fault protection. For the first and second (50/51 only) stages the user may independently select a definite time delay (DMT) or an inverse time delay (IDMT) with different types of curves (IEC, IEEE, RI, RECT, RXIDG, BNP EDF).

Each stage and related time-delay can be programmed to provide adjust selectivity.

The IDMT stages have a selectable reset feature: DMT (0 to 600 s) or an IDMT timer so as to reduce clearance times when intermittent faults occur.

The PowerLogic P1 relays have separate instantaneous and delayed indications for each stage and output relays and LEDs can be configured to indicate the faulted phase(s).

Each protection stage can be disabled, configured to trip a circuit-breaker or to issue an ALARM signal only.

Functions	Setting range		
	min.	max.	Steps
[50/51] Phase overcurrent			
I> ?	Disabled, Trip, Alarm Trip-Inrush Bl (A, E, E+) Trip-Latch (A, E, E+) Trip-Phase A (A, E, E+) Trip-Phase B (A, E, E+) Trip-Phase C (A, E, E+)		
I>	0.1 In	4 In (IDMT) 40 In (DMT)	0.01 In
Delay type	DMT, IEC SI, IEC VI, IEC EI, LTI, STI, RC, RI, IEEE MI, IEEE VI, IEEE EI, US CO2-P20, US CO8, RXIDG, BNP, EDF, US CO2-P40, US CO5, US CO6, US CO7, US, CO9, US CO11, HV_Fuse		
tI>	0.05 s	200 s	0.01 s
I> TMS	0.02	1.50	0.01
I> TD	0.02	100	0.01
I> Reset Delay Type	DT or IDMT		
DT I> tReset	0.00 s	600 s	0.01 s
K (RI)	0.1	10	0.1
I>> ?	Disabled, Trip, Alarm Trip-Inrush Bl (A, E, E+) Trip-Latch (A, E, E+) Trip-Phase A (A, E, E+) Trip-Phase B (A, E, E+) Trip-Phase C (A, E, E+)		
I>>	0.1 In	4 In (IDMT) 40 In (DMT)	0.01 In
Delay type	DMT, IEC SI, IEC VI, IEC EI, LTI, STI, RC, RI, IEEE MI, IEEE VI, IEEE EI, US CO2-P20, US CO8, RXIDG, BNP EDF, US CO2-P40, US CO5, US CO6, US CO7, US CO9, US CO11, HV_Fuse		
tI>>	0.05 s	200 s	0.01 s
I>> TMS	0.02	1.50	0.01
I>> TD	0.02	100	0.01
I>> Reset Delay Type	DT or IDMT		
DT I>> tReset	0.00 s	600 s	0.01 s
K (RI)	0.1	10	0.01
I>>> ?	Disabled, Trip, Alarm Trip-Inrush Bl (A, E, E+) Trip-Latch (A, E, E+) Trip-Phase A (A, E, E+) Trip-Phase B (A, E, E+) Trip-Phase C (A, E, E+)		
I>>>	1 In	40 In	0.01 In
tI>>>	0 s	200 s	0.01 s

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Three-Phase Overcurrent (50/51) & Earth Fault Overcurrent (50N/51N) (cont.)

Three independent stages are available both for phase and earth fault protection. For the first and second (50/51 only) stages the user may independently select a definite time delay (DMT) or an inverse time delay (IDMT) with different types of curves (IEC, IEEE, RI, RECT, RXIDG, BNP EDF).

Each stage and related time-delay can be programmed to provide adjust selectivity.

The IDMT stages have a selectable reset feature: DMT (0 to 600 s) or an IDMT timer so as to reduce clearance times when intermittent faults occur.

The PowerLogic P1 relays have separate instantaneous and delayed indications for each stage and output relays and LEDs can be configured to indicate the faulted phase(s).

Each protection stage can be disabled, configured to trip a circuit-breaker or to issue an ALARM signal only.

Functions	Setting range		
	min.	max.	Steps
[50/51N] Phase-earth non directional overcurrent			
High sensitivity current set			
(0.01-2Ien)			
IN_1 (IN>)	0.01 Ien	0.2 Ien (IDMT) 2.0 Ien (DMT)	0.01 Ien
IN_2 (IN>>)	0.05 Ien	2.0 Ien	0.01 Ien
IN_3 (IN>>>) (E, E+)	0.05 Ien	2.0 Ien	0.01 Ien
Low sensitivity current set			
(0.05-12Ien)			
IN_1 (IN>1)	0.05 Ien	1.2 Ien (IDMT)12 Ien (DMT)	0.01 Ien
IN_2 (IN>>)	0.3 Ien	12 Ien	0.01 Ien
IN_3 (IN>>>) (E, E+)	0.3 Ien	12 Ien	0.01 Ien
[50/51N] Phase-earth non directional overcurrent			
IN_1 (IN>) stage?	Disabled, Trip, Alarm Trip-Inrush Bl (A, E, E+) Trip-Latch (A, E, E+)		
Delay type	DMT, IEC SI, IEC VI, IEC EI, UK LTI, UK STI, UK RC, RI, IEEE MI, IEEE VI, IEEE EI, US CO2-P20, US CO8, RXIDG, BNP EDF, US CO2-P40, US CO5, US CO6, US CO7, US CO9, US CO11, HV_Fuse		
tIN_1 (tIN>)	0.05 s	200 s	0.01 s
IN_1 (IN>) TMS	0.02	1.50	0.01
IN_1 (IN>) TD	0.02	100	0.01
IN_1 (IN>) Reset Delay Type	DT or IDMT		
DT IN_1 (IN>) tReset	0.00 s	600 s	0.01 s
K (RI)	0.1	10	0.1
IN_2 (IN>>) stage?	Disabled, Trip , Alarm Trip-Inrush Bl (A, E, E+) Trip-Latch (A, E, E+)		
tIN_2 (tIN>>)	0 s	200 s	0.01 s
IN_3 (IN>>) stage? (Model E)	Disabled, Trip, Alarm Trip-Inrush Bl (A, E, E+) Trip-Latch (A, E, E+)		
tIN_3 (tIN>>) (Model E)	0 s	200 s	0.01 s

PowerLogic™ P1F Description
Protection Function - Setting Ranges

Switch-on-to-Fault (based on 50/51)

The closing of a circuit breaker might inadvertently lead to a short-circuit fault due to a maintenance ground clamp not yet removed. The PowerLogic P1F relays incorporate a settable switch-on–to-fault protection function. It provides an instantaneous trip over a settable time period after local or remote manual closure.

Inrush current in transformer applications can have an influence on the selectivity of instantaneous trips; the short time-delay (DMT) can therefore be set for this protection element in order to maintain selectivity and make it possible to have a current threshold below any inrush current peak. One independent DMT current stage is available for phase fault protection.

Functions	Setting range		
	min.	max.	Steps
[50/51] SOTF (switch on to fault) (Model B, A and E+)			
SOTF ?	Disabled, Trip, Alarm, Trip with Inrush blocking, Trip Latch		
SOTF	1 In	40 In	0.01 In
tSOTF	0 s	600 s	0.01 s

Inrush Blocking

The 2nd Harmonic Blocking, in PowerLogic P1F, detects high inrush current inflows that occur upon connection of transformers or rotating machines. The function will block the phase overcurrent and earth fault elements (freely selectable).

Functions	Setting range		
	min.	max.	Steps
Inrush Blocking (Model A, E and E+)			
Inrush Blocking	No, Yes, Closing		
2nd Harmonic Ratio	10%	50%	1%
Inrush Reset Time	0 s	200 s	0.01s
Unblock Inrush Time	0 s	200 s	0.01s

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Negative Sequence Overcurrent (46)

The PowerLogic P1F relays (model E, E+) include a programmable function specially designed to detect unbalanced load or fault conditions. The three stages of negative sequence overcurrent have the same setting ranges and time delay as the phase overcurrent.

Functions	Setting range		
	min.	max.	Steps
[46] Negative Sequence Overcurrent			
I2> ?	Disabled, Trip, Alarm, Trip with Inrush blocking (E, E+),Trip Latch (E, E+)		
I2>	0.1 In	4 In	0.01 In
Delay type	DMT, IEC SI, IEC VI, IEC EI, UK LTI, UK STI, UK RC, RI, IEEE MI, IEEE VI, IEEE EI, US CO2-P20, US CO8, RXIDG, BNP EDF, US CO2-P40, US CO5, US CO6, US CO7, US CO9, US CO11, HV_Fuse		
tI2>	0.05 s	200 s	0.01 s
I2> TMS	0.02	1.50	0.01
I2> TD	0.02	100	0.01
Reset Delay Type I2>	DT or IDMT		
DMT tReset I2>	0.00 s	600 s	0.01 s
RTD/RTMS Reset I2>	0.00 s	600 s	0.01 s

Blocking Logic

When PowerLogic P1F relays are used in critical networks, the management of protection relays must take surrounding devices into consideration. Any blocking digital inputs can be independently configured to lock any combination of selected elements (i.e. current stages, thermal replica, etc.). A typical application is to use a dedicated digital input to block the time-delayed settings of phase/earth fault protection in a relay in response to the phase/earth fault start condition of a downstream relay.

This function allows the relays to clear the fault quickly and correctly when used in a cascading scheme.

Broken Conductor (46BC)

A typical unbalanced fault that can occur on the system is an open circuit fault. This fault can arise from broken conductor, discrepancy of one switchgear poles position or blowing of a fuse.

PowerLogic P1F relays (Model E, E+) are able to measure the ratio of negative to positive sequence current (I2/I1). This fully programmable function allows more sensitivity and stability than pure negative sequence measurement

Functions	Setting range		
	min.	max.	Steps
[46BC] Broken Conductor (Model E and E+)			
Broken Cond.?	Disabled, Trip, Alarm, Trip with Inrush blocking (E, E+),Trip Latch (E, E+)		
Ratio I2/I1	20%	100%	1%
tBCond>	0.05 s	200 s	0.01 s
Brkn. Cond I< Block	0.1 In	1 In	0.01 In

PowerLogic™ P1F Description
Protection Function - Setting Ranges

Autorecloser (79)

PowerLogic P1F relays (Model E, E+) include a 4-shot triphase autorecloser. All the programmed protection functions may independently start any of the shots and the user can program which functions are allowed to trip after any of the shots. This makes possible special reclosing cycles e.g. as requested for coordination with fuses in distribution with tapped transformers.

To limit an excessive number of reclosing cycle in a short period of time, a setting can be used to define the maximum number of reclosing cycle allowed in a period of time after first one was detected.

Dead and reclaim times are freely adjustable. A counter stores the number of reclose commands. This information is free locally or remotely. To inform operator that autorecloser has been blocked internally or externally, output relays can be assigned to these signals.

Functions	Setting range		
	min.	max.	Steps
[79] Autoreclose (Model E+)			
Autoreclose ?	Disabled or Enabled		
Dead time tD1	0.01s	600s	0.01s
Dead time tD2	0.01s	600s	0.01s
Dead time tD3	0.01s	600s	0.01s
Dead time tD4	0.01s	600s	0.01s
Reclaim Time tR	0.02s	600s	0.01s
Fast O/C Trip (I>, I>>, I>>>)	Enabled or Disabled for every cycle		
Fast O/C Trip Delay setting	0.00s	9.99s	0.01s
Fast E/GND Trip	Enabled or Disabled for every cycle		
Fast E/GND Trip Delay setting	0.00s	9.99s	0.01s
Close Shot tI>	Enabled or Disabled for every cycle		
Close Shot tI>>	Enabled or Disabled for every cycle		
Close Shot tI>>>	Enabled or Disabled for every cycle		
Close Shot tIN_1 (IN>)	Enabled or Disabled for every cycle		
Close Shot tIN_2 (IN>>)	Enabled or Disabled for every cycle		
Close Shot tIN_3 (IN>>>)	Enabled or Disabled for every cycle		
Close Shot tAUX1	Enabled or Disabled for every cycle		
Close Shot tAUX2	Enabled or Disabled for every cycle		
Inhibit Trip tI>	Enabled or Disabled for every cycle		
Inhibit Trip tI>>	Enabled or Disabled for every cycle		
Inhibit Trip tI>>>	Enabled or Disabled for every cycle		
Inhibit Trip tIN_1 (IN>)	Enabled or Disabled for every cycle		
Inhibit Trip tIN_2 (IN>>)	Enabled or Disabled for every cycle		
Inhibit Trip tIN_3 (IN>>>)	Enabled or Disabled for every cycle		
Inhibit Trip tAUX1	Enabled or Disabled for every cycle		
Inhibit Trip tAUX2	Enabled or Disabled for every cycle		
Ext. CB Faulty Monitoring ?	Yes or No		
Ext. Block via Input?	Yes or No		
Start Dead Time on	Protection Reset or CB trips		
Rolling Demand ?	Yes or No		
Max. cycle number Roll. Dem.	2	100	1
Time period Rolling Demand	1 mn	24 h	1 mn
Time Inhibit on Close tI	0.0 s	600 s	0.01 s
Signaling Reset	No or on Close [79]		

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Trip Via Binary Inputs AUX1, AUX2, AUX3, AUX4

Timers operate if the state of an input mapped to this function changes in such a way that the function will be triggered. Timers can be used for CB tripping or alarm signaling.

This function is available when inputs are energized via an auxiliary power supply.

To upload them, it is possible to use the front USB port (eSetup Easergy Pro and/or PowerLogic Studio) or the rear serial port (DCS). Event records are stored in a non volatile FRAM memory. All events are time-stamped to 1 ms.

Functions	Setting range		
	min.	max.	Steps
Auxiliary timers (Model A, E and E+)			
Aux1 ?	Disabled, Trip, Alarm, Trip-Inrush Bl (A, E, E+), Trip-Latch (A, E, E+), Load Shedding (E, E+), AR after LS Hi (E, E+), AR after LS Lo (E, E+)		
Time-delay tAux1	0	600 s	0.01s
Aux2 ?	Disabled, Trip, Alarm, Trip-Inrush Bl (A, E, E+), Trip-Latch (A, E, E+), Load Shedding (E, E+), AR after LS Hi (E, E+), AR after LS Lo (E, E+)		
Time-delay tAux2	0	600 s	0.01s
Aux3 ?	Disabled, Trip, Alarm, Trip-Inrush Bl (A, E, E+), Trip-Latch (A, E, E+), Load Shedding (E, E+), AR after LS Hi (E, E+), AR after LS Lo (E, E+)		
Time-delay tAux3	0	600 s	0.01s
Aux4 ?	Disabled, Trip, Alarm, Trip-Inrush Bl (A, E, E+), Trip-Latch (A, E, E+), Load Shedding (E, E+), AR after LS Hi (E, E+), AR after LS Lo (E, E+)		
Time-delay tAux4	0	600 s	0.01s

Cold Load Pick-Up

PowerLogic P1F cold load pick-up temporarily raises the setting of selectable stages closer to the lad profile in order to avoid unwanted trips.

The setting value can be increased by 800% for example for a settable duration. To trigger this function, the CB closed position or current criteria are used.

Functions	Setting range		
	min.	max.	Steps
Cold Load PU			
Cold Load PU ?	Disabled or Current+Input or Input (A, E, E+)		
Cold load PU Level	20%	999%	1%
Cold load PU tCL	0s	6000 s	0.1 s
CLPU I>	Yes or No		
CLPU I>>	Yes or No		
CLPU I>>>	Yes or No		
CLPU IN_1 (IN>)	Yes or No		
CLPU IN_2 (IN>>)	Yes or No		
CLPU Itherm (NA)	Yes or No		

Selective Relay Scheme Logic

The PowerLogic P1F relays (Model E, E+) include selective relay scheme logic. A dedicated digital input can temporarily alter the time delay settings in response to the phase/earth fault start condition of a downstream relay.

This function allows the PowerLogic relays to quickly clear the fault when used in a cascade scheme.

Functions	Setting range		
	Min.	Max.	Step
Selective Relay Scheme Logic (Model E+)			
SEL1 ?	Disabled or Enabled		
tSEL1	0.00 s	600.0 s	0.01s
SEL1 tI>>	Yes or No		
SEL1 tI>>>	Yes or No		
SEL1 tIN>>	Yes or No		
SEL1 tIN>>>	Yes or No		
SEL2 ?	Disabled or Enabled		
tSEL2	0.00 s	600.0 s	0.01s
SEL2 tI>>	Yes or No		
SEL2 tI>>>	Yes or No		
SEL2 tIN>>	Yes or No		
SEL2 tIN>>>	Yes or No		

Output Relay Latching (86)

All output contacts may be latched freely.

Latched outputs can be reset via the activation of a logic input, through the front panel interface or by remote communication.

Instantaneous Information

Outputs and LEDs can be programmed with instantaneous information from freely selectable protection elements: with or without latching.

Additionally, every start of a protection element is recorded in the event recorder and the instantaneous recorder.

The instantaneous information is typically generated after the threshold has been exceeded.

Communication and Synchronization

The PowerLogic P1 offers communication protocols allowing its utilization in most network control and data acquisition systems (via Modbus, IEC 60870-5-103). The protocol can be selected in the P1V and P1F mIt has been designed for permanent multi-drop connection through the rear RS485 communication port.

The PowerLogic P1 incorporates an internal clock to allow 1 ms accuracy time tagging of alarms, events, fault and disturbance records. To avoid any drifting of the time-tagging clock, it's necessary to periodically synchronize the relays.

Two Setting Groups

External conditions may require the need for different settings or I/O configuration. The PowerLogic P1 provides two independent setting groups. The active setting group can be switched from the local HMI or due to external conditions (digital input change of state or DCS control).

The two setting groups include protection settings, binary input, output and LED configuration.

Local/Remote Mode of CB Commands

The goal of this feature is to make it possible to block commands sent remotely through communication networks (such as setting parameters, control commands, etc.) that could cause accidents or maloperation during maintenance work performed on site.

The local mode can be set via a digital input assigned to this feature or an RS485. The local mode state can be indicated via the configured LED.

Circuit Breaker/Contactor Command

Circuit breaker control is available from the front panel user interface, optically-isolated inputs and remotely via substation communications. Circuit breaker control is also possible via the function keys (Close/Open).

For contactor application the output contact has to be configured with reverse logic & latching.

It is possible to send a local open/close command through the HMI upon operator confirmation.

Circuit Breaker Condition Monitoring

The circuit breaker condition monitoring features include:

• Monitoring the number of breaker trip operations
• Recording the sum of the broken current
• Monitoring the breaker operating time

An alarm signal is emitted if the above parameters exceed the settable threshold.

Fault & Alarm Recording

The last 20 faults and 5 alarms records are stored inside the PowerLogic P1 relays.

Each fault includes: Record number/ Fault time / Active setting group / Faulted phase / Protection operation / Magnitude of input quantities.

Fault indication helps the user to clearly identify the fault and monitor the relay's settings and operations as all information is available on the relay HMI.

Fault records are stored in a non-volatile FRAM memory.

PowerLogic™ P1F Description

Control and Monitoring Function -
Setting Ranges

Control and Monitoring Functions

Control & monitoring functions		Setting range		
		Min.	Max.	Step
CB Control time	**Models**			
tOpen Pulse min	All models	0.1 s	10 s	0.01 s
tClose Pulse	All models	0.1 s	10 s	0.01 s
Time-delay for Close	Models B, A, E, E+	0.0 s	200 s	0.01 s
Time-delay for faulty CB external signal (Model B, A, E and E+)				
tCB FLT ext		1 s	200 s	1 s
Remote control mode (Model A, E and E+)				
Remote CTRL Mode		Remote only Remote + Local		
[52] Unblock SOTF Time Pulse after CB Close (Model B, A, E and E+)				
52 Unblock SOTF Time		0 s	200 s	0.01 s
Trip Circuit (TC) Supervision (Model A, E and E+)				
TC Supervision ?		No Yes Yes / 52A		
TC Supervision tSUP		0.1 s	10 s	0.01 s
Circuit breaker control and monitoring setting ranges (Model A, E and E+)				
Max CB Open Time	0.01 s	10 s	0.01 s	
Max CB Close Time	0.01 s	10 s	0.01 s	

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Disturbance Records

Disturbance records (P1F model A, E, E+)	
Functions	**Value**
Triggers	Any protection stage selected to trip CB, logical input , remote command
Data	AC input channels Digital input and output states

Functions	Default value	Setting range		
		Min.	**Max.**	**Step**
Pre-fault Time	0.1	0.1	2	0.01
Post-fault Time	0.1	0.1	1	0.01
Max duration time	1	0.10	4 (A, E) 3 (E+)	0.01
Disturb rec Trig	on Inst.	on Trip on Inst.		
Trigger	Start signal of protection selected for tripping Trip signal of protection selected for tripping Logic input (Start Distur.R.)			

Event records (not available in model L without RS485)	
Capacity	200 events
Time-tag	1 millisecond
Triggers	Any selected protection alarm and threshold Logic input change of state Setting changes Self test events

Fault records	
Capacity	20 faults
Time-tag	1 millisecond
Triggers	Any selected protection which trip CB
Data	Fault date Protection thresholds Setting Group AC inputs measurements Fault measurements

Alarm recorder	
Capacity	5 alarm information
Time-tag	1 millisecond
Triggers	Any selected protection which is selected for signaling only (set to Alarm)
Data	Date, hour, origin (any protection alarm)

PowerLogic™ P1V Description
General Overview

Main Features

PowerLogic P1V is a basic numerical relay that helps to provide reliable and effective voltage and frequency protection with automation, control and measurement functions. It may be applied to all low voltage or medium voltage applications as a primary or back-up protection device.

PowerLogic P1V has always been strongly linked to flexible and easy-to-use protection relays. It inherits the well known MiCOM Px10 and VAMP 11V series. With attention to simplicity and cost effectiveness, the PowerLogic P1V becomes the reference for the most efficient devices for standard protection applications.

Thanks to the cost to functionality ratio, the PowerLogic P1V is an innovative solution that is tailored to user's needs and can be applied in any type of low or medium voltage network where voltage or frequency protection is required.

Many selectable options embedded in the relay offer a high level of flexibility in terms of application and maintenance. VT ratio, communication protocol, HMI language or independent settings of hysteresis for under or over-voltage protection are all selectable in the menu. Moreover, only 3 relay models are used to accommodate specific applications and operating conditions. This approach helps optimize the protection to the requirements and helps minimize wasted functionality and cost. A unique list of only 10 model variants (type designations) cover all model, voltage input range and auxiliary power supply options, meaning that ordering and spares holding is simplified for ease of use.

Switchable serial communication (IEC 60870-5-103 or Modbus) allows the device to connect to almost any kind of SCADA system. A front USB port and multilingual HMI makes PowerLogic P1V user-friendly with reduced maintenance costs.

PowerLogic P1V is housed in a standard flush mounting case which can be complemented by two optional accessories:

- Wall mounting adaptor
- Transparent plastic front cover to limit unauthorized access.

Application

PowerLogic P1V is a basic numerical relay provides reliable and effective voltage or voltage and frequency protection with automation, control and measurement functions. Typical applications are:

- LV or MV applications
- Primary or back-up protection device
- Retrofit of electromechanical relay

Customer Benefits

Easy to use
Help economize your time and money

Flexible
Help optimize your investment

Reliable
Help reduce risk and power outage
Strive for sustainability

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IEEE device no.	PowerLogic™ P1V functions	Model L	Model N	Model A
	Phase-to-neutral or phase to phase voltage protection	●	●	●
27	Phase under voltage (AND/OR logic)	●	●	●
59	Phase over voltage (AND/OR logic)	●	●	●
59N	Neutral voltage displacement		●	●
59N	Derived Vo sequence over voltage	●	●	●
47	Negative sequence over voltage		●	●
27D	Positive sequence under voltage			●
81U/81O	Under/Over frequency			●
86	Output relay latching	●	●	●
	Blocking logic		●	●
	Settable hysteresis	●	●	●
	Binary inputs	0	2	6
	Output relays	3	5	7
	Watchdog contact	1	1	1
	Phase voltage inputs	3	3	3
	Neutral voltage		1	1
	Remote communication (RS485)		Modbus / IEC103	Modbus / IEC103
	Mini-USB front port		●	●
	Powering thru mini-USB front port			●
	Event recording		200	200
	Fault recording	20	20	20
	Disturbance recording			4s
	Counters			●
	Setting groups	2	2	2
	Time synchronization (via binary input)			●
	VT Supervision		●	●
	CB Supervision		●	●
	CB control via front keys / RS485 / Binary input	● / - / -	● / ● / -	● / ● / ●

PowerLogic™ P1V Description
Protection Function - Setting Ranges

Three Phase Overvoltage (59)

PowerLogic P1V relays offer three independent stages both for phase and earth fault protection. For the first stage (59) it is possible to set a definite time delay (DT) or an inverse time delay (IDMT) with different types of curves (see below). Each stage and related time delay can be programmed to provide maximum selectivity.

In both functions the first stage reset delay type can be selected between DT or IDMT timer to reduce clearance times when intermittent faults occur. Phase overvoltage protection function (59) can also be configured as the undervoltage function ("OR TRIP", "AND TRIP", "OR Alarm", "AND Alarm" etc.).

The PowerLogic P1V relay has separate instantaneous and delayed indications for each stage. Output relays and LEDs can be configured to indicate the faulted phase(s). Each protection function can be disabled, enabled, configured to trip a circuit breaker or as alarm signal only.

Each protection stage can be selected to Trip the CB (works when all three phases are faulty – AND option, or if in any one phase fault appears – OR option) or to indicate a signal (Alarm) only, there is possibility to choose trip and alarm with blocking option from state of CB contacts (52a).

Functions	Setting range		
	min.	max.	Steps
Overvoltage			
V> ?	Disabled OR Trip, OR Alarm, AND Trip, AND Alarm, OR Trip/52a (N,A), OR Alarm/52a (N,A), AND Trip/52a (N,A), AND Alarm/52a (N,A)		
V> Threshold	5 V 20 V	200 V 720 V	0.1 V 0.1 V
V> Delay Type	DT, IEC_SI, IEC_VI, IEC_EI, IEC_LTI, UK_STI, RECT, RI, IEEE_MI, IEEE_VI, IEEE_EI, CO2_Px20, US_CO8, RXIDG, BPN_EDF, CO2_Px40		
tV> /TMS/TD	0.02 s	200 s	0.01 s
V> Reset Delay Type	DT High State IDMT		
V> DMT tReset	0 s	600 s	0.01 s
V>> ?	Disabled OR Trip, OR Alarm, AND Trip, AND Alarm, OR Trip/52a (N,A), OR Alarm/52a (N,A), AND Trip/52a (N,A), AND Alarm/52a (N,A)		
V>> Threshold	5 V 20 V	200 V 720 V	0.1 V 0.1 V
tV>>	0.02 s	200 s	0.01 s
V>>> ?	Disabled OR Trip, OR Alarm, AND Trip, AND Alarm, OR Trip/52a (N,A), OR Alarm/52a (N,A), AND Trip/52a (N,A), AND Alarm/52a (N,A)		
V>>> Threshold	5 V 20 V	200 V 720 V	0.1 V 0.1 V
tV>>>	0.02 s	200 s	0.01 s

IDMT tripping can be blocked if any DMT stage is started, settings: IDMT interlock by DMT (GLOBAL SETTINGS/O/V ADVANCED column). These settings is common for E/Gnd Fault O/V [59N], Phase O/V [59] and Phase U/V [27].

PowerLogic™ P1V Description
Protection Function - Setting Ranges

Earth Fault Overvoltage (59N)

In the PowerLogic P1V relays the earth fault element operates from a measured (NA) or calculated from phase to neutral or phase to phase voltages (L) earth fault voltage value.

The first earth fault stage has time-delayed characteristics which are selectable between inverse definite minimum time (IDMT) and definite time (DT). The second and third stages have a definite time characteristic only.

Functions	Setting range		
	min.	max.	Steps
Earth fault overvoltage			
VN> ?	Disabled, Trip (measured) (N,A), Alarm (measured) (N,A), Trip (Ua+Ub+Uc), Alarm (Ua+Ub+Uc)		
VN> Threshold	0.5 V	130 V	0.1 V
V> Delay Type	DT, IEC_SI, IEC_VI, IEC_EI, IEC_LTI, UK_STI, RECT, RI, IEEE_MI, IEEE_VI, IEEE_EI, CO2_Px20, US_CO8, RXIDG, BPN_EDF, CO2_Px40		
tVN> /TMS/TD	0.02 s	200 s	0.01 s
VN> Reset Delay Type	DT High State IDMT		
VN> DMT tReset	0 s	600 s	0.01 s
VN>> ?	Disabled, Trip (measured) (N,A), Alarm (measured) (N,A), Trip (Ua+Ub+Uc), Alarm (Ua+Ub+Uc)		
VN>> Threshold	0.5 V	130 V	0.1 V
tVN>>	0.02 s	200 s	0.01 s
VN>>> ?	Disabled, Trip (measured) (N,A), Alarm (measured) (N,A), Trip (Ua+Ub+Uc), Alarm (Ua+Ub+Uc)		
VN>>> Threshold	0.5 V	130 V	0.1 V

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Negative Sequence Overvoltage (47)

This function is used for protection of the system against unbalanced voltage conditions in the network.

It offers two independent stages, first stage V2> can be set for definite time delay (DMT) or an inverse time delay (IDMT) with typical characteristics. Second stage V2>> can be set to definite time delay only.

Functions	Settings	Default settings
Negative sequence overvoltage		
V2> ?	Disabled Trip Alarm Trip/52a Alarm/52a	Disabled
V2> Threshold	5…200 V (step: 0.1 V) 20…720 V (step: 0.1 V)	20 V (for 57...130 Vac) 20 V (for 220...480 Vac)
V2> Delay Type	DT IEC_SI IEC_VI IEC_EI IEC_LTI UK_STI RECT RI IEEE_MI IEEE_VI IEEE_EI CO2_Px20 US_CO8 RXIDG BPN_EDF CO2_Px40	DT
tV2> /TMS/TD	0.02… 200 s (step: 0.01 s)	0.02 s
V2> Reset Delay Type	DT High State IDMT	DT High State
V2>> ?	Disabled Trip Alarm Trip/52a Alarm/52a	Disabled
V2>> Threshold	5… 200 V (step: 0.1 V) 20… 720 V (step: 0.1 V)	40 V (for 57...130 Vac) 40 V (for 220...480 Vac)
tV2>>	0.02… 200 s (step: 0.01 s)	0.02 s

Measurements

The PowerLogic P1V series offers a complete set of measurement functions to replace the conventional metering functions of switchgear and control gear installations.

The measurement functions cover phase and residual voltages, system frequency and harmonics from phase voltages. Basic condition monitoring, breaker wear and voltage transformers.

All measurements are available locally or remotely.

Depending on the configuration of the VTs connected and chosen model, PowerLogic P1V provides full measurements and displays them as true RMS values on the screen:

• Phase-to-neutral voltages Va, Vb, Vc
• Phase-to-phase voltages Vab, Vbc, Vca
• Neutral voltage VN (calculated in model L, measured or calculated in models N and A)
• Frequency (model A)
• Positive sequence of voltage (model A)
• Negative sequence of voltage (models N, A)

Frequency Protection (81O/81U)

The frequency protection function has two possibilities of operation: under-frequency and overfrequency.

Underfrequency is used to detect abnormal, low frequency conditions in comparison to the rated frequency, while overfrequency option can detect abnormal, higher frequency conditions.

The frequency element included in the PowerLogic P1V relay provides six stages of non-directional overfrequency or underfrequency protection with independent time-delay characteristics.

These characteristics are only definite time (DT) characteristic.

Functions	Setting range		
	min.	max.	Steps
Frequency protection			
f1 ?	Disabled		
f2 ?	f> Trip		
f3 ?	f> Alarm		
f4 ?	f< Trip		
f5 ?	f< Alarm		
f6 ?			
f1 Threshold	40 Hz @ 50 Hz	60 Hz @ 50 Hz	0.01 Hz
f2 Threshold	50 Hz @ 60 Hz	70 Hz @ 60 Hz	
f3 Threshold			
f4 Threshold			
f5 Threshold			
f6 Threshold			
tf1	0.1 s	600 s	0.01 s
tf2			
tf3			
tf4			
tf5			
tf6			

Blocking Logic

When PowerLogic P1V is used in a critical network, it must take into consideration all surrounding devices. A locking digital input can be independently configured to lock any combination of selected elements. This function allows the relay to activate quickly and correctly when applied in a cascading scheme.

Relay Output Latching (86)

All relay outputs may be latched freely. Latched outputs can be reset via the activation of a logic input, through the front panel interface or by remote communication.

Instantaneous Information

Outputs and LEDs can be programmed with instantaneous information from freely selectable protection elements: with or without latching. Additionally, every start of a protection element is recorded in the event recorder and the instantaneous recorder. The instantaneous information is typically generated within 30ms after the threshold has been exceeded.

Trip Via Binary Inputs

Binary inputs are freely configured to timers AUX1 - AUX5. When an external voltage triggers the input, the protection function will operate. This external trip functionality may be used with a Buchholz relay or any other protection device.

Two Setting Groups

External conditions may require the need for different settings or input / output configuration. The PowerLogic P1V offers two independent setting groups to make life easy and efficient. The active setting group can be switched from the local HMI or remotely via a digital input state change, or SCADA system command. The two setting groups include protection settings, binary inputs, relay outputs and LEDs.

Input or Output Configuration

All inputs and outputs can be freely configured for available functions (blocking of protection element, LED reset, outputs reset, start, trip of every protection element, etc.). All inputs and outputs can be assigned to any predefined function.

Relay Maintenance Mode

The PowerLogic P1V incorporates direct control of the output relays (without the need to inject any current). This functionality allows the user to quickly check the external wiring of the relay's output contacts for simplified commissioning.

Local/Remote Mode of CB Commands

Local or remote operating mode can be enabled or disabled via a digital input, or via the RS 485 communication port. This operating mode can be indicated via the LED configuration. The goal of this feature is to block commands sent remotely through the communication port (settings, control commends etc.) when in local mode. This minimizes accidents or maloperation during maintenance work on site.

PowerLogic™ P1V Description
Command and Control Functions

Circuit Breaker or Contactor Commands

Depending on the model chosen, circuit breaker control is available from:

- Front panel user interface (open/close)
- Optically isolated digital inputs
- Remote substation communication.

Circuit Breaker Condition Monitoring

The circuit breaker condition monitoring features include:

- Monitoring the number of breaker trip operations
- Monitoring the breaker operating time

An alarm signal is emitted if the above parameters exceed the settable threshold.

Self Monitoring

Comprehensive self-monitoring procedures within the P1V aim to identify possible issues before they cause malfunction.

A functional self-test is carried out whenever the auxiliary voltage is turned on.

The result of the diagnostics is stored in non-volatile memory and determines whether the protection unit will be blocked, alarmed, or healthy.

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Base Unit Description
Local HMI

Presentation

All functions, including protection, automation, communication, LEDs, inputs and outputs, can be programmed and modified using the front panel user interface (Human Machine Interface).

The LCD informs the user about settings, measurements & faults with a pull-down menu structure allowing easy and quick access to any data.

Working Language

The relay display language can be changed in the menu system.

All the texts and messages displayed on HMI are available in:

• **P1F**: English/German/French/Spanish/Russian/Turkish /Regional. (Polish or Portuguese can overwrite on "Regional")

• **P1V:** English/German/French/Spanish/Turkish

Wiring

External connections are made via screw terminals. The screw terminals allow connection of threaded wires of up to 2.5 mm^2 or solid wires of 4 mm^2 of conductor cross section, with the exception of current terminals that have up to 4mm^2 for threaded wires and 6mm^2 for solid wires

Type port	Physical link	Connectors	Data rate	Comms. mode	Protocol
RS485	Screened twisted pair	Screws or snap-on	4800 or 9600 or 19200 or 38400 or 57600 or 115200 (default:19.2 kbit/s)	Data Bit: 8 Stop bit: 1/ 2 Parity: None/Odd/Even Address: 1 to 247	Modbus RTU, IEC 60870-5-103, Modbus PO (selectable in menu)
USB	USB2.0	PC: type A male PowerLogic P1: type mini B male	4800 or 9600 or 19200 or 38400 or 57600 or 115200 or 187500 kbits/s	Data Bit:8 Stop bit: 1 Parity: None Address: 1	GetSet default Modbus RTU IEC 60870-5-103

Base Unit Description
Front and Rear Panel Description

Front Panel Description

1 – **Red "Trip" LED**

2, 3, 4, 5, 6, 7, – **Freely programmable LED (second LED is yellow, rest of them red)**

8 – **Green "Healthy" LED (Watchdog)**

9 – **Display (graphic liquid crystal display - LCD)**

10 – **Home key**

11 – **Reset/Clear key**

12 – **4 arrow keys, and confirm entry OK key**

13 – **CB Open key**

14 – **CB Close Key**

15 – **Mini USB type B for local connection**
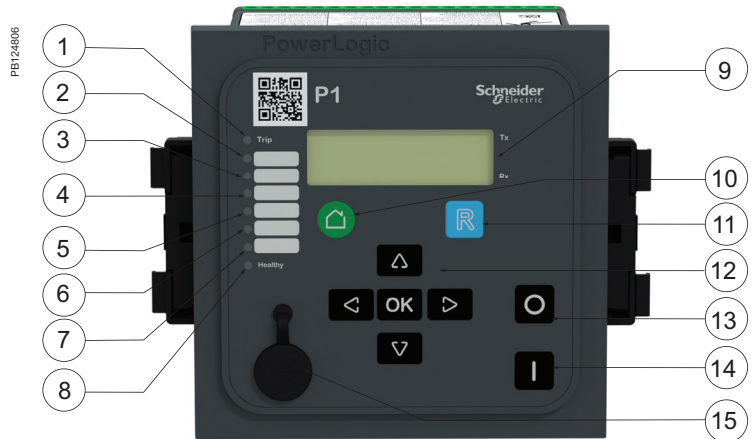
Rear Panel Description

PowerLogic™ P1F	PowerLogic™ P1V
1 Terminal block A:	
Auxiliary voltage Vaux	Auxiliary voltage Vaux
Output contacts: WD, RL1-RL3	*Output contacts:* WD, RL1-RL3
Binary inputs: L1, L2	*Binary inputs:* L1, L2
RS485	RS485 **(models N, A)**
2 Current ring terminal block B	
Output contacts RL6, RL7 **(model A)** or RL4, RL5 **(model E, E+)**	*Output contacts* RL6, RL7 **(model A)**
Binary inputs: L3, L4 **(model A)** or L5, L6, L7, L8 **(models E, E+)**	*Binary inputs:* L3, L4, L5, L6 **(model A)**
3 Terminal block C	
Current analogue inputs (phases & earth)	Phase voltage analogue inputs
Output contacts RL4, RL5 **(models N, A)**	Earth voltage analogue input **(models N, A)**
Binary inputs: L3, L4 **(model E, E+)**	*Output contacts* RL4, RL5 **(models N, A)**

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Base Unit Dimensions
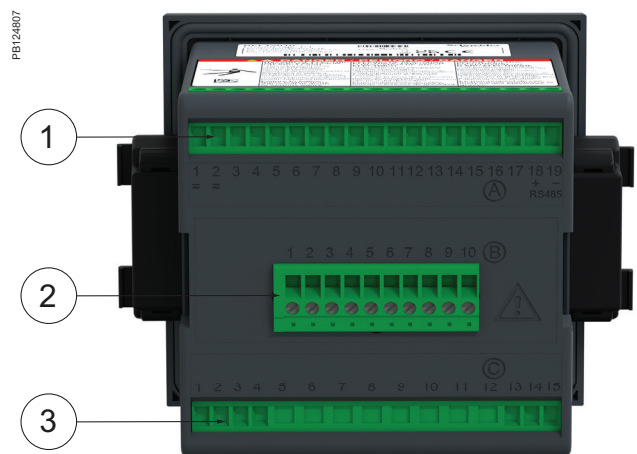
Case

All the models of PowerLogic P1 have a flush mounting plastic case:

Dimensions	
Height	116.5 mm
Width	116.5 mm
Total depth	119 mm
Weight	
PowerLogic P1	approx.0.8 Kg

Wall mounting solution is possible by using the wall mounting adapter (accessories).

Dimensions & Weight

Dimensions of Cut Out

Base Unit Characteristics
Environmental Characteristics
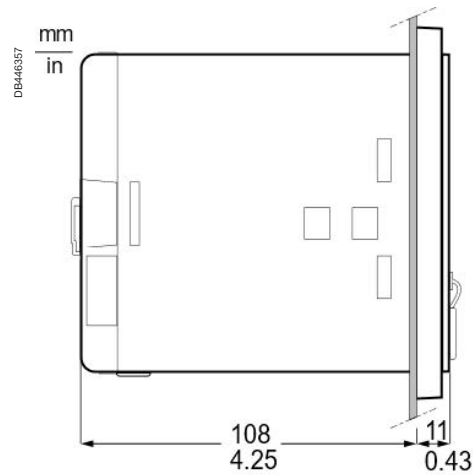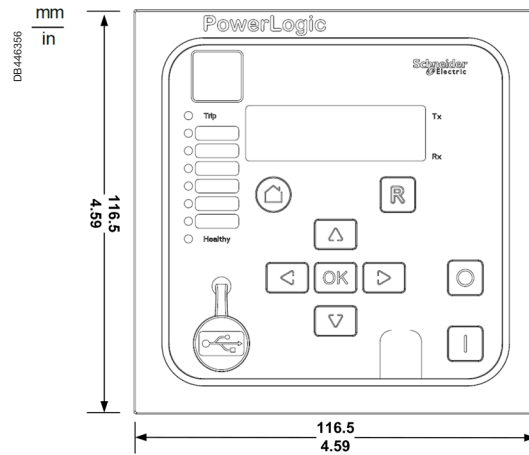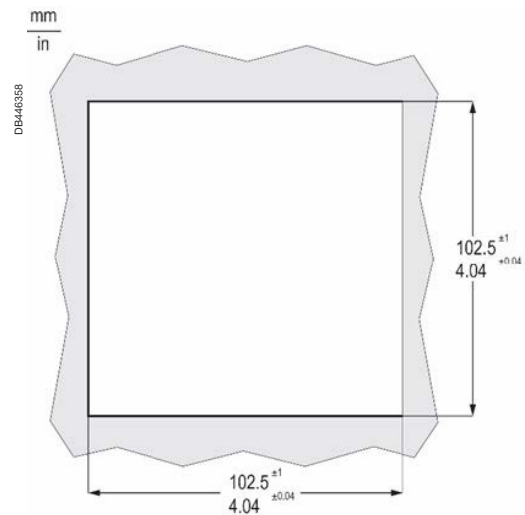
EMC Tests	Standard	Value
Ambient Temperature Range	EN60255-1 EN60068-2-1 EN60068-2-2	*Operating temperature range:* -25...+60 °C (-13...+140 °F) *Short time operation temperature range (<16h):* -30...+70 °C (-22...+158 °F) *Storage and transit:* -30...+70 °C (-22...+158 °F)
Ambient Humidity Range	EN 60068-2-78	21 days at 93% relative humidity and +40 °C 10 days at 93% relative humidity and +60 °C
	EN 60068-2-30	Damp heat cyclic, six (12 + 12) hour cycles, 93% RH, +25...+55 °C
Vibration Test	EN 60255-21-1	Response class 1, 0,5 g_n: 10...150 Hz Endurance class 1, 1 g_n; 10...150 Hz
Shock and Bump	EN 60255-21-2: 1995	Shock response class 1, 5 g_n/11 ms Shock withstand class 1, 10 g_n/16 ms Bump class 1, 15 g_n/11 ms
Seismic	EN 60255-21-3	2 g_n horizontal/1 g_n vertical
Enclosure Protection	EN 60529	IP 40 Protection for relay housing IP 20 Protection for terminals. IP 54 Protection (front panel) against dust and dripping water for flash mounted case.

EMC Directives	Standard
EMC Compliance CE 2014/30/EU	Compliance with the European Commission's EMC Directive Product Specific Standards were used to establish conformity: EN 60255-26: 2009 EN 60255-1: 2010
Safety Objectives for Electrical Equipment CE 2006/95/EC	Compliance with the European Commission's Low Voltage Directive. Compliance is demonstrated by reference to generic safety standards : EN60255-27:2005

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Ratings
Power Supply and Nominal Burden

Auxiliary Power Supply Vx

Nominal auxiliary voltage Vx (ordering options)	24...60 Vdc/24...60 Vac (50/60 Hz) (Models B, A, E and E+) 90...250 Vdc/90...240 Vac (50/60 Hz) (Model B, A, E and E+) 24...250 Vdc/24...240 Vac (50/60 Hz) (Models L, N and E+)
Operating range	19...72 Vdc, 19...66 Vac (Models B, A, E and E+) 71...300 Vdc, 71...265 Vac (Model B, A and E) 19...300 Vdc/19...265 Vac (50/60 Hz) (Models L and N)
Tolerable AC ripple	Up to 15% for a dc supply, per IEC 60255-11

Nominal Burden

	DC values	AC values
Rated Voltage	24...60 V + 10%/- 20% 90...250 V + 10%/- 20%	24...60 V + 10%/- 20% 90...250 V + 10%/- 20%
Ripple content	15%	-
Frequency	-	40...70 Hz
Typical consumption	24 V - 2.5 W 240 V - 2.5 W	24 V - 4.0 VA 240 V - 10.5 VA
Maximum consumption	24 V - 4.0 W 240 V - 4.0 W	24 V - 6.0 VA 240 V - 13.5 VA
Acceptable momentary outages*	24 V - 20 ms 240 V - 1.2 s	24 V - 20 ms 240 V - 2.1 s

(*) Half of the binary inputs and half of the output relays should be energized. Communication modules should be activated (EN 60255-26)

Auxiliary Power Supply Voltage Interruption

0% residual voltage,
5 s (50 Hz), 5 s (60 Hz)
5 s (dc)

Power-up Time for Auxiliary Supply Voltage Only

Time to power up via auxiliary supply: < 0.5 s

Ratings
Current and Voltage Inputs

Frequency (current and voltage inputs)	
Nominal frequency	50 Hz or 60 Hz (selectable in P1V and P1F menu)

Phase current inputs (PowerLogic™ P1F)	
Nominal current (In)	1 A or 5 A (selectable via HMI)
RMS measurement in range	40...1000 Hz
Fundamental harmonic measurement in range	40...70 Hz
Operating range	0.1...40 In
Nominal Burden at In	< 0.3 VA at In=5 A < 0.1 VA at In=1 A
Thermal withstand	1 s @ 100 x rated current 2 s @ 40 x rated current 10 s @ 30 x rated current continuous: 4 x rated current

Earth current inputs (PowerLogic™ P1F)	
Nominal current (Ien):	1 A or 5 A (selectable via HMI)
Fundamental harmonic measurement in range	40...70 Hz
Operating range	Selected at order (Cortec) 0.01...2 Ion 0.05...12 Ion
Nominal Burden at Ion	< 0.3 VA at In=5 A; < 0.1 VA at In=1 A
Thermal withstand	1 s @ 100 x rated current 2 s @ 40 x rated current 10 s @ 30 x rated current continuous @ 4 x rated current
Ion: earth fault input nominal current (Ien)	

Voltage (VN) Analog VT Inputs		
Nominal voltage range		57...130 Vac
Input impedance		40 kOhms
Operation range		5...130 Vac
1st harmonic measurement in range		40...70 Hz
Nominal burden at voltages	57 V	0.08 VA
	100 V	0.25 VA
	110 V	0.3025 VA

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Ratings
Frequency and Current Inputs

Binary inputs (optically isolated inputs)			
Characteristics	**Application to hardware option**	**DC Values**	**AC values**
Operating range	24...60 Vac/dc	19...66 V	19...66 V
	90...240 Vac/250 Vdc	72...275 V	72...264 V
Typical switching threshold	24...60 Vac/dc	13 V	12 V
	90...240 Vac/250 Vdc	42 V	40 V
Maximum polarization current approx.	24...60 Vac/dc	12 mA (66 V)	12 mA (66 V)
	90...240 Vac/250 Vdc	2.5 mA (275 V)	2.5 mA (264 V)
Maximum continuous withstand	24...60 Vac/dc	66 V	66 V
	90...240 Vac/250 Vdc	300 V	264 V
Filtering time	24...60 Vac/dc	30 ms	30 ms
	90...240 Vac/250 Vdc	30 ms	30 ms

Binary input energy consumption		
Logic input burden for Vx	24...60 Vac/dc	R input = approx. 6 kOhms
	90...240 Vac/250 Vdc	R input = approx. 109 kOhms
Logic input recognition time	24...60 Vac/dc	As filtering time + 2 ms
	90...240 Vac/250 Vdc	As filtering time + 2 ms

Ratings
Output Relay Characteristics

Contact ratings	
Contact relay	Dry contact, Ag Ni
Carry capability	5 A continuous
Rated Voltage	250 Vac

Breaking characteristics for RL1, RL3 and WD	
Making capacity	250 V, 30 A, 200 ms 2000 operations
AC breaking capacity	1250 VA resistive (cos ϕ = unity) 1250 VA inductive (cos ϕ = 0.7)
DC breaking capacity	250 Vdc 50 W resistive 30 W inductive (L/R = 40 ms)
Operation time	<10 ms
Durability	
Loaded contact	10000 operations minimum
Unloaded contact	100000 operations minimum

Breaking characteristics for RL4 RL5, RL6, RL7	
AC breaking capacity	1250 VA resistive (cos ϕ = unity) 1250 VA inductive (cos ϕ = 0.7)
DC breaking capacity	250 Vdc 30 W resistive 15 W inductive (L/R = 40 ms)
Operation time	< 10 ms
Durability	
Loaded contact	10000 operations minimum
Unloaded contact	100000 operations minimum

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Connection Diagram
PowerLogic™ P1V

PowerLogic™ P1V Models: L[(1)], N, A

Variant No. 1

Typical connection: 3 phase VTs
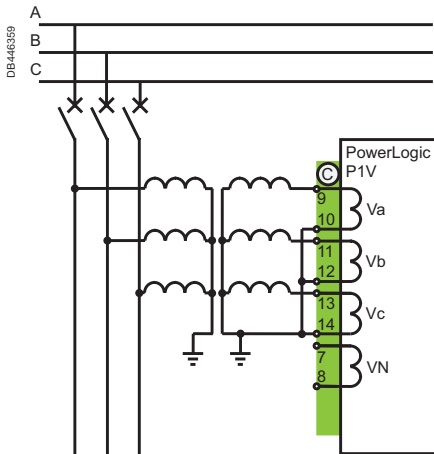
Variant No. 2

Typical connection: 3 phase VTs and VN neutral voltage measured from open delta
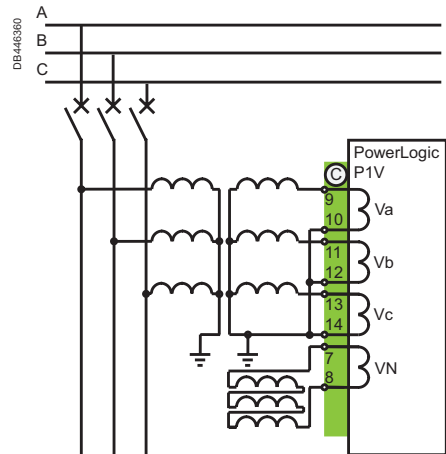
Variant No. 3

Typical connection: 2 phase to phase VTs, and VN neutral voltage measured from open delta
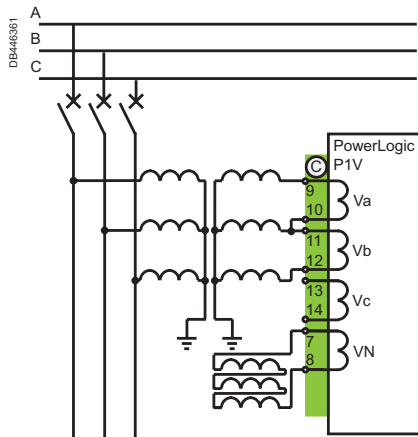
Variant No. 4

Typical connection: 3 phase to phase VTs, and VN neutral voltage measured from open delta
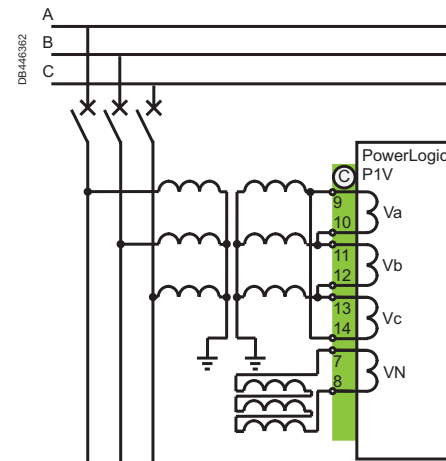
(1) No neutral voltage analog input

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Connection Diagram

PowerLogic™ P1F

PowerLogic™ P1F Models: L, N, B, A, E, E+

Variant No. 1	Variant No. 2

Typical connection 3 phase CTs

Typical connection 2 phase CTs
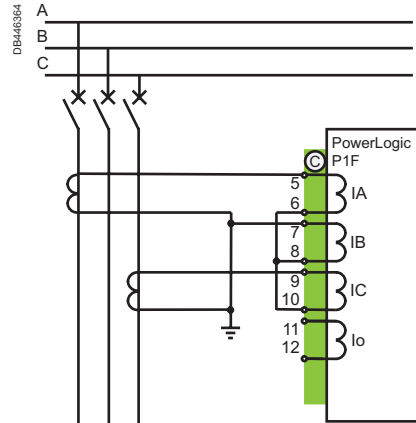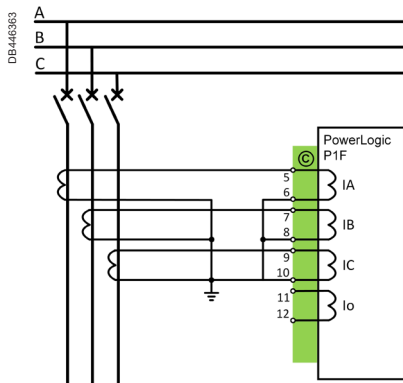
Variant No. 3	Variant No. 4

Typical connection 3 phase CTs, earth fault current measured on the common point of the 3 phase CTs

Typical connection 3 phase CTs, earth fault current measured by core balance CT

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Connection Diagram
PowerLogic™ P1F
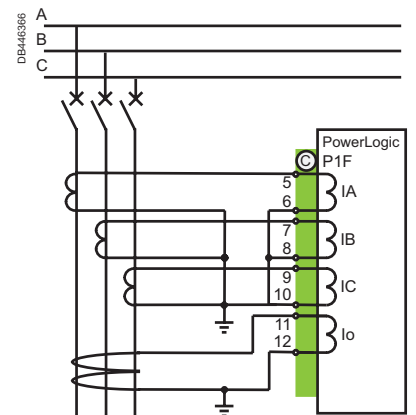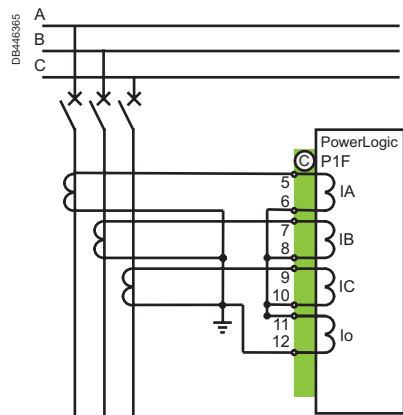
PowerLogic™ P1F Models: L, N, B, A, E, E+

Variant No. 5	Variant No. 6
Typical connection 3 phase CTs	Typical connection 2 phase CTs
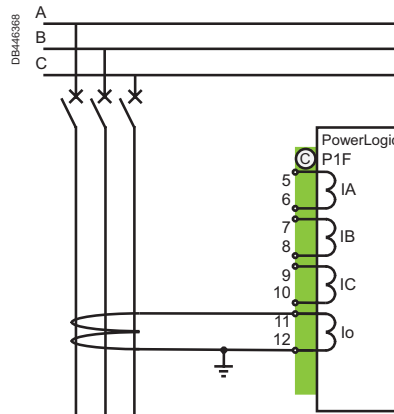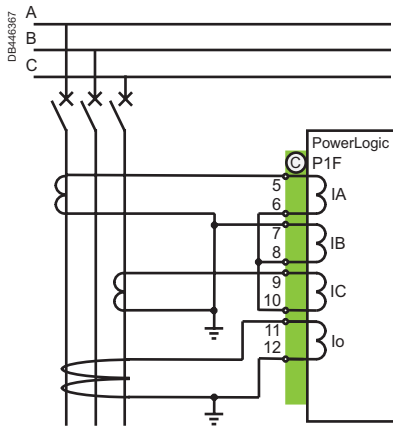
PowerLogic™ P1F model: E+ only

Variant for Neutral voltage 3Vo from open delta connection

Typical connection 3 phase CTs, earth fault CBCT and neutral voltage
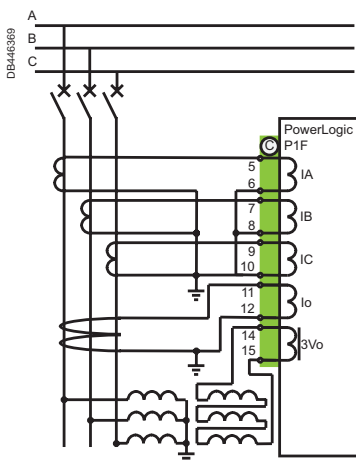
PowerLogic™ Digital Experience

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PowerLogic™ Digital Experience

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PowerLogic™ P1 Software
Presentation

DM105613

eSetup
Easergy Pro

eSetup Easergy Pro

eSetup Easergy Pro offers facilities to set up PowerLogic relays. Intuitive and simple, eSetup Easergy Pro is a user-oriented interface to assist you during the engineering, commissioning and operation of PowerLogic protection relays.

Its streamlined workflow and graphical representations has been designed to smooth your configuration process.

The software is available for download on the Schneider Electric website.

Connect the PC running eSetup Easergy Pro to the USB port of the PowerLogic protection relay during commissioning to adjust the settings and test the relay.
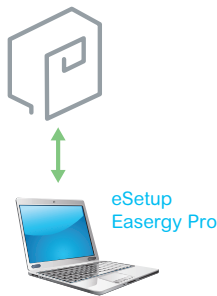
More info and download installation file

on www.se.com

eSetup Easergy Pro
at each step of the digital life

DM105615

Commissioning

Engineering

Operation

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PowerLogic™ P1 Software

Description

During Engineering

- Create the configuration of the PowerLogic P1 relay: select the appropriate options and receive the order code
- Set the characteristics of the CTs, VTs connected to the relay, and select the protection functions that will be activated and their settings
- Map the digital inputs of the relay and different internal signals to the relevant functions, LEDs, and digital outputs, using a straightforward matrix format.
- Complete the setting of additional functions (disturbance recorder, event logging system, clock synchronization, etc.).

During Commissioning

- Connect to the front panel of one single relay
- Open the Digital Inputs menu to check the status of inputs. Reverse the polarity or add a filtering delay if necessary
- Open the Relays menu and force the status change of the output relays in order to check the wiring.

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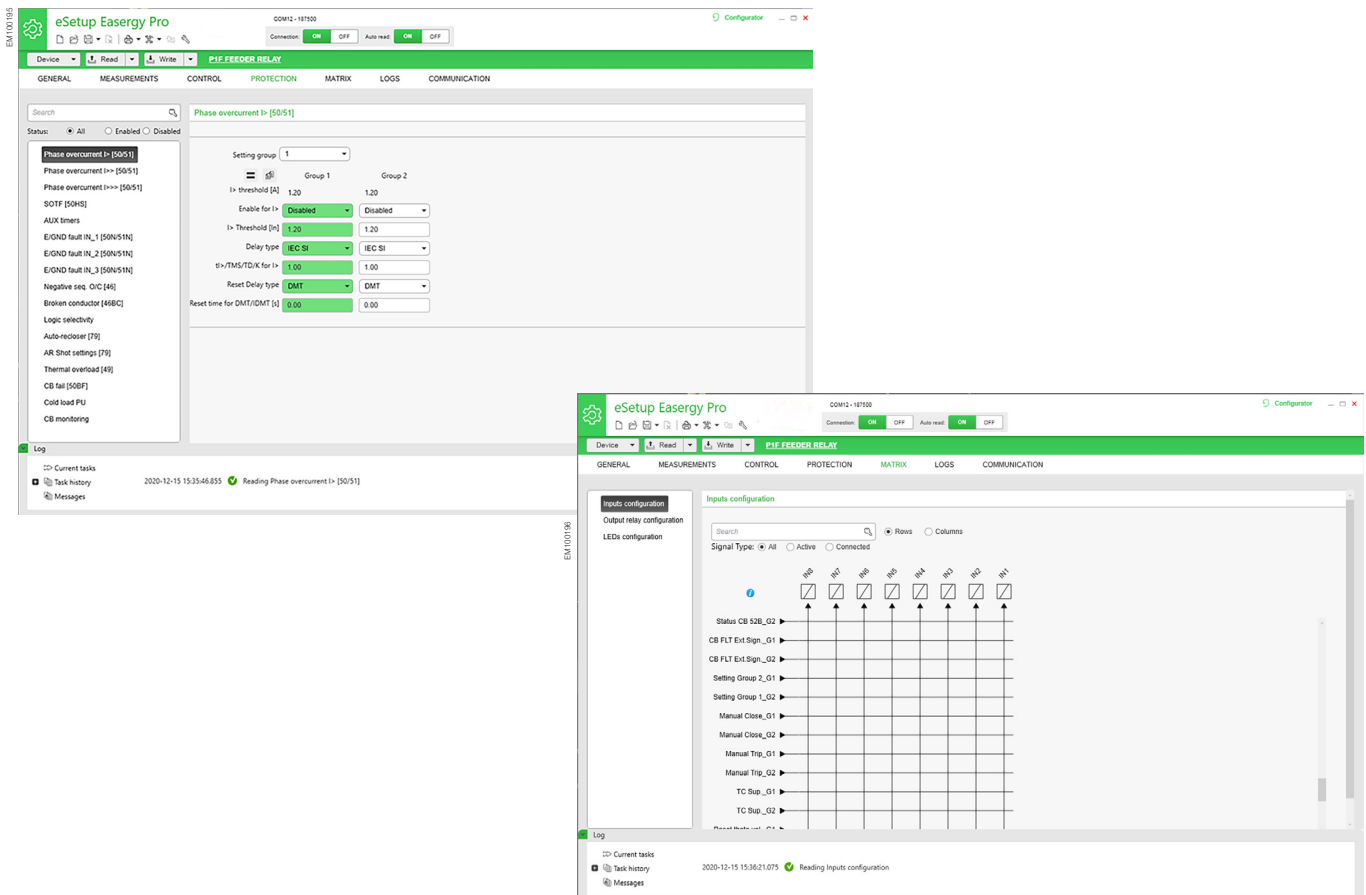
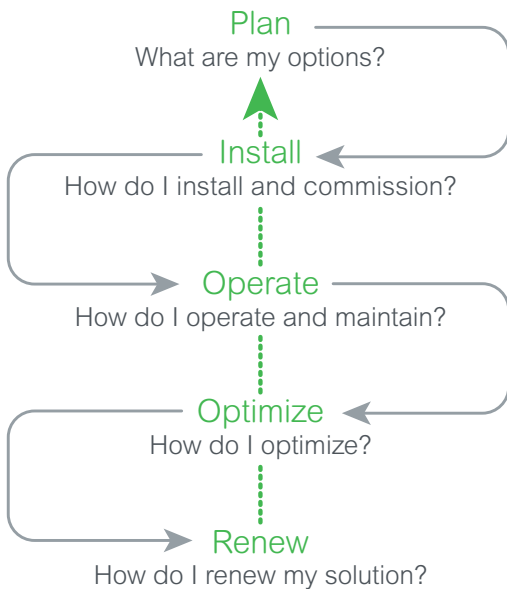# Schneider Electric Services

Schneider Electric Services

Greater Peace of Mind Throughout your Installation Lifecycle

How can you reduce costs and improve performance at the same time?

When it comes to your electrical distribution infrastructure, the answer is straightforward: get professional expertise.

Life cycle services

Plan — What are my options?

Install — How do I install and commission?

Operate — How do I operate and maintain?

Optimize — How do I optimize?

Renew — How do I renew my solution?

When it comes to your electrical distribution installation, we can help you:

- Increase productivity, reliability, and safety
- Mitigate risk and limit downtime
- Keep equipment up to date and extend lifespan
- Cut cost and increase savings
- Improve your return on investment

CONTACT US!

www.se.com

Plan

Schneider Electric helps you plan the design and execution of your solution, looking at how to make your process more dependable and optimize time:

- **Technical feasibility studies:** Design solution in your environment.
- **Preliminary design:** Accelerate turnaround time to reach a final solution design.

Install

Schneider Electric will help you to install more efficient, more reliable and safer solutions based on your plans:

- **Project management:** Complete your projects on time and within budget.
- **Commissioning:** Ensure your actual performance versus design, through on-site testing and commissioning, and tools and procedures.

Operate

Schneider Electric helps you maximize your installation uptime and control your capital expenditures through its services offering:

- **Asset operation solutions:** Provide the information you need to help: increase safety, enhance installation performance, and optimize asset maintenance and investment.
- **Advantage service plans:** Customize service plans that include preventive, predictive and corrective maintenance.
- **On-site maintenance services:** Deliver extensive knowledge and experience in electrical distribution maintenance.
- **Spare parts management:** Ensure spare parts availability and optimized maintenance budget of your spare parts.
- **Technical training:** Build necessary skills and competencies to properly and safely operate your installations.

Optimize

Schneider Electric proposes recommendations for improved safety, availability, reliability and quality:

- **MP4 electrical assessment:** Define an improvement and risk management program.

Renew

We extend the life of your system while providing upgrades and we can even offer to take full responsibility for the end-of-life processing of old electrical equipment:

- **Retrofit:** Keep up to date and improve the performance of electrical installations.
- **MV product end of life:** Recycle and recover outdated equipment with end-of-life services.

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On-site Condition Maintenance with ProDiag MV Relay

Why Carry Out Diagnostics?

Business competitiveness depends strongly on productivity, and productivity means uptime. On-site condition maintenance, with regular diagnostics, provides a long-term solution to reduce risk of downtime.

Why Perform PowerLogic™ Relay Diagnostics with Schneider Electric?

Schneider Electric offers a complete range of maintenance services to provide you with the necessary level of maintenance for your PowerLogic devices. Having Schneider Electric at your side means our highly qualified personal can perform the right maintenance, while complying with manufacturer procedures and international services.

Diagnosing Protection Relay Tripping Capability

The ProDiag MV Relay diagnostic solution should be used on MV protection relays that have not received any diagnostics within the last four years.

This diagnostic checks the protection relay's conformity against the original product specifications verify if that they meet their goals of:

• Reducing risks by isolating hazardous segments of the network where an electrical fault has been detected
• Maintaining energy availability
• Maximizing uptime by performing in-depth analysis and de-energizing equipment only when necessary
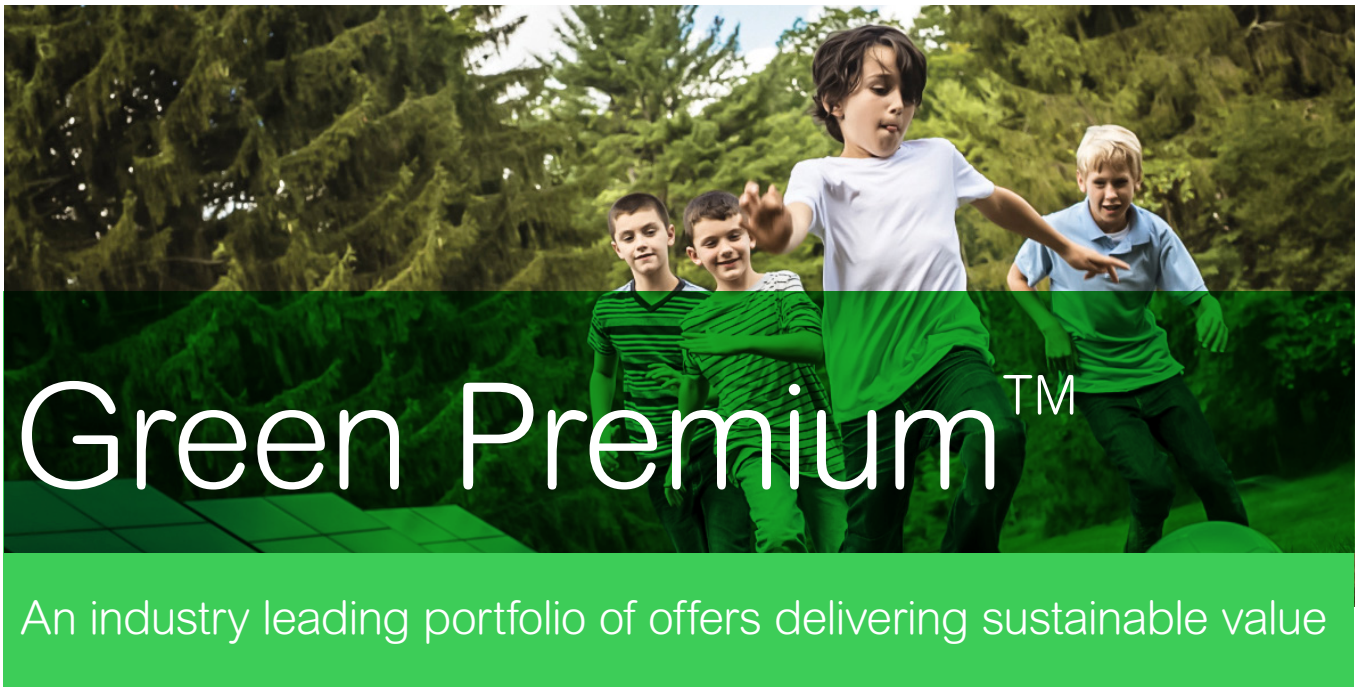
ProDiag MV Relay's Unique Features:

• Automatic download of all protection relay settings through drivers in the ProDiag MV Relay manager
• Easy verification of modifications made to protection settings since the last visit
• Easy verification of MV Relay original technical specifications
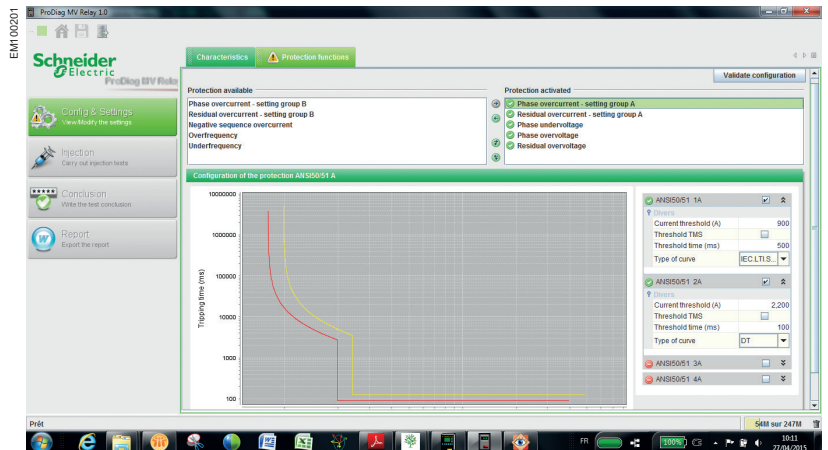
*PEP: Product Environmental Profile (i.e. Environmental Product Declaration)

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Environmental Information with Green Premium™ Ecolabel

Green Premium™

An industry leading portfolio of offers delivering sustainable value

More than 75% of our product sales offer superior transparency on the material content, regulatory information and environmental impact of our products:

- RoHS compliance
- REACh substance information
- Industry leading # of PEP's*
- Circularity instructions

Discover what we mean by green
Check your products!

The Green Premium program stands for our commitment to deliver customer valued sustainable performance. It has been upgraded with recognized environmental claims and extended to cover all offers including Products, Services and Solutions.

CO_2 and P&L impact through… Resource Performance
Green Premium brings improved resource efficiency throughout an asset's lifecycle. This includes efficient use of energy and natural resources, along with the minimization of CO_2 emissions.

Cost of ownership optimization through… Circular Performance
We're helping our customers optimize the total cost of ownership of their assets. To do this, we provide IoT-enabled solutions, as well as upgrade, repair, retrofit, and remanufacture services.

Peace of mind through… Well-being Performance
Green Premium products are RoHS and REACh compliant. We're going beyond regulatory compliance with step-by-step substitution of certain materials and substances from our products.

Improved sales through… Differentiation
Green Premium delivers strong value propositions through third-party labels and services. By collaborating with third-party organizations we can support our customers in meeting their sustainability goals such as green building certifications.

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Notes

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Ordering

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Ordering

Ready-To-Use Configuration

PowerLogic™ P1F Ordering Variants

- Please indicate the Part No. (for example: **REL15000**) to your Schneider Electric correspondent
- For other variants please contact your Schneider Electric correspondent

PowerLogic™ P1F - Feeder				
Language pack 1: English / German / French / Spanish / Russian / Turkish / Portuguese / Polish				
Part No.	Qty.	Designation		
Model L: 4 binary outputs, without binary inputs and communication				
REL15000	☐	Ion = 1A/5A ; 0.01...2 Ion	Vx = 24...240Vac/250Vdc;	P1F1L1N0N92N0NN11N
REL15001	☐	Ion = 1A/5A ; 0.05...12Ion	Vx = 24...240Vac/250Vdc;	P1F1L1N3N92N0NN11N
Model L: 4 binary outputs, without binary inputs, rear RS485 port included				
REL15002	☐	Ion = 1A/5A ; 0.01...2 Ion	Vx = 24...240Vac/250Vdc;	P1F1L1N0N92N1NN11N
REL15003	☐	Ion = 1A/5A ; 0.05...12Ion	Vx = 24...240Vac/250Vdc;	P1F1L1N3N92N1NN11N
Model N: 6 binary outputs, without binary inputs, rear RS485 and front USB port				
REL15004	☐	Ion = 1A/5A ; 0.01...2 Ion	Vx = 24...240Vac/250Vdc;	P1F1N1N0N92N1NN11N
REL15005	☐	Ion = 1A/5A ; 0.05...12Ion	Vx = 24...240Vac/250Vdc;	P1F1N1N3N92N1NN11N
Model B: 4 binary inputs; 4 binary outputs, rear RS485 and front USB port including powering				
REL15006	☐	Ion = 1A/5A ; 0.01...2 Ion	Vx = 24...60 Vac/Vdc	P1F1B1N0N91N1NN11N
REL15007	☐	Ion = 1A/5A ; 0.01...2 Ion	Vx = 90...240 Vac/250 Vdc	P1F1B1N0N92N1NN11N
REL15007R *	☐	Ion = 1A/5A ; 0.01...2 Ion	Vx = 90...240 Vac/250 Vdc	P1F1B1N0N92N1NN11N
REL15008	☐	Ion = 1A/5A ; 0.05...12 Ion	Vx = 24...60 Vac/Vdc	P1F1B1N3N91N1NN11N
REL15009	☐	Ion = 1A/5A ; 0.05...12 Ion	Vx = 90...240 Vac/250 Vdc	P1F1B1N3N92N1NN11N
REL15009R *	☐	Ion = 1A/5A ; 0.05...12 Ion	Vx = 90...240 Vac/250 Vdc	P1F1B1N3N92N1NN11N
Model A: 4 binary inputs, 8 binary outputs, rear RS485, front USB with powering, disturbance recorder				
REL15010	☐	Ion = 1A/5A ; 0.01...2 Ion	Vx = 24...60 Vac/Vdc	P1F1A1N0N91N1NN11N
REL15011	☐	Ion = 1A/5A ; 0.01...2 Ion	Vx = 90...240 Vac/250 Vdc	P1F1A1N0N92N1NN11N
REL15011R	☐	Ion = 1A/5A ; 0.01...2 Ion	Vx = 90...240 Vac/250 Vdc	P1F1A1N0N92N1NN11N
REL15012	☐	Ion = 1A/5A ; 0.05...12 Ion	Vx = 24...60 Vac/Vdc	P1F1A1N3N91N1NN11N
REL15013	☐	Ion = 1A/5A ; 0.05...12 Ion	Vx = 90...240 Vac/250 Vdc	P1F1A1N3N92N1NN11N
REL15013R	☐	Ion = 1A/5A ; 0.05...12 Ion	Vx = 90...240 Vac/250 Vdc	P1F1A1N3N92N1NN11N
REL15023	☐	Ion = 1A/5A ; 0.05...12 Ion	Vx = 90...240 Vac/250 Vdc	P1F1E113N92N1NN11N

* incl. EAC certification

Ready-To-Use Configuration

PowerLogic™ P1F Ordering Variants

- Please indicate the Part No. (for example: **REL15000**) to your Schneider Electric correspondent
- For other variants please contact your Schneider Electric correspondent

PowerLogic™ P1F - Feeder
Language pack 1: English / German / French / Spanish / Russian / Turkish / Portuguese / Polish

Part No.	Qty.	Designation		
Model E: 8 binary inputs; 6 binary outputs, rear RS485, front USB with powering, disturbance rec., auto reclose				
REL15014	☐	Ion = 1A/5A ; 0.01...2 Ion	Vx = 24...60Vac/Vdc	P1F1E1N0N91N1NN11N
REL15015	☐	Ion = 1A/5A ; 0.01...2 Ion	Vx = 90...240Vac/250Vdc	P1F1E1N0N92N1NN11N
REL15016	☐	Ion = 1A/5A ; 0.05...12 Ion	Vx = 24...60Vac/Vdc	P1F1E1N3N91N1NN11N
REL15017	☐	Ion = 1A/5A ; 0.05...12 Ion	Vx = 90...240Vac/250Vdc	P1F1E1N3N92N1NN11N
Model E+: neutral voltage input, 8 binary inputs; 6 binary outputs; rear RS485, front USB with powering, disturbance recorder, auto reclose				
REL15020	☐	Ion = 1A/5A ; 0.01...2 Ion	Vx = 24...60Vac/Vdc	P1F1E110N91N1NN11N
REL15021	☐	Ion = 1A/5A ; 0.01...2 Ion	Vx = 90...240Vac/250Vdc	P1F1E110N92N1NN11N
REL15021R *	☐	Ion = 1A/5A ; 0.01...2 Ion	Vx = 90...240Vac/250Vdc	P1F1E110N92N1NN11N
REL15022	☐	Ion = 1A/5A ; 0.05...12 Ion	Vx = 24...60Vac/Vdc	P1F1E113N91N1NN11N
REL15023	☐	Ion = 1A/5A ; 0.05...12 Ion	Vx = 90...240Vac/250Vdc	P1F1E113N92N1NN11N
REL15023R *	☐	Ion = 1A/5A ; 0.05...12 Ion	Vx = 90...240Vac/250Vdc	P1F1E113N92N1NN11N

PowerLogic™ P1F - Feeder
Language pack 3: English / Chinese Simplified / Korean / Traditional Chinese

Part No.	Qty.	Designation		
Model B: 4 binary inputs; 4 binary outputs, rear RS485 and front USB port including powering				
REL15006C	☐	Ion = 1A/5A ; 0.01...2 Ion	Vx = 24...60Vac/Vdc	P1F1B1N0N91N1NN31N
REL15007C	☐	Ion = 1A/5A ; 0.01...2 Ion	Vx = 90...240Vac/250Vdc	P1F1B1N0N92N1NN31N
REL15008C	☐	Ion = 1A/5A ; 0.05...12 Ion	Vx = 24...60Vac/Vdc	P1F1B1N3N91N1NN31N
REL15009C	☐	Ion = 1A/5A ; 0.05...12 Ion	Vx = 90...240Vac/250Vdc	P1F1B1N3N92N1NN31N
Model E: 8 binary inputs; 6 binary outputs, rear RS485, front USB with powering, disturbance rec., auto reclose				
REL15014C	☐	Ion = 1A/5A ; 0.01...2 Ion	Vx = 24...60Vac/Vdc	P1F1E1N0N91N1NN31N
REL15015C	☐	Ion = 1A/5A ; 0.01...2 Ion	Vx = 90...240Vac/250Vdc	P1F1E1N0N92N1NN31N
REL15016C	☐	Ion = 1A/5A ; 0.05...12 Ion	Vx = 24...60Vac/Vdc	P1F1E1N3N91N1NN31N
REL15017C	☐	Ion = 1A/5A ; 0.05...12 Ion	Vx = 90...240Vac/250Vdc	P1F1E1N3N92N1NN31N

* incl. EAC certification

Ready-To-Use Configuration

PowerLogic™ P1V Ordering Variants

- Please indicate the Part No. (for example: **REL15000**) to your Schneider Electric correspondent
- For other variants please contact your Schneider Electric correspondent

PowerLogic™ P1V - Voltage
Language pack 1: English / German / French / Spanish / Russian / Turkish / Portuguese / Polish

Part No.	Qty.	Designation		
Model L: 3 voltage inputs, 4 binary outputs, without binary inputs and communication				
REL15024	☐	Un = 57...130 Vac	Vx = 24...240 Vac/250 Vdc	P1V1L10N1N2N0NN11N
REL15024R *	☐	Un = 57...130 Vac	Vx = 24...240 Vac/250 Vdc	P1V1L10N1N2N0NN11E
REL15025	☐	Un = 220...480 Vac	Vx = 24...240 Vac/250 Vdc	P1V1L10N2N2N0NN11N
Model N: 4 voltage inputs, 6 binary outputs, 2 binary inputs, rear RS485 and front USB port, communication protocol switchable between IEC 60870-5-103 or Modbus				
REL15026	☐	Un = 57...130 Vac	Vx = 24...60 Vac/dc	P1V1N11N1N1N1NN11N
REL15027	☐	Un = 220...480 Vac	Vx = 24...60 Vac/dc	P1V1N11N2N1N1NN11N
REL15028	☐	Un = 57...130 Vac	Vx = 90...240 Vac/250 Vdc	P1V1N11N1N2N1NN11N
REL15028R *	☐	Un = 57...130 Vac	Vx = 90...240 Vac/250 Vdc	P1V1L10N1N2N0NN11E
REL15029	☐	Un = 220...480 Vac	Vx = 90...240 Vac/250 Vdc	P1V1N11N2N2N1NN11N
Model A: 4 voltage inputs with frequency protection, 8 binary outputs, 6 binary inputs, rear RS485, front USB port with USB powered configuration, communication protocol switchable between IEC 60870-5-103 or Modbus.				
REL15030	☐	Un = 57...130 Vac	Vx = 24...60 Vac/dc	P1V1A11N1N1N1NN11N
REL15031	☐	Un = 220...480 Vac	Vx = 24...60 Vac/dc	P1V1A11N2N1N1NN11N
REL15032	☐	Un = 57...130 Vac	Vx = 90...240 Vac/250 Vdc	P1V1A11N1N2N1NN11N
REL15032R *	☐	Un = 57...130 Vac	Vx = 90...240 Vac/250 Vdc	P1V1A11N1N2N1NN11E
REL15033	☐	Un = 220...480 Vac	Vx = 90...240 Vac/250 Vdc	P1V1A11N2N2N1NN11N

PowerLogic™ P1V - Feeder
Language pack 3: English / Chinese Simplified / Korean / Traditional Chinese

Part No.	Qty.	Designation		
Model A: 4 voltage inputs with frequency protection, 8 binary outputs, 6 binary inputs, rear RS485, front USB port with USB powered configuration, communication protocol switchable between IEC 60870-5-103 or Modbus				
REL15030C	☐	Un = 57...130 Vac	Vx = 24...60 Vac/dc	P1V1A11N1N1N1NN31N
REL15031C	☐	Un = 220...480 Vac	Vx = 24...60 Vac/dc	P1V1A11N2N1N1NN31N
REL15032C	☐	Un = 57...130 Vac	Vx = 90...240 Vac/250 Vdc	P1V1A11N1N2N1NN31N
REL15033C	☐	Un = 220...480 Vac	Vx = 90...240 Vac/250 Vdc	P1V1A11N2N2N1NN31N

* incl. EAC certification

Accessories

PowerLogic™ P1 - Accessories

Part No.	Designation	
REL15039	Wall mounting adaptor for PowerLogic P1	
REL15040	Front cover for PowerLogic P1	
REL15041	Mounting spring clips for PowerLogic P1 (Supplied with the relay)	
REL15042	Mounting screw clamps for PowerLogic P1	

TOOLS

www.se.com

This international web site allows you to access all the Schneider Electric solutions and product information via:

- Comprehensive descriptions

- Range datasheets

- A download area

- Product selectors

You can also access information dedicated to your business and contact your Schneider Electric country support.

Web Selector

This site allows you to access the Schneider Electric products in just two clicks via a comprehensive range of datasheets, with direct links to:

- Complete libraries: technical documents, catalogs, FAQs, brochures

- Selection guides from the e-catalog

- Product discovery sites and their animations

You will also find illustrated overviews, news to which you can subscribe, and a list of country contacts
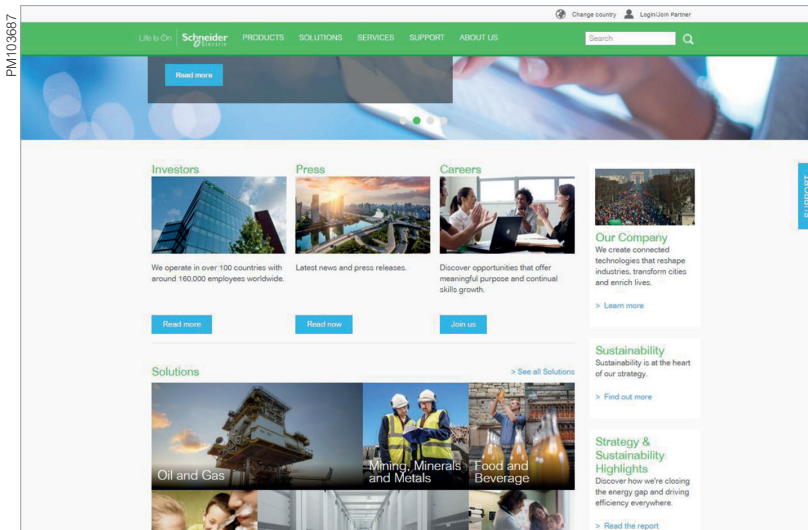
Training

Training allows you to acquire the expertise (installation design, work with power on, etc.) to increase efficiency and improve customer service.

The training catalog includes beginner's courses in electrical distribution, knowledge of MV and LV switchgear, operation and maintenance of installations, and design of LV installations to give a few examples.

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Notes

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As standards, specifications and designs develop from time to time, please ask for confirmation of the information given in this document.

Over 75 % of Schneider Electric products have been awarded the Green Premium ecolabel.

Green Premium™