



PowerLogic™ P3 Standard



PowerLogic™ P3 Advanced

PowerLogic P3 is a family of digital protection relays for distribution networks dedicated to:

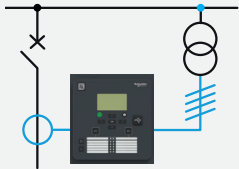
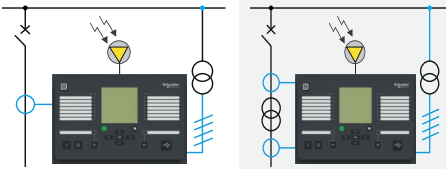
- **Buildings and Industry:**
 - Retail
 - Hotels
 - Healthcare
 - Education and research
 - Transportation
 - Industrial buildings
 - Data Center
- **Utilities - Energy distribution**
- **Large sites:**
 - Oil and Gas
 - Mining
 - Mineral and Metals
 - Water

PowerLogic P3 protection relay is based on proven technology concepts and developed in close cooperation with customers, so it's built to meet your toughest demands. It's available in two sizes to best fit your needs:

- The PowerLogic™ P3 Standard combines protection functions such as directional earth fault for feeder and motor protection in a one-box solution.
- The PowerLogic™ P3 Advanced features a modular design that allows user-defined conventional protection and arc flash protection solutions in both new and existing power distribution systems.

PowerLogic products are designed to be user friendly, a feature that is proven in our customer reports day after day. You'll benefit from features that include:

- A complete set of protection functions, related to the application
- Arc detection (PowerLogic™ P3 Advanced)
- Dedicated circuit breaker control with single-line diagram, push buttons, programmable function key and LEDs, and a customizable alarm
- Multilingual HMI for customized messaging
- Settings tool relay management software for setting parameters, configuring, and network fault simulation
- Both serial and Ethernet communication, including redundancy
- IEC 61850 standard Ed.1 & Ed.2

PowerLogic™ P3 contains		PowerLogic™ P3 Standard		PowerLogic™ P3 Advanced	
Two main devices, each with specific functions to address your needs in a one-box design, regardless of application.					
Feeder					
Transformer					
Motor					
Generator					
Characteristics					
Measuring inputs	Phase current	1/5A CT or LPCT (x3) ⁽⁵⁾		1/5A CT or LPCT (x3) ⁽⁵⁾	1/5A CT (x6)
	Residual current	1/5A CT or 0.2/1A CT or CSH 2A/20A		(1/5A+0.2/1A) CT (1/5A + CSH 2/20A)	2 x (1/5A+0.2/1A) CT, 1 x (1/5A) CT
	Voltage	VT (x1)	VT (x4) or LPVT (x4) ⁽⁵⁾	VT (x4) or LPVT (x4) ⁽⁵⁾	VT (x4)
Arc-flash sensor input		-		Loop sensor: 1 Point sensor: 2, 4 or 6 ⁽¹⁾⁽²⁾	Loop sensor: 1 Point sensor: 2, 4 or 6 ⁽¹⁾
Digital	Input	10/8	14/16	6 to 36	6 to 16
	Output	5/8 + SF	11/8 + SF	10 to 21 + SF	10 to 13 + SF
Analogue	Input	0 or 4 ⁽¹⁾		0 or 4 ⁽¹⁾	
	Output	0 or 4 ⁽¹⁾		0 or 4 ⁽¹⁾	
Temperature sensor input		0 or 8 or 12 ⁽¹⁾		0 or 8 or 12 ⁽¹⁾	
Front port		USB type B		USB type B	
Nominal power supply		24 Vdc or 24...48 Vdc or 38.4...265 Vdc or 48...230 Vac ⁽⁴⁾		24...48 Vdc or 38.4...265 Vdc or 110-240 Vac	
Ambient temperature, in service		-40...60 °C (-40...140 °F)		-40...60 °C (-40...140 °F)	
Communication					
Rear ports		●	●	●	●
RS232, IRIG/B, RS485, Ethernet		●	●	●	●
IEC61850 ed1 & ed2		●	●	●	●
IEC 60870-5-101 & 103		●	●	●	●
DNP3 over Ethernet		●	●	●	●
DNP3 serial		●	●	●	●
Protocols	Modbus serial	●	●	●	●
	Modbus over Ethernet	●	●	●	●
	Ethernet IP ⁽⁶⁾	●	●	●	●
	Profibus DP	●	●	●	●
SPAbus		●	●	●	●
Redundancy protocols (RSTP/PRP)		●	●	●	●
Others					
Control		4 objects 4 displays	4 objects 8 displays	8 objects 3-8 display	
Logic (Matrix + Logic equation)		●		●	
Withdrawable CT connector with shorting		●		-	
Remote HMI		-		●	
Hardware dimensions (W/H/D)		171 x 176 x 214 ⁽³⁾ mm/6.73 x 6.93 x 8.43 in		264 x 177 x 208 mm/10.39 x 6.97 x 8.19 in	

(1) Depends on optional module
 (2) P3L30 can have 1 loop or 2-point sensors only
 (3) 226 mm (8.90 in) with ring-lug connectors
 (4) Check the available power supply range from the device's serial number label
 (5) P3U30, P3F30, P3M30 relays only. Consult us for other models
 (6) Consult us for availability

Protection functions	ANSI code	Feeder (P3U)		Motor (P3U)		Advanced (P3x)						
		P3U20	P3U30	P3U20	P3U30	P3F30	P3L30	P3M30	P3M32	P3G30	P3G32	P3T32
Under-impedance	21G	-	-	-	-	-	-	-	-	2	2	-
Fault locator	21FL	-	1	-	1	1	1	-	-	-	-	-
Overfluxing	24	-	-	-	-	-	-	-	-	1	1	1
Synchro-check	25	-	2	-	2	2	2	2	2	2	2	2
Undervoltage	27	-	3	-	3	3	3	3	3	3	3	3
Positive sequence undervoltage	27P	-	-	-	-	-	-	-	-	2	2	-
Directional active under/reverse power	32R/32L	-	2	-	2	2	2	2	2	2	2	-
Phase undercurrent	37	1	1	1	1	-	-	1	1	-	-	-
Temperature monitoring	38/49T	12 ⁽¹⁾⁽²⁾	12 ⁽²⁾	12 ⁽¹⁾⁽²⁾	12 ⁽²⁾	12 ⁽²⁾	12 ⁽²⁾	12 ⁽²⁾	12 ⁽²⁾	12 ⁽²⁾	12 ⁽²⁾	12 ⁽²⁾
Loss of field	40	-	-	-	-	-	-	-	-	1	1	-
Under-reactance	21/40	-	-	-	-	-	-	-	-	2	2	-
Negative sequence overcurrent (motor, generator)	46	-	-	2	2	-	-	2	2	2	2	2
Incorrect phase sequence	46	-	-	1	1	-	-	1	1	-	-	-
Cur. unbalance, broken conductor	46BC	1	1	-	-	1	1	-	-	-	-	-
Negative sequence overvoltage protection	47	-	3	-	3	3	3	3	3	3	3	3
Excessive start time, locked rotor	48/51LR	-	-	1	1	-	-	1	1	-	-	-
Thermal overload	49	1	1	1	1	1	1	1	1	1	1	1
Phase overcurrent	50/51	3	3	3	3	3	3	3	3	3	3	3
Earth fault overcurrent	50N/51N	5	5	5	5	5	5	5	5	5	5	5
Breaker failure	50BF	1	1	1	1	1	1	1	1	1	1	1
Switch On To Fault (SOTF)	50HS	1	1	1	1	1	1	1	1	1	1	1
Capacitor bank unbalance	51C	2	2	2	2	2	2	2	2	2	2	2
Voltage dependent overcurrent	51V	-	1	-	1	1	1	-	-	1	1	-
Overvoltage	59	-	3	-	3	3	3	3	3	3	3	3
Capacitor overvoltage	59C	1	1	-	-	1	1	-	-	-	-	-
Neutral voltage displacement	59N	3	3	3	3	2	2	2	2	2	2	2
CT supervision	60	1	1	1	1	1	1	1	1	1	2	2
VT supervision	60FL	-	1	-	1	1	1	1	1	1	1	1
Restricted earth fault (high imped.)	64REF/64BEF	1	1	1	1	1	1	1	1	1	1	1
Restricted earth fault (low imped.)	64REF	-	-	-	-	-	-	-	1	-	1	1
Stator earth fault	64S	-	-	-	-	-	-	-	-	1	1	-
Frequent start inhibition	66	-	-	1	1	-	-	1	1	-	-	-
Directional phase overcurrent	67	-	4	-	4	4	4	4	4	4	4	4
Directional earth-fault o/c	67N	3	3	3	3	3	3	3	3	3	3	3
Transient intermittent	67NI	1	1	-	-	1	1	-	-	-	-	-
Magnetizing inrush detection	68F2	1	1	1	1	1	1	1	1	1	1	1
Fifth harmonic detection	68H5	1	1	1	1	1	1	1	1	1	1	1
Pole slip	78PS	-	-	-	-	-	-	-	-	1	1	-
Vector Shift	78 VS	-	1	-	-	-	-	-	-	-	-	-
Auto-recloser	79	5	5	-	-	5	5	-	-	-	-	-
Over or under frequency	81	-	2/2	-	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2
Rate of change of frequency	81R	-	1	-	1	1	1	1	1	1	1	1
Under frequency	81U	-	3	-	3	3	3	3	3	3	3	3
Lockout	86	1	1	1	1	1	1	1	1	1	1	1
Line differential	87L	-	-	-	-	-	2	-	-	-	-	-
Motor/Generator differential	87M/87G	-	-	-	-	-	-	-	2	-	2	-
Transformer differential	87T	-	-	-	-	-	-	-	-	-	-	2
Programmable stages	99	8	8	8	8	8	8	8	8	8	8	8
Arc-flash detection (AFD)		-	-	-	-	8	8	8	8	8	8	8
Cold load pick-up (CLPU)		1	1	1	1	1	1	1	1	1	1	1
Programmable curves		3	3	3	3	3	3	3	3	3	3	3
Setting groups ⁽³⁾		4	4	4	4	4	4	4	4	4	4	4

(1) Temperature sensors optional for P3U20
 (2) Using external RTD module

(3) Not all protection functions have 4 setting groups. See details in the manual.

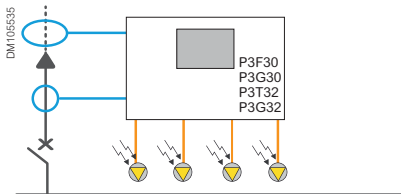
Control functions	Feeder & Motor (P3U)		Advanced (P3x)						
	P3U20	P3U30	P3F30	P3L30	P3M30	P3M32	P3G30	P3G32	P3T32
Switchgear control and monitoring	1/6	6	8	8	8	8	8	8	8
Switchgear monitoring only	2	2	2	2	2	2	2	2	2
Programmable switchgear interlocking	●	●	●	●	●	●	●	●	●
Local control on single-line diagram	●	●	●	●	●	●	●	●	●
Local control with O/I keys	●	●	●	●	●	●	●	●	●
Local/remote function	●	●	●	●	●	●	●	●	●
Function keys	2	2	2	2	2	2	2	2	2
Custom logic (logic equations)	●	●	●	●	●	●	●	●	●
Control with Mobile application	●	●	●	●	●	●	●	●	●
Measurement									
RMS current values	●	●	●	●	●	● ⁽¹⁾	●	● ⁽¹⁾	● ⁽¹⁾
RMS voltage values	●	●	●	●	●	●	●	●	●
RMS active, reactive, and apparent power	-	●	●	●	●	●	●	●	●
Frequency	●	●	●	●	●	●	●	●	●
Fundamental frequency current values	●	●	●	●	●	● ⁽¹⁾	●	● ⁽¹⁾	● ⁽¹⁾
Fundamental frequency voltage values	-	●	●	●	●	●	●	●	●
Fundamental frequency active, reactive, and apparent power values	-	●	●	●	●	●	●	●	●
Power factor	-	●	●	●	●	●	●	●	●
Energy values active and reactive	-	●	●	●	●	●	●	●	●
Energy transmitted with pulse outputs	-	●	●	●	●	●	●	●	●
Demand values: phase currents	●	●	●	●	●	●	●	●	●
Demand values: active, reactive, apparent power and power factor	-	●	●	●	●	●	●	●	●
Min and max demand values: phase currents	●	●	●	●	●	●	●	●	●
Min and max demand values: RMS phase currents	●	●	●	●	●	●	●	●	●
Min and max demand values: active, reactive, apparent power and power factor	-	●	●	●	●	●	●	●	●
Maximum demand values over the last 31 days and 12 months: active, reactive, apparent power	-	●	●	●	●	●	●	●	●
Minimum demand values over the last 31 days and 12 months: active, reactive power	-	●	●	●	●	●	●	●	●
Max and min values: currents	●	●	●	●	●	●	●	●	●
Max and min values: voltages	●	●	●	●	●	●	●	●	●
Max and min values: frequency	●	●	●	●	●	●	●	●	●
Max and min values: active, reactive, apparent power and power factor	-	●	●	●	●	●	●	●	●
Harmonic values of phase current and THD	●	●	●	●	●	● ⁽¹⁾	●	● ⁽¹⁾	● ⁽¹⁾
Harmonic values of voltage and THD	-	●	●	●	●	●	●	●	●
Voltage sags and swells	-	●	●	●	●	●	●	●	●
Logs and Records									
Sequence of event record	●	●	●	●	●	●	●	●	●
Disturbance record	●	●	●	●	●	●	●	●	●
Tripping context record	●	●	●	●	●	●	●	●	●
Monitoring functions									
Trip circuit supervision (ANSI 74)	1	1	1	1	1	1	1	1	1
Circuit breaker monitoring	1	1	1	1	1	1	1	1	1
Relay monitoring	●	●	●	●	●	●	●	●	●

(1) Function available on both sets of CT inputs

Busbar arc protection

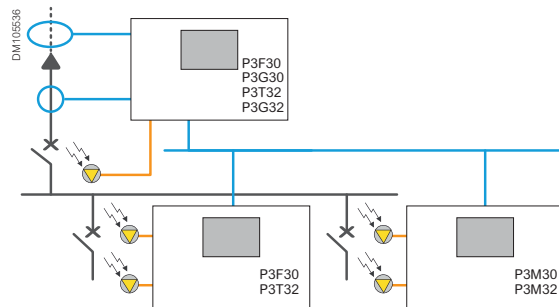
- Arc protection, activated by overcurrent and light signals, or light signals alone

Centralized busbar arc protection



- Up to 4 light point sensors to monitor the busbar

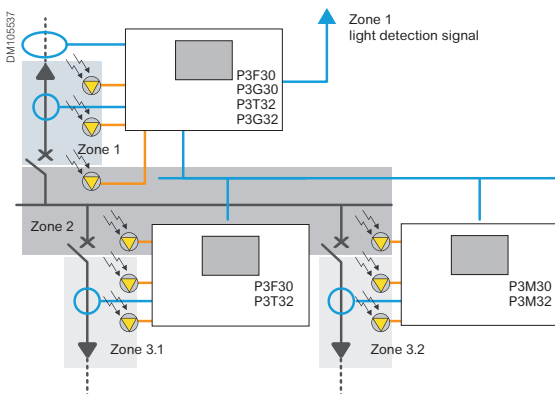
De-centralized busbar arc protection



- Up to 4 light point sensors in each relay
- Transmission of light detection signals via digital I/O or IEC 61850 GOOSE messages

Zone arc protection

- Up to 8 arc protection stages in each relay

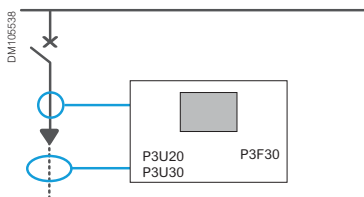


- Light detection in zone 1: signal sent to upstream relay for tripping
- Light detection in zone 2: incomer PowerLogic™ P3 trips, if fault confirmed by overcurrent
- Light detection in zone 3: corresponding outgoing PowerLogic™ P3 trips, if fault confirmed by overcurrent

Outgoing protection

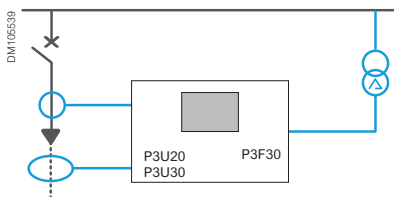
- Feeder overcurrent protection
- Feeder overload protection

Protection of low-capacitance feeders in impedance-earthed or solidly-earthed neutral systems



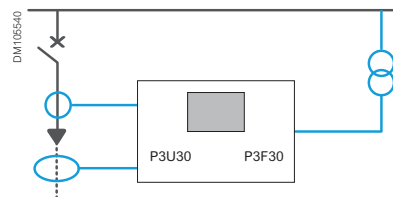
- Feeder earth-fault overcurrent

Protection of high-capacitance feeders in impedance-earthed or compensated or isolated neutral systems



- Directional earth-fault overcurrent
- Transient intermittent earth-fault

Protection of feeders with metering

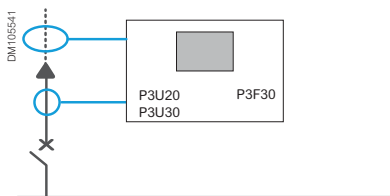


- Power and energy measurement
- Min and max demand values over the last 31 days and 12 months

Incomer protection

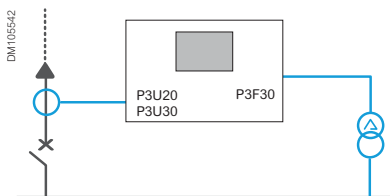
- Busbar overcurrent protection

Incomer protection without voltage monitoring



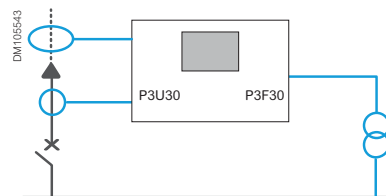
- Earth-fault overcurrent

Incomer protection with voltage and frequency monitoring



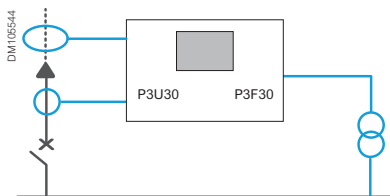
- Neutral voltage displacement protection for isolated system

Incomer protection with voltage and frequency monitoring



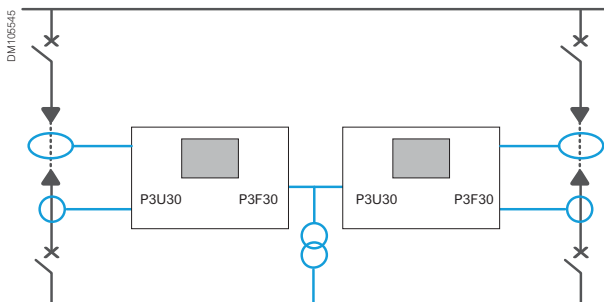
- Under/over voltage
- Frequency, rate of change of frequency

Incomer protection with power quality monitoring



- Voltage and frequency min and max values
- Voltage harmonic values and THD
- Voltage sags and swells

Parallel incomer protection

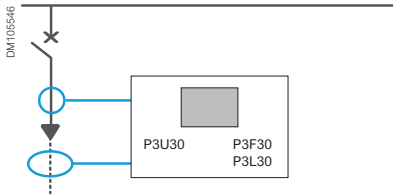


- Directional phase overcurrent
- Directional earth-fault overcurrent

Line protection

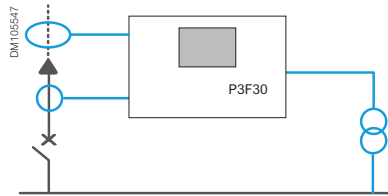
- Overcurrent and earth-fault protection (directional and non-directional)
- Feeder overload protection

Overhead line protection



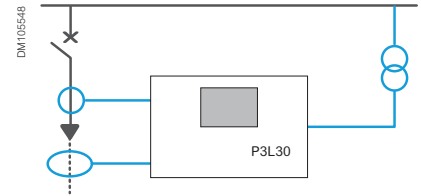
- Recloser
- Feeder fault locator

Incomer protection with fault locator



- Incomer fault locator

Line protection with line differential

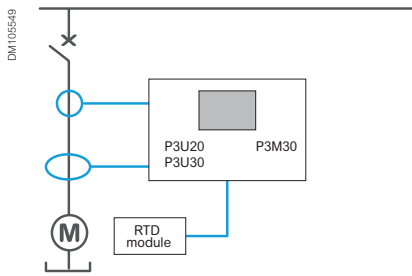


- Line differential protection

Motor protection

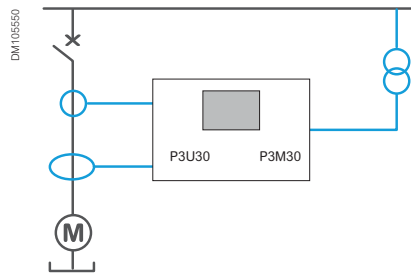
- Motor overcurrent and earth-fault overcurrent
- Thermal overload
- Motor start-up supervision
- Motor restart inhibition

Motor protection without voltage monitoring



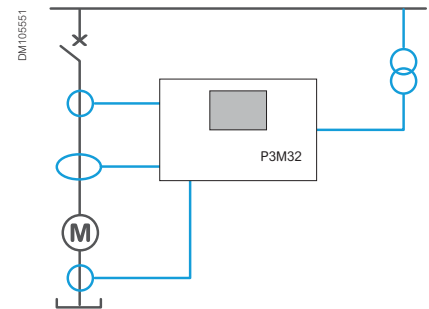
- Temperature measurement (Stator, bearings)

Motor protection with voltage monitoring



- Undervoltage protection

Motor protection with differential function

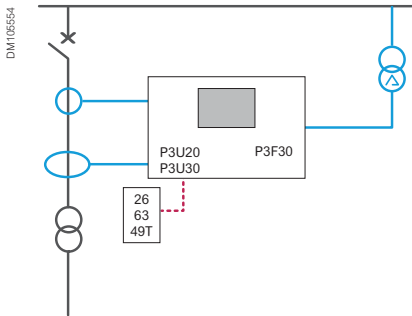


- Differential protection

Transformer feeder protection

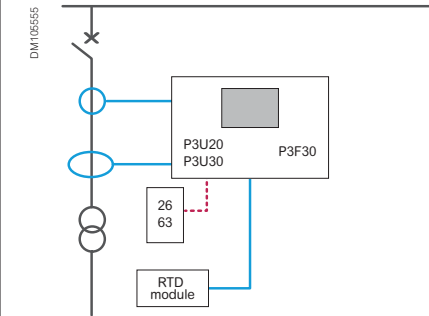
- Transformer overcurrent and earth-fault overcurrent protection
- Thermal overload protection
- External trip from thermostat/Buchholz

Transformer feeder protection



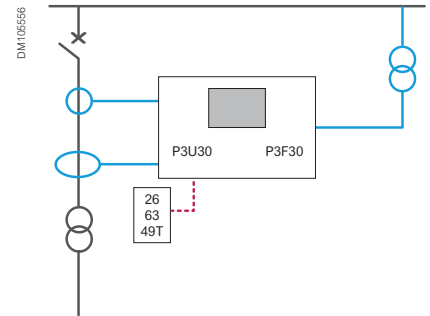
- Directional earth-fault overcurrent for impedance earthed or compensated neutral systems

Transformer feeder protection without voltage monitoring



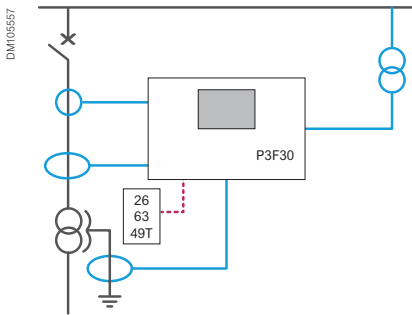
- Temperature measurement (ambient, oil)

Transformer feeder protection with voltage monitoring



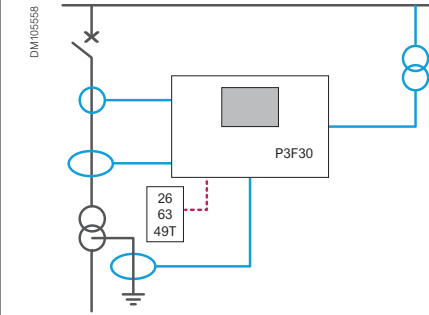
- Over and undervoltage protection

Transformer feeder protection with additional current measurement



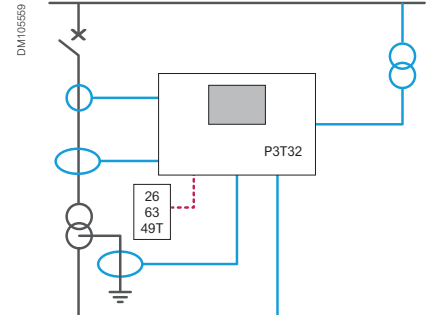
- Tank earth-leakage protection

Transformer feeder protection with differential function



- Earth-fault overcurrent on the secondary side

Transformer feeder protection with differential function

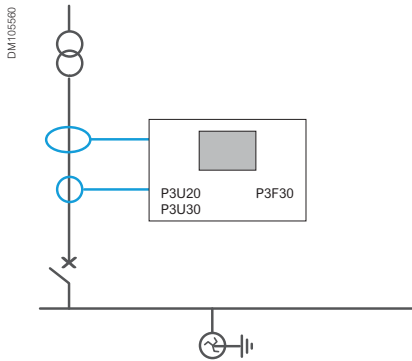


- Differential protection
- Restricted earth-fault protection (high impedance)

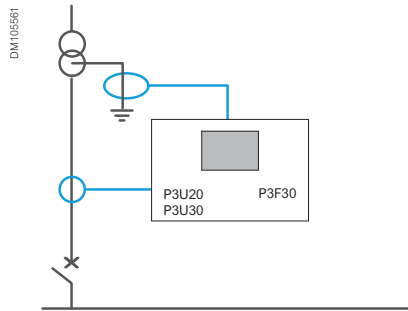
Transformer incomer protection

- Busbar overcurrent protection
- Inter-trip from primary CB protection

Transformer incomer protection without voltage monitoring

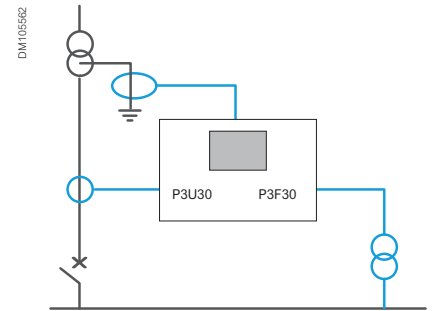


- Transformer earth-fault overcurrent



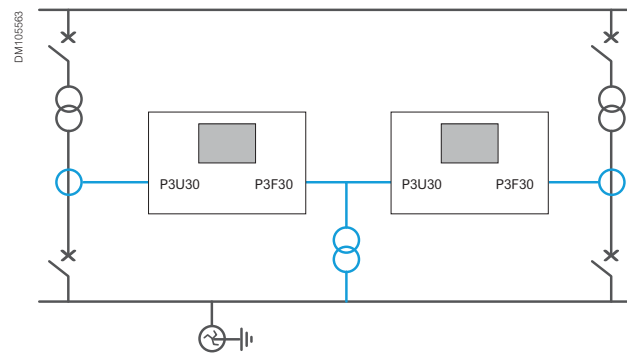
- Earth-fault overcurrent for transformer and back-up protection

Transformer feeder protection with voltage monitoring



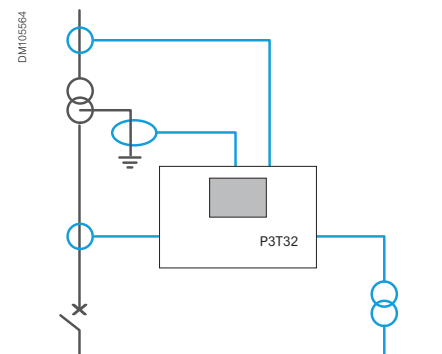
- Over and undervoltage protection
- Power and energy measurement
- Min and max demand values over the last 31 days and 12 months

Parallel transformer incomer protection



- Directional phase overcurrent

Transformer incomer protection with differential function overcurrent

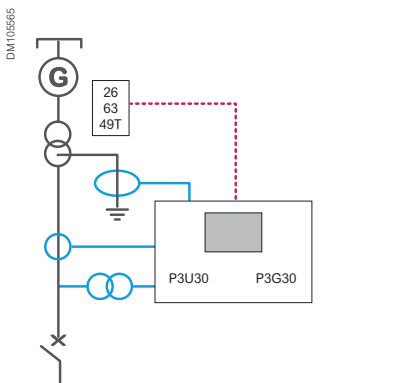


- Transformer differential overcurrent
- Restricted earth-fault overcurrent (high impedance)

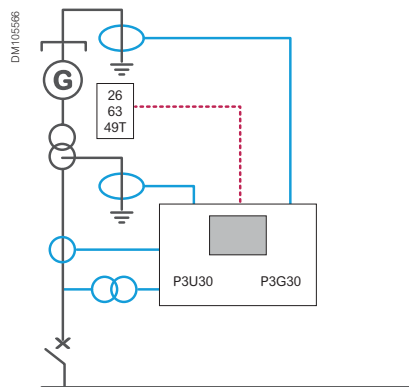
Small generator transformer unit protection

- Overcurrent protection of the supplied network
- Voltage and frequency monitoring
- External trip from thermostat/Buchholz

Protection of a stand-alone generator-transformer unit

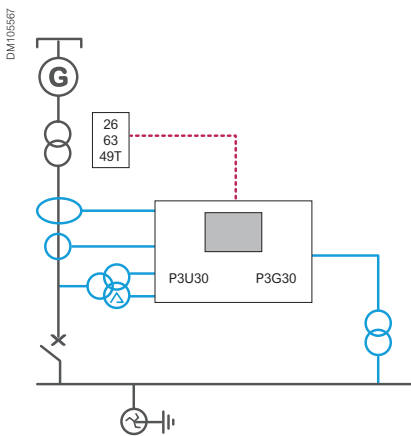


- Earth-fault overcurrent protection of the supplied network
- Note: monitoring of generator insulation must be ensured by another device

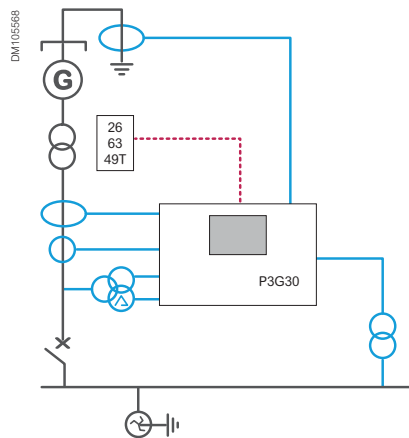


- Earth-fault overcurrent protection of the generator
- Earth-fault overcurrent protection of the supplied network

Protection of a generator-transformer unit coupled to another source



- Earth-fault overcurrent protection of the transformer
 - Neutral voltage displacement to detect transformer earth-fault when CB is open
 - Synchro-check
- Note: monitoring of generator insulation must be ensured by another device

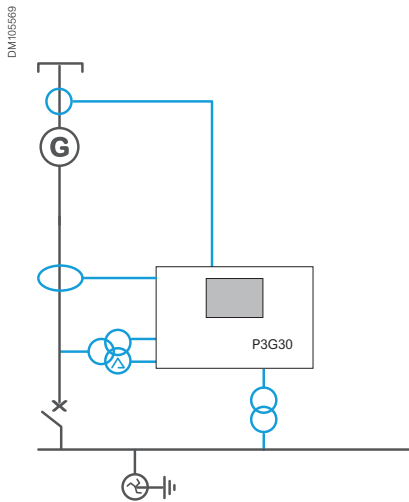


- Earth-fault overcurrent protection of the generator and the transformer
- Neutral voltage displacement to detect transformer earth-fault when CB is open
- Synchro-check

Mid-size generator protection

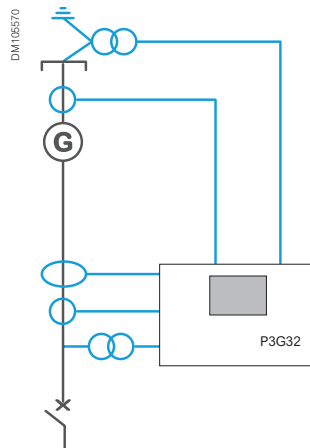
- Under-impedance
- Loss of field
- Voltage and frequency monitoring

Protection of a generator coupled to another source



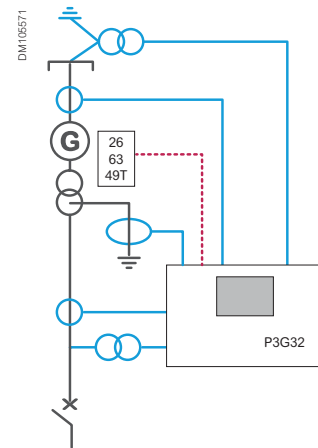
- Earth-fault overcurrent protection of the generator when coupled
- Neutral voltage displacement to detect generator earth-fault when CB is open
- Synchro-check

Generator protection with differential function



- Stator earth-fault detection
- Differential protection

Generator-transformer unit protection with differential function

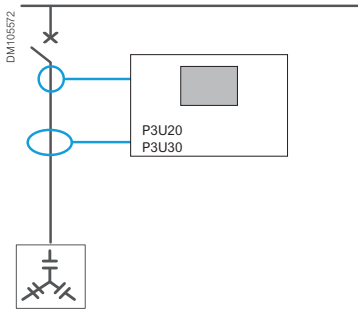


- Stator earth-fault detection
- Differential protection
- Restricted earth-fault protection (high impedance)

Capacitor bank protection

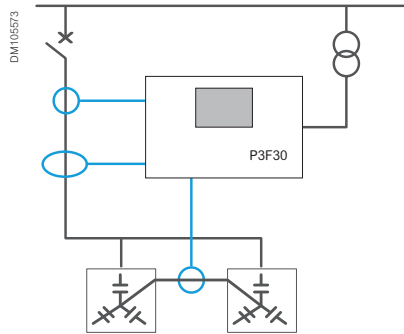
- Capacitor bank overcurrent and earth-fault protection
- Capacitor bank overload protection

Capacitor bank protection without voltage monitoring



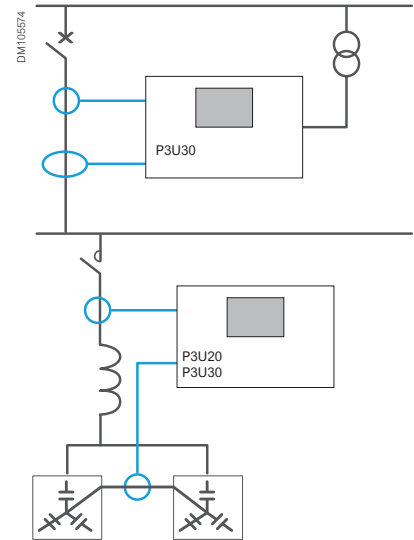
- Capacitor overvoltage protection, based on current measurement and harmonics
- Current harmonic values and THD

Capacitor bank protection with voltage monitoring



- Capacitor bank unbalance
- Overvoltage
- Current and voltage harmonic values and THD

Protection of harmonic filters



- Overvoltage
- Capacitor bank unbalance
- Capacitor overvoltage protection, based on current measurement and harmonics
- Current harmonic values and THD