

# INGEPAC

# PL 70

## Relay Current protection



INGEPAC™ PL70 offers protection for a wide variety of applications.

The PL70 family offers the most characteristic protection functions applicable to electric systems, economic and simple equipments. Apart from the main protection and automation functions (overcurrent, voltage, breaker failure, frequency, phase shift, field loss, autoreclose, synchrocheck), these devices offer a series of additional functions, such as communications, event recording, logic programming, breaker monitoring, etc., making of these machines an economic alternative for the automation of electric systems.

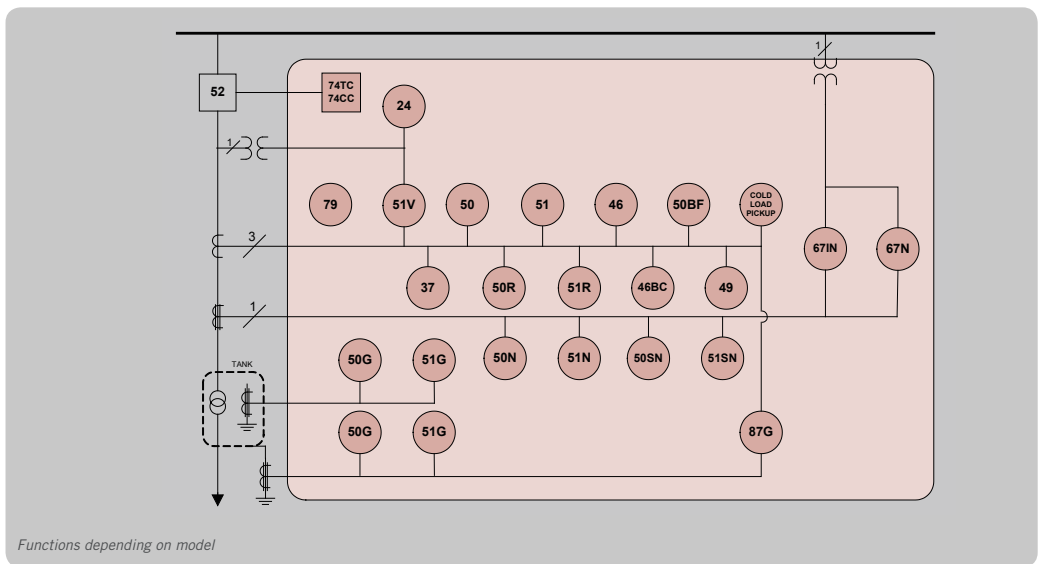
### Software

All of the equipment in the INGEpac™ family can be accessed using powerful software tools developed by Ingeteam and which run on Windows®.

Application software is specifically designed for simple and user-friendly access to the equipment.

INGESAS EFS

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Functions depending on model

### Protection functions

- 50/51, 50/51N Three-phase and earth overcurrent
- 67N Directional neutral overcurrent
- 50/51SN Sensitive neutral detection
- 46 Reverse sequence overcurrent (unbalance)
- 46BC Broken conductor
- 67N Directional isolated neutral overcurrent
- 50/51R Residual overcurrent
- 37 Minimum current
- 49 Thermal image
- 51V Voltage controlled overcurrent
- 50BF Breaker failure
- 87N Restricted earth protection
- 24 Overexcitation
- End fault protection
- Cold load pickup

### Other functions

- 79 Recloser
- Breaker monitoring**
- 74TC/CC trip and close circuit supervision
- Openings, closures, kl2 counter
- Excessive number of trips alarm
- Command failure
- Pulse opening/closure command or change of status detection (latch)
- Flashover
- Data Acquisition Functions**
- Measurements historical report (maximum/minimum)
- Event, fault and oscillographic recorder
- Current measurement (fundamental and sequences), voltage and power measurement, demand maximeter
- Digital inputs and outputs

### Communications

- DB9 RS232 PROCOME protocol front port
- Up to 2 rear ports: RS232, RS485, Glass Fibre Optic, Plastic Fibre Optic, Ethernet
- PROCOME, Modbus, DNP 3.0, IEC60870-5-101 protocols
- Synchronisation**
- Via communications protocol or via demodulated IRIG-B input.
- Local interface**
- Keypad + local display (2 rows x 8 characters)

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# Ingeteam

## Electromagnetic and Insulation

- Measurement of conducted radioelectric emissions in DC power port **IEC60255-25/EN55022**
- Measurement of radiated radioelectric emissions **IEC60255-25/EN55022**
- Insulation resistance test **IEC60255-5**
- Dielectric test **IEC60255-5**
- Impulse voltage test **IEC60255-5**
- Electrostatic discharges immunity test **ENV 50204/IEC 61000-4-2**
- Radiated radiofrequency fields immunity test **ENV 50204/IEC 61000-4-3**
- Electrical fast transients immunity test **IEC61000-4-4**
- Surge immunity test **IEC61000-4-5**
- Conducted disturbances induced by radio-frequency fields immunity test **IEC61000-4-6**
- 50 Hz magnetic fields immunity test **IEC61000-4-8**
- Pulse magnetic fields immunity test **IEC61000-4-9**
- Damped oscillatory magnetic fields immunity test **IEC61000-4-10**
- 50 Hz magnetic fields immunity test **IEC61000-4-17**
- Damped oscillatory waves immunity test **IEC61000-4-18/IEC60255-22-1**
- DC supply voltage polarity inversion, variations, dips and interruptions immunity test **IEC61000-4-29/IEC60255-11**
- Power frequency immunity test **IEC60255-22-7**
- IEEC C37.90-1 SWC Fast Transients Oscillatory Wave

## Climatic

- Cold test **IEC 60068-2-1**
- Dry heat test **IEC 60068-2-2**
- Damp heat test, steady state **IEC 60068-2-78**
- Change of temperature (thermal shock) **IEC 60068-2-14**

## Mechanical

- Vibration test **IEC60255-21-1**
- Shock and bump test **IEC 60255-21-2**
- Seismic **IEC 60255-21-3**

## Main Features

- Wide variety of protection functions in models designed for specific applications
- Intuitive configuration and monitoring software supplied with the equipment. It does not require a previous configuration to communicate with the equipment.
- User-defined logic signals
- Digital inputs and outputs and programmable LED indicators
- Serial and Ethernet communication
- Real time monitoring and recording of the parameters of the breaker
- Events and faults recording
- Automatic reclosing functions
- 4 setting groups for the automatic adaptation of the relay's programming to the grid conditions.
- Synchronisation via demodulated IRIG-B or global reference through communication protocols

## Options

- Connections Connector for pin or ring type terminals
- Field interfaces

Configuration	Digital inputs	Digital outputs	Others
0	2	6	
1	8	11	
2	7	11	IRIG-B

- Power supply; 12 Vcc; 24/48 Vcc; 125/220 Vcc; 220 Vca
- Power supply voltage measurement
- Communications ports All of the pieces of equipment have a front RS232 port for local access and additionally: 1 serial; 2 serial; 1 serial + 1 Ethernet
- Communication ports connection types:
  - Serial: RS232, RS485, Glass Fibre Optic, Plastic Fibre Optic
  - Ethernet: RJ45
- IP54 front lid
- Models by protection functions:
  - PL70IT (3xl phases + 1xl neutral): 50/51, 50/51N, 50/51R, 46, 46FA, 37, 50FI, 79, Cold load, 74TC/CC
  - PL70IS (3xl phases + 1xl neutral): 50/51, 50/51N, 50/51R, 46, 46FA, 37, 50FI, 79, Cold load, 74TC/CC
  - PL70IA (1xl + 1xV): 67NA, 74TC/CC
  - PL70ID (1xl + 1xV): 67N, 50FI, 74TC/CC
  - PL70IP (3xl phases + 1xl neutral): 50/51, 50/51N, 50/51R, 49, 46, 46FA, 87N, 74TC/CC
  - PL70IM (1xl): 50/51, 49, 50FI, 74TC/CC
  - PL70FI (3xl phases + 1xl neutral): 50FI (mono/three-pole), Flashover (by current measurement), End fault, 74TC/CC
  - PL70IV (3xl phases + 1xV): 50/51, 50/51R, 49, 46, 46FA, 51V, 50FI, 74TC/CC

## Applications

- Protection for feeders with or without autoreclose
- Motor protection
- Backup protection for transformers
- Electric machines earthing protection
- Breaker protection
- Isolated neutral grids earthing protection

