

# INGEPAC

# DA PT1 / PT6

Protection relay  
Feeders



**INGEPAC™ DA PT1** and **INGEPAC™ DA PT6** are multifunctional devices that offer a comprehensive solution for protecting and controlling **medium voltage feeders** and **electric motors**.

Due to its **powerful logic programming** and **local and remote access capabilities**, the INGEpac™ DA range offer **high flexibility** for the user, by providing **local and remote operation** and **automatic configurable functions** in the same device. In addition, event recording, fault reports, measurements historical record and oscillography are included in every model.

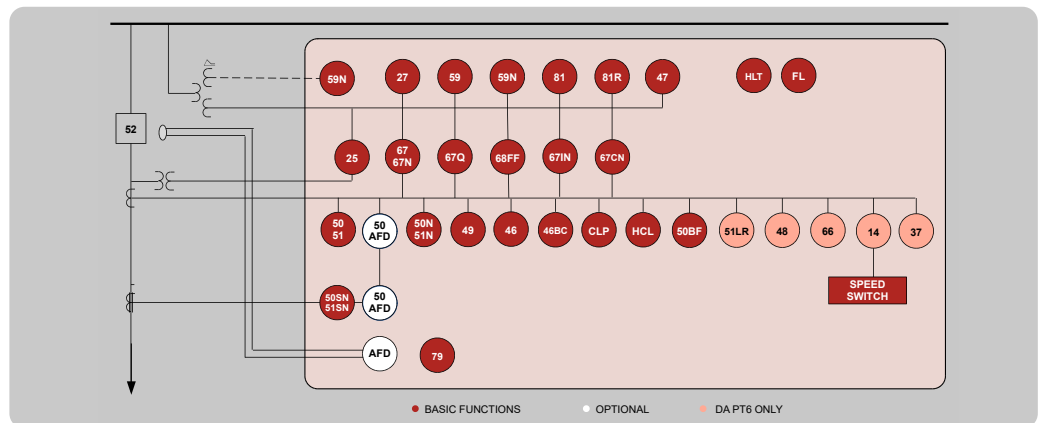
The INGEpac™ DA range is a **cost-effective solution** for protection and control systems for which **IEC 61850** standard compliance is required, including access in other protocols and **web services** as well.

## Software

All INGEpac™ range devices can be set and monitored with powerful software tools by INGETEAM running in a Windows® environment.

This application software has been specifically designed for simple and user-friendly access to the devices.

**INGESYS EFS**



## Protection Functions

50/51 (67)  
50N/51N (67N)  
50SN/51SN. (67SN) (SEF) (optional)  
46TOC (67Q), 46IOC (67Q)  
46BC Broken conductor  
2nd harmonic restraint  
27, 59 Under and overvoltage  
59N Neutral overvoltage  
47 V2 overvoltage  
81M/m  
81R Rate of Change of Frequency (ROCOF)  
HCL High current locking  
CLP Cold load pickup  
HLT Hot Line Tag

49

50BF Breaker failure

## Motor functions (only DA PT6)

51LR Rotor jam  
37  
66 Maximum starting rate  
48 Excessive starting time  
14 Speed switch

## Optic arc-flash protection (optional)

50 ARC

## Fault locator

**Monitoring Units**  
68FF Fuse failure monitoring  
Breaker Monitoring  
ki2 per pole  
Closing and trip circuit monitoring

Excessive number of trips  
Breaker status logic

## Automation

25 Synchrocheck  
79 Auto-reclose  
Sequence coordination

## Data Acquisition Functions

Phase and neutral current  
Phase and synchronism voltage  
Active and reactive power  
Active and reactive energy counters, both directions  
Event recording and fault reports  
Breaker monitoring  
Oscillography  
Measurements historical data record

## Communications

Rear ports: 1 serial RS232/485 and 2 Ethernet  
Protocols: IEC 61850 Ed. 2, DNP 3.0, IEC 60870-5-103, IEC 60870-5-104, Modbus  
Modbus RTU Master protocol for other devices integration  
Web and FTP server  
**Synchronisation**  
IEEE 1588, SNTP and IIRIG-B input  
**Local Interface**  
Keyboard and operational buttons (optional)  
Graphics display (optional)

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**Ingeteam**

## Electromagnetic and Insulation Tests

· Measurements of conducted radioelectric disturbances	EN 55022
· Measurements of radiated disturbance field strength	EN 55022
· Insulation resistance measurement	IEC 60255-5
· Dielectric withstand	IEC 60255-5
· Impulse voltage	IEC 60255-5
· Electrostatic discharge immunity	IEC 61000-4-2
· Radiated radiofrequency electromagnetic field immunity	EN 61000-4-3
· Electrical fast transient/burst immunity	IEC 61000-4-4
· Surge immunity	IEC 61000-4-5
· Immunity to conducted disturbances, induced by radio-frequency fields	IEC 61000-4-6
· Power frequency magnetic field immunity test	IEC 61000-4-8
· Impulse magnetic field immunity	IEC 61000-4-9
· Damped oscillatory magnetic field immunity	IEC 61000-4-10
· Ripple on DC input power port	IEC 61000-4-17
· Damped oscillatory wave immunity	IEC 61000-4-18
· Voltage dips, short interruptions and voltage variations immunity	IEC 61000-4-29
· Power frequency immunity	IEC 60255-22-7
· Withstand to radiated electromagnetic interference from transceivers	IEEE C37.90.2

## Climatic

· Cold	IEC 60068-2-1
· Dry heat	IEC 60068-2-2
· Change of temperature	IEC 60068-2-14
· Damp heat, cyclic	IEC 60068-2-30
· Damp heat, steady	IEC 60068-2-78

## Mechanical

· Vibration	IEC 60255-21-1 / EN 60068-2-6
· Shock and bump	IEC 60255-21-2 / EN 60068-2-27
· Seismic	EN 60255-21-3
· Random vibrations	IEC 60068-2-64

## Main features

- Protection for Medium Voltage feeders and small and medium size motors
- Local operation and setting by means of a graphic display, and remotely through serial and Ethernet protocols
- User-friendly configuration and supervision software. The device data model is integrated automatically to the software when connected, not needing any previous configuration work
- All the main communication protocols used in electrical substations environment are available in all the devices of the INGEpac™ DA range
- Wide range current inputs allowing the same device to be connected to 1 A and 5 A CT secondary.
- User logic signals according to the IEC 61131-3 standard
- Different options for programmable digital inputs and outputs number
- Local signalling through programmable LED indicators
- Circuit breaker and operation monitor
- Fault location
- Faults and events recording
- Secure access using password

## Options

- With display, for flush mounting or without display, for back plate surface mounting
- Supply voltage: 24/48 Vdc or 125/220 Vdc
- Full boards configurations with up to 45 digital inputs and 21 digital outputs, or 36 digital inputs and 26 digital outputs
- PRP/HSR redundant communications
- Optic arc-flash protection (light or light + current), up to 4 inputs for optic sensors INGEpac™ LSD
- Serial and Ethernet communication both copper or fibre optic

## Accessories

- INGEpac™ LSD: fiber optic sensor, point and longitudinal fiber models

## Applications

- Main protection & control in feeders
- Small and medium size motors protection & control
- Arc detection