NP900 Series

Protection, control, measurement and monitoring IEDs

The optimal management of electrical power systems is based in particular on the reliability, availability and communication skills of protection, measurement and automation devices.

As a significant improvement over its NP800 series of relays, ICE has introduced the NP900 series. This new range includes many advanced features such as IEC 61850 communication protocol as standard, a large graphical display, wider measurement ranges and fully customisable logic functions.

Our user friendly configuration software SMARTline (**S**etting, **M**easurement, **A**nalysis, **R**ecording, **T**ime-saving) comprises SMART9 configurator for the NP900s as well as SMARTsoft for NP800s, Railway and Regulation.

This range is designed for the protection of all types of Generation, Industrial, Railway and Distribution networks.

- Comprehensive protection IEDs for feeders, transformers, generators, motors and busbars
- Bay control, alarm, measurement and monitoring IEDs

- IEC 61850 protocol (PRP,HSR)
- Customisable HMI (measurement, display, control, MIMIC)
- PLC (programmable logic functions)

FUNCTIONS

		PROTECTION						
		FEEDER		MACHINE			TRANSFORMER	
Protection functions	ANSI	F910	F915	M910	M915	G915	T916	TA915
Three phase overcurrent protection	50/51	X	X	X	X	X	X	X
(Sensitive) Earth-fault protection	50N/51N	X	X	X	X	X	X	X
Harmonic overcurrent protection / inrush blocking	50H/51H/68H	X	X	X	X	X	X	X
Current unbalance / broken conductor protection	46/46R/46L	X	X	X	X	X	X	X
Cable thermal overload protection	49F	X	X					
Restricted earth fault protection (low-imp) / Cable-end differential protection	87N	X	X	X	X		X	X
Directional three-phase overcurrent protection	67		X		X	X		X
Directional (sensitive) residual overcurrent protection	67N		X		X	X		X
Intermittent earth fault protection	67NT		X		X			
Overvoltage protection	59		X		X	X		X
Undervoltage protection	27		X		X	X		X
Positive sequence under/overvoltage protection	47/27P/59NP		X		X	X		X
Residual voltage protection	59N		X		X	X		X
Frequency protection	81O/81U		X		X	X		X
Rate of change of frequency	81R		X		X	X		X
Vector Jump / surge	78		X			X		X
Reverse/under/over power protection	32/37/32R		X		X	X		X
Differential protection (2-winding transformer, generator, motor)	87T/87M/87G						X	
Transformer thermal overload protection	49T						X	X
Machine thermal overload protection	49M			X	X	X		
Motor start-up supervision element/locked rotor supervision	48/14			X	X			
Restart inhibit / frequent starts	66			X	X			
Undercurrent monitor	37			X	X			
Load jam monitor	51M/51LR			X	X			
Power factor	55				X	X		
Under impedance protection	21					X		X
Voltage controlled/dependent overcurrent protection	51V		X			X		
Loss of field	40					X		
Overexcitation protection	24					X		X
100% stator earth-fault protection	64S					X		
Breaker failure protection	50BF/52BF	X	X	X	X	X	X	X
Programmable functions	99	X	X	X	X	X	X	X
Measuring and monitoring								
Phase and residual currents (IL1, IL2, IL3, I01, I02)		X	X	X	X	X	X	X
Voltage measurements (UL1-UL3, U12-U31, U0, SS)			X		X	X		X
Fault locator	21FL		X					X
Current THD and harmonics (up to 31st)		X	X	X	X	X	X	X
Voltage harmonics (up to 31st)			X		X	X		X
Frequency (f)		X	X	X	X	X	X	X
Power (P, Q, S, pf)			X		X	X		X
Energy (E+, E-, Eq+, Eq-)			X		X	X		X
Circuit breaker wear		X	X	X	X	X	X	X
Disturbance recorder (3.2 kHz)		X	X	X	X	X	X	X
Current transformer supervision		X	X	X	X	X	X	X
Fuse failure	60		X		X	X		X
Trip circuit supervision	74TC	X	X	X	X	X	X	X
Control								
Controllable objects		5	5	5	5	5	5	5
Synchrocheck	25		X			X		X
Auto-reclose	79	X	X					
Zero sequence recloser	79N		X					
Switch onto fault logic		X	X					
Cold-load pick-up block	68	X	X				X	X
Setting groups		8	8	8	8	8	8	8
Automatic voltage regulator	90							X
Lock out relay	86	X	X	X	X	X	X	X
Hardware								
Current inputs		5	5	5	5	5	10	5
Voltage inputs			4		4	4		4
Digital inputs		3	3	3	3	3	3	3
Output relays		5+1	5+1	5+1	5+1	5+1	5+1	5+1
Communication media								
RJ 45 Ethernet 100Mb (front)		X	X	X	X	X	X	X
RJ 45 Ethernet 100Mb and RS 485 (rear)		X	X	X	X	X	X	X
Nb of slots for **Option** hardware		4	3	4	3	3	2	3
8 Digital inputs board		0 to 4	0 to 3	0 to 3	0 to 3	0 to 3	0 to 2	0 to 3
5 Digital outputs board		0 to 2	0 to 2	0 to 2	0 to 2	0 to 2	0 to 2	0 to 2
Arc protection (4 sensor channels + 2 DO + 1 DI)	50Arc/50NArc	0 or 1	0 or 1	0 or 1	0 or 1	0 or 1	0 or 1	0 or 1
8 x RTD input	49RTD	0 to 2	0 to 2	0 to 2	0 to 2	0 to 2	0 to 2	0 to 2
Double LC fiber Ethernet 100Mb HSR/PRP (rear)		0 or 1	0 or 1	0 or 1	0 or 1	0 or 1	0 or 1	0 or 1
Double Ethernet RJ45 - 100Mb HSR/PRP (rear)		0 or 1	0 or 1	0 or 1	0 or 1	0 or 1	0 or 1	0 or 1
mA analog measures (1 input + 4 outputs)		0 to 2	0 to 2	0 to 2	0 to 2	0 to 2	0 to 2	0 to 2
Double ST fiber Ethernet 100Mb (rear)		0 or 1	0 or 1	0 or 1	0 or 1	0 or 1	0 or 1	0 or 1
Double RJ45 Ethernet 100Mb (rear)		0 or 1	0 or 1	0 or 1	0 or 1	0 or 1	0 or 1	0 or 1
RS232 + serial fiber PP/PG/GP/GG (rear)		0 or 1	0 or 1	0 or 1	0 or 1	0 or 1	0 or 1	0 or 1

X: Existing

FUNCTIONS

PROTECTION	CONTROL, MONITORING & MEASURING					
BUSBAR	SIGNAL	BAY CONTROL	POWER	ENERGY		
V911	S914	BC915	P915	E915	ANSI	Protection functions
				Indication	50/51	Three phase overcurrent protection
				Indication	50N/51N	(Sensitive) Earth-fault protection
					50H/51H/68H	Harmonic overcurrent protection / inrush blocking
					46/46R/46L	Current unbalance / broken conductor protection
					49F	Cable thermal overload protection
					87N	Restricted earth fault protection (low-imp) / Cable-end differential protection
				Indication	67	Directional three-phase overcurrent protection
				Indication	67N	Directional (sensitive) residual overcurrent protection
					67NT	Intermittent earth fault protection
X					59	Overvoltage protection
X				Indication	27	Undervoltage protection
X					47/27P/59NP	Positive sequence under/overvoltage protection
X				Indication	59N	Residual voltage protection
X					81O/81U	Frequency protection
X					81R	Rate of change of frequency
X					78	Vector Jump / surge
					32/37/32R	Reverse/under/over power protection
					87T/87M/87G	Differential protection (2-winding transformer, generator, motor)
					49T	Transformer thermal overload protection
					49M	Machine thermal overload protection
					48/14	Motor start-up supervision element/locked rotor supervision
					66	Restart inhibit / frequent starts
					37	Undercurrent monitor
					51M/51LR	Load jam monitor
					55	Power factor
					21	Under impedance protection
					51V	Voltage controlled/dependent overcurrent protection
					40	Loss of field
					24	Overexcitation protection
					64S	100% stator earth-fault protection
X		X			50BF/52BF	Breaker failure protection
X		X			99	Programmable functions
						Measuring and monitoring
		X	X	X		Phase and residual currents (IL1, IL2, IL3, I01, I02)
X		X	X	X		Voltage measurements (UL1-UL3, U12-U31, U0, SS)
		X		X	21FL	Fault locator
		X	X	X		Current THD and harmonics (up to 31st)
X		X	X	X		Voltage harmonics (up to 31st)
		X	X	X		Frequency (f)
		X	X	X		Power (P, Q, S, pf)
		X	X	X		Energy (E+, E-, Eq+, Eq-)
		X				Circuit breaker wear
X		X	X	X		Disturbance recorder (3.2 kHz)
		X		X		Current transformer supervision
X		X		X	60	Fuse failure
X		X			74TC	Trip circuit supervision
						Control
5	10	10		10		Controllable objects
X		X			25	Synchrocheck
		X			79	Auto-reclose
					79N	Zero sequence recloser
X						Switch onto fault logic
					68	Cold-load pick-up block
8		8	8			Setting groups
					90	Automatic voltage regulator
X	X	X	X	X	86	Lock out relay
						Hardware
		5	5	5		Current inputs
4		4	4	4		Voltage inputs
3	3	3	3	3		Digital inputs
5+1	5+1	5+1	5+1	5+1		Output relays
						Communication media
X	X	X	X	X		RJ 45 Ethernet 100Mb (front)
X	X	X	X	X		RJ 45 Ethernet 100Mb and RS 485 (rear)
5	6	3	3	3		Nb of slots for **Option** hardware
0 to 5	0 to 6	0 to 3	0 to 3	0 to 3		8 Digital inputs board
0 to 2	0 to 2	0 to 2	0 to 2	0 to 2		5 Digital outputs board
					50Arc/50NArc	Arc protection (4 sensor channels + 2 DO + 1 DI)
0 to 2	0 to 2	0 to 2	0 to 2	0 to 2	49RTD	8 x RTD input
0 or 1	0 or 1	0 or 1	0 or 1	0 or 1		Double LC fiber Ethernet 100Mb HSR/PRP (rear)
0 or 1	0 or 1	0 or 1	0 or 1	0 or 1		Double Ethernet RJ45 - 100Mb HSR/PRP (rear)
0 to 2	0 to 2	0 to 2	0 to 2	0 to 2		mA analog measures (1 input + 4 outputs)
0 or 1	0 or 1	0 or 1	0 or 1	0 or 1		Double ST fiber Ethernet 100Mb (rear)
0 or 1	0 or 1	0 or 1	0 or 1	0 or 1		Double RJ45 Ethernet 100Mb (rear)
0 or 1	0 or 1	0 or 1	0 or 1	0 or 1		RS232 + serial fiber PP/PG/GP/GG (rear)

X: Existing

CHARACTERISTICS & BENEFITS

Integrated protection and control IEDs
Full range:
- Feeder, machine, transformer and voltage protection IEDs
- Bay control, alarm annunciation and indication IEDs
- Power or Energy monitoring IEDs
- Powerful PLC programming included allowing extensive customisation

Measurement range and accuracy
- Energy and power measurement accuracy : better than Class 0.5
- Large range measurement
- Configurable rated current: 0.2 to 10A
- Configurable rated voltage: 0.2 to 400V
- Wide operating frequency band: 6 to 75Hz (tracking mode)

Fast performance
- Sub-cycle instantaneous trip time
- Fast integrated arc protection (Option)

Integrated logical schemes
- User programmable functions

Intuitive HMI
- Large and customisable HMI
- Configurable MIMIC display
- 16 freely configurable LEDs with user text

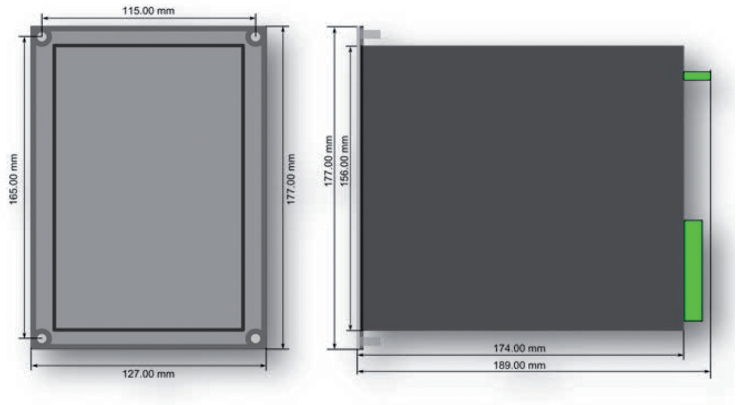
Case (dimensions without protection gasket)
- H, W, D without terminal 177x127x174 mm
- H, W, D with terminal 177x127x189 mm
  (casing height 4U, width ¼ rack, depth 210 mm)
- H, W of front plate 177x127 mm
- H, W of cut out 160x106 mm
- Removable protection gasket width 3mm

Non-volatile memory
High recording capacity available:
- Up to 100 disturbance records
- Up to 10,000 events

Communication
- IEC 61850 with GOOSE and support of
  - Rapid Spanning Tree Protocol (RSTP)
  - Parallel Redundancy Protocol (PRP)
  - High-availability Seamless Redundancy (HSR)
- IEC 870-101/103/104, Modbus, DNP 3.0
- Proprietary protocol SPA

Time synchronisation
- SNTP (Simple Network Time Protocol) and NTP (Network Time Protocol) support

Software
- User friendly SMART9 with instant download of all IED settings
- Extensive event log and diagnostics information



SMART9

SMART9, integrated software for the Industry, Railway and Transmission ranges, helps the user get the best from NP900 series relays.

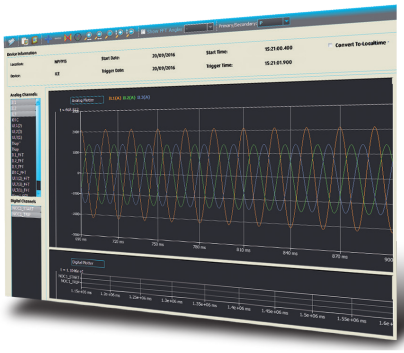
Setting — adjustment of all parameters, with 1 or 8 tables according to product, can be prepared on or off-line (configuration files can be saved, backed-up and edited on the user's PC and can be assigned unique identifying names for each relay in a connected system).

Maintenance — follow-up of installations is made easy by access to the operation counters, cut square amps, overload number.

Analysis — measurement functions reflect the installation state in real time and allow its follow-up without penalising protection functions. According to the model, specific screens represent the electric quantities in the appropriate diagram (PQ, UI, ZΘ...).

Recording — events and disturbance recordings will help understanding the faults suffered by the installation. Recordings are stored on the user's PC in COMTRADE format and can be used to simulate a fault using a test set.

Time saving — commissioning functions offer an immediate and exhaustive overview of the network characteristics as well as diagnosis tools such as installation wiring checks.



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