



PZ-1000 DISTANCE PROTECTION RELAY



CSPC



INTRODUCTION

The PZ1000 relay are digital distance protection device, especially suitable for primary protection of simple or double overhead transmission and subtransmission line (high or medium voltage).

Their advanced microprocessor design and rapid signal processing algorithm make them fast acting and safe. They maintain the reliability and performance required to handle transmission and distribution network.

PZ1000 unit has a serial front communication port and can have up to two rear ports that allow:

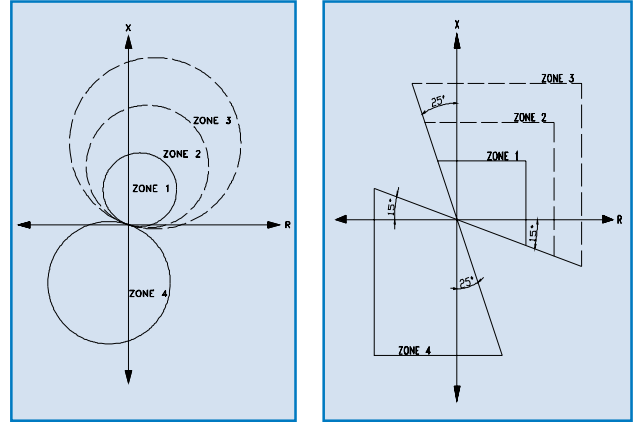
- ✓ To link the unit to a Protection and Control Integrated System.
- ✓ To access the status, historical data, and setting information, locally and / or remotely through telephone communication.

It also has a third rear port for pilot protection, that allow the direct connection between two protection.



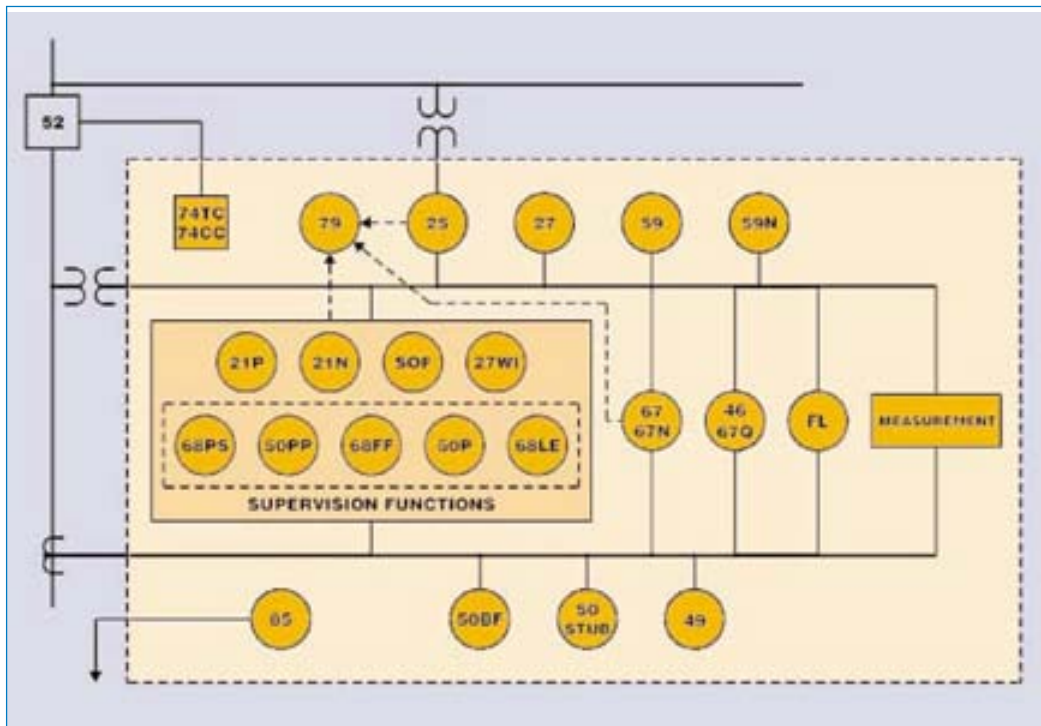
DESCRIPTION

The PZ1000 distance protection incorporate 4 MHO and/or quadrangular trip characteristic zone and a 5th additional quadrangular zone for phase-phase and phase-earth fault plus pilot protection scheme, supervision alarm (pole by pole) and other function, making it a top level distance protection.



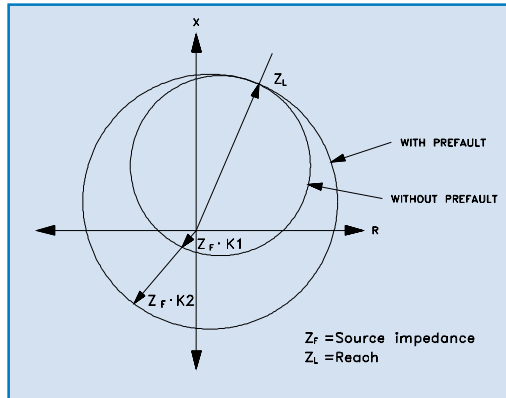
It also has a breaker failure protection unit and a single pole/triple pole recloser with up to 4 hot. Breaker monitor function, number of trip, etc. work by pole by pole.

FUNCTIONAL DESCRIPTION



DISTANCE PROTECTION

- ✓ Extension of zone 1
- ✓ Zone 4 is used for tripping and pilot protection
- ✓ The use of direct sequence voltage polarization, produce a backward expansion of MHO.



- ✓ All the characteristic are supported by other protection and supervision function which ensure the safe operation of the protection device.

Negative sequence directional unit

All impedance unit are supervised by a negative sequence directional unit which indicate the direction of the fault.

Pilot protection schemes

Via communication with other terminal, the following protection scheme are possible:

- Staggered trip
- Permissive overreach: POTT
- Permissive underreach: PUTT
- Directional block: DCB
- Directional unblock: DCUB

Additional scheme :

- ECHO (for permissive scheme)
- Reverse direction blocking
- Weak infeed
- Direct transfer trip

The pilot protection is executed via digital input and/or serial communication



Enable by single-phase and phase-phase overcurrent

This enable the distance unit if the current exceed pre-set single-phase or phase-phase threshold.

Fuse failure

This block the distance unit if the disappearance of any voltage is detected. The directional unit and/or the voltage unit can also be locked depending on setting.

Power swing

This block the phase-phase distance unit and give power swing trip, if power unbalance oscillation is detected.

Load encroachment

This block the phase-phase distance unit if the impedance detected is within the load zone defined by the user.

Switch-onto-Fault

This set off an instant non directional three-phase trip when the switch close on a fault in the line.

OTHER PROTECTION FUNCTIONS

Directional overcurrent units

The PZ1000 has 2 additional protection unit for phase directional overcurrent and for neutral directional overcurrent a backup for the main distance unit, thus increasing the operational reliability of the relay.

Overvoltage / Undervoltage units

The PZ1000 has two three-phase voltage unit: one for overvoltage and the other for undervoltage. Each phase is analyzed separately.

Homopolar overvoltage

This function protect against fault to earth.

Breaker failure protection

It verifies the correct operation of a breaker when clearing a fault, causing in other case, the trip of breaker of the position needed to isolate the fault.

Stub protection

This protect against fault between current transformer and line isolator configured with a breaker and a half scheme. It is an overcurrent unit which is activated when the line isolator is open.

Thermal image

It protect the line against thermal overload, calculating the temperature depending on the current and recent load condition of the protected unit.

Current unbalance

This device protect the line against unbalance produced in the current as a consequence of power system anomalies or unbalance load. This function is selected by setting a directional or non directional.

MONITORING FUNCTIONS

Breaker monitoring (for each pole)

An event is generated when the ΣkP meter for any phase exceeded the threshold set.

Trip and close circuit supervision 74TC/CC (for each pole)

This detects any anomaly in the circuit with the switch open or closed.

Excessive number of trips (for each pole)

This generates an event and sends a signal to the control unit when the trips per phase exceed a preset number in a set time. It blocks the recloser when the set number is exceeded.

Open phase alarm

This sets off an alarm when an open phase is detected.

CT's monitoring

This generates an alarm when detecting a failure in a current input channel (only for models with I_n calculated in the own line).



AUTOMATISMS AND COMANDS

Single pole/triple pole recloser

- ✓ Programmable up to 4 shots
- ✓ The first shot is single/triple pole and the rest are triple pole
- ✓ Different time for each shot
- ✓ Operation counter for each shot
- ✓ Engaged/disengaged by setting, input and communication

Syncrocheck

This function compares the voltage signal for one phase (in modulus and argument) on both sides of the switch, and permits the switch to be closed when the pre-set conditions are met. It can be used for both manual and automatic closing.

The angle difference is calculated compensating the breaker closing time.

Dead line detection (DLD)

This function detects the disconnected phase of a line, generating a signal.

Self-testing

The PZ1000 digital protection relay runs the following ongoing self-diagnostic check:

- ✓ Software running
- ✓ Power supply voltage
- ✓ Hardware
- ✓ Picking-up of measurement

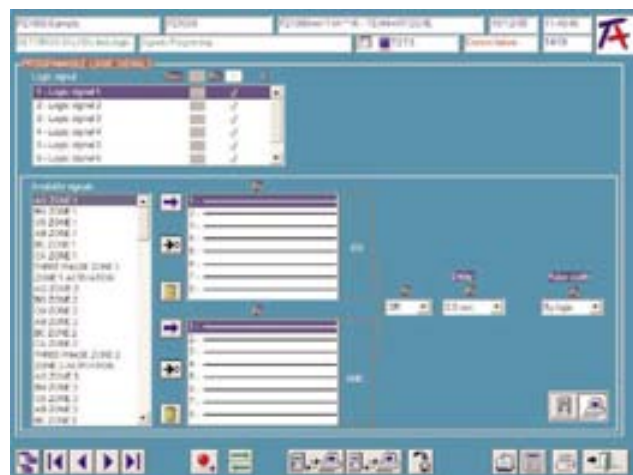
Failures detected by self-testing, are signalled by any of the double outputs (configurable).

Pole discrepancy

This unit checks the pole status concordance, causing three pole opening after exceeding the set time with any pole in a status different from the rest.

Programmable logic functions

The user can configure up to 6 logic signals which can be assigned to output relays and LEDs via the SIPCON Protection software.



DATA ACQUISITION

Measurement

The PZ1000 protection relay measures the following magnitude in real time:

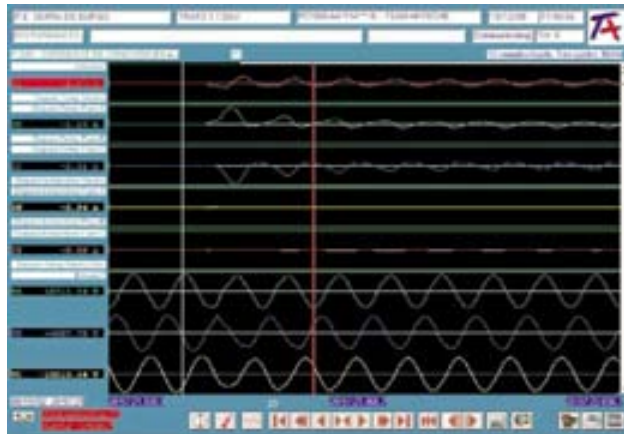
- ✓ Per phase and neutral current (1%)
- ✓ Average current (1%)
- ✓ Single and compound voltage per phase (0,5%)
- ✓ Average single and compound voltage (0,5%)
- ✓ Frequency (0,01Hz)
- ✓ Active and reactive power level and power factor (1%)
- ✓ Two-way energy (Class 5)

Note1: Other accuracy on demand.

Note2: Depending on model, equipment include external battery voltage measurement.

Oscillograph data recorder

- ✓ Depending on the model, the non volatile memory of PZ1000 unit can store:
 - 20 record for 30 cycle
 - 10 record for 60 cycle
- ✓ Each record comprise the sample from 8 analogue signal and the status of 16 selectable digital signal
- ✓ Tripping and preliminary start-up are configurable
- ✓ The disturbance are collected and exported in COMTRADE format.



Fault records

- ✓ The last 9 fault are stored in the non volatile memory with the following data:
 - Date and time of start-up, beginning and end of fault
 - Pre-fault and fault level of electrical parameter
 - Duration and type of fault
 - Unit engaged
 - Fault distance
 - Trip zone and / or pilot trip

Fault locator

The fault locator process the information gathered on each fault and calculate the distance to the fault location. The distance is given in km and it can be accessed via the display or the PC.

Setting groups

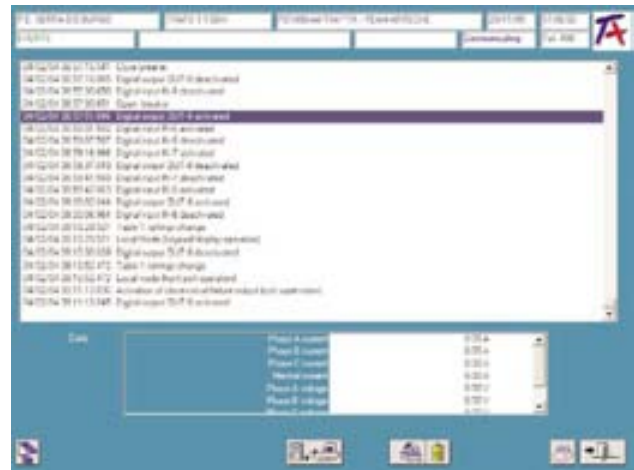
The unit has 4 setting group. The active table selection can be made from the protection console or digital input activation.

Event recording

Queue of 200 event stored in non volatile memory can be recovered in text format on PC.

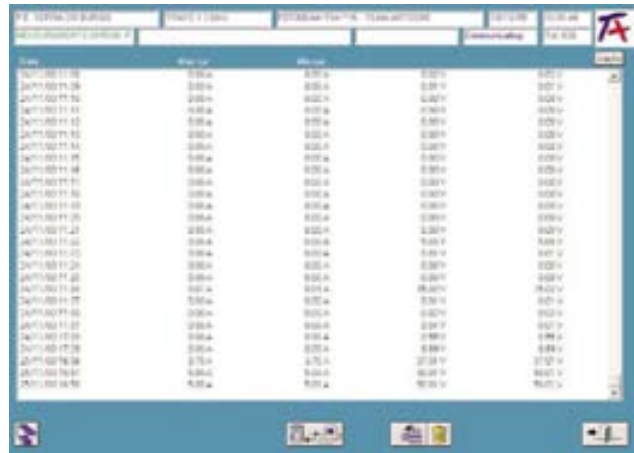
- ✓ Each event is accompanied by:

- Date and time of occurrence
- Descriptive code of event
- Level of electrical parameter (voltage and current) at the time of occurrence



Historical reports

A queue of 100 historical reports is stored in the non volatile memory, covering maximum and minimum average current and average voltage level within a programmable time window.



Time synchronization

- ✓ Via communication
- ✓ Via demodulated IRIG-B input

The unit has clock with backup battery.

Demand maximeter

The unit stores the maximum current value, plus the time tag for the moment when it occurs.

MAN-MACHINE INTERFACE

The PZ1000 unit have the following user communication element :

Display / keyboard



Featuring:

- ✓ 2 line, 16-character LCD
- ✓ 16-key keyboard
- ✓ 12 programmable LED indicator and 1 two-colour alarm LED
- ✓ 4 push-button that can be deactivated by setting:



Breaker closure



Breaker open



Local / Remote



Maneuver permission

This permit :

- ✓ Displaying of input , measurement , date and time , statistical data and latest fault.
- ✓ Displaying and modification of setting and active table, assignment of input , output and LED .

Optionally, the unit can incorporate a frontal lid obtaining a IP of 54.

Communications

The unit has :

- ✓ 1 front serial port for local communication.
- ✓ 2 rear serial port (1 optional), for local and/or remote access to protection and monitoring information.

The e output can provide all the information available on the protection device, and can be used to modify setting of all type via SIPCON-protection software by TEAM ARTECHE.

The PZ1000 also feature an optional rear serial output for pilot protection.

Rear port's programmable communication protocols

The communication protocol for the first rear port (COM-1) is always Procome. The protocol of the second rear port (COM-2), if exist, is chosen by the user out of the next communication protocol : DNP or Procome.

The third rear port use a particular protocol with which teleprotection signal are sent and received.

SOFTWARE

TEAM ARTECHE use the SIPCON-Protection program, developed for PC running under WINDOWS. This program allow clear, simple dialogue with the unit for access to the information stored in it and for adjustment.

All configuration accesses are password protected to prevent tampering by unauthorized personnel.

The outstanding features of the SIPCON-Protection program include the following:

- ✓ Automatic detection of the unit with which it is in dialogue.
- ✓ Unit status display via status screen



- ✓ Pre-entation and modification of setting



- ✓ Filling and pre-entation of all information stored by the relay: event , fault , historical data, oscillography reading , etc.

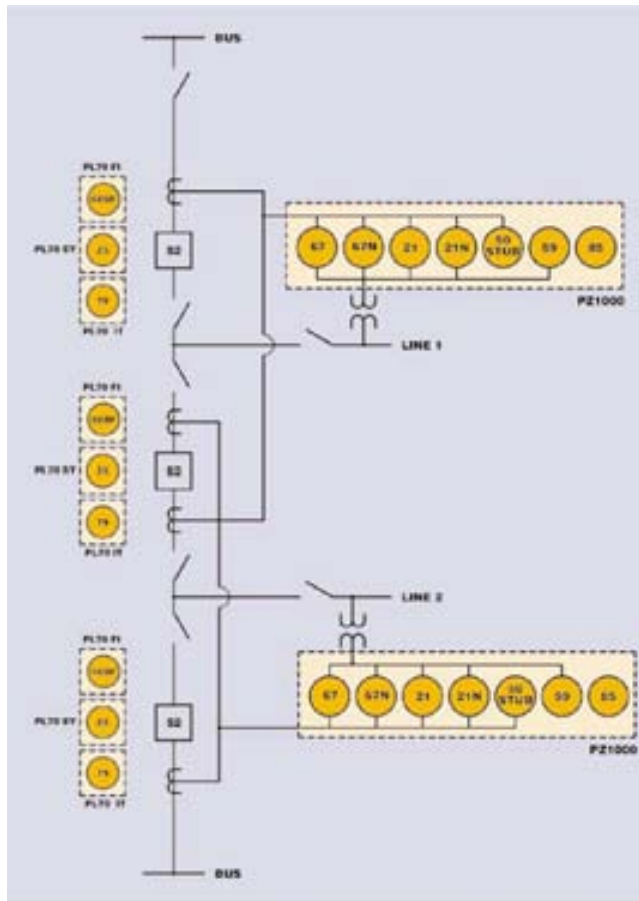
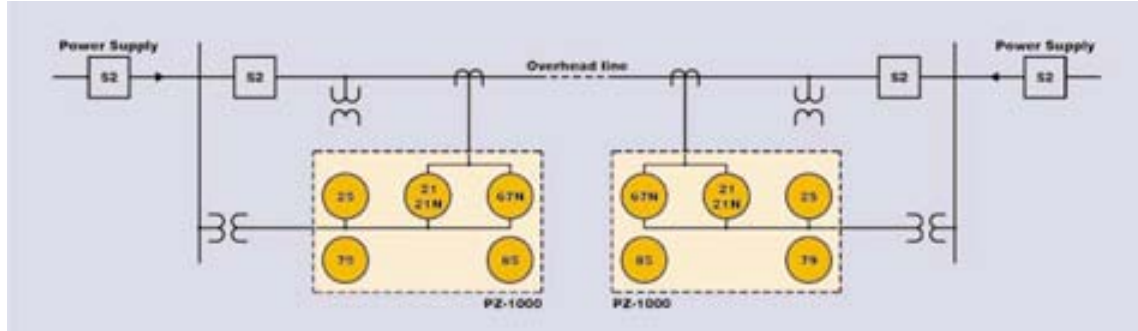


SIPCON Protection is compatible with the software used in TEAM ARTECHE' integrated protection and monitoring system , and can be incorporated into them a just one more function module.

APPLICATIONS

PROTECTION OF OVERHEAD LINES WITH POWER SUPPLY FROM BOTH ENDS

The illustration shows the application of a PZ1000 relay to protect overhead lines. In this protection scheme the pilot protection function is used to protect overhead lines powered from both ends.



STUB PROTECTION

The illustration shows the application of a PZ1000 unit, to protect a breaker and a half scheme, in which stub protection is used to protect against faults between current transformer and the isolator, when that isolator is open.

The existence of three switches and the need for a breaker failure unit, recloser and synchrocheck for each of them, is handled by using TEAM ARTECHE' PL-70 single function device :

- ✓ PL-70 SY: For the synchrocheck function.
- ✓ PL-70 FI: For the breaker failure function.
- ✓ PL-70 IT: For the recloser function.



SETTINGS

DISTANCE PROTECTION (21)

MHO Reach

Setting [®]	Range	Step
Phase to earth Zone 1 to 4 (Ω)	0.01-300.00	0.01
Phase to phase Zone 1 to 4 (Ω)	0.01-300.00	0.01

Note: Setting for all 4 zone are independent

Cuadrilateral Reach

Setting [®]	Range	Step
Phase to earth reactance Zone 1 to 5 (Ω)	0.01-300.00	0.01
Phase to earth reactance Zone 1 to 5 (Ω)	0.01-300.00	0.01
Phase to phase reactance Zone 1 to 5 (Ω)	0.01-300.00	0.01
Phase to phase reactance Zone 1 to 5 (Ω)	0.01-300.00	0.01

Note: Setting for all 4 zone are independent

Zero Sequence Compensation

Setting [®]	Range	Step
Zone 1 modulu	0.01-50.00	0.01
Zone 1 angle (deg)	0-359°	1°
Zone 2 modulu	0.01-50.00	0.01
Zone 2 angle (deg)	0-359°	1°
Other zone modulu	0.01-50.00	0.01
Other zone angle (deg)	0-359°	1°
Mutual comp. zone 1 KMO modulu	0.01-300.00	0.01
Mutual comp. zone 1 KMO angle	0-359°	1°
Mutual comp. zone 2 KMO modulu	0.01-300.00	0.01
Mutual comp. zone 2 KMO angle	0-359°	1°
Mutual comp. other zone KMO modulu	0.01-300.00	0.01
Mutual comp. other zone KMO angle	0-359°	1°

Timing

Setting [®]	Range	Step
Zone 1 phase to earth ()	0.0-100	0.01
Zone 2 phase to earth ()	0.0-100	0.01
Zone 3 phase to earth ()	0.0-100	0.01
Zone 4 phase to earth ()	0.0-100	0.01
Zone 5 phase to earth ()	0.0-100	0.01
Zone 1 phase to phase ()	0.0-100	0.01
Zone 2 phase to phase ()	0.0-100	0.01
Zone 3 phase to phase ()	0.0-100	0.01
Zone 4 phase to phase ()	0.0-100	0.01
Zone 5 phase to phase ()	0.0-100	0.01

General Setting

Setting [®]	Range	Step
Phase to earth fault unit	MHO, Cuadrilateral	
Phase to phase fault unit	MHO & cuadrilateral, none	
Single pole trip	MHO, Cuadrilateral	
	MHO & cuadrilateral, none	
	YES/NO	

Single Phase / Phase-Phase Overcurrent

Setting [®]	Range	Step
Enable (independent)	YES/NO	
Single phase thre hold (A)	(0.2-30) In	0.1
Phase-phase thre hold (A)	(0.2-30) In	0.1
Def. time () (independent)	0.00-10	0.01

Fuse Failure (68FF)

Setting [®]	Range	Step
Enable	YES/NO	
Negative eq. thre hold (V)	10.00-165.00	0.1
Negative eq. thre hold (A)	(0.2-30) In	0.1

Open Phase Alarm

Setting [®]	Range	Step
Enable	YES/NO	
Negative equence thre hold (V)	10.00-165.00	0.1
Negative equence thre hold (A)	(0.2-30) In	0.1

Pilot Protection Scheme[®]

Setting [®]	Range	Step
Scheme type	- Staggered trip - Permissive overreach - Permissive underreach - Directional block - Directional unblock	
RTP input dropout time	0.00-1.00	0.01
Block additional delay ()	0.00-1.00	0.01
Lo of guard delay	0.00-0.15	0.01
ECHO enabled	YES/NO	
Min. RTP delay fo ECHO ()	0.00-10	0.01
Reverse zone block enable	YES/NO	
Reverse zone block delay	0.00-10	0.01
Weak infeed enable	YES/NO	
Direct trip enable	YES/NO	

Overreaching Direction

Setting [®]	Range
Zone 2	No Forward Backward with trip Backward without trip
Zone 3	No Forward Backward with trip Backward without trip
Zone 4	No Backward with trip Backward without trip
Zone 5	No Forward Backward Non-directional

Power Swing (68PS)

Setting [®]	Range	Step
Enable	YES NO YES + Z5 YES - Z5	
Inner X (Ω)	0.01-300.00	0.01
Inner R (Ω)	0.01-300.00	0.01
Outer X (Ω)	0.01-300.00	0.01
Outer R (Ω)	0.01-300.00	0.01
Direct equence thre hold (A)	(0.2-30) In	0.1
Activation time ()	0.01-50.00	0.01
I_{max} thre hold (A)	(0.2-30) In	0.1
I_2/I_{max} ratio	10-50	0.1
Z1, Z2, Z3, Z4, Z5 zone lockout	YES/NO	

Load Encroachment (68LE)

Setting [®]	Range	Step
Enable	YES/NO	
I_1 thre hold (A)	(0.2-30) In	0.1
Impedance (Ω)	0.01-300	0.1
(independ. forward & reverse)		
Angle + (gnd)	0-359°	1°
(independ. forward & reverse)		
Angle - (gnd)	0-359°	1°
(independ. forward & reverse)		

Switch-onto-Fault

Setting [®]	Range	Step
Enable	NO YES+Z2 YES+Z5	
Positive equence thre hold (V)	10.00-165.00	0.1
Positive equence thre hold (A)	(0.2-30) In	0.1



SETTINGS

DEAD LINE DETECTION

Settings	Range	Step
Enabling	YES/NO	
Minimum voltage threshold (V)	10-165	1
Minimum current threshold (S)	(10-200) % In	0.01

THERMAL IMAGE (49)

Settings	Range	Step
Enabling	YES/NO	
Heating ratio (min.)	3-60	1
Cooling ratio (min.)	3-180	1
Alarm threshold (%)	60-100	1
Minimum current (A)	0.2 - 6.0	0.1

CURRENT UNBALANCE (46)

Settings	Range	Step
Timed enable	YES / NO	
Timed pickup	(0.2-4) In	0.1
Response type	Definite time Normal inverse IEC Very inverse IEC Extr. inverse IEC Uer IEC (mod.) Normal inverse ANSI Very inverse ANSI Extr. inverse ANSI Uer ANSI (mod.)	
Time index		
ANSI	0.5-30	0.1
IEC-BSC	0.05-1.09	0.01
Definite time	0-100	0.1
Torque control	YES/NO	
Instantaneous enable	YES/NO	
Instantaneous pickup	(0.2-20) In	0.1
Instantaneous additional time	0-10	0.01

RECLOSER (79)

Settings	Range	Step
Reclosure type selection	Single pole, triple pole, single/triple pole, dependent	
Number of programmed shots	1-4	1
Single pole 1 st shot time ()	0.1-20	0.1
Triple pole 1 st shot time ()	0.1-20	0.1
2 nd shot time ()	1-300	0.1
3 rd shot time ()	1-300	0.1
4 th shot time ()	1-300	0.1
Sec. t. after single pole closing	1-300	0.1
Sec. t. after triple pole closing	1-300	0.1
Sec. t. after manual pole closing	1-100	0.1
Synchronization time delay ()	1-300	0.1

STUB PROTECTION (PHASE/NEUTRAL)

Settings	Range	Step
Enable	YES/NO	
Trip	(0.2-30) In	0.1
Additional time ()	0-10	0.01

OVERVOLTAGE (59) AND UNDERVOLTAGE (27)

Settings	Range	Step
Phase Overvoltage trip	50-165	0.1
Phase Undervoltage trip	10-150	0.1
Definite time () (independent)	0.00-10	0.01

CLOSURE PERMISSION AFTER TRIP

Settings	Range	Step
Zone 1	YES/NO	
Zone 2	YES/NO	
Zone 3	YES/NO	
Zone 4	YES/NO	
Phase in t.	YES/NO	
Phase timed	YES/NO	
Neutral in t.	YES/NO	
Neutral timed	YES/NO	
Enable extension zone 1	YES/NO	
Ext. factor of zone 1 phase to phase fault	0.1-3	0.1
Ext. factor of zone 1 phase to earth fault	0.1-3	0.1
In t. neutral locking after monopolar trip	YES/NO	
1 st timed neutral locking after monopolar trip	YES/NO	
In t. unbalance locking after monopolar trip	YES/NO	
Timed unbalance locking after monopolar trip	YES/NO	

PHASE AND NEUTRAL DIRECTIONAL ELEMENTS (67)

Settings	Range	Step
Timed enable	NO, YES, YES + Dropout	
Timed pickup	(0.2-4) In	0.1
Response type	Definite time Normal inverse IEC Very inverse IEC Extr. inverse IEC Uer IEC (mod.) Normal inverse ANSI Very inverse ANSI Extr. inverse ANSI Uer ANSI (mod.)	
Time index		
ANSI	0.5-30	0.1
IEC-BSC	0.05-1.09	0.01
Definite time	0-100	0.1
Torque control	YES/NO	
Instantaneous enable	YES/NO	
Instantaneous pickup	(0.2-30) In	0.1
Instantaneous additional time	0-10	0.01
Torque control	YES/NO	
Negative/zero sequence angle	0-359°	1°
Directional lockout	Vpol < No Vpol < FF or Vpol < No FF or Vpol <	

BREAKER FAILURE (50BF)

Settings	Range	Step
Enable	YES/NO	
Phase retore (A)	(0.1-30) In	0.1
Definite time ()	0.05-10	0.01

HOMOPOLAR OVERVOLTAGE UNIT (59N)

Settings	Range	Step
Timed enable	YES/NO	
Timed pickup	2-200	0.1
Type of timed response	Equal to 67 function	
Time index		
ANSI	0.5-30	0.1
IEC-BSC	0.05-1.09	0.01
Definite time	0-100	0.1
Instantaneous enable	YES/NO	
Instantaneous pickup	2-200	0.1
Additional instantaneous time	0-10	0.01



TECHNICAL CHARACTERISTICS

Power supply

- Voltage
 - ✓24 Vdc: 19 - 35 Vdc
 - ✓48 Vdc: 37 - 77 Vdc
 - ✓125 Vdc: 90 - 160 Vdc
 - ✓220 Vdc: 165 - 280 Vdc
- Ripple: 20 % over rated
- Burden: 25 W max.

AC current Inputs

- Thermal capacity for 1 Or 5 A circuit
 - ✓Continuou : 20 A
 - ✓For 1 : 500 A
 - ✓For 1/2 cycle: 1250 A
- Burden for In=5 A: 0.25 VA
- Burden for In=1 A: 0.03 VA

Programmable phase order: ABC or CBA

AC voltage Inputs

- Thermal capacity:
 - ✓Continuou : 2 x Vn
 - ✓For 1 min: 3 x Vn
- Burden Vn: 0.01VA

Output contacts

Programmable trip relay :

- Carry: 8 A continuou
- Make (0.5): 30A
- Breaking capacity (L/R = 40 m):
 - ✓48V: 0.5A
 - ✓125V: 0.3A
 - ✓220V: 0.2A

Programmable auxiliary relay :

- Carry (continuou): 10A
- Make (0.5): 30A
- Breaking capacity (L/R = 40m):
 - ✓48V: 0.3A
 - ✓125V: 0.2A

REED relay for pilot protection:

- Maximum voltage: 200Vdc
- Carry: 0.5A
- Breaking capacity (Re i tive): 10W
- Open/clo e time: 0.5m

Optical signals

- 12 programmable red LED
- 1 two color LED for self-te ting

Digital inputs

- 8/16 programmable
- Voltage range:
 - ✓For 24 - 48 Vdc: 20 - 160 Vdc
 - ✓For 110 - 125 - 220 Vdc: 86 - 280 Vdc
- Inactive below:
 - ✓For 24 - 48 Vdc: 13 Vdc
 - ✓For 110 - 125 - 220 Vdc: 50 Vdc
- Burden: 3 mA

Accuracy

- Protection: 3 %

Communication ports

- Front port: RS-232-C
- Rear port :
 - ✓Port 2: Protection and control
 - ✓Port 3 (optional): Protection and control
 - ✓Port 4 (optional): Teleprotection
- Port type : RS-232-C
- Connector RS-232-C: DTE 9 pin female D type
- Cable type: Shielded
- Cable length: 15m max.
- Isolation: 500V
- Connector RS485: DTE 9 pin female D type
- Cable type: Shielded cro ed
- Cable length: 1000m max.
- Isolation: 500 V
- Connector GFO: ST
- Wavelength: 820 nm
- Allowed attenuation: 8db with 62,5/125 μm gla F.O.
- Multimode gla F.O.: 62,5/125 μm
- Maximun di tance: 1,5 Km
- Pla tic F.O.
- Connector PFO: Standard of HP
- Wavelength: 660 nm
- Allowed attenuation: 24,7 db with 1mm pla tic cable
- Maximun di tance: 115 m with 1mm pla tic cable
- 1,9 Km with 200 μm ilica cable

Note: Port 4, O.F. or RS232.

- Baud rate: 300-38400bp .
- Communication protocol : IEC 870-5 PROCOME (Optional depending on model: IEC 870-5-103, DNP 3.0, MODBUS RTU).

Time synchronization

- Demodulated IRIG-B input.
- U ing protocol (Serial port 1,2 and 3).
- Clock with backup battery.

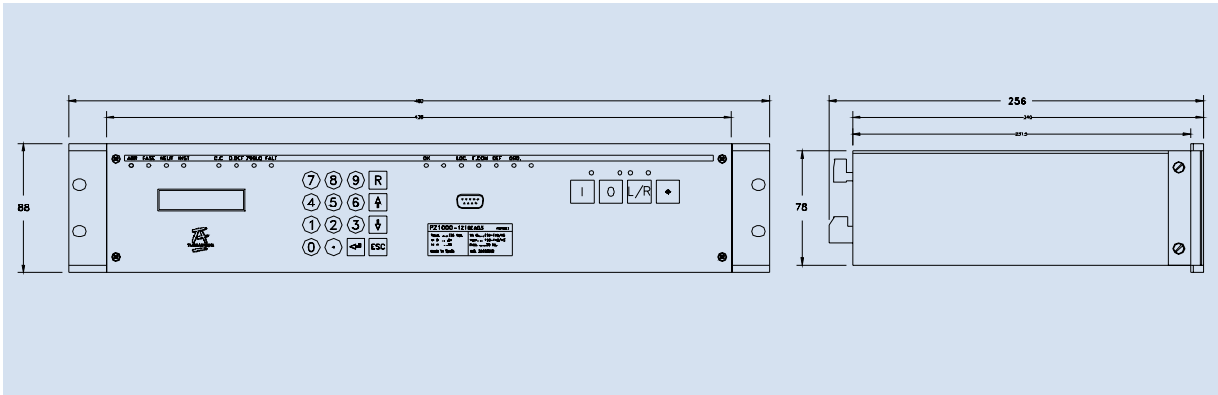
Environmental features

- Operating temperature: -10°C / 55°C
- ✓Optional depending on model : -20°C / 75°C
- Storage temperature: -40°C / 85°C
- Reative humidity: Until 95% without conden ation.

Mechanical features

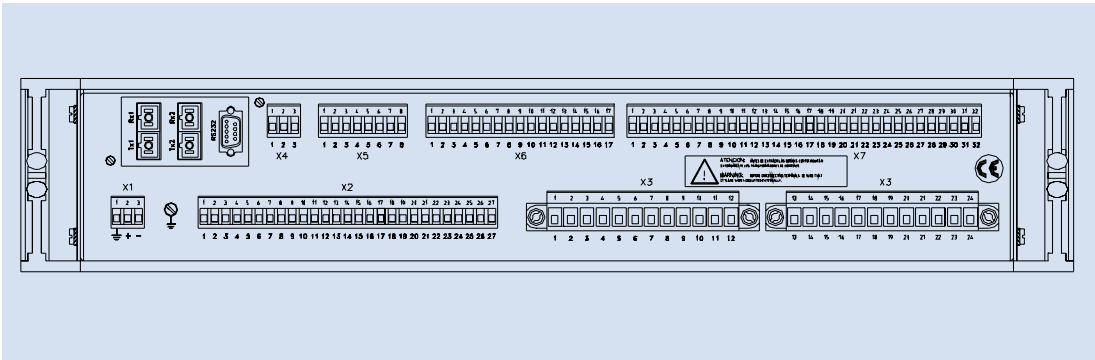
- Realy weight: 6.5Kg
- Standard front IP: IP40
- Optional front IP: IP54

DIMENSIONS

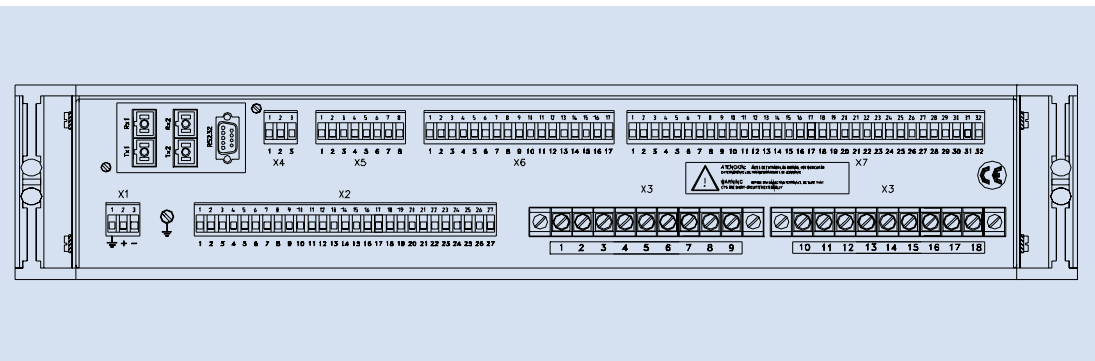


REAR VIEW

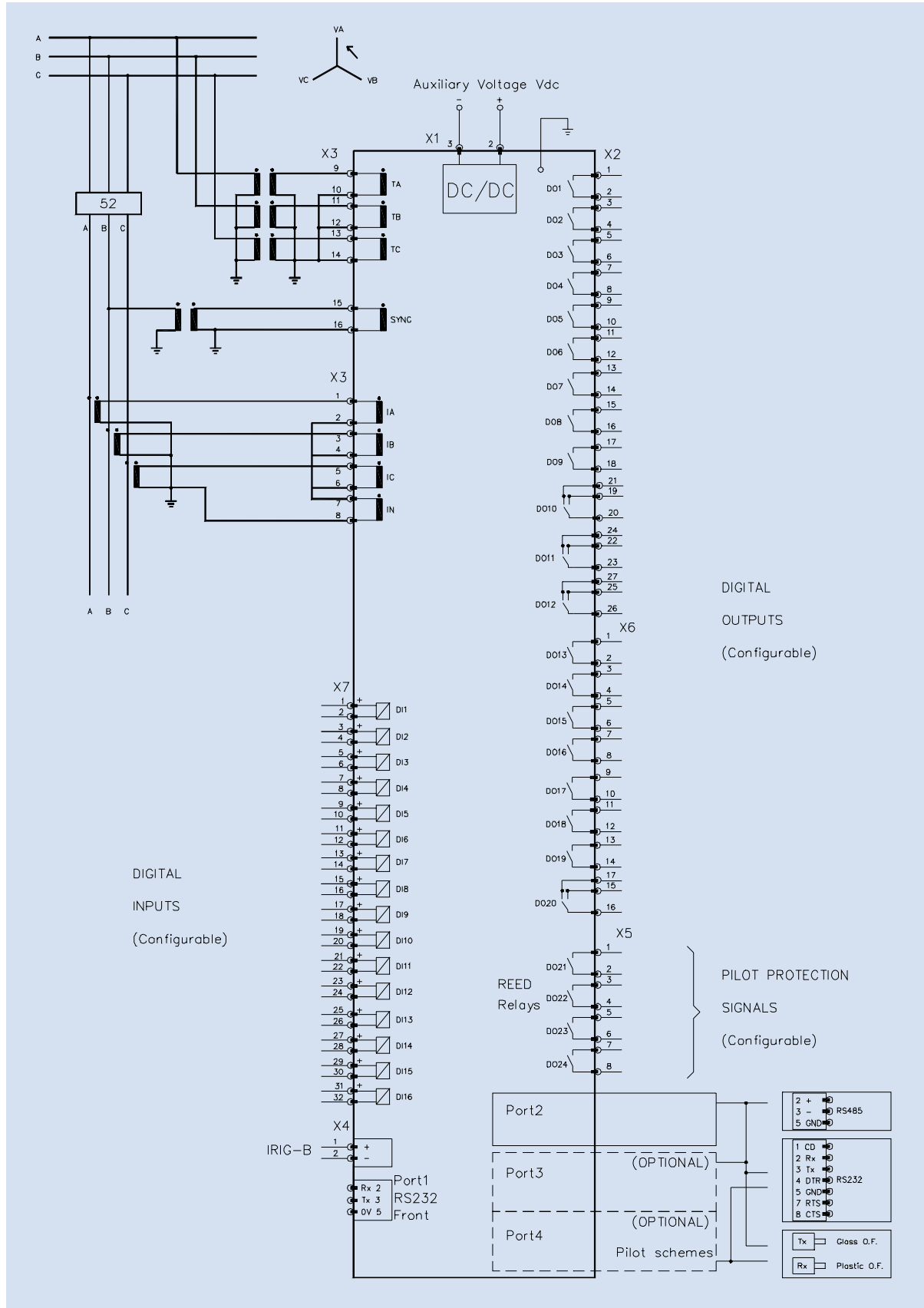
Pin type terminal



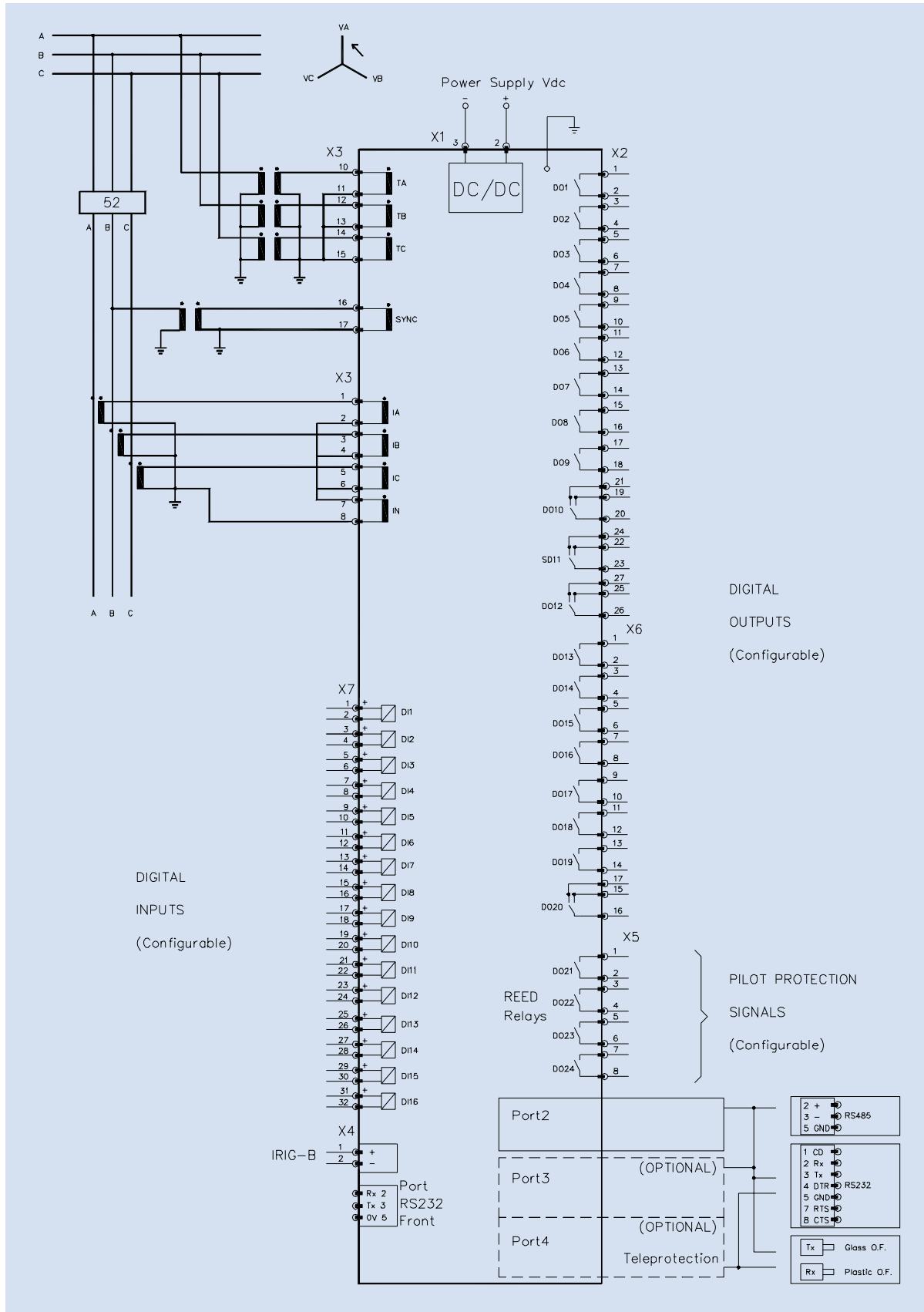
Closed terminal - for analog input



PIN TYPE TERMINALS



CLOSED TERMINALS - FOR ANALOG INPUTS



QUALITY POLICY

Since it was founded, TEAM ARTECHE has committed itself to complying with the guideline laid out in its quality policy, oriented toward the continuous improvement of its product and service in each and every one of its activities, in order to obtain complete client satisfaction.

The ISO 9001 international certificate shows that the design, manufacturing and service provided by TEAM ARTECHE follow the most secure and stringent control and supervision procedure.

Every unit manufactured by TEAM ARTECHE is designed to operate under every electrical substation and industrial plant condition, complying with the most exigent electromagnetic, environmental and mechanical test, thus incorporating the CE mark of electromagnetic compliance.



STANDARDS AND TESTS

Electrical:			
Immunity to electrostatic discharge	IEC 255-22-2	class IV	8 kV contact discharge 16 kV air discharge
Immunity to fast transient burst	IEC 255-22-4	class IV	4 kV
Immunity to voltage pulse	IEC 1000-4-5	class IV	4 kV in common mode 2 kV in differential mode
Immunity to 1 MHz damped wave	IEC 255-22-1	class III	2.5 kV in common mode 1 kV in differential mode
Measurement of insulation resistance	IEC 255-5		according to standard
Measurement of dielectric rigidity	IEC 255-5	class III	2 kV ac
Measurement of insulation with voltage pulse	IEC 255-5	class III	5 kV, 1.2/50 μs
Electromagnetic:			
Measurement of radiated electromagnetic Interference	EN 50081-2 /EN 55011	class A - group 1	
Immunity to radiated radiofrequency field	IEC 1000-4-3 IEC 255-22-3	class III	10 V/m, 26-1000 MHz
Immunity to induced radiofrequency signal	EN 50082-2 /ENV 50141	class III	10 V, AM modulation 1kHz range: 0.15-80 MHz
Mechanical:			
Vibration	IEC 255-2-1	class I	
Shock and bump	IEC 255-21-2	class I	
Environmental:			
Cold	IEC 68-2-1		(-10°C, 3 day)
Dry heat	IEC 68-2-2		(+55°C, 3 day)
Damp heat	IEC 68-2-3		(+40°C, 93% relative humidity)
Change of temperature	IEC 68-2-14		(-10/+55°C)



SELECTION TABLE

MODEL PZ1000		A								
OPTIONS										
67N with optional current polarization (Procome)	A									
67N with optional current polarization (DNP) (**)	B									
67N with fixed current polarization (DNP)	C									
Others	X									
POWER SUPPLY RATING										
19-60 Vdc	Y									
80-160 Vdc	Z									
165-280 Vdc	W									
PHASE NOMINAL CURRENT										
5A	1									
1A	2									
Other currents	3									
NEUTRAL NOMINAL CURRENT										
5A	1									
1A	2									
0.25A	3									
Otros calibres	X									
NOMINAL VOLTAGE										
2-165V	A									
Other currents	B									
COMMUNICATIONS (2, 3 & 4 serial outputs)(*)										
NO serial port	0									
Glass O.F.	1									
Plastic O.F.	2									
RS485	3									
RS232	4									
TEMPERATURE										
Normal	-									
Extended	E									
ANALOG INPUTS TERMINALS										
Pin type Standard terminals	1									
Closed terminals	2									

Continuous improvement of its products is one of the main objectives of TEAM ARTECHE. Consequently, this catalogue information can be modified without previous advice. To get a complete information, consult the manual or contact our commercial department.

Note: Point out in the order if it is wanted IP40 or IP54.

(*) Blank corresponding to each serial output must be filled independently. The serial output 4 is used only for teleprotection between two PZ1000. The communication protocol of the serial output 2 is chosen out of the next communication protocol: DNP or Procome, while the communication protocol of the serial output 3 is always Procome.

(**) By using a setting, the measure from the transformer 4 can be used as a neutral current or as a polarization current for the 67N (in this case IN is calculated).





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