

PIDIN

Технические характеристики

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Ижевск (3412)26-03-58	Набережные Челны (8552)20-53-41	Севастополь (8692)22-31-93	Череповец (8202)49-02-64
Иркутск (395)279-98-46	Нижний Новгород (831)429-08-12	Симферополь (3652)67-13-56	Ярославль (4852)69-52-93
Россия (495)268-04-70	Киргизия (996)312-96-26-47	Казахстан (7172)727-132	

Monitoring Relay Interface protection Relay Type PI-DIN 0126

CARLO GAVAZZI



- Single and Three phase monitoring relay
- Auxiliary power supply 230Vac or 24Vdc
- ROCOF anti-islanding detection
- Settings, menu and logs navigation by means of a front joystick
- Dual password protected settings
- Dual function alarm LED
- Data logger with 10 last events logging
- RS485 serial communication
- Approved according to VDE-AR-N 4105 2018-11, G98 Issue 1 – Amendment 1 16 May 2018 / G99 Issue 1 – Amendment 3 16 May 2018 and Dansk Energi - Tekniske betingelser LV produktion 1.1
- Compact dimensions, 4 DIN Modules



Product Description

The PI-DIN protection device has been designed and developed for the connection of energy production plants, to the public grid, in countries where compliance to VDE-AR-N 4105 2018-11, G98 Issue 1 – Amendment 1 16 May 2018 / G99 Issue 1 – Amendment 3 16 May 2018 or Dansk Energi - Tekniske betingelser LV produktion 1.1 approvals is required. Voltage and Frequency are constantly monitored and in case the measured values are out of the specified range the grid feeding is interrupted by opening the “interface switch”. The interface switch consists of 2 independent electric switching devices connected in series for redundancy. PIDIN 0126 is a single fault fail safe device which ensures safe operation even in case of failure of any of the devices composing the system. The protection concept can be implemented on any energy generating power plant, alternatively, or in addition, to the Integrated interface protection. PI-DIN records all the events and it keeps the last 10 occurred, indicating

date and time. This device is also equipped with an RS485 serial communication port. Through the serial port it is possible to read the actual data, the events log and to erase the events. The rotary switch is equipped with a slit that allows the application of a padlock or a lead seal to avoid non-authorized access to the setting menu.

Ordering Key

PI DIN 0126 H I2R2 S1 XX

Model _____
 Mounting _____
 Norm _____
 Auxiliary voltage _____
 I/O _____
 Serial Communication _____
 Option _____

Type Selection

Model Interface protection	PI
Mounting	DIN (4 modules)
Approvals VDE-AR-N 4105 2018-11; G98 Issue 1 – Amendment 1 16 May 2018 / G99 Issue 1 – Amendment 3 16 May 2018; Dansk Energi - Tekniske betingelser LV produktion 1.1	0126
Auxiliary power supply 230 Vac 24 Vdc	H L
Inputs 2 digital inputs	I2
Outputs 2 relay outputs	R2
Communication RS485 port	S1
Option None	XX

Protection parameters

Code/Protection Function	Description	VDE-AR-N 4105 2018-11	ENA EREC G98 1-2-2018-5-16 / G99 1-3-2018-05-16	Dansk Energi - Tekniske betingelser LV produktion 1.1
U<	Voltage drop level 1	0.8 Un 50ms	0.8 Un 2.5s	0.85 Un 50s
U>	Voltage rise level 1	1.10 Un 50ms	1.14 Un 1 s	1.1 Un 60 s
U>>	Rise in voltage protection level 2	1.15 Un 50ms	1.19 Un 0.5s	1.15 Un 0.2s
U<<	Voltage drop level 2	0.45 Un 300ms	-	0.80 Un 0.2s
f<	Frequency decrease protection	47.5 Hz 50ms	47.5 Hz 20s	47.5 Hz 0.2s
f>	Frequency increase protection	51.5 Hz 50ms	52 Hz 0.5s	51.5 Hz 0.2s
f<<	Frequency decrease protection	-	47Hz 0.5s	-
AI Seq	Incorrect phase sequence	-	-	-
ROCOF	Derivative Frequency	2 Hz/s	1 Hz /s	2.5 Hz/s
Recovery	Recovery	0.85 < Un < 1.1 47.5 < f < 50.1 t ≥ 60 s	0.8 < Un < 1.14 47.5Hz < f < 52 Hz t ≥ 20 s	0.85 < Un < 1.1 47.5 < f < 50.5 180s

Note: default editable parameters

Events & Alarms messages

Events	Note
Number registered events	10 - FIFO - with hour and date
Alarms	<ul style="list-style-type: none"> Triggered for: U>, U>>, f<, f>, f<<, U<, U<<, AI Seq, ROCOF Interface switch operation failure PI-DIN internal fault.

Reading Input Specifications

Rated inputs	1P, 3P, 3Pn 230V _{LN} /400V _{LL}	Display +RS485 accuracy (@25°C ±5°C, RH 60%, 45+60Hz) Voltage Frequency	±0.5% RDG +1DGT ±0.1Hz
System type			
Rated voltage			
Temperature drift	≤200ppm/°C		
Rated frequency	50Hz		



I/O Signals Specifications

Digital inputs functions	2 inp. for external contactors	Output relay type	SPDT 8A @ 250Vac 2,5A @ 250Vac 5A @ 24 Vdc 2,5A @ 24Vdc >30*10 ⁶ ops >10*10 ⁵ ops @ 8A 250Vac cosφ1
Inputs	Safety of operation control (output ≤ 5VDC)	Contact configuration	
Functions	Feedback Switch2	Contact AC1	
Input 1	Terminals 1-3 or 1-33	Contact AC15	
Input 2	Feedback Switch1	Contact DC12	
Common terminals	Terminals 42-33 or 42-3	Contact DC13	
Output relay function	Terminals 3 - 33	Mechanical life	
Output relay 1	Switch1	Electrical life	
Output relay 2	Terminals NO 12, NC 11, COM13		
	Switch2		
	Terminal NO 9, NC, 8, COM 10		

Main Functions

Password 1	4-digit numeric code to prevent non-authorized change of U>, U< time, U<< time, recovery condition, time / clock, reset communication settings	System selection	3-phases (4-wires) 3-phases (3-wires) 1-phase (2-wires)
Password 2	4-digit numeric code to select the approval and set protection for parameters not covered by Password 1	Real time clock	Clock and calendar
		Functions	Hour: minutes: seconds with format hours
		Time format	Day-Month-Year with DD-MM-YY
		Date format	Life: 10 Years
		Battery*	Type: 1 Metal-ion non-replaceable
			Weight: 0.04 g

**Note: The device contains metal-ion batteries. For the sending, you must comply with the relevant packaging and labelling regulation.*

Insulation Between Inputs and Outputs

	Measuring inputs	Relay outputs	Digital inputs	Communication port	Auxiliary support
Measuring inputs	-	4kV	4kV	4kV	4kV
Relay outputs	4kV	-	4kV	4kV	4kV
Digital inputs	4kV	4kV	-	4kV	4kV
Communication port	4kV	4kV	4kV	-	4kV
Auxiliary supply	4kV	4kV	4kV	4kV	-

Serial Communication RS485

RS485 Port Type	Multidrop, bidirectional (static and dynamic variables).	Data format	1 bit for start, 8 bit for dates, no parity/odd parity, equal parity, 1 bit for stop.
Connection	2 wires, Half Duplex. Max. distance 1000m, termination on instrument.	Communication speed	Selectable: 4,8 k, 9,6k, 19,2 bit/s.
Address Protocol	247, selezionabile by frontal. MODBUS (RTU). Data (bidirectional)	Network devices	1/5 unit load. Max. 160 devices in the same network.
Dynamic (only reading) Static	Variables of system and phase All configuration parameters.		

General Specifications

Operating temperature	From -20 a +55°C (-4°F to 131°F) (U.R. from 0 to 90% without condensation @ 40°C)	Protection degree Front	IP50
Storage temperature	From -30 to +70°C (-22°F to 158°F) (U.R. <90% without condensation @ 40°C)	Screw terminals	IP20
Overvoltage Category	III	Pollution degree 2	
Insulation class	II (Double insulation)	Cofornity standards Safety	EN60255-27
Insulation (for 1 minute)	According to EN60255-27 Please see "Insulation between inputs and outputs" table.	Approvals	CE VDE-AR-N 4105 2018-11; ENA EREC G98 1-2-2018-05-16 / G99 1-3-2018-05-16; Dansk Energi - Tekniske betingelser LV produktion 1.1
Dielectric strength	4kVAC RMS for 1 minute	Terminals	Screw
Rejection rate CMRR	100dB, from 48Hz to 62Hz	Cable reference	Max. 2.5mm ²
EMC Immunity	EN61000-6-2	Tightening torque	Min./Max.: 0.4Nm/1Nm.
EMC Emission	EN61000-6-3	Housing (4 DIN Modules)	
		Dimensions (WxHxD)	90 x 71.6 x 66.3 mm
		Material	Front: ABS Self extinguishing; UL 94 V-0
		Mounting	DIN rail
		Weight	300g (including packaging)

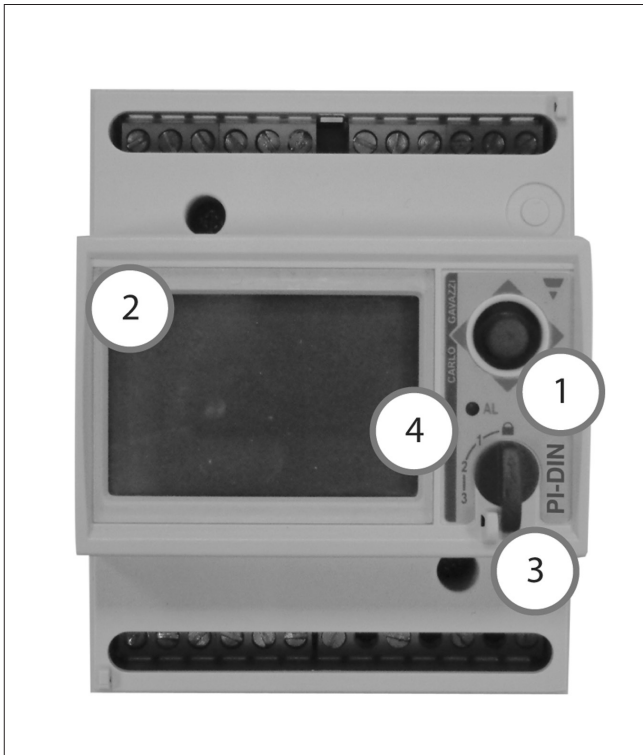
Auxiliary Power Supply Specifications

PINDIN0126HI2R2S1XX		PINDIN0126LI2R2S1XX	
Input voltage	115Vac or 230Vac -20% / +15%	Input voltage	24Vdc -20% / +20%
Consumption	7VA	Consumption	2W
Recommended fuse*	2 x T 0.16A L250V	Recommended fuse*	2 x T 0.25A L250V
		*Both supply poles must be fused	

Display, LEDs and Commands

Display refresh time	≤ 100 ms		parameters, system, etc... Selector is provided with a slit for lead seal locking.
Display Model	3 lines, 4 DGT LCD		
Digit dimension	h 7mm		
Joystick	Variables reading selection, operating parameters settings, triggered events list.		
Rotary switch	programming menus access: password, date & time, interface protection	LED on front panel	Dual function RED LED Lit: alarm triggered. Flashing: when the alarm condition is present during the fixed delay time

Front Panel Description



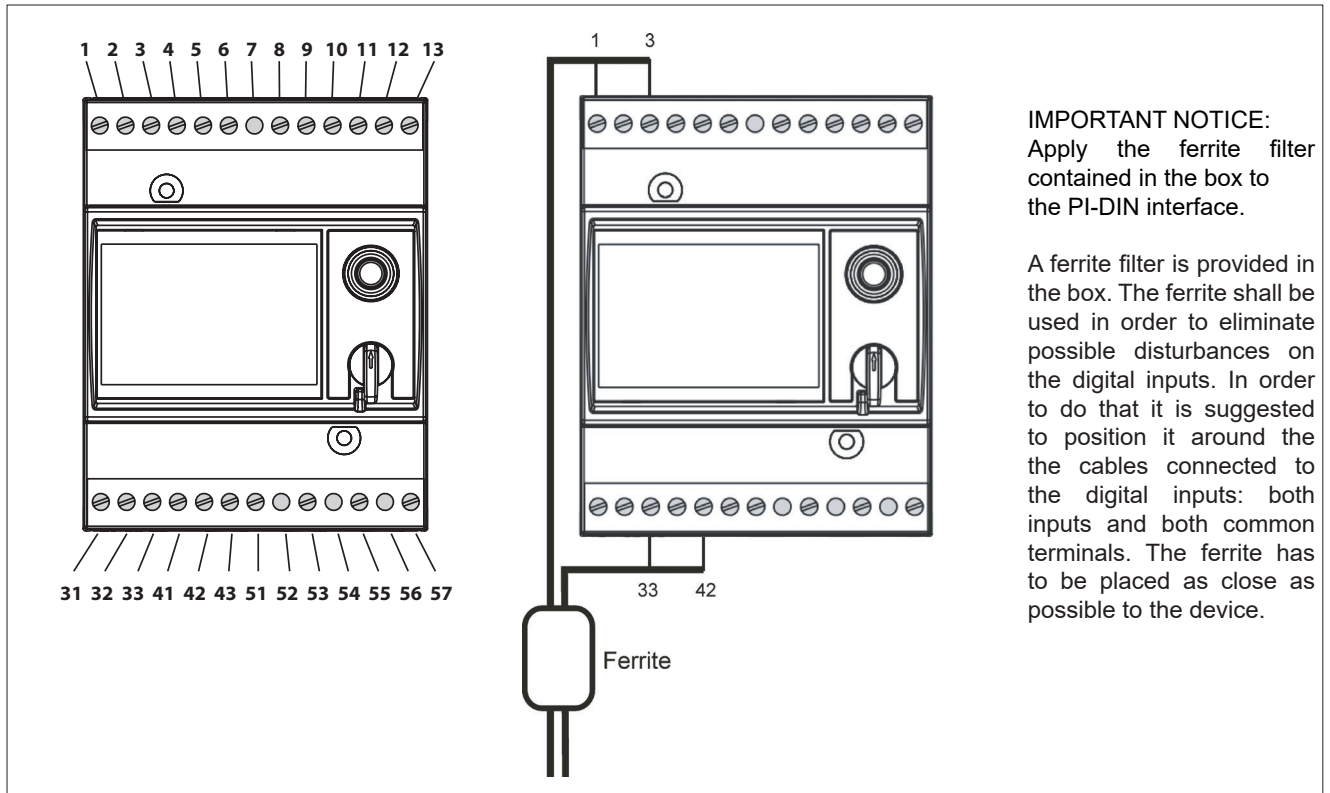
1. Joystick
Programming menus parameters configuration and navigation.
Events and variables scrolling.

2. Display
LCD with alphanumerical indications:
- Display configuration parameters;
- Display all the measured variables;
- Display logged events.

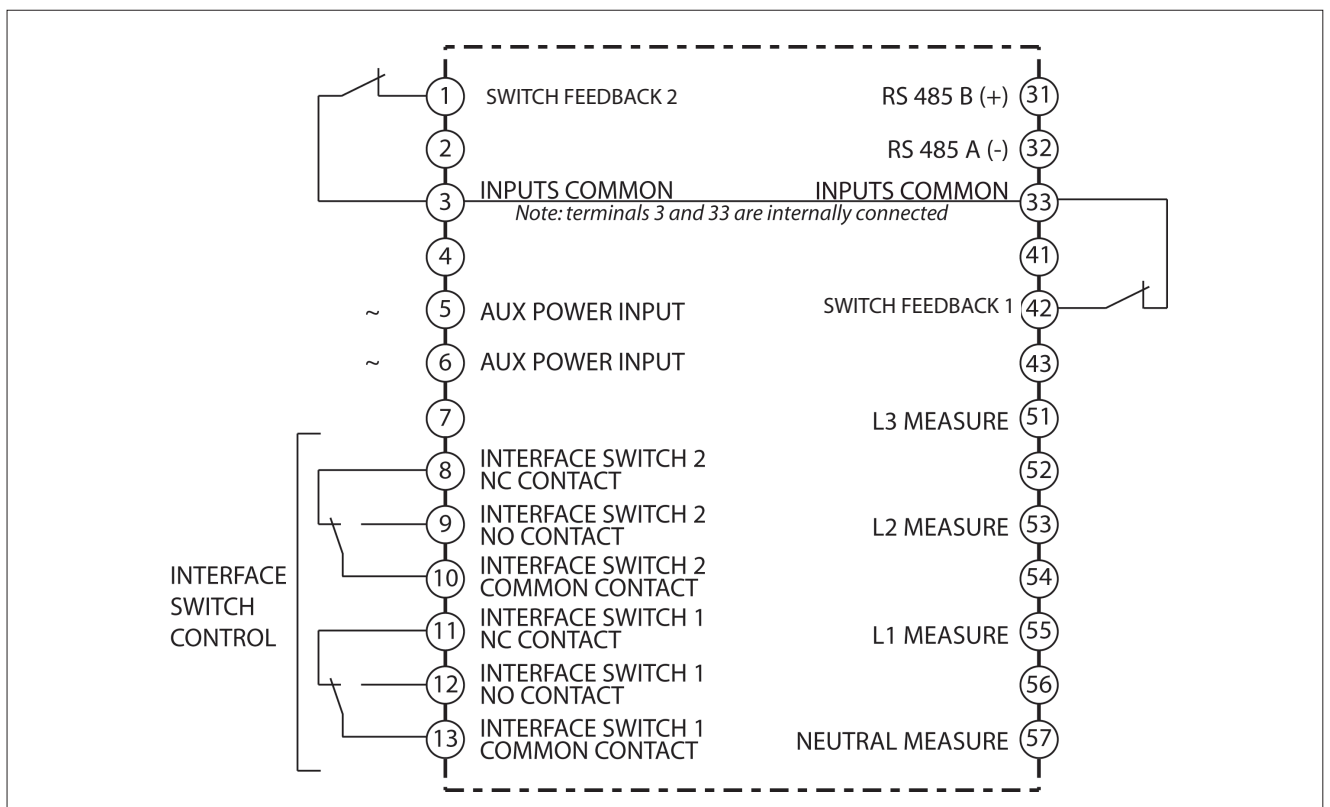
3. Programming menu selector
With the Rotary selector (lead seal lockable) it is possible to select the main menu, the setting menu or the configuration menu.

4. Alarm
Status LED
- OFF, no alarms
- ON, triggered alarm protection tripped

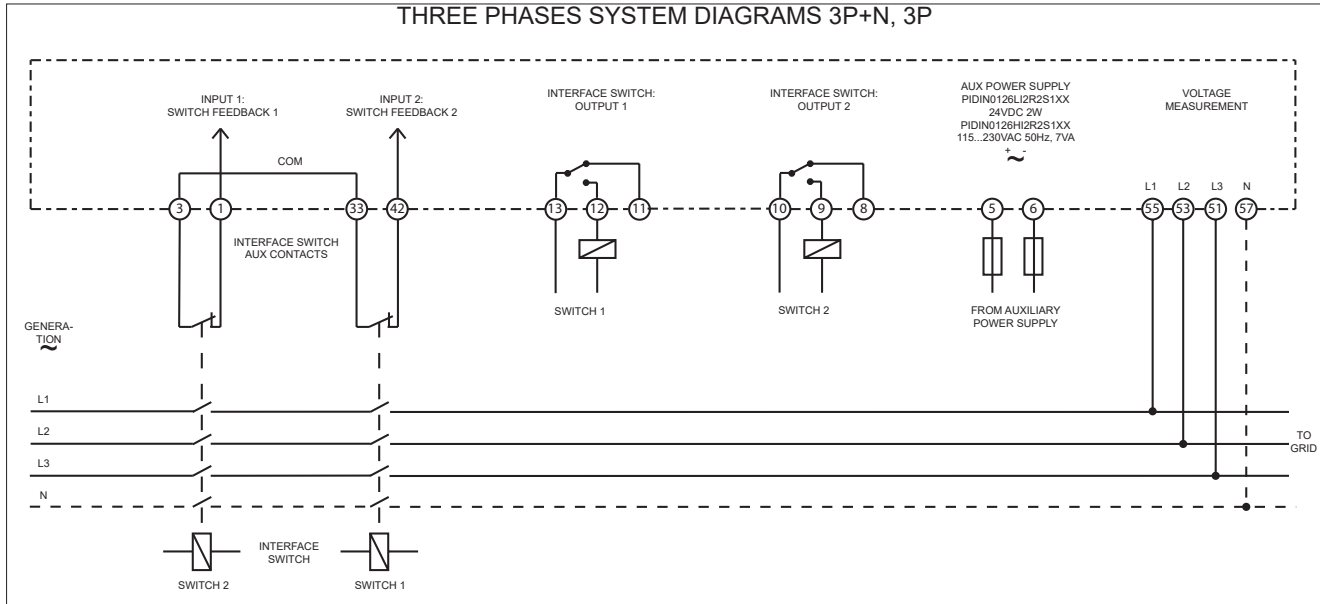
Terminal Board Layout (back view)



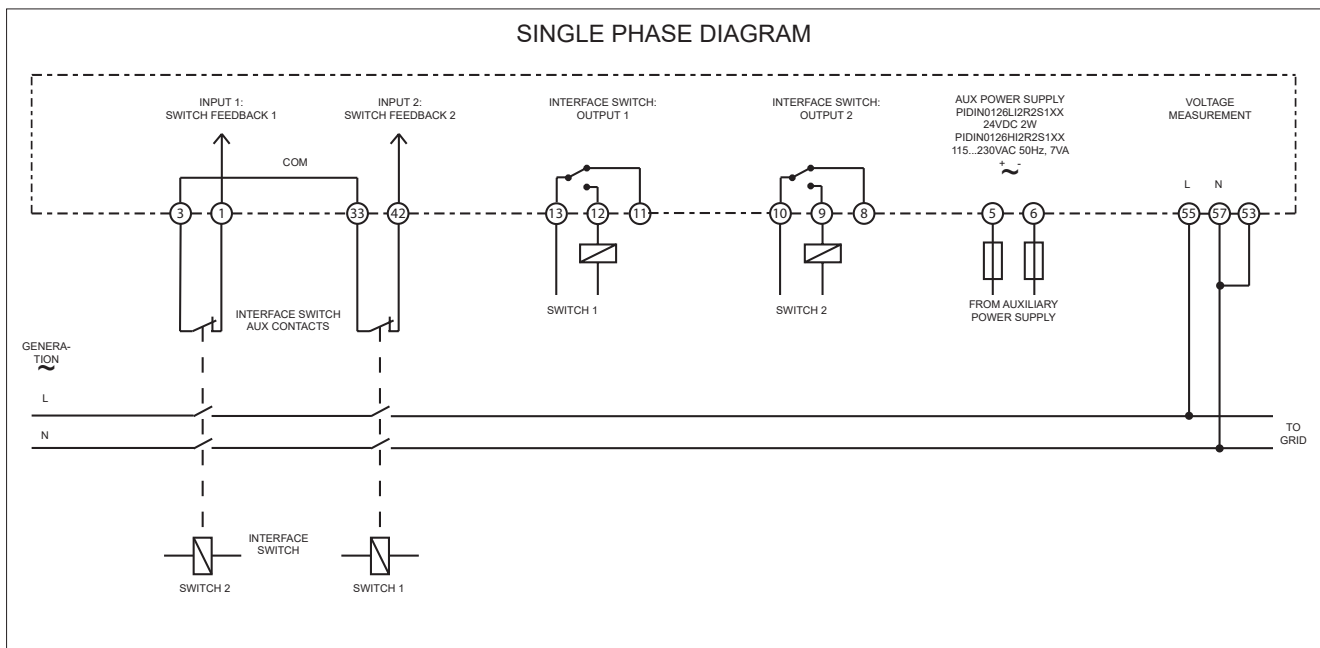
Input/Output pinout



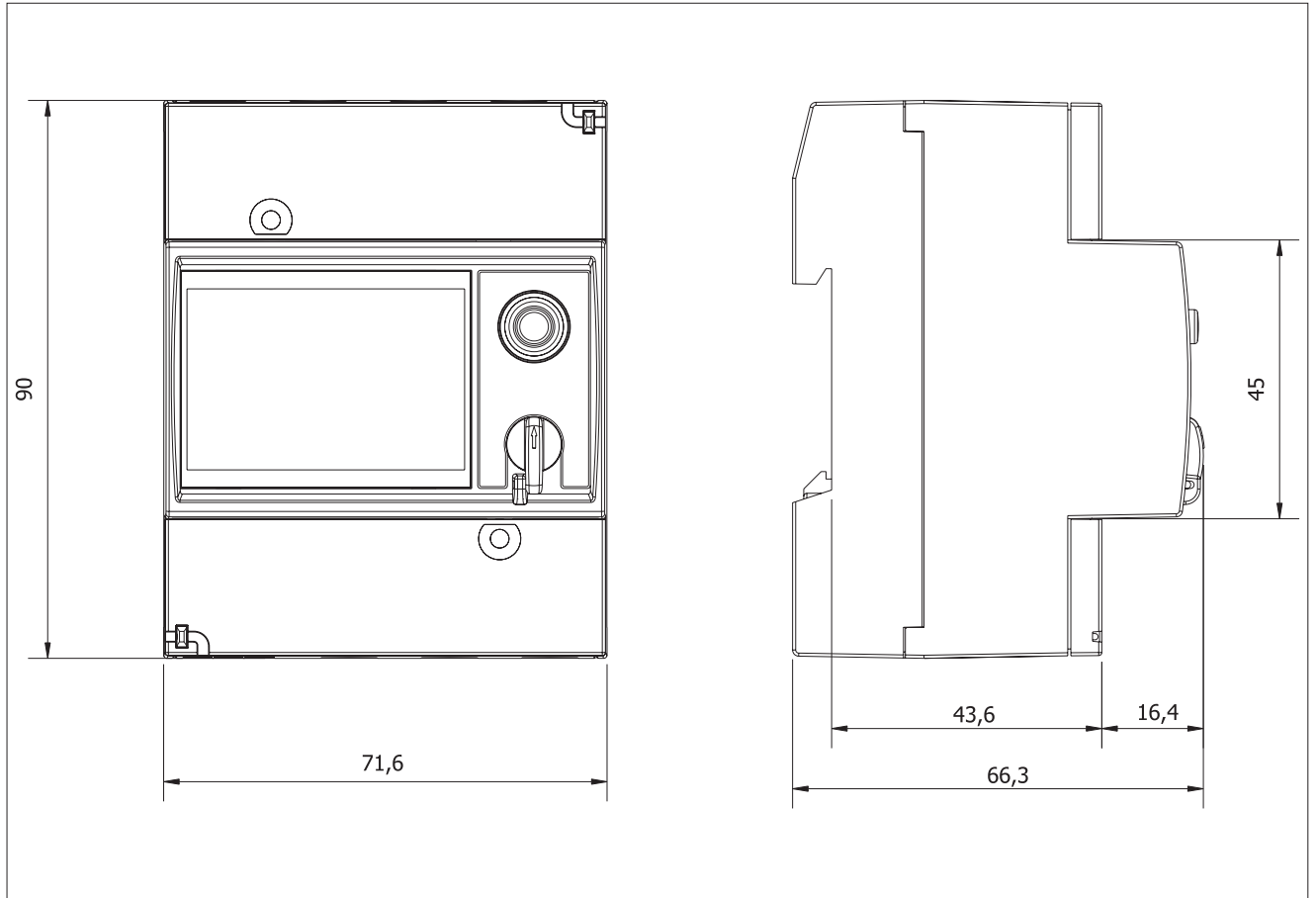
Three Phases System Wirings



Single Phases System Wirings



Dimensions (mm)



Monitoring Relay Interface protection Relay Type PI-DIN CEI 0-21: 2019-04

CARLO GAVAZZI



- Single and Three phase monitoring relay
- Auxiliary power supply 115...230Vac (H) or 24Vdc (L)
- Settings, menu and logger navigation by means of front joystick
- Password protected settings
- 4 digital inputs, 2 relay outputs
- Dual Function Alarm LED
- Data logger with 10 last events logging
- RS485 Serial communication
- Approved according to CEI 0-21:2019-04 (relevant to installations with Power $\geq 800W$)

Product Description

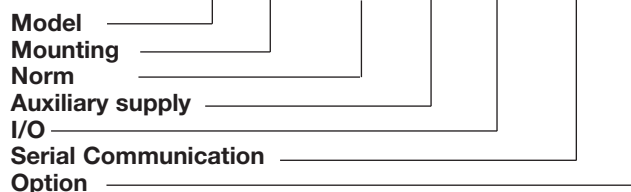
The PI-DIN interface protection device is a monitoring relay especially designed for the connection of renewable energy production plants to the public utility. Voltage and frequency are constantly monitored and measured. In case the measured values are out of the Norm

specified ranges the grid feeding is interrupted by opening the main breaker. Feeding is restored as soon as the grid values return to specified ranges. This specific device is equipped with 2 relay outputs: one for the control of the main breaker ("DDI") and the second one for the backup

breaker ("Rincalzo") which is mandatory on plants above 20kWp according to CEI 0-21:2019-04 Norm. The PI-DIN logs all the events with registration of date, time and type of the last 10 events. The data can be remotely read in real time by means of the RS 485 communication line. The

line can also be used for remote configuration, simplifying the operation.

Ord. key PI DIN 0021 H I4R2 S1 XX



Type Selection

Model Interface protection	PI
Mounting	DIN (4 modules)
Norm CEI 0-21: ed. 2019-04	0021
Auxiliary supply High voltage 115...230Vac Low Voltage 24Vdc	H L
I / O 4 digital inputs, 2 relay outputs	I4R2
Communication RS485 port	S1
Option None	XX

Integrated protection functions

Code/Protection Function	Description
27.S1	Min. voltage set 1
27.S2	Min. voltage set 2
59.S1	Max. voltage set 1 (EN 61000-4-30)
59.S2	Max. voltage set 2
81<.S1	Min. frequency set 1
81<.S2	Min. frequency set 2
81>.S1	Max. frequency set 1
81>.S2	Max. frequency set 2
BF (Breaker Failure)	DDI open failure
AI Seq	incorrect phase sequence



Interface protection

Voltage Setpoint		Timings	
Maximum voltage (59.S1)* *the average value is calculated by measuring the voltage for 10 minutes, every 3s a new average value is calculated on the previous 10 minutes, according to CEI EN 61000-4-30.	1.1Un	Turn on delay Overvoltage protection (59.S1)	1s Variable according to the start / end voltage value. Max. 603 s.
Max. voltage (59.S2)	1.15Un	Overvoltage protection (59.S2)	200ms
Min. voltage (27.S1)	0.85Un	Undervoltage protection (27.S1)	1.5s
Min. voltage (27.S2)	0.15Un	Undervoltage protection (27.S2)	200ms
Rated grid frequency	50Hz	Overfrequency protection (81>.S1)	100ms
Frequency Setpoint		Underfrequency protection (81<.S1)	100ms
Max. frequency (81>.S1)	50.2Hz	Overfrequency protection (81>.S2)	100ms o 1s (remote mode)
Min. frequency (81<.S1)	49.8Hz	Underfrequency protection (81<.S2)	100ms o 4s (remote mode)
Max. frequency (81>.S2)	51.5Hz		
Min. frequency (81<.S2)	47.5Hz		

Connection / Reconnection conditions

Verified conditions	Relapse rate
Max. frequency (81>.S1 ; S2)	between 0.997 and 0.999
Min. frequency (81<.S1 ; S2)	between 1.001 and 1.003
Max. voltage (59.S1 ; S2)	between 0.95 and 0.97
Min. voltage (27.S1 ; S2)	between 1.03 and 1.05
Turn on delay connection	1s
Reconnection after Interface Protection	0.05s

Events & Allarms messages

Events	Note
Number registered events	10 - FIFO - with hour and date
Alarms	<ul style="list-style-type: none"> Triggered for: 59.S1 or 59.S2, 27.S1 or 27.S2, 81>S1 or 81>S2, 81<S1 or 81<S2. Main contactor fault detection (DDI) or internal fault.
Registered events	Remote Off, Local Control, External Signal.

Timings and thresholds settings

Parameter	Default	Setting Range	Setting Steps
27.S1 : Min. voltage set 1	0.85Un 1.5s	0.2Un ÷ 1Un 0.05s ÷ 5s	0.05Un 0.05s
27.S2 : Min. voltage set 2	0.15Un 0.2s	0Un ÷ 1Un 0.05s ÷ 5s	0.05Un 0.05s
59.S1 : Max. voltage set 1 EN 61000-4-30	1.10Un ≤ 603s*	1.0Un ÷ 1.20Un -	0.01Un -
59.S2 : Max. voltage set 2	1.15Un 0.2s	1.0Un ÷ 1.3Un 0.05s ÷ 1s	0.01Un 0.05s
81<.S1 : Min. frequency set 1	49.8Hz 0.1s	47.0Hz ÷ 50.0Hz 0.05s ÷ 5s	0.1Hz 0.05s
81<.S2 : Min. frequency set 2	47.5Hz 0.1s(1) o 4s(2)	47.0Hz ÷ 50.0Hz 0.05s ÷ 5s	0.1Hz 0.05s
81>.S1 : Max. frequency set 1	50,2 Hz 0.1s	50.0Hz ÷ 52.0Hz 0.05s ÷ 5s	0.1Hz 0.05s
81>.S2 : Max. frequency set 2	51.5Hz 0.1s(1) o 1s(2)	50.0Hz ÷ 52.0Hz 0.05s ÷ 5s	0.1Hz 0.05s

(1) Local mode (2) Remote Mode

According to the Norm the timing setting can only be modified when the device is set on "remote mode".

*Note: Variable according to the start / end voltage value.

Reading input specifications

Rated inputs System type Rated voltage	1P, 3P, 3Pn 230V _{LN} /400V _{LL}	Display accuracy (@25°C ±5°C, RH 60%, 45÷60Hz) Voltage Frequency Voltage repeatability Frequency tolerance Timing repeatability	±0.5% RDG +1DGT ±0.1Hz ≤5% ±20mHz ≤3% ±20ms
Distortion (THD)	+/-1% @ full scale		
Temperature drift	≤ 200ppm/°C		
Rated frequency	50Hz		
Input impedance 400VL-L 230VL-N			

I/O signals specifications

Digital inputs functions Input 1 Input 2 Input 3 Input 4 Common terminals	Local Control Terminals 1-33 or 1-3 External Signal Terminals 2-3 or 2-33 Remote Off Terminals 41-3 or 41-33 DDI Auxiliary Contact Terminals 42-33 or 42-3 Terminals 3 and 33	Output relay function Output Relay 1 Output Relay 2	DDI Breaker Terminals NO 12, NC 11, COM 13 Backup Breaker Terminals NO 9, NC 8, COM 10
Digital inputs type "LOW" level input voltage "HIGH" level input voltage Max. input current	< 0,5V 2.4V a 25VCC < 1mA	Output relay type Contact configuration Contact AC1 Contact AC15 Contact DC12 Contact DC13 Mechanical life Electrical life	SPDT 8A @ 250Vac 2.5A @ 250Vac 5A @ 24Vdc 2.5A @ 24Vdc > 30*10 ⁶ ops > 10*10 ⁵ ops @ 8A 250Vac cosφ 1

Main Functions

Password Default	4-digit numeric code Password "0".	Clock Functions Time format Date format Battery life	Clock and calendar Hour: minutes: seconds with formats selection 24 hours or AM/PM. Day-month-year with DD-MM-YY or MM-DD-YY format selection 10 years
System selection 3Ph system 3Ph system 1Ph system	3-phases (4-wires). 3-phases (3-wires). 1-phase (2-wires).		

Table for settings as inputs

"OP MODE"	Inputs		Frequency thresholds	Tripping timings
	Input 2 "External Signal" Terminals 2-3 or 2-33	Input 3 "Local Control" Terminals 1-33 or 1-3		
"Loc": local operation	Irrelevant	Open	Restrictive 49.80Hz ÷ 50.20Hz	49.80Hz - 0.1s 50.20Hz - 0.1s
	Irrelevant	Close	Permissive 47.50Hz ÷ 51.50Hz	47.50Hz - 0.1s 51.50Hz - 0.1s
"Rem": remote operation	Open	Irrelevant	Restrictive 49.80Hz ÷ 50.20Hz	49.80Hz - 0.1s 50.20Hz - 0.1s
	Close	Irrelevant	Permissive 47.50Hz ÷ 51.50Hz	47.50Hz - 4s 51.50Hz - 1s



Serial communication RS485

RS485 Port			
Type	Multidrop, bidirectional (static and dynamic variables).	Data format	1 bit for start, 8 bit for data, no parity/odd parity, equal parity, 1 bit for stop.
Connection	2 wires, Half Duplex. Maximum distance 1000m, termination on instrument.	Communication speed	Selectionable: 4.8k, 9,6k, 19.2k bit/s.
Address	247, selezionabile by frontal keyboard.	Network devices	1/5 unit load. Maximum 160 devices in the same network.
Protocol	MODBUS/JBUS (RTU)		
Data (bidirectional)			
Dynamic (only reading)	Variables of system and phase: please see "List of variables measured" table.		
Static (reading and writing)	All configuration parameters.		

General specification

Operating temperature	From -20 a +55°C (-4°F to 131°F) (U.R. from 0 to 90% without condensation @ 40°C)	Conformity Standards	
		Safety	EN61010-1
Storage temperature	From -30 to +70°C (-22°F to 158°F) (U.R. < 90% without condensation @ 40°C)	Approvals	CE, CEI 0-21:2019-04
		Terminals	Screw
Installation category	Cat. IV (IEC60664, EN60664)	Cable references	Max. 2.5 mm ² .
Dielectric strength	3310Vac for 1 minute	Tightening torque	Min./Max.: 0.4Nm/1Nm.
Rejection rate		Housing	
CMRR	100dB, from 48Hz to 62Hz	Dimensions (WxHxD)	90x71.6x66.3mm
EMC	according to EN61000-6-3 and EN61000-6-2.	Material	Front: ABS, Self extinguishing: UL 94 V-0 DIN rail
Protection degree		Mounting	
Front	IP50	Weight	300g ca (including packaging)
Screw terminals	IP20		
Pollution degree	3		

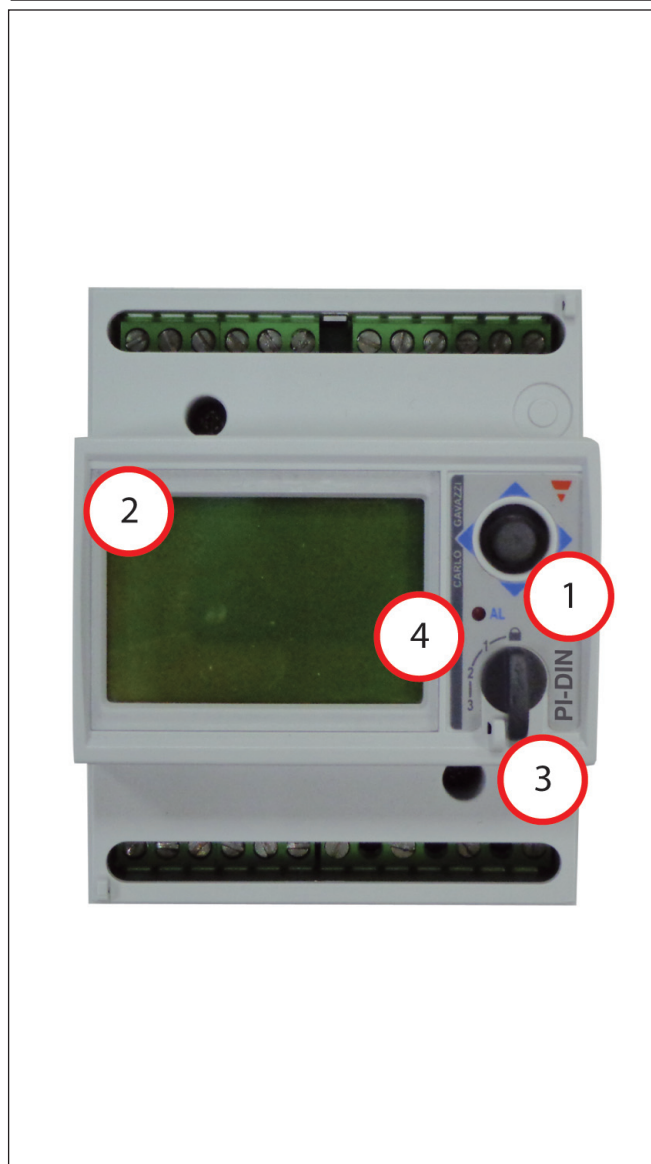
Auxiliary power supply specifications

Auxiliary power supply		Self-consumption	
" H " version	115..230Vac, 48-62Hz -20% +15%	" H " version	7VA
" L " version	24Vdc -20% +20%	" L " version	2W

Display, LEDs and commands

Display refresh time	≤ 100 ms	Rotary switch	programming menus access: password, date & time, interface protection parameters, system, etc... Selector is provided with a slit for lead seal locking.
Display	2 lines, 4-DGT 1 line, 8-DGT		
Model	LCD	LED on front panel	Dual function RED LED Lit: alarm triggered Blinking: Alarm triggered, elapsing delay before opening.
Digit dimension	h 7mm		
Joystick	Variables reading selection, operating parameters settings, triggered events list.		

Front panel description



1. Joystick

Programming menus parameters configuration and navigation. Events and variables scrolling.

2. Display

LCD with alphanumerical indications:

- Display configuration parameters;
- Display all the measured variables;
- Display logged events.

3. Programming menu selector

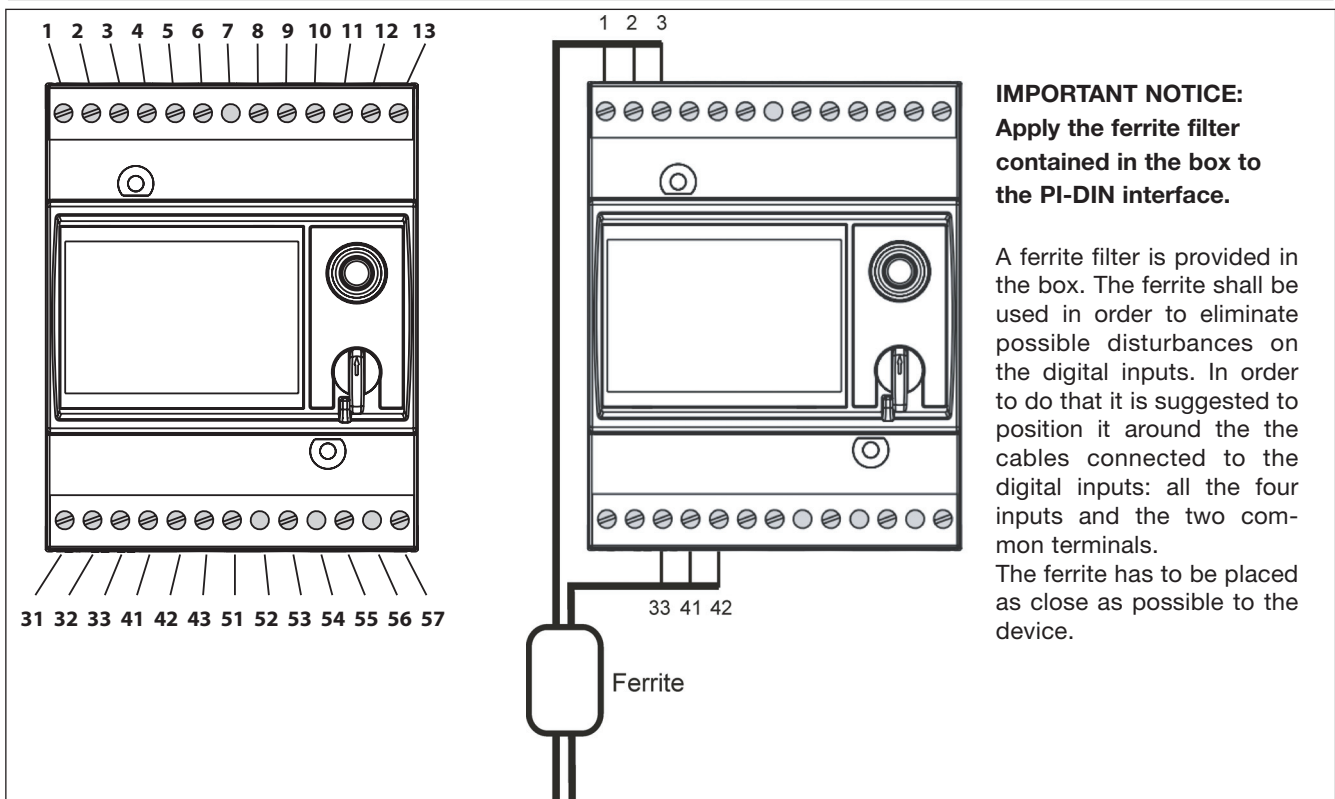
With the Rotary selector (lead seal lockable) it is possible to select the main menu, the setting menu or the configuration menu.

4. Alarm LED

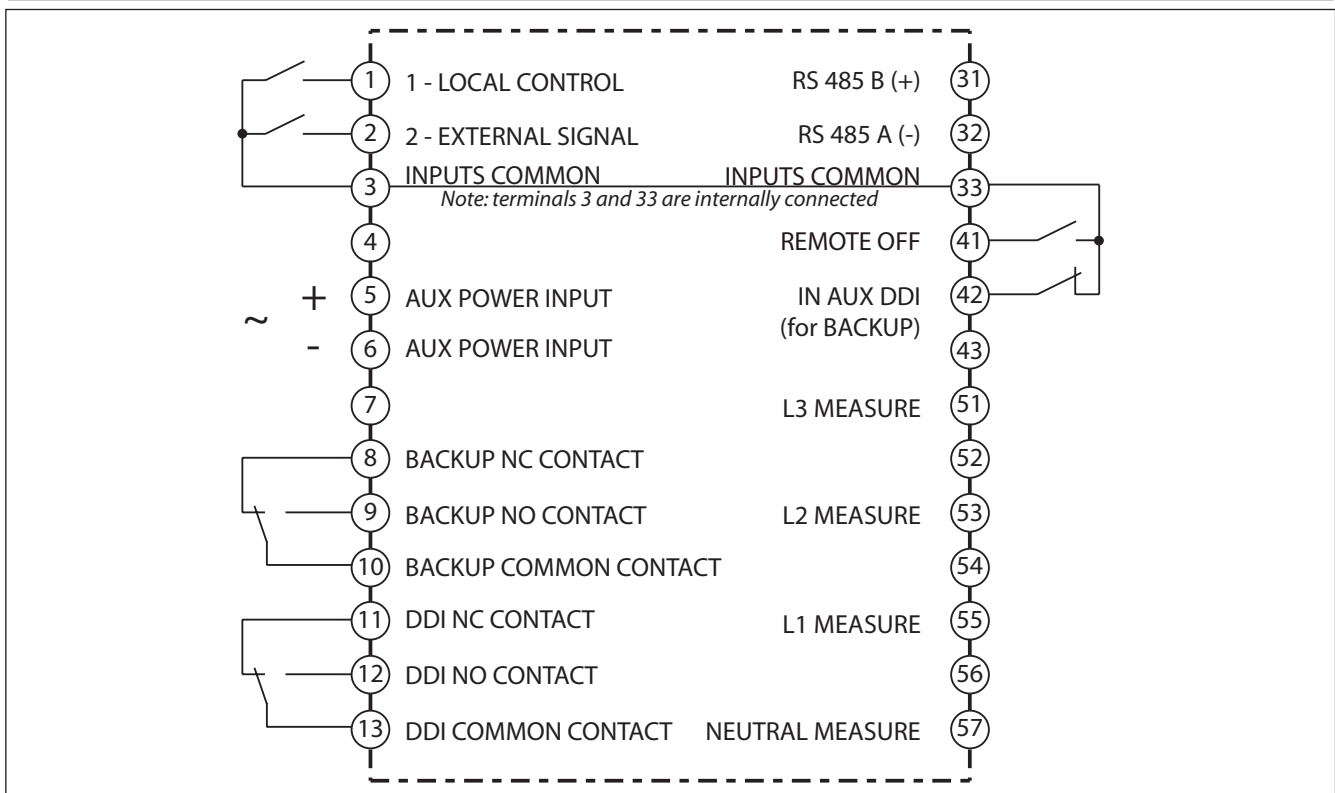
Status LED

- OFF, no alarms
- ON, triggered alarm protection tripped
- Blinking, alarm triggered, protection tripping after delay.

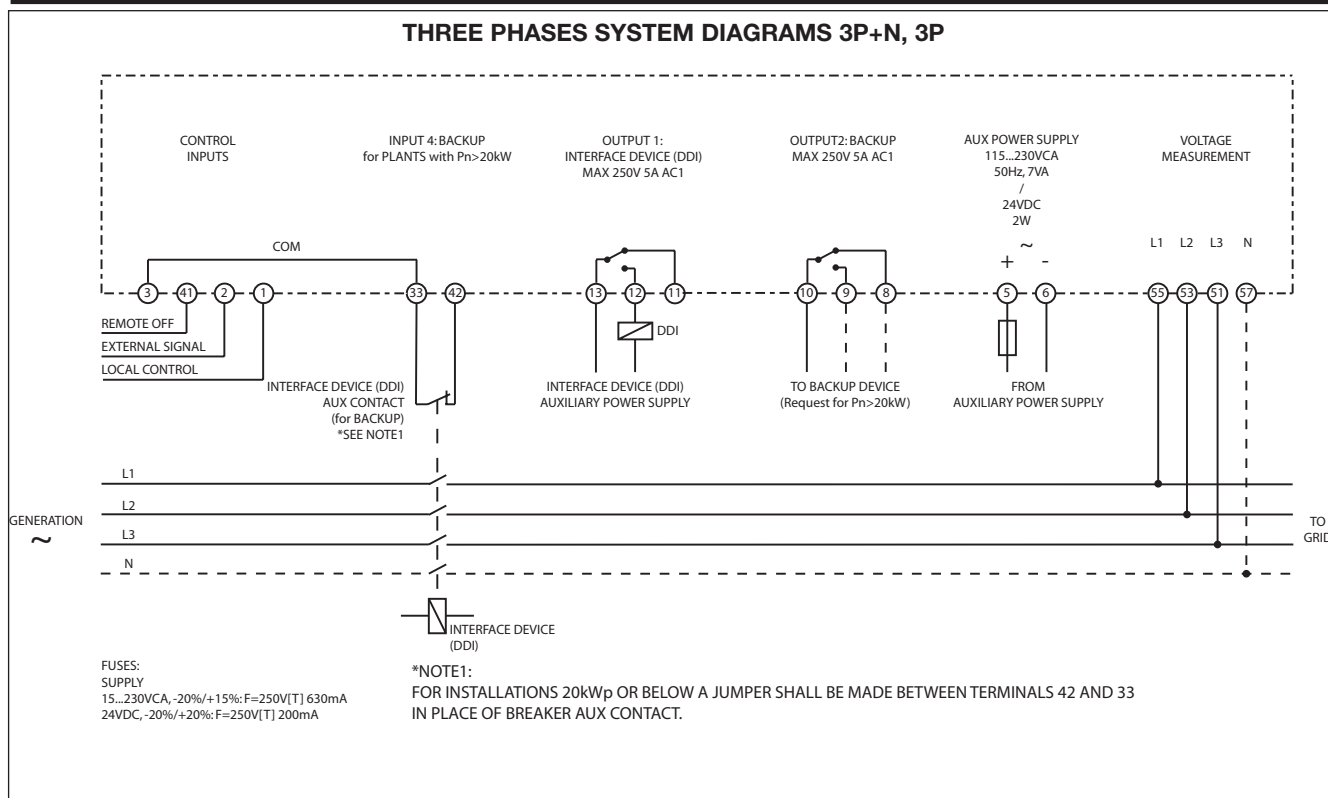
Terminal board layout (back view)



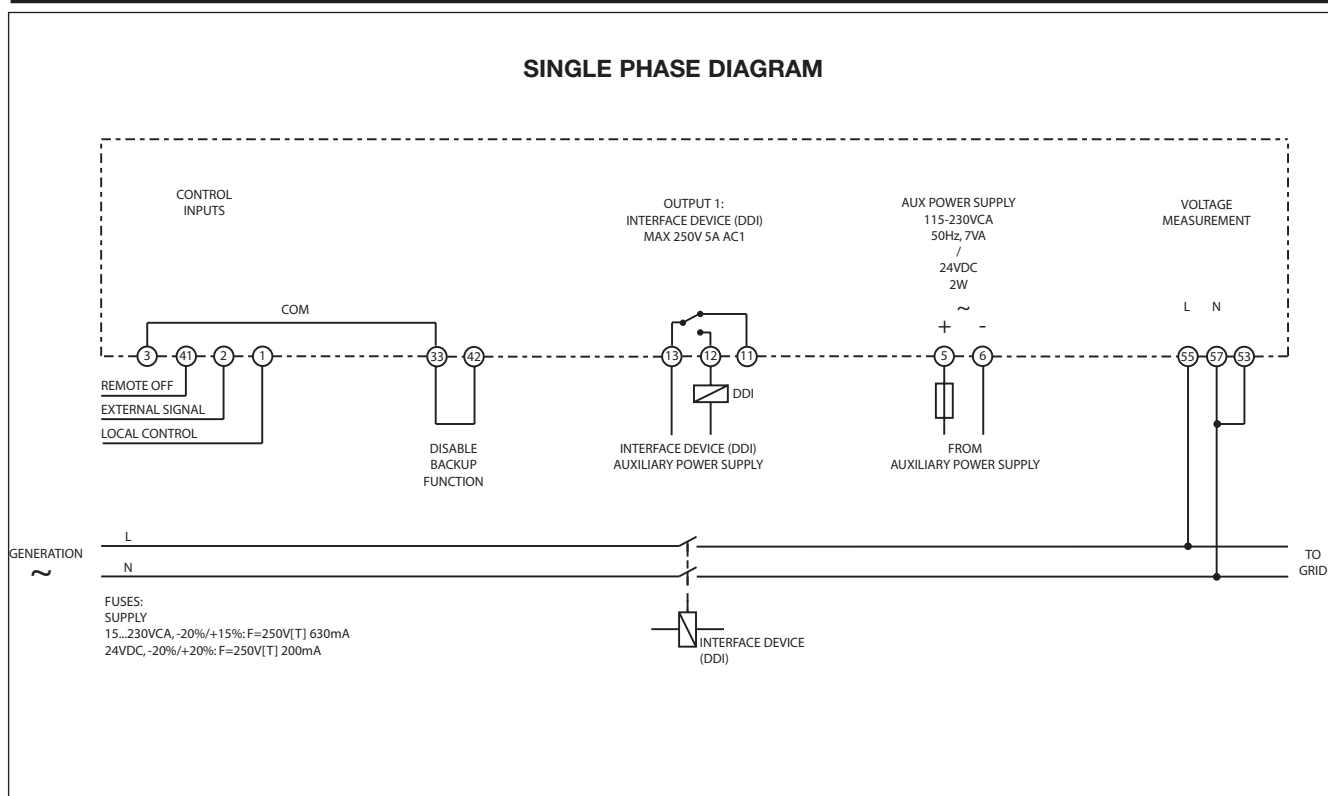
Input/Output pinout



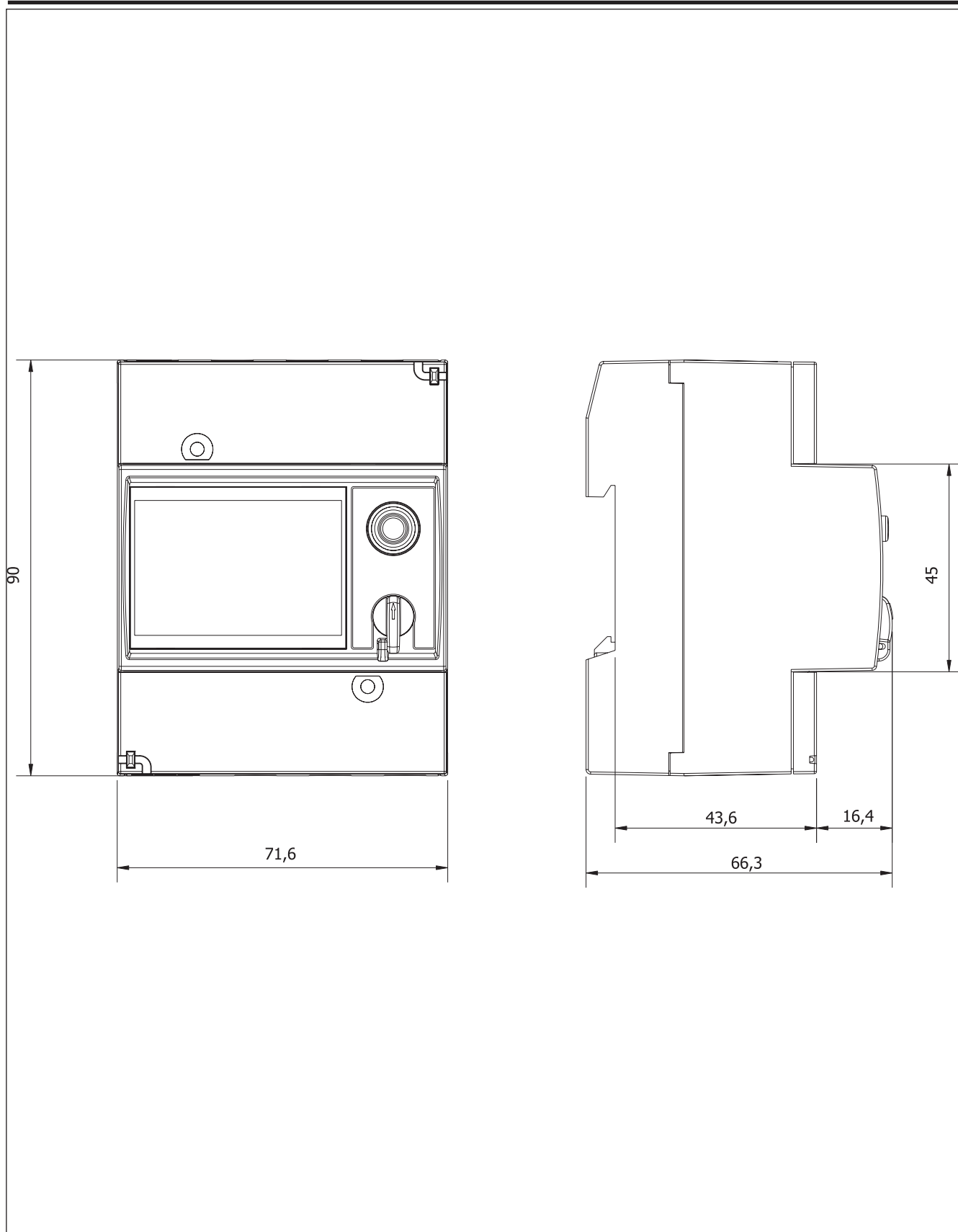
Three Phases System wirings



Single Phases System wirings



Dimensions (mm)



По вопросам продаж и поддержки обращайтесь:

Алматы (7273)495-231	Казань (843)206-01-48	Новокузнецк (3843)20-46-81	Смоленск (4812)29-41-54
Архангельск (8182)63-90-72	Калининград (4012)72-03-81	Новосибирск (383)227-86-73	Сочи (862)225-72-31
Астрахань (8512)99-46-04	Калуга (4842)92-23-67	Омск (3812)21-46-40	Ставрополь (8652)20-65-13
Барнаул (3852)73-04-60	Кемерово (3842)65-04-62	Орел (4862)44-53-42	Сургут (3462)77-98-35
Белгород (4722)40-23-64	Киров (8332)68-02-04	Оренбург (3532)37-68-04	Тверь (4822)63-31-35
Брянск (4832)59-03-52	Краснодар (861)203-40-90	Пенза (8412)22-31-16	Томск (3822)98-41-53
Владивосток (423)249-28-31	Красноярск (391)204-63-61	Пермь (342)205-81-47	Тула (4872)74-02-29
Волгоград (844)278-03-48	Курск (4712)77-13-04	Ростов-на-Дону (863)308-18-15	Тюмень (3452)66-21-18
Вологда (8172)26-41-59	Липецк (4742)52-20-81	Рязань (4912)46-61-64	Ульяновск (8422)24-23-59
Воронеж (473)204-51-73	Магнитогорск (3519)55-03-13	Самара (846)206-03-16	Уфа (347)229-48-12
Екатеринбург (343)384-55-89	Москва (495)268-04-70	Санкт-Петербург (812)309-46-40	Хабаровск (4212)92-98-04
Иваново (4932)77-34-06	Мурманск (8152)59-64-93	Саратов (845)249-38-78	Челябинск (351)202-03-61
Ижевск (3412)26-03-58	Набережные Челны (8552)20-53-41	Севастополь (8692)22-31-93	Череповец (8202)49-02-64
Иркутск (395)279-98-46	Нижний Новгород (831)429-08-12	Симферополь (3652)67-13-56	Ярославль (4852)69-52-93
Россия (495)268-04-70	Киргизия (996)312-96-26-47	Казахстан (7172)727-132	

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