

## ZEPTO 96

### INSTALLATION INSTRUCTION

#### COPYRIGHT

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#### WARRANTY

This product is covered by a warranty against material and manufacturing defects for a period of 24 months period from the manufacturing date.  
The warranty does not cover the defects that are due to:

- Negligent and improper use
- Failures caused by atmospheric hazards
- Acts of vandalism
- Wear out of materials
- Firmware upgrades

Akse reserves the right, at its discretion, to repair or substitute the faulty products  
The warranty is not applicable to the products that will result defective in consequence of a negligent and improper use or an operating procedure not contemplated in this manual.

#### RETURN AND REPAIR FORMALITIES

Akse accepts the return of instruments for repair only when authorized in advance. The transport costs are at customer charge.

#### RE-SHIPING OF REPAIRED PRODUCT

The terms for re-shipment of repaired products are ex-works, i.e. the transport costs are at customer charge.

Products returned as defective but found to be perfectly working by our laboratories, will be charged a flat fee to account for checking and testing time irrespective of the warranty terms.

#### SAFETY

This instrument was manufactured and tested in compliance with IEC 61010 class 2 standards for operating voltages up to 250 VAC rms phase to neutral.

In order to maintain this condition and to ensure safe operation, the user must comply with the indications and markings contained in the following instructions:

- When the instrument is received, before starting its installation, check that it is intact and no damage occurred during transport.
- Before mounting, ensure that the instrument operating voltages and the mains voltage are compatible then proceed with the installation.
- The instrument power supply needs no earth connection.
- The instrument is not equipped with a power supply fuse; a suitable external protection fuse must be foreseen by the contractor.
- Maintenance and/or repair must be carried out only by qualified, authorized personnel
- If there is ever the suspicion that safe operation is no longer possible, the instrument must be taken out of service and precautions taken against its accidental use.
- Operation is no longer safe when:
  - 1) There is clearly visible damage.
  - 2) The instrument no longer functions.
  - 3) After lengthy storage in unfavorable conditions.
  - 4) After serious damage occurred during transport



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The instruments must be installed in respect of all the local regulations.

#### OPERATOR SAFETY

**Warning:** Failure to observe the following instructions may lead to a serious danger of death.

- During normal operation dangerous voltages can occur on instrument terminals and on voltage and current transformers. Energized voltage and current transformers may generate lethal voltages. Follow carefully the standard safety precautions while carrying out any installation or service operation.
- The terminals of the instrument must not be accessible by the user after the installation. The user should only be allowed to access the instrument front panel where the display is located.
- Do not use the digital outputs for protection functions nor for power limitation functions. The instrument is suitable only for secondary protection functions.
- The instrument must be protected by a breaking device capable of interrupting both the power supply and the measurement terminals. It must be easily reachable by the operator and well identified as instrument cut-off device.
- The instrument and its connections must be carefully protected against short-circuit.

**Precautions:** Failure to respect the following instructions may irreversibly damage to the instrument.

- The instrument is equipped with PTC current limiting device but a suitable external protection fuse should be foreseen by the contractor.
- The outputs and the options operate at low voltage level; they cannot be powered by any unspecified external voltage.
- The application of currents not compatible with the current inputs levels will damage to the instrument.

Further documentation may be downloaded from our web site [www.electrex.it](http://www.electrex.it).  
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#### DECLARATION OF CONFORMITY

Akse hereby declares that its range of products complies with the following directives EMC 89/336/EEC 73/23CE 93/68 CE and complies with the following product's standard

CEI EN 61326 – IEC 61326 CEI EN 61010 – IEC 1010.

The product has been tested in the typical wiring configuration and with peripherals conforming to the EMC directive and the LV directive.

#### READINGS

- Press for 2 seconds to show
- Meter and firmware version
  - Serial Number
  - RS485 Address

2EP t0 171  
5n 356 535  
Add r 027



#### READINGS DISPLAYED

(The parameters available vary according to instrument configuration)

	meas	U	f	I	P	Q	S	PF
Press to scroll readings	page	L-N	f	I	P	Q	S	PF
		L-L		In	P Avg	Q L Avg	S Avg	
		THD L-N		THD	P MD	Q C Avg	S MD	
		THD L-L		I Avg		Q L MD		
				I MD		Q C MD		

#### READINGS DISPLAYED

(The parameters available vary according to instrument configuration)

	cnt	Press to change readings			
Press for 2 seconds		Ea Σ	Er L Σ	Er C Σ	Es Σ
		Ea Σ €2	Er L Σ €2	Er C Σ €2	Es Σ €2
		TIME Σ	TIME €2		

#### LEGEND OF PARAMETERS AND SYMBOLS

L-N	Phase Neutral	U	Voltage
L-L	Phase Phase	I	Current
THD	Total Harmonic Distortion	In	Neutral current
Avg	Average (rolling) value	P	Active Power
MD	Maximum Demand	Q	Reactive Power
L	Inductive	S	Apparent Power
C	Capacitive	PF	Power Factor
TIME Σ	Life Time (total) (hour/100)	Ea	Active Energy
TIME €2	Life Time (partial) (hour/100)	Er	Reactive Energy
CNT Σ	Pulse count (total)	Es	Apparent Energy
CNT €2	Pulse count (partial)	f	Frequency

#### MECHANICAL CHARACTERISTICS

Enclosure	Self-extinguishing plastic material class V0
Protection degree	IP51 on front panel, IP20 terminals side
Dimensions	96 x 96 x 72 mm

#### VOLTAGE INPUT

Direct	Up to 300 Vrms phase-neutral or 519 Vrms phase to phase
With external PT(VT)	Primary: programmable (max. 400 kV) Secondary: programmable (max. 300 V)
	Overload: 900 Vrms phase to phase for 1 sec
Power supply	230/240Vac +/- 10% 50/60Hz
Self consumption	< 3VA

#### MODELS

PFA8C11-02	ZEPTO 96 RS485 230-240V ENERGY ANALYSER
PFA8C11-12	ZEPTO 96 RS485 230-240V 1DI 2DO ENERGY ANALYSER

## DEVICE SETUP

### BUTTONS DESCRIPTION

Click	Raise the value of the selected field	Decrease the value of the selected field	Go to the next field
Click 2 sec	Go to the next window	Go to the first field of the window	Exit setup

**ENTER SETUP**  
(Press together for 2 seconds)



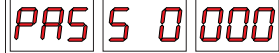
**EXIT SETUP**  
(Press for 2 seconds)



### SETUP SEQUENCE

PAGE	PARAMETERS	VALUES AVAILABLE	DEFAULT
------	------------	------------------	---------

PASSWORD REQUEST	0000 ... 9999	0000
------------------	---------------	------



RS485	RS485 Address	1 ... 247	27
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Baudrate	2400, 4800, 9600, 19200, 38400	9600
Data Bit	7 or 8	8
Parity	N = no parity, E = even parity, O = odd parity	N
Stop Bit	1 or 2	2



NETWORK	Type	3PH-3W-2CT, 3PH-4W, 2PH-2W, 1PH-2W	3PH-4W
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CT (Primary)	10000	5
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CT ( )	1 o 5	5
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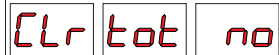
VT (Primary)	400000	1
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VT (Secondary)	300	1
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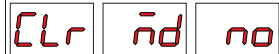
CLEAR TOTAL COUNTERS	NO, YES	NO
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CLEAR PARTIAL COUNTERS	NO, YES	NO
------------------------	---------	----



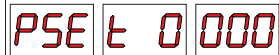
CLEAR MAX DEMAND	NO, YES	NO
------------------	---------	----



RESTORE FACTORY SETTINGS	NO, YES	NO
--------------------------	---------	----



ENTER NEW PASSWORD	0000 ... 9999	0000
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**NOTA n.1**

3PH-3W-2CT	2-phase, 3 wires, delta
3PH-4W	3-phase 4 wires, star
2PH-2W	2-phase, 2 wires, bi-phase
1PH-2W	1-phase, 2 wires, mono-phase

### "Err" MESSAGE

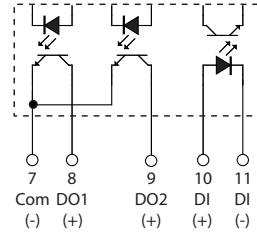
During the set-up operations of the instrument may display the message "Err". It means that the parameter settings were incorrect. To restore the factory configuration (RESTORE FACTORY SETTING) follow the following steps:



After performing this procedure, the instrument will restart as setuped at the factory. Restore the instrument does not entail the loss of the values recorded during the operation.

## DIGITAL INPUTS AND OUTPUTS CONNECTION

(Applicable only to type PFA8C11-12)



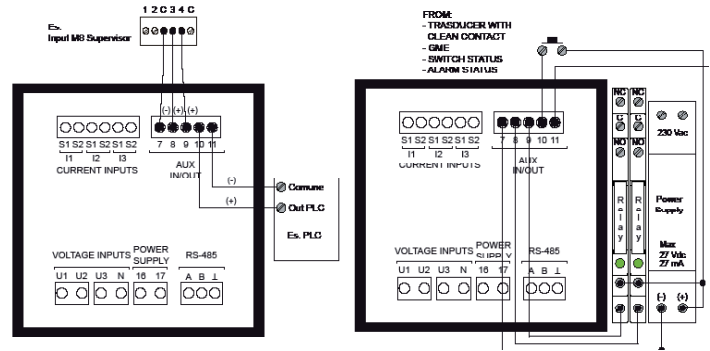
### Digital inputs

Supply voltage (external):	from 10 to 30 Vdc
Current consumption:	from 2 to 10mA
Max. count frequency 10 or 100Hz	10 or 100Hz

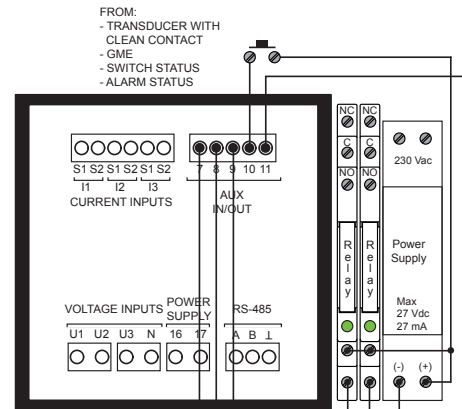
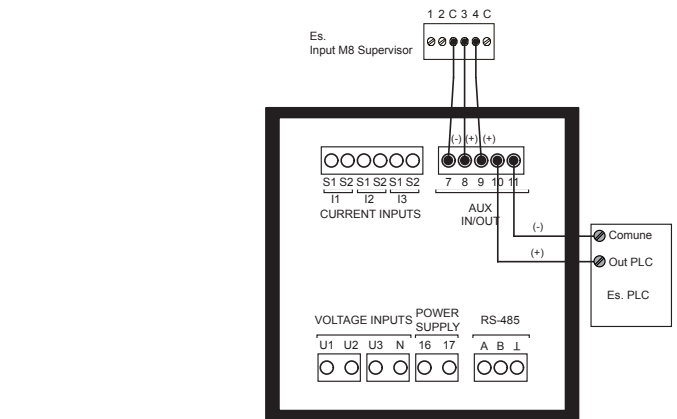
N.B. For gas meters a galvanic separation is needed comply to ATEX standards

### Digital outputs (optocoupled NPN transistor type per DIN 43864)

Maximum applicable voltage:	27 Vdc
Maximum switchable current:	27mA



## EXAMPLES OF INPUT AND OUTPUT CONNECTIONS



U	f	I	P	Q	S	PF
<p>Tensione Fase Neutro Voltage Phase Neutral</p> <p>Tensione Fase Fase Voltage Phase Phase</p> <p>THD Tensione Fase Neutro THD Voltage Phase Neutral</p> <p>THD Tensione Fase Fase THD Voltage Phase Phase</p>	<p>Frequenza Frequency</p> <p>Corrente di neutro Neutral current</p> <p>THD Corrente THD Current</p> <p>AVG corrente AVG current</p> <p>MD corrente MD current</p>	<p>Potenza Attiva Active Power</p> <p>AVG potenza attiva AVG active power</p> <p>MD potenza attiva MD active power</p>	<p>Potenza Reattiva Reactive Power</p> <p>AVG potenza reattiva induttiva AVG reactive inductive power</p> <p>AVG potenza reattiva capacitativa AVG reactive capacitive power</p> <p>MD potenza reattiva induttiva MD reactive inductive power</p> <p>MD potenza reattiva capacitativa MD reactive capacitive power</p>	<p>Potenza Apparente Apparent Power</p> <p>AVG potenza apparente AVG apparent power</p> <p>MD potenza apparente MD apparent power</p>	<p>Fattore di potenza Power Factor</p>	

Press to change measure

U	f	I	P	Q	S	PF
<p>Energia Attiva (Totale o tariffa 1) Active Energy (Total or Tarif 1)</p> <p>Energia Attiva (Parziale o tariffa 2) Active Energy (Partial or Tarif 2)</p> <p>Tempo di funzionamento (totale) (ore/100) Life Time (total) (hour/100)</p>	<p>Energia Reattiva Induttiva (Totale o Tariffa 1) Reactive Inductive Energy (Total or Tarif 1)</p> <p>Energia Reattiva Induttiva (Parziale o tariffa 2) Reactive Inductive Energy (Partial or Tarif 2)</p> <p>Tempo di funzionamento (parziale) (ore/100) Life Time (partial) (hour/100)</p>	<p>Energia Reattiva Capacitiva (Totale o Tariffa 1) Reactive Capacitive Energy (Total or Tarif 1)</p> <p>Energia Reattiva Capacitiva (Parziale o tariffa 2) Reactive Capacitive Energy (Partial or Tarif 2)</p>	<p>Energia Apparente (Totale o Tariffa 1) Apparent Energy (Total or Tarif 1)</p> <p>Energia Apparente (Parziale o tariffa 2) Apparent Energy (Partial or Tarif 2)</p>			

Press to change measure

Hold for 2 seconds

### VOLTAGE AND CURRENT CONNECTION

#### Voltage connection

Use cables with max cross-section of 2,5 mm<sup>2</sup> if flexible 4 mm<sup>2</sup> if rigid and connect to the terminals marked voltage input on the device according to the following diagrams.

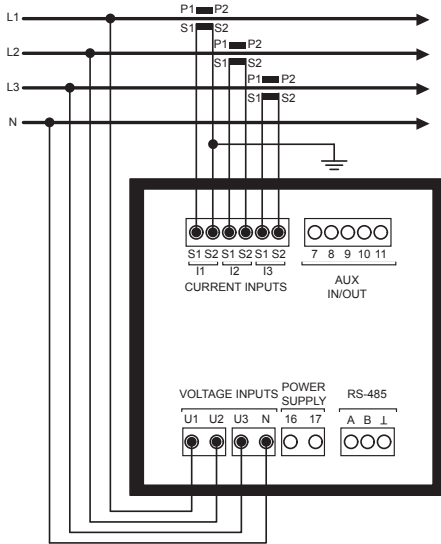
#### Current connection

It is necessary to use external CTs with a primary rating adequate to the load to be metered and with a 5A or 1A secondary rating. The number of CTs to be used (1, 2 or 3) depends upon the type of network. Connect the CT output(s) to the terminals marked I1, I2, I3 (current input) of the instrument according to the applicable diagrams that follow. Use cables with cross-section adequate to the VA rating of the CT and to the distance to be covered. The max cross-section for the terminals is 4 mm<sup>2</sup>.

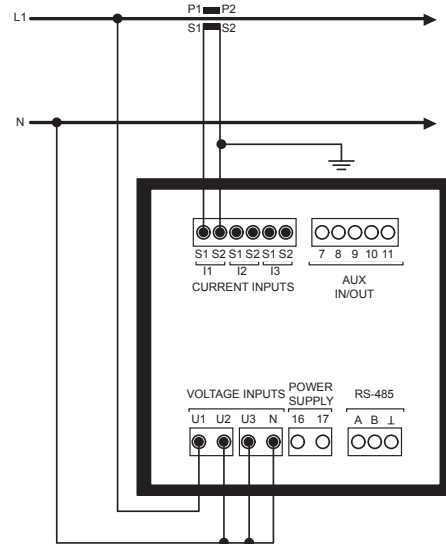
**N.B. The CT secondary must always be in short circuit when not connected to the instrument in order to avoid damages and risks for the operator.**

**Warning:** The phase relationship among voltage and current signals, the P1-P2 orientation and the S1-S2 connection of the CT(s) must be carefully respected. All disregard of this rule or of the wiring diagram leads to severe measurement errors.

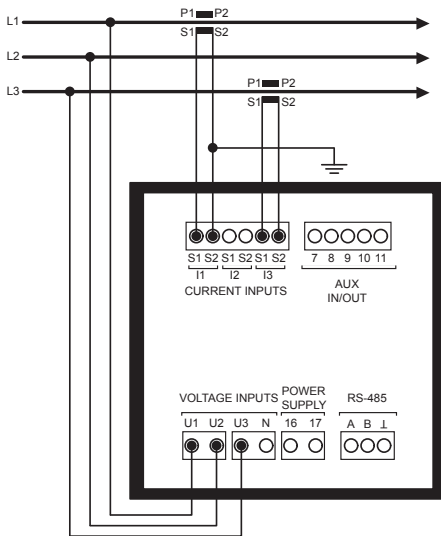
#### 4W STAR (4 WIRE) 3PH-4W



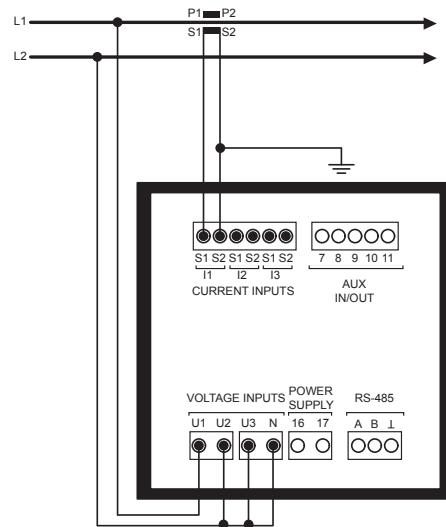
#### SINGLE PHASE 1PH-2W



#### 3W DELTA (3 WIRE) 3PH-3W-2CT



#### BI-PHASE 2PH-2W



#### POWER SUPPLY AND SERIAL LINE CONNECTION

The instrument is fitted with a separate power supply. The power supply terminals are numbered (16) and (17). Use cables with max cross-section of 2,5 mm<sup>2</sup> if flexible, 4 mm<sup>2</sup> if rigid.

