

FEMTO D4 70A

INSTALLATION INSTRUCTIONS

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WARRANTY

This product is covered by a warranty against material and manufacturing defects for a 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-SHIPPING 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 CEI EN 61010-1 CAT III -300V, class 2, standards for operating voltages up to 300 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

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 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.

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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 CEI EN 61326 – IEC 61326 CEI EN 61010 – IEC 61010

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

READINGS



READINGS DISPLAYED IN THE UPPER SCREEN AREA
(The parameters available vary according to instrument configuration)

| ▲ meas | Ea | Er | Es | U | U-f | I | P | Q | S | PF |
|-----------|--------|------------|--------|-----|-------|---|---|---|---|----|
| ▼ page | Ea Imp | Er Ind Imp | Es Imp | L-N | L-N f | I | P | Q | S | PF |

Press to scroll readings

| | | | | | | | | | | |
|---------|-------------|--------|---------|-----------|-------|-----------|-----------|-----------|--|--|
| Ea Exp | Er Cap Imp | Es Exp | L-L | L-L f | In | P Avg Imp | Q Avg Imp | S Avg Imp | | |
| Ea Fase | Er Ind Exp | | THD L-N | THD L-N f | THD | P Avg Exp | Q Avg Exp | S Avg Exp | | |
| | Er Cap Exp | | THD L-L | THD L-L f | I Max | P MD Imp | Q MD Imp | S MD Imp | | |
| | Er Ind Fase | | Min L-N | Min L-N | I Avg | P MD Exp | Q MD Exp | S MD Exp | | |
| | | | Min L-L | Min L-L | I MD | | | | | |
| | | | Max L-N | Max L-N | | | | | | |
| | | | Max L-L | Max L-L | | | | | | |

U 230.0 L₁N
230.0 L₂N
U 230.0 L₃N

READINGS DISPLAYED IN THE LOWER SCREEN AREA
(The parameters available vary according to instrument configuration)

| ► cnt | Premere per cambiare misura | | | |
|---------------------|-----------------------------|---------|---------|-------|
| Press for 2 seconds | Ea Σ+ | Er L Σ+ | Er C Σ+ | Es Σ+ |
| | Ea Σ- | Er L Σ- | Er C Σ- | Es Σ- |
| | Ea P+ | Er L P+ | Er C P+ | Es P+ |
| | Ea P- | Er L P- | Er C P- | Es P- |
| | CNT1 Σ | | | |
| | CNT1 P | | | |
| | TIME Σ | TIME P | | |
| | TEMP °C | TEMP °F | | |

Ex 562319.62 kvarh L ↴

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 |
| Imp (+) | Import value | S | Apparent Power |
| Exp (-) | Export value | PF | Power Factor |
| IND | Inductive | Ea | Active Energy |
| CAP | Capacitive | Er | Reactive Energy |
| Min | Minimum values (10 cycles time base) | Es | Apparent Energy |
| Max | Maximum values (10 cycles time base) | f | Frequency |
| TIME Σ | Life Time (total) | TEMP °C | Temperature in °Celsius |
| TIME P | Life Time (partial) | TEMP °F | Temperature in °Fahrenheit |
| CNT Σ | Pulse count (total) | | |
| CNT P | Pulse count (partial) | | |

MECHANICAL CHARACTERISTICS

| | |
|----------------------|---|
| Case | Self-extinguishing plastic material class V0 |
| Protection degree | IP40 on front panel |
| Size | 70 x 90 x 58 mm (4 DIN modules) |
| CURRENT INPUT | |
| Direct | Up to 300 Vrms phase-neutral or 519 Vrms phase to phase |
| | Overload: 900 Vrms phase to phase for 1 sec |
| Power supply | 230/240Vac +/- 10% 50/60Hz |
| Self consumption | < 3VA |
| MODELS | |
| PFA6411-E2 | FEMTO D4 RS485 230-240V 1DI 2DO SELF-POWERED ENERGY ANALYZER |

DEVICE SETUP

OPERATING KEYS

| Click | Change selected field value | Change selected field value | Go to next field |
|-------------|-----------------------------|-----------------------------|------------------|
| Click 2 sec | Go to next window | Back to initial entry field | Exits setup |

ENTERS INTO SET UP MODE
(Push together for 2 seconds)



SETUP SEQUENCE

| PAGE | PARAMETERS | VALUES AVAILABLE | DEFAULT |
|-------------------------|-----------------|--|---------|
| RICHIESTA PASSWORD | | 0000 ... 9999 | 0000 |
| RS485 | | | |
| | RS485 Address | 1 ... 247 | 27 |
| | Rate | 2400, 4800, 9600, 19200, 38400 | 38400 |
| | Data Bit | 7 or 8 | 8 |
| | Parity | N = no parity, E =even parity, O = odd parity | N |
| | Stop Bit | 1 or 2 | 2 |
| | RS-485 | ADDR 027 COM 38400-B-N-2 S.T. 100 | |
| NETWORK | | | |
| | Type (note n.1) | 3PH-3W-2CT, 3PH-4W, 2PH-2W, 1PH-2W | 3PH-4W |
| | Export | NO, YES | NO |
| | CT | 10000/1 o 5 | 5/5 |
| | VT | 400000/300 | 1/1 |
| | NETWORK | TYPE 1PH-2W EXPORT NO I FS 70 | |
| AVG-MD TIME (note n.2) | | | |
| | POWERS | 1...60 (minutes) | 15 |
| | CURRENTS | 1...60 (minutes) | 8 |
| | AVG-MD TIME | POWERS 15 CURRENTS 08 | |
| ALARM 1 / A (note n.11) | | | |
| | MODE (note n.3) | Normal, 1-OF-3, 3-OF-3, DERIV, UNBAL | NORMAL |
| | TYPE (note n.4) | MAX, MIN | MIN |
| | MEAS (note n.5) | Controlled measure. See table n.1 for register selection | 200 |
| | THRE (note n.5) | Threshold value | 0 |
| | ALARM 1/A | MODE NORMAL TYPE MIN MEAS 200 THRE 000.00 | |
| ALARM 1 / B | | | |
| | HYST | 1...100 (%) | 1 |
| | DELAY | 1...99 (secondi) | 1 |
| | AVG (note n.6) | 1...99 (secondi) | 1 |
| | OUT (note n.7) | Normal, Hold, Pulse-L, Pulse-S | NORMAL |
| | ALARM 1/B | HYST 01 DELAY 01 S/01 S AVG 01 OUT NORMAL | |
| ALARM 2 / A (note n.11) | | | |
| | MODE (note n.3) | Normal, 1-OF-3, 3-OF-3, DERIV, UNBAL | NORMAL |
| | TYPE (note n.4) | MAX, MIN | MIN |
| | MEAS (note n.5) | Controlled measure. See table n.1 for register selection | 200 |
| | THRE (note n.5) | Threshold value | 0 |
| ALARM 2 / B | | | |
| | HYST | 1...100 (%) | 1 |
| | DELAY | 1...99 (seconds) | 1 |
| | AVG (note n.6) | 1...99 (seconds) | 1 |
| | OUT (note n.7) | Normal, Hold, Pulse-L, Pulse-S | NORMAL |
| ALARM 3 / A (note n.11) | | | |
| | MODE (note n.3) | Normal, 1-OF-3, 3-OF-3, DERIV, UNBAL | NORMAL |
| | TYPE (note n.4) | MAX, MIN | MIN |
| | MEAS (note n.5) | Controlled measure. See table n.1 for register selection | 200 |
| | THRE (note n.5) | Threshold value | 0 |
| ALARM 3 / B | | | |
| | HYST | 1...100 (%) | 1 |
| | DELAY | 1...99 (seconds) | 1 |
| | AVG (note n.6) | 1...99 (seconds) | 1 |
| | OUT (note n.7) | Normal, Hold, Pulse-L, Pulse-S | NORMAL |
| ALARM 4 / A (note n.11) | | | |
| | MODE (note n.3) | Normal, 1-OF-3, 3-OF-3, DERIV, UNBAL | NORMAL |
| | TYPE (note n.4) | MAX, MIN | MIN |
| | MEAS (note n.5) | Controlled measure. See table n.1 for register selection | 200 |
| | THRE (note n.5) | Threshold value | 0 |
| ALARM 4 / B | | | |
| | HYST | 1...100 (%) | 1 |
| | DELAY | 1...99 (seconds) | 1 |
| | AVG (note n.6) | 1...99 (seconds) | 1 |
| | OUT (note n.7) | Normal, Hold, Pulse-L, Pulse-S | NORMAL |

DIGITAL OUT 1 (note n.8)

| | | |
|----------------------|--|--------|
| MODE | PULSE, ALARM, REMOTE | PULSE |
| POLARITY | NO, NC | NO |
| DIGITAL OUT 1 | | |
| MEAS (note n.9) | P-IMP, QL-IMP, QC-IMP, S-IMP, P-EXP, QL-EXP, QC-EXP, S-EXP | P-IMP |
| PRIMARY (note n.10) | YES, NO | YES |
| WEIGHT | 1...10000000 (Wh/100) | 100000 |
| WIDTH | 50ms...1S | 500 |
| PULSE OUT 1 | | |
| MEAS | P-IMP | P-IMP |
| PRIMARY | YES | YES |
| WEIGHT | 100.00k | 100000 |
| WIDTH | 0500 | 500 |

DIGITAL OUT 2 (note n.8)

| | | |
|--------------------------|--|--------|
| MODE | PULSE, ALARM, REMOTE | PULSE |
| POLARITY | NO, NC | NO |
| PULSE OUT 2 | | |
| MEAS (note n.9) | P-IMP, QL-IMP, QC-IMP, S-IMP, P-EXP, QL-EXP, QC-EXP, S-EXP | QL-IMP |
| PRIMARY (note n.10) | YES, NO | YES |
| WEIGHT | 1...10000000 (Wh/100) | 100000 |
| WIDTH | 50ms...1S | 500 |
| DISPLAY | | |
| CONTRAST | 20 - 45 | 28 |
| CLEAR TOTAL COUNTERS | NO, YES | NO |
| CLEAR PARTIAL COUNTERS | NO, YES | NO |
| CLEAR MIN-MAX | NO, YES | NO |
| RESTORE FACTORY SETTINGS | NO, YES | NO |
| ENTER NEW PASSWORD | 0000 ... 9999 | 0000 |

EXIT SETUP
(push for 2 seconds)



TABLE n.1 (ModBus Registers for alarm configuration)

| REGISTER | DESCRIPTION | SYMBOL | UNITS |
|----------|---|--------------|-------|
| 200 | Phase to Neutral Voltage, THD | THD U1N | [%] |
| 202 | Phase to Neutral Voltage, THD | THD U2N | [%] |
| 204 | Phase to Neutral Voltage, THD | THD U3N | [%] |
| 206 | Phase to Phase Voltage, THD | THD U12 | [%] |
| 208 | Phase to Phase Voltage, THD | THD U23 | [%] |
| 210 | Phase to Phase Voltage, THD | THD U31 | [%] |
| 212 | Phase Current, THD | THD I1 | [%] |
| 214 | Phase Current, THD | THD I2 | [%] |
| 216 | Phase Current, THD | THD I3 | [%] |
| 218 | Frequency of U1N | f | [Hz] |
| 220 | Phase to Neutral Voltage, RMS Amplitude | U1N | [V] |
| 222 | Phase to Neutral Voltage, RMS Amplitude | U2N | [V] |
| 224 | Phase to Neutral Voltage, RMS Amplitude | U3N | [V] |
| 226 | Phase to Phase Voltage, RMS Amplitude | U12 | [V] |
| 228 | Phase to Phase Voltage, RMS Amplitude | U23 | [V] |
| 230 | Phase to Phase Voltage, RMS Amplitude | U31 | [V] |
| 232 | Phase Current, RMS Amplitude | I1 | [A] |
| 234 | Phase Current, RMS Amplitude | I2 | [A] |
| 236 | Phase Current, RMS Amplitude | I3 | [A] |
| 238 | Neutral Current, RMS Amplitude | IN | [A] |
| 240 | Phase Active Power (Imp/ Exp) | P1 | [W] |
| 242 | Phase Active Power (Imp/ Exp) | P2 | [W] |
| 244 | Phase Active Power (Imp/ Exp) | P3 | [W] |
| 246 | Phase Reactive Power (Imp/ Exp) | Q1 | [var] |
| 248 | Phase Reactive Power (Imp/ Exp) | Q2 | [var] |
| 250 | Phase Reactive Power (Imp/ Exp) | Q3 | [var] |
| 252 | Phase Apparent Power | S1 | [VA] |
| 254 | Phase Apparent Power | S2 | [VA] |
| 256 | Phase Apparent Power | S3 | [VA] |
| 258 | Phase Power Factor (Imp/ Exp) | PF1 | [-] |
| 260 | Phase Power Factor (Imp/ Exp) | PF2 | [-] |
| 262 | Phase Power Factor (Imp/ Exp) | PF3 | [-] |
| 264 | Phase to Neutral Voltage, Mean THD | THD UI | [%] |
| 266 | Phase to Phase Voltage, Mean THD | THD UD | [%] |
| 268 | Phase Current, Mean THD | THD I | [%] |
| 270 | Phase to Neutral Voltage, Mean RMS Amplitude | UI | [V] |
| 272 | Phase to Phase Voltage, Mean RMS Amplitude | UD | [V] |
| 274 | Three phase current, RMS Amplitude | I | [A] |
| 276 | Total active power (Imp/ Exp) | PS | [W] |
| 278 | Total reactive power (Imp/ Exp) | QS | [var] |
| 280 | Total apparent power | SS | [VA] |
| 282 | Total power factor (Imp/ Exp) | PFS | [-] |
| 332 | Phase Current, RMS Amplitude, AVG | I1 AVG | [A] |
| 334 | Phase Current, RMS Amplitude, AVG | I2 AVG | [A] |
| 336 | Phase Current, RMS Amplitude, AVG | I3 AVG | [A] |
| 344 | Total imported active power, AVG | P Imp AVG | [W] |
| 346 | Total imported inductive power, AVG | Qind Imp AVG | [var] |
| 348 | Total imported capacitive power, AVG | Qcap Imp AVG | [var] |
| 350 | Total imported apparent power, AVG | S Imp AVG | [VA] |
| 352 | Total exported active power, AVG | P Exp AVG | [W] |
| 354 | Total exported inductive power, AVG | Qind Exp AVG | [var] |
| 356 | Total exported capacitive power, AVG | Qcap Exp AVG | [var] |
| 358 | Total exported apparent power, AVG | S Exp AVG | [VA] |
| 376 | External Pulse Counter, With Weight, Total counter or Tariff T1 | CNT1 S | |
| 384 | External Pulse Counter, With Weight, Partial Counter or Tariff T2 | CNT1 P | |

| | |
|------------|----------------------------|
| 3PH-3W-2CT | 2 phases 3 wires, triangle |
| 3PH-4W | 3 phases 4 wires, Star |
| 2PH-2W | 2 phases 2 wires, biphasic |
| 1PH-2W | 1 phase 2 wires, monophase |

Note n.2

| | |
|----------|--|
| POWERS | Integration time of the average value (AVG) and peak value (MD) for power (from 1 to 60 minutes) |
| CURRENTS | Integration time of the average value (AVG) and peak value (MD) for current (from 1 to 60 minutes) |

Note n.3

| | |
|--------|---|
| Normal | Classic Alarm with reference to a fixed threshold or to maximum and minimum delay and applicable hysteresis. "AVG" parameter is not used. |
| 1-OF-3 | Consider also the 2 following registers of the selected one in "MEAS". Works on a fixed max or min threshold with delay and applicable hysteresis. If one of the three register exceed the threshold the alarm goes on. "AVG" parameter is not used. |
| 3-OF-3 | Consider also the 2 following registers of the selected one in "MEAS". Works on a fixed max or min threshold with delay and applicable hysteresis. When all the three register exceed the threshold the alarm goes on. "AVG" parameter is not used. |
| DERIV | "THRE" parameter becomes a % value, "AVG" parameter is used. The instant value applied to the alarm on "MEAS" is compared with its value mediated obtained on the basis of the time set on "AVG". When the instantaneous value combined alarm differs in more (setting "Max") or less (setting "Min") from the average value ("AVG") of the percentage set on "THRE" the alarm goes on. With delay and applicable hysteresis. |

| | |
|-------|---|
| UNBAL | Consider also the 2 following registers of the selected one in "MEAS". "THRE" parameter becomes a % value. Alarm goes on when one of the three register is different from the percentage set on "THRE" comply with the higher value of the three read register if "MAX" is set on "TYPE", or comply with the lower value of the three register if "MIN" is set on "TYPE". With delay and applicable hysteresis. |
|-------|---|

Note n.4

| | |
|-----|--|
| MAX | Alarm setting in excess compared with the established conditions. With the exception of "UNBAL". |
| MIN | Alarm setting in decrease compared with the established conditions. With the exception of "UNBAL". |

Note n.5

| | |
|------|--|
| MEAS | Indicates which register (and thus measure) the alarm is related. See table n.1 input register. |
| THRE | Alarm threshold in absolute value, with the exception made for "DERIV" and "UNBAL" in which the value inserted becomes a percentage. |

Note n.6

| | |
|-----|---|
| AVG | Parameter to be used only in "DERIV" mode. Is the duration of the reference (in seconds) used to create a reference value for the instantaneous readings. |
|-----|---|

Note n.7

| | |
|---------|--|
| NORMAL | Physical output of the alarm excited during the duration of the alarm. It restores automatically |
| HOLD | Output remains excited until manual reset made via Modbus |
| PULSE-L | Output generate a 500ms impulse when the alarm goes on. |
| PULSE-S | Output generate a 100ms impulse when the alarm goes on. |

Note n.8

| | |
|--------|---|
| PULSE | Enables exit function as impulsive |
| ALARM | Enables exit function as alarm |
| REMOTE | Enables function output via protocol Modbus |
| NO | Normally open |
| NC | Normally closed |

Note n.9

| | |
|--------|---|
| P-IMP | Imported Active Power (Energy) |
| QL-IMP | Imported Reactive Inductive Power (Energy) |
| QC-IMP | Imported Reactive Capacitive Power (Energy) |
| S-IMP | Imported Apparent Power (Energy) |
| P-EXP | Exported Active Power (Energy) |
| QL-EXP | Exported Reactive Inductive Power (Energy) |
| QC-EXP | Exported Reactive Capacitive Power (Energy) |
| S-EXP | Exported Apparent Power (Energy) |

Note n.10

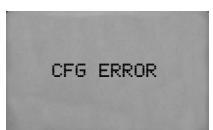
| | |
|-----|--------------------------|
| YES | Referred to CT primary |
| NO | Referred to CT secondary |

Note n.11

| | |
|-----------|---|
| ALLARME 1 | Alarm related to the physical output: DIGITAL OUT 1 (DO1, terminal 8) |
| ALLARME 2 | Alarm related to the physical output: DIGITAL OUT 2 (DO2, terminal 9) |
| ALLARME 3 | Only MODBUS alarm |
| ALLARME 4 | Only MODBUS alarm |

MESSAGE "CFG ERROR"

During the set up operation a "CFG ERROR" message could appear. This means that some wrong parameters are typed. To restore the factory default settings use the following procedure (RESTORE FACTORY SETTING):

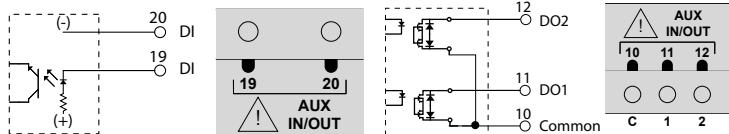


RESTORE
FACTORY SETTINGS
YES



Once this procedure is done the meter is configured with its factory default settings. Stored data will remain after the restore operation.

DIGITAL INPUTS AND OUTPUTS CONNECTION



Digital Inputs

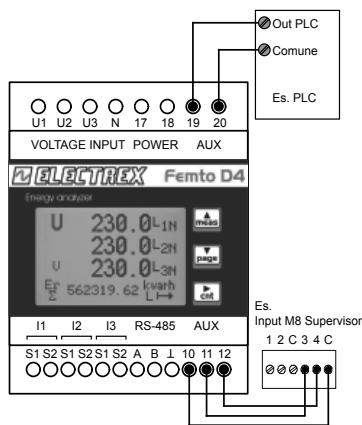
| | |
|----------------------------|------------|
| Supply voltage (external): | 15 Vdc |
| Current consumption: | 5 mA |
| Max. count frequency | 10 o 100Hz |

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

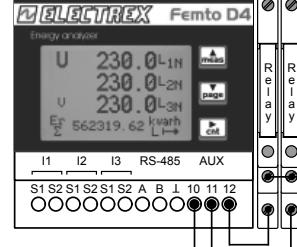
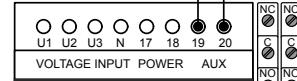
Digital outputs (optocoupled NPN transistor type for DIN 43864)

| | |
|-----------------------------|-------------|
| Maximum applicable voltage: | 250 V ac/dc |
| Maximum switchable current: | 100 mA |

INPUT & OUTPUTS CONNECTION EXAMPLE



DA:
- TRASDUTTORE CON
CONTATTO PULITO
- GME
- STATO INTERRUTTORE
- STATO ALLARMI



Max 250 V ac/dc
Max 100 mA

ALARM SET UP EXAMPLE

To ensure that the exit "DIGITAL OUT 1" remain excited for the alarm duration (latching) when average active power (MEAS 344) exceeds the value of 100 kW, hysteresis, 5% and latency of 5 seconds set the parameters such as table:

| | | |
|-----------------|--|--------|
| MODE (note n.2) | Normal, 1-OF-3, 3-OF-3, DERIV, UNBAL | NORMAL |
| TYPE (note n.3) | MAX, MIN | MAX |
| MEAS (note n.4) | Controlled measure. See table n.1 for register selection | 344 |
| THRE (note n.4) | Threshold value | 100000 |
| HYST | 1...100 (%) | 5 |
| DELAY | 1...99 (seconds) | 5 |
| AVG (note n.5) | 1...99 (seconds) | 1 |
| OUT (note n.6) | Normal, Hold, Pulse-L, Pulse-S | NORMAL |
| MODE | PULSE, ALARM, REMOTE | ALARM |
| POLARITY | NO, NC | NO |

To ensure that the exit "DIGITAL OUT 2" remain excited for the alarm duration (latching) when average active power (MEAS 344) goes down the value of 90 kW, hysteresis, 5% and latency of 5 seconds set the parameters such as table:

| | | |
|-----------------|--|--------|
| MODE (note n.2) | Normal, 1-OF-3, 3-OF-3, DERIV, UNBAL | NORMAL |
| TYPE (note n.3) | MAX, MIN | MIN |
| MEAS (note n.4) | Controlled measure. See table n.1 for register selection | 344 |
| THRE (note n.4) | Threshold value | 90000 |
| HYST | 1...100 (%) | 5 |
| DELAY | 1...99 (seconds) | 5 |
| AVG (note n.5) | 1...99 (seconds) | 1 |
| OUT (note n.6) | Normal, Hold, Pulse-L, Pulse-S | NORMAL |
| MODE | PULSE, ALARM, REMOTE | ALARM |
| POLARITY | NO, NC | NO |

VOLTAGE AND CURRENT CONNECTION

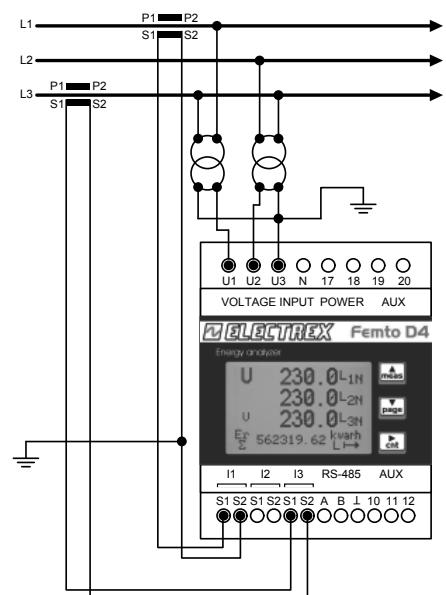
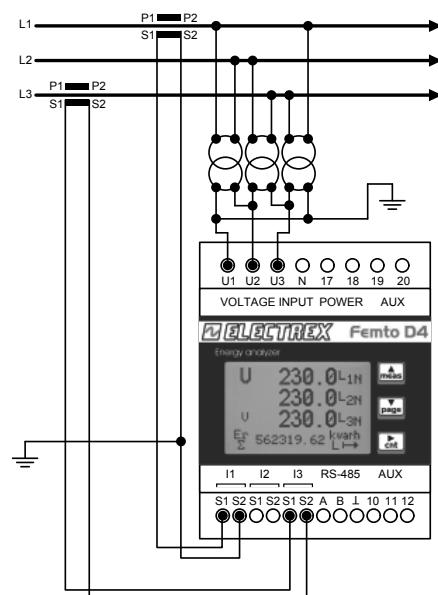
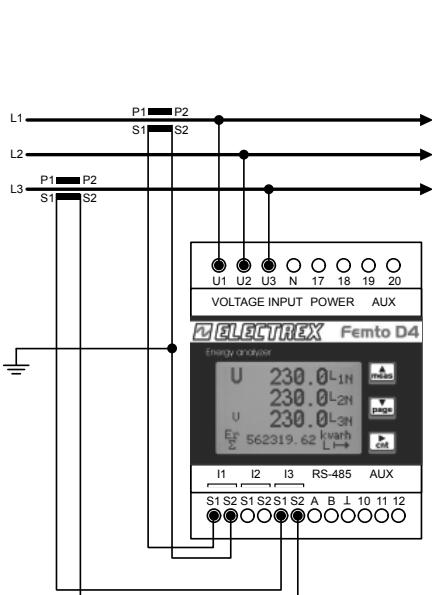
Voltage connection: Use cables with max cross-section of 2,5 mm² if stranded 4 mm² if rigid and connect them to the clamps marked VOLTAGE INPUT on the instrument according to the applicable diagrams that follow.

Current connection: Use appropriate CT primary, and secondary 5 or 1A. 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 2,5 mm² if stranded and 4 mm² if rigid.

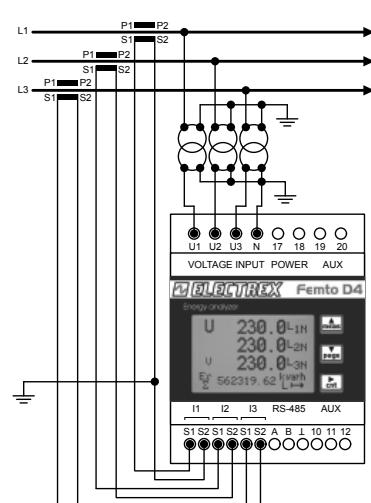
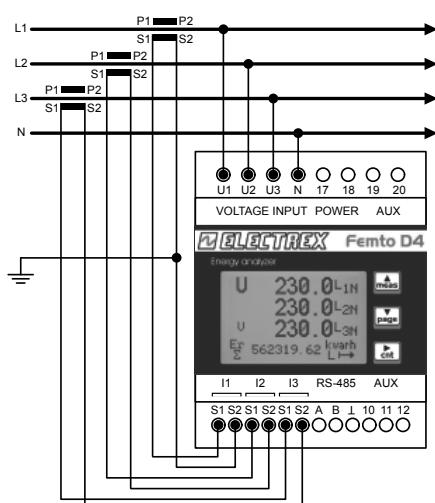
N.B. The CT secondary must always be in short circuit when not connected to the instrument in order to avoid damages and risks for the operator.

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. Disregard of this warning or of wiring diagram leads to major measurement errors.

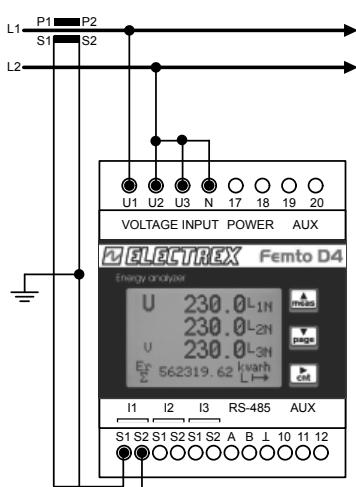
TRIANGLE 3W (3 WIRES) 3PH-3W-2CT



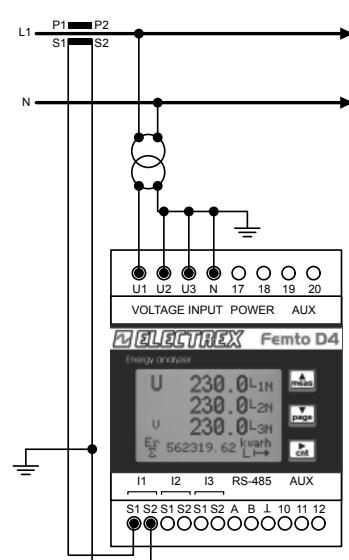
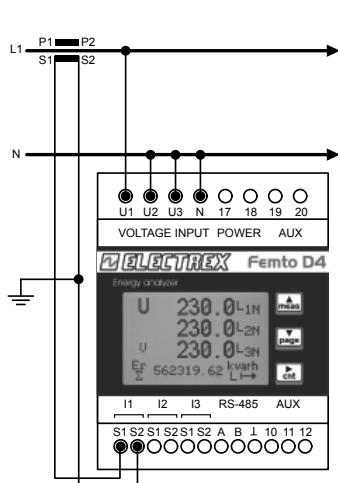
STAR 4W (4 WIRES) 3PH-4W



BI-PHASE 2PH-2W



SINGLE PHASE 1PH-2W



POWER SUPPLY AND SERIAL LINE CONNECTION

The instrument is fitted with a separate power supply. The power supply terminals are numbered (17) and (18). Use cables with max cross-section of 2,5 mm² if stranded, 4 mm² if rigid.

