

Installation and use instructions
65 A direct connection three-phase energy analyzer with
Modbus, pulse or M-Bus interface
Codice 10002202

The analyzer measures active and reactive energy, summing (easy connection mode on) or separating imported energy from exported energy. It manages two energy tariffs using a digital input or Modbus command. It can be equipped with an optional output to communicate measurements: pulse output, RS485 Modbus, or M-Bus port. It measures three DIN modules, with backlit LCD display with sensitive touch screen areas for page scrolling and parameters setting.

Istruzioni installazione e uso
Analizzatore di energia trifase 65 A connessione diretta
con interfaccia Modbus, impulso o M-Bus
Codice 10002202

Analizzatore misura l'energia attiva e reattiva, sommando (modalità easy connection attivata) oppure separando l'energia importata da quella esportata. Gestisce due tariffe di energia tramite ingresso digitale o comando Modbus. È dotato di uscita opzionale per la comunicazione delle misure: uscita impulsiva, porta RS485 Modbus o porta M-Bus. Misura tre moduli DIN, con display LCD retroilluminato a touch screen, con scorrimento delle pagine e impostare i parametri.

Installations- und Gebrauchsanweisung
Energieanalyator, dreiphasig, 65 A, für den Direktanschluss
mit Modbus-, Impuls- oder M-Bus-Schnittstelle
Artikelnummer 10002202

Der Energieanalyator misst die Wirk- und Blindenergie und summiert (bei aktiviertem Modus easy connection) oder trennt bezogene und gelieferte Energie. Es werden zwei Energietarife über Digitalinput oder Modbus-Befehl verwaltet. Das Gerät verfügt über einen optionalen Ausgang für die Übermittlung der Messdaten: Impulsausgang, Modbus-Schnittstelle (RS485) oder M-Bus-Schnittstelle. Es ist mit drei Modulen für die DIN-Schienenmontage sowie mit einem LCD-Display mit Hintert. Touch-Bereichen und Touchscreen für die Navigation durch die Seiten und die Parametrierung ausgestattet.

EN Features	
Electrical specifications	
Power Consumption	Self-powered (via measured voltage) 1 W, s 10 VA
Base current	1 A
Maximum current (continuing)	65 A
Minimum current	0.25 A
Start up current	0.02 A
Working voltage	0.08-400 V L-L ac (mains voltage)
Frequency	45-65 Hz
Accuracy class	Active energy: Class 1 (EN62053-21) / Class B (EN50470-3)
	Reactive energy: Class 2 (EN62053-23)
Environmental specifications	
Working temperature	from -25 to +45°C (from -13 to +10°F)
Storage temperature	from -30 to +40°C (from -22 to +10°F)
RH, %	from 10 to 90% non-condensing (40°C)
Environment	Intended for indoor use only
Output specifications	
Pulse output	1000 impulses/kWh. Proportional to measured active energy (EN62052-31)

NOTE: NOTE: for further details, see relevant protocols available on our website. To set output parameters, see **Parameter menu (Fig. 17)**.

LED specifications
Pulse weight 1000 impulses/kWh (EN50470-3, EN62052-11)
Duration 90 ms
Color Red and orange

General features
Terminals 1-6: section 2.5-16 mm², torque 2.8 Nm
7-12: R: section 1.5 mm², torque 0.4 Nm
Protection grade IP51, terminals: IP20
See Fig. 19

Cleaning
Use a slightly dampened cloth to clean the instrument display, do not use abrasives or solvents.

SERVICE AND WARRANTY
In the event of malfunctions, full or partial information on the warranty, contact the TOSCANO branch or distributor in your country.

Caratteristiche elettriche	
Alimentazione	Autoalimentato (tramite tensione misurata)
Corrente base	1 A
Corrente massima (continua)	65 A
Corrente minima	0.25 A
Corrente di avvio	0.02 A
Tensione di esercizio	0.08-400 V (a tensione di linea)
Frequenza	45-65 Hz
Classe di precisione	Energia attiva: Classe 1 (EN 62053-21) / Classe B (EN 50470-3)
	Energia reattiva: Classe 2 (EN 62053-23)
Caratteristiche ambientali	
Temperatura di esercizio	Da -25 a +45 °C (da -13 a +10 °F)
Temperatura di stoccaggio	Da -30 a +40 °C (da -22 a +10 °F)
Ambiente	Da 10 a 90% non condensante a 40°C
	Destinato solo per uso interno.
Caratteristiche uscite	
Uscita impulsiva	1000 impulsi/kWh. Proporzionale all'energia attiva misurata (EN62052-31)

NOTA: Per maggiori dettagli vedere il relativo protocollo disponibile nel nostro sito web. Per impostare i parametri delle uscite, vedi **Menu parametri (Fig. 17)**.

Caratteristiche LED
Pesa impulso 1000 impulsi/kWh (EN50470-3, EN62052-11)
Durata 90 ms
Colori Rosso e arancione

Caratteristiche generali
Morsetti 1-6: sezione 2.5-16 mm², coppia di serraggio 2.8 Nm
7-12: R: sezione 1.5 mm², coppia di serraggio 0.4 Nm
Frontalino: IP51, morsetti: IP20
Vedi Fig. 19

Pulizia
Per mantenere pulito il display dello strumento installare usare un panno leggermente inumidito con acqua saponata o solventi.

ASSISTENZA E GARANZIA
In caso di malfunzionamenti, gentile o informazioni sulla garanzia contattare il filiale TOSCANO o il distributore nel paese di appartenenza.

Elettrische Daten	
Versorgung	Eigenversorgung (über Messspannung)
Verbrauch	1 W, s 10 VA
Grundstrom	1 A
Max. Strom (Dauerstrom)	65 A
Min. Strom	0.25 A
Anlaufstrom	0.02 A
Betriebsspannung	0.08-400 V AC (Leiterspannung)
Frequenz	45-65 Hz
Genauigkeitsklasse	Wirkenergie: Klasse 1 (EN 62053-21) / Klasse B (EN 50470-3)
	Blindleistung: Klasse 2 (EN 62053-23)
Umgebungsbedingungen	
Betriebstemperatur	Von -25 bis +45 °C (von -13 bis +10 °F)
Lagertemperatur	Von -30 bis +40 °C (von -22 bis +10 °F)
Relative Luftfeuchtigkeit	von 10 bis 90% nicht-kondensierend bei 40 °C
Umgebung	Nur für den Gebrauch im Innenbereich geeignet.
Technische Daten Ausgänge	
Impulsausgang	1000 Impulse/kWh. Proportional zur gemessenen Wirkenergie (EN62052-31)

HINWEIS: weitere Informationen hierzu finden Sie in dem relevanten Protokoll auf unserer Website. Für die Parametrierung der Ausgänge siehe **Menü Parameter (Abb. 17)**.

Technische Daten LED
Impulsweite 1000 Impulse/kWh (EN 50470-3, EN 62052-11)
Impulsdauer 90 ms
Farbe Rot und Orange

Allgemeine technische Daten
Klemmen 1-6: Querschnitt 2.5-16 mm², Anzugsmoment 2.8 Nm
7-12: R: Querschnitt 1.5 mm², Anzugsmoment 0.4 Nm
Vordrucktaste: IP51, Klemmen: IP20
Abmessungen: Siehe Abb. 19

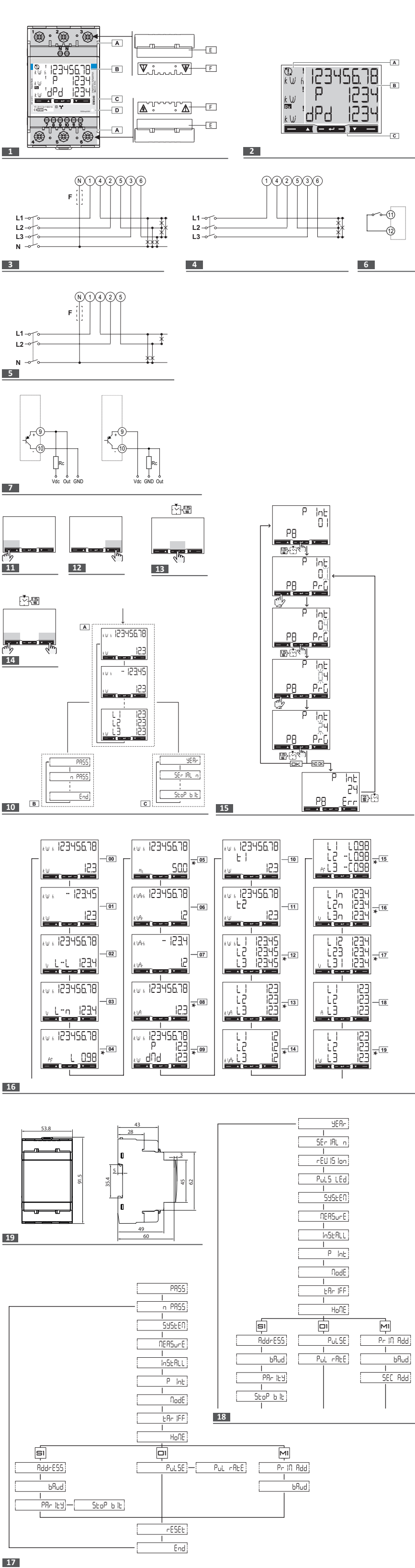
REINIGUNG
Das Display am installierten Gerät mit einem leicht befeuchteten Tuch reinigen. Keine Scheuer- oder Lösungsmittel verwenden.

KUNDENTEST UND GARANTIE
Bei Störungen oder Fehlern bzw. wenn Sie Ansprüche bezüglich der Garantie benötigen, kontaktieren Sie bitte die Niederlassung von TOSCANO oder den zuständigen Vertriebspartner in Ihrem Land.

CE **2004/108/EC** **IEC62052-11**
2006/22/EC **IEC 60471-512**
(only PF option)

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Distribuido por Adajusa



GENERAL WARNINGS
DANGER: Live parts. Heart attack, burns and other injuries. Disconnect the power supply and load before installing the analyzer. Protect terminals with covers. The energy analyzer should only be installed by qualified/authorized personnel.

These instructions are an integral part of the product. They should be consulted for all situations tied to installation and use. They should be kept within easy reach of operators, in a clean place and in good conditions.

Important connection note
Before connecting any input/output wire, the protection cover (Fig. 1, F) must be correctly installed. The metallic part of the wire or ferrule must be completely inserted into the terminal.

Product (Fig. 1)
Fig. 3 Three-phase system, 4-wire. 315 mA fuse (F), if required by local law.
Fig. 4 Three-phase system, 3-wire.
Fig. 5 Two-phase system, 3-wire. 315 mA fuse (F), if required by local law.
Fig. 6 Digital input. Open contact +tariff 1, closed contact +tariff 2.
Fig. 7 Pulse output (two possible connections)
Vdc: external voltage (direct current)
Vdc: output contact (transistor PNP open collector)
GND: ground output contact (transistor PNP open collector)
Open collector outputs: the load resistance (RL) must be designed so that the closed contact current is under 100 mA (V_{cc} is equal to 1 V dc). DC voltage (V_{cc}) must be less than or equal to 80 V.

Display (Fig. 2)
A Unit of measure and signal area:
Incorrect voltage connections
! specific to one phase, incorrect current direction
! specific to one phase, incorrect voltage direction
Rx version S1 only. Modbus command correctly received.
Tx version S1 only. Modbus command correctly sent to master.
A Area with specific section information
C Command area

Connection diagrams
Diagram Description
Fig. 3 Three-phase system, 4-wire. 315 mA fuse (F), if required by local law.
Fig. 4 Three-phase system, 3-wire.
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In case you want to mount the sealing terminal caps (Fig. 1 E) remember to lock them with the appropriate cable sealing.

Controllo dei collegamenti
L'analizzatore controlla che i collegamenti effettuati siano corretti e segnali eventuali anomalie. È possibile disabilitare il controllo tramite il parametro **Install**, vedi **Menu parametri (Abb. 17)**.
Ipotesi iniziali
Il controllo si basa su alcune ipotesi iniziali del sistema da misurare. In particolare, si ipotizza che ogni fase del sistema è caratterizzata da:
• un carico con fattore di potenza PF>0.766 (<40°) se induttivo o PF>0.996 (<5°) se capacitivo
• corrente pari almeno al 10% della corrente nominale (65 A)
Controlli e segnalazioni
Di seguito i controlli nell'ordine in cui vengono eseguiti e corrispondenti segnalazioni:
Controllo
Ordine delle tensioni
Verso della corrente *
NOTA *: controllo effettuato solo se le energie importate ed esportate sono misurate separatamente (Measure = b).

Struttura del menu (Fig. 10)
A Menu misure. Misure visualizzate di default all'accensione. Le pagine sono caratterizzate dall'unità di misura di riferimento.
B Menu parametri. Pagine per impostare i parametri. Richiedono password di accesso.
C Menu informazioni. Pagine che mostrano, senza dover inserire una password, informazioni e i parametri impostati.

Comandi
Navigation
Operation
Visualizzare la pagina successiva
Visualizzare la pagina precedente
Entrare nel menu parametri
Uscire dal menu parametri
Entrare nei menu informazioni
Uscire dai menu informazioni
NOTA: dopo 120 s di inattività viene visualizzata la pagina delle misure impostate in Home e il comando funziona solo al secondo tocco. Al primo tocco dell'area di comando touch si avvia la retroilluminazione del display.

Setting a parameter (Fig. 15)
Procedure example: how to set P int=24.
NOTE: the first displayed value is the current one. Settings are applied when the value is confirmed. The value is being edited if **Prg** appears, the set value is out of range if **Err** appears. After 120 s of disuse on a value being set, the title page is displayed (P int in the figure) and **Prg** disappears. After another 120 s, the measurement page set in Home returns.

Measurement menu (Fig. 16)
NOTE *: only displayed if full display mode is set (Mode = Full).
General measurement pages
Page Description
00 Total imported active energy**
01 Total active power
02 Total imported active energy**
03 Total active power
04 Average system mains voltage
05 Requested average power (P = demand) calculated for the set interval. The value remains the same for the entire interval. It is 0 during the first start up interval.
06 Maximum requested power (dM = Peak demand) reached since last reset
07 Active energy imported with tariff 1 (1). Displayed if tariff management is on (Tariff = on).
08 Active power
09 Total active energy imported with tariff 2 (2). Displayed if tariff management is on (Tariff = on).
10 Active power
11 Total active energy imported with tariff 2 (2). Displayed if tariff management is on (Tariff = on).
12 Active power
13 Total active energy imported with tariff 2 (2). Displayed if tariff management is on (Tariff = on).
14 Active power

Measurement menu (Fig. 16)
NOTE **: if easy connection is on (Measure = A), it indicates total energy without considering the direction.
NOTE **: displays without imported and exported energy are measured separately (Measure = b).
Single phase measurement pages
Page Description
12 Imported active energy. If easy connection is on (Measure = A), it indicates total energy without considering the direction.
13 Apparent power
14 Imported reactive energy

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AVVERTENZE GENERALI
PERICOLO: Parti sotto tensione. Arresto cardiaco, bruciature e altre lesioni. Scollegare l'alimentazione e il carico prima di installare l'analizzatore. Proteggere i morsetti con le coperture. L'installazione degli analizzatori d'energia deve essere eseguita solo da persone qualificate/autorizzate.

Queste istruzioni sono parte integrante del prodotto. Devono essere consultate per tutte le situazioni legate all'installazione e all'uso. Devono essere conservate in modo che siano accessibili agli operatori, in un luogo pulito e mantenuto in buone condizioni.

Nota importante sulle connessioni
Installare correttamente la placchetta di protezione morsetti (Fig. 1, F) prima di collegare qualsiasi filo di ingresso/uscita. La parte metallica del filo deve essere completamente inserita nel terminale.

Legenda codice (lato analizzatore) TEC400D-DIN
AVX: 208-400 V a tensione di linea, 5(65) A, sistema trifase
T: sistema per corrente trifase, 3 o 4 fili, sistema per corrente bifase, 3 fili
X: autolimitazione (tramite tensione misurata)
O1: impulsiva
a1: S1: porta Modbus RS485
M1: porta M-Bus
PFA: energia totale (somma di energia e reattiva) secondo MID
PFB: solo l'energia positiva è certificata secondo MID.

Prodotti (Fig. 1)
A Morsetti per collegamenti corrente e comunicazione
B Backlit LCD retroilluminato con aree comando touch
C Display
D LED
E Impugnatura rossa: 1 impulso = 1 Wh
F Arancione: potenza attiva totale negativa. Controllo effettuato solo se le energie importate ed esportate sono misurate separatamente (Measure = b).
F Coperture sigillabili dei morsetti
G Placchette di protezione morsetti

Display (Fig. 2)
A Area unità di misura e segnalazione:
LCD Display con Hintergrundbeleuchtung und Touchbereich für die Eingabe von Befehlen
C Modell, Eckdaten und Seriennummer
D LED
E Impugnatura rossa: 1 Impuls = 1 Wh
F Arancione: dauerhaft leuchtend: negative Gesamtwirkleistung. Die Kontrolle wird nur dann ausgeführt, wenn bezogene und gelieferte Energie getrennt gemessen werden (Measure = b).
F Verschiebbare Klemmenabdeckungen
F Schutzhüllen der Klemmen

Falls Sie die plomberbaren Klemmenabdeckungen (Abb. 1 E) montieren möchten, sperren Sie sie bitte mit dem entsprechenden Siegelgerät.

Schemi di collegamento
Fig. 3 Sistema trifase, 4 fili. Fusibile (F) da 315 mA, se previsto dalle leggi locali.
Fig. 4 Sistema trifase, 3 fili.
Fig. 5 Sistema bifase, 3 fili. Fusibile (F) da 315 mA, se previsto dalle leggi locali.
Fig. 6 Ingresso digitale. Contatto aperto = tariffa 1, contatto chiuso = tariffa 2.
Fig. 7 Uscita impulsiva (due collegamenti possibili)
Vdc: tensione di alimentazione esterna (corrente continua)
Vdc: contatto in uscita (transistor PNP open collector)
GND: contatto uscita a terra (transistor PNP open collector)
Open collector outputs: la resistenza di carico (RL) deve essere dimensionata affinché la corrente a contatto chiuso sia inferiore a 100 mA (V_{cc} = 1 V dc). La tensione cc (V_{cc}) deve essere inferiore o uguale a 80 V.

Controllo dei collegamenti
L'analizzatore controlla che i collegamenti effettuati siano corretti e segnali eventuali anomalie. È possibile disabilitare il controllo tramite il parametro **Install**, vedi **Menu parametri (Abb. 17)**.
Ipotesi iniziali
Il controllo si basa su alcune ipotesi iniziali del sistema da misurare. In particolare, si ipotizza che ogni fase del sistema è caratterizzata da:
• un carico con fattore di potenza PF>0.766 (<40°) se induttivo o PF>0.996 (<5°) se capacitivo
• corrente pari almeno al 10% della corrente nominale (65 A)
Controlli e segnalazioni
Di seguito i controlli nell'ordine in cui vengono eseguiti e corrispondenti segnalazioni:
Controllo
Ordine delle tensioni
Verso della corrente *
NOTA *: controllo effettuato solo se le energie importate ed esportate sono misurate separatamente (Measure = b).

Struttura del menu (Fig. 10)
A Menu misure. Misure visualizzate di default all'accensione. Le pagine sono caratterizzate dall'unità di misura di riferimento.
B Menu parametri. Pagine per impostare i parametri. Richiedono password di accesso.
C Menu informazioni. Pagine che mostrano, senza dover inserire una password, informazioni e i parametri impostati.

Comandi
Navigation
Operation
Visualizzare la pagina successiva
Visualizzare la pagina precedente
Entrare nel menu parametri
Uscire dal menu parametri
Entrare nei menu informazioni
Uscire dai menu informazioni
NOTA: dopo 120 s di inattività viene visualizzata la pagina delle misure impostate in Home e il comando funziona solo al secondo tocco. Al primo tocco dell'area di comando touch si avvia la retroilluminazione del display.

Setting a parameter (Fig. 15)
Procedure example: how to set P int=24.
NOTE: the first displayed value is the current one. Settings are applied when the value is confirmed. The value is being edited if **Prg** appears, the set value is out of range if **Err** appears. After 120 s of disuse on a value being set, the title page is displayed (P int in the figure) and **Prg** disappears. After another 120 s, the measurement page set in Home returns.

Measurement menu (Fig. 16)
NOTE *: only displayed if full display mode is set (Mode = Full).
General measurement pages
Page Description
00 Total imported active energy**
01 Total active power
02 Total imported active energy**
03 Total active power
04 Average system mains voltage
05 Requested average power (P = demand) calculated for the set interval. The value remains the same for the entire interval. It is 0 during the first start up interval.
06 Maximum requested power (dM = Peak demand) reached since last reset
07 Active energy imported with tariff 1 (1). Displayed if tariff management is on (Tariff = on).
08 Active power
09 Total active energy imported with tariff 2 (2). Displayed if tariff management is on (Tariff = on).
10 Active power
11 Total active energy imported with tariff 2 (2). Display

