



Strumento Multifunzione per reti bassa tensione 96x96mm

Linea trifase 80...500V (fase-fase)
Linea monofase 50...290V
Inserzione su TA dedicati
Rapporto TA e TV esterni programmabile
Energia attiva c.l.0,5
Diagnostica, correzione sequenza fasi

Network monitor for low voltage 96x96mm

Three-phase line 80...500V (phase-phase)
Single-phase 50...290V
Connection with external dedicated CT
Programmable external CT-VT ratio
Active energy c.l.0,5
Phase sequence correction, diagnostic

Nemo 96 HD



Moduli/Modules

Comunicazione RS485

RS485 communication

Comunicazione RS232

RS232 communication

Comunicazione MBUS

MBUS communication

Comunicazione PROFIBUS

PROFIBUS communication

Comunicazione LONWORKS

LONWORKS communication

Comunicazione BACNET

BACNET communication

Uscita Impulsi

Output pulse

Uscita Analogica

Output analogue

Allarmi

Alarms

Corrente di Neutro

Neutral current

I/O 2 Ingressi SPST - 2 Outputs

I/O 2 Inputs SPST - 2Outputs

I/O 2 Ingressi 12-24Vcc - 2 Uscite

I/O 2 Inputs 12-24Vdc - 2 Outputs

Memorizzazione valori energia - RS485

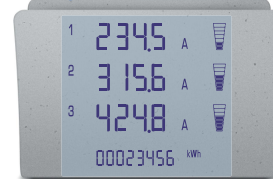
RS485 - Energy value storage

Comunicazione ETHERNET

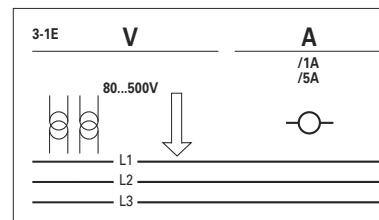
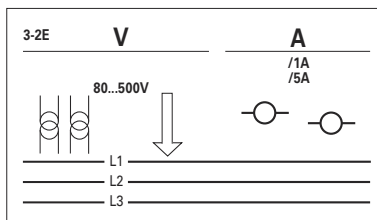
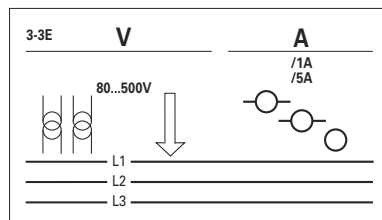
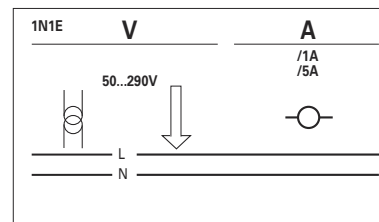
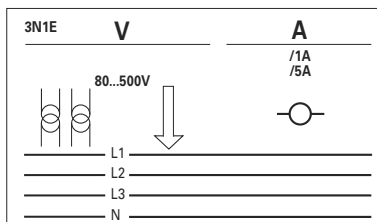
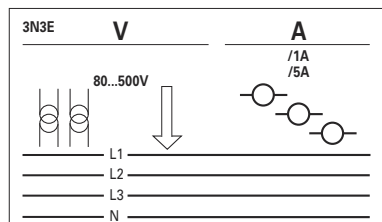
ETHERNET communication



DISPLAY



- ▶ Tensioni
Voltages
- ▶ Correnti
Currents
- ▶ Potenza Attiva, Reattiva, Apparente
Active, Reactive, Apparent Power
- ▶ Energia Attiva, Reattiva
Active, Reactive Energy
- ▶ Fattore di potenza
Power Factor
- ▶ Frequenza
Frequency
- ▶ Contatore
Run Hour
- ▶ THD
THD



	MODELLO MODEL		Nemo 96HD		
	LINEA NETWORK		bt / LV		
INGRESSO INPUT	CONNESSIONE CONNECTION		Monofase / Single-phase	✓	
			Trifase, carico equilibrato Three-phase, balanced load		✓
			Trifase, carico squilibrato Three-phase, unbalanced load		✓
	DIAGNOSTICA, CORREZIONI SEQUENZA FASI / PHASE SEQUENCE CORRECTION, DIAGNOSTIC		✓		
	VALORI NOMINALI RATED VALUE		Tensione (fase-fase) / Voltage (phase-phase)		400V
			Corrente / Current		1 e/and 5A
	INGRESSO CORRENTE INPUT CURRENT		TA dedicati / Dedicated CT		✓
			Isolato / Insulated		
	RAPPORTO PROGRAMMABILE PROGRAMMABLE RATIO		TV (kTV) / VT (kVT)		1...10
			TA/CT	Portate / Ranges	
I _{pn} / I _{sn}				1...9999	
max. kTV x kTA / max. kVT x kCT				99'990	
		Shunt			
VISUALIZZAZIONE DISPLAY	ENERGIA ATTIVA ACTIVE ENERGY		Precisione / Accuracy EN/IEC61557-12		cl.0,5
			Precisione energia cc Energy accuracy dc		
			Positiva, totale e parziale Positive, total and partial		✓
			Negative, totale / Negative total		✓
	ENERGIA REATTIVA REACTIVE ENERGY		Precisione / Accuracy EN/IEC61557-12		cl.2
			Positiva, totale / Positive, total		✓
			Positiva, parziale / Positive, partial		✓
			Negativa, totale / Negative, total		✓
	TENSIONE VOLTAGE		di Fase e concatenata / Phase and linked		✓
	CORRENTE CURRENT		di Fase e di neutro (calcolata) Phase and neutral (computed)		✓
			di Neutro (misurata) Neutral (measured)		IF96006
			Media-medio massima di fase Phase demand and max. demand		✓
	FATTORE DI POTENZA POWER FACTOR		Trifase / Three-phase		✓
			Di fase / Phase		✓
	POTENZA POWER		Attiva, reattiva, apparente Active, reactive, apparent		✓
			Media e medio massima Demand and max. demand		✓
			Attiva e reattiva di fase Phase active and reactive		✓
	DISTORSIONE ARMONICA Corrente / Tensione HARMONIC DISTORTION Current / Voltage		THD		✓
			Analisi / Analysis		
FREQUENZA / FREQUENCY				✓	
MISURA C.C. ¹ / D.C. ¹ MEASURE					
CONTAORE / RUN HOUR METER				✓	
SEQUENZA FASI ERRATA / WRONG PHASE SEQUENCE				✓	
TEMPERATURA / TEMPERATURE				IF96016	
USCITE OUTPUT	IMPULSI / PULSES				IF96003
	RELE' ALLARMI / ALARM RELAYS				IF96005
	RELE' ALLARMI + INGRESSI DIGITALI / ALARM RELAYS + DIGITAL INPUTS				IF96010+IF96011
	ANALOGICA / ANALOGUE				IF96004
	RS232				IF96002
COMUNICAZIONE COMMUNICATION	RS485 MODBUS RTU				IF96001
	RS485 + MEMORIA / RS485 + MEMORY				IF96012
	PROFIBUS				IF96007A
	LONWORKS				IF96009
	M-BUS				IF96013
	BACNET				IF96014
	ETHERNET				IF96015
	TRASMISSIONE RADIO 868MHz / 868MHz RADIO TRANSMISSION				

¹ Tensione, corrente, potenza, Ah positivi e negativi / ¹ Voltage, current, power, Ah positive and negative

CODICI DI ORDINAZIONE ORDERING CODE	AL. AUSILIARIA AUX. SUPPLY	INGRESSO NOMINALE RATED INPUT	
MF96001	80...265Vca/ac - 110...300V cc/dc	400V (trifase/three-phase)	1 e / and 5A
MF96002	11...60V cc/dc	400V (trifase/three-phase)	1 e / and 5A

LEGENDA: = Parametro Programmabile

LEGEND: = Programmable Parameter

VISUALIZZAZIONE

Tipo display: cristallo liquido retroilluminato

Riduzione automatica della retroilluminazione, dopo 20 sec. di inattività della tastiera

Contrasto: 4 valori selezionabili

Retroilluminazione: 0 - 30 - 70 - 100%

Punti di lettura: 10-000 4 cifre (altezza cifre 12 mm)

Conteggio energia: numeratore 8 cifre (altezza cifre 8 mm)

Unità ingegneristica: visualizzazione automatica in funzione dei rapporti TA e TV impostati

Risoluzione: automatica, con il maggior numero di decimali possibili

Punto decimale: automatico, con la maggior risoluzione possibile

Aggiornamento lettura: 1,1 secondi

Pagina personalizzata: grandezze visualizzabili all'accensione

DISPLAY

Type of display: LCD backlit

Automatic backlit reduction off after 20 s that keyboard is not used

Contrast: 4 selectable values

Backlit: 0 - 30 - 70 - 100%

N° of reading points: 10-000 4 digits (high digit 12 mm)

Energy count: 8 digit counter (high digit 8 mm)

Engineering units: automatic display according to the set VT and CT ratios

Resolution: automatic, with the highest possible number of decimals

Decimal point: automatic, with the highest possible resolution

Reading update: 1,1 seconds

Customized page: content of default page

PRECISIONE IN CONFORMITA'	CONFORMITY ACCURACY WITH	EN/IEC 61557-12	
Energia attiva	Active energy	Ea	cl.0,5
Energia reattiva	Reactive energy	Erv	cl.2
Tensione	Voltage	U	cl.0,5
Corrente	Current	I	cl.0,5
Potenza attiva	Active power	P	cl.0,5
Potenza reattiva	Reactive power	Qv	cl.1
Potenza apparente	Apparent power	Sv	cl.1
Frequenza	Frequency	f	cl.0,5
Fattore di potenza	Power factor	PFv	cl.0,5
THD	THD	THDu / THDi	cl.2

PAGINE VISUALIZZAZIONE

La visualizzazione è suddivisa in quattro menù, accessibili con i relativi tasti funzione:

U

I

DISPLAY PAGES

Display is divided into four menus which can be reached with the relevant function keys:

PQS

ET

TENSIONE di fase e concatenata VOLTAGE phase and linked	CORRENTE di fase e di neutro CURRENT phase and neutral	POTENZA TRIFASE attiva, reattiva, apparente, distortante ¹ THREE-PHASE POWER active, reactive, apparent, distorting ¹	FATTORE DI POTENZA di fase e trifase POWER FACTOR phase and three-phase
TENSIONE MINIMA di fase MINIMUM VOLTAGE phase	CORRENTE MEDIA di fase CURRENT DEMAND phase	POTENZA FASE attiva, reattiva, apparente PHASE POWER active, reactive, apparent	FREQUENZA FREQUENCY
TENSIONE MASSIMA di fase MAXIMUM VOLTAGE phase	PICCO CORRENTE MEDIA di fase MAX. CURRENT DEMAND phase	POTENZA MEDIA attiva, reattiva, apparente POWER DEMAND active, reactive, apparent	CONTAORE RUN HOUR
DISTORSIONE ARMONICA TENSIONE di fase e concatenata VOLTAGE HARMONIC DISTORTION phase and linked	MEDIA DELLE 3 CORRENTI AVERAGE CURRENT $\frac{I_1 + I_2 + I_3}{3}$	PICCO POTENZA MEDIA attiva, reattiva, apparente MAX. POWER DEMAND active, reactive, apparent	ENERGIA ATTIVA POSITIVA totale e parziale POSITIVE ACTIVE ENERGY partial and total
	DISTORSIONE ARMONICA CORRENTE di fase CURRENT HARMONIC DISTORTION phase		ENERGIA REATTIVA POSITIVA parziale e totale POSITIVE REACTIVE ENERGY partial and total
			ENERGIA ATTIVA NEGATIVA NEGATIVE ACTIVE ENERGY
			ENERGIA REATTIVA NEGATIVA NEGATIVE REACTIVE ENERGY

¹ valori validi dalla versione Firmware 2.15

In tutte le pagine di visualizzazione è sempre presente l'energia totale attiva o reattiva (alternate).

¹ values valid starting from 2,15 Firmware version

The total active or reactive energy (alternatively) is always displayed on all the display pages.

PARAMETRI PROGRAMMABILI

Programmazione: tramite tastiera frontale, 4 tasti

Accesso programmazione: protetto da password

Menù programmazione: suddiviso su 3 livelli

LIVELLO 1 Pagina visualizzazione personalizzata

Connessione

Tempo integrazione corrente / potenza media

Contrasto display

Retroilluminazione display

Corrente nominale

LIVELLO 2 Rapporto trasformazione TV e TA esterni

PARAMETRI AZZERABILI

Valore minimo e massima tensione

Corrente media

Picco corrente media

Picco potenza media attiva, reattiva, apparente

Contaore

Energia attiva parziale

Energia reattiva parziale

INGRESSO

 **Connessione:** rete monofase – trifase 3 e 4 fili

Inserzione su trasformatori di corrente esterni dedicati

Tensione trifase nominale Un: 400V

Tensione trifase: 80...500V (fase-fase)

Tensione monofase nominale Un: 230V

Tensione monofase: 50...290V

 **Rapporto TV esterno:** 1...10 (massima tensione primaria TV 1200V)

Corrente nominale In: 5A – 1A

Corrente massima Imax: 1,2In

Sovraccarico istantaneo: 20In/0,5s

 **Rapporto TA esterno:** 1...9999 (max. corrente primaria TA 50kA/5A – 10kA/1A)

Frequenza nominale fn: 50Hz

Variazione ammessa: 47...63Hz

Tipo di misura: vero valore efficace

Contenuto armonico: in accordo con EN/IEC 62053-22 e EN/IEC 62053-23

Tempo di avviamento (conteggio energia): < 5s

Autoconsumo tensione: 0,1VA (fase-neutro alla tensione nominale)

Autoconsumo corrente: 1VA (per fase alla corrente massima 6A)

CORRENTE MEDIA – POTENZA MEDIA

 **Tempo integrazione:** 5/8/10/15/20/30/60 min.

CONTAORE

Conteggio ore e minuti

 **Avvio conteggio:** selezionabile, presenza tensione opp. potenza

Tensione: tensione di fase > 10V

 **Potenza:** potenza nominale attiva trifase

Valore programmabile: 0...50%Pn

Pn = Potenza nominale attiva trifase = Tensione trifase nominale Un x Corrente In x $\sqrt{3}$

Un = 400V

In = 1A opp. 5A

Pn = 400V x 5A x $\sqrt{3}$ = 3464W opp. 400V x 1A x $\sqrt{3}$ = 692,8W

DIAGNOSTICA, CORREZIONE SEQUENZA FASI

Nel software del dispositivo è stato introdotto un algoritmo di diagnostica e di riparazione della sequenza di inserzione voltmetrica ed amperometrica. La funzione è attivabile a richiesta con password e consente di visualizzare e modificare via software la sequenza di cablaggio a patto che le seguenti condizioni siano rispettate:

- 1) Il conduttore di neutro (nella rete a 4 fili) sia correttamente posizionato al morsetto corrispondente (normalmente numero 11).

PROGRAMMABLE PARAMETERS

Programming: through front keyboard, 4 keys

Programming access: password-protected

Programming menu: subdivided on 3 levels

LEVEL 1 Customized display page

Connection

Average power/current delay time

Display contrast

Display backlit

Current rating

LEVEL 2 External VT and CT ratio

RESETTABLE PARAMETERS

Min. and max. voltage value

Current demand

Current max. demand

Active, reactive, apparent power max. demand

Run hour

Partial active energy

Partial reactive energy

INPUT

 **Connection:** single –phase and three-phase network, 3 and 4-wire

Connection with external dedicated current transformers

Three-phase voltage rating Un: 400V

Three-phase voltage: 80...500V (phase-phase)

Single-phase voltage rating Un: 230V

Three-phase voltage: 50...290V

 **External VT ratio:** 1...10 (max. VT primary 1200V)

Current rating In: 5A – 1A

Max. current Imax: 1,2In

Instantaneous overload: 20In/0,5s

 **External CT ratio:** 1...9999 (max. CT primary 50kA/5A – 10kA/1A)

Frequency rating fn: 50Hz

Tolerance: 47...63Hz

Type of measurement: true RMS value

Harmonic content: according to EN/IEC 62053-22 and EN/IEC 62053-23

Start time (energy count): < 5s

Voltage rated burden: 0,1VA (neutral-phase to voltage rating)

Current rated burden: 1VA (each phase to max. current 6A)

CURRENT DEMAND – POWER DEMAND

 **Average period:** 5/8/10/15/20/30/60 min.

RUN HOUR METER

Hours and minutes count

 **Count start:** power or voltage present selectable

Voltage: phase-voltage > 10V

 **Power:** 3-phase active power rating

Programmable value: 0...50%Pn

Pn = 3-phase active power rating = 3-phase active voltage rating Un x Current In x $\sqrt{3}$

Un = 400V

In = 1A or. 5A

Pn = 400V x 5A x $\sqrt{3}$ = 3464W or. 400V x 1A x $\sqrt{3}$ = 692,8W

PHASE SEQUENCE CORRECTION, DIAGNOSTIC

In the software of the device IME have added a specific functionality to detect and correct many problems concerning voltage and / or current connection.

This function can be activated through password and allows to display and modify the connection sequence provided that the following conditions are respected:

- 1) The neutral wire (in a 4-wire network) is connected to the right terminal (normally number 11).

- 2) Non siano presenti incroci di conduttori fra TA differenti (es. sulla fase 1 del dispositivo vi sia un cavo proveniente dal TA 1 e sull'altro un cavo dal TA 2).
- 3) Il fattore di potenza sia compreso fra 1 e 0,5 Induttivo per ciascuna fase.
- Vedi www.imeitaly.com "SUPPORTO TECNICO".

ALIMENTAZIONE AUSILIARIA

Valore nominale **Uaux ca**: 80...265V

Frequenza nominale: 50Hz

Frequenza di funzionamento: 47...63Hz

Autoconsumo: $\leq 2,5\text{VA}$ (230Vac backlight 30% senza moduli esterni)

Valore nominale **Uaux cc**: 110...300Vcc - 11...60Vdc

Autoconsumo: $\leq 3,5\text{W}$ (senza moduli)

Protezione contro l'inversione di polarità

ISOLAMENTO

(EN/IEC 61010-1)

Categoria di installazione: III

Grado di inquinamento: 2

Tensione di riferimento per l'isolamento: 300V (Fase - neutro)

- 2) No crossings between cables connected to CTs (e.g. avoid that on phase 1 of the meter -terminals 1 and 3 - are connected some way both to CT1 and CT2).
- 3) The power factor is between 1 and 0,5 - Inductive load - for each phase.
- See www.imeitaly.com "TECHNICAL SUPPORT".

AUXILIARY SUPPLY

Rated value **Uaux ac**: 80...265V

Rated frequency: 50Hz

Working frequency: 47...63Hz

Rated burden: $\leq 2,5\text{VA}$ (230Vac backlight 30% without external modules)

Rated value **Uaux dc**: 110...300Vdc - 11...60Vdc

Rated burden: $\leq 3,5\text{W}$ (without modules)

Protected against incorrect polarity

INSULATION

(EN/IEC 61010-1)

Installation category: III

Pollution degree: 2

Insulation voltage rating: 300V (phase - neutral)

PROVE TESTS

Tensione a impulso 1,2 / 0µs0,5J
Voltage test 1,2 / 50µs 0,5J

Tensione alternata valore efficace 50Hz 1min
Alternating voltage r.m.s value 50Hz 1min

6kV

3kV

4kV

PROVE DI COMPATIBILITA' ELETTROMAGNETICA

Emissione in accordo con EN / IEC 61326-1 classe B

Immunità in accordo con EN / IEC 61326-1

CONDIZIONI AMBIENTALI

Temperatura di riferimento: $23^{\circ}\text{C} \pm 2^{\circ}\text{C}$

Campo di funzionamento specificato: -5...55°C

Campo limite per l'immagazzinamento e trasporto: - 25...70°C

Adatto all'utilizzo in climi tropicali

Massima potenza dissipata¹: $\leq 5\text{W}$

¹ Per il dimensionamento termico dei quadri

TESTS FOR ELETROMAMAGNETIC COMPATIBILITY

Emission according to EN / IEC 61326-1 class B

Immunity according to EN / IEC 61326-1

ENVIRONMENTAL CONDITIONS

Reference temperature: $23^{\circ}\text{C} \pm 2^{\circ}\text{C}$

Specified operating range: -5...55°C

Limit range for storage and transport: - 25...70°C

Suitable for tropical climates

Max. power dissipation¹: $\leq 5\text{W}$

¹ For switchboard thermal calculation

CUSTODIA

Custodia: incasso (foratura pannello 92x92mm)

Frontale: 96x96mm

Profondità: 62mm

Profondità massima: 81mm (con moduli opzionali)

Connessioni: morsetti fissaggio a vite (ingressi di corrente)
a estrazione (ingressi di tensione)

Materiale custodia: policarbonato autoestinguente

Grado di protezione (EN/IEC 60529): IP54 frontale, IP20 morsetti

Peso: 285 grammi

HOUSING

Housing: flush mounting (panel cutout 92x92mm)

Front frame: 96x96mm

Depth: 62mm

Max. depth: 81mm (with optional modules)

Connections: screw terminals (input current)
to plug out (input voltage)

Housing material: self-extinguishing polycarbonate

Protection degree (EN/IEC 60529): IP54 front frame, IP20 terminals

Weight: 285 grams

PORTATA MORSETTI

INGRESSO TENSIONE

Cavo rigido: min.0,05mm² / max. 4,5mm²

Cavo flessibile: min.0,05mm² / max. 2,5mm²

Coppia serraggio consigliata: 0,6Nm

INGRESSO CORRENTE

Cavo rigido: min.0,05mm² / max. 6mm²

Cavo flessibile: min.0,05mm² / max. 4mm²

Coppia serraggio consigliata: 1Nm

ALIMENTAZIONE AUSILIARIA

Cavo rigido: min.0,05mm² / max. 4,5mm²

Cavo flessibile: min.0,05mm² / max. 2,5mm²

Coppia serraggio consigliata.: 0,6Nm

TERMINAL CAPACITY

VOLTAGE INPUT

Rigid cable: min.0,05mm² / max. 4,5mm²

Flexible cable: min.0,05mm² / max. 2,5mm²

Tightening torque advised: 0,6Nm

CURRENT INPUT

Rigid cable: min.0,05mm² / max. 6mm²

Flexible cable: min.0,05mm² / max. 4mm²

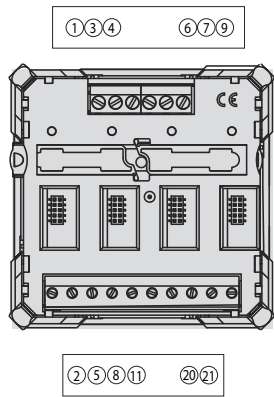
Tightening torque advised: 1Nm

AUX. SUPPLY

Rigid cable: min.0,05mm² / max. 4,5mm²

Flexible cable: min.0,05mm² / max. 2,5mm²

Tightening torque advised: 0,6Nm



MODULI OPZIONALI

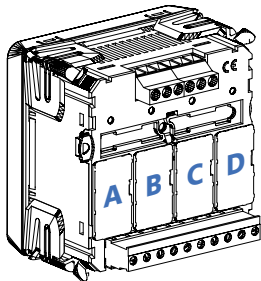
Nello strumento possono essere inseriti fino a quattro moduli opzionali.
 I moduli comunicazione sono in alternativa tra loro (non possono coesistere).
 Per le opzioni uscita impulsi, uscita analogica e allarmi, è possibile inserire uno o due moduli.
 Nella tabella vengono riportati i vincoli di composizione dei moduli: numero massimo moduli e posizione di inserimento.

OPTIONAL MODULES

In the meter up to four optional modules can be connected.
 Communication modules are as an alternative to them (they cannot coexist).
 For the options pulse outputs, analog output and alarms, it is possible to connect one or two modules.
 In the table are listed module composition constrictions: max. number of modules and connection position.

Codice Code	Descrizione Description	N. Max.	Posizione Position				Firmware ²	Nota Tecnica Technical Note
			A	B	C	D		
IF96001	Comunicazione RS485 RS485 communication	1	•				Tutte All	NT675
IF96002	Comunicazione RS232 RS232 communication	1	•				Tutte All	NT676
IF96003	2 uscite impulsi energia 2 energy pulse outputs	2	•	•	•	•	Tutte All	NT677
IF96004	2 uscite analogiche 0/4...20mA 2 analogue outputs 0/4...20mA	2			•	•	1.08	NT678
IF96005	2 allarmi 2 alarms	2	•	•	•	•	Tutte All	NT679
IF96006	Corrente di neutro Neutral current	1			•		1.08	NT683
IF96007A	Comunicazione PROFIBUS PROFIBUS communication	1	•				3.12	NT682
IF96009	Comunicazione LONWORKS LONWORKS communication	1	•				2.00	NT684
IF96010	I/O 2 Ingressi SPST - 2 Uscite SPST I/O 2 Inputs SPST - 2 Outputs SPST	2			•	•	2.06	NT702
IF96011	I/O 2 Ingressi 12-24Vcc - 2 Uscite SPST I/O 2 Inputs 12-24Vcc - 2 Outputs SPST	2			•	•	2.06	NT703
IF96012	Memorizzazione valori energia - RS485 RS485 - Energy value storage	1	•				2.06	NT704
IF96013	Comunicazione MBUS MBUS communication	1	•				2.06	NT707
IF96014	Comunicazione BACNET BACNET communication	1	•				2.08	NT743
IF96015	Comunicazione ETHERNET ETHERNET communication	1	•				2.00	NT785
IF96016	Misure di Temperatura Measure temperature	1				•	2.30	NT810

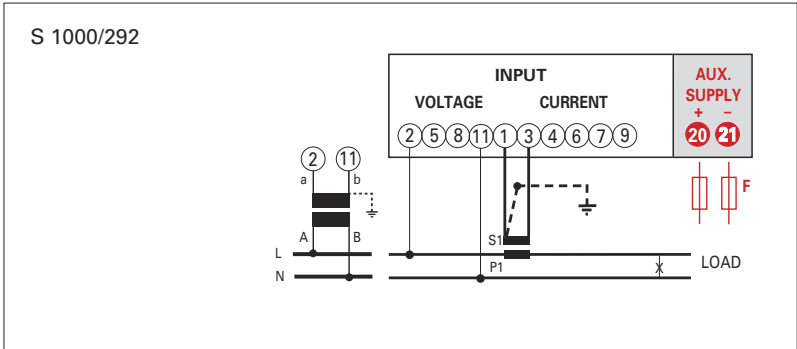
In tabella viene indicata la versione Firmware dello strumento che supporta la funzione del modulo aggiuntivo.
 Utilizzando un modulo comunicazione IF96001 (RS485) o IF96002 (RS232) è possibile aggiornare la versione Firmware (a partire dalla versione 2.00) direttamente in campo, con l'ausilio di un PC e del software di download.



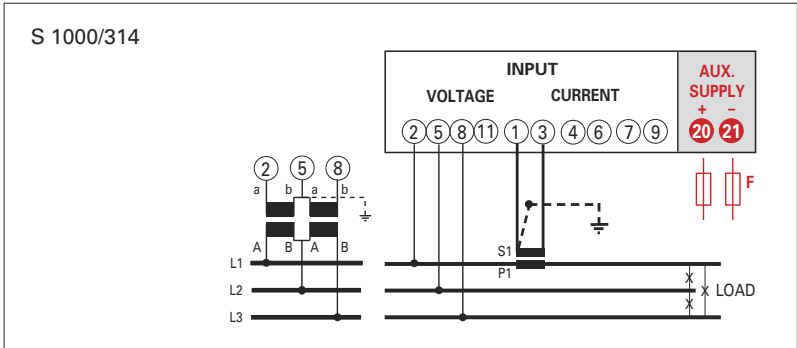
²On the table it is shown the Firmware version of the meter which supports the function of the extra module.
 By using an IF96001 (RS485) or IF96002 (RS232) communication module it is possible to update the Firmware version (starting from 2.00 version) directly on field, with the help of a PC and the download software.

F : 1A gG

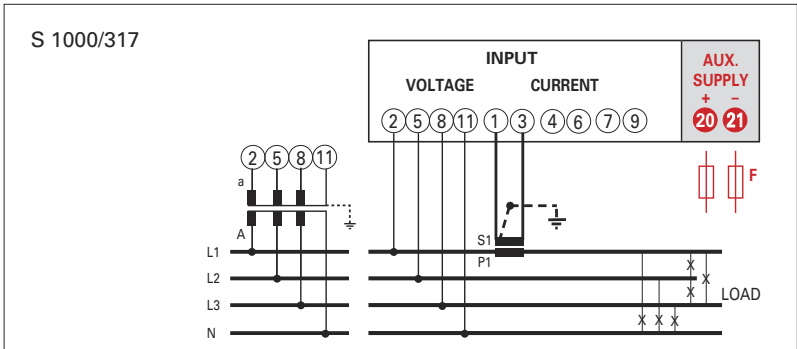
1n1E
Linea Monofase
Single phase network



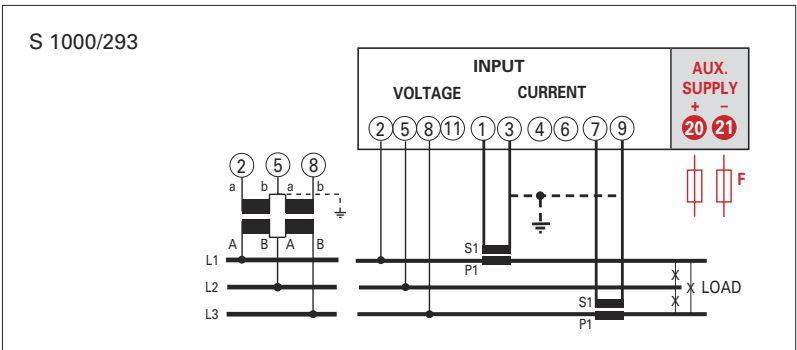
3-1E
Linea Trifase 3 Fili 1 Sistema
Three-phase 3-wires network 1 Systems



3n1E
Linea Trifase 4 Fili, 1 Sistema
Three-phase 3-wires network, 1 Systems



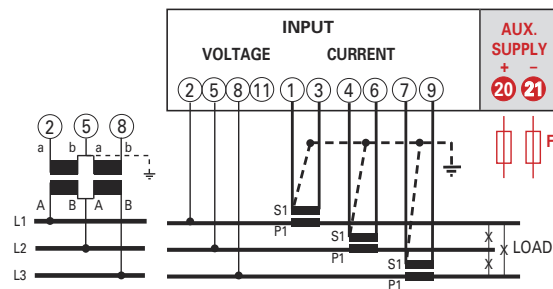
3-2E
Linea Trifase 3 fili, 2 Sistemi
Three-phase 3-wires network, 2 Systems



3-3E

Linea trifase 3 fili 3 Sistemi
Three-phase 3-wires network, 3 Systems

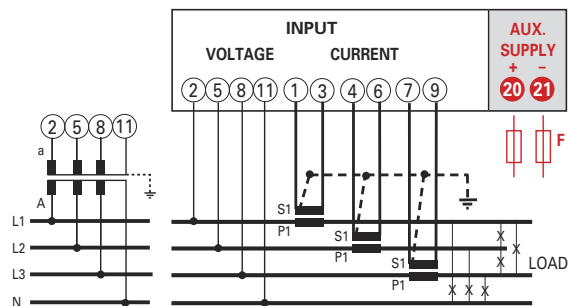
S 1000/294



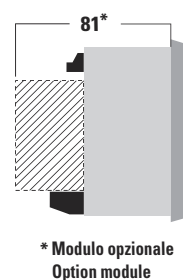
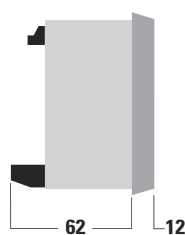
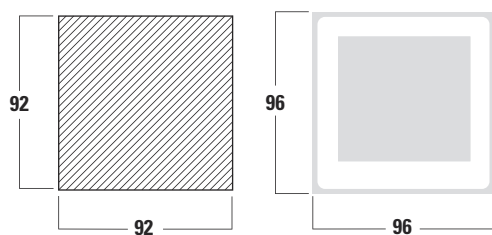
3n3E

Linea Trifase 4 fili, 3 Sistemi
Three-phase 4-wire network, 3 Systems

S 1000/295



DIMENSIONI DIMENSIONS



* Modulo opzionale
Option module



www.imeitaly.com

Centrale de mesure multifonctions pour réseau BT 96x96mm

Réseau triphasé 80...500V (phase-phase)
Monophasé 50...290V
Raccordement sur TC dédié
Rapport TC et TT externe programmable
Energie active c.l.0,5
Diagnostic, correction séquence de phase

Network monitor for low voltage 96x96mm

Three-phase line 80...500V (phase-phase)
Single-phase 50...290V
Connection with external dedicated CT
Programmable external CT-VT ratio
Active energy c.l.0,5
Phase sequence correction, diagnostic

Nemo 96 HD



Modules/Modules

Communication RS485

RS485 communication

Communication RS232

RS232 communication

Communication MBUS

MBUS communication

Communication PROFIBUS

PROFIBUS communication

Communication LONWORKS

LONWORKS communication

Communication BACNET

BACNET communication

Sortie impulsions

Output pulse

Sortie analogique

Output analogue

Alarmes

Alarms

Courant du neutre

Neutral current

I/O 2 Entrées SPST - 2 Sorties

I/O 2 Inputs SPST - 2Outputs

I/O 2 Entrées 12-24Vdc - 2 Sorties

I/O 2 Inputs 12-24Vdc - 2 Outputs

Mémorisation valeur de l'énergie - RS485

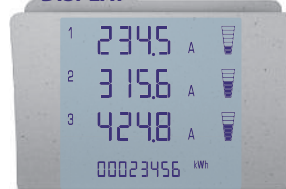
RS485 - Energy value storage

Communication ETHERNET

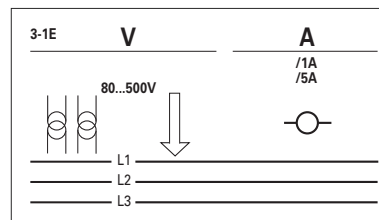
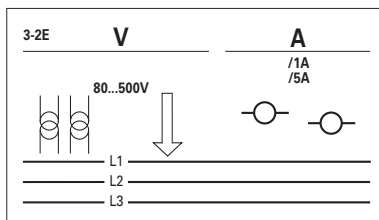
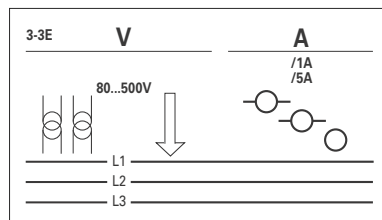
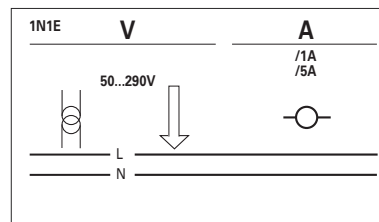
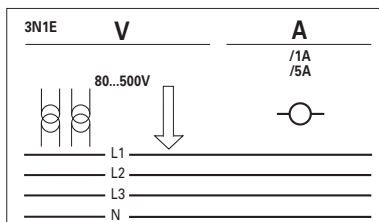
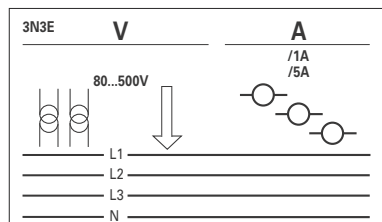
ETHERNET communication



DISPLAY



- **Tensions**
Voltages
- **Courants**
Currents
- **Puissance Active, Réactive, Apparente**
Active, Reactive, Apparent Power
- **Energie Active, Réactive**
Active, Reactive Energy
- **Facteur de puissance**
Power Factor
- **Fréquence**
Frequency
- **Compteur horaire**
Run Hour
- **THD**
THD



MODELE MODEL		Nemo 96HD		
RESEAU NETWORK		bt / LV		
ENTREE INPUT	RACCORDEMENT CONNECTION	Monophasé / single-phase	✓	
		Triphasé, équilibré Three-phase, balanced load	✓	
		Triphasé, non équilibré Three-phase, unbalanced load	✓	
	DIAGNOSTIC, CORRECTION SEQUENCE DE PHASE / PHASE SEQUENCE CORRECTION, DIAGNOSTIC		✓	
	VALEUR NOMINALE RATED VALUE	Tension (phase-phase) / Voltage (phase - phase)		400V
		Courant / Current		1 et 5A
	ENTREE COURANT INPUT CURRENT	TC dédié (shunt) / Dedicated CT (shunt)		✓
		Isolé / Insulated		
	RAPPORT PROGRAMMABLE PROGRAMMABLE RATIO	TT (kTT) / VT (KVT)		1...10
		TC / CT	Calibres / Ranges	
I _{pn} / I _{sn}			1...9999	
max. kTT x kTC / max. kVT x kCT		99'990		
Shunt				
AFFICHAGE DISPLAY	ENERGIE ACTIVE ACTIVE ENERGY	Précision / Accuracy EN/IE61557-12		cl.0,5
		Précision énergie dc / Energy accuracy dc		
		Positive, totale et partielle Positive, totale and partial		✓
		Négative, totale / Negative total		✓
	ENERGIE RÉACTIVE REACTIVE ENERGY	Précision / Accuracy EN/IE61557-12		cl.2
		Positive totale / Positive, total		✓
		Positive partielle / Positive, partial		✓
		Négative, totale / Negative, total		✓
	TENSION / VOLTAGE	Simple et composée / Phase and linked		✓
	COURANT CURRENT	Par phase et du neutre (calculé) Phase and neutral (computed)		✓
		du neutre (mesuré) Neutral (measured)		IF96006
		Moyenne et moyenne max. Phase demand and max. demand		✓
	FACTEUR DE PUISSANCE POWER FACTOR	Triphasé / Three-phase		✓
		Par phase / Phase		✓
	PUISSANCE POWER	Active, réactive, apparente Active, reactive, apparent		✓
		Moyenne et moyenne max. Demand and max. demand		✓
		Active et réactive par phase Phase active and reactive		✓
	DISTORSION HARMONIQUE Courant / Tension HARMONIC DISTORTION Current / Voltage	THD		✓
		Analyse		
	FREQUENCE / FREQUENCY		✓	
MESURE D.C. ¹ / D.C.MEASURE ¹				
COMPTEUR HORAIRE / RUN HOUR METER		✓		
SEQUENCE DE PHASE ERRONEE / WRONG PHASE SEQUENCE		✓		
TEMPERATURE		IF96016		
SORTIES OUTPUTS	IMPULSIONS / PULSES		IF96003	
	RELAIS ALARMES / ALARM RELAYS		IF96005	
	RELAIS ALARMES + ENTREE NUMERIQUE / ALARM RELAYS + DIGITAL INPUTS		IF96010+IF96011	
	ANALOGIQUE / ANALOGUE		IF96004	
	RS232		IF96002	
COMMUNICATION	RS485 MODBUS RTU		IF96001	
	RS485 + MEMOIRE / RS485 + MEMORY		IF96012	
	PROFIBUS		IF96007A	
	LONWORKS		IF96009	
	M-BUS		IF96013	
	BACNET		IF96014	
	ETHERNET		IF96015	
	TRANSMISSION RADIO 868MHz / 868Mhz RADIO TRASMISSION			

¹ Tension, Courant, Puissance, Ah positif et négatif / ¹ Voltage, current, power, Ah positive and negative

REFERENCE ORDERING CODE	ALIMENTATION AUXILIAIRE AUX. SUPPLY	ENTREE NOMINALE RATED INPUT	
9017 6040	80...265Vac - 110...300Vdc	400V (triphasé/ <i>three-phase</i>)	1 et / and 5A
9017 6039	11...60Vdc	400V (triphasé/ <i>three-phase</i>)	1 et / and 5A

 **LEGENDE :** = Paramètres programmables

AFFICHAGE

Type d'affichage: cristaux liquides rétroéclairés (LCD)

Extinction automatique du rétroéclairage, temporisation 20 secondes

 **Contraste:** 4 valeurs sélectionnables

 **Rétroéclairage:** 0 - 30 - 70 - 100%

Nbre de points d'affichage: 10 000 4 chiffres (hauteur des chiffres 12 mm)

Comptage de l'énergie: compteur numérique (hauteur des chiffres 8 mm)

Unités de mesures: affichage automatique en fonction des rapports TT et TC sélectionnés

Résolution: automatique, avec le plus grand nombre de décimales possible

Point décimal: automatique, avec la plus haute résolution possible

Echantillonnage: 1,1 secondes

 **Page personnalisable:** contenu de la page par défaut

LEGEND :  = Programmable Parameter

DISPLAY

Type of display: LCD backlit

Automatic backlit reduction off after 20 s that keyboard is not used

 **Contrast:** 4 selectable values

 **Backlit:** 0 - 30 - 70 - 100%

N° of reading points: 10 000 4 digits (high digit 12 mm)

Energy count: 8 digit counter (high digit 8 mm)

Engineering units: automatic display according to the set VT and CT ratios

Resolution: automatic, with the highest possible number of decimals

Decimal point: automatic, with the highest possible resolution

Reading update: 1,1 seconds

 **Customized page:** content of default page

PRECISION EN CONFORMITE AVEC/ CONFORMITY ACCURACY WITH/		EN/IEC 61557.12	
Energie active	Active energy	Ea	cl.0,5
Energie réactive	Reactive energy	Erv	cl.2
Tension	Voltage	U	cl.0,5
Courant	Current	I	cl.0,5
Puissance active	Active power	P	cl.0,5
Puissance réactive	Reactive power	Qv	cl.1
Puissance apparente	Apparent power	Sv	cl.1
Fréquence	Frequency	f	cl.0,5
Facteur de puissance	Power factor	PFv	cl.0,5
THD	THD	THDu / THDi	cl.2

VISUALISATION DES PAGES

L'affichage est subdivisé en 4 menus accessibles par les touches concernées :

U



I



PQS



ET



TENSION simple et composée VOLTAGE phase and linked	COURANT par phase et du neutre CURRENT phase and neutral	PUISSANCE TRIPHASEE active, réactive, apparente, distorsion ¹ THREE-PHASE POWER active, reactive, apparent, distortion ¹	FACTEUR DE PUISSANCE par phase et triphasée POWER FACTOR phase and three-phase
TENSION MINIMUM par phase MINIMUM VOLTAGE phase	COURANT MOYEN par phase CURRENT DEMAND phase	PUISSANCE PAR PHASE active, réactive, apparente PHASE POWER active, reactive, apparent	FREQUENCE FREQUENCY
TENSION MAXIMUM par phase MAXIMUM VOLTAGE phase	COURANT MOYEN MAX. par phase MAX. CURRENT DEMAND phase	PUISSANCE MOYENNE active, réactive, apparente POWER DEMAND active, reactive, apparent	COMPTEUR HORAIRE RUN HOUR
DISTORSION HARMONIQUES TENSION par phase et composée VOLTAGE HARMONIC DISTORTION phase and linked	MOYENNE DES 3 COURANTS AVERAGE CURRENT $\frac{I1 + I2 + I3}{3}$	PUISSANCE MOYENNE MAX. active, réactive, apparente MAX. POWER DEMAND active, reactive, apparent	ENERGIE ACTIVE POSITIVE totale et partielle POSITIVE ACTIVE ENERGY partial and total
	DISTORSION HARMONIQUES COURANT par phase CURRENT HARMONIC DISTORTION phase		ENERGIE REACTIVE POSITIVE partielle et totale POSITIVE REACTIVE ENERGY partial and total
			ENERGIE ACTIVE NEGATIVE NEGATIVE ACTIVE ENERGY
			ENERGIE REACTIVE NEGATIVE NEGATIVE REACTIVE ENERGY

¹ valeurs valides à partir de la version Firmware 2.15

L'énergie active ou réactive (alternativement) est toujours visualisée sur toutes les pages d'affichage.

¹ values valid starting from 2,15 Firmware version

The total active or reactive energy (alternatively) is always displayed on all the display pages.

PARAMETRES PROGRAMMABLES

Programmation: par touches en façade, 4 touches

Accès à la programmation: protégé par un mot de passe

Menu programmation: subdivisé en trois niveaux

NIVEAU 1 Page d'affichage personnalisée

Raccordement

Temps d'intégration courant/puissance moyenne

Affichage contraste

Affichage rétroéclairage

Courant nominal

NIVEAU 2 Rapport TT externe et TC externe

REARMEMENT DES PARAMETRES

Valeur tension min. et max.

Courant moyen

Courant moyen max.

Valeur moyenne max. de la puissance active, réactive, apparente

Compteur horaire

Energie active partielle

Energie réactive partielle

ENTREE

 **Raccordement:** réseau monophasé, triphasé 3 et 4 fils

Raccordement sur TC externes dédiés

Tension triphasée nominale Un: 400V

Tension triphasée: 80...500V (phase-phase)

Tension monophasée nominale Un: 230V

Tension monophasée: 50...290V

 **Rapport TT externe:** 1...10 (max. primaire TT 1200V)

Courant nominal In: 5A - 1A

Courant maximum Imax: 1,2In

Surcharge instantanée: 20 In/0,5 secondes

 **Rapport TC externe:** 1...9999 (max. primaire TC 50kA/5A - 10kA/1A)

Fréquence nominale fn: 50Hz

Variation admissible: 47...63Hz

Type de mesure: valeur efficace vraie RMS

Taux des harmoniques: selon la norme EN/IEC 62053-22 et EN/IEC 62053-23

Temps de démarrage (comptage de l'énergie): < 5 s

Autoconsommation tension: 0,1VA (neutre-phase vers tension nominale)

Autoconsommation courant: 1VA (par phase vers courant max. 6A)

COURANT MOYEN - PUISSANCE MOYENNE

 **Temps d'intégration:** 5/8/10/15/20/30/60 min.

COMPTEUR HORAIRE

Comptage heures et minutes

 **Départ comptage:** présence puissance ou tension sélectionnable

Tension: tension par phase >10V

 **Puissance:** puissance nominale active triphasée

Valeurs programmables: 0-50%Pn

Pn: Puissance nominale active triphasée = Tension triphasée nominale Un x Courant In x $\sqrt{3}$

Un: 400V

In: 1 ou 5A

Pn: $400V \times 5A \times \sqrt{3} = 3464W$ ou $400V \times 1A \times \sqrt{3} = 692,8W$

DIAGNOSTIC, CORRECTION SEQUENCE DE PHASE

IME a rajouté un algorithme pour détecter et corriger de nombreux problèmes liés au raccordement tension et / ou courant.

Cette fonction peut être activée par un mot de passe et permet d'afficher et de modifier, via software, la séquence de raccordement pour autant que les conditions suivantes soient remplies:

1) fil du neutre (dans un réseau 4 fils) est raccordé à la borne correspondante (normalement numéro 11).

PROGRAMMABLE PARAMETERS

Programming: through front keyboard, 4 keys

Programming access: password-protected

Programming menu: subdivided on 3 levels

LEVEL 1 Customized display page

Connection

Average power/current delay time

Display contrast

Display backlit

Current rating

LEVEL 2 External VT ratio and CT ratio

RESETTABLE PARAMETERS

Min. and max. voltage value

Current demand

Current max. demand

Active, reactive, apparent power max. demand

Run hour

Partial active energy

Partial reactive energy

INPUT

 **Connection:** single-phase, three-phase network 3 and 4-wire

Connection with external dedicated current transformers

Three-phase voltage rating Un: 400V

Three-phase voltage: 80...500V (phase-phase)

Single-phase voltage rating Un: 230V

Single-phase voltage: 50...290V

 **External VT ratio:** 1...10 (max. VT primary 1200V)

Current rating In: 5A - 1A

Max. current Imax: 1,2In

Instantaneous overload: 20In/0,5 seconds

 **External CT ratio:** 1...9999 (max. CT primary 50kA/5A - 10kA/1A)

Frequency rating fn: 50Hz

Tolerance: 47...63Hz

Type of measurement: true RMS value

Harmonic content: according to EN/IEC 62053-22 and EN/IEC 62053-23

Start time (energy count): < 5 s

Voltage rated burden: 0,1VA (neutral-phase to voltage rating)

Current rated burden: 1VA (each phase to max. current 6A)

CURRENT DEMAND - POWER DEMAND

 **Average period:** 5/8/10/15/20/30/60 min.

RUN HOUR METER

Hours and minutes count

 **Count start:** power or voltage present selectable

Voltage: phase-voltage >10V

 **Power:** 3-phase active power rating

Programmable value: 0-50%Pn

Pn: 3-phase active power rating = 3-phase active voltage rating Un x Current In x $\sqrt{3}$

Un: 400V

In: 1 or 5A

Pn: $400V \times 5A \times \sqrt{3} = 3464W$ or. $400V \times 1A \times \sqrt{3} = 692,8W$

PHASE SEQUENCE CORRECTION, DIAGNOSTIC

In the software of the device IME have added a specific functionality to detect and correct many problems concerning voltage and / or current connection.

This function can be activated through password and allows to display and modify the connection sequence provided that the following conditions are respected:

1) The neutral wire (in a 4-wire network) is connected to the right terminal (normally number 11).

2) Pas de croisements entre les câbles raccordés aux TC (ex.: sur la phase 1 de l'appareil éviter un câble provenant de TA1 et un câble provenant de TA2)

3) Le facteur de puissance est compris entre 1 et 0,5 inductif pour chacune des phases.

Voir www.imeitaly.com "TECHNICAL SUPPORT"

ALIMENTATION AUXILIAIRE

Valeur nominale Uaux ac: 80...265V

Fréquence nominale: 50Hz

Fréquence de fonctionnement: 47...63Hz

Autoconsommation: $\leq 2,5\text{VA}$ (230Vca backlight 30% sans module externe)

Valeur nominale Uaux dc: 110...300Vdc - 11...60Vdc

Autoconsommation: $\leq 3,5\text{W}$ (sans modules)

Protection contre l'inversion de polarité

ISOLEMENT

(EN / IEC 61010-1)

Catégorie de l'installation: III

Degré de pollution: 2

Tension de référence pour l'isolement: 300V (Phase - neutre)

Circuits considérés *Considered circuits*

Alimentation / Entrée mesure *Supply / Measure inputs*

Tous les circuits et la masse *All circuits and earth*

TEST DE COMPATIBILITÉ ÉLECTROMAGNÉTIQUE

Tests d'émission selon la norme EN / IEC 61326-1 classe B

Tests d'immunité selon la norme EN / IEC 61326-1

CONDITIONS D'UTILISATION

Température de référence: $23^{\circ}\text{C} \pm 2^{\circ}\text{C}$

Température d'utilisation: $-5...55^{\circ}\text{C}$

Température limite pour le transport et le stockage: $-25...70^{\circ}\text{C}$

Adapté pour l'utilisation en climat tropical

Puissance maximum dissipée¹: $\leq 5\text{W}$

¹ Pour le dimensionnement thermique du coffret

BOITIER

Boîtier: encastré (découpe panneau 92x92mm)

Face avant: 96x96mm

Profondeur: 62mm

Profondeur maximum: 81mm (avec modules optionnels)

Raccordement: bornier à vis (entrée courant) bornier fixe
bornier à vis (entrée tension) bornier débrochable

Matériaux du boîtier: polycarbonate autoextinguible

Degré de protection (EN/ IEC 60529): IP54 face avant, IP20 bornes

Poids: 285 grammes

CAPACITE DES BORNES

ENTREE TENSION

Fil rigide : min.0,05mm² / max. 4,5mm²

Fil souple: min.0,05mm² / max. 2,5mm²

Couple de serrage conseillé: 0,6Nm

ENTREE COURANT

Fil rigide: min.0,05mm² / max. 6mm²

Fil souple: min.0,05mm² / max. 4mm²

Couple de serrage conseillé: 1Nm

ALIMENTATION AUXILIAIRE

Fil rigide: min.0,05mm² / max. 4,5mm²

Fil souple: min.0,05mm² / max. 2,5mm²

Couple de serrage conseillé.: 0,6Nm

2) No crossings between cables connected to CTs (e.g. avoid that on phase 1 of the meter -terminals 1 and 3 - are connected some way both to CT1 and CT2).

3) The power factor is between 1 and 0,5 - Inductive load - for each phase.

See www.imeitaly.com "TECHNICAL SUPPORT".

AUXILIARY SUPPLY

Rated value Uaux ac: 80...265V

Rated frequency: 50Hz

Working frequency: 47...63Hz

Rated burden: $\leq 2,5\text{VA}$ (230Vac backlight 30% without external modules)

Rated value Uaux dc: 110...300Vdc - 11...60Vdc

Rated burden: $\leq 3,5\text{W}$ (without modules)

Protected against incorrect polarity

INSULATION

(EN/IEC 61010-1)

Installation category: III

Pollution degree: 2

Insulation voltage rating: 300V (phase - neutral)

TESTS TESTS

Tension à impulsions 1,2 / 0μs0,5J
Voltage test 1,2 / 50μs 0,5J

Tension alternative valeur efficace 50Hz 1min
Alternating voltage r.m.s value 50Hz 1min

6kV

3kV

-

4kV

TESTS FOR ELETROMAGNETIC COMPATIBILITY

Emission according to EN / IEC 61326-1 class B

Immunity according to EN / IEC 61326-1

ENVIRONMENTAL CONDITIONS

Reference temperature: $23^{\circ}\text{C} \pm 2^{\circ}\text{C}$

Specified operating range: $-5...55^{\circ}\text{C}$

Limit range for storage and transport: $-25...70^{\circ}\text{C}$

Suitable for tropical climates

Max. power dissipation¹: $\leq 5\text{W}$

¹ For switchboard thermal calculation

HOUSING

Housing: flush mounting (panel cutout 92x92mm)

Front frame: 96x96mm

Depth: 62mm

Max. depth: 81mm (with optional modules)

Connections: screw terminals (input current)
to plug out (input voltage)

Housing material: self-extinguishing polycarbonate

Protection degree (EN/IEC 60529): IP54 front frame, IP20 terminals

Weight: 285 grams

TERMINAL CAPACITY

VOLTAGE INPUT

Rigid cable: min.0,05mm² / max. 4,5mm²

Flexible cable: min.0,05mm² / max. 2,5mm²

Tightening torque advised: 0,6Nm

CURRENT INPUT

Rigid cable: min.0,05mm² / max. 6mm²

Flexible cable: min.0,05mm² / max. 4mm²

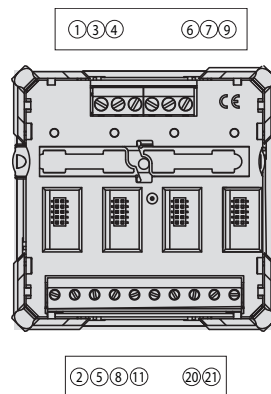
Tightening torque advised: 1Nm

AUX. SUPPLY

Rigid cable: min.0,05mm² / max. 4,5mm²

Flexible cable: min.0,05mm² / max. 2,5mm²

Tightening torque advised: 0,6Nm



MODULES OPTIONNELS

4 modules optionnels peuvent être raccordés à la centrale de mesure.

Les modules de communication sont des alternatives (ils ne peuvent pas coexister).

Pour les options sorties impulsions, sorties analogiques et alarmes, il est possible de raccorder un ou deux modules.

Le tableau ci-dessous indique les possibilités de composition de modules : nombre max. de modules ainsi que les positions de raccordement.

OPTIONAL MODULES

In the meter up to four optional modules can be connected.

Communication modules are an alternative to them (they cannot coexist).

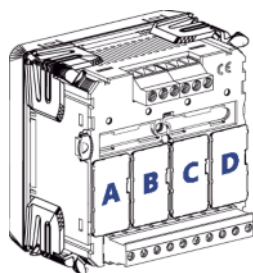
For the options pulse outputs, analog output and alarms, it is possible to connect one or two modules.

In the table are listed module composition constrictions: max. number of modules and connection position.

Référence Code	Description Description	N. Max.	Position Position				Firmware ²	Notice technique Technical notice
			A	B	C	D		
IF96001	Communication RS485 RS485 communication	1	•				Toute All	NT675
IF96002	Communication RS232 RS232 communication	1	•				Toute All	NT676
IF96003	2 sorties impulsions énergie 2 energy pulse outputs	2	•	•	•	•	Toute All	NT677
IF96004	2 sorties analogiques 0/4...20mA 2 analogue outputs 0/4...20mA	2			•	•	1.08	NT678
IF96005	2 alarmes 2 alarms	2	•	•	•	•	Toute All	NT679
IF96006	Courant du neutre Neutral current	1			•		1.08	NT683
IF96007A	Communication PROFIBUS PROFIBUS communication	1	•				3.12	NT682
IF96009	Communication LONWORKS LONWORKS communication	1	•				2.00	NT684
IF96010	I/O 2 Entrées SPST - 2 Sorties SPST I/O 2 Inputs SPST - 2 Outputs SPST	2			•	•	2.06	NT702
IF96011	I/O 2 Entrées 12-24Vdc - 2 Sorties SPST I/O 2 Inputs 12-24Vdc - 2 Outputs SPST	2			•	•	2.06	NT703
IF96012	Mémorisation valeur énergie - RS485 RS485 - Energy value storage	1	•				2.06	NT704
IF96013	Communication MBUS MBUS communication	1	•				2.06	NT707
IF96014	Communication BACNET BACNET communication	1	•				2.08	NT743
IF96015	Communication ETHERNET ETHERNET communication	1	•				2.00	NT785
IF96016	Mesure de température Measure temperature	1				•	2.30	NT810

²sur le tableau figure la version firmware de la centrale nécessaire pour supporter la fonction du module supplémentaire.

En utilisant un module de communication IF96001 (RS485) ou IF96002 (RS232), il est possible de mettre à jour la version firmware (à partir de la version 2.00) directement en façade, à l'aide d'un PC et du logiciel approprié.

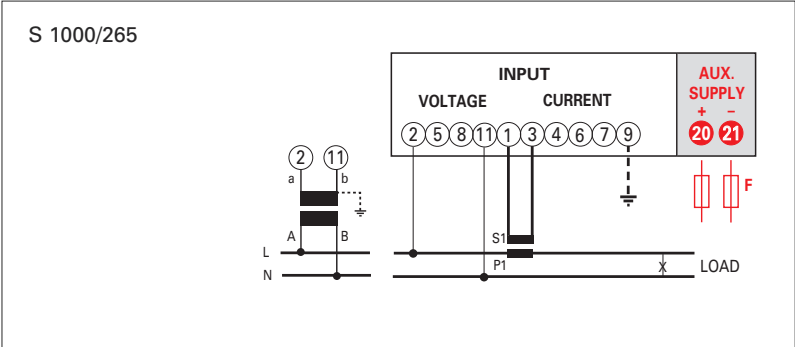


²On the table it is shown the Firmware version of the meter which supports the function of the extra module.

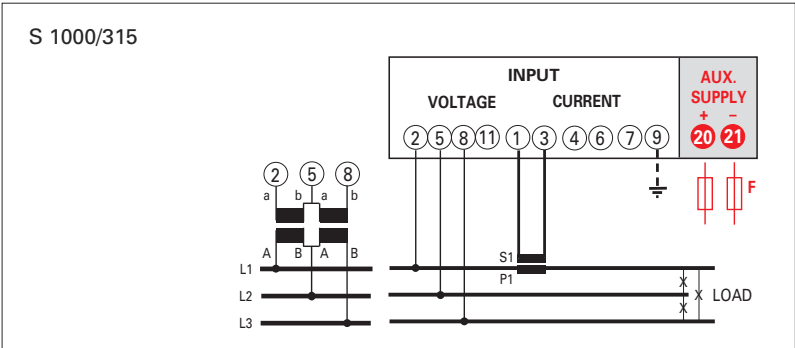
By using an IF96001 (RS485) or IF96002 (RS232) communication module it is possible to update the Firmware version (starting from 2.00 version) directly on field, with the help of a PC and the download software.

F : 1A gG

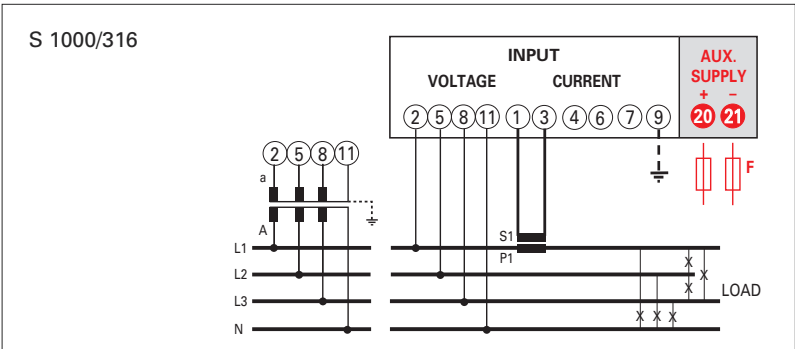
1n1E
Réseau monophasé
Single phase network



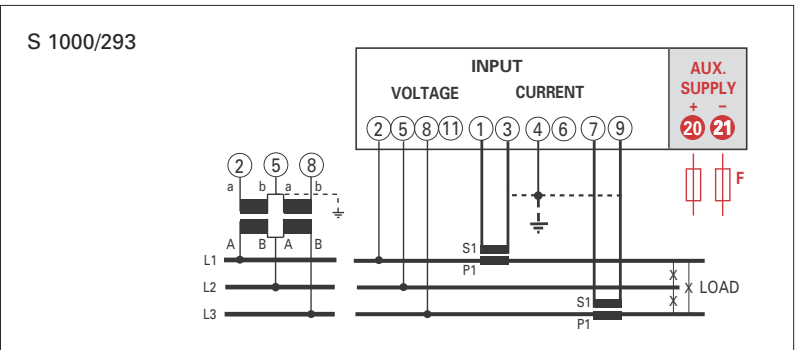
3-1E
Réseau triphasé 3 fils, 1 système
Three-phase 3-wires network 1 Systems



3n1E
Réseau triphasé 3 fils, 1 système
Three-phase 3-wires network, 1 Systems



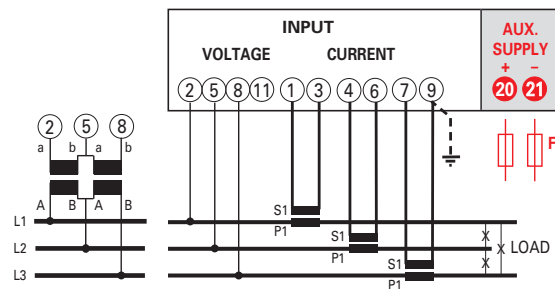
3-2E
Réseau triphasé 3 fils, 2 systèmes
Three-phase 3-wires network, 2 Systems



3-3E

Réseau triphasé 3 fils, 3 systèmes
Three-phase 3-wires network, 3 Systems

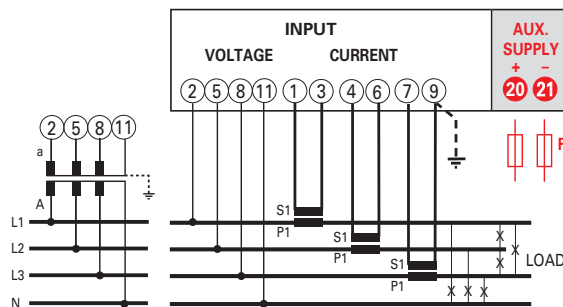
S 1000/267



3n3E

Réseau triphasé 4 fils, 3 systèmes
Three-phase 4-wire network, 3 Systems

S 1000/268



DIMENSIONS DIMENSIONS

