Energy Meter ET340

- **Three phase energy transducer**
- **Class 1 (kWh) according to EN62053-21**
- **Accuracy ±0.5% RDG (current/voltage)**
- **Direct current measurement up to 65AAC**
- **Energy measurement: kWh and kvarh (imported/exported); kWh+ by 2 tariffs; kWh per phase**
- **System variables: kW, kvar, kVA, VLL, VLN, PF, Hz, kWdmd, kWdmd peak**
- **Phase variables: kW, kvar, kVA, VLL, VLN, A, PF**
- **Self power supply**
- **Dimensions: 3-DIN module**
- **Protection degree (front): IP20**
- **Optical port**
- **RS485 Modbus port (optional)**
- **Digital input (for tariff management)**
- **Run hour meter**
- **Easy connection or wrong current direction detection**

Product description

Three-phase transducer. Particularly indicated for active energy metering and for cost allocation in applications up to 65 A (direct connection), with dual tari management availability. It can measure imported and exported energy or be programmed to consider only the imported one. Housing for DIN-rail mounting, with IP20 front degree protection. The transducer is provided with RS485 Modbus port.

Type Selection

Range code		System		Power supply		Output	
AV2:	208 to 400 VLL AC - 5(65)A (Direct connection)	**3:**	3-phase, 3- or 4-wire; 2-phase 3-wire	**X:**	self power supply -20% +20% of the rated measuring input voltage, 45 to 65Hz	**S1:**	RS485 Modbus port

Option	
X:	none

Input specifications

Rated Inputs	
Current type	3-phase loads, direct connection
Current range	5(65)A
Nominal voltage	208 to 400 VLL AC
Accuracy (@25°C ±5°C, R.H. ≤60%, 45 to 65 Hz)	
Current	Imin=0.25A; Ib: 5A, Imax: 65A; Un: 113 to 265VLN (196 to 460VLL) Imin=0.25A; Ib: 5A, Imax: 65A; from 208 to 400 VLL AC From 0.04Ib to 0.2Ib: ±(0.5%RDG+1DGT) From 0.2Ib to Imax: ±(0.5%RDG)
Phase-neutral voltage	In the range Un: ±(0.5% RDG)
Phase-phase voltage	In the range Un: ±(1% RDG)
Frequency	Range: 45 to 65Hz.
Active power	From 0.05 In to Imax, within Un range, PF=1: ±(1% RDG) From 0.1 In to Imax, within Un range, PF=0.5L or 0.8C: ±(1% RDG)
Power factor	±[0.001+1%(1.000 - "PF RDG")]
Reactive power	From 0.05 In to Imax, within Un range, sinphì=1: ±(2% RDG) From 0.1 In to Imax, within Un range, sinphì=0.5L or 0.8C: ±(2% RDG)
Energies	
Active energy	Class 1 according to EN62053-21
Reactive energy	Class 2 according to EN62053-23
Start-up current:	20mA Self-consumption is not measured.
Start-up voltage	90VLN
Resolution	
Current	0.001 A
Voltage	0.1 V
Power	0.1 W or var
Frequency	0.1Hz
PF	0.001
Energies (positive)	0.1 kWh or kvarh
Energies (negative)	0.1 kWh or kvarh
Run hour meter	0.01 h
Energy additional errors	
Influence quantities	According to EN62053-21
Temperature drift	≤200ppm/°C
Sampling rate	4096 samples/s @ 50Hz 4096 samples/s @ 60Hz

Max. and Min. data values	
Energies	Max. 99 999 999 Min. 0.01
Variables	Max. 9999 Min. 0.01
Run hour meter	0.01 h
Memory	
Energy	10^12 cycles. Energy value is saved every time the less significant digit increases.
Programming parameters	10^12 cycles. When a parameter is modified, only the relevant memory cell is overwritten
LEDs	
Right LED	Flashing red light pulses according to EN50470-3, EN62052-11, 1000 pulse per kWh (min. period: 90ms)
Left LED	Fix green light: power-on Blinking red light: power-on and communication in progress
Current overloads	
Continuous	65A, @ 50Hz
For 10ms	8450 A
Voltage Overloads	
Continuous	1.2 Un
For 500ms	2 Un
Input impedance	
230VL-N	1.2Mohm
120VL-N	1.2Mohm
5(65) A	< 1.25VA

Digital input specifications

Digital inputs	Free of voltage contact
Function	Tariff management (switch between t1-t2)
Number of inputs	1
Contact measurement voltage	5 V
Input impedance	1kohm
Contact resistance	≤1kohm, close contact ≥100kohm, open contact

Overload	In case a voltage is erroneously applied to the digital input, the input is not damaged up to 30 VAC/ DC.

Output specifications

RS485 serial port	RS485 by screw connection or RS485 by standard female RJ45 connectors (not shielded).
Function	For communication of measured data, programming parameters
Protocol	ModBus RTU (slave function)
Baud rate	9.6, 19.2, 38.4, 57.6, 115.2 kbaud,
Data format	even or no parity,
Address	1 to 247 (default: 01)
Driver input capability	1/8 unit load. Maximum 247 devices on the same bus.
Data refresh time	1sec
Read command	50 words available in 1 read command
RJ45 pin-out	According to Modbus standard: A- (pin5), B+ (pin4), GND (pin8)
Other ports	All the Modbus ports (screw terminals, two RJ45) are in parallel. Only one port at a time can be used.

Optical port	
Description	Frontal bi-directional infrared optical coupling with CG optical reader device “Opto-prog”
Function	For remote communication of measured data and setting of programming parameters
Protocol	ModBus RTU (slave function)
Baud rate	9.6, 19.2 kbaud, even or no parity
Address	1
Data refresh time	1 sec
Read command	50 words available in 1 read command
Optical port LEDs	
LED axial distance	6.5 mm
LED function	- Upper LED is a receiver (from the master to the transducer - Lower LED is a transmitter (from the trasducer to the master).

General specifications

Operating temperature	-20 to +65 °C, indoor, (R.H. from 0 to 90% non-condensing @ 40°C)
Storage temperature	-30°C to +80°C (R.H. < 90% noncondensing @ 40°C)
Overvoltage category	Cat. III
Insulation (for 1 minute)	4000 VAC RMS between measuring inputs and digital/serial output (see table) 4000 VAC RMS
Dielectric strength	4000 VAC RMS for 1 minute
EMC	According to EN62052-11
Electrostatic discharges	15kV air discharge;
Immunity to irradiated electromagnetic fields	Test with current: 10V/m from 80 to 2000MHz;
Electromagnetic fields	Test without any current: 30V/m from 80 to 2000MHz;
Burst	On current and voltage measuring inputs circuit: 4kV
Immunity to conducted disturbances	10V/m from 150KHz to 80MHz
Surge	On current and voltage measuring inputs circuit: 4kV;
Radio frequency	According to CISPR 22

Standard compliance	
Safety	EN62052-11
Metrology	EN62053-21
Approvals	CE
Connections	
Cable cross-section area	Measuring inputs: max. 16 mm^2, min. 2.5 mm^2 with/without metallic cable ferrule; Max. screw tightening torque: 2.8 Nm
Other terminals	1.5 mm^2, Min./Max. screws tightening torque: 0.4 Nm
Housing	
Dimensions (WxHxD)	54 x 90 x 63 mm
Material	Noryl, self-extinguishing: UL 94 V-0
Sealing covers	Included
Mounting	DIN-rail
Protection degree	
Front	IP20
Screw terminals	IP20
Weight	Approx. 240 g (packing included)

Power supply specifications

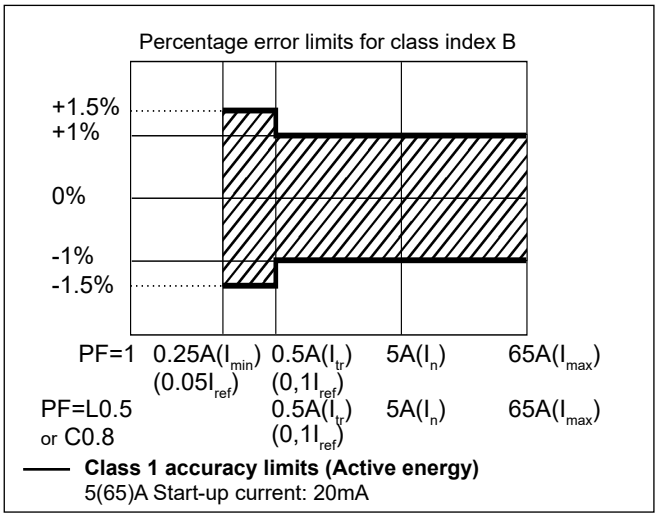
Self power supply	208 to 400VAC VLL, -20% +20% 50/60Hz
Power consumption	≤ 1W, ≤ 10VA

Insulation (for 1 minute) between inputs and outputs

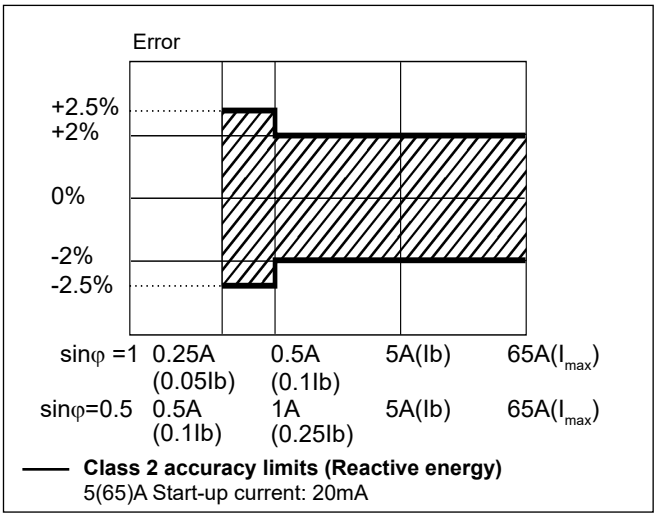
	Measuring input	Serial output	Digital input
Measuring input	-	4 kV	4 kV
Serial output	4 kV	-	0 kV
Digital input	4 kV	0 kV	-

Accuracy (according to EN62053-21 and EN62053-23)

kWh, accuracy (RDG) depending on the current



kvarh, accuracy (RDG) depending on the current

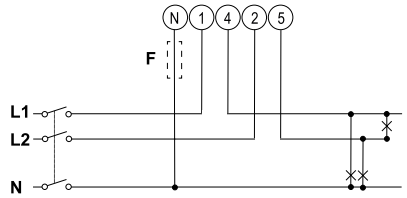


Available variables

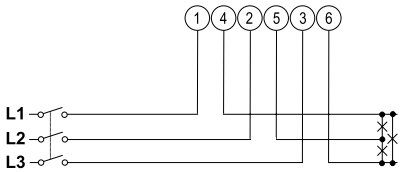
1	kWh+ (imported)
2	kWh- (exported)
3	kWh (t1 and t2)
4	kW
5	kW dmd
6	kW dmd peak
7	kvar
8	kVA
9	V
10	A
11	PF
12	Hz
13	Run hour meter

Wiring diagrams

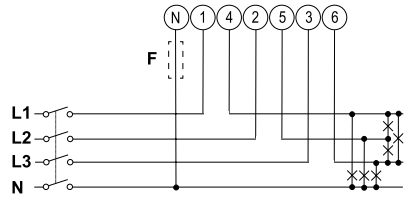
Two-phase system, 3-wire (F 315mA) **Fig.1**



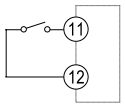
Three-phase system, 3-wire. **Fig.2**

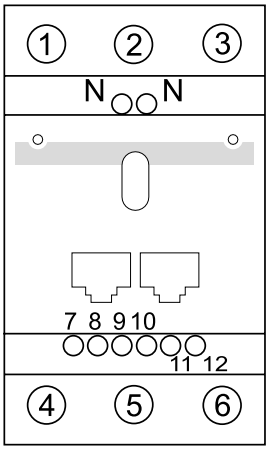


Three-phase system, 4-wire. (F 315mA) **Fig.3**

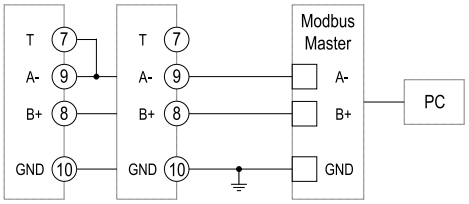


Digital Input **Fig.4**





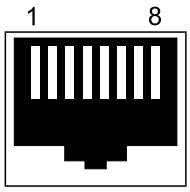
RS485 Modbus communication port **Fig.5**



Additional instruments with RS485 are connected in parallel. The serial output must only be terminated on the last network device connecting terminals A- and T. For connections longer than 1000 m use a signal repeater. Maximum 247 transceivers on the same bus.

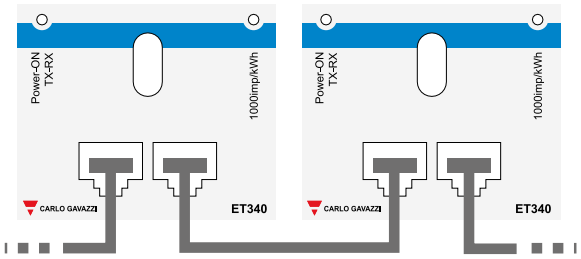
Wiring diagrams (cont.)

Modbus RJ45 female connector connection diagram **Fig.6**



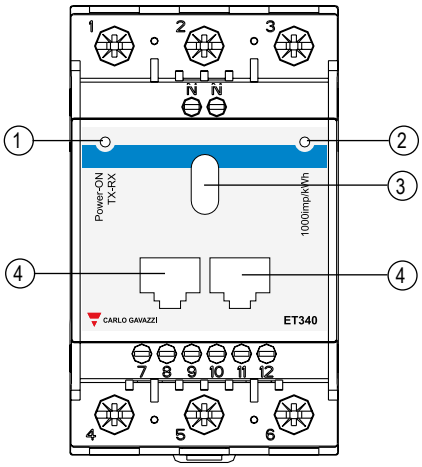
4	B+
5	A-
8	GND

RS485 (RJ45) Modbus connection **Fig.7**



The serial output must only be terminated on the last network device connecting terminals A- (9) and T (7). For connections longer than 1000 m use a signal repeater. Maximum 247 transceivers on the same bus.

Front panel description



1. **LED**
   Power-ON LED with communication indication (when blinking)

2. **LED**
   LED proportional to kWh reading

3. **Optical port**
   Optical port for data transmission or programming

4. **RJ45 Modbus RTU ports (RS485)**
   Modbus ports for fast bus connection. The ports are in parallel. The screw terminals can be used as well (same Modbus port).

Dimensions