

IE10...

Single-Phase Meter



APPLICATION

Single element meter, type **IE10**, is intended for measuring active energy in two-wire, single phase networks.

APPLICABLE STANDARDS

IEC 62053-11, IEC 62052-11, EN 60521, IEC 521, BS 5685, IS 13010

RATINGS

Standard reference voltage:220 – 240 V, or others

Frequency:50 Hz

Class Index:2

Current ratings

- for 400% overload:2,5/10 A, 5/20 A, 10/40 A
20/80 A
- for 500% overload:10/50 A, 20/100 A
- for 600% overload:5/30 A, 10/60 A
- for 800% overload:5/40 A

BASIC PERFORMANCES

- tamper-proof design
- long-term stability and high reliability
- easily accessible adjustment mechanisms
- magnetic or jewel bearing
- meter case with IS or BS terminal block
- service life expectancy 30 years
- low-temperature coefficient
- high torque
- flat curve for wide range meters
- small influence quantities
- extremely low power consumption
- high resistance to surge voltages
- resistant to shocks up to 40 G

DESIGN AND CONSTRUCTION

Driving element consists of single voltage and current electromagnets, adjustment mechanisms, a rotor with a bearing, a brake magnet and a register which are mounted to a frame made of 2 mm thick CRC steel sheet.

Meter base is made of UV stabilized polycarbonate material (Lexan 243R) or bakelite, a thermosetting material (Phenolic resin).

Optionally, a base is completed with a carrying handle, and does not incorporate any other metal parts for fixing the meter.

Terminal block is made of bakelite. A terminal block is inserted into the PC meter base. It is completed with potential and series terminals for proper connection of the meter.

It is made in accordance with the UL-94 flammability test.

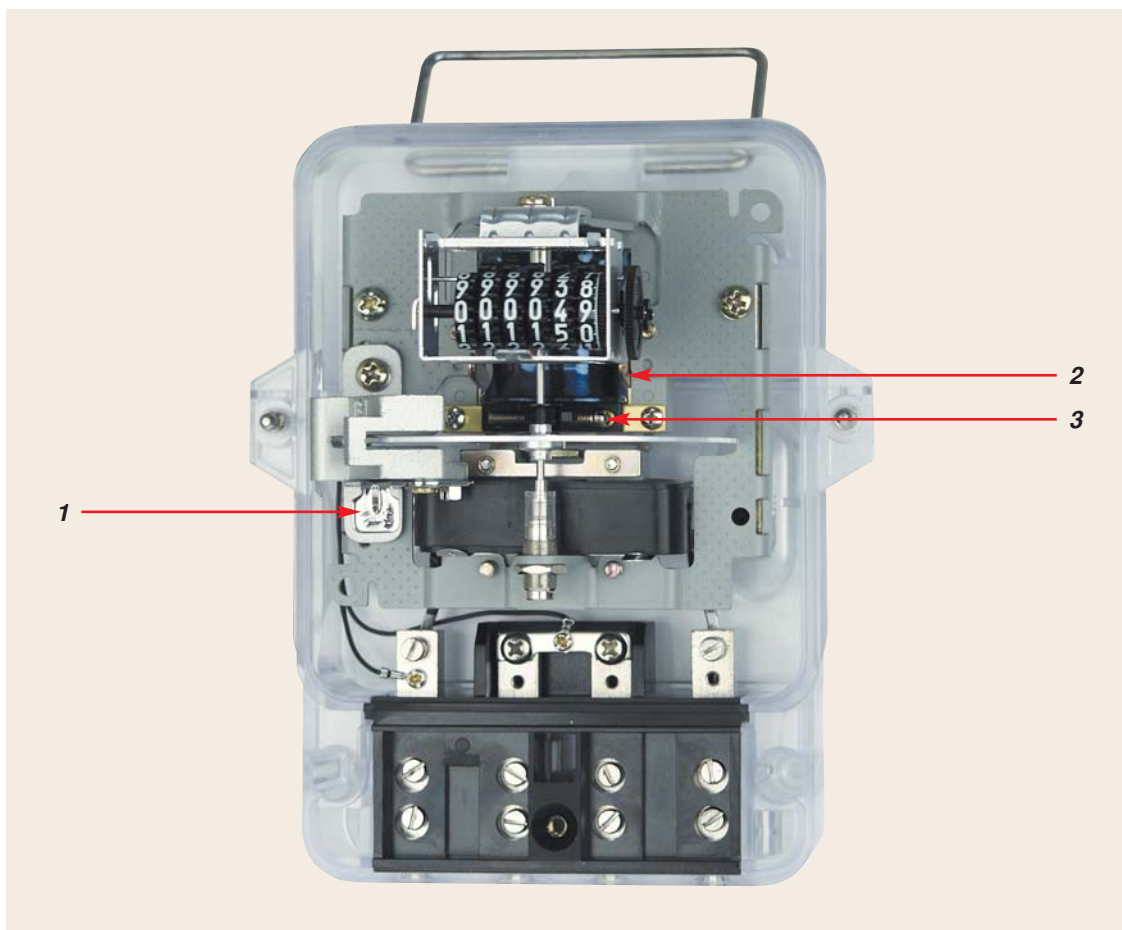
The bakelite base forms an integral part with the meter terminal block.

Connection terminals are made of nickel plated brass material. The bore diameter is 5.5 – 9 mm. Current coil ends are tightened with a single screw, and external wires are connected by means of two terminal screws.

Meter cover is made of polycarbonate (Lexan 243R), UV stabilized, fully transparent material. The interior of the meter can be observed from all directions. The meter cover and the base can be sealed either from the front or from the rear side.

Terminal cover is made of the same material as the meter cover. Both extended and short types are available. The connection diagram is labelled on the terminal block.

METER ADJUSTMENTS



- 1 – FL adjustment**
- 2 – PF adjustment**
- 3 – LL adjustment**

Carrying frame is made of CRC steel. It enables a long-term dimensional stability. It is fixed to the base indirectly through two elastic carriers fixed on the base with two screws, which prevents mechanical damage of the metering system from shocks caused by rough handling or heavy transport conditions. The frame is protected against corrosion by electrostatic painting.

Voltage and current cores are made of first class cold rolled non-oriented grain silicon steel material (CRNGO). The laminations are stuck together with no rivets in up-to-date "FASTEC" technology. The cores are protected against corrosion by electrostatic painting.

Voltage coil is wound around a plastic former that is made of polypropylene, a plastic material, with enamelled cooper wire that is additionally encapsulated in PVC shrinkable plastic tube, or closed in a plastic box, to provide high breakdown strength and prevent penetration of moisture.

Current coil is wound with round or rectangular synthetic resin insulated wire. A wire square section enables low current density (5.0 A/sq mm).

Rotor is made of pure Al sheet moulded to the stainless steel, non-magnetic, 2 mm thick shaft. The rotor diameter is 90 mm and its thickness is 1.2 mm. The shaft is moulded to the disc by Al alloy by means of Fisher die-casting technology. The meter rotor is marked with the edge mark and/or 100- or 200-division scale from the upper side, for calibration and observation purposes.

The hole is punched in the rotor disc to prevent creeping at 75% – 110% of reference voltage.

Upper bearing is a pin type. The upper bearing housing is made of nickel plated brass. Together with a graphite pivot it serves as an axial low friction rotor guide and long-term stability of meter registration. The pin diameter is 0.48 mm.

Lower bearing is a magnetic repulsion type, made of rare earth SmCo magnetic material, or sapphire double cup jewel bearing.

A high-polished pin in conjunction with a graphite pivot enables low friction during the meter long life period. The magnetic bearings are thermal-compensated and lubrication free.

Brake magnet is a 4-pole two-direction version. Two magnetic cubes are made of AlNiCo V material and are die-cast in Al alloy. The brake magnet air gap is 2.5 mm.

The brake magnet is thermal-compensated with two FeNi plates in the temperature range from - 20°C to + 55°C.

Register mechanism is cyclometric type. The one-directional or uni-directional 6- or 7-digit single-tariff registers can be incorporated into the meters. High-polished shafts rotate in a plastic bearing impressed to the aluminium, self-aligning register frame. Register bearings, gears, drums and pinions are made of Grilamid or Polyacetale material. The register is self-aligning type and is fixed to the frame with one screw.

Reverse running stop device prevents the rotor rotation in reverse direction in case of any attempt of fraud of energy or wrong connection.

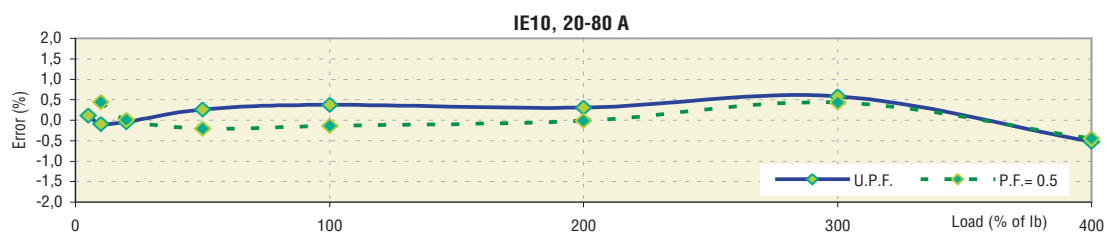
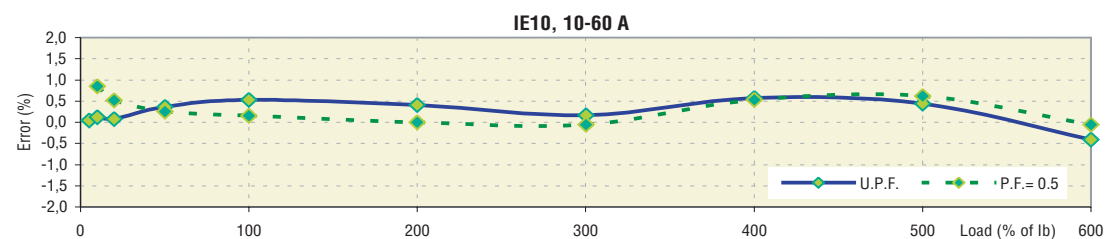
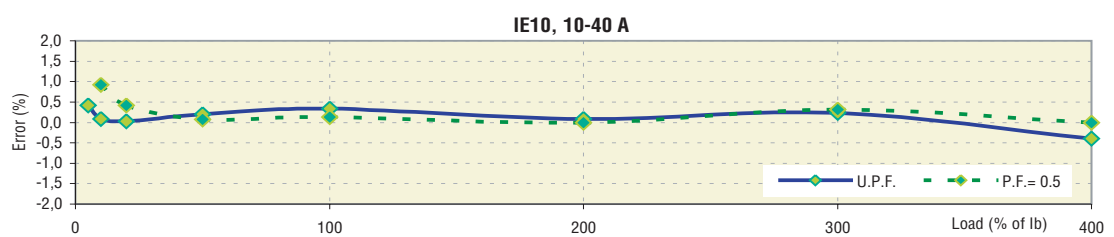
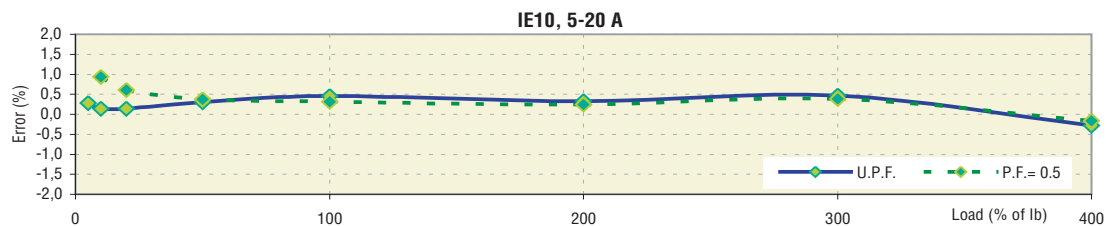
Nameplate is made of Polycarbonate plastic Lexan 503R –light grey, enforced by fibber glass. It includes all meter data and some property numbers or bar coding.

Adjustments

- **Power factor adjustment (PF)** consists of two cooper vanes movable in the side gapes of voltage electromagnet.
- **Low load adjustment (LL)** is micrometric type adjusted by an adjustment screw.
- **Full load adjustment (FL)** can be adjusted by removing the adjustment lever, fixed to the brake magnet.

The directions of adjustments are clearly marked on the nameplate.

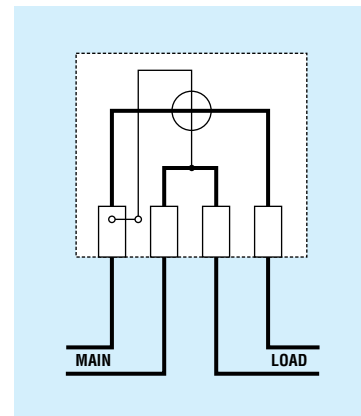
TYPICAL LOAD CHARACTERISTICS



TECHNICAL DATA

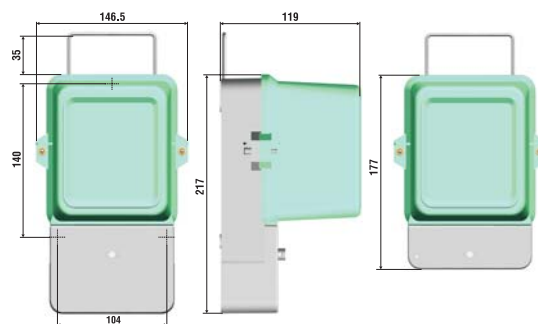
Meter Type	IE10					
Rated voltage, U_{ref} (V)	240					
Rated frequency, Hz	50					
Class index	2					
Basic current, I_b (A)	2,5	5	10	20	10	5
Maximum current, I_{max} (A)	10	20	40	80	60	40
Load capacity of I_b (%) – thermal	400 500			600 700		800 900
Rated torque, $\times 10^{-4}$ Nm at 240 V	≥ 4.60			≥ 3.90	≥ 3.20	
Rated rotor speed at 240 V	15.0 – 19.2			12	9.6	
Power consumption – voltage circuit – current circuit	0.90 - 1.00 W / 4.0 VA 0.25 VA					
Running with no load	0.75 to 1.15 U_{ref}					
Starting current	max. 0.5					
Permanence factor	≥ 1.20					
Efficiency factor	≥ 1.20					
Influence quantities	IS13010, EN 60521, IEC 62053-11, IEC62052-11					
Test voltage at 50Hz / 1 min.	4 kV					
Impulse voltage resistance	8 kV peak					
Mass	1.30 – 1.60 kg approx.					
Expectancy life	30 years					

CONNECTION DIAGRAM

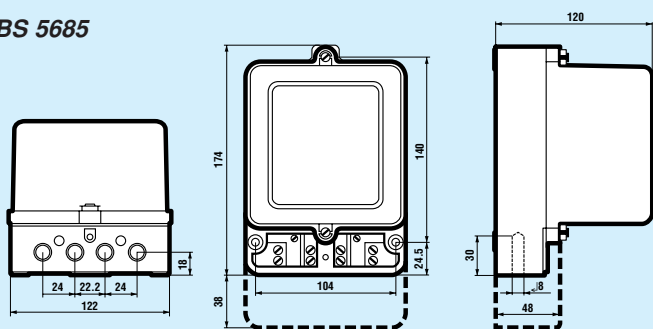


OVERALL AND FIXING DIMENSIONS

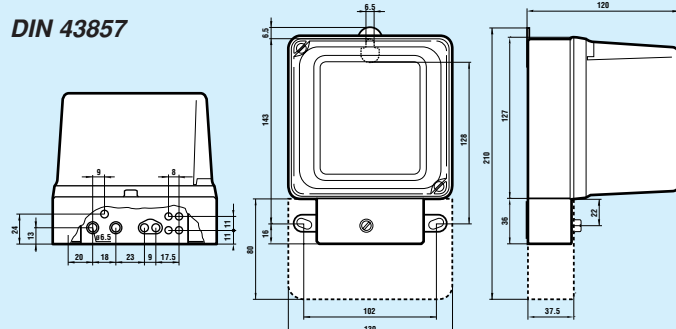
IS 13010



BS 5685



DIN 43857



Owing to periodical improvements of our products the supplied products can differ in some details from the data stated in the prospectus material.