

# Revalco<sup>®</sup>

measuring instruments



**STANDARDS**

The **Revalco** kWh-meters listed in this catalogue have been manufactured according to the following standards: CEI 13-13 / IEC 521, 145, e 529 / VDE 0418 / DIN 40040 / SEN 0601 / BS5685.

**TEST VOLTAGE**

The instruments are tested according to the International Standards with an effective voltage of 2000V at 50Hz for 1 minute. This test voltage corresponds to a maximum nominal reference voltage for the 0,6kV insulation.

**ACCURACY CLASS**

The accuracy class of the Active energy kWh-meters is 2. The accuracy class of the Reactive energy kWh-meters is 3.

**OVERLOAD**

The current coils of the instruments are capable of withstanding over loading of up to 400% permanently. The voltage coils withstands a continuous over loading of up to 120% times the nominal voltage.

**OPERATING TEMPERATURE**

The instruments satisfy the requisites of the International standards, for which the operating temperature is 20°C +/-10°C. They can however function in continuous service without deterioration and with an acceptable error of class, with temperatures ranging between 0 °C and +40°C. In any case the temperature of the coils can not be high than 50°C.

**STORAGE TEMPERATURE**

The storage temperature should range from -40°C e +65°C. Temperatures which exceed the two limits can alter the chemical conditions of the siliconic fluid.

**HUMIDITY**

The instruments are suitable for functioning with a maximum relative humidity of 95% without condensation, at a temperature of +35°C for a maximum of 65 days per year. The relative average annual humidity value should not exceed 65%.

**HOUSING**

The housing are in bakelite with IP52 protection degree, while on the terminals the protection degree is IP30.

**NO LOAD WORK**

If the voltmeter circuits are powered with a nominal voltage +/- 20% with nominal frequency +/- 5%, the disk must do less than 1 turn. This standard saves the users because inform if in absence of load (ammeter circuit not connected) the disk turns. On the other side as that it is possible the presence of a residual current (also if small), to avoid the rotation of the disk it is present a device that stops the back turn of it.

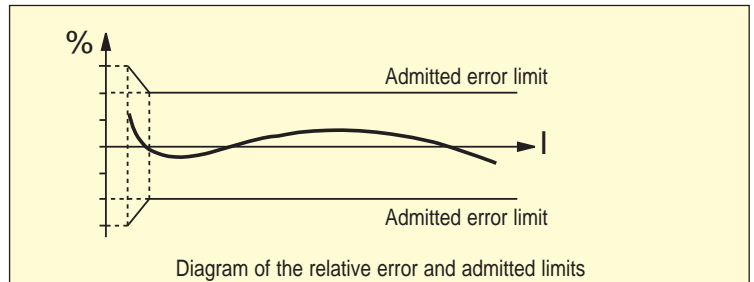
**STARTING**

The system of the kWh-meter must start and turn continually with 0,5% of the nominal current and cosφ =1 at a nominal voltage and frequency. This standards save the selling company as that assure the functioning of the kWh-meter over a minimum load. To verify this standard, a load correspondent to the above value is applied and verify that disk do at least 3 complete turns.

**ERROR LIMITS**

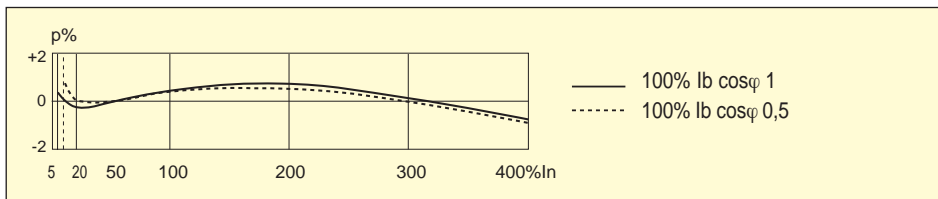
The admitted error limits are the followings:

Power factor	Current	Error limits
1	From 10% to 5% of the max current	± 3% ± 4%
0,5	From 20% to 10% of the max current	± 3% ± 4%



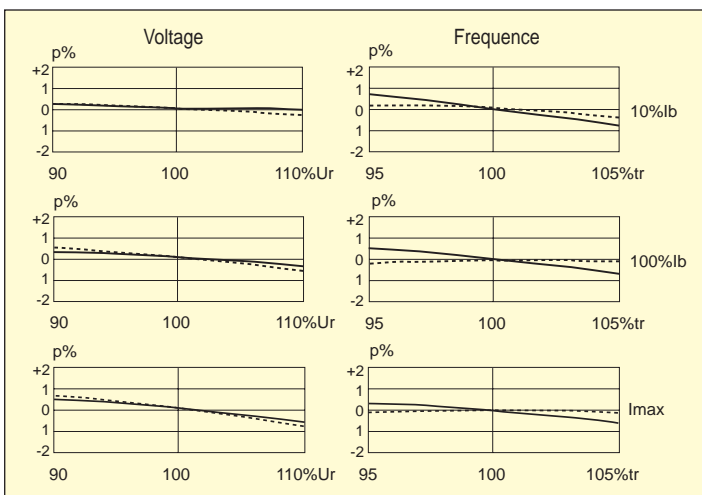
**CURVE ERROR OF A THREE PHASE KWH-METERS**

Influence of load

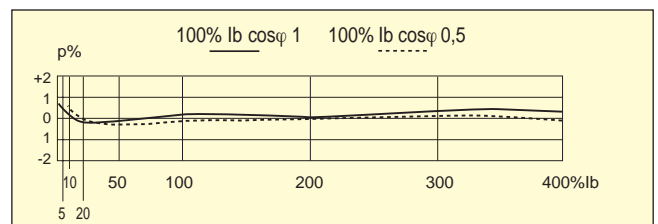


**CURVE ERROR OF A SINGLE PHASE KWH-METERS**

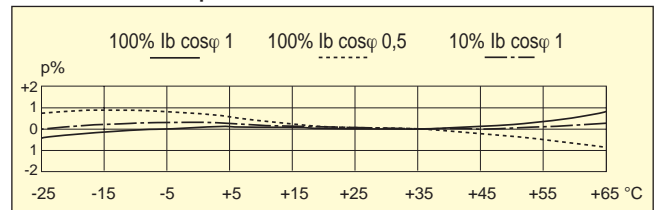
Influence of voltage and frequency variation



Influence of load



Influence due to temperature variation



## — CALCULATION OF THE MULTIPLICATION FACTOR

When it is necessary to calculate the multiplication factor (constant K) for the reading of kWh-meter that uses:

- C.T. only (example 400/5A) it is necessary to divide the primary and secondary value **400: 5 = 80 (K)**
- C.T. and V.T. (example C.T. 400/5A and V.T. 380/100V) it is necessary to operate as above and multiply the 2 obtained values  
**400:5= 80 (K<sub>1</sub>)    380:100 = 3,8 (K<sub>2</sub>)    80x3,8 = 304 (K)**



**Note that the CTs to connect with the kWh-meters must have class 0,5 and a minimum power of 6VA.**

## — MOUNTING POSITION



**The only possible operating position is vertical, including any test procedures, because if in horizontal position the weight of the disk stops every movements of the system, simulating a fault.**