MI7125
Universal Power Meter

Iskra MIS, d.d.

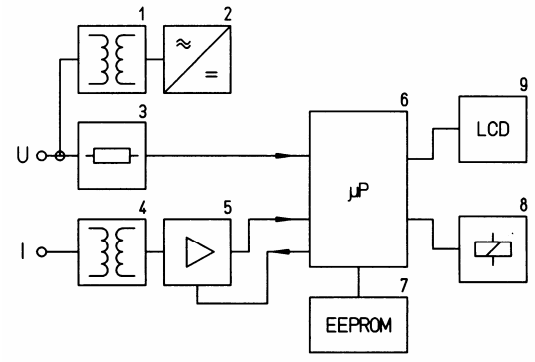
FEATURES:

- All measurements:
  True RMS AC voltage, true RMS AC current
  Active / reactive / apparent power
  Active / reactive energy
  φ, power factor
  Frequency
  Measurement of average values in time intervals (MD)
- Large graphic illuminated LCD display with excellent visibility
- Setting parameters via a front panel
- Display of primary values of the measured quantities
- More than 50 displayed parameters (V, A, kW, kVA, kvar, kWh, PF, Hz, MD, etc)
- Programmable CT and VT ratios
- Input voltage up-to 775 V_{L-L}
- Accuracy for most measuring quantities: class 0.5
- Auxiliary power supply:
  Universal 24…220 V DC or 48...230 V AC/ 40…65 Hz or AC only
- Multi language support (7 languages)

DESCRIPTION

The MI7125 universal power meter is the measuring instrument, which is used for measuring and monitoring the electric quantities in a three-phase electric energy distribution system. The instrument operation is based on fast sampling of input quantities (currents and voltages) in all three phases. The built-in microprocessor calculates other quantities (power, energy, currents, voltages, frequency, power factor and phase angle) from the obtained data.
The meter with an optionally built-in pulse output is designed for sending data to the devices for checking and monitoring consumed energy.

Measured quantities are read out on a large graphic LCD, which is controlled via a keyboard on the instrument's front panel. Moreover, it is also possible to set the meter parameters like current and voltage transformers ratios, the MD measuring mode, etc., via the keyboard.
Multi language support enables you to choose between 7 languages (English, German, Spanish, French, Russian, Danish, and Slovenian).



Picture 2: Block diagram

Picture 1: Universal power meter MI7125

TECHNICAL DATA

GENERAL:

- Measurement principle: True RMS value measurement, microprocessor sampling

MEASURING INPUTS:

Voltage:

- Nominal input voltage (Un): 57.74, 63.5 or 230 V_{L-N}
- Optional nominal voltage 50 to 300 V_{L-N}
- Maximum measuring voltage 775 V_{L-L}
  See Regulations on page 2
- Measuring range 0 ... 1.5 Un
- Consumption [VA]: < 0.1 VA
- Overload capacity:

Input value	Number of applications	Duration of one application	Interval between two successive applications
1.5 x Un [2)]	—	continuously	—
2 x Un [2)]	10	1 s	100 s

Table 1: Overload capacity

[2)] – For aux power supply see page 3 under “Power supply - rated values”

Current:

- Nominal input current (In): 1 or 5 A
- Measuring range 0 ... 1.6 In
- Consumption [VA]: < 0.1 VA
- Overload capacity:

Input value	Number of applications	Duration of one application	Interval between two successive applications
3 x In	—	continuously	—
25 x In	5	3 s	300 s
50 x In	1	1 s	—

Table 2: Overload capacity

Frequency:

- Nominal frequency fn: 50/60 Hz

POWER SUPPLY:

Auxiliary universal (AC/DC) voltage:

- Rated voltage (Ur): 24…220 V DC
  48…230 V AC (40…65 Hz)
- Supply burden: < 5 VA

Auxiliary AC voltage:

Rated voltage (Ur)	Rated operating range
57.74 V 63.5 V 100 V 110 V 230 V 400 V 500 V	80…120 % Ur

Table 2: Rated AC voltage for Auxiliary power supply

- Frequency range: 45…65 Hz
- Supply burden: < 5 VA

ACCURACY:

Accuracy is presented as percentage of nominal value of measured quantity, unless in cases, when it is presented as absolute value**:**

- RMS current:
  Phase current I1, I2, I3 and average current Iavg 0.5
  Neutral current In 1
- RMS voltage:
  Phase to neutral voltages U1, U2, U3
  and average phase to neutral voltage Uavg (pn)
  10 … 100 % Un 0.5
  0 … 10 % Un 1
  Phase to phase voltages U1-U2, U2-U3, U3-U1
  and average phase to phase voltage Uavg (pp) 1
- Frequency: ± 10 mHz
- System:
  Active, reactive and apparent power 0.5
  Active energy according to **EN 61036**: 1996, Class 1
  Reactive energy according to **EN 61268**: 1995, Class 2
- Power factor:
  Input range 0.05 In…1.2 In, 0.1 Un…1.2 Un ± 0.5°
- Angle:
  angle between phase U and I,
  power angle total and angle
  between phase voltages (φ12, φ23, φ31): ± 0.5°
- Dynamic demand values:
  Apparent power total (St)
  active power total (Pt), reactive power total (Qt) 1
- Maximum demand since last reset or power down:
  Total current (It), apparent power total (St)
  active power total (Pt) (positive or negative)
  reactive power total (Qt) 1

Reference conditions:

- Ambient temperature: 0…50 °C
- Input: Un
  (connected to the measuring transformer) In
- Active/reactive factor: cosφ = 1 / sinφ = 1
- Waveform: Sinusoidal

DIGITAL OUTPUTS:

- Output relays: maximum 2 relay, for active and/or reactive energy control
- Maximum switching power 50 VA
- Maximum switching voltage 350 V DC or peak AC
- Maximum switching current 1A
- Maximum pulses per hour 4000
- Pulse duration 100 ms

SETTING RANGE OF TRANSFORMER RATIOS:

Current ratio:

When setting the current ratio only the primary value may be altered; the secondary value (1A or 5A) must be specified with the order.

CT ratio	CT ratio step	1 A CT	5 A CT
1…63	1	1…63	5…315
65…315	5	65…315	325…1575
320…630	10	320…630	1600…3150
650…3150	50	650…3150	3250…15750
4000		4000	20000

Table 3: Selectable current ratios

Voltage ratio:

Both the primary and secondary values of the VT ratio may be set.

Secondary voltage settings		Primary voltage settings	
Voltage Range	Voltage Step	Voltage Range	Voltage Step
10…137 V	1 V	0.1…1599.9 V	0.1 V
		1…15.999 kV	1 V
140…775 V	5 V	10…159.99 kV	10 V
		100…1599.9 kV	100 V

Table 4: Selectable voltage ratios

HOUSING:

- Material of housing: PC/ABS
  non-flammable, according to **UL 94 V-0**
- Mounting: panel mounting
  Cutting for mounting: $92^{+0.8}$
  Fixing element: with a screw
- Enclosure protection: IP 52
- Protection for connection terminals: IP 00
  IP 20 for terminals with protection cover
  (IP 00 for connection terminals)
  according to **EN 60529**: 1989
- Weight: approx. 800 g

CONECTION TERMINALS:

- Permissible cross section of the connection leads:
  For current inputs: ≤ Ø 6mm single wire
  For voltage inputs, communication, auxiliary power supply and relay outputs: ≤ 2.5 mm^2 single wire

REGULATIONS:

- Protection: Protection class **II**
  Aux. supply AC 600 V, installation category **III**
  Aux. supply AC / DC 300 V, installation category **III**
  Pollution degree 2
- Test voltage: 3.7 kV rms
  according to **EN 61010-1**: 1990

ENVIRONMENTAL CONDITIONS:

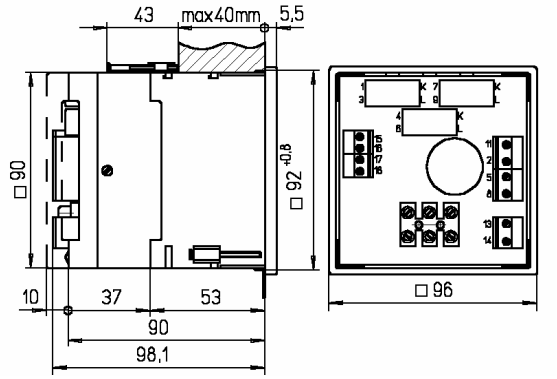
Climatic rating: according to **EN 61036**: 1996
according to **EN 61268**: 1995

- Operating temperature -10 to +65 °C
- Storage temperature -25 to +70 °C
- Annual mean relative humidity: ≤ 75% r.h.

EU DIRECTIVES

Low voltage directive **73/23/EEC**:
EN 61010-1: 1993 and **EN 61010-A3**: 1995
Safety requirements for electrical equipment for measurement, control, and laboratory use, Part 1: General requirements
Radio interference according to IEC/CISPR 22
AC power supply: class B ITE
Universal power supply: A ITE
EMC directive **89/336/EEC**:
EN 61036 item 4.5: 1996
Alternating current static watt-hour meters for active energy (classes 1 and 2).

DIMENSIONAL DRAWINGS

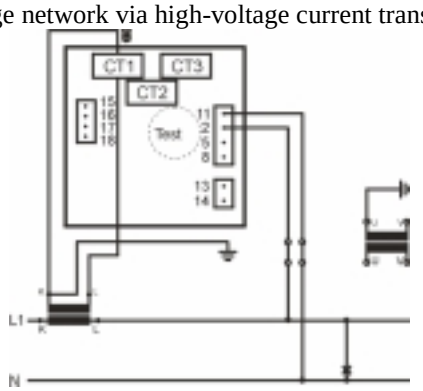


Picture 3: Dimensional drawing (all dimensions are in mm)

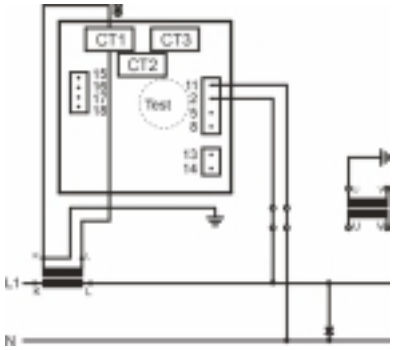
Picture 4: Front panel

CONNECTION

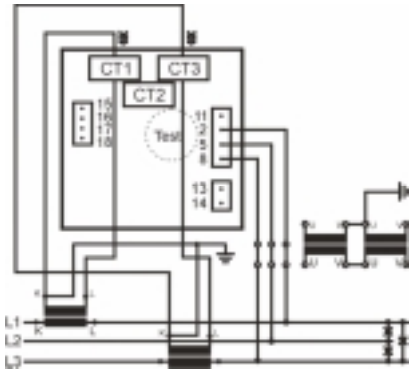
Instrument's voltage inputs can be connected directly to the low-voltage network, or to the high-voltage network via high-voltage transformer.
Instrument's current inputs can be connected to the low-voltage network via current transformer or to the high-voltage network via high-voltage current transformer.



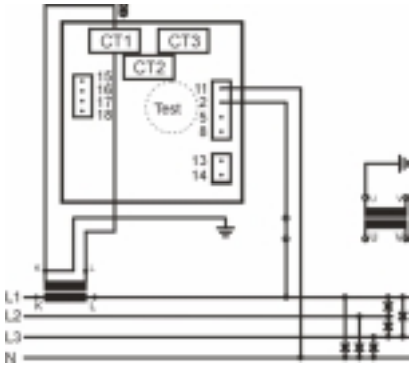
Picture 5: Single phase system (1b)



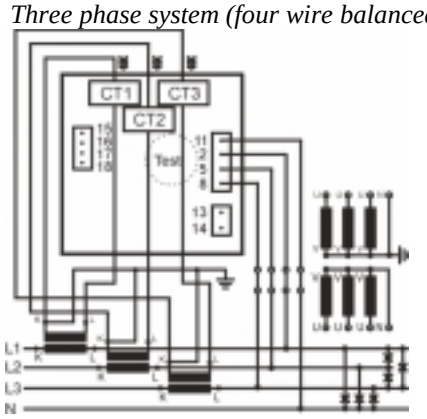
Picture 6: Three phase system (three wire balanced - 3b)



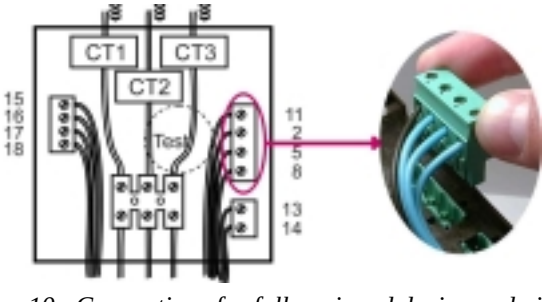
Picture 7: Three phase system (three wire unbalanced - 3u)



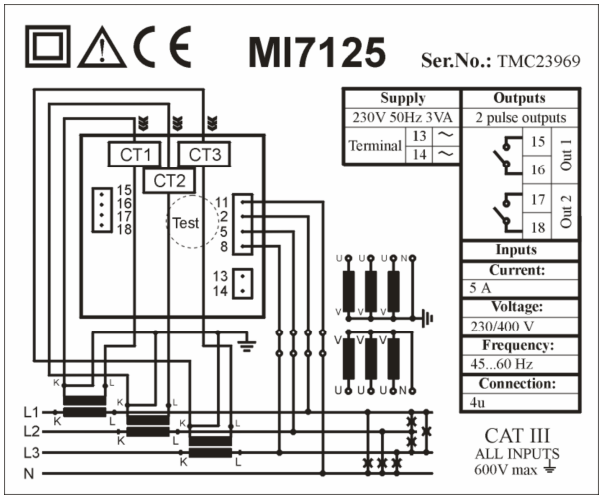
Picture 8: Three phase system (four wire balanced - 4b)



Picture 9: Three phase system (four wire unbalanced - 4u)



Picture 10: Connections for full equipped device and picture of connector



Picture 11: Label

CONNECTION TABLE

Function			Connection
Measuring input:	AC current	IL1	CT1
		IL2	CT2
		IL3	CT3
	AC voltage	UL1	2
		UL2	5
		UL3	8
		N	11
Relay outputs (optional)	Output 1	OUT1	15 / 16
	Output 2	OUT2	17 / 18
Auxiliary power supply:		+ / AC	13
		- / AC	14

Table 5: Connections

SPECIFICATION AND ORDERING INFORMATION

Instrument:

For ordering it is necessary to specify:

- Type of the measuring centre
- Connection and nominal values of input signal
- Auxiliary power supply values
- Number of relay outputs (optional)

Ordering code:

MI7125 a b c d

Description			Code
Inputs:			
Nominal input voltage			
b	Measuring range phase to neutral	57.74 V_{L-N}	A
		63.5 V_{L-N}	B
		230 V_{L-N}	C
Nominal input current			
a	Measuring range	1 A	1
		5 A	5
Auxiliary power supply:			
c	Value of power supply voltage	110 V	1
		230 V	2
		AC/DC 48V-230V/24V-220V	3
		57.74 V	4
		100 V	5
		400 V	6
		500 V	7
Relay outputs (optional):			
d	Number of relay outputs	without relay output	0
		1 or 2 outputs	1 or 2

Table 6: Ordering information

ORDERING EXAMPLE:

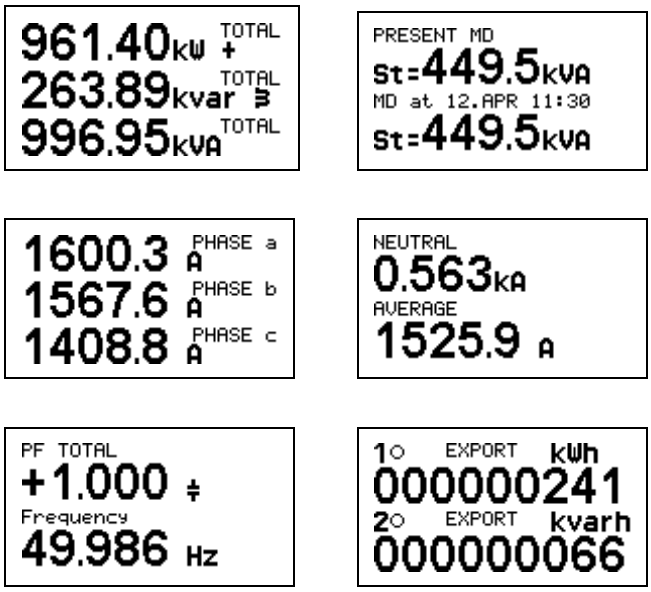
Universal power meter MI7125 is connected to secondary phase voltage is 63.5 V_{L-N}, secondary current is 5 A. It has AC auxiliary power supply 230 V and one relay output.

Ordering code:

MI7125 5 B 2 1

DATA PRESENTATION

Data is presented on the 128 x 64 dot graphic LCD with yellow/green backlight (37 x 69 mm).



Picture 12: Examples of presented data on graphic LCD

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