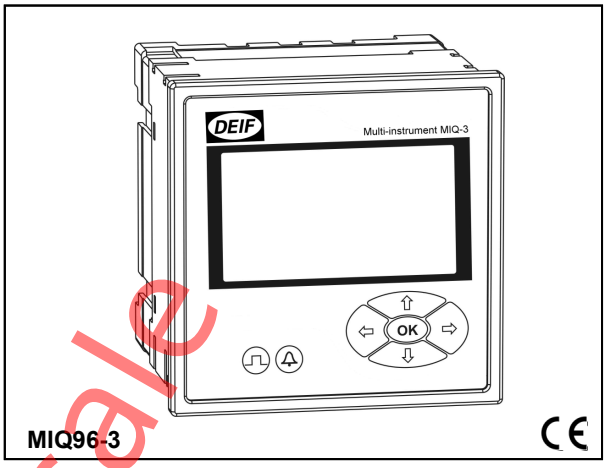
DEIF A/S

Type MIQ96-3

Multi-instrument

4921210131B

- ***All 1- or 3-phase AC measurements, true RMS***
- ***Programmable CT and VT ratios***
- ***More than 50 displayed parameters (V, A, kW, kVA, kVAr, kWh, PF, Hz, MD, THD, etc.)***
- ***Serial RS485 output for all values***
- ***Pulse output for kWh and kVArh or limit switches***
- ***Configurable display***
- ***Multi-language support***



Application

The MIQ96-3 multi-instrument is a microprocessor-based measuring unit providing measurement of all electrical quantities on a single-phase or 3-phase electric energy distribution network, showing the measurements on the built-in display and transmitting these as:

- 2 pulse outputs for kWh and kVArh
- A serial output RS485

The MIQ96-3 measures true RMS values on all network topologies with/without neutral and with both balanced and unbalanced load.

The MIQ96-3 contains all necessary measuring circuits and presents all values on a graphic LCD display.

The MIQ96-3 is a flexible and programmable unit, which enables the user to easily adapt the unit to the application in question. Reset of counters and change of parameters can be password-protected.

Standard functions

The unit is designed for measurement on a 3-phase or 1-phase network.

Measured and calculated values on a 3W4 connection:

- Current (3-phase actual current, neutral current, average current, THD in each phase)
- Phase to neutral voltage (3-phase actual voltage, average voltage, THD in each phase, phase angle)
- Phase to phase voltage (3-phase actual voltage, average voltage, THD between phase 1, 2 and 3)
- Active power (3-phase W total and W for each phase)
- Reactive power (3-phase VAr total and VAr for each phase)
- Apparent power (3-phase VA total and VA for each phase)
- Power factor PF (3-phase PF total and PF for each phase)
- Frequency
- Energy measuring counter Export and Import
- 4 counters: (1) export kWh, (2) export kVArh
  (3) import kWh, (4) import kVArh
- Maximum demands (load from consumer)

The MIQ96-3 enables measurement of MDs of total active, reactive and apparent power, moreover the sum of currents.

RS485 Modbus serial output

RS485 Modbus provides remote value-reading of all values and allows remote entering of password, time, MD, reset of counters, etc.

The Modbus communication protocol is compatible with MIQ96-2.

Energy measurement by 2 relay outputs

For counter 1 and 2:

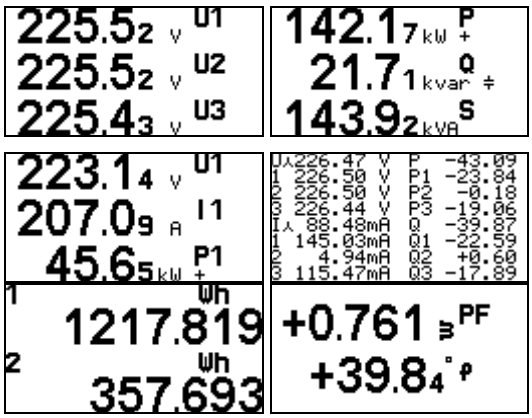
The two potential-free relay outputs can be programmed to transmit any fixed number of pulses per produced kWh (1) or kVArh (2). Alternatively, these relays can be configured as limit switches. See Appendix for User's Manual for further information.

Display

Data are displayed on a 128 x 64 dot graphic LCD with illumination (37 x 69 mm). The indication symbols on the instrument front are optical LEDs for energy flow and active alarm.

Multi-lingual support (13 languages).

Configurable display examples:



Auxiliary supply

Universal AC and DC aux. supply:

48…230V AC 50/60 Hz and 24…220V DC.

Type MIQ96-3

Technical specifications

Meas. voltage Un: Ph-N 230V AC Ph-Ph 400V AC, range 0.1…1.5 x Un
Consumption: < 0.1 VA per phase

Overload capacity:
1.5 x Un continuously
2 x Un for 10 s

Meas. current In: -/1 A or -/5 A, range 0…1.6 x In
Consumption: < 0.1 VA per phase

Overload capacity:
3 x In continuously
25 x In for 3 s
50 x In for 1 s

Meas. frequency: 50/60 Hz, range 16…400 Hz

Auxiliary supply: Working range:
40…276V AC 40...65 Hz
19…300V DC

Overload capacity:
1.2 x Un continuously
1.5 x Un for 10 s

Consumption: < 5 VA

Accuracy:

Phase voltage Ph-N	0.5% of range
Phase-phase voltage	1.0% of range
Current	0.5% of range
Neutral current	1.0% of range
Active power	0.5% of range
Reactive power	0.5% of range
Apparent power	0.5% of range
Power factor	0.5% of range
MD values	1.0% of range
Active energy EN61036:	1996 class1
React. energy EN61268:	1995 class2
Frequency	0.05% of reading
THD	1.0%

Note: All measurements are calculated with harmonics present up to 15th harmonics

Response time: 64 periods ~ 1.28 s at 50 Hz

Real time clock: 1 minute/month

Relay outputs

Contact ratings: 250 V - 6 A - 1500 VA (AC)
(250V AC - 6 A resistive AC load 100.000 operations)

35 V - 6 A - 210 W (DC)
(30V DC - 6 A resistive load 500.000 operations)

Contact voltage: Max. 250 V (AC)
Max. 100 V (DC)

Isolation: 1000 V (AC) between open contacts
4000 V (AC) between coil and contacts

Pulse: Max. pulses per hour: 4000
Pulse duration: 10…300 ms

Fuse: All voltage inputs should be protected by a 2 A fuse

RS485 port

Connection type: Multi-drop (32 connections per link)

Signal levels: RS485

Cable type: Belden 3105A or equivalent (twisted pair)

Max. cable length: 1000 m

Connector: Screw terminals

Isolation: 3.7 kV rms for 1 minute between all ter-minals and all other circuits

Transmission

Mode: Asynchronous

Message format: Modbus RTU

Data rate: 1200 to 115200 bits/s

Safety: To EN 61010-1
Installation cat. III, 300 V. Pollution degree 2
Installation cat. II, 600 V. Pollution degree 2

Test voltage: 3.7 kV rms according to EN 61010-1

EMC: To EN 61036
To EN 61326-1: 1997 for mentioned accu-racy. (To EN 61000-6-1/2/3/4 for a general 1.0% accuracy on all measurements)

Connections: Permissible cross section of the connection leads

Wire: Multi stranded: 1.5 mm^2
Single stranded: 2.5 mm^2

Protection:

Enclosure:	IP52
Terminals:	IP00
According to EN 60529:	1989

Climate:

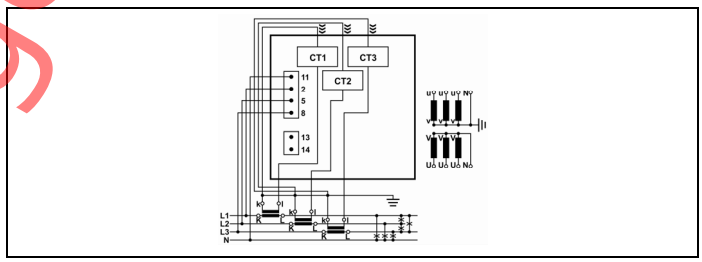
According to EN 61036:	1996
According to EN 61268:	1995
Operating temperature:	-10 to +55°C
Storage temperature:	-25 to +70°C
Annual mean relative humidity:	≤ 75% r.h.

Housing: Plastic, in compliance with UL 94 V0

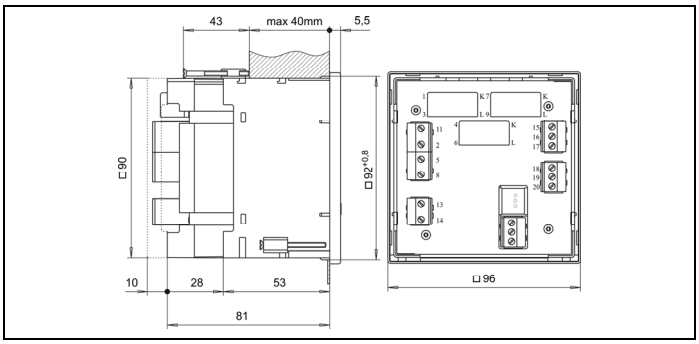
Connection

In the menu “Setting”, setup for the following connections is available: 1W, 1W3, 2W3, 1W4, 3W4.

Principle diagram for 3W4 connection:



Dimensions in (mm)



Order specifications

MIQ96-3

Measuring input: Phase-phase 400V AC, 5 A

Aux. supply: 40…276V AC, 40…65 Hz, 19…300V DC

DEIF no. 1200900013

Due to our continuous development we reserve the right to supply equipment which may vary from the described.

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