



Universal measuring instruments

Digital diversity versus analogue simplicity

Universal measuring instruments of UMG 96L and UMG 96 product families are mainly designed for use in low and medium voltage distribution systems. Due to the large number of available measurement values in an extremely compact measuring unit, a number of analogue measurement instruments can be replaced and, therefore, installation costs can be reduced. Additional functions such as the recording of minimum and maximum values, the operating hour meter, the bi-metallic strip function, password protection and many more offer a significant amount of added value. The high measurement accuracy and a large LCD-display means universal application possibilities and offer fundamental advantages in comparison to analogue measuring instruments.

Areas of application

- Replacement of analogue measurement instruments
- Display and control of electrical parameters in energy distribution systems
- Cost centre data collection
- Measurement value generator for building management systems or PLC
- Limit value monitoring

Universal measuring instruments

UMG 96L/UMG 96 universal measuring instruments 96 x 96mm front panel mounting

The use of energy measurement technology in energy distribution has moved dynamically towards digital universal measuring instruments in the past few years. The advantages are obvious: lower equipment costs for more information and functionality. In addition, digital measuring technology is more accurate, even all along the entire lifespan.

Clear cost advantages also result from the construction of the switchgear which results in lower installation costs and less wiring efforts in comparison to analogue measuring technology. Universal measuring instruments of the UMG 96L and UMG 96 product families are mainly designed for use in low and medium voltage distribution systems.

In addition to the large quantity of electrical measurement values, this series also offers a number of additional functions such as the recording of minimum and maximum values, the operating hour meter, the bi-metallic strip function, password protection and many more.



Main features

- Compact housing dimensions (96x96 mm), minimal installation depth
- User-friendly and reliable terminals
- Large LCD with outstanding legibility
- The large quantity of electrical measurement values, replaces 13 analogue measurement units and more
- Excellent reliability and long life span

Applications

The UMG 96L and UMG 96 measurement instruments are digital front panel mounted measuring instruments which are suitable for measuring and recording electrical parameters (True-RMS) in 50/60 Hz networks. The measurement is configured for three-phase systems with a neutral conductor (TN and TT networks). At the network frequency of 50 Hz or 60 Hz, the scanning frequency of the random measurements which take place once per second is 2.5 kHz or 3.0 kHz. The supply voltage and scanning frequency for operating the UMG 96L is taken from the L1-N measurement voltage. The effective values and the minimum and maximum values are recorded every 15 minutes and the programming data is immediately stored in a non-volatile memory (EEPROM). The main characteristic of the measurement instrument is the compact construction (96x96 mm) and the high level of stability.

In order to achieve the functional diversity of the universal measurement instrument, you would need 13 analogue units such as an ampere meter, volt meter, volt meter switch, power meter (kW, kVA, kvar, $\cos \varphi$), an effective and reactive energy meter (kWh/kvarh) and a frequency meter. This means that the planning, installation, wiring and storage costs are significantly reduced in comparison to the use of analogue measuring instruments. Another advantage is the higher precision and better legibility.



Measurement value displays

The extremely legible LCD display in connection with the function keys informs the user about the selected measurement values (actual, low, high and average values). Three measurement values can be simultaneously displayed in the LCD data field. The contrast of the LCD display can be adjusted by the user.

Display selection and automatic display rotation

All measurements values can be called up in the initial delivery status. Measurement values which are not required can be hidden and displayed again when necessary. A cycle between 1 and 250 seconds can be set for the automatic display rotation. The display rotation function can also be deactivated.

Display examples



L-L voltage



cos (phi)



Effective power



Effective energy

Bi-metallic function (average value generation)

A common average time for achieving measurement values in L1, L2, L3 and N and an average time for the power measurement values of effective power, apparent power and reactive power can be programmed. These values can be integrated at selectable time of 5, 10, 30, 60, 300, 480 and 900 seconds and stored as a highest average value.

Operating hour meter

The operating hour meter is immediately activated when the unit is switched on and can not be reset. The time is recorded at a 15 minute resolution and is displayed in hours.

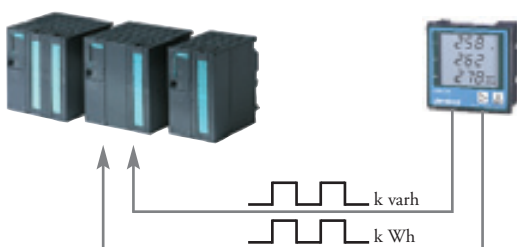
Digital outputs for effective or reactive energy consumption or limit values

Digital outputs can be used as pulse outputs for the effective or reactive energy consumption or as switch outputs. The digital outputs can be programmed in order to monitor the measurement data. The transistor output can also be linked with the measurement value of the limit value by programming which is activated if the value is not achieved or is exceeded. The transistor output is suitable for controlling electrical devices with a DC operating voltage or units with NPN inputs e.g. PLC.

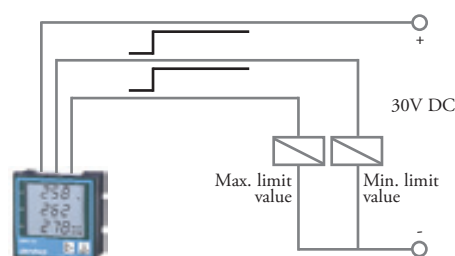
Password

The user can protect programming and configurations against unauthorised changes with a 3-digit password.

Cost centre data collection and monitoring limit values (UMG 96)



Digital output for cost centre data collection



Digital output for limit value monitoring

Product variants and technical data

Overview of product variants			
Description	Type	Operating voltage	Item number
Four-phase universal measuring instrument 50/60Hz; Current transformer: ..1/5A Measurement range: L - N: 50 ... 255V-AC; L - L: 86 ... 442V- AC	UMG 96L	L-N: 196 ... 255V- AC	52.14.001
As above but measurement range: L - N: 16 ... 80V- AC; L - L: 28 ... 139V-AC	UMG 96L	L-N: 45 ... 80V- AC	52.14.005
As above but measurement range: L - N: 25 ... 160V- AC; L - L: 45 ... 277V-AC	UMG 96L	L-N: 90 ... 160V- AC	52.14.007
Four-phase universal measuring instrument 50/60Hz; Current transformer: ..1/5A, 2 digital /pulse outputs Measurement range: L - N: 50 ... 275V-AC; L - L: 87 ... 476V- AC	UMG 96	L-N: 196 ... 275V- AC	52.09.001
As above but measurement range: L - N: 20 ... 76V- AC; L - L: 35 ... 132V-AC	UMG 96	L-N: 49 ... 76V- AC	52.09.002
As above but measurement range: L - N: 30 ... 140V- AC; L - L: 52 ... 242V-AC	UMG 96	L-N: 98 ... 140V- AC	52.09.005

General technical data		
Operating voltage		Refer to order details above
Scanning rate		2.5 / 3 kHz
Weight		250g
Dimensions		W= 96mm x H 96mm x D= 42mm
Mounting		Front panel installation
Working temperature		-10...+55 °C
Storage temperature		-20...+70 °C
Protection class (reverse/front)	According to EN60529	IP 20/50
Connectable conductors	Single wire, multi-wire, fine-wire, pin cable lugs, ferrule	0.08 - 2.5mm ² 1.5mm ²

Measurement range		
Voltage L-N		Refer to order details
Voltage L-L		Refer to order details
Current	.../1A or .../5A	0.02...6 A
Frequency, mains		45 ...65 Hz

Measurement values											
Measurement parameter	Display range	Measurement range at scaling factor ¹	L1	L2	L3	Sum	Lowest value	Average value ^{*1}	Max value	Max measurement value	Measurement accuracy
Current 1/5A L1-L3	0.00 .. 9.99 kA	0.02 .. 6 A	●	●	●			●	●	●	±1 %
Current calculated in N	0.00 .. 9.99 kA	0.06 .. 18 A				●		●	●	●	±3 %
Voltage L-N	0.0 .. 34 kV	50 .. 255 V AC ^{*2}	●	●	●		●			●	±1 %
Voltage L-L	0.0 .. 60 kV	86 .. 442 V AC ^{*2}	●	●	●		●			●	±2%
Frequency (U)	45.0 .. 65.0 Hz		●								±1.5 %
Effective power, sum ,+/-	0.00 W .. 150 MW	1.8 W .. 2.4 kW	●	●	●	●		●	●	●	±1.5 %
Apparent power, sum	0.00 VA .. 150 MVA	1.8 VA .. 2.4 kVA	●	●	●	●		●		●	±1.5 %
Reactive power, sum	0.00 var .. 150 MVar	1.8 var .. 2.4 kvar	●	●	●	●		●			Ind.±1.5 %
Cos phi	0.00 ind. ... 1.00 .. 0.00 kap.	0.00 kap. ... 1.00 .. 0.00 ind.	●	●	●						±3 % ^{*4}
Effective energy, consumed	0 .. 999.999.999 kWh					●					Class 2 ^{*3}
Reactive energy, inductive	0 .. 999.999.999 kvarh					●					Class 2 ^{*3}
Operating hour meter	0 .. 999.999.999 h										±2 min per day

^{*1} - integration over time: 5, 10, 30, 60, 300, 480, 600 and 900 seconds.

^{*2} - also available: measurement range: L-N 16 .. 80V, AC, L-L 28 .. 139V, AC, operating voltage: L-N 45 .. 80V, AC and measurement range: L-N 25 .. 160V, AC, L-L 45 .. 277V, AC, Operating voltage: L-N 90 .. 160V, AC (the operating voltage is taken from the measurement voltage)

^{*3} - accuracy class according to DIN EN61036:2001-01, VDE0418 part 7, IEC61036:1996 + A1:2000

^{*4} - the measured apparent power must be in a range between 1 and 100%.

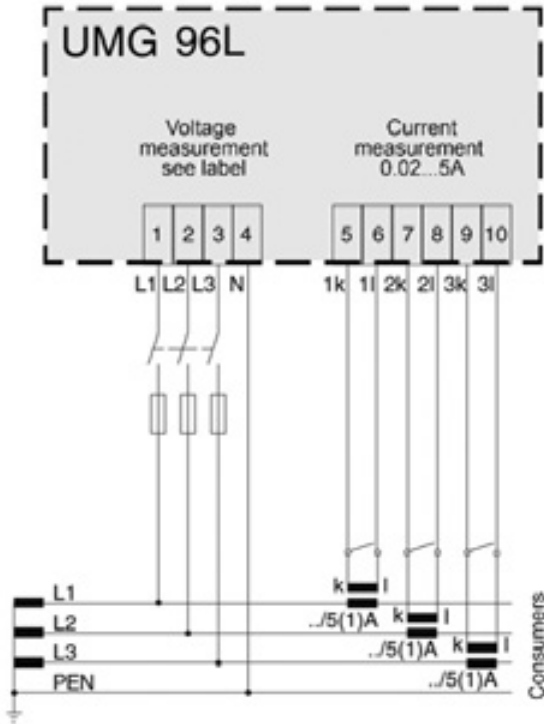
Periphery		
2 digital outputs	As switch output or pulse output	UMG 96 only

UMG 96L / UMG 96

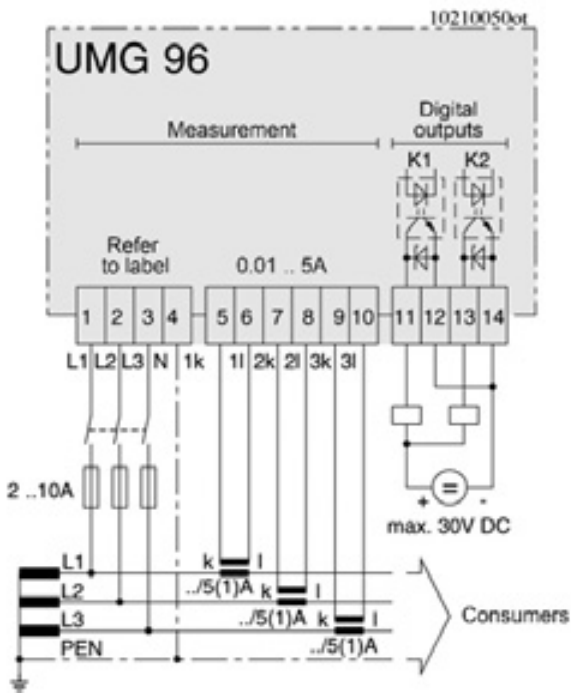


Typical connection options

UMG 96L

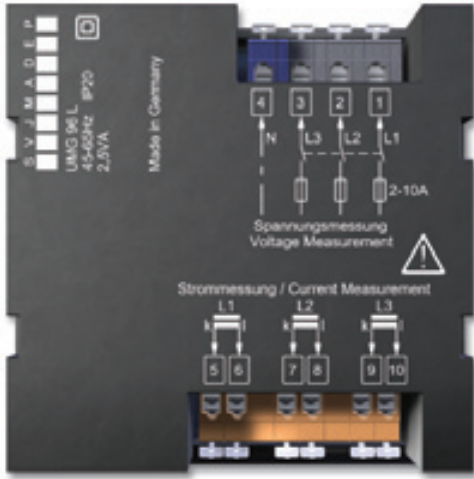


UMG 96

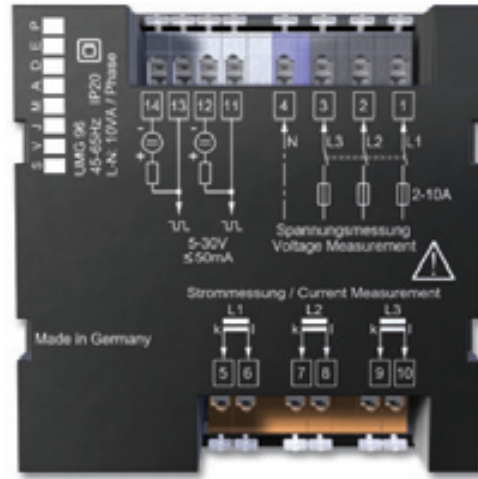


UMG 96L / UMG 96

Connection illustrations

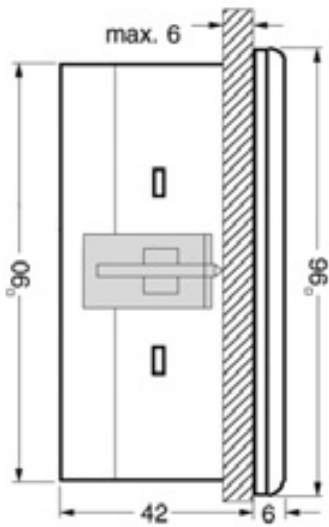


UMG 96L - reverse side of unit

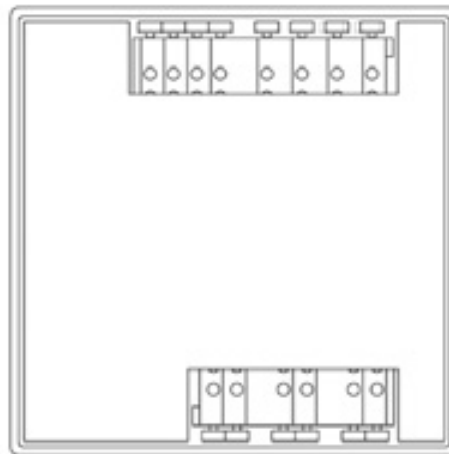


UMG 96 - reverse side of unit

Dimensional drawings



Side view



Reverse side, panel cut-out dimensions: 92^{+0,8} x 92^{+0,8} mm

All dimensions stated in this drawing are in mm.