

multimes F96 TFT

Housing dimensions
(H x W x D in mm)

96 x 96 x 55

Data display

TFT

Interface

KBR eBus*
Modbus*
KBR eBus TCP*
Modbus TCP*

* depending on the respective device type.



Three-phase network measuring device

Highlights

- Measurement accuracy in accordance with IEC 61557-12
- Voltage quality in accordance with IEC 61000-4-30
- Color TFT display, individually adjustable by the user
- Optionally upgradeable interfaces
- Easy and intuitive operation
- Graphic representation with pointer diagram and oscilloscope, as well as bar chart of network harmonics up to 63rd harmonic
- Version with direct Rogowski coils connection

An overview of the **technical details** can be found on pages 30 to 33.

Do you have any questions concerning a product or a special requirement? We will be happy to advise you personally.

Product advice:
+49 (0) 9122 63730
info@kbr.de

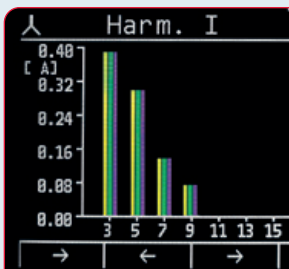
The electronic network measuring devices of the **multimes F96** series measure and monitor all important parameters in a three-phase network and are available in different versions. The measurement function for harmonics of the voltage and current harmonics as well as the graphic evaluation of waveforms and the analysis of voltage dips can be used



Device types multimes F96...

Device types multimes F96...	...-0-TFT-1DO-US1 / -US5	...-0-TFT1DO-R1-US1 / -US5	...-0-TFT-ESMS-1DO-US1 / -US5	...-0-TFT-ESMS-1DO-R1-US1 / -US5	...-2-TFT-ESMS-2RO1DO-US1 / -US5	...-2-TFT-ESMS-2RO1DO-R1-US1 / -US5	...-2-TFT-MS-2RO1DO-US1 / -US5	...-2-TFT-MS-2RO1DO-R1-US1 / -US5	...-2-TFT-ET-2RO1DO-US1 / -US5	...-2-TFT-ET-2RO1DO-R1-US1 / -US5	...-2-TFT-MT-2RO1DO-US1 / -US5	...-2-TFT-MT-2RO1DO-R1-US1 / -US5	...-2-TFT-ESET-2RO1DO-GW-US1 / -US5	...-2-TFT-ESET-2RO1DO-R1-GW-US1 / -US5
Pulse inputs 1 (P+/Q+/P-/Q-)	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Relay outputs	-	-	-	-	2	2	2	2	2	2	2	2	2	2
KBR eBus RS485	-	-	■	■	■	■	-	-	-	-	-	-	■	■
Modbus RS485	-	-	■	■	■	■	■	■	-	-	-	-	-	-
KBR eBus TCP/IP	-	-	-	-	-	-	-	-	■	■	-	-	■	■
ModbusTCP/IP	-	-	-	-	-	-	-	-	-	-	■	■	-	-
Power supply	US1: 1 to 240 V +/- 10% AC/DC 50/60 Hz, 8 VA, 4 W													
Power supply	Optional US5: 22.5 to 64 V +/- 10% AC/DC 50/60 Hz, 8 VA, 4 W													
Gateway function	-	-	-	-	-	-	-	-	-	-	-	-	■	■
Rogowski connection	-	■	-	■	-	■	-	■	-	■	-	■	-	■

Harmonics



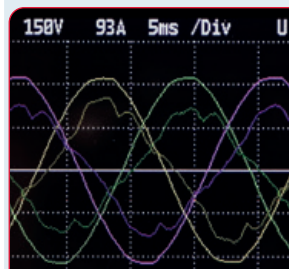
Bar chart for graphical representation of the harmonics up to the 63rd Voltage and current harmonics

Voltage dip diagnosis



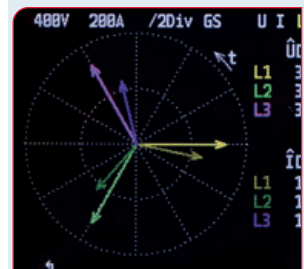
Graphical diagnosis of voltage and current history in case of a voltage dip according to IEC 61000-4-30

Oscilloscope



Oscilloscope analysis function of the three-phase and alternating current values

Phasor diagram



Pointer diagram of voltage and current for phase angle analysis

to evaluate the voltage quality with this affordable measuring device.

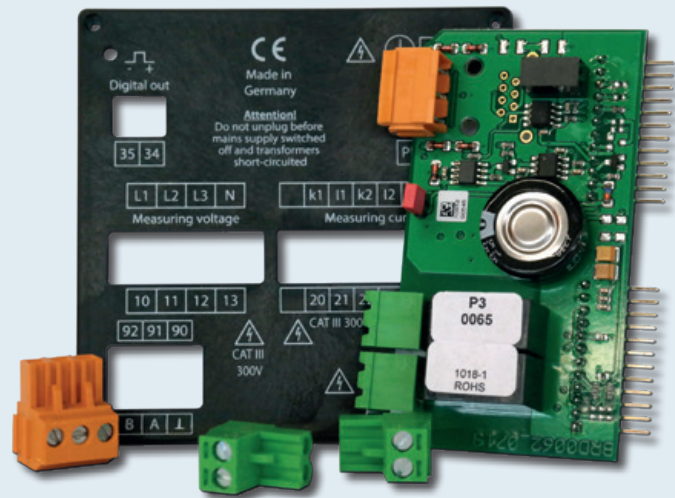
All device versions are equipped with a pulse output. Aside from the **F96-0** entry level model, the load profile (P+|P-|Q+|Q-) can be saved with all device versions and later read out via eBus. The network voltage can be mon-

itored in accordance with EN 61000-4-30. In case of a limit violation, the voltage and current history is saved. This history can be conveniently analyzed using the color TFT display. Different optional interfaces and protocols allow various applications.

multimes F96 interfaces

Interfaces

KBR eBus*
Modbus*
KBR eBus TCP*
Modbus TCP*



* depending on the respective device type.

Upgradeable interfaces

Highlights







- Comfortably upgradeable interfaces
- Different interfaces and outputs allow various extension and application options
- Straightforward on-site installation of the PCB
- PCB exchange is possible for any device version
- The device mounting depth remains the same

An overview of the **technical details** can be found on pages 30 to 33.

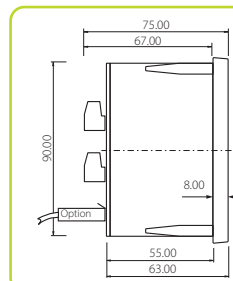
The optional PCBs are upgradeable interfaces for the **multimes F96** measuring devices and enable you to react flexibly to different measurement tasks. With our clever set-up, the **multimes F96 series** measuring devices can be upgraded from a base device to a high-end device with the required interface and relay outputs in only a few steps. It is very easy to install or exchange PCBs on-site. The device mounting depth remains the same.

With different upgrade kits, you can extend the functionality with **Modbus serial**, **Modbus TCP**, **eBus serial** or **eBus TCP**. With these options, you can count on future-proof, efficient and sustainable measurement technology which meets all certification criteria for **energy data management in accordance with ISO 50001**.

Upgrade kits: turn a base device into a high-end device in the blink of an eye

Base device multimes F96-0-TFT-1DO-US1 / -US5	Optional PCB upgrade kit *	Available interface(s)	Additional functions	Item no.
	 multimes F96-2-TFT-MS-2RO1DO-US1 / -US5	Modbus RS485	Real-time clock, 2 x relay outputs	23765
	 multimes F96-2-TFT-MT-2RO1DO-US1 / -US5	Modbus Ethernet	Real-time clock, 2 x relay outputs	23763
	 multimes F96-2-TFT-ESMS-2RO1DO-US1 / -US5	KBR eBus RS485 Modbus RS485	Real-time clock, 2 x relay outputs	23761
	 multimes F96-2-TFT-ET-2RO1DO-US1 / -US5	KBR eBus Ethernet	Real-time clock, 2 x relay outputs	23762
	 multimes F96-0-TFT-ESMS-1DO-US1 / -US5	KBR eBus RS485 Modbus RS485	–	23760

*The optional PCB can be exchanged for any **multimes F96** version. The technical details and device versions of the **multimes F96** are listed on page 20.

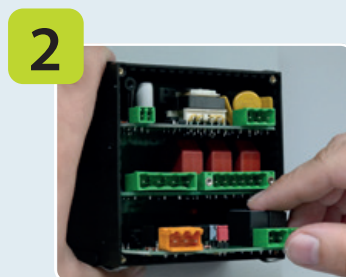


The device mounting depth remains the same even when the PCB is inserted!

Retrofitting made easy: Just 3 steps in 3 minutes



Short-circuit the transformer and unplug the connector. Remove the four Phillips screws and remove the rear panel of the device.

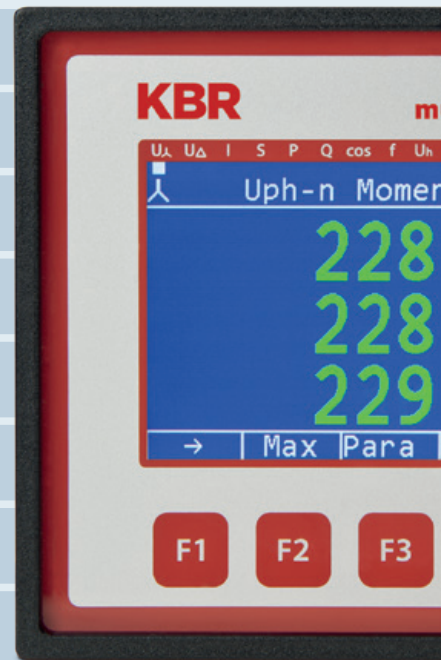
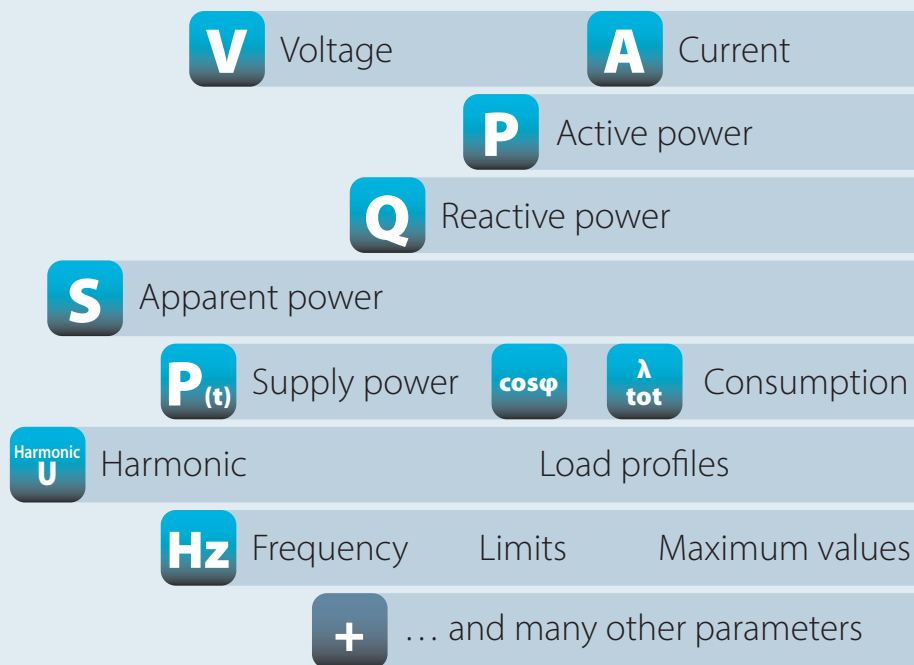


Slide the optional board into the guide provided.



Fasten the new rear panel of the device with the four Phillips screws – done.

MULTIMESS F96 ROGOWSKI: RETROFITTING SWITCHGEARS



RETROFIT

multimes F96 Rogowski.
IMPROVES YESTERDAY FOR THE DAY AFTER TOMORROW.

With our energy measuring devices, efficient energy management is very easy. We will be happy to advise you personally.

Product advice:
+49 (0) 9122 63730

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Retrofitting current transformers into existing switchgears is always a difficult task. With the use of Rogowski coils, this work can be done quickly. Transformers can be installed without the hassle of shutting off the system under voltage. The bands can be used in virtually any distribution thanks to their flexible, narrow design. and can

even be installed in tiny spaces between individual conductors without a problem. Rogowski coils are usually the only way to retrofit a measurement when parallel connections or copper rails are involved. The KBR Rogowski coils special structure allows it to be installed in any position, without changing the measurement sensor.

The multimes F96 measuring devices with Rogowski coils are the best solution for retrofitting switchgears. If measuring devices have to be retrofitted in switchgears, the subsequent installation of current transformers is the biggest challenge. A multimes F96 and its flexible Rogowski coils can solve that challenge easily, quickly, and efficiently.



multimes F96 with Rogowski coils: The easy way to a modern switchgear
Optional upgradeable interfaces make the multimes F96 reliable for the future. Save time and expense.



Subsequent assembly made easy, even in the tightest spaces, your switchgear will always be „up to date.“

multimes Device matrix



DIN rail				
...D4-0-BS	...D6-1-LED-ESMS-2DI1DO-US1	...D9-PQ-3-LCD-MSMT-US8	...F96-0-TFT-1DO-US1 (US5)	...F96-0-TFT-1DO-R1-US1 (US5)

Device types multimes ...

MEASURED VALUES	Voltage	U Ph - N (L1 - L3) | U Ph - Ph	■	■	■	■	■
	Current	I Ph (L1 - L3)	■	■	■	■	■
	Average current value	I Ph (L1 - L3)	■	■	■	■	■
	Neutral conductor current	I_N | I_N -average	-	■	■	■	■
	Apparent power	S Ph (L1 - L3) | S total	■	■	■	■	■
	Active power	P Ph (L1 - L3) | P total	■	■	■	■	■
	Fundamental reactive power ind./cap.	Q (L1 - L3) | Q1 overall; total	■	■	-	■	■
	Fundamental and harmonic reactive power Q	Q (L1 - L3) | Q1 overall; total	-	-	■	-	-
	Frequency	f (L1)	■	■	■	■	■
	Rotary field control:	Rotary field display in degrees	-	-	■	■	■
	Phasor diagram	Graphic display	-	-	-	■	■
	Power factors ind./cap.	Fundamental component $\cos\phi$ (L1 - L3)	■	-	■	■	■
		Total power factor λ (L1 - L3) | λ total	-	■	■	■	■
	Electrical energy	Continuous counter for active energy P+ | P-	■	-	■	■	■
Continuous counter for reactive energy Q+ | Q-		■	-	■	■	■	
Tariffs	HT / NT	-	-	-	■	■	
MEMORY	Load profile memory P+ | P- | Q+ | Q-	Ring buffer for 40 days	-	■	-	-	-
		Ring buffer for 365 days	-	-	■	-	-
	Daily, active and reactive energy	P+ | P- | Q+ | Q-	-	■	■	-	-
	Maximum indicator function (min./max.)		-	■	■	-	-
	Operation logbook		-	■	-	-	-
Event memory		-	■	-	-	-	
PQ ANALYSIS	Harmonics	THD-U (L1 - L3) %	-	-	■	■	■
		Sum of current harmonics I_d (L1 - L3) A	-	-	■	■	■
		3rd - 63rd Harmonic. (L1 - L3) voltage %	-	-	-	■	■
		3rd - 50th (180th) Harmonic. (L1 - L3) voltage %	-	-	■	-	-
		3rd - 63rd Harmonic. (L1 - L3) current A	-	-	-	■	■
		3rd - 50th (180th) Harmonic. (L1 - L3) current A	-	-	■	-	-
	Bar chart	THD-U | THD-I	-	-	-	■	■
	Oscilloscope / pointer diagram	Graphic display	-	-	-	■	■
	Oscilloscope recorder	With trigger function	-	-	■	-	-
	RMS recorder	With trigger function	-	-	■	-	-
	Event recorder		-	-	■	-	-
	Permanent recorder		-	-	■	-	-
	Software includes reporting according to EN 50160		-	-	■	-	-
All measured values in accordance with class A		-	-	■	-	-	

Switchboard installation 96 x 96 mm														Switchboard installation 144 x 144 mm													
... F96-0-TFT-ESMS-1DO-US1 (US5)	...	...	...	...	...	...	...	...	...	...	...	...	...	... F144-0-LED-EP-2RO1DO-US1 (US5)	...	...	...	...	...	...	...	...	...	...	...	...	...
... F96-0-TFT-ESMS-1DO-R1-US1 (US5)	...	...	...	...	...	...	...	...	...	...	...	...	...	... F144-2-LED-ESMS-2RO1DO-US1 (US5)	...	...	...	...	...	...	...	...	...	...	...	...	...
... F96-2-TFT-ESMS-2RO1DO-US1 (US5)	...	...	...	...	...	...	...	...	...	...	...	...	...	... F144-2-LED-ESMS-2RO1DO3AO-US1 (US5)	...	...	...	...	...	...	...	...	...	...	...	...	...
... F96-2-TFT-ESMS-2RO1DO-R1-US1 (US5)	...	...	...	...	...	...	...	...	...	...	...	...	...	... F144-2-LED-ESMSDP-2RO1DO-US1 (US5)	...	...	...	...	...	...	...	...	...	...	...	...	...
... F96-2-TFT-ET-2RO1DO-US1 (US5)	...	...	...	...	...	...	...	...	...	...	...	...	...	... F144-2-LED-ESMSDP-2RO1DO3AO-US1 (US5)	...	...	...	...	...	...	...	...	...	...	...	...	...
... F96-2-TFT-ET-2RO1DO-R1-US1 (US5)	...	...	...	...	...	...	...	...	...	...	...	...	...	... F144-2-LED-ESMSET-2RO1DO-US1 (US5)	...	...	...	...	...	...	...	...	...	...	...	...	...
... F96-2-TFT-ESET-2RO1DO-US1 (US5)	...	...	...	...	...	...	...	...	...	...	...	...	...	... F144-2-LED-ESMSET-2RO1DO3AO-US1 (US5)	...	...	...	...	...	...	...	...	...	...	...	...	...
... F96-2-TFT-ESET-2RO1DO-R1-GW-US1 (US5)	...	...	...	...	...	...	...	...	...	...	...	...	...	... F144-2-LED-ESMSMT-2RO1DO-US1 (US5)	...	...	...	...	...	...	...	...	...	...	...	...	...
... F96-2-TFT-MS-2RO1DO-US1 (US5)	...	...	...	...	...	...	...	...	...	...	...	...	...	... F144-2-LED-ESMSMT-2RO1DO3AO-US1 (US5)	...	...	...	...	...	...	...	...	...	...	...	...	...
... F96-2-TFT-MS-2RO1DO-R1-US1 (US5)	...	...	...	...	...	...	...	...	...	...	...	...	...	... F144-PQ-3-TFT-MSMT-US8	...	...	...	...	...	...	...	...	...	...	...	...	...
... F96-2-TFT-MT-2RO1DO-US1 (US5)	...	...	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...	...	...	...	...
... F96-2-TFT-MT-2RO1DO-R1-US1 (US5)	...	...	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...	...	...	...	...

multimes

Device matrix



Device types multimes ...

		DIN rail				
		...D4-0-BS	... D6-1-LED-ESMS-2DI1DO-US1	...D9-PQ-3-LCD-MSMT-US8	...F96-0-TFT-1DO-US1 (US5)	...F96-0-TFT-1DO-R1-US1 (US5)
HOUSING	DIN rail 4 TE	■	-	-	-	-
	DIN rail 6 TE	-	■	-	-	-
	DIN rail 9 TE	-	-	■	-	-
	Front panel mounting 96 x 96 mm	-	-	-	■	■
	Front panel mounting 144 x 144 mm	-	-	-	-	-
DISPLAY	LCD	-	■	■	-	-
	TFT	-	-	-	■	■
	LED	-	-	-	-	-
VOLTAGE MEASURING INPUTS	3 x 30 ... 400 ... 480 V AC	■	■	-	-	-
	3 x 5 ... 500 ... 600 V AC	-	-	-	■	■
	3 x 0 ... 690 V AC	-	-	■	-	-
CURRENT MEASURING INPUTS	Current transformer 3 x 1 (5) A	■	■	-	■	-
	Current transformer 4 x 1 (5) A	-	-	■	-	-
	Rogowski band 3 x 1000 A	-	-	-	-	■
	Rogowski band 3 x 3000 A	-	-	-	-	■
INTERFACES	RS 485 KBR eBus configuration interface	-	-	-	-	-
	RS 485 KBR module bus	■	-	-	-	-
	RS 485 Modbus	-	■	■	-	-
	RS 485 KBR eBus	-	■	-	-	-
	RS 485 Profibus DP	-	-	-	-	-
	TCP/IP Modbus	-	-	■	-	-
	TCP/IP eBus	-	-	-	-	-
	TCP/IP eBus and RS 485 with gateway function	-	-	-	-	-
OUTPUTS	2 x relay outputs	-	-	-	-	-
	1 x 50 digital output	-	■	-	■	■
	3 x analog output 0 (4) – 20 mA, 0 (2) – 10 V	-	-	-	-	-
POWER SUPPLY	Via measuring voltage	■	-	-	-	-
	US1: 100 to 240 V; AC/DC; 50/60 Hz	-	■	-	■	■
	US5: 22.5 to 64 V; AC/DC; 50/60 Hz	-	-	-	□	□
	US8: 90 to 264 V; AC; 50/60 Hz; 100 to 350 V DC	-	-	■	-	-

