





## Areas of application

- Energy management
- Cost centre analysis
- Measured value transducer for PLC controls or building management systems (BMS)
- For energy billing purposes

## Main features

- Communication: Modbus, M-Bus, S0 pulse outputs
- Direct measurement up to 65 A, transformer measurement up to 6 A, secondary (CT ration freely adjustable)
- 1 or 2 tariffs
- 4-quadrant measurement
- Class 1 for effective energy
- MID and IEC calibrated at the factory
- Lead-sealed terminal cover
- Measured values: Active energy, reactive energy, active power, reactive power
- Precision class 1 for active energy

## Applications

- Logging of active and reactive energy
- S0 pulse outputs, proportional to energy flowing, can be connected to a control system PLC, SCADA system or data logger
- Integrated interface makes available protocols such as M-Bus or Modbus RTU
- Measurements of 1 and 3-phase systems with a voltage of L-N 230 V AC / L-L 400 V AC
- Measurement of input currents via direct connection or via current transformer (.../1 A or .../5 A)
- DIN rail installation

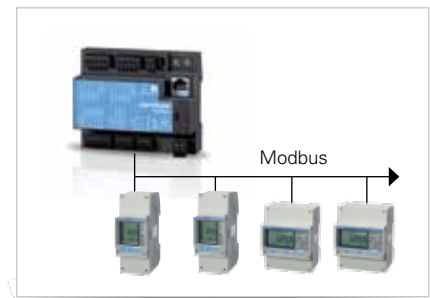


Fig.: Measured energy values are available via the integrated communication interface Modbus RTU.

# MID energy meter B21 – Single-phase energy meter, 65 A

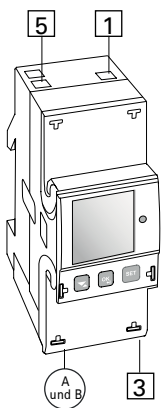
## Single-phase energy meter (1 + N)

- Direct connection up to 65 A
- With measured values and alarm function
- Width, 2 DIN modules
- Tested and approved per MID\*1 and IEC
- Pulse output included

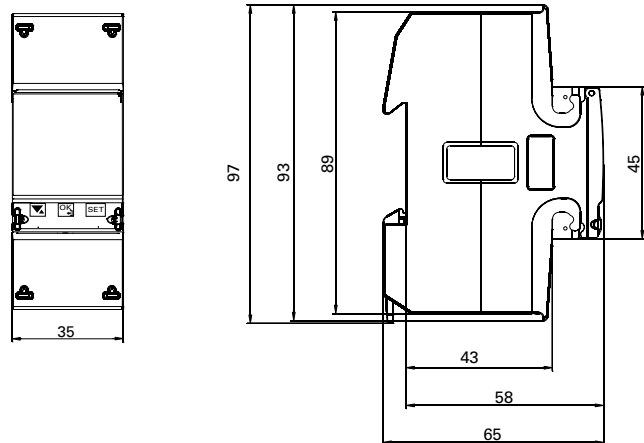


\*1 Regional different requirements apply in Switzerland in connection with MID energy meters.

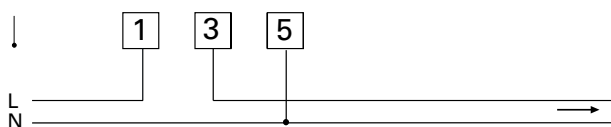
Voltage V	Precision class	Inputs/outputs	Communication	Type	Item no.	Weight
1 x 230 V AC	Active energy: B (class 1) Reactive energy: class 2	2 outputs, 2 inputs	Pulse output	B21 311-10J	14.01.353	0.14
			Pulse output, RS-485	B21 312-10J	14.01.354	0.15
			Pulse output, M-Bus	B21 313-10J	14.01.355	0.15



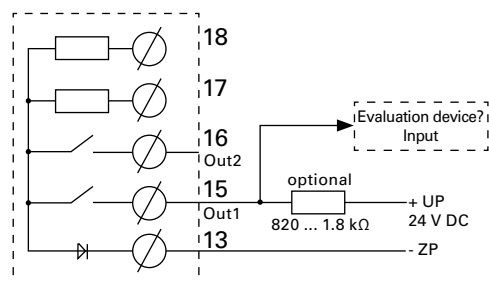
Dimensions in mm



B21 connection terminals



Pulse output S0



# MID energy meter B23 – Three-phase energy meter, direct measurement, 65 A

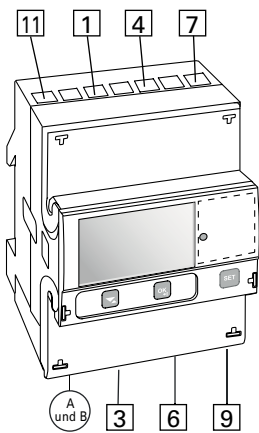
## Three-phase energy meter, direct measurement (3 + N)

- Direct connection up to 65 A
- With measured values and alarm function
- For 3-conductor and 4-conductor connection
- Width, 4 DIN modules
- Tested and approved per MID\*1 and IEC
- Pulse output included

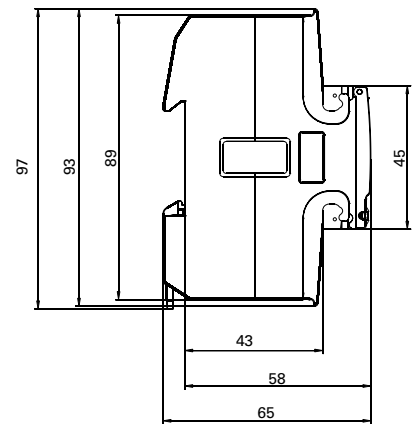
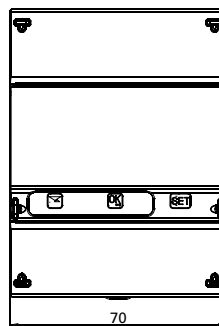


\*1 Regional different requirements apply in Switzerland in connection with MID energy meters.

Voltage V	Precision class	Inputs/outputs	Communication	Type	Item no.	Weight
3 x 230/400 V AC	Active energy: B (class 1) Reactive energy: class 2	2 outputs, 2 inputs	Pulse output	B23 311-10J	14.01.356	0.33
			Pulse output, RS-485	B23 312-10J	14.01.357	0.34
			Pulse output, M-Bus	B23 313-10J	14.01.358	0.35

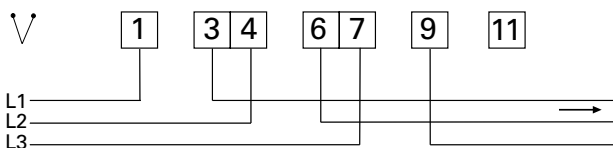


Dimensions in mm

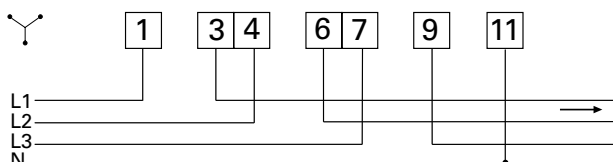


### B23 connection terminals

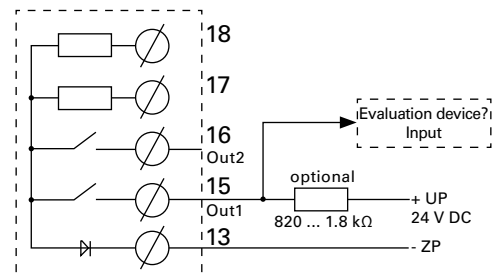
3-conductor connection with 2 measuring units



4-conductor connection with 3 measuring units



### Pulse output S0



# MID energy meter B24 – Three-phase energy meter, CT measurement, 6 A

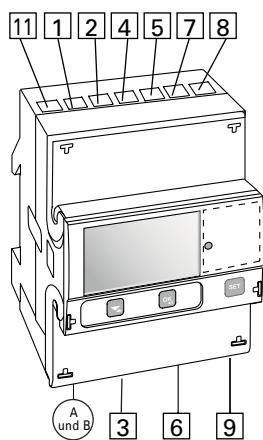
## Three-phase energy meter, CT measurement (3 + N)

- Transformer connection CT, 1(6) A
- Transformer ratio freely adjusted up to 9999/1-6
- With measured values and alarm function
- For 3-conductor and 4-conductor connection
- Width, 4 DIN modules
- Tested and approved per MID\*1 and IEC
- Pulse output included

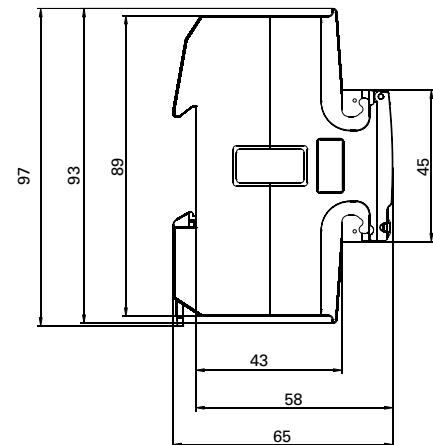
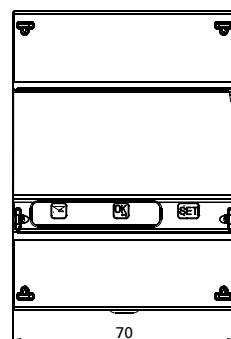


\*1 Regional different requirements apply in Switzerland in connection with MID energy meters.

Voltage V	Precision class	Inputs/outputs	Communication	Type	Item no.	Weight
3 x 230/400 V AC	Active energy: B (class 1) Reactive energy: class 2	2 outputs, 2 inputs	Pulse output	B24 311-10J	14.01.359	0.27
			Pulse output, RS-485	B24 312-10J	14.01.360	0.27
			Pulse output, M-Bus	B24 313-10J	14.01.361	0.29

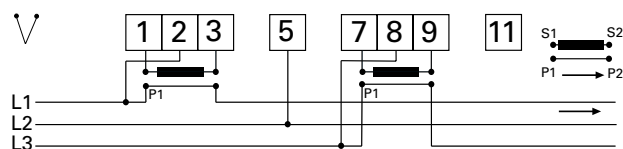


Dimensions in mm

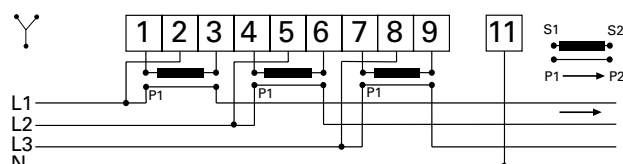


## B24 connection terminals

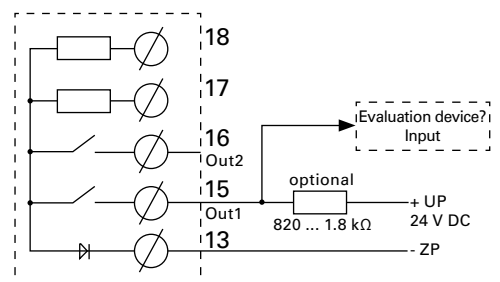
### 3-conductor connection with 2 measuring units



### 4-conductor connection with 3 measuring units



## Pulse output S0



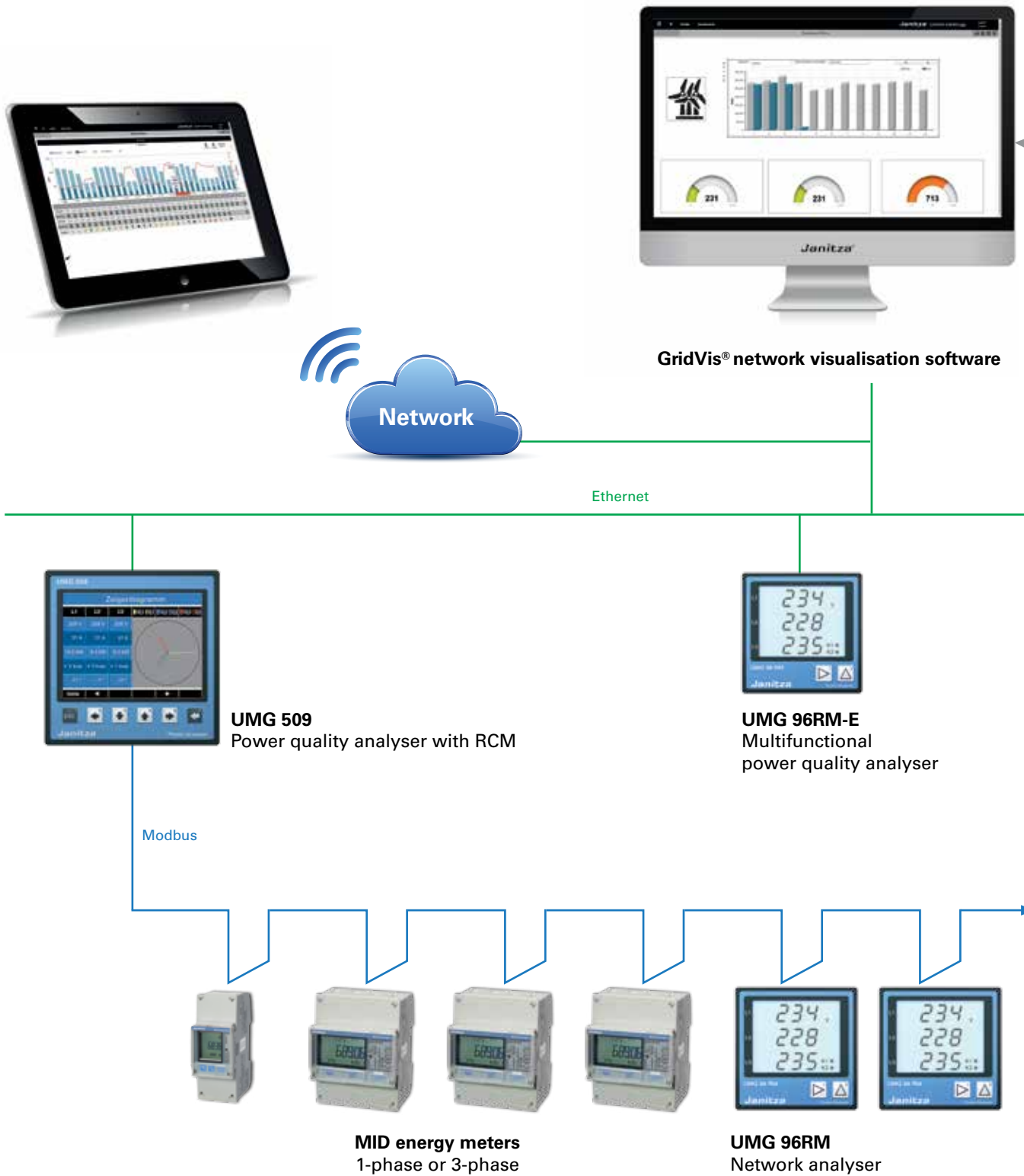


## Device overview and technical data

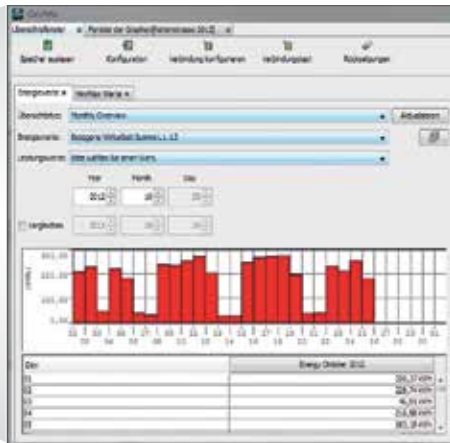
	B21 Single-phase energy meter	B23 Three-phase energy meter, direct measurement	B24 Three-phase energy meter, CT measurement
<b>Voltage/current inputs</b>			
Rated voltage	230 V AC	3 x 230/400 V AC	3 x 230/400 V AC
Voltage range	220 – 240 V AC (-20% – +15%)	3 x 220 – 240 V AC (-20% – +15%)	3 x 220 – 240 V AC (-20% – +15%)
Power dissipation, voltage circuits	1.0 VA (0.4 W) total	1.6 VA (0.7 W) total	1.6 VA (0.7 W) total
Power dissipation, current circuits	0.007 VA (0.007 W) at 230 V AC and $I_b$	0.007 VA (0.007 W) per phase at 230 V AC and $I_b$	0.007 VA (0.007 W) per phase at 230 V AC and $I_b$
Reference current $I_{ref}$	5 A	5 A	1 A
Transition current $I_{tr}$	0.5 A	0.5 A	0.05 A
Max. current $I_{max}$	65 A	65 A	6 A
Min. current $I_{min}$	0.25 A	0.25 A	0.02 A
Start-up current $I_{st}$	< 20 mA	< 20 mA	< 1 mA
Connection cross-section	1 – 25 mm <sup>2</sup>	1 – 25 mm <sup>2</sup>	0.5 – 10 mm <sup>2</sup>
Recommended tightening torque	3 Nm	3 Nm	1.5 Nm
<b>Transformer ratio</b>			
Configurable current ratio (CT)	–	–	9999/1-6
<b>Pulse display (LED)</b>			
Pulse frequency	1000 imp/kWh	1000 imp/kWh	5000 imp/kWh
Pulse length	40 ms	40 ms	40 ms
<b>General information</b>			
Frequency	50 or 60 Hz ± 5%	50 or 60 Hz ± 5%	50 or 60 Hz ± 5%
Precision class	B (cl. 1) and reactive power cl. 2	B (cl. 1) and reactive power cl. 2	B (cl. 1) and reactive power cl. 2
Effective power	1%	1%	0,5%, 1%
Energy display	LCD with 6 digits	LCD with 7 digits	LCD with 7 digits
<b>Environmental</b>			
Operating temperature	-40 °C – +70 °C	-40 °C – +70 °C	-40 °C – +70 °C
Storage temperature	-40 °C – +85 °C	-40 °C – +85 °C	-40 °C – +85 °C
Humidity	75% annual average, 95% on 30 days/year	75% annual average, 95% on 30 days/year	75% annual average, 95% on 30 days/year
Fire and heat resistance	Terminal 960 °C, covering 650 °C (IEC 60695-2-1)	Terminal 960 °C, covering 650 °C (IEC 60695-2-1)	Terminal 960 °C, covering 650 °C (IEC 60695-2-1)
Water and dust resistance	IP20 on terminal strip without protective housing and IP51 in protective housing, per IEC 60529	IP20 on terminal strip without protective housing and IP51 in protective housing, per IEC 60529	IP20 on terminal strip without protective housing and IP51 in protective housing, per IEC 60529
Mechanical environment	Class M1 per Measuring Instrument Directive (MID), (2004/22/EC)	Class M1 per Measuring Instrument Directive (MID), (2004/22/EC)	Class M1 per Measuring Instrument Directive (MID), (2004/22/EC)
Electromagnetic environment	Class E2 per Measuring Instrument Directive (MID), (2004/22/EC)	Class E2 per Measuring Instrument Directive (MID), (2004/22/EC)	Class E2 per Measuring Instrument Directive (MID), (2004/22/EC)

<b>Digital outputs</b>			
Current	2 – 100 mA	2 – 100 mA	2 – 100 mA
Voltage	24 V AC – 240 V AC, 24 V DC – 240 V DC. With meters with only 1 output, 5 – 40 V DC	24 V AC – 240 V AC, 24 V DC – 240 V DC. With meters with only 1 output, 5 – 40 V DC	24 V AC – 240 V AC, 24 V DC – 240 V DC. With meters with only 1 output, 5 – 40 V DC
Output pulse frequency	Programmable: 1 – 999999 pulse/kWh, pulse/MWh	Programmable: 1 – 999999 pulse/kWh, pulse/MWh	Programmable: 1 – 999999 pulse/kWh, pulse/MWh
Pulse length	10 – 990 ms	10 – 990 ms	10 – 990 ms
Connection cross-section	0,5 – 1 mm <sup>2</sup>	0,5 – 1 mm <sup>2</sup>	0,5 – 1 mm <sup>2</sup>
Recommended tightening torque	0.25 Nm	0.25 Nm	0.25 Nm
<b>Digital inputs</b>			
Voltage	0 – 240 V AC/DC	0 – 240 V AC/DC	0 – 240 V AC/DC
OFF	0 – 12 V AC/DC	0 – 12 V AC/DC	0 – 12 V AC/DC
ON	57 – 240 V AC/24 – 240 V DC	57 – 240 V AC/24 – 240 V DC	57 – 240 V AC/24 – 240 V DC
Min. pulse length	30 ms	30 ms	30 ms
Connection cross-section	0,5 – 1 mm <sup>2</sup>	0,5 – 1 mm <sup>2</sup>	0,5 – 1 mm <sup>2</sup>
Recommended tightening torque	0,25 Nm	0.25 Nm	0.25 Nm
<b>Electromagnetic compatibility</b>			
Surge voltage testing	6 kV 1,2/50 μs (IEC 60060-1)	6 kV 1,2/50 μs (IEC 60060-1)	6 kV 1,2/50 μs (IEC 60060-1)
Voltage swell testing	4 kV 1,2/50 μs (IEC 61000-4-5)	4 kV 1,2/50 μs (IEC 61000-4-5)	4 kV 1,2/50 μs (IEC 61000-4-5)
Cable-based transients	4 kV (IEC 61000-4-4)	4 kV (IEC 61000-4-4)	4 kV (IEC 61000-4-4)
Immunity from interference from electromagnetic HF fields	80 MHz – 2 GHz (IEC 61000-4-6)	80 MHz – 2 GHz (IEC 61000-4-6)	80 MHz – 2 GHz (IEC 61000-4-6)
Immunity from interference from conducted interference	150 kHz – 80 MHz (IEC 61000-4-6)	150 kHz – 80 MHz (IEC 61000-4-6)	150 kHz – 80 MHz (IEC 61000-4-6)
Immunity from interference with harmonics	2 kHz – 150 kHz	2 kHz – 150 kHz	2 kHz – 150 kHz
High frequency emissions	EN 55022, Klasse B (CISPR22)	EN 55022, Klasse B (CISPR22)	EN 55022, Klasse B (CISPR22)
Electrostatic discharge	15 kV (IEC 61000-4-2)	15 kV (IEC 61000-4-2)	15 kV (IEC 61000-4-2)
Standards	IEC 62052-11, IEC 62053-21 class 1 & 2, IEC 62053-22 class 0,5S, IEC 62053-23 class 2, IEC 62054-21, GB/T 17215.211-2006, GB/T 17215.312-2008 class 1 & 2, GB/T 1725.322-2008 class 0.5S, GB 4208-2008, EN 50470-3 category A, B & C		
<b>Mechanical</b>			
Material	Polycarbonate in transparent front glass, top and bottom housing and terminal covering		
<b>Dimensions</b>	<b>35 x 97 x 65 mm (B x H x T)</b>	<b>70 x 97 x 65 mm (B x H x T)</b>	<b>70 x 97 x 65 mm (B x H x T)</b>
DIN modules	2	4	4

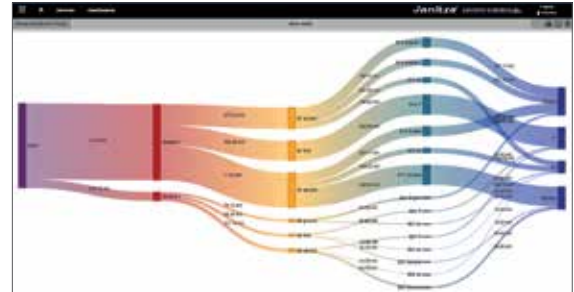
# Remote read-out with a higher-level PC







Tabular energy reports



Sankey diagrams



Dashboard Editor



**UMG 604**  
Power quality analyser

Modbus

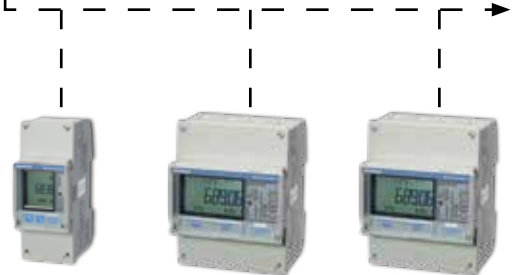


**MID energy meters**  
1-phase or 3-phase



**ProData® data logger**  
Gateway for energy meter

Pulse inputs



**MID energy meters**  
1-phase or 3-phase



Communication:  
Modbus, M-Bus,  
S0 pulse outputs



Direct measurement  
up to 65 A, transformer  
measurement up to 6 A  
secondary (CT ratio freely  
adjustable)



1 or 2 tariffs  
4 quadrant measurement  
Class 1 for effective  
energy



MID and IEC  
calibrated  
at the factory  
Lead-sealed terminal  
cover



Measured values:  
- Effective power  
- Reactive energy  
- Effective power  
- Reactive power

