multiwave active:
THE MULTITALENT FOR ALL DISTURBANCE PATTERNS.

Whether harmonics, load unbalance or reactive power – one device for all requirements.

- Easy expansion due to modular design
- Control current or voltage controlled
- Minimal maintenance effort
- Filtering up to 51. harmonic
- Simple and fast commissioning

\+ ...and much more

multiwave active operates completely digitally and intelligently

The flexibility of the **multiwave active** is shown by the fact that the filter can be coupled to the power grid on the load or grid side and can be controlled by current or voltage. Once configured with a few clicks, the instantaneous mains current is measured permanently and occurring harmonics, load unbalance, reactive power as well as phase shifts are actively compensated. In microseconds, the **multiwave active** calculates the compensation currents for this and feeds them into the grid. Via the display, commissioning, selection and setting of individual parameters is very user-friendly.

With the right partner to an individual system

To find the best network quality solution for your business and facility, KBR's expert **Power Quality Service** is available to help: From consulting to network analysis and planning, to implementation and after-sales support. To say **multiwave active** has clearly improved your power quality efficiency.

multiwave®
Active Filter Solution

POWER QUALITY
MADE IN GERMANY

Control both current and voltage controlled or both at the same time

Due to its individual control, the **multiwave active** adapts to any network and any requirement. All three control modes have their advantages.

Current-guided:

- Only one device is to be compensated
- Design via current spectrum
- Network symmetries
- Optimum utilization of transformer and cable
- Reactive power factor correction 50 Hz

Voltage guided:

- Control to the standard limits
- Adheres to the standard limits at the connection point of the filter
- High voltage distortion from medium voltage
- Compensation of small or high-frequency harmonic levels
- No installation of current transformers necessary

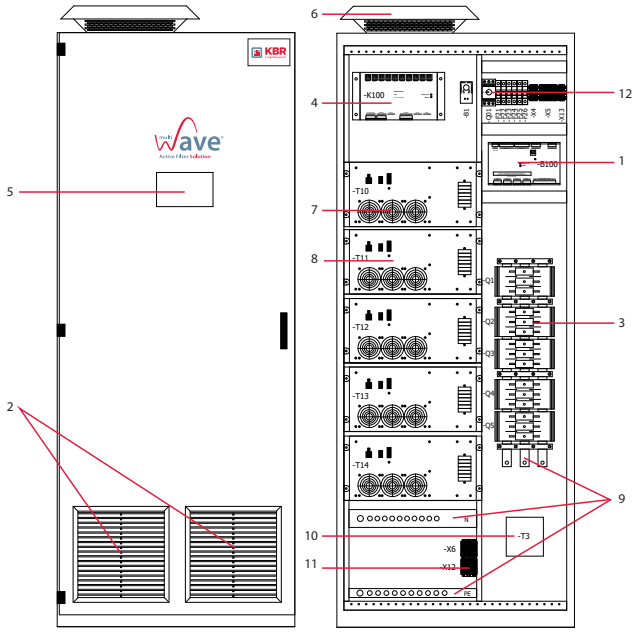
Combination:

- Compensation of low-frequency harmonics via current control, higher-frequency harmonics via voltage control. Thus, optimal utilization of the filter.

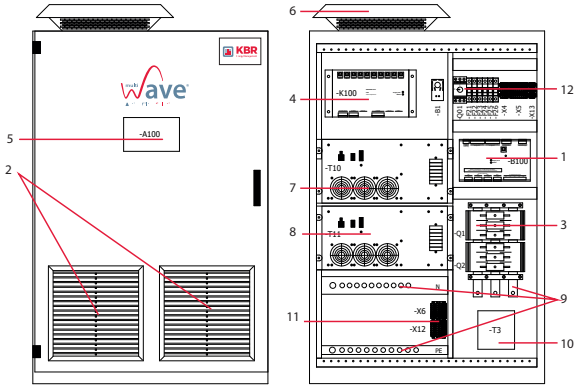
multiwave active Technical data

Rated voltage AC	400 V (max. 415 V) ±10 %				
Network frequency	50 / 60 Hz				
Peak current	2x rated current				
Cable connection	3-phase + PE + N/PEN, neutral conductor connection is required (Network configuration: TN)				
Operating mode	3-wire operation: External conductor, symmetrical and asymmetrical (positive and negative sequence network) 4-wire operation: also has neutral conductor (positive, negative, and zero sequence network)				
Compensation	1. – 51. Harmonic (50 Hz) // 1 – 41. Harmonic (60 Hz) All harmonics can be filtered at the same time				
Additional functions	- Dynamic reactive power compensation - Active and reactive power balancing (negative sequence network up to 60 %, zero sequence network up to 30 % rated current) - Voltage stabilization through Q(U) control - Flicker compensation - Neutral conductor load reduction				
Number of filter modules	1	2	3	4	5
Rated current	60 A	120 A	180 A	240 A	300 A
Neutral conductor current	180 A	360 A	540 A	720 A	900 A
compensation power	42 kvar	84 kvar	126 kvar	168 kvar	210 kvar
Cabinet type	A | B | C	A | B	A	A	A
Power dissipation	< 2.6% of compensation power maximum < 2.3% in typ. operation, < 0.7 % in idle, < 100 W in standby				
Switching frequency	20 kHz (low-loss version)				
Controls	Internal control computer with two digital signal processors				
Device setup and display	Via internal web servers (TCP/IP) and PC, SD card, or Anybus interface (field bus interface)				
Response time	<< 1ms				
Interfaces	- Ethernet (TCP/IP) - Various field bus systems via optional Anybus plug-in module (e.g. Profinet, Modbus TCP) - 4 digital outputs: 250 VAC (3 A) / 110 VDC (0.7 A) / 24 VDC (1 A), potential and parameterizable - 4 digital inputs: 24 VDC (10 mA), configurable for remote control and easy additional parameter adjustment				
Current transformers	3-phase current measurement, xx/5 A or xx/1 A (parameterizable) The required current transformers are not included, class 1 or better recommended				
Inverters	3-level IGBT with intermediate voltage circuit (electrolytic capacitors)				
Coloring	Standard RAL 7035 light gray (other colors and designs on request)				
Dimensions	Standard: H/W/D 2000/800/600 mm Optional: other housing shapes and dimensions on request				
Cooling	Air cooling with speed-controlled fans				
IP Protection type	Standard IP20, optional IP21				
Ambient conditions	- Maximum ambient temperature without reduced performance: 40 °C - Recommended ambient temperature for continuous operation: < 25 °C - Minimum operating temperature: 0 °C - Relative humidity: maximum 95 % - Transport/storage: -20 °C … 70 °C				
Overvoltage category	CAT III, 300 V				
EMC class	Standard: EN 55011, Class A1 (industrial environment), optional: Class B (residential area)				
Standards	EN 50178, EN 61439-1, EN 61439-2, EN 61-6-2, EN 61000-6-4, EN 55011				

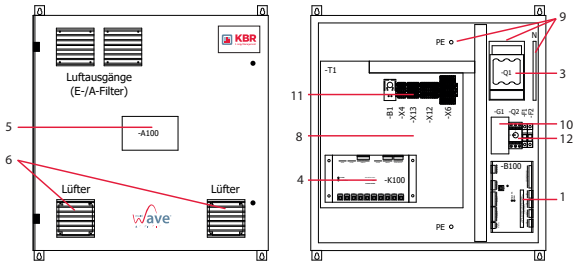
1. Measurement and I/O module (MIO)
2. Air inlet
3. NH 000 fused circuit breaker
4. Control computer (CCU)
5. Touch panel
6. Roof/door ventilator
7. Fan for Filter module
8. Filter module
9. Power connection/busbar
10. 24 V DC power supply
11. Terminal strip
12. Overcurrent protection equipment (circuit breaker)



A | Free standing cabinet



B | floor standing wall cabinet



C | Wall cabinet

Types	Dimensions (H x W x D)	Extensibility
A | Free standing cabinet	2000 x 800 x 600 mm(excluding fan)	up to a maximum of 5 modules (210 kvar, 300 A)
B | floor standing wall cabinet	1200 x 800 x 600 mm(excluding fan)	up to maximum 2 modules (84 kvar, 120 A)
C | Wall cabinet	800 x 800 x 400 mm	1 module (42 kvar, 60 A)

Description of standards	Standards
Electromagnetic compatibility	EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11, EN 61000-6-2, EN 61000-6-2, EN 61000-6-4 and EN 55011
Safety requirements	EN 62477-1, EN 60664-1, IEC 60364-6
Low voltage switchgear combination	EN 61439-1, EN 61439-2
Equipment of power installations with electronic equipment	EN 50178
Protection class	IP20 according to EN 60529 (air cooled)
Approval mark: CE Mark	2006/95/EC