

## Output

\* The Adjusted characteristics values are for reference. R<sub>L</sub>: Resistive load

| Model                                      |           | BP4610                                                                                                                     | BP4620                    | BP4630                    | BP4640                      | BP4650                      | BP4660                     | BP4670                       | BP4680                       | BP4690                       | BP46100                    |
|--------------------------------------------|-----------|----------------------------------------------------------------------------------------------------------------------------|---------------------------|---------------------------|-----------------------------|-----------------------------|----------------------------|------------------------------|------------------------------|------------------------------|----------------------------|
| Maximum output voltage* CV mode            |           |                                                                                                                            |                           |                           |                             |                             |                            |                              |                              |                              |                            |
| DC                                         |           | + 115 V (set + Vo limit to 117 V and -Vo limit to - 7 V), - 115 V (set + Vo limit to 7 V and - Vo limit to - 117 V)        |                           |                           |                             |                             |                            |                              |                              |                              |                            |
|                                            |           | R <sub>L</sub> = 23 Ω                                                                                                      | R <sub>L</sub> = 12 Ω     | R <sub>L</sub> = 7.7 Ω    | R <sub>L</sub> = 5.7 Ω      | R <sub>L</sub> = 4.6 Ω      | R <sub>L</sub> = 3.8 Ω     | R <sub>L</sub> = 3.3 Ω       | R <sub>L</sub> = 2.9 Ω       | R <sub>L</sub> = 2.6 Ω       | R <sub>L</sub> = 2.3 Ω     |
| DC to 0.5 kHz                              |           | ± 60 V                                                                                                                     |                           |                           |                             |                             |                            |                              |                              |                              |                            |
|                                            |           | R <sub>L</sub> = 6 Ω                                                                                                       | R <sub>L</sub> = 3 Ω      | R <sub>L</sub> = 2 Ω      | R <sub>L</sub> = 1.5 Ω      | R <sub>L</sub> = 1.2 Ω      | R <sub>L</sub> = 1 Ω       | R <sub>L</sub> = 0.86 Ω      | R <sub>L</sub> = 0.75 Ω      | R <sub>L</sub> = 0.67 Ω      | R <sub>L</sub> = 0.6 Ω     |
| 0.5kHz to 40 kHz                           |           | ± 60 V                                                                                                                     |                           |                           |                             |                             |                            |                              |                              |                              |                            |
|                                            |           | R <sub>L</sub> = 4 Ω                                                                                                       | R <sub>L</sub> = 2 Ω      | R <sub>L</sub> = 1.3 Ω    | R <sub>L</sub> = 1 Ω        | R <sub>L</sub> = 0.8 Ω      | R <sub>L</sub> = 0.67 Ω    | R <sub>L</sub> = 0.57 Ω      | R <sub>L</sub> = 0.5 Ω       | R <sub>L</sub> = 0.44 Ω      | R <sub>L</sub> = 0.4 Ω     |
| 40kHz to 150 kHz                           |           | ± 50 V                                                                                                                     |                           |                           |                             |                             |                            |                              |                              |                              |                            |
|                                            |           | R <sub>L</sub> = 6 Ω                                                                                                       | R <sub>L</sub> = 3 Ω      | R <sub>L</sub> = 2 Ω      | R <sub>L</sub> = 1.5 Ω      | R <sub>L</sub> = 1.2 Ω      | R <sub>L</sub> = 1 Ω       | R <sub>L</sub> = 0.86 Ω      | R <sub>L</sub> = 0.75 Ω      | R <sub>L</sub> = 0.67 Ω      | R <sub>L</sub> = 0.6 Ω     |
| Maximum output current* CC mode            |           |                                                                                                                            |                           |                           |                             |                             |                            |                              |                              |                              |                            |
| DC to 0.5kHz                               |           | ±10A/R <sub>L</sub> =6Ω                                                                                                    | ±20A/R <sub>L</sub> =3Ω   | ±30A/R <sub>L</sub> =2Ω   | ±40A/R <sub>L</sub> =1.5Ω   | ±50A/R <sub>L</sub> =1.2Ω   | ±60A/R <sub>L</sub> =1Ω    | ±70A/R <sub>L</sub> =0.86Ω   | ±80A/R <sub>L</sub> =0.75Ω   | ±90A/R <sub>L</sub> =0.67Ω   | ±100A/R <sub>L</sub> =0.6Ω |
| 0.5 kHz to 30 kHz                          |           | ±15A/R <sub>L</sub> =4Ω                                                                                                    | ±30A/R <sub>L</sub> =2Ω   | ±45A/R <sub>L</sub> =1.3Ω | ±60A/R <sub>L</sub> =1Ω     | ±75A/R <sub>L</sub> =0.8Ω   | ±90A/R <sub>L</sub> =0.67Ω | ±105A/R <sub>L</sub> =0.57Ω  | ±120A/R <sub>L</sub> =0.5Ω   | ±135A/R <sub>L</sub> =0.44Ω  | ±150A/R <sub>L</sub> =0.4Ω |
| 30 kHz to 70 kHz                           |           | ±8.3A/R <sub>L</sub> =6Ω                                                                                                   | ±16.6A/R <sub>L</sub> =3Ω | ±24.9A/R <sub>L</sub> =2Ω | ±33.2A/R <sub>L</sub> =1.5Ω | ±41.5A/R <sub>L</sub> =1.2Ω | ±49.8A/R <sub>L</sub> =1Ω  | ±58.1A/R <sub>L</sub> =0.86Ω | ±66.4A/R <sub>L</sub> =0.75Ω | ±74.7A/R <sub>L</sub> =0.67Ω | ±83 A/R <sub>L</sub> =0.6Ω |
| Small amplitude frequency characteristics* |           | CV mode: DC to 200 kHz (amplitude 12 Vp-p, 500 Hz reference ), CC mode: DC to 70 kHz (amplitude 12 Vp-p, 500 Hz reference) |                           |                           |                             |                             |                            |                              |                              |                              |                            |
| Response calibration function              |           | Response characteristic can be adjusted with knobs on the front panel (Time constant: T, Voltage: V, and Current: I )      |                           |                           |                             |                             |                            |                              |                              |                              |                            |
| Rise / Fall Time                           |           | CV mode : 2.5 μs* (square ± 60 V ) CC mode : 4 μs* (square, for the following current )                                    |                           |                           |                             |                             |                            |                              |                              |                              |                            |
|                                            |           | ± 10 A                                                                                                                     | ± 20 A                    | ± 30 A                    | ± 40 A                      | ± 50 A                      | ± 60 A                     | ± 70 A                       | ± 80 A                       | ± 90 A                       | ± 100 A                    |
| Output Impedance*                          | CV mode   | 7mΩ+1.3μH                                                                                                                  | 3.5mΩ+0.65μH              | 2.4mΩ+0.43μH              | 1.8mΩ+0.33μH                | 1.4mΩ+0.26μH                | 1.2mΩ+0.22μH               | 1mΩ+0.19μH                   | 0.9mΩ+0.17μH                 | 0.8mΩ+0.15μH                 | 0.7mΩ+0.13μH               |
|                                            | CC mode   | 10kΩ/0.45μF                                                                                                                | 5kΩ/0.90μF                | 3.3kΩ/1.35μF              | 2.5kΩ/1.8μF                 | 2kΩ/2.25μF                  | 1.7kΩ/2.7μF                | 1.5kΩ/3.15μF                 | 1.3kΩ/3.6μF                  | 1.2kΩ/4.05μF                 | 1kΩ/4.5μF                  |
| Output + voltage / - voltage               |           | + 7 V to + 117 V (initial : + 62 V, resolution 0.1 V) / - 117 V to - 7 V (initial : - 62 V, resolution 0.1 V)              |                           |                           |                             |                             |                            |                              |                              |                              |                            |
| Voltage Limiter                            |           | ※The difference between the + voltage and the - voltage setting is restricted to 24 V or higher and 124 V or lower.        |                           |                           |                             |                             |                            |                              |                              |                              |                            |
| Output                                     | + current | + 1 A to + 26 A                                                                                                            | + 2 A to + 52 A           | + 3 A to + 78 A           | + 4 A to + 104 A            | + 5 A to + 130 A            | + 6 A to + 156 A           | + 7 A to + 182 A             | + 8 A to + 208 A             | + 9 A to + 234 A             | + 10 A to + 260 A          |
| Current Limiter                            | - current | - 26A to - 1 A                                                                                                             | - 52 A to - 2 A           | - 78 A to - 3 A           | - 104 A to - 4 A            | - 130 A to - 5 A            | - 156 A to - 6 A           | - 182 A to - 7 A             | - 208 A to - 8 A             | - 234 A to - 9 A             | - 260 A to -10 A           |

\*Adjusted characteristics

**Signal Sources** Selectable from among internal source, external signal, and internal source + external signal.

|                                    |                         |                                            |                 |                  |                  |                  |                  |                  |                 |                  |                    |
|------------------------------------|-------------------------|--------------------------------------------|-----------------|------------------|------------------|------------------|------------------|------------------|-----------------|------------------|--------------------|
| Internal signal source             |                         |                                            |                 |                  |                  |                  |                  |                  |                 |                  |                    |
| CV mode                            |                         |                                            |                 |                  |                  |                  |                  |                  |                 |                  |                    |
| DC voltage Setting range           |                         | - 115 to + 115 V ( resolution 0.01 V )     |                 |                  |                  |                  |                  |                  |                 |                  |                    |
| AC voltage                         | Amplitude setting range | 0 Vp-p to 120 Vp-p ( resolution 0.1 Vp-p ) |                 |                  |                  |                  |                  |                  |                 |                  |                    |
|                                    | Waveform                | Sine, Square, Arbitrary (16 types )        |                 |                  |                  |                  |                  |                  |                 |                  |                    |
|                                    | Frequency setting range | 1 Hz to 100 kHz ( resolution 0.1 Hz )      |                 |                  |                  |                  |                  |                  |                 |                  |                    |
| CC mode                            |                         |                                            |                 |                  |                  |                  |                  |                  |                 |                  |                    |
| DC current                         | Setting range           | - 10 A to + 10 A                           | - 20 A to +20 A | - 30 A to + 30 A | - 40 A to + 40 A | - 50 A to + 50 A | - 60 A to + 60 A | - 70 A to + 70 A | - 80A to + 80 A | - 90 A to + 90 A | - 100 A to + 100 A |
|                                    | Resolution              | 0.01 A                                     |                 |                  |                  |                  |                  |                  |                 |                  |                    |
| AC current                         | Amplitude setting range | 0 to 30 Ap-p                               | 0 to 60 Ap-p    | 0 to 90 Ap-p     | 0 to 120 Ap-p    | 0 to 150 Ap-p    | 0 to 180 Ap-p    | 0 to 210 Ap-p    | 0 to 240 Ap-p   | 0 to 270 Ap-p    | 0 to 300 Ap-p      |
|                                    | Resolution              | 0.1 Ap-p                                   |                 |                  |                  |                  |                  |                  |                 |                  |                    |
|                                    | Waveform                | Sine, Square, Arbitrary (16 types )        |                 |                  |                  |                  |                  |                  |                 |                  |                    |
|                                    | Frequency setting range | 1 Hz to 100 kHz ( resolution 0.1 Hz )      |                 |                  |                  |                  |                  |                  |                 |                  |                    |
| External signal input              |                         |                                            |                 |                  |                  |                  |                  |                  |                 |                  |                    |
| Phase                              |                         | In phase                                   |                 |                  |                  |                  |                  |                  |                 |                  |                    |
| Input impedance                    |                         | 10 kΩ                                      |                 |                  |                  |                  |                  |                  |                 |                  |                    |
| Non-destructive max. input voltage |                         | ± 5 V                                      |                 |                  |                  |                  |                  |                  |                 |                  |                    |
| Frequency range                    |                         | DC to 200 kHz                              |                 |                  |                  |                  |                  |                  |                 |                  |                    |
| Gain                               | CV mode                 | 100                                        |                 |                  |                  |                  |                  |                  |                 |                  |                    |
|                                    | CC mode                 | 10 A / V                                   | 20 A / V        | 30 A / V         | 40 A / V         | 50 A / V         | 60 A / V         | 70 A / V         | 80 A / V        | 90 A / V         | 100 A / V          |

## Sequence Function

|                             |              |                                                                                                                                         |  |  |  |  |  |  |  |  |
|-----------------------------|--------------|-----------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|--|--|
| Number of sequences         |              | 1 sequence for each of the CV mode and CC mode                                                                                          |  |  |  |  |  |  |  |  |
| Number of steps / Step time |              | 1 to 255 (within 1 sequence) / 0.1 ms to 999.9999 s (resolution 0.1 ms) ※Operation within each steps should be constant or linear sweep |  |  |  |  |  |  |  |  |
| Parameters                  | CV mode      | DC voltage, Superimposed AC voltage, Frequency, Waveform, Step sync output 2 bits                                                       |  |  |  |  |  |  |  |  |
|                             | CC mode      | DC current, Superimposed AC current, Frequency, Waveform, Step sync output 2 bits                                                       |  |  |  |  |  |  |  |  |
| Jump count                  |              | 1 to 999, or continuous                                                                                                                 |  |  |  |  |  |  |  |  |
| Sequence control            | Start / Stop | Start the sequence / Stop the sequence.                                                                                                 |  |  |  |  |  |  |  |  |
|                             | Hold         | Maintains settings at that point. The operation resumes at sequence start.                                                              |  |  |  |  |  |  |  |  |
|                             | Branch       | Branches to the specified step.                                                                                                         |  |  |  |  |  |  |  |  |

## Others

|                            |                   |                                                                                                                                                                                        |                 |                 |                  |                                         |              |                  |              |               |             |  |
|----------------------------|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-----------------|------------------|-----------------------------------------|--------------|------------------|--------------|---------------|-------------|--|
| Monitor Output             |                   | Output voltage, Output current                                                                                                                                                         |                 |                 |                  |                                         |              |                  |              |               |             |  |
| Measurement Functions      |                   | DC output voltage, DC output current, AC output voltage, AC output current                                                                                                             |                 |                 |                  |                                         |              |                  |              |               |             |  |
| Arbitrary Waveform Memory  |                   | 16 (1024 words, 16 bit.) Write is performed via the USB interface.                                                                                                                     |                 |                 |                  |                                         |              |                  |              |               |             |  |
| Store / Recall Memory      |                   | the basic settings (operation mode, DC, superimposed AC, output limiters) can be saved to memories No. 1 to No. 30                                                                     |                 |                 |                  |                                         |              |                  |              |               |             |  |
| Protective Functions       |                   | If Output voltage over, Output current over, Internal output loss, Power supply anomaly, Internal overheating and Operation panel anomaly are detected, the protective function works. |                 |                 |                  |                                         |              |                  |              |               |             |  |
| Interface                  |                   | USB Interface ( USBTMC / USB1.1 )                                                                                                                                                      |                 |                 |                  |                                         |              |                  |              |               |             |  |
| Other function             |                   | Output ON / OFF function, external control input / output, key lock, beep, reset, self-diagnosis function                                                                              |                 |                 |                  |                                         |              |                  |              |               |             |  |
| Power Input                | Voltage           | 80 V to 250 V                                                                                                                                                                          |                 |                 |                  | 180 V to 250 V , Three-phase three-wire |              |                  |              |               |             |  |
|                            | Frequency         | 50 Hz / 60 Hz ± 2 Hz                                                                                                                                                                   |                 |                 |                  |                                         |              |                  |              |               |             |  |
|                            | Power consumption | 1.2 kVA max.                                                                                                                                                                           | 2.4 kVA max.    | 3.6 kVA max.    | 4.8 kVA max.     | 6 kVA max.                              | 7.2 kVA max. | 8.4 kVA max.     | 9.6 kVA max. | 10.8 kVA max. | 12 kVA max. |  |
| Dimensions (W x H x D)(mm) |                   | 430 x176 x 551                                                                                                                                                                         | 430 x 354 x 551 | 430 x 710 x 686 | 505 x 1150 x 700 |                                         |              | 955 x 1150 x 700 |              |               |             |  |
| Weight (Approx.)           |                   | 26 kg                                                                                                                                                                                  | 53 kg           | 97 kg           | 170 kg           | 180 kg                                  | 290 kg       | 305 kg           | 320 kg       | 335 kg        | 350 kg      |  |
| Accessory                  |                   | Manual, CD-ROM, Ferrite core (for USB cable) , Power code set (for BP4610 / BP4620 only)                                                                                               |                 |                 |                  |                                         |              |                  |              |               |             |  |

\*Note: The contents of this catalog are current as of March 7, 2018

- Product appearance and specifications are subject to change without notice.
- Before purchase, contact us to confirm the latest specifications, price and delivery date.

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