

# MAP130 Series

AC-DC Power Supplies

Bel Power Solutions MAP130 Series of single and multiple output power supplies provide fully regulated outputs with high peak current capabilities in a compact 8.5 x 4.5 x 2.0-inch U-channel chassis. Other standard features include auto select AC input, thermal shutdown (with warning), remote sense, and metric and SAE mounting inserts. MAP130 series complies with EMC product standard EN 61204-3.

This convection-cooled series is designed for use in industrial environments in temperatures up to 50°C.

All products are approved to the latest international regulatory standards and all RoHS compliant models bear the CE Mark.



## KEY FEATURES

- Automatic 110/230 V Input Voltage Selection
- All Outputs Fully Regulated
- Remote Sense
- Overvoltage Protection and Overtemperature Protection
- Power Fail Signal Included
- Greater than 100,000 Hour MTBF
- U-Channel Chassis: 8.5 x 4.5 x 2.0 inch (215.9 x 114.3 x 50.8 mm)
- Optional Cover
- Metric and SAE Mounting Inserts
- RoHS Compliant
- CE Marked to Low Voltage Directive
- Meets EMC Standards: EN 61204-3  
EN 55032  
EN 61000-3-3



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## 1. SINGLE-OUTPUT MODEL SELECTION

| MODEL <sup>6</sup> | OUTPUT VOLTAGE | ADJUSTMENT RANGE | CONTINUOUS CURRENT      | PEAK CURRENT <sup>1</sup> | LINE REGULATION | LOAD REGULATION | RIPPLE & NOISE <sup>2</sup> | INITIAL SETTING ACCURACY |
|--------------------|----------------|------------------|-------------------------|---------------------------|-----------------|-----------------|-----------------------------|--------------------------|
| MAP130-1005G       | 5V             | 4.75V to 5.50V   | 26A                     | 30A                       | 0.2%            | 1%              | 1%                          | 5.1V to 5.2V             |
| MAP130-1012G       | 12/15V         | 11.4V to 15.75V  | 12A/10A <sup>3</sup>    | 13.8A/11A <sup>3</sup>    | 0.2%            | 1%              | 1%                          | 12.0V to 12.2V           |
| MAP130-1024G       | 24V/28V        | 22.5V to 30.0V   | 6.25A/5.4A <sup>3</sup> | 6.8A/5.9A <sup>3</sup>    | 0.2%            | 1%              | 1%                          | 23.9V to 24.1V           |

## 2. MULTIPLE-OUTPUT MODEL SELECTION – 130 W CONTINUOUS OUTPUT POWER

| MODEL <sup>6</sup> | OUTPUT VOLTAGE | ADJUSTMENT RANGE | OUTPUT CURRENT | PEAK CURRENT <sup>4</sup> | LINE REGULATION | LOAD REGULATION | RIPPLE & NOISE <sup>5</sup> | INITIAL SETTING ACCURACY |
|--------------------|----------------|------------------|----------------|---------------------------|-----------------|-----------------|-----------------------------|--------------------------|
| MAP130-4000G       | +5V            | 4.75V to 5.50V   | 20A            | 30A                       | 0.2%            | 1%              | 1%                          | 5.1V to 5.2V             |
|                    | +12V           | 11.5V to 12.5V   | 5A             | 10A                       | 0.5%            | 2%              | 1%                          | 11.75V to 12.0V          |
|                    | -5V            | Fixed            | 1A             | 1A                        | 0.5%            | 2%              | 1%                          | -4.8V to -5.2V           |
|                    | -12V           | Fixed            | 1A             | 1A                        | 0.5%            | 2%              | 1%                          | -11.6V to -12.4V         |
| MAP130-4001G       | +5V            | 4.75V to 5.50V   | 20A            | 30A                       | 0.2%            | 1%              | 1%                          | 5.1V to 5.2V             |
|                    | +24V           | 23.0V to 25.0V   | 3.5A           | 5A                        | 0.5%            | 2%              | 2%                          | 23.9V to 24.1V           |
|                    | -12V           | Fixed            | 1A             | 1A                        | 0.5%            | 2%              | 1%                          | -11.6V to -12.4V         |
|                    | +12V           | Fixed            | 1A             | 1A                        | 0.5%            | 2%              | 1%                          | -11.6V to -12.4V         |
| MAP130-4002G       | +5V            | 4.75V to 5.50V   | 20A            | 30A                       | 0.2%            | 1%              | 1%                          | 5.1V to 5.2V             |
|                    | +12V           | 11.5V to 12.5V   | 5A             | 10A                       | 0.5%            | 2%              | 1%                          | 11.9V to 12.1V           |
|                    | -12V           | Fixed            | 1A             | 1A                        | 0.5%            | 2%              | 1%                          | -11.6V to -12.4V         |
|                    | +12V           | Fixed            | 1A             | 1A                        | 0.5%            | 2%              | 1%                          | 11.6V to 12.4V           |
| MAP130-4003G       | +5V            | 4.75V to 5.50V   | 20A            | 30A                       | 1%              | 1%              | 1%                          | 5.1V to 5.2V             |
|                    | +15V           | 14.0V to 16.0V   | 4A             | 8A                        | 1%              | 2%              | 1%                          | 15.0V to 15.1V           |
|                    | -5V            | Fixed            | 1A             | 1A                        | 2%              | 2%              | 1%                          | -4.8V to -5.2V           |
|                    | -15V           | Fixed            | 1A             | 1A                        | 2%              | 2%              | 1%                          | -14.7V to -15.3V         |
| MAP130-4010G       | +5V            | 4.75V to 5.50V   | 20A            | 30A                       | 0.2%            | 1%              | 1%                          | 5.1V to 5.25V            |
|                    | +12V           | 11.5V to 12.8V   | 5A             | 10A                       | 0.5%            | 2%              | 1%                          | 11.75V to 12.0V          |
|                    | -5V            | Fixed            | 1A             | 1A                        | 0.5%            | 2%              | 1%                          | -4.8V to -5.2V           |
|                    | -12V           | Fixed            | 3A             | 3A                        | 0.5%            | 2%              | 1%                          | -11.6V to -12.4V         |

<sup>1</sup> Peak load for 60 seconds or less are acceptable, 10% duty cycle, maximum.

<sup>2</sup> Typical peak to peak noise expressed as a percentage of output voltage, 20 MHz bandwidth.

<sup>3</sup> MAP130-1012 output currents are expressed as 12 V / 15 V operation. MAP130-1024 output currents are expressed as 24 V / 28 V operation.

<sup>4</sup> Peak loads up to 165 Watts, (total of all outputs), for 60 seconds or less are acceptable, (10% duty cycle max.).

<sup>5</sup> Maximum peak to peak noise expressed as a percentage of output voltage, 20 MHz bandwidth.

<sup>6</sup> Models without suffix G are not RoHS-compliant (Leaded solder used) and are not recommended for new designs or already EOL.

Model numbers highlighted in yellow are EOL / Obsolete

## 3. INPUT SPECIFICATIONS

| PARAMETER            | CONDITIONS / DESCRIPTION   | MIN         | NOM | MAX | UNITS            |     |
|----------------------|--|-------------|-----|-----|------------------|-----|
| Input Voltage - AC   | Auto-ranging   | Low Range   | 90  | 110 | 132              | VAC |
|                      |  | High Range  | 175 | 230 | 264              |     |
| Input Frequency      | AC input   | 47          |     | 63  | Hz               |     |
| Brown Out Protection | Lowest AC input voltage when regulation is maintained with full rated loads. | 90          |     |     | VAC              |     |
| Hold-up Time         | Nominal AC input voltage (115 VAC)   | 130 W load: | 40  |     | ms               |     |
| Input Current        | 90 VAC, 130 W load   |             | 3.3 |     | A <sub>RMS</sub> |     |
| Input Protection     | Non-user serviceable internally located AC input line fuse.                  |             |     |     |                  |     |
| Inrush Surge Current | Internally limited by thermistor. Vin = 264 VAC (one cycle). 25° C.          |             |     | 38  | A <sub>PK</sub>  |     |
| Operating Frequency  | Switching frequency of main transformer.                                     | Range:      | 16  | 120 | kHz              |     |

## 4. OUTPUT SPECIFICATIONS

| PARAMETER              | CONDITIONS / DESCRIPTION   | MIN  | NOM                       | MAX | UNITS |
|------------------------|--|------|---------------------------|-----|-------|
| Efficiency             | Full Load @ 115 VAC (Varies with distribution of loads among outputs.)   |      | 71% typical               |     |       |
| Minimum Loads          | MAP130-1012  | 1.25 |                           |     | A     |
|                        | MAP130-1024  | 0.63 |                           |     |       |
|                        | MAP130-1005 and all multiple output models, main channel only  | 3.00 |                           |     |       |
| Ripple and Noise       | Full Load, 20 MHz Bandwidth.   |      | See Model Selection Chart |     |       |
| Output Power           | Continuous output power, all multiple output models.   |      |                           | 130 | W     |
|                        | Peak output power (60s max., 10% duty cycle), all multiple output models.  |      |                           | 165 |       |
| Overshoot / Undershoot | Output voltage overshoot/undershoot at turn-on / turn-off.   |      |                           | 1   | %     |
| Regulation             | Varies by output, regulation includes line changes from 90-132 VAC or 175-264 V, changes in load starting at 20% load and changing to 100% load. |      | See Model Selection Chart |     |       |
| Transient Response     | Recovery time, to within 1% of initial set point due to a 50-100% load change, 4% max. deviation. (Main output only on multiple output units).   |      |                           | 500 | µs    |
| Turn-on Delay          | Time required for initial output voltage stabilization.  |      |                           | 2   | s     |
| Turn-on Rise Time      | Time required for output voltage to rise from 10% to 90%.  |      |                           | 20  | ms    |

## 5. INTERFACE SIGNALS & INTERNAL PROTECTION

| PARAMETER                            | CONDITIONS / DESCRIPTION   | MIN              | NOM  | MAX  | UNITS |
|--------------------------------------|--|------------------|------|------|-------|
| Overvoltage Protection               | Provided on single output units and only the main output of multiple output units.                                     | MAP130-1012      | 17.0 | 22.0 | VDC   |
|                                      |  | MAP130-1024      | 32.0 | 37.0 |       |
|                                      |  | All other models | 5.5  | 6.8  |       |
| Overcurrent Protection               | All models have inherent short circuit protection. Units will automatically restart at the removal of the fault.       |                  |      |      |       |
| Remote Sense                         | Total voltage compensation for main output cable losses.   |                  |      | 250  | mV    |
| Power Fail Warning <sup>7</sup>      | Logic LO (denotes power fail detected).  |                  |      | 0.7  | V     |
|                                      | Logic HI with internal pull-up to output.  |                  | 10   |      | kΩ    |
|                                      | Power Fail trip point, maximum load, decreasing line.  | 86               |      | 94   | VAC   |
|                                      | Time before regulation dropout, at full load, due to loss of input power.  | 5                |      |      | ms    |
| Overtemperature Warning <sup>8</sup> | Warning prior to system shutdown due to excessive internal temperatures. Shifts Power Fail signal to a logic LO state. | 20               |      |      | ms    |

<sup>7</sup> Power Fail not available on MAP130-1012 and MAP130-1024.

<sup>8</sup> MAP130-1012 and MAP130-1024 have overtemperature protection, but do not have the warning feature.



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## 6. SAFETY SPECIFICATIONS

| PARAMETER                    | CONDITIONS / DESCRIPTION   | MIN  | NOM | MAX | UNITS |
|------------------------------|--|------|-----|-----|-------|
| Agency Approvals             | Approved to the latest edition of the following standards; UL/CSA 60950-1, IEC 62368-1 and EN 62368-1. |      |     |     |       |
| Dielectric Withstand Voltage | Input to Chassis   | 2121 |     |     | VDC   |
|                              | Input to Output (tested by manufacturer only)  | 4242 |     |     |       |
| Insulation Resistance        | Input to output  | 7    |     |     | MΩ    |
| Touch Current                | EN 62368-1, 264 VAC  |      |     | 800 | μA    |

## 7. EMC SPECIFICATIONS

**MAP130 complies with EMC product standard EN 61204-3.**

Conducted emissions EN 55032 Class B

Radiated emissions EN 55032 Class B (MAP130-1005 meets Class A)

| PHENOMENON   | BASIC STANDARD | TEST ITEM   | TEST SPECIFICATION                         | PERFORMANCE CRITERIA |
|--|----------------|---|--|----------------------|
| Radio-frequency electromagnetic field<br>Amplitude modulated | EN 61000-4-3   | Frequency<br>Field strength<br>AM 1 kHz             | 80 - 1000 MHz<br>10 V/m<br>80%             | A                    |
|  |                |   | 1,4 to 2 GHz<br>3 V/m<br>80%               |                      |
| Fast transient   | EN 61000-4-4   | Line to ground voltage<br>Tr/Th<br>Repetition freq. | 2 to 2,7 GHz<br>1 V/m<br>80 %              | A                    |
|  |                |   | ±2 kV<br>5/50 ns<br>100 kHz                |                      |
| Conducted disturbances<br>induced by radio-frequency fields  | EN 61000-4-6   | Frequency<br>Amplitude<br>AM 1 kHz                  | 0,15 to 80 MHz<br>10 V<br>80 %             | A                    |
| Voltage dips   | EN 61000-4-11  | Residual voltage                                    | 0 % during 1/2 cycle<br>0 % during 1 cycle | A                    |
|  |                |   | 40 % during 10/12 cycles<br>at 50/60 Hz    |                      |
|  |                |   | 70 % during 25/30 cycles<br>at 50/60 Hz    |                      |
|  |                |   | 80 % during 250/300 cycles<br>at 50/60 Hz  | B                    |

## 8. ENVIRONMENTAL SPECIFICATIONS

| PARAMETER                           | CONDITIONS / DESCRIPTION                  | MIN | NOM   | MAX   | UNITS            |
|-------------------------------------|---|-----|-------|-------|------------------|
| Altitude                            | Operating                                 |     |       | 6.5   | kilofeet         |
|                                     | Non-operating                             |     |       | 40    |                  |
| Operating Temperature <sup>11</sup> | Derate linearly above 50°C by 2.5% per °C |     |       |       |                  |
|                                     | At 100% load:                             | 0   |       | 50    | °C               |
|                                     | At 50% load:                              | 0   |       | 70    |                  |
| Storage Temperature                 |   | -40 |       | 85    | °C               |
| Temperature Coefficient             | 0°C to 70°C (after 15-minute warm-up)     |     | ±0.02 | ±0.05 | %/°C             |
| Relative Humidity                   | Non-condensing                            | 5   |       | 95    | %RH              |
| Shock                               | Operating, peak acceleration              |     |       | 20    | G <sub>PK</sub>  |
| Vibration                           | Random vibration, 10 Hz to 2 kHz, 3 axis  |     |       | 6     | G <sub>RMS</sub> |

<sup>11</sup> External airflow of minimum 23 CFM used in ambient over 25°C.

## 9. MECHANICAL SPECIFICATIONS / OPTIONS

| PARAMETER      | CONDITIONS / DESCRIPTION   | MIN                  | NOM  | MAX | UNITS |
|----------------|--|----------------------|------|-----|-------|
| Dimensions     |  | 215.9 x 114.3 x 50.8 |      |     | mm    |
|                |  | 8.50 x 4.50 x 2.00   |      |     |       |
| Weight         |  |                      | 1.13 |     | kg    |
|                |  |                      | 2.5  |     | lb    |
| Cover (Option) | Order the cover number 412-59586-G separately.<br>For convection cooled applications with covers, derate output power as follows:<br>Derate all multiple output models and MAP130-1005 to 120 watts.<br>Derate MAP130-1012 and MAP130-1024 to 140 watts. |                      |      |     |       |
|                | Dimensions:  | 215.9 x 114.3 x 55.1 |      |     | mm    |
|                |  | 8.5 x 4.5 x 2.17     |      |     | in    |

## 10. CONNECTIONS

| CONNECTOR                  | CONDITIONS / DESCRIPTION   |
|----------------------------|--|
| Input & Output Connectors  | 6-32 screw wire clamps on 0.312" (7.9 mm) centers,<br>0.045" (1.1 mm) square pins on 0.156" (3.96 mm) centers,<br>Mates with Molex series 2139, 6442 & 41695 |
| Power Fail Connections, J2 | 0.035" (0.89 mm) square pins on 0.100" (2.54 mm) centers;<br>Mates with Molex series 2695 & 6471   |
| Chassis                    | 0.090" (2.286 mm) aluminum alloy with clear finish   |



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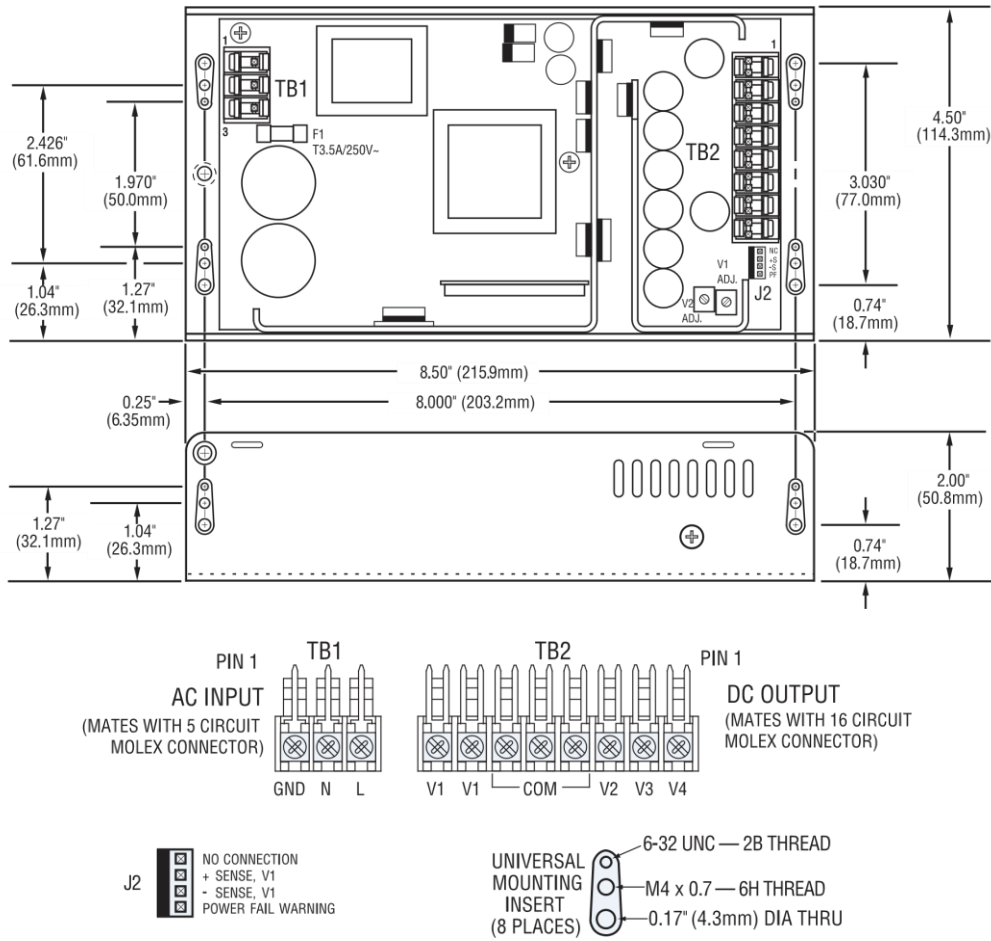


Figure 1. Mechanical Drawing

For more information on these products consult: [tech.support@psbel.com](mailto:tech.support@psbel.com)

**NUCLEAR AND MEDICAL APPLICATIONS** - Products are not designed or intended for use as critical components in life support systems, equipment used in hazardous environments, or nuclear control systems.

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