

# P R B X

POWERBOX Defense Line 600  
DBB Series  
600W  
AC/DC Conduction Cooled

## Description

The DBB, very compact and low profile 600W AC/DC power supply in chassis format, incorporates input filtering, input and output protections, very robust mechanical mounting and connection, conformal coating and MIL-STD options required in most of the severe environment for industrial, defense applications. The PSU provides high reliability, high efficiency, input-to-output isolation, soft start and active very low inrush circuit, overtemperature protection, input over/undervoltage lockout. The PSU is configurable with 1 to 3 outputs in many output voltages from 3V3 to 48VDC, other outputs are even possible as semi-standard versions, they are continuously short-circuit proof. The 100°C baseplate allows operation in high temperature environment.

## Features

85-264 VAC input voltage ranges , PFC  
1-3 isolated outputs  
200\*127\* 40mm very low profile  
Industrial or ruggedized versions  
Active very low inrush current  
Many output configurations are available  
Conduction cooled 100°C baseplate  
Safety IEC/EN 60950-1, RoHS lead-free-solder compliant

## Input

|                         |                                                                              |
|-------------------------|------------------------------------------------------------------------------|
| Operating input voltage | 85-264VAC. 100-350VDC.                                                       |
| Frequency               | 44Hz min, 50Hz typ, 440Hz max.                                               |
| Power factor            | 0.96 typ, 0.98 max, 230VAC, 50Hz, Pnom.                                      |
| Input current           | 16A at Vin min.                                                              |
| No-load input power     | 15W at Vin typ.                                                              |
| Peak inrush current     | 4A typ, 10A max at Vin max                                                   |
| Start-up time           | 2s typ, 5s max                                                               |
| Input fuse              | A fuse mounted inside the psu protects against damages in case of a failure. |
| Fuse type               | Littlefuse, 10A, 0451010.MRL.                                                |
| Transient protection    | Yes, automatic recovery.                                                     |

## Output

|                           |                                                                                      |
|---------------------------|--------------------------------------------------------------------------------------|
| Parallel operation        | Yes, active current sharing<br>Parallel only identical outputs (voltage and power)   |
| Redundant operation       | Requires external oring diodes.                                                      |
| Hold-up time              | See manual                                                                           |
| Output current limitation | All outputs are protected against short circuit                                      |
| Overvoltage protection    | Incorporated on each output, latching.                                               |
| Remote on/off             | An isolated INHIB signal disable corresponding output voltage when connected to RTN. |
| Output voltage adjustment | 90-110%Vnom.                                                                         |
| Remote sense              | V1, V2, total drop <0.5V, positive line drop <0.25V.                                 |
| Powergood & LED           | Each output, referenced to RTN, OK-closed.                                           |
| Auxiliary bias voltage    | Limited to 200mA.                                                                    |

## Environmental

|                         |                                                |
|-------------------------|------------------------------------------------|
| Operating ambient temp. | -20°C to +71°C, see derating (T-option -40°C). |
| Heatsink temperature    | -20°C to +100°C (T-option -40°C).              |
| Storage temperature     | -40°C to +125°C.                               |
| Thermal considerations  | Baseplate should not exceed 100°C.             |
| Thermal protection      | 105°C +/-5°C baseplate, automatic recovery.    |



|            |                          |
|------------|--------------------------|
| Damp heat  | MIL STD 810F Proc. 507.4 |
| Shock      | MIL STD 810F Proc. 516.5 |
| Vibrations | MIL STD 810F Proc. 514.5 |

## General

|                       |                                                                                   |
|-----------------------|-----------------------------------------------------------------------------------|
| MTBF                  | MIL-HDBK-217F, GB, 40°C baseplate, 285000h                                        |
| Electric strenght     | Input to earch 1500Vrms.<br>Input to output 3000Vrms.<br>Output to earth 500Vrms. |
| Insulation resistance | >100Mohms.                                                                        |
| Dimensions            | 200 x 127 x 40mm.                                                                 |
| Weight                | Approx 1,02 kg.                                                                   |
| Case                  | Aluminum natural.                                                                 |

## Standards

|                         |                                                                   |
|-------------------------|-------------------------------------------------------------------|
| Safety standards        | Built to meet IEC60950-1.                                         |
| EMC                     |                                                                   |
| Surges                  | Built to meet EN61000-4-5, 1kV, Criteria B.<br>2kV, Criteria A.   |
| Electrostatic discharge | Built to meet EN61000-4-2, 8000V, Critiera B.                     |
| Fast transients/burst   | Built to meet EN61000-4-4, 4000V, Critiera B.                     |
| Harmonics               | Built to meet EN61000-3-2.                                        |
| Flickers                | Built to meet EN61000-3-3.<br>Built to meet EN61000-4-3, -6, -11. |

## Options

## Description

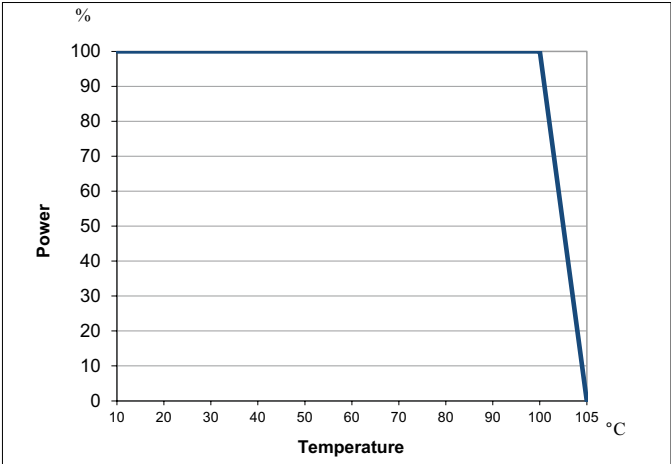
|                         |                                                                                                                                                                          |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MIL-STD ruggedized (-M) | Meet MIL-STD 461E CE102, MIL-STD 1399-300A, MIL-STD810E shock & vibrations.<br>No laboratory certification.                                                              |
| -40°C operation (-T)    | The thermal grade of the DC/DC converters used and other components are changed to comply with low ambient temperature.                                                  |
| Conformal coating (-V)  | During manufacturing process , when V option is specified, components and pcb are covered with an acrylic coating to address high level of ambient humidity application. |
| Heatsink (-H, -H1)      | -H: a 15 mm heatsink is mounted on the baseplate with longitudinal fins.<br>-H1: a 15 mm heatsink is mounted on the baseplate with transversal fins.                     |
| IP enclosure (-IP)      | IP65 sealed enclosure.                                                                                                                                                   |

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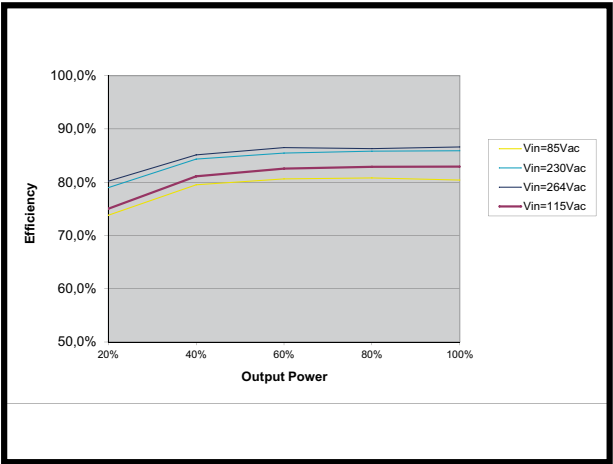
| Output                 |             | 3V3                              |     |      | 5V  |     |     | 12V  |      |      | 15V  |     |      | 24V  |     |      | 28V  |      |      | 48V  |     |      |      |
|------------------------|-------------|----------------------------------|-----|------|-----|-----|-----|------|------|------|------|-----|------|------|-----|------|------|------|------|------|-----|------|------|
| Characteristics        | Conditions  | min                              | typ | max  | min | typ | max | min  | typ  | max  | min  | typ | max  | min  | typ | max  | min  | typ  | max  | min  | typ | max  | Unit |
| Output voltage         |             | 3V3                              |     |      | 5   |     |     | 12   |      |      | 15   |     |      | 24   |     |      | 28   |      |      | 48   |     |      | V    |
| Trim range             | Factory set | 3                                |     | 3.6  | 4.5 |     | 5.5 | 10.8 |      | 13.2 | 13.5 |     | 16.5 | 21.6 |     | 26.2 | 25.2 |      | 30.8 | 43.2 |     | 51.8 | V    |
| Overvoltage protection |             | 4.5                              |     |      | 6.5 |     |     | 14.9 |      |      | 18.5 |     |      | 29.1 |     |      | 34   |      |      | 58   |     |      | V    |
| Output noise           | 20Mhz       | 100                              |     |      | 100 |     |     | 150  |      |      | 150  |     |      | 150  |     |      | 150  |      |      | 200  |     |      | mVpp |
| Efficiency             |             | 75                               |     |      | 83  |     |     | 85   |      |      | 84   |     |      | 85   |     |      | 83   |      |      | 84   |     |      | %    |
| Load regulation        | Vin nom     | 1                                |     |      | 1   |     |     | 0.5  |      |      | 0.5  |     |      | 0.4  |     |      | 0.4  |      |      | 0.4  |     |      | %    |
| M board                |             | includes 1 M module below        |     |      |     |     |     |      |      |      |      |     |      |      |     |      |      |      |      |      |     |      |      |
| Output current         |             | 0                                |     | 80   | 0   |     | 80  | 0    |      | 50   | 0    |     | 40   | 0    |     | 25   | 0    |      | 21.5 | 0    |     | 12.5 | A    |
| Max power              |             | 264                              |     |      | 400 |     |     | 600  |      |      | 600  |     |      | 600  |     |      | 600  |      |      | 600  |     |      | W    |
| Output current limit   |             | 92                               | 104 |      | 92  | 108 |     | 57.5 | 67.5 |      | 46   | 56  |      | 29   | 39  |      | 24   | 29   |      | 14   | 17  |      | A    |
| m board                |             | includes up to 2 m modules below |     |      |     |     |     |      |      |      |      |     |      |      |     |      |      |      |      |      |     |      |      |
| Output current         |             | 0                                |     | 45   | 0   |     | 40  | 0    |      | 25   | 0    |     | 20   | 0    |     | 12.5 | 0    |      | 10.7 | 0    |     | 6.25 | A    |
| Max power              |             | 150                              |     |      | 200 |     |     | 300  |      |      | 300  |     |      | 300  |     |      | 300  |      |      | 300  |     |      | W    |
| Output current limit   |             | 54                               | 64  |      | 46  | 52  |     | 29   | 35   |      | 23   | 26  |      | 14.5 | 17  |      | 12.5 | 14.5 |      | 7.2  | 8.2 |      | A    |
| μ board                |             | includes up to 3 μ modules below |     |      |     |     |     |      |      |      |      |     |      |      |     |      |      |      |      |      |     |      |      |
| Output current         |             | 0                                |     | 22.7 | 0   |     | 20  | 0    |      | 12.5 | 0    |     | 10   | 0    |     | 6.25 | 0    |      | 5.3  | 0    |     | 3.1  | A    |
| Max power              |             | 75                               |     |      | 100 |     |     | 150  |      |      | 150  |     |      | 150  |     |      | 150  |      |      | 150  |     |      | W    |
| Output current limit   |             | 25                               | 31  |      | 23  | 26  |     | 14.5 | 17   |      | 11   | 14  |      | 7.2  | 8.2 |      | 6.2  | 7    |      | 3.6  | 4.4 |      | A    |

General conditions: 25°C ambient. For each output voltage max. power configuration.

Derating Curve

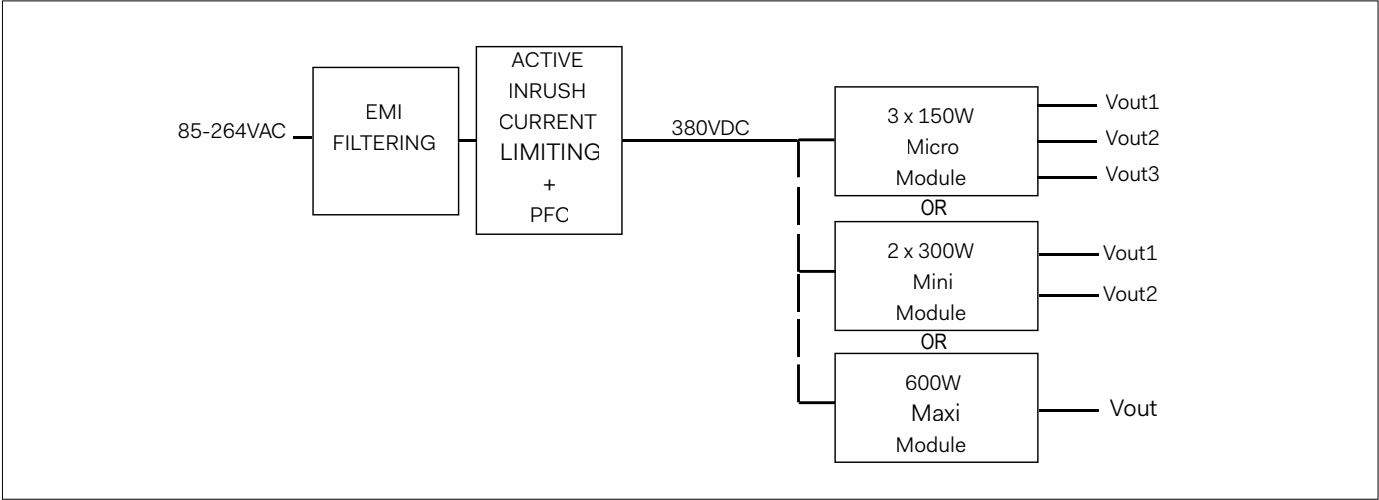


Efficiency curve



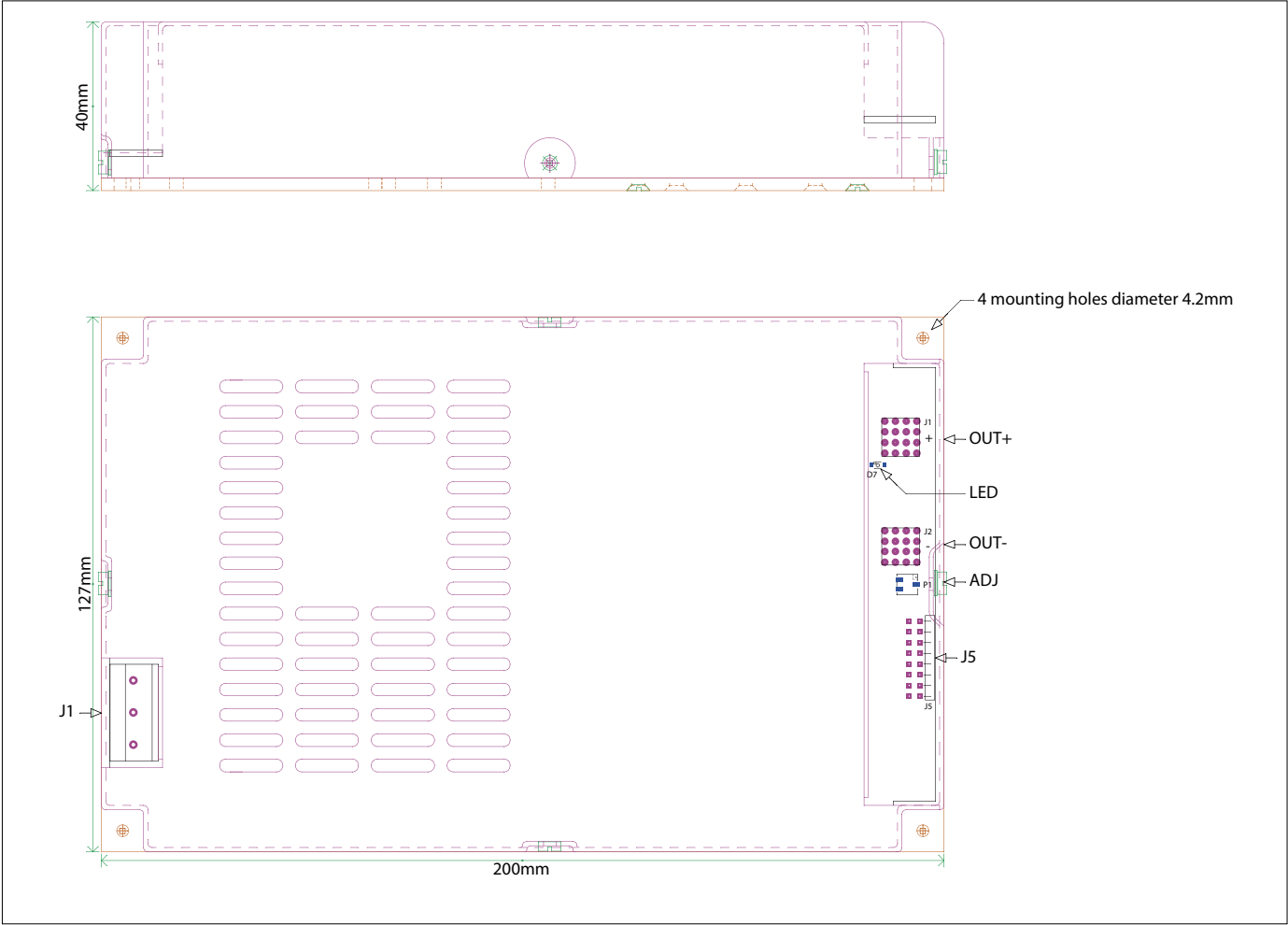
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Block Diagram



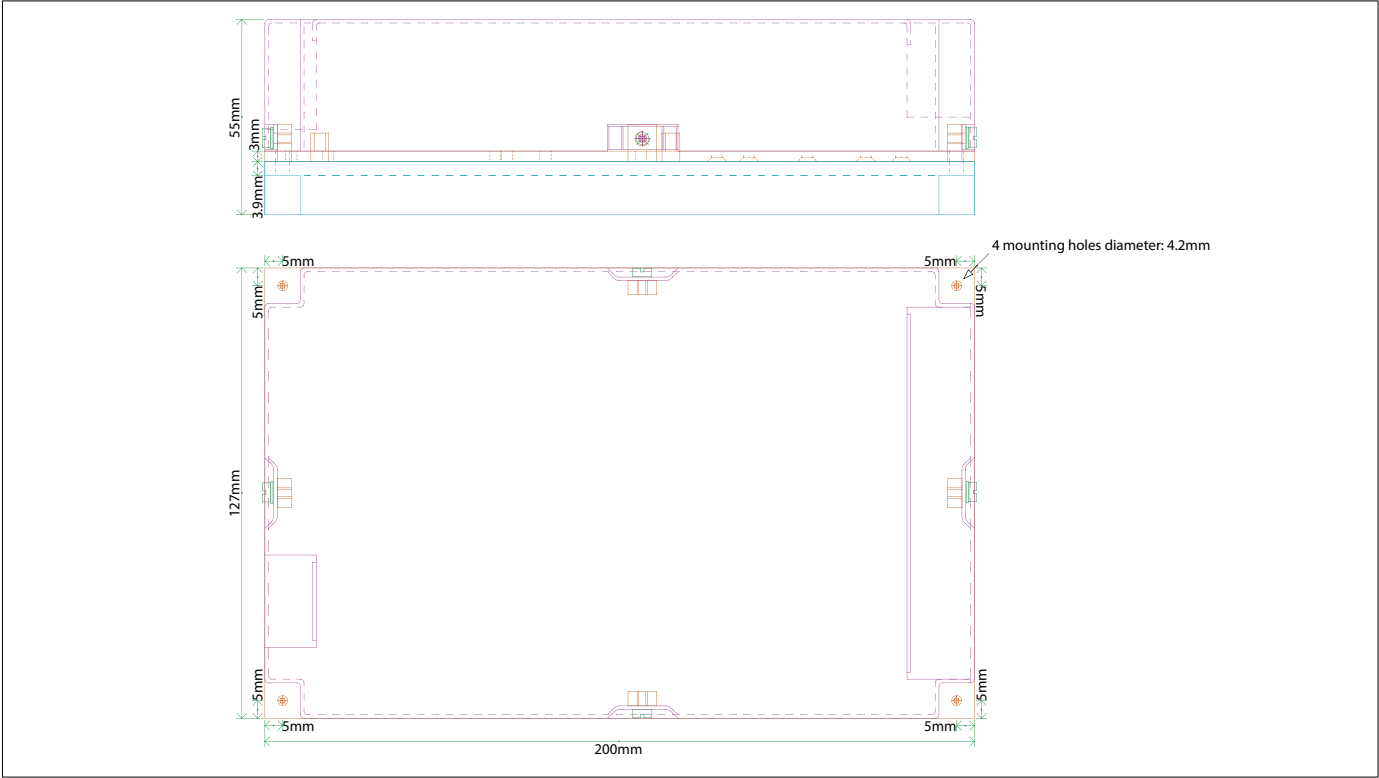
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Mechanical

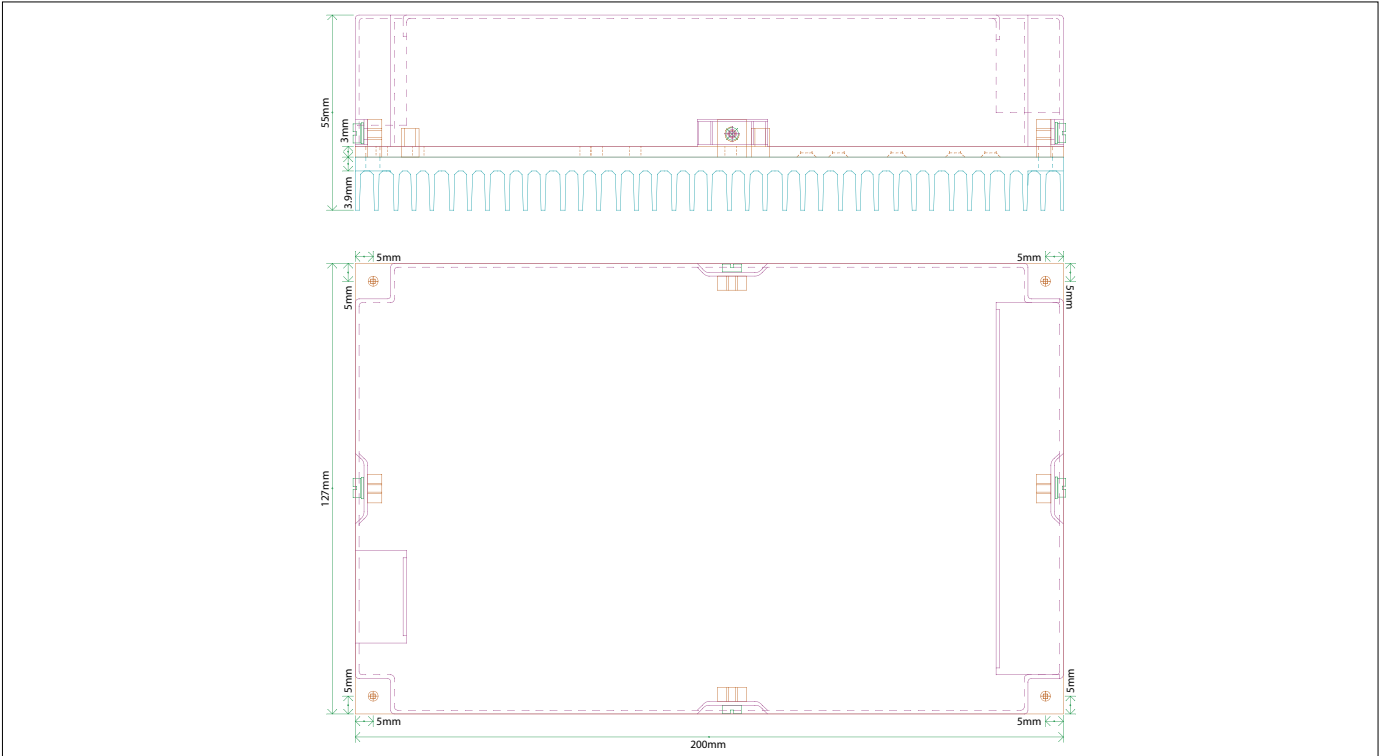


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Mechanical - H Option

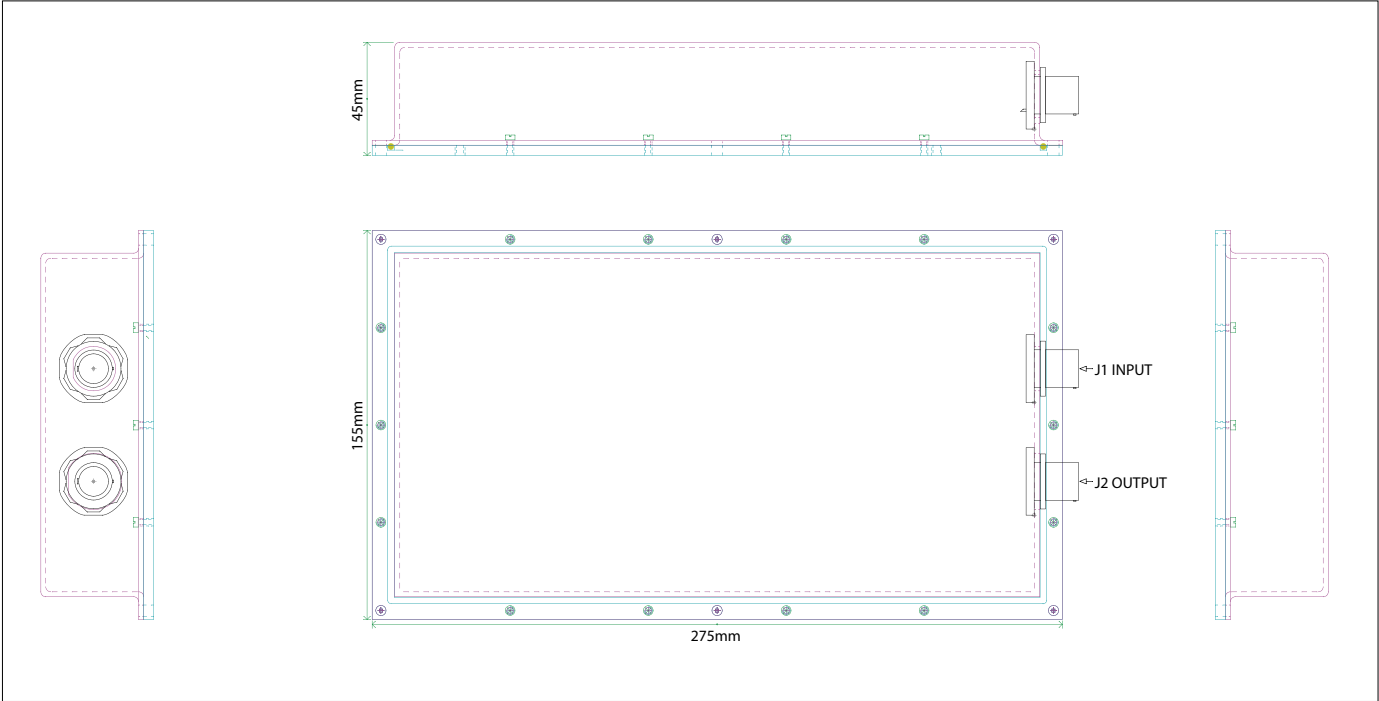


Mechanical - H1 Option



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Mechanical - IP Option



Pin Connection

| Description                                            | Pin           | Connector                        |
|--------------------------------------------------------|---------------|----------------------------------|
| <b>Input screw type connector GMKDS 3/3-7.62</b>       |               |                                  |
| 1                                                      | J1-1          | Earth                            |
| 2                                                      | J1-2          | Neutral AC/N                     |
| 3                                                      | J1-3          | Line AC/L                        |
| <b>Signals Wurth 690368191472 Female Male 2*7 pins</b> |               |                                  |
| μ-board                                                | m-board       | M-board                          |
| J5-1 : ACFAIL                                          | J5-1 : ACFAIL | J5-1 : ACFAIL                    |
| J5-2 : PGOOD                                           | J5-2 : PGOOD  | J5-2 : PGOOD                     |
| J5-3 : RTN                                             | J5-3 : RTN    | J5-3 : RTN                       |
| J5-4 : INHIB                                           | J5-4 : INHIB  | J5-4 : NC                        |
| J5-5 : +5VAUX                                          | J5-5 : +5VAUX | J5-5 : +5VAUX                    |
| J5-6 : S1+                                             | J5-6 : S1+    | J5-6 : NC                        |
| J5-7 : S1-                                             | J5-7 : S1-    | J5-7 : NC                        |
| J5-8 : ADJ1                                            | J5-8 : ADJ1   | J5-8 : NC                        |
| J5-9 : NC                                              | J5-9 : PR1    | J5-9 : PR1                       |
| J5-10 : NC                                             | J5-10 : NC    | J5-10 : NC                       |
| J5-11 : ADJ2                                           | J5-11 : PR2   | J5-11 : INHIB                    |
| J5-12 : S2+                                            | J5-12 : S2+   | J5-12 : S1+                      |
| J5-13 : S2-                                            | J5-13 : S2-   | J5-13 : S1-                      |
| J5-14 : ADJ3                                           | J5-14 : ADJ2  | J5-14 : ADJ1                     |
| <b>Output M-board power connectors</b>                 |               |                                  |
| OUT+                                                   | J1            | Würth Press-Fit M4 Ref : 7461095 |
| OUT-                                                   | J2            | Würth Press-Fit M4 Ref : 7461095 |
| <b>Output m-board power connectors</b>                 |               |                                  |
| OUT1+                                                  | J1            | Würth Press-Fit M3 Ref : 7461093 |
| OUT1-                                                  | J2            | Würth Press-Fit M3 Ref : 7461093 |
| OUT2+                                                  | J3            | Würth Press-Fit M3 Ref : 7461093 |
| OUT2-                                                  | J4            | Würth Press-Fit M3 Ref : 7461093 |
| <b>Output μ-board power connectors</b>                 |               |                                  |
| OUT1+                                                  | J1-1          | Würth Press-Fit M3 Ref : 7461093 |
| OUT1-                                                  | J1-2          | Würth Press-Fit M3 Ref : 7461093 |
| OUT2+                                                  | J1-3          | Würth Press-Fit M3 Ref : 7461093 |
| OUT2-                                                  | J1-4          | Würth Press-Fit M3 Ref : 7461093 |
| OUT3+                                                  | J1-6          | Würth Press-Fit M3 Ref : 7461093 |
| OUT3-                                                  | J1-7          | Würth Press-Fit M3 Ref : 7461093 |

***Authorised, valued-added distributor***

Australia & New Zealand



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