



### Bulletin 1606 — Power Supplies\*\*

- Quick mounting and connecting, innovative DIN-Rail mount, smallest in class
- UL Listed NEC Class 2; Class 1, Div. 2; Semi F47; ODVA Approved
- Low inrush current limiting
- PFC Active or Passive
- Wide range input; auto select input
- Superior overload design (continuous current, no hiccup)
- NEC Class 2 'Limited Power' options
- Selectable operating mode (single/parallel)
- Superior efficiency and temperature rating

#### Special Modules

- Brownout buffer, DC to DC converter, N+1 redundancy, DC UPS

#### Standards Compliance

- World-wide Certifications
- NEC Class 2
- Class 1 Div. 2 (T3A)
- cULus, CE, C-Tick, ATEX
- SEMI F47 Compatible
- ABS/GL/RINA (Marine)

#### Certifications



### Table of Contents

|                                           |           |
|-------------------------------------------|-----------|
| Product Sizing                            | this page |
| Quick Guide                               | 8-8       |
| Special Applications                      | 8-8       |
| Catalog Number                            |           |
| Explanation                               | 8-9       |
| Product Selection                         | 8-9       |
| Specifications and Approximate Dimensions | 8-13      |

\* Not all features apply to all power supplies; see individual power supply descriptions for specifics  
 \*\* A more detailed list of performance specifications can be found at the Allen-Bradley web site  
[http://www.ab.com/industrialcontrols/products/power\\_supplies/index.html](http://www.ab.com/industrialcontrols/products/power_supplies/index.html)

### How to Select a Bulletin 1606 Power Supply

The Bulletin 1606 line of Power Supplies is designed with "reserve power" thereby eliminating the need to oversize your power supply to start high inrush loads.

#### Steps to size a Power Supply

1. Determine the "Average" continuous current of the load and the typical inrush current.
2. Select a power supply where the rated load is at/or below the current of the device and the Peak Current is less than the short-circuit rating of the power supply.

#### Notes:

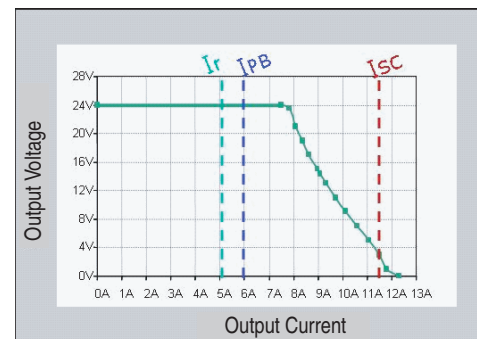
- ReservePower will deliver up to 25% additional current continuously.
- PowerBoost will deliver 150% of rated current for up to 5 s.

#### Example:

Application: Single Phase 120V input, 24V output, 5 A continuous current with 7.5 A inrush current

Solution: 1606-XLS120E

#### Output Characteristic for XLS120E (5 A) Power Supply



IRATED: 5 A  
 ISHORT CIRCUIT: >9 A  
 IPOWER BOOST: 7.5 A

8

| Cat. No.       | IRATED [A] | ISHORT CIRCUIT (25 °C) [A] | IPOWER BOOST OR IRESERVEPOWER [A] |
|----------------|------------|----------------------------|-----------------------------------|
| 1606-XLS80E    | 3.3        | 5.2                        | 5.4§                              |
| 1606-XLS120E   | 5          | 9                          | 7.5§                              |
| 1606-XLS240E   | 10         | 21                         | 15§                               |
| 1606-XLS480E   | 20         | 30                         | 30§                               |
| 1606-XLS480E-3 | 20         | 29                         | 30§                               |
| 1606-XLSDNET4  | 3.8        | 4                          | —                                 |
| 1606-XLSDNET8  | 8          | 7                          | —                                 |
| 1606-XLE80E    | 3.3        | 5.5                        | 3.6                               |
| 1606-XLE120E   | 5          | 11                         | 6                                 |
| 1606-XLE240E   | 10         | 16                         | 12                                |

§ Products with ReservePower.

⚡ Short circuit current values are temperature dependent for the selected product; i.e., the higher the ambient temperature, the lower the short circuit current.

➤ Hiccup Overload design.

## Quick Guide

## Bulletin 1606-(number from table) ⌘ Power Supply Quick Guide

|                    | 15...40 W                   | 50 W              | 60 W                         | 72...80 W                  | 90...100 W            | 120 W                                                              | 180 W  | 240 W                                                              | 480 W                                       | 720 W    | 960 W                    |
|--------------------|-----------------------------|-------------------|------------------------------|----------------------------|-----------------------|--------------------------------------------------------------------|--------|--------------------------------------------------------------------|---------------------------------------------|----------|--------------------------|
| 5...5.5V           | XLP15A<br>XLP25A            | —                 | —                            | —                          | —                     | —                                                                  | —      | —                                                                  | —                                           | —        | —                        |
| 10...12V           | XLP30B                      | —                 | —                            | —                          | —                     | —                                                                  | —      | —                                                                  | —                                           | —        | —                        |
| 12...15V 1-Ph      | XLP15B                      | XLP50B            | XLP60BQ<br>XLP60BQT          | —                          | XLP90B                | —                                                                  | XL180B | —                                                                  | —                                           | —        | —                        |
| 12...15 V 3-Ph     | —                           | —                 | —                            | —                          | XLE96B                | —                                                                  | —      | —                                                                  | —                                           | —        | —                        |
| (+/-)12 and 15V    | XLP36C                      | —                 | —                            | —                          | —                     | —                                                                  | —      | —                                                                  | —                                           | —        | —                        |
| 24...28V 1-Ph      | XLP15E<br>XLP30E<br>XLP30EQ | XLP50E<br>XLP50EZ | XL60D<br>XLP60EQ<br>XLP60EQT | XLS80E<br>XLE80E<br>XLP72E | XLP95E<br>XLP100E     | XLS120E<br>XLS120EA<br>XLE120E<br>XLE120EC<br>XLE120EE<br>XLE120EN | —      | XLS240E<br>XLS240EC<br>XLE240E<br>XLE240EP<br>XLE240EE<br>XLE240EN | XLS480E<br>XLS480EA<br>XLS480EC<br>XLS480EE | —        | XLS960EE                 |
| 24...28V 2-Ph/3-Ph | —                           | —                 | —                            | —                          | XLP90E-2<br>XLP100E-2 | XLE120E-2                                                          | —      | XL240E-3C<br>XLE240E-3                                             | XLS480E-3<br>XLS480E-3C                     | XL720E-3 | XLE960DX-3N<br>XLS960E-3 |
| 36...43V           | —                           | —                 | —                            | —                          | —                     | —                                                                  | —      | —                                                                  | XLS480G-3                                   | —        | —                        |
| 48...56V 1-Ph      | —                           | XLP50F            | —                            | —                          | XLP100F               | —                                                                  | —      | XLE240F                                                            | XLS480F                                     | —        | XLS960FE                 |
| 48...56V 3-Ph      | —                           | —                 | —                            | —                          | —                     | —                                                                  | —      | XLE240F-3                                                          | XLS480F-3                                   | —        | XLE960MX-3N<br>XLS960F-3 |
| 24V Redundant      | —                           | —                 | XL60DR                       | —                          | —                     | XL120DR                                                            | —      | XL240DR                                                            | —                                           | —        | —                        |
| DeviceNet          | —                           | —                 | —                            | XLEDNET3                   | XLSDNET4              | —                                                                  | —      | XLSDNET8                                                           | —                                           | —        | —                        |

⌘ Example: For a 24...28 Volt, 3-Phase, 120 Watt power supply, the **Cat. No.** would be **1606-XL120E-3**.

## Special Applications

| Bulletin Number | NEC Class 2                                                                                                                                           | ABS/GL Marine                                                                                                                     | Hazardeous Location Rating, Class 1 Div 2                                                                                                  | ODVA Requirements    | Conformal Coating                   | ATEX                             |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-------------------------------------|----------------------------------|
| 1606-XLE        | XLE80E                                                                                                                                                | All XLE Power Supplies                                                                                                            | All XLE Power Supplies                                                                                                                     | XLEDNET3             | XLE120EC                            | —                                |
| 1606-XLP        | XLP15A<br>XLP15B<br>XLP15E<br>XLP25A<br>XLP30B<br>XLP30E<br>XLP36C<br>XLP50B<br>XLP50E<br>XLP50EZ<br>XLP50F<br>XLP72E<br>XLP90B<br>XLP90E-2<br>XLP95E | XLP15A<br>XLP15B<br>XLP15E<br>XLP25A<br>XLP30E<br>XLP36C<br>XLP50E<br>XLP50EZ<br>XLP72E<br>XLP90B<br>XLP100E<br>XLP100F<br>XLPRED | XLP15A<br>XLP15B<br>XLP15E<br>XLP25A<br>XLP30B<br>XLP30E<br>XLP50B<br>XLP50E<br>XLP50EZ<br>XLP72E<br>XLP90B<br>XLP95E<br>XLP100E<br>XLPRED | —                    | —                                   | —                                |
| 1606-XLS        | XLSDNET4                                                                                                                                              | ALL XLS Power Supplies                                                                                                            | All XLS Power Supplies*                                                                                                                    | XLSDNET4<br>XLSDNET8 | XLS240EC<br>XLS480E-C<br>XLS480E-3C | XLS120EA<br>XLS240EA<br>XLS480EA |

\* Cat. No. 1606-XLS240K does not have Hazardeous Location Rating.

## Catalog Number Explanation

**Important:** The following cat. no. breakdown is for explanation purposes only. It is not a product configurator. Not all combinations of fields are valid product cat. nos. First, select the desired power supply using the Product Selection tables. Then, use this breakdown for verification and explanation only.

1606 – XLS 480 E – 3  
a b c d e

| a                 |                    | b                  |             | c              |                             | e                      |                                                      |
|-------------------|--------------------|--------------------|-------------|----------------|-----------------------------|------------------------|------------------------------------------------------|
| Power Supply Type |                    | Rated Output Watts |             | Output Voltage |                             | Multi-Phase Variations |                                                      |
| Code              | Description        | Code               | Description | Code           | Description                 | Code                   | Description                                          |
| XLP               | Compact family     | 15                 | 15 W        | A              | 5V DC                       |                        | Can be left blank                                    |
| XLS               | Performance family | 25                 | 25 W        | B              | 10...12V DC or 12...15 V DC | -2                     | Two phase                                            |
| XLE               | Essential family   | 30                 | 30 W        | C              | Dual +/- 12 and 15V DC      | -3                     | Three phase                                          |
|                   |                    | 36                 | 36 W        | D              | 24V DC                      | -3C                    | Three phase, conformal coating                       |
|                   |                    | 40                 | 40 W        | E              | 24...28V DC                 | -3H                    | Three phase, input voltage 400V AC and 450...700V DC |
|                   |                    | 50                 | 50 W        | F              | 48...56V DC                 | -3N                    | Three phase, input voltage 480V AC                   |
|                   |                    | 60                 | 60 W        | G              | 36...43V DC                 | -D                     | 360...900V - DC Only                                 |
|                   |                    | 72                 | 72 W        | M              | 48V DC                      |                        |                                                      |
|                   |                    | 80                 | 80 W        |                |                             |                        |                                                      |
|                   |                    | 90                 | 90 W        |                |                             |                        |                                                      |
|                   |                    | 95                 | 95 W        |                |                             |                        |                                                      |
|                   |                    | 100                | 100 W       |                |                             |                        |                                                      |
|                   |                    | 120                | 120 W       |                |                             |                        |                                                      |
|                   |                    | 180                | 180 W       |                |                             |                        |                                                      |
|                   |                    | 240                | 240 W       |                |                             |                        |                                                      |
|                   |                    | 480                | 480 W       |                |                             |                        |                                                      |
|                   |                    | 720                | 720 W       |                |                             |                        |                                                      |
|                   |                    | 960                | 960 W       |                |                             |                        |                                                      |

| d                 |                                      |
|-------------------|--------------------------------------|
| Special Functions |                                      |
| Code              | Description                          |
|                   | Can be left blank                    |
| C                 | Conformal coating                    |
| R                 | Redundancy module                    |
| P                 | Power factor correction              |
| Z                 | Removeable Terminations              |
| X                 | Semi-Regulated                       |
| E                 | Regional voltage; 230V AC input only |
| N                 | Regional voltage; 120V AC input only |
| A                 | ATEX                                 |

**Note:** Special output signals are only available with the 960 W power supply.

## Product Selection

## 1606-XLS Performance — Single- and Three-Phase

## Single-Phase

| Input Voltage                | Output Power [W] | Output Voltage | Output Current [A] | Input Circuit Protection*                   | Steady State Input Current 120/230 [V AC] | Parallel Operation | DC OK Relay | Cat. No.        |
|------------------------------|------------------|----------------|--------------------|---------------------------------------------|-------------------------------------------|--------------------|-------------|-----------------|
| 100...240V AC, 110...300V DC | 80               | 24...28        | 3.3                | 6 A Slow Blow Fuse or Cat. No. 1489-A1C060  | 1.41/0.82                                 | Yes                | —           | 1606-XLS80E     |
|                              | 120              | 24...28        | 5                  |                                             | 1.10/0.62                                 | Yes                | ✓           | 1606-XLS120E    |
|                              | 120              | 24...28        | 5                  |                                             | 1.10/0.62                                 | Yes                | ✓           | * 1606-XLS120EA |
|                              | 180              | 12...15        | 15                 |                                             | 1.65/0.93                                 | Yes                | ✓           | 1606-XLS180B    |
|                              | 240              | 24...28        | 10                 | 6 A Slow Blow Fuse or Cat. No. 1489-A1C060  | 2.22/1.22                                 | Yes                | ✓           | 1606-XLS240E    |
|                              | 240              | 24...28        | 10                 |                                             | 2.22/1.22                                 | Yes                | ✓           | * 1606-XLS240EA |
|                              | 240              | 24...28        | 10                 |                                             | 2.22/1.22                                 | Yes                | ✓           | ▶ 1606-XLS240EC |
|                              | 240              | 48...56        | 5                  |                                             | 2.22/1.22                                 | Yes                | ✓           | 1606-XLS240F    |
|                              | 240              | 28...32        | 8                  |                                             | 2.22/1.22                                 | Yes                | ✓           | 1606-XLS240K    |
|                              | 480              | 24...28        | 20                 | 10 A Slow Blow Fuse or Cat. No. 1489-A1C100 | 4.56/2.48                                 | Yes                | ✓           | 1606-XLS480E    |
|                              | 480              | 24...28        | 20                 |                                             | 4.56/2.48                                 | Yes                | ✓           | ▶ 1606-XLS480EC |
|                              | 480              | 24...48        | 20                 |                                             | 4.56/2.48                                 | Yes                | ✓           | * 1606-XLS480EA |
| 200...240V AC                | 480              | 48...56        | 10                 |                                             | 4.56/2.48                                 | Yes                | ✓           | 1606-XLS480F    |
| 100...240V AC, 110...300V DC | 480              | 36...42        | 13.3               |                                             | 4.56/2.48                                 | Yes                | ✓           | 1606-XLS480G    |
| 200...240V AC, 220...300V DC | 960              | 24...28        | 40                 |                                             | —/4.6                                     | Yes                | ✓           | 1606-XLS960EE   |

\* Unit has internal (not accessible/replaceable) input fuse. Additional protection is not required if used on branch circuits ≤ UL test levels. Consult local codes and regulations for installation.

▶ The **C** suffix in the Cat. No. indicates that the product has **conformal coating**.

\* The **A** suffix in the Cat. No. indicates that the product carries the **ATEX** rating.

1606-XLP Compact — Single- and Two-Phase  
Single-Phase

| Input Voltage                          | Output Power [W] | Output Voltage | Output Current [A] | Input Circuit Protection                          | Steady State Input Current 120/230 [V AC] | Parallel Operation | DC OK Relay  | Cat. No.      |
|----------------------------------------|------------------|----------------|--------------------|---------------------------------------------------|-------------------------------------------|--------------------|--------------|---------------|
| 100...240V AC, 85...375V DC            | 15               | 5...5.5        | 3                  | 10 A Slow Blow Fuse or Cat. No. 1489-A1C100/ 15 A | 0.28/0.17                                 | Yes                | —            | 1606-XLP15A   |
|                                        |                  | 12...15        | 1.3                |                                                   | 0.28/0.17                                 |                    | —            | 1606-XLP15B   |
|                                        |                  | 24...28        | 0.6                |                                                   | 0.28/0.17                                 |                    | —            | 1606-XLP15E   |
|                                        | 25               | 5...5.5        | 5                  |                                                   | 0.60/0.30                                 | Yes                | —            | 1606-XLP25A   |
|                                        | 30               | 10...12        | 3                  |                                                   | 0.60/0.25                                 | Yes                | —            | 1606-XLP30B   |
|                                        |                  | 24...28        | 1.3                |                                                   | 0.60/0.35                                 |                    | —            | 1606-XLP30E   |
|                                        |                  |                |                    |                                                   | 0.54/0.30                                 |                    | —            | 1606-XLP30EQ  |
|                                        | 36               | +/- 12/15V     | 2.8                |                                                   | 0.65/0.40                                 | No                 | —            | 1606-XLP36C   |
|                                        | 50               | 12...15        | 4.2                |                                                   | 1.00/0.60                                 | Yes                | —            | 1606-XLP50B   |
|                                        |                  | 24...28        | 2.1                |                                                   | 0.77/0.44                                 | Yes                | —            | 1606-XLP50E   |
|                                        |                  | 24...28        | 2.1                |                                                   | 1.00/0.60                                 | Yes                | —            | 1606-XLP50EZ  |
|                                        |                  | 48...56        | 1                  |                                                   | 1.00/0.60                                 | Yes                | —            | 1606-XLP50F   |
|                                        | 54               | 12...15        | 4.5                |                                                   | 0.91/0.54                                 | Yes                | —            | 1606-XLP60BQ  |
|                                        | 54               | 12...15        | 4.5                |                                                   | 0.97/0.61                                 | Yes                | —            | 1606-XLP60BQT |
|                                        | 60               | 24...48        | 2.1                |                                                   | 0.98/0.58                                 | Yes                | —            | 1606-XLP60EQ  |
|                                        | 60               | 24...48        | 2.1                |                                                   | 1.05/0.66                                 | Yes                | —            | 1606-XLP60EQT |
| 100...120/220...240V AC, 220...375V DC | 72               | 24...28        | 3                  | 1.60/0.80                                         | Yes                                       | —                  | 1606-XLP72E  |               |
|                                        | 90               | 12...15        | 7.5                | 1.90/0.90                                         | Yes†                                      | —                  | 1606-XLP90B  |               |
| 100...200/200...240V AC, 220...375V DC | 95               | 24...28        | 3.9                | 2.00/0.95                                         | No                                        | —                  | 1606-XLP95E  |               |
|                                        | 100              | 24...28        | 4.2                | 2.10/1.00                                         | Yes†                                      | —                  | 1606-XLP100E |               |
|                                        |                  | 48...56        | 2.1                | 2.10/1.00                                         | Yes†                                      | —                  | 1606-XLP100F |               |

Two-Phase

| Input Voltage | Output Power [W] | Output Voltage | Output Current [A] | Input Circuit Protection                                 | Steady State Input Current 400...480 [V AC] | Parallel Operation | DC OK Relay | Cat. No.       |
|---------------|------------------|----------------|--------------------|----------------------------------------------------------|---------------------------------------------|--------------------|-------------|----------------|
| 380...480V AC | 90               | 24...28        | 3.75               | 10 A Slow Blow Fuse or<br>Cat. No. 1489-A1C100/<br>20 A* | 2 x 0.36                                    | No‡                | —           | 1606-XLP90E-2  |
| 380...480V AC | 100              | 24...28        | 4.2                |                                                          | 2 x 0.40                                    | Yes‡               | —           | 1606-XLP100E-2 |

\* Unit has internal (not accessible/replaceable) input fuse. Additional protection is not required if used on branch circuits ≤ UL test levels.  
‡ Single/parallel operation (inclined characteristic) selectable (jumper). Consult local codes and regulations for installation.

Bulletin 1606 Back-of-Panel Brackets

Instead of snapping the power supply onto a DIN Rail, you can mount it to the back of the panel. This set consists of two steel brackets which replace the existing DIN Rail aluminum brackets at the back of the unit.

**Note:** You need one set per unit.

| Description                                                                 | Cat. No. |
|-----------------------------------------------------------------------------|----------|
| Back-of-panel bracket for XLS and XLE power supplies, <b>below 20 A</b>     | 1606-XLB |
| Back-of-panel bracket for XLS and XLE power supplies, <b>20 A and above</b> | 1606-XLC |

## Bulletin 1606-XLP

|                                                 | 1606-XLP95E                                        | 1606-XLP100E                                                                                                                             | 1606-XLP100F                                                                                          | 1606-XLP100E-2                   |
|-------------------------------------------------|----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|----------------------------------|
| Output Volts/Watts                              | 24...28V/95 W                                      | 24...28V/100 W                                                                                                                           | 48...56V/100 W                                                                                        | 24...28V/100 W                   |
| Input Voltage (47...63 Hz)                      | 100...120/220...240V AC auto select; 220...375V DC |                                                                                                                                          |                                                                                                       | 2Ø, 380...480V AC                |
| Operational Range                               | 85...132/184...264V AC                             |                                                                                                                                          |                                                                                                       | 323...552V AC                    |
| Hold-up Time                                    | >40 ms (230V AC)<br>>20 ms (100V AC)               |                                                                                                                                          |                                                                                                       | >48 ms (400V)<br>>85 ms (480V)   |
| Rated Input Current                             | <2.0 A (100V AC)<br><0.95 A (220V AC)              | <2.1 A (100V AC)<br><1.0 A (220V AC)                                                                                                     |                                                                                                       | <0.46 A (400V)<br><0.40 A (480V) |
| Efficiency                                      | typ. 90%                                           |                                                                                                                                          | typ. 91%                                                                                              | typ. 89%                         |
| Output Voltage                                  | 24...28V<br>24.5V preset                           |                                                                                                                                          | 48...56V<br>48V preset                                                                                | 24...28V<br>Preset at 24.5V      |
| Rated Output Current                            | 3.9 A (@ 24.5V),<br>3.2 A (@ 28V)                  | 4.2 A (@ 24.5V),<br>3.6 A (@ 28V)                                                                                                        | 2.1 A (@ 48V),<br>1.8 A (@ 56V)                                                                       | 4.2 A (@ 24V),<br>3.6 A (@ 28V)  |
| Power Boost                                     | —                                                  | —                                                                                                                                        | —                                                                                                     | —                                |
| Ripple/Noise                                    | <50 mV <sub>pp</sub>                               | <50 mV <sub>pp</sub>                                                                                                                     | <50 mV <sub>pp</sub>                                                                                  | <50 mV <sub>pp</sub>             |
| Operating Temperature Range (T <sub>amb</sub> ) | -10...+70 °C<br>>60 °C: 2 W/K derating             |                                                                                                                                          |                                                                                                       |                                  |
| Non-Operating Temperature Range                 | -40...+85 °C                                       |                                                                                                                                          |                                                                                                       |                                  |
| MTBF*                                           | appr. 500 000 hours                                |                                                                                                                                          |                                                                                                       |                                  |
| Dimensions (W x H x D)                          | 73 x 75 x 103 mm                                   |                                                                                                                                          |                                                                                                       |                                  |
| Weight                                          | 360 g                                              |                                                                                                                                          |                                                                                                       |                                  |
| Certifications/Standards*                       | 1, 2, 3, 4, 5, 6, 7                                | 1, 2, 3, 5, 6, 9                                                                                                                         | 1, 2, 3, 5, 6, 9                                                                                      |                                  |
| Special Features                                | NEC Class 2 power supply;<br>Class 1 Div. 2        | Single/parallel operation<br>(inclined characteristic) select<br>on front panel;<br>ABS/GL/RINA (Marine);<br>Class 1 Div. 2;<br>Semi F47 | Single/parallel operation (inclined characteristic) select on front<br>panel;<br>ABS/GL/RINA (Marine) |                                  |

\* 1) = CE, 2) = UL 508 (cULus LISTED), 3) = UL 1950 (cURus), 4) = CSA C22.2, No. 60950, 5) Safety standards = IEC/EN 60950, EN 50178, 6) EMC standards = EN 55011 (Class B), EN 55022 (Class B), EN 61000-6-2, 7) EMC standards = EN 61000-3-2 (A14), EN 50081-1, 9) ABS/GL/RINA (Marine)

♣ MTBF determined by Siemens norm SN 29500 at full load current and 40 °C

### "DC Ok" Output

**Function:** Indicating whether the unit is operating properly. Output can directly energize a relay or a control light.

**Signaling:** Output signal is at a "high" level (24V, current source) in normal operation (no overload, overheating, short circuit). When the output signal switches to "low" level (no power at output), Vout remains for 5 ms (nominal) at nominal load.

**Connection (signal common):** Connection is made with respect to the "Signal GND" terminal (signal output).

**Important:** Do not connect to the power output (terminals + and -).

**Permissible load:** resistance - min. 300 Ω, e.g. 24V relay, control lights (LEDs need no series resistance), Evaluation logic.

**For 5V signal:** In order to receive a 5V signal: switch a 5V Zener diode (0.5 W) and 1 kΩ resistance in parallel between this output and the "Signal GND" terminal.

### "Thermal Alarm" Output

**Function:** Output gives warning shortly before and while overtemperature state occurs. Output can directly control a relay or a control light.

**Signaling:** Output signal is at a "high" level (24V, current source) in normal operation (no overtemperature). At overtemperature, the output switches to "low". Only when the temperature in the unit increases further will the unit reduce its output current (power output).

**Connection and permissible load:** same as for "DC ok" output.

### "Current Monitor" Output

**Function:** Measuring the output current (power output). Output signal is proportional to the output current of the unit.

**Connection:** Made with respect to the "Signal GND" terminal (signal output).

**Important:** Do not connect to the power output (terminals + and -).

**Signaling:** Voltage measuring: Voltage at signal output is 1V per 10 A output current (Ri(voltmeter) > 100 k ohm )  
Current measurement: Current at signal output is 1 mA per 10 A output current (Ri(ammeter) < 100 W)

### "Current Balance" In-/Output

**Function:** Using these terminals, parallel operating units ensure an equal load sharing (active balancing). Balancing also works reliably with decoupling diodes at the power output (redundancy).

**Connection:** Connect together "Current Balance" outputs of all units involved.

**Important:** Signal common here is the - terminal of the power output, not the "Signal GND". Do not connect the "Signal GND" terminals to each other!

### "Signal GND" Terminal

**Function:** Grounding terminal for all signal terminals (not for "Current Balance").

**Connection instructions:** Do not connect this terminal with terminals + or - of the unit (not even over a load: risk of overload). Do not connect this terminal with terminals of other units (not even with the "Signal GND" terminal of another unit).

**Permissible load:** Maximum current load: 0.3 A. Terminal is fused internally with a self-healing fuse (polyswitch).

