

## X Series

## 375 and 500 Watt AC-DC Converters



Input range 85...264 V AC with PFC  
1 or 2 isolated, regulated outputs up to 96 V  
3 kV AC I/O electric strength test voltage



- Electrically and mechanically rugged DIN-rail front end
- Outputs individually controlled with 150% output peak power
- Operating ambient temperature range  $-40...60^{\circ}\text{C}$  with convection cooling

### Selection chart for front ends

| Output 1                      |                            | Output 2                      |                            | Input voltage<br>$U_{i \min} \dots U_{i \max}$             | Rated power<br>$T_A = 60^{\circ}\text{C}$<br>$P_{o \text{ tot}} [\text{W}]$ | Type       | Options <sup>1</sup> |
|-------------------------------|----------------------------|-------------------------------|----------------------------|--|---|------------|----------------------|
| $U_{o \text{ nom}}$<br>[V DC] | $I_{o \text{ nom}}$<br>[A] | $U_{o \text{ nom}}$<br>[V DC] | $I_{o \text{ nom}}$<br>[A] |  |   |            |                      |
| 24.7                          | 15                         | -                             | -                          | 85...264 VAC<br>(14...440 Hz) <sup>3</sup><br>90...350 VDC | 375   | LXR 1601-6 | R<br>D1...D5         |
| 24.7                          | 20                         | -                             | -                          |  | 500   | LXN-1601-6 |                      |
| 37                            | 9.9                        | -                             | -                          |  | 375   | LXR 1701-6 | S<br>M2              |
| 37                            | 13.2                       | -                             | -                          |  | 500   | LXN 1701-6 |                      |
| 49.4                          | 7.5                        | -                             | -                          |  | 375   | LXR-1801-6 | F, F1<br>K2          |
| 49.4                          | 10                         | -                             | -                          |  | 500   | LXN-1801-6 |                      |
| 24.7                          | 10                         | 24.7                          | 10                         | 500  | LXN-2660-6  |            |                      |
| 49.4                          | 5                          | 49.4                          | 5                          | 500  | LXN 2880-6  |            |                      |

### Selection chart for Battery chargers<sup>2</sup>

| Output                        |                            | Input voltage<br>$U_{i \min} \dots U_{i \max}$ | Rated power<br>$T_A = 60^{\circ}\text{C}$<br>$P_{o \text{ tot}} [\text{W}]$ | Type          | Options <sup>1</sup> |
|-------------------------------|----------------------------|--|---|---------------|----------------------|
| $U_{o \text{ nom}}$<br>[V DC] | $I_{o \text{ nom}}$<br>[A] |  |   |               |                      |
| 25.7...29.3                   | 12.6                       | 85...264 VAC<br>(14...440 Hz) <sup>3</sup>     | 345   | LXR 1240-6 M1 | F, F1<br>K2          |
| 25.7...29.3                   | 16.9                       |  | 460   | LXN 1240-6 M1 |                      |
| 51.4...58.6                   | 6.3                        | 90...350 VDC                                   | 345   | LXR 1740-6 M1 |                      |
| 51.4...58.6                   | 8.4                        |  | 460   | LXN 1740-6 M1 |                      |

<sup>1</sup> For lead times and minimum order quantities contact Power-One.

<sup>2</sup> For availability contact Power-One.

<sup>3</sup> Input frequency range certified for 14...440 Hz. For continuous operating frequency <40 Hz and >100 Hz contact factory.

**Input**

|                 |   |                 |
|-----------------|---|-----------------|
| Input voltage   | world wide mains, single phase                | 85...264 V AC   |
|                 | for derating information see application note | 90...350 V DC   |
| Input frequency | wide frequency range                          | 16 2/3...440 Hz |
| Power factor    | active PFC                                    | up to 0.99      |
| Inrush current  | virtually no inrush current                   |                 |

**Output**

|                                 |  |                               |
|---------------------------------|--|-------------------------------|
| Efficiency                      | $U_{i\text{ nom}}, I_{o\text{ nom}}$                           | up to 89%                     |
| Output voltage setting accuracy | $U_{i\text{ nom}}, I_{o\text{ nom}}$                           | $\pm 1.3\% U_{o\text{ nom}}$  |
| Output voltage noise            | IEC/EN 61204   | typ. 50 mV                    |
| Output voltage ripple           | sinusoidal output ripple at twice the line frequency           | $\leq 1.2 V_{\text{pp}}$      |
| Line and cross regulation       | $U_{i\text{ min}} \dots U_{i\text{ max}}$                      | typ. 50 mV                    |
| Load regulation                 | 0...100% $I_{o\text{ nom}}, U_{i\text{ nom}}$                  | $-1.6\% U_{o\text{ nom}}$     |
| Minimum load                    | not required   |                               |
| Current limitation              | rectangular U/I characteristic                                 | 101...112% $I_{o\text{ nom}}$ |
| Short term peak power           | 1 s, electronically controlled                                 | 150% $I_{o\text{ nom}}$       |
| Operation in parallel           | enabled by droop current share                                 |                               |
| Hold-up time                    | $I_{o\text{ nom}}, U_o$ decreases to 80% of $U_{o\text{ nom}}$ | typ. 15 ms                    |

**Control**

|                   |                  |
|-------------------|------------------|
| Status indication | LED output(s) OK |
|-------------------|------------------|

**Protection**

|                            |  |
|----------------------------|--|
| Input reverse polarity     | bridge rectifier                             |
| Input fuse                 | not user accessible                          |
| Input undervoltage lockout | 10 A, fast blow                              |
| Input overvoltage lockout  | typ. 80% $U_{i\text{ min}}$                  |
| Input overvoltage lockout  | typ. 105% $U_{i\text{ max}}$                 |
| Input transient            | voltage depending resistor (VDR)             |
| Output(s)                  | no-load, overload and short circuit proof    |
| Output overvoltage         | second control loop, each output, 24/48 V    |
| Overtemperature            | 30/60 V SELV                                 |
| Overtemperature            | reduced output power if thermally overloaded |

**Safety**

|                                |   |            |
|--------------------------------|---|------------|
| Approvals in progress          | EN 60950, UL 1950, CSA22.2 No. 950, UL 508 listed |            |
| Electric strength test voltage | class I, I/case                                   | 2 kV AC    |
|                                | class I, I/O                                      | 3 kV AC    |
|                                | class I, O/case                                   | 1 kV AC    |
|                                | class I, O/O                                      | 0.35 kV AC |
| Pollution degree               | AC-in / DC-in                                     | 3/2        |
| Degree of protection           |   | IP 20      |

**EMC**

|                                |  |             |
|--------------------------------|--|-------------|
| Electrostatic discharge        | IEC/EN 61000-4-2, level 4, contact/air (8/15 kV)           | criterion A |
| Electromagnetic field          | IEC/EN 61000-4-3, level 3 (10 V/m)                         | criterion A |
| Electr. fast transients/bursts | IEC/EN 61000-4-4, level 4, capacitive/direct (4/2 kV)      | criterion A |
| Surge                          | IEC/EN 61000-4-5, level 3, in and out, line to line (2 kV) | criterion B |
|                                | level >3, input, line to case (3.5 kV)                     | criterion B |
|                                | level 2, output, line to case (1 kV)                       | criterion A |
| Conducted disturbances         | IEC/EN 61000-4-6, level 3 (10 V)                           | criterion A |
| Electromagnetic emissions      | CISPR 22/EN 55022, conducted                               | class B     |

**Environmental**

|                                  |  |                          |
|----------------------------------|--|--------------------------|
| Operating ambient temperature    | $U_{i\text{ nom}}, I_{o\text{ nom}}$ , convection cooled | -40...60°C               |
| Operating case temperature $T_C$ | $U_{i\text{ nom}}, I_{o\text{ nom}}$                     | -40...87°C               |
| Storage temperature              | non operational  | -40...100°C              |
| Damp heat                        | IEC/EN 60068-2-3, 93%, 40°C                              | 56 days                  |
| Shock and vibration              | unit wall mounted with brackets                          |                          |
| Shock                            | IEC/EN 60068-2-27, 11 ms                                 | 50 g <sub>n</sub>        |
| Bump                             | IEC/EN 60068-2-29, 11 ms                                 | 25 g <sub>n</sub>        |
| Vibration, sinusoidal            | IEC/EN 60068-2-6, 10...60/60...2000 Hz                   | 0.35 mm/5 g <sub>n</sub> |
| Vibration, random                | IEC/EN 60068-2-64, 20...500 Hz                           | 0.05 g <sup>2</sup> /Hz  |
| MTBF                             | MIL-HDBK-217E, G <sub>B</sub> , 40°C                     | 400'000 h                |

**Options**

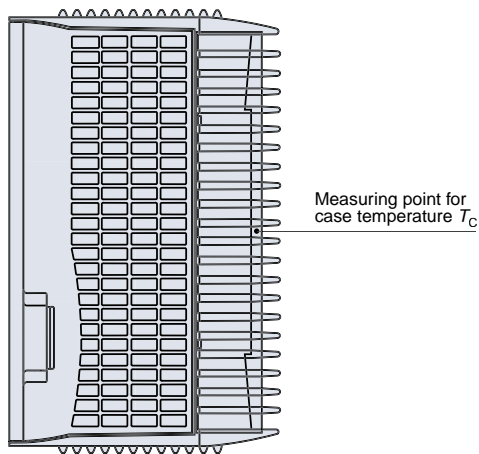
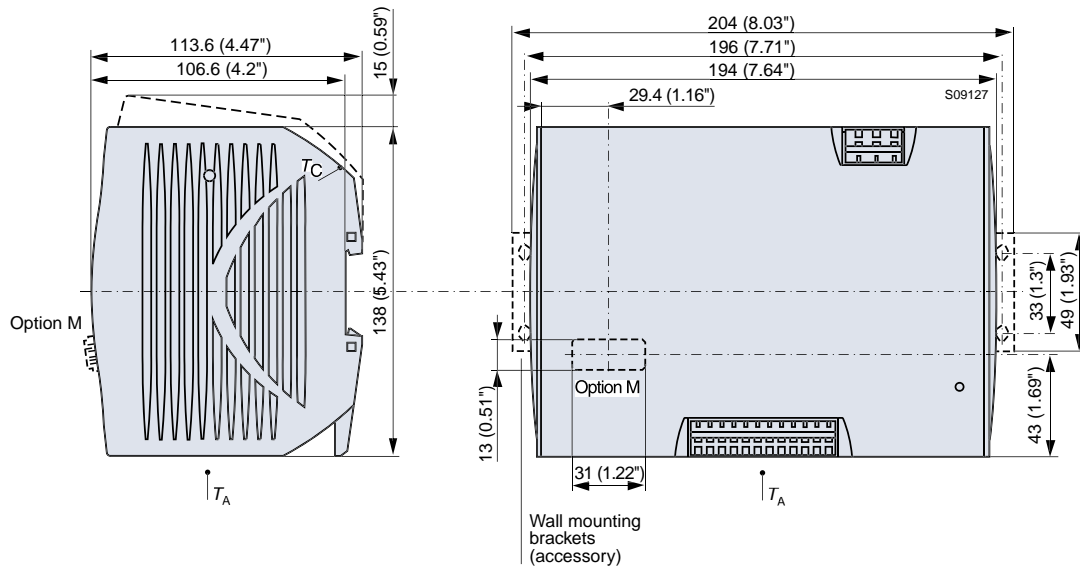
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|---|-------------------------------------|---------|
| Input and output undervoltage monitoring    |                                     | D1...D5 |
| Output voltage adjustment                   | 10 V...110% of $U_{o\text{ nom}}$   | R       |
| Remote on/off                               |                                     | S       |
| Multi option choice                         | (D1...D5, R, S) via Sub-D connector | M1...M2 |
| Built-in second input fuse in the neutral   |                                     | F       |
| No fuse fitted (for operation from high DC) |                                     | F1      |
| System connectors with screw terminals      |                                     | K2      |

# X Series

# 375 and 500 Watt AC-DC Converters

## Mechanical data

Tolerances  $\pm 0.3$  mm (0.012") unless otherwise indicated.

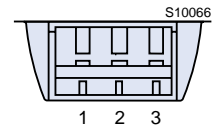


## DIN Rail Mountable

## X Series

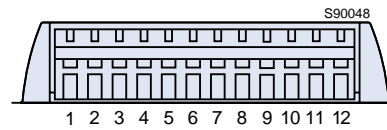
### Terminal allocation input side

| Pin | Des. | Determination    |
|-----|------|------------------|
| 1   | ⊕    | Protective earth |
| 2   | N~   | Input neutral    |
| 3   | P~   | I                |



### Terminal allocation output side

| Pin | Des. | Single output | Double output |
|-----|------|---------------|---------------|
| 1   | ⊕    | Earth to load | Earth to load |
| 2   | +    | Output pos.   | Output 1 pos. |
| 3   | +    | Output pos.   | Output 1 pos. |
| 4   | -    | Output neg.   | Output 1 neg. |
| 5   | -    | Output neg.   | Output 1 neg. |
| 6   | +    | Output pos.   | Output 2 pos. |
| 7   | +    | Output pos.   | Output 2 pos. |
| 8   | -    | Output neg.   | Output 2 neg. |
| 9   | -    | Output neg.   | Output 2 neg. |
| 10  | Aux1 | Options       | Options       |
| 11  | Aux2 | Options       | Options       |
| 12  | ⊕    | Earth to load | Earth to load |



### Accessories

Mounting brackets for vertical chassis/wall mounting  
 Protective covers over input and output terminals