# 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

LGA    c**RU**us    C E

- Electrically and mechanically rugged DIN-rail front end
- Outputs individually controlled with 150% output peak power
- Operating ambient temperature range −40...60°C with convection cooling

## Selection chart for front ends

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

| Output | | Input voltage $U_{i\,min}…U_{i\,max}$ | Rated power $T_A = 60°C$ $P_{o\,tot}$ [W] | Type | Options[1] |
|---|---|---|---|---|---|
| $U_{o\,nom}$ [V DC] | $I_{o\,nom}$ [A] | | | | |
| 25.7...29.3 | 12.6 | 85…264 VAC | 345 | LXR 1240-6 M1 | F, F1 |
| 25.7...29.3 | 16.9 | (14…440 Hz)[3] | 460 | LXN 1240-6 M1 | K2 |
| 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 | |

[1] For lead times and minimum order quantities contact Power-One.

[2] For availability contact Power-One.

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

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

## Control

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

## Protection

| Input reverse polarity | bridge rectifier | |
|---|---|---|
| Input fuse | not user accessible | 10 A, fast blow |
| Input undervoltage lockout | | typ. 80% $U_{i\,min}$ |
| Input overvoltage lockout | | typ. 105% $U_{i\,max}$ |
| 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 | 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 | $U_{i\,nom}$, $I_{o\,nom}$, convection cooled | $-40...60°C$ |
| Operating case temperature $T_C$ | $U_{i\,nom}$, $I_{o\,nom}$ | $-40...87°C$ |
| 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 | $50\ g_n$ |
| Bump | IEC/EN 60068-2-29, 11 ms | $25\ g_n$ |
| Vibration, sinusoidal | IEC/EN 60068-2-6, 10...60/60...2000 Hz | $0.35\ mm/5\ g_n$ |
| Vibration, random | IEC/EN 60068-2-64, 20...500 Hz | $0.05\ g^2/Hz$ |
| MTBF | MIL-HDBK-217E, $G_B$, 40°C | 400'000 h |

## Options

| | | |
|---|---|---|
| Input and output undervoltage monitoring | | D1...D5 |
| Output voltage adjustment | 10 V...110% of $U_{o\,nom}$ | 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 fittet (for operation from high DC) | | F1 |
| System connectors with screw terminals | | K2 |

## Mechanical data

Tolerances ±0.3 mm (0.012") unless otherwise indicated.

European
Projection

113.6 (4.47")
106.6 (4.2")
15 (0.59")
$T_C$
Option M
138 (5.43")
$T_A$

204 (8.03")
196 (7.71")
194 (7.64")
29.4 (1.16")
S09127
33 (1.3")
49 (1.93")
43 (1.69")
13 (0.51")
Option M
31 (1.22")
$T_A$

Wall mounting
brackets
(accessory)

Measuring point for
case temperature $T_C$
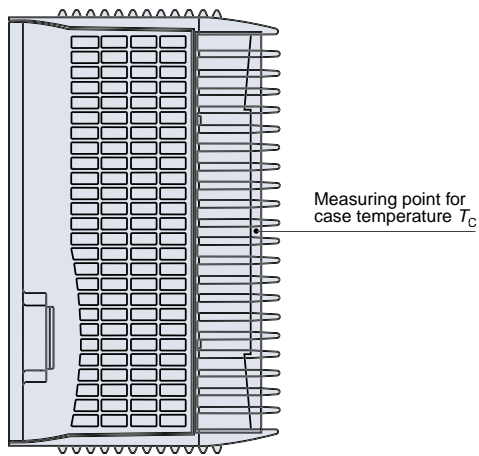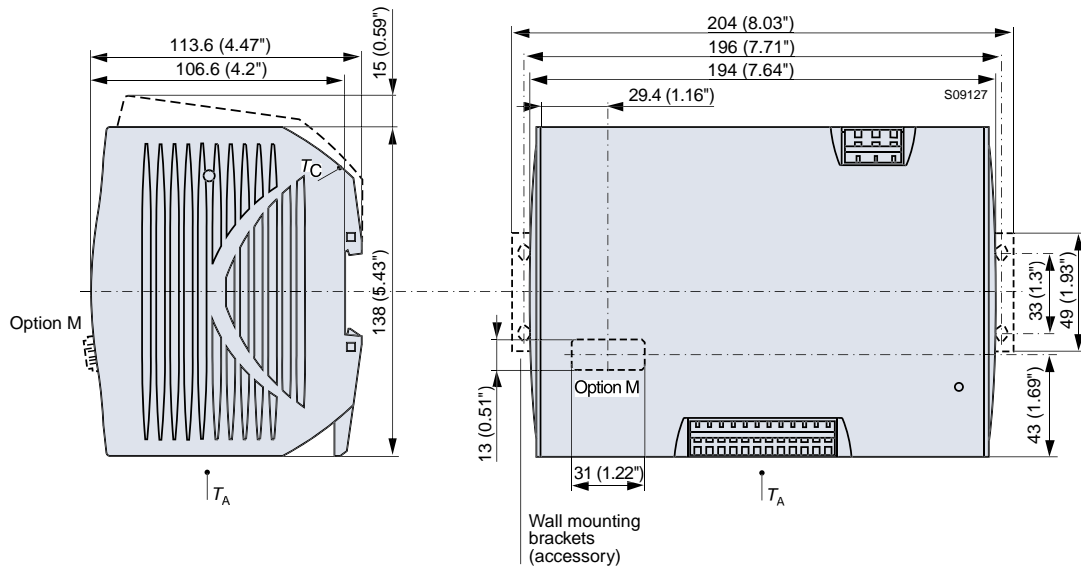
## Terminal allocation input side

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



S10066

1  2  3
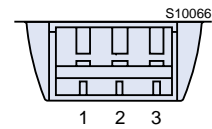
## Terminal allocation output side

| 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 |



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1 2 3 4 5 6 7 8 9 10 11 12
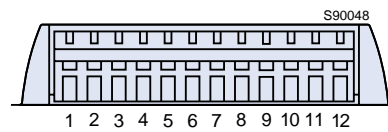
## Accessories

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