

Switch mode power supplies

78
SERIES



Building automation



Elevators and lifts



Automation for blinds, grilles and shutters



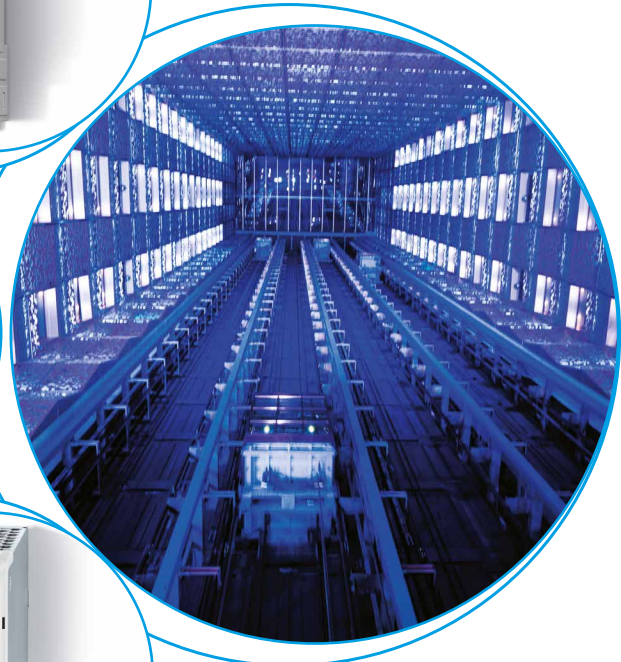
Hoists and cranes



Panels for electrical distribution



Pump Control



12 W Low profile Modular DC Power Supplies for electrical cabinets

Type 78.12....2400

- Output 24 V DC, 12 W, 0.63 A

Type 78.12....2402

- Output 24 V DC, 12 W, 0.5 A
- Modular LED driver for stripes and LED lamps, TUV certified following IEC61347-2-13

Type 78.12....1200

- Output 12 V DC, 12 W, 1.25 A
- Designed for SELV system (EN 60950)
- 17.5 mm (1 module) x 61 mm deep
- Low (< 0.4 W) stand-by power consumption
- Thermal protection: internal, with V_{out} shutdown - power OFF to reset
- Short circuit protection: Hiccup (auto-recovery) mode
- Overvoltage protection: Varistor
- Flyback topology
- Compliant with EN 60950-1 and EN 61204-3
- Parallel working for automatic redundancy - with OR diodes
- Dual Polarity and Series connection permissible
- 35 mm rail (EN 60715) mount

Screw terminal



For outline drawing see page 25

Output specification

| | | | | |
|---|----|-------|-----------------|-------|
| Output current (-20...+40 °C, 230 V AC input) | A | 0.63 | 0.5 | 1.25 |
| Rated current I_N (50 °C, full input operating range) | A | 0.50 | N/A | 1 |
| Rated voltage | V | 24 | 24 | 12 |
| Rated power | W | 12 | 12 | 12 |
| Output power (-20...+40 °C, 230 V AC input) | W | 15 | 12 | 15 |
| Peak current capability for 3 ms* | A | 2 | 2 | 3 |
| Output voltage adjust | V | — | — | — |
| Voltage variation (from no-load to full-load) | | < 1% | < 1% | < 1% |
| Voltage ripple @ full load** | mV | < 200 | < 200 | < 200 |
| Hold-up time @ full load: with 100 V AC input | ms | > 10 | > 10 @ 110 V AC | > 10 |
| with 260 V AC input | ms | > 90 | > 90 @ 240 V AC | > 90 |

Input specification

| | | | | |
|---|----------------------|--------------|--------------|--------------|
| Nominal voltage (U_N) | V AC (50/60 Hz) | 110...240 | 110...240 | 110...240 |
| | V DC (not polarized) | 220 | — | 220 |
| Operating range | V AC (50/60 Hz) | 100...265*** | 100...265*** | 100...265*** |
| | V DC | 140...370 | — | 140...370 |
| Max power consumption (@ 100 V AC, 50 Hz) | VA | 28.2 | 28.2 | 32 |
| | W | 14.2 | 14.2 | 17.2 |
| Stand-by power consumption | W | < 0.4 | < 0.4 | < 0.4 |
| Power factor | | 0.50 | 0.50 | 0.53 |
| Max current consumption (@ 88 V AC) | A | 0.25 | N/A | 0.30 |
| Max. inrush current (peak @ 265 V) for 3 ms | A | 10 | 10 | 10 |
| Replaceable input fuse | | — | YES | — |

Technical data

| | | | | |
|--|------|-------------------------|-------------------------|-------------------------|
| Efficiency (@ 230 V AC) | % | 85 | 85 | 87 |
| MTTF | h | > 400 · 10 ³ | > 400 · 10 ³ | > 400 · 10 ³ |
| Start-up delay | s | < 1 | < 1 | < 1 |
| Dielectric strength between input/output | V AC | 3000 | 3000 | 3000 |
| Dielectric strength between input/PE | V AC | — | — | — |
| Ambient temperature range**** | °C | -20...+60 | -20...+40 | -20...+60 |
| Protection category | | IP 20 | IP 20 | IP 20 |

Approvals (according to type)

78.12....2400



- 24 V DC, 12 W output
- SELV
- General use for 24 V DC load



78.12....2402



- 24 V DC, 12 W output
- SELV
- Modular LED driver with 24 V DC output

78.12....1200



- 12 V DC, 12 W output
- SELV
- General use for 12 V DC load

- * (see diagrams P78)
- ** peak to peak, 100 Hz component, with 100 V AC input
- *** 88...100 V AC with output current limited to 80% I_N
- **** (see derating diagrams L78)

F

**25 W Low profile Modular DC
Power Supplies for electrical cabinets**
Type 78.25....2400

- Output 24 V DC, 25 W
- 35 mm (2-module) x 61 mm deep

Type 78.25....1200

- Output 12 V DC, 25 W
- 35 mm (2-module) x 61 mm deep
- Low (< 0.4 W) stand-by power consumption
- Thermal protection: internal, with V_{out} shutdown - power OFF to reset
- Short circuit protection: Hiccup (auto-recovery) mode
- Overvoltage protection: Varistor
- Flyback topology
- Compliant with EN 60950-1 and EN 61204-3
- Parallel working for automatic redundancy - with OR diodes
- Dual Polarity and Series connection permissible
- 35 mm rail (EN 60715) mount

Screw terminal


78.25....2400


- 24 V DC, 25 W output


78.25....1200


- 12 V DC, 25 W output

- * (see diagrams P78)
- ** peak to peak, 100 Hz component, with 100 V AC input
- *** 88...100 V AC with output current limited to 80% I_N
- **** (see derating diagrams L78)

For outline drawing see page 25

Output specification

| | | | |
|--|----------------------|---|-------------------------|
| Output current (-20...+40 °C, 230 V AC input) | A | 1 | 2.1 |
| Rated current I_N (50 °C, full input operating range) | A | 0.75 | 1 |
| Rated voltage | V | 24 | 12 |
| Rated power | W | 25 | 25 |
| Output power (-20...+40 °C, 230 V AC input) | W | 25 | 25 |
| Peak current capability for 3 ms* | A | 3 | 4 |
| Output voltage adjust | V DC | — | — |
| Voltage variation (from no-load to full-load) | | < 1% | < 1% |
| Voltage ripple @ full load** | mV | < 200 | < 200 |
| Hold-up time @ full load: | | | |
| with 100 V AC input ms | | >40 | > 40 |
| with 260 V AC input ms | | >100 | > 100 |
| Input specification | | | |
| Nominal voltage (U_N) | V AC (50/60 Hz) | 110...240 | 110...240 |
| | V DC (not polarized) | 220 | 220 |
| Operating range | V AC (50/60 Hz) | 100...265*** | 110...265*** |
| | V DC | 140...370 | 140...370 |
| Max power consumption (@ 100 V AC, 50 Hz) | VA | 56.4 | 56 |
| | W | 27.5 | 27.3 |
| Stand-by power consumption | W | ≤ 0.5 | ≤ 0.30 |
| Power factor | | 0.50 | 0.50 |
| Max current consumption (@ 88 V AC) | A | 0.43 | 0.43 |
| Max. inrush current (peak @ 265 V) for 3 ms | A | 20 | 20 |
| Replaceable input fuse | | — | — |
| Technical data | | | |
| Efficiency (@ 230 V AC) | % | 89 | 89 |
| MTTF | h | > 400 · 10 ³ | > 400 · 10 ³ |
| Start-up delay | s | < 1 | < 1 |
| Dielectric strength between input/output | V AC | 2500 | 2500 |
| Dielectric strength between input/PE | V AC | — | — |
| Ambient temperature range**** | °C | -20...+60 | -20...+60 |
| Protection category | | IP 20 | IP 20 |
| Approvals (according to type) | |  | |

36 W and 50 W High efficiency, low profile Modular DC Power Supplies for electrical cabinets

Type 78.36

- Output 24 V DC, 36 W

Type 78.50

- Output 12 V DC, 50 W
- Designed for SELV system (EN 60950)
- Suitable for backup battery systems

- High efficiency (up to 91%)
- Low (< 0.3 W) stand-by power consumption
- Thermal protection: internal, with V_{out} shutdown - power OFF to reset
- Short circuit protection: Hiccup (auto-recovery) mode
- Overvoltage protection: Varistor
- Flyback topology
- ZVS (Zero-voltage-switching), quasi-resonant mode switching
- Compliant with EN 60950-1 and EN 61204-3
- Parallel working for automatic redundancy - with OR diodes
- Dual Polarity and Series connection permissible
- Compact dimensions: 70 mm (4-modules) wide, 61 mm deep
- 35 mm rail (EN 60715) mount

Screw terminal



For outline drawing see page 25

Output specification

| | | | |
|--|----|-------|---------|
| Output current (-20...+40 °C, 230 V AC input) | A | 1.7 | 4.6 |
| Rated current I _N | | | |
| (50 °C, input (100...265)V AC - (140...370)V DC) | A | 1.5 | 4.2 |
| Rated voltage | V | 24 | 12 |
| Rated power | W | 36 | 50 |
| Output power (-20...+40 °C, 230 V AC input) | W | 40 | 55 |
| Peak current capability for 3 ms* | A | 8 | 12 |
| Output voltage adjust | V | — | 12...14 |
| Voltage variation (from no-load to full-load) | | < 1% | < 1% |
| Voltage ripple @ full load** | mV | < 200 | < 200 |
| Hold-up time @ full load: with 100 V AC input | ms | > 20 | > 30 |
| with 260 V AC input | ms | > 100 | > 150 |

Input specification

| | | | |
|---|----------------------|-----------------------|-----------|
| Nominal voltage (U _N) | V AC (50/60 Hz) | 110...240 | 110...240 |
| | V DC (not polarized) | 220 | 220 |
| Operating range | V AC (50/60 Hz) | 100...265*** | 88...265 |
| | V DC | 140...370 | 140...370 |
| Max power consumption | VA | 57.5 | 86 |
| (@ 100 V AC, 50 Hz) | W | 43 | 57 |
| Stand-by power consumption | W | < 0.4 | < 0.3 |
| Power factor | | 0.74 | 0.65 |
| Max current consumption (@ 88 V AC) | A | 0.6 | 0.7+6 |
| Max. inrush current (peak @ 265 V) for 3 ms | A | 12 | 30 |
| Input fuse | | 1 A - T (replaceable) | 1.6 A - T |

Technical data

| | | | |
|--|------|-------------------------|-------------------------|
| Efficiency (@ 230 V AC) | % | 86 | 90 |
| MTTF | h | > 600 · 10 ³ | > 400 · 10 ³ |
| Start-up delay | s | < 1 | < 1 |
| Dielectric strength between input/output | V AC | 3000 | 3000 |
| Dielectric strength between input/PE | V AC | — | 1500 |
| Ambient temperature range**** | °C | -20...+70 | -20...+70 |
| Protection category | | IP 20 | IP 20 |

Approvals (according to type)



- 24 V DC, 36 W output



- 12 V DC, 50 W output
- Output adjustable between 12-14 V
- ZVS technology
- SELV

* (see diagrams P78)

** peak to peak, 100 Hz component, with 100 V AC input

*** 88...100 V AC with output current limited to 80% I_N

**** (see derating diagrams L78)

suitable for battery charging (see details page 18)

**60 W High efficiency, low profile
Modular DC Power Supplies for electrical
cabinets**
Type 78.60

- Output 24 V DC, 60 W
- Designed for SELV system (EN 60950)

Type 78.61

- Output 24 V DC, 60 W
- Suitable for backup battery systems

- High efficiency (up to 91%)
- Low (< 0.3 W) stand-by power consumption
- Thermal protection: internal, with V_{out} shutdown - power OFF to reset
- Short circuit protection: Hiccup (auto-recovery) mode
- Overvoltage protection: Varistor
- Flyback topology
- ZVS (Zero-voltage-switching), quasi-resonant mode switching
- Compliant with EN 60950-1 and EN 61204-3
- Parallel working for automatic redundancy - with OR diodes
- Dual Polarity and Series connection permissible
- Compact dimensions: 70 mm (4-modules) wide, 61 mm deep
- 35 mm rail (EN 60715) mount

Screw terminal



For outline drawing see page 25

Output specification

| | | | |
|---|----|---------|---------|
| Output current (-20...+40 °C, 230 V AC input) | A | 2.8 | 2.6 |
| Rated current I_N (50 °C, input (100...265)V AC - (140...370)V DC) | A | 2.5 | 2.5 |
| Rated voltage | V | 24 | 24 |
| Rated power | W | 60 | 60 |
| Output power (-20...+40 °C, 230 V AC input) | W | 68 | 68 |
| Peak current capability for 3 ms* | A | 10 | 8 |
| Output voltage adjust | V | 24...28 | 24...28 |
| Voltage variation (from no-load to full-load) | | < 1% | < 1% |
| Voltage ripple @ full load** | mV | < 200 | < 200 |
| Hold-up time @ full load: with 100 V AC input | ms | > 20 | > 20 |
| with 260 V AC input | ms | > 130 | > 130 |

Input specification

| | | | |
|--|----------------------|-----------|-------------------------|
| Nominal voltage (U_N) | V AC (50/60 Hz) | 110...240 | 110...240 |
| | V DC (not polarized) | 220 | 220 |
| Operating range | V AC (50/60 Hz) | 88...265 | 88...265 |
| | V DC | 140...370 | 140...370 |
| Max power consumption (@ 100 V AC, 50 Hz) | VA | 105 | 90 |
| | W | 68 | 67.5 |
| Stand-by power consumption | W | < 0.45 | < 0.4 |
| Power factor | | 0.65 | 0.75 |
| Max current consumption (@ 88 V AC) | A | 0.9 | 0.9 |
| Max. inrush current (peak @ 265 V) for 3 ms | A | 30 | 30 |
| Input fuse | | 1.6 A - T | 1.6 A - T (replaceable) |

Technical data

| | | | |
|--|------|-------------------------|-------------------------|
| Efficiency (@ 230 V AC) | % | 91 | 91 |
| MTTF | h | > 500 · 10 ³ | > 500 · 10 ³ |
| Start-up delay | s | < 1 | < 1 |
| Dielectric strength between input/output | V AC | 3000 | 3000 |
| Dielectric strength between input/PE | V AC | 1500 | 1500 |
| Ambient temperature range**** | °C | -20...+70 | -20...+70 |
| Protection category | | IP 20 | IP 20 |

Approvals (according to type)

78.60


- 24 V DC, 60 W output
- Output adjustable between 24-28 V
- ZVS technology
- SELV

78.61



- 24 V DC, 60 W output
- Output adjustable between 24-28 V
- ZVS technology
- Suitable for battery charging

* (see diagrams P78)

** peak to peak, 100 Hz component, with 100 V AC input

*** 88...100 V AC with output current limited to 80% I_N

**** (see derating diagrams L78)

 suitable for battery charging (see details page 18)

Industrial Switch Mode DC Power Supplies: 110 W to 130 W

Type 78.1A

- Output 24 V DC, 120 W

Type 78.1B

- Output 24 V DC, 110 W, compact size
- Secure electrical separation (SELV according to EN 60950)

Type 78.1D

- Output 24 V DC, 130 W
- Double stage active Power Factor Correction

- Fold-Back overload characteristics for Battery charging applications and parallel working for increased load current (78.1D)
- High efficiency (up to 93%)
- Low stand-by power consumption (down to 1 W)
- LLC (78.1B) or forward topology (78.1D)
- Thermal protection: internal with pre-alert alarm via LED and auxiliary contact, and with V_{out} safety shutdown - power OFF to reset (78.1D)
- Overload indication: Pre-alert alarm via LED and auxiliary contact indication (78.1D)
- Boost current: Without time limit, with LED and auxiliary contact indication (78.1D)
- Overload protection: Fold-back mode (78.1D)
- Short circuit protection: Hiccup (auto-recovery) mode
- Input fuse: Easily replaceable plus spare
- Overvoltage protection: Varistor
- Compliant with EN 60950-1 and EN 61204-3
- Parallel working for increased load current (with OR diodes)
- Dual Polarity and Series connection permissible
- 35 mm rail (EN 60715) mount

For outline drawing see page 25, 26, 27

Output specification

| | | | | |
|--|------------------------|--------------|--------------|--------------|
| Output current (-20...+50 °C, 230 V AC input) | A | 6.0 (@40 °C) | 5.0 (@40 °C) | 5.4 (@50 °C) |
| Output current (-20...+50 °C, 120 V AC input) | A | 4.5 (@40 °C) | 4.5 (@40 °C) | 5.4 (@50 °C) |
| Rated voltage | V | 24 | 24 | 24 |
| Rated power | W | 120 (@40°C) | 110 (@40°C) | 130 (@50°C) |
| Max. output power (-20...+40 °C, 230 V AC input) | W | 140 | 120 | 130 |
| Peak current capability for 5 ms* | A | 10 | 10 | 10 |
| Output voltage adjust | V DC | 24...28 | 24...28 | 24...28 |
| Voltage variation (from no-load to full-load) | | < 2% | < 3% | < 1% |
| Voltage ripple @ full load** | mV | < 500 | < 300 | < 100 |
| Hold-up time @ full load: | with 120 V AC input ms | >25 | >20 | > 20 |
| | with 250 V AC input ms | >110 | >90 | > 20 |

Input specification

| | | | | |
|---|------------------------------------|------------------|-----------------------|--------------------------|
| Nominal voltage (U _N) | V AC (50/60 Hz) | 120...240 | 120...240 | 110...240 |
| | V DC | — | 220 | 110...240 |
| Operating range | V AC (50/60 Hz) | 120...250 | 100...265 | 88...265 |
| | V DC | — | 140...275 (polarized) | 95...275 (non-polarized) |
| Drop out DC Voltage | V | — | 110 | 80 |
| Max power consumption | VA | 195 (@50 Hz) | 268 (@50 Hz) | 145 (@50 Hz) |
| | W (@ minimum V AC operating range) | 134 (@50 Hz) | 133 (@50 Hz) | 145 (@50 Hz) |
| Stand-by power consumption | W | < 1.9 | < 1.0 | < 3.3 |
| Power factor | | 0.69 | 0.5 | 0.998 |
| Max current consumption | A | 1.75 (@120 V AC) | 1.75 (@115 V AC) | 1.6 (@88 V AC) |
| Max. inrush current (peak @ 250 V) for 3 ms | A | 13 | 12 | 12 |
| Replaceable input fuse | | — | 3.15 A - T | 2.5 A - T |

Technical data

| | | | | |
|--|------|-------------------------|-------------------------|-------------------------|
| Efficiency (@ 230 V AC) | % | 92 | 93 | 89 |
| MTTF | h | > 500 · 10 ³ | > 500 · 10 ³ | > 400 · 10 ³ |
| Start-up delay | s | < 3 | < 1 | < 1 |
| Dielectric strength between input/output | V AC | 2000 | 2500 (SELV) | 2500 |
| Dielectric strength between input/PE | V AC | — | 1500 | 1500 |
| Ambient temperature range*** | °C | -20...+60 | -20...+70 | -20...+70 |
| Protection category | | IP 20 | IP 20 | IP 20 |

Approvals (according to type)

NEW 78.1A



- 24 V DC, 120 W output
- Output adjustable between 24-28 V

78.1B



- 24 V DC, 110 W output
- Output adjustable between 24-28 V
- Compact size, low stand-by consumption

78.1D



- 24 V DC, 130 W output
- Output adjustable between 24-28 V
- Double stage with active PFC (Power Factor Correction)

Replaceable fuse + spare



Thermal protection with LED indication



(depending on type)

Auxiliary contact signalling



- * (see diagrams P78)
- ** peak to peak, 100 Hz component, with 120 V AC input (see derating diagrams L78)
- *** suitable for battery charging (see details page 18)

**Industrial Switch Mode DC Power Supply:
240 W**
**High efficiency PSU with high peak output
current and low stand by power consumption**
Type 78.2A

- Output 24 V DC, 240 W
- High efficiency (up to 94%)
- Low stand-by power consumption
- LLC topology
- Thermal protection internal, power OFF to reset
- Boost current: Without time limit
- Short circuit protection: Hiccup (auto-recovery) mode
- Overvoltage protection: Varistor
- Compliant with EN 61204-3
- Parallel working for increased load current (with OR diodes)
- Dual Polarity and Series connection permissible
- 35 mm rail (EN 60715) mount

Screw terminal



For outline drawing see page 27

Output specification

| | | |
|--|------|-------------------------|
| Output current (-20...+40 °C, 230 V AC input) | A | 11 (@30°C) / 10 (@40°C) |
| Output current (-20...+40 °C, 120 V AC input) | A | 9 |
| Rated voltage | V | 24 |
| Rated power | W | 240 (@40°C) |
| Max. output power (-20...+30 °C, 230 V AC input) | W | 260 |
| Peak current capability for 5 ms* | A | 25 |
| Output voltage adjust | V DC | 24...28 |
| Voltage variation (from no-load to full-load) | | < 3% |
| Voltage ripple @ full load** | mV | < 300 |
| Hold-up time @ full load: with 100 V AC input | ms | > 30 |
| with 250 V AC input | ms | > 50 |

Input specification


| | | |
|---|-----------------|-------------------------------|
| Nominal voltage (U _N) | V AC (50/60 Hz) | 120 or 230 |
| Operating range | V AC (50/60 Hz) | 95...130 or 185...250 |
| Drop out DC Voltage | V | — |
| Max power consumption | VA | 361 (@ 50 Hz) |
| (@ minimum V AC operating range) | W | 265 (@ 50 Hz) |
| Stand-by power consumption | W | ≤ 3 @ 120 V ; ≤ 2.6 W @ 230 V |
| Power factor | | 0.73 |
| Max current consumption | A | 3.5 (@ 100 V AC) |
| Max. inrush current (peak @ 265 V) for 3 ms | A | 14 |
| Replaceable input fuse | | — |

Technical data

| | | |
|--|------|-------------------------|
| Efficiency (@ 230 V AC) | % | 94 |
| MTTF | h | > 400 · 10 ³ |
| Start-up delay | s | < 1 |
| Dielectric strength between input/output | V AC | 2000 |
| Dielectric strength between input/PE | V AC | — |
| Ambient temperature range*** | °C | -20...+60 |
| Protection category | | IP 20 |

Approvals (according to type)**NEW 78.2A**

- 24 V DC, 240 W output
- Output adjustable between 24-28 V

- * (see diagrams P78)
- ** peak to peak, 100 Hz component, with 100 V AC input
- *** (see derating diagrams L78)
-  suitable for battery charging (see details page 18)

Industrial Switch Mode DC Power Supply: 240 W

Overload characteristics support parallel working for increased load current

Type 78.2E

- Output 24 V DC, 240 W
- Double stage active Power Factor Correction
- High efficiency (up to 93%)
- Low stand-by power consumption
- Forward topology
- Thermal protection: internal with pre-alert alarm via LED and auxiliary contact, and with V_{out} safety shutdown - power OFF to reset
- Overload indication: Pre-alert alarm via LED and auxiliary contact indication
- Boost current: Without time limit, with LED and auxiliary contact indication
- Overload up to 20 A
- Short circuit protection: Hiccup (auto-recovery) mode
- Input fuse: Easily replaceable plus spare
- Overvoltage protection: Varistor
- Compliant with EN 60950-1 and 61204-3
- Parallel working for increased load current (with OR diodes)
- Dual Polarity and Series connection permissible
- 35 mm rail (EN 60715) mount

Screw terminal



For outline drawing see page 26

Output specification

| | | |
|--|------|---------|
| Output current (-20...+40 °C, 230 V AC input) | A | 10.8 |
| Rated current I _N (50 °C, full input operating range) | A | 10 |
| Rated voltage | V | 24 |
| Rated power | W | 240 |
| Output power (-20...+40 °C, 230 V AC input) | W | 250 |
| Peak current capability for 5 ms* | A | 25 |
| Output voltage adjust | V DC | 24...28 |
| Voltage variation (from no-load to full-load) | | < 1% |
| Voltage ripple @ full load** | mV | < 100 |
| Hold-up time @ full load: with 110 V AC input | ms | > 20 |
| with 260 V AC input | ms | > 20 |

Input specification

| | | |
|--|-----------------|--------------------------|
| Nominal voltage (U _N) | V AC (50/60 Hz) | 110...240 |
| | V DC | 110...240 |
| Operating range | V AC (50/60 Hz) | 88...265 |
| | V DC | 90...275 (non-polarised) |
| Drop out DC Voltage | V | 80 |
| Max power consumption (@ minimum V AC operating range) | VA | 275 (@ 50 Hz) |
| | W | 274 (@ 50 Hz) |
| Stand-by power consumption (@ 88 V) | W | ≤ 2.8 |
| Power factor | | 0.995 |
| Max current consumption | A | 3.0 (@ 88 V AC) |
| Max. inrush current (peak @ 265 V) for 3 ms | A | 12 |
| Replaceable input fuse | | 3.15 A - T |

Technical data

| | | |
|--|------|-------------------------|
| Efficiency (@ 230 V AC) | % | 93 |
| MTTF | h | > 400 · 10 ³ |
| Start-up delay | s | < 1 |
| Dielectric strength between input/output | V AC | 2500 |
| Dielectric strength between input/PE | V AC | 1500 |
| Ambient temperature range*** | °C | -20...+70 |
| Protection category | | IP 20 |

Approvals (according to type)

78.2E



- 24 V DC, 240 W output
- Output adjustable between 24-28 V
- Double stage with active PFC (Power Factor Correction)

Replaceable fuse + spare



Thermal protection with LED indication



Auxiliary contact signalling



* (see diagrams P78)

** peak to peak, 100 Hz component, with 110 V AC input

*** (see derating diagrams L78)

KNX power supply with 30 V DC output - 640 mA

- Output 30 V DC 640 mA, KNX Bus
- Diagnostic LEDs
- 72 mm wide (4 modules)
- 35 mm rail (EN 60715) mount
- Suitable for ETS 4 (or latest versions)

78.2K

Screw terminal


NEW 78.2K.1.230.3000


- Thermal protection, overload protection and short-circuit protection
- Two power supplies can be installed 15 meters apart

F

For outline drawing see page 28

Output specification

| | | |
|----------------|----|-----|
| Output current | mA | 640 |
| Output voltage | V | 30 |

Input specification

| | | |
|----------------------------|------|-----------|
| Nominal voltage (U_N) | V AC | 230...240 |
| Operating range | V AC | 185 - 260 |
| Stand-by power consumption | W | 1.45 |
| Power factor | | 0.62 |
| Max current consumption | A | 0.25 |

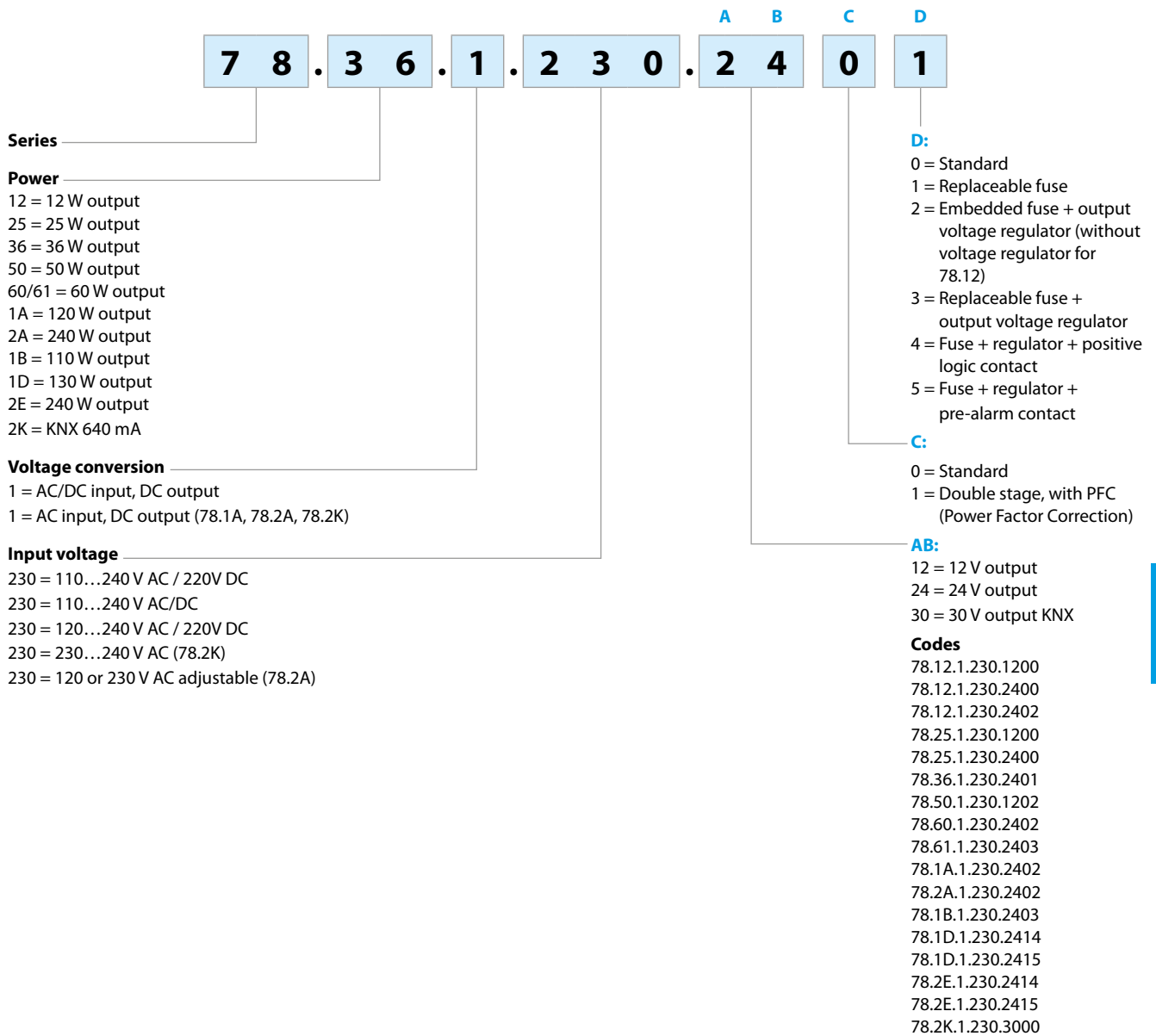
Technical data

| | | |
|--|------|--------|
| Minimum distance between power supplies | m | 15 |
| Dielectric strength between input/output | V AC | 3000 |
| Ambient temperature range | °C | -5/+45 |
| Protection category | | IP 20 |


Approvals (according to type)

Ordering information

Example: 78 series switch mode power supply, 36 W - 24 V DC output, supply voltage 110...240 V AC, replaceable fuse.




Technical data

| EMC specifications (according to EN 61204-3) | | Reference standard | 78.12, 78.25, 78.36 | 78.50, 78.60, 78.61 | 78.1A | 78.1B | 78.1D | 78.2A | 78.2E |
|---|---------------------|--------------------|---|---------------------------|----------|-----------------------------|----------|----------|----------|
| Electrostatic discharge | contact discharge | EN 61000-4-2 | 4 kV | 4 kV | 4 kV | 4 kV | 4 kV | 4 kV | 4 kV |
| | air discharge | EN 61000-4-2 | 8 kV | 8 kV | 8 kV | 8 kV | 8 kV | 8 kV | 8 kV |
| Radiated electromagnetic field | 80...1000 MHz | EN 61000-4-3 | 6 V/m | 10 V/m | 10 V/m | 10 V/m | 10 V/m | 10 V/m | 10 V/m |
| | 1...2.8 GHz | EN 61000-4-3 | 3 V/m | 3 V/m | 3 V/m | 3 V/m | 3 V/m | 10 V/m | 10 V/m |
| Fast transients (burst 5/50 ns, 5 and 100 kHz) | on supply terminals | EN 61000-4-4 | 2 kV | 3 kV | 2 kV | 2 kV | 3 kV | 3 kV | 3 kV |
| Voltage pulses on supply terminals (surge 1.2/50 µs) | common mode | EN 61000-4-5 | 2 kV | 2 kV | 2 kV | 2 kV | 3 kV | 2.5 kV | 2.5 kV |
| | differential mode | EN 61000-4-5 | 2 kV (78.12), 4 kV* (78.36) | 4 kV* | 4 kV** | 4 kV** | 4 kV** | 4 kV | 4 kV** |
| Radio-frequency common mode voltage (0.15...230 MHz) | on supply terminals | EN 61000-4-6 | 6 V | 10 V | 10 V | 10 V | 10 V | 10 V | 10 V |
| Short interruptions | | EN 61000-4-11 | 5 cycles | 6 cycles | 5 cycles | 5 cycles | 6 cycles | 5 cycles | 5 cycles |
| Radio-frequency conducted emissions | 0.15...30 MHz | EN 55022 | class B | class B | class A | class B | class B | class A | class B |
| Radiated emissions | 30...1000 MHz | EN 55022 | class B | class B | class A | class A | class A | class A | class A |
| Terminals | | | Max | | | Min...Max | | | |
| Wire size (Solid cable, stranded cable) | | mm ² | 1 x 4 / 2 x 2.5 | | | 1 x 0.5...1 x 4 | | | |
| | | AWG | 1 x 12 / 2 x 14 | | | 1 x 20...1 x 12 | | | |
| Wire size (Solid cable, stranded cable for 78.50, 78.60, 78.1A and 78.2A) | | mm ² | 1 x 2.5 | | | 1 x 0.5...2.5 | | | |
| | | AWG | 1 x 14 | | | 1 x 20...14 | | | |
|  Screw torque | | Nm | 0.8 | | | 0.5 | | | |
| Wire strip length | | mm | 8 / 8 (for 78.1A and 78.2A) | | | 8 / 8 (for 78.1A and 78.2A) | | | |
| Other data | | | | | | | | | |
| Power lost to the environment with rated output current | | W | 2 (78.12), 2.3 (78.25), 5 (78.36, 78.50), 5.4 (78.60/61) | | | | | | |
| | | W | 10 (78.1A), 9 (78.1B), 13.2 (78.1D), 15.3 (78.2A), 16.8 (78.2E) | | | | | | |

* input fuse may blow for surges higher than 1.5 kV

** input fuse may blow for surges higher than 2 kV

Technical data for 78.2K

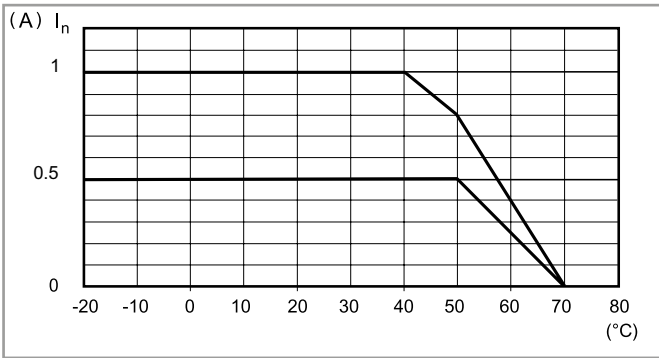
| EMC specifications (according to EN 61204-3) | | Reference standard | 78.2K |
|---|---------------------|--------------------|-----------------|
| Electrostatic discharge | contact discharge | EN 61000-4-2 | 4 kV |
| | air discharge | EN 61000-4-2 | 8 kV |
| Radiated electromagnetic field | 80...1000 MHz | EN 61000-4-3 | 10 V/m |
| | 1...2.8 GHz | EN 61000-4-3 | 3 V/m |
| Fast transients (burst 5/50 ns, 5 and 100 kHz) | HBES terminals | EN 61000-4-4 | 1 kV |
| | on supply terminals | EN 61000-4-4 | 2 kV |
| Voltage pulses on supply terminals (surge 1.2/50 µs) | DM supply terminals | EN 61000-4-5 | 1 kV |
| | CM supply terminals | EN 61000-4-5 | 2 kV |
| | HBES terminals | EN 61000-4-5 | 2 kV |
| Radio-frequency common mode voltage (0.15...230 MHz) | HBES terminals | EN 61000-4-6 | 10 V |
| | on supply terminals | EN 61000-4-6 | 10 V |
| Short interruptions | criterion A | EN 61000-4-11 | 10 cycles |
| Radio-frequency conducted emissions | 0.15...30 MHz | EN 55022 | class B |
| Radiated emissions | 30...1000 MHz | EN 55022 | class B |
| Terminals | | | Max |
| Wire size (Solid cable, stranded cable) | | mm ² | 1 x 4 / 2 x 2.5 |
| | | AWG | 1 x 12 / 2 x 14 |
|  Screw torque | | Nm | 0.8 |
| Wire strip length | | mm | 9 |
| Other data | | | |
| Power lost to the environment with rated output current | | W | 4.8 |

DM: differential mode

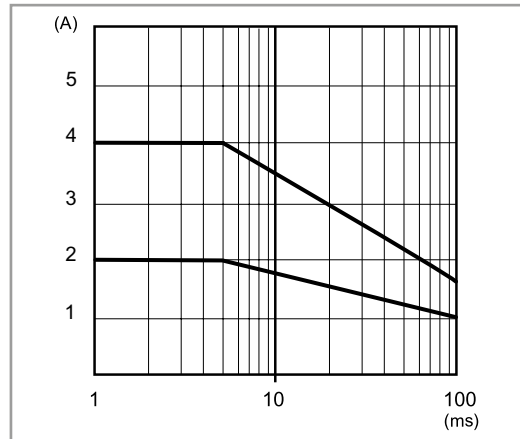
CM: common mode

Output specification

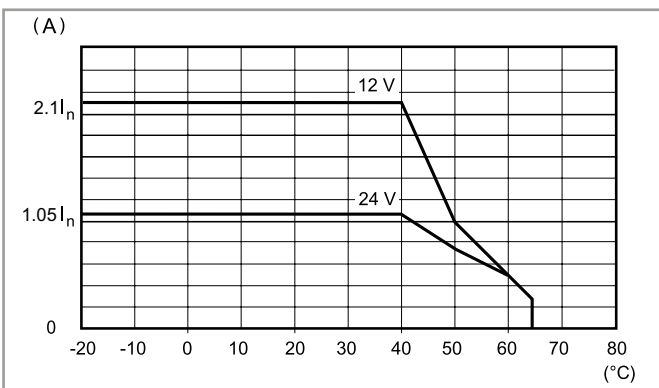
L78-1 Output current v ambient temperature (78.12)



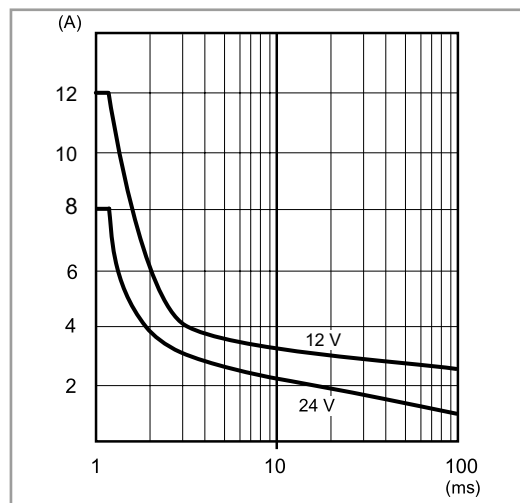
P78-1 Output peak current v time (78.12)



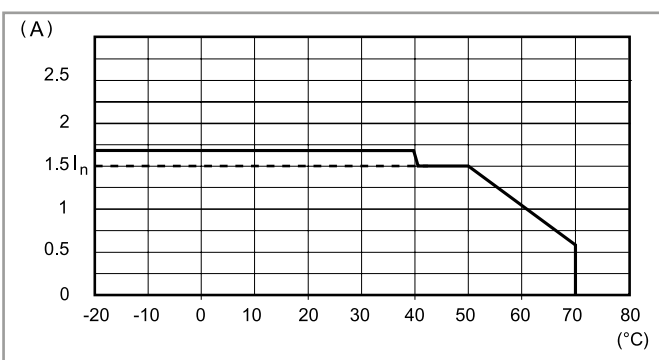
L78-2 Output current v ambient temperature (78.25)



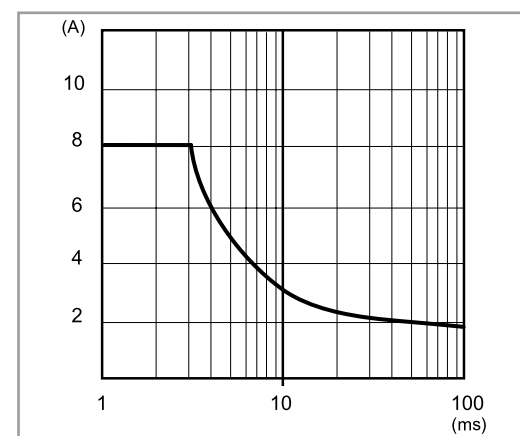
P78-2 Output peak current v time (78.25)



L78-3 Output current v ambient temperature (78.36)

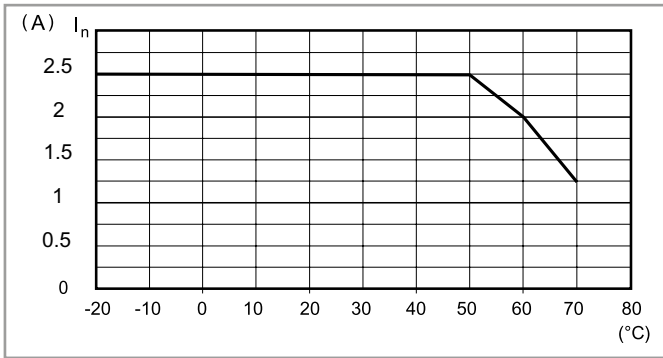


P78-3 Output peak current v time (78.36)

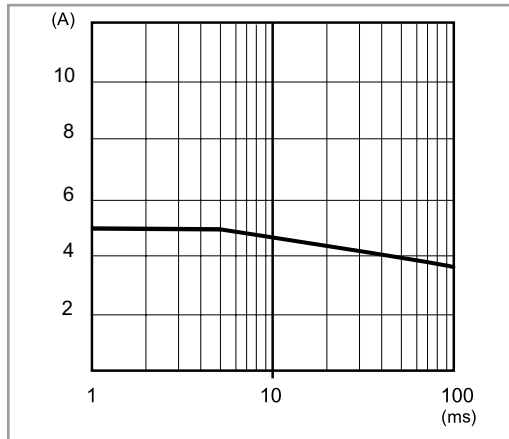


Output specification

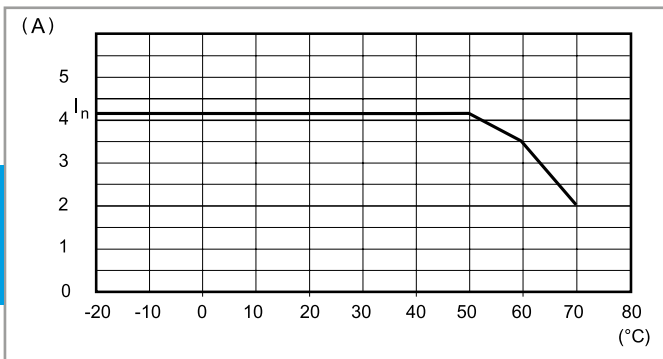
L78-4 Output current v ambient temperature (78.60)



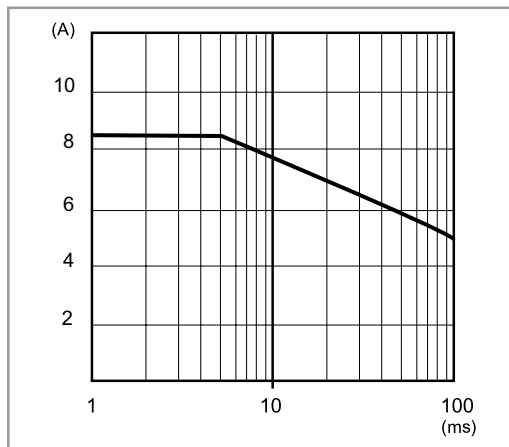
P78-4 Output peak current v time (78.60)



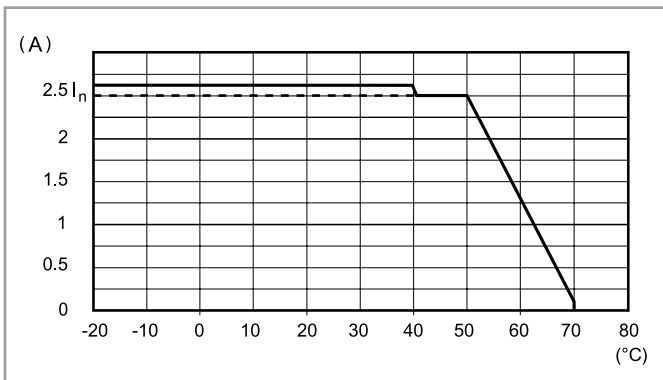
L78-5 Output current v ambient temperature (78.50)



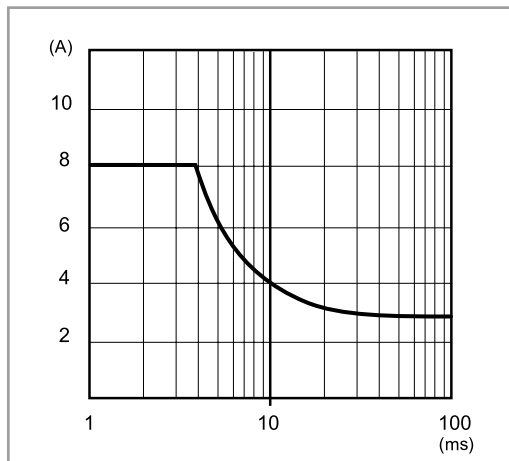
P78-5 Output peak current v time (78.50)



L78-6 Output current v ambient temperature (78.61)



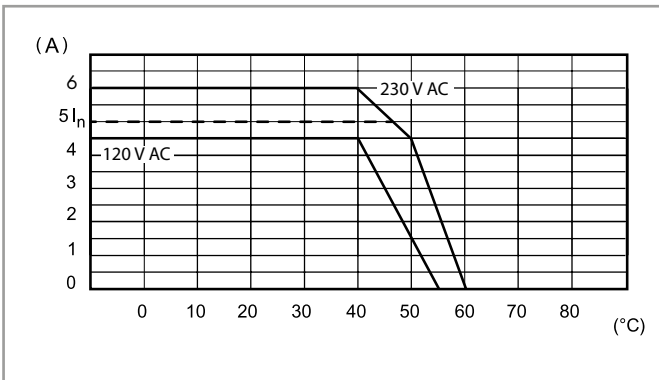
P78-6 Output peak current v time (78.61)



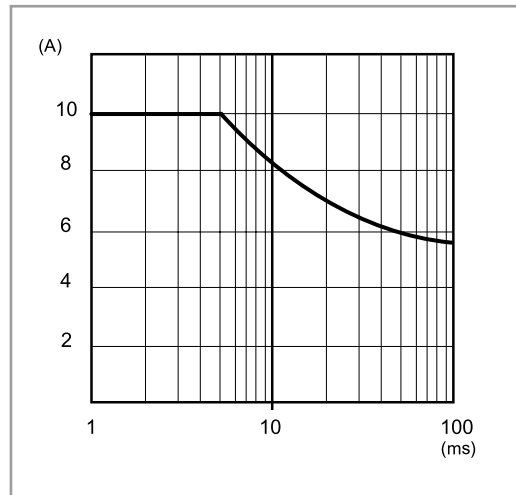
F

Output specification

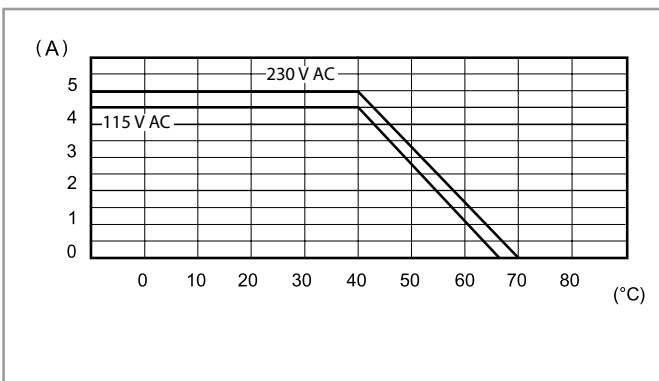
L78-7 Output current v ambient temperature (78.1A)



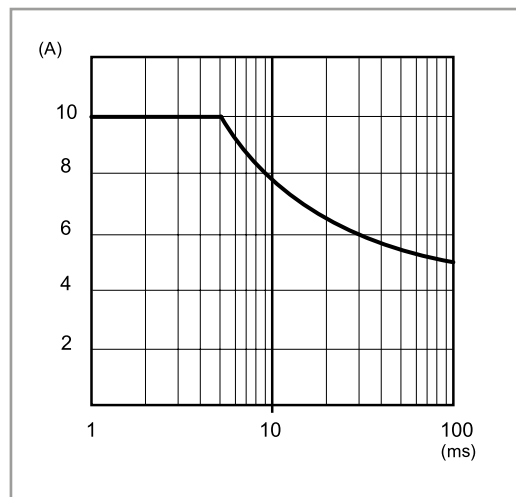
P78-7 Output peak current v time (78.1A)



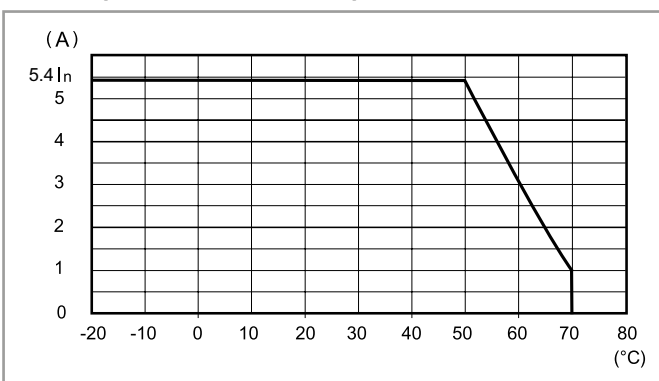
L78-8 Output current v ambient temperature (78.1B)



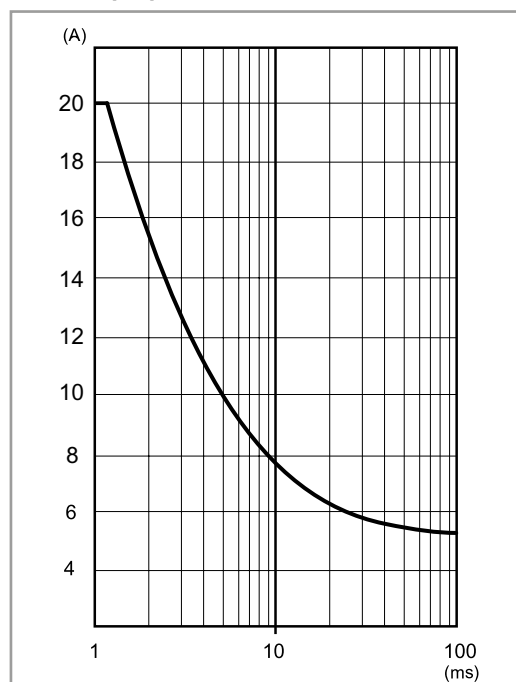
P78-8 Output peak current v time (78.1B)



L78-9 Output current v ambient temperature (78.1D)

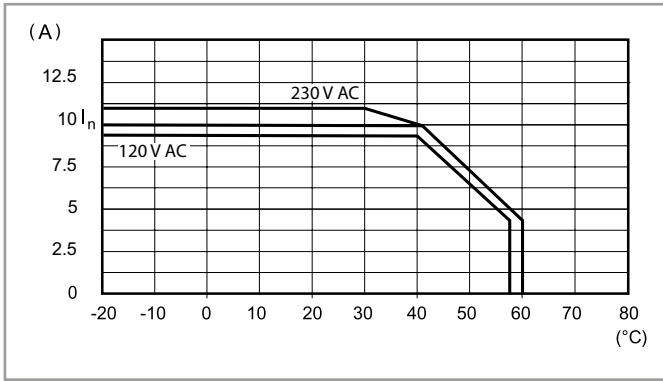


P78-9 Output peak current v time (78.1D)

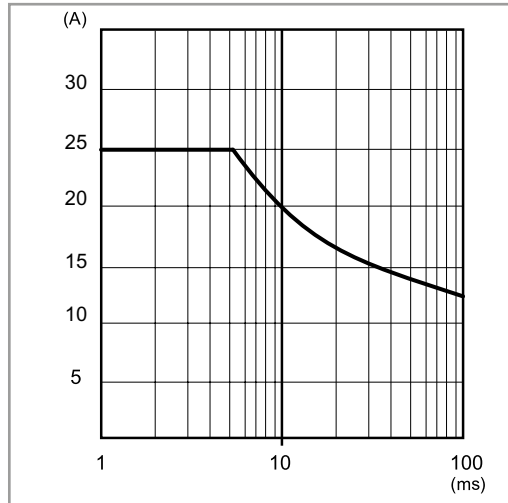


Output specification

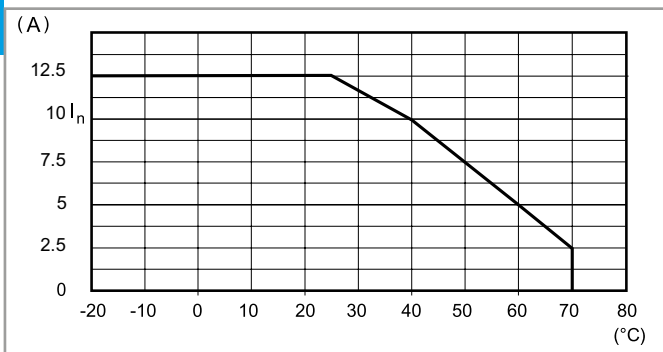
L78-10 Output current v ambient temperature (78.2A)



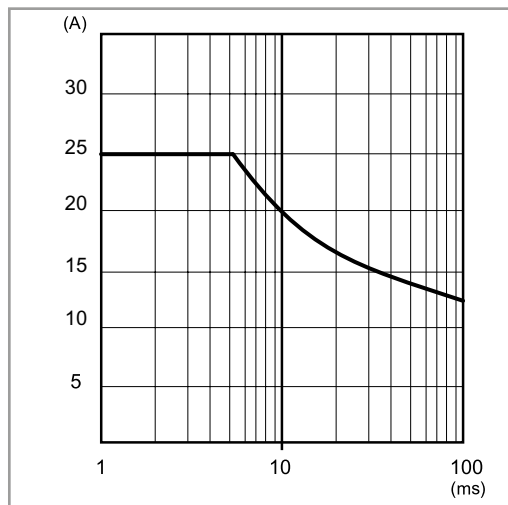
P78-10 Output peak current v time (78.2A)



F L78-11 Output current v ambient temperature (78.2E)

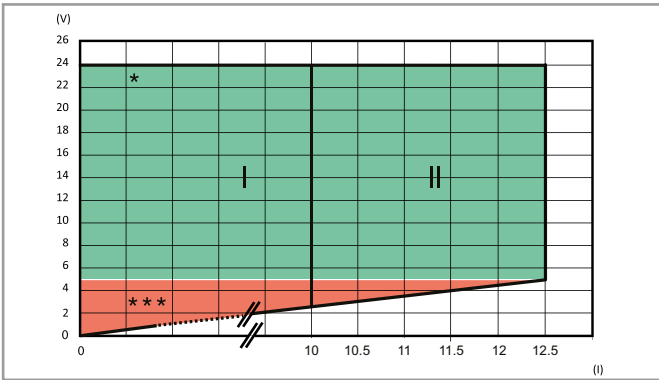


P78-11 Output peak current v time (78.2E)



Output specification

FB78-5 Output voltage v output current (78.2E)

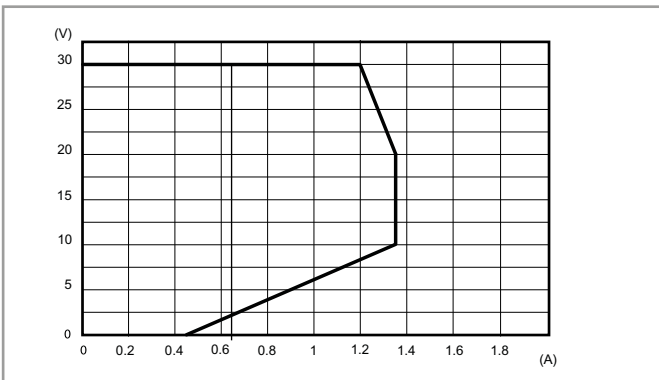


I: Output characteristic for temperature up to 50 °C

II: Output characteristic for temperature up to 25 °C

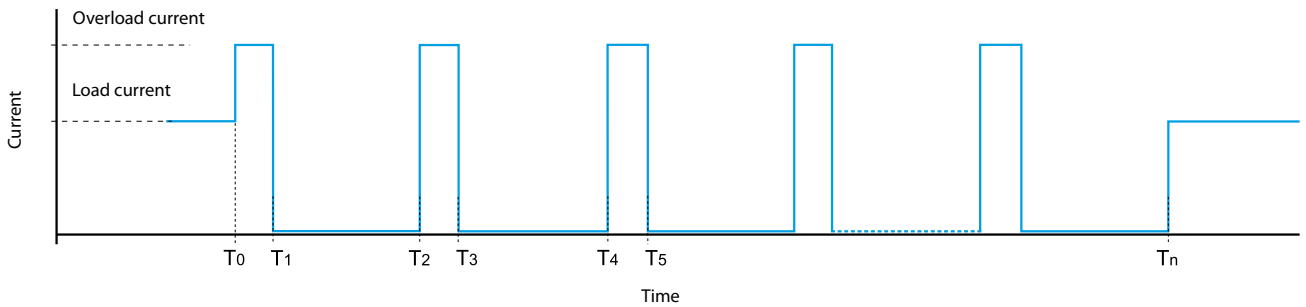
* / ***: See LED table below

FB78-6 Output voltage v output current (78.2K)



Overload diagram, KNX approved

Hiccup mode



Under normal conditions, the 78 Series Power Supply supplies the current required by the load.

However, under abnormal conditions such as a short circuit or heavy overload (T_0) the output voltage will be rapidly reduced to zero - followed by the current (T_1). After approximately 2 seconds (T_1 to T_2), the power supply checks for the persistence of the anomaly over the time period T_2 to T_3 (30 to 100ms - dependent on the type of anomaly). If the anomaly persists, as shown above, the current is again reset to 0 A for a further 2 s (T_3 to T_4). This "hiccup" process is repeated until the anomaly is removed (T_n), whereon the power supply then returns to normal working.

78.1B is able to handle this anomaly for 15 s. After this time it enters in protection mode, and a manual reset is necessary by removing and re-applying the supply voltage

Fold-back technology and battery charging

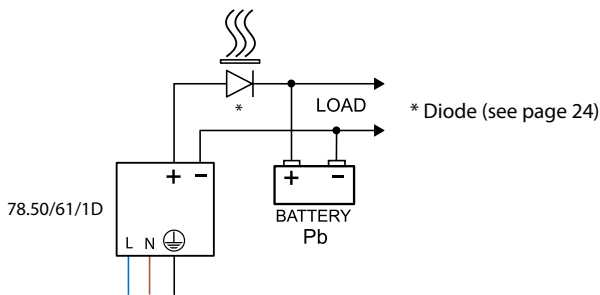
Fold-back technology allows load current to be maintained under conditions of heavy overload. In case of heavy overload, the fold-back circuit will provide the output current and the output voltage, in accordance with the relevant "FB" diagram. In practice, when overcurrent is drawn by the load, the fold-back circuit reduces the output voltage supplying the current up to the maximal value, then it starts to work in hiccup mode. Also in case of short circuit, the power supply will work in hiccup mode. Both these conditions end when the anomaly is removed, and the power supply returns to normal working.

The fold-back mode allows the use of the power supply as a **battery charger**, in particular 78.50/61 for charging lead acid batteries (both standard and gel types) rated 7...24 Ah and 78.1D for charging lead batteries rated 17...38 Ah. In any case, it is necessary to verify that the charging characteristics of the batteries are compliant with the output characteristics of the power supply.

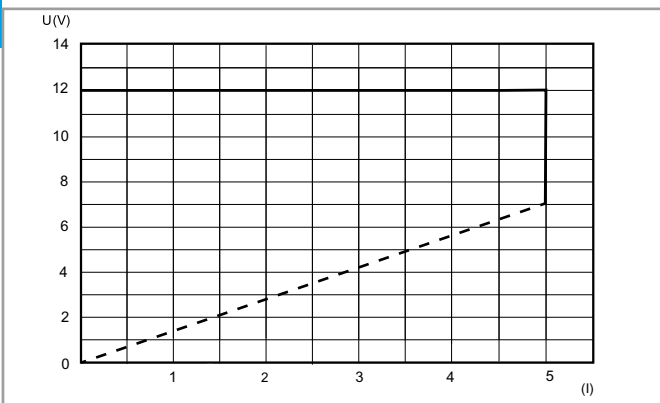
It is suggested to insert a diode in series between the + output and the + input of the battery (if not already installed in the battery unit).

Back-up connection for mains interruption

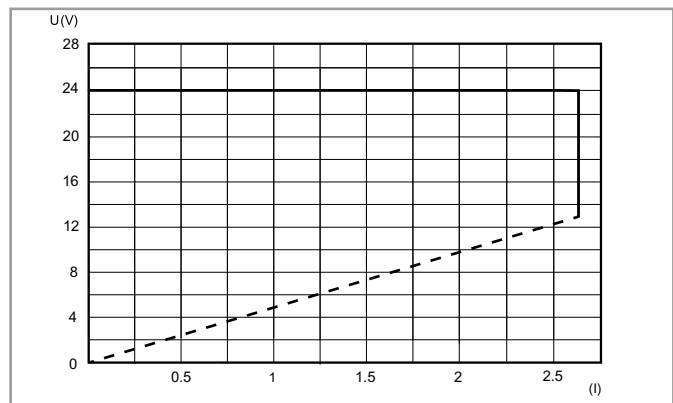
When the mains is ON, the power supply is able to charge the battery and supply the load at the same time (the power supply must be rated minimum 110 % of the load). When the mains is OFF, the battery starts to supply the load.



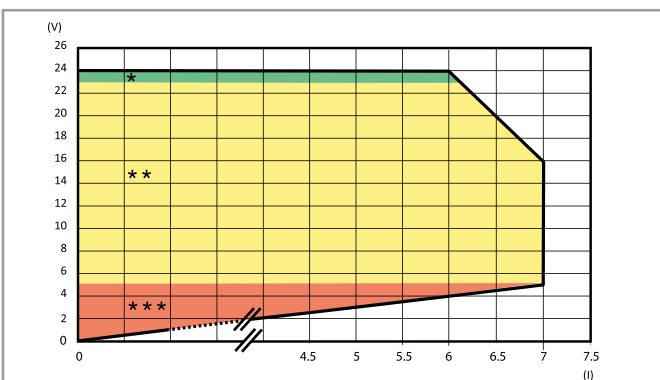
F **FB78-1 Output voltage v output current (78.50)**



FB78-2 Output voltage v output current (78.60/61)



FB78-3 Output voltage v output current (78.1D)



Fold-back characteristic for ambient temperature up to 50 °C

* / ** / ***: See LED table below

78.1D, 78.2E LED table

Feedback contact switching mode: Type 78.xx.x.xxx.24x4 ("positive logic")

The NO contact closes when power is applied to the unit and remains closed unless there is a serious fault preventing the power supply unit from delivering output current. (Such as a broken fuse, power supply failure, short-circuit or thermal protection.)

This version is suitable, for example, for signalling to a remote PLC all those alarms representing a service interruption of the power supply output.

| Type | Area | State | LED | Contact 13-14 |
|--------------------------------------|------|-----------------------|----------------|---------------|
| 78.1D.1.230.2414 78.2E.1.230.2414 | * | OK | DC OK ALARM | OFF |
| | ** | Overload (78.1D only) | DC OK ALARM | OFF |
| | *** | Short circuit | DC OK ALARM | OFF |
| | | Thermal limit | DC OK ALARM | |
| | | Thermal protection# | DC OK ALARM | OFF |

#Remove the supply voltage, following the intervention of the thermal protection, in order to reset the power supply.

78.1D, 78.2E LED table

Feedback contact switching mode: Type 78.xx.x.xxx.24x5 ("pre-alarm")

The NO contact closes when an anomaly happens (Overload, short circuit, thermal limit, thermal protection).

This version is suitable, for example, for activating visual or audible alarms, or to activate a cooling fan.











| Type | Area | State | LED | Contact 13-14 |
|--------------------------------------|------|-----------------------|----------------|---------------|
| 78.1D.1.230.2415 78.2E.1.230.2415 | * | OK | DC OK ALARM | OFF |
| | ** | Overload (78.1D only) | DC OK ALARM | OFF |
| | *** | Short circuit | DC OK ALARM | OFF |
| | | Thermal limit | DC OK ALARM | |
| | | Thermal protection# | DC OK ALARM | OFF |

#Remove the supply voltage, following the intervention of the thermal protection, in order to reset the power supply.

78.12, 78.25, 78.36, 78.50, 78.60, 78.61, 78.1A, 78.2A, 78.1B LED table

| Type | State | LED |
|--|---------------|-----|
| 78.12.1.230.xx00 78.25.1.230.1200 78.25.1.230.2400 | OK | |
| 78.36.1.230.2401 78.50.1.230.1202 78.60.1.230.2402 78.61.1.230.2403 78.1A.1.230.2402 | Short circuit | |
| | Thermal limit | OFF |
| 78.2A.1.230.2402 78.1B.1.230.2403 | OK | |
| | Short circuit | |
| | Thermal limit | OFF |

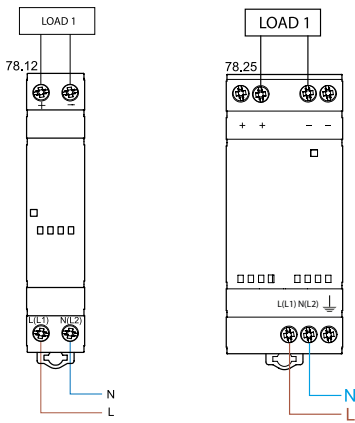
LED table

| Type | Area | State | LED | OUTPUT |
|------------------|---|-------------------------------------|---|--------|
| 78.2K.1.230.3000 | CHECK START UP | V_{out} OK |  • OFF • OFF | ON |
| | | V_{out} LOW < 29V |  • OFF • OFF | OFF |
| | | V_{out} HIGH > 33V | • OFF  • OFF | OFF |
| | NORMAL FUNCTION | V_{out} OK I_{out} > 0.9A |  • OFF  | ON |
| | | V_{out} < 29V I_{out} > 0.9A | • OFF • OFF  | ON |
| |  Alarm condition: T_{amb} > 45°C @ I_{nom} . | Pre-alarm: up to 60s |  • OFF  | ON |
| | | Latched alarm | • OFF • OFF  | OFF |

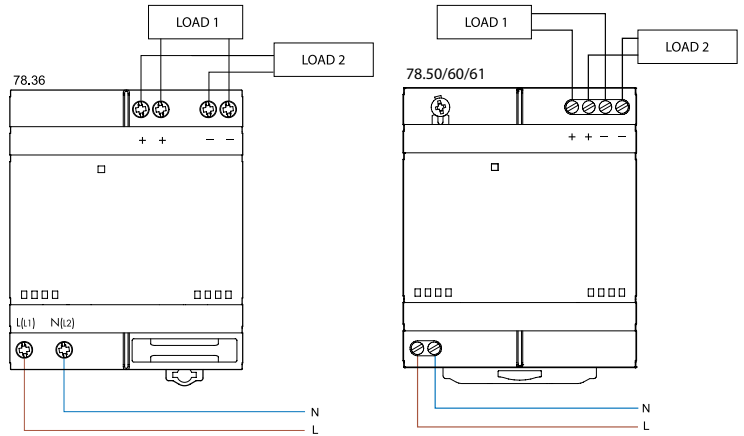
F

Wiring diagrams for 78.12, 78.25, 78.36, 78.50, 78.60 & 78.61

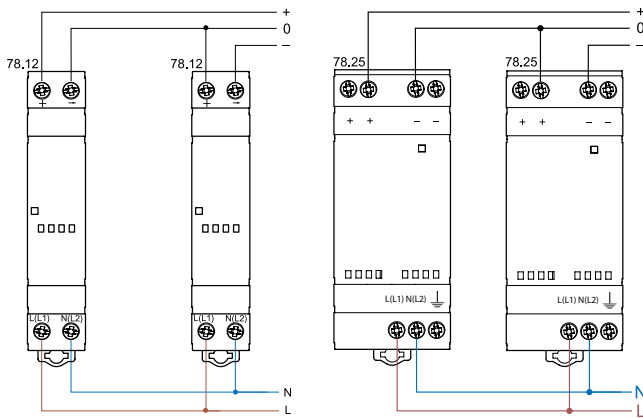
Basic connections



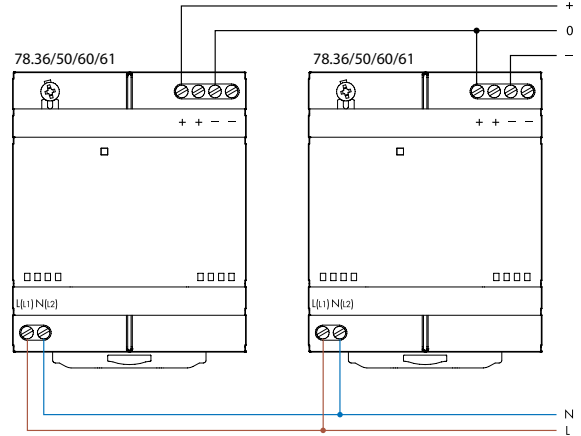
Basic connections



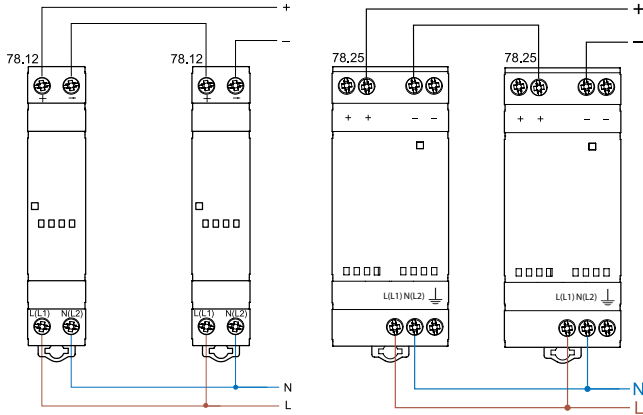
Dual polarity connection



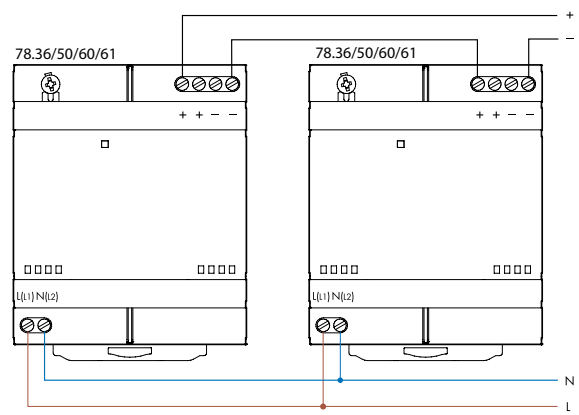
Dual polarity connection



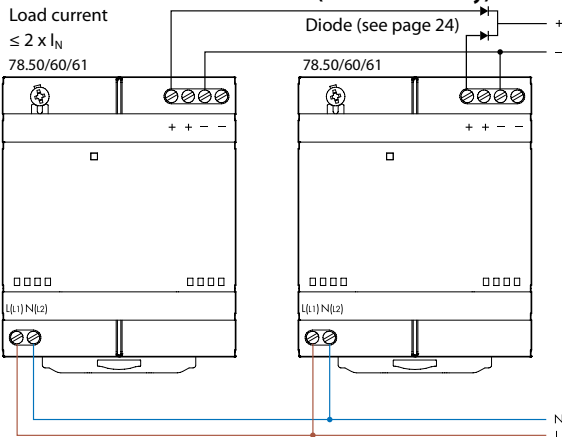
Series connection



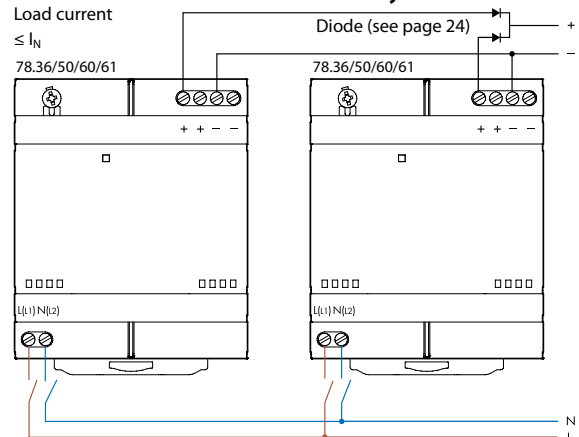
Series connection



Parallel connection (78.50/60/61 only)



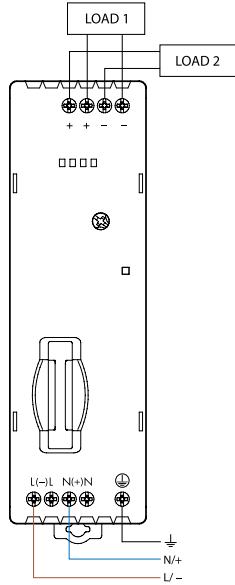
Manual redundancy



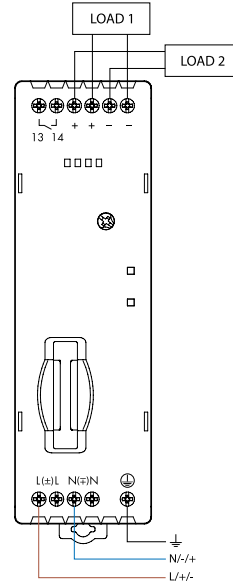
Wiring diagrams for 78.1B & 78.1D

Basic connections

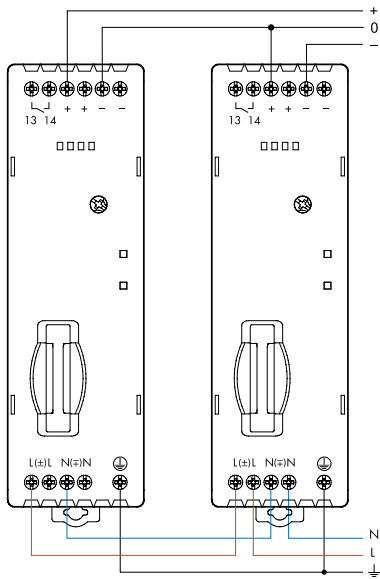
78.1B - Power supply connection



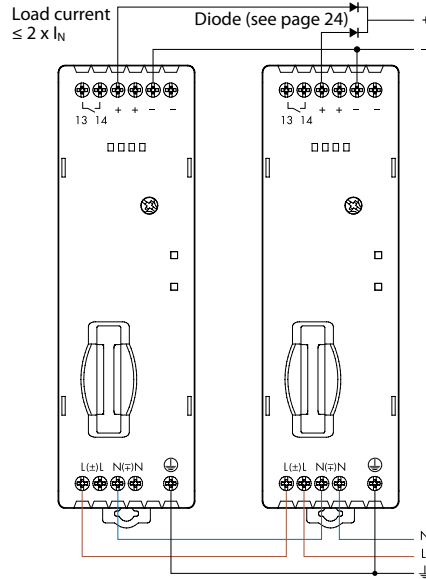
78.1D - Power supply connection



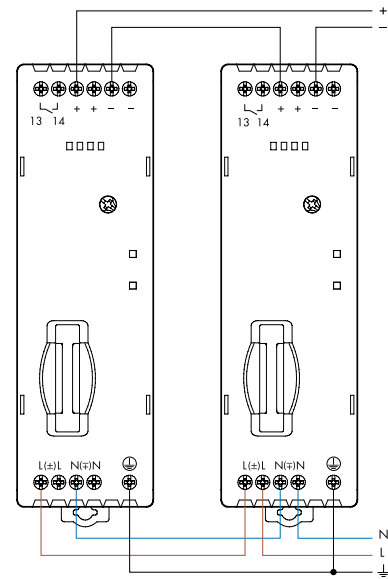
Dual polarity connection



Parallel connection



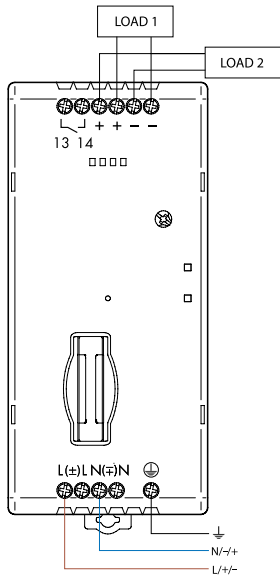
Series connection



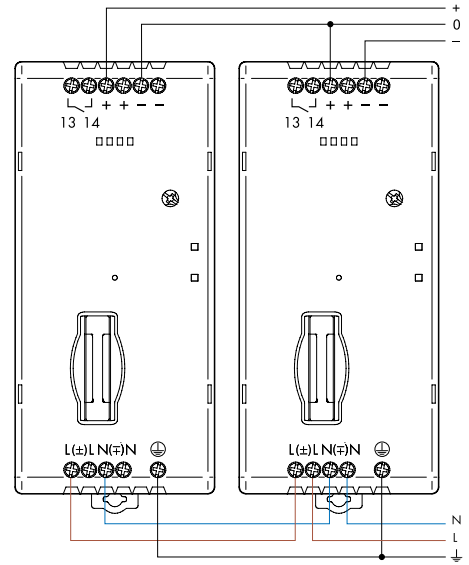
F

Wiring diagrams for 78.2E

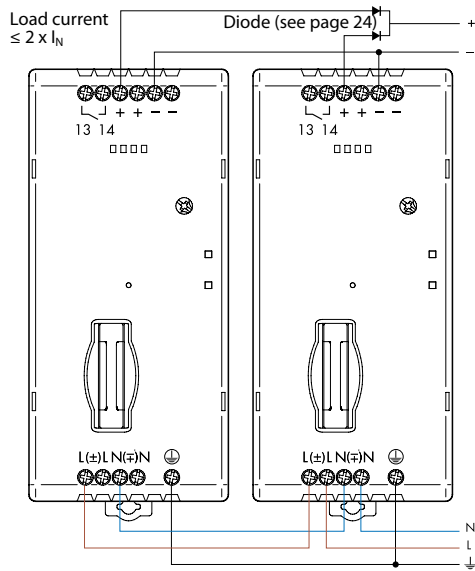
Basic connections



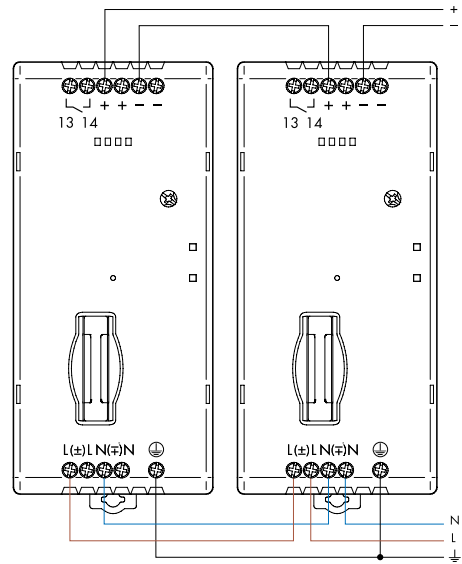
Dual polarity connection



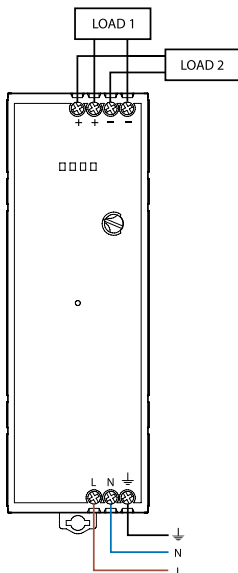
Parallel connection



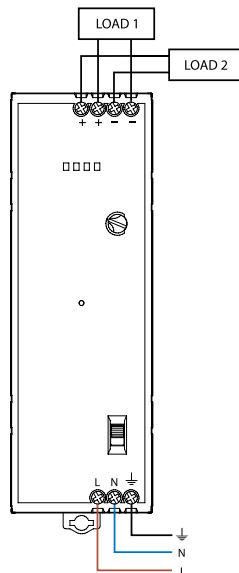
Series connection



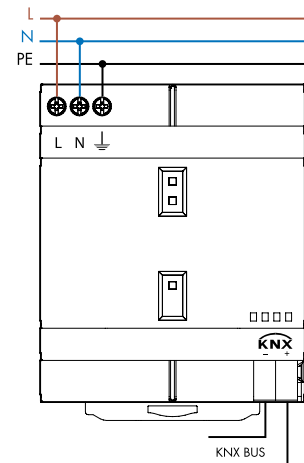
Wiring diagram for 78.1A



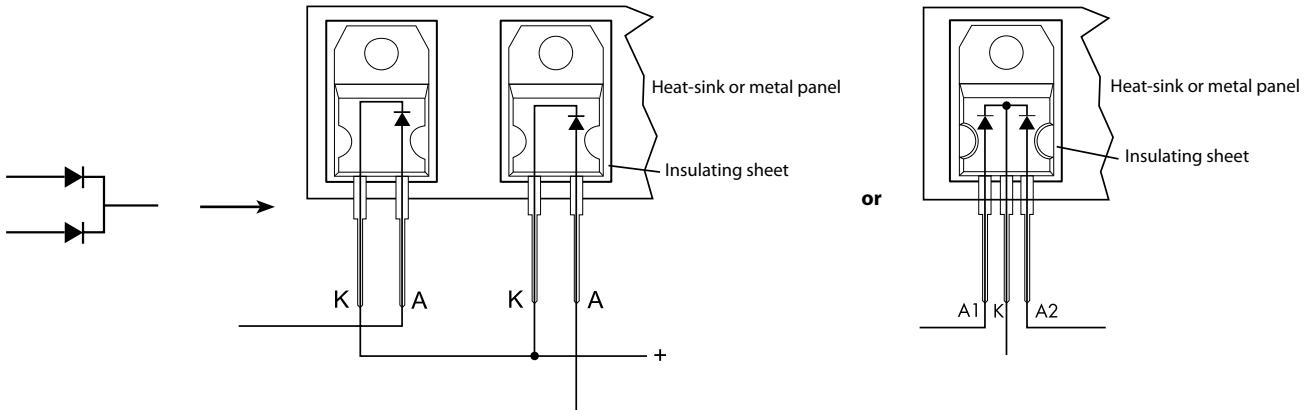
Wiring diagram for 78.2A



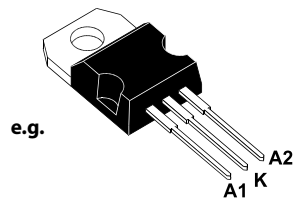
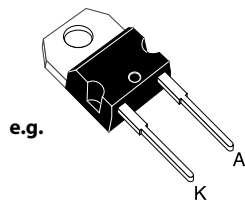
Wiring diagram for 78.2K



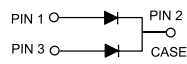
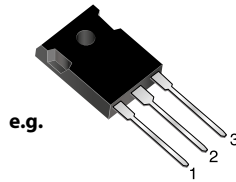
Diode(s)



Diode for type 78.25, 78.36, 78.50, 78.60, 78.61



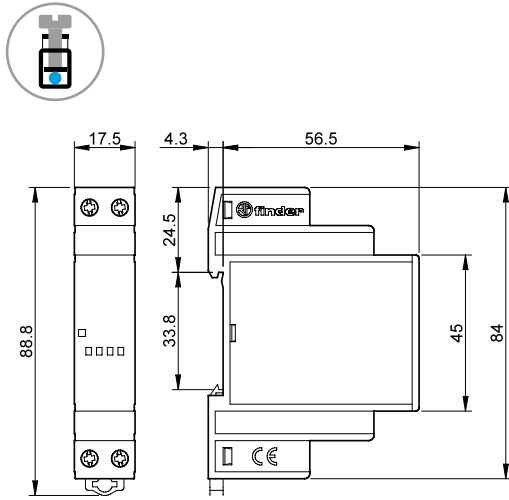
Diode for type 78.1B, 78.1D, 78.2E



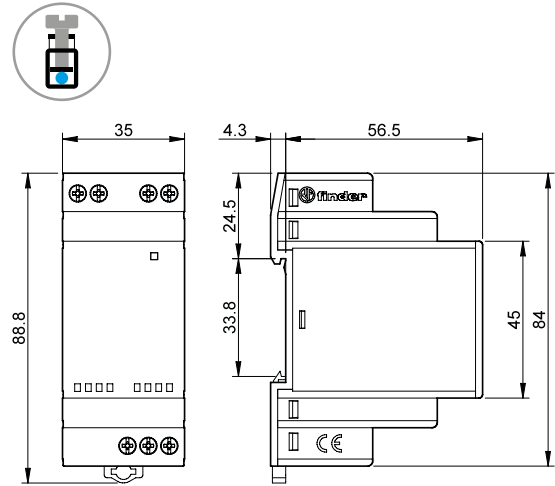
TO-247AD
MBR 4060PT

Outline drawings

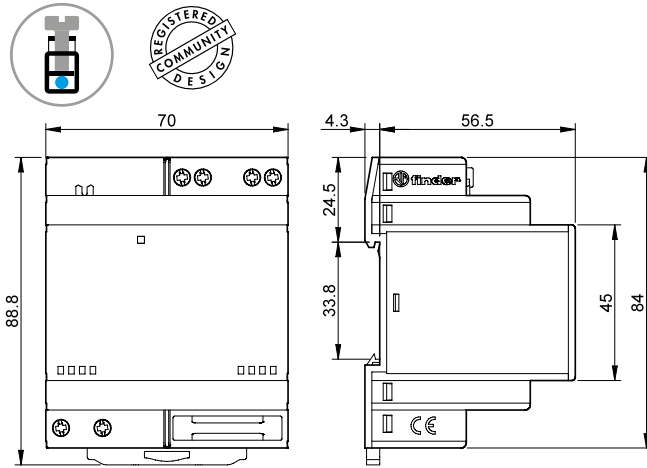
Type 78.12
Screw terminal



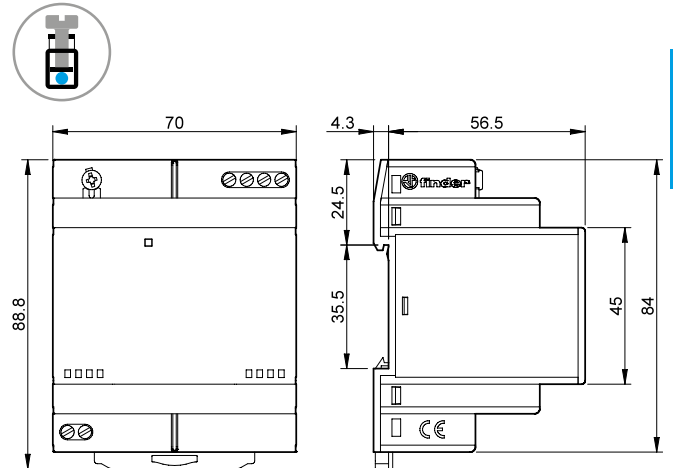
Type 78.25
Screw terminal



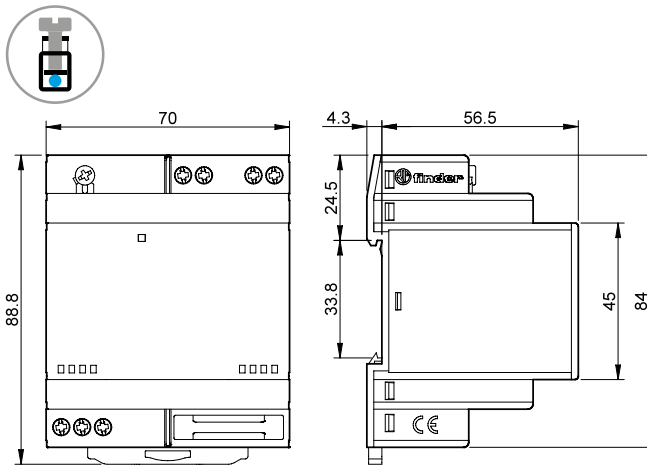
Type 78.36
Screw terminal



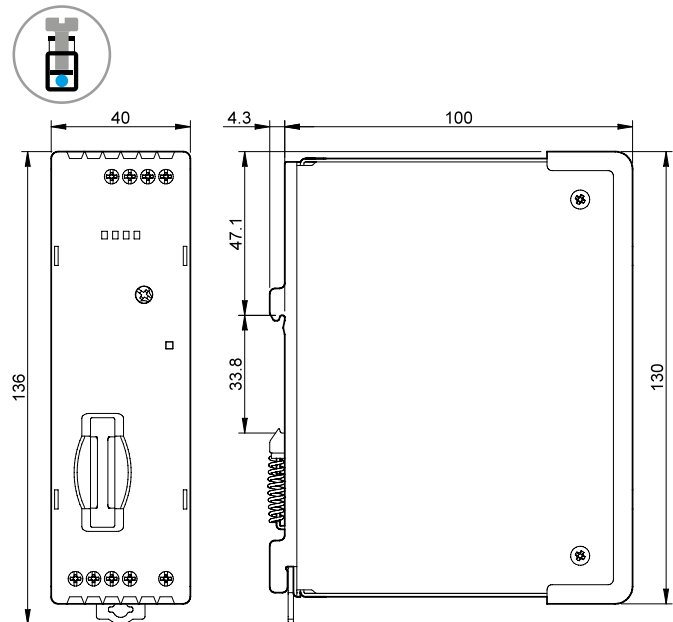
Types 78.50 / 78.60
Screw terminal



Type 78.61
Screw terminal

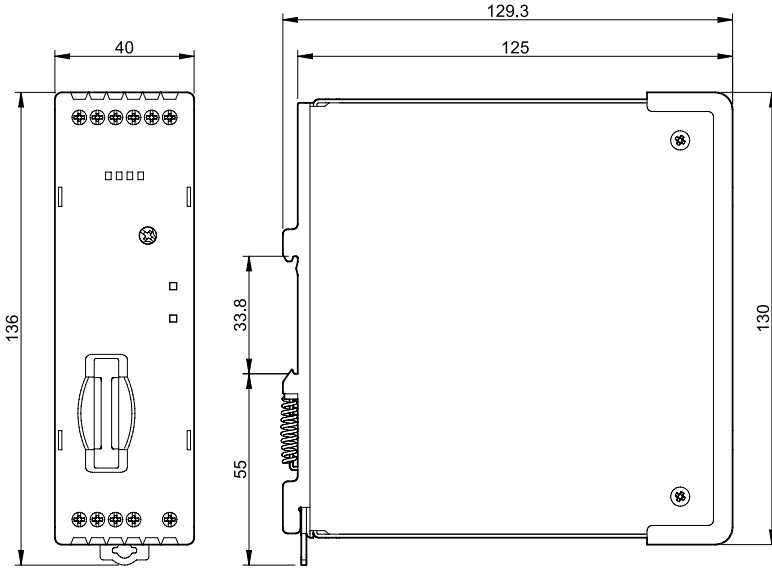


Type 78.1B
Screw terminal



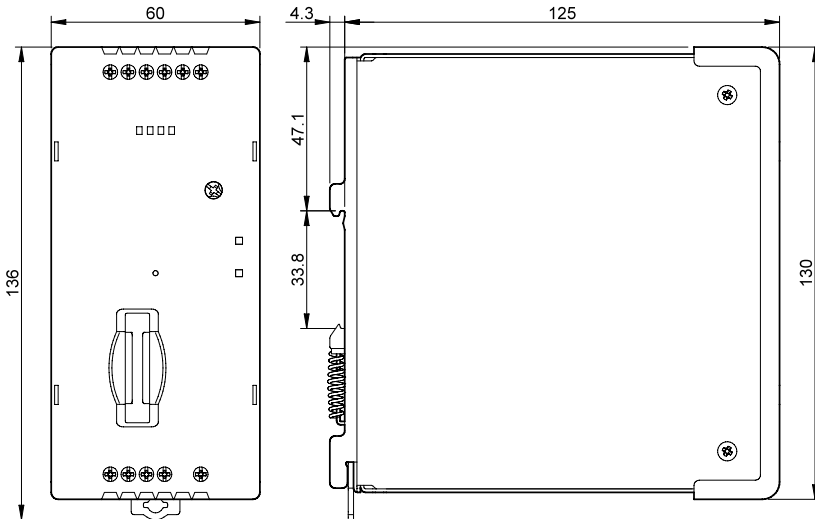
Outline drawings

Type 78.1D
Screw terminal



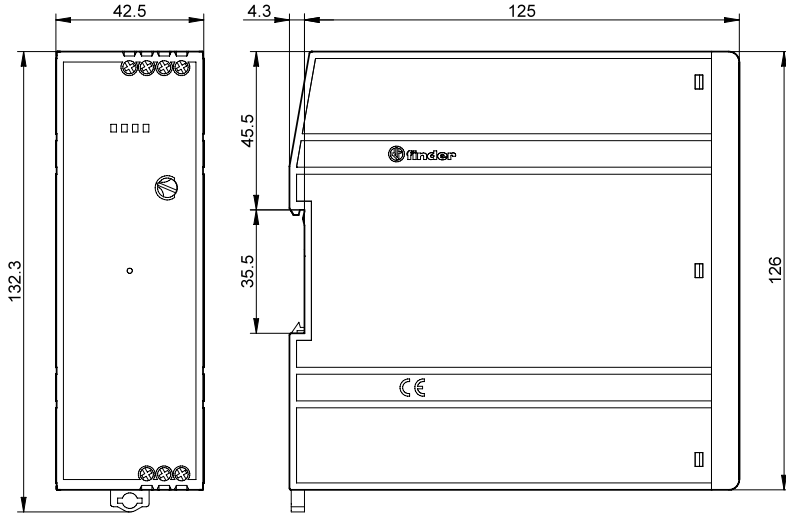
F

Type 78.2E
Screw terminal

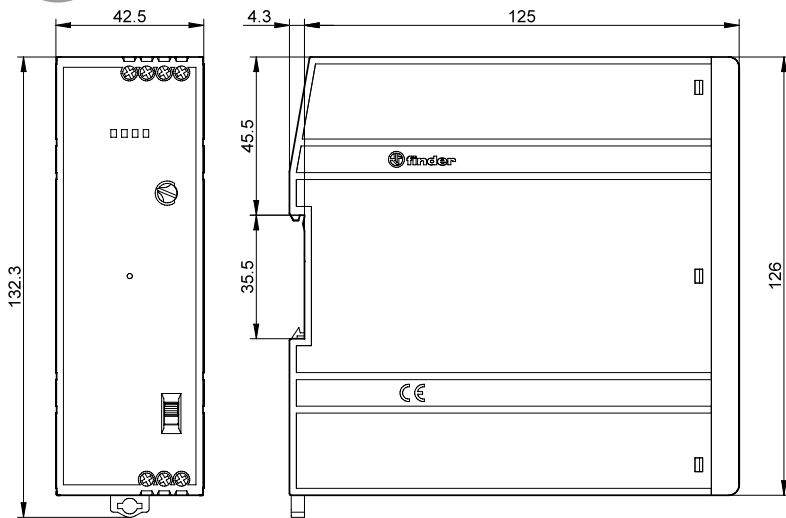


Outline drawings

Type 78.1A
Screw terminal

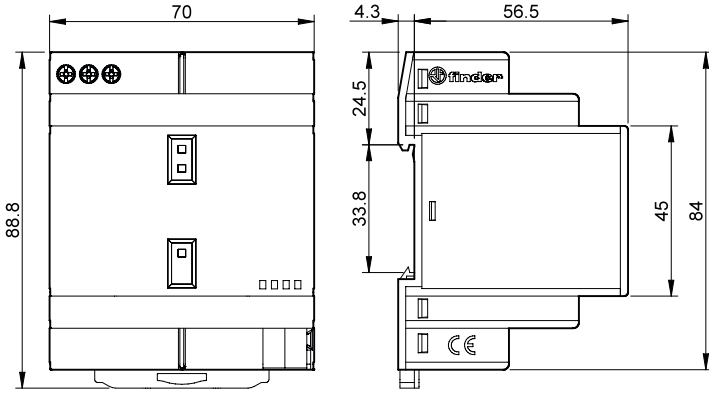


Type 78.2A
Screw terminal



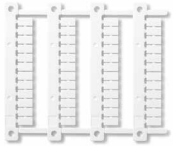
Outline drawings

Type 78.2K
Screw terminal



Accessories

F



Sheet of marker tags (CEMBRE Thermal transfer printers), (48 tags), 6 x 12 mm

060.48

060.48



Identification tag, plastic, 1 tag, 17 x 25.5 mm (for 78.12/25/36/50/60/61)

019.01

019.01