

Distributors

Europe

Belgium

nv HELPELEC sa
Kroninglaan, 11
Av. du Couronnement, 11
B-1200 Bruxelles
Tel + 32 (0) 2 762 33 38
Fax + 32 (0) 2 762 37 01
info@helpelec.be
www.helpelec.be

Germany North

Hubert Schroeter KG
Saseler Bogen 1
D-22393 Hamburg
Tel + 49 (0) 40 / 60 00 06-0
Fax + 49 (0) 40 / 60 00 06-30
schroeter.hh@t-online.de
www.schroeter-hh.de

Italy

elsap s.p.a.
Viale Famagosta, 61
I-20124 Milano
Tel + 39 02 89 12 52 72 r.a.
Fax + 39 02 89 12 53 04 r.a.
support@elsap.it
www.elsap.it

Spain/Portugal

DIASA Energy, S.A.
Ctra. Ajalvir - Torrejón, km. 1,800
Polg. Industrial Las Marineras,
nave 35
E-28864 Ajalvir
Tel + 34 (0) 91 884 35 19
Fax + 34 (0) 91 884 41 18
diasa.energy@wanadoo.es
www.diasaenergy.com

England

Haredata Ltd.
Hyde House
Victoria Avenue
GB-North Yorkshire
HG1 1DX
Tel + 44 (0) 14 23-54 30 00
Fax + 44 (0) 14 23-54 30 17
sales@haredata.co.uk
www.haredata.co.uk

Germany South

Kellner Netcom GmbH
Siemensstr. 28
D-70825 Korntal-Münchingen
Tel + 49 (0) 71 50 / 94 30-943
Fax + 49 (0) 71 50 / 20 59
energie@kellner.de
www.kellner.de

Netherlands

Hilltronic b.v.
Isaac Newtonstraat 3
NL-3261 MC Oud Beijerland
Postbus 1598
NL-3260 BB Oud Beijerland
Tel + 31 (0) 186 62 25 62
Fax + 31 (0) 186 62 25 69
office@hilltronic.com
www.hilltronic.com

Switzerland

Novitronic AG
Thurgauerstraße 74
CH-8050 Zürich
Tel + 41 (0) / 1-3 06 91 91
Fax + 41 (0) / 1-3 06 91 81
info@novitronic.ch
www.novitronic.ch

France

**CATS ZA de Courtaboeuf
Immeuble Oslo
Microel**
19 avenue de Norvège
F-91941 Les Ulis Cedex
Tel + 33 (0) 169 07 08 24
Fax + 33 (0) 169 07 17 23
communication@microel.fr
www.microel.fr

Ireland

Eltech Agencies Ltd.
Robert Scott House
7-10 Patricks Quay
IRL-Cork
Tel + 353 (0) 21 / 450 93 66
Fax + 353 (0) 21 / 450 93 44
eltech@iol.ie

Nordic countries

Awilco Electronic ApS
Yderholmvej 64
DK-4623 Lille Skensved
Tel + 45 (0) 56 56 55 00
Fax + 45 (0) 56 56 55 05
mail@awilco.dk
www.awilco.dk

France

**CATS ZA de Courtaboeuf
Immeuble Oslo
Solutec**
19 avenue de Norvège
F-91941 Les Ulis Cedex
Tel + 33 (0) 169 59 21 50
Fax + 33 (0) 169 59 21 51
marketing@solutec-france.fr
www.solutec-france.fr

Israel

Tamuz Electronics Ltd.
P.O. Box 332
IL-60944 Batzra
Tel + 972 (9) 744 27 20
Fax + 972 (9) 744 29 52
info@tamuz-ele.co.il
www.tamuz-ele.co.il

Russia

ELTECH
11 Pobedy str.
RUS-196070 Saint-Petersburg
Tel + 7 (812) 327 9090
Fax + 7 (812) 373 9890
???@eltech.spb.ru
www.eltech.spb.ru



FRIWO Gerätebau GmbH
P.O. Box 11 64 · D-48342 Ostbevern
Tel + 49 (0) 25 32 / 81-0
Fax + 49 (0) 25 32 / 81-112
sales@friwo.de · www.friwo.de

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www.ceag-ag.com

Power unlimited



Distribution Handbook



Distribution Handbook

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FRIWO Power Solutions

Company & Products



IT-Communication



Medical equipment



Consumer



Industrial equipment

**FRIWO – power unlimited
Power supplies for all applications**

FRIWO develops and produces power supplies and chargers which correspond to various technical and country specific requirements.

FRIWO Gerätebau GmbH, wholly-owned subsidiary of CEAG AG, being listed in the SDax, is the world's leading supplier of chargers and power supplies. As a global player the CEAG group is present in all the world's markets with a global sales and distribution network, and above all in those areas where you need us.

FRIWO develops and produces power supplies and chargers which correspond to various technical and country specific requirements. FRIWO has laid the foundation stone for the present market success with the launch of the first plug power supply in 1971 and is a noted leader of power supply and charger technology throughout the world.

FRIWO is continually extending its leading position in the power supply field by means of the consistent, technological advancement of the products coupled with an innovative design.

FRIWO delivers state-of-the-art power supplies and chargers in line with its strategic business units

For the four customer segments:

- IT-Communication
- Medical equipment
- Consumer
- Industrial equipment

Switchmode Power Supplies

PP 3

Conforms to IEC 60950

3 Watt



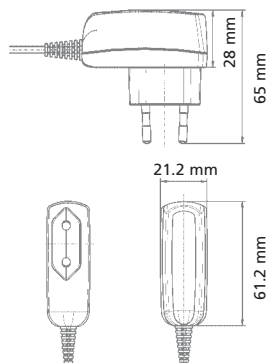
PP 3 USA/EURO

Applications

Telecom applications
Portable instruments peripherals

Characteristics

Universal input 100 - 240 V AC
Constant voltage current limited
Low leakage current < 10 μ A
Low standby power \leq 0.3 Watt



PP 3 EURO

Technical data

Input voltage 100 - 240 V
Input current 85 mA
Frequency 50 - 60 Hz
Efficiency 75% typ. at full load
EMC norm Conforms to FCC, CISPR 22, EN 55022, class B
IEC 61000-4-3; IEC 61000-4-6
Output voltage tolerance \pm 5%

Environmental specification

Operating temp. 0 °C to 40 °C at maximum load
Storage temp. -40 °C to 85 °C
Humidity 5% to 95% non condensing
Input Transient Susceptibility Complies with IEC 61000 requirements

Safety specification

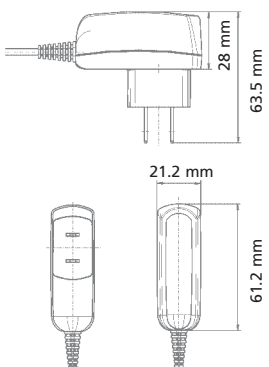
Standards Fulfills Class II SELV for the following applications: EN 60950/IEC 60950, VDE, CE label,

Reliability specification

MTBF calculation 200,000 hours at maximum load levels and an ambient temperature of 25 °C (in correspondence with MIL-HDBK-217)

Mechanical specification

Weight 60 g
Plug connector AC input: Mains plugs are available for the following countries: EURO, USA
DC output: Universal output plug system



PP 3 USA

| Voltage | Output data Current | EURO | | USA | |
|---------|------------------------|----------|-----------|----------|-----------|
| | | Part No. | Order No. | Part No. | Order No. |
| 5 V | 600 mA | 15.1291 | 1882750 | 15.1301 | 1882760 |
| 12 V | 250 mA | 15.1294 | 1882753 | 15.1304 | 1882763 |

Switchmode Power Supplies

PP 6

Conforms to IEC 60950

6 Watt



PP 6 EURO



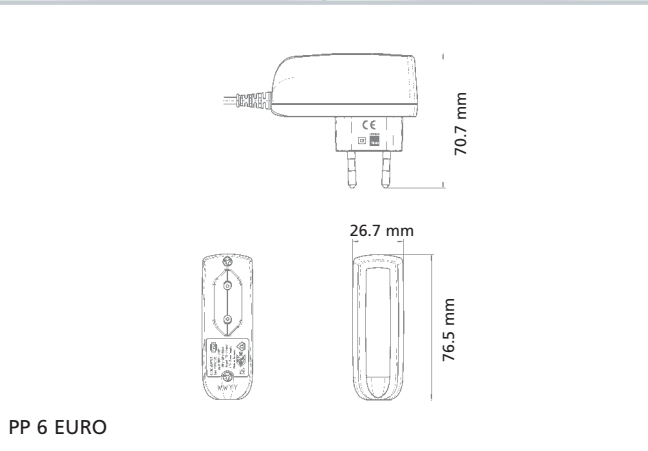
PP 6 USA

Applications

Modems
Portable battery operated equipment
Household appliances
Communication accessories

Characteristics

Universal input 100 - 240 V AC
EMC conformity
Constant voltage, current limited
Light weight, compact size
Low leakage current < 10 μ A
Low standby power \leq 0.3 Watt



PP 6 EURO

Technical data

Input voltage 100 V AC - 240 V AC
Input current 0.15 A
Frequency 50 - 60 Hz
Efficiency 75% typ. at full load
EMC norm Conforms to FCC, CISPR 22, EN 55022, class B
IEC 61000-4-3; IEC 61000-4-6

Output voltage tolerance

\pm 5%

Environmental specification

Operating temp. 0 °C to 40 °C at maximum load
Storage temp. -40 °C to 85 °C
Humidity 5% to 95% non condensing
Input Transient Susceptibility Complies with IEC 61000 requirements

Safety specification

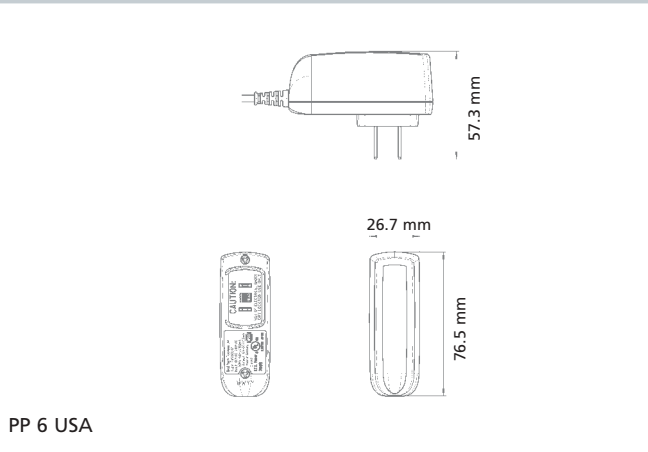
Standards Fulfills Class II SELV for the following applications: EN 60950/IEC 60950, VDE, CE label, UL 60950

Reliability specification

MTBF calculation 200,000 hours at maximum load levels and an ambient temperature of 25 °C (in correspondence with MIL-HDBK-217)

Mechanical specification

Weight 70 g
Plug connector AC input: Mains plugs are available for the following countries: EURO, USA
DC output: Universal output plug system



PP 6 USA

| Output data | | | EURO | | USA | |
|-------------|---------|--------------|----------|-----------|----------|-----------|
| Voltage | Current | Ripple volt. | Part No. | Order No. | Part No. | Order No. |
| 3 V | 1300 mA | 300 mV pp | 15.1614 | 1883765 | 15.1616 | 1883767 |
| 5 V | 1000 mA | 200 mV pp | 15.1028 | 1882105 | 15.1583 | 1814934 |
| 6 V | 850 mA | 180 mV pp | 15.1029 | 1882106 | 15.1584 | 1814935 |
| 7.5 V | 650 mA | 150 mV pp | 15.1030 | 1882107 | 15.1585 | 1814936 |
| 9 V | 550 mA | 150 mV pp | 15.1031 | 1882108 | 15.1586 | 1814937 |
| 12 V | 450 mA | 150 mV pp | 15.1032 | 1882109 | 15.1587 | 1814938 |
| 15 V | 360 mA | 150 mV pp | 15.1033 | 1882110 | 15.1588 | 1814939 |
| 18 V | 300 mA | 150 mV pp | 15.1034 | 1882111 | 15.1589 | 1814940 |
| 24 V | 220 mA | 150 mV pp | 15.1035 | 1882112 | 15.1590 | 1814941 |

Switchmode Power Supplies

PP 8

Conforms to IEC 60950

8 Watt



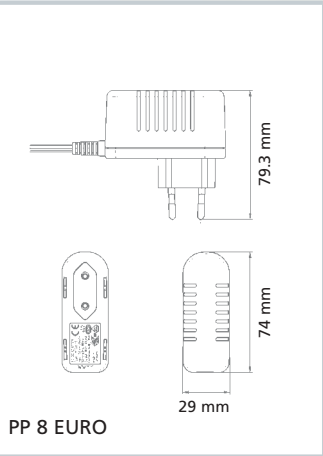
PP 8

Applications

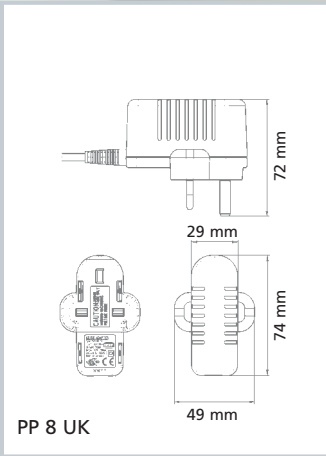
- IT equipment
- Measurement and weighing technology
- Laser and lighting technology
- Security technology / camera technology
- Office and data transmission appliances

Characteristics

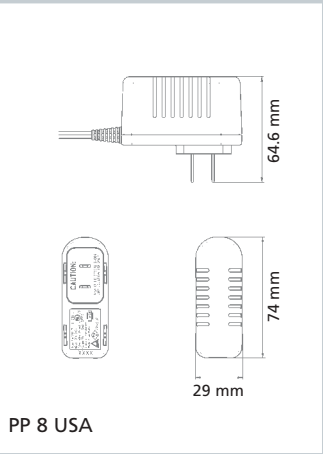
- Universal input 100 - 240 V AC
- EMC conformity
- High performance
- Constant voltage, current limited
- Light weight, compact size
- Low leakage current < 10 μ A
- Low standby power \leq 0.3 Watt



PP 8 EURO



PP 8 UK



PP 8 USA

Technical data

- Input voltage** 100 V AC - 240 V AC
- Input current** 0.17 A at 115 V AC / 0.08 A at 230 V AC
- Frequency** 50 - 60 Hz
- Efficiency** 70% typ. at full load
- EMC norm** Conforms to FCC, CISPR 22, EN 55022, class B IEC 61000-4-3; IEC 61000-4-6

Output voltage tolerance

\pm 5% at full load

Environmental specification

- Operating temp.** 0 °C to 40 °C at maximum load
- Storage temp.** -40 °C to 70 °C
- Humidity** 5% to 95% non condensing
- Input Transient Susceptibility** Complies with IEC 61000 requirements

Safety specification

- Standards** Fulfills Class II SELV for the following applications: IEC 60950, UL 60950, VDE, CE label

Reliability specification

- MTBF calculation** 200,000 hours at maximum load levels and an ambient temperature of 25 °C (in correspondence with MIL-HDBK-217)

Mechanical specification

- Weight** 70 g
- Plug connector** AC input: Mains plugs are available for the following countries: EURO, UK, USA/Japan
DC output: Universal output plug system

| Voltage | Output data | | | EURO | | UK | | USA | |
|---------|-------------|--------------|----------|-----------|----------|-----------|----------|-----------|--|
| | Current | Ripple volt. | Part No. | Order No. | Part No. | Order No. | Part No. | Order No. | |
| 3 V | 1700 mA | 300 mV pp | 15.1617 | 1819725 | 15.1618 | 1819726 | 15.1619 | 1819727 | |
| 5 V | 1300 mA | 200 mV pp | 15.1530 | 1814804 | 15.1543 | 1814894 | 15.1551 | 1814902 | |
| 6 V | 1150 mA | 180 mV pp | 15.1531 | 1814805 | 15.1544 | 1814895 | 15.1552 | 1814903 | |
| 7.5 V | 900 mA | 150 mV pp | 15.1532 | 1814806 | 15.1545 | 1814896 | 15.1553 | 1814904 | |
| 9 V | 800 mA | 150 mV pp | 15.1533 | 1814807 | 15.1546 | 1814897 | 15.1554 | 1814905 | |
| 12 V | 700 mA | 150 mV pp | 15.1534 | 1814808 | 15.1547 | 1814898 | 15.1555 | 1814906 | |
| 15 V | 530 mA | 150 mV pp | 15.1535 | 1814809 | 15.1548 | 1814899 | 15.1556 | 1814907 | |
| 18 V | 440 mA | 150 mV pp | 15.1536 | 1814810 | 15.1549 | 1814900 | 15.1557 | 1814908 | |
| 24 V | 330 mA | 150 mV pp | 15.1537 | 1814811 | 15.1550 | 1814901 | 15.1558 | 1814909 | |

Switchmode Power Supplies

PP 8 Medical

Conforms to IEC 60601-1

8 Watt



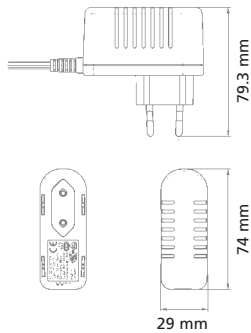
PP 8 Medical

Applications

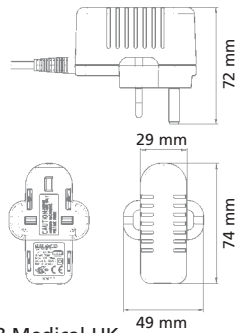
Blood analyzer
Patient monitors
Measuring instruments
Laboratory technology

Characteristics

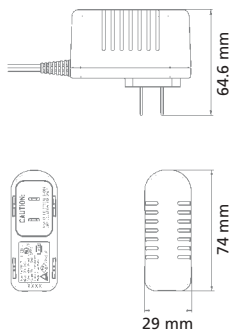
Universal input 100 - 240 V AC
EMC conformity
High performance
Constant voltage, current limited
Light weight, compact size
Low leakage current < 10 μ A
Low standby power \leq 0.3 Watt



PP 8 Medical EURO



PP 8 Medical UK



PP 8 Medical USA

Technical data

Input voltage 100 V AC - 240 V AC
Input current 0.17 A at 115 V AC / 0.08 A at 230 V AC
Frequency 50 - 60 Hz
Efficiency 70% typ. at full load
EMC norm Conforms to FCC, CISPR 22, EN 55022, class B
IEC 61000-4-3; IEC 61000-4-6

Output voltage tolerance

\pm 5% at full load

Environmental specification

Operating temp. 0 °C to 40 °C at maximum load
Storage temp. -40 °C to 70 °C
Humidity 5% to 95% non condensing
Input Transient Susceptibility Complies with IEC 61000 requirements

Safety specification

Standards Fulfills Class II SELV for the following applications: IEC 60601-1, UL 60950, VDE, CE label

Reliability specification

MTBF calculation 200,000 hours at maximum load levels and an ambient temperature of 25 °C (in correspondence with MIL-HDBK-217)

Mechanical specification

Weight 70 g
Plug connector AC input: Mains plugs are available for: EURO, UK, USA/Japan
DC output: Universal output plug system

World exclusive

Medical power supplies 100 - 240 V input voltage without earthing, leakage current < 10 μ A

| Output data | | | EURO | | UK | | USA | |
|-------------|---------|--------------|----------|-----------|----------|-----------|----------|-----------|
| Voltage | Current | Ripple volt. | Part No. | Order No. | Part No. | Order No. | Part No. | Order No. |
| 3 V | 1700 mA | 240 mV pp | 15.1620 | 1819728 | 15.1621 | 1819729 | 15.1622 | 1819730 |
| 5 V | 1300 mA | 240 mV pp | 15.1504 | 1883631 | 15.1559 | 1814910 | 15.1567 | 1814918 |
| 6 V | 1150 mA | 240 mV pp | 15.1505 | 1883632 | 15.1560 | 1814911 | 15.1568 | 1814919 |
| 7.5 V | 900 mA | 240 mV pp | 15.1506 | 1883633 | 15.1561 | 1814912 | 15.1569 | 1814920 |
| 9 V | 800 mA | 240 mV pp | 15.1507 | 1883634 | 15.1562 | 1814913 | 15.1570 | 1814921 |
| 12 V | 700 mA | 240 mV pp | 15.1508 | 1883635 | 15.1563 | 1814914 | 15.1571 | 1814922 |
| 15 V | 530 mA | 240 mV pp | 15.1509 | 1883636 | 15.1564 | 1814915 | 15.1572 | 1814923 |
| 18 V | 440 mA | 240 mV pp | 15.1510 | 1883637 | 15.1565 | 1814916 | 15.1573 | 1814924 |
| 24 V | 330 mA | 240 mV pp | 15.1511 | 1883638 | 15.1566 | 1814917 | 15.1574 | 1814925 |

Switchmode Power Supplies

SPA 3

Conforms to IEC 60950

3 Watt



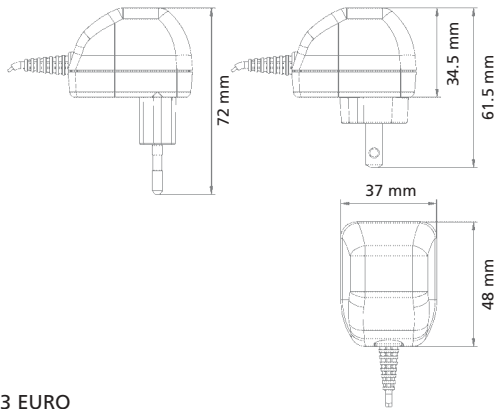
SPA 3 EURO

Applications

Portable battery operated equipment
Household appliances

Characteristics

Universal input 100 - 240 V AC
EMC conformity
For applications without earth connection only
Ultra light weight and compact size



SPA 3 EURO

Technical data

Input voltage 100 V AC - 240 V AC
Input current 0.2 A at 115 V AC / 0.1 A at 230 V AC
Frequency 47 - 63 Hz
Efficiency min. 60% typ. at full load
EMC norm Conforms to FCC, CISPR 22, EN 55022, class B
IEC 61000-4-3; IEC 61000-4-6

Output voltage tolerance

± 15%

Environmental specification

Operating temp. 0 °C to 40 °C at maximum load
Storage temp. -40 °C to 85 °C
Humidity 5% to 95% non condensing
Input Transient Susceptibility Complies with IEC 61000 requirements

Safety specification

Standards Fulfills Class II SELV for the following applications: EN 60950/IEC 60950, conforms to CE label, CCEE/CCIB GB 4943

Reliability specification

MTBF calculation 100,000 hours at maximum load levels and an ambient temperature of 25 °C (in correspondence with MIL-HDBK-217)

Mechanical specification

Weight 76 g
Plug connector AC input: Main plug are available for the following country: EURO
DC output: Universal output plug system

| Output data | | | EURO | |
|-------------|---------|--------------|----------|-----------|
| Voltage | Current | Ripple volt. | Part No. | Order No. |
| 5 V | 540 mA | 500 mV pp | 22.0353 | 1883498 |
| 6 V | 450 mA | 400 mV pp | 22.0354 | 1883499 |
| 7.5 V | 360 mA | 350 mV pp | 22.0355 | 1883500 |
| 9 V | 300 mA | 300 mV pp | 22.0356 | 1883501 |
| 12 V | 225 mA | 300 mV pp | 22.0357 | 1883502 |
| 15 V | 180 mA | 300 mV pp | 22.0358 | 1883503 |

Switchmode Power Supplies

MPP 6

Conforms to IEC 60950

6 Watt



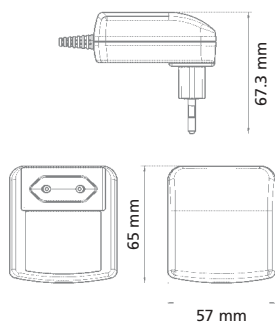
MPP 6

Applications

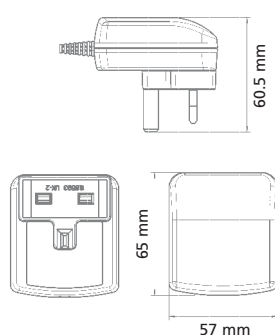
PDA's
MPEG Players
Digital Cameras

Characteristics

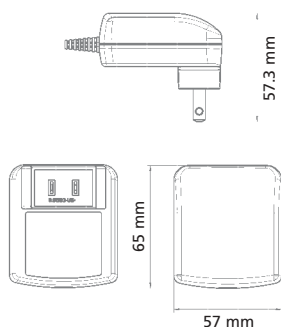
Universal input 100 - 240 V AC
Interchangeable primary adapters
Constant voltage, current limited
Low leakage current < 10 μ A
Low standby power \leq 0.3 Watt



MPP 6 EURO



MPP 6 UK



MPP 6 USA

Technical data

Input voltage 100 V AC - 240 V AC
Input current 0.15 A
Frequency 50 - 60 Hz
Efficiency 75% typ. at full load
EMC norm Conforms to FCC, CISPR 22, EN 55022, class B
IEC 61000-4-3; IEC 61000-4-6
Output voltage tolerance \pm 5%

Environmental specification

Operating temp. 0 °C to 40 °C at maximum load
Storage temp. -40 °C to 85 °C
Humidity 5% to 95% non condensing
Input Transient Susceptibility Complies with IEC 61000 requirements

Safety specification

Standards Fulfills Class II SELV for the following applications: IEC 60950, UL 60950, VDE, CE label

Reliability specification

MTBF calculation 200,000 hours at maximum load levels and an ambient temperature of 25 °C (in correspondence with MIL-HDBK-217)

Mechanical specification

Weight 90 g
Plug connector AC input: FRIWO exchangeable mains plug system: EURO, UK, USA/Japan, ROW
DC output: Universal output plug system

Output data

Worldwide

| Voltage | Current | Ripple volt. | Part No. | Order No. |
|---------|---------|--------------|----------|-----------|
| 3 V | 1300 mA | 300 mV pp | 15.1615 | 1883766 |
| 5 V | 1000 mA | 200 mV pp | 15.1575 | 1814927 |
| 6 V | 850 mA | 180 mV pp | 15.1576 | 1814928 |
| 7.5 V | 650 mA | 150 mV pp | 15.1577 | 1814929 |
| 9 V | 550 mA | 150 mV pp | 15.1578 | 1814930 |
| 12 V | 450 mA | 150 mV pp | 15.1579 | 1814931 |
| 15 V | 360 mA | 150 mV pp | 15.1580 | 1814932 |
| 18 V | 300 mA | 150 mV pp | 15.1581 | 1814933 |
| 24 V | 220 mA | 150 mV pp | 15.1582 | 1814934 |

Switchmode Power Supplies

MPP 15

Conforms to IEC 60950

15 Watt



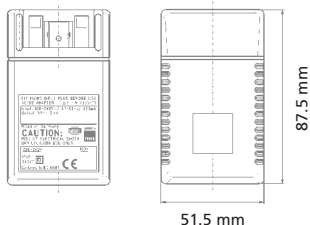
MPP 15

Applications

Office equipment
Data transmission devices
IT equipment
Measurement and weighing technology

Characteristics

Universal input 100 - 240 V AC
Interchangeable primary adapters
Constant voltage, current limited
Light weight and universal use
Low leakage current < 10 μ A
Low standby power \leq 0.5 Watt



MPP 15

Technical data

Input voltage 100 V AC - 240 V AC
Input current 0.4 A
Frequency 47 - 63 Hz
Efficiency 80% typ. at full load
EMC norm Conforms to FCC, CISPR 22, EN 55022, class B
IEC 61000-4-3; IEC 61000-4-6

Output voltage tolerance

\pm 10%

Environmental specification

Operating temp. 0 °C to 40 °C at maximum load
Storage temp. -40 °C to 70 °C
Humidity 5% to 95% non condensing
Input Transient Susceptibility Complies with IEC 61000 requirements

Safety specification

Standards Fulfills Class II SELV for the following applications: UL 60950, CSA 950 (cUL), IEC 60950, VDE, CE label

Reliability specification

MTBF calculation 200,000 hours at maximum load levels and an ambient temperature of 25 °C (in correspondence with MIL-HDBK-217)

Mechanical specification

Weight 130 g
Plug connector AC input: FRIWO exchangeable mains plug system: EURO, UK, USA/Japan, Australia, ROW
DC output: Universal output plug system

| Voltage | Output data | | Worldwide | |
|---------|-------------|--------------|-----------|-----------|
| | Current | Ripple volt. | Part No. | Order No. |
| 3 V | 2500 mA | 75 mV pp | 15.0891 | 1812102 |
| 5 V | 2400 mA | 75 mV pp | 15.0792 | 1812037 |
| 6 V | 2100 mA | 75 mV pp | 15.0791 | 1812036 |
| 7.5 V | 1700 mA | 90 mV pp | 15.0788 | 1812038 |
| 9 V | 1500 mA | 120 mV pp | 15.0661 | 1811970 |
| 12 V | 1250 mA | 150 mV pp | 15.0740 | 1811971 |
| 15 V | 1000 mA | 180 mV pp | 15.0793 | 1812039 |
| 18 V | 840 mA | 240 mV pp | 15.0584 | 1812040 |
| 24 V | 630 mA | 240 mV pp | 15.0794 | 1812041 |

Switchmode Power Supplies

MPP 30

Conforms to IEC 60950

30 Watt



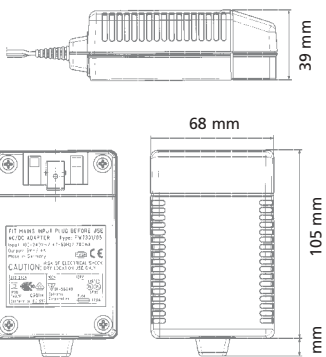
MPP 30

Applications

Office equipment
Data transmission devices
IT equipment
Measurement and weighing technology

Characteristics

Universal input 100 - 240 V AC
Interchangeable primary adapters
Constant voltage, current limited
Compact size & universal use
Low leakage current < 10 μ A
Low standby power \leq 0.5 Watt



MPP 30

Technical data

Input voltage 100 V AC - 240 V AC
Input current 0.7 A
Frequency 47 - 63 Hz
Efficiency 80% typ. at full load
EMC norm Conforms to FCC, CISPR 22, EN 55022, class B
IEC 61000-4-3; IEC 61000-4-6

Output voltage tolerance

\pm 10%

Environmental specification

Operating temp. 0 °C to 40 °C at maximum load
Storage temp. -40 °C to 70 °C
Humidity 5% to 95% non condensing
Input Transient Susceptibility Complies with IEC 61000 requirements

Safety specification

Standards Fulfills Class II SELV for the following applications: UL 60950, CSA 950 (cUL), IEC 60950, VDE, CE label

Reliability specification

MTBF calculation 200,000 hours at maximum load levels and an ambient temperature of 25 °C (in correspondence with MIL-HDBK-217)

Mechanical specification

Weight 278 g
Plug connector AC input: FRIWO exchangeable mains plug system: EURO, UK, USA/Japan, Australia, ROW
DC output: Universal output plug system

| Output data | | | Worldwide | |
|-------------|---------|--------------|-----------|-----------|
| Voltage | Current | Ripple volt. | Part No. | Order No. |
| 5 V | 4000 mA | 75 mV pp | 11.9831 | 1811463 |
| 6 V | 3600 mA | 80 mV pp | 11.9832 | 1811464 |
| 7.5 V | 3300 mA | 90 mV pp | 11.9833 | 1811465 |
| 9 V | 3000 mA | 90 mV pp | 11.9834 | 1811466 |
| 12 V | 2500 mA | 100 mV pp | 11.9835 | 1806413 |
| 15 V | 2000 mA | 100 mV pp | 11.9836 | 1811467 |
| 18 V | 1660 mA | 120 mV pp | 11.9837 | 1811483 |
| 24 V | 1250 mA | 80 mV pp | 11.9838 | 1811484 |

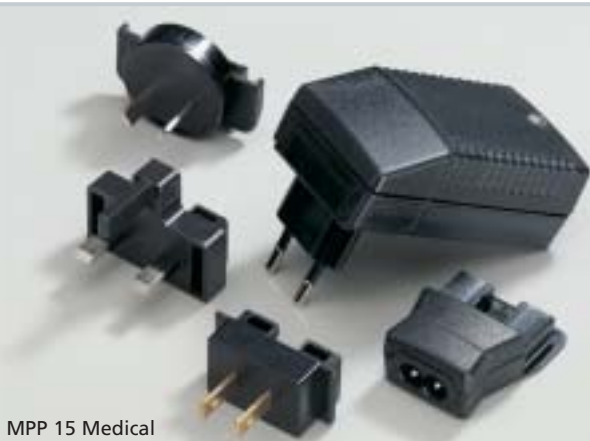
| Internally adjustable power supplies | | | Worldwide | |
|--------------------------------------|--------------|-------------------------|-----------|-----------|
| Voltage | Current | Ripple volt. | Part No. | Order No. |
| 5-15 V | 1700-2700 mA | ca. 1% U _{out} | 15.0543 | 1811820 |
| 15-48 V | 550-1400 mA | ca. 1% U _{out} | 15.0542 | 1811819 |

Switchmode Power Supplies

MPP 15 Medical

Conforms to IEC 60601

15 Watt



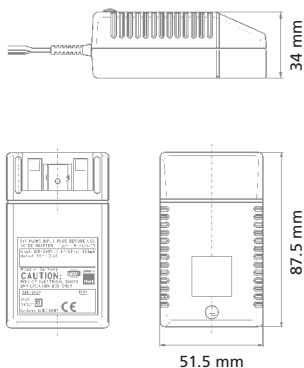
MPP 15 Medical

Applications

Blood analyzer
Patient monitors
Measuring instruments
Laboratory technology

Characteristics

Universal input 100 - 240 V AC
Interchangeable primary adapters
Constant voltage, current limited
Green LED indicating power-on
Low leakage current < 10 μ A
Low standby power \leq 0.5 Watt



MPP 15 Medical

Technical data

Input voltage 100 V AC - 240 V AC
Input current 0.4 A
Frequency 50 - 60 Hz
Efficiency 80% typ. at full load
EMC norm Conforms to FCC, CISPR 22, EN 55022, class B
IEC 61000-4-3; IEC 61000-4-6

Output voltage tolerance

\pm 10%

Environmental specification

Operating temp. 0 °C to 40 °C at maximum load
Storage temp. -40 °C to 70 °C
Humidity 5% to 95% non condensing
Input Transient Susceptibility Complies with IEC 61000 requirements

Safety specification

Standards Fulfills Class II SELV for the following applications: IEC 60601-1, UL 2601, VDE, CE label, fulfills medical application class B/BF/CF

Reliability specification

MTBF calculation 200,000 hours at maximum load levels and an ambient temperature of 25 °C (in correspondence with MIL-HDBK-217)

Mechanical specification

Weight 130 g
Plug connector AC input: FRIWO exchangeable mains plug system: EURO, UK, USA/Japan, Australia, ROW
DC output: Universal output plug system

World exclusive

Medical power supplies 100 - 240 V input voltage without earthing, leakage current < 10 μ A

| Voltage | Output data | | Worldwide | |
|---------|-------------|--------------|-----------|-----------|
| | Current | Ripple volt. | Part No. | Order No. |
| 5 V | 2400 mA | 75 mV pp | 15.1429 | 1883256 |
| 6 V | 2100 mA | 75 mV pp | 15.1430 | 1883257 |
| 7.5 V | 1700 mA | 75 mV pp | 15.1431 | 1883258 |
| 9 V | 1500 mA | 90 mV pp | 15.1432 | 1883259 |
| 12 V | 1250 mA | 120 mV pp | 15.1433 | 1883260 |
| 15 V | 1000 mA | 150 mV pp | 15.1434 | 1883261 |
| 18 V | 840 mA | 180 mV pp | 15.1435 | 1883262 |
| 24 V | 630 mA | 240 mV pp | 15.1436 | 1883263 |

Switchmode Power Supplies

MPP 30 Medical

Conforms to IEC 60601

30 Watt



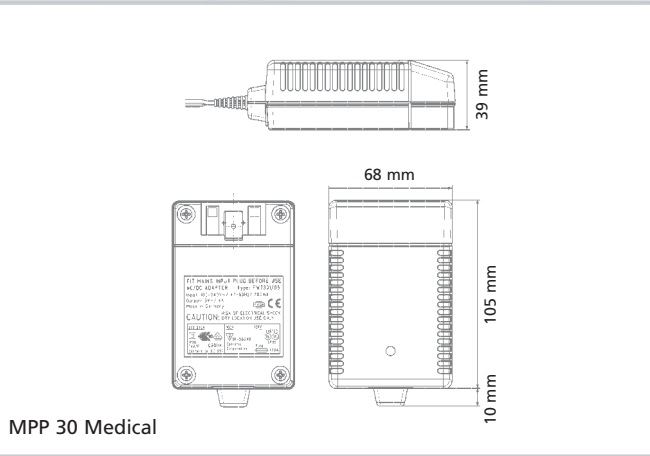
MPP 30 Medical

Applications

Inhalers
Patient monitors
Patient lifts
Measuring instruments
Laboratory technology

Characteristics

Universal input 100 - 240 V AC
Interchangeable primary adapters
Constant voltage, current limited
Green LED indicating power-on
Low leakage current < 10 μ A
Low standby power \leq 0.5 Watt



MPP 30 Medical

Technical data

Input voltage 100 V AC - 240 V AC
Input current 0.7 A
Frequency 50 - 60 Hz
Efficiency 80% typ. at full load
EMC norm Conforms to FCC, CISPR 22, EN 55022, class B
IEC 61000-4-3; IEC 61000-4-6

Output voltage tolerance

\pm 10%

Environmental specification

Operating temp. 0 °C to 40 °C at maximum load
Storage temp. -40 °C to 70 °C
Humidity 5% to 95% non condensing
Input Transient Susceptibility Complies with IEC 61000 requirements

Safety specification

Standards Fulfills Class II SELV for the following applications: IEC 60601-1, UL 2601, VDE, CE label, fulfills medical application class B/BF/CF

Reliability specification

MTBF calculation 200,000 hours at maximum load levels and an ambient temperature of 25 °C (in correspondence with MIL-HDBK-217)

Mechanical specification

Weight 278 g
Plug connector AC input: FRIWO exchangeable mains plug system: EURO, UK, USA/Japan, Australia, ROW
DC output: Universal output plug system

World exclusive

Medical power supplies 100 - 240 V input voltage without earthing, leakage current < 10 μ A

| Output data | | | Worldwide | |
|-------------|---------|--------------|-----------|-----------|
| Voltage | Current | Ripple volt. | Part No. | Order No. |
| 5 V | 4000 mA | 75 mV pp | 15.1437 | 1883264 |
| 6 V | 3600 mA | 75 mV pp | 15.1438 | 1883265 |
| 7.5 V | 3300 mA | 75 mV pp | 15.1439 | 1883266 |
| 9 V | 3000 mA | 90 mV pp | 15.1440 | 1883267 |
| 12 V | 2500 mA | 100 mV pp | 15.1441 | 1883268 |
| 15 V | 2000 mA | 100 mV pp | 15.1442 | 1883269 |
| 18 V | 1660 mA | 120 mV pp | 15.1443 | 1883270 |
| 24 V | 1250 mA | 120 mV pp | 15.1444 | 1883271 |

Switchmode Power Supplies

DT 10

Conforms to IEC 60950

10 Watt



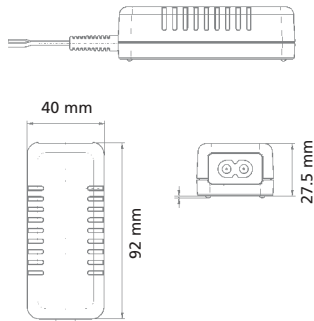
DT 10

Applications

Office equipment
Data transmission devices
IT equipment
Measurement and weighing technology

Characteristics

Universal input 100 - 240 V AC
EMC conformity
High performance
Constant voltage, current limited
Compact desktop unit
Low leakage current < 250 μ A
Standby power \leq 1 Watt



DT 10

Technical data

Input voltage 100 V AC - 240 V AC
Input current 0.3 A
Frequency 50 - 60 Hz
Efficiency 79% typ. at full load
EMC norm Conforms to FCC, CISPR 22, EN 55022, class B
IEC 61000-4-3; IEC 61000-4-6

Output voltage tolerance

\pm 10% at full load

Environmental specification

Operating temp. 0 °C to 40 °C at maximum load
Storage temp. -40 °C to 70 °C
Humidity 5% to 95% non condensing
Input Transient Susceptibility Complies with IEC 61000 requirements

Safety specification

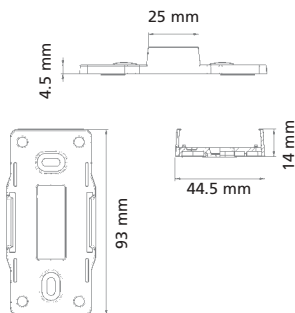
Standards Fulfills Class II SELV for the following applications: UL 60950, CSA 950 (cUL), IEC 60950, VDE, CE label

Reliability specification

MTBF calculation 200,000 hours at maximum load levels and an ambient temperature of 25 °C (in correspondence with MIL-HDBK-217)

Mechanical specification

Weight 126 g including a 2 metre output cable
Plug connector AC input: 2 PIN IEC 320, C 8 input socket
DC output: Universal output plug system



Wall fastening

| Voltage | Output data | | Worldwide | |
|---------|-------------|--------------|-----------|-----------|
| | Current | Ripple volt. | Part No. | Order No. |
| 5 V | 2000 mA | 120 mV pp | 15.1010 | 1812115 |
| 6 V | 1700 mA | 120 mV pp | 15.1011 | 1812116 |
| 7.5 V | 1400 mA | 115 mV pp | 15.1012 | 1812117 |
| 9 V | 1200 mA | 135 mV pp | 15.1013 | 1812307 |
| 12 V | 1000 mA | 180 mV pp | 15.1014 | 1812110 |
| 15 V | 800 mA | 225 mV pp | 15.1015 | 1812308 |
| 18 V | 660 mA | 270 mV pp | 15.1016 | 1812309 |
| 24 V | 500 mA | 300 mV pp | 15.1017 | 1812310 |
| 48 V | 250 mA | 480 mV pp | 15.1018 | 1812311 |

Switchmode Power Supplies

DT 55

Conforms to IEC 60950

55 Watt



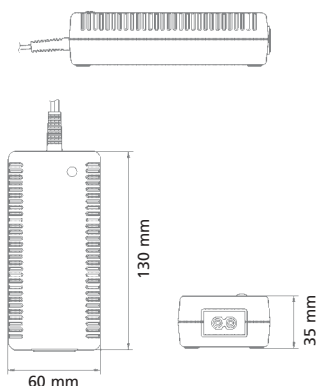
DT 55

Applications

Notebooks
Computer accessories
Telecommunication equipment
Automation technology
TFT displays

Characteristics

Universal input 120 - 240 V AC
High performance
Compact desktop unit
Overvoltage protection and short circuit protection



DT 55

Technical data

Input voltage 120 V AC - 240 V AC
Input current 1.5 A
Frequency 47 - 63 Hz
Efficiency min. 80% typ. at full load
Inrush current max. 40 A at 230 V Cold Start
EMC norm Conforms to FCC, CISPR 22, EN 55022, class B
IEC 61000-4-3; IEC 61000-4-6

Output voltage tolerance ± 10%

Environmental specification

Operating temp. 0 °C to 40 °C at maximum load
Storage temp. -40 °C to 70 °C
Humidity 5% to 95% non condensing
Input Transient Susceptibility Complies with IEC 61000 requirements

Safety specification

Standards Fulfills Class II SELV for the following applications: EN 60950/IEC 60950, TÜV GS, UL 60950, CSA 950 (cUL), conforms to CE label, CCEE/CCIB GB 4943

Reliability specification

MTBF calculation 100,000 hours at maximum load levels and an ambient temperature of 25 °C (in correspondence with MIL-HDBK-217)

Mechanical specification

Weight 295 g including a 2 metre output cable
Plug connector AC input: 2 PIN IEC 320, C 8 input socket
DC output: 2 m cable with connector plug 2.5 x 5.5 x 9.5 mm, center positiv standard

Output data

Worldwide

| Voltage | Current | Ripple volt. | Part No. | Order No. |
|---------|---------|--------------|----------|-----------|
| 12 V | 3800 mA | 250 mV pp | 22.0060 | 1808889 |
| 15 V | 3300 mA | 250 mV pp | 22.0059 | 1808888 |
| 18 V | 3000 mA | 200 mV pp | 22.0058 | 1808887 |
| 20 V | 2700 mA | 200 mV pp | 22.0057 | 1808886 |
| 24 V | 2300 mA | 200 mV pp | 22.0056 | 1808885 |

Linear Power Supplies

AC/AC L 35/48

Conforms to IEC 61558

3-20 Watt



35 AC



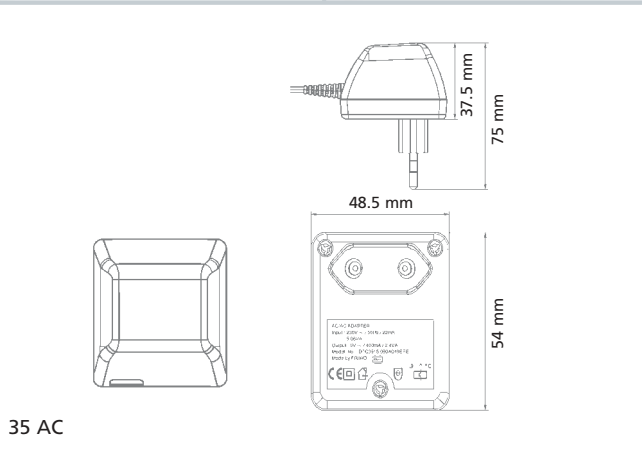
48 AC

Applications

Small office equipment
Personal electronic power
Portable electronic battery charger

Characteristics

Lowest cost Linear
Enclosed plastic case
High sensibility



35 AC

Technical data

Input voltage 230 V AC
Frequency 50 Hz
EMC norm Conforms to FCC, CISPR 22, EN 55022, class B
IEC 61000-4-3; IEC 61000-4-6

Environmental specification

Operating temp. 0 °C to 40 °C at maximum load
Storage temp. -40 °C to 40 °C

Safety specification

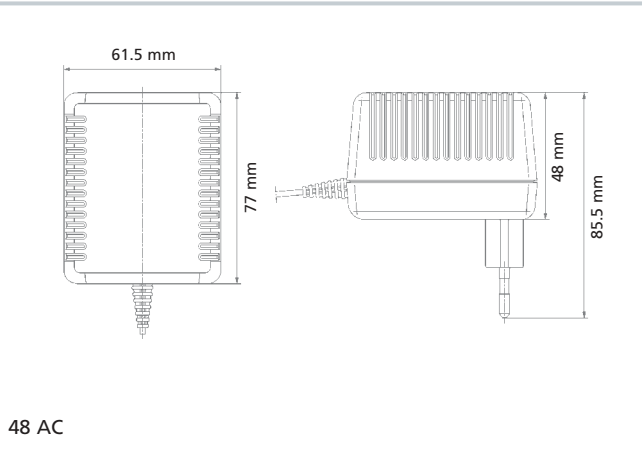
Standards Fulfills Class II SELV for the following applications: IEC 61558, CE label

Reliability specification

MTBF calculation 100,000 hours at maximum load levels and an ambient temperature of 25 °C (in correspondence with MIL-HDBK-217)

Mechanical specification

Weight 110 g (35 AC) / 400 g (48 AC)
Plug connector AC input: Main plug is available for the following country: EURO
DC output: Universal output plug system



48 AC

| Output data | | | EURO | |
|-------------|---------|---------|----------|-----------|
| Voltage | Current | Housing | Part No. | Order No. |
| 6 V | 400 mA | 35 AC | 22.0371 | 1883559 |
| 9 V | 300 mA | 35 AC | 22.0330 | 1883465 |
| 9 V | 1900 mA | 48 AC | 22.0360 | 1883466 |
| 12 V | 230 mA | 35 AC | 22.0368 | 1883556 |
| 12 V | 1540 mA | 48 AC | 22.0331 | 1883467 |
| 15 V | 190 mA | 35 AC | 22.0367 | 1883555 |
| 15 V | 1240 mA | 48 AC | 22.0373 | 1883561 |
| 18 V | 980 mA | 48 AC | 22.0366 | 1883554 |
| 24 V | 125 mA | 35 AC | 22.0375 | 1883563 |
| 24 V | 750 mA | 48 AC | 22.0372 | 1883560 |

| Output data | | | UK | |
|-------------|---------|---------|----------|-----------|
| Voltage | Current | Housing | Part No. | Order No. |
| 9 V | 1900 mA | 48 AC | 22.0376 | 1883564 |

Linear Power Supplies

DC Unregulated

L 41/48

12 Watt

Conforms to IEC 61558

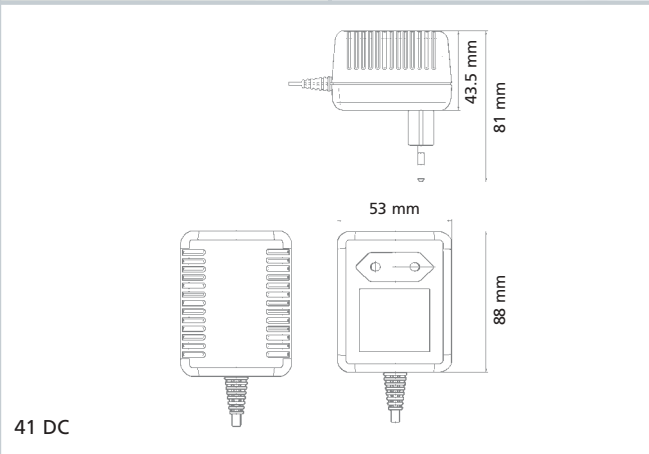


Applications

Small office equipment
Personal electronic power
Portable electronic battery charger

Characteristics

Lowest cost Linear
Enclosed plastic case
High sensibility



Technical data

Input voltage 230 V AC
Frequency 50 Hz
EMC norm Conforms to FCC, CISPR 22, EN 55022, class B
IEC 61000-4-3; IEC 61000-4-6

Environmental specification

Operating temp. 0 °C to 40 °C at maximum load
Storage temp. -40 °C to 40 °C

Safety specification

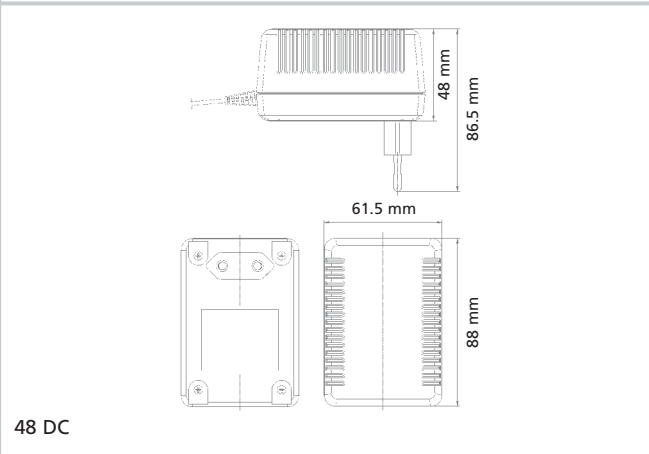
Standards Fulfills Class II SELV for the following applications: IEC 61558, CE label

Reliability specification

MTBF calculation 100,000 hours at maximum load levels and an ambient temperature of 25 °C (in correspondence with MIL-HDBK-217)

Mechanical specification

Weight 270 g (41 DC) / 410 g (48 DC)
Plug connector AC input: Mains plug are available for the following countries: EURO, UK
DC output: Universal output plug system



| Output data | | | EURO | | |
|-------------|---------|---------|----------|-----------|--|
| Voltage | Current | Housing | Part No. | Order No. | |
| 6 V | 900 mA | 41 DC | 22.0369 | 1883557 | |
| 9 V | 1000 mA | 48 DC | 22.0332 | 1883468 | |
| 9 V | 680 mA | 41 DC | 22.0370 | 1883558 | |
| 12 V | 580 mA | 41 DC | 22.0341 | 1883472 | |
| 12 V | 1000 mA | 48 DC | 22.0333 | 1883469 | |
| 18 V | 500 mA | 48 DC | 22.0374 | 1883562 | |
| 24 V | 500 mA | 48 DC | 22.0342 | 1883482 | |

| Output data | | | UK | | |
|-------------|---------|---------|----------|-----------|--|
| Voltage | Current | Housing | Part No. | Order No. | |
| 12 V | 580 mA | 41 DC | 22.0377 | 1883565 | |

Linear Power Supplies Adjustable and Regulated

Conforms to IEC 61558

7 Watt



Applications

Small office equipment
Personal electronic power
Portable electronic battery charger

Characteristics

Lowest cost Linear
Enclosed plastic case
High sensibility

Technical data

Input voltage 230 V AC
Frequency 50 Hz
EMC norm Conforms to FCC, CISPR 22, EN 55022, class B
IEC 61000-4-3; IEC 61000-4-6

Environmental specification

Operating temp. 0 °C to 40 °C at maximum load
Storage temp. -40 °C to 40 °C

Safety specification

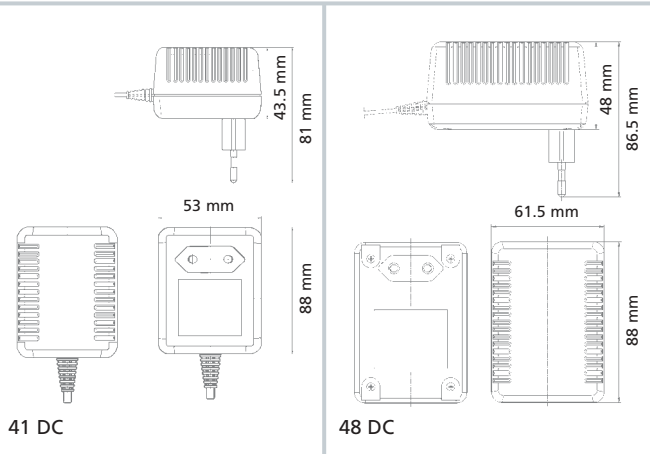
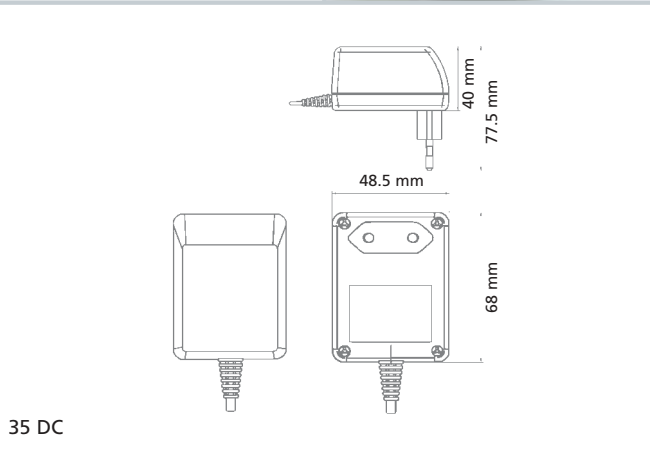
Standards Fulfills Class II SELV for the following applications: IEC 61558, CE label

Reliability specification

MTBF calculation 100,000 hours at maximum load levels and an ambient temperature of 25 °C (in correspondence with MIL-HDBK-217)

Mechanical specification

Weight 200 g (35 DC) / 250 g (41 DC) / 500 g (48 DC)
Plug connector AC input: Mains plugs are available for the following countries: EURO, UK, USA
DC output: Universal output plug system



| Internally adjustable / Output data | | | EURO | | UK | | USA | |
|-------------------------------------|------------|-------------|----------|-----------|----------|-----------|----------|-----------|
| Voltage | Set. range | Work. range | Part No. | Order No. | Part No. | Order No. | Part No. | Order No. |
| 1-11 V | 600-60 mA | 600-60 mA | 11.4070 | 1430084 | 11.4600 | 1463586 | 11.4911 | 1482157 |
| 10-24 V | 280-60 mA | 280-60 mA | 11.4071 | 1430092 | 11.4601 | 1463594 | 11.4912 | 1482181 |

| Regulated / Output data | | | EURO | |
|-------------------------|---------|---------|----------|-----------|
| Voltage | Current | Housing | Part No. | Order No. |
| 5 V | 270 mA | 35 DC | 22.0334 | 1883470 |
| 5 V | 500 mA | 41 DC | 22.0336 | 1883473 |
| 6 V | 500 mA | 41 DC | 22.0337 | 1883474 |
| 7.5 V | 500 mA | 41 DC | 22.0338 | 1883475 |
| 9 V | 190 mA | 35 DC | 22.0335 | 1883471 |
| 9 V | 300 mA | 41 DC | 22.0339 | 1883476 |
| 12 V | 600 mA | 48 DC | 22.0340 | 1883477 |

Switchmode Chargers NiCd / NiMH

Conforms to IEC 60335



DT 80-Ni



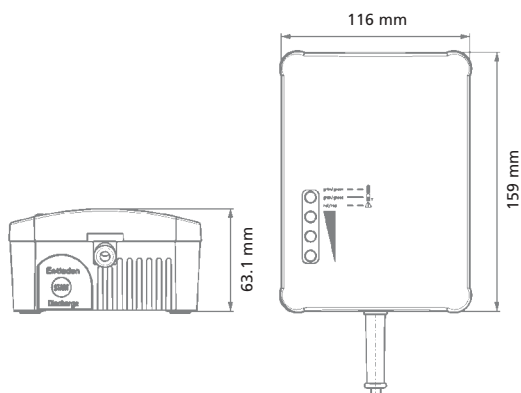
MPP 30-Ni

Applications

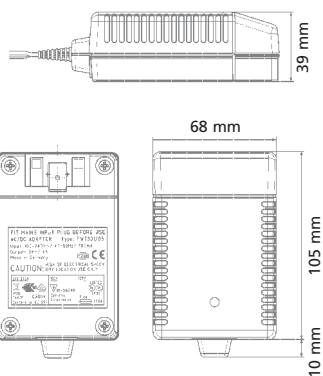
- Diving lights
- Electrical vehicles
- Cleaning machines
- Stair lifts/patient lifts
- Medical technology
- Mobile lighting

Characteristics

- Input 230 V AC / 100 - 240 V AC
- Interchangeable primary adapters
- Low standby power
- EMC conformity
- Constant Current
- Discharge button
- delta U or gradient recording of the temp. ($\delta T / \delta t$)



DT 80



MPP 30

Technical data (DT 80-Ni / MPP 30-Ni)

- Input voltage** 230 V AC / 100 V AC - 240 V AC
- Input current** 0.5 A / 0.4 A
- Frequency** 50 - 60 Hz
- Efficiency** 80% typ. at full load / typ. 30...83%
- EMC norm** Conforms to FCC, CISPR 22, EN 55022, class B
IEC 61000-4-3; IEC 61000-4-6
- Output voltage tolerance** $\pm 10\%$

Environmental specification (DT 80-Ni / MPP 30-Ni)

- Operating temp.** 0 °C to 40 °C at maximum load
- Storage temp.** -40 °C to 70 °C
- Humidity** 5% to 95% non condensing
- Input Transient Susceptibility** Complies with IEC 61000 requirements

Safety specification (DT 80-Ni / MPP 30-Ni)

- Standards** Fulfills Class II SELV for the following applications: UL 60950, CSA 950 (cUL), IEC 60950, IEC 60335-2-29, VDE, CE label

Reliability specification (DT 80-Ni / MPP 30-Ni)

- MTBF calculation** 100,000 hours at maximum load levels and an ambient temperature of 25 °C (in correspondence with MIL-HDBK-217)

Mechanical specification (DT 80-Ni / MPP 30-Ni)

- Weight** 700 g / 278 g
- Plug connector** AC input: 2 PIN IEC 320, C 8 plug / FRIWO exchangeable mains plug system: EURO, UK, USA/Japan, Australia, ROW
DC output: customized plug / 2 m connecting cable with customized plug connection / chargers with temp. cut-out. with a 3 wire output cable stripped and tinned

| Battery Cap. | Output data | | | Housing | Starting by | | Cut-out by | | | EURO | | Worldwide | |
|---------------|-------------|--------------|--|---------|-------------|---------|------------|-------|----------|----------|-----------|-----------|-----------|
| | Current | No. of cells | | | Mains | Battery | Time | Temp. | -delta U | Part No. | Order No. | Part No. | Order No. |
| 5.0 - 20.0 Ah | 2500 mA | 20 | | DT 80 | • | • | • | • | • | 15.1108 | 1882926 | - | - |
| 3.5 - 7.0 Ah | 950 mA | 10 - 20 | | MPP 30 | • | • | • | • | • | - | - | 15.0377 | 1811894 |
| 2.8 - 7.0 Ah | 1000 mA | 10 - 12 | | MPP 30 | • | • | • | • | • | - | - | 15.0350 | 1812609 |
| 2.8 - 4.5 Ah | 1400 mA | 8 - 12 | | MPP 30 | • | • | • | • | • | - | - | 15.0493 | 1880408 |
| 2.5 - 10.0 Ah | 2000 mA | 5 - 6 | | MPP 30 | • | • | • | • | • | - | - | 15.0635 | 1818681 |

Switchmode Chargers

Lead Acid

Conforms to IEC 60335



DT 80-PB



MPP 15-PB



MPP 30-PB

Applications

- Starter batteries
- Cleaning machines
- Stair lifts/patient lifts
- Electrical vehicles
- Mobile lighting
- Mobile measuring technology
- Professional photographic technology

Characteristics

- EMC conformity
- Interchangeable primary adapters
- Low standby power
- Constant Current
- Light weight, compact size
- High performance

Technical data (DT 80-PB / MPPs)

- Input voltage** 230 V AC / 100 V AC - 240 V AC
- Input current** 0.6 A / 0.18 A (MPP 15-PB) / 0.5 A (MPP 30-PB)
- Frequency** 47 - 53 Hz / 50 - 60 Hz
- Efficiency** 80% typ. at full load
- EMC norm** Conforms to FCC, CISPR 22, EN 55022, class B IEC 61000-4-3; IEC 61000-4-6

Output voltage tolerance

± 10%

Environmental specification (DT 80-PB / MPPs)

- Operating temp.** 0 °C to 40 °C at maximum load
- Storage temp.** -40 °C to 70 °C
- Humidity** 5% to 95% non condensing
- Input Transient Susceptibility** Complies with IEC 61000 requirements

Safety specification (DT 80-PB / MPPs)

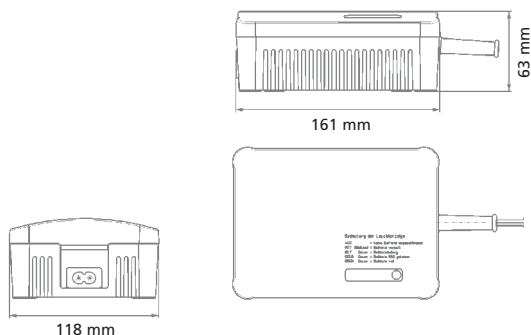
- Standards** Fulfills Class II SELV for the following applications: IEC 61000 / IEC 60335-2-29, EN 60335-2-29, VDE, UL CUL

Reliability specification (DT 80-PB / MPPs)

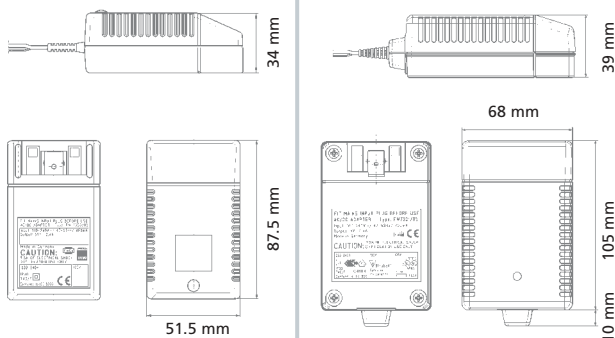
- MTBF calculation** 100,000 hours at maximum load levels and an ambient temperature of 25 °C (in correspondence with MIL-HDBK-217)

Mechanical specification (DT 80-PB / MPPs)

- Weight** 700 g / 110 g (MPP 15-PB), 225 g (MPP 30-PB)
- Plug connector** AC input: 2 PIN IEC 320, C 8 plug / FRIWO exchangeable mains plug system: EURO, UK, USA/Japan, Australia, ROW
DC output: customized plug / 2 m connecting cable with customized plug connection



DT 80



MPP 15

MPP 30

Output data

| Voltage | Current | Capacity | Characteristics | Housing |
|---------|---------|----------------|-----------------|---------|
| 6 V | 1600 mA | 3.0 - 6.0 Ah | IU0U | MPP 15 |
| 12 V | 1000 mA | 3.0 - 20.0 Ah | IU0U | MPP 15 |
| 12 V* | 1500 mA | 4.5 - 30.0 Ah | IU0U | MPP 15 |
| 12 V | 2000 mA | 4.5 - 28.0 Ah | IU0U | MPP 30 |
| 12 V* | 5000 mA | 25.0 - 40.0 Ah | IU0U | DT 80 |
| 24 V* | 750 mA | 3.0 - 14.0 Ah | IU0U | MPP 15 |
| 24 V | 1000 mA | 3.0 - 7.2 Ah | IU0U | MPP 30 |
| 24 V* | 1400 mA | 4.5 - 28.0 Ah | IU0U | MPP 30 |
| 24 V* | 2000 mA | 10.0 - 16.0 Ah | IU0U | DT 80 |

EURO/UK

Worldwide

| Part No. | Order No. | Part No. | Order No. |
|----------|-----------|----------|-----------|
| - | - | 15.0982 | 1812114 |
| - | - | 15.0765 | 1812105 |
| 15.1088 | 1881712 | - | - |
| - | - | 15.0981 | 1812112 |
| 15.1317 | 1882566 | - | - |
| 15.0694 | 1812104 | - | - |
| - | - | 15.0933 | 1812113 |
| 15.0980 | 1812108 | - | - |
| 15.1318 | 1882567 | - | - |

* Input data 230 V AC

Linear Chargers NiCd / NiMH

Conforms to IEC 60335



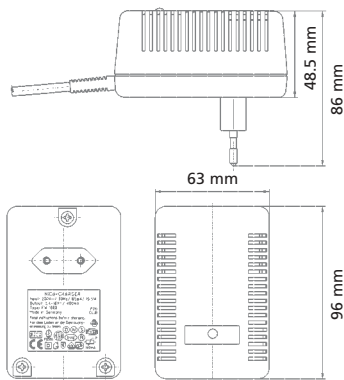
L 54-Ni

Applications

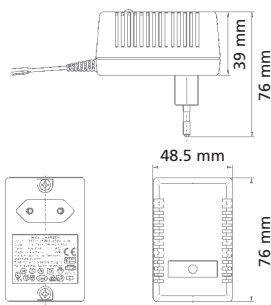
Mobile lighting
Mobile measuring instruments
Toy applications
Photographic technology

Characteristics

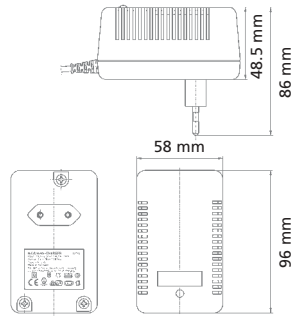
Overload protection
Gentle charging
LED charging display
Low EMC emissions



54/5 EURO



38/15 EURO



48/2 EURO

Technical data

Input voltage 120 V AC or 230 V AC
Input current 0.28 A (L 38-Ni) / 0.6 A (L 48-Ni) / 0.85 A (L 54-Ni)

Frequency 50 Hz

EMC norm Conforms to FCC, CISPR 22, EN 55022, class B
IEC 61000-4-3; IEC 61000-4-6

Output voltage tolerance ± 10%

Environmental specification

Operating temp. 0 °C to 40 °C at maximum load

Storage temp. -40 °C to 70 °C

Humidity 5% to 95% non condensing

Input Transient Susceptibility Complies with IEC 61000 requirements

Safety specification

Standards Fulfills Class II SELV for the following applications: IEC 60335-2-29, EN 60335-2-29, CE label, VDE

Reliability specification

MTBF calculation 100,000 hours at maximum load levels and an ambient temperature of 25 °C (in correspondence with MIL-HDBK-217)

Mechanical specification

Weight 219 g (L 38-Ni) / 384 g (L 48-Ni) / 516 g (L 54-Ni)

| Capacity | Current | Output data | | | Starting by | EURO | | USA | |
|---------------|---------|--------------|-------------|---------|-------------|----------|-----------|----------|-----------|
| | | No. of cells | Charg. time | Housing | | Part No. | Order No. | Part No. | Order No. |
| 0.5 - 0.75 Ah | 180 mA | 2 - 6 | 4 | 38/15 | Time | 11.8076 | 1815549 | - | - |
| 0.5 - 0.75 Ah | 120 mA | 7 - 11 | 6 | 38/15 | T. grad. | 11.8860 | 1811315 | - | - |
| 1.2 - 1.4 Ah | 260 mA | 2 - 12 | 6 | 48/2 | -delta U | 11.8156 | 1811179 | - | - |
| 4.0 - 5.0 Ah | 400 mA | 2 - 12 | 12 | 54/5 | | 11.8291 | 1811182 | - | - |
| 4.0 - 5.0 Ah | 400 mA | 2 - 12 | 12 | 54/6 | | - | - | 11.8563 | 1811827 |

Linear Chargers Lead Acid

Conforms to IEC 60335



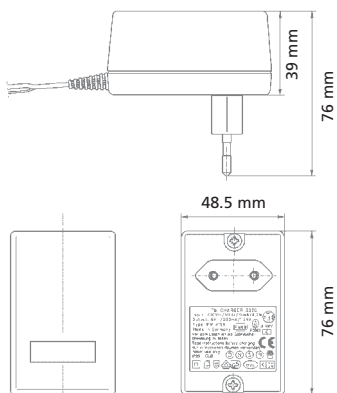
L 38-PB

Applications

Mobile measuring instruments
Security technology
Photographic technology

Characteristics

Overload protection
Gentle charging
LED charging display
Low EMC emissions



38/15 EURO

Technical data

Input voltage 230 V AC
Frequency 50 Hz
EMC norm Conforms to FCC, CISPR 22, EN 55022, class B
IEC 61000-4-3; IEC 61000-4-6
Output voltage tolerance ± 10%

Environmental specification

Operating temp. 0 °C to 40 °C at maximum load
Storage temp. -40 °C to 70 °C
Humidity 5% to 95% non condensing
Input Transient Susceptibility Complies with IEC 61000 requirements

Safety specification

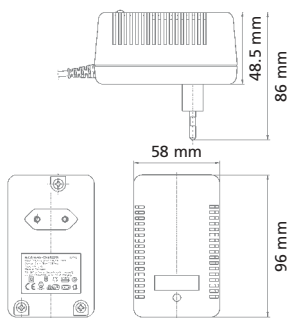
Standards Fulfills Class II SELV for the following applications: IEC 60335-2-29, EN 60335-2-29, CE label, VDE

Reliability specification

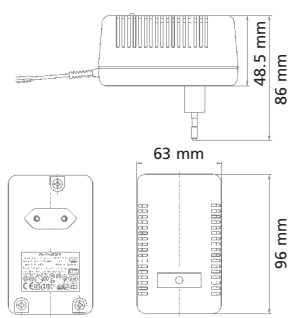
MTBF calculation 100,000 hours at maximum load levels and an ambient temperature of 25 °C (in correspondence with MIL-HDBK-217)

Mechanical specification

Weight 239 g (L 38-PB) / 410 g (L 48-PB) / 507 g (L 54-PB)



48/2 EURO



54/5 EURO

| Voltage | Current | Output data | | | EURO | |
|---------|---------|----------------|--------------|---------|----------|-----------|
| | | Characteristic | Capacity | Housing | Part No. | Order No. |
| 6 V | 200 mA | W | 0.8 - 2.0 Ah | 38/15 | 11.8404 | 1811805 |
| 6 V | 200 mA | IU | 0.8 - 2.0 Ah | 38/15 | 11.6302 | 1808096 |
| 6 V | 600 mA | IU | 3.0 - 6.0 Ah | 54/5 | 11.6303 | 1811811 |
| 12 V | 100 mA | W | 0.5 - 1.2 Ah | 38/15 | 11.8406 | 1811806 |
| 12 V | 200 mA | W | 0.8 - 2.0 Ah | 38/15 | 11.8407 | 1811807 |
| 12 V | 300 mA | IU | 1.2 - 3.0 Ah | 48/2 | 11.6301 | 1811809 |
| 12 V | 500 mA | IU | 1.6 - 4.0 Ah | 54/5 | 11.6304 | 1811712 |
| 24 V | 250 mA | IU | 2.0 - 5.0 Ah | 54/5 | 11.6305 | 1811683 |

The Secondary Adapter Plug System

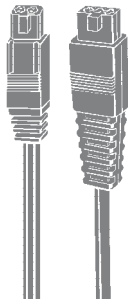


Universal jacks

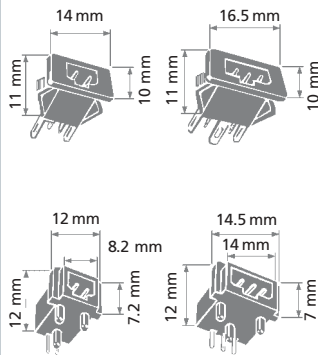
In addition to the standardized low voltage plug-in connections such as coaxial (in accordance with DIN 45323) and jack connectors (in accordance with DIN 45318) FRIWO also provides customized connecting cables.

The wire diameter which is generally used in this case ranges from 0.25 to 1.5 mm². Both flat and round cables can be used. FRIWO has its own plug system with self cleaning fork contacts and the corresponding sockets for or PWB installation. This plug connection is available in 2 or 3 contact design.

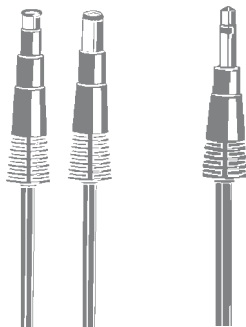
In addition to the safe contact and the self cleaning of the fork contacts this system also provides the advantage of extremely small dimensions. The illustrated low voltage plugs only represent one section of the comprehensive range. Customized designs, special versions and conditions and other dimensions can be obtained upon request.



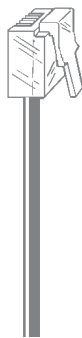
Device connector



Texas sockets



Coaxial plugs & male jacks



Phone connectors (on request)

| Texas sockets | | |
|---------------------|-----------|-----------|
| Designation | Contacts | Order No. |
| Housing inst. | 2-pin | 1323938 |
| Circuit board inst. | 2-pin | 1321609 |
| Texas plug | | |
| Designation | | Order No. |
| Plug | | 1812758 |
| Male jacks | | |
| Outside Ø | Length mm | Order No. |
| 2.5 | 13 | 1812756 |
| 3.5 | 14 | 1812757 |

| Coaxial plugs | | | |
|---------------|----------|-----------|-----------|
| Outside Ø | Inside Ø | Length mm | Order No. |
| 3.5 | 1.3 | 9.5 | 1812748 |
| 4.0 | 1.7 | 11.0 | 1812749 |
| 5.5 | 2.1 | 9.5 | 1812750 |
| 5.5 | 2.1 | 11.5 | 1812751 |
| 5.5 | 2.1 | 14.0 | 1812752 |
| 5.5 | 2.5 | 9.5 | 1812753 |
| 5.5 | 2.5 | 11.5 | 1812754 |
| 5.0 | 1.95 | DIN 45323 | 1812755 |

Exchangeable Primary Adapters

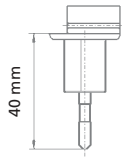


Primary adapters

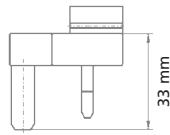
The unit series can be variably equipped with the country mains plugs which are illustrated. Your applications and products can be sold and used worldwide due to the set of all country mains plugs which can be added to the unit.

Mobility and dependability with respect to the use of the product are increased in this way and provide a constant level of dependability and availability – irrespective of the area of use.

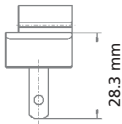
In countries with mains plugs which are not covered by EURO, UK, USA mains plugs the ROW adapter (Rest of the world) with the 2 contact IEC 320 C 8 socket provides a standardized alternative.



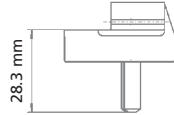
EURO



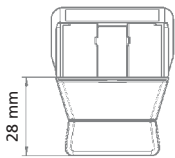
UK



USA



Australia



ROW

Primary adapters

| Country | Order No. |
|------------------|-----------|
| EURO | 1717707 |
| UK | 1717618 |
| USA | 1717715 |
| Australia MPP 15 | 1800496 |
| Australia MPP 30 | 1804237 |
| ROW | 1809281 |

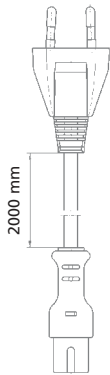
Power Cords with IEC 320 C 7 Plug



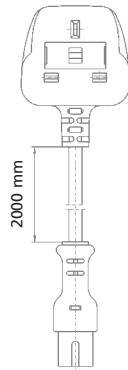
2 metre power cords

Mains power cords with the 2 contact IEC 320 C 7 mains plug provide a specific solution for each country. All power cords are 2 metres long. These power cords are envisaged for use in the IEC 320 C 8 socket which go with them.

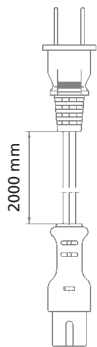
You will find the IEC 320 C 8 socket in our FRIWO ROW adapter (see page 25) in the DT 55 mains power supplies (see page 15) and also in the DT 10 mains power supplies (see page 14).



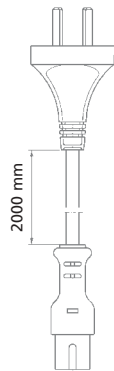
EURO



UK



USA



Australia

Power cords

| Country | Order No. |
|-----------|-----------|
| EURO | 1812274 |
| UK | 1812275 |
| USA | 1812276 |
| Australia | 1812277 |

FRIWO Standards



type-approvals

Quite often the legal requirements for power supplies are very difficult to understand, and sometimes represent a hurdle even for the specialist. In order to ensure a standardised order processing.

FRIWO has created its own standards. It represents the minimum requirements for a power supplies and chargers specification.

In case the customer did not specify detailed requirements, this proprietary standard always applies. It essentially refers to the latest revisions of applicable national and international standards on safety and EMI/EMC. You can therefore rely on a uniform safety for all FRIWO power supplies and chargers.

| Wide range | Input voltages (Tolerance $\pm 10\%$) | | | |
|-----------------|--|-------------------|-----------|-------|
| | EURO | USA | Australia | Japan |
| 100 - 240 V | 230 V | 120 V | 240 V | 100 V |
| Mains frequency | | Temperature range | | |
| 50 - 60 Hz | | 0 - 40 °C | | |

| Interface according to the relevant standard | | |
|--|---------------------------------|-------------|
| EURO | USA | Worldwide |
| EN 61558 | UL 1310 | IEC 61558 |
| EN 60950 | UL 60950 | IEC 60950 |
| EN 60335 | UL 1310 | IEC 60335 |
| EN 60601 | UL 2601 | IEC 60601 |
| Interference suppression | | |
| ISM devices | Electronic household appliances | ITE devices |
| EN 55011 | EN 55014 | EN 55022 |