

General description

This document describes a switch mode power supply unit (AC/DC converter). The unit is designed as wall plug device. It is available with a plug for Europe, US (Japan, Canada) and UK with a wide range input voltage (90 - 264V AC). Other plugtypes can be tooled on request. The output voltage is fixed with a tolerance of $\pm 1\%$ or $\pm 3\%$. Output voltages are available between 3V and 24V DC. Secondary cable connection to power supply is available fixed or plugable. Secondary plug is available in different forms. The power supply is for indoor use only. The standard power supply is meant for use with information technology equipment.

Features

- Wide Input Range (90-264V)
- Output voltage fixed
- Output voltage stability $\pm 1\%$ or $\pm 3\%$
- Output power 6W
- High efficiency, typically 70%
- Protection Class II
- Protection Group IP54
- Europe, UK, US Plug available
- Secondary plug customer specific
- Manufacturing according to ISO 9001
- Smallest available size
- Austrian National Innovations Award

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Applications

- Electronic organiser (PDA)
- Mobile phones (Travel charger)
- Computer Accessories (Modem, Scanner)
- Personal entertainment (CD-Player, MD)
- Consumer electronic (camera, calculator)
- Medical applications (Fusion pump)
- Measuring Equipment

Approvals

- CE
- ÖVE (CCA)
- cUL 1310

Test standards

- EN 50 075, IEC 83
- EN 50 081-1
- EN 50 082-1
- EN 55 022
- EN 60 555
- EN 60 950

Revision history of this document

Actual Revision: 01
Previous Revision: none

Page of actual Rev.	Page of prev. Rev.	Changes since last release

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1 Certifications

1.1 Area specific approvals

- CE
- ÖVE (CCA) Austrian approval
- cUL 1310 Class 2 power units

1.2 Tests

- EN 50 075, IEC 83 Flat non-wireable two-pole plugs
- EN 50 081-1 EMC generic emission standard
- EN 50 082-1 EMC generic immunity standard
- EN 55 022 Limits and methods of measurements of radio interference
- EN 60 555 Disturbances in supply systems
- EN 60 950 Safety of information technology equipment

In addition the following testapprovals are in process:

- IEC 68-2-1, Test Ab Cold test: -20°C, 0% .. 10% R.H., 96 hours, power supply full load
- IEC 68-2-2, Test Bb Dry heat: +50°C, 0% .. 10% R.H., 96 hours, power supply full load
- IEC 68-2-14, Test Na Rapid temperature changes: from -10°C to +40°C, 30 times, Time period 1 hour, Temperature change time <5sec, 0% .. 10% R.H., power supply full load
- IEC 68-2-30, Test Cb Damp heat test: 40°C, 90% .. 95% R.H., 48 hours
- IEC 68-2-32, Test Ed Free fall: 1m
- IEC 68-2-6, Test Fc Vibrations: 3 times in each direction
amplitude 0.8 mmp-p, frequency 10Hz .. 30Hz, 5 minutes
amplitude 0.4 mmp-p, frequency 30Hz .. 60Hz, 5 minutes

2 Technical Input Specification

2.1 Input Parameters

Table 1

Input parameters for power supplies with wide input voltage range

Parameter	Key	Min	Typ	Max	Unit	Condition
Input voltage	U_1	90		264	V	Full load, $U_1 = 120V$
Input current	I_1			140	mA	
Input frequency	f_1	47	50	63	Hz	With load
Efficiency	η	63	70	85	%	
Switching frequency	$f_{1,sw}$	35		250	kHz	

3 Technical Output Specification

3.1 Output Parameters

Table 2

Output parameters for power supplies with different fixed output voltages

Idle mode		Short circuit		Full load (resistive load)		
U_2	P_1	U_2	I_2	U_2	I_2	P_2
[V]	[W]	[V]	[A]	[V]	[A]	[W]
3.0	<0.75	<1	<1.2	3.0	1	3
4.5	<0.75	<1	<1.2	4.5	1	4.5
5.0	<0.75	<1	<1.2	5.0	1	5
6.0	<0.75	<1	<1.2	6.0	1	6
7.5	<0.75	<1	<0.96	7.5	0.8	6
9.0	<0.75	<1	<0.8	9.0	0.67	6
12.0	<0.75	<1	<0.6	12.0	0.5	6
15.0	<0.75	<1	<0.48	15.0	0.4	6
18.0	<0.75	<1	<0.4	18.0	0.33	6
24.0	<0.75	<1	<0.3	24.0	0.25	6

Table 3

Output parameters for power supply

Parameter	Key	Min	Typ	Max	Unit	Condition
Ripple voltage at switching freq	$U_{n-n,hf}$		75	150	mV	Full load
Reverse current $U_2=5V$	I_r		1.7	2.5	mA	Disconnected from mains
Reverse current $U_2=24V$	I_r		10	15	mA	Disconnected from mains

3.2 Typical Output Characteristic

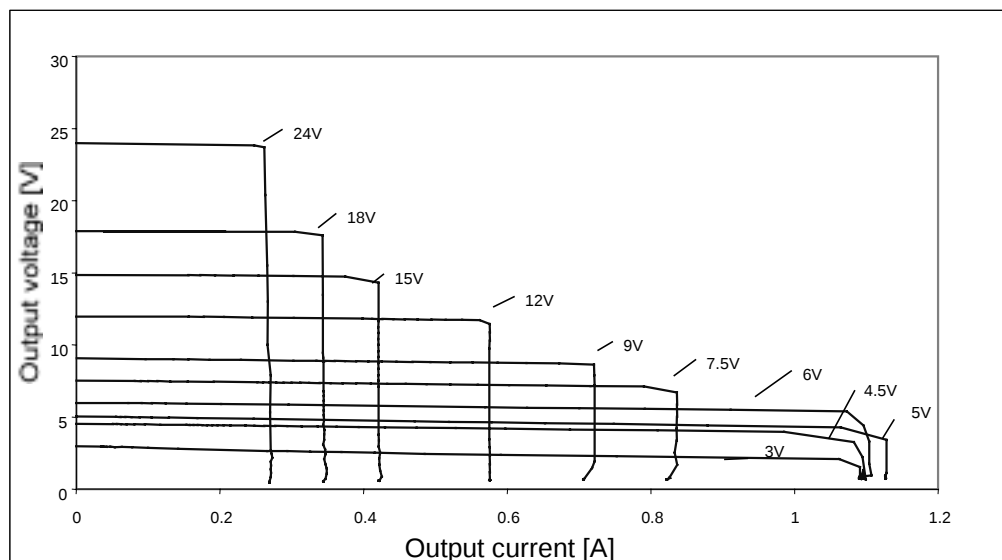


Figure 1
Output Characteristic: $U_1 = 230V$; $f_1 = 50$ Hz; resistive load

3.3 Typical Efficiency Characteristic

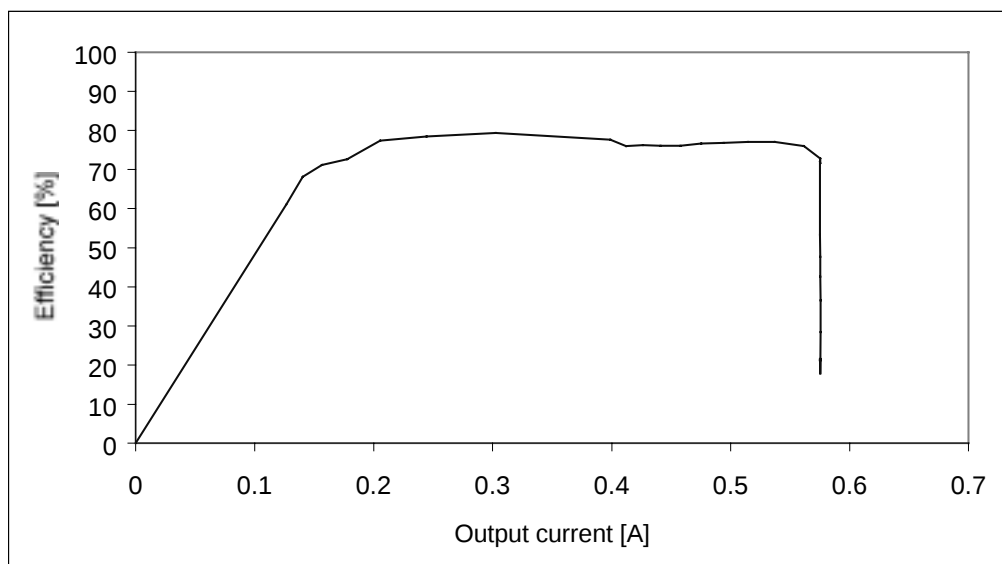


Figure 2
Typical Efficiency characteristic: $U_1 = 230V$; $f_1 = 50$ Hz; resistive load
Egston Power Supply N2EFSW 6W 12V representative sample

3.4 Output Voltage Transients

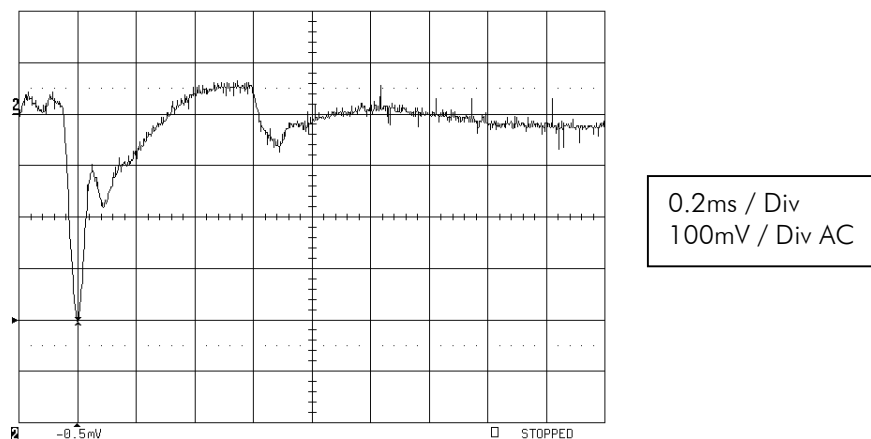


Figure 3

Output voltage transients

Egston Power Supply N2EFSW 6W 12V representative sample,
10% to 100% resistive load change at 1kHz

3.5 Output Ripple Voltage

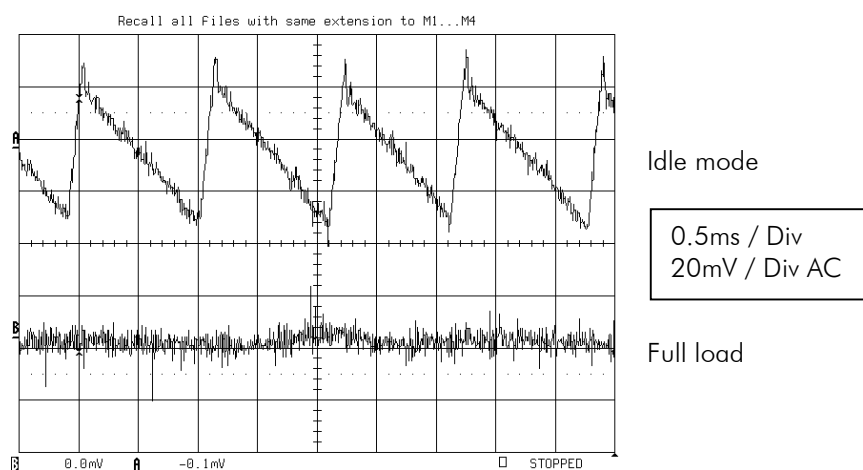


Figure 4

Output ripple voltage

Egston Power Supply N2EFSW 6W 24V representative sample

4 Electromagnetic Specification

4.1 Electromagnetic Characteristic

Test according to EN 55 022 class B passed.

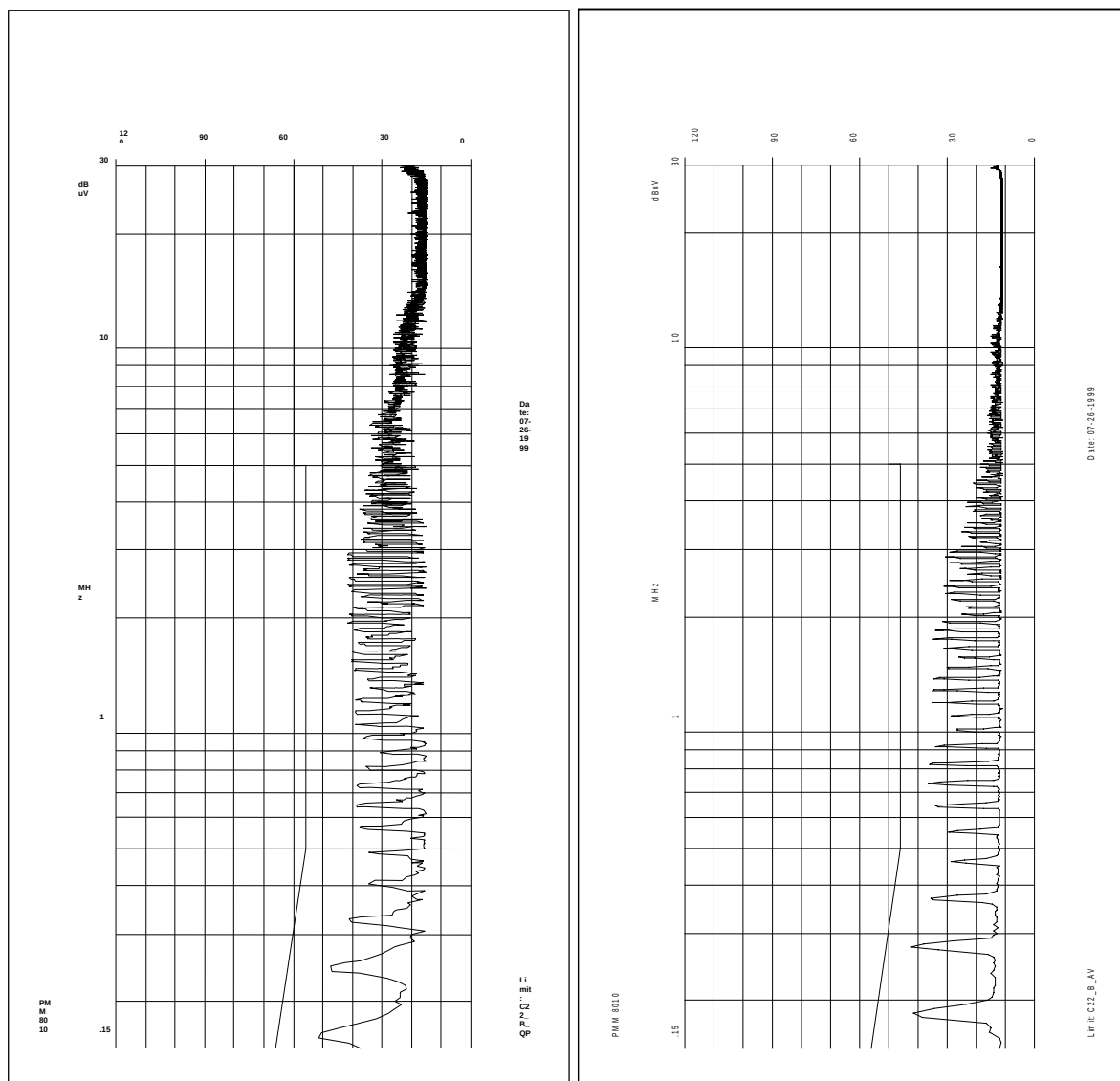


Figure 5
Electromagnetic characteristics (Peak and average measurement, conducted EMC)
Egston Power Supply N2EFSW 6W 12V representative sample

4.2 Immunity to fast Transients (Burst)

According to EN 61 000 -4 -4 (IEC801-4) 1kV passed.

4.3 Immunity to Radiated Electromagnetic Field

According to EN 61 000 -4 -3 (IEC801-4) 10V/m passed.

4.4 Surge Capability

According to EN 61 000 -4 -5 (IEC801-5) 1kV passed.

5 Environmental Condition

5.1 Temperature Range

Table 4

Temperature ranges for storage and operation

	Min	Max	Unit
Storage Temperature	-30	80	°C
	-22	176	°F
Operation Temperature	0	40	°C
	32	104	°F

5.2 Humidity

Maximum 95% without condensation

6 Mechanical Parameters

6.1 Housing

Plastic Housing Material: ABS/PC blend (UL 94 V0)
 Colour: Black

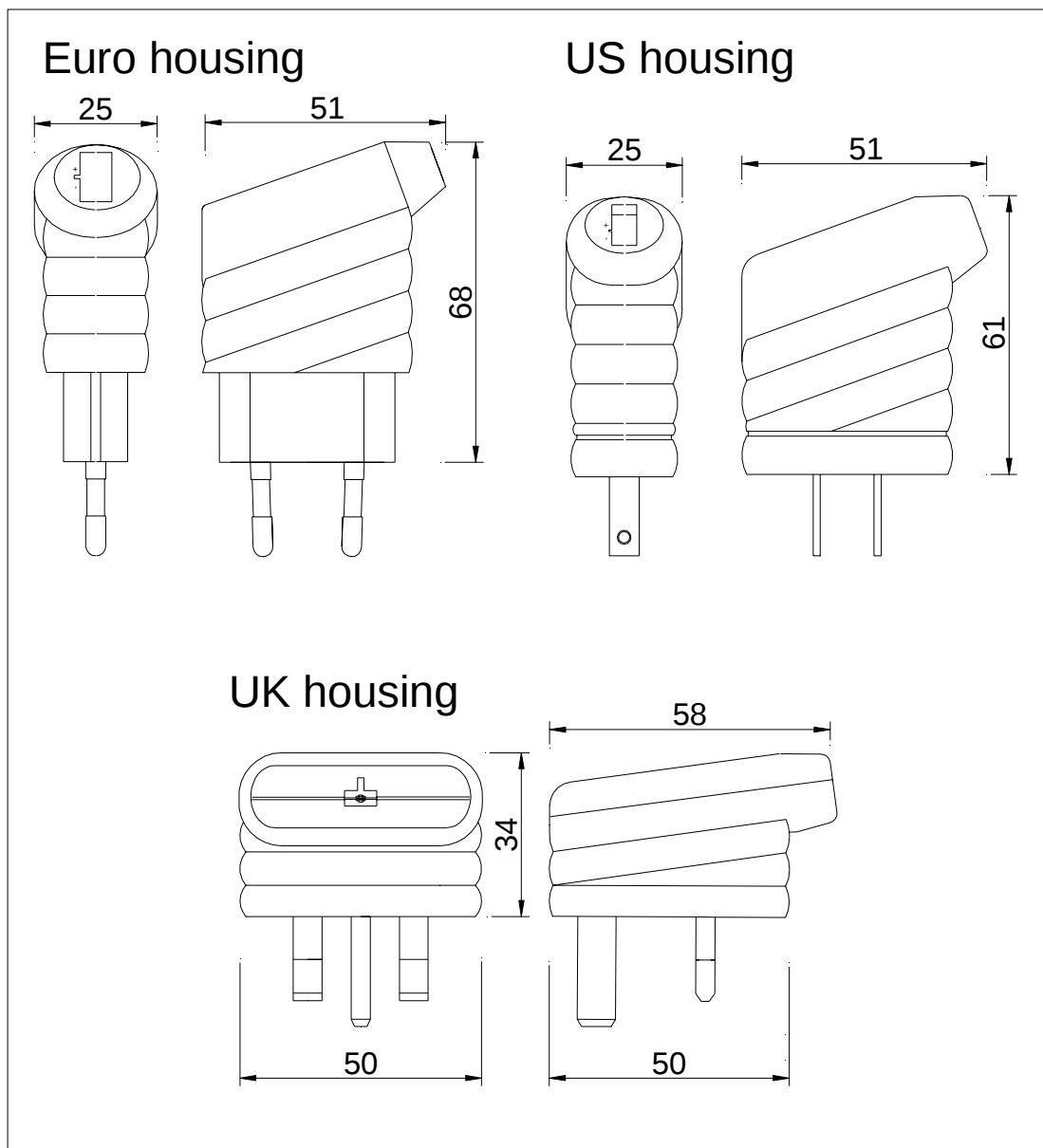


Figure 6
 Dimensions in mm

6.2 Weight

Table 5

Weight of power supply without cable and secondary plug

Version	Weight (g)	Weight (oz)
Euro-Housing	45	1.6
US-Housing	45	1.6
UK-Housing	59	2

6.3 Typical Marking

On power supply unit:

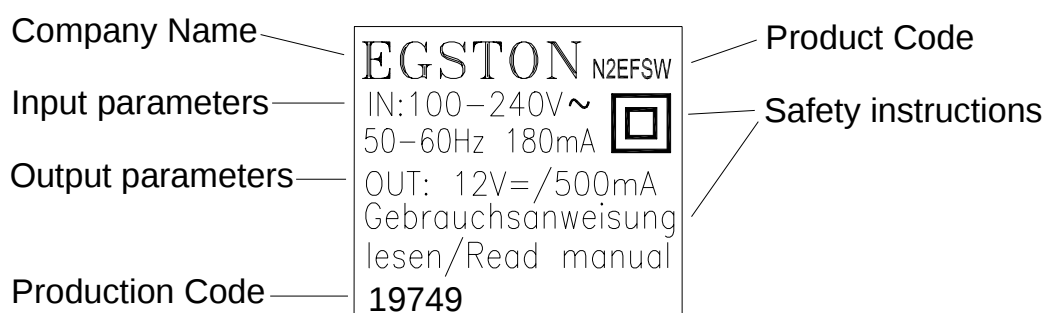


Figure 7

Example of Label on plastic housing by laser marking

Marking on power supply unit is possible according to customer requirements.

Further markings like approval logos (CE, ÖVE, UL) and company name (EGSTON) are directly moulded onto plastic material of housing.

6.4 Secondary Cable and Plug

A fixed or plugable cable to the power supply can be chosen. Refer to the Product Code in the ordering information section of this document.

Table 6
Cable length

	Length	Unit
Standard cable	1.5	m
Maximum length to pass specifications	3	m

We offer a universal plug set with 5 different types. Other plugs available.

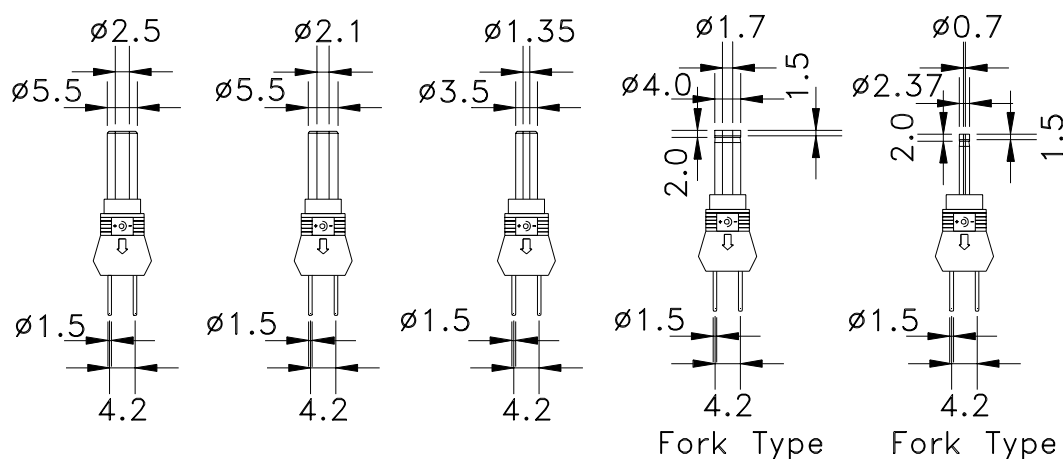


Figure 8
Universal plug set

The polarity of the universal plugs can be set by the user.

7.1 Generic Product Code

	<u>OUTPUT CURRENT</u>
	<u>OUTPUT VOLTAGE</u>
	<u>OUTPUT STABILITY</u> 1 ± 1% 3 ± 3%
	<u>INPUT RANGE (optional)</u> W Wide input range (90-264V)
	<u>APPLICATION</u> S Standard M Medical T Telecom version for grounded appliances
	<u>CABLE CONNECTION</u> S Cable plugable F Cable fix
	<u>PLUG</u> E Euro plug U US/Japan, Canada Plug G United Kingdom Plug P PCB design
	<u>DESIGN, OPERATION TEMPERATURE RANGE</u> 1 SMPS, -20 .. 50°C 2 SMPS, 0 .. 40°C
	<u>SUPPLY TYPE</u> N Egston Power Supply

Table 7
Product code

7.2 Packaging

7.2.1 Cardboard box

The power supply (with cable, secondary plug and manual) is available in a cardboard box with Egston-design or user-specific-design. Marking on the cardboard can be provided on a printed label, according customer requirements. 50 cardboard boxes are packed in one outer box.

Table 8
Dimensions of cardboard box

Version	Length	Width	Height	Unit
Europe	85	98	32	mm
US	85	98	32	mm
UK	85	105	54	mm

7.2.2 Bulk packaging

The Euro- and US-units (without individual cardboard box) can be delivered in bulk packaging in lots of 100 pieces / package.

The UK-units can be delivered in 50 pieces / package.

Table 9
Weight per package

Version	Weight (kg)	Weight (oz)
Euro-, US-Units	~12	~423
UK-Units	~7	~247

7.3 Sales Office



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