

Certificate No:
TAE00001AK
 File No:
822.20
 Job Id:
262.1-003904-7

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Power supply unit

with type designation(s)
FLATPACK 2 & SMARTPACK

Issued to

Eltek AS
DRAMMEN, Norway

is found to comply with
DNV GL rules for classification – Ships and offshore units

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

Voltage output	24 - 48 V DC
Power	1.8 - 8.0 kW
Temperature class	A
Vibration class	A
Humidity class	A
Enclosure class	A

This Certificate is valid until **2021-06-30**.

Issued at **Høvik** on **2016-09-20**

DNV GL local station: **Station Oslo Maritime and CAP**

Approval Engineer: **Nicolay Horn**

for **DNV GL**

Trond Sjøvåg
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

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Name and place of manufacturer's

ELTEK TECHNOLOGY (DONGGUAN) LTD
 GUANCHENG SCIENCE & TECHNOLOGY PARK
 GUANGCHENG RD SEC
 SHILONG RD
 DONGGUAN
 GUANGDONG 523000 CHINA

ELTEK S R O
 PALENICA 53/79
 033 17 LIPTOVSKY HRADOK
 SLOVAK REPUBLIC

VTECH COMMUNICATIONS LTD CMS DIV
 XIA LING BEI MANAGEMENT ZONE
 LIAO BU DISTRICT
 DONGGUAN
 GUANGDONG 523411 CHINA

DELTA ELECTRONICS (JIANGSU) LTD.
 NO 1688 JIANGXING EAST RD
 WUJIANG ECONOMIC DEVELOPMENT ZONE
 SUZHOU CITY
 JIANGSU PROVINCE 215200 CHINA

Product description

Constant voltage charger / UPS/ Power supplies for different applications. The TA includes single components power supply (PS), power rack (PR), controller and power systems, without battery.

Description	Attributes
Power Supply:	FLATPACK 2
Controller:	SMARTPACK
Power shelf:	PS
System:	See table below
Input Voltage, nominal:	100 to 250 VAC, 45 to 66 Hz or 20-75VDC / 80-300VDC
Protection:	IP 20 (See limitation)
System design:	Rack system or individual units.

Type designation	Input voltage (VAC)	Output voltage (VDC)	Output Power (W)	Eltek Partnumber
FLATPACK2 48/1800	100-250	48	1800	241115.001
FLATPACK2 48/2000	100-250	48	2000	241115.100
FLATPACK2 48/2000 HE	100-250	48	2000	241115.105
FLATPACK2 48/2000 BF *	100-250	48	2000	241115.110
FLATPACK2 48/2000 BF HT *	100-250	48	2000	241115.120
FLATPACK2 24/1800 HE Marine	100-250	24	1800	241115.205M
FLATPACK2 24/2000 Marine	100-250	24	2000	241115.200M
FLATPACK2 24/2000 WOR Marine	100-250	24	2000	241115.250M
FLATPACK2 24/4000 Dual **	100-250	24	4000	241115.400
FLATPACK2 48/4000 Dual **	100-250	48	4000	241115.500
FLATPACK2 Standalone box	100-250	-	-	M20101.000
SMARTPACK Extended	20-75Vdc	-	-	242100.110
SMARTPACK RS-232 Front	20-75Vdc	-	-	242100.111
SMARTPACK RS-232 Rear	20-75Vdc	-	-	242100.112
SMARTPACK WEB/SNMP	20-75Vdc	-	-	242100.113
SMARTPACK WEB/SNMP	20-75Vdc	-	-	242100.118
SMARTPACK Basic/Slave	20-75Vdc	-	-	242100.000
FP2 PS 4 rect 4AC HC Marine	100-250	24/48	-	233070
FP2 PS 4 rect 4AC HC HVDC	100-250Vac / 80-300Vdc	420Vmax	8000	268035

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Type designation	Input voltage (VAC)	Output voltage (VDC)	Output Power (W)	Eltek Partnumber
SYSTEM***	100-250	24	6000 / 8000	C20301.000
FLATPACK2 24/40A HE	100-250	24	1000	241115.205B
FLATPACK2 48/2000 HE Marine	100-250	48/60	2000	241115.705M
FLATPACK2 48-60/15A HE	100-250	48/60	1000	241115.705B
FLATPACK2 110/2000 HE Marine	100-250	110	2000	241115.805M
FLATPACK2 110-125/10A HE	100-250	110	1250	241115.805B
FLATPACK2 220/2000 HE Marine	100-250	220	2000	241115.815M
FLATPACK2 220/5A HE	100-250	220	1225	241115.815B
FLATPACK2 110-120V/20A HE	100-250	110	2900	241119.805
FLATPACK2 220V/10A HE	100-250	220	2640	241119.815
FP2 24-60V 4kW BF Wallbox	100-250	24/48/60	4000	CTO30210.000
FP2 24V 4kW 1x230V SPD Wb	100-250	24	4000	C20210.401
DIN RAIL MARINE FILTER	100-250	-	-	241120.930
FP2 PS 2 rect 2AC HC	100-	0-275V	4000	252189
KIT Wb Cabinet basic SP2	-	-	-	279818
FP2 48V 4kW 2x230V SPD Wb	100-250	48	4000	C30210.400
FP2 24-110V 4kW 1x230V Wb	100-250	24/48/60/110	4000	C30210.401
Smartpack2 Master Marine	16Vdc	-	-	242100.500M
Smartpack2 Basic Marine	20-172Vdc	-	-	242100.501M
SP2 Basic Industrial Marine	10-75Vdc	-	-	242100.601M
I/O Monitor	±16Vdc	-	-	242100.304
I/O Monitor type 3	±16Vdc	-	-	242100.306
I/O Monitor type 2	±16Vdc	-	-	242100.502
Battery Monitor	±16Vdc	-	-	242100.300

* BF = Back to front

** 2 Flatpack joined together

*** Output power is maximum 8 kW when 4 rectifiers are mounted and maximum 6 kW when 3 rectifiers and a Smartpack is used.

Application/Limitation

For installation in control rooms and dry accommodation spaces on board ships and mobile offshore units.

The products type approved as listed above have been improved to withstand marine environments.

"The power systems and the individual items as listed above can operate at full load with an ambient temperature of 45°C – 60°C, depending of rectifier. After maximum ambient is achieved the output power will derate up to 75°C until the rectifier shuts down." The derating is approx. 20-33W/°C depending of type of rectifier. See manufacturer specification for details.

To be installed in an enclosure with an IP degree in accordance with DNV Rules w.r.t. location.

Type Approval documentation

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Tests carried out

Type / safety tests in accordance with IEC 60950-1. Dry heat test, damp heat test, vibration test, EMC tests, input supply tests (voltage dips, short interruptions and voltage variation), high voltage test and insulation resistance.

Marking of product

Model number - input voltage - output voltage - maximum current.

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the Type approval is complied with and that no alterations are made to the product design or choice of materials.

The main elements of the survey are:

- Inspection on factory samples, selected at random from the production line (where practicable)
- Review of type approval documentation
- Review of possible change in design, materials and performance
- Ensuring traceability between manufacturer's product type marking and Type Approval Certificate.

Survey to be performed at least every second year.

END OF CERTIFICATE