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REPORT

on

POWER CIRCUIT AND MOTOR-MOUNTED APPARATUS

TDK-Lambda Corp.
Niigata, Japan

DESCRIPTION

PRODUCTS COVERED:

*USL, CNL – Switching power supplies, Models HWS80A-3, HWS80A-5, HWS80A-12, HWS80A-15, HWS80A-24, HWS80A-48, HWS100A-3, HWS100A-5, HWS100A-12, HWS100A-15, HWS100A-24, HWS100A-48; followed by /, may be followed by HD, may be followed by R, followed by A, **may be followed by CO2**, may be followed by FG, **may be followed by** DIN.

Switching Power Supply, Models HWS100A-, followed by 5, 12, 15, 24 or 48, followed by /E, followed by H or V, may be followed by HD, may be followed by R, followed by A, may be followed by CO2, may be followed by FG, may be followed by DIN.

GENERAL:

These devices are open-type switching power supplies, employing an Isolating-Type, Step-down Transformer and related circuitry enclosed within a metallic cover. These power supplies are intended for use in industrial control applications, in a pollution degree 2 environment.

ELECTRICAL RATINGS:

Model	Power Input			Power Output		
	Vac	Hz	A	Vdc	A (max.)	W (max.)
HWS80A-3	100-240	50-60	0.8	3.3 (2.97-3.96)	16	52.8
HWS80A-5	100-240	50-60	1.1	5 (4.0-6.0)	16	80.0
HWS80A-12	100-240	50-60	1.1	12 (9.6-14.4)	6.7	80.4
HWS80A-15	100-240	50-60	1.1	15 (12.0-18.0)	5.4	81.0
HWS80A-24	100-240	50-60	1.1	24 (19.2-28.8)	3.4	81.6
HWS80A-48	100-240	50-60	1.1	48 (38.4-52.8)	1.7	81.6
HWS100A-3	100-240	50-60	1.0	3.3 (2.97-3.96)	20	66.0
HWS100A-5	100-240	50-60	1.4	5 (4.0-6.0)	20	100.0
HWS100A-12	100-240	50-60	1.4	12 (9.6-14.4)	8.5	102.0
HWS100A-15	100-240	50-60	1.4	15 (12.0-18.0)	7.0	105.0
HWS100A-24	100-240	50-60	1.4	24 (19.2-28.8)	4.5	108.0
HWS100A-48	100-240	50-60	1.4	48 (38.4-52.8)	2.1	100.8

The permissible maximum output current is specified in the derating curve related to the surrounding air temperature, and mounting direction. See ILL. 1 for derating curve **on models without suffix "/E", and ILL. 1A for derating curve on models with suffix "/E".**

ENVIRONMENTAL RATINGS:

Maximum Surrounding Air Temperature: 70°C.

NOMENCLATURE

For models without suffix "/E":

Example:

HWS100A-	3	/	HD	R	A	**CO2**	**FG**	DIN
A	B		C	D	E	**F**	**G**	***H**

A - Basic Type
HWS80A-: HWS80A series
HWS100A-: HWS100A series

B – Output voltage rating
3: 3.3 V
5: 5 V
12: 12 V
15: 15 V
24: 24 V
48: 48 V

C – Conformal coating for PWB
None: Not provided
HD: Provided

D – Remote control function
None: Not provided
R: Provided

E – Cover
A: Provided

F – **Conformal coating for PWB**
None: Not provided
CO2: Provided

*G - **Low leakage current type**
None: Not provided
FG: **Provided**

H - DIN rail mounting type
None: Not provided
* DIN: **Provided**

NOMENCLATURE (cont'd)

For models with suffix "/E":

Example:

HWS100A-	5	/	EH	HD	R	A	CO2	FG	DIN
A	B		C	D	E	F	G	H	I

A - Basic type

B – Output voltage rating
5: 5 V
12: 12 V
15: 15 V
24: 24 V
48: 48 V

C - European Terminal
EH: Horizontal type
EV: Vertical type

D – Conformal coating for PWB
None: Not provided
HD: Provided

E – Remote control function
None: Not provided
R: Provided

F – Cover
A: Provided

G – Conformal coating for PWB
None: Not provided
CO2: Provided

H - Low leakage current type
None: Not provided
FG: Provided

I - DIN rail mounting type
None: Not provided
DIN: Provided

TECHNICAL CONSIDERATIONS (NOT FOR UL REPRESENTATIVE'S USE):

USL - Indicates United States Standards – Listed, Investigated using US requirements as noted in the Test Record.

CNL – Indicates Canadian National Standards – Listed, Investigated using Canadian requirements as noted in the Test Record.

CONSTRUCTION DETAILS

Spacings were evaluated using requirements as noted in the test record.

Corrosion Protection – All ferrous metal parts are suitably protected against corrosion by painting, plating or the equivalent.

Connections – All electrical connections made by wiring mechanically secured before soldering, or terminated in Listed closed-loop type, unturned-end type, or male/female quick-disconnect type connectors with positive engagement.

Summary of Figures and Illustrations – The following figures and illustrations are included in this Report.

FIG. or ILL. No.	Description
***FIGs.** 1, **1A and** 2	Overall view **of models without suffix "/E"**
***FIGs.** 3 **and 3A**	Internal view **of models without suffix "/E"**
FIGs. 4, 5 and 5A	**Overall view of models with suffix "/E"**
***ILLs.** 1 **and** 1A	Derating Curve
***ILLs.** 2, 2A, **2B, and 2C**	Insulation Sheet
*ILL. 3, 3A, **3B and 3C**	PWB Trace
ILL. 4	Transformer (T2)
ILL. 5	Derating Curve for HWS80A series
ILL. 6	Heatsink for FETs
ILL. 7	Fixing bracket for Secondary circuit
ILL. 8	Bus bar
ILLs. 9 and 10	**Details of the coating area on PWB for models without suffix "/E"**
ILL. 11	**Details of the coating area on PWB for models with suffix "/E"**
ILL. 12	**2.0 mm thick Metal Chassis for models with suffix "/E"**
ILL. 13	**Alternate 2.0 mm thick Metal Chassis for models with suffix "/E"**

MARKINGS:

The following marking shall be appeared on the device by molded, die-stamped, paint-stenciled, stamped, etched metal, laser engraved or on a label R/C (PGDQ2/8) or (PGJI2/8). No. 1 through No. 3 shall be visible when the device is mounted singularly.

1. Listee's name, trademark or trade name.
2. Catalog number.
3. Electrical rating.
4. **For USL models,** "Use wires suitable for at least 75°C" or "Use wires rating at least 75°C" or equivalent.
5. "For use in Pollution Degree 2 Environment" or "Pollution Degree: 2" or equivalent.
6. "Maximum surrounding air temperature 70°C" or "Max. surrounding air temperature: 70°C" or equivalent.
7. The month and year of manufacture or date coding serial numbers.
8. **For models with suffix "/E", "See derating curves and mounting orientation information in Instruction Manual" or equivalent.**
9. **For CNL models with suffix "/E", "WARNING: Use conductors with insulation rated for at least 90°C".**

*The following markings shall be **shipped separately with** the device, on the smallest unit container or carton, or in the instruction manual in the smallest unit container or carton. **In addition, the device shall be marked on the device with a reference to the information:**

1. Marking for proper connections at wiring terminals.
2. Wire type of field installed conductor, Copper conductors only.
3. For models without suffix "/E", tightening torque for field wiring terminals, 14.2 lb-in. and 1.6 N·m.
4. The output derating curve, related to the surrounding air temperature and mounting direction.
5. "For use in Pollution Degree 2 Environment".

The following markings shall be shipped separately with the device.

1. **For models with suffix "/E", the ratings of overcurrent protection, the type of overcurrent protection and the coordination of the conductor sizes with overcurrent protection for the power output circuit. If cUL Listed fuse or UL Listed with CSA certified fuse is used as overcurrent protection, "type" may be represented by the Class.**