2500 LN series

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Single Output DC/DC Converter

Features

- Pin Compatible to Tyco LW020 and LW025
- Positive and Negative Logic
- Up to 87% Efficiency
- Industry Standard 2.0" X 1.6" X 0.40" Package
- Remote On/Off, Output Over Voltage and Short Circuit Protection

Descriptions

The 2500LN, single output power modules are 12 to 25 watt DC/DC converters available in a single output configuration providing 2.0 VDC to 15 VDC outputs and are fully compatible to Tyco series LW020 and LW025 providing both positive and negative on/of logic. These 400kHz, switching converters are available 48V inputs with efficiencies up to 87%. Offering pin for pin and full functionality to the Tyco LW series these converters are the only true second source available in the market.

Output Characteristics

	Min	Typ	Max	Unit/Comments
Output Voltage Set Point		±1		% Output voltage at nominal line & FL
Total Band Error	-2		+2	% Output voltage including line/load regulation setting
Line Regulation		±0.5		% Output voltage measured from min. input line to max.
Load Regulation		±0.5		% Output voltage measured from FL to 10% FL
Temperature Coefficient		±0.01		% per degree C
Ripple/Noise		60	100	mV p-p measured at 20 MHz bandwidth with ext. 1 µf cap.
Output Voltage and Current				Refer to model selection chart
Load Transient Response		±2		% Deviation of output voltage for a 25% load change for 200µS
Output Voltage Trim	-10		+10	% Output Voltage
Short Circuit Protection				Indefinite, Automatic Recovery
Overvoltage Protection		135		%; Clamp type, (2.0 & 2.5 VDC output set at 3.9 VDC)

Input Characteristics

	Min	Typ	Max	Units/Comments
Input Voltage	36	48	75	VDC
Under Voltage Lock out		33		VDC
Over Voltage Shutdown		80		VDC
Full Load Input Current			0.59	A (0.33 for 2.0VDC model)
Input Fuse Requirements			2	Amps; Slow blow type
Efficiency by Model				
2502V0S48LN		76		%; FL Nominal Line
2502V5S48LN		78		%; FL Nominal Line
2503V3S48LN		80		%; FL Nominal Line
2505S48LN		84		%; FL Nominal Line
2512S48LN		86		%; FL Nominal Line
2515S48LN		87		%; FL Nominal Line
Switching Frequency	360	400	440	kHz; Factory set
Remote Shut Down (Optional)				
Positive Logic Off	0		0.80	VDC; Referenced to input (-)
Positive Logic On	3.5		0.80	VDC or open;Referenced to input (-)
Negative Logic On	0			VDC; Referenced to input (-)
Negative Logic Off	3.5			VDC or open;Referenced to input (-)
Input - Output Capacitance			1000	pF
Input Filter				LC type
Isolation Voltage	1500			VDC
Isolation Resistance	100			MOhms

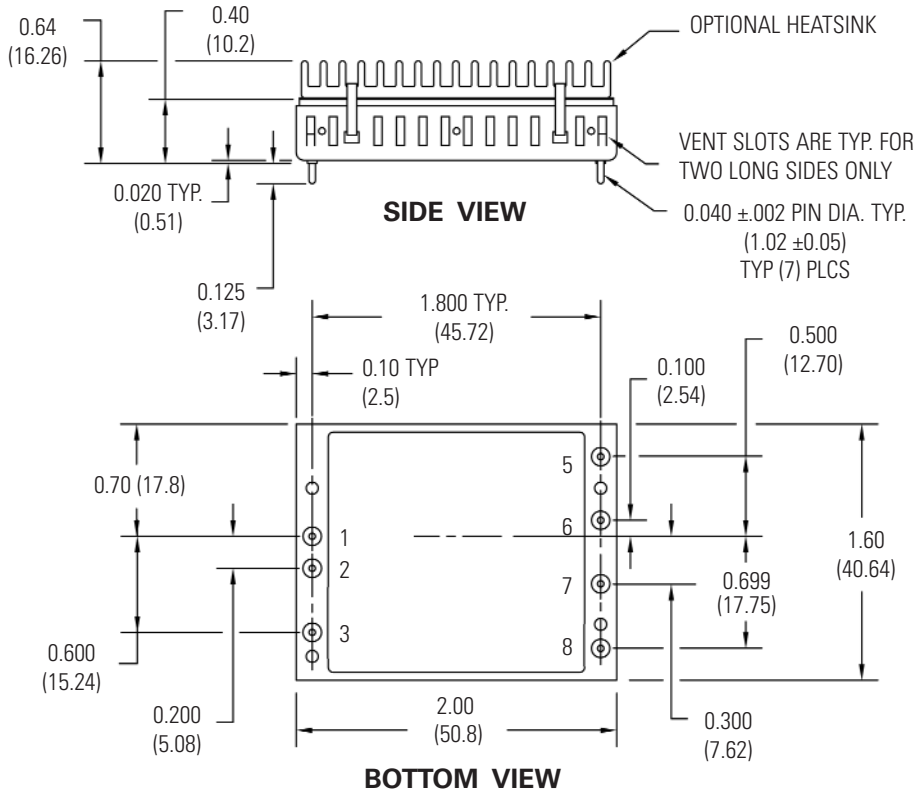
Model Selection Chart

	Input Voltage (VDC)	Output Voltage (VDC)	Full Load Output Current(A)
2502V0S48LN	48	2.0	6.0
2502V5S48LN	48	2.5	6.0
2503V3S48LN	48	3.3	6.0
2505S48LN	48	5.0	5.0
2512S48LN	48	12.0	2.0
2515S48LN	48	15.0	1.66

General Characteristics

	Min	Typ	Max	Unit/Comments
Operating Temp. Range	-40		+105	°C; measured at baseplate
Storage Temp. Range	-55		+125	°C; measured at baseplate
Material Flammability				UL94V-0
Altitude: Operating			10,000	Feet
Non-Operating			40,000	Feet
Relative Humidity	5		95	% Humidity, non-condensing
Weight			22	Grams
Size				2.0" X1.6" X0.40"
Case Material				Black coated aluminum
Agency Approvals				UL/CUL1950, TUV, EN60950

Outline Drawing



Pin Out Chart

PINS	FUNCTION
1	+ INPUT
2	- INPUT
4	CONTROL
5	NO PIN
6	+ OUTPUT
7	- OUTPUT
8	TRIM

Notes:

1. Unless otherwise specified dimensions are in inches (mm).

Tolerances	Inches	mm
	X.XX = ±0.02	X.X = ±0.5
	X.XXX= ±0.010	X.XX = ±0.25

2. Controlling dimension in inch.

All specifications are typical at nominal input, nominal load and 25° C unless otherwise specified.
External, low ESR, 10 microfarad (minimum) capacitor across output is recommended for operation.

How To Order

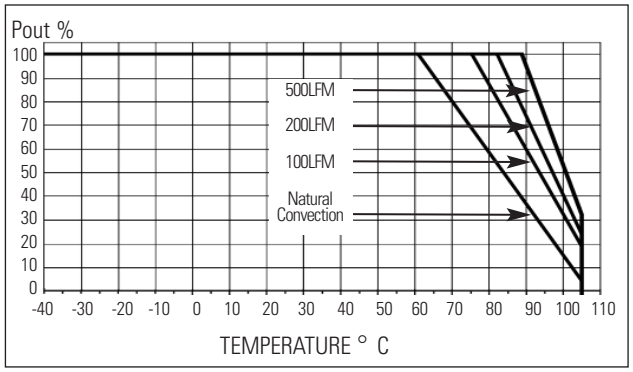
How to Order

25 XX S XX LN

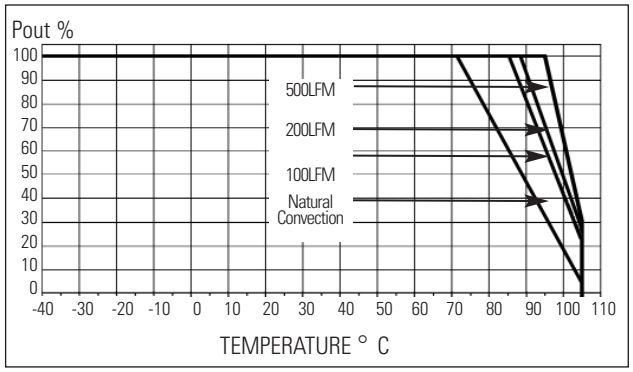
- 25 — Wattage
- XX — Output Voltage
- S — Single Output
- XX — Input Voltage
- LN — Series

Derating Curves

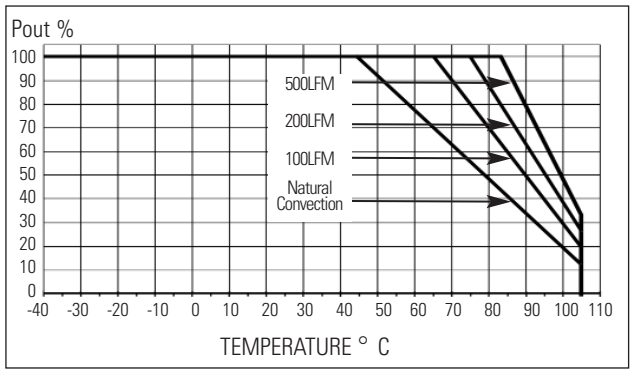
MODEL 2500LN Single 2V & 2.5V (Without heatsink)



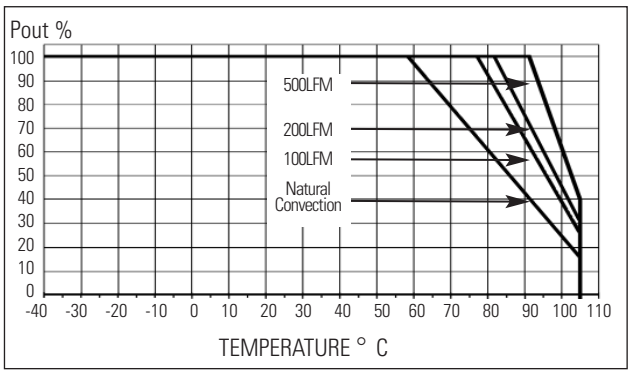
MODEL 2500LN Single 2V & 2.5V (With heatsink)



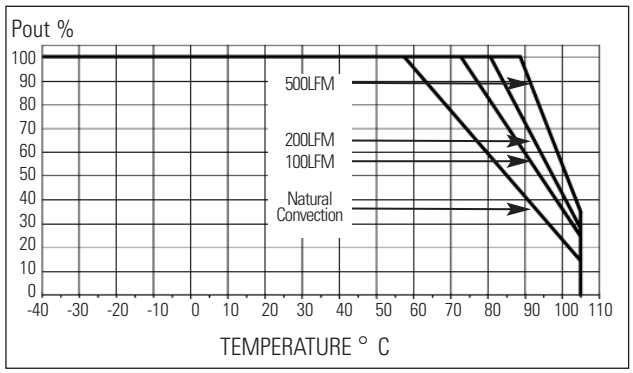
MODEL 2500LN Single 3.3V & 5V (Without heatsink)



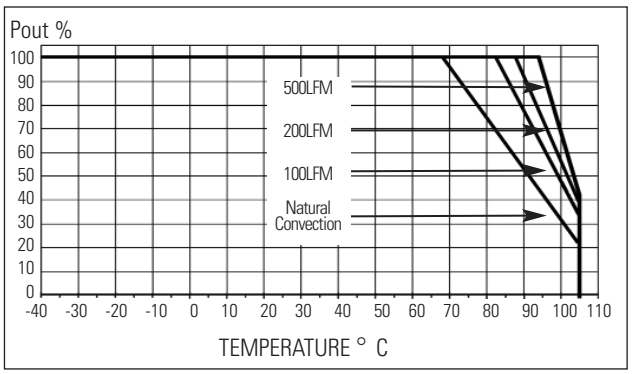
MODEL 2500LN Single 3.3V & 5V (With heatsink)



MODEL 2500LN Single12V & 15V (Without heatsink)



MODEL 2500LN Single 12V & 15V (With heatsink)



Output Voltage Adjustment (2500LN Single Series)

Output voltage trim allows the user to increase or decrease the output voltage set point of a module. This is accomplished by connecting an external resistor between the TRIM pin and either the Vo(+) or Vo(-) pins. With an external resistor between the TRIM and Vo(+) pins (Radj-down), the output voltage set point (Vo, adj) decreases. With an external resistor between the TRIM pin and Vo(-) pin (Radj-up), Vo, adj increases.

The following equations determine the required external resistor value to obtain an output voltage change of Δ %:

$$\text{Radj-down} = \left[\frac{A - C}{\Delta\%} - (A + B) \right] K\Omega$$

$$\text{Radj-up} = \left[\frac{C}{\Delta\%} - B \right] K\Omega$$

				Example	
Device	A	B	C	- 5% Vo Radj-down	+ 5% Vo Radj-up
+5Vo	4.02	16.90	2.01	19.3 KΩ	23.3 KΩ
+12Vo	15.40	15.40	1.58	245.6 KΩ	16.0 KΩ
+15Vo	21.50	16.90	1.76	356.3 KΩ	18.2 KΩ
+3.3Vo	14.0	51.10	5.19	110.9 KΩ	52.8 KΩ
+2.5Vo	14.0	51.10	7.02	75.3 KΩ	88.9 KΩ
+2.0Vo	14.0	51.10	8.75	39.9 KΩ	123.9 KΩ

NOTE:
THE ADJUSTED OUTPUT VOLTAGE CANNOT EXCEED +/- 10%
OF THE NOMINAL OUTPUT VOLTAGE.
TRIM FUNCTION MATCHES THAT OF TYCO™ LW020 SERIES.

2500 LN series

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Dual Output DC/DC Converter

Features

- Pin Compatible to Tyco LW020 and LW025
- Positive and Negative Logic
- Up to 87% Efficiency
- Industry Standard 2.0" X 1.6" X 0.40" Package
- Remote On/Off, Output Over Voltage and Short Circuit Protection

Descriptions

The 2500LN, dual output power modules are 25 watt DC/DC converters available in a dual output configuration providing 5.0 VDC to 15 VDC outputs and are fully compatible to Tyco series LW020 and LW025 providing both positive and negative on/of logic. These 400kHz, switching converters are available 48V inputs with efficiencies up to 87%. Offering pin for pin and full functionality to the Tyco LW series these converters are the only true second source available in the market.

Output Characteristics

	Min	Typ	Max	Unit/Comments
Output Voltage Set Point		±1		% Output voltage at nominal line & FL
Total Band Error	-3		+3	% Output voltage including line/load regulation setting
Line Regulation		±0.5		% Output voltage measured from min. input line to max.
Load Regulation		±1.0		% Output voltage measured from FL to 10% FL
Temperature Coefficient		±0.01		% per degree C
Ripple/Noise		60	100	mV p-p measured at 20 MHz bandwidth with ext. 1 µf cap.
Output Voltage and Current				Refer to model selection chart
Load Transient Response		±2		% Deviation of output voltage for a 25% load change for 200µS
Output Voltage Trim	-10		+10	% Output Voltage
Short Circuit Protection				Indefinite, Automatic Recovery
Overvoltage Protection		135		%; Clamp type

Input Characteristics

	Min	Typ	Max	Units/Comments
Input Voltage	36	48	75	VDC
Under Voltage Lock out		33		VDC
Over Voltage Shutdown		80		VDC
Input Fuse Requirements			2	Amps; Slow blow type
Efficiency by Model				
2505D48LN		84		%; FL Nominal Line
2512D48LN		86		%; FL Nominal Line
2515D48LN		87		%; FL Nominal Line
Switching Frequency	360	400	440	kHz; Factory set
Remote Shut Down (Optional)				
Positive Logic Off	0		0.80	VDC;Referenced to input (-)
Positive Logic On	3.5			DC or open;Referenced to input (-)
Negative Logic On	0		0.80	VDC;Referenced to input (-)
Negative Logic Off	3.5			VDC or open;Referenced to input (-)
Input - Output Capacitance			1000	pF
Input Filter				LC type
Isolation Voltage	1500			VDC
Isolation Resistance	100			MOhms

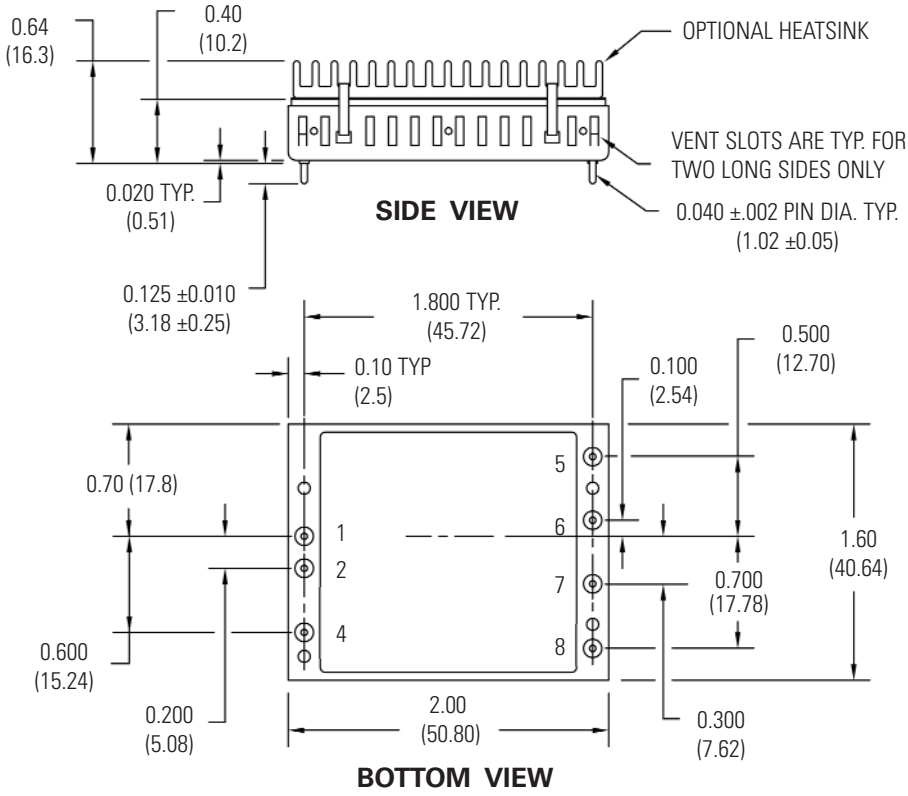
Model Selection Chart

	Input Voltage (VDC)	Max Input Current (A)	Output Voltage (VDC)	Full Load Output Current(A)
2505D48LN	48	0.62	±5.0	± 2.5
2512D48LN	48	0.58	±12.0	± 1.0
2515D48LN	48	0.59	±15.0	± 0.83

General Characteristics

	Min	Typ	Max	Unit/Comments
Operating Temp. Range	-40		+105	°C; measured at baseplate
Storage Temp. Range	-55		+125	°C; measured at baseplate
Material Flammability				UL94V-0
MTBF	5			million hrs, at 40°C
Altitude: Operating			10,000	Feet
Non-Operating			40,000	Feet
Relative Humidity	5		95	% Humidity, non-condensing
Weight			22	Grams
Size				2.0" X1.6 X0.4"
Case Material				Black coated aluminum
Agency Approvals				UL/CUL1950, TUV, EN60950

Outline Drawing



Pin Out Chart

PINS	FUNCTION
1	+ VIN
2	- VIN
4	CONTROL
5	+ VOUT
6	COMMON
7	- VOUT
8	TRIM

Notes:

1. Unless otherwise specified dimensions are in inches (mm).
   Tolerances Inches mm
   X.XX = ±0.02 X.X = ±0.5
   X.XXX= ±0.010 X.XX = ±0.25
2. Controlling dimension in inch.
3. Case is vented on 2" long sides only.

All specifications are typical at nominal input, nominal load and 25° C unless otherwise specified.
External, low ESR, 10 microfarad (minimum) capacitor across input is recommended for operation.

How To Order

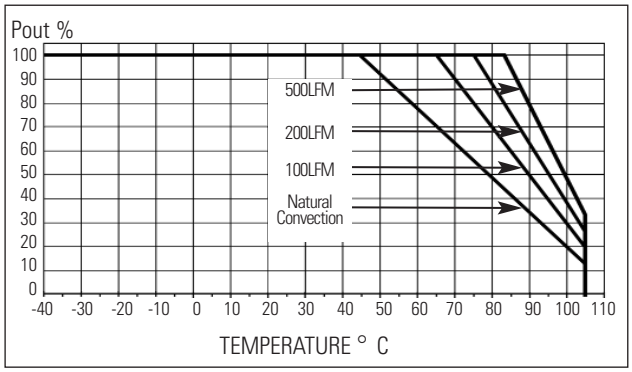
How to Order

25 XX D XX LN

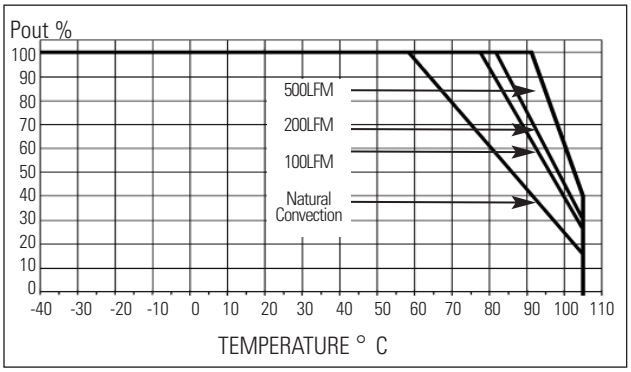
- 25 — Wattage
- XX — Output Voltage
- D — Dual Output
- XX — Input Voltage
- LN — Series

Derating Curves

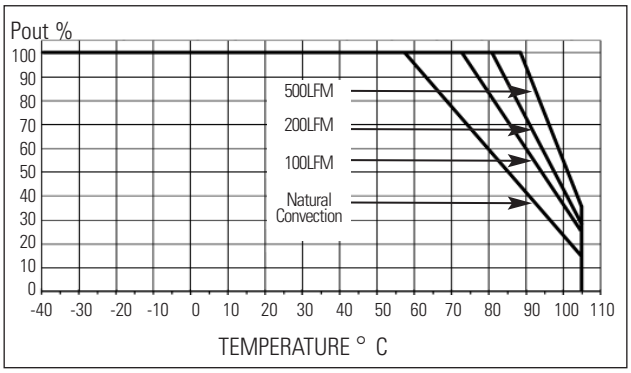
MODEL 2500LN Dual ±5V (Without heatsink)



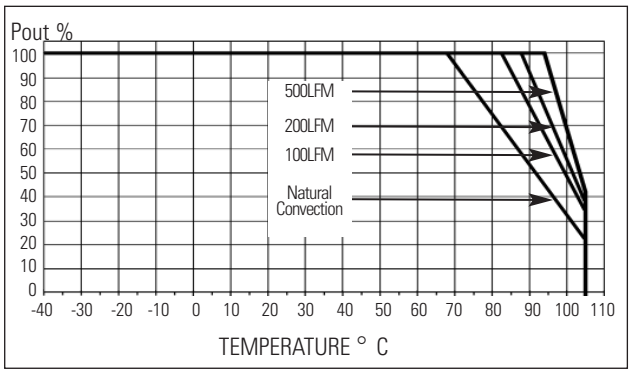
MODEL 2500LN-H Dual ±5V (With heatsink)



MODEL 2500LN Dual ±12 & ±15V (Without heatsink)



MODEL 2500LN-H Dual ±12 & ±15V (With heatsink)



Output Voltage Adjustment (2500LN Dual Series)

Output voltage trim allows the user to increase or decrease the output voltage set point of a module. This is accomplished by connecting an external resistor between the TRIM pin and either the Vo(+) or Vo(-) pins. With an external resistor between the TRIM and Vo(+) pins (Radj-down), the output voltage set point (Vo, adj) decreases. With an external resistor between the TRIM pin and Vo(-) pin (Radj-up), Vo, adj increases.

The following equations determine the required external resistor value to obtain an output voltage change of Δ %:

$$\text{Radj-down} = \left[\frac{A - C}{\Delta\%} - (A + B) \right] K\Omega$$

$$\text{Radj-up} = \left[\frac{C}{\Delta\%} - B \right] K\Omega$$

				Example	
Device	A	B	C	- 5% Vo Radj-down	+ 5% Vo Radj-up
+5Vo	4.75	3.65	1.19	62.8 KΩ	20.15 KΩ
+12Vo	15.40	14.70	1.60	245.9 KΩ	17.3 KΩ
+15Vo	16.90	14.70	1.41	278.2 KΩ	13.5 KΩ

NOTE:
THE ADJUSTED OUTPUT VOLTAGE CANNOT EXCEED +/- 10%
OF THE NOMINAL OUTPUT VOLTAGE.
TRIM FUNCTION MATCHES THAT OF TYCO™ LW020 SERIES.