LET240 Series

240 W 3-Phase AC-DC DIN Rail Switching Power Supply

Not Recommended for New Design

LET240 Series is Bel Power Solutions three-phase AC-DC DIN-Rail switching power supply. It features a cost-effective, energy efficient green power supply solution for standard DIN-rail mounting.

LET240 power supplies offer a high level of stability and immunity to noise for electricity industry, and other industrial equipment in a variety of harsh environments.

The units provide good EMC performance, and are compliant to EMC standards EN 55032 and EN 55035, safety standards UL 61010-1, CSA C22.2 No. 61010-1, UL 61010-2-201, CSA C22.2 No. 61010-2-201, EN 62368-1, BS EN 62368-1.

FEATURES

- Input range: 342 - 528 VAC (Nominal: 380 - 480 VAC) (two- or three-phase input available)
- Operating ambient temperature range -30°C to +70°C
- High I/O isolation voltage up to 4000 VAC
- Low ripple & noise
- High efficiency
- Operating altitude 5000 m
- DC OK function
- Peak load 130% for 3 s
- Output short circuit, over-current, over-voltage, over-temperature protection
- OVC III
- UL 61010-1, CSA C22.2 No. 61010-1, UL 61010-2-201, CSA C22.2 No. 61010-2-201, EN 62368-1, BS EN 62368-1 safety approved
- Dimensions 54 x 124 x 110 mm (2.13 x 4.88 x 4.33 in)

APPLICATIONS

- Industrial control equipment
- Factory automation
- Mechanical and electrical equipment

1. MODEL SELECTION

MODEL [1]	NOMINAL INPUT VOLTAGE RANGE	NOM OUTPUT VOLTAGE	MAX OUTPUT CURRENT	EFFICIENCY	MAX. CAPACITIVE LOAD	MAX OUTPUT POWER
LET240-24	380 - 480 VAC	24 V	10 A	92%	10 000 µF	240 W
LET240-48	380 - 480 VAC	48 V	5 A	92 %	5 000 µF	240 W

[1] Add suffix "CC2" for Conformal Coating on both sides

2. INPUT SPECIFICATIONS

All specifications are measured at Ta = 25°C, humidity <75 % RH, nominal input voltage and rated output load, unless otherwise specified.

PARAMETER	DESCRIPTION / CONDITIONS	MIN	TYP	MAX	UNIT
Input voltage (3-phase)	Nominal, ± 10% each phase Range	380 342		480 528	VAC
Input frequency		47		63	Hz
Input current	400 VAC 500 VAC			0.85 0.75	A
Inrush current [2]	400 VAC		50	60	A
Leakage current	480 VAC			2.0	mA_{RMS}

[2] Cold start

3. OUTPUT SPECIFICATIONS

All specifications are measured at Ta = 25°C, humidity <75 % RH, nominal input voltage and rated output load, unless otherwise specified.

PARAMETER	DESCRIPTION / CONDITIONS	MIN	TYP	MAX	UNIT
Adjustable output voltage [3]	LET240-24 LET240-48	24 48		28 55	VDC
Output current	LET240-24 LET240-48			10 5	A
Output voltage accuracy	At full load range		± 1		%
Line regulation	Rated load		± 0.5		%
Load regulation	400 VAC		± 1		%
Ripple & noise [4]	LET240-24 LET240-48		100 150	150 200	mV
Temperature coefficient			± 0.03		%/°C
Minimum load		0			%
Stand-by power consumption				2	W
Start-up time				1.5	s
Hold-up time	400 VAC 500 VAC	10 30	20 40		ms
DC OK Signal [5]	Resistive load 30 VDC / 1 A max.				

[3] The actual adjustment range may extend outside the values stated, care should be exercised to ensure that the output voltage and power levels remain within the published maximum values. Turn clockwise to decrease.

[4] Measured with 20 MHz bandwidth (peak-to-peak value), output parallel 47 µF electrolytic capacitor and 0.1 µF ceramic capacitor.

[5] When the output voltage is normal, the relay is connected. As soon as the output voltage dips below 90% Vo, the relay is disconnected.

4. PROTECTIONS

PARAMETER	DESCRIPTION / CONDITIONS		MIN	TYP	MAX	UNIT
Short circuit protection	The power supply enters the hiccup mode after constant current operation for 3 s (typ.), continuous, self-recovery					
Over current protection	The power supply enters the hiccup mode after constant current operation for 3 s (typ.), self-recovery		≥ 130			% Io
Over voltage protection	Hiccup, self-recovery	LET240-24 LET240-48			36 65	V
Over temperature protection	Start Release		 50		85	°C

5. ENVIRONMENTAL SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITIONS		MIN	TYP	MAX	UNIT
Operating temperature			-30		+70	°C
Storage temperature			-40		+85	°C
Temperature derating	+60°C to +70°C		3.0			%/°C
Input voltage derating	320 VAC - 340 VAC 550 VAC - 600 VAC	Three-phase input	1.0 0.4			%/VAC
	320 VAC - 340 VAC 550 VAC - 600 VAC	Two-phase input (80 %Io)	1.0 0.4			
Humidity	Storage, non-condensing				95	%RH
Altitude	Derating of 3.5 °C / 1000 m for operating altitude > 2000 m				5000	m
MTBF	MIL-HDBK-217F @ 25 °C		300 000			hrs

6. EMC SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITIONS		CLASS / LEVEL / CRITERION
Conducted emissions	EN 55032 / CISPR 32		Class B
Radiated emissions	EN 55032 / CISPR 32		Class B
Harmonic current	IEC/EN 61000-3-2		Class A
Voltage flicker	IEC/EN 61000-3-3		
ESD immunity	IEC/EN 61000-4-2,	Contact ±8 kV / Air ±15 kV	Performance Criterion A
Radiated field immunity	IEC/EN 61000-4-3,	10 V/m	Performance Criterion A
Electrical fast transient	IEC/EN 61000-4-4,	± 2 kV	Performance Criterion A
Surge immunity	IEC/EN 61000-4-5,	Line to line ±2 kV / Line to ground ±4 kV	Performance Criterion A
Conducted immunity	IEC/EN 61000-4-6,	10 V_{RMS}	Performance Criterion A
PFM field immunity	IEC/EN 61000-4-8,	30 A/m	Performance Criterion B
Voltage dips, interruptions	IEC/EN 61000-4-11,	100% dip 1 periods, 30% dip 25 periods, 100% interruptions 250 periods	Performance Criterion B

7. SAFETY SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITIONS	MIN	TYP	MAX	UNIT
Safety approvals	UL 61010-1, CSA C22.2 No. 61010-1, UL61010-2-201, CSA C22.2 No. 61010-2-201, EN 62368-1, BS EN 62368-1				
Safety class	Class I				
Isolation test	Input to Output (test for 1 min., leakage current < 10 mA) Input to PE (test for 1 min., leakage current < 15 mA) Output to PE (test for 1 min., leakage current < 15 mA) Output to DC OK (test for 1 min., leakage current < 15 mA)	4000 2500 500 500			VAC
Insulation resistance	Test voltage: 500 VDC	100			MΩ

8. MECHANICAL SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITIONS	MIN	TYP	MAX	UNIT
Dimensions			54 x 124 x 110 2.13 x 4.88 x 4.33		mm in
Weight			750		g
Case material [6]	Metal (AL1100, SGCC))				
Cooling	Convection (Natural air flow)				

[6] *When the power supply is in use, the enclosure of the product needs to be connected to the system grounding.*

9. DERATING CURVES

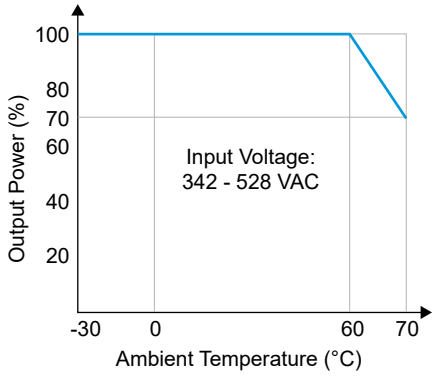


Figure 1. Temperature Derating Curve

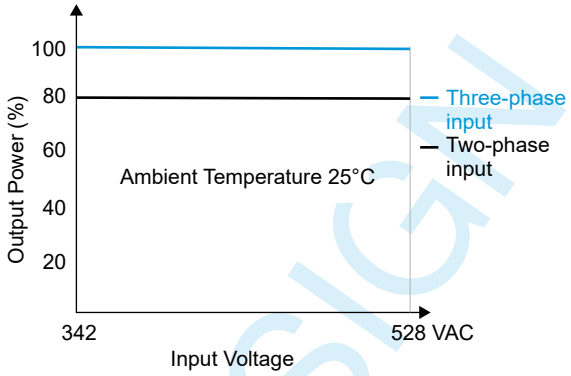


Figure 2. Input Voltage Derating Curve

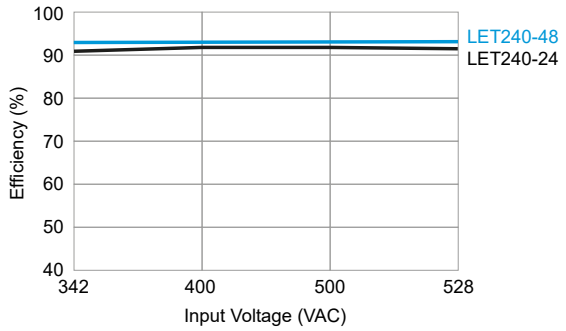


Figure 3. Efficiency vs Input Voltage Derating Curve (Full Load)

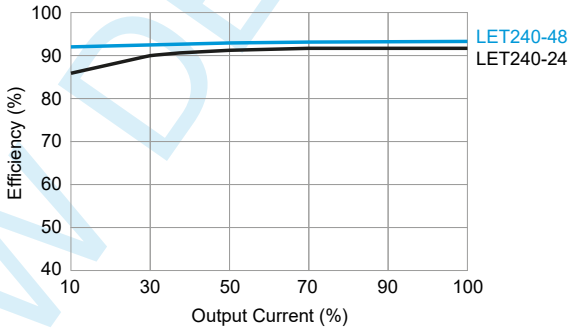
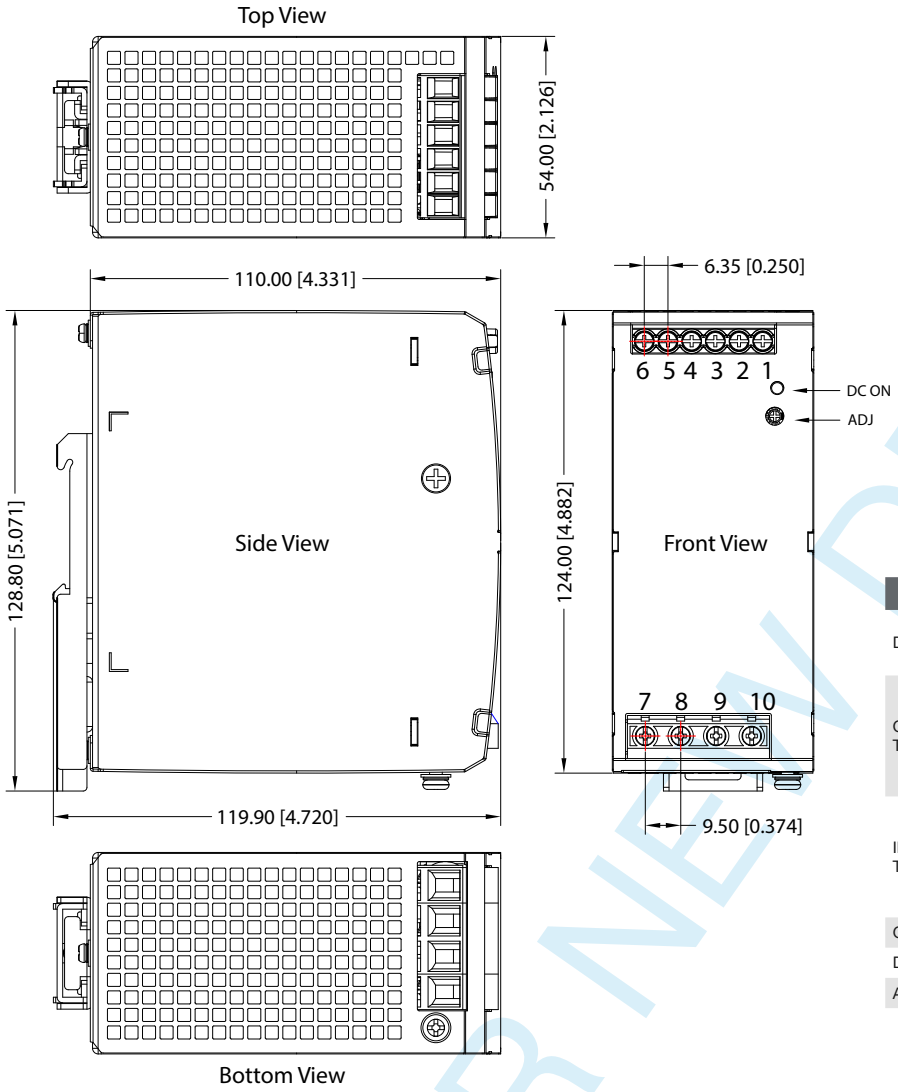


Figure 4. Efficiency vs Output Load Derating Curve (Vi = 400 VAC)

10. MECHANICAL DRAWINGS



	PIN	FUNCTION
DC OK SIGNAL	1 2	Monitors the output voltage on the output terminals
OUTPUT TERMINAL	3 4 5 6	-Vo -Vo +Vo +Vo
INPUT TERMINAL	7 8 9 10	AC (L1) AC (L2) AC (L3) ⏚
GROUNDING SCREW *	11	⏚
DC ON		Green LED
ADJ		Output voltage adjustment

** Pin 10 and the grounding screw (11) are interconnected. Either Pin 10 or the grounding screw (11) need to be connected to earth.*

Figure 5. Mechanical Drawing

All dimensions are in mm [in]

General tolerance ±1.00 mm [±0.039 in]

Wire range: Input: 24-10 AWG (12-10 AWG for pin10)
Output: 24 V: 16-10 AWG
48 V: 18-10 AWG
DC OK: 24-16 AWG

Tightening torque: Input: max. 1.0 Nm
Output: max. 0.5 Nm

Mounting DIN Rail TS35 (rail needs to be connected to safety ground)