



# ULTRA LEVEL TECH CO., LTD.

www.ultralevel.com.tw Tel:+886-2-29180118 Fax:+886-2-29181465

We Supply the Power Customers Need ISO9001

## 250W ~ 400W AC-DC PFC MEDICAL & ITE APPROVED POWER SUPPLY RL0402 SINGLE OUTPUT SERIES



RL0402U Series (U-Chassis Type): 8(L) x 5(W) x 1.6(H) inches.  
RL0402E Series (Enclosed Type): 9(L) x 5(W) x 1.6(H) inches.

### PRODUCT SPECIFICATIONS:

**Input Voltage:** 90 ~ 264Vac full range, 47 ~ 63Hz.  
**Input Current:** 6.35A at 90VAC full load.  
**Inrush Current:** 70A Max @ 230VAC with full load and cold start.  
**Power Factor Correction:** 0.98 @ Vin: 230Vac full load.  
**Fan Drive:** 12VDC/400mA is available to drive an external fan.  
**Transient Response:** Returns to within 1% in less than 2.5mS for a 50% load change and the peak transient does not exceed 5%.  
**Overshoot:** Turn-on/off not exceed 5% over nominal voltage.  
**Efficiency:** 70% ~ 85% depends on model.  
**Turn On Delay:** 1 second maximum at 230 VAC.  
**Hold Up Time:** 20mS min. at 80% of full load.  
**Adjustability:** Output user adjustable +/-5% minimum.  
**Remote Sense (for under 12V models):** Designated **RS+** and **RS-** on the CN3.  
 (Not available for current sharing models)  
**Remote On-Off:** Designated as **RSW** on the CN3, requires a low signal to inhibit output.  
**Power Supply On:** Green LED designated as **LED 1** on the PCB.  
**LED display:** Bi-color green **LED** in front panel (RL0402E only); Any protection occurred or RSW applied low signal will emit orange.  
**Power Good:** **PG** on CN3 goes high 100-500mS after DC regulation and low at least 1mS before loss of regulation (Open collector).  
**Current Sharing:** Designated as **CSH** on the CN3, optional single wired for forced current sharing function and parallel up to 4 units within 10% accuracy at full load.  
**Current Monitor:** Designated as **CMN** on the CN3 for current sense for a 0.5V to 3VDC to represent 0% to 100% output current.  
**Margin (Option):** Designated as **MAG** on the CN3 providing output voltage remote adjustment by applying logical low ~ high signal.  
**Input Circuit Protection (primary):** Two T8A/250V fuses inserted.  
**Over-Power Protection:** 110-140% of I-Max and auto-recovery.

### FEATURES:



- ◆ Safety Approvals to IEC/EN/UL60601-1 3<sup>rd</sup> Edition
- ◆ Optional N+1 Forced Active Current Sharing
- ◆ High Quality & Reliable Component Usage
- ◆ Variable Fan Speed & Low Acoustical Noise
- ◆ Active Power Factor Corrected to EN61000-3-2 class D
- ◆ Providing Peak Power 700W within 500uS duty duration
- ◆ U-Chassis & Enclosed with built-in fan Mechanical Options
- ◆ Current Monitoring and Remote Voltage adjustment (Margin)



**Short Circuit Protection:** Trip without damage and auto-recovery.  
**Over-Voltage Protection:** Latching down will occur when output voltage exceed 130% and recycle AC input to reset.  
**Input Voltage Protection:** Power shut down under 80 +/-5Vac, and recovered over 86Vac.  
**Over Temperature Protection:** Protected in the event of excessive operating ambient 85 degree, and automatic recovery.  
**Switching Frequency:** 30KHZ fixed frequency.  
**Operating Temperature:** 0 °C to +70°C ambient, de-rating at 2.5% per degree from +50°C to +70°C.  
**Storage Temperature:** -20 to +85 degrees C.  
**Operating Humidity:** 5% to 90% RH, Non-condensing.  
**Storage Humidity:** 5% to 95% RH, Non-condensing.  
**Vibration:** Frequency 5 to 50 Hz, acceleration +/-7.35 M/(SxS) on X,Y and Z Axis.  
**EMC:** EN60601-1-2/EN61204-3 Class B conducted / radiated; EN61000-3-2,3; IEC61000-4-2, 3, 4, 5, 6, 8, 11.  
**Safety:** EN/ IEC/ UL60601-1 3<sup>rd</sup> edition; EN/ IEC/ UL62368-1.  
**Leakage Current:** Medical degree < 200uA; ITE degree < 1.5mA.  
**HI-POT Test:** 1500 Vac between input line and chassis (2mA DC cut off current); 4000Vac between primary and secondary windings; Primary to core 1500VAC. All for 3 sec.  
**Grounding Test:** Apply 40 A from ground pin to the earthed connection point. Maximum allowable resistance is 0.1ohm.  
**Warranty:** 2 years.  
**MTBF:** 100000 Hrs (according to MIL-HBK-217F) at 30°C.  
**Cooling:** :RL0402U Series: U-Chassis @400W max. with 23CFM airflow or 250W max. under convection cooling.  
 RL0402E Series: Enclosed with side built-in fan @400W max.  
**Burn in:** 45 +/- 5 degree C for 1 hour @230Vac with full load.  
**Enclosure:** RL0402U Series: 8(L) x 5(W) x 1.6(H) inches.  
 RL0402E Series: 9(L) x 5(W) x 1.6(H) inches.  
**Weight:** RL0402U Series: 1.3KG; RL0402E Series: 1.6KG.



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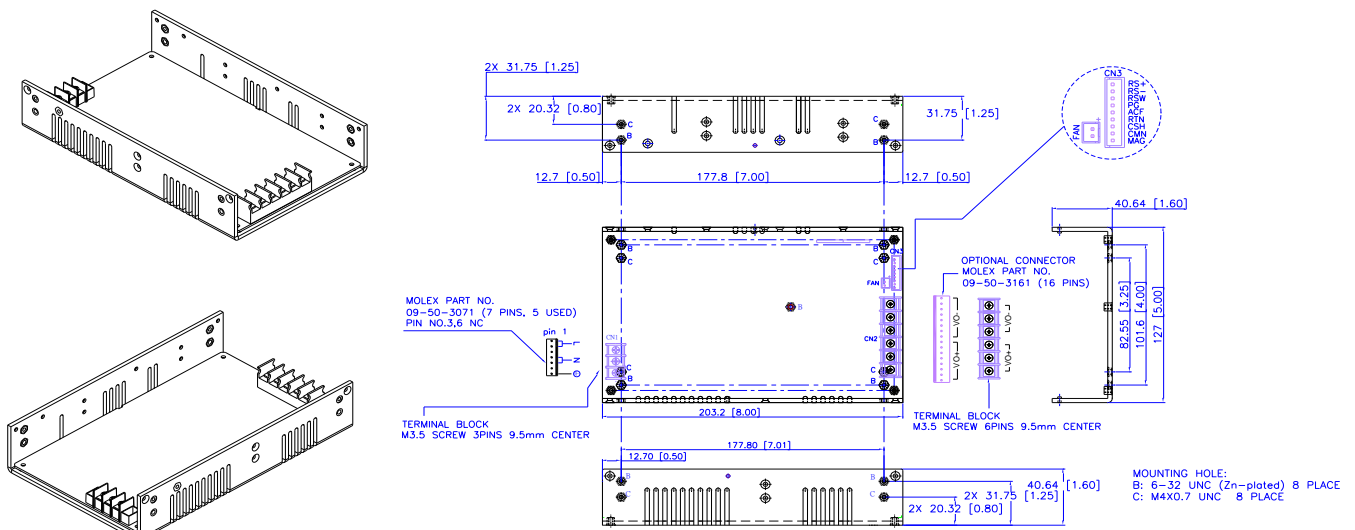
## OUTPUT VOLTAGE / CURRENT RATING CHART: Measured at output power connector.

Model	Output Range	Preset Voltage	Max. Output Power or Current		Total Regulation	Ripple & Noise
			Type U (Convection)	Type U (with forced air) & E		
RL0402x-03(I)	2 ~ 3.3V	3.3V	45A	60A	+/- 1%	+/-1%
RL0402x-05(I)	5 ~ 6V	5V	45A	60A	+/- 1%	+/-1%
RL0402x-12(I)	12 ~ 15V	12V	250W	400W	+/- 1%	+/-1%
RL0402x-18(I)	16 ~ 21V	18V	250W	400W	+/- 1%	+/-1%
RL0402x-24(I)	22 ~ 30V	24V	250W	400W	+/- 1%	+/-1%
RL0402x-36(I)	31 ~ 41V	36V	250W	400W	+/- 1%	+/-1%
RL0402x-48(I)	42 ~ 58V	48V	250W	400W	+/- 1%	+/-1%

- NOTE:**
- \* RL0402x-yz. x = U (U-Chassis Type) or E (Enclosed with built-in Fan Type). or y = **03, 05, 12, 18, 24, 36 or 48**. z = blank or I where I denote forced current sharing option (OR-ring diode).
  - \* RL0402U Series: 400W max. with 23CFM airflow or 250W max. under convection cooling
  - \* RL0402E Series: 400W max. with built-in fan flow.
  - \* All output ranges are covered in agency certifications and preset output voltage for each model as above listings.
  - \* Providing peak power to 700W within 500uS for all models, longer duty duration need contact manufacture.
  - \* 1% minimum load is required to maintain the ripple and regulation.
  - \* Output is fully isolated.

## OUTLINE DRAWING:

RL0402U Series (U-Chassis Type): 8(L) x 5(W) x 1.6(H)inches; Weight: 1.3kg



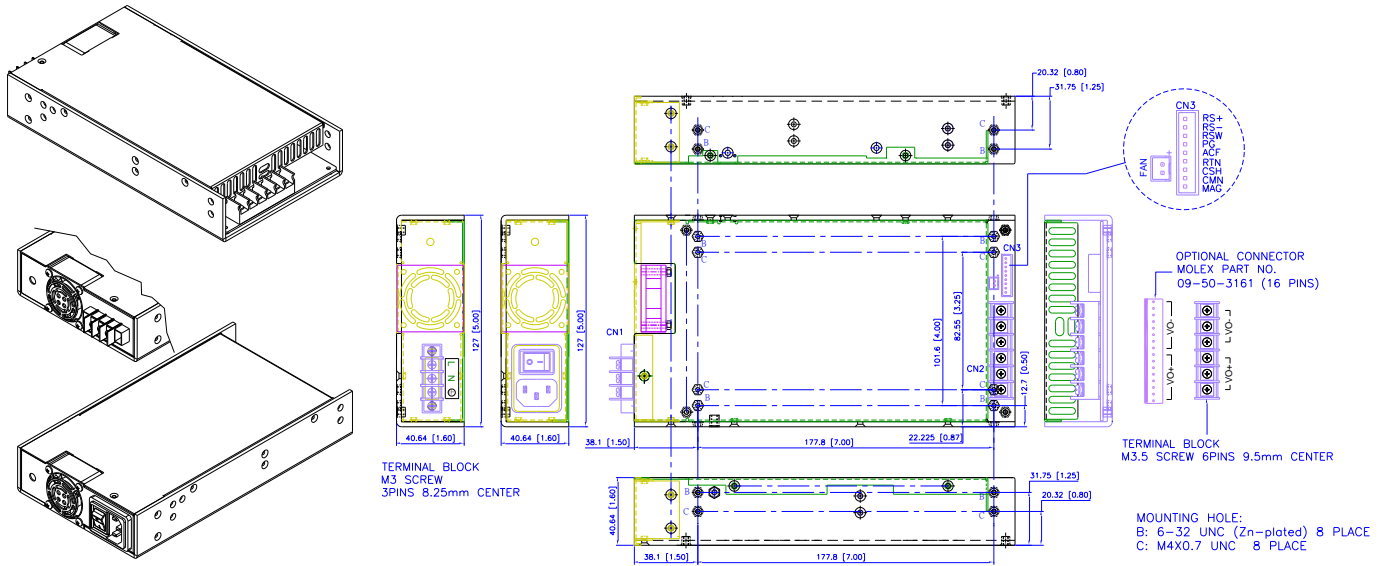


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RL0402E Series (Enclosed with built-in Fan Type): 9(L) x 5(W) x 1.6(H)inches; Weight: 1.6kg.



## I/O Connector pin assignment:

### Input Connector(CN1):

RL0402U Series: Mating Molex Part No. 09-50-3071 equivalent(7 pin, 5 used), or Howder Terminal block Part No. HD-121-3P.

RL0402E Series: IEC320 or equivalent Snap-in mounting type or DINKLE Terminal block Part No. DT-35-A02W-03 (3 pin).

**Output Connector (CN2):** Mating Molex Part No.09-50-3161 (16 pins), or Howder (HD-121-6P) M3.5, 8 pins terminal block, 9.5MM Center.

**Output Pin Assignment:** (See right table).

### Logic signal connectors (CN3):

Mating JST XHP-9 or equivalent (CHYAO SHIUNN JS-2001-09) Mating Pins: JST SXH-002T-P0.6 for AWG 30 to 26.

**Mounting Inserts:** 6-32, M4 4 Places individually with maximum penetration 0.15 inches on bottom side and 0.25 inch on both side.

	Molex	Howder
VO+	(Pins 1-8)	(Pins 1-3)
VO-	(Pins 9-16)	(Pins 4-6)