

Dual Range ILc-VRp

International

Precision voltage regulator

Isolation transformer

ILc-VRp model

ILc-2000-VRp-
 Dual Range

2000 VA
 2000 watts
 input:
 120 or 240vac
 output:
 115 &/or 230vac

Isolation Line Conditioner with Precision PWM Automatic Voltage Regulation and 120vac or 240vac Input Capability

Continuous fast and no-break PWM voltage regulation

The ILc-VRp dual range automatic precision voltage regulator with built-in low-impedance isolation transformer allows trouble-free operation of electronic equipment over a very wide ac voltage range of 120 or 240vac +/-20% found in many developing countries.

Output regulation responds in less than one line cycle and corrects output voltage to +/-2.5% with 20,000 corrections per second. There is no switching of taps or otherwise a break in the power path as continuous PWM (pulse-width-modulation) switching of the primary winding of a buck-boost transformer leaves the secondary power path intact.



Typical ILc-VRp applications

Designed for applications where absolutely safe and precisely regulated ac power is required, such as mobile telecommunications, wireless, satellite and carrier equipment.

*Power with a
 Precision Attitude™*

Key features of the ILc-VRp Series dual range isolation line conditioner with precision PWM automatic voltage regulation

- Dual voltage input enables use with either 120vac or 240vac power
- Dual voltage output enables 115vac via two NEMA 5-15R receptacles, and/or 230vac via one BS1362 socket
- Outstanding voltage regulation under normal input range of: +/- 20% of 120 or 240vac, output voltage will be a precision 115 or 230vac +/-2.5% (47~63Hz)
- No switching of power path and unit always starts up on sine wave zero crossing, reducing inrush currents
- Failsafe: automatic bypass
- Coordinated surge protection per IEC61312
- Common-mode noise elimination
- Advanced noise and interference filter reduces dV/dt from 6kV/μS to less than 10V/μS
- Lightweight design
- Two year warranty



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Dual voltage
range isolation
transformer with
precision PWM
automatic
voltage regulator

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Key ILC-2000-VRp-Dual Range system benefits

The lightweight, high efficiency dual voltage range ILC-VRp is easy to install in indoor environments. The unit comes in a rack-mountable enclosure and has the ability to accept either 120vac or 240vac +/-20% input via either a IEC320 C-20 input connector for the 120vac, or an IEC320C-13 inlet connector for the 240vac. Power output is up to 1800watts, and can be drawn from Either/or Both 115vac **and** 230vac +/-2.5%, as long as total output power is not exceeded.

115vac and 230vac outputs are provided via two standard NEMA 5-15R receptacles for the 115vac, and one UK BS 1363 outlet connector for the 230vac.

The automatic bypass assures that connected equipment will not shut down, even if the ILC-VRp unit were to fail. The ILC-VRp is compatible with all loads as it does not switch any components in the power path. ILC-VRp's ultra-low impedance assures stability even with the most demanding loads.

The isolation line conditioner components provide maximum equipment protection against surges, spikes and transients, for higher equipment reliability and maximum equipment operating life. In addition, improved repeatability, fewer reboots or system lock-ups. Also, a reduction in equipment down time and service costs can be expected.

Maximum transformer and regulator performance, reliability and lifetime is achieved by a design with no moving mechanical parts other than a thermostatically controlled high reliability cooling fan to control the unit's internal temperature.

How the ILC-VRp 2000VA Dual Range system works

The ILC-VRp unit is comprised of an automatic precision voltage regulator, and an isolation line conditioner. Unit has a front panel key switch to select either 120vac or 240vac, with a safety interlock to prevent voltage from appearing on unused terminals.

The high frequency IGBT driven converter microprocessor takes the incoming ac power, measures against the nominal voltage and adds or subtracts voltage, 20,000 times per second, to achieve precisely regulated 230 or 120vac output, cycle by cycle. Voltage correction times do not exceed 1 cycle, or 20 milliseconds for all mains ac voltage changes, even for instantaneous voltage changes from 96 to 144vac (when at the 120vac input setting) or from 192 to 288vac (when at the 240vac input setting).

The ILC-VRp starts on sine wave zero voltage crossing point upon turn-on. This reduces potentially damaging inrush currents into difficult loads.

The automatic bypass will be activated when there is a fault condition, and makes operation possible without regulation. Three LEDs display unit status, the Green LED indicates Normal (regulating protected mode operation), Yellow LED indicates Bypass (non-regulated output), and the Red LED indicates a Fault condition. (If Green LED is off, it means internal circuit board needs replacement).

A low-impedance isolation transformer provides complete isolation between the primary and secondary, and permits bonding its output neutral to ground, which completely eliminates all disturbances between neutral and ground.

The leakage inductance of the isolation transformers, in combination with capacitive elements and MOVs, provide superb noise filtering, as well as coordinated multi-stage surge protection in accordance with the principles of IEC-61312.

Dual Range ILc-VRp



Dual voltage range isolation transformer with precision PWM automatic voltage regulator

Specification	ILc-2000-VRp-Dual Range
Electrical	
Capacity in VA (watts)	2kVA (2kW)
Transformer type	Isolation transformer with key-switched taps for dual range capability.
Regulator engine	High frequency 20kHz IGBT driven voltage regulation converter. Pulse-width-modulated (PWM) ac to dc converter and dc to ac topology.
Input	
Nominal voltage	120 or 240 volts ac (User selectable via key switch with safety interlock to prevent voltage from appearing on the unused terminals).
Normal operating range	120 or 240vac +/-20%. Short duration (less than 5 minutes) operation +/-30%.
Nominal frequency	47 to 63Hz
Input circuit breaker	Input circuit breaker (150% overload capability for heavy start load).
Circuit breaker rating	20 amps@120vac or 10 amps@240vac.
Input	120vac IEC320C-20 inlet. 240vac IEC320C-13 inlet.
Output	
Nominal voltage	115vac and/or 230vac
Power efficiency	Better than 96%
Voltage regulation	115vac+/-2.5%, or 230vac+/-2.5%
Automatic bypass	Automatic bypass will be activated when there is a fault condition.
Safe start	Unit starts on sine wave zero voltage crossing point upon turn-on. Unit is fully functional/regulated within 5 seconds of mains restoration.
System status indicators (per phase)	System status LED's provided as follows: Green LED (blinking) indicates Normal (regulating mode operation); Yellow LED (blinking) indicates Bypass (non-regulated output); Red LED indicates Overload (system may shut down).
Surge protection	A three-stage surge protection system consisting of isolation transformer, capacitor and MOV is included.
Surge test conditions	Class 2 & Class 3 simulated lightning surge (Combination wave) per ANSI/IEEE C62.41-1991, Cat. C test waveform: 6kV, 3kA, 8x20µS
Surge let-through voltages (system will continue to operate without interruption under these conditions)	Single pulse: L-N: 50V, L-G: 50V, N-G: 0.5V Ring wave: L-N: 20V, L-G: 20V, N-G: 0.5V Combination wave: L-N: 250V, L-G: 250V, N-G: 0.5V The measured rate of voltage rise/fall (dV/dt) of the remnant waveform is less than 10V/µS with input test waveform dV/dt of 6kV/µS.
Common mode filtering	Neutral-ground bond eliminates all noise or voltage on neutral (< 0.5V)
Normal mode filtering	A built-in inductor-capacitor filter attenuates EMI/RFI noise from output.
Output receptacles	Two NEMA 5-15R 120vac, and One UK BS1363 230vac socket.
Physical	
Dimensions	436mm(17.2")wide x 127mm(5")high x 381mm(15")deep
Weight	22.7 kg(50 lbs)
Rack-mountng (optional)	For 19" Front mounting: MK-8019A. For 19" Rear mounting: MK-8019B.
Safety	
Standards	Design ready to meet UL, CUL and EMC standards.
Environmental	
Ambient temperature	-5° to +35°C(23° to 95°F)
Cooling method	Fan cooled.
Warranty	
Warranty	Two year limited warranty, parts and labor.

TSi's ongoing product improvement process makes specifications subject to change. Other companies product names herein are for identification purposes only, and may be trademarks of their respective companies.



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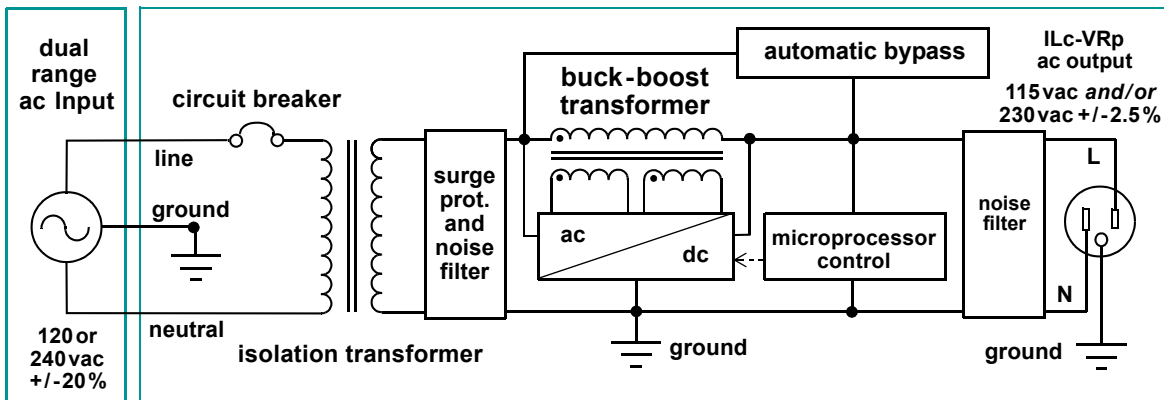
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ILC-2000-VRp-Dual Range system architecture



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- Dual voltage range input: 120vac **Or** 240vac
- Dual voltage range output: 115 vac **And/Or** 230vac
- Precision PWM automatic voltage regulator with low-impedance isolation transformer