

# APPLICATION NOTE #110

# Model 3000iL AC Source/Analyzer

## Single Phase Line Input Operation



### Introduction

The California Instruments Model 3000iL AC source/power analyzer is designed to operate from three phase input power and is available in two versions to accommodate either nominal 208 V line to line three phase or nominal 400 V line to line three phase input. However, the 208 V three phase input model may be operated from a 230 V single phase circuit capable of supplying at least 25 A rms. 3000 VA output power is still available in this mode of operation.

The 400 V line to line three phase input unit cannot be operated from a single phase supply.

This application note describes the connection that should be used for this situation as well as safety, protection, and regulatory considerations.

### Single Phase Connection

When operating the 3000iL from a single phase input line, the 230 Volt line to neutral must be connected to terminals L1 and L2 on the input terminal block. The required branch circuit must be capable of supplying at least 25 A rms. A 30 A rms rated branch circuit with suitable circuit breaker protection is recommended. The connection diagram for this setup is shown in Figure 1.

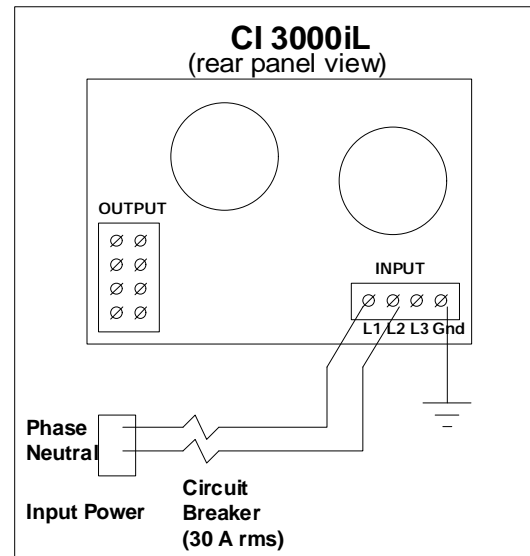


Figure 1 : Single phase connection for 3000iL

Note that the nominal single phase line input should be 230 V rms with a low line of 207 V rms and a high line of 253 V rms. The supply voltage must be within this range. Take care to size the input cable to minimize voltage drop caused by the high rms. input current.

If the nominal mains voltage is 400V 3 Ø (L-L), take great care to prevent accidental connection of a 208 V rated unit, as this could cause severe damage to the AC Power Source. Conversion of 208 V units to 400 V or vice versa is not possible. The iL Series is shipped with a fixed input voltage configuration.

## Output Power Rating

All model 3000iL specifications are maintained using single phase input. This includes full rated output power of 3000 VA single or three phase. Used this way, the 3000iL makes an ideal 1Ø to 3Ø converter for Avionics or Utility power applications. At all times, maximum operating temperature and airflow requirements must be maintained to ensure safe operation.

Other models in the iL Series such as the 4500iL and 4801iL are not suitable for single phase input operation due to the potential higher output power conditions.

## Status Error

When operating the 3000iL from a single phase line input, the Rail bit (11) in the Questionable Status Register will be set to indicate a missing phase on the input. This bit should be disabled in the Questionable Status Enable register. See the iL Series programming manual for details.

## CE-Mark

Operating the Model 3000iL from single phase input does not require modification to the unit. Since the 3000iL is CE Marked, importation and sale within the EEC is valid. However, the 3000iL has not been extensively tested under the conditions described in this application note. We do not warranty that when operated from a single phase supply, the unit will meet the various IEC specifications that form the CE requirements for this type of product. Engineering analysis does however indicate that the most sensitive area of RF emissions, directly from the high power switching amplifier, should not be compromised by this input power change. The area where performance may be compromised is conducted emissions, due to the efficiency of the input line filter when operated in a single phase mode. Any claims concerning conformity to IEC regulations only apply to a unit used in the normal mode of operation of 208 V (L-L) 3 Ø line power.

## Conclusion

Use of the 3000iL with single phase input power can provide a solution in those situations where three phase power is not available and the single phase utility power offers 230 V rms at 30 A..

Under all other conditions however, California Instruments recommend use of three phase input for all of its iL Series models.

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