



# LIMITAMP<sup>®</sup>

## Synchronous Motor Field Application and Protection Module

### GENERAL

The IC3655A105 solid-state starting and protection module contains the logic circuits essential for starting, synchronizing, and protecting synchronous motors. When used with electro-mechanical devices in the motor line and field circuits (contactors and breakers), to connect and disconnect power, the combination makes a complete synchronous motor controller.

### APPLICATION

This control is designed for use with slip-ring synchronous motors which accelerate by means of the squirrel-cage (or amortisseur) winding. It depends on the induced-field feed-back to provide synchronizing control and stall protection. The peak induced field volts must be greater than 300 volts for 125-volt rated fields and greater than 500 volts for 250-volt rated fields. If induced voltage is greater than 1000 volts RMS, consult factory.

An unloader relay is provided as standard.

Since synchronous motors vary widely in types and design, care must be taken to provide proper motor control data. The control can only be applied to the motor for which it is ordered. Grounding resistor FGRS is provided automatically with module.



### FEATURES:

**Annunciator lights** to signal operation of the squirrel-cage protective function or out-of-step operation.

**Test card** to permit testing of the squirrel-cage and power-factor cards.

#### Calibrated knobs to adjust:

- Power-factor trip (0.6 to 1.0 lag)
- Time delay for operation of the power-factor function after pull-out (0.2 to 1.0 second)
- Percent of synchronous speed at which synchronization occurs (90- to 98-percent speed)

**Field application** at precise speed and rotor angle.

**Protection** of the squirrel cage against stall and prolonged acceleration up to final slip speed. Protection is also provided for motor over-heating due to successive starts.

**Loss of excitation protection** which can be detected by lagging power factor as long as the field circuit is intact\*.

**Pull-out protection** by lagging power factor.

**Avoidance of nuisance tripping.**

**Response to power factor only** — not current magnitude plus power factor.

\*An open field circuit may not be protected by the standard controller. For comprehensive field-loss/field-failure protection, dc voltage-failure relay and dc current-failure relay are recommended.

**SPECIFICATIONS: See page 2.**

## SPECIFICATIONS:

### Power Inputs:

115/230-volt, 50- or 60-Hertz input must be the same phase sequence as L1-L2 of the motor. Five-ampere rated current-transformer signal from L3 is required. Current signal must be 50 milliamperes minimum.

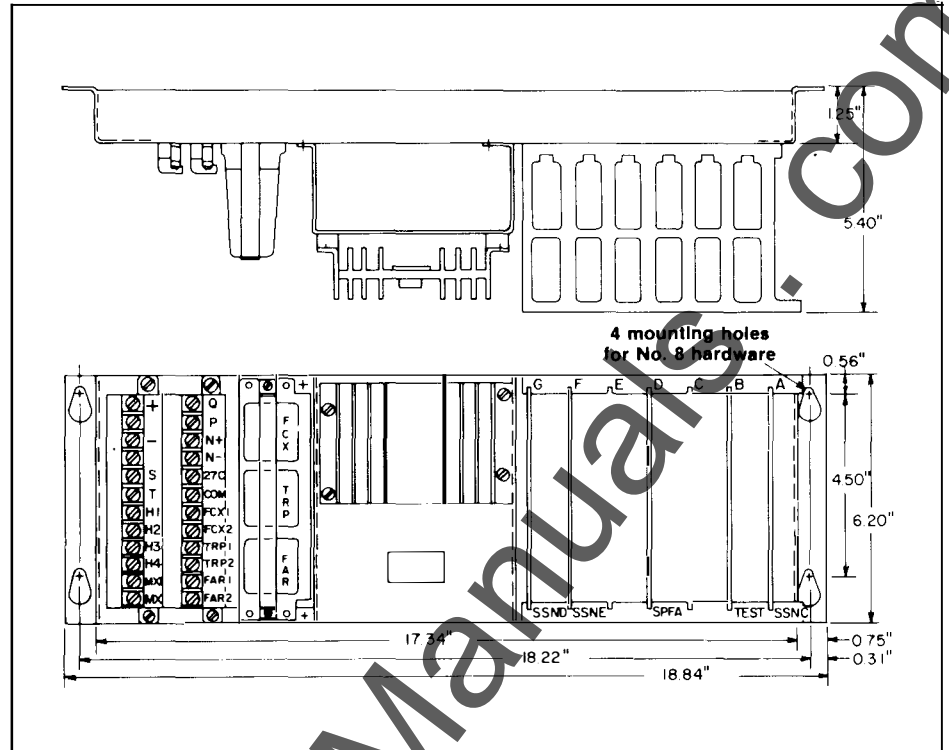
### Outputs:

Relay contacts rated 7 amperes resistive at 115/230 volts; 50 or 60 Hertz, for operating field contractor. Noise suppressor units must be added to operating coils of all magnetic relays and contactors connected to input and output circuits of module.

## HOW TO ORDER

Specify Catalog No. IC3655A105 and provide the following information:

- \_\_\_ Motor type
- \_\_\_ Voltage
- \_\_\_ Phase
- \_\_\_ Frequency
- \_\_\_ Power factor
- \_\_\_ Temperature rise
- \_\_\_ Stator full-load current
- \_\_\_ Rated field current at full-load
- \_\_\_ Resistance of field at 25 C
- \_\_\_ Excitation voltage
- \_\_\_ Discharge resistance
- \_\_\_ Induced field current (full-voltage at 0-, 75-, and 90-percent speed)
- \_\_\_ Allowable stall time, full voltage
- \_\_\_ Allowable running time at 50- or 75-percent speed



Dimensions for mounting