

EMICC

MEDIUM VOLTAGE SOFT STARTER

2.5kV
CLASS

3.6kV
CLASS

5kV
CLASS

7.2kV
CLASS



200A, 400A, 600A Availability

Specifications

Type of Load

3-phase medium voltage AC induction or synchronous motors

AC Supply Voltage

2300, 3300, 4160, 6000/7200V,
VAC +10% to -15%, 50/60 Hz line voltages

Overload Rating

600% for 30s, 500% for 60s

Power Circuits

Series strings of SCR power modules (1 to 6 pairs of SCRs per phase depending on voltage rating)

SCR Peak Inverse Voltage

Line Voltage	PIV Rating
2300	6500
3300	9000
4160	13000
6000	18000
6600	19500

HMC 1072 BIL Rating

45kV Standard / 60kV with arrestors

Transient Voltage Protection

Dv/dt circuits (1 per SCR pair)

Ambient Operating Conditions

0-50°C (82°F to 122°F) (Optional -40° to 50°C with heaters)

5-95% relative humidity

0-3300 ft. (1000m above sea level without derating).

Digital Control Unit (DCU)

Programmable keypad/operator with 2 lines x 20 character backlit LCD display. Status/Alarm LEDs (indicate; Power, Run, Alarm, Trip, Aux 1-8)

Auxiliary Contacts

Multiple Form C contacts rated 5A@ 250VAC max.

6 fully programmable relays (including fail-safe operation)

5 dedicated relays (fault, at-speed, etc.)

Programmable Features

Motor FLA, service factor, insulation class
Dual Ramp Adjustments—Two independent settings for:

- Initial Torque 0-100% of nominal torque, voltage or current

- Current Limit 200 - 600% of motor FLA

- Acceleration Time 1-120 Sec.

Motor and Starter Protection

Electronic Overload

Phase Loss

Phase Imbalance

Phase Reversal

Short Circuit Detection

Over/Under Current

Over/Under Voltage

Shorted SCR/Shunt Trip

Starter Over-Temp

Coast Down Lockout

Starts per Hour Lockout

Time between starts

RTD Input (Option)

Ground Fault (Option)

Statistical Data

Elapsed run time, last start time, average starting current, stores history of up to 60 events (data includes date & time, phase & ground fault current). Also displays time-to-trip, remaining inhibit time and starts/hour values.

Metering (Voltage & Current)

Percent to FLA, phase currents, kVAR, kVA, kW, power factor, demand, avg. stat current, remaining thermal register, thermal capacity to start, measured capacity to start, time since last start, line frequency, phase order, RTD values (optional).

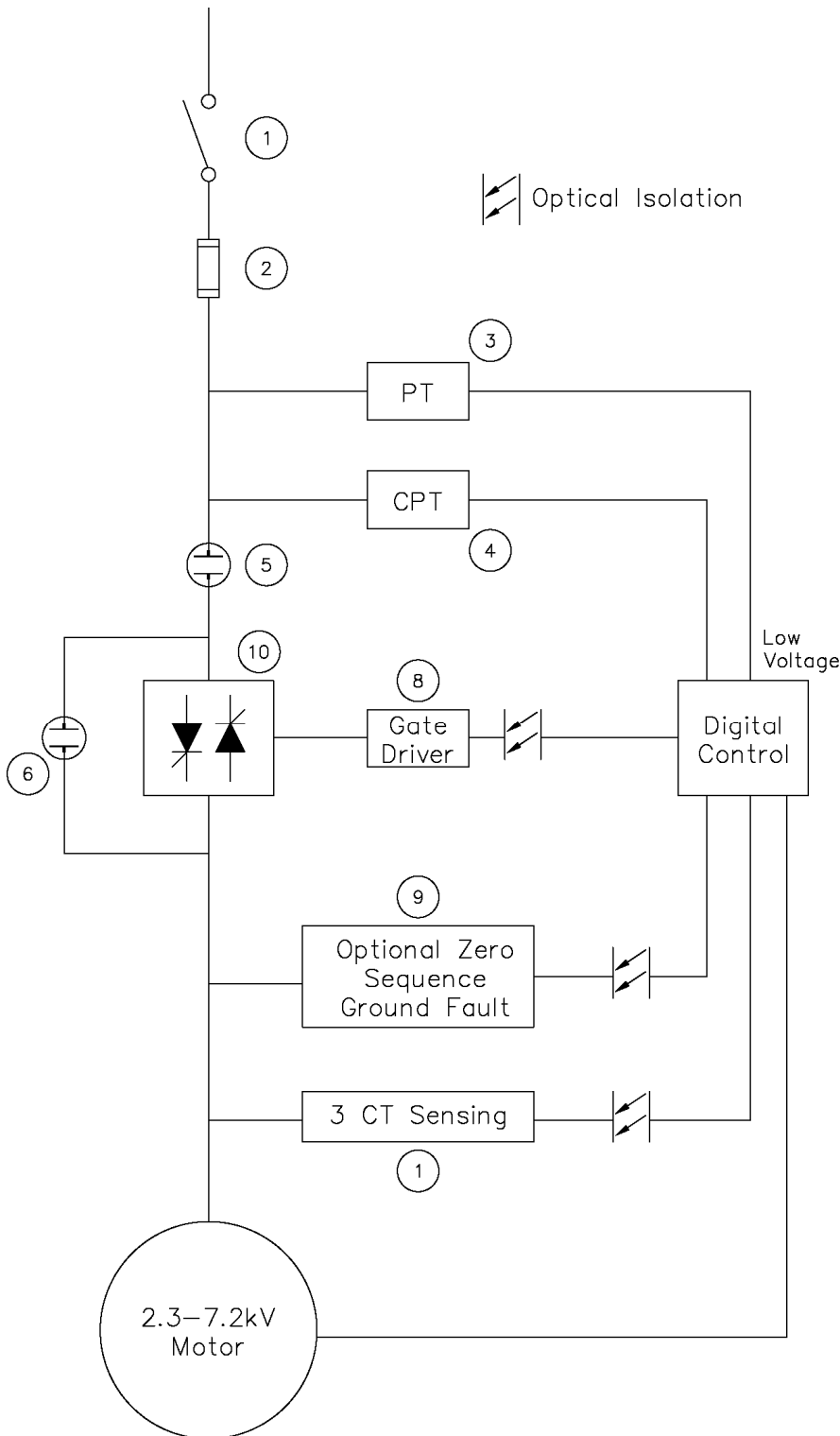
Enclosure

When included with additional control units the "1072" is a modular system of medium voltage (MV) equipment. Each soft start of the system is based on a 975 mm / 38.4-inch-wide by 914 / 36in. Deep module "3 pitch" of equipment but may increase in size to (1300mm) 51.2 in. wide. Cubicles are available in 1, 2, 3, or 4 pitch wide sections to house load break switches, transitions to breakers or transformers, power factor correction capacitors, autotransformer or reactor equipment, income line connections, synchronous controls, and special metering, monitoring, and protection equipment. The cubicles are floor-mounted, available in extendable-at-each-end lineups, and may be obtained in back-to-back, back-to-wall, or free-standing sections finished in ANSI 61 light gray.

Motor Protection

ANSI/IEE Number	System/Protection Features	Standard
19	Reduced voltage soft start	✓
27	Under voltage	✓
37	Undercurrent	✓
46	Current imbalance	✓
47	Phase rotation	✓
48	Locked rotor/ incomplete sequence	✓
49	I ² t electronic motor overload	✓
50	Instantaneous electronic over current trip	✓
51	Over current	✓
55	Power factor trip	✓
59	Over voltage protection	✓
66	Starts per hour and time between starts	✓
81	Frequency variance	✓
86	Lockout/ start inhibit	✓
50N/51G/N	Ground fault detection, instantaneous and current	Optional
49/38	Stator and bearing RTD protection	Optional
14	Speed switch and tachometer trip	Optional

Soft starter line diagram



1. **Load Break with viewing window**
2. **Coordinated Motor Fuse Protection**
3. **Isolated PT for Voltage Sensing**
4. **Control Power Transformer**
5. **Isolation Contactor Rated for Across the Line Start**
6. **Bypass Contactor Rated for Across the Line Start**
7. **Sustained Pulse Gate Drive
*Fiber Optically Isolated***
8. **Zero Sequence Ground Fault Option
*Fiber Optically Isolated***
9. **Optional Zero Sequence Ground Fault Card
*Fiber Optically Isolated***
10. **Heavy Duty SCR Stack Assembly
*With Ring Transformer Sustained Pulse Firing***

Integration, Communication, & Thermal protection

Flexible I/O

- 120Vac control power input accepts long control circuit runs without the need for interposing relays.
- 8 programmable relay outputs for control flexibility without the need for external auxiliary relays or add-on cards.
- 2 programmable analog outputs (0-10Vdc or 4-20mA).

Communication

- RS-232 for communications with a PC.
- RS-485 for multi-drop communications with Modbus RTU standard.
- Profibus, DeviceNet, EtherNet/IP, PROFINET, Modbus TCP (Communication Modules are options).

TRUE THERMAL MODELING

Monitors the motor for excessive thermal conditions due to starting, running and even ambient conditions.

THERMAL MODEL BIASING

Adjusts for heating effects of phase current imbalance or optional RTD inputs.

RETENTIVE THERMAL MEMORY

For continuous overload protection even after a complete Power loss. When power is restored, the soft start remembers the last thermal condition of the motor, observes the off time via a real-time clock and adjusts the thermal model accordingly.

TRUE TIME THERMAL TRACKING

Adjusts the thermal model for different cooling rates based on motor temperature, running state or power loss.

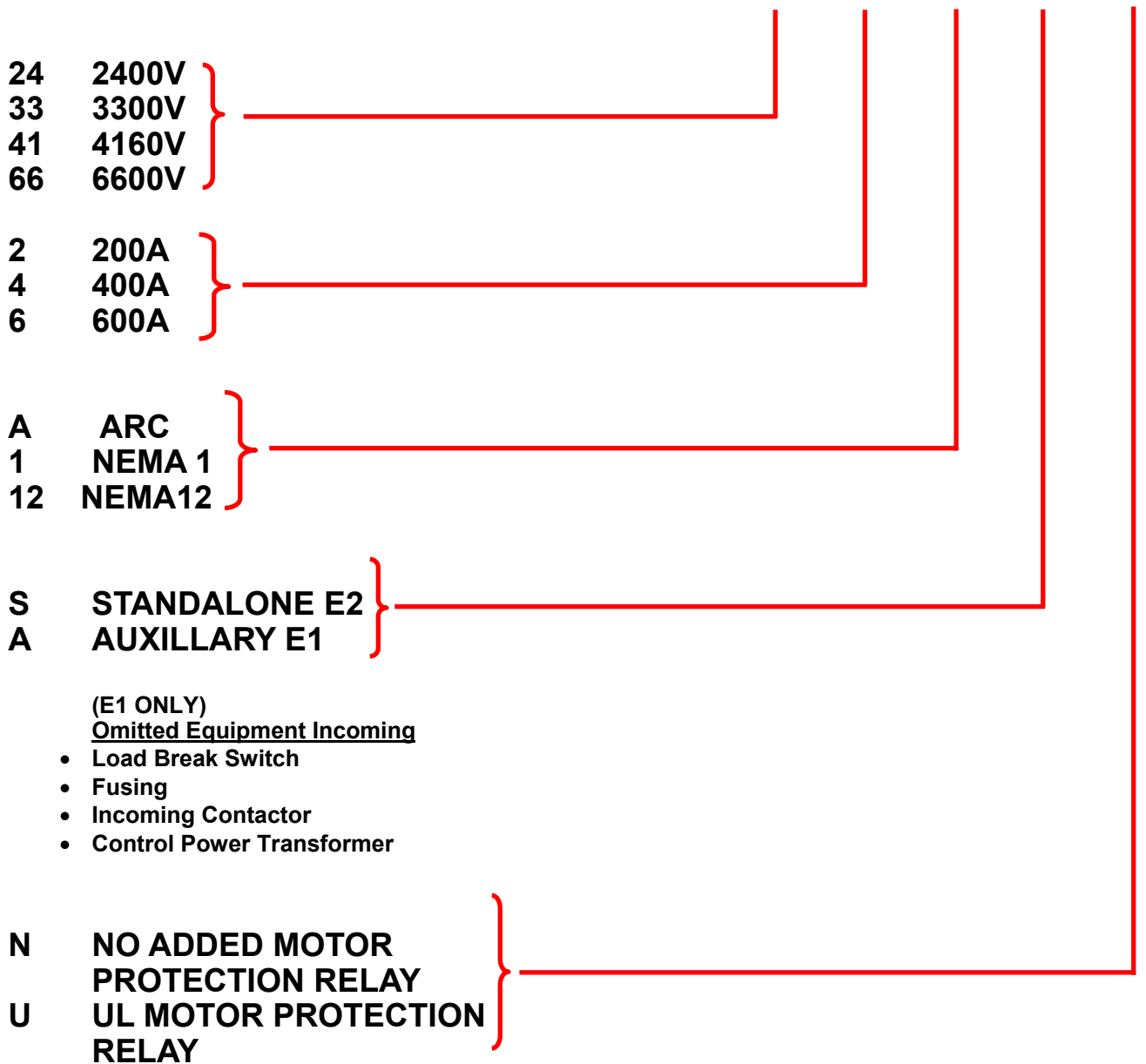
DYNAMIC RESET RESPONSE

Reset is only allowed after the motor has sufficient thermal capacity for a successful restart.

Starter Model Numbers

Soft Start Options

HMC 1072 SS - A - B - C - D - E





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