

Motor Starters With SmartStart™ Technology

*The worlds best fans deserve
the best motor protection.*

SMARTSTART™



 **GREENHECK**
Building Value in Air.

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Greenheck Motor Starters

With SmartStart™ Technology

Engineers

Are you ensuring the best quality and consistency with your motor starter specification?

The motor starter you specify is critical to ensuring maximum protection for today's high efficiency fan motors. It can also be used to interface with the building management system (BMS). Specifying Greenheck's SmartStart motor starter with your fan will ensure that you get the best possible protection for your fan and make it simple to interface the fan with the building's BMS.

Contractors

Are you spending too much time coordinating motor starter issues at the jobsite?

Yes, it is possible to provide a superior motor starter, save money, and eliminate jobsite headaches. The Greenheck SmartStart motor starter provides superior motor protection, has an attractive first cost, and ensures that the starter is correctly sized and tagged to match the fan. Coordinating motor starters really can be that easy!

Communication Challenges

Communication breakdowns between the mechanical and electrical trades often lead to challenges with fan starters.

Examples:

- Mismatch between the starter and fan motor due to misinterpreted specifications.
- Expensive change orders when starters are forgotten in the bidding process.
- Design changes not being coordinated between the engineer, mechanical and electrical trades.

These miscommunications cost time and money and often lead to starter installations that provide minimal protection to the fan motor.

Maximize protection to your motor with a Greenheck starter with SmartStart.

Specify Greenheck motor starters with your fan and:

- Get the best and quickest responding motor protection available.
- Select additional features for damper control and fire safety system interfacing.
- Greenheck's CAPS program automatically sizes the motor starter to match the fan.

Furnish Greenheck motor starters with your fan and:

- Eliminate sorting and guess work at the jobsite. Starters ship with tags that match the fan.
- Significantly reduce installation time with intelligent pre-engineered design and easy plug-in terminal strip.
- Fine tune with adjustable wide range electronic overload protection.
- Eliminate start up delays.



Built-up Starters

Even with good communication, problems can occur when "built-up" starters use mismatched, incomplete or poor quality components.

Built-up Starter Components



SMARTSTART™

One of the fundamental functions of a motor starter is to protect the motor from damage due to overheating. The SmartStart protection in the Greenheck motor starter is the best in the business.

As with most starters, Greenheck's motor starter provides basic overload protection based on the maximum FLA (full load amps) setting, phase unbalance, and cycle fault (when the starter is activated at a rate exceeding 1200 starts/hr). But then we go beyond.

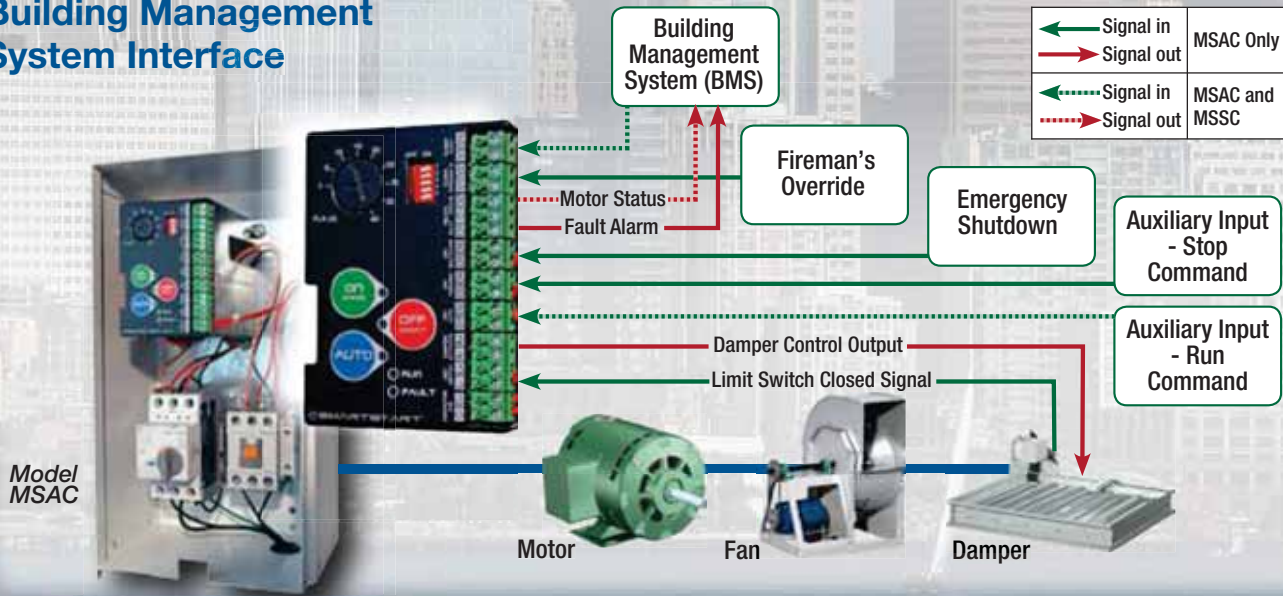
Rapid Locked Rotor Detection: Other starters with locked rotor protection take 10 seconds to respond. Greenheck's starter detects a locked rotor within 0.5 seconds, extending motor life.

Maximum Time to Start: Monitors inrush current to detect harmful extended starting conditions and trips the motor if it doesn't start in 10 seconds, regardless of FLA setting—extending motor life.

Out of Calibration: Based on the inrush current, the overload will determine the motor's nominal running amps. The starter will trip and protect the motor in situations where the overload is set outside the calculated motor protection range.

Stall Prevention: Similar to the "Locked Rotor Detection" feature, but kicks in after the motor is running at FLA. So if the impeller jams, the motor is stopped before critical damage occurs.

Building Management System Interface



Save time and money by specifying and supplying SmartStart Starters from Greenheck.

Estimated Installation Time* Per Component		
Starter Components	Model MSAC	Multiple Component
Auto Contact	3	5
Building Automation Relay	3	25
Current Sensor	3	15
High Pressure Limit Switch	5	30
Fire System Relay 2	3	15
Emergency Shutdown 2	3	30
Estimated Total Time	20	120
Save up to 100 minutes in time		

*Estimated time is shown in minutes

Models

Greenheck motor starters are intelligently designed and pre-engineered to make system integration easy and reliable. Two models are available, depending on the desired interface with the building management system.

Model Features	MSAC	MSSC
Voltage input from BMS	x	x
Auxiliary input (run command contact)	x	x
Motor status output	x	x
Fault alarm output signal	x	
Fireman's override	x	
Emergency shutdown	x	
Damper control output and limit switch closed loop signal	x	
Auxiliary input (stop command contact)	x	

Greenheck Starter Components

Physical Interface - Hand/Off/Auto (HOA) keypad with corresponding LED lights. Also, LED status indicators.

Overload Protection - Electronic Class 10 overload protection with FLA capability up to 40A. A large dial provides easy and accurate adjustment of full FLA setting. MSAC may be set to Class 10 or Class 20.

Disconnect (optional) - Provides short-circuit protection and allows manual control of input power to the motor for fan servicing. Includes a lockable switch and resettable motor circuit protector with phase unbalance protection.

Disconnect must be within 50 feet and in line of sight to motor.

Easy System Integration - Building automation ready with pre-engineered input and output capabilities specifically designed for fan operation.

Magnetic Contactor - Closes contacts to allow input power to pass through to the motor when it receives the energize signal.

Enclosure - 16 gauge steel with industrial polyurethane coating.

- NEMA-1 enclosure is available for indoor installations. Lockable door is standard.
- NEMA-3R enclosure is available for outdoor installations. Door is lockable with full perimeter gasket. Keypad is also lockable.



Model MSAC shown with optional disconnect switch

Horsepower Range	
200/208 V	¾-7½ hp
230 V	¾-10 hp
460 V	¾-20 hp
575 V	¾-25 hp



MSSC and MSAC models are Listed for enclosed industrial control panel (UL/cUL) File E24264

Motor Starter Standard Control (MSSC)

Magnetic Motor Starters for 3 phase motors shall be enclosed in a 16 gauge steel, industrial polyurethane coated enclosure with the appropriate environmental rating. Starters shall consist of a horsepower rated magnetic contactor, a minimum of one Normally Open and one Normally Closed auxiliary control contacts and solid state electronic overload relay. Overload relay shall protect all three phases with an adjustable current setting of 1-40 amps to allow field adjustment for specific motor Full Load Amps (FLA). Interchangeable heater elements are not acceptable.

The overload relay must provide the following motor protection features: if the FLA on the overload is set outside an acceptable range to properly protect the motor, the overload must trip and close a contact to indicate fault event. Overload relay shall provide phase failure, phase loss, cycle fault and stall protection. Overload must detect a locked rotor upon startup and trip within 0.5 seconds if such condition is detected. Overload must also monitor motor inrush current on startup and if detected FLA does not reach nominal running amps within 10 seconds, trip and stop the motor. Provide field selectable manual or automatic reset of overload as well as reset pushbutton on the starter cover to restore normal operation after a trip or fault condition. In the event of a power failure, starter shall restart in last known operating mode.

When the starter is remotely controlled by an automation system, the starter shall include remote run terminals which accept both a voltage input signal and a contact closure. The voltage run input shall accept both AC and DC signals from 12-250V to allow direct connection of the transistorized automation signal to the starter. Starter must contain an integral current sensor with Normally Open contact which closes to indicate motor run status.

Installed accessories shall include Hand-Off-Auto operation switch with LED pilot light indicators for Hand, Off, Auto, Run and Overload conditions. All pilot devices shall be water tight and dust tight.

Manufacturer shall provide and install tags with engraved lettering to designate equipment served. All starters must be provided with a universal power supply capable of a 200 to 600 volt input range.

Enclosed combination starters shall include all of the magnetic starter requirements in addition to a disconnecting method in accordance with National Electrical Code. Each disconnect shall be of the Motor Circuit Protector type, carry a UL 508F rating and provide a minimum interrupting rating of 30,000 Available Interrupting Current (AIC) for the combination starter. All disconnects shall include a lock-out mechanism when in the off position.

Motor Starter Advanced Control (MSAC)

All requirements for MSSC plus the following:

The starter shall provide a provision for Fireman's Override operation. When activated, the starter must run the motor in any mode (Hand, Off or Auto) regardless of other inputs or lack of inputs either manual or auto. If the starter is controlled by a fire alarm or life safety system, the starter shall include an Emergency Shutdown input which will disable the starter from operating in either Hand or Auto mode regardless of other inputs either manual or auto.

In applications where the motor is interlocked with a damper or valve and 24VDC actuator, control must be available within the starter enclosure. The starter must be able to provide a voltage output to operate the actuator to open the damper or valve without closing the motor circuit. The starter will only close the motor circuit and start the motor after it has received a contact closure from a limit or end switch confirming the damper or valve position.

In the event of a power failure, starter shall also be capable of restart with 10 second delay, or restart in "off" mode.

Starter must contain a Normally Open contact which closes when an overload trip condition occurs.

The starter or combination starter shall be UL Listed.

