

The background of the entire page is a collage of three images. The top image shows a close-up of a hand holding a black plastic component, possibly a switch or button, with a control panel featuring several upward-pointing arrows and an 'ESC' button visible in the background. The middle image shows a large industrial machine, likely a conveyor belt or sorting system, with a large pile of material (possibly gravel or sand) being processed. The bottom image shows a man in a light-colored shirt and a dark cap working on a large, open metal cabinet, which appears to be an electrical control panel or motor housing. The man is using a tool to work on the interior of the cabinet.

**EAT•N**

**Cutler-Hammer**

**IT Soft Starters**

High Hp Reduced Voltage Applications

Industrial Focus

S752

S801

S811

MV801

# The Perfect Partnership.



## IT. Soft Starters and High Horsepower Applications

Eaton offers soft starters that provide the safety and reliability of 24V DC control power, keep heat generation to a minimum, and retrofit into existing enclosures or Motor Control Centers. Not only that, but Cutler-Hammer **IT.** Soft Starters' small size and advanced feature set will meet the most demanding design and system expectations.

With a direct focus on control system design and customer profitability, Eaton is proud to offer the Cutler-Hammer Intelligent Technologies (**IT.**) Soft Starters for high horsepower reduced voltage applications – a complete offering for the Industrial and Construction customer.

The S752, S801, S811 and MV801 Soft Starters provide controlled acceleration and deceleration of three-phase motors and offer a range of control and application flexibility to meet the needs of most industrial applications. **IT.** Soft Starters for high horsepower applications – the intelligent solution to your industrial motor control needs.

## Eaton Gives You the Choice

With an impressive line of soft starters designed with large motor industrial demands in mind, Eaton gives you choices. Whether it's the S752, S801, communicating S811, or medium voltage MV801 **IT.** Soft Starters, you are guaranteed to find a Cutler-Hammer solution to fit your application needs.

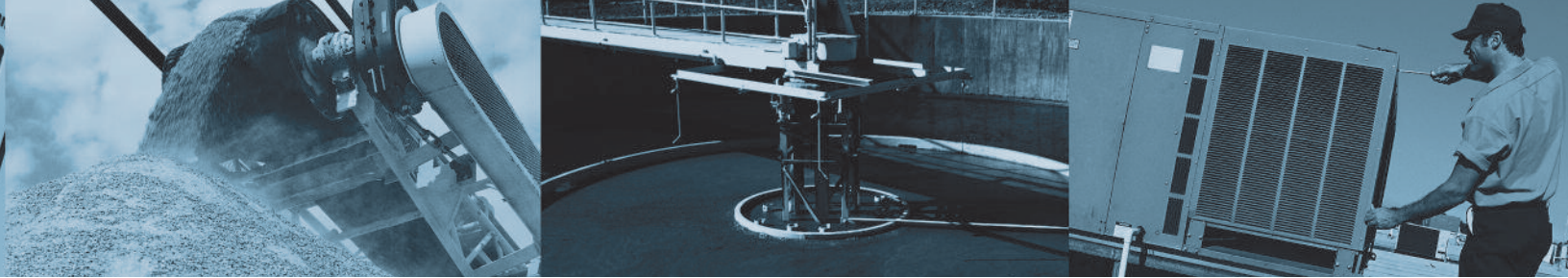
Small size, easy configuration, and advanced technology make these soft starters ideal for use in the most demanding and sophisticated commercial and industrial applications.

We have **IT.** for every application – offering a complete range of solid-state reduced voltage starters optimized for your application requirements.

Not only does Eaton offer the soft starter for your specific application, but the service and availability offered are beyond compare. With Service Centers around the country that provide customer specific solutions and offer localized support, and warehouses stocked with product, Eaton is dedicated to meeting your project schedules and goals.

From advanced starting and stopping control to integrated motor protection and communications capabilities, the **IT.** line of soft starters provides a unique combination of soft starting and flexible protective features along with the technological advances you've come to expect from Eaton's Cutler-Hammer products.





## Target Applications

### Aggregate

- Reduced starting torque lowers stress on the mechanical drive and driven load, avoiding injury and machinery damage
- Overload protection along with other sophisticated trip features increase reliability and uptime
- Low and medium voltage solutions for aggregate-duty applications with simplified mounting for the needed flexibility

- Communications allows for real-time system monitoring (S811, S752 Only)
- Customer service and tech support when you need it

### Pumping / Wastewater

- Reduces snapping of belts, extending the life of the belt 2-6 times
- Pump control algorithm limits pressure surges, maximizing the life of pumping and piping systems while minimizing costs associated with system downtime. It also

eliminates “water hammer” so applications require fewer pipe hangers, which contributes to fewer leaks, increasing pump life.

- Communications give you the flexibility associated with the real-time monitoring of process and diagnostic data and insight into the condition of equipment and processes without a site visit
- Reduced torque decreases stress on equipment, lowering failure rates

### HVAC

- Communications capabilities enable integration into building management systems for easy monitoring and troubleshooting
- Small size permits the use of smaller panels and enclosures, allowing you to capitalize on significant space savings

## Why choose soft starting?

A Cutler-Hammer **IT** Soft Starter uses Silicon Controlled Rectifiers (SCRs) to electronically reduce the voltage output to the motor, allowing for a ramp up to the line voltage.

Soft starting a motor will reduce mechanical component shock, minimizing coupling and shaft damage, preventing rotor and winding failure, and stopping drive belt squeal and breakage. With an **IT** Soft Starter, mechanical system components can be significantly reduced in size because of lower starting torque values (250-500% FLA), which also prolongs their life.

Soft starting can also prevent damage to loads by eliminating

sudden system acceleration and violent speed variations - contributing to fewer mechanical breakdowns, improving the quality of the product and process. The reduced inrush currents will also decrease stress on the electrical distribution system, increasing the life of electrical components.

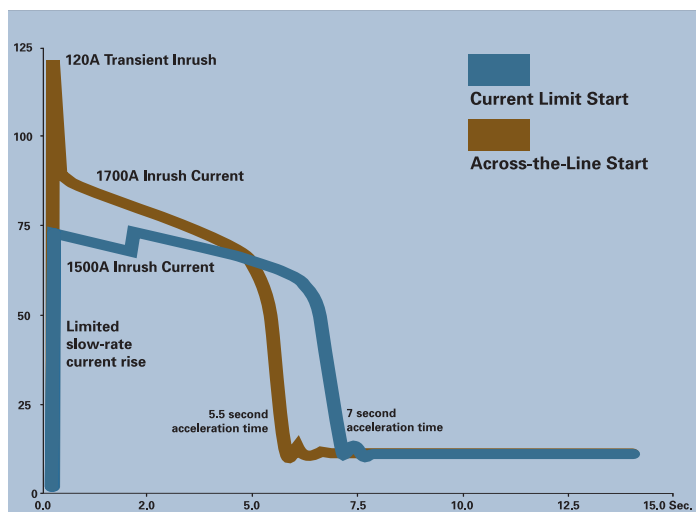
Many local authorities around the country are adding reduced voltage requirements to their codes. For example, the City of Seattle requires that reduced voltage starting be used with any motor rated at 50hp and above. **IT** Solid-State Reduced Voltage Soft Starters are the perfect solution to meeting these new starting standards.

### Other benefits include:

- Soft stopping of the load where a stop time that is greater than the coast to rest time is required – a feature that is beneficial in pumping and conveyor applications.

- Reducing line brownouts and reducing or eliminating the costs associated with power distribution violations. An **IT** Soft Starter controls peak power demand while a full-voltage starter can apply from 600 up to 800% FLA on start-up.

### Soft Starting vs. Across-the-Line Starting



# What value do Eaton *IT*. Soft

## Keeping heat under control.

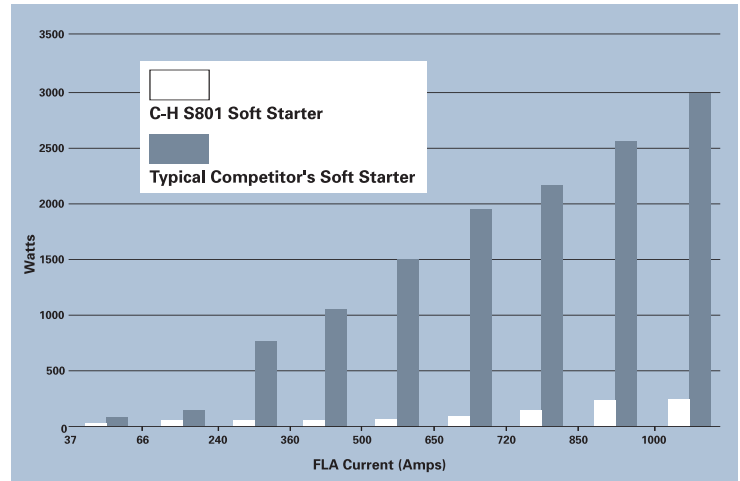
All the *IT*. Soft Starters featured here have run bypass mode, designed to significantly reduce the heat generated by the starter, minimizing enclosure sizes and costs. The sophisticated design removes the soft starter SCRs from the circuit after the contacts close during the bypass operation. This reduces the internal heating created by the SCRs, while the bypass contactor directly connects the motor to the line and improves system efficiency by reducing internal power losses. On top of that, the bypass contactor is internal to the soft starter, eliminating the need for

additional devices and further reducing enclosure sizes and minimizing installation time.

Packaged *IT*. Soft Starters give you more motor current in dramatically reduced enclosures. This is possible because *IT*. has fewer parts and generates less heat, which gives you more horsepower per MCC section or square inch of wall space. *IT*. gives you the maximum performance in the smallest package.

The graph illustrates the typical heat loss from the competition compared to that of Eaton's

Soft Starter Heat Loss Comparison



Cutler-Hammer *IT*. Soft Starters. What does less heat mean? It means substantial cost savings

when it comes to enclosure sizes and enclosure ventilating requirements.

## No need to worry when *IT*. is at work.

Cutler-Hammer *IT*. Soft Starters feature IP20 rated finger-safe terminals, offer 24V DC control and are available in explosion-proof enclosures, emphasizing Eaton's commitment to keeping you safe. When your personnel and equipment are at risk, nothing but the safest, most reliable soft starter will do – *IT*. is the answer.

The hazards of human contact with AC current are well known; low voltage DC control power eliminates hazards for personnel while working on control systems. Further, the use of 24V DC control simplifies compliance with NEC and

OSHA regulations. From a global perspective, one DC voltage bypasses the need to transform the variety of AC input voltages used worldwide. Again, improving safety conditions and reducing system costs.

The S752, S801 and S811 all use a 24V DC pulse width modulated coil control for the bypass contactor that results in minimum power, only 5.0W steady state. 24V DC control

reduces the risk of injury and damage from electrical shock and short circuit faults. The PWM coils in combination with an efficient *IT*. Power Supply, work to reduce or eliminate the negative effects of electrical system disturbances, brown-outs and protect against power loss. Also, the removable and lockable control terminal block eliminates control wiring errors when replacing a device, providing yet another level of safety.

Packaged *IT*. Soft Starters allow for multiple environmental applications including those needing NEMA 7/9 enclosures, increasing safety in areas where hazardous materials are handled or stored. These enclosures boast the highest

interrupting rate available in the market at 65kAIC. Available with either bolted or threaded stainless steel hardware, NEMA 7/9 enclosed soft starters come in a variety of sizes, all while keeping footprint to a minimum. Cover control options range from Start/Stop pushbuttons to 3-position selector switches - a wide range of additional features can be provided upon request. Whether your application calls for combination or non-combination units, Eaton offers an unparalleled level of safety with NEMA 7/9.

Nothing is more costly than system downtime - why not choose an *IT*. Soft Starter and be confident in the safety and integrity of your control system?



# Starters offer your business?

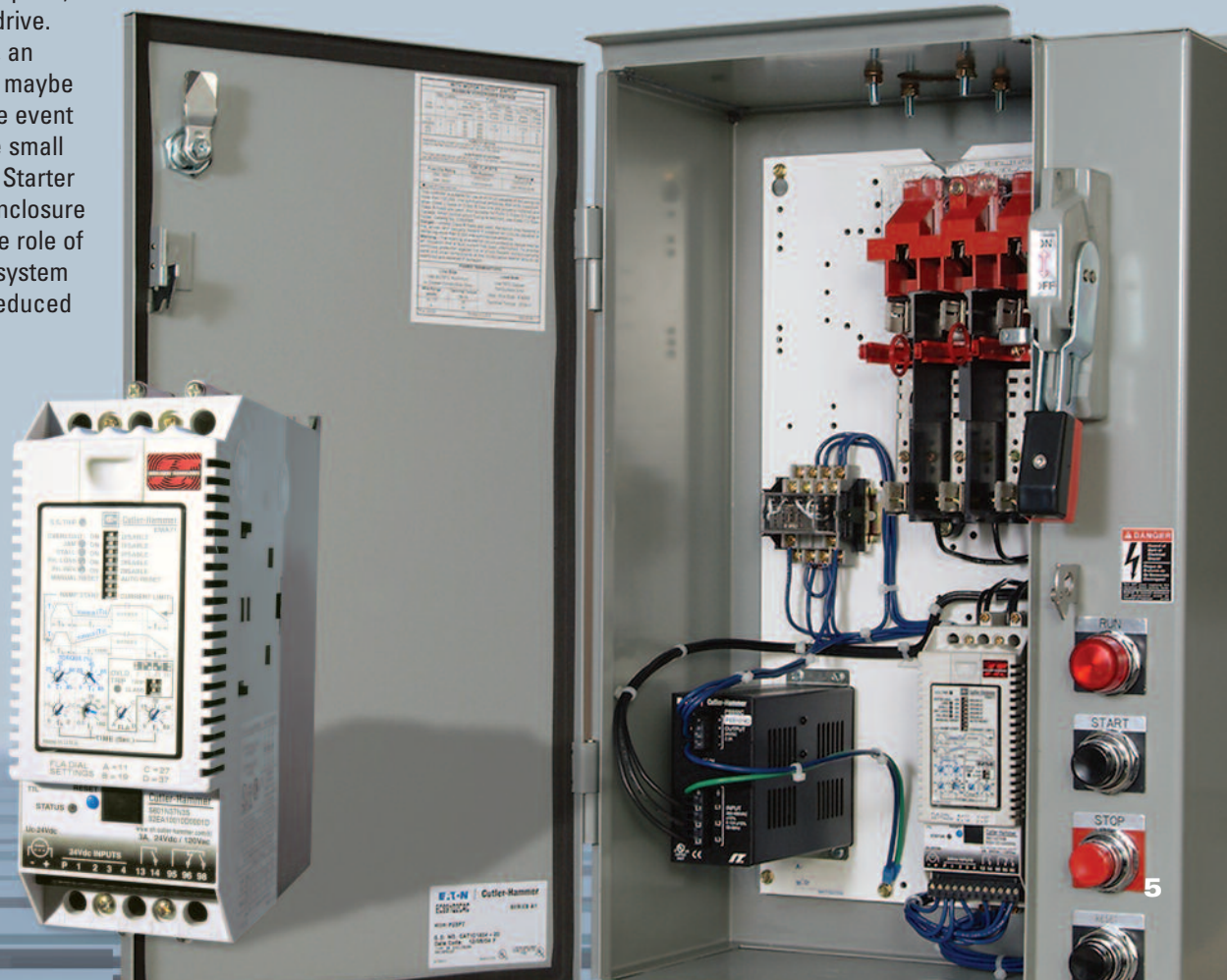
## The perfect fit.

The small size of **IT** Soft Starters make them the perfect option for existing soft starting or retrofitting applications. At sizes that are 55-91% smaller than leading competitors' soft starters of the same ratings, **IT** is the answer.

The S752, S801, S811 and MV801 combine the overload and bypass contactor into one device for fast and easy installation. Functions traditionally provided by multiple devices are now offered in one compact package. With their small size, they can easily fit in place of existing soft starters, wye-delta starters or across-the-line NEMA and IEC starters. This feature allows easy upgrades to existing systems.

Often an application may call for variable motor speed, requiring the use of a drive. In critical applications, an across-the-line starter maybe used as a bypass in the event that the drive fails. The small footprint of the **IT** Soft Starter enables it to fit in the enclosure with the drive, filling the role of the bypass while your system reaps the benefits of reduced voltage starting.

**IT** Packaged Soft Starters offer system solutions to a variety of applications – the configurable protection and operation parameters allow for application to multiple motor types and loads in the same small package size. **IT** in Enclosed Control means a 22-78% smaller enclosure, while **IT** in an MCC bucket gives you a 30-63% difference in size to competitive offerings. Just think, a 135-amp unit can fit in a 12" MCC bucket, and it weighs only 9lbs! Now you can get the benefits of soft starting without having to change enclosure sizes or add additional assemblies. And since every inch of enclosure space savings can equal \$100 in cost savings – **IT** really is the perfect fit.



# Control, Monitor, Protect.

## IT. S801 and communicating S811 Soft Starters

Eaton’s Cutler-Hammer **IT. S801** revolutionized the reduced voltage control marketplace with its advanced feature set and small size. The new **IT. S811** offers all the popular features of the S801, but adds enhanced functionality with the new DIM (Digital Interface Module) and communications

capabilities. Designed to control the acceleration and deceleration of 3-phase motors up to 690V, both the S801 and S811 are available from 11 amps through 1,000 amps. The S801/S811 are available in Type 1, 12, 3R, 4, 4X and 7/9 enclosures.

### IT. S801/S811 Control Functions

<b>Voltage Ramp Start</b>	
Initial Torque Control	0–85%
Soft Start	0.5–180 seconds
<b>Current Limit Start</b>	
Maximum Current	0–85%
Soft Start	0.5–180 seconds
<b>Kick-Start</b>	0–85%, 0–2 sec
<b>Soft Stop</b>	0–60 seconds

### Electrical Ratings

Operating Voltage (Ue)	200–600 V AC 690V option T–V Frames
Max Current Capacity	1000A
Steady State Current	1.0A N–T Frames 1.4A V–Frame
Inrush Current Amps	10
Operating Frequency	47–63Hz

### Environmental Ratings

Operating Temperature	-30–40°C
Storage Temperature	-50–70°C
Altitude	2000m
Humidity	95% Non-Condensing

### Standards and Certifications

IEC 60947-4-2	EN 60947-4-2	CE Marked	CSA Certification
cULus Listed (File # E202571)		UL Listed (NMFT)–Frame N37 to V85	
CSA Elevator (2411 01)		UL Listed (NMFT)–Frame N37 to V85	

## Key Features S811

- The DIM (Digital Interface Module) on the S811 provides an intuitive, easy to use human interface with powerful configuration tools to maximize system performance.
- Door or device mounted, the DIM enables users to safely configure, commission, monitor and troubleshoot the system at the electrical panel without opening the enclosure door.
- System operating parameters can be monitored enterprise-wide through a communications network. Increase process uptime by providing data for process management and preventive diagnostics.
- Built-in communications capabilities through Cutler-Hammer QC (Quick Connect) Port. The QCPort allows the soft starter to be connected to a variety of networks, including DeviceNet and EtherNet/Modbus. The S811 communication parameters can be configured with the DIM or through the network using CH Studio.

## Key Features S801/S811

- Internal run bypass contactors and overload protection eliminate the need for additional devices, thereby reducing enclosure sizes, minimizing installation and wiring time and reducing overall assembly size and cost.
- Kick-start feature enables soft starting of high friction loads.
- Pump control option with sophisticated pump algorithms on both starting and stopping that minimize the pressure surges that cause water hammer. The pump control option will maximize the life of the pump and piping systems while minimizing the downtime caused by system failure.

### S811 Monitoring Capabilities

Phase Currents	Control Voltage
Average Current	Device Temperature
Current as a % of FLA	Start Count
Thermal Memory	Breaker Status
Phase Voltage	Fault Queue
Average Voltage	

### S801/S811 Protective Features

Electronic Motor Overload	Phase Reversal
Short Circuit Coordination with Eaton	Shorted SCR Detection
Circuit Breakers or with fuses	Open SCR Detection (S811 Only)
Jam	Under Current
Stall	Under Voltage (S811 Only)
SCR Over Temperature	Over Voltage (S811 Only)
Phase Loss	Diagnostics (S801 LED; S811 Fault Queue)
Phase Imbalance	
Automatic or Manual Reset	



# Integral run bypass and overload protection. A small but complete package.

## IT. S752 Soft Starter

The **IT. S752** is very compact, multi-functional, easy to install and easy to program. The device is available in configurations to be applied either in the line of the motor, or in the delta windings of the motor. The in-line device is available for current ranges from 0.25 to 50 amps. The inside-the-delta device is available for current ranges from 0.44 to 78 amps.

With its integral solid-state overload protection and run bypass contactor, the **IT. S752** eliminates the need to purchase additional devices, reducing component, wiring, panel and enclosure costs. The S752 is available as a component for panel mounting, in Motor Control Centers or in Enclosed Control (NEMA 1, 3R, 4, 4X, 7/9 and 12).

### IT. S752

#### Control Functions

##### Voltage Ramp Start

Initial Torque Control	0–95%
Soft Start	0.5–30 seconds

<b>Soft Stop</b>	0–30 seconds
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#### Electrical Ratings (Standard Duty Ratings)

Operating Voltage (Ue)	200–600 V AC
In-Line Current Capacity	50A
Inside-the-Delta Current Capacity	78A
Control Steady State Current	200mA
Inrush Current (During Bypass)	3.6A @ 50mS

Max In-Line Power	@ 575 V AC	40HP
	@ 440V	30kW
Max Inside-the-Delta Power	@ 575 V AC	75HP
	@ 440V	45kW

Operating Frequency	47-63 Hz
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#### Environmental Ratings

Operating Temperature	-35 to 40° C
Storage Temperature	-40 to 80° C
Altitude	2000m
Humidity	95% Non-Condensing
Vibration	IEC 68-2-6 3g 10-150Hz

#### Standards and Certifications

UL Listed (NMFT)	IEC 60947-4-2	CSA Certified (321106)
CE Marked	EN 60947-4-2	CSA Elevator Duty (241103)

## Key Features

- Easy to read LED displays device status and provides fault indication.
- Advanced selectable protective features safeguard the motor and system against a variety of system faults.
- Run bypass mode greatly reduces internal heating created by the power dissipation across the SCRs. The bypass contactor directly connects the motor to the line and improves system efficiency by reducing internal power losses. Less heat minimizes enclosure size and cooling requirements and maximizes the life of all devices in the enclosure.
- Internal run bypass contactor and overload protection eliminate the need for additional devices, thereby reducing enclosure sizes, minimizing installation and wiring time and reducing overall assembly size and cost.
- Wide range of overload FLA settings (31 – 100% of rated current) and selectable trip class (10, 20, 30) offers users the flexibility to fine tune the starter to match specific application requirements.
- 24V DC control module enhances personnel and equipment safety.
- Communications enabled with the addition of a SNAP (Starter Network Adapter Product).

## Protective Features

Electronic Motor Overload  
Short Circuit Coordination with Eaton Circuit Breakers or with fuses  
SCR Over Temperature  
Phase Loss  
Phase Imbalance  
Automatic or Manual Reset  
Bypass Dropout



# Ideal MV Component Solution.

## IT. MV801 Medium Voltage Soft Starter

Featuring proven **IT** technology, the MV801 is the ideal component solution for medium voltage soft starting applications. The unique inclusive design of the MV801 encases all its components, including the SCRs and power

and control circuitry. This uncluttered design simplifies installation while minimizing device and assembly costs. It's the answer for Electrical OEMs that do not manufacture their own soft starter.

### Protective Features

- |                              |                           |
|------------------------------|---------------------------|
| Motor Overload               | Phase Reversal            |
| Overtemperature              | Shorted SCR Detection     |
| Jam                          | Load Disconnect Detection |
| Stall                        | Diagnostics               |
| Phase Loss/Current Unbalance |                           |

### Key Features

- Separately housed control circuitry, communications and control interface module results in the control circuitry operating at lower temperatures, maximizing the life of the electronic components. Electromagnetic interference from the power circuit is also minimized.
- Inclusive design encases the SCRs, power circuitry, run bypass contactors and overload protection, simplifying installation.
- Internal run bypass contactors and overload protection eliminate the need for additional devices, thereby reducing enclosure sizes, minimizing installation and wiring time and reducing overall assembly size and cost.
- Easy to use control interface module provides for fast and simple set-up of starting parameters and protective features.

IT. MV801	
Control Functions	
Voltage Ramp Start	
Initial Torque Control	0-85%
Soft Start	0.5-180 seconds
Current Limit Start	
Maximum Current	0-85%
Soft Start	0.5-180 seconds
Kick-Start	0-85%, 0-2 sec
Soft Stop	0-60 seconds
Electrical Ratings	
Max Operating Voltage (Ue)	4800V
Max Current Capacity	420A
Max Steady State Current	4.6A
Max Inrush Current	21A
Operating Frequency	47-63Hz
Environmental Ratings	
Operating Temperature	-30-40°C
Storage Temperature	-50-70°C
Altitude	2000m
Humidity	95% Non-Condensing
Standards and Certifications	
UL 347	IEC 68-2-30 (damp heat)
CSA 22.2 no. 14-95 in conjunction with T.I.L no. D-21 issued 2-8-95	



The complete *IT* soft starting line.



**Eaton's electrical business is a global leader in electrical control, power distribution, and industrial automation products and services. Through advanced product development, world-class manufacturing methods, and global engineering services and support, Eaton's electrical business provides customer-driven solutions under brand names such as Cutler-Hammer®, Powerware®, Durant®, Heinemann®, Holec® and MEM®, which globally serve the changing needs of the industrial, utility, light commercial, residential, and OEM markets. For more information, visit [www.EatonElectrical.com](http://www.EatonElectrical.com).**

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