

EAT•N

Cutler-Hammer

Soft Starters

Product Focus

IT Soft Starter Overview



THE MOST ADVANCED SOFT STARTER:

COMPACT, EASY-TO-PROGRAM, EASY-TO-INSTALL, THE IT LINE OF SOFT STARTERS ARE THE MOST ADVANCED AVAILABLE. RANGING FROM 12 AMP TO 850 AMP CONFIGURATIONS, IT SOFT STARTERS ARE IDEALLY SUITED TO OPEN, ENCLOSED, OR MOTOR CONTROL CENTER APPLICATIONS.



THE MOST ADVANCED REDUCED VOLTAGE SOFT STARTERS

Compact, easy-to-program, easy-to-install, the new Intelligent Technologies (IT) line of reduced voltage Soft Starters is the most advanced available anywhere in the world.

Ranging from 12-850 amps and with 13 models in 4 frame sizes from 65-290mm, the new IT Soft Starters provide advanced functionality along with unsurpassed configuration flexibility for open, enclosed or motor control center applications.

IT Soft Starters are the most compact on the market today. IT Soft Starters are 30-90% smaller than competing soft starters.

Cutler-Hammer's approach to the Intelligent Technologies product lines was based on extensive customer input. This included numerous interviews and a survey involving over 700 companies worldwide.

The data compiled from this survey concludes that customers want a soft starter that combines low unit price, labor savings, reduced operating costs, and advanced functionality.

The result? The Intelligent Technologies Soft Starter by Cutler-Hammer.

IT - Intelligent Technologies.

Size definitely matters. Existing soft starter technology uses separate semiconductors, bypass contactors, and overload relays to control and protect the motor. This costs you installation time and money. With the IT line, Cutler-Hammer places the soft starter, run bypass contactor and overload into a single easy-to-use package. This allows you to design a smaller, less costly, installation. For example, a 135 amp device can be easily configured in a 18-inch MCC bucket. In fact, IT Soft Starters are so small that they are 55-91% smaller than the leading soft start competitor of the same rating.

The IT Soft Starter's compactness allows you to reduce the size of your designs or easily retrofit an IT Soft Starter in place of the full-voltage starter you are using today. Taking advantage of the reduced electrical and mechanical stress that a soft start offers.

The new IT line is simply the smallest and safest soft starter in the world, offering more protection and more control features than anything on the market.

Can you afford not to have IT?

FOR MORE INFORMATION ON THE CUTLER-HAMMER LINE OF INTELLIGENT TECHNOLOGIES REDUCED VOLTAGE SOFT STARTERS, VISIT OUR WEB SITE.

www.cutlerhammer.eaton.com/it

The most compact soft starters in the world.



THE INTELLIGENT TECHNOLOGIES LINE OF
SOFT STARTERS FROM CUTLER-HAMMER
COMBINE ADVANCED MICROPROCESSOR
TECHNOLOGY WITH SUPERIOR STARTING
FUNCTIONALITY, AND UNSURPASSED MOTOR
PROTECTION—ALL IN THE MOST COMPACT
SOFT STARTER PACKAGE AVAILABLE.

CUTLER-HAMMER ENGINEERING SERVICES & SYSTEMS (CH-ESS)

OFFERS YOU 24X365 EMERGENCY ENGINEERING SERVICE.

CH-ESS ALSO PROVIDES NUMEROUS ON-SITE SERVICES INCLUDING:

- PROJECT MANAGEMENT
- START-UP COMMISSIONING
- PREVENTIVE & PREDICTIVE MAINTENANCE
- PLANT-LIFE EXTENSION
- CONSULTING / ADVISORY SUPPORT
- OEM EQUIPMENT SERVICED & UPGRADED

(INCLUDING SQUARE D, GE, ABB,
SIEMENS AND OTHERS)



24VDC CONTROL—COST EFFICIENCY, SAFETY, GLOBAL ACCEPTANCE

IT Soft Starters superiority begins with the control package which features 24VDC control running a Digital Signal Processor, or DSP, and utilizing a low impedance run circuit, all of which contribute to the IT Soft Starter's safety, advanced functionality, and compact size.

Functionality that Beats the Competition.

Control via 24VDC is reliable, cost efficient, globally accepted, and offers huge safety advantages over traditional AC control. Many products ranging from sensors to PLCs to valve manifolds have already changed to 24VDC power. Cutler-Hammer is taking the next step with motor control.

The use of 24VDC control reduces PLC output card costs, increases output card reliability and simplifies a customer's compliance with CE marking requirements and safety standards.

Y-DELTA VERSUS IT — SMALLER, LOWER COST, EASIER ON EQUIPMENT

With most Y-Delta starters many of the advanced features of IT are functions that must be added at the expense of cost and space. The IT Soft Starter, for example has built-in overload protection (overloads must be added to Y-Delta starters) so IT Soft Starters are more compact, easier to wire, and less costly than their Y-Delta counterparts.

IT Soft Starters do a better job of controlling motor torque which leads to longer gearbox and bearing life, reduced belt wear, and elimination of the hammer effect — all of which increase your productivity and reduce costs.

The IT Soft Starter is a single, easy-to-wire, high performance unit. In contrast, a Y-Delta starter requires 3-4 contactors, a timer, a separate overload, a mechanical interlock, 2-3 electrical interlocks, and all the wiring needed to connect these devices. The result is higher cost for Y-Delta technology in terms of components, installation, and maintenance.

IT VERSUS FULL VOLTAGE – LOWER COST

The IT Soft Starter costs you less in terms of power consumption. An IT Soft Starter also reduces line brown-outs and decreases overall energy usage. For example, an IT Soft Starter controls peak power demand while a full-voltage starter can apply 600 - 800% FLA on start up.

System cost savings are significant with an IT Soft Starter versus a full voltage starter. With an IT Soft Starter, mechanical components can have longer life or be reduced in size because of lower starting torque values (250 - 500% FLA current with SSRV).

Because an IT Soft Starter reduces stress on a system by eliminating the jolts and violent speed variations that full-voltage starters introduce to a process, fewer mechanical breakdowns occur, improving the quality of the product and process.



**MICROPROCESSOR TECHNOLOGY —
ADVANCED CONTROL
AND MOTOR PROTECTION**
CUTLER-HAMMER INCORPORATED
A MICROPROCESSOR INTO EACH SOFT
STARTER, ALLOWING FOR ADVANCED
CONTROL ALGORITHMS, A COIL CONTROLLED
LOW IMPEDANCE RUN CONTACTOR, AND HALL
EFFECT CURRENT SENSORS. THE MICRO-
PROCESSOR ALSO HAS FULLY FUNCTIONAL
BUILT-IN OVERLOAD PROTECTION -
CRITICAL IN MOTOR CONTROL CENTER
AND ENCLOSED CONTROL APPLICATIONS
WHERE THE STARTER/PROTECTION
RELAY SIZE COUNTS MOST.

MOVs (METAL OXIDE VARISTORS) OFFER ADDED PROTECTION TO THE SOFT STARTER AND MOTOR. THEY ARE AN EASY-TO-INSTALL ACCESSORY THAT MOUNTS DIRECTLY ON TO THE SOFT STARTER.



Benefits of 24VDC.

With many of the I/O products already shifting to 24VDC control along with valve activators, mini contactors, PLCs and logic networks, it is only natural that motor control will also become 24VDC control.

The reasons for switching to 24VDC are fourfold: safety, reliability, cost savings and functionality. 24VDC is inherently safer for personnel than the traditional 110-240VAC control voltage used in motor control. Highly reliable transistor switches can be used in place of hard contacts to increase system reliability. With 24VDC you also see large savings due to lower cost I/O, no metal conduit, reliability and global acceptance. Finally, 24VDC will give a more consistent cycle time, is fault tolerant, and gives much better ride through characteristics.



AN EASY-TO-USE AND EASY-TO-UNDERSTAND CONTROL INTERFACE MODULE MAKES INSTALLATION AND SET-UP A SNAP. WITH THE IT SOFT STARTER, PROGRAMMING IS EASY. AND ONCE PROGRAMMED, YOU CAN LEAVE THE MODULE IN OR REMOVE IT TO RETAIN THE ORIGINAL SETTINGS. WITH THIS MODULE, YOU CAN PROGRAM THE DIFFERENT START-UP CONFIGURATIONS, SET-UP THE VARIOUS OVERLOAD PARAMETERS AND SETTINGS, AND EVEN RUN DIAGNOSTICS TO DETERMINE THE CAUSE OF A TRIP.



WITH THE 200MM AND 290MM FRAME SIZES, YOU CAN SELECT VARIETY OF LUG SIZES TO MEET YOUR APPLICATION NEEDS. THESE RANGE FROM ONE CABLE TO SIX CABLE CONNECTORS, AND WIRE SIZES UP TO 500 MCM. THE LUGS THEMSELVES ARE EASY TO INSTALL, SIMPLE TO USE.



A FEW MINUTES AND A SCREWDRIVER ARE ALL YOU NEED TO PROGRAM THE EASY-TO-USE IT SOFT STARTER CONTROL INTERFACE.



POWER SUPPLY FEATURES

- 55 WATTS STEADY STATE
- 250 WATTS FOR 150 MSECS
- 115, 230 & 360-480VAC INPUT (+/- 1-15%)
- SMALLER THAN EQUIVALENT CPT
- COST COMPETITIVE WITH CPT
- DIN RAIL & PANEL MOUNT
- 50 OR 60HZ APPLICATIONS
- 24VDC OUTPUT

THE CUTLER-HAMMER POWER SUPPLY HAS A 50% SMALLER FOOTPRINT THAN THE CPT IT IS REPLACING, RESULTING IN SIGNIFICANT SPACE SAVINGS. IT IS ALSO EASIER TO INSTALL THAN THE CPT.

WITH SIGNIFICANT SIZE BENEFITS,
YOU CAN EASILY PLACE A 50HP IT
SOFT STARTER IN A 12" MCC BUCKET.



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

IN RETROFIT APPLICATIONS THE IT SOFT STARTER EASILY
REPLACES MOST EXISTING MOTOR CONTROL DEVICES.



Maximum Performance.

Ultra Compact Package.

IT SOFT STARTERS, UP TO 700HP, CAN
BE PLACED IN A STANDARD MCC
WHICH SAVES VALUABLE FLOOR SPACE.



INDUSTRY CONFIGURABLE PACKAGE

Packaged IT Soft Starters allow for multiple environmental applications - NEMA 1, 12, 3R and 4X. Configurable protection and operation parameters allow application to multiple motor types and loads in the same package size. Most existing Cutler-Hammer MCC's can be retrofit or upgraded with replacement units, and many enclosure mounted electromechanical starters can be retrofit with equivalent HP size IT Soft Starters. IT Packaged Soft Starters offer the lowest cost system solutions in any application.

MOST COMPETITIVE PACKAGE

IT Packaged Soft Starter enclosures are 22% - 78% smaller, and MCC units are 30% - 63% smaller than competitive offerings. These generate less heat and are more reliable than other reduced voltage starting methods. Software tools are available to configure enclosure requirements for any application. IT Packaged Soft Starters offer the most competitive solution in the market.

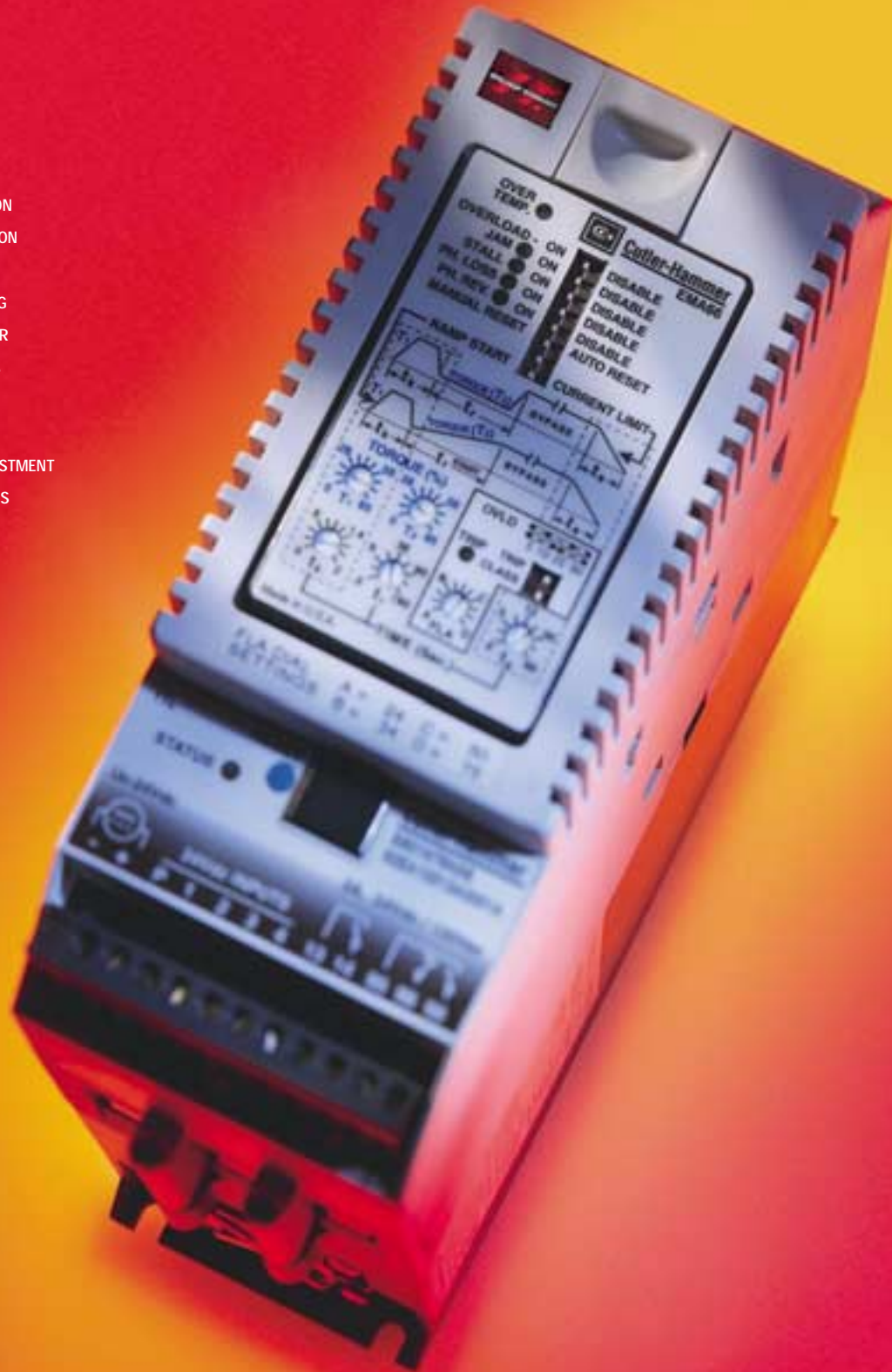
BY INTEGRATING ALL MAJOR MOTOR PROTECTION FEATURES, IT TECHNOLOGY RESULTS IN DRAMATICALLY SMALLER SOFT STARTERS. FOR EXAMPLE, A 135A DEVICE WEIGHING ONLY 9 POUNDS CAN BE EASILY CONFIGURED IN A 18-INCH MCC BUCKET. IT SOFT STARTERS ARE 55% TO 91% SMALLER THAN LEADING COMPETITORS SOFT STARTERS.

IT technology — Compact and Powerful.



THE IT SOFT STARTER PACKS UNMATCHED FUNCTIONALITY AND PROTECTIVE FEATURES INTO THE SMALLEST PACKAGE ON THE MARKET TODAY.

- KICK START
- RAMP START
- SOFT STOP
- STALL PROTECTION
- JAM PROTECTION
- CURRENT LIMIT RAMP
- PHASE REVERSAL
- SHORTED SCR
- OVER-TEMP PROTECTION
- PHASE LOSS PROTECTION
- FINGER PROOF DESIGN
- RMS CURRENT SENSING
- DSP MICRO-PROCESSOR
- INTERNAL RUN BYPASS
- DENSE PACKAGING
- 24VDC CONTROL
- 3.2: 1 OVERLOAD ADJUSTMENT
- SELECTABLE TRIP CLASS
- JOG FORWARD
- AUTO MANUAL RESET



LONGER LIFE OF SYSTEM EQUIPMENT

With the impressive list of control and protective functions, this new line of products is designed to significantly increase the protection it offers your system equipment (e.g. motors, belts, pumps etc.). The benefit of increased system equipment protection is longer life and longer system equipment uptime.

Features and Benefits.

REDUCED POWER DRAW

Power control features like Ramp Start, Current Limit Start & Jog Forward provide maximum flexibility in selecting start profiles minimizing both mechanical and electrical stress while maximizing motor performance.

IMPROVED SAFETY

IT Soft Starters offer fingerproof deadfront construction reducing the chance of electrical shock. With the use of 24VDC control power, pilot devices and relays can be operated more safely.

SYSTEM COST SAVINGS

With improved reliability, longer life of system equipment, reduced power draw, space savings and improved safety, you enjoy the benefit of a significant improvement in system uptime and a reduction in system downtime resulting in overall system cost saving.

TIME SAVINGS

Time savings in using Intelligent Technologies Soft Starters are achieved through a quick and easy set-up procedure, user friendly operational design, the longer life of system equipment and improved safety.

PRODUCTIVITY

Overall, Intelligent Technologies Soft Starters significantly improve your productivity by saving you time and money. This is demonstrated by longer product life, longer runs between breakdowns and the ease of installation and operation.



CUTLER-HAMMER BELIEVES THAT YOUR SERVICE EXPERIENCE SHOULD BE AS EASY AND STRESS-FREE AS POSSIBLE. WITH HIGHLY TRAINED EXPERTS PROVIDING A SINGLE POINT OF CONTACT, WE WILL MANAGE ALL OF YOUR SUPPORT ISSUES TO A SUCCESSFUL CONCLUSION. THIS INCLUDES RAPID RESPONSE TO WARRANTY ISSUES AS WELL AS AFTER-MARKET SUPPORT PERSONNEL WHO WORK EXCLUSIVELY TO SUPPLY YOU WITH CUTLER-HAMMER REPLACEMENT PARTS.

Technical Specifications.

PHYSICAL DATA

Dimensions (WxHxD)	N Frame	65x187x168 (mm)	2.6x7.4x6.6 (in.)
	R Frame	110x200x180 (mm)	4.4x7.9x7.0 (in.)
	T Frame	200x322x170 (mm)	7.6x12.7x6.7 (in.)
	V Frame	280x420x195 (mm)	9.1x16.6x7.7 (in.)
Weight	N Frame	2.5 Kg.	5.6 pounds
	R Frame	4.6 Kg.	10.2 pounds
	T Frame	18.0 Kg.	39.5 pounds
	V Frame	41.5 Kg.	91.3 pounds

ELECTRICAL RATINGS

Voltage	Maximum 600 Volts
Current	Per Frame Size
Frequency	47 - 63 Hz

HP / KW RATINGS

	230V	460V	575V	400V
N Frame	3 - 20 Hp	10 - 50 HP	15 - 60 Hp	5.5 - 30 kW
R Frame	10 - 50 Hp	25 - 100 HP	40 - 125 Hp	18.5 - 55 kW
T Frame	25 - 125 Hp	50 - 250 HP	60 - 300 Hp	30 - 160 kW
V Frame	50 - 300 Hp	100 - 700 HP	125 - 900 Hp	55 - 475 kW

PROTECTIVE FEATURES

Overtemperature	110° C
Overload	Selectable trip class 5, 10, 20 or 30 3.2 : 1 adjustment range
Jam	Selectable
Stall	Selectable
Phase Loss	Selectable
Phase Reversal	Selectable
Shorted SCR	Internal fault detection

CONTROL FEATURES

Kick Start	0 - 85% Locked rotor torque 0 - 2 seconds
Ramp Start	0 - 85% Locked rotor torque 0.5 - 180 seconds
Current Limit Start	0 - 85% Locked rotor Current 0.5 - 180 seconds
Soft Stop	0 - 60 seconds
Internal Run Bypass	Standard
Fault Indication	Control Interface Module

CONTROL CONNECTIONS

Control Power	24V DC, 20 watts steady state
Control Voltage Range	19.8 - 30 VDC
Digital Inputs	Permissive Run Jog Forward Electronic Reset
Digital Outputs	Bypass indication (up to speed) Fault indication (Form C) 24VDC or 120VAC, 3 amp maximum

ENVIRONMENT

Operating Temperature	0 to +50° C with no derating (consult CH for derating information)
Storage Temperature	-51° to +71° C
Relative Humidity	95% non-condensing
Altitude	< 2000 meters (consult CH for higher elevations)
Vibration	3g
Shock	15g

CERTIFICATIONS

UL 508
IEC 947-4-2
EN 60 947.2
CE Marked EMC/LV Directives
CSA - 22.2 (Pending)



Company Information

Eaton's Cutler-Hammer business is a worldwide leader providing customer-driven solutions. From power distribution and electrical control products to industrial automation, the Cutler-Hammer business utilizes advanced product development, world-class manufacturing, and offers global engineering services and support. To learn more about Eaton's innovative Cutler-Hammer products and solutions call 1-800-525-2000, for engineering services call 1-800-498-2678, or visit www.cutler-hammer.com.

Eaton Corporation is a global \$8 billion diversified industrial manufacturer that is a leader in fluid power systems; electrical power quality, distribution and control; automotive engine air management and fuel economy; and intelligent truck systems for fuel economy and safety. Eaton's 55,000 employees work in 29 countries on six continents. For more information, visit www.eaton.com.

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