EATON | Cutler-Hammer

IT. IEC Contactors, Starters, Overload Relays, and Accessories

Product Focus

Control and Expanded Functionality for Intelligent Technologies (***IT.***)

See How *IT.* All Works Together

A Complete Family of IEC Components and Assemblies

- 6A-400A
- Full Voltage Non-Reversing Contactors
- 3-Pole with Integral Solid-State Hold-in Circuit
- 24V DC Control

Solid-State Overload Relays

- Non-Reversing/ Reversing
- 3-Phase
- Microprocessor-Based Design
- Selectable Trip Class, Protective Functions, and Reset Mode
- Adjustable FLA, 3.2:1
- Contactor Mounted or Standalone

- 0.25A-400A
- Full Voltage Non-Reversing Starters (FVNR)
- Reversing Starters
- Reversing Contactors

SNAP (Starter Network Adapter Product) for Applications Requiring Communications

- QSNAP for QCPort
- DSNAP for DeviceNet™

- Auxiliary Contacts
- Reversing Wiring Kits

There's more to *IT.*!!

Electromechanical Motor Control Products: Part of *IT.*
With a direct focus on speed, control system design, and customer profitability; Eaton is proud to offer Cutler-Hammer Intelligent Technologies (***IT.***) – a complete line of forward-thinking motor control devices including contactors, starters, overload relays, and accessories. These new products are available as open style components and in enclosed control and motor control centers. Eaton's newest Cutler-Hammer Electromechanical Motor Control products are the most innovative in the world. These advanced components are small in size but deliver big features; including 24V DC control, communication capabilities, and expanded functionality.

See how many ways these devices can revolutionize the selection and use of what was once thought to be standard control.

Lower Installed Costs
We've designed ***IT.*** to keep installation costs to a minimum. Small size, less weight, modularity, removable terminal blocks, integrally wired solid-state control circuit components, complete starter assemblies, and communications capabilities to minimize point-to-point wiring are just a few features that keep overall costs down.

Low coil and overload relay power consumption reduces energy usage; and less heat generation eliminates or reduces control panel cooling and ventilation requirements.

24V DC Control
The Smartest and Safest Choice in Power Today
Control with 24V DC 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 24V DC power.

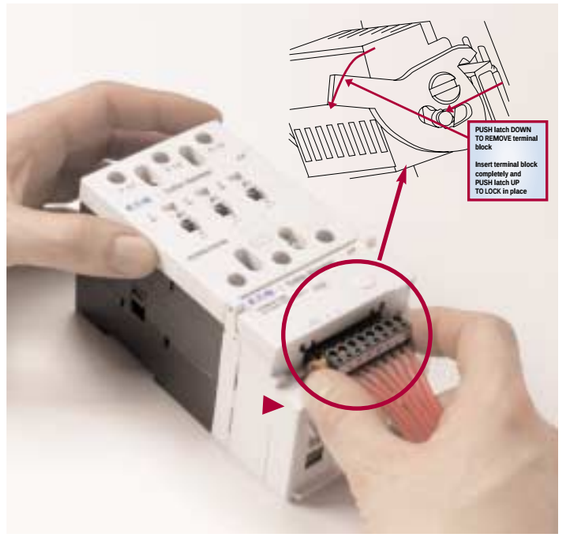
By incorporating 24V DC control, we've reduced the risk inherent to working with higher control voltages. Other safety features include guarded terminals, an environmentally friendly design – no hazardous materials, and Type 2 Coordination. Through ***IT.***, we've ensured a safe working environment for personnel.

Improved Process and Application Management
Say goodbye to the days of reactive management! We've made ***IT.*** smart with communication capabilities, status indication, diagnostics, remote reset abilities, and selectable protective functions that simplify troubleshooting and maximize production time. Monitoring application parameters, such as thermal memory phase loss, current unbalance, and "time-to-reset," over a communication network enables proactive management of processes and applications.

S801 Soft Starters were the first components of the *IT*. family.

IT. Contactors

12A 7.5HP @ 460V (5.5kW @ 400V) *IT.* Full Voltage Non-Reversing (FVNR) Contactor (27mm) saves an average of 38% panel area and 60% weight of equivalently rated devices.



Control terminal block with locking feature is easily removed and wired without interfering with power wire connections.

High performance and multiple features make these contactors the industry's finest. Low power coils, voltage loss ride through, integrated control circuit wiring, and long life (up to 20 million mechanical operations) – all in the most compact, modular, and easy-to-install package available.

- Small size: 12A, 7.5HP @ 460V (5.5kW @ 400V) in a 27mm wide frame size and 32A, 20HP @ 460V (15kW @ 400V) in a 45mm wide frame size.
- 24V DC control – safe, reliable, a global standard. Pulse width modulated coil utilizes minimum power – only 1.3W on 12A devices to 5.6W on 200A devices.
- Control circuit is automatically completed during factory and field assembly.
  - ▲ Integral solid-state auxiliary hold-in circuit.
  - ▲ Removable control wiring terminal block with locking feature.
- Accessories can be easily installed and removed.
  - ▲ 1- and 2-pole, front mounted auxiliary contacts.
  - ▲ 1- and 2-pole, side mounted auxiliary contacts (250A - 400A).
  - ▲ Mechanical interlocks for reversing assemblies.
- DIN rail installation and removal without the use of tools for devices up to 100A. Unobstructed fixing holes for panel installation.
- CENELEC terminal markings.
- UL, CSA, CE and KEMA approvals. Meets industrial environment EMC immunity and emission requirements.
- IP20 guarded terminals to prevent accidental contact with live parts.
- Environmentally friendly - cadmium free contacts and non-hazardous molding materials.
- Power contacts can be inspected for trouble-shooting and ease of maintenance.

Small Size
IT. Contactors are the smallest on the market today, requiring as little as 56% of the panel area of equally rated devices. Build smaller machines and equipment by building smaller control panels. They weigh less too, as little as 22% of equally rated devices – so shipping costs are less.

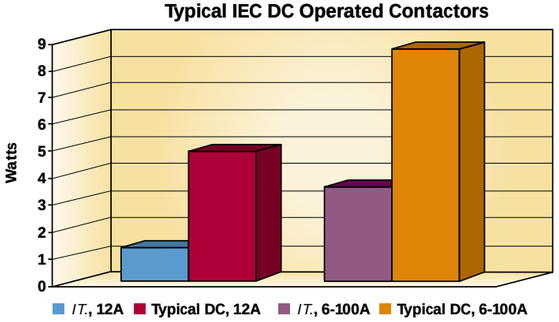
Safety and Low Power with 24V DC Control
Sealed coil power is as little as 20% of typical devices, enabling smaller power supplies to be used. Reduce energy consumption and minimize heat generation in the control panel. Eliminate or reduce the need for ventilation and cooling.

Easy to Wire
Even though they're small, wiring is still easy. Terminals are clearly marked with CENELEC markings. Contactors feature back-out, self-lifting pressure plates or box lug pressure type terminals.

Maximum Flexibility
Field installable accessories and field assembled contactors maximize inventory flexibility and enable customization.

***IT.* FVNR Contactor (45mm) 32A 20HP @ 460V (15kW @ 400V)**

Sealed Coil Power - *IT.* Versus Typical IEC DC Operated Contactors

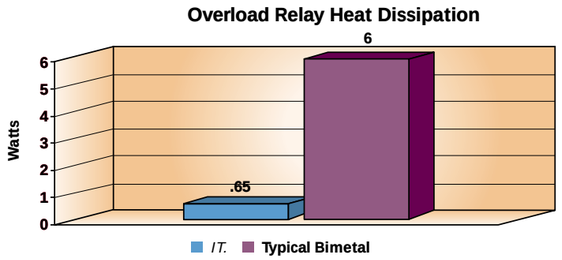


***IT.* sealed coil power is as little as 20% of typical equivalently rated IEC, DC operated contactors, and only 40% on average from 6A to 100A.**

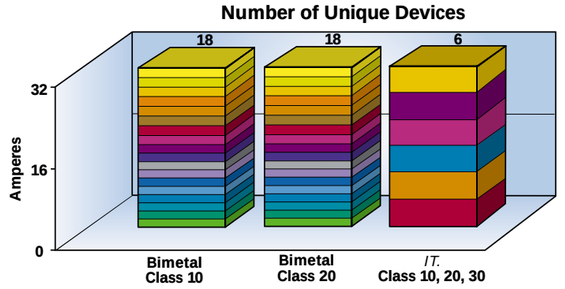
IT. Starters and Assemblies

Easy-to-Install Compact Devices
Electric motors are the prime movers in industry today. ***IT.*** components satisfy all of the feature, performance, and functional requirements for non-reversing and reversing electric motors. Productivity can be maximized and operating costs reduced by properly protecting motors and their controllers. Type 2 Coordination, up to 100kA, ensures the starters won't be damaged by short circuit fault currents. We've developed selectable and programmable motor protective functions that are not available in a "traditional overload relay" and, we've made them cost-effective for each and every motor.

- Small size, up to 32A, 20HP @ 460V (15kW @ 400V) in a 45mm wide frame size.
- 24V DC pulse width modulated coil utilizes minimum power, only 3.2W on 32A devices to 5.6W on 200A devices.
- Microprocessor-based overload relay with advanced functionality.
  - ▲ Selectable Trip Class – 10, 20, or 30 without software.
  - ▲ Selectable phase loss and current unbalance protection.
  - ▲ Wide range full load amperes (FLA) adjustment, 3.2:1.
  - ▲ Selectable manual, automatic, and remote reset.
  - ▲ Integral remote reset function can be actuated by an external input device.
  - ▲ 24-bit floating point math calculations to provide RMS calibrated current measurement.
  - ▲ Alarm output or "Alarm without trip" for critical applications that cannot be shut down.
  - ▲ LED status indication provides fault cause, thermal memory, current unbalance, and device setting information.
- Control circuit is automatically completed during factory or field assembly.
  - ▲ Integral solid-state hold-in circuit and overload relay trip circuit.
  - ▲ Reversing contactor and starter coil control/ overload circuit energizes both forward and reverse contactors – only one control point for wiring.
- Test function verifies performance and functionality of the overload relay.
- Protective cover can be locked closed, preventing tampering and unauthorized adjustment of overload relay settings.
- Type 2 Coordination, up to 100kA, with standard fuses, circuit breakers, and motor circuit protectors.
- UL, CSA, CE, and KEMA approvals. Meets industrial environment EMC emission and immunity requirements.
- Starter Network Adapter Product (SNAP) module provides status indication and communicates starter and application parameters, as well as diagnostics. SNAP also provides control and expanded protective functions.



A single typical bimetal overload relay generates as much heat as 10 *IT.* overload relays.



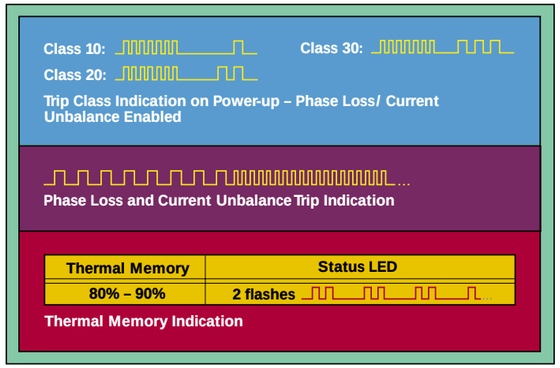
Only 6 *IT.* devices are needed to cover motor FLAs from 0.25A to 32A, compared to 18 typical bimetal overload relays. A 66% reduction in inventory. And, *IT.* provides Trip Class 10, 20, and 30 in a single device. Many solid-state and bimetal overload relays are typically a single, fixed Trip Class.

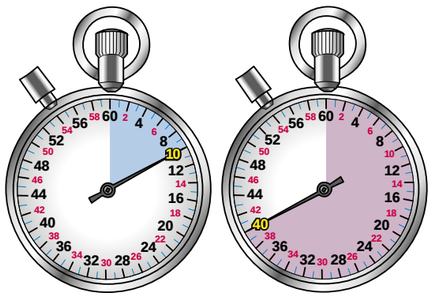
LED Status Indication and Diagnostics
- Flashing LED provides application parameters, diagnostics, and device settings to simplify troubleshooting, maintenance, and improve application and process management.
- Fault indication (overload, phase loss, "ready-to-reset")
- Settings (Trip Class, phase loss, and current unbalance enabled or disabled)
- Application parameters (thermal memory)

Phase Loss Protection
- Single-phase conditions are the leading cause of motor damage. ***IT.*** Overload Relays trip within 10 seconds on phase loss, compared to 40 seconds or more for typical bimetal overload relays.

Low Power Consumption and Low Heat Generation
- ***IT.*** Overload Relays actually measure current, unlike traditional bimetal overload relays which indirectly model motor temperature.
- ***IT.*** Overload Relays generate only 650mW of heat compared to 6W for typical bimetal overload relays.
- Reduce energy consumption and minimize heat generation in the control panel. Eliminate the need for ventilation and cooling.

Wide FLA Adjustment Range
- Each ***IT.*** Overload Relay can be adjusted over a range of 3.2:1. Inventory is minimized, and FLAs can also be set for motors with varying service factors.





***IT.* trips in 10 seconds on phase loss!**

Typical bimetal takes 40 seconds to trip on phase loss

Accessories For *IT.*

When standard contactor and starter features and functionality need to be expanded for the most demanding applications, customize them with field installable accessories.

Starter Network Adapter Product (SNAP)
- Can be installed or removed without tools.
- Requires no additional panel space.
- Wiring harness provided as standard for easy connection to the overload relay.
- DeviceNet™ or QCPort versions.
- Communicate application parameters (power and contact status, FLA setting, trip codes, starter size, operating current, thermal memory, overload range, ground fault).
- Starter control functions (forward/reverse, trip reset).
- Protective functions (alarm on current threshold, extended thermal overload and current unbalance, nuisance trip avoidance).

Auxiliary Contacts
- 1- and 2-pole front mounted for 6A-400A devices.
- 1- and 2-pole side mounted for 250A-400A devices.
- 2-pole front mounted logic level (0.1A @ 125-250V AC) for 6A-400A devices.

Ring Terminals
- Useful in semiconductor, utility, automotive, and international applications.

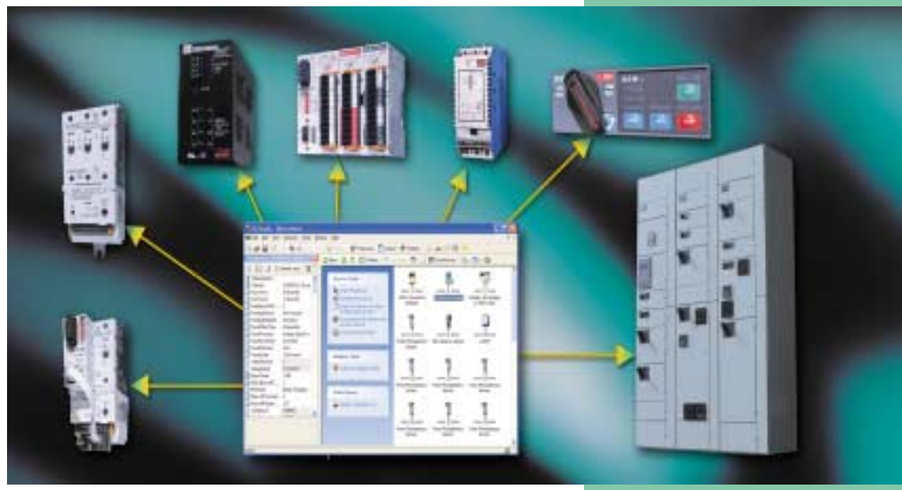
General Items
- Common accessories can be used on all devices – contactors, starters, and reversing assemblies.
- CENELEC and NEMA terminal markings.
- IP20 guarded terminals and fanning strips (for reversing assemblies) prevent accidental contact with live parts.

Reversing Kits
- Includes fanning strips, mechanical interlock, mounting plate, and hardware.

Mechanical Interlock
- 6mm wide, prevents the simultaneous operation of the forward and reverse contactors.

Network Communications

The complete family of ***IT.***. components (contactors and starters, soft starters, communication gateways, cover controls, I/O, and power supplies) can be easily integrated into a complete manufacturing system solution. Motor control centers and enclosed starters assembled from individual components are available as part of the solution too. ***IT.*** devices are plug-and-play and communication ready for integration in DeviceNet™ networks. Configuration is easy with Cutler-Hammer Studio Software.



Benefit from Network Communications
- Improve process and application management.
  - ▲ Monitor device and application parameters
  - ▲ Troubleshoot with device diagnostics and status indication
  - ▲ Expand control and protective functions
  - ▲ Share information across the enterprise
- Reduce installed costs
  - ▲ Minimize point-to-point hardwiring
  - ▲ Simplify control system design and future upgrades and expansions
- Enhanced safety.
  - ▲ 24V DC control – safe, reliable, a global standard

Where Can You Use *IT.*?

Everywhere!
Designed and tested for the most demanding global applications.

***IT*. Contactors, Starters, Overload Relays, and Accessories comply with, or exceed, applicable global standards requirements:**
- UL 508
- CSA C22.2 No. 14
- IEC/EN 60947-4-1

More importantly, they meet the demanding requirements of the industrial plant floor:
- Operating temperature: -40º C to 65º C (-40º F to 149º F).
- Humidity: 95% non-condensing.
- Shock: 15g, half-wave sinusoidal, 11msec.
- Vibration: 5-150Hz (100 to 6.7 msec).
- EMC immunity and emission for industrial environments.

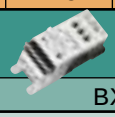
***IT.* provides solutions and offers benefits in a wide variety of industries:**
Material Handling, Packaging Machinery, Woodworking Equipment, Plastic and Rubber Machinery, Furnaces and Ovens, Pumps and Compressors, Car Wash Equipment, Overhead Doors, Water and Wastewater Treatment, Elevators and Escalators, Automotive, Distribution Centers, Airports, Food and Beverage, and more….

Here are two specific applications…

1- Water Treatment Facility
IT. Starters are used to control holding tank pumps. The installation also includes SNAP modules to provide thermal memory and current information.
The result: The risk of tank overflow and emergency shut-downs has been reduced.

2- Welding Control
IT. Contactors are used to control welding equipment in an automotive assembly plant.
The result: Smaller control panels were required due to the small size of ***IT.*** devices. Enhanced safety was provided to shop floor and maintenance employees with 24V DC control, guarded terminals, and Type 2 Coordination.

Technical Specifications

Non-Reversing Contactors Catalog No. Prefix: E111								
	A06	A09	A12	B18	B25	B32	C40	C50
Max AC-1 Ie (A)	12	16	20	25	40	50	63	85
Max. AC-3 Ie (A)	6	9	12	18	25	32	40	50
HP @ 460V	3	5	7.5	10	15	20	25	30
kW @ 400V	2.2	4	5.5	9	12.5	15	18.5	25
Height (mm/in)	75/3.0			111/4.37			113/4.45	
Width (mm/in)	27/1.1			45/1.8			54/2.1	
Depth (mm/in)	60/2.4			60/2.4			60/2.4	
Weight (kg/lbs)	0.135/0.30			0.31/0.70			0.415/0.91	
Coil Sealed Power (W)	1.3			3.7			4.2	
Reversing Contactors Catalog No. Prefix: E511	A06	A09	A12	B18	B25	B32	C40	C50
Overload Relays for Non-Reversing Starters Catalog No. Prefix: E05N				 BXR			 CXR	
FLA Adjustment Range				0.25-0.8, 0.59-1.9, 1.4-4.4, 2.8-9.0, 6.3-20, 10-32			0.25-0.8, 0.59-1.9, 1.4-4.4, 2.8-9.0, 5-16, 8.4-27, 16-50	
Overload Relays for Reversing Starters Catalog No. Prefix: E06N				BXR			CXR	
Non-reversing Starters Catalog No. Prefix: E101								
	B18			B25	B32		C40	C50
Height (mm/in)	127/5.0						138/5.4	
Width (mm/in)	45/1.8						54/2.1	
Depth (mm/in)	63/2.5						63/2.5	
Weight (kg/lbs)	0.4/0.88						0.525/1.16	
Coil Sealed Power (W)	3.2						3.6	
Reversing Starters Catalog No. Prefix: E501	B18			B25	B32		C40	C50
Accessories								
Auxiliary Contacts Front Mounted 1- & 2-Pole (Cat. No. Prefix: EMA) Side Mounted 1- & 2-Pole (Cat. No. Prefix: EMAS)								
SNAP Modules - for use with starters DSNAP for DeviceNet QSNAP for QCPort								
Reversing Kits Includes fanning strips, mechanical interlock, mounting plate and hardware				EMRKTB			EMRKTC	

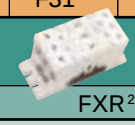
1 *Contact your Cutler-Hammer sales engineer* 2 *Preliminary Data*



D65	D85	D10	E12	E16	E20	F25[2]	F31[2]	F40[2]
100	115	130	200	225	250	300	375	450
65	85	100	125	160	200	250	315	400
50	60	75	100	125	150	200	250	300
33	45	55	63	80	110	132	160	220
150/5.9			203/8.0			355/14		
76/3.0			105/4.1			140/5.5		
79/3.1			90/3.5			175/6.9		
1.27/2.8			3.05/6.7			9.1/20		
5.0			5.6			[1]		

D65	D85	D10	E12	E16	E20	F25[2]	F31[2]	F40[2]





DXR	EXR	FXR[2]
5-16, 8.4-27, 14-45, 31-100	14-45, 28-90, 42-135, 63-200	42-135, 84-270, 125-400

DXR	EXR	FXR[2]



D65	D85	D10	E12	E16	E20	F25[2]	F31[2]	F40[2]
150/5.9			203/8.0			483/19.0		
76/3.0			105/4.1			140/5.5		
79/3.1			90/3.5			175/6.9		
1.32/2.91			3.2/7.05			12.3/27		
5.0			5.6			[1]		

D65	D85	D10	E12	E16	E20	F25[2]	F31[2]	F40[2]

Come and Get *IT.*

Contactors, Starters, Overload Relays, and Accessories – a Total System Solution Providing:

- Lower Installed Costs.
- Enhanced Safety.
- Improved Process and Application Management.

Power Supplies

Contactors and Starters

Motor Control Centers

Enclosed Control

Soft Starters

SNAP Modules

Cover Controls

I/O and Adapter Modules

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Eaton Corporation is a global $7.3 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 has 49,000 employees and sells products in more than 50 countries. For more information, visit www.eaton.com.

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Printed in USA
Form No. BR03403001E / CSS 2902
March 2002