



hubbell industrial controls, inc.

EUCLID™



- AC & DC Motor Controllers and Accessories
 - Power & Neutral Grounding Resistors
 - Pushbuttons • Magnet Controllers
 - Speed Switches • Sensing Devices
 - Drum Switches

EUCLID™ AC & DC Controllers for lifting and travel motors on cranes and other motorized equipment.

DC Magnetic Motor Controls

NEMA rated heavy-duty controls for travel or hoisting motors. Both types include mill duty components on a panel that allows front wiring and front component accessibility. NEMA type 1, NEMA type 1A with gasket, and NEMA type 3R enclosures are available.

Travel Control units feature:

- Smooth, responsive acceleration.
- Safe, controlled stopping.

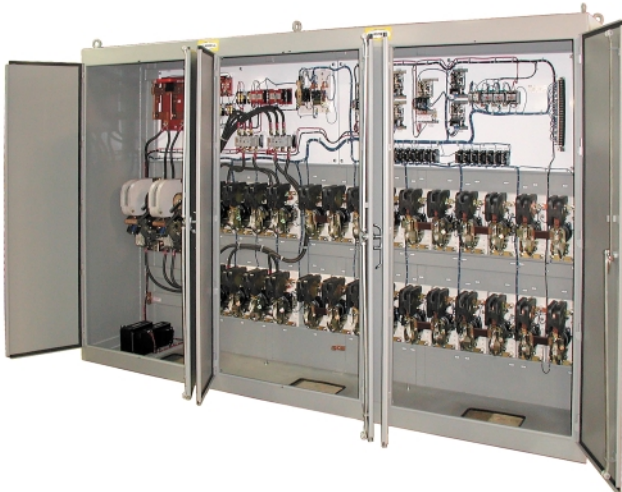
Hoist Control units feature:

- Complete operator control both hoisting and lowering.
- Dynamic braking; no mechanical brake required.
- High speed no-load hoisting and lowering.



AC Magnetic Motor Controls

Euclid AC controllers are for use with new or existing wound rotor or squirrel cage motor drives. Depending on model and type, they are ideal for motor primary or secondary controls, eddy current brake hoists, counter torque hoists, lift bridges and other large machines. Designed to take vibration and dirt, there is no sensitive “on-board” computer, and they can be repaired by in plant people.



There is a type for virtually every application:

- Reversing/plugging travel controller
- Dynamic lowering hoist controller
- Mechanical Load brake hoist controller
- Counter torque hoist controller
- Electric load brake hoist controller
- AC hoist controller with compensated DC dynamic lowering
- DC dynamic lowering hoist controller
(advantages of a dc hoist controller on an ac crane)

Crane Protective Panel:

- Overload and under voltage protection on all motors on a crane.
- Overload relays for three motors standard. Protection for additional motors can be added.

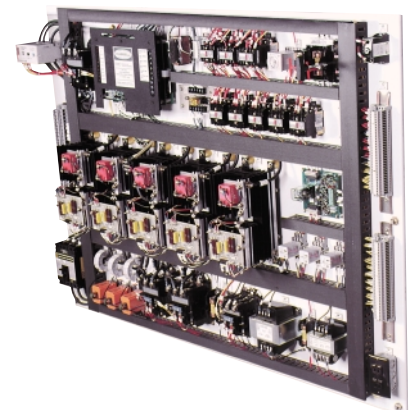
AC Static Crane Controls

Solid state stepless controls are ideal for controlling overhauling loads such as lift bridges, bridge cranes, bucket/grapple cranes, portal/whirly cranes, turbine cranes, tramways, and coke oven drives. These highly versatile controllers utilize squirrel cage or wound rotor AC induction motors through 500 hp or more and are available with either primary or secondary thyristors. They are capable of operating on 208/230/380/460/575, 3 phase VAC, 50/60 hz.

Modular Components:

Hubbell's modular approach offers functional units that can be integrated into a complete control system, either new or existing. Available modules include:

- | | | |
|--------------------------|------------------------|----------------------|
| • Variable Speed Control | • Power Thyristor | • Eddy Current Brake |
| • Tachometer Continuity | • Tachometer/Overspeed | • TPM Test |



EUCLID™ AC & DC Bridge Controllers

Hubbell offers several different controls for swing, bascule or vertical lift bridges. Type of control is determined by the mechanical and structural features of the bridge and the number and location of drive motors.

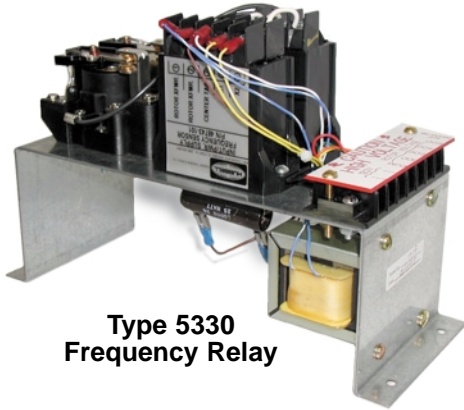
AC Motor Controllers:

- Primary thyristor static reversing for use with wound rotor motors.
- Stepped magnetic contactor/resistor for use with wound rotor motors.
- AC Vector controllers for use with squirrel cage motors.
 - Manual drum controllers for use with wound rotor motors.

DC Motor Controllers:

- DC constant potential stepped magnetic reversing or reversing/dynamic braking controllers for use with series wound motors.
- DC constant potential stepped magnetic controllers for use with shunt wound motors.

EUCLID™ AC & DC Controller Components



**Type 5330
Frequency Relay**

Electronic Frequency Relay

Master/slave system designed to be used with wound rotor motor controls. Master unit, which can be used as a stand-alone relay, is a complete frequency relay providing one point of frequency detection. The slave unit must be used with the master unit and provides additional point of frequency detection. Up to five slave units can be used with each master.

Standard features include:

- Green “Relay-on” and red “Relay Picked-up” indicators.
- 5.5–218 hz response range.
- Single frequency adjustment set point for each device.
- Hand held calibration module to monitor, calibrate or troubleshoot the system.

Static In-Line Timer

Solid state, in-line timing unit for AC or DC contactor and relay control circuits where a timed “ON” delay is required. Typical application is on crane and mill drives. The timing range is field adjustable by integral potentiometer and ranges from 0.08 seconds to 16.0 seconds, depending on model.

Standard features include:

- Totally encapsulated, solid state design.
- Shock a vibration resistant.
- Wide range ambient temperature operation.



Type 5350 Static In-Line Timer



Type 5360 Arc Suppressor

Arc Suppressor

Designed to reduce contact arcing in DC control circuits with operating voltages between 24 and 275 volts DC. When permanently connected in parallel with the operating coil, the arc suppressor may eliminate the use of an interposing relay.

Standard features include:

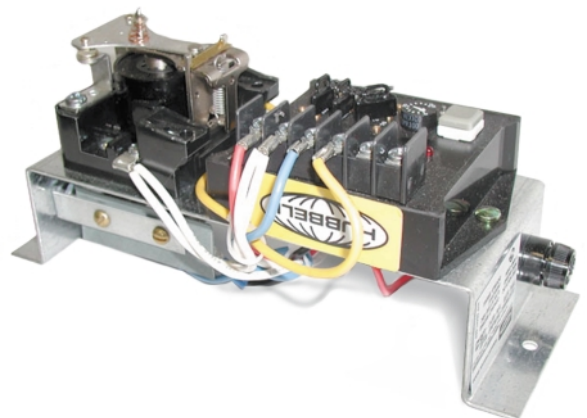
- Totally encapsulated, electronic design.
- Shock and vibration resistant.
- Operating voltage 24 to 275 volts DC.
- Operating temperature range from -40° to 65°C.

Electronic Overload Relay

Performs both the inverse time and instantaneous trip functions normally performed by two separate electro-mechanical overload relays. It receives the current signals from an optional ammeter shunt and may be used with any dc motor that requires overload current protection.

Standard features include:

- Automatic reset. Manual reset of trip indicators.
- Green “Overload-on” and yellow “Overload-Condition” indicators.
- Negative or positive shunt applications.
- Mill-duty design.
- Double break contacts.
- Latched red “Overload-Trip” indicators.



EUCLID™ Pendant and Surface Mounted Pushbutton Stations for precision control of cranes and other motorized equipment.

Versatile PBM Pendant Station

- Basic modular construction.
- Light weight, rugged, “Safety Yellow” molded enclosures.
- NEMA 3, 3R, 4, 4X when equipped with Hubbell PBM 4X inserts and Hubbell Cord Connector Kits.
- Readily available 22mm NEMA 4X pushbutton elements.
- Five sizes, 3 to 11 buttons.
- AC or DC

PBM Pushbutton Station



PBP Pendant Pushbutton Station



Series PBP

- AC or DC.
- Molded, high visibility yellow all rubber enclosure.
- NEMA Types 4 & 4X–Suitable for most indoor or outdoor industrial environments.
- One to five speed inserts plug into front accessible terminal board.

Modular, Cam Operated PBC, WPBC, XPBC

- 150 VAC or 300 VDC.
- Silver-to-silver self cleaning contacts.
- One to fourteen buttons.
- Up to five speed points and eight common circuits for each direction. Thousands of combinations available.
- Contact blocks easily inspected and replaced.
- Pendant and surface mounted models.
- Highly customizable. Some available options:
 - Duplex mounting; two stations together.
 - Stepless speed acceleration.
 - Conduit box, junction box, handles, circular button guards.

Series PBC

- Steel enclosure cover. Fiberglass rear access/insulating cover.
- NEMA Type 1–General purpose, indoor service.

Series WPBC

- Machined, extruded aluminum enclosure.
- NEMA Type 3R–Rainproof and sleet resistant outdoor service.

Series XPBC

- Cast aluminum enclosure, engineered to meet hazardous duty requirements.
- Rated for NEMA Type 7, Class 1, Group C or D, Div. 1 or 2, indoor hazardous locations.



Series XPBC

Rugged and Time Proven HD and WP (not shown)

- Basic modular construction.
- Designed for heavy duty applications of all kinds.
- Single speed, two speed or maintained contact inserts.

CPB Compact Pendant Pushbutton Station

- Touch safety yellow molded polymer housing.
- Ideal for electric hoist and industrial machine control.
- Ergonomically designed to fit the hand comfortably.
- Choice of single speed, two speed, or on-off.
- UL and CSA listed.
- Ambient temperature range -20° to 158°F (-29° to 70°).
- Optional Cord Connector Kit permits use in NEMA 4X watertight, dust tight and corrosion resistant applications or for outdoor use.
- Mechanical interlock prevents actuating both buttons simultaneously.



CPB Station

EUCLID™ Power and Neutral Grounding Resistors

Three Types of Power Resistors

Type SSR—Ideal for use in secondary of AC wound rotor motors.

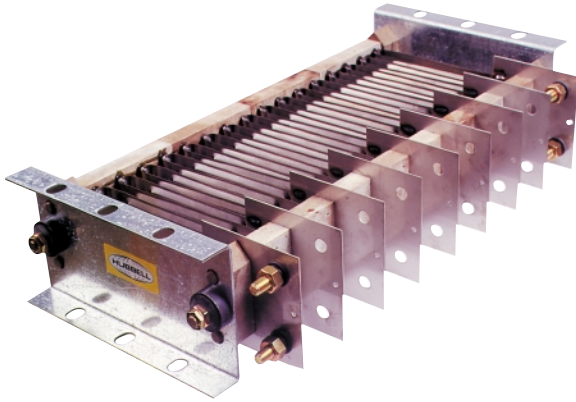
- 1.3 to 101 Amps.
- Hexwound or edgewound continuous resistive elements.
- Porcelain core strips.
- Corrosion resistant materials.

Type K

- 38 to 195 Amps
- Continuous stainless steel edgewound element.
- Mill type construction
- Floating element expands and contracts freely.

Type HHC

- 125 to 695 Amps
- Computer designed, free floating folded ribbon stainless steel element.
- No welds in element to cause mechanical or electrical failure.
- Designed for effective cooling air flow.

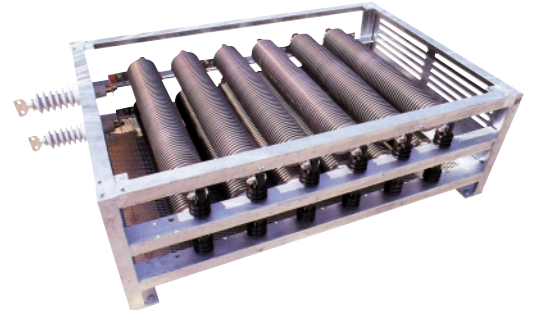


Type HHC Power Resistor

Neutral Grounding Resistors

Used for resistance grounding of industrial power Systems. They limit the maximum fault current to a value which will not damage generating, distribution, or other associated equipment in the power system, yet allow sufficient fault current to flow to operate protective relays to clear the fault.

- High thermal capacity absorbs high current surges.
- Maximum current to 2000 amps, depending on model and time rating.
- Rugged shock-resisting, double insulated construction.
- Continuous stainless steel element.
- Open or louvered frames and safety enclosures also available.



Edgewound Resistive Elements in Open Frame



Resistor Racks and Enclosures

EUCLID offers a wide variety of racks and enclosures for grouping or stacking resistors. Included are open, indoor screened and outdoor racks. Metal covers may be cane, ventilated weatherproof or totally enclosed non-ventilated.



EUCLID™ Magnet Controls and Disconnect Switches



**Model 4292 Yardmaster
Lifting Magnet Control**

Lifting Magnet Controls

Varistor or resistor type, automatic discharge or manual, EUCLID has them. Discharge resistor and varistor types provide safe discharge path for stored energy. EUCLID™ magnet controls are kind to your lifting magnet. They all feature:

- Suited for many uses from light scrap to heavy billets or plates.
- Fast and clean release of full load load.
- Accurate release of partial load.
- Precise control of dribbling.
- Front wired and front accessible components for quick installation and service.

Model 4291–Varistor type. Automatic discharge

- 50 to 350 Amps cold magnet current.
- Mill duty, Long contact life, Minimum maintenance.

Model 4292–Yardmaster. Varistor type. Automatic discharge

- 5 to 100 Amps cold magnet current.
- Heavy-duty time proven components arranged to provide optimum control of your lifting magnets.
- Mechanically interlocked “Lift” and “Drop” NEMA rated mill duty contactors.

Model 4295–Resistor type. Automatic discharge

- 13 to 175 Amps cold magnet current.
- Mechanically rugged high thermal capacity discharge resistor .
- Permanently connected discharge path completely independent of the line.
- Mechanically interlocked “Lift” and “Drop” contactors.

Model 4296–Resistor type. Manual discharge

- 13 to 130 Amps cold magnet current.
- Heavy-duty time proven components. Minimum maintenance.
- Mechanically interlocked “Lift” and “Drop” contactors.

Lifting Magnet Disconnect Switch

Fused safety disconnect switch designed to safely allow the operator to disconnect a highly inductive lifting magnet while the magnet is still energized. Standard safety switches are not designed to disconnect an energized magnet.

- High capacity discharge resistor.
- Supplied in a NEMA type 3R wall mounting enclosure



Lifting Magnet Power Supplies

Diode rectifier designed and rated for the demanding requirements where short circuits on the DC bus are common or a problem.

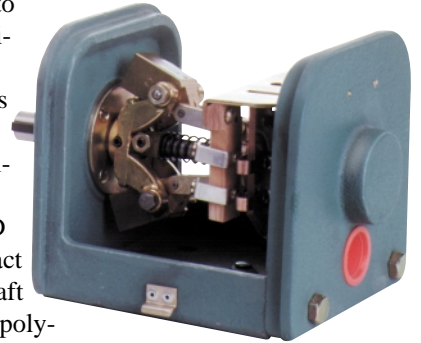
- High capacity discharge resistor.
- Supplied in a NEMA type 3R wall mounting enclosure.

EUCLID™ Speed Switches and Sensors



Speed Switches

Speed switches are designed to respond to overspeed, underspeed or stopped conditions. Typical applications include conveyors, motors, generators, fans, pumps and machine tools. EUCLID can supply three types: Fluid/eddy current (similar to the old centrifugal switches but upgraded for greater accuracy and durability); Light chopping disk with an LED light source and light sensitive cell; Proximity sensing (a non-contact technology which requires no physical connection such as input shaft extension). Cast iron, cast aluminum, brass or fiberglass reinforced polyester enclosures meet NEMA ratings (specific rating varies with model).



Hot Metal, Infrared, Proximity and Optical Detectors and Sensors

Universal Hot Metal Detectors—Sense hot metal objects and initiate a desired action (shown-right).

- Detects object without physical contact.
- Adjustable temperature range...no need to stock replacement unit for each temperature.
- Built to meet demanding mill requirements.
- Air purged and air or water cooled lenses available.
- Adjustable response time.



Optical Position Detectors—Continuously detects the presence and position of hot metal emitting infrared radiation.

- Rotating lens system with infrared sensitive cell.
- Rugged, mill duty scanner enclosure and mounting.
- Easy installation. No electrical scanner phasing required at start-up.
- NEMA 12 enclosed control unit.
- Air cool or water cooled jacket.



Infrared Detectors—Sense hot metallic or non-metallic materials such as steel, copper glass, ceramics or plastics.

- Precise detection of product leading and trailing edge.
- NEMA 13 cast aluminum enclosure. Rugged. Suitable for mill use.
- Swivel bracket. Easy installation, set-up and maintenance.
- Self test feature operated from remote pushbutton.

Long Range Proximity Sensors—Ideal for mounting flush or slightly below floor pans, roller tables or other conveyors.

- Sensing ranges from 1.18" (30mm) to 39" (1000mm).
- Detects objects as small as 3/16" (4mm) square.
- AC and DC voltages.
- Minimal misreadings due to sloppy parts placement, material reflectivity or dirty/contaminated optics.
- Built-in temperature compensation.



EUCLID™ Master Switches, Drum Controllers, Limit Switches



Mini-Master Handle Operated Cam Switch

- Housings for surface or flush mounting.
- NEMA Types 1, 3, 4 and 13.
- Up to five speed points in each direction.
- Up to 16 circuits plus feed for each direction.
- Jamb-proof mechanism for contact protection.
- Plunger detents give operator “positive position feel”.



Cam Operated Master Switches

Designed for multi-speed control functions. Rugged construction to withstand rough service encountered in steel mill applications such as crane, coal or ore bridges, blooming or rolling mills, etc.

- Available with lever action or joystick.
- 600 volt, AC or DC
- May be either floor or desk mounted.
- Open or with NEMA 1 enclosure.
- Positive cam operation.
- Step type or stepless.
- Double-break silver alloy contacts with self cleaning action.
- Up to six speed points in each direction (lever action). Five with joystick.

Furnas Brand Class 58 Drum Switch

Start, stop and change speed and/or rotating direction of reversible AC and DC electric motors. Ideal for boats hoists, doors, metal and woodworking machinery, conveyors.

- Rated at 10HP 600V.
- Choice of handle kits.
- Easy terminal access.
- Variety of enclosures, NEMA 1 or NEMA 4.
- UL listed and CSA certified.



AC & DC Limit Switches

EUCLID Power Limit Switches—Ideal for Crane Hoist Overtravel Protection

- Weight tripped and weight reset assures positive trip action.
- Rugged cast iron or fiberglass housing.
- Four oversize, pre-lubricated ball bearings for minimum friction and maintenance.
- Available as AC or DC.

Quick Break Power Limit Switches—Closed by Weight of Striking Lever

- NEMA & CEMA ratings 1, 3, 4, 9 general purpose, weather proof, watertight, or explosion proof enclosures.
- Mill duty construction.
- Hard drawn copper moving and stationary contacts.
- Available as AC or DC.
- Automatic reset.
- Easy maintenance and access to fingers, contact tips, drum segments and tension springs.



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