

**Type 4010 Reversing/Plugging Travel Controller  
With NEMA Rated Clapper Contactors**

Type 4010 **Reversing/Plugging Travel Controller** is a simple, easy to understand system with smooth, timed or frequency responsive acceleration and plugging control of wound rotor motors used on travel motions for all types of cranes. The motor is started with all the rotor resistance in the circuit. Clapper contactors in the controller short out the external rotor resistance in timed or frequency responsive steps, under control of a master switch, to provide smooth and rapid acceleration. During reversing, a frequency sensitive plugging relay prevents all of the secondary resistor contactors from closing until the motor is practically at rest. This keeps all of the external rotor resistance in the circuit during reversal to provide safe, controlled stopping.

Type 4010 reversing/plugging control panels are suitable for use with ac wound rotor motors on crane bridge or trolley drives. These panels can also be used on any reversing drive that is non-overhauling. Panels are arranged for use with separate ac or rectifier operated dc brakes.

**460/3/60 VAC Controller with Protection**

*Discount Schedule E41 (ER)*

Crane Rating			Contactor NEMA Size			Type 4010 List Prices				
Power	HP	Amps	Prim.	Sec.	No. of Speed Points	Open Panel	NEMA Type 1 Enclosed	NEMA Type 1A Enclosed	NEMA Type 3R Enclosed	NEMA Type 12 Enclosed
Single Motor Control with Protection	10	67	2	2	4	\$15,000	\$19,000	\$19,840	\$20,800	\$23,000
	15	67	2	2	4	\$15,000	\$19,000	\$19,840	\$20,800	\$23,000
	20	67	2	2	5	\$17,360	\$21,360	\$22,200	\$23,160	\$25,360
	25	67	2	2	5	\$17,360	\$21,360	\$22,200	\$23,160	\$25,360
	30	67	2	2	5	\$17,720	\$21,360	\$22,200	\$23,160	\$25,360
	40	67	2	2	5	\$17,720	\$21,360	\$22,200	\$23,160	\$25,360
	50	133	3	2	5	\$20,480	\$24,480	\$25,320	\$26,280	\$28,480
	60	133	3	2	5	\$20,480	\$24,480	\$25,320	\$26,280	\$28,480
	75	133	3	2	5	\$20,480	\$24,480	\$25,320	\$26,280	\$28,480
	100	200	4	4	6	\$29,280	\$33,280	\$34,120	\$35,080	\$37,280
	125	200	4	4	6	\$29,280	\$33,280	\$34,120	\$35,080	\$37,280
	150	400	5	5	6	\$34,640	\$38,640	\$39,480	\$40,400	\$42,640
	200	400	5	5	6	\$34,640	\$38,640	\$39,480	\$40,400	\$42,640
	250	400	5	5	6	\$42,000	\$46,000	\$46,800	\$47,800	\$50,000
300	400	5	5	6	\$42,000	\$46,000	\$46,800	\$47,800	\$50,000	
Duplex Motor Control with Protection	2 X 5	67	2	2	4	\$24,000	\$28,000	\$28,840	\$29,800	\$32,000
	2 X 10	67	2	2	4	\$24,000	\$28,000	\$28,840	\$29,800	\$32,000
	2 X 15	67	2	2	4	\$24,000	\$28,000	\$28,840	\$29,800	\$32,000
	2 X 20	67	2	2	4	\$24,000	\$28,000	\$28,840	\$29,800	\$32,000
	2 X 25	133	3	2	5	\$32,800	\$36,800	\$37,640	\$38,600	\$40,800
	2 X 30	133	3	2	5	\$32,800	\$36,800	\$37,640	\$38,600	\$40,800
	2 X 40	133	3	2	5	\$32,800	\$36,800	\$37,640	\$38,600	\$40,800
	2 X 50	200	3	3	5	\$44,960	\$44,960	\$45,800	\$46,800	\$48,960
	2 X 60	200	3	3	5	\$40,960	\$44,960	\$45,800	\$46,800	\$48,960
	2 X 75	400	3	4	6	\$55,400	\$59,400	\$60,240	\$61,200	\$63,400
	2 X 100	400	4	4	6	\$55,400	\$59,400	\$60,240	\$61,200	\$63,400
	2 X 125	400	4	4	6	\$55,400	\$59,400	\$60,240	\$61,200	\$63,400
	2 X 150	400	5	5	6	\$67,200	\$71,200	\$72,000	\$73,000	\$75,200
	2 X 200	800	5	5	6	\$74,240	\$79,040	\$79,880	\$80,800	\$83,040
2 X 250	800	5	5	6	\$86,400	\$91,200	\$92,000	\$93,000	\$95,200	
2 X 300	800	5	6	6	\$98,400	\$103,200	\$104,000	\$105,000	\$107,200	

\* Last Step Automatic



## Type 4011 Dynamic Lowering Host Controller With NEMA Rated Clapper Contactors

Type 4011 Dynamic Lowering Host Controller provides braking action by applying a single-phase connection to the primary of a three-phase wound rotor motor. It is recommended where slow lowering speeds are not required for overhauling loads of 50% or more and for hoists that do not use mechanical or electrical load brakes.

Five speed points are provided for hoisting. Lowering is controlled by three master switch points. In the first-point lowering, single-phase power is applied to the motor primary with a dynamic braking connection. An overhauling load will lower at a speed depending on the load, but a non-overhauling load will not lower. On second-point lowering, weak down torque drives drive down non-overhauling loads and permits accurate inching of light loads.

If the motor accelerates to 80% speed, the last accelerator closes and drives the load down in regeneration. This prevents motor overspeeding with an overhauling load on the hook. The third-point lowering accelerates the motor to full speed similar to full-speed hoisting.

### Single Motor Controller with Protection

*Discount Schedule E41 (ER)*

Crane Rating			Contactor NEMA Size			Type 4011 List Prices				
Power	HP	Amps	Prim.	Sec.	No. of Speed Points	Open Panel	NEMA Type 1 Enclosed	NEMA Type 1A Enclosed	NEMA Type 3R Enclosed	NEMA Type 12 Enclosed
230V 3 Phase 50/60 Hertz	10	67	2	2	4	\$18,000	\$22,000	\$22,840	\$23,800	\$26,000
	15	67	2	2	4	\$18,000	\$22,000	\$22,840	\$23,800	\$26,000
	20	67	2	2	5	\$20,600	\$24,600	\$25,440	\$26,400	\$28,600
	25	133	3	2	5	\$24,280	\$28,280	\$29,120	\$30,080	\$32,280
	30	133	3	2	5	\$24,280	\$28,280	\$29,120	\$30,080	\$32,280
	40	133	3	2	5	\$24,280	\$28,280	\$29,120	\$30,080	\$32,280
	50	200	4	4	5	\$32,080	\$36,080	\$36,920	\$37,880	\$40,080
	60	200	4	4	5	\$32,080	\$36,080	\$36,920	\$37,880	\$40,080
	75	400	5	5	5	\$37,760	\$41,760	\$42,600	\$43,560	\$45,760
	100	400	5	5	6	\$44,000	\$48,000	\$48,800	\$49,800	\$52,000
	125	400	5	5	6	\$44,000	\$48,000	\$48,800	\$49,800	\$52,000
	150	400	5	5	6	\$44,000	\$48,000	\$48,800	\$49,800	\$68,000
	200	800	6	6	6	\$59,200	\$64,000	\$64,800	\$65,800	\$68,000
	250	800	6	6	7*	\$67,600	\$72,400	\$73,200	\$74,200	\$76,400
300	800	6	6	7*	\$67,600	\$72,400	\$73,200	\$74,200	\$76,400	
460V 3 Phase 50/60 Hertz	10	67	2	2	4	\$18,000	\$22,000	\$22,840	\$23,800	\$26,000
	15	67	2	2	4	\$18,000	\$22,000	\$22,840	\$23,800	\$26,000
	20	67	2	2	5	\$20,600	\$24,600	\$25,440	\$26,400	\$28,600
	25	67	2	2	5	\$20,600	\$24,600	\$25,440	\$28,600	\$28,600
	30	67	2	2	5	\$20,600	\$24,600	\$25,440	\$26,400	\$28,600
	40	67	2	2	5	\$20,600	\$24,600	\$25,440	\$26,400	\$28,600
	50	133	3	2	5	\$24,280	\$28,280	\$29,120	\$30,080	\$32,280
	60	133	3	2	5	\$24,280	\$28,280	\$29,120	\$30,080	\$32,280
	75	133	3	2	5	\$24,280	\$40,160	\$29,120	\$30,080	\$32,280
	100	200	4	4	6	\$36,160	\$40,160	\$41,000	\$41,960	\$44,160
	125	200	4	4	6	\$36,160	\$48,000	\$41,000	\$41,960	\$44,160
	150	400	5	5	6	\$44,000	\$48,000	\$48,800	\$49,800	\$52,000
	200	400	5	5	6	\$44,000	\$48,000	\$48,800	\$49,800	\$52,000
	250	400	5	5	7*	\$51,200	\$56,200	\$56,000	\$57,000	\$59,200
300	400	5	5	7*	\$51,200	\$56,200	\$56,000	\$57,000	\$59,200	

\* Last Step Automatic



## Type 4012 Mechanical Load Brake Hoist Controller With NEMA Rated Clapper Contactors

Type 4012 is an effective hoist controller for applications where speeds can vary with the load and frequent lowering is not required. Timing devices or frequency responsive relays for accelerating contactors provide smooth acceleration control.

The first hoist position of the master switch provides low torque for taking up slack cable and hoisting light loads. Subsequent master switch points allow additional contactors to close until the desired hoisting speed is attained. Movement of the master switch in the lowering direction produces similar results. The load is driven downward against the retarding action of the mechanical load brake and timed or frequency responsive accelerating relays provide smooth acceleration.

Type 4012 reversing control panels are suitable for use with AC wound rotor motors on crane hoist drives.

Type 4012 controllers are for use on hoists that are equipped with mechanical load brake or a means of providing control of overhauling loads. These controllers provide good speed control hoisting and lowering, within the capability of the mechanical load brake.

### Single Motor Controller with Protection

*Discount Schedule E41 (ER)*

Crane Rating			Contactor NEMA Size			Type 4012 List Prices				
Power	HP	Amps	Prim.	Sec.	No. of Speed Points	Open Panel	NEMA Type 1 Enclosed	NEMA Type 1A Enclosed	NEMA Type 3R Enclosed	NEMA Type 12 Enclosed
230V 3 Phase 50/60 Hertz	10	67	2	2	4	\$14,840	\$18,840	\$19,680	\$20,640	\$22,840
	15	67	2	2	4	\$14,840	\$18,840	\$19,680	\$20,640	\$22,840
	20	67	2	2	5	\$17,200	\$21,200	\$22,040	\$23,000	\$25,200
	25	133	3	2	5	\$20,320	\$24,320	\$25,160	\$26,120	\$28,320
	30	133	3	2	5	\$20,320	\$24,320	\$25,160	\$26,120	\$28,320
	40	133	3	2	5	\$20,320	\$24,320	\$25,160	\$26,120	\$28,320
	50	200	4	4	5	\$25,440	\$29,440	\$30,280	\$31,240	\$33,440
	60	200	4	4	5	\$25,440	\$29,440	\$30,280	\$31,240	\$33,440
	75	400	5	5	5	\$30,080	\$34,080	\$34,920	\$35,880	\$38,080
	100	400	5	5	6	\$34,440	\$38,440	\$39,280	\$40,240	\$42,440
	125	400	5	5	6	\$34,440	\$38,440	\$39,280	\$40,240	\$42,440
	150	400	5	5	6	\$34,440	\$38,440	\$39,280	\$40,240	\$42,440
	200	800	6	6	6	\$46,200	\$51,000	\$51,840	\$52,800	\$55,000
	250	800	6	6	7*	\$53,800	\$58,600	\$59,440	\$60,400	\$62,600
300	800	6	6	7*	\$53,800	\$58,600	\$59,440	\$60,400	\$62,600	
460V 3 Phase 50/60 Hertz	10	67	2	2	4	\$14,840	\$18,840	\$19,680	\$20,640	\$22,840
	15	67	2	2	4	\$14,840	\$18,840	\$19,680	\$20,640	\$22,840
	20	67	2	2	5	\$17,200	\$21,200	\$22,040	\$23,000	\$25,200
	25	67	2	2	5	\$17,200	\$21,200	\$22,040	\$23,000	\$25,200
	30	67	2	2	5	\$17,200	\$21,200	\$22,040	\$23,000	\$25,200
	40	67	2	2	5	\$17,200	\$21,200	\$22,040	\$23,000	\$25,200
	50	133	3	2	5	\$20,320	\$24,320	\$25,160	\$26,120	\$28,320
	60	133	3	2	5	\$20,320	\$24,320	\$25,160	\$26,120	\$28,320
	75	133	3	2	5	\$20,320	\$24,320	\$25,160	\$26,120	\$28,320
	100	200	4	4	6	\$29,040	\$33,040	\$33,880	\$34,840	\$37,040
	125	200	4	4	6	\$29,040	\$33,040	\$33,880	\$34,840	\$37,040
	150	400	5	5	6	\$34,440	\$38,440	\$39,280	\$40,240	\$42,000
	200	400	5	5	6	\$34,440	\$38,440	\$39,280	\$40,2040	\$42,000
	250	400	5	5	7*	\$41,800	\$45,800	\$47,600	\$47,600	\$49,800
300	400	5	5	7*	\$41,800	\$45,800	\$47,600	\$47,600	\$49,800	

\* Last Step Automatic



## Type 4013 Counter Torque Hoist Controller With NEMA Rated Clapper Contactors

Type 4013 Counter Torque Hoist Controller is recommended for applications such as bucket hoists, boom hoists and magnet cranes, where a fixed minimum load exists which insures an over hauling condition at all times and where accurate positioning and slow speeds are not required.

The Counter Torque system uses reverse power to control speed in the lowering direction without the need for a load brake.

Control in the hoisting direction is the standard secondary resistor method with frequency responsive type acceleration. In the lowering direction, the master switch is not effective until the third-point. If the load is heavy enough, it will begin to lower. If the load is not heavy enough, it will try to hoist, but a frequency sensing relay will prevent hoisting. The operator does not have to reset the control by returning the master switch to the off-point. Moving the master switch to the fifth-point lower will accelerate the motor to full speed under control of the frequency responsive accelerating relays and drive the load down in regeneration. The operation in fourth-point lowering is the same as described for the third-point, except that the load accelerates at a faster speed.

### Single Motor Controller with Protection

*Discount Schedule E41 (ER)*

Crane Rating			Contactor NEMA Size			Type 4013 List Prices				
Power	HP	Amps	Prim.	Sec.	No. of Speed Points	Open Panel	NEMA Type 1 Enclosed	NEMA Type 1A Enclosed	NEMA Type 3R Enclosed	NEMA Type 12 Enclosed
230V 3 Phase 50/60 Hertz	10	67	2	2	5	\$18,280	\$22,280	\$23,120	\$24,080	\$26,280
	15	67	2	2	5	\$18,280	\$22,280	\$23,120	\$24,080	\$26,280
	20	67	2	2	6*	\$20,920	\$24,920	\$25,760	\$26,720	\$28,920
	25	133	3	2	6*	\$24,600	\$28,600	\$29,440	\$30,400	\$32,600
	30	133	3	2	6*	\$24,600	\$28,600	\$29,440	\$30,400	\$32,600
	40	133	3	2	6*	\$24,600	\$28,600	\$29,440	\$30,400	\$32,600
	50	200	4	4	6*	\$32,480	\$36,480	\$37,320	\$38,280	\$40,480
	60	200	4	4	6*	\$32,480	\$36,480	\$37,320	\$38,280	\$40,480
	75	400	5	5	6*	\$38,160	\$42,160	\$43,000	\$44,000	\$46,160
	100	400	5	5	6*	\$38,160	\$42,160	\$43,000	\$44,000	\$46,160
	125	400	5	5	6*	\$38,160	\$42,160	\$43,000	\$44,000	\$46,160
	150	400	5	5	6*	\$38,160	\$42,160	\$43,000	\$44,000	\$46,160
	200	800	6	6	7	\$59,600	\$64,400	\$65,200	\$66,200	\$68,400
	250	800	6	6	7	\$59,600	\$64,400	\$65,200	\$66,200	\$68,400
300	800	6	6	7	\$49,600	\$64,400	\$65,200	\$66,200	\$68,400	
460V 3 Phase 50/60 Hertz	10	67	2	2	5	\$18,280	\$22,280	\$23,120	\$24,080	\$26,280
	15	67	2	2	5	\$18,280	\$22,280	\$23,120	\$24,080	\$26,280
	20	67	2	2	6*	\$20,920	\$24,920	\$25,760	\$26,720	\$28,920
	25	67	2	2	6*	\$20,920	\$24,920	\$25,760	\$26,720	\$28,920
	30	67	2	2	6*	\$20,920	\$24,920	\$25,760	\$26,720	\$28,920
	40	67	2	2	6*	\$20,920	\$24,920	\$25,760	\$26,720	\$28,920
	50	133	3	2	6*	\$24,600	\$28,600	\$29,440	\$30,400	\$32,600
	60	133	3	2	6*	\$24,600	\$28,600	\$29,440	\$30,400	\$32,600
	75	133	3	2	6*	\$24,600	\$28,600	\$29,440	\$30,400	\$32,600
	100	200	4	4	6*	\$32,480	\$36,480	\$37,320	\$38,280	\$40,480
	125	200	4	4	6*	\$32,480	\$36,480	\$37,320	\$38,280	\$40,480
	150	400	5	5	6	\$38,160	\$42,160	\$43,000	\$44,000	\$46,160
	200	400	5	5	6	\$38,160	\$42,160	\$43,000	\$44,000	\$46,160
	250	400	5	5	7*	\$46,400	\$60,400	\$51,200	\$52,200	\$54,400
300	400	5	5	7*	\$46,400	\$60,400	\$51,200	\$52,200	\$54,400	

\* Last Step Automatic



## Type 4014 Electric Load Brake Hoist Controller With NEMA Rated Clapper Contactors

The Type 4014 Electric Load Brake Hoist Controller is relatively simple yet provides great precision in load handling. It is particularly useful for handling variable loads at pre-selected sub-synchronous speeds, and also provides slower and more stable lowering speeds than other ac stepped wound rotor hoist motion controllers. Typical applications are in assembly or manufacturing operations where the crane is used frequently.

In this system the eddy current brake and wound rotor motor are coupled directly to a common shaft. The brake serves as an artificial load for the motor and develops braking torque by frictionless means; thus, the lowering control is stable even at very slow speeds.

The controller acts as a plain reversing controller with five master switch points for hoisting and five for lowering. In hoisting, the eddy current brake is energized in the first and second point hoist and de-energized in the last three points hoist. When energized during hoisting, the brake artificially loads the motor thus causing the light hook loads to be hoisted slowly. For lowering, the brake is energized on the first four points lowering and de-energized on the fifth. When the brake is energized during lowering, it's torque opposes the motor torque and permits loads to be lowered slowly.

Type 4014 reversing current panels are suitable for use with ac wound rotor motors on crane hoist drives with eddy current brakes.

### Single Motor Controller with Protection

*Discount Schedule E41 (ER)*

Crane Rating			Contactor NEMA Size			Type 4014 List Prices				
Power	HP	Amps	Prim.	Sec.	No. of Speed Points	Open Panel	NEMA Type 1 Enclosed	NEMA Type 1A Enclosed	NEMA Type 3R Enclosed	NEMA Type 12 Enclosed
230V 3 Phase 50/60 Hertz	10	67	2	2	5	\$21,800	\$25,800	\$26,640	\$27,600	\$29,800
	15	67	2	2	5	\$21,800	\$25,800	\$26,640	\$27,600	\$29,800
	20	67	2	2	6*	\$25,000	\$29,000	\$29,840	\$30,800	\$33,000
	25	133	3	2	6*	\$29,400	\$33,400	\$34,240	\$35,200	\$37,400
	30	133	3	2	6*	\$29,400	\$33,400	\$34,240	\$35,200	\$37,400
	40	133	3	2	6*	\$29,400	\$33,400	\$34,240	\$35,200	\$37,400
	50	200	4	4	6*	\$38,000	\$42,000	\$42,800	\$43,800	\$46,000
	60	200	4	4	6*	\$38,000	\$42,000	\$42,800	\$43,800	\$46,000
	75	400	5	5	6*	\$44,800	\$48,800	\$49,600	\$50,600	\$52,800
	100	400	5	5	6*	\$44,800	\$48,800	\$49,600	\$50,600	\$52,800
	125	400	5	5	6*	\$44,800	\$48,800	\$49,600	\$50,600	\$52,800
	150	400	5	5	6*	\$44,800	\$48,800	\$49,600	\$50,600	\$52,800
	200	800	6	6	7*	\$70,400	\$75,200	\$76,000	\$77,000	\$79,200
	250	800	6	6	7*	\$70,400	\$75,200	\$76,000	\$77,000	\$79,200
	300	800	6	6	7*	\$70,400	\$75,200	\$76,000	\$77,000	\$79,200
460V 3 Phase 50/60 Hertz	10	67	2	2	5	\$21,800	\$25,800	\$26,640	\$27,600	\$29,800
	15	67	2	2	5	\$21,800	\$25,800	\$26,640	\$27,600	\$29,800
	20	67	2	2	6*	\$25,000	\$29,000	\$29,840	\$30,800	\$33,000
	25	67	2	2	6*	\$25,000	\$29,000	\$29,840	\$30,800	\$33,000
	30	67	2	2	6*	\$25,000	\$29,000	\$29,840	\$30,800	\$33,000
	40	67	2	2	6*	\$25,000	\$29,000	\$29,840	\$30,800	\$33,000
	50	133	3	2	6*	\$29,400	\$33,400	\$34,240	\$35,200	\$37,400
	60	133	3	2	6*	\$29,400	\$33,400	\$34,240	\$35,200	\$37,400
	75	133	3	2	6*	\$29,400	\$33,400	\$34,240	\$35,200	\$37,400
	100	200	4	4	6*	\$38,000	\$42,000	\$42,800	\$43,800	\$46,000
	125	200	4	4	6*	\$38,000	\$42,000	\$42,800	\$43,800	\$46,000
	150	400	5	5	6*	\$44,800	\$48,800	\$49,600	\$50,600	\$52,800
	200	400	5	5	6*	\$44,800	\$48,800	\$49,600	\$50,600	\$52,800
	250	400	5	5	7*	\$54,800	\$58,800	\$59,600	\$60,600	\$62,800
	300	400	5	5	7*	\$54,800	\$58,800	\$59,600	\$60,600	\$62,800

\* Last Step Automatic



**Type 4017 AC Hoist Controller  
with Compensated DC Dynamic Lowering  
With NEMA Rated Clapper Contactors**

Type 4017 is a DC dynamic lowering hoist controller providing braking action by rectifying the voltage developed on the wound rotor motor slip rings and connecting the DC voltage to a single phase of the three phase wound rotor primary windings. It is recommended for hoists with a fixed minimum load which do not have a mechanical or eddy current brake, but still require good speed regulation.

Control in hoisting is the standard secondary resistor method. In lowering five speed points are provided with the secondary slip voltage rectified and connected to a single phase of the primary. The controller provides relatively flat speed-torque curves similar to eddy current brake hoist performance.

Suitable for all NEMA and CMAA service classes.

**Single Motor Controller with Protection**

*Discount Schedule E41 (ER)*

Crane Rating			Contactor NEMA Size			Type 4017 List Prices				
Power	HP	Amps	Prim.	Sec.	No. of Speed Points	Open Panel	NEMA Type 1 Enclosed	NEMA Type 1A Enclosed	NEMA Type 3R Enclosed	NEMA Type 12 Enclosed
230V 3 Phase 50/60 Hertz	10	67	2	2	5	\$30,220	\$36,120	\$37,296	\$38,640	\$41,720
	15	67	2	2	5	\$30,520	\$36,120	\$37,296	\$38,640	\$41,720
	20	67	2	2	6*	\$35,000	\$40,600	\$41,776	\$43,120	\$46,200
	25	133	3	2	6*	\$41,160	\$46,760	\$47,936	\$49,280	\$52,360
	30	133	3	2	6*	\$41,160	\$46,760	\$47,936	\$49,280	\$52,360
	40	133	3	2	6*	\$41,160	\$46,760	\$47,936	\$61,320	\$52,360
	50	200	4	4	6*	\$53,200	\$58,800	\$59,920	\$61,320	\$64,400
	60	200	4	4	6*	\$53,200	\$58,800	\$59,920	\$61,320	\$64,400
	75	400	5	5	6*	\$62,720	\$68,432	\$69,440	\$70,840	\$73,920
	100	400	5	5	6*	\$62,720	\$68,320	\$69,440	\$70,840	\$73,920
	125	400	5	5	6*	\$62,720	\$68,320	\$69,440	\$70,840	\$73,920
	150	400	5	5	6*	\$62,720	\$38,320	\$69,440	\$70,840	\$73,920
	200	800	6	6	7*	\$98,560	\$105,280	\$106,400	\$107,800	\$110,880
	250	800	6	6	7*	\$98,560	\$105,280	\$106,400	\$107,800	\$110,880
300	800	6	6	7*	\$98,560	\$105,280	\$106,400	\$107,800	\$110,880	
460V 3 Phase 50/60 Hertz	10	67	2	2	5	\$30,520	\$36,120	\$37,296	\$38,640	\$41,720
	15	67	2	2	5	\$30,520	\$36,120	\$37,296	\$38,640	\$41,720
	20	67	2	2	6*	\$35,000	\$40,600	\$41,776	\$43,120	\$46,200
	25	67	2	2	6*	\$35,000	\$40,600	\$41,776	\$43,120	\$46,200
	30	67	2	2	6*	\$35,000	\$40,600	\$41,776	\$43,120	\$46,200
	40	67	2	2	6*	\$35,000	\$40,600	\$41,776	\$43,120	\$46,200
	50	133	3	2	6*	\$41,160	\$46,760	\$47,936	\$49,280	\$52,360
	60	133	3	2	6*	\$41,160	\$46,760	\$47,936	\$49,280	\$52,360
	75	133	3	2	6*	\$41,160	\$46,760	\$47,936	\$49,280	\$52,360
	100	200	4	4	6*	\$53,200	\$58,800	\$59,920	\$61,320	\$64,400
	125	200	4	4	6*	\$53,200	\$58,800	\$59,920	\$61,320	\$64,400
	150	400	5	5	6	\$62,720	\$68,320	\$69,440	\$70,840	\$73,920
	200	400	5	5	6	\$62,720	\$68,320	\$69,440	\$70,840	\$73,920
	250	400	5	5	7*	\$76,720	\$82,320	\$83,440	\$84,840	\$87,920
300	400	5	5	7*	\$76,720	\$82,320	\$83,440	\$84,840	\$87,920	

\* Last Step Automatic



## Type 4016 Crane Protective Panel With NEMA Rated Clapper Contactors

The Type 4016 Crane Protective Panels provide overload and undervoltage protection for all motors on a crane where the individual control panels are furnished "without protection".

The standard crane protective panel includes a 3 pole main line clapper contactors and overload relays for three motors. Overload relays for additional motors can be added.

Suitable for all NEMA and CMAA classes

### Crane Protective Panel

*Discount Schedule E41 (ER)*

Crane Rating			Prim.	Sec.	Contact- tor NEMA Size	Type 4016 List Prices					
Power	MAX Total Motor HP	MAX HP any motion				Open Panel	NEMA Type 1 Enclosed	NEMA Type 1A Enclosed	NEMA Type 3R Enclosed	NEMA Type 12 Enclosed	Adder for One Set O.L. Relays
230V 3 Phase 50/60 Hertz	30	67	2	2	5	\$8,800	\$11,200	\$12,040	\$13,000	\$13,600	\$1,600
	63	67	2	2	5	\$12,800	\$15,200	\$16,040	\$17,000	\$17,600	\$2,800
	110	67	2	2	6*	\$15,200	\$17,600	\$18,440	\$19,400	\$20,000	\$3,200
	225	133	3	2	6*	\$18,000	\$20,400	\$21,240	\$22,200	\$22,800	\$3,600
	450	133	3	2	6*	\$24,800	\$28,000	\$28,840	\$29,800	\$30,400	\$5,800
460V 3 Phase 50/60 Hertz	60	67	2	2	5	\$8,800	\$11,200	\$12,040	\$13,000	\$13,600	\$1,600
	125	67	2	2	5	\$12,800	\$15,200	\$16,040	\$17,000	\$17,600	\$2,800
	220	67	2	2	6*	\$15,200	\$17,600	\$18,440	\$19,400	\$20,000	\$3,200
	450	67	2	2	6*	\$18,000	\$20,400	\$21,240	\$22,200	\$22,800	\$3,600
	900	67	2	2	6*	\$24,800	\$28,000	\$28,840	\$29,800	\$30,400	\$5,800

*One set of overload relays consists of three inverse time magnetic overload relays.*

### Material List for Type 4016 Crane Protective Panel

- 1 - Three pole disconnect switch
- 1 - Two pole fused control disconnect switch
- 3 - Ambient compensated thermal overload relays
- 1 - Control circuit rectifier
- 1 - Three pole main line clapper contactor

### Surface Mounting Pushbutton Station

Refer to Bulletin 2000, P/N 99826-007 (on/off) \$350.00 E42 (ES)

**Refer to page 9 for  
 additional modifications**





**Resistors for Types 4010, 4011 and 4012 Controls**

Discount Schedule E42 (ES)

MAX HP Single Motor	Resistor Service Class List Price Schedule E42 (ES)			Approximate No. of Mill Frames		
	162	172	92	162	172	92
5	\$910	\$1,120	\$1,330	1	1	1
7.5	\$1,330	\$1,330	\$1,960	1	1	2
10	\$1,470	\$1,820	\$2,590	1	1	2
15	\$1,890	\$2,030	\$2,940	1	2	2
20	\$2,170	\$2,590	\$3,710	1	2	3
25	\$2,590	\$3,150	\$4,410	2	2	3
30	\$3,080	\$3,640	\$5,180	2	3	4
40	\$3,640	\$4,620	\$6,580	2	3	4
50	\$4,620	\$5,740	\$8,120	3	3	4
60	\$5,180	\$6,580	\$9,450	3	3	5
75	\$6,860	\$7,910	\$11,410	4	4	6
100	\$7,560	\$10,570	\$15,120	5	5	9
125	\$10,220	\$10,860	\$18,270	6	6	12
150	\$11,550	\$14,980	\$21,770	7	6	15
200	\$14,980	\$19,600	\$28,420	9	9	18
250	\$18,760	\$25,060	\$36,400	12	15	24
300	\$22,470	\$30,030	\$43,610	14	18	28

**Resistors for Types 4013, 4014 and 4017 Controls**

Discount Schedule E42 (ES)

MAX HP Single Motor	Resistor Service Class List Price Schedule E42 (ES)			Approximate No. of Mill Frames		
	161	171	91	161	171	91
5	\$1,330	\$2,240	\$2,520	1	1	1
7.5	\$1,960	\$2,800	\$3,710	1	1	1
10	\$2,380	\$3,150	\$4,550	1	2	2
15	\$2,940	\$3,920	\$5,600	1	2	3
20	\$3,920	\$5,740	\$7,420	2	3	3
25	\$4,480	\$6,090	\$8,540	2	3	3
30	\$4,900	\$6,720	\$9,310	2	3	4
40	\$6,440	\$8,890	\$12,250	2	3	4
50	\$8,750	\$11,690	\$16,660	3	4	5
60	\$9,520	\$13,020	\$18,060	3	6	6
75	\$11,960	\$15,820	\$22,190	3	6	6
100	\$16,310	\$21,910	\$31,010	5	7	9
125	\$19,740	\$26,320	\$37,520	6	9	12
150	\$24,640	\$32,550	\$46,830	8	12	15
200	\$27,230	\$37,520	\$51,730	10	15	18
250	\$39,270	\$52,150	\$74,620	12	18	24
300	\$45,570	\$60,830	\$86,590	15	24	28

**Resistor Racks**

Discount Schedule E42 (ES)

Mounted In:	Interwire	Add	Minimum
Open Racks	No	15%	\$700
Open Racks	Yes	30%	\$1,400
Enclosed Racks	Yes	50%	\$2,275

**Resistor Information**

NEMA Class 16/12 is recommended for standard crane duty. NEMA Class 17/12 is recommended for severe crane duty. NEMA Class 91/92 is recommended for very severe crane duty.

Drives with anti-friction bearings should use Class 162, 172 or 92 resistors. Drives with plain bearings should use Class 163, 173 or 93 resistors.

Duplex controls require two sets of resistors.

Approximate number of mill frame shown are based on Hubbell standard resistor designs for controllers listed. These designs are for typical drive loading with motors having standard NEMA characteristics and electrical data.

For 30HP and below, edgewound type 3003 SSR resistor frames are supplied.

**Type 4216 Mill Master Switches**

Discount Schedule E42 (ES)

Master Switch Speed Points	Type 4010 & Type 4012	Type 4011 & Type 4017	Type 4013
4	\$3,300	\$3,780	\$3,780
5	\$3,300	\$3,780	\$3,780
6	\$3,780	\$4,650	\$3,780
Add for Spring Return	\$540	\$540	\$540
Add for Off-Point Latch	\$420	\$420	\$420





### Controller modifications (4010,11, 12, 13, 14, 17) Disc. Sched. E41 (ER)

Mod No.	Description		Contactor NEMA Size					
			2	3	4	5	6	
<b>Protective Devices</b>								
1	Omit MKS, LV, OL1, OL2, OL3	Deduct	\$2,000	\$3,400	\$4,000	\$4,800	\$6,000	
2	Omit Overload Relays (OL1, OL2, OL3)	Add	\$1,200	\$2,400	\$2,800	\$3,200	\$3,600	
3	Supply MCB in place of MKS	Add	\$400	\$400	\$1,200	\$2,000	\$3,200	
4	Supply MCB in place of fused CKS	Add	\$400	\$400	\$400	\$400	\$400	
5	Supply power fuse clips	Add	\$320	\$600	\$720	\$1,200	\$1,800	
6	Supply power fuses and fuse clips	Add	\$600	\$1,200	\$1,600	\$2,400	\$4,200	
7	Three pole power knife switch, unfused (Isolating Switch for Duplex Panels)	Add	\$400	\$600	\$800	\$1,200	\$2,000	
<b>Power Circuit Devices</b>								
8	Additional Accelerator step	Add	\$2,400	\$3,000	\$3,600	\$4,400	\$7,600	
9	Power Terminal Board	Add	\$1,400	\$1,800	\$2,400	\$3,200	\$5,600	
<b>Relays</b>								
10	Shunt Brake Relay	Add	\$760	\$760	\$760	\$760	\$760	
11	Control Relay (6 Circuit Max.)	Add	\$800	\$800	\$800	\$800	\$800	
12	Substitute solid state timers for frequency accelerating relays	Deduct	\$600	\$1,000	\$1,200	\$1,200	\$1,600	
<b>Miscellaneous</b>								
13	Arc suppressor (radio operation)	Add	\$1,600	\$1,600	\$1,600	\$1,600	-	
14	Arc suppressor (pendant operation)	Add	-	\$1,600	\$1,600	\$1,600	-	
15	Shunt Brake Rectifier with forcing (panel mounted)	Add	See Page 12 for Brake Rectifiers					
16	Miniature voltmeter (panel mounted)	Add	\$400	\$400	\$400	\$400	\$400	
17	Miniature ammeter (panel mounted, includes C.T.)	Add	\$800	\$1,000	\$1,200	\$1,400	\$1,600	

### Special Construction Disc. Schedule E41 (ER)

Multipanel Construction		
Description	Top Mounted Resistors	Side Mounted Resistors
Mounting and interwiring more than one controller in a common enclosure	Add 15% to the total price of the separate enclosed controllers	
Mount and wire resistors	\$600 per motion plus 20% of the resistor price	\$500 per motion plus 30% of the resistor price
Resistor Enclosure Covers		
Front and side screen covers	20% of resistor price \$800 min.	30% of resistor price \$600 min.
Screened indoor enclosures	40% of resistor price \$1600 min.	50% of resistor price \$1000 min.
Louvered outdoor enclosures	50% of resistor price \$200 min.	60% of resistor price \$1200 min.

Unitized Construction		
Description	Top Mounted Resistors	Side Mounted Resistors
Mounting individual controllers and resistor racks on a common skid	Estimate length of each skid. Multiply length by \$600 per foot.	
Interwire controller to main disconnect if on the same skid	Add 10% of controller price	
Mount and wire resistors	\$600 per motion plus 20% of the resistor price	\$500 per motion plus 30% of the resistor price
Resistor Enclosure Covers		
Front and side screen covers	20% of resistor price \$800 min.	30% of resistor price \$600 min.
Screened indoor enclosures	40% of resistor price \$1600 min.	50% of resistor price \$1000 min.
Louvered outdoor enclosures	50% of resistor price \$200 min.	60% of resistor price \$1200 min.

### Bill of Materials (all contactors clapper type)

Description	4010		4011	4012	4013	4014	4017
	Single Motor	Duplex Motor	Single Motor	Single Motor	Single Motor	Single Motor	Single Motor
Three pole main knife switch	1	1	1	1	1	1	1
Two pole fused control disconnect switch	1	1	1	1	1	1	1
Magnetic overload relay	3	6	3	3	3	3	3
Two pole mainline contactor	1	1	1	1	1	1	1
Two pole directional contactors	2	2	2	2	2	2	2
Two pole dynamic braking contactor			1				
One pole accelerating contactors							12 - 21
Two pole accelerating contactors	3 - 5	6 - 10	3 - 6	3 - 6	4 - 7	4 - 7	
Frequency relays	3 - 5	6 - 10	2 - 5	2 - 5	4 - 7	2 - 5	2 - 5
Accelerating timing relays							3 - 5
Compensated DC feedback controller							1
ECB control unit						1	
Control circuit transformer			1	1	1	1	1
Control circuit rectifier	1	1	1	1	1	1	1
Control relays					2	1	
Brake relay			1				
Timing relay					1	1	
Undervoltage relay	1	1	1	1	1	1	1



**Class II AC Crane Controllers**  
**With NEMA Rated Machine Tool Contactors**

**Single Motor Controller Without Protection**

*Discount Schedule E41 (ER)*

Crane Rating				Contactor NEMA Size			List Prices				
Controller Type	230V HP	460V HP	Amps	Prim.	Sec.	No. of Speed Points	Single Motor Control Without Protection				
							Open Panel	NEMA Type 1 Enclosed	NEMA Type 1A Enclosed	NEMA Type 3R Enclosed	NEMA Type 12 Enclosed
4020 Rev/Plug Travel	7.5	10	30	1	1	3	\$4,720	\$5,600	\$5,900	\$6,460	\$6,880
	20	40	67	2	2	3	\$6,320	\$7,180	\$7,480	\$8,040	\$8,480
	40	80	133	3	2	4	\$11,100	\$11,960	\$12,260	\$12,820	\$13,240
4022 Rev/Plug Load Brake Hoist	7.5	10	30	1	1	3	\$4,560	\$5,420	\$5,720	\$6,280	\$6,700
	20	40	67	2	2	3	\$6,140	\$7,000	\$7,320	\$7,860	\$8,300
	40	80	133	3	2	4	\$10,920	\$11,780	\$12,640	\$12,640	\$13,080
4024 Rev/Plug Load Brake Hoist	7.5	10	30	1	1	3	\$7,320	\$6,180	\$8,480	\$9,040	\$9,460
	20	40	67	2	2	3	\$9,460	\$10,320	\$10,620	\$11,180	\$11,620
	40	80	133	3	2	4	\$13,880	\$14,740	\$15,060	\$15,600	\$16,040

**4026 Three Motor Protective Panel**

*Discount Schedule E41 (ER)*

Crane Rating				Contactor NEMA Size	List Prices					Add for Additional Overload Relays
Electric Service	Max Total HP	Max HP Any Motion	Cont. Amps		Open Panel	NEMA Type 1 Enclosed	NEMA Type 1A Enclosed	NEMA Type 3R Enclosed	NEMA Type 12 Enclosed	
230V 3 Phase 50/60 Hz	10	7.5	30	1	\$4,280	\$5,240	\$5,460	\$5,900	\$6,100	\$640
	30	20	50	2	\$6,320	\$6,760	\$6,960	\$7,400	\$7,620	\$980
	63	40	100	3	\$8,180	\$8,600	\$8,820	\$9,240	\$9,460	\$1,300
	110	63	150	4	\$11,520	\$11,960	\$12,160	\$12,600	\$12,820	\$1,720
460/575V 3 Phase 50/60 Hz	20	10	30	1	\$4,820	\$5,240	\$5,460	\$5,900	\$6,100	\$640
	60	40	50	2	\$6,320	\$6,760	\$6,960	\$7,400	\$7,620	\$980
	125	80	100	3	\$8,180	\$8,600	\$8,820	\$9,240	\$9,460	\$1,300
	225	125	150	4	\$11,520	\$11,960	\$12,160	\$12,600	\$12,820	\$1,720

\* One set of overload relays consists of (3) inverse time thermal overload relays.



**Class II Controller Modifications**

**Type 4020, 4022, 4024 Only** *Discount Schedule E41 (ER)*

Mod. No.	Description	NEMA Size			
		1	2	3	4
<b>Protection Devices</b>					
1	Three pole power knife switch, unfused	\$440	\$440	\$640	---
2	Supply power fuse clips	\$340	\$340	\$640	\$780
3	Supply power fuse and clips	\$640	\$640	\$1,300	\$1,720
4	Supply three thermal overload relays	\$640	\$980	\$1,300	---
5	Supply three magnetic overload relays	\$1,720	\$1,720	\$3,020	---
6	Two pole control knife switch, unfused	\$440	\$440	\$440	---
7	Supply control fuses and fuse clips	\$220	\$220	\$220	---
8	Supply low voltage (under voltage) relay	\$440	\$440	\$440	---
<b>Power Circuit Devices</b>					
9	Additional acceleration step, untimed	\$560	\$860	\$1,380	---
10	Main line contactor	\$560	\$860	\$1,380	---
<b>Relays</b>					
11	Brake Relay	\$480	\$480	\$480	---
12	Control Relay	\$440	\$440	\$440	---
13	Solid state timer for acceleration step	\$520	\$520	\$520	---
<b>Miscellaneous</b>					
14	Control Transformer	\$560	\$740	\$740	---

**Class II Resistors** *Discount Schedule E42 (ES)*

MAX HP Single Motor	Type 3003 / Size 5 Coils Standard Frames			
	NEMA Service Class			
	152	162	172	92
0.5	\$770	\$770	\$770	\$910
1	\$980	\$980	\$980	\$1,120
2	\$1,120	\$1,120	\$1,120	\$1,365
5	\$1,365	\$1,365	\$1,365	\$1,645
7.5	\$1,435	\$1,575	\$1,645	\$1,890
10	\$1,505	\$1,645	\$1,890	\$2,100
15	\$1,645	\$1,890	\$2,100	\$2,415
20	\$1,890	\$2,275	\$2,415	\$6,695
25	\$2,030	\$2,485	\$2,250	\$3,010
30	\$2,485	\$3,010	\$3,605	\$4,130
40	\$3,060	\$4,130	\$4,970	\$5,880
50	\$4,305	\$5,180	\$6,160	\$7,315
60	\$5,180	\$6,405	\$7,735	\$9,415
75	\$6,020	\$7,315	\$8,715	\$10,395

**Class II Controller Bill of Materials**

Component	Controller Type			
	4020	4022	4024	4026
Type 5130 Three Pole Reversing Contactor	1	1	1	
Type 5130 Three Pole Non-reversing Contactor				1
Three (3) Speed	2	2		
Four (4) Speed	3	3	3	
Type 5350 Static Acceleration Timer	1	1	1	
Plugging Relay	1			
Eddy Current Brake Control, (Resistor, Transformer, Fuse, Rectifier, Series and Timing relay)			1	
3 Pole Main Disconnect Switch				1
Thermal Overload Relays with Heaters				3
Control Transformer				1
Fused Control Disconnect Switch				1

**Type 4211 Mini-Master  
Switches for  
Class II Controllers**  
*Discount Schedule E20 (EA)*

Speed Points	List Price
3	\$1,185
4	\$1,260
5	\$1,365



# Euclid™ AC Heavy Duty Crane Controllers

## AISE Standard AC Mill Motors

AISE Motor Frame Size	1 Hour HP Rating	Sync. Speed (RPM)	Full Load Torque (Ft Lbs)	Primary Current at 460 VAC	Secondary Volts	Secondary Amps
AC 1	5	1200	23	8	140	19
AC 2	10	1200	46	15	195	26.5
AC 4	20	1200	92	30	265	38
AC 8	40	1200	184	55	250	75
AC 12	60	1200	276	76	300	92
AC 18	90	900	540	149	260	162
AC 25	125	900	750	172	305	190
AC 30	150	900	895	215	340	207
AC 40	200	720	1490	291	275	335
AC 50	300	720	1857	365	310	375

## Wound Rotor Motors with NEMA Secondary Values

1 Hour HP Rating	Sync. Speed (RPM)	Full Load Torque (Ft Lbs)	Primary Current at 460 VAC	Secondary Volts	Secondary Amps
5	1200	23	8.9	140	19
	900	31	10.9		
7.5	1200	35	13.2	165	23
	900	46	13.7		
10	1200	46	16.6	195	26.5
	900	62	16.1		
15	1200	69	22.0	240	32.5
	900	93	26.0		
20	1200	92	28.0	265	38
	900	124	32.0		
25	1200	115	34.0	220	60
	900	155	38.0		
30	1200	138	40.0	240	65
	900	185	46.0		
40	1200	185	55.0	315	60
	900	247	61.0		
50	1200	221	69.0	350	67
	900	309	76.0		
60	1200	277	78.0	375	74
	900	371	88.0		
75	1200	346	97.0	385	90
	900	464	116.0		
100	1200	461	129.0	360	130
	900	619	130.0		
125	1200	576	189.0	385	150
	900	770	160.0		
150	900	926	195.0	380	185

## Type 4207 Shunt Brake Rectifiers with Forcing Discount Schedule E42 (ES)

Brake Size	NEMA 1 Indoor Enclosed	NEMA 3R Outdoor Enclosed
8"	\$4000	\$4800
10"	\$4000	\$4800
13"	\$4000	\$4800
16"	\$5000	\$5800
19"	\$5000	\$5800
23"	\$6000	\$6800
30"	\$6000	\$6800

Rectifiers can be panel mounted with motion controllers

Prices Subject to Change without Notice



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