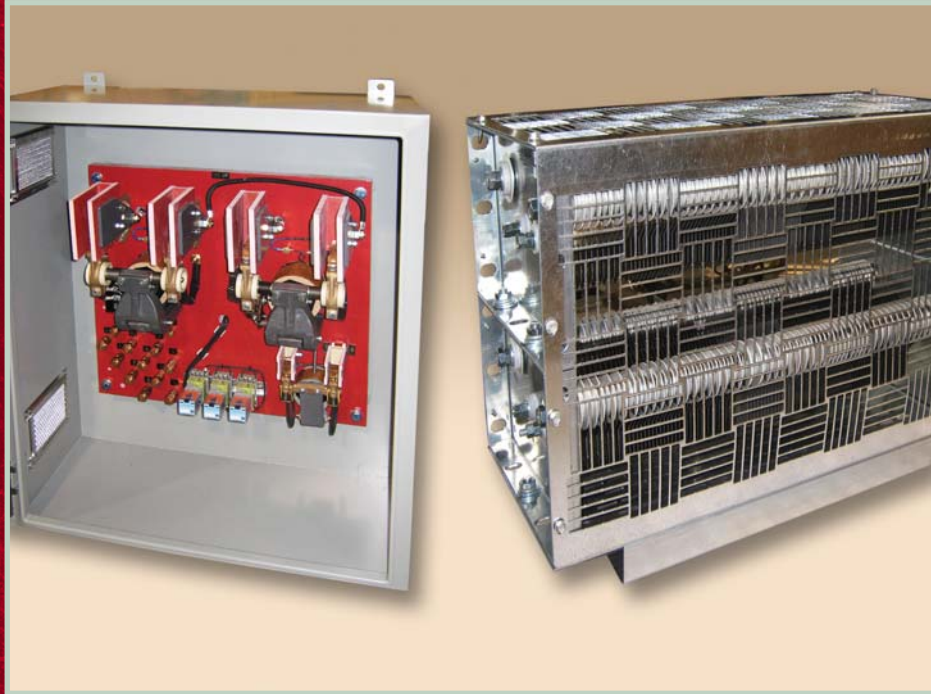


OHIO MODEL RD-3A AUTO/MANUAL DROP MAGNET CONTROLLER



INSTALLATION, MAINTENANCE, AND PARTS BULLETIN

OPERATING RANGE 100-200 A
(COLD MAGNET CURRENT)

DESCRIPTION

The RD-3A Controller is a heavy duty magnet controller used for magnets whose cold current ranges from 100 A to 200 A dc. Cold current references the current flowing through the magnet when the magnet temperature is 25°C throughout.

AUTOMATIC DROP

A reverse current adjustment provides for a fast, clean drop of the magnet over the complete range of magnetic material with one movement of the master switch or push button

MANUAL DROP

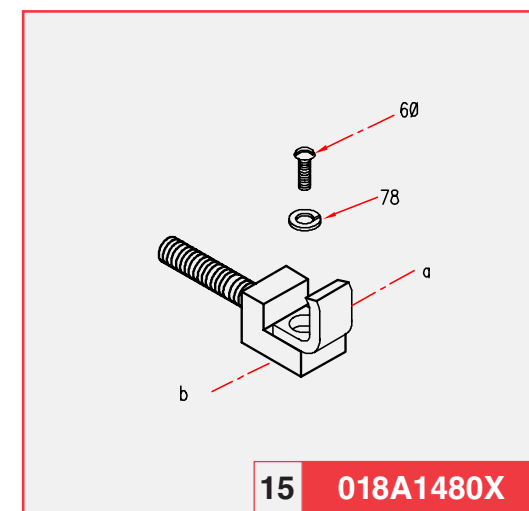
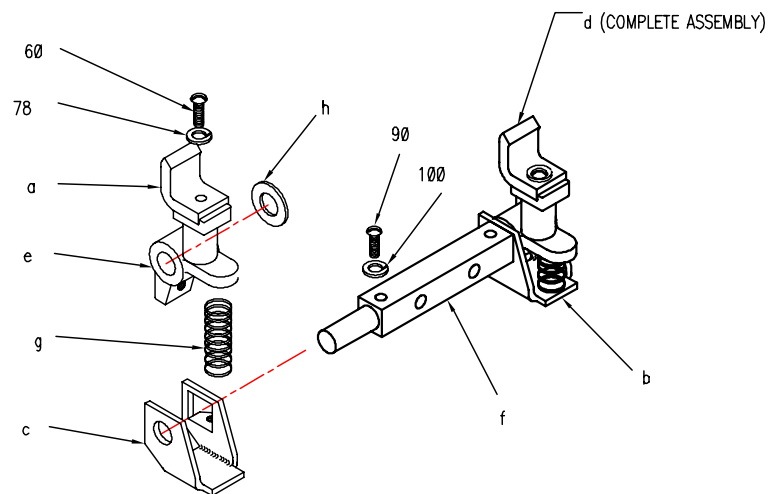
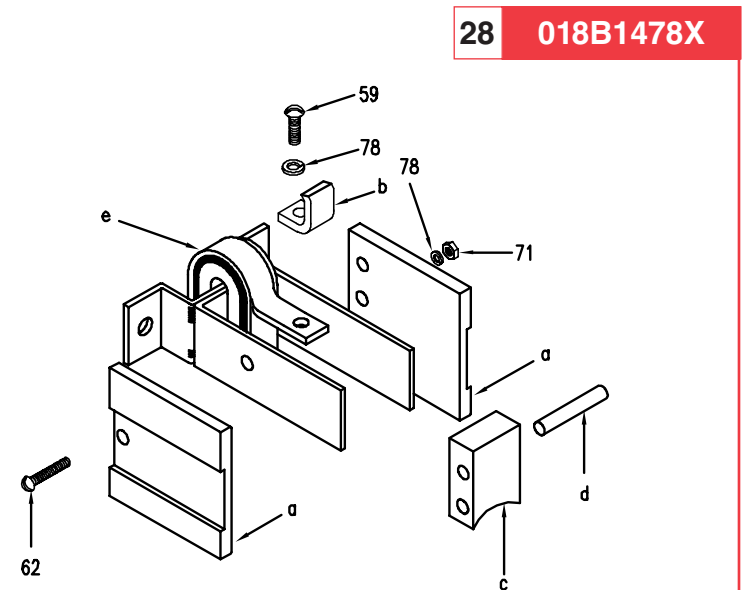
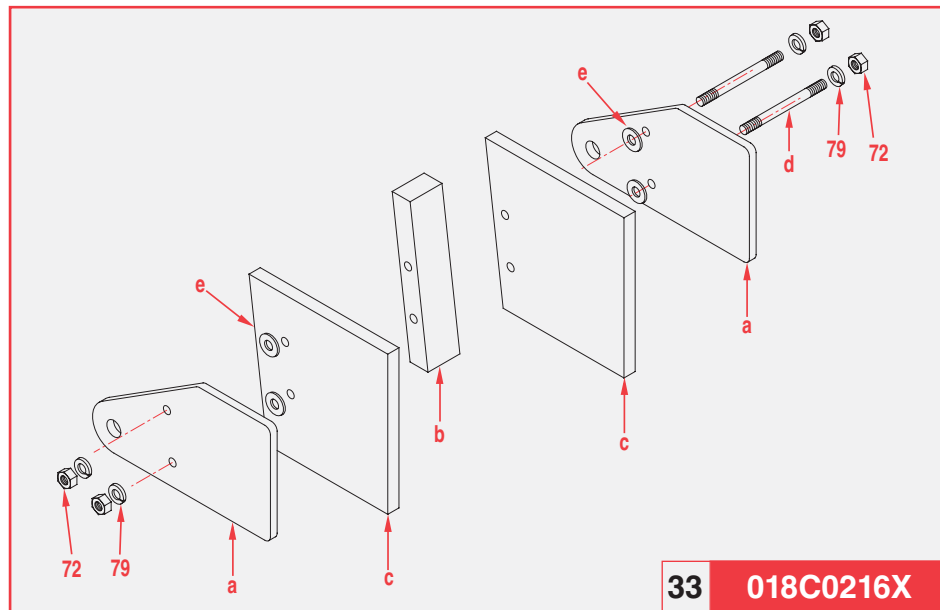
Allows for partial dropping of the load by controlling the amount of reverse current to the magnet. A drop position on the master switch or push button that is spring returned to off, gives the operator complete control of the drop cycle.

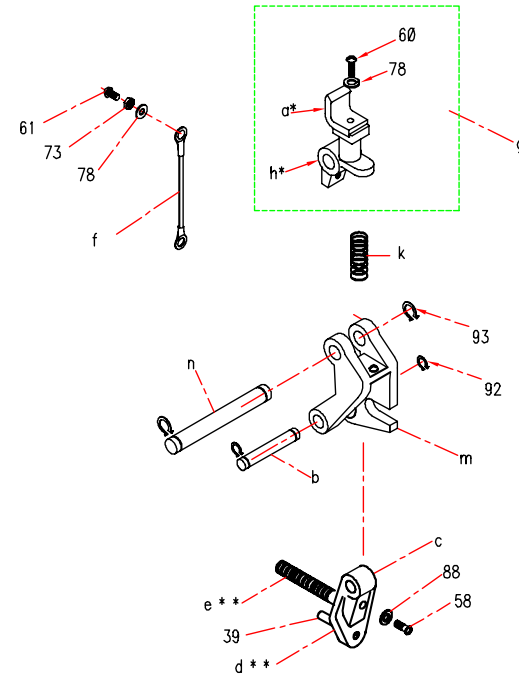
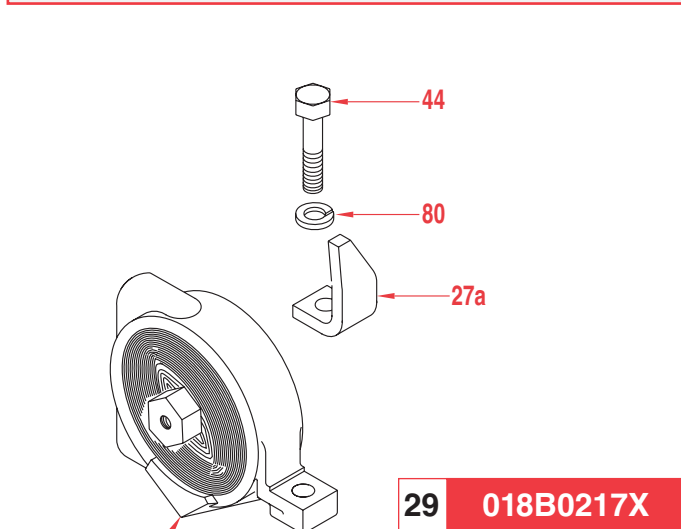
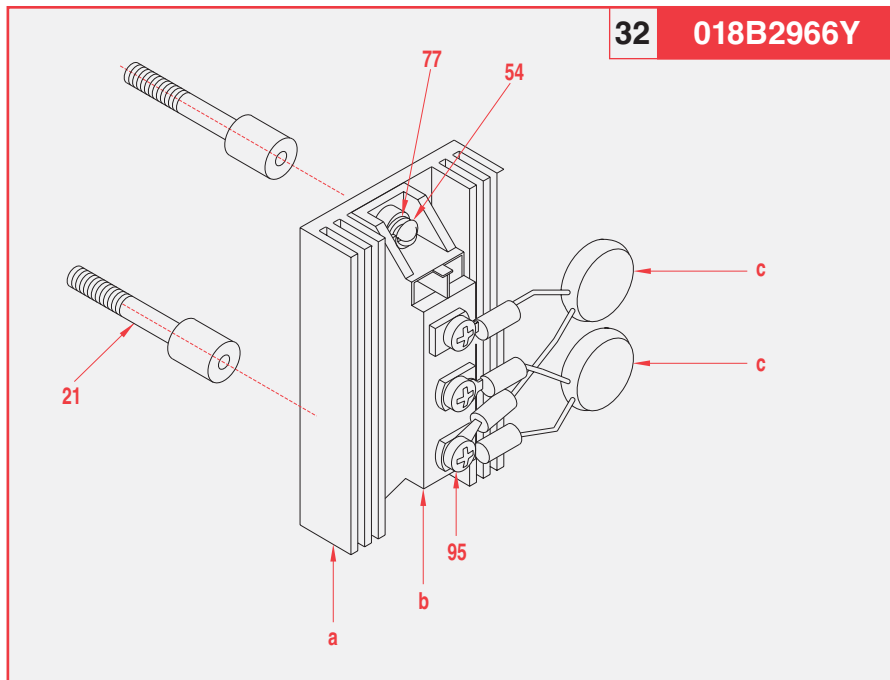
INSTALLATION PROCEDURES

- Mount the controller to a solid surface with the mounting bars provided.
- The controller must be mounted vertically with the "TOP" up to operate properly.
- Mount the controller away from sources of heat and direct exhaust of engines.
- Allow enough room around the controller & resistor bank for air circulation.
- Route electrical wires through the bottom of the enclosure and connect securely to the terminals.
- All electrical circuits must be free from grounds and shorts.
- Remove shipping material from the arc shields before operating the controller.
- The resistor bank must be mounted separately. Provide a cover for the resistor bank to protect it from the weather & dirt.
- The timers are factory preset for magnets rated 150-200 A: TR1=1.25 s; TR2=3.5 s
- For magnets rated below 150 A: TR1=0.75 s; TR2=2.0 s.
- Make additional minor timer adjustments to TR2 for optimal drop characteristics to suit material being handled.

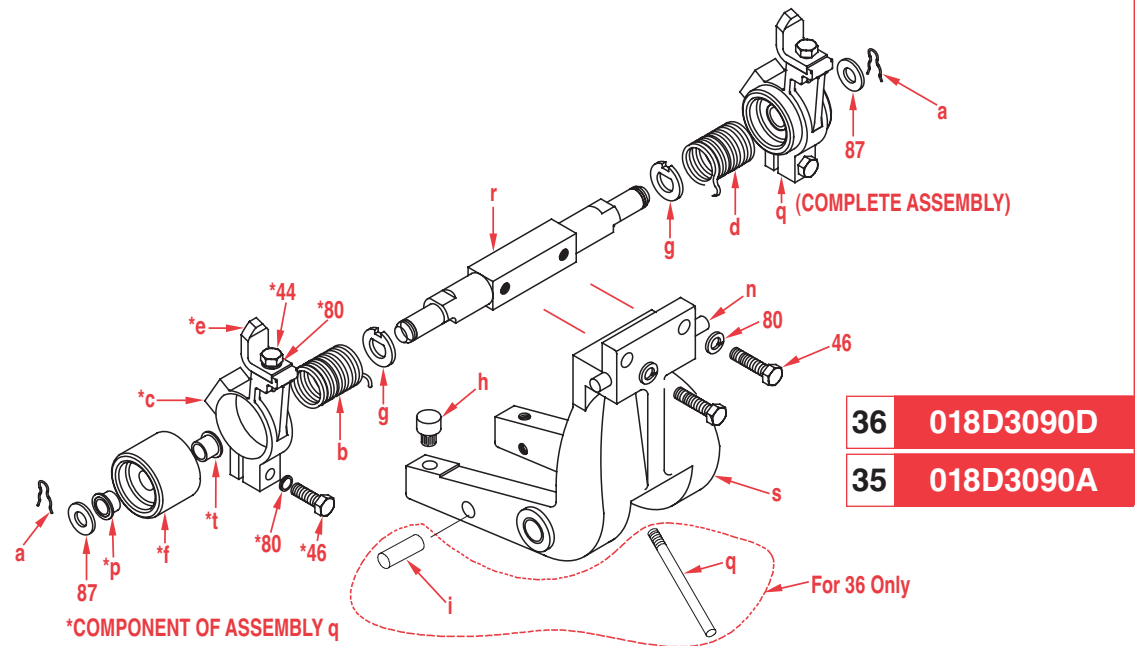
Procedure Start with the dial set at low range. Pick up and drop a load of the material to be handled. If the material does not completely fall off the magnet, increase the adjustment and try another load. If the material drops off and then some jumps back up to the magnet before it can fall free, reduce the adjustment and try another load. When all the material falls cleanly from the magnet, the controller is properly set.

RD-3A SUBASSEMBLIES



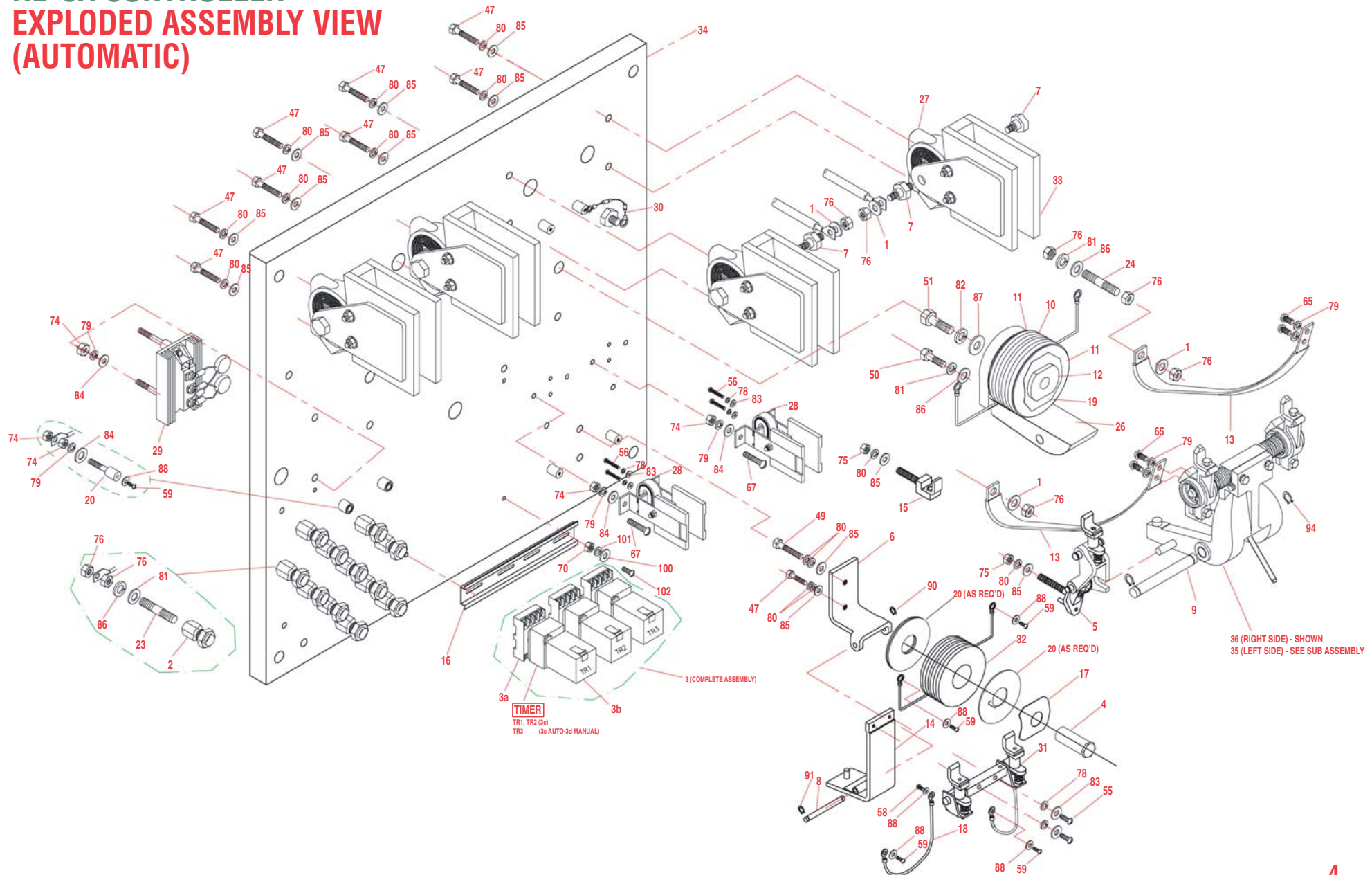


5 018B2966A



OHIO MODEL RD-3A AUTO/MANUAL DROP MAGNET CONTROLLER

RD-3A CONTROLLER EXPLODED ASSEMBLY VIEW (AUTOMATIC)



RD-3A HARDWARE PARTS LIST

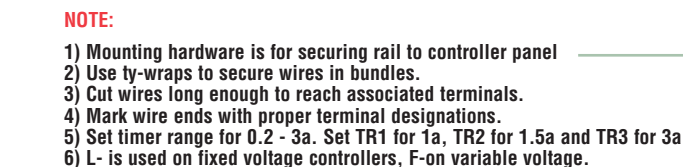
ITEM	PART NUMBER	REQ A230	REQ M230	REQ 0-230	DESCRIPTION	ITEM	PART NUMBER	REQ A230	REQ M230	REQ 0-230	REQ A115	REQ M115	REQ 0-115	DESCRIPTION	ITEM	PART NUMBER	REQ A230	REQ M230	REQ 0-230	REQ A115	REQ M115	REQ 0-115	DESCRIPTION
1	A-900118-21	12	12	12	FLATWASHER: 3/8	31	018B5074X	2	2	2				SWITCH ARM ASSEMBLY	49	A-900007-08	1	1	1				SCR HEX HEAD: 5/16-18 x 2.0 UNC STEEL
2	A-900215-02	11	11	11	CABLE CONNECTOR: #2 - #8	31a	018A1443X	4	4	4				CONTACT TIP	50	A-900008-08	2	2	2				SCR HEX HEAD: 3/8-16 x 1.75 UNC STEEL
3	120B010A04	1		1	TIMER RELAY ASSEMBLY - AUTO	31b	018A2604A	2	2	2				CONTACT BRACKET	51	A-900010-09	2	2	2				SCR HEX HEAD: 1/2-13 x 2.5 UNC STEEL
3	120B010A12		1		TIMER RELAY ASSEMBLY - MANUAL	31c	018A2605A	2	2	2				CONTACT BRACKET	54	A-900023-06	2	2	2				SCR RH SLOTTED: 10-32 x 0.75 UNF STEEL
3a	A-900254-12	3	3	3	RELAY SOCKET	31d	018A2614A	4	4	4				CONTACT ARM ASSEMBLY	55	A-900023-07	2	2	2				SCR RH SLOTTED: 10-32 x 0.88 UNF STEEL
3b	A-900568-34	3	3	3	RELAY: 2-DPDT; 240 V-dc COIL	31e	018A2614X	4	4	4				CONTACT ARM ASSEMBLY	56	A-900023-09	4	4	4				SCR RH SLOTTED: 10-32 x 1.25 UNF STEEL
3c	A-900573-27	3	2	3	TIMER: DELAY-OFF; 240 V-dc	31f	018A2618X	2	2	2				REVERSE ARM SHAFT	58	A-900023-13	3	3	3				SCR RH SLOTTED: 10-32 x 0.31 UNF BRASS
3d	A-900573-31		1		TIMER: INTERVAL; 240 V-dc	31g	018A2625X	4	4	4				CONTACT SPRING	59	A-900023-14	10	12	12				SCR RH SLOTTED: 10-32 x 0.38 UNF BRASS
4	018A6209A	1	1	1	REVERSE CORE ASSEMBLY	31h	018A2631X	4	4	4				SPACER WASHER	60	A-900023-15	2	2	2				SCR RH SLOTTED: 10-32 x 0.50 UNF BRASS
5	018B2966A	1	1	1	AUXILIARY ARM ASSEMBLY	32	018A1508J			1				REVERSE SWITCH COIL: MANUAL 230 V	61	A-900023-24	1	1	1				SCR RH SLOTTED: 10-32 x 0.63 UNF BRASS
5a	018A1443X	2	2	2	CONTACT TIP	33	018C0216X	2	2	2				ARC SHIELD ASSEMBLY: MAIN	62	A-900023-25	1	1	1				SCR RH SLOTTED: 10-32 x 1.75 UNF BRASS
5b	018A1444A	2	2	2	ARM PIN	33a	018A0120X	4	4	4				BLOWOUT EAR	65	A-900025-17	8	8	8				SCR RH SLOTTED: 1/4-20 x 0.50 UNC BRASS
5c	018A1482A	2	2	2	AUXILIARY ARM BASE ASSEMBLY	33b	018A0126X	2	2	2				SPACER WASHER	67	A-900025-22	4	4	4				SCR RH SLOTTED: 1/4-20 x 1.75 UNC BRASS
5d	018A1482X	2	2	2	AUXILIARY BASE	33c	018A0130X	4	4	4				BLOWOUT SHIELD	69	A-900063-02	1	1	1				SCR SOC CUP PT: 1/4-20 x 0.25 STEEL
5e	018A1484X	2	2	2	STUD: 2.18 in 55.5 mm	33d	018A0139X	4	4	4				STUD: Ø3.13 in 80 mm	70	A-900106-38	2	2	2				HEX NUT: M4 x 0.7 STEEL
5f	018A1487A	2	2	2	SHUNT	33e	018A1362X	16	16	16				WASHER	72	A-900106-05	16	16	16				NUT HEX: 1/4-20 STEEL
5g	018A2614A	2	2	2	CONTACT ARM ASSEMBLY	34	018D5511C	1	1	1				PANEL	73	A-900106-21	1	1	1				NUT HEX: 10-32 NF BRASS
5h	018A2614X	2	2	2	CONTACT ARM ASSEMBLY	35	018D3090D	1	1	1				ARM ASSEMBLY	74	A-900108-11	26	28	28				NUT HEX JAM: 1/4-20 NC BRASS
5k	018A2670X	2	2	2	SPRING	35a	A-900221-05	2	2	2				HAIR PIN CLIP: Ø0.38 in 10 mm	75	A-900108-12	2	2	2				NUT HEX JAM: 5/16-18 NC BRASS
5m	018A2898X	2	2	2	AUXILIARY ARM	35b	018A0104X	1	1	1				SPRING : LEFT	76	A-900112-07	46	46	46				NUT HEX JAM: 3/8-16 NC BRASS
5n	018A2945A	2	2	2	ARM PIN	35c	018A0118X	2	2	2				CONTACT ARM: MACHINED	77	A-900115-18	2	2	2				LOCKWASHER SPLIT: #10 BRASS
6	018A2615X	1	1	1	SWITCH FRAME MACHINED	35d	018A0121X	1	1	1				SPRING: RIGHT	78	A-900115-03	8	8	8				LOCKWASHER SPLIT: #10 STEEL
7	018A0123X	8	8	8	BLOWOUT BOLT WITH STUD	35e	018A0125X	2	2	2				CONTACT TIP	79	A-900115-05	22	24	24				LOCKWASER SPLIT: ¼ STEEL
8	018A2623A	1	1	1	ARM PIN: Ø0.25 in 6 mm	35f	018A0128A	2	2	2				ARM INSULATION	80	A-900115-06	28	28	28				LOCKWASHER SPLIT: 5/16 STEEL
9	018A0140C	2	2	2	ARM PIN: Ø0.5 in 12 mm	35g	018A0129X	2	2	2				STOP WASHER	81	A-900115-07	17	17	17				LOCKWASHER SPLIT: 3/8 STEEL
10	018A0151F	2	2	2	MAIN COIL: 230 V	35h	018A0135X	2	2	2				SPRING PIN	82	A-900115-09	2	2	2				LOCKWASHER SPLIT: ½ STEEL
11	018A0152X	6	6	6	INSULATING WASHER	35k	018A0138X	1	1	1				STOP	83	A-900118-03	6	6	6				FLATWASHER: #10 STEEL
12	018A0154A	2	2	2	ASSEMBLY	35p	A-900298-02	2	2	2				BEARING: SELF LUBRICATIONG	84	A-900118-05	14	16	16				FLATWASHER: ¼ STEEL
13	018A0317D	4	4	4	SHUNT ASSEMBLY	35r	018B0131X	1	1	1				ARM SHAFT	85	A-900118-06	16	16	16				FLATWASHER: 5/16 STEEL
14	018A2622X	1	1	1	REVERSE SWITCH ARM ASSEMBLY	35s	018B0219A	2	2	2				CONTACT ARM ASSEMBLY	86	A-900118-07	17	17	17				FLATWASHER: 3/8 STEEL
15	018A1480X	1	1	1	STATIONARY CONTACT ASSEMBLY - AUXILIARY	35t	018C2992A	1	1	1				MAIN ARM MACHINED	87	A-900118-09	6	6	6				FLATWASHER: ½ STEEL
15a	018A1443X	1	1	1	CONTACT TIP	35u	A-900298-03	2	2	2				BEARING: SELF LUBRICATIONG	88	A-900118-18	14	16	16				FLATWASER: #10 BRASS
15b	018A1486X	1	1	1	AUXILIARY CONTACT BRACKET	36	018D3090A	1	1	1				ARM ASSEMBLY +INTERLOCK & OPERATING PIN	91	A-900219-02	2	2	2				EXTERNAL RETAINER RING: SHAFT ¼ STEEL
16	A-900235-03	200	200	200	35 mm DIN RAIL (LENGTH IN MILLIMETRES)	36a	A-900221-05	2	2	2				HAIR PIN CLIP: Ø0.38 in 10 mm	92	A-900219-04	2	2	2				EXTERNAL RETAINER RING: SHAFT 5/16 STEEL
17	018A2637X	1	1	1	SPRING WASHER	36b	018A0104X	1	1	1				SPRING : LEFT	93	A-900219-06	2	2	2				EXTERNAL RETAINER RING: SHAFT 3/8 STEEL
18	018A2720A	2	2	2	SHUNT ASSEMBLY	36c	018A0118X	2	2	2				CONTACT ARM: MACHINED	94	A-900219-09	4	4	4				EXTERNAL RETAINER RING: SHAFT ½ STEEL
19	018A2866X	2	2	2	CLAMP WASHER	36d	018A0121X	1	1	1				SPRING: RIGHT	95	A-900413-08	3	3	3				SCREW ASSEMBLY: M5 x 0.8 x 16 mm STEEL9697
20	018A2977X	6	6	6	SEPERATOR WASHER	36e	018A0125X	2	2	2				CONTACT TIP	100	A-900115-28	2	2	2				FLATWASHER: M4 STEEL
21	018A3010X	10	8	10	TERMINAL STUD	36f	018A0128A	2	2	2				ARM INSULATION	101	A-900118-35	2	2	2				LOCKWASHER: M4 STEEL
23	018A3878A	11	11	11	TERMINAL STUD: 2.5 in 65 mm	36g	018A0129X	2	2	2				STOP WASHER	102	A-900416-11	2	2	2				SCREW: M4 x 0.7 x 35 mm STEEL
24	018A3878X	4	4	4	TERMINAL STUD: 2.75 in 70 mm	36h	018A0135X	2	2	2				SPRING PIN	103	A-900244-38	3	3	3				RELAY HOLD DOWN TY-WRAP
26	018B0116A	2	2	2	MAIN FRAME	36k	018A0138X	1	1	1				STOP	WIRE KITS:								
27	018B0217A	4	4	4	BLOWOUT COIL ASSEMBLY: MAIN	36l	018A1476A	1	1	1				OPERATING PIN	105B009G01	1						MAIN PANEL WIRE KIT	AUTOMATIC
27a	018A0125X	4	4	4	CONTACT TIP	36p	A-900298-02	2	2	2				BEARING: SELF LUBRICATIONG	105B009G02		1					MAIN PANEL WIRE KIT	MANUAL
28	018B1478X	2	2	2	BLOWOUT COIL ASSEMBLY: DROP	36q	018A5645X	1	1	1				THREADED ROD	105B009G03			1				MAIN PANEL WIRE KIT	VARIABLE
28a	018A0803X	4	4	4	ARC SHIELD SIDE	36r	018B0131X	1	1	1				ARM SHAFT									
28b	018A1443X	2	2	2	CONTACT TIP	36s	018B0219A	2	2	2				CONTACT ARM ASSEMBLY									
28c	018A1503X	2	2	2	ARC SHIELD SPACER	36t	018C2992A	1	1	1				MAIN ARM MACHINED									
28d	018A1523X	2	2	2	DOWEL	36u	A-900298-03	2	2	2				BEARING: SELF LUBRICATIONG									
28e	018A2726X	2	2	2	CONTACT BRACKET	37	100A013B1	1	1	1				NAME PLATE									
29	018B2966Y	1	1	1	DIODE/HEATSINK ASSEMBLY	38	1400A074002	3	3	3				SUPPRESSOR DIODE ASSEMBLY									
29a	A-900565-17	1	1	1	HEAT SINK: DRILLED	39	A-900146-02	1	1	1				STAINLESS STEEL SPRING PIN40									
29b	A-900550-26	1	1	1	DIODE MODULE	44	A-900007-02	8	8	8				SCR HEX HEAD: 5/16-18 x 0.75 UNC STEEL									
29c	018A2966Q	2	2	2	MOV SUPPRESSOR ASSEMBLY	46	A-900007-05	8	8	8				SCR HEX HEAD: 5/16-18 x 1.25 UNC STEEL									
30	1400A074001	1	1		CONTROL DIODE ASSEMBLY	47	A-900007-06	9	9	9				SCR HEX HEAD: 5/16-18 x 1.5 UNC STEEL									

Technical drawing of a three-phase motor with a star-delta switch. The drawing shows the motor body with three windings (Tr1, Tr2, Tr3) and a switch mechanism. The drawing includes various dimensions and labels for components and connections.

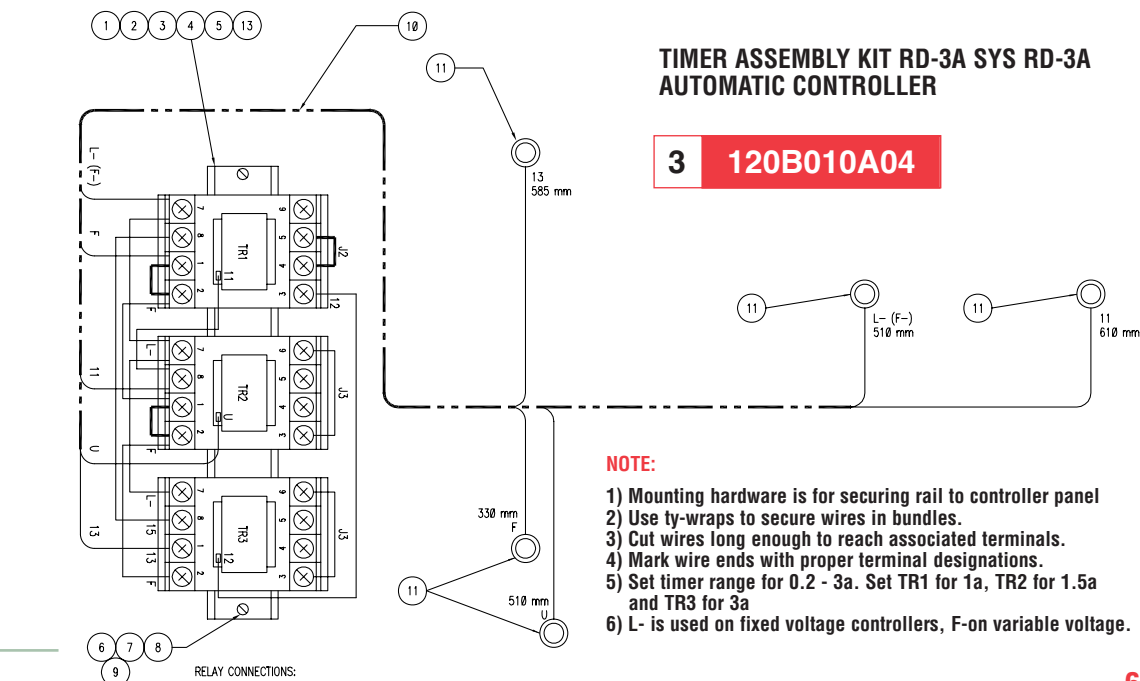
Dimensions and labels:

- 1, 2, 3, 4, 5, 13, 14: Terminal numbers at the top.
- 10: Dimension for the top terminal block.
- 11: Dimension for the switch mechanism.
- 13 585 mm: Dimension for the motor body.
- Tr1, Tr2, Tr3: Labels for the three windings.
- 11, 13, 15: Labels for the switch mechanism.
- U, F: Labels for the switch mechanism.
- 330 mm: Dimension for the switch mechanism.
- 510 mm: Dimension for the switch mechanism.
- 6, 7, 8, 9: Terminal numbers at the bottom.

3 120B010A12



NO	QTY	SYMBOL	PART NUMBER	DESCRIPTION
1	200		A-900235-03	35mm DIN MOUNTING RAIL
2	3		A-900254-12	RELAY SOCKET: 8 PIN
3	3	TR1-TR3	A-900568-34	RELAY: 2-DPDT; 240 V dc COIL
4	3	TR1-TR3	A-900573-27	TIMER: DELAY-OFF; 240 V dc
5	6		A-900567-07	JUMPER
6	2		A-900416-11	SCREW: M4 x 0.7 x 35mm
7	4		A-900118-35	FLATWASHER: M4
8	4		A-900115-28	LOCKWASHER: M4
9	2		A-900106-38	HEX NUT: M4 x 0.7 mm
10	15		A-950000-48	WIRE: 1.5MM ² (#16 AWG) NEOPRENE BLACK
11	5		A-900210-123	WIRE TERMINAL: 6mm (0.25 in) STUD
12			A-900210-109	WIRE TERMINAL: 6mm (0.31 in) STUD
13	3		A-900244-38	RELAY HOLD DOWN TY-WRAP
14				
15				

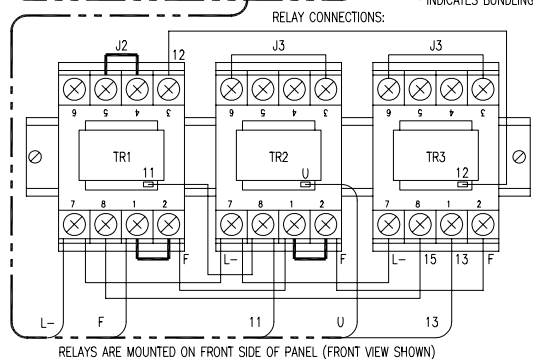
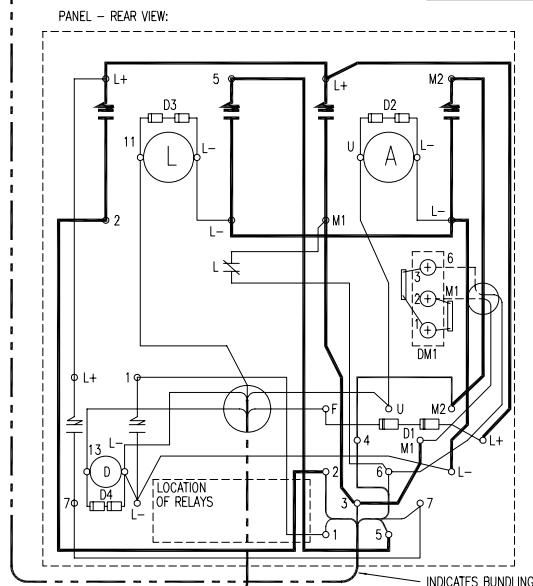
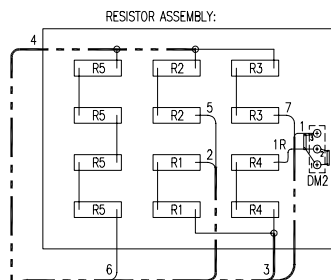


3 120B010A04

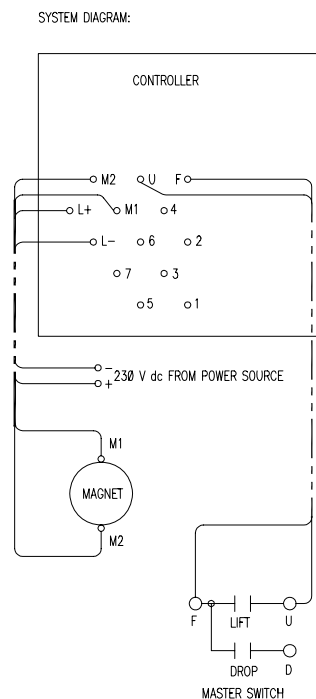
NOTE:

- 1) Mounting hardware is for securing rail to controller panel
- 2) Use ty-wraps to secure wires in bundles.
- 3) Cut wires long enough to reach associated terminals.
- 4) Mark wire ends with proper terminal designations.
- 5) Set timer range for 0.2 - 3a. Set TR1 for 1a, TR2 for 1.5a and TR3 for 3a
- 6) L- is used on fixed voltage controllers. F-on variable voltage.

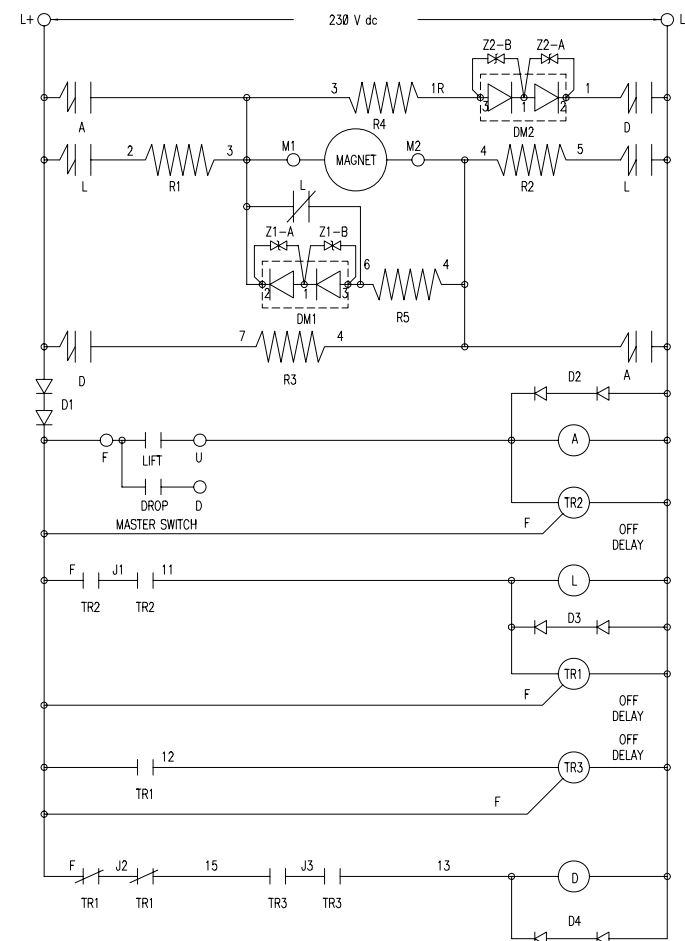
RD-3A WIRING DIAGRAMS



NO	SYMBOL	DESCRIPTION	FUNCTION
1	A	150 A LIFT CONTACTOR	MAIN LINE CONTACTOR
2	L	150 A LIFT CONTACTOR	REDUCED POWER CONTACTOR
3	D	25 A DROP CONTACTOR	REVERSE POWER CONTACTOR
4	TR3	D CONTACT ACTIVATE	REVERSE CYCLE DELAY TIMER
5	TR2	L CONTACT DELAY OPEN	REVERSE POWER ACTIVE TIMER
6	TR1	D CONTACT DELAY ACTIVATE	REDUCED POWER ACTIVE TIMER
7	R1	POWER RESISTOR: $0.5 \Omega \times 2$	REDUCED POWER RESISTOR
8	R2	POWER RESISTOR: $0.5 \Omega \times 2$	REDUCED POWER RESISTOR
9	R3	POWER RESISTOR: $3.1 \Omega \times 2$	REVERSE POWER RESISTOR
10	R4	POWER RESISTOR: $3.1 \Omega \times 2$	REVERSE POWER RESISTOR
11	R5	POWER RESISTOR: $2.3 \Omega \times 4$	MAGNET DISCHARGE RESISTOR
12	DM1.2	POWER DIODE ASSEMBLY	R5 CUTOFF DURING LIFT
13	D1	ANTI-REVERSE CONTROL DIODE	REVERSE POLARITY PROTECT
14	Z1-Z2	METAL OXIDE VARISTOR (MOV)	DIODE VOLT SPIKE PROTECT
15	D2-D4	DISCHARGE DIODE	LIMIT DISCHARGE SPIKE



SET TIMERS DIP SWITCHES FOR 0.2 TO 3 s RANGE.



NOTES:

- 1) Diodes D2 - D4 are mounted on the front side of the controller.
- 2) Timers are preset at factory for magnets rated above 150A.
- 3) Reduce timing on TR2 & TR3 for magnets rated below 150A.
See tabulation.
- 4) Make additional minor timing adjustments on TR3 for optimum drop characteristics to suit the material being handled.
- 5) Set timer TR1 for 1 s.
- 6) Reference assembly diagram 120B010A04 for connections to relays.

MAGNET COLD CURRENT (A)	TIME (s)	
	TR2	TR3
150 - 200	1.25	3.00
100 - 150	0.75	2.00

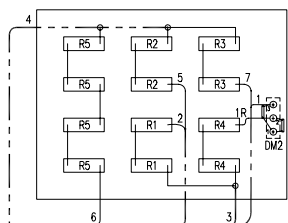
RD-3A AUTOMATIC CONTROLLER
WIRING DIAGRAM & SCHEMATIC
018C5507AB

RD-3A WIRING DIAGRAMS

NOTES:

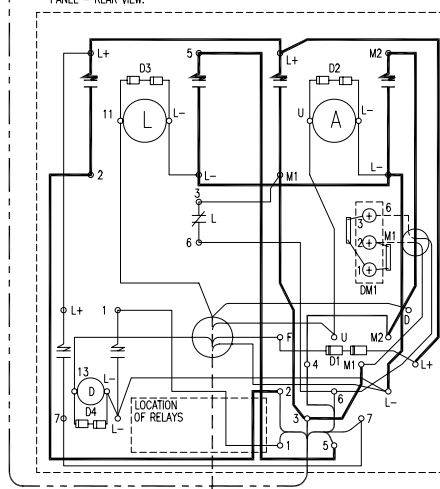
- 1) Diodes D2 - D4 are mounted on the front side of the controller.
- 2) Timers are preset at factory for magnets rated above 150 A.
- 3) Reduce timing on TR2 & TR3 for magnets rated below 150 A. See tabulation.
- 4) Make additional minor timing adjustments on TR3 for optimum drop characteristics to suit the material being handled.
- 5) Set timer TR1 for 1 s.
- 6) Reference assembly diagram 120B010A12 for connections to relays.

RESISTOR ASSEMBLY:



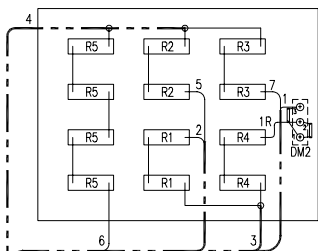
MAGNET COLD CURRENT (A)	TIME (s)	
	TR2	TR3
150 - 200	1.25	5.00
100 - 150	0.75	5.00

PANEL - REAR VIEW:

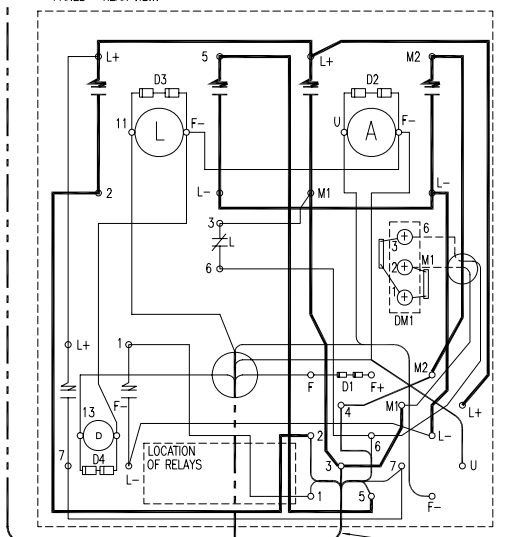


RD-3A WIRING DIAGRAMS

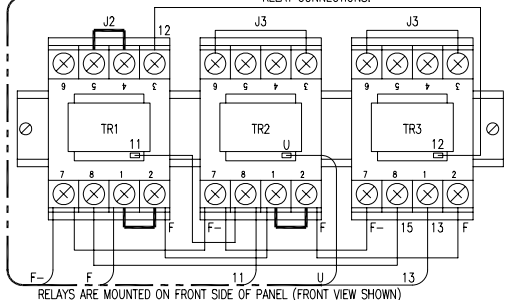
RESISTOR ASSEMBLY:



PANEL - REAR VIEW:

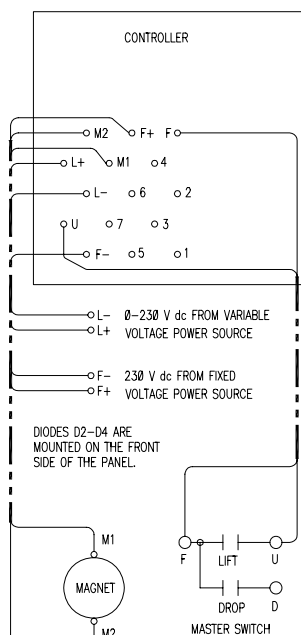


RELAY CONNECTIONS:

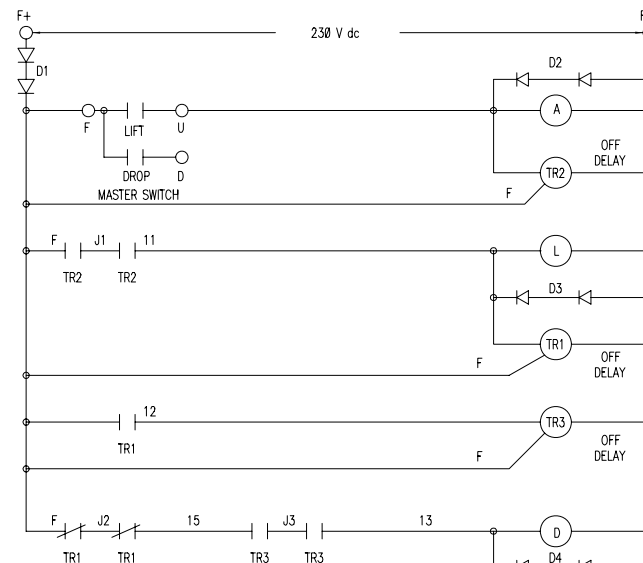
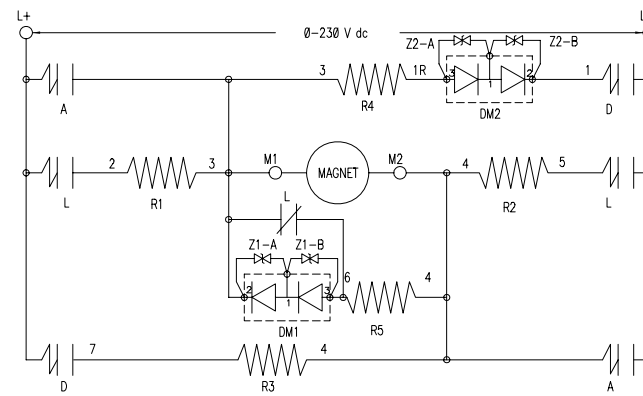


RELAYS ARE MOUNTED ON FRONT SIDE OF PANEL (FRONT VIEW SHOWN)

SYSTEM DIAGRAM:



SET TIMERS DIP SWITCHES FOR 0.2 TO 3 s RANGE.



NOTES:

1) TIMERS ARE PRESET AT FACTORY FOR MAGNETS RATED ABOVE 150 A

MAGNET COLD CURRENT (A)	TIME (s)	
	TR1	TR2
150 - 200	1.25	3.50
100 - 150	0.75	2.00

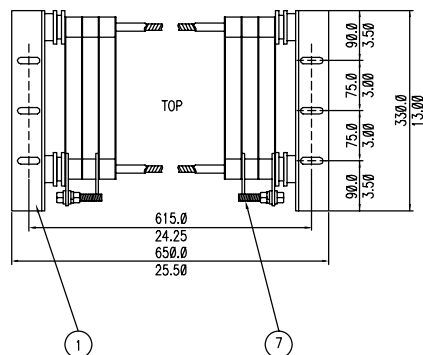
NOTES:

- 1) Timers are preset at factory for magnets rated above 150 A.
- 2) Reduce timing on TR2 & TR3 for magnets rated below 150 A. See tabulation. Set TR1 for 1 s.
- 3) Make additional minor timing adjustments on TR3 for optimum drop characteristics to suit the material being handled.
- 4) Set timer TR1 for 1 s.
- 5) Reference assembly diagram 120B010A04 for connections to relays.

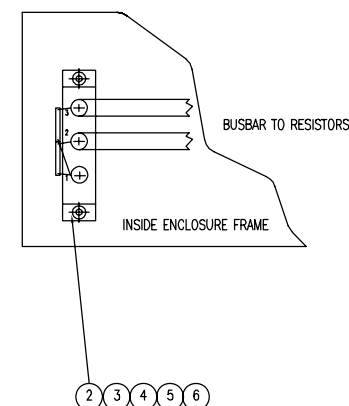
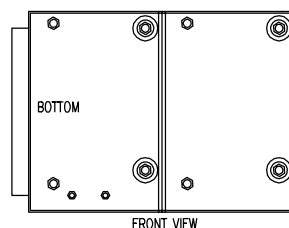
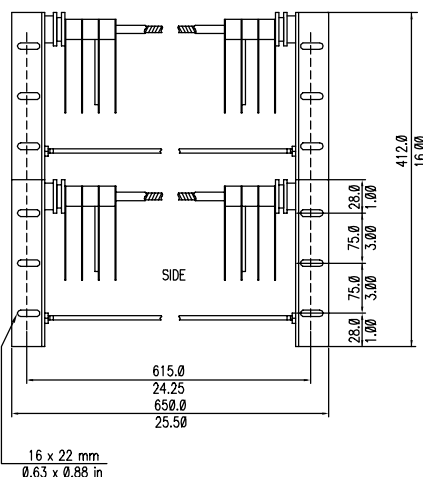
VARIABLE VOLTAGE OPERATION
RD-3A AUTOMATIC CONTROLLER
WIRING DIAGRAM & SCHEMATIC

018C5507AC

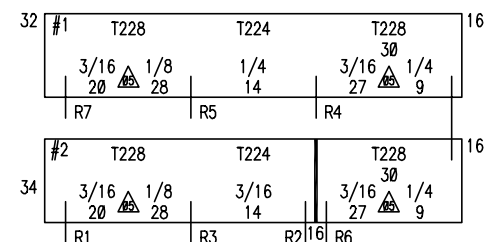
RD-3A RESISTOR BANK DESCRIPTION AND SPECIFICATIONS



STEP	RESISTANCE	C.C.
R1-R3	6.2 Ω	16
R3-R2	1.0 Ω	34
R4-R6	9.2 Ω	20
R4-R5	1.0 Ω	34
R4-R7	6.2 Ω	16



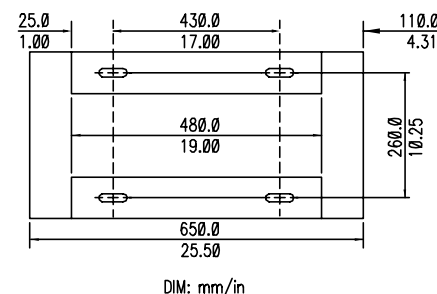
NO	QTY	PART NUMBER	DESCRIPTION
1	1	120B005A8	RESISTOR BANK: RD-3A GRID TYPE
2	1	A-900550-26	MODULAR DOUBLE DIODE: 110A; 1.2 kV
3	2	018A2966Q	MOV SUPPRESSOR ASSEMBLY
4	2	A-900413-10	SCR ASSY: M5 x 0.8 x 18mm
5	2	A-900106-39	HEX NUT: M5 x 0.8mm
6	A/R	A-950009-01	HEAT SINK COMPOUND
7	7	A-900206-01	TERMINAL LUG
8			
9			



2 banks, each 650 x 330 x 206mm (25.5 x 13 x 8 in).
39620B endframes, bolt banks together.
Furnish jumper and 2 piece screened cover.
Heat shield per drawing 37836A.
Modified per drawing 39620A.

Replaces guyan #E-15345

MOUNTING FOOT PATTERN (BOTTOM VIEW):



DIODE MOUNTING INSTRUCTIONS:

- 1) Diode is mounted on the inside of enclosure frame in space provided at the lower left corner of resistor bank.
- 2) Remove screen cover to access diode mounting area.
- 3) Before installing diode, remove factory installed shorting jumper located on extended busbar.
- 4) Apply heat sink compound to bottom base of diode. Mount diode onto frame with terminal #3 of diode mounted on top. diode mounting holes will line up with existing holes in enclosure frame. secure diode to enclosure frame with specified hardware.
- 5) Connect busbar to terminals #2 and #3 as shown using hardware provided with diode.
- 6) Check for snugness of all fasteners.

RESISTOR BANK: RD-3A

120C003A13

STEP BY STEP CONTROLLER OPERATION

AUTOMATIC CONTROLLER

1. When a signal is given by closing the contacts between terminals "F" and "U", the "A" coil and the off-delay timer relay "TR2" are energized.
2. This closes the "A" contacts and applies full power to the magnet.
3. The closing of the "TR2" contact energizes the "L" coil; closing the "L" contacts and also energizes the off-delay timer relay "TR1".
4. The closing of the "TR1" contact energizes the off-delay timer relay "TR3".
5. The closing of the "TR1" contact energizes the off-delay timer relay "TR3"..
6. When the "F" to "U" contact is broken, the "A" coil is de-energized.
7. This opens the "A" contacts and sends current through resistors "R1" and "R2" to drop the magnet current to about half. The magnet will also begin to discharge through DM1 and R5. Timer "TR2" is also de-energized and begins to time out .
8. Once timer "TR2" has completely timed out, its contacts connected to timer "TR1" and coil "L" open up. Coil "L" drops out and timer "TR1" begins to time out. The magnet continues to discharge through DM1 and R5.
9. When timer "TR1" completely times out the normally closed contacts in series with the drop coil will close. Timer "TR3" will still be active and the circuit will be complete allowing the drop coil "D" to energize. The drop coil "D" will remain engaged until timer "TR3" will time out.

MANUAL CONTROLLER

1. When a signal is given by closing the contacts between terminals "F" and "U", the "A" coil and the off-delay timer relay "TR2" are energized.
2. This closes the "A" contacts and applies full power to the magnet.
3. The closing of the "TR2" contact energizes the "L" coil; closing the "L" contacts and also energizes the off-delay timer relay "TR1".
4. The closing of the "TR1" contact energizes the off-delay timer relay "TR3".
5. The normally closed "TR1" contacts in series with the drop coil "D" are opened and the normally opened "TR3" contacts are closed.
6. When the "F" to "U" contact is broken, the "A" coil is de-energized.
7. This opens the "A" contacts and sends current through resistors "R1" and "R2" to drop the magnet current to about half. The magnet will also begin to discharge through DM1 and R5. Timer "TR2" is also de-energized and begins to time out
8. Once timer "TR2" has completely timed out, its contacts connected to timer "TR1" and coil "L" open up. Coil "L" drops out and timer "TR1" begins to time out. The magnet continues to discharge through DM1 and R5.
9. In order to activate the manual drop action, the momentary switch lever has to be moved to the "DROP" position. With timer "TR1" timed out, interval timer "TR3" will engage, closing the "TR3" contacts and engaging the drop coil. The drop coil will remain engaged until timer "TR3" times out or the momentary "DROP" switch is released.



MAINTENANCE AND TROUBLE SHOOTING

Check all contact tips for excess wear & burning. Replace if needed.

Check arc shields for burnt areas. replace any that are badly burnt.

Check for burned or damaged insulation on shunts or wires. Replace if found.

Check for carbon tracking on the base panel and insulating parts. If found remove by filing or scraping. If carbon can not be removed, replace the part.

Check gap [20 mm opening] between the main contacts (#27a and 35e). Adjust by loosening screw (#46) on part (#35c) and turning the assembly.

All pin connections should move easily and contact springs should provide force when the contacts are closed. If the springs do not provide contact force, replace them.

Check Power Diode (DM1) integrity with a standard Digital Multi-Meter (DMM) set to the diode check function. (See the owners manual for details.)

Disconnect the leads to the diode and remove the MOV suppressors (Z1 & Z2) to isolate from the circuit. Place the red lead of the meter on terminal 1 of the diode (the number is stamped next to the terminal) and the black lead on terminal 2. Meter should read <1.0. Reverse the leads and the meter should read open (1.00) or ∞ . Repeat for terminals 3 (red) and 1 (black). If the diode reads bad, replace. Reconnect wires and MOVs (Z1 & Z2).

Note: Z1 & Z2 are MOV suppressors to help limit voltage spikes applied to DM1 and causing Damage



OHIO MAGNETICS—PERFORMANCE ENGINEERED



EMERGENCY SPARE PARTS KITS AND/OR KITS

Automatic — #ESP-018M6100X1

- Contains the parts most likely to fail due to a system problem or a high voltage spike. It is recommended that one of these kits be kept on hand to avoid unnecessary down time.

Manual — #ESP-018M6100X2

- Converts old style contact arm to diode.

OLD STYLE PNEUMATIC TIMER UPGRADE KIT: 120M01A04



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