Instruction Bulletin | Boletín de instrucciones | Directives d'utilisation

6815-14
11/00
Columbia, SC, USA

Magnet Controllers for DC Lifting Magnets
Class 6815 Type M35, MF, 35, M60, and MF60
Controladores de imán para imanes de levantamiento de cd
Clase 6815 tipos M35, MF35, M60, y MF60
Contrôleurs d'aimant pour aimants de levage cc
Classe 6815 types M35, MF35, M60, et MF60

Retain for future use. / Conservar para uso futuro. / À conserver pour usage ultérieur.

SQUARE D

INTRODUCTION

Table 1: Ampere Ratings

Type	Series	Rating (A)
M35	A	15–35
M60		25–60
MF35	A and B	15–35
MF60		25–60

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, BURN, OR EXPLOSION

- This equipment must be installed and serviced only by qualified electrical personnel.
- Before working on or inside the equipment, turn off all power supplying it.
- Always use a properly rated voltage sensing device to confirm the power is off.
- Before turning on the power to this equipment, replace all devices, doors, and covers.

Failure to follow these instructions will result in death or serious injury.

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These ampere ratings apply to the cold current drawn by a magnet when its internal temperature is 68–77 °F (20–25 °C). Do not use the controller with a magnet above or below the controller rated ampere range.

Type MF controllers include a slow-discharge fanning (dribble) control feature.

INSTALLATION

Figure 1: Class 6815 Type M60

1. Unpack the controller carefully. Remove the shipping tape from the contactors.
2. Check the nameplate data for the correct equipment. Check that the contactor operating coils are the correct voltages.
3. Check that all parts are undamaged and secure.
4. Bolt the controller securely into position. Provide adequate clearance in front of the controller for opening the door, inspection, and maintenance. Allow at least 1.5 in. ventilation clearance below the controller.
5. With all power disconnected, pivot the arc chutes upward and manually operate the contactors. The power contact tips should meet squarely. If they do not, refer to “Contact Tip Alignment” in the “Adjustment” section of the contactor instruction bulletin.
6. Pivot the arc chutes back to their proper position.
7. Wire all external circuits to the disconnect switch in accordance with the wiring diagram on the inside of the door.

⚠ DANGER

ARCING HAZARD

- Electrical interruption produces an arc and hot particles.
- Do not stand directly in front of the controller when operating it with the door open.
- Service personnel should wear personal protective equipment.

Failure to follow these instructions will result in serious burns.

PRELIMINARY STARTUP

With Magnet Disconnected

NOTE: Drop contactors 1D and 2D and drop relay DR do not operate with the magnet disconnected.

1. Place the pilot device in the “Drop” position.
2. Apply voltage to the controller. For the best performance, ensure that the voltage is between 230–250 V.

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3. Check the polarity with a voltmeter.

NOTE: The controller does not operate if the polarity is reversed.

4. With voltage applied to the controller, place the pilot device in "Lift" position. Lift contactors 1L and 2L (also fanning contactor F in Type MF controllers) should close freely.
5. On Type MF controllers only, hold the FAN push button down. Lift contactors should open. Release the FAN push button. Lift contactors should re-close.
6. De-energize the controller by placing the pilot device in the drop position. The contactors in step 4 should re-open.

STARTUP

With Magnet Connected

1. Disconnect power from the controller.
2. Make certain that all the arc chutes are pivoted to their fully down position.
3. Connect the magnet.
4. Apply power to the controller.
5. Repeat steps 4–6 as listed in "Preliminary Startup". Note that when drop is initiated, drop contactors DR, 1D, and 2D should close for approximately 1–3 seconds.

ADJUSTMENT FOR CLEAN DROP

To adjust the controller for a clean drop without repicking, the controller has a reverse current rheostat and monitor light. To obtain the best setting for a given magnet, start with the rheostat knob set near MIN, then make lifts and drops at successively higher settings until the light blinks at the end of the drop cycle (see Monitor Light Operation nameplate), or until a clean drop is obtained. Do not set the knob higher than necessary to get a clean drop on all types of loads being handled. Reset the rheostat when the magnet is changed.

PREVENTIVE MAINTENANCE AND TROUBLESHOOTING

⚠ DANGER

HAZARDOUS VOLTAGE

This equipment must be installed and serviced only by qualified electrical personnel.

Failure to follow this instruction will result in death or serious injury.

ARCING HAZARD

- Electrical interruption produces an arc and hot particles.
- Do not stand directly in front of the controller when operating it with the door open.
- Service personnel should wear personal protective equipment.

Failure to follow these instructions will result in serious burns.

Inspect contact tips on the lift and drop contactors on a regular basis for wear and excessive pitting (see "Maintenance" in the contactor instruction bulletin for instructions). Square D recommends that replacement contact tip kits be kept on hand. Each kit contains two contact tips and mounting hardware. *Replace both tips together.*

During operation, periodically inspect for abnormal conditions. In particular, inspect for the following conditions while the device drops a load:

- Excessive or unequal arcing when the two lift contactors open.
- Excessive or unequal arcing when the two drop contactors open.

Should either condition occur, shut down the system to prevent further damage, and check the following items:

- Contact tips and pigtail connectors on all contactors
- Electrical continuity of all fuses, resistors, and the reverse current rheostat
- Electrical continuity of all electrical interlocks
- Shorts and grounds in the system, including the generator, cable, reel, and magnet. Because ohmmeters may not detect grounds, use a 500 V or 1000 V meg-ohmmeter.

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Standard Type M-35, MF-35, M-60, MF-60

Parts Location Diagram

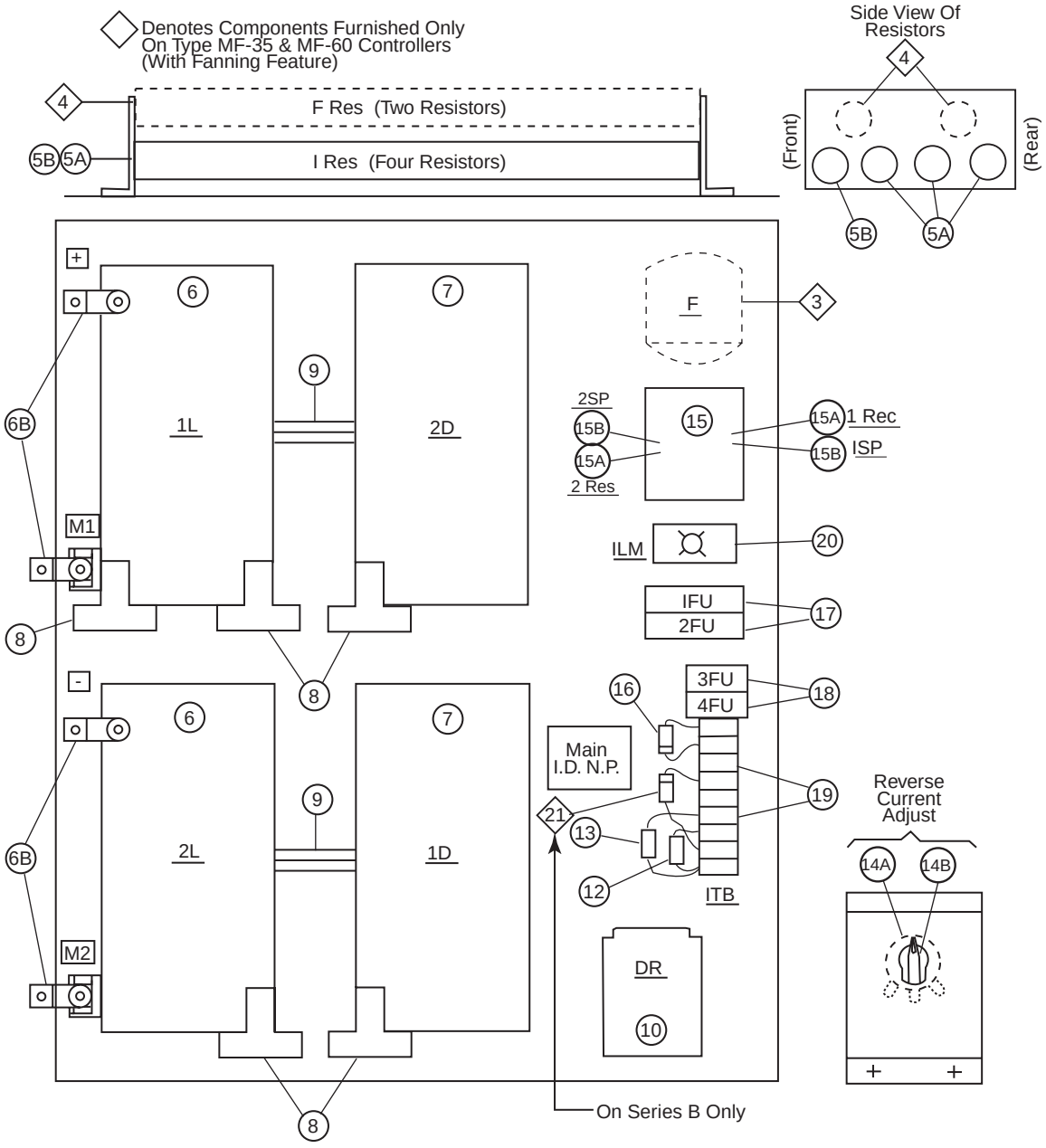

Figure 2: Standard Type M-35, MF-35, M-60, MF-60 Magnet Controllers Parts Location Diagram

NOTE: For definitions of callouts and resistor values refer to Table 2 on page 7.

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NOTE: In Table 2 the quantity in parentheses is for the optional fanning feature.

Table 2: Type M35, M60, MF35, and MF60 Magnet Controller Parts

Symbol	Item No.	Description [1]	Qty.	Part No. or Class and Type No.			
				Type M35	Type M60	Type MF35	Type MF60
—	1A	Assembled control panel (Does not include items 2, 4, 5A, or 5B)	1	Class 6815 Type MP35 [2]	Class 6815 Type MP60 [2]	Class 6815 Type MFP35 [2]	Class 6815 Type MFP60 [2]
	2	Enclosure only, with door	1	50911-048-51			
	2A	Door only	1	50911-064-52			
F	3	Fanning relay	(1)	(none)		Class 8501 Type GDO31 with 240 V DC coil [3]	
	3A	Replacement contact tip set for item 3	(1)	—		Class 9998 Type GG4 Kit	
FRES	4	Fanning resistors (located above items 5A and 5B)	(2)	(none)		26114-52330, 3 Ω 420 W	
1RES	5A	Discharge resistors, center tapped (located behind item 5B)	3	26114-52410 10 Ω 420 W	26114-52355 5.5 Ω 420 W	26114-52410 10 Ω 420 W	26114-52355 5.5 Ω 420 W
	5B	Discharge resistor (located in front of item 5A)	1	26114-52337 3.75 Ω 420 W	26114-52320 2 Ω 420 W	26114-52337 3.75 Ω 420 W	26114-52320 2 Ω 420 W
1L, 2L	6	Lift contactors, complete except for lugs (6B) and electrical and mechanical interlock equipment (items 8 and 9)	2	Class 7004 Type MXDO1, Form Y781 with 120 V coil [4]			
	6A	Replacement silver-faced contact tips for two lift contactors	1	Class 9998 type MX2 *Do not substitute.* (contains 2 moveable tips, 2 stationary tips, and hardware)			
1L, 2L	6B	Power terminal lugs	4	25050-03610			
1D, 2D	7	Drop Contactors, complete except for electrical and mechanical interlock equipment (items 8 and 9)	2	Class 7004 Type MXCO1 with 120 V coil [5]			
	7A	Replacement contact tips for two drop contactors	2	Class 9998 Type MX1 kit (contains 2 moveable tips, 2 stationary tips, and hardware)			
1L, 2L, 1D, F	8	Electrical interlocks (for items 6 and 7) (quantity shown for standard controllers)	→	Class 9999 Type MX11 kit (each kit contains 1 N.O. & 1 N.C. interlock) One kit required for each 2L, 1D, and 2D. Two kits required for 1L.			
1L-2D, 1D-2L	9A	Mechanical interlocks	2	Class 9999 Type MM1 kit [5]			
DR	10	Drop relay	1	Class 7001 Type DO22S5 with 48 V DC coil			
2RES	11	25 W/50 Ω Reset resistor	1	26160-26450			
3RES	12	2 W/82 Ω Control resistor	1	26108-08220			
4RES	13	5 W/1.2 kΩ Control resistor	1	26101-13612			
1RH	14A	50 W/1.0 kΩ Rheostat (reverse current adjustment)	1	26198-34310			
	14B	Pointer knob (for item 14A)	1	29203-04002			
1REC, 2REC, 1SP, 2SP	15	Heat sink assembly, complete (includes 2 item 15A diodes, 2 item 15B surge suppressors, 2 heat sink plates, and 2 mounting brackets)	1	50911-010-54			
1REC, 2REC	15A	Diodes (power circuit)	2	27906-33850			
1SP, 2SP	15B	Surge suppressors	2	27920-93200			
3REC	16	Diode (control circuit)	1	27906-11602			
1FU, 2FU	17	Fuses (power circuit)	2	25413-00260 (Bussman FRN7.0 or equal)			
3FU, 4FU	18	Fuses (control circuit)	2	25419-10091 (Bussman KTK3 or equal)			
1TB	19	Control terminals (quantity shown for standard M and MF controllers)	9	Class 9080 Type GP3			
1LM	20	Monitor light module	1	50910-017-51			
4REC	21	Diode assembly (on Type MF Series B only)	(1)	50910-030-50			

[1] Indented items listed directly under a device are component parts of that device.

[2] Add Form number (if any) from main nameplate on original Type M panel.

[3] See bulletin 311AS for relay components.

[4] See bulletin 7004-63 for contactor components.

[5] See bulletin 7004-61 for contactor components and instructions.

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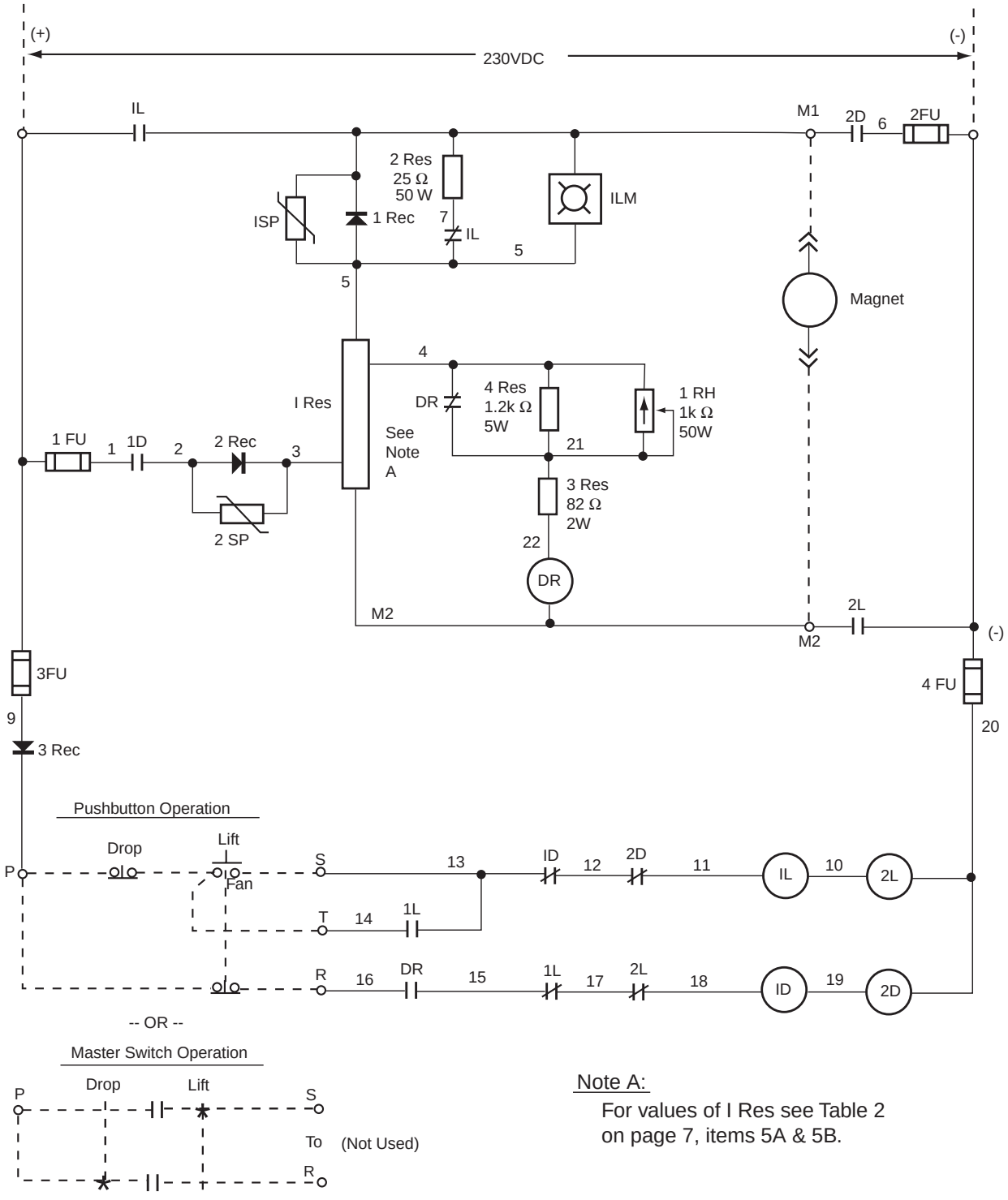

Note A:

For values of I Res see Table 2 on page 7, items 5A & 5B.

Figure 3: Standard Type M35 and M60 Magnet Controller Elementary Diagram

NOTE: Controller operates only when using indicated polarity.

NOTE: Text in parentheses refer to terminal designations.

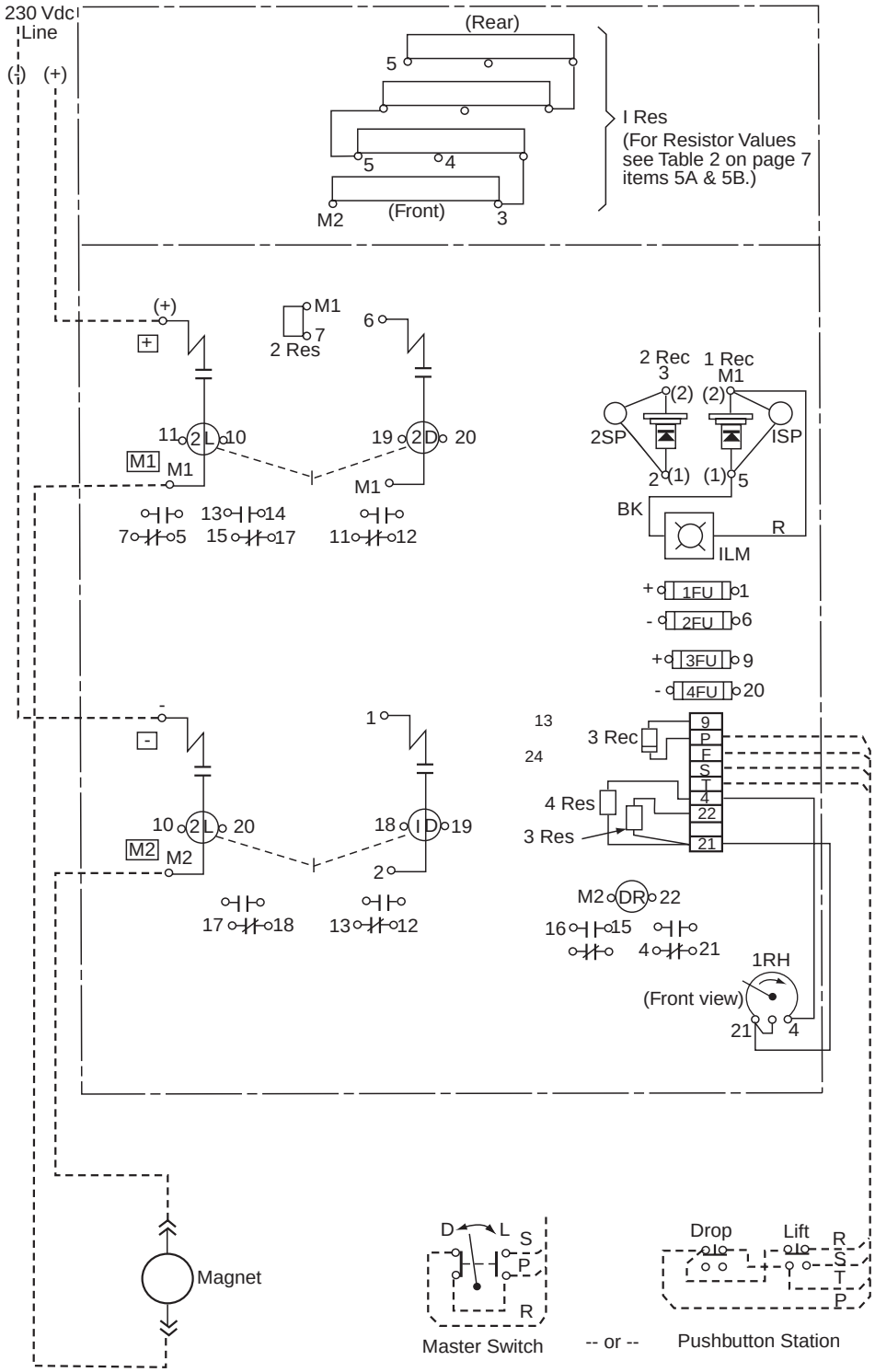

Figure 4: Standard Type M35 and M60 Magnet Controller Connection Diagram

NOTE: Controller operates only when using indicated polarity.

NOTE: Text in parentheses refer to terminal designations.

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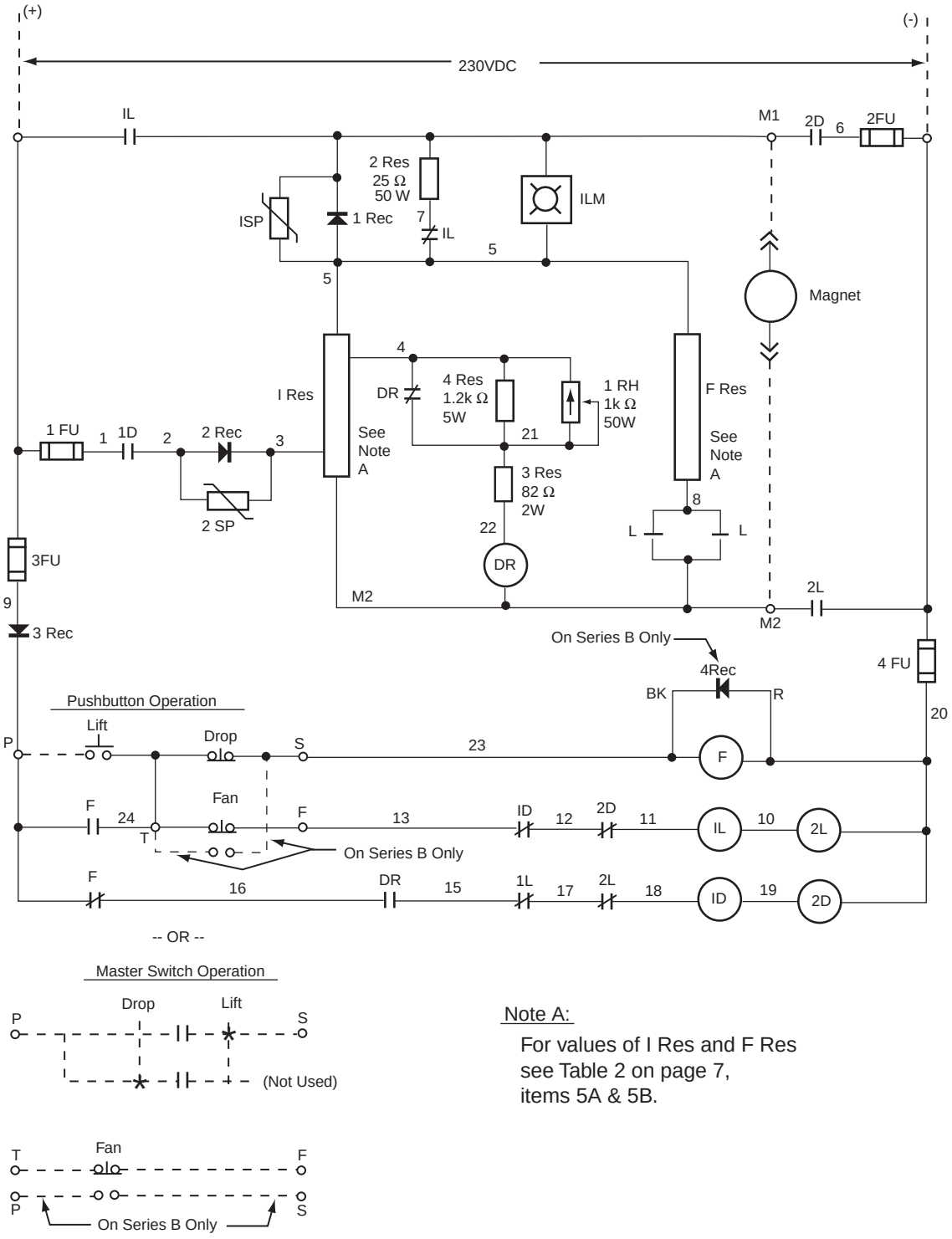

Note A:

For values of I Res and F Res see Table 2 on page 7, items 5A & 5B.

Figure 5: Standard Type MF35 and MF60 Magnet Controller Elementary Diagram

NOTE: Controller operates only when using indicated polarity.

NOTE: Text in parentheses refer to terminal designations.

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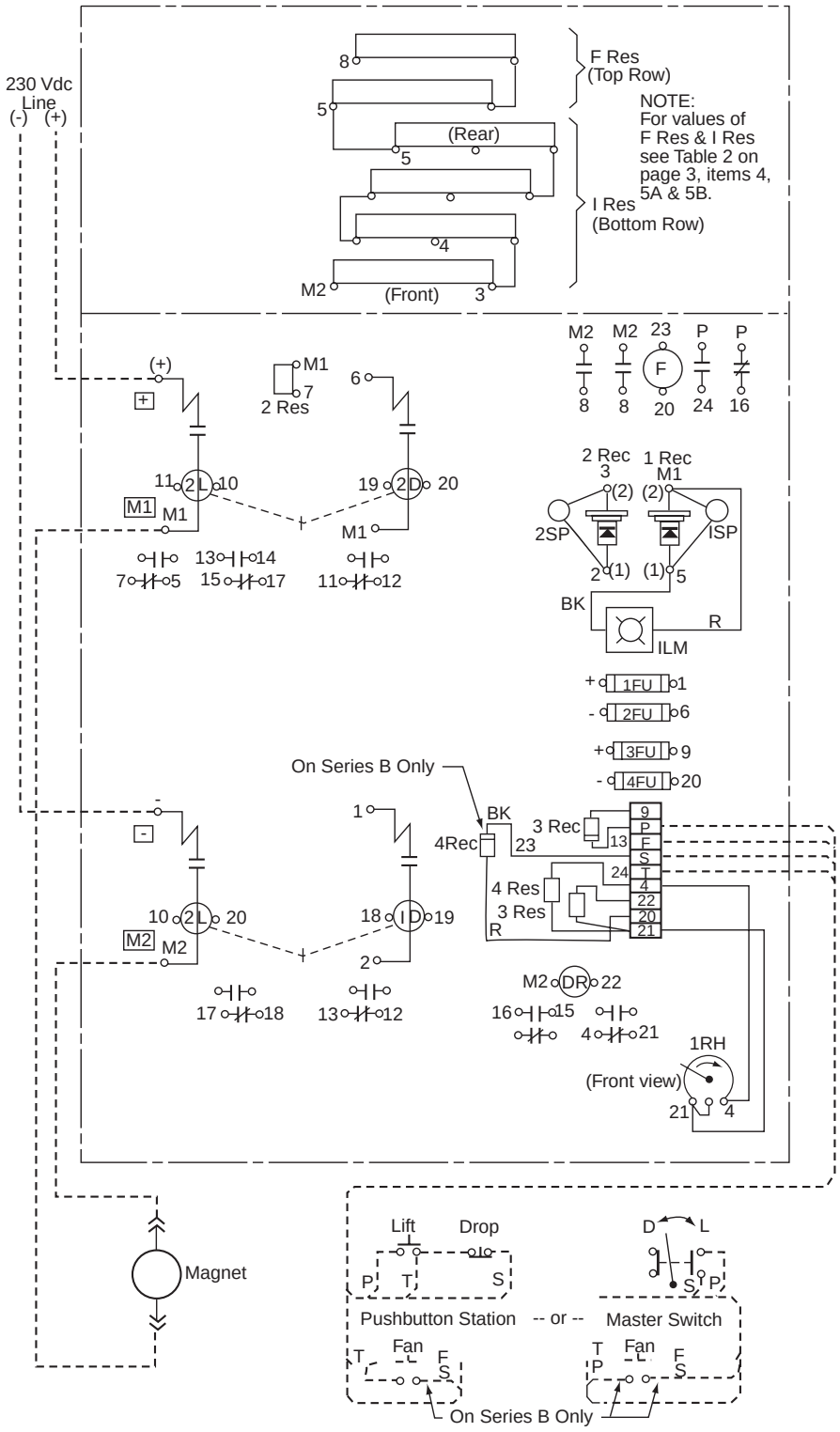

Figure 6: Standard Type MF35 and MF60 Magnet Controller Connection Diagram

NOTE: Controller operates only when using the indicated polarity.

NOTE: Text in parentheses refer to terminal designations.