CLASS 6140 TYPE M____-11 MANUAL MAGNETIC DISCONNECT SWITCH NEMA SIZES 4, 5, 6, 7 & 8, SERIES A

DESCRIPTION

The Class 6140 Manual Magnetic Disconnect Switch is a dc magnetic device used as a main disconnect for crane electrical circuits. It is not to be used for lifting magnet service. It is designed to meet NEMA Standards. It is capable of interrupting operational overload currents, but not short circuit or fault currents in excess of operating overloads.

The basic manual magnetic disconnect switch consists of the equipment listed below. Additional equipment may be included for a specific installation.

2 - Class 7004 Type M, Form Y78-1 (with silver faced power contact tips), SPNO contactors. The contactors are mechanically tied. One normally open and one normally closed electrical interlocks are included for indicating lights.

1 - Two pole, fused, control circuit knife switch

* - Class 9600 Type AI-1 arc inhibitors

* Not required on NEMA sizes 4 and 5 devices

1 - Required on NEMA size 6 device
2 - Required on NEMA sizes 7 and 8 devices

† - Class 8503 Type HDO - 30

† Not required on NEMA sizes 4 and 5 devices

1 - Required on NEMA sizes 6, 7 and 8 devices

MANUAL MAGNETIC DISCONNECT SWITCH RATINGS — MAXIMUM

600 volts dc 40°C Ambient

Panel Type	NEMA Size	Continuous Ampere Rating
MF__-11	4	150
MG__-11	5	300
MH__-11	6	600
MJ__-11	7	900
MK__-11	8	1350

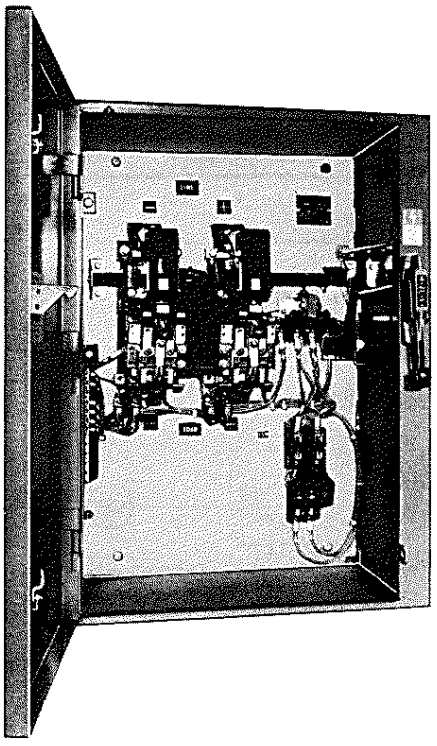
ELECTRICAL INTERLOCKS

Electrical interlocks are rated in accordance with NEMA Standard ICS-2-125 (A600 and N600 Table Ratings).

A600	Maximum Continuous Amperes	Maximum Make and Break Current Amperes							
		120V		240V		480V		600V	
		Make	Break	Make	Break	Make	Break	Make	Break
AC	10	60	6	30	3	15	1.5	12	1.2

N600	Maximum Continuous Amperes	Maximum Make and Break Current Amperes					
		125V		250V		600V	
		Make	Break	Make	Break	Make	Break
DC	10	2.2	2.2	1.1	1.1	.4	.4

Electrical interlocks consist of stationary contacts mounted on the contact arm support and moving contacts attached to the bottom of the contact arm. A set of



electrical interlocks contains one normally open and one normally closed double break contacts. Make and break ratings apply for double-throw contacts only when both the normally open and normally closed contacts are connected to the same polarity.

CONTACT TIPS

The movable and stationary power contact tips are identical. Silver-faced contact tips are standard on crane manual magnetic disconnect switches since the contactors remain closed for long periods of time.

INSTALLATION

1. Unpack disconnect switch carefully. Remove shipping tape from contactors.
2. Check nameplate data for correct equipment. Check that the contactor operating coils are the correct voltage (Refer to basic parts list for coil voltage. Note that the two coils are connected in series and each coil is a half voltage coil).
3. Check that all parts are undamaged and secure.
4. The disconnect switch is designed for wall mounting. Mount the disconnect switch vertically to a rigid support and fasten down tightly. Provide adequate clearance in front of the switch for opening the door, inspection and maintenance.

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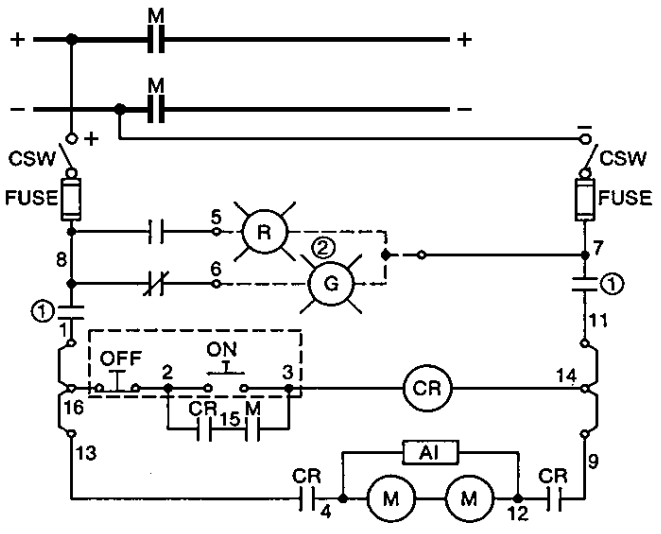
5. With all power removed, pivot the arc chutes upwards and operate the contactors by hand. The power contact tips should meet squarely. If they do not, align them by the procedure in the ADJUSTMENT — Contact Tip Alignment instructions in the contactor service bulletin.
6. Pivot the arc chutes back to their proper position.

CAUTION: DO NOT OPERATE THE CONTACTORS UNDER LOAD UNLESS THE ARC CHUTE IS PIVOTED TO THE FULLY DOWN POSITION.

7. Wire all external circuits to the disconnect switch in accordance with the wiring diagram.



1 Contacts controlled by operating handle.

2 Indicating lamps (if used).

OPERATION

Moving the operating handle of the disconnect switch to the up or ON position closes two mechanically operated normally open electrical interlocks. The contactors can now be closed electrically by a push button. The push button or other energizing means is effective only when the operating handle on the disconnect switch is in the up or ON position.

Mechanical interlocking is provided. When the door is open, the operating handle cannot be inadvertently moved to the up or ON position. In addition, when the door is closed and the operating handle is in the up or ON position, the door cannot be inadvertently opened.

Electrical interlocks on the contactors may be used to operate indicating lights to show when the power contacts are open or closed.

When the operating handle on the disconnect switch is moved to the down or OFF position, the two mechanically operated electrical interlocks are opened and the contactors are de-energized.

With the operating handle in the OFF position, the operating mechanism provides a mechanical interference to prevent inadvertent closing of the power contact tips.

WARNING: ALL POWER MUST BE DISCONNECTED FROM THE MANUAL MAGNETIC DISCONNECT SWITCH BEFORE PERFORMING ANY EMERGENCY ACCESS OR OPERATION, ADJUSTMENT, MAINTENANCE OR TROUBLESHOOTING PROCEDURES.

EMERGENCY ACCESS OR OPERATION PROCEDURE

Normally, access to the interior of the manual magnetic disconnect switch is limited by mechanical interlocking when the handle is in the up or ON position. Qualified personnel may, however, bypass the mechanical interlocking when necessary by the following procedure:

1. Remove all power from the manual magnetic disconnect switch.
2. Disengage mechanical latches at the top and bottom of the door by turning slotted screws (A & B, Fig. 1) counterclockwise approximately 1½ turns with a screwdriver.
3. Disengage mechanical latch on the flange operating handle mechanism by turning the spring loaded slotted screw (C, Fig. 1) on side of mechanism clockwise (counterclockwise on NEMA Size 7 & 8) with a screwdriver while simultaneously opening the door.

If it is necessary to close the manual magnetic disconnect switch with the door open (i.e., for adjustment of the contactors or electrical interlocks), the switch may be closed as follows:

1. Remove all power from the manual magnetic disconnect switch.
2. Push down on the operating mechanism latch (Fig. 2) located in the interior of the manual magnetic disconnect switch and simultaneously move the operating handle to the up or ON position.
3. The contactors can now be closed manually

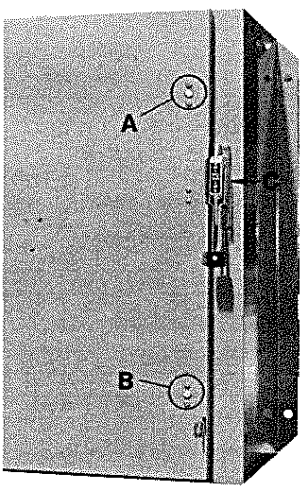


Figure 1

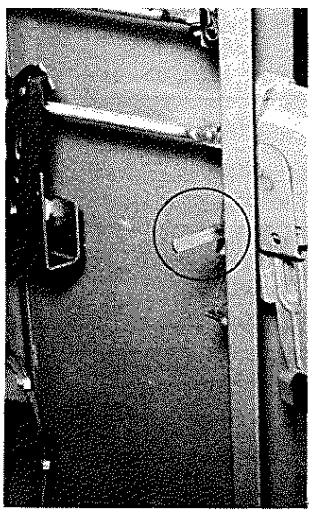


Figure 2

ADJUSTMENT

OPERATING MECHANISM

The operating mechanism is adjusted at the factory and no further adjustment is required.

ELECTRICAL INTERLOCKS ON OPERATING MECHANISM

The electrical interlocks on the operating mechanism are identical to the electrical interlocks on the contactor.

Refer to ADJUSTMENT — Electrical Interlock instructions in the contactor service bulletin. (See Basic Parts List in this Service Bulletin for appropriate contactor service bulletin.)

CONTACTORS

Refer to the ADJUSTMENT section of the contactor service bulletin.

MAINTENANCE

OPERATING MECHANISM

Periodic lubrication of the operating mechanism may be required depending on operational and environmental conditions. The areas circled, should be lightly lubricated with NLGI Grade 2 Grease (Fig. 3).

ELECTRICAL INTERLOCKS ON OPERATING MECHANISM

The electrical interlocks on the operating mechanism are identical to the electrical interlocks on the contactor.

Refer to the MAINTENANCE — Electrical Interlock Replacement instructions in the contactor service bulletin.

CONTACTORS

Refer to the MAINTENANCE section of the contactor service bulletin.

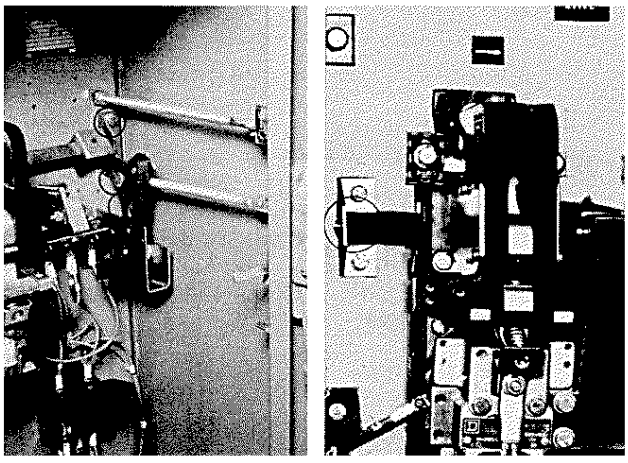


Figure 3

TROUBLESHOOTING

Refer to the Basic Parts List in this Service Bulletin for the contactor coil rating. Refer to Manual Magnetic Rating Table in this Service Bulletin for continuous ampere rating.

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TROUBLE	POSSIBLE CAUSE	REMEDY
Contactor contacts will not close or operation is sluggish.	1. Refer to TROUBLESHOOTING section in the contactor service bulletin.	1. Refer to TROUBLESHOOTING section in the contactor service bulletin.
	2. Electrical Interlocks on operating mechanism not closing.	2. Check that the control circuit contacts are closing when the operating handle is in the up or ON position and that they are not burned or scored.
	3. Control circuit fuse blown.	3. Replace control circuit fuse.
Power contact tips overheating, short contact tip life.	1. Improper power contact tips.	1. Replace with silver faced power contact tips.
	2. Refer to TROUBLESHOOTING section in the contactor service bulletin.	2. Refer to TROUBLESHOOTING section in the contactor service bulletin.
Operating coil overheats	1. Refer to TROUBLESHOOTING section in the contactor service bulletin.	1. Refer to TROUBLESHOOTING section in the contactor service bulletin.

BASIC PARTS LIST

	Contactors						
Manual Magnetic NEMA Size	Class 7004 Form Y78-1 Type	Silver Faced PowerContact Tip Kit Class 9998 Type	Electrical Interlock Kit Class 9999 Type	Coil Part No.	Coil Rating Volts DC	Coil Rating Ohms Res @ 20°C	Service Bulletin
4	MFO-1	MF-2	MX-11	D51017-056-51	115-120	407	7004-67
5	MGO-1	MG-2	MX-11	D51019-243-56	115-120	310	7004-69
6	MHO-1	MH-2	MX-11	D51020-243-74	115-120	192	7004-71
7	MJO-1	MJK-2	MX-11	D51022-056-74	115-120	94	7004-73
8	MKO-1	MJK-2	MX-11	D51022-056-74	115-120	94	7004-75

	Magnetic Overload Relays (If Used)			Power Fuses (If Used)		Control Circuit Relays	
Manual Magnetic NEMA Size	Class 9055 Type*	Coil Part No.	Service Bulletin	Type	Ampere Rating	Class 8501 Type†	Service Bulletin
4	AO NO	750-D135-G1 750-D135-G1	260AS 261AS	FRN	150	—	—
5	AO NO	750-F94-G1 750-F94-G1	260AS 261AS	FRN	300	—	—
6	AO NO	A51141-020-01 A51141-020-01	260AS 261AS	FRN	600	HDO-30	343AS
7	AO NO	C51141-144-01 C51141-144-01	260AS 261AS	KRA	800	HDO-30	343AS
8	AO NO	C51141-144-01 C51141-144-01	260AS 261AS	KRA	1200	HDO-30	343AS

Manual Magnetic NEMA Size	Control Circuit Fuses Type	Control Circuit Fuses Ampere Rating	Contactor Tie Bar Qty.	Contactor Tie Bar Part No.
4	NON	15	1	A51047-302-01
5	NON	15	1	A51048-297-01
6	NON	15	1 2	A51049-130-01 B50512-157-08
7	NON	15	1	B51051-216-01
8	NON	15	1	B51051-216-01

* AO - Time Delay Trip Type, NO - Instantaneous Trip Type

† Coil rated 230-240 volts DC, 213 ohms at 20°C, Part No. 31071-412-53