

Clamped EBMX Motor Control Series – Combination Line Starters, Motor Starters, Circuit Breakers, Disconnect Switches

Installation & Maintenance Information

IF 1794

SAVE THESE INSTRUCTIONS FOR FUTURE REFERENCE

APPLICATION

The Clamped EBMX Motor Control Series is used for general motor control, circuit protection and disconnection in hazardous environments. It provides disconnecting means, motor branch circuit protection, motor running protection, under voltage protection and remote starting and stopping by means of a combination of thermal magnetic or electronic trip circuit breakers, magnetic motor starters and load break disconnect switches.

EBMX Series Enclosures are suitable for use in Class I, Groups B, C, D; Class II, Groups E, F, G; and Class III hazardous (classified) areas as defined by the National Electrical Code® (NEC) Article 500.

EBMX Series Enclosures should be installed, inspected and serviced by qualified and competent personnel.

NEMA 4X with no cover operators or pilot lights only. NEMA 3R with pushbutton or selector switch.

ENCLOSURE INSTALLATION

⚠ WARNING

To avoid risk of electric shock, electrical power must be OFF before and during product installation and maintenance. Failure to comply can result in damage to equipment or injury to personnel.

- Select a mounting location that will provide suitable strength and rigidity for supporting the enclosure, all contained wiring and control devices. See Figure 1 and Table 1 for enclosure mounting dimensions. Ensure final mounting height of enclosure is such that no operator handle, pushbutton or selector switch is located higher than 6' 7" off the ground. See Appendix for enclosure to enclosure spacing.
- Install four (4) 1/2" diameter mounting bolts in the mounting surface per Figure 1. Then remove the top two (2) in preparation for placing the enclosure in position.
- Install detachable mounting feet while enclosure is on the floor or work bench (see Figure 2).
 - Insert four (4) wedge shaped mounting feet into dovetail slots in enclosure body.
 - Tap each foot to securely tighten into slot.
- Two (2) steel lifting plates are included to provide a means for mechanical lifting. Each steel plate is attached to the top side of the body and cover flange with two (2) 5/16" stainless steel bolts.

⚠ CAUTION

To avoid injury to personnel, ensure the four (4) 5/16-18 bolts are torqued to 11 ft.-lbs. on each of the two (2) lifting plates before attempting to lift the enclosure. Always lift enclosures using BOTH lifting plates. Always verify all clamps are fully engaged and holding body and cover together before lifting. Use appropriate lifting equipment to ensure a lift angle of 90 degrees or less is maintained (see Figure 3).

- Position enclosure on mounting surface with mounting feet on the lower two (2) mounting bolts. While continuing to support the enclosure in position, install the top two (2) bolts. Tighten all four (4) mounting bolts securely in place.
- Once the enclosure is securely fastened to the mounting location, attach to conduit system.
- Install approved conduit sealing fittings as required by the NEC plus any other applicable codes. Use explosionproof RE Series Reducers for conduit smaller than tapped opening.

⚠ CAUTION

Sealing fittings must be installed in accordance with the NEC and properly poured. See instructions supplied with sealing fittings. NOTE: Select nipple lengths sufficient to permit sealing fittings and unions to clear the flange.

- Remove the two (2) lifting plates by removing the two (2) 5/16" bolts holding each plate to the body and cover of the enclosure. Once removed, discard the lifting plates. Replace all 5/16" bolts for future pry point.

⚠ CAUTION

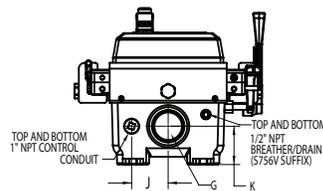
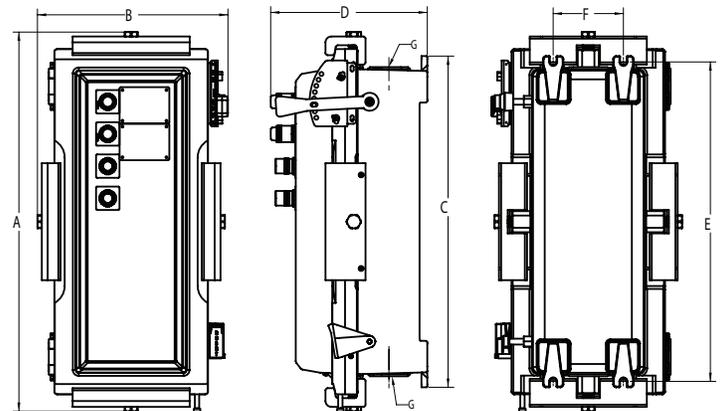
- Hazardous location information specifying class and group is marked on the nameplate of each enclosure.
- No conduit openings are to be added in the field.
- All unused conduit openings must be plugged with explosionproof plugs. Plugs must be a minimum of 1/8 inch thick and engage a minimum of five (5) full threads.

⚠ CAUTION

For gas Groups B, C, D with an ambient temperature range not less than -25°C; and for gas Groups C, D with ambient temperature range less than -50°C, to prevent external fire or explosion, do not connect to a supply circuit having a capability of delivering more than 10,000 rms symmetrical amperes.

For gas Groups C, D with an ambient temperature range of not less than -25°C, to prevent external fire or explosion, do not install switching equipment intended to interrupt more than at 240/480 VAC 65,000 symmetrical amps and 600 VAC 35,000 symmetrical amperes.

Do not install equipment which will produce external surface temperatures exceeding the ignition temperature of the flammable or combustible materials which may surround this enclosure. Circuit interrupting devices, such as switches, relays and circuit breakers, which may be installed in the enclosure, may fail electrically or mechanically unless they have been investigated and found suitable for operation in the hazardous locations involved.



NOTE

Clamps require at least 0.5" travel to allow cover to be opened. The clamp is fully extended after 0.9" of travel.

Figure 1

Enclosure size	A	B	C	D	E	F	G		J	K	Approx. weight (lbs.)
							drilled & tapped	with reducer			
1	22.11	15.98	18.04	12.86	17.13	6.00	2 NPT	1.5 NPT	3.12	3.01	100
2	32.40	16.28	28.31	13.56	27.25	6.00	3 NPT	2.5 NPT	3.12	3.28	160
3	42.28	17.93	38.15	13.85	37.25	6.00	3 NPT	2.5 NPT	3.93	3.56	280

Table 1 (in Inches)

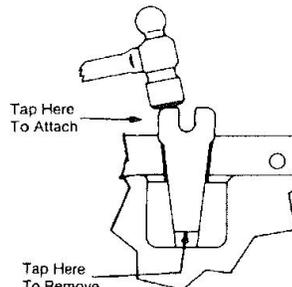


Figure 2 – Tap-in Mounting Feet

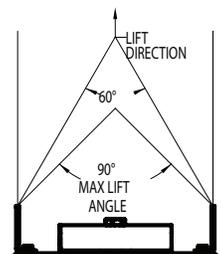


Figure 3

OPENING COVER

⚠ WARNING

To prevent injury to personnel and/or damage to enclosure, DO NOT use impact driver or other power type tools on clamp actuators. Only a manually operated wrench or ratchet should be used to tighten and loosen clamps. Keep clear of potential pinch points near clamp when actuating.

EBMX Enclosures are furnished with precision machined clamps for securing the enclosure. Make sure all clamps are fully retracted (counter-clockwise on actuators) until actuator cannot be turned before attempting to open or close the cover. There should be a minimum of 3/16" gap between clamp and enclosure before opening or closing cover. (See Figure 4).

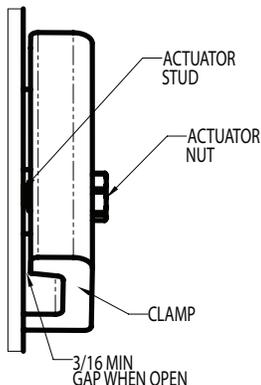


Figure 4 – Clamp Clearance Opening and Closing

After all clamps are fully disengaged, firmly grasp the cover handle in lower right corner of cover and carefully swing cover open to prevent damage to the ground joint surface or precision machined taper on cover. Avoid striking cover, or devices in cover, on neighboring enclosures or structures. If cover is stuck closed, a tool can be used to pry between two (2) bolts in the top right corner to open the cover. While prying, be sure no part of the pry device comes in contact with the edge of the flange, which could damage the flame path.

⚠ CAUTION

To avoid the risk of explosion or electrical shock, hammers or prying tools must not be allowed to damage the flat machined joint surfaces or cover gasket.

CLOSING COVER

⚠ CAUTION

To avoid the risk of explosion, cover joints must be cleaned before replacing cover. Dirt or foreign material must not accumulate on flat ground joint surfaces. Surfaces must seat fully against each other to provide a proper explosionproof joint. Clean machined interface surfaces of clamp engagement on clamp, body and cover, as well as gasket. Clean clamps and clamping surfaces, actuator nuts and actuator studs. Ensure clamps, clamping surfaces, actuator nuts and studs are not worn and are in proper operating condition.

⚠ CAUTION

To avoid the risk of explosion, before closing cover, be certain all clamps are retracted fully away from the body and cover. This is important to prevent damage to the ground joint surface by the clamps when the cover is closed (see Figure 4). When closing cover, be sure wiring is not pinched between body and cover flanges.

Use handle in bottom right corner of cover, and keep hands clear of body and cover flange while closing to avoid injury. When cover is closed, tighten all clamps snug before wrenching any actuators tight. Torque to 40-45 ft.-lbs. Only use clamp assembly supplied with the enclosure or replacement hardware from the manufacturer. They are matched to the enclosure and substitutes may impair the explosionproof safety of the enclosure. If the clamp assembly is damaged, contact manufacturer.

GROUNDING AND BONDING

Grounding and bonding of the conduit and equipment is required by the National Electrical Code. A grounding conductor, when used, must be connected to the grounding lug(s), furnished (see Figure 7). Suffix S214 provides an external ground lug in bottom left corner of enclosure.

⚠ WARNING

To avoid the risk of explosion, the EBMX Series Enclosures must be securely attached into a permanently grounded system in accordance with Article 501-16, 502-16 of the National Electrical Code. The internal grounding lug shall be used as the primary equipment ground.

Determine the type of distribution system to be used that complies with NEC requirements and ensures grounding continuity.

All conductive materials that enclose the electrical conductors, attached equipment or forming part of such equipment, must be grounded. A permanent conducting connection must be made between all such equipment and the earth.

INSTALLATION OF INTERNAL COMPONENTS

If EBMX Enclosure only (without motor starter, circuit breaker or disconnect switch) is supplied, the internal operating mechanism (bail assembly) for the circuit breaker/HMCP must be removed prior to installation on a combo unit. Motor starter reset mechanism DOES NOT have to be removed for starter installation (see Tables 2 and 3 for electrical component options, as well as Appendix Table A1).

NOTE: The interior equipment mounting plate may be removed to aid in the installation of the disconnect switch, circuit breaker, motor starter or other optional equipment. Before removing mounting plate, follow Step 1A of 'Circuit Breaker Installation' section, for removing the linkage between operating mechanisms and the enclosure, if required.

Enclosure size	Internal electrical components
1	Eaton EG Breaker Eaton HMCPPE Socomec 30/60A Fused Disconnect Switch Socomec 30/60/100A Non-fused Disconnect Switch Eaton Freedom NEMA 0, 1, 2 Starters Square D HGL Breaker GE TED Breaker
2	Eaton JG Breaker Socomec 100A Fused Disconnect Switch Eaton Freedom NEMA 3 Starters Eaton Freedom NEMA 0, 1, 2 Combo Starters with Eaton EG Breaker/HMCPPE Eaton Freedom NEMA 0, 1, 2 Combo Starters with Eaton JG Breaker/HMCPJ
3	Eaton LG Breaker Eaton HMCPJ Eaton HMCPJL Socomec 200A Fused Disconnect Eaton Freedom NEMA 4 Starters Eaton Freedom NEMA 3 Combo Starter with Eaton EG Breaker/HMCPPE Eaton Freedom NEMA 4 Combo Starter with Eaton JG Breaker/HMCPJ

Table 2 – Empty Enclosure Sizes and Associated Manufacturers

CIRCUIT BREAKER/HMCP INSTALLATION

Consult instructions from circuit breaker/HMCP manufacturer before beginning installation. The mounting plate and operating mechanism will accommodate breaker/HMCP manufacturers and amperage ranges per Table 3.

Enclosure size	Breaker/HMCP options	Max. amperage
1	Eaton EG Eaton HMCPPE Sq. D GE	15-100A 100A 15-100A 15-100A
2	Eaton JG	125-225A
3	Eaton JG Eaton LG Eaton HMCPJ Eaton HMCPJL	250A 300-500A 250A 400A

Table 3 – Breaker Manufacturers and Amperages

- If circuit breaker is going into a new empty breaker only enclosure (non-populated), it is possible to install the breaker without removing the bail assembly. Remove two (2) bail finger screws to remove top bail finger. With bail finger removed, and breaker handle in OFF position, the breaker can be slid from the top of the enclosure down. Skip to Step 4 below, and then reinstall top bail finger, making sure two (2) bail fingers are on either side of breaker toggle. Follow Step 9, and if alignment of mechanism is required, follow steps below.
 - To remove bail assembly, unfasten stop nut (from shoulder screw) that joins the handle link and middle link together. Slide the middle link arm off the shoulder screw. (Do not remove shaft nut that secures the handle link to the threaded handle shaft). (See Figure 5).
- Loosen but do not remove the top two (2) 1/4-20 round head screws, which secure the bail brackets to the mounting plate.
- Unthread the bottom two (2) 1/4-20 round head screws from the mounting plate. The bottom two (2) screws are captive to the bail brackets and should not be removed. Move the bail assembly until the bracket slots are clear of the top two (2) screws. Set aside the bail assembly.
- Install circuit breaker LINE side up. Select the correct manufacturer's mounting holes on equipment plate before positioning circuit breaker. Secure breaker to mounting plate with screws provided from circuit breaker manufacturer (Sq. D/GE breaker hardware not provided). Spacers are included for Eaton LG breakers, which should be placed under the head of mounting hardware before installing through breaker.
- After circuit breaker is installed, verify label on the middle link for hole alignment based on the breaker manufacturer. See Appendix Table A1 for link hole position per configuration and adjust if required. Re-attach the middle link to handle link with shoulder screw and stop nut removed in Step 1 per Figure 5.

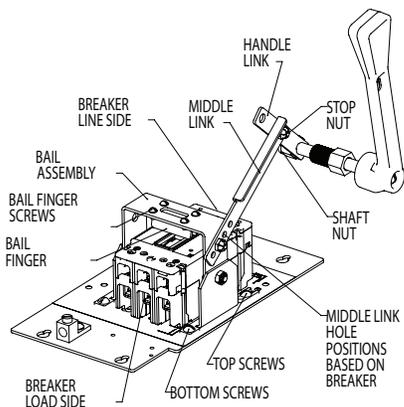


Figure 5 – Circuit Breaker Install

6. Reposition bail assembly over toggle arm of circuit breaker and slide bail brackets under the top two (2) 1/4-20 screws in the mounting plate.
7. Align bail assembly mounting holes/slots (bottom two (2) 1/4-20 screws) over the holes in the mounting plate labeled for the manufacturer's circuit breaker.
8. Securely fasten all four (4) 1/4-20 screws on the bail assembly.
9. Visually inspect for proper alignment and accurate mechanism for correct operation. If necessary (to prevent over/under toggle travel and allow resetting of tripped breaker), adjust the circuit breaker stops as required (see Figure 6).
10. Locate adjustable stop buttons in the appropriate holes for correct breaker operation. See 'Circuit Breaker/HMCP Operation Test' below.

CIRCUIT BREAKER/HMCP OPERATION TEST

- Move breaker handle to the extreme "OFF" (Reset) position and adjust stop button so that it just touches the handle.
- Manually trip the breaker and verify the operating system will allow resetting.
- Move breaker handle to the "ON" position and adjust stop button so that it just touches the handle.
- Move breaker handle "ON" then "OFF", confirming operation.

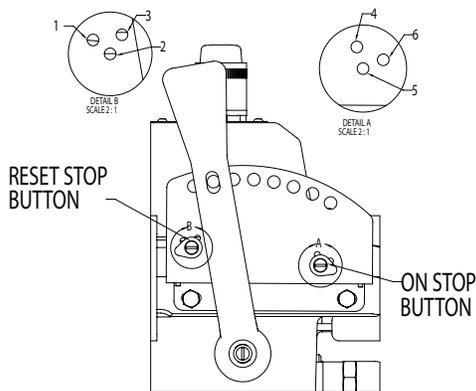


Figure 6 – Breaker Handle Stop Buttons (Shown in Nominal Middle Positions)

STARTER INSTALLATION

Consult instructions from starter manufacturer before beginning installation.

Mounting plate and reset mechanism will accommodate Eaton motor starters.

1. To facilitate motor starter installation, select the correct mounting holes for the starter type being installed on mounting plate. Secure starter to mounting plate with screws provided (see Figure 7).

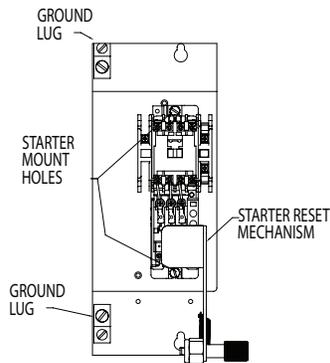


Figure 7 – Starter

2. Install thermal overload relay/heater, if required, per manufacturer's instructions.

STARTER RESET OPERATION TEST

- Verify reset mechanism contacts reset button on starter and can fully depress and retract.
- After resetting starter, ensure the reset handle touches the stop bar on exterior of enclosure. In certain conditions, the reset handle might need to be manually pulled back.

DISCONNECT SWITCH INSTALLATION

Consult instructions from disconnect manufacturer before beginning installation. The mounting plate and operating mechanism will accommodate disconnect manufacturers and amperage ranges per Table 2 above. See Appendix Table A3 for HP ratings.

1. Install drive stud into the disconnect switch side opening (fused or non-fused). Short drive stud is for fused disconnects; long drive stud for non-fused. See Figure 8A.
2. Verify label on middle link for hole alignment with disconnect link based on disconnect manufacturer. See Appendix Table A1 for link hole position per configuration.
3. Verify disconnect link is in correct "ON" and "OFF" orientation for "horizontal" or "vertical" position. **Failure to do so could damage the disconnect.** See Figure 8D and disconnect instruction sheet. Slide disconnect link onto drive stud and then slide bushing over drive stud. See Figure 8C.
4. Position disconnect based on mounting plate layout, ensuring drive stud and bushing touch disconnect stop plate.
5. Screw disconnect to mounting plate using supplied 10-32 screws.

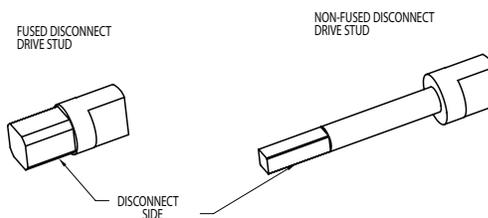


Figure 8A

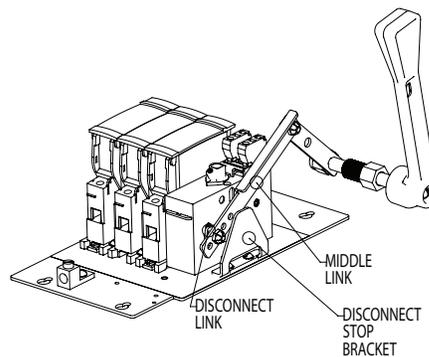


Figure 8B

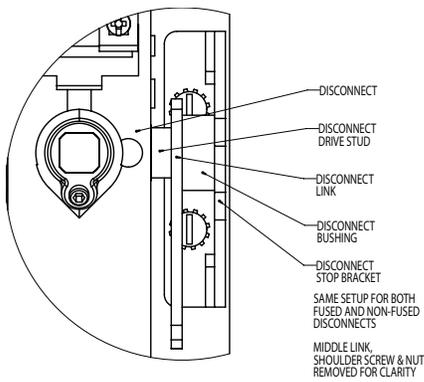


Figure 8C

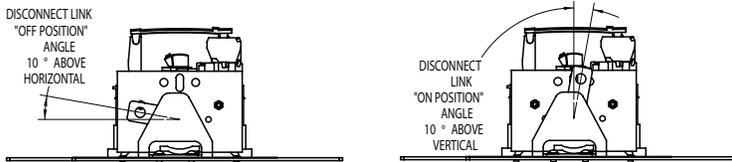


Figure 8D

6. Visually inspect for proper alignment and accurate mechanism for correct operation. If necessary (to prevent over/under travel and allow disconnect to turn ON and OFF), adjust the disconnect stops as follows (see Figure 6).
7. Locate adjustable stop buttons in the appropriate holes for disconnect manufacturer to be used as shown in Figure 6. Adjust stop buttons as required per disconnect switch operation test below.

DISCONNECT SWITCH OPERATION TEST

- Move disconnect handle to the "OFF" position and adjust stop button so that it just touches the handle.
- Move disconnect handle to the "ON" position and adjust stop button so that it just touches the handle.
- Move disconnect handle "ON" then "OFF"; confirming operation.

WIRING CONNECTIONS

1. Reinstall mounting plate (if previously removed) before pulling any wires into enclosure. Check tightness of all internal fasteners of enclosure, including those holding electrical equipment and mounting plate, before wiring. Fasteners could loosen from shipment/installation.
2. Connect grounding conductors to the ground lugs on the mounting plate. Pull all phase conductors into enclosure and make connections as shown in breaker and/or starter, disconnect manufacturer's instructions. All electrical connections should be tightened to torque values specified in manufacturer's literature and comply with the National Electrical Code and all local codes. Verify torque of any existing wiring.
3. When connecting control wires to devices mounted in the cover, use wire clamps and harness supplied. Route wires to prevent damage when opening or closing cover. Route wires to avoid breaker, disconnect and starter reset mechanisms. Always maintain required electrical spacing.
4. Test wiring for correctness with continuity checks and also for unwanted grounds with an insulation resistance check.

See Appendix Table A1 for wiring sizing, lug torque values and conduit seal fill limitations.

SEALS

Pour sealing compound into approved sealing fittings in accordance with the manufacturer's instructions. Verify correct conduit seal selected for wire fill based on wiring method.

BREATHER/DRAIN

For installation or removal of breather and/or drain, reference **IF 843**.

EMP OPERATOR INSTALLATION

Crouse-Hinds Series EMP and EMPS operators are available for use with the EBMX motor control series. EMP Operators can be installed before or after components are secured to the mounting plate. Consult Eaton's Crouse-Hinds Division's catalog for details.

NOTE: When installing EMP (pilot light only) and EMPS operators (short assemblies only) in EBMX covers, refer to the installation instructions in **IF 872**.

⚠ WARNING

To avoid risk to personnel, electrical power must be OFF before and during installation and maintenance.

Check wire routing by opening cover as wide as possible and then closely observe whether wires rub on the flange surface.

⚠ WARNING

To avoid damage to enclosure, EMP operators must not protrude more than 2.75" from inside cover. New EMP operators installed in the field must be secured with a sealing nut to maintain current NEMA rating.

OTHER ELECTRICAL OPTIONS

See Table A4 for other electrical options and the EBMX replacement parts list for other components that can be added to an EBMX Enclosure.

CLAMPED EBMX MAINTENANCE

⚠ WARNING

To avoid risk to personnel, always disconnect primary power source before opening enclosure for inspection or service.

1. Frequent inspection should be made of the enclosure, clamp assembly, actuators, operators and internal components. A maintenance schedule for maintenance checks should be determined by the environment and frequency of use. It is recommended that it should be at least once a year.
2. Perform visual, electrical and mechanical checks on all components on a regular basis.
 - Visually check for undue heating evidenced by discoloration of wires or other components, damaged or worn parts or leakage evidenced by water or corrosion in the interior.
 - Electrically check to make sure that all connections are clean and tight and that contacts in the components make or break as required.
 - Mechanically check that all parts are properly assembled, and operating mechanisms move freely.
3. A waterguard desiccant packet has been installed in this enclosure at the factory. The purpose of the desiccant is to absorb and remove water on contact or from the atmosphere, and protect the enclosed equipment from damage. The desiccant packet will expand 3 to 4 times its original size. Desiccant should be checked and replaced at regular equipment service intervals or every 3 to 6 months. Always keep desiccant pack away from wiring, components, etc. A waterguard desiccant is non-toxic, emits no fumes and generates no heat during use. No gloves, masks or special clothing is required to handle this product.
4. Ensure all clamps are fully open before closing cover onto the body. See Figure 4. Close cover and thread fasteners tight before torquing. Torque all clamp actuators securely to 40-45 ft.-lbs.
5. If the gasket becomes worn, cut or damaged, it can be replaced. Contact factory for replacement kit and follow installation instructions in **IF 1616**.

⚠ CAUTION

To avoid risk of explosion, clean both ground joint surfaces of body, cover and clamp interface surfaces before closing. Dirt or foreign material must not accumulate on flat ground joint surfaces. Surfaces must seat fully against each other to provide a proper explosionproof seal. Clean clamps and clamping surfaces, actuator nuts and studs. Ensure clamps, clamping surfaces, actuator nut and stud are not worn and are in proper condition.

Replacement parts are available through Eaton's Crouse-Hinds Division.

6. An Electrical Preventive Maintenance Program as described in the National Fire Protection Association Bulletin NFPA No. 70B is recommended.

APPENDIX A

Configuration type	Enclosure size	Mfr.	Model	Max. amps	Wire range AWG	Lug torque in.-lb. (N-m)	40°C ampacity wire AWG required	55°C ampacity wire AWG required	Notes: 40°C rating assumes 75°C wire; 55°C rating assumes 90°C wire	Handle link	Middle link
Breaker Only	1	EATON	EG	100A	#14-3/0	50 (5.6)	2	1		1	3
Breaker Only	1	GE	TED	100A	#2-2/0	55 (6.2)	2	1		1	2
Breaker Only	1	SQUARE D	HGL	100A	#14-1/0	90 (10.2)	2	1		1	1
Breaker Only	2	EATON	JG	200A	#8-350MCM	177 (20.0)	4/0	250		1	3
Breaker Only	3	EATON	JG	250A	#8-350MCM	177 (20.0)	300	350		1	1
Breaker Only	3	EATON	LG	500A	(2) #2-500MCM	372 (42.0)	2 (300)	2 (300)	Requires double conductor lug and 40% fill conduit seals (500A; 50°C ambient max.)	2	1
HMCP	1	EATON	HMCPPE	100A	#14-3/0	50 (5.6)	2	1		1	3
HMCP	3	EATON	HMCPJ	250A	#8-350MCM	177 (20.0)	300	350		1	1
HMCP	3	EATON	HMCPPL	400A	(2) #2-500MCM	372 (42.0)	2 (300)	2 (300)	Requires double conductor and 40% fill conduit seals	2	1
Eaton Starter Size 0	1	EATON	AN16B	15A	#16-#8	15 (1.7)	8	8		NA	NA
Eaton Starter Size 1	1	EATON	AN16D	50A	#14-#8	20 (2.3)	6	6		NA	NA
Eaton Starter Size 2	1	EATON	AN16G	70A	#14-#2	50 (5.6)	4	4		NA	NA
Eaton Starter Size 3	2	EATON	AN16K	100A	#14-1/0	50 (5.6)	1	1		NA	NA
Eaton Starter Size 4	3	EATON	AN16N	200A	#6-250MCM	200 (22.6)	4/0	250		NA	NA
Eaton Thermal OLR NEMA 0	See Starter Above	EATON	AN16B	15A	#16-#8	20 (2.3)	8	8	Thermal overload relay output wiring values only	NA	NA
Eaton Thermal OLR NEMA 1	See Starter Above	EATON	AN16D	50A	#14-#8	40 (4.5)	6	6		NA	NA
Eaton Thermal OLR NEMA 2	See Starter Above	EATON	AN16G	70A	#14-#6	50 (5.6)	4	4		NA	NA
Eaton Thermal OLR NEMA 3	See Starter Above	EATON	AN16K	100A	#14-1/0	50 (5.6)	1	1		NA	NA
Eaton Thermal OLR NEMA 4	See Starter Above	EATON	AN16N	200A	#6-250MCM	120 (13.6)	4/0	250		NA	NA
Eaton Electronic OLR NEMA 0	See Starter Above	EATON	AN19B	15A	#12-#6	30 (3.4)	8	8	Electronic overload relay output wiring values only	NA	NA
Eaton Electronic OLR NEMA 1	See Starter Above	EATON	AN19D	50A	#12-#6	30 (3.4)	6	6		NA	NA
Eaton Electronic OLR NEMA 2	See Starter Above	EATON	AN19G	70A	#12-#6	30 (3.4)	4	5		NA	NA
Eaton Electronic OLR NEMA 3	See Starter Above	EATON	AN19K	100A	#6-#1	30 (3.4)	1	1		NA	NA
Eaton Electronic OLR NEMA 4	See Starter Above	EATON	AN19N	200A	#8-4/0	124 (14.0)	4/0	250		NA	NA
NEMA Size 0 Combo	2	EATON	EG	15A	See Components Above	See Components Above	8	8		1	1
NEMA Size 1 Combo	2	EATON	EG	50A	See Components Above	See Components Above	6	6		1	1
NEMA Size 2 Combo	2	EATON	EG	70A	See Components Above	See Components Above	4	4		1	1
NEMA Size 3 Combo	3	EATON	EG	125A	See Components Above	See Components Above	1/0	1/0		1	4
NEMA Size 4 Combo	3	EATON	JG	150A	See Components Above	See Components Above	2/0	3/0	Thermal overload relay only	1	1
NEMA Size 4 Combo	3	EATON	JG	200A	See Components Above	See Components Above	4/0	250	40°C ambient max.; thermal overload relay only	1	1
NEMA Size 0 Combo ET Breaker	2	EATON	JG - Electronic	15A	See Components Above	See Components Above	8	8		1	1
NEMA Size 1 Combo ET Breaker	2	EATON	JG - Electronic	50A	See Components Above	See Components Above	6	6		1	1
NEMA Size 2 Combo ET Breaker	2	EATON	JG - Electronic	70A	See Components Above	See Components Above	4	4		1	1
NEMA Size 3 Combo ET Breaker	3	EATON	JG - Electronic	100A	See Components Above	See Components Above	1/0	1/0		1	4
NEMA Size 4 Combo ET Breaker	3	EATON	JG - Electronic	150A	See Components Above	See Components Above	2/0	3/0	Thermal overload relay only	1	1
NEMA Size 4 Combo ET Breaker	3	EATON	JG - Electronic	200A	See Components Above	See Components Above	4/0	250	40°C ambient max.; thermal overload relay only	1	1
Disconnect (Fused)	1	SOCOME	FUSERBLOC UL 3861 3004	30A	#10-#6	30 (3.4)	10	10		2	3
Disconnect (Fused)	1	SOCOME	FUSERBLOC UL 3861 3005	60A	#10-#6	30 (3.4)	6	4		2	3
Disconnect (Fused)	2	SOCOME	FUSERBLOC UL 3861 3010	100A	#12-#1	50 (5.6)	2	1		2	2
Disconnect (Fused)	3	SOCOME	FUSERBLOC UL 3861 3020	200A	#6-300MCM	120 (13.6)	4/0	250		2	1
Disconnect (Non-fused)	1	SOCOME	M UL98 2201-3003	30A	#12-2/0	50 (5.6)	10	10		2	3
Disconnect (Non-fused)	1	SOCOME	M UL98 2201-3006	60A	#12-2/0	50 (5.6)	6	4		2	3
Disconnect (Non-fused)	1	SOCOME	M UL98 2200-3010	100A	#12-2/0	50 (5.6)	2	1		2	3

Table A1 – Configuration List

Ratings			
Temperature	Voltage	AIC rating	Gas Groups
-25°C to 40°C	240V	10k	B, C, D
	480V		
	600V		
-25°C to 40°C	240V	65k	C, D
	480V		
	600V		
-50°C to 40°C	240V	10k	C, D
	480V		
	600V		
-25°C to 60°C	240V	10k	B, C, D
	480V		
	600V		
-25°C to 60°C	240V	65k	C, D
	480V		
	600V		

Table A2 – Temperature and Power Ratings

Series	Amperage	Fuse type	220-240 VAC	440-480 VAC	600 VAC	125 VDC	250 VDC
EBMX1D	30A	N/A	10	20	25	N/A	N/A
EBMX1D	60A		20	40	50		
EBMX1D	100A		25	50	50		
EBMX1D	30A	J Type	7.5	15	20	3	5
EBMX1D	60A		15	30	50	3	10
EBMX2D	100A		30	60	75	7.5	20
EBMX3D	200A		60	125	150	15	40

Table A3 – Fusible and Non-fusible Switches HP Ratings, 3-pole, 600 VAC Max., 250 VDC Max. Fused Only

	Size 1 Enclosure	Size 2 Enclosure	Size 3 Enclosure
Breakers			
Starters		See "Model" Column of Table A1	
Fused Disconnect			
Non-fused Disconnect			
Transformers (Cover Mount)	Cutler-Hammer MTE C0100E2A, C0100E4C with Eaton PFK1 Fuse Kit	Cutler-Hammer MTE C0100E2A, C0100E4C C0200E2A, C0200E4C with Eaton PFK1 Fuse Kit	Cutler-Hammer MTE C0200E2A, C0200E4C C0300E2A, C0300E4C with Eaton PFK1 Fuse Kit
Heaters (Cover Mount – 2.75" Spacing)		Ohmite 270 Series 2" Heater with #9 Brackets	

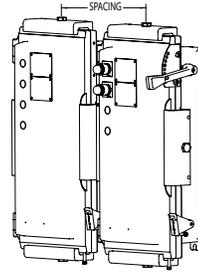
**Table A4 – Accessory Electrical Components
(see Replacement Parts Catalog for replacement mechanical parts)**

Enclosure-to-enclosure Spacing – Charts Based on Top Flange of Enclosures Aligned to Same Height

EBMXS in Left Enclosure and Any EBMX in Right Enclosure

		Enclosure on Right		
		Size 1	Size 2	Size 3
Enclosure on Left	Size 1	17.50	17.63	18.50
	Size 2	17.63	17.87	18.63
	Size 3	18.50	18.63	19.50

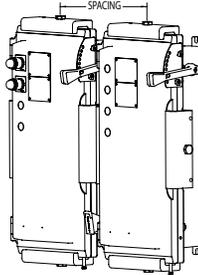
Table A5 – Center-to-center Enclosure Spacing:
EBMXS in Left Enclosure, Any EBMX in Right Enclosure



EBMXB,C,D in Left Enclosure and No Cover Operators in Right Enclosure

		Enclosure on Right		
		Size 1	Size 2	Size 3
Enclosure on Left	Size 1	17.50	17.63	20.00
	Size 2	17.63	17.87	20.13
	Size 3	18.50	18.63	21.00

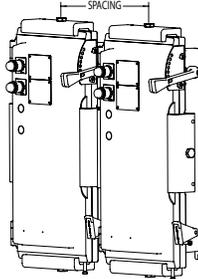
Table A6 – Center-to-center Enclosure Spacing:
EBMXB,C,D in Left Enclosure, Any EBMX with No Cover Operators in Right Enclosure



EBMXB,C,D in Left Enclosure and Cover Operators in Right Enclosure

		Enclosure on Right		
		Size 1	Size 2	Size 3
Enclosure on Left	Size 1	19.63	19.76	20.00
	Size 2	19.76	20.00	22.26
	Size 3	20.63	20.76	23.13

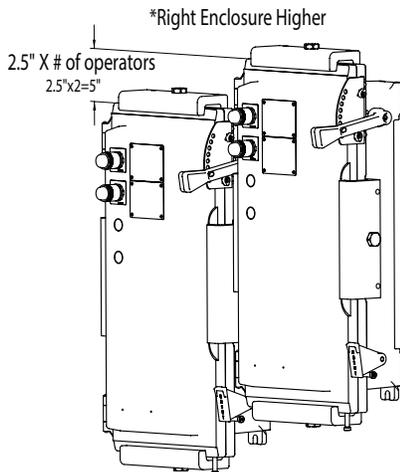
Table A7 – Center-to-center Enclosure Spacing:
EBMXB,C,D in Left Enclosure, Any EBMX with Cover Operators in Right Enclosure



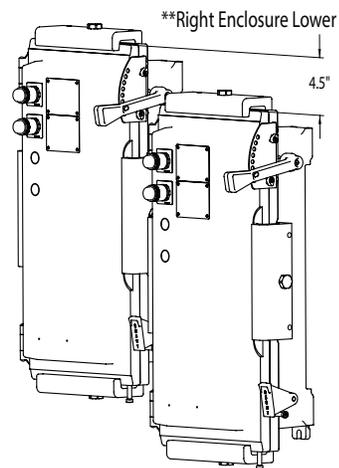
VERTICAL OFF SETTING OF ENCLOSURE TO REDUCE WIDTH WHEN OPERATORS IN COVER (use when Table A7 dimensions are too large)

*Right enclosure height increased by 2.5" times number operators in right enclosure – use Table A6

Example: 2.5" x 2 operators = 5" increased height



**Right enclosure height decreased 4.5" below left enclosure – use Table A5



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