INSTRUCTION SHEET
No. 903 DC Heavy Duty Mill Relay
Time Delay and Instantaneous Trip

INSTRUCTIONS
Be sure to disconnect the power to the relay before making any adjustments or repairs.

DESCRIPTION
The model 903 relay is a magnetically operated single or two coil DC overload relay. It's normally closed contacts are opened when the relay is tripped. The contacts of the single coil relay are closed mechanically upon removal of the tripping current from the series coil except for relays using the hand or external reset as shown on page 3. The two coil overload relay contacts are mechanically closed upon removal of the tripping current from the series coil and the voltage from the shunt coil except for relays using the hand or external reset. Operation of the hand or external reset is required, when used, in addition to current removal from coils to reset the relays. Both the single and two coil relays are available in either time delay or instantaneous trip operation.

TIME DELAY TRIP - When so constructed, this relay will provide time delay trip on normal settings and instantaneous trip on excessive overloads. Time delay, proportional to the degree of overloads is provided by oil in the dashpot mechanism up to approximately 250% of the relay setting. Above this value, instantaneous trip is obtained.

INSTANTANEOUS TRIP – When so constructed, this relay furnishes instantaneous trip at normal overload conditions. No oil is used in the dashpot for instantaneous application.

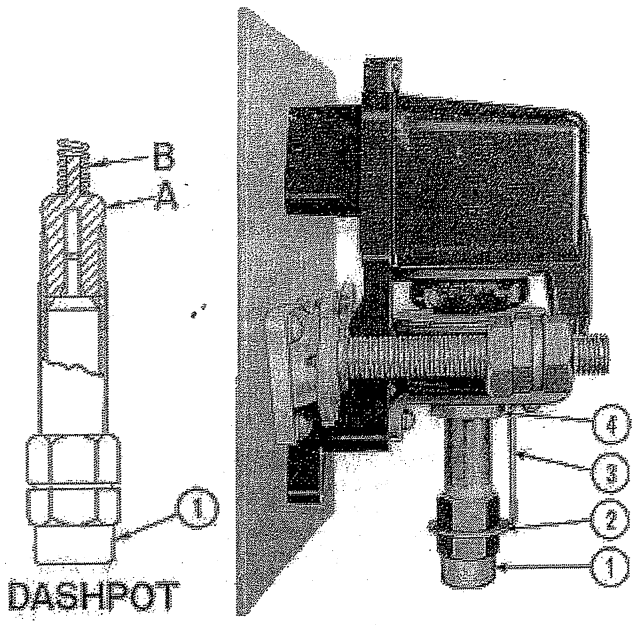
This relay may be used for either two or three wire control or the equivalent depending on the number of coils used in the device. The single coil relay consisting of the series coil only requires 3 wire control. The two coil relay consisting of a series and shunt coil requires 2 wire control.

The single coil overload relay should be used with 3 wire control or its equivalent where the control circuit and relay contacts opens after the relay trips. This is necessary because the contacts reset to close when the tripping current is removed from the coil except when hand or external reset is used where in addition to, it's operation is required to reset.

The two coil relay should be used with 2 wire control or its equivalent as the shunt coil maintains a magnetic pull on the plunger causing the contacts to remain open after the relay has been tripped. Removal of the tripping current from the series coil and the voltage from the shunt coil permits the contacts to mechanically close except when the hand or external reset is used where in addition to, it's operation is required to reset.

Failure to use the proper wire control or its equivalent will create a recycling condition as the series coil is connected in series with the motor armature. The recycling can lead to motor burnout or other damage before the problem is located and corrected. Usage of the hand or external reset should not change the requirements for selection of proper wire control. The hand or external reset is an added feature whereby manual operation is required before the contact can reset.

INSTALLATION
The relay for time delay trip operation is inoperative as shipped. Preparing the relay for operation is accomplished in a few easy steps;
First, loosen the locknut (item 4) and raise the indicating locking washer (item 2) to allow the dashpot assembly (item 1) to be unscrewed from the relay proper. If the spring (item 23) on page 3 is supplied, take care not to damage it when removing from the dashpot.
Remove the neoprene pug (A) and spring (B) from the dashpot assembly.



CAUTION - Take care not spill any oil from the dashpot.
Discard the neoprene plug (A) and spring (B) unless re-shipment o f the relay will be required. Just before re-shipment, replace the clean the neoprene plug (A) and spring (B) as originally received.
Screw the dashpot assembly into the relay to the desired setting. When doing this, be sure the spring (item 23 on page 3) if used, has been placed between the lock nut (item 4) and the indicating lock washer (item 2) with the large looped end of the spring resting on the indicating lock washer. In addition, the nib of the indicating locking washer must be positioned in the slot of the indicator plate (item 3) and the indicating locking washer raised to permit the dashpot to be screwed into the relay. Lowering the indicating locking washer over the hexagonal portion of the dashpot assembly so it rest on the ring (item 19) to indicate the setting.

The relay for instantaneous trip operation is functional as shipped. It does not use oil and is manufactured with a .06 inch diameter hole drilled through the bottom of the dashpot. It is not shipped with the neoprene plug (A) or the spring (B).

CALIBRATION
The relay is calibrated at the factory. The calibration currents are stamped on the indicator plate (item 3). They represent the minimum, mid-point, and maximum range of settings. Setting can be changed if desired.

TO CHANGE SETTING – Loosen the lock nut (item 4) and raise the indicating lock washer (item 2) to allow the dashpot (item 1) to be rotated. Take care not to damage the spring (item 23 on page 3) if used, when doing this. After the desired setting is obtained, place the indicating locking washer (item 2) over the hexagon portion of the dashpot and tighten the lock nut (item 4). The dashpot is now securely locked in the desired position.

CALIBRATION (cont'd)

TO LOWER THE TRIPPING CURRENTS – Rotate the dashpot in a clockwise direction. This will raise the dashpot and increase the magnetic pull on the plunger to lower the value at which the relay will trip.

TO RAISE THE TRIPPING CURRENT - Rotate the dashpot in a counter clockwise direction. This will lower the dashpot and reduce the magnetic pull on the plunger increasing the value at which the relay will trip.

CARE

No special care is required in the maintenance of the relay. Occasionally lubricate the bearing points of the contact mechanism with SAE # 20 oil. Keep the contact assembly clean. A suitable solvent on clean cloth may be used if necessary. Apply a small amount of clean Vaseline to the contacting surfaces after cleaning. The cover should not be removed except for inspection and service. When the relay is used in an excessively dirty environment, all debris should be periodically removed from the relay, including coils and terminals.

OIL FOR TIME DELAY TRIP ONLY – When the level of the oil in the dashpot drops below the normal nominal level of .75 inch, it is recommended that the oil be replaced with fresh oil after the dashpot parts have been cleaned. Do not mix old and new oil. Use only Eaton P/N 637-555. This special oil is supplied in a pre-measured container under P/N 99-360 that contains the proper amount of oil for one dashpot.

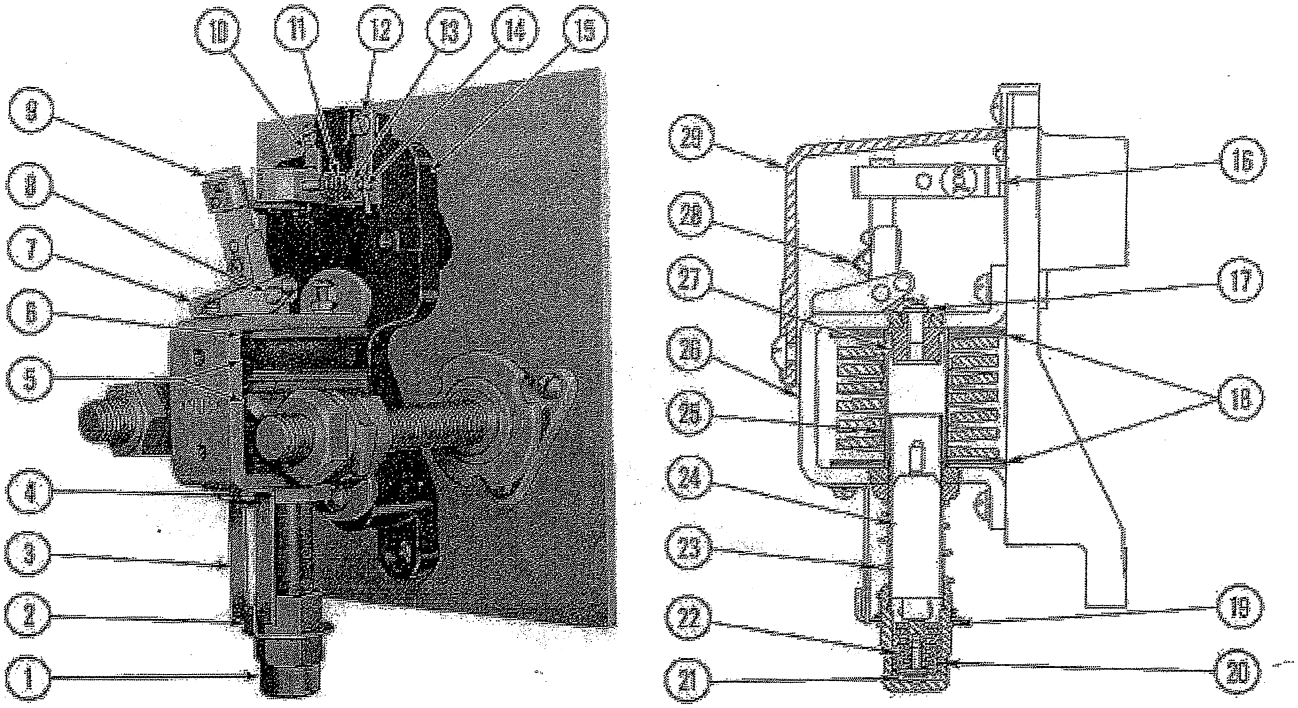
RENEWAL PARTS

		903 DC Overload Relay Without Hand Or External Reset		903 DC Overload Relay With Hand Or External Reset	
Item No.	Description Of Part	No. Req.	Part No.	No. Req.	Part No.
	Dashpot (includes item 19)	1		1	
1	Time Trip		51-784		51-784
	Instant Trip		51-784-2		51-784-2
2	Indicating Lock washer	1	52-650	1	52-650
3	Indicating Plate (give complete nameplate data)	1	.....	1	.....
	10-32 X .281 Sems Screw	2	11-1802	2	11-1802
4	Lock Nut	1	15-634	1	15-634
5	Coil(s)	1	Give No. On Coil	1	Give No. On Coil
6	Insulating Washer (2.00" Dia)	As Req'd	1016-1202	As Req'd	1016-1202
7	Support	As Req'd	79-6720	As Req'd	79-6720
8	Pin	2	13-1012-30	2	13-1012-30
* 9	Contact Lever	1	24-4812	1	24-2194
	Bracket	1	40-497	1	40-497
10	10-32 X .312 Binding Head Screw	1	11-1656	1	11-1656
	8-32 X .375 Sems Screw	1	11-1142	1	11-1142
* 11	Spring	2	69-2569	2	69-2569
	Bracket	1	40-497-3	1	40-497-3
12	10-32 X .312 Binding Head Screw	1	11-1656	1	11-1656
	8-32 X .375 Sems Screw	1	11-1142	1	11-1142
13	Cup washer	2	16-934-11	2	16-934-11
14	Pin (.188 X 1.00 long round head)	2	13-3307-6	2	13-3307-6
15	Molded Base	1	17-7129	1	17-7129
* 16	Contact Finger	2	40-591-2	2	40-591-2
17	Push Rod	1	61-1063	1	61-1063
18	Insulating Washer	As Req'd	1016-1165	As Req'd	1016-1165
19	Ring	1	28-495-10	1	28-495-10
20	Piston	1	51-781	1	51-781
21	Screw	1	11-1592	1	11-1592
* 22	Spring	1	69-1766	1	69-1766
23	Spring (when used)	1	69-1839	1	69-1839
24	Plunger Complete (includes items 20, 21, & 22)	1	51-780	1	51-780
25	Insulating Tuber	1	56-1080-7	1	56-1080-7
26	Magnet Frame	1	17-9321	1	17-9321
27	Plug	1	51-356	1	51-356
28	Spring	1	69-2398	1	69-2398
29	Cover	1	49-2455	...	.....
30	Support	...	.....	2	20-451
	¼-20 X .50 Sems Screw	...	.....	2	11-1108
31	Latch Lever			1	52-1083
37	Dashpot Oil (1 tube contains enough oil for 1 dashpot)	1	99-360	1	99-360
38	Renewal Set Of Contacts (includes items 9, 11, 14, 16 & 28)	1	6-194-3	1	6-194-2

* We recommend these items be stocked. The quantity to be stocked is determined by the total numbers of relays in service.

RENEWAL PARTS

No. 903 DC Heavy Duty Mill Relay Without Hand or External Reset



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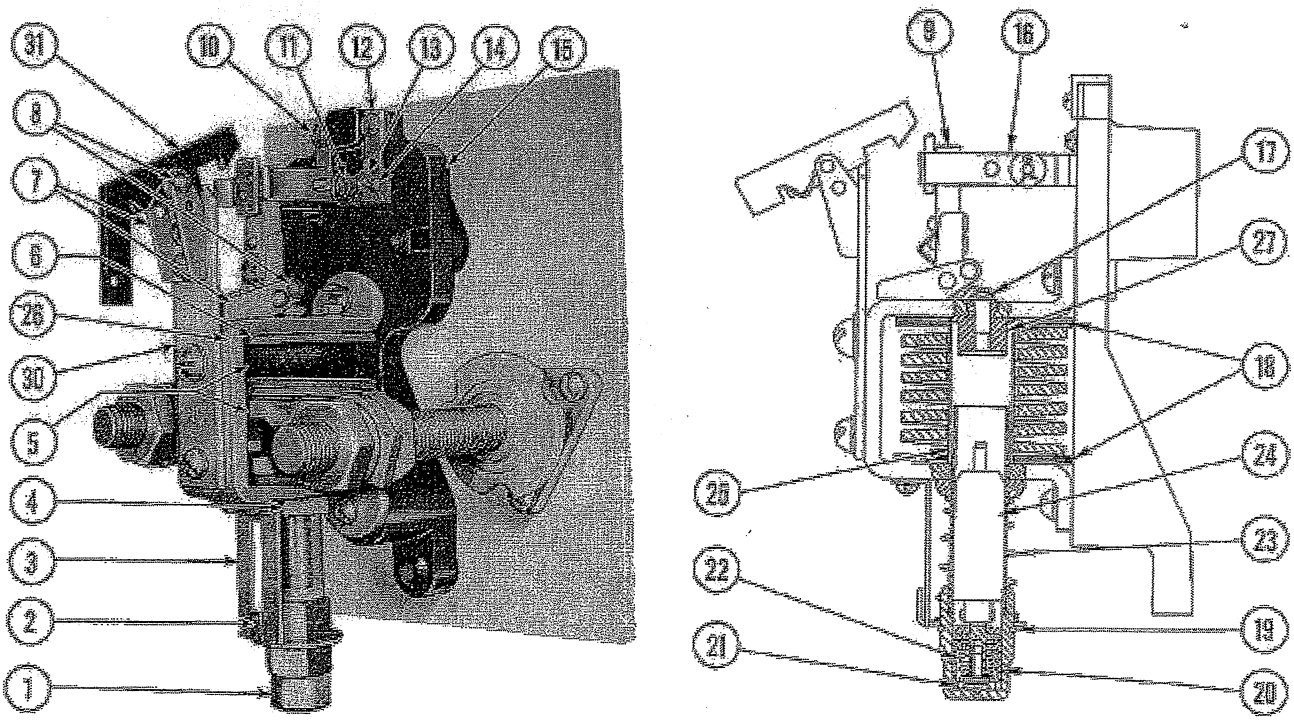

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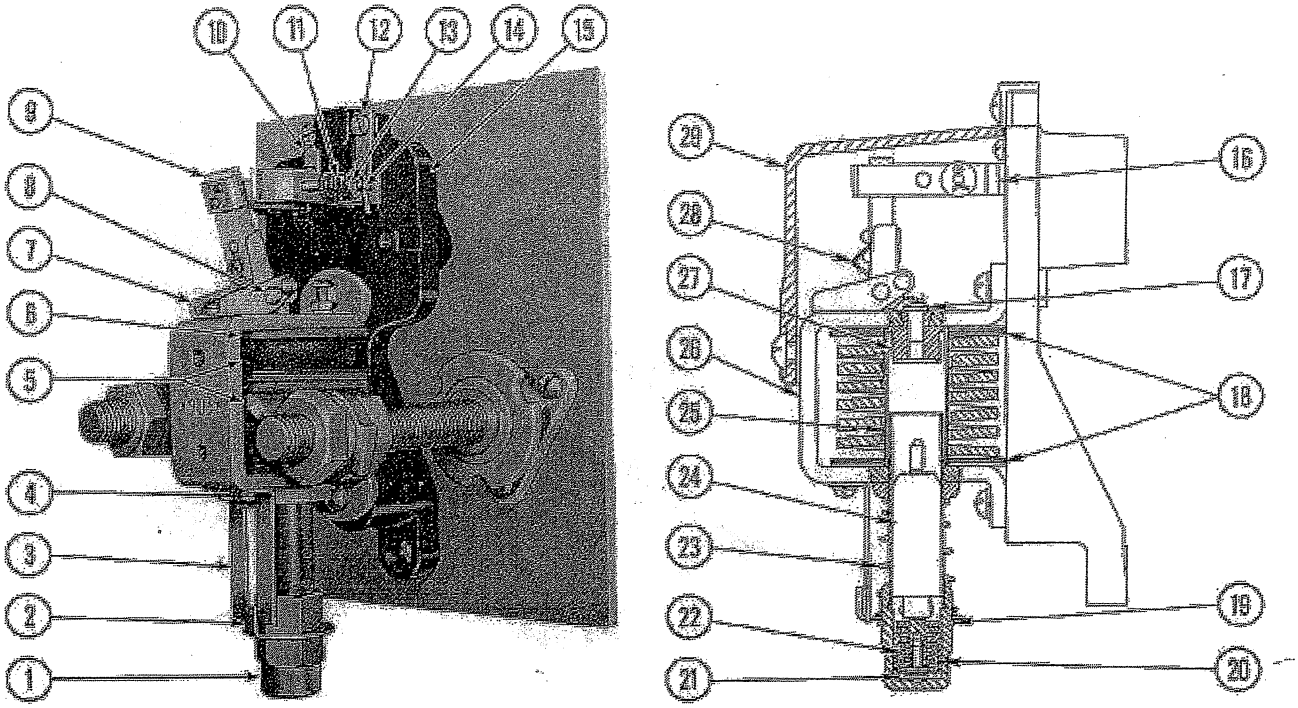

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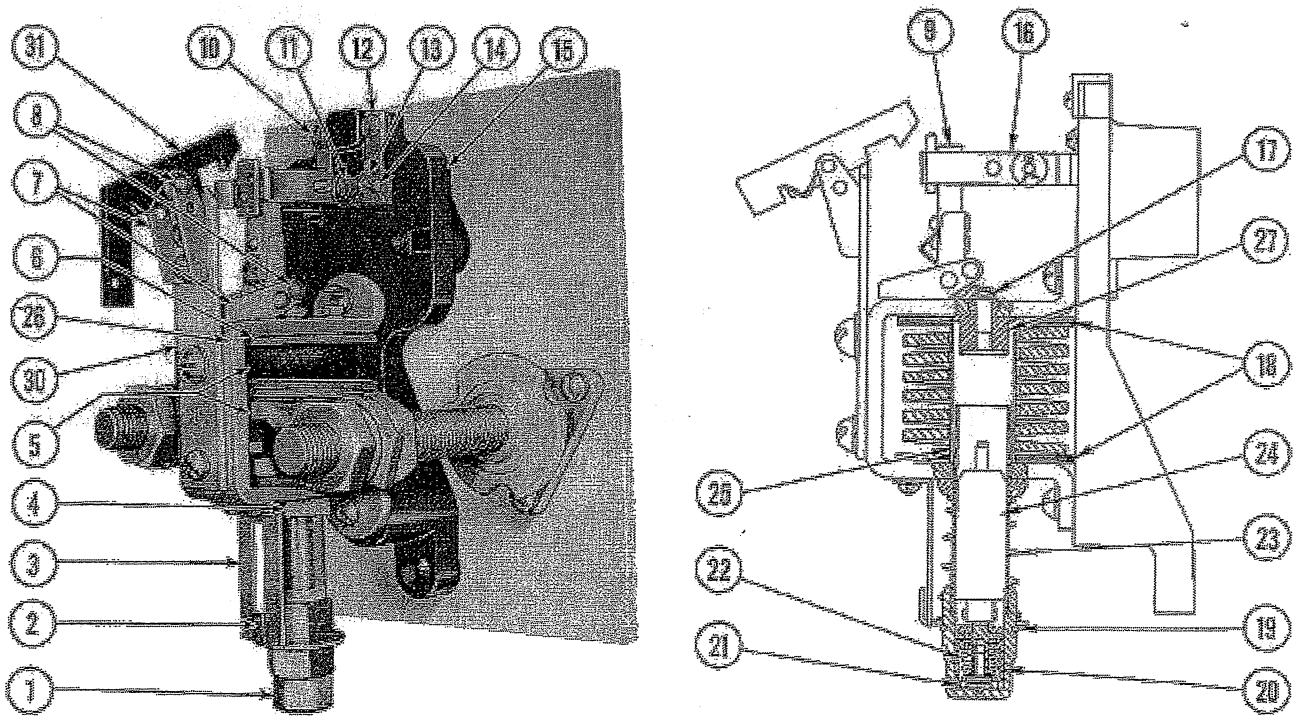
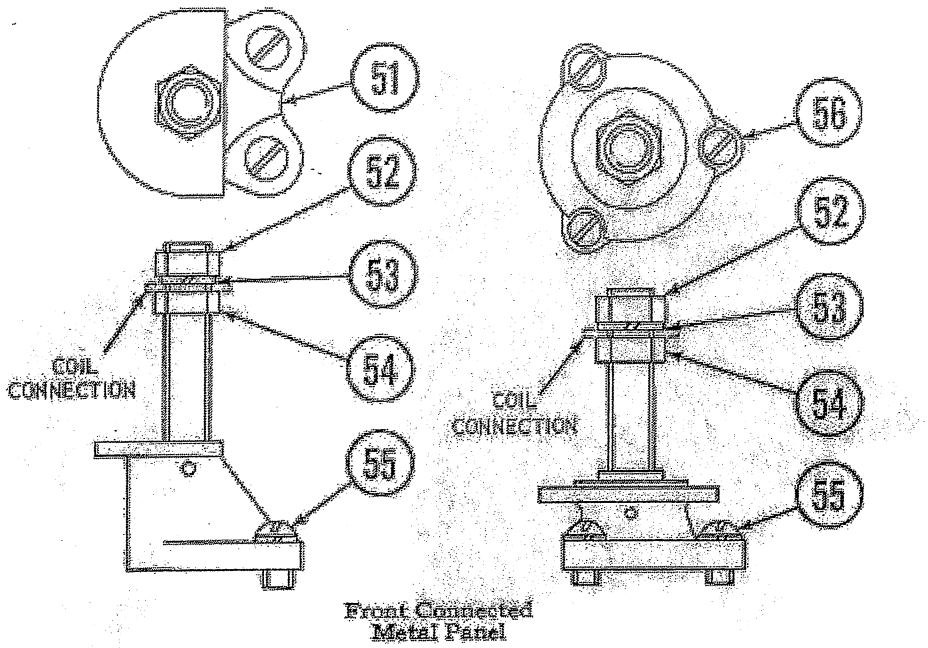


COIL TERMINAL MOUNTINGS



Item No.	Description Of Part	No. Req.	Part No.
51	Stud With Insulated Base (3/8-16 thread)	As Req'd	80-4100
52	Nut (steel) ..... 3/8-16 ..... ½-13 ..... ¾-12	As Req'd	 915-1004Z 915-1403Z 15-1250
53	Helical Washer..... 3/8 ..... 1/2 ..... 3/4	As Req'd	 916-231 916-199 916-1602Z
54	Nut (brass) ..... 3/8-16 ..... ½-13 ..... ¾-12	As Req'd	 15-399 815-1128 815-1408
55	Screw ¼-20 X .50 ..... Screw ¼-20 X .75	As Req'd	911-848Z 911-852Z
56	Stud With Insulated Base (1/2-13 thread) ..... Stud With Insulated Base (3/4-12 thread)	As Req'd	80-4101 80-4102

NOTE: ALL PARTS FOR OBSOLETE REAR CONNECTED INSULATED THROUGH THE PANEL CONNECTION TYPE CONSTRUCTION COIL MOUNTING HARDWARE ARE OBSOLETE