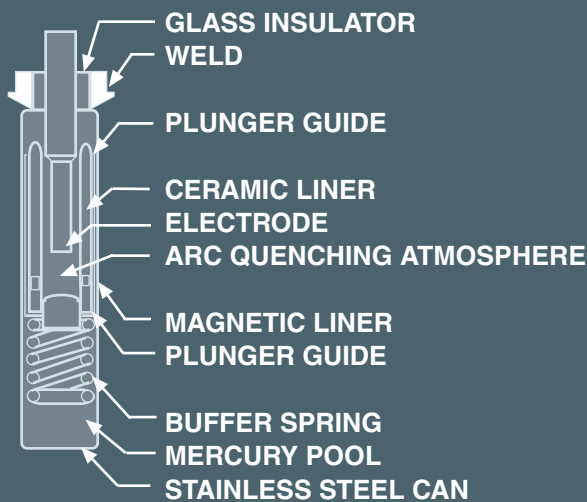


APPLICATION DATA

MERCURY DISPLACEMENT TUBE



PRINCIPLE OF OPERATION

The sectional view shows our normally open style Mercury Displacement tube with the plunger assembly floating on the mercury pool.

When the coil power is off, the mercury level is below the electrode tip. No electrical path exists between the electrode and mercury pool.

When coil power is applied, the plunger is drawn down into the mercury by the pull of the magnetic field. This action raises the mercury level, so it covers the end of the electrode closing the circuit.

When coil power is turned off, the buoyant force of the mercury causes the plunger assembly to rise, dropping the mercury level, and breaking the circuit.

APPLICATION DATA

Mercury Displacement relays are ideal for adverse environments-

-Where high inrushes are encountered
-Where hermetically sealed contact operation is required because of corrosive, dirty, or moist ambient conditions.
-Where use does not permit contact maintenance.
-Where reduced noise levels are required.
-Where minimum weight and size are desired.

DESIGN FEATURES

Mercury Displacement Relays provide a perpetually self-renewing contact to assure maximum contact life and minimum contact resistance. Conventional contactors are destroyed by pitting and welding under high load conditions. MDR's have a single moving part that floats free on a pool of mercury. There are no hinges, pivots, pins or mechanical linkage to wear out or break. The result is a life expectancy which exceeds other types of contactors handling the same loads and duty cycle.

Liquid Mercury Contact - provides a new contact surface with every actuation. Mercury is self-renewing and does not pit, weld, disintegrate or oxidize.

Hermetic sealing - provides internal and external protection from arcing.

Inert Gas atmosphere - contactor tube is evacuated, then pressurized with a combination of gases which extinguish arcing and contribute to long life. The pressurized gases provide for a high dielectric withstanding voltage between contact surfaces.

Low Contact Resistance - Large electrode and mercury volume creates low contact resistance and provides high inrush current capability.

Quiet Operation - Audible noise normally associated with conventional contactors is eliminated with mercury displacement tubes and the buffer spring assembly.

APPLICATION OF "M" SERIES VS "ML" SERIES

The series "ML" is physically the same as the "M" series except for the type of gases used in the contactor tubes. The "ML" series was developed for use with resistive and tungsten loads on AC power ONLY. The "ML" series will give much greater life than the "M" series for these types of loads and is intended for high activation use, such as molding machines or ovens. The "ML" series, however is not intended for use with motor loads on AC power, or for resistive, tungsten, or motor loads on DC power. The "M" series, which is our universal series is rated to be used on all types of loads resistive, tungsten, and motor for both AC and DC power.

RECOMMENDED FUSE PROTECTION

MDR's are capable of accepting high inrush currents however, short circuit currents can damage the contactor. Fast acting fuses should be used in-line with the contactor load to protect against short circuit fault current. UL class J and class RK-1 fuses are recommended.





LISTED 367G
File E52197

FEATURES

- SILENT OPERATION
- HIGH DC VOLTAGE RATINGS
- OPTIONAL DIN MOUNT ADAPTERS
- STABLE CONTACT RESISTANCE

CONTACT LOAD RATINGS TABLE

	VOLTAGE	RESISTIVE AMPS (AC1) (DC1)	TUNGSTEN AMPS		HP		MOTOR AMPS	
			NO	NC	1Ø	3Ø	1Ø	3Ø
M35	120 VAC	35*	35*	35*	3*	5*	34	30
	240 VAC	35*	17	17	5*	7.5*	28	19
	480 VAC	35*	9	9	5*	10*	14	14
	600 VAC	35*	7	7	5*	10*	11.2	11
	24 VDC	35*	35*	35*	1/2		27	
	48 VDC	35*	35*	35*	1/2		13.5	
	125 VDC	16*	16*	16*	1/2		5.2	
	250 VDC	12*	12*	12*	1/2		2.6	
ML35	120 VAC	35*	35*	35*				
	240 VAC	35*	17	17				
	480 VAC	35*	9	9				
	600 VAC	35*	7	7				
M60	120 VAC	60*	60*	45*	3*	5*	34	30
	240 VAC	60*	30	22.5	5*	10*	28	28
	480 VAC	60*	15	11.2	7.5*	15*	21	21
	600 VAC	50	12	9	7.5*	15*	16	17
	24 VDC	60*	50*	50*	3/4		39	
	48 VDC	60*	50*	50*	3/4		19.5	
	125 VDC	40*	40*	40*	3/4		7.4	
	250 VDC	20*	20*	20*	3/4		3.7	
ML60	120 VAC	60*	60*	45*				
	240 VAC	60*	30	22.5				
	480 VAC	60*	15	11.2				
	600 VAC	50	12	9				
M100	120 VAC	100*	100*					
	240 VAC	100*	60*					
	480 VAC	100*	30*					
	600 VAC	80	24					
	24 VDC	100*	100*					
	48 VDC	100*	100*					
125 VDC	80*	80*						
250 VDC	40*	40*						

GENERAL SPECIFICATIONS (@ 25°C)

	UNITS	
COIL		
Pull-in Voltage AC (50/60 Hz): ≤	% of nominal	80
Pull-in Voltage DC: ≤	% of nominal	80
Dropout Voltage AC (50/60 Hz): ≥	% of nominal	78
Dropout Voltage DC: ≥	% of nominal	65
Maximum Voltage:	% of nominal	110
Resistance Tolerance:	% ±	10
Coil Power AC (50/60 Hz):	VA	7 to 26.4
Coil Power DC:	W	3.1 to 9.1
Insulation System		
Per UL Standard 1446:		Class B (130 °C)
Duty:		Continuous
CONTACTS		
Material:		Mercury
Minimum Recommended Load:	amps	1 @ 5 VDC or 5 W
TIMING		
Operate Time @ Nominal voltage:	ms	50
Release Time @ Nominal voltage:	ms	80 to 100
DIELECTRIC STRENGTH		
Coil to Contacts:	V rms	2650
Across Open Contacts:	V rms	2650
Pole to Pole:	V rms	2650
Contacts to Frame:	V rms	2650
Insulation Resistance:	megohms	1000 @ 500
	minimum@VDC	
TEMPERATURE		
Operating, AC Lower:	°C	-40
Operating, AC Upper:	°C	+60
Operating, DC Lower:	°C	-40
Operating, DC Upper:	°C	+60
Storage, Lower:	°C	-55
Storage, Upper:	°C	+100
LIFE EXPECTANCY		
Electrical @ Rated Load (AC1):	operations	100,000
Mechanical @ no Load :	operations	5,000,000
MISCELLANEOUS		
Operating Position:		Vertical ±10%
Load Terminals:		M35: AWG 6-14 wire pressure connectors M60: AWG 2-12 wire pressure connectors M100: AWG 1-8 wire pressure connectors
Coil Terminals:		#6-32 pan head screws
Weight:	grams	370 to 1078

* UL and CSA Listed



HERMETICALLY SEALED STAINLESS STEEL TUBES

Every contactor tube is hermetically sealed for maximum life. The MDR provides protection to the user from arcing and other hazards of switching heavy loads with exposed contacts.

MDR MERCURY DISPLACEMENT RELAYS



CLASS WM35, WM60 & WM100 SWITCH RESISTIVE, TUNGSTEN, AND MOTOR LOADS. HIGH INRUSH CAPACITY. RECOMMENDED FOR DC LOADS. CLASS WML35 & WML60 RECOMMENDED FOR LONGER LIFE WHEN SWITCHING AC RESISTIVE AND TUNGSTEN LOADS.

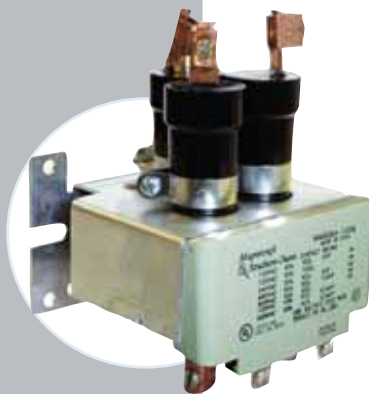
1, 2 & 3 POLES
35, 60 AMPS
1 POLE 100 AMPS



1 POLE
35 OR 60 AMPS



2 POLES
35 OR 60 AMPS



3 POLES
35 OR 60 AMPS



1 POLE
100 AMPS



STANDARD PART NUMBERS	COIL MEASURED @ 25 °C	
	NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)
1 POLE NORMALLY OPEN, 35 AMP		
WM35A-120A	120 VAC 50/60Hz	700 Ω
WM35A-240A	220/240 VAC 50/60Hz	2,800 Ω
WM35A-24D	24 VDC	186 Ω
2 POLE NORMALLY OPEN, 35 AMP		
WM35AA-120A	120 VAC 50/60Hz	218 Ω
WM35AA-240A	220/240 VAC 50/60Hz	1,200 Ω
WM35AA-24D	24 VDC	98 Ω
3 POLE NORMALLY OPEN, 35 AMP		
WM35AAA-120A	120 VAC 50/60Hz	111 Ω
WM35AAA-240A	220/240 VAC 50/60Hz	430 Ω
WM35AAA-24D	24 VDC	63 Ω
1 POLE NORMALLY CLOSED, 35 AMP		
WM35B-120A	120 VAC 50/60Hz	460 Ω
ML SERIES 1 POLE NORMALLY OPEN, 35 AMP		
WML35A-120A	120 VAC 50/60Hz	700 Ω
WML35A-240A	220/240 VAC 50/60Hz	2,800 Ω
ML SERIES 2 POLE NORMALLY OPEN, 35 AMP		
WML35AA-120A	120 VAC 50/60Hz	218 Ω
WML35AA-240A	220/240 VAC 50/60Hz	1,200 Ω
ML SERIES 3 POLE NORMALLY OPEN, 35 AMP		
WML35AAA-120A	120 VAC 50/60Hz	111 Ω
WML35AAA-240A	220/240 VAC 50/60Hz	430 Ω
1 POLE NORMALLY OPEN, 60 AMP		
WM60A-120A	120 VAC 50/60Hz	700 Ω
WM60A-240A	220/240 VAC 50/60Hz	2,800 Ω
WM60A-24D	24 VDC	186 Ω
2 POLE NORMALLY OPEN, 60 AMP		
WM60AA-120A	120 VAC 50/60Hz	218 Ω
WM60AA-240A	220/240 VAC 50/60Hz	1,200 Ω
WM60AA-24D	24 VDC	98 Ω
3 POLE NORMALLY OPEN, 60 AMP		
WM60AAA-120A	120 VAC 50/60Hz	111 Ω
WM60AAA-240A	220/240 VAC 50/60Hz	430 Ω
WM60AAA-24D	24 VDC	63 Ω
1 POLE NORMALLY CLOSED, 60 AMP		
WM60B-120A	120 VAC 50/60Hz	460 Ω
ML SERIES 1 POLE NORMALLY OPEN, 60 AMP		
WML60A-120A	120 VAC 50/60Hz	700 Ω
WML60A-240A	220/240 VAC 50/60Hz	2,800 Ω
ML SERIES 2 POLE NORMALLY OPEN, 60 AMP		
WML60AA-120A	120 VAC 50/60Hz	218 Ω
WML60AA-240A	220/240 VAC 50/60Hz	1,200 Ω
ML SERIES 3 POLE NORMALLY OPEN, 60 AMP		
WML60AAA-120A	120 VAC 50/60Hz	111 Ω
WML60AAA-240A	220/240 VAC 50/60Hz	430 Ω
1 POLE NORMALLY OPEN, 100 AMP		
WM100A-120A	120 VAC 50/60Hz	73.5 Ω
WM100A-240A	220/240 VAC 50/60Hz	300 Ω
WM100A-24D	24 VDC	53 Ω

OTHER COIL VOLTAGES ARE AVAILABLE ON SPECIAL ORDER. CONTACT FACTORY FOR DETAILS