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TECHNOLOGY GROUP

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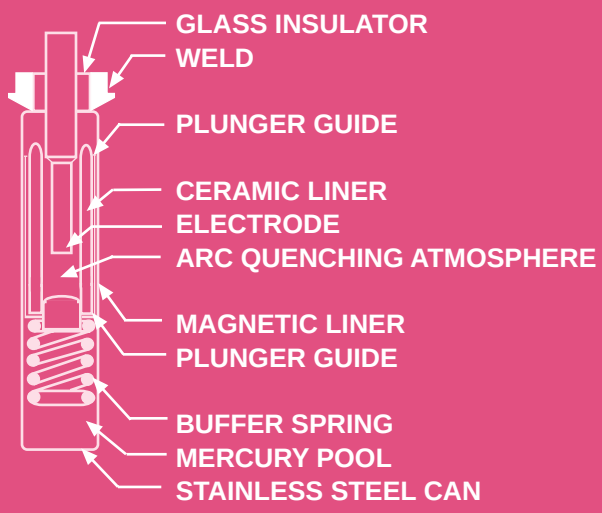
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APPLICATION DATA

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 assemble 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 comparable size 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 - Switch clacking normally associated with conventional hard 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

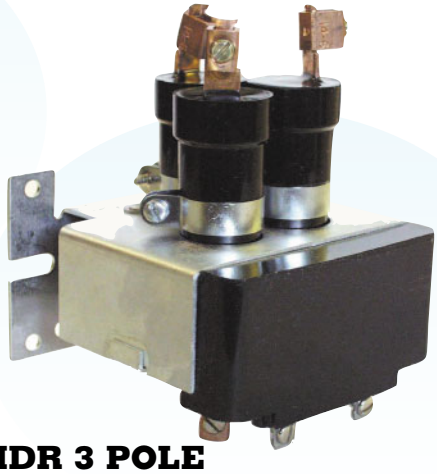
MDR's are capable of accepting high inrush currents however, short circuit currents can damage the contactor. Fast acting fuses should be used in-line with the contactor load to protect against short circuit fault current. UL class J and class RK-1 fuses are recommended.

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

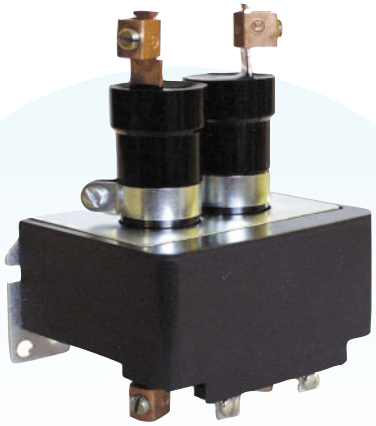
MDR'S ARE IDEAL FOR SWITCHING RESISTIVE, TUNGSTEN, AND MOTOR LOADS FOR BOTH AC AND DC APPLICATIONS.



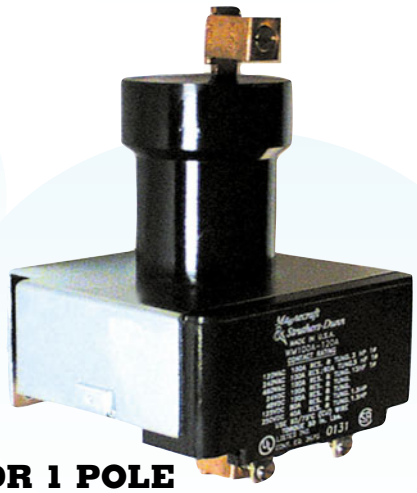
MDR 1 POLE
35 & 60 AMPS



MDR 3 POLE
35 & 60 AMPS



MDR 2 POLE
35 & 60 AMPS



MDR 1 POLE
100 AMPS

UL LISTED 367G

UL Listed
File No. E52197

HERMETICALLY SEALED STAINLESS STEEL TUBES

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

DISPOSAL OF TUBES THAT ARE NO LONGER OPERABLE

Magnecraft, at no charge, will accept and properly dispose of mercury tubes which are no longer operable.
All you need to do is prepay the freight.
Return the tube(s) to:
Magnecraft & Struthers-Dunn
Attn: Manufacturing Manager
MDR Recycling
700 Orange Street
Darlington, SC 29532-3793



GENERAL SPECIFICATIONS

COIL

Frequency of Operation:	60 per minute max
	80% of nominal voltage, typ
Pull-in voltage:	AC & DC coils
Dropout voltage:	78% of nominal voltage, typical AC coils
	65% of nominal voltage, typical DC coils

CONTACTS

Material:	Mercury.
Contact resistance:	0.002 ohm M60 & M100
	0.003 ohm M30 & M30

TIMING

Operate:	50 milliseconds typical
Dropout:	80 milliseconds typical

DIELECTRIC STRENGTH

Across open Contact:	2650 V rms

TEMPERATURE

Operating:	- 35˚C to + 60˚C Under continuous load

LIFE EXPECTANCY

Electrical:	100,000 operations @ rated resistive load.
Mechanical:	5,000,000 operations @ no load

MISCELLANEOUS

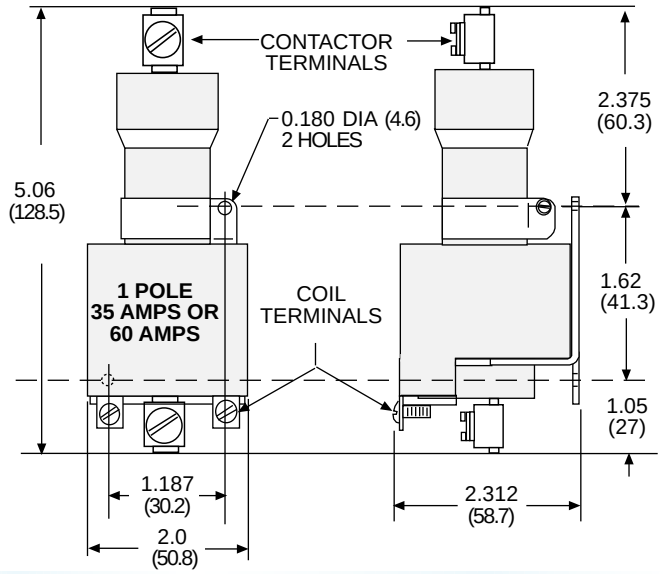
Insulation Material:	Class B - 130˚C
Load Terminals:	M35 pressure connectors for AWG 6-14 wire; M60 pressure connectors for AWG 2-12 wire; M100 pPressure connectors for AWG 1-8 wire
Mounting:	Vertical ±10˚C
Options:	Combination of SPST-NO & SPST-NC contact configurations. Available. Other coil voltages available. Time delay module offered consult factory for details

MERCURY DISPLACEMENT RELAYS

1, 2 & 3 POLES, 35 & 60 AMPS

OUTLINE DIMENSIONS

DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).

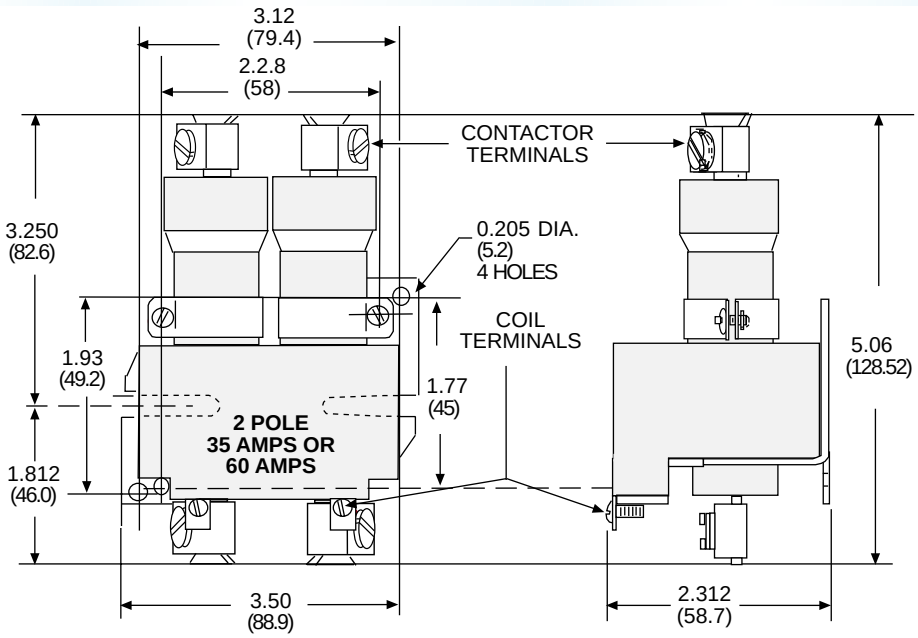


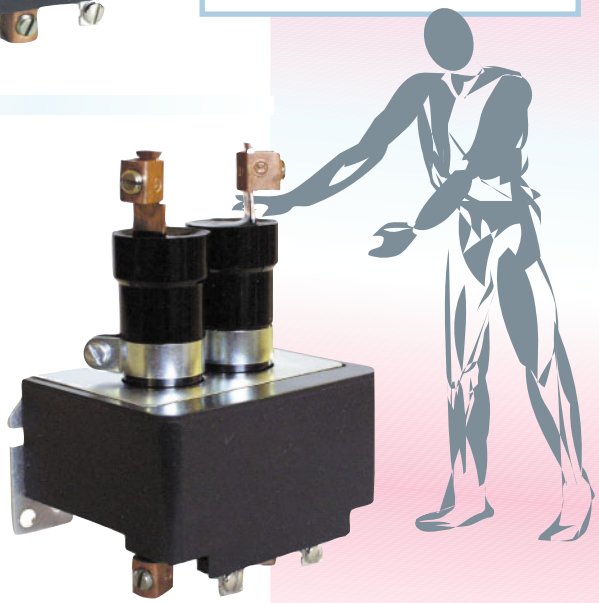


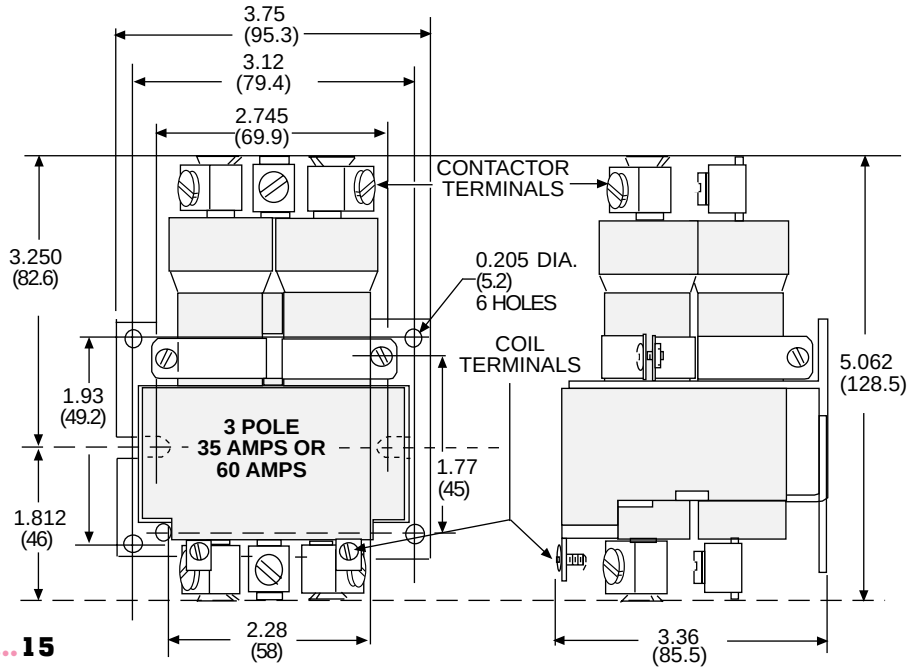
UL LISTED 367G

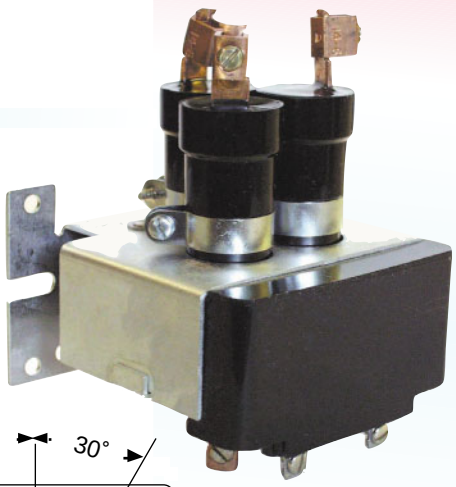
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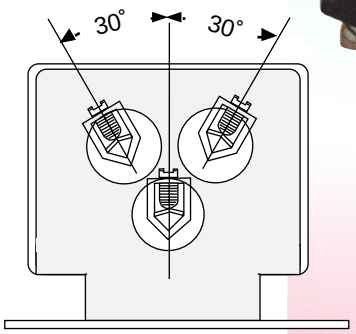
NOTE:
THE OUTLINES FOR THE N.C. VERSIONS ARE NOT SHOWN. THE TUBE IS POSITIONED APPROXIMATELY 0.43 INCHES (11 MM) LOWER IN THE COIL. THE OVERALL HEIGHT IS THE SAME AS THE N.O. VERSION.











MERCURY DISPLACEMENT RELAYS

1, 2 & 3 POLES, 35 AMPS

UL CONTACT RATINGS TABLE FOR M35A-M35B

VOLTAGE	HP 1Ø	HP 3Ø	MOTOR AMPS 1Ø	MOTOR AMPS 3Ø	RESISTIVE AMPS	TUNGSTEN AMPS
120VAC	3*	5*	34	30	35*	35*
240VAC	5*	7.5*	28	19	35*	17
480VAC	5*	10*	14	14	35*	9
600VAC	5*	10*	11.2	11	35*	7
24VDC	1/2		27		35*	35*
48VDC	1/2		13.5		35*	35*
125VDC	1/2		5.2		16*	16*
250VDC	1/2		2.6		12*	12*

* UL and CSA Listed
SEE MDR GENERAL SPECIFICATIONS AND DIMENSIONS.

UL LISTED 367G

UL Listed
File No. E52197

UL CONTACT RATINGS TABLE FOR ML35A-ML35B

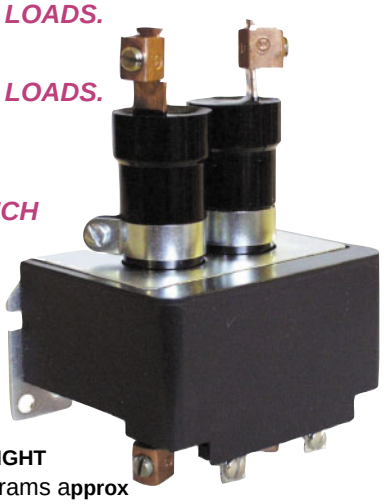
VOLTAGE	RESISTIVE AMPS	TUNGSTEN AMPS
120VAC	35*	35*
240 VAC	35*	17
480VAC	35*	9
600VAC	35*	7

* UL and CSA Listed



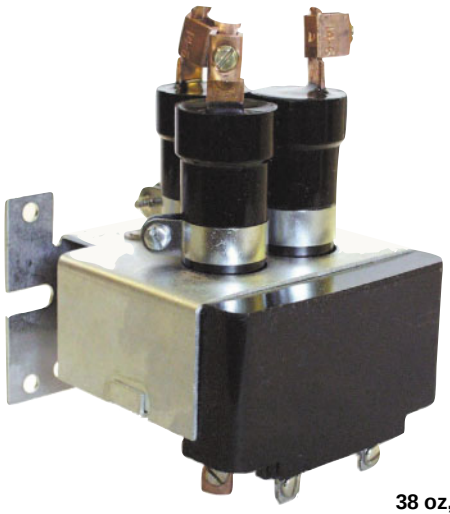
CLASS WM35
SWITCHES RESISTIVE, TUNGSTEN, AND MOTOR LOADS.
HIGH INRUSH CAPACITY.
RECOMMENDED FOR DC LOADS.

WEIGHT
13 oz, 370 grams **approx**



CLASS WML35
RECOMMENDED FOR MUCH LONGER LIFE WHEN SWITCHING AC RESISTIVE AND TUNGSTEN LOADS.

WEIGHT
26 oz, 738 grams **approx**



UP

RECOMMENDED MOUNTING POSITION ±10°

WEIGHT
38 oz, 1078 grams **approx**

STANDARD PART NUMBERS	NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)	NOMINAL COIL CURRENT
	COIL MEASURED @ 25˚C		
1 POLE NORMALLY OPEN CONTACT			
WM35A-120A	120 VAC	700 Ω	0.058 AMP
WM35A-240A	240 VAC,60Hz/ 220 VAC,50Hz	2.800 Ω	0.029 AMP
WM35A-24D	24 VDC	186 Ω	0.120 AMP
2 POLE NORMALLY OPEN CONTACT			
WM35AA-120A	120 VAC	218 Ω	0.135 AMP
WM35AA-240A	240 VAC,60Hz/ 220 VAC,50Hz	1,200 Ω	0.063AMP
WM35AA-24D	24 VDC	98 Ω	0.232 AMP
3 POLE NORMALLY OPEN CONTACT			
WM35AAA-120A	120 VAC	111 Ω	0.220 AMP
WM35AAA-240A	240 VAC,60Hz/ 220 VAC,50Hz	430 Ω	0.117 AMP
WM35AAA-24D	24 VDC	63 Ω	0.375 AMP
1 POLE NORMALLY CLOSED CONTACT			
WM35B-120A	120 VAC	460 Ω	0.115 AMP
ML SERIES 1 POLE NORMALLY OPEN CONTACT			
WML35A-120A	120 VAC	700 Ω	0.058 AMP
WML35A-240A	240 VAC,60Hz/ 220 VAC,50Hz	2.800 Ω	0.029 AMP
ML SERIES 2 POLE NORMALLY OPEN CONTACT			
WML35AA-120A	120 VAC	218 Ω	0.135 AMP
WML35AA-240A	240 VAC,60Hz/ 220 VAC,50Hz	1,200 Ω	0.063 AMP
ML SERIES 3 POLE NORMALLY OPEN CONTACT			
WML35AAA-120A	120 VAC	111 Ω	0.220 AMP
WML35AAA-240A	240 VAC,60Hz/ 220 VAC,50Hz	430 Ω	0.117 AMP

OTHER COIL VOLTAGES AVAILABLE, CONSULT FACTORY FOR DETAILS

MERCURY DISPLACEMENT RELAYS

1 , 2 & 3 POLES, 60 AMPS

UL CONTACT RATINGS TABLE FOR M60A-M60B

VOLTAGE	HP 1Ø	HP 3Ø	MOTOR AMPS 1Ø	MOTOR AMPS 3Ø	RESISTIVE AMPS	TUNGSTEN AMPS "A" (N.O.)	TUNGSTEN AMPS "B" (N.C.)
120VAC	3*	5*	34	30	60*	60*	45*
240VAC	5*	10*	28	28	60*	30	22.5
480VAC	7.5*	15*	21	21	60*	15	11.2
600VAC	7.5*	15*	16	17	50 **	12	9
24VDC	3/4		39		60*	50*	50*
48VDC	3/4		19.5		60*	50*	50*
125VDC	3/4		7.4		40*	40*	40*
250VDC	3/4		3.7		20*	20*	20*

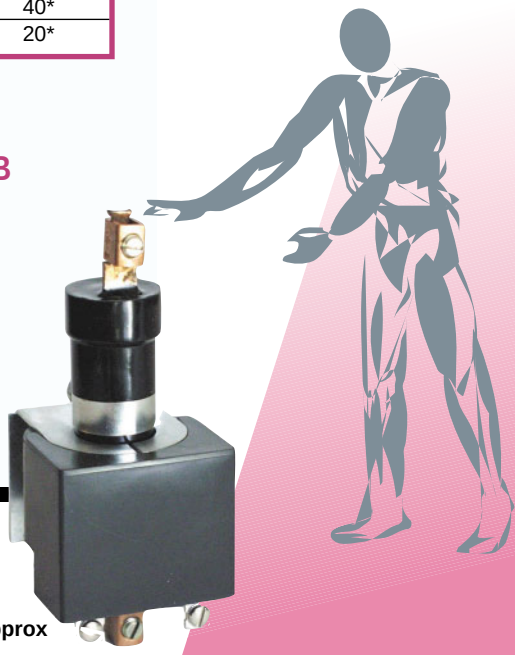
* UL and CSA Listed ** 3 POLE 40 AMPS PER POLE
SEE MDR GENERAL SPECIFICATIONS AND DIMENSIONS.

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UL CONTACT RATINGS TABLE FOR ML60A-60B

VOLTAGE	RESISTIVE AMPS	TUNGSTEN AMPS "A" (N.O.)	TUNGSTEN AMPS "B" (N.C.)
120VAC	60*	60*	45*
240VAC	60*	30	22.5
480VAC	60*	15	11.2
600VAC	50 **	12	9

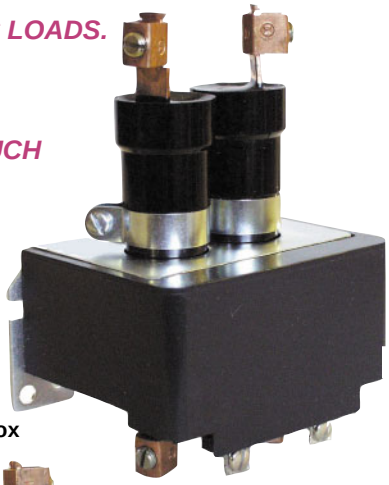
* UL and CSA Listed ** 3 POLE 40 AMPS PER POLE



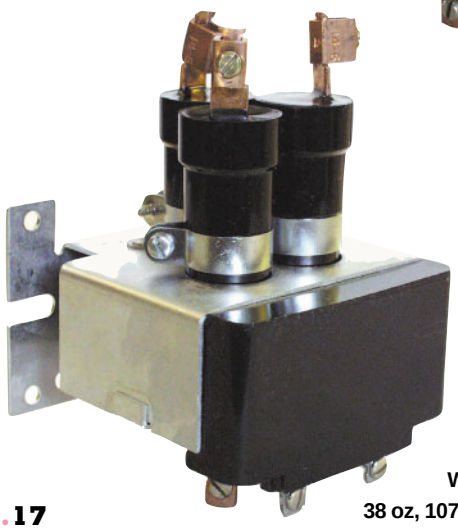
CLASS WM60
SWITCHES RESISTIVE,
TUNGSTEN, AND MOTOR LOADS
HIGH INRUSH CAPACITY.
RECOMMENDED FOR DC LOADS.

WEIGHT
13 oz, 370 grams **approx**

CLASS WML60
RECOMMENDED FOR MUCH
LONGER LIFE WHEN
SWITCHING AC
RESISTIVE AND
TUNGSTEN LOADS.



WEIGHT
26 oz, 738 grams **approx**



UP

RECOMMENDED MOUNTING POSITION ±10

WEIGHT
38 oz, 1078 grams **approx**

STANDARD PART NUMBERS	NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)	NOMINAL COIL CURRENT
	COIL MEASURED @ 25°C		
1 POLE NORMALLY OPEN CONTACT			
WM60A-120A	120 VAC	700 Ω	0.058 AMP
WM60A-240A	240 VAC,60Hz/ 220 VAC,50Hz	2.800 Ω	0.029 AMP
WM60A-24D	24 VDC	186 Ω	0.120 AMP
2 POLE NORMALLY OPEN CONTACT			
WM60AA-120A	120 VAC	218 Ω	0.135 AMP
WM60AA-240A	240 VAC,60Hz/ 220 VAC,50Hz	1,200 Ω	0.063AMP
WM60AA-24D	24 VDC	98 Ω	0.232 AMP
3 POLE NORMALLY OPEN CONTACT			
WM60AAA-120A	120 VAC	111 Ω	0.220 AMP
WM60AAA-240A	240 VAC,60Hz/ 220 VAC,50Hz	430 Ω	0.117 AMP
WM60AAA-24D	24 VDC	63 Ω	0.375 AMP
1 POLE NORMALLY CLOSED CONTACT			
WM60B-120A	120 VAC	460 Ω	0.115 AMP
ML SERIES 1 POLE NORMALLY OPEN CONTACT			
WML60A-120A	120 VAC	700 Ω	0.058 AMP
WML60A-240A	240 VAC,60Hz/ 220 VAC,50Hz	2.800 Ω	0.029 AMP
ML SERIES 2 POLE NORMALLY OPEN CONTACT			
WML60AA-120A	120 VAC	218 Ω	0.135 AMP
WML60AA-240A	240 VAC,60Hz/ 220 VAC,50Hz	1,200 Ω	0.063AMP
ML SERIES 3 POLE NORMALLY OPEN CONTACT			
WML60AAA-120A	120 VAC	111 Ω	0.220 AMP
WML60AAA-240A	240 VAC,60Hz/ 220 VAC,50Hz	430 Ω	0.117 AMP

OTHER COIL VOLTAGES AVAILABLE, CONSULT FACTORY FOR DETAILS

MERCURY DISPLACEMENT RELAYS

1 POLE 100 AMPS

UL CONTACT RATINGS TABLE

VOLTAGE	RESISTIVE AMPS	TUNGSTEN AMPS	HORSEPOWER SINGLE PHASE
120VAC	100	100*	3
240VAC	100	60	5
480VAC	100	30*	15
600VAC	80*	24*	10*
24VDC	100	100	1.5*
48VDC	100	100	1.5*
125VDC	80	80	1.5*
250VDC	40	40	1.5*

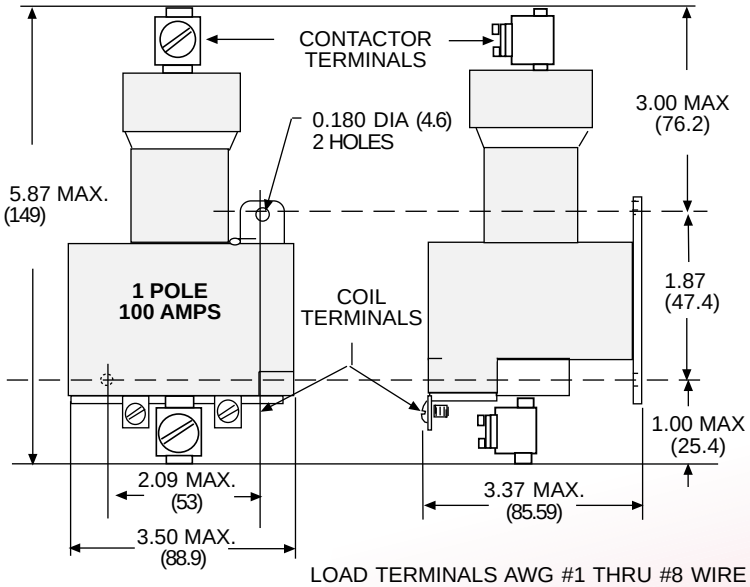
*NON UL RATING

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UL Listed
File No. E52197

CLASS WM100
CAPABLE OF SWITCHING 100 AMP
LOADS UP TO 480 VAC / 48 VDC

OUTLINE DIMENSIONS
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).



LOAD TERMINALS AWG #1 THRU #8 WIRE

GENERAL SPECIFICATIONS

COIL
- Frequency of Operation: 60 per minute max
- Pull-in voltage: 80% of nominal voltage, typ. AC & DC coils
- Dropout voltage: 78% of nominal voltage, typ. AC coils; 65% of nominal voltage, typ. DC coils

CONTACTS
- Material: Mercury
- Contact resistance: 2 milliohm typical

TIMING
- Operate: 50 milliseconds typical
- Dropout: 100 milliseconds typical

DIELECTRIC STRENGTH
- Across open Contact: 2650 V rms

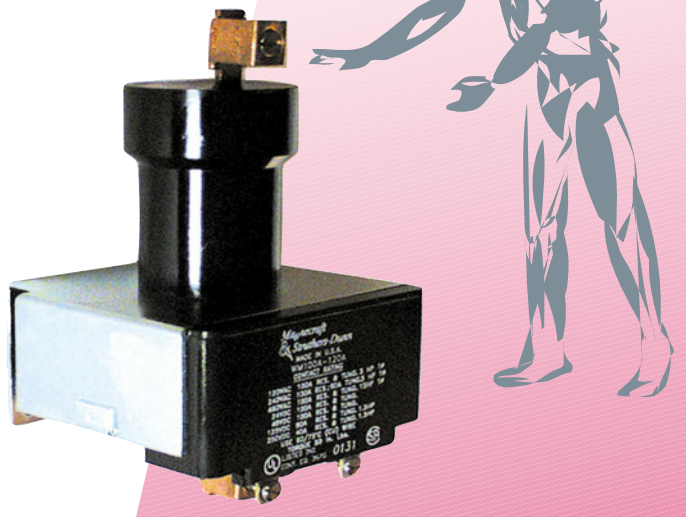
TEMPERATURE
- Operating: - 35˚C to + 60˚C under continuous load

LIFE EXPECTANCY
- Electrical: 100,000 operations @ rated resistive load
- Mechanical: 5,000,000 operations @ no load

MISCELLANEOUS
- Insulation Material: Class B - 130˚C.
- Connections: Pressure connectors for #1-8 AWG wire
- Options: Other coil voltages available consult factory for details
- Weight: 15.9 oz. 450 grams approx.

UP

VERTICAL MOUNTING RECOMMENDED ±10˚



STANDARD PART NUMBERS	COIL MEASURED @ 25˚C: NOMINAL INPUT VOLTAGE	NOMINAL RESISTANCE (OHMS)	NOMINAL COIL CURRENT
AC OPERATED NORMALLY OPEN CONTACT			
WM100A-120A	120 VAC	73.5 Ω	0.225 AMP
WM100A-240A	240 VAC,60Hz/ 220 VAC,50Hz	300 Ω	0.138 AMP
WM100A-24D	24 VDC	53 Ω	0.380 AMP

Artisan Technology Group is an independent supplier of quality pre-owned equipment

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Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

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