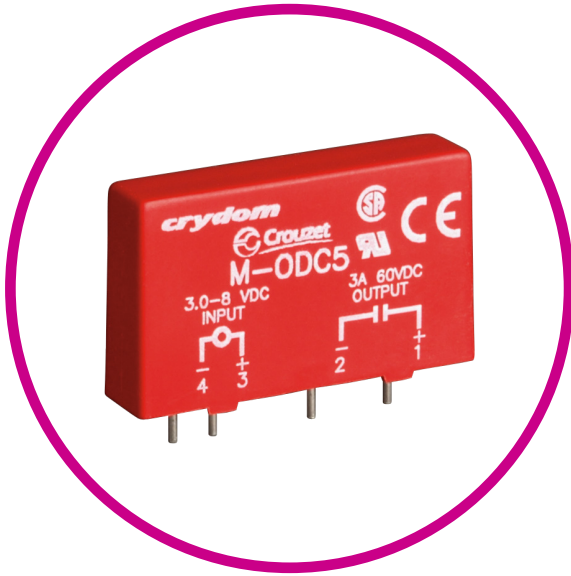


# M SERIES | OUTPUT MODULES

I/O MODULES



## Features

- AC Modules have High Current Thyristors with 100 Amp
- Surge Capability
- Plug into mounting boards for 0.6" modules
- Zero or Random Turn-On Available in AC Modules
- 4kV Optical isolation (1500 VAC Isolation for FET DC Output Modules)
- UL Recognized, CSA Certified, CE Compliant
- Industry standard packaging and Color Coding Black (AC Output) Red (DC Output)

## SPECIFICATIONS

### Input

Part Number	M-OAC5	M-OAC5A	M-OAC5AH	M-OAC5AR	M-OAC5R
Nominal Voltage [VDC]	5.0	5.0	5.0	5.0	5.0
Minimum Voltage [VDC] <sup>(2)</sup>	2.75	2.75	2.75	2.75	2.75
Maximum Voltage [VDC]	8.0	8.0	8.0	8.0	8.0
Drop-out Voltage [VDC]	1.0	1.0	1.0	1.0	1.0
Maximum Current [mA] <sup>(3)</sup>	20	20	20	20	20
Resistance [Ohms] <sup>(4)</sup>	220	220	220	220	220

Part Number	M-OAC24	M-OAC24A	M-ODC5	M-ODC5A	M-ODC5F
Nominal Voltage [VDC]	24	24	5.0	5.0	5.0
Minimum Voltage [VDC] <sup>(2)</sup>	18	18	2.75	2.75	2.75
Maximum Voltage [VDC]	32	32	8.0	8.0	8.0
Drop-out Voltage [VDC]	1.0	1.0	1.0	1.0	1.0
Maximum Current [mA] <sup>(3)</sup>	13	13	18	18	18
Resistance [Ohms] <sup>(4)</sup>	2000	2000	250	250	250

Part Number	M-ODC5MA	M-ODC5MC	M-ODC5ML	M-ODC24	M-ODC24A
<b>Nominal Voltage [VDC]</b>	5.0	5.0	5.0	24	24
<b>Minimum Voltage [VDC]<sup>(2)</sup></b>	2.75	2.75	2.75	18	18
<b>Maximum Voltage [VDC]</b>	8.0	8.0	8.0	32	32
<b>Drop-out Voltage [VDC]</b>	1.0	1.0	1.0	1.0	1.0
<b>Maximum Current [mA]<sup>(3)</sup></b>	18	18	18	13	13
<b>Resistance [Ohms]<sup>(4)</sup></b>	250	250	250	2000	2000

## Output

Part Number	M-OAC5	M-OAC5A	M-OAC5AH	M-OAC5AR	M-OAC5R
<b>Nominal Line Voltage</b>	120 VAC	240 VAC	240 VAC	240 VAC	120 VAC
<b>Minimum Line Voltage</b>	12 VAC	24 VAC	24 VAC	24 VAC	12 VAC
<b>Maximum Line Voltage</b>	140 VAC	280 VAC	280 VAC	280 VAC	140 VAC
<b>Max Off-State Voltage<sup>(5)</sup></b>	400 Vpeak	600 Vpeak	600 Vpeak	600 Vpeak	400 Vpeak
<b>Max Off-State Leakage<sup>(6)</sup></b>	0.1mArms	0.1mArms	0.1mArms	0.1mArms	0.1mArms
<b>Static Off-State dv/dt<sup>(7)</sup></b>	200 V/usec	200 V/usec	200 V/usec	200 V/usec	200 V/usec
<b>Maximum Rated On-State Current<sup>(8)</sup></b>	3.5 Arms	3.5 Arms	5.0 Arms	3.5 Arms	3.5 Arms
<b>Minimum On-State Current</b>	50 mArms	50 mArms	50 mArms	50 mArms	50 mArms
<b>Max Surge Current<sup>(9)</sup></b>	100 Apeak	100 Apeak	100 Apeak	100 Apeak	100 Apeak
<b>On-State Voltage Drop or Resistance<sup>(10)</sup></b>	1.6 V	1.6 V	1.6 V	1.6 V	1.6 V
<b>Maximum Turn-On Time [msec] (13)</b>	8.33	8.33	8.33	0.1	0.1
<b>Maximum Turn-Off Time [msec] (13)</b>	8.33	8.33	8.33	8.33	8.33
<b>Input/Output Isolation Voltage (14)</b>	4000 Vrms	4000 Vrms	4000 Vrms	4000 Vrms	4000 Vrms
<b>Input/Output Capacitance</b>	8 pF	8 pF	8 pF	8 pF	8 pF
<b>Operating Temperature Range</b>	-30 to 80°C	-30 to 80°C	-30 to 80°C	-30 to 80°C	-30 to 80°C
<b>Storage Temperature Range</b>	-40 to 80°C	-40 to 80°C	-40 to 80°C	-40 to 80°C	-40 to 80°C
<b>Line Frequency Range</b>	47 to 63 Hz	47 to 63 Hz	47 to 63 Hz	47 to 63 Hz	47 to 63 Hz
<b>Weight</b>	1.1 oz. (31.2g)	1.1 oz. (31.2g)	1.1 oz. (31.2g)	1.1 oz. (31.2g)	1.1 oz. (31.2g)

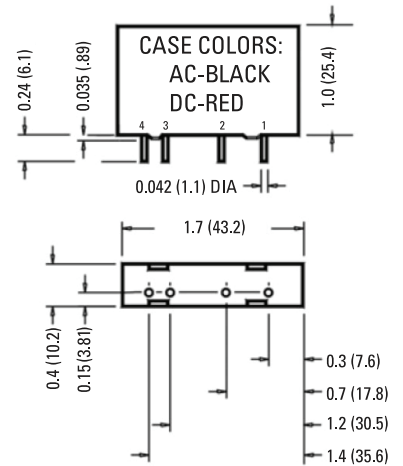
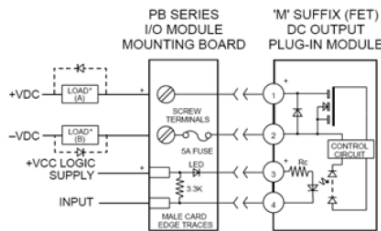
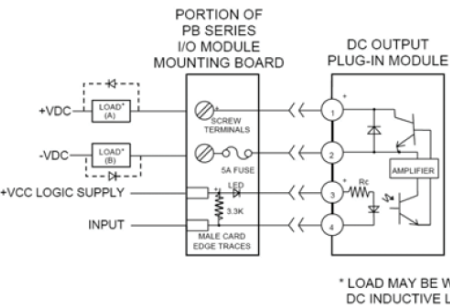
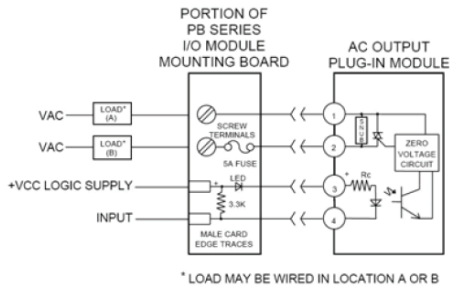
Part Number	M-OAC24	M-OAC24A	M-ODC5	M-ODC5A	M-ODC5F
Nominal Line Voltage	120 VAC	240 VAC	5-48 VDC	5-150 VDC	5-48 VDC
Minimum Line Voltage	12 VAC	24 VAC	3.0 VDC	3.0 VDC	3.0 VDC
Maximum Line Voltage	140 VAC	280 VAC	60 VDC	250 VDC	60 VDC
Max Off-State Voltage <sup>(5)</sup>	400 Vpeak	600 Vpeak	60 VDC	250 VDC	60 VDC
Max Off-State Leakage <sup>(6)</sup>	0.1mArms	0.1mArms	10 uA	10 uA	1mA
Static Off-State dv/dt <sup>(7)</sup>	200 V/usec	200 V/usec	N/A	N/A	N/A
Maximum Rated On-State Current <sup>(8)</sup>	3.5 Arms	3.5 Arms	3.0 A	1.0 A	3.0 A
Minimum On-State Current	50 mArms	50 mArms	10 mA	10 mA	10 mA
Max Surge Current <sup>(9)</sup>	100 Apeak	100 Apeak	5.0 A	5.0 A	5.0 A
On-State Voltage Drop or Resistance <sup>(10)</sup>	1.6 V	1.6 V	1.5 V	1.5 V	1.5 V
Maximum Turn-On Time [msec] <sup>(13)</sup>	8.33	8.33	0.1	0.1	0.025
Maximum Turn-Off Time [msec] <sup>(13)</sup>	8.33	8.33	0.75	0.75	0.05
Input/Output Isolation Voltage <sup>(14)</sup>	4000 Vrms	4000 Vrms	4000 Vrms	4000 Vrms	4000 Vrms
Input/Output Capacitance	8 pF	8 pF	8 pF	8 pF	8 pF
Operating Temperature Range	-30 to 80°C	-30 to 80°C	-30 to 80°C	-30 to 80°C	-30 to 80°C
Storage Temperature Range	-40 to 80°C	-40 to 80°C	-40 to 80°C	-40 to 80°C	-40 to 80°C
Line Frequency Range	47 to 63 Hz	47 to 63 Hz	DC	DC	DC
Weight	1.1 oz. (31.2g)	1.1 oz. (31.2g)	1.1 oz. (31.2g)	1.1 oz. (31.2g)	1.1 oz. (31.2g)

Part Number	M-ODC5MA	M-ODC5MC	M-ODC5ML	M-ODC24	M-ODC24A
Nominal Line Voltage	5-150 VDC	5-90 VDC	5-48 VDC	5-48 VDC	5-150 VDC
Minimum Line Voltage	1.0 VDC	1.0 VDC	50 VDC	60 VDC	250 VDC
Maximum Line Voltage	200 VDC	100 VDC	50 VDC	60 VDC	250 VDC
Max Off-State Voltage <sup>(5)</sup>	200 VDC	100 VDC	50 VDC	60 VDC	250 VDC
Max Off-State Leakage <sup>(6)</sup>	10 uA	10 uA	10 uA	10 uA	10 uA
Static Off-State dv/dt <sup>(7)</sup>	N/A	N/A	N/A	N/A	N/A
Maximum Rated On-State Current <sup>(8)</sup>	3.0 A	5.0 A	1.0 A	3.0 A	
Minimum On-State Current	1.0 mA	1.0 mA	10 mA	10 mA	10 mA
Max Surge Current <sup>(9)</sup>	10 A	10 A	10 A	5.0 A	5.0 A
On-State Voltage Drop or Resistance <sup>(10)</sup>	0.25 Ohms	0.10 Ohms	0.05 Ohms	1.5 V	1.5 V
Maximum Turn-On Time [msec] <sup>(13)</sup>	1.0	1.0	1.0	0.1	0.1
Maximum Turn-Off Time [msec] <sup>(13)</sup>	0.05	0.05	0.05	0.75	0.75
Input/Output Isolation Voltage <sup>(14)</sup>	1500 Vrms	1500 Vrms	1500 Vrms	4000 Vrms	4000 Vrms
Input/Output Capacitance	8 pF	8 pF	8 pF	8 pF	8 pF
Operating Temperature Range	-30 to 80°C	-30 to 80°C	-30 to 80°C	-30 to 80°C	-30 to 80°C
Storage Temperature Range	-40 to 80°C	-40 to 80°C	-40 to 80°C	-40 to 80°C	-40 to 80°C
Line Frequency Range	DC	DC	DC	DC	DC
Weight	1.1 oz. (31.2g)	1.1 oz. (31.2g)	1.1 oz. (31.2g)	1.1 oz. (31.2g)	1.1 oz. (31.2g)

## GENERAL NOTES

- (1) Specifications apply to an ambient temperature of -30 to 80 °C unless otherwise noted.
- (2) Without external LED status indicator Add 1.7 volts for external LED if utilized.
- (3) At nominal input voltage, without external LED status indicator.
- (4) +/- 10% at 25°C.
- (5) Maximum 1 minute duration for OAC modules when applied as a DC voltage rather than a peak AC voltage.
- (6) At maximum line voltage, 25°C for OAC modules, and 80°C for ODC modules.
- (7) Minimum DV/DT per EIA/NARM RS433, method RS397, DV/DT ratings do not apply to DC output models.
- (8) At 40°C derate OAC modules 58 mA/°C to 80°C derate ODC, ODCxMC and ODCxML modules 50mA/°C to 80°C CSA rating of OAC modules is 3.0 Arms at 40°C
- (9) At 25°C for 1 second maximum duration: 1 AC cycle for AC modules, 1 second for DC modules.
- (10) At maximum rated on-state current and 25°C.
- (11) At maximum line voltage, maximum rated output current, nominal input voltage and 25°C switching speed of OAC modules is based upon 60 Hz line frequency
- (12) At 25°C for 1 second maximum duration.
- (13) 1/3 HP at 240 VAC 1/8 HP at 120 VAC.
- (14) At 25°C for 1 second maximum duration.

## EQUIVALENT CIRCUIT DIAGRAMS / MECHANICAL SPECIFICATIONS



UNLESS OTHERWISE SPECIFIED  
DIMENSIONS: INCHES (MILLIMETERS)  
TOLERANCE: ±0.020 (±0.50)

## AGENCY APPROVALS & CERTIFICATIONS





## WARNINGS



### RISK OF MATERIAL DAMAGE AND HOT ENCLOSURE

- The product's side panels may be hot, allow the product to cool before touching
- Follow proper mounting instructions including torque values
- Do not allow liquids or foreign objects to enter this product

**Failure to follow these instructions can result in serious injury, or equipment damage.**



### HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Disconnect all power before installing or working with this equipment
- Verify all connections and replace all covers before turning on power

**Failure to follow these instructions will result in death or serious injury.**

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