

DMP Series  
308-74 2

**SERIES DMP**  
Microprocessor  
Interface Modules

Input/Output  
AC and DC

**GENERAL DESCRIPTION:**

The Crydom Series DMP Input and Output Modules are a family of high performance microprocessor interface switches designed to meet the demands of a rapidly expanding industrial control market. These reliable Crydom I/O modules provide an electrically clean, photo-isolated (4000 VRMS min), noise-free interface between programmable controllers, microprocessors and computerized machine controls and external elements such as limit switches, thermostats, pressure switches, motors/motor starters, valves and heaters.

The DMP modules have been designed to achieve high performance at a record low cost by utilizing total machine automation and labor-saving state-of-the-art robotics to assemble the entire module. The inherent quality of product consistency is combined with advanced circuit design and innovative packaging.

In a compact vertical mount package, the modules occupy only 0.90 square inches of board space. The entire module is sealed with a skin tight epoxy coating that provides excellent environmental protection while retaining very high heat transfer characteristics, allowing components to run cooler and to perform more reliably.

While physically different, the DMP modules are electrical plug-in replacements for Crydom (similarly numbered) Series 6 modules, as well as competitors' models listed as equivalents.

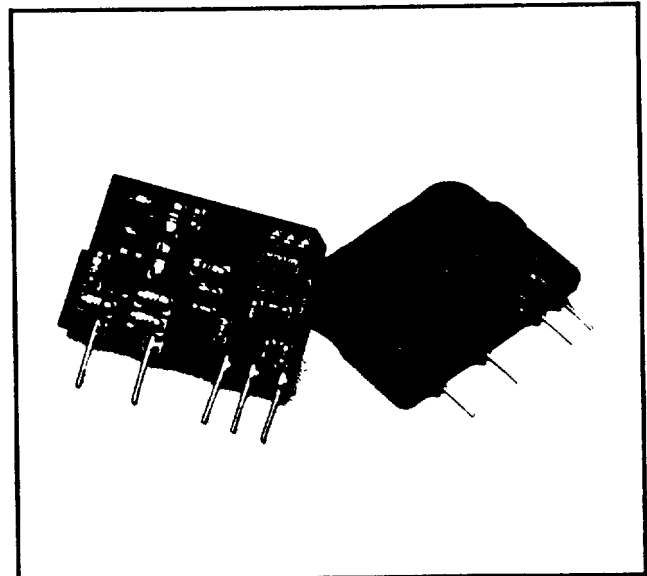
**INPUT MODULES**

The input modules accept power level field control signals and convert them to photo-isolated logic level signals through noise suppression circuitry suitable for input to a microprocessor or logic system.

**OUTPUT MODULES**

Crydom Output Modules accept logic level control signals to switch AC or DC loads up to 3.0 Amps at 45°C ambient temperature. The AC modules have integral snubbers for low power factor loads and also provide zero-voltage switching. DC models incorporate transient voltage suppression.

- UL Recognized, CSA Certified ■
  - Opto-Isolated, 4000 VRMS ■
  - Zero Voltage Switching (AC) ■
  - High Transient Rating ■
  - High Noise Immunity ■
  - Internal Transient Suppression ■
  - High Packaging Density ■
  - Small Footprint ■
  - Compatible with ■
- Microprocessor 5 Volt Logic Systems

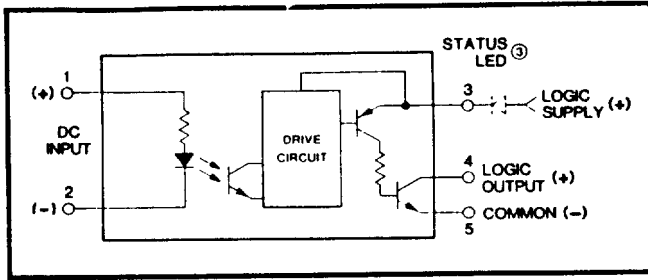


Input/Output Modules (and Equivalents)

Model No.	Electrical Equivalents ①	Type	Maximum Load Current/Voltage
DMP6101A ✓	IDC5	DC/IN	25 mA @ 30 VDC
DMP6201A ✓	IAC5	AC/IN	25 mA @ 30 VDC
DMP6202A ✓	IAC5A	AC/IN	25 mA @ 30 VAC
DMP6301A ✓	ODC5	DC/OUT	3.0A DC @ 60 VDC
DMP6402A ✓	OAC5A	AC/OUT	3.0A(RMS) @ 280 VAC

General Characteristics		Units	
Dielectric Strength @ 50/60 Hz (Input/Output) ①	4000	V(RMS)	
Insulation Resistance @ 500 VDC (Input/Output)	10 <sup>10</sup>	Ohms	
Max Capacitance (Input/Output)	8	pF	
Ambient Temperature Range	Operating	-40 to 80	°C
	Storage	-40 to 125	°C

DC Input, 5 volt logic



Electrical Specifications (-40°C ≤ T<sub>A</sub> ≤ 80°C)

INPUT	MIN	MAX	UNITS
Input On Voltage	10	32	VDC
Input Off Voltage	-32	3.0	VDC
Allowable Input Current for Output Off-State		2.0	mA
Input Current (@ 12 VDC)		9.0	mA
Input Current (@ 32 VDC)		32	mA
Input Resistance (in series with coupler LED)	1100		Ohms

OUTPUT

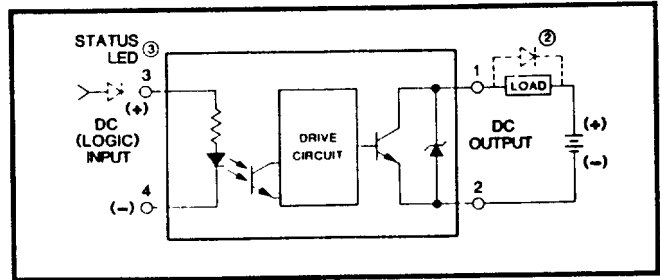
(Note: All voltages referenced to Pin 5)

Breakdown Voltage (Pin 4)	30		VDC
Output Current (Pin 4)		25	mA
On-State Voltage (Pin 4) (@ 25 mADC)		0.4	VDC
Off-State Leakage (Pin 4) (@ 30 VDC)		100	μA
Logic Supply Voltage (Pin 3)	3.5	6.0	VDC
Logic Supply Current No Ext. LED (V applied to Pin 3)		20	mA
Logic Supply Current With Ext. LED (V applied to LED)		15	mA
Turn-On Time (T <sub>D</sub> + T <sub>R</sub> )		100	μs
Turn-Off Time (T <sub>D</sub> + T <sub>F</sub> )		100	μs

Footnotes (refer to circled numbers)

- ① Voltage applied for 1 minute
- ② Inductive loads should be diode suppressed.
- ③ LED optional. May be placed in series with logic supply (pin 3) to indicate on-state (reduces voltage at pin 3 by approximately 1.7V). LEDs are included in system mounting boards (see bulletin C100-5).
- ④ Derate 0.04 Amp/°C from 45°C (see derating curve, Figure 1).
- ⑤ Built-in snubber will commutate inductive load to 0.5 power factor over temperature range.
- ⑥ Zener diode built-in to suppress transient voltage in excess of ratings
- ⑦ For low load current, on-state voltage may go to 3.5V max, because of pilot-only turn-on
- ⑧ Off-state dv/dt test method per EIA/NARM standard RS-443, paragraph 13.11.1
- ⑨ The DMP series modules are electrical plug-in replacements for competitors' models listed as equivalents (parenthesized above) as well as Crydom Series 6 parts with same basic part numbers.

DC Output, 5 volt logic



Electrical Specifications (-40°C ≤ T<sub>A</sub> ≤ 80°C)

INPUT	MIN	MAX	UNITS
Input On Voltage ①	3.0	6.0	VDC
Input Off Voltage	-32	1.0	VDC
Input Current (@ 5V)		15	mA
Input Resistance (in series with coupler LED)	270		Ohms

OUTPUT

Load Current (@ 45°C) (See Fig. 1) ④	0.02	3.0	A
Load Voltage ⑥	3.0	6.0	VDC
Surge Current (1 sec)		5.0	A
On-State Voltage (@ Max. Current)		1.5	VDC
Off-State Leakage (@ 60 VDC)		1.0	mA
Turn-On Time (T <sub>D</sub> + T <sub>R</sub> )		100	μs
Turn-Off Time (T <sub>D</sub> + T <sub>F</sub> )		100	μs

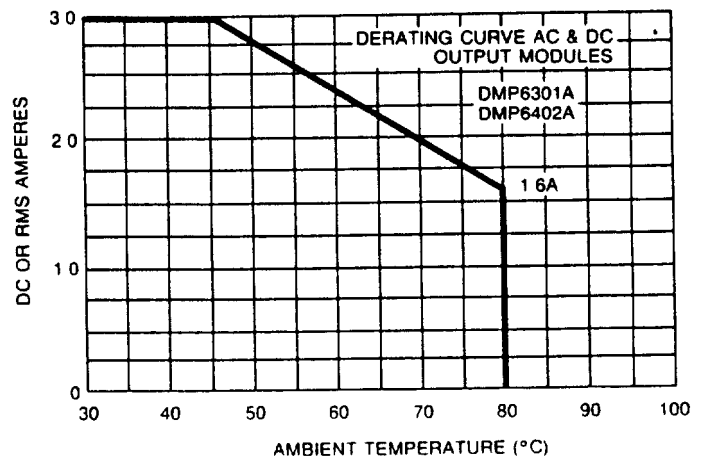


Figure 1. Maximum Output Current vs Ambient Temperature

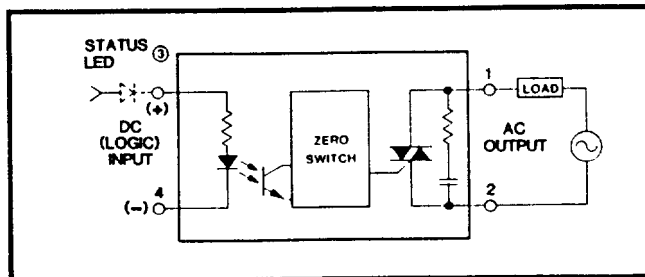
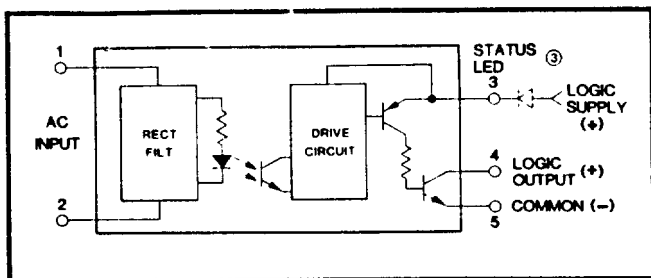
DMP6201A  
DMP6202A  
AC Input, 5 volt logic

(IAC5)  
(IAC5A)

DMP6402A

(OAC5-A)

AC Output, 5 volt logic



Electrical Specifications ( $-40^{\circ}\text{C} \leq T_A \leq 80^{\circ}\text{C}$ )

INPUT		MIN	MAX	UNITS
Input On Voltage	✓ DMP6201A	90	140	V (RMS)
	DMP6202A	180	280	V (RMS)
Input Off Voltage	DMP6201A	0.0	30	V (RMS)
	DMP6202A	0.0	60	V (RMS)
Allowable Input Current for Output Off-State	DMP6201A		2.0	mA (RMS)
	DMP6202A		1.5	mA (RMS)
Input Current	(@ 120V) DMP6201A		6.0	mA (RMS)
	(@ 240V) DMP6202A		6.0	mA (RMS)
Frequency Range		47	420	Hz
Overvoltage ( $\leq 1\text{ms}$ )		600		V(peak)
Input Impedance	DMP6201A	20	24	K Ohms
	DMP6202A	50	60	K Ohms

Electrical Specifications ( $-40^{\circ}\text{C} \leq T_A \leq 80^{\circ}\text{C}$ )

INPUT	MIN	MAX	UNITS
Input On Voltage ③	3.0	6.0	VDC
Input Off Voltage	-32	1.0	VDC
Input Current (@ 5V)		15	mA
Input Resistance (in series with coupler LED)	270		Ohms

OUTPUT

Load Current (@ $45^{\circ}\text{C}$ ) (See Fig. 1) ① ③	0.02	3.0	A (RMS)
Load Voltage	12	280	V (RMS)
Frequency Range	47	63	Hz
Surge Current 1-Cycle (Non-Rep.)		80	A (peak)
Transient Overvoltage	600		V (peak)
On-State Voltage (@ Max. Curr.) ⑦		1.5	V (peak)
Off-State Leakage @ 240 V (RMS)		5.0	mA (RMS)
Off-State $dv/dt$ ①	200		V/ $\mu\text{s}$
Turn-On Time (Next Zero Voltage)		1/2	Cycle
Turn-Off Time (Next Zero Current)		1/2	Cycle

OUTPUT (Note: All voltages referenced to Pin 5)

Breakdown Voltage (Pin 4)	30		VDC
Output Current (Pin 4)		25	mA
On-State Voltage (Pin 4) (@ 25 mADC)		0.4	VDC
Off-State Leakage (Pin 4) (@ 30 VDC)		100	$\mu\text{A}$
Logic Supply Voltage (Pin 3)	3.5	6.0	VDC
Logic Supply Current		20	mA
No Ext. LED (V applied to Pin 3)		15	mA
With Ext. LED (V applied to LED)		15	mA
Turn-On Time ( $T_D + T_R$ )		20	ms
Turn-Off Time ( $T_D + T_F$ )		200	ms

Surge Characteristics — AC Output Module

The curves in Figure 2 apply to a non-repetitive uniform amplitude surge of a given time and peak current, preceded and followed by any rated load condition. Also shown is the number of these surge occurrences that can be tolerated before device damage. For example, in Figure 2, a life of  $10^9$  surge occurrences can be estimated for a 16 A (Peak) surge of 0.1 seconds duration. The junction temperature must be allowed to return to its steady-state value before reapplication of surge current.

Control of conduction may be momentarily lost if currents exceed the  $10^4$  curve values from initial junction temperatures greater than  $40^{\circ}\text{C}$ .

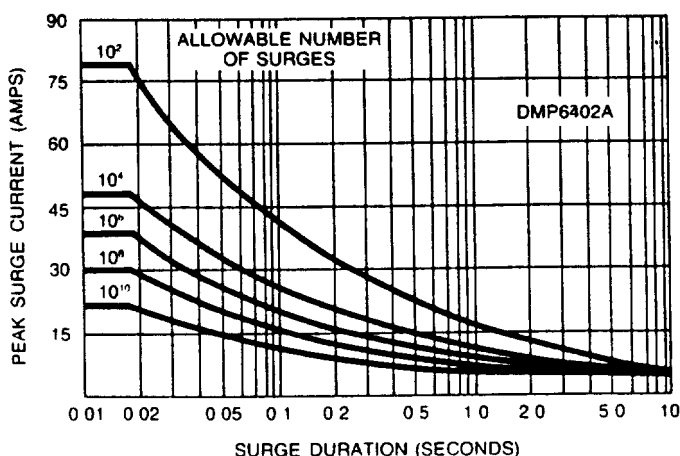
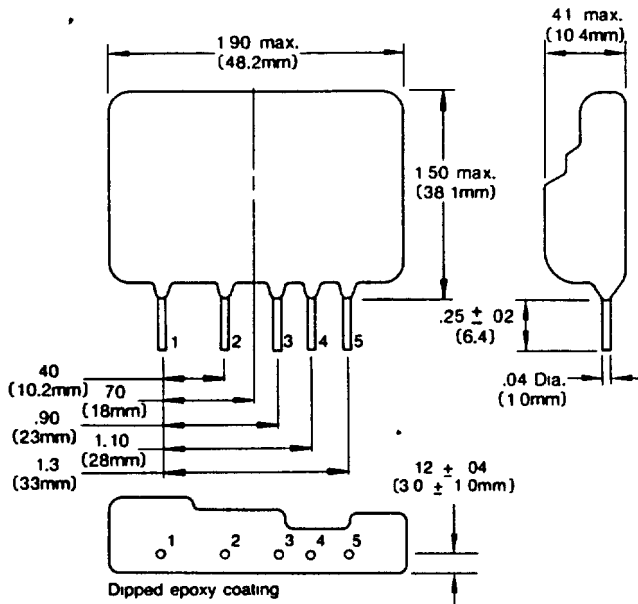


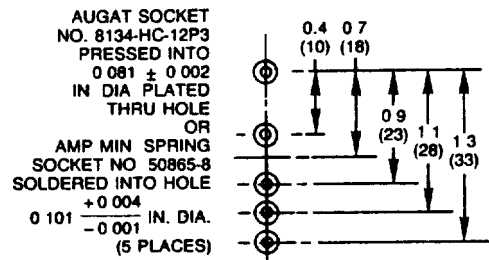
Figure 2. Peak Surge Current vs Duration, AC Output Module

## MECHANICAL SPECIFICATIONS



**Weight:** 0.8 oz. (23 grams)  
**Encapsulant:** Thermally conductive epoxy  
**Pins:** Tin-plated copper  
**Tolerances:**  $\pm 0.020$  in. (0.5mm)  
**Dimensions:** Inches (mm)

## PLUG-IN MOUNTING HARDWARE FOR 1/16" PCB



**Note:** Dimensions in (mm) for reference only

Data and specifications subject to change without notice

# CRYDOM

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