



# IAC/OAC IDC/ODC

## Input/Output Modules

File E81606 & E29244

File LR38595M77

Users should thoroughly review the technical data before selecting a product part number. It is recommended that users also seek out the pertinent approvals files of the agencies/laboratories and review them to ensure the product meets the requirements for a given application.

### Features

- Industry standard package and pin-out.
- Color coded by function.
- 4,000V rms optical isolation.
- High immunity to false operation.
- Series compatible.
- Output modules can be controlled from sinking or sourcing logic.
- Compatible with 2IO series mounting boards.

### Engineering Data (all I/O modules)

**Switch Form:** 1 Form A (SPST-NO)  
**Duty:** Continuous.  
**Isolation:** 4,000V rms, 60 Hz.  
**Capacitance:** 8 pF Typical (input to output).  
**Operating Temperature:** -30°C to +80°C.  
**Storage Temperature:** -40°C to +85°C.  
**Potting Compound Flammability:** UL94V-0.  
**Approximate Weight:** 1.38 oz. (35g).

### Ordering Information

Typical Part Number ►

OAC

-5

H

#### 1. Basic Series:

IAC = AC input module - yellow case  
 IDC = DC input module - white case  
 OAC = AC output module - black case  
 ODC = DC output module - red case

#### 2. Input or Logic Voltage:

5 = 5VDC  
 15 = 15VDC  
 24 = 24VDC

#### 3. Options:

Blank = IAC Type — 120VAC/VDC input (90-140VAC/VDC) \* \*  
           IDC Type — 3.3-32VDC input \* \*  
           OAC Type — 3A, 24-280VAC, zero voltage turn-on output  
           ODC Type — 3A, 3-60VDC output

A = IAC Type — 240VAC/VDC input (180-280VAC/VDC) \* \*  
       OAC Type — 3A, 24-280VAC, zero voltage turn-on output  
       ODC Type — 1A, 3-250VDC output  
       IDC Type — 10-60VDC input \* \*

E = IAC Type — 18-36VAC/VDC input \* \*

F = IDC Type — 4-32VDC input & fast turn-on & turn-off times \* \*

H = OAC Type — 5A, 24-280VAC, zero voltage turn-on output

R = OAC Type — 5A, 12-280VAC, random voltage turn-on output

\* \* Is not polarity sensitive.

Our authorized distributors are more likely to maintain the following items in stock for immediate delivery.

|        |        |         |
|--------|--------|---------|
| IAC-5  | IDC-24 | OAC-24A |
| IAC-5A | OAC-5  | ODC-5   |
| IAC-5E | OAC-5A | ODC-5A  |
| IAC-15 | OAC-5H | ODC-15  |
| IAC-24 | OAC-15 | ODC-15A |
| IDC-5  | OAC-24 | ODC-24  |

# IAC

## AC Input Modules

### Input Specifications

| Parameter                          | Conditions      | Units   | IAC-5 IAC-15<br>IAC-24 |      |      | IAC-5A IAC-15A<br>IAC-24A |      |      | IAC-5E IAC-15E<br>IAC-24E |      |      |
|------------------------------------|-----------------|---------|------------------------|------|------|---------------------------|------|------|---------------------------|------|------|
|                                    |                 |         | Min.                   | Typ. | Max. | Min.                      | Typ. | Max. | Min.                      | Typ. | Max. |
| Control Voltage Range $V_{IN}$     |                 | VAC/VDC | 90                     | 120  | 140  | 180                       | 240  | 280  | 18                        | 24   | 36   |
| Must Operate Voltage $V_{IN(OP)}$  |                 | VAC/VDC | 90                     |      |      | 180                       |      |      | 18                        |      |      |
| Must Release Voltage $V_{IN(REL)}$ |                 | VAC/VDC | 20                     |      |      | 20                        |      |      | 3                         |      |      |
| Max. Input Current                 | @ $V_{IN}=Max.$ | mA      | 6                      |      |      | 6                         |      |      | 18                        |      |      |
| Input Resistance                   |                 | Ohms    | 28K                    |      |      | 75K                       |      |      | 2K                        |      |      |

### Output Specifications (@ +25°C unless otherwise specified)

| Parameter                      | Conditions      | Units     | IAC-5 IAC-5A<br>IAC-5E             |      |      | IAC-15 IAC-15A<br>IAC-15E          |      |      | IAC-24 IAC-24A<br>IAC-24E          |      |      |
|--------------------------------|-----------------|-----------|------------------------------------|------|------|------------------------------------|------|------|------------------------------------|------|------|
|                                |                 |           | Min.                               | Typ. | Max. | Min.                               | Typ. | Max. | Min.                               | Typ. | Max. |
| Maximum Output Voltage         |                 | VDC       | 30                                 |      |      | 30                                 |      |      | 30                                 |      |      |
| Maximum Output Current         |                 | mADC      | 50                                 |      |      | 50                                 |      |      | 50                                 |      |      |
| Maximum Output Leakage Current | $V_{OUT}=Max.$  | $\mu$ ADC | 10                                 |      |      | 10                                 |      |      | 10                                 |      |      |
| Maximum Output Voltage Drop    | $I_{SINK}=50mA$ | VDC       | .2                                 |      |      | .2                                 |      |      | .2                                 |      |      |
| Logic Supply Voltage $V_{CC}$  |                 | VDC       | 3                                  | 5    | 6    | 12                                 | 15   | 18   | 20                                 | 24   | 30   |
| Logic Supply Current           | $V_{CC}=Max.$   | mADC      | 18                                 |      |      | 18                                 |      |      | 18                                 |      |      |
| Turn-On Time (Nominal)         | $I_{SINK}=25mA$ | ms        | 20                                 |      |      | 20                                 |      |      | 20                                 |      |      |
| Turn-Off Time (Nominal)        | $I_{SINK}=25mA$ | ms        | 30                                 |      |      | 30                                 |      |      | 30                                 |      |      |
| Output Type (Open Collector)   |                 |           | Normally Open <sub>(SINKING)</sub> |      |      | Normally Open <sub>(SINKING)</sub> |      |      | Normally Open <sub>(SINKING)</sub> |      |      |

# OAC

## AC Output Modules

### Input Specifications

| Parameter                          | Conditions         | Units | OAC-5 OAC-5A<br>OAC-5H OAC-5R |      |      | OAC-15 OAC-15A<br>OAC-15H OAC-15R |      |      | OAC-24 OAC-24A<br>OAC-24H OAC-24R |      |      |
|------------------------------------|--------------------|-------|-------------------------------|------|------|-----------------------------------|------|------|-----------------------------------|------|------|
|                                    |                    |       | Min.                          | Typ. | Max. | Min.                              | Typ. | Max. | Min.                              | Typ. | Max. |
| Control Voltage Range $V_{IN}$     |                    | VDC   | 3                             | 5    | 8    | 9                                 | 15   | 18   | 18                                | 24   | 32   |
| Must Operate Voltage $V_{IN(OP)}$  |                    | VDC   | 3                             |      |      | 9                                 |      |      | 18                                |      |      |
| Must Release Voltage $V_{IN(REL)}$ |                    | VDC   | 1                             |      |      | 1                                 |      |      | 1                                 |      |      |
| Maximum Input Current              | @ $V_{IN}=Nominal$ | mADC  | 20                            |      |      | 16                                |      |      | 13                                |      |      |
| Input Resistance $R_{IN}$          |                    | Ohms  | 220                           |      |      | 1000                              |      |      | 2000                              |      |      |

PIN-3 must be positive with respect to PIN-4 for correct operation.

### Output Specifications (47 to 63 Hz., @ +25°C unless otherwise specified)

| Parameter                            | Conditions   | Units      | OAC-5 OAC-5A<br>OAC-15 OAC-15A<br>OAC-24 OAC-24A |         |      | OAC-5H IAC-15H<br>OAC-24H |         |      | OAC-5R OAC-15R<br>OAC-24R |         |      |
|--------------------------------------|--------------|------------|--|---------|------|---------------------------|---------|------|---------------------------|---------|------|
|                                      |              |            | Min.   | Typ.    | Max. | Min.                      | Typ.    | Max. | Min.                      | Typ.    | Max. |
| Load Voltage $V_L$                   |              | V rms      | 24   | 120/240 | 280  | 24                        | 120/240 | 280  | 24                        | 120/240 | 280  |
| Repetitive Blocking Voltage          |              | V peak     | ±600   |         |      | ±600                      |         |      | ±600                      |         |      |
| Load Current $I_L^*$                 |              | A rms      | .05  |         | 3    | .05                       |         | 5    | .05                       |         | 5    |
| Output Current Derating              |              | mA/°C      | 58mA/°C  |         |      | 66mA/°C                   |         |      | 66mA/°C                   |         |      |
| Single Cycle surge Current           |              | A peak     | 100  |         |      | 250                       |         |      | 250                       |         |      |
| Leakage Current (Off-State) @ 60 Hz. | $V_L=120VAC$ | mA rms     | 1  |         |      | 1                         |         |      | 1                         |         |      |
|                                      | $V_L=240VAC$ | mA rms     | 2  |         |      | 2                         |         |      | 2                         |         |      |
| On-State Voltage Drop                | $I_L=Max.$   | V peak     | 1.6  |         |      | 1.6                       |         |      | 1.6                       |         |      |
| Static dv.dt (Off-State)             |              | V/ $\mu$ s | 200  |         |      | 200                       |         |      | 200                       |         |      |
| Turn-On Time                         | @f=60 Hz.    | ms         | 8.3  |         |      | 8.3                       |         |      | .1                        |         |      |
| Turn-Off Time                        |              | ms         | 8.3  |         |      | 8.3                       |         |      | 8.3                       |         |      |
| Output Type (Form)                   |              |            | Normally Open 1A                                 |         |      | Normally Open 1A          |         |      | Normally Open 1A          |         |      |
| H/P/ Rating @ 240VAC                 |              |            | 1/4HP  |         |      | 1/2HP                     |         |      | 1/2HP                     |         |      |

# IDC DC Input Modules

## Input Specifications

| Parameter                          | Conditions      | Units | IDC-5 IDC-15<br>IDC-24 |      |      | IDC-5A IDC-15A<br>IDC-24A |      |      | IDC-5F IDC-15F<br>IDC-24F |      |      |
|------------------------------------|-----------------|-------|------------------------|------|------|---------------------------|------|------|---------------------------|------|------|
|                                    |                 |       | Min.                   | Typ. | Max. | Min.                      | Typ. | Max. | Min.                      | Typ. | Max. |
| Control Voltage Range $V_{IN}$     |                 | VDC   | ±3.3                   | ±24  | ±32  | ±10                       |      | ±60  | ±4                        |      | ±32  |
| Must Operate Voltage $V_{IN(OP)}$  |                 | VDC   |                        |      | ±3.3 |                           |      | ±10  |                           |      | ±4   |
| Must Release Voltage $V_{IN(REL)}$ |                 | VDC   | ±2                     |      |      | ±3                        |      |      | ±1                        |      |      |
| Maximum Input Current              | @ $V_{IN}=Max.$ | mA    |                        | 34   |      |                           | 34   |      |                           | 68   |      |
| Input Resistance                   |                 | Ohms  |                        | 1K   |      |                           | 2K   |      |                           | 500  |      |

## Output Specifications (@ +25°C unless otherwise specified)

| Parameter                      | Conditions      | Units | IDC-5 IDC-5A               |     |     | IDC-15 IDC-15A             |     |     | IDC-24 IDC-24A             |     |     | IDC-5F                     |     |     | IDC-15F                    |     |     | IDC-24F                    |     |     |
|--------------------------------|-----------------|-------|----------------------------|-----|-----|----------------------------|-----|-----|----------------------------|-----|-----|----------------------------|-----|-----|----------------------------|-----|-----|----------------------------|-----|-----|
|                                |                 |       | Min                        | Typ | Max | Min                        | Typ | Max | Min                        | Typ | Max | Min                        | Typ | Max | Min                        | Typ | Max | Min                        | Typ | Max |
| Maximum Output Voltage         |                 | VDC   |                            |     | 30  |                            |     | 30  |                            |     | 30  |                            |     | 30  |                            |     | 30  |                            |     | 30  |
| Maximum Output Current         |                 | mADC  |                            |     | 50  |                            |     | 50  |                            |     | 50  |                            |     | 50  |                            |     | 50  |                            |     | 50  |
| Maximum Output Leakage Current | $V_{OUT}=Max.$  | µADC  |                            |     | 10  |                            |     | 10  |                            |     | 10  |                            |     | 10  |                            |     | 10  |                            |     | 10  |
| Maximum Output Voltage Drop    | $I_{SINK}=50mA$ | VDC   |                            |     | .2  |                            |     | .2  |                            |     | .2  |                            |     | .2  |                            |     | .2  |                            |     | .2  |
| Logic Supply Voltage $V_{CC}$  |                 | VDC   | 3                          | 5   | 6   | 12                         | 15  | 18  | 20                         | 24  | 30  | 3                          | 5   | 6   | 12                         | 15  | 18  | 20                         | 24  | 30  |
| Logic Supply Current           | $V_{CC}=Max.$   | mADC  |                            |     | 18  |                            |     | 18  |                            |     | 18  |                            |     | 18  |                            |     | 18  |                            |     | 18  |
| Turn-On Time (Nominal)         | $I_{SINK}=25mA$ | ms    |                            | 1*  |     |                            | 1*  |     |                            | 1*  |     |                            | .05 |     | .05                        |     | .05 |                            |     | .05 |
| Turn-Off Time (Nominal)        | $I_{SINK}=25mA$ | ms    |                            | 1*  |     |                            | 1*  |     |                            | 1*  |     |                            | .10 |     | .10                        |     | .10 |                            |     | .10 |
| Output Type (Open Collector)   |                 |       | Normally Open<br>(SINKING) |     |     | Normally Open<br>(SINKING) |     |     | Normally Open<br>(SINKING) |     |     | Normally Open<br>(SINKING) |     |     | Normally Open<br>(SINKING) |     |     | Normally Open<br>(SINKING) |     |     |

\* Nominal Turn-On and Turn-Off times for IDC5A, IDC15A & IDC24A are 5 ms.

# ODC DC Output Modules

## Input Specifications

| Parameter                          | Conditions         | Units | ODC-5 ODC-5A |      |      | ODC-15 ODC-15A |      |      | ODC-24 ODC-24A |      |      |
|------------------------------------|--------------------|-------|--------------|------|------|----------------|------|------|----------------|------|------|
|                                    |                    |       | Min.         | Typ. | Max. | Min.           | Typ. | Max. | Min.           | Typ. | Max. |
| Control Voltage Range $V_{IN}$     |                    | VDC   | 3            | 5    | 8    | 9              | 15   | 18   | 18             | 24   | 32   |
| Must Operate Voltage $V_{IN(OP)}$  |                    | VDC   |              |      | 3    |                |      | 9    |                |      | 18   |
| Must Release Voltage $V_{IN(REL)}$ |                    | VDC   | 1            |      |      | 1              |      |      | 1              |      |      |
| Maximum Input Current              | @ $V_{IN}=Nominal$ | mADC  |              |      | 18   |                |      | 16   |                |      | 13   |
| Input Resistance $R_{IN}$          |                    | Ohms  |              |      | 250  |                |      | 1000 |                |      | 2000 |

PIN-3 must be positive with respect to PIN-4 for correct operation.

## Output Specifications (@ +25°C unless otherwise specified)

| Parameter                           | Conditions | Units | ODC-5 ODC-24<br>ODC-15 |      |      | ODC-5A ODC-24A<br>ODC-15A |      |      |
|-------------------------------------|------------|-------|------------------------|------|------|---------------------------|------|------|
|                                     |            |       | Min.                   | Typ. | Max. | Min.                      | Typ. | Max. |
| Load Voltage $V_L$                  |            | VDC   | 3                      |      | 60   | 3                         |      | 250  |
| Load Current $I_L$                  |            | ADC   | .01                    |      | 3    | .01                       |      | 1    |
| Maximum Surge Current for 1 Second  |            | ADC   |                        |      | 5    |                           |      | 5    |
| Maximum Leakage Current (Off-State) | $V_L=MAX$  | µADC  |                        |      | 500  |                           |      | 2000 |
| Maximum On-State Voltage Drop       | $I_L=MAX$  | VDC   |                        |      | 1.5  |                           |      | 1.5  |
| Maximum Turn-On Time                |            | ms    |                        |      | .1   |                           |      | .1   |
| Maximum Turn-Off Time               |            | ms    |                        |      | .75  |                           |      | .75  |

At 40°C, derate by 50mA/°C to 80°C.

PIN-1 must be positive with respect to PIN-2 for correct operation.

IAC Operating Diagram



OAC Operating Diagram



IDC Operating Diagram



ODC Operating Diagram



Outline Dimensions



Note: Pin 5 is not present on Output Modules.

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