

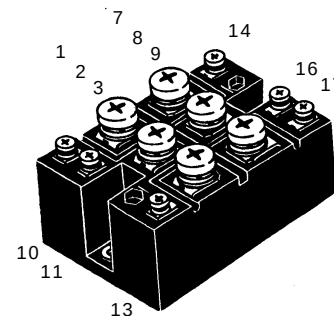
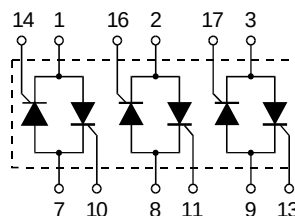
# Three Phase AC Controller Modules

$$I_{RMS} = 50 \text{ A}$$

$$V_{RRM} = 800-1600 \text{ V}$$

Preliminary data

| $V_{RSM}$<br>$V_{DSM}$<br>V | $V_{RRM}$<br>$V_{DRM}$<br>V | Type         |
|-----------------------------|-----------------------------|--------------|
| 800                         | 800                         | VWO 50-08io7 |
| 1200                        | 1200                        | VWO 50-12io7 |
| 1400                        | 1400                        | VWO 50-14io7 |
| 1600                        | 1600                        | VWO 50-16io7 |



| Symbol         | Test Conditions                                                                                                                                             | Maximum Ratings                                           |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|
| $I_{RMS}$      | $T_C = 85^\circ\text{C}$ , 50 - 400 Hz (per phase)                                                                                                          | 50 A                                                      |
| $I_{TRMS}$     | $T_{VJ} = T_{VJM}$                                                                                                                                          | 36 A                                                      |
| $I_{TAVM}$     | $T_C = 85^\circ\text{C}$ ; (180° sine)                                                                                                                      | 23 A                                                      |
| $I_{TSM}$      | $T_{VJ} = 45^\circ\text{C}$ ; $V_R = 0$<br>$t = 10 \text{ ms}$ (50 Hz), sine                                                                                | 520 A                                                     |
|                | $t = 8.3 \text{ ms}$ (60 Hz), sine                                                                                                                          | 560 A                                                     |
|                | $T_{VJ} = T_{VJM}$ ; $V_R = 0$<br>$t = 10 \text{ ms}$ (50 Hz), sine                                                                                         | 460 A                                                     |
|                | $t = 8.3 \text{ ms}$ (60 Hz), sine                                                                                                                          | 500 A                                                     |
| $I^2t$         | $T_{VJ} = 45^\circ\text{C}$ ; $V_R = 0$<br>$t = 10 \text{ ms}$ (50 Hz), sine                                                                                | 1350 A <sup>2</sup> s                                     |
|                | $t = 8.3 \text{ ms}$ (60 Hz), sine                                                                                                                          | 1320 A <sup>2</sup> s                                     |
|                | $T_{VJ} = T_{VJM}$ ; $V_R = 0$<br>$t = 10 \text{ ms}$ (50 Hz), sine                                                                                         | 1060 A <sup>2</sup> s                                     |
|                | $t = 8.3 \text{ ms}$ (60 Hz), sine                                                                                                                          | 1050 A <sup>2</sup> s                                     |
| $(di/dt)_{cr}$ | $T_{VJ} = T_{VJM}$ ; $f = 50 \text{ Hz}$ , $t_p = 200 \mu\text{s}$<br>$V_D = 2/3 V_{DRM}$<br>$I_G = 0.3 \text{ A}$<br>$di_G/dt = 0.3 \text{ A}/\mu\text{s}$ | repetitive, $I_T = 150 \text{ A}$<br>100 A/ $\mu\text{s}$ |
|                |                                                                                                                                                             | non repetitive, $I_T = I_{TAVM}$<br>500 A/ $\mu\text{s}$  |
| $(dv/dt)_{cr}$ | $T_{VJ} = T_{VJM}$ ; $V_{DR} = 2/3 V_{DRM}$<br>$R_{GK} = \infty$ ; method 1 (linear voltage rise)                                                           | 1000 V/ $\mu\text{s}$                                     |
| $P_{GM}$       | $T_{VJ} = T_{VJM}$ ; $t_p = 30 \mu\text{s}$                                                                                                                 | 10 W                                                      |
|                | $I_T = I_{TAVM}$ ; $t_p = 300 \mu\text{s}$                                                                                                                  | 5 W                                                       |
| $P_{GAVM}$     |                                                                                                                                                             | 0.5 W                                                     |
| $V_{RGM}$      |                                                                                                                                                             | 10 V                                                      |
| $T_{VJ}$       |                                                                                                                                                             | -40...+125 °C                                             |
| $T_{VJM}$      |                                                                                                                                                             | 125 °C                                                    |
| $T_{stg}$      |                                                                                                                                                             | -40...+125 °C                                             |
| $V_{ISOL}$     | 50/60 Hz, RMS; $t = 1 \text{ min}$                                                                                                                          | 2500 V~                                                   |
|                | $I_{ISOL} \leq 1 \text{ mA}$ ; $t = 1 \text{ s}$                                                                                                            | 3000 V~                                                   |
| $M_d$          | Mounting torque (M5)                                                                                                                                        | 5/44±15 % Nm/lb.in.                                       |
|                | Terminal connection torque (M3; M5)                                                                                                                         | 1.5/13±15 % Nm/lb.in.                                     |
| Weight         | typ.                                                                                                                                                        | 180 g                                                     |

## Features

- Thyristor controller for AC (circuit W3C acc. to IEC) for mains frequency
- Package with metal base plate
- Isolation voltage 3000 V~
- Planar passivated chips
- UL applied

## Applications

- Switching and control of three phase AC circuits
- Softstart AC motor controller
- Solid state switches
- Light and temperature control

## Advantages

- Easy to mount with two screws
- Space and weight savings
- Improved temperature and power cycling
- High power density

Data according to IEC 60747 refer to a single thyristor/diode unless otherwise stated.  
IXYS reserves the right to change limits, test conditions and dimensions

| Symbol     | Test Conditions                                                                                                                                                  | Characteristic Values  |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| $I_D, I_R$ | $T_{VJ} = T_{VJM}; V_R = V_{RRM}; V_D = V_{DRM}$                                                                                                                 | $\leq 5$ mA            |
| $V_T$      | $I_T = 80$ A; $T_{VJ} = 25^\circ\text{C}$                                                                                                                        | $\leq 1.65$ V          |
| $V_{T0}$   | For power-loss calculations only                                                                                                                                 | 0.85 V                 |
| $r_T$      |                                                                                                                                                                  | 11 m $\Omega$          |
| $V_{GT}$   | $V_D = 6$ V; $T_{VJ} = 25^\circ\text{C}$                                                                                                                         | $\leq 1.0$ V           |
|            | $T_{VJ} = -40^\circ\text{C}$                                                                                                                                     | $\leq 1.6$ V           |
| $I_{GT}$   | $V_D = 6$ V; $T_{VJ} = 25^\circ\text{C}$                                                                                                                         | $\leq 100$ mA          |
|            | $T_{VJ} = -40^\circ\text{C}$                                                                                                                                     | $\leq 150$ mA          |
| $V_{GD}$   | $T_{VJ} = T_{VJM}; V_D = 2/3 V_{DRM}$                                                                                                                            | $\leq 0.2$ V           |
| $I_{GD}$   |                                                                                                                                                                  | $\leq 5$ mA            |
| $I_L$      | $T_{VJ} = 25^\circ\text{C}; t_p = 10$ $\mu\text{s}$<br>$I_G = 0.3$ A; $di_G/dt = 0.3$ A/ $\mu\text{s}$                                                           | $\leq 200$ mA          |
| $I_H$      | $T_{VJ} = 25^\circ\text{C}; V_D = 6$ V; $R_{GK} = \infty$                                                                                                        | $\leq 150$ mA          |
| $t_{gd}$   | $T_{VJ} = 25^\circ\text{C}; V_D = 1/2 V_{DRM}$<br>$I_G = 0.3$ A; $di_G/dt = 0.3$ A/ $\mu\text{s}$                                                                | $\leq 2$ $\mu\text{s}$ |
| $t_q$      | $T_{VJ} = T_{VJM}; I_T = 20$ A, $t_p = 200$ $\mu\text{s}$ ; $di/dt = -10$ A/ $\mu\text{s}$<br>$V_R = 100$ V; $dv/dt = 15$ V/ $\mu\text{s}$ ; $V_D = 2/3 V_{DRM}$ | typ. 150 $\mu\text{s}$ |
| $R_{thJC}$ | per thyristor; sine $180^\circ\text{el}$                                                                                                                         | 1.20 K/W               |
|            | per module                                                                                                                                                       | 0.20 K/W               |
| $R_{thJK}$ | per thyristor; sine $180^\circ\text{el}$                                                                                                                         | 1.31 K/W               |
|            | per module                                                                                                                                                       | 0.218 K/W              |
| $d_s$      | Creeping distance on surface                                                                                                                                     | 8.0 mm                 |
| $d_A$      | Creepage distance in air                                                                                                                                         | 4.5 mm                 |
| $a$        | Max. allowable acceleration                                                                                                                                      | 50 m/s <sup>2</sup>    |

## Dimensions in mm (1 mm = 0.0394")

