

THYRO-A

DIGITAL THYRISTOR SCR POWER CONTROLLERS

8 TO 1500 AMPS



With highly flexible interfacing for the load and power supply side, Thyro-A® modules precisely and reliably control power in an expanded range of applications.

PRODUCT HIGHLIGHTS

- Wear-free operations and precise, reliable performance
- DIN rail mounting (up to 60 A; for 1- and 2-phase devices)
- Integrated protection against contact
- Rated voltages up to 600 V; currents up to 1500 A
- 1-, 2- and 3-phase versions (2-phase version for 3-phase load without deploying the neutral conductor)
- Integrated semiconductor fuses
- LED status and level indication
- USB interface

TYPICAL APPLICATIONS

- Automotive (paint drying equipment)
- Chemical (pipe trace heaters, pre-heating equipment)
- Furnace construction (industrial, diffusion, drying ovens)
- Glass (plate glass equipment, feeders, finishing equipment)
- Machine building (extruders, plastic presses)
- Packaging (shrink tunnels)
- Printing machines (IR drying)

SPECIFICATIONS

| Thyro-A Series | | |
|---|---|---|
| Operating Modes | | |
| TAKT (full wave switch) | Full frequency package control | |
| VAR (phase-angle firing) | Firing of each sinus half-wave | |
| QTM (half wave frequency package control) | Quick operating mode for ohmic load without a transformer | |
| VT | Combination of operating modes VAR and TAKT (on request) | |
| Thyro-A | | |
| 1A... | 1-phase version, for 1-phase load between 2-phases or for 1-phase connected to the neutral phase; operating modes: TAKT, VAR, QTM, VT | |
| 2A... | 2-phase version for 3-phase load in cost saving 3-phase circuit; operating mode: TAKT | |
| 3A... | 3-phase version, for 3-phase load; operating modes: TAKT, VAR, VT | |
| Rated Voltage ...H 3 | | |
| ...230... | 230 V -57% +10% | |
| ...400... | 400 V -57% +10% | |
| ...500... | 500 V -57% +10% | |
| Rated Voltage ...H RL3 and H RLP 3 | | |
| ...230... | 230 V -15% +10% | 230 V -57% combined with 24 V input |
| ...400... | 400 V -15% +10% | 400 V -57% combined with 24 V input |
| ...500... | 500 V -15% +10% | 500 V -57% combined with 24 V input |
| ...600... | 600 V -15% +10% | 600 V -57% combined with 24 V input |
| Network Frequency | For all types from 47 to 63 Hz | |
| Rated Current | | |
| ...-xxx... | 8A, 16, 30, 45, 60, 100, 130, 170, 280, 350, 495, 650, 1000, 1400, 1500 A | |
| Load Types | | |
| Types | Ohmic loads employed at R_{warm}/R_{cold} ratio 6:1 | |
| | Limitation of on 3 x I_{nom} | |
| | Transformer loads | |
| Network Load | Internal network load optimization for the operating modes QTM and TAKT | |
| | Interface for external network load optimization available, e.g. Thyro-Power Manager | |
| Functional Features | | |
| ...F... | Forced ventilation | |
| ...H 3 | Set point inputs | 2 set point inputs, secured (SE LV, PE LV) from the mains |
| | | Input of analog set point, signal intervals: 0(4)-20 mA, 0(1)-5 V, 0(2)-10 V |
| | | Control input for switch operation mode - dual point Control is possible ($U_{On} = 3$ to 24 V) digital set point is provided by the process computer or bus system |
| Control types V_{eff} / V_{eff}^2 | | |

SPECIFICATIONS (CONTINUED)

Power Supply Side

- Power supply voltage range of up to $0.43 \times U_{nom}$ › Frequency 47 to 63 Hz
- Internal network load optimization in TAKT and QTM operating modes
- Optional external network load optimization with Thyro-Power Manager

Certificates

- Quality standard in accordance with ISO 9001
- Canadian National Standard C22.2 No. 14
- Approval in accordance with UL 508
- CE conformity
- S.C.C.R. according to UL 508 A (100 kA short-circuit test), accredited 8 to 350 A
- RoHS conformity 5/6

| Thyro-A Series | |
|---|--|
| ...H RL3 (additional to ...H 3 features) | |
| Control types | $V_{eff} / V_{eff}^2 / I_{eff} / I_{eff}^2$ |
| Load monitoring | Via an adjustable response threshold |
| Limitations | Current limitation I_{eff} / \hat{I} VAR current peak limitation to $\hat{I} = 3 \times I_{nom}$ |
| Relay output | Exchanger, max. contact load 250 V, 6 A, 180 W, 1500 VA |
| Analog output | Signal level 0(2)-10 V / 0(4)-20 mA, max. compliance voltage 10 V Can also be used as adjustment aid |
| External supply | 24 V DC/AC, connected upon demand |
| Load types | Ohmic load employed at R_{warm}/R_{cold} ratio of up to 6 (only deployed for H RL3 and H RLP3) Limitation to $\hat{I} = 3 \times I_{nom}$ (for H RL3 and H RLP3 in VAR) |
| Operational display | Via LEDs and relay output (exchanger, indications adjustable) |
| ...H RLP3 (additional to ...H RL3 features) | |
| Control types | $V_{eff} / V_{eff}^2 / I_{eff} / I_{eff}^2 / P$ |
| System Interface | |
| Optional bus module for PROFIBUS® DPV1, Modbus® RTU, DeviceNet™, CANopen®, PROFINET®, Modbus® TCP, Ethernet/IP® | |
| Thyro-Tool PC software via USB interface | |
| Type Key Example | |
| Type Key | Thyro-A 2A 400-280 HF RLP3 |
| Explanation | Thyro-A Digital power controller |
| | 2A Thyro-A as 2-phase version, suitable for 3-phase load in cost-saving 3-phase circuit |
| | 400 400 V rated voltage |
| | -280 280 rated A current |
| | H Semiconductor fuse |
| | F Forced ventilation |
| | R Failure Indicator relay |
| | L Load monitoring, including analog output |
| | P Performance control |
| | 3 Additional Thyro-A identification |

THYRO-A



| Thyro-A 1A H 3/H RL3/H RLP 3 single-phase power controller | | | | | | | | | | | | |
|--|----------|------------|-------------|-------------------|-------|-------|-------|----------------|-----------------|-----|-----|---------------------|
| ...H 3 | ...H RL3 | ...H RLP 3 | Current (A) | Unit Rating (kVA) | | | | Power Loss (W) | Dimensions (mm) | | | Approx. Weight (kg) |
| | | | | 230 V | 400 V | 500 V | 600 V | | W | H | D | |
| | | | 8 | 3.2 | 3.2 | 4 | - | 9 | 45 | 136 | 129 | 0.7 |
| | | | 16 | 3.7 | 6.4 | 8 | - | 30 | 45 | 136 | 129 | 0.7 |
| | | | 30 | 6.9 | 12 | 15 | - | 47 | 45 | 136 | 129 | 0.7 |
| | | | 45 | 10 | 18 | 22.5 | - | 52 | 52 | 203 | 184 | 1.7 |
| | | | 60 | 14 | 24 | 30 | - | 80 | 52 | 203 | 184 | 1.7 |
| | | | 100 | 23 | 40 | 50 | - | 105 | 75 | 203 | 193 | 1.9 |
| | | | 130 | 30 | 52 | 65 | - | 150 | 125 | 320 | 241 | 4 |
| | | | 170 | 39 | 68 | 85 | - | 210 | 125 | 320 | 241 | 4 |
| ...F... | ...F... | ...F... | 280 | 64 | 112 | 140 | - | 330 | 125 | 370 | 241 | 5 |
| ...F... | ...F... | ...F... | 350 | 80 | 140 | 175 | - | 390 | 125 | 400 | 261 | 8.4 |
| ...F... | ...F... | ...F... | 495 | - | 198 | 247 | 297 | 603 | 112 | 414 | 345 | 15 |
| ...F... | ...F... | ...F... | 650 | - | 260 | 325 | 390 | 726 | 112 | 414 | 345 | 15 |
| ...F... | ...F... | ...F... | 1000 | - | 400 | 500 | 600 | 1396 | 239 | 729 | 516 | 35 |
| ...F... | ...F... | ...F... | 1400 | - | - | 700 | 840 | 1815 | 239 | 729 | 516 | 35 |
| ...F... | ...F... | ...F... | 1500 | - | 600 | - | - | 1855 | 239 | 729 | 516 | 35 |



| Thyro-A 2A H 3/H RL3/H RLP 3 dual-phase power controller for three phase loads with three -phase circuit | | | | | | | | | | | | |
|--|----------|------------|-------------|-------------------|-------|-------|----------------|-----------------|-----|-----|---------------------|--|
| ...H 3 | ...H RL3 | ...H RLP 3 | Current (A) | Unit Rating (kVA) | | | Power Loss (W) | Dimensions (mm) | | | Approx. Weight (kg) | |
| | | | | 400 V | 500 V | 600 V | | W | H | D | | |
| | | | 8 | 6 | 7 | - | 18 | 89 | 136 | 129 | 1.4 | |
| | | | 16 | 11 | 14 | - | 60 | 89 | 136 | 129 | 1.4 | |
| | | | 30 | 21 | 26 | - | 94 | 89 | 136 | 129 | 1.4 | |
| | | | 45 | 31 | 39 | - | 96 | 104 | 203 | 184 | 3.4 | |
| | | | 60 | 42 | 52 | - | 160 | 104 | 203 | 184 | 3.4 | |
| | | | 100 | 69 | 87 | - | 210 | 150 | 203 | 193 | 3.8 | |
| | | | 130 | 90 | 112 | - | 300 | 250 | 320 | 241 | 8 | |
| | | | 170 | 118 | 147 | - | 420 | 250 | 320 | 241 | 8 | |
| ...F... | ...F... | ...F... | 280 | 194 | 242 | - | 660 | 250 | 393 | 241 | 11 | |
| ...F... | ...F... | ...F... | 350 | 242 | 303 | - | 780 | 250 | 430 | 261 | 16.7 | |
| ...F... | ...F... | ...F... | 495 | 343 | 429 | 514 | 1206 | 194 | 380 | 345 | 22 | |
| ...F... | ...F... | ...F... | 650 | 450 | 563 | 675 | 1453 | 194 | 380 | 345 | 22 | |
| ...F... | ...F... | ...F... | 1000 | 693 | 866 | 1039 | 2811 | 417 | 685 | 516 | 54 | |
| ...F... | ...F... | ...F... | 1400 | - | 1212 | 1454 | 3451 | 417 | 685 | 516 | 54 | |
| ...F... | ...F... | ...F... | 1500 | 1039 | - | - | 3531 | 417 | 685 | 516 | 54 | |



| Thyro-A 3A H 3/H RL3/H RLP 3 three -phase power controller | | | | | | | | | | | |
|--|----------|------------|-------------|-------------------|-------|-------|----------------|-----------------|-----|-----|---------------------|
| ...H 3 | ...H RL3 | ...H RLP 3 | Current (A) | Unit Rating (kVA) | | | Power Loss (W) | Dimensions (mm) | | | Approx. Weight (kg) |
| | | | | 400 V | 500 V | 600 V | | W | H | D | |
| | | | 8 | 6 | 7 | - | 27 | 135 | 135 | 129 | 2.1 |
| | | | 16 | 11 | 14 | - | 90 | 135 | 136 | 129 | 2.1 |
| | | | 30 | 21 | 26 | - | 141 | 135 | 136 | 129 | 2.1 |
| | | | 45 | 31 | 39 | - | 144 | 156 | 203 | 184 | 5.1 |
| | | | 60 | 42 | 52 | - | 240 | 156 | 203 | 184 | 5.1 |
| | | | 100 | 69 | 87 | - | 315 | 225 | 203 | 193 | 5.7 |
| | | | 130 | 90 | 112 | - | 450 | 375 | 320 | 241 | 12 |
| | | | 170 | 118 | 147 | - | 630 | 375 | 320 | 241 | 12 |
| ...F... | ...F... | ...F... | 280 | 194 | 242 | - | 990 | 375 | 393 | 241 | 15 |
| ...F... | ...F... | ...F... | 350 | 242 | 303 | - | 1170 | 375 | 430 | 261 | 25.5 |
| ...F... | ...F... | ...F... | 495 | 343 | 429 | 514 | 1822 | 276 | 380 | 345 | 30 |
| ...F... | ...F... | ...F... | 650 | 450 | 563 | 675 | 2192 | 276 | 380 | 345 | 30 |
| ...F... | ...F... | ...F... | 1000 | 693 | 866 | 1039 | 4127 | 583 | 685 | 516 | 74 |
| ...F... | ...F... | ...F... | 1400 | - | 1212 | 1454 | 5086 | 583 | 685 | 516 | 74 |
| ...F... | ...F... | ...F... | 1500 | 1039 | - | - | 5206 | 583 | 685 | 516 | 74 |

ORDERING INFORMATION

For ordering information, please contact your local Advanced Energy sales representative.



For international contact information,
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ABOUT ADVANCED ENERGY

Advanced Energy (AE) has devoted more than three decades to perfecting power for its global customers. AE designs and manufactures highly engineered, precision power conversion, measurement and control solutions for mission-critical applications and processes.

AE's power solutions enable customer innovation in complex semiconductor and industrial thin film plasma manufacturing processes, demanding high and low voltage applications, and temperature-critical thermal processes.

With deep applications know-how and responsive service and support across the globe, AE builds collaborative partnerships to meet rapid technological developments, propel growth for its customers and power the future of technology.

PRECISION | POWER | PERFORMANCE

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