

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.