



THYRO-FAMILY

Thyro-S™

Thyro-A™

Thyro-AX™

Thyro-P™

DIGITAL POWER CONTROLLER

State-of-the-Art Technology



Industries/Applications

- Automotive industry
- Chemical industry and mineral oil industry
- Crystal growing
- Furnace construction
- Furniture industry
- Glass industry
- IR drying
- Machine building industry
- Packaging industry
- Painting machines and printers

Thyro-Family

Advanced Energy presents the new Thyro-Family with its digital power controllers Thyro-S, Thyro-A, Thyro-AX and Thyro-P. As an important part of the application process they assure product quality, reproducibility, communication capability as well as a high degree of availability.

The thyristor power controllers of Advanced Energy switch or regulate electrical energies worldwide and in nearly all industrial sectors, starting from simple up to complex high-end applications.

Owing to their precision and reliability Advanced Energy thyristor power controllers offer security for all application processes where melting, heating, drying and forming is applicable.

Certificates

- Quality standard to DIN EN ISO 9001
- Certification to UL 508
- SCCR, according with UL 508A (100 kA short circuit test)
- Canadian National Standard
- CE-compliant
- RoHS compliant 5/6
- Secure separation between power and control section
- Integrated semiconductor fuses

Advanced Energy offers with the Thyro-Family a comprehensive product scope of power controllers which is completely digital and bus-compatible.

This results in cost saving solutions especially supported by improvements in the areas of:

- Process control
- Process documentation
- Commissioning
- System availability
- Installation effort

THYRO-S™

Thyristor switch 16A – 280A



Thyro-S

Thyro-S ...H1

- Rated voltages 230 V, 400 V, 500 V
- Rated currents up to 280 A
- U_{Mains} up to $0.43 \times U_{\text{nom}}$
- Frequency 47 Hz to 63 Hz
- Wear-free operation
- Compact design
- Easy handling and connection
- 3 phase system by connecting two Thyro-S
- Standard system interface
 - Optional bus connection
 - Connection to PC software Thyro-Tool Family
- Control input with 24 V DC (>3 V = ON)
- Operating modes 1:1, 1:2, 1:3, 1:5
- For resistive loads

Thyro-S ...H RL1

in addition to Thyro-S ...H1:

- Load circuit monitoring
- Measurement of current (bus connection required)
- Possibility of additional external electronic supply 24 V DC/AC
- Alarm relay

Options for Thyro-S

- Bus connection via bus module:
 - PROFIBUS DPV1
 - Modbus RTU
 - Modbus TCP/IP
 - DeviceNet
 - CANopen
 - EtherNet/IP
 - PROFINET
- Thyro-Tool Family for quick commissioning and simple visualization

THYRO-A™

Thyristor power controller 8A – 1500A



Thyro-A 1A



Thyro-A 2A



Thyro-A 3A

Thyro-A

- Rated voltages 230 V, 400 V, 500 V, 600 V
- Rated currents up to 1,500 A
- U_{Mains} up to $0,43 \times U_{\text{nom}}$
- Frequency 47 Hz to 63 Hz
- 1-/2-/3-phase
- Standard system interface
 - Optional bus connection
 - Connection to PC software Thyro-Tool Family
- Set point settings:
 - Analog input 0(4)-20 mA, 0(1)-5 V, 0(2)-10 V
 - Digital via bus system or PC software
- Suitable for resistive and transformer loads
- Soft-start function for transformer loads
- Channel separation
- Mains load optimization

Thyro-A 1A

- Rated voltages 230 V, 400 V, 500 V, 600 V
- Operating modes:
 - Full frequency package control TAKT
 - Phase-angle VAR
 - Half-wave frequency package control QTM
- For 1 phase load between 2 phase or phase against neutral

Thyro-A 2A

- Rated voltages 400 V, 500 V, 600 V
- Operating mode:
 - Full frequency package control TAKT
- For 3 phase economic circuits (delta connection or star connection without neutral)

Thyro-A 3A

- Rated voltages 400 V, 500 V, 600 V
- Operating modes:
 - Vollschwingungs-TAKT
 - Phasenschnitt VAR
- For 3 phase load (star connection without neutral, star connection with neutral, delta connection or open delta)

Thyro-A ...H1

- Control types U, U²

Thyro-A ...H RL1

- Control types U, U², I, I²
- Alarm relay
- Load monitoring
- $R_{\text{warm}}/R_{\text{cold}}$ up to ≤ 6
- Analog output 10 V/20 mA
- Possibility of additional external electronic supply 24 V DC/AC

Thyro-A ...H RLP1

In addition to Thyro-A ...H RL1:

- Control type P
- Power indication at analog output

Options for Thyro-A

- Bus connection via bus module:
 - PROFIBUS DPV1
 - Modbus RTU
 - Modbus TCP/IP
 - DeviceNet
 - CANopen
 - EtherNet/IP
 - PROFINET
- Thyro-Tool Family for quick commissioning and simple visualization
- Thyro-Power Manager for mains load optimization of several Thyro-A power controllers

THYRO-AX™

Thyristor power controller 16A – 1500A



Thyro-AX 1A



Thyro-AX 2A



Thyro-AX 3A

Thyro-AX

- Rated voltages from 24 V to 600 V
- Rated currents from 16 A to 1,500 A
- Frequency 47 Hz to 63 Hz
- 1-/2-/3-phase
- Standard system interface
 - optional bus connection
 - Connection to PC software Thyro-Tool AX
- Set point settings:
 - 2 analog inputs, switchable 0(4)-20 mA, 0(1)-5 V, 0(2)-10 V
 - Digital via bus system or Thyro-Tool AX
- Suitable for resistive and transformer loads
- Network load optimization:
 - Internal for operating modes QTM and TAKT
 - External via connection of Thyro-Power Manager
- Flexible connection technology
- USB 2.0 interface

Thyro-AX 1A

- For 1 phase load between 2 phase or phase against neutral
- Rated voltages from 24 V to 600 V
- Operating modes:
 - Full frequency package control TAKT
 - Phase-angle VAR
 - Half-wave frequency package control QTM
 - Switch control SWITCH

Thyro-AX 2A

- For 3 phase economic circuits (delta connection or star connection without neutral)
- Rated voltages from 24 V to 600 V
- Operating modes:
 - Full frequency package control TAKT
 - Switch control SWITCH

Thyro-AX 3A

- For 3 phase load (star connection without neutral, star connection with neutral, delta connection or open delta)
- Rated voltages from 24 V to 600 V
- Operating modes:
 - Full frequency package control TAKT
 - Phase-angle VAR
 - Switch control SWITCH

Thyro-AX ...H RLP2

- Control types U, U², I, I², P
- Load monitoring
- R_{warm}/R_{cold} up to ≤ 6
- Analog output 0/2-10 V, 0/4-20 mA
- External electronic supply 85 V – 265 V (47 Hz – 63 Hz)
- Graphic user interface via display and relay output (exchanger, status signals adjustable)
- Power indication at analog output

Options for Thyro-AX

- Bus connection vis bus module
 - PROFIBUS DPV1
 - Modbus RTU
 - Modbus TCP/IP
 - DeviceNet
 - CANopen
 - EtherNet/IP
 - PROFINET
- Internal USB and Ethernet for connection with PC software Thyro-Tool AX for quick commissioning and easy visualization
- Thyro-Power Manager for network load optimization of several power controllers

THYRO-P™

Thyristor power controller 16A – 2900A



Thyro-P 1P



Thyro-P 3P



Local operating and display unit (LBA-2)

Thyro-P

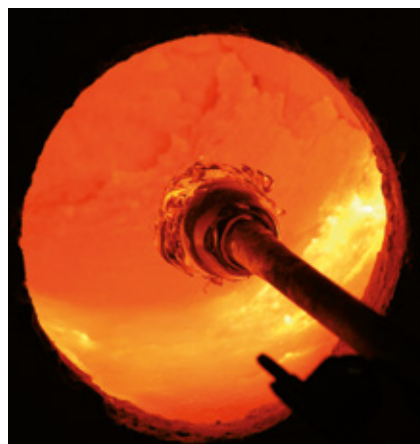
- Rated voltages 400 V, 500 V and 690 V within the voltage range 184 V up to 759 V
- Rated currents up to 2,900 A
- Frequency 45 Hz to 65 Hz
- 1-/2-/3-phase
- Menu driven graphic user interface
- Set point setting:
 - 2 analog inputs 0(4)-20 mA, 0(1)-5 V, 0(2)-10 V
 - Digital via bus system or PC software (RS232, LWL)
- Control types U, U², I, I², P
- Suitable for resistive and transformer loads as well as loads with high R_{warm}/R_{cold} up to factor 20 (MOSI mode)
- Soft-start function for transformer load
- Load circuit monitoring
- Possibility of external electronic supply (AC 185 V - 550 V, 45 Hz - 65 Hz)

Thyro-P VSC

The new type range Thyro-P 1P VSC offers power controllers with connections of primary or secondary voltage sequence control (VSC) for mains load optimization. These can be used in thermal application with high dynamic specifications (operating mode VAR_VSC).

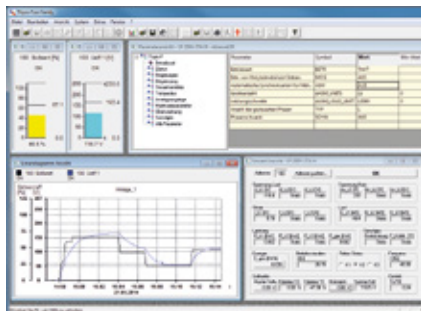
Options for Thyro-P

- Bus connection via adapter card
 - PROFIBUS DPV1
 - Modbus RTU
 - Modbus TCP/IP
 - DeviceNet
 - EtherNet/IP
 - PROFINET
- Digital and dynamic working mains load optimization dASM for synchronization of multiple power controllers, suitable for Thyro-P type series (excluding Thyro-P VSC) in operating mode TAKT
- Thyro-Power Manager for network load optimization of several power controllers



- Local operating and display unit LBA-2 with integrated process data recorder for easy, intuitive operation of Thyro-P and Thyro-P VSC power controller series via touch display
 - Switchable display to bar chart, line chart, actual values or data logger
 - Integrated SD card to load / save data
 - Process data recorder of up to 6 parameters as well as status messages
 - Analysis via LBA-2 tool (on PC)
 - EasyStart feature for easy commissioning of Thyro-P with basic settings
 - Languages: German, English, French, Italian, Spanish, Swedish, Chinese, Turkish and Czech
- Bluetooth-Adapter (2.000.000.407) for wireless communication with Thyro-P and Thyro-P VSC power controller series
- Cabinet installation kit for LBA / LBA-2 is eligible for cabinet door or panel installation.
- Thyro-Tool Family for quick commissioning and simple visualization

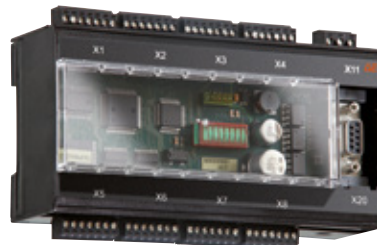
OPTIONS



Thyro-Tool Family



PROFIBUS-DPV1 interface



Thyro-Power Manager

Software

Thyro-Tool Family

PC software for commissioning, visualization and diagnosis of Thyro-Family power controllers (Thyro-P, Thyro-A und Thyro-S).

Key features are e.g.:

- Comparison of parameter sets
- Display of set points and actual value
- Line charts of process data (optional printing)
- Bar chart
- Simultaneous presentation of process data of several power controllers

Thyro-Tool AX

The tailored software for Thyro-AX is easy to connect via USB interface to the Thyro AX. Individual analysis's can be done for each connected Thyro-AX (system driven via IP address):

- Actual value
- Set points
- Line charts
- Parameter analysis
- Simultaneous presentation of process data of several power controllers

Communication

The bus modules of type series Thyro-A, Thyro-AX and Thyro-S and the bus interfaces of type series Thyro-P are available for the following bus systems:

- PROFIBUS DPV1
- Modbus RTU
- Modbus TCP/IP
- DeviceNet
- CANopen
- EtherNet/IP
- PROFINET

Key features for Thyro-S, Thyro-A and Thyro-AX bus modules:

- Optional connection of up to 8 power controllers
- Per bus module only one address is necessary
- Access to set points, actual points and parameters of the power controller
- Transfer of set points as float number in physical units
- Function control via LED's
- Control of Thyro-S via digital set points (according to OFF, 1/5, 1/3, 1/2, ON)
- Voltage supply 24 V DC, 150 mA

Thyro-Power Manager

The Thyro-Power Manager is an additional device for static main load optimization of a multiple actuator configuration of up to 10 power controllers in the operating mode of full frequency package control (TAKT).

In addition the Thyro-Power Manager can be used for tasks such as monitoring of system load peaks, data logging, data monitoring and as an E/A component. Therefore the Thyro-Power Manager allows e.g. the repeatability of operating costs as an outcome of reduced load peaks and system perturbations – a primary challenge of each application.

Key features

- Easy handling per switch and potentiometer, alternative per software tool
- Possibility of connection to fieldbus
- Voltage supply 110 V/230 V; 50 Hz/60 Hz
- Error and alarm output
- Measurement
 - Load and energy consumption
 - Mains voltage
 - Temperature
- Integrated hours counter



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