



THYRO-P® AND THYRO-P® VSC
DIGITAL THYRISTOR SCR POWER CONTROLLERS





Thyro-P[®] and Thyro-P[®] VSC

Digital thyristor SCR power controllers

The precise, reliable performance of Thyro-P[®] SCR power controllers is the result of over 50 years of power-control expertise across a range of industries worldwide.

RELIABLE, FAST, ECONOMIC, EASY TO CONTROL, AND COMMUNICATION-ENABLED

Thyro-P[®] products precisely and reliably control voltage, current, or power in a range of industrial processes.

- › Excellent control accuracy using a 32-bit RISC processor
- › Easy handling

APPLICATIONS
Automotive
Chemical and oil
Extruders and plastic presses
Furniture
Furnace construction
Glass
IR drying
Machine building
Packaging
Painting machines and printers
Pipe trace heaters

With these key features, Thyro-P SCR power controllers meet the needs of new applications and advanced processes requirements:

- › Comprehensive operating and control modes
- › Easy integration into process and automation systems

EASY COMMUNICATION AND CONTROL

Adjust performance parameters via menu. Control and monitor set points and actual process values via analog outputs or a wide range of optional bus systems. The optional LBA-2 operation/display unit provides easy, intuitive operation via touchscreen.

WIDE PERFORMANCE RANGE

The series offers rated currents up to 2900 A and voltages up to 690 V. Application-specific solutions are also available with significantly higher currents and voltages.

MAINS LOAD OPTIMIZATION

Mains load optimization functionality includes fully digital dASM operation in TAKT operating mode. The new Thyro-P 1P VSC model offers primary or secondary voltage sequence control (VSC) connections for mains load optimization in thermal applications with high dynamic specifications (operating mode VAR_VSC).

FEATURES

- › Easy handling, for rapid and reliable commissioning
- › High efficiency, wear-free operation
- › Easy connection to automation equipment via bus interfaces
- › Integrated soft-starting for operation with downstream transformer
- › Broad band electric power supply for control voltage
- › Six LED status indicators
- › Three self-programmable monitoring relays
- › Error memory with occurrence time recording
- › Integrated load circuit monitoring
- › Integrated semiconductor fuses
- › Secure separation between power and control section
- › Connection on SELF/PELV circuit
- › Elapsed hour meter
- › Energy meter, resettable, in kWh

**FOR TRANSFORMER LOADS, RESISTIVE LOADS,
AND HEATING ELEMENTS WITH LARGE R_{WARM}/R_{COLD}**

LBA-2 REMOTE OPERATING AND DISPLAY UNIT

With an integrated process data recorder, the optional LBA-2 unit enables, intuitive operation of Thyro-P and Thyro-P VSC power controllers via touch display.

- › Large 2.8" touch display for menu-driven operation
- › Switchable display to
 - Bar chart
 - Line chart
 - Actual values (numerical)
 - Data logger
- › Integrated SD card to load or save data
- › Long-term data recording of up to six process parameters, as well as status messages
- › Analysis via LBA-2 tool (on PC):
 - Long-term line-chart data
 - Related status messages
 - PDF export
- › EasyStart feature for easy commissioning of Thyro-P with basic settings
- › Optional Bluetooth functionality:
 - With Bluetooth feature (2.000.000.409)
 - Without Bluetooth feature (2.000.000.408)

- › Retrofittable into existing Thyro-P standard units (downward compatible to LBA)
- › Cabinet doors assembly via SEK cabinet installation kit
- › Languages: German, English, French, Italian, Spanish, Swedish, Chinese, Turkish, and Czech



Remote Operating and Display (LBA-2)

BLUETOOTH ADAPTER

The Bluetooth adapter (2.000.000.407) enables wireless communication with Thyro-P and Thyro-P VSC power controller series via

- › Smartphone with Android operating system
- › Tablet PC with Android operating system
- › Laptop with Thyro-Tool Family (from version 4.0)

It can either be attached to the Thyro-P module, such as LBA-2 or be used together with SEK (cabinet installation kit).

CABINET INSTALLATION KIT (SEK)

- › Enables cabinet door or panel installation
- › Can be used with the LBA-2 Bluetooth adapter



MAINS LOAD OPTIMIZATION AND COMMUNICATION OPTIONS

dASM MAINS LOAD OPTIMIZATION

This function enables digital and dynamic working mains load optimization for the Thyro-P series (excluding Thyro-P VSC) in operating mode TAKT.

FEATURES:

- › Easy installation and commissioning of dASM function
- › Mains load optimization in groups of up to 32 similar units
- › Distance of up to 40 meters between two power controllers
- › Fast response to set point and load changes
- › Power monitoring (load level)
- › Easy wiring, parameter setting, and commissioning
- › Easy retrofitting of dASM feature to existing units by replacing the Thyro-P control unit

THYRO-TOOL FAMILY

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

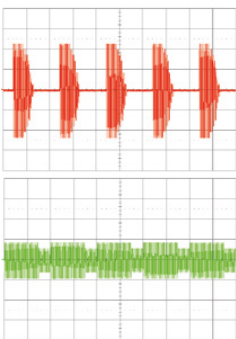
AVAILABLE FUNCTIONS:

- › Parameter comparison
- › Process-data line diagrams (with print option)
- › Bar charts
- › Simultaneous display of process data from various power controllers
- › Simultaneous connection of up to 998 Thyro-P SCR power controllers

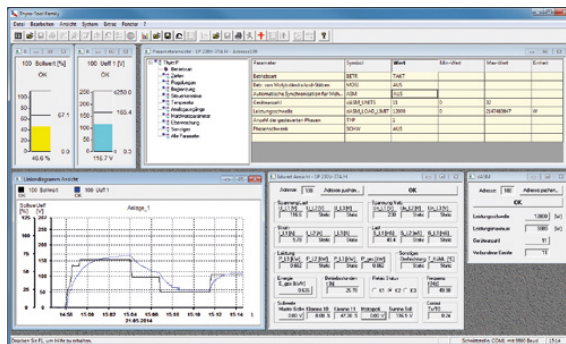
BUS INTERFACES

- › Profibus DPV1®
- › PROFINET®
- › DeviceNet™
- › EtherNet/IP®
- › Modbus RTU®
- › Modbus TCP®

Additional connections are available up on request.



dASM Mains Load Optimization



Thyro-Tool Family



Ethernet Interface Card

SUMMARY SPECIFICATIONS

THYRO-P SERIES	
Load Types	Resistive loads, transformer loads, and loads with large R_{warm}/R_{cold} up to factor 20 (MOSI operating mode)
Operating Modes	TAKT: full frequency package control
	VAR: phase-angle
	SSSD: soft-start-soft-down
	VSC_VAR: Voltage sequence control with phase-angle
Control Types	U-voltage, U ² -voltage, I-current, I ² -current, P-power, without regulation
Set Point Input	2 analog inputs, control start/finish can be set as desired between 0-20 mA; 0-10 V.
Actual Value Outputs	3 measuring values for optional display of U, I and P; can be set as desired between 0...20 mA; 0...10 V
Load Circuit/Self Monitoring	Provided
Operation/Fault Indicators	Via 3 fault signaling relays and LED's, free configurable
Error Memory	Long-term storage of an unlimited number of status messages is possible with the process data recording function.
Interfaces	RS-232, fiber optic, as well as for various bus systems
TECHNICAL DATA	
Rated Connection Voltage	400 V type: 230 V -20% up to 400 V +10%*
	500 V type: 230 V -20% up to 500 V +10%*
	690 V type: 500 V -20% up to 690 V +10%**
Frequency	All types, 45 to 65 Hz
Control Voltage	AC 230 V (-20%) up to 500 V (+10%)
Ventilator (HF Types Only)	230 V, 50 to 60 Hz
Ambient Temperature	Up to 35°C (95°F) by external fan cooling (for HF types, with integrated fan) with rated current
	Up to 45°C (113°F) by passive convection cooling with rated current
	At higher temperatures, operation is permissible with reduced current limits.
	Max 40°C for UL applications
Storage Temperature	-25 to +55°C (-13 to 131°F)
Humidity Class	DIN EN 50178 Tab. 7
Site Altitude	Up to 1000 m above sea level at nominal load; above 1000 m, on request

* The control unit can be supplied by separate control voltage.

** The control unit must be supplied by separate control voltage.

CERTIFICATES

- › Quality standard to DIN EN ISO 9001
- › UL certification
- › SCCR, (see operating instructions) according to UL 508A (100 kA short circuit test)
- › CE compliant
- › Canadian National Standard
- › RoHS compliant 5/6



Thyro-P 1P



Thyro-P 2P



Thyro-P 3P

THYRO-P® MODEL

Thyro-P 1P					Thyro-P 2P					Thyro-P 3P				
1-phase power controller					2-phase power controller for 3-phase economic circuit					3-phase power controller				
Full wave switch (TAKT)					Full wave switch (TAKT)					Full wave switch (TAKT)				
Phase-angle firing (VAR)					--					Phase-angle firing (VAR)				
Soft-start-soft-down (SSSD)					Soft-start-soft-down (SSSD)					Soft-start-soft-down (SSSD)				
Phase	V	A		kVA	Phase	V	A		kVA	Phase	V	A		kVA
1P	400	16	H	6	2P	400	16	H	11	3P	400	16	H	11
1P	400	37	H	15	2P	400	37	H	25	3P	400	37	H	25
1P	400	75	H	30	2P	400	75	H	52	3P	400	75	H	52
1P	400	110	H	44	2P	400	110	H	76	3P	400	110	H	76
1P	400	130	H	52	2P	400	130	H	90	3P	400	130	H	90
1P	400	170	H	68	2P	400	170	H	118	3P	400	170	H	118
1P	400	280	HF	112	2P	400	280	HF	194	3P	400	280	HF	194
1P	400	495	HF	198	2P	400	495	HF	343	3P	400	495	HF	343
1P	400	650	HF	260	2P	400	650	HF	450	3P	400	650	HF	450
1P	400	1000	HF	400	2P	400	1000	HF	693	3P	400	1000	HF	693
1P	400	1500	HF	600	2P	400	1500	HF	1039	3P	400	1500	HF	1039
1P	400	2100	HF	840	2P	400	2000	HF	1385	3P	400	1850	HF	1281
1P	400	2900	HF	1160	2P	400	2750	HF	1905	3P	400	2600	HF	1801
1P	500	16	H	8	2P	500	16	H	14	3P	500	16	H	14
1P	500	37	H	18	2P	500	37	H	32	3P	500	37	H	32
1P	500	75	H	38	2P	500	75	H	65	3P	500	75	H	65
1P	500	110	H	55	2P	500	110	H	95	3P	500	110	H	95
1P	500	130	H	65	2P	500	130	H	112	3P	500	130	H	112
1P	500	170	H	85	2P	500	170	H	147	3P	500	170	H	147
1P	500	280	HF	140	2P	500	280	HF	242	3P	500	280	HF	242
1P	500	495	HF	248	2P	500	495	HF	429	3P	500	495	HF	429
1P	500	650	HF	325	2P	500	650	HF	563	3P	500	650	HF	563
1P	500	1000	HF	500	2P	500	1000	HF	866	3P	500	1000	HF	866
1P	500	1500	HF	750	2P	500	1500	HF	1300	3P	500	1500	HF	1300
1P	500	2100	HF	1050	2P	500	2000	HF	1732	3P	500	1850	HF	1602
1P	500	2900	HF	1450	2P	500	2750	HF	2381	3P	500	2600	HF	2251
1P	690	80	H	55	2P	690	80	H	95	3P	690	80	H	95
1P	690	200	HF	138	2P	690	200	HF	239	3P	690	200	HF	239
1P	690	300	HF	207	2P	690	300	HF	358	3P	690	300	HF	358
1P	690	500	HF	345	2P	690	500	HF	597	3P	690	500	HF	597
1P	690	780	HF	538	2P	690	780	HF	932	3P	690	780	HF	932
1P	690	1400	HF	966	2P	690	1400	HF	1673	3P	690	1400	HF	1673
1P	690	2000	HF	1380	2P	690	1850	HF	2210	3P	690	1700	HF	2031
1P	690	2600	HF	1794	2P	690	2400	HF	2868	3P	690	2200	HF	2629



Thyro-P 1P...VSC 2



Thyro-P 1P...VSC 3

THYRO-P® VSC MODEL

Thyro-P 1P...VSC 2					Thyro-P 1P...VSC 3				
2-step VSC connection					3-step VSC connection				
Voltage sequence control with phase-angle firing (VSC_VAR)					Voltage sequence control with phase-angle firing (VSC_VAR)				
Phase	V	A		kVA	Phase	V	A		kVA
1P	500	16	H	8	1P	500	16	H	8
1P	500	37	H	18	1P	500	37	H	18
1P	500	75	H	38	1P	500	75	H	38
1P	500	110	H	55	1P	500	110	H	55
1P	500	130	H	65	1P	500	130	H	65
1P	500	170	H	85	1P	500	170	H	85
1P	500	280	HF	140	1P	500	280	HF	140
1P	500	495	HF	248	1P	500	495	HF	248
1P	500	650	HF	325	1P	500	650	HF	325
1P	500	1000	HF	500	1P	500	1000	HF	500
1P	500	1500	HF	750	1P	500	1500	HF	750
1P	500	2100	HF	1050	1P	500	2100	HF	1050
1P	500	2900	HF	1450	1P	500	2900	HF	1450
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1P	690	80	H	55	1P	690	80	H	55
1P	690	200	HF	138	1P	690	200	HF	138
1P	690	300	HF	207	1P	690	300	HF	207
1P	690	500	HF	345	1P	690	500	HF	345
1P	690	780	HF	538	1P	690	780	HF	538
1P	690	1400	HF	966	1P	690	1400	HF	966
1P	690	2000	HF	1380	1P	690	2000	HF	1380
1P	690	2600	HF	1794	1P	690	2600	HF	1794