



THYRO-P™

THYRO-P™ VSC **NEW**

Digital thyristor power controller (SCR)

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Digital thyristor power controller (SCR)

The Thyro-P is the result of consistent implementation of more than 50 years of experience in the field of power controllers.

### Basic features

- Ease of handling for rapid and reliable commissioning
- High efficiency, wear-free operation
- Ease of connection to automation equipment via bus interfaces
- Transformer load, resistive load as well as heating elements with large  $R_{\text{warm}}/R_{\text{cold}}$
- Integrated soft-starting for operation with downstream transformer
- Broad band electric power supply for control voltage
- 6 LED status indicators
- 3 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/PELF circuit
- Elapsed hour meter
- Energy meter, releasable, in kWh

### Secure, fast, economic, easy to handle and communication enabled.

The power controllers (SCR) of Thyro-P can be used wherever voltage, current or power needs to be controlled precisely and reliably in industrial processes. Using broad band electric power supply, optional dynamic mains load optimization for operating mode TAKT, the fully digital dASM procedure – or in operating mode VAR with voltage sequence control (VSC) for type range Thyro-P VSC – and a new user friendly interface with optional LBA-2, a wide range of industrial applications and industries is adaptable for Thyro-P such as:

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

With various operating and control modes, good connections to process and automation systems, high level of control accuracy using a 32-bit RICS processor and easy handling, the reliable, digital Thyro-P meets future requirements for new applications. Parameters can be adapted via menus; set points and actual values of the process can be redirected via analog outputs or optional via bus systems. The Thyro-P series offers rated currents up to 2,900 A and voltages up to 690 V due to the deployment of modern network thyristors. Application specific solutions are also available with significant higher currents and voltages.

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 applications with high dynamic specifications (operating mode VAR\_VSC).

# OPTIONS

## Local operating and display unit LBA-2



Local operating and display unit (LBA-2)

The local operating and display unit LBA-2, with integrated process data recorder, is eligible for easy, intuitive operation of Thyro-P and Thyro-P VSC power controller series 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 / save data
- Process data recorder for long time recording of up to 6 parameters as well as status messages
- Analysis via LBA-2 tool (on PC) of long term data of the line chart and according status messages during the specified period, incl. saving as PDF file
- EasyStart feature for easy commissioning of Thyro-P with basic settings
- 2 options:
  - with Bluetooth feature (2.000.000.409)
  - without Bluetooth feature (2.000.000.408)
- Can be retrofitted into existing Thyro-P standard units (downward compatible to LBA)
- Cabinet doors assembly via SEK
- Languages: German, English, French, Italian, Spanish, Swedish, Chinese, Turkish and Czech

### Bluetooth adapter

The Bluetooth adapter (2.000.000.407) is eligible for wireless communication with Thyro-P and Thyro-P VSC power controller series. It can either be attached on Thyro-P such as LBA-2 or be used together with SEK (cabinet installation kit).

The wireless communication works together with the following devices:

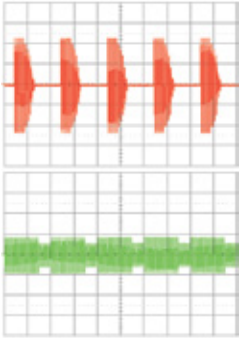
- Smartphone with Android operating system
- Tablet PC with Android operating system
- Laptop with Thyro-Tool Family (from version 4.0)

### Cabinet installation kit (SEK)

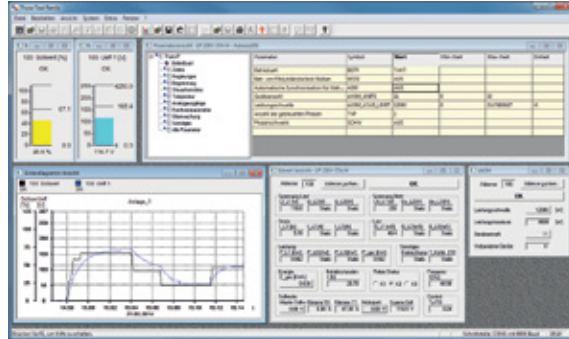
The cabinet installation kit for LBA / LBA-2 is eligible for cabinet door or panel installation, by wiring. The SEK is also eligible for using the LBA-2 Bluetooth adapter.

# OPTIONS

Mains load optimization and communication



dASM mains load optimization



Thyro-Tool Family



Ethernet interface card

## dASM Netzlastoptimierung

dASM is a digital and dynamic working mains load optimization, suitable for Thyro-P type series (excluding Thyro-P VSC) in operating mode TAKT.

After connecting the Thyro-P's via RJ45 patch cables, only a very easy parameterization is needed at the dASM master.

### Further features are

- 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
- Very short response times for setpoint and load changes
- Monitoring of total load – Power monitoring (load level)
- Plug & Play: Easy wiring, parameter setting and commissioning
- Retrofittable of dASM feature to existing units by replacing the Thyro-P control unit

## Thyro-Tool Family

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

### With functions, such as:

- Comparing sets of parameters
- Line diagrams of process data (with print option)
- Bar charts
- Simultaneous display of process data from various power controllers
- Simultaneous connection of up to 998 Thyro-P power controllers

## Bus interfaces

The bus interfaces are compact circuit boards which are inserted into Thyro-P control unit after removing the centric front panel.

A standard connection is possible to the following field bus systems:

- Profibus DPV1
- PROFINET
- DeviceNet
- EtherNet/IP
- Modbus RTU
- Modbus TCP

A connection is available on request to other than the stated bus systems.

# TECHNICAL DATA

(excerpt)

Thyro-P data	
Load type	resistive load, transformer load and loads with large $R_{warm}/R_{cold}$ up to parameter 20 (MOSI 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 <sup>2</sup> -voltage, I-current, I <sup>2</sup> -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 status messages in unlimited number is possible with the function of process data recording
Interfaces	RS232, fiber optic as well as for various bus systems
Technical data	
Rated connection voltage (V)	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 Hz to 65 Hz
Control voltage	AC 230 V (-20 %) up to 500 V (+10 %);
Ventilator (only for HF types)	230 V, 50 Hz to 60 Hz
Ambient temperature	up to 35 °C by external fan cooling (for HF types, with integrated fan) with rated current
	up to 45 °C by passive convection cooling with rated current
	at higher temperatures the operation is permissible with reduced current limits
	with UL applications max. 40 °C
Storage temperature	-25 °C up to +55 °C;
Humidity class	DIN EN 50178 Tab. 7
Site altitude	up to 1,000 m above sea level at nominal load; above 1,000 m, on request

## 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
- GOST certification
- RoHS compliant 5/6

\* the control unit can be supplied by separate control voltage

\*\* the control unit has to be supplied by separate control voltage

# TYPE RANGE

## Thyro-P



Thyro-P 1P



Thyro-P 2P



Thyro-P 3P

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)					Phase-angle firing (VAR)				
Soft-Start-Soft-Down (SSSD)					Soft-Start-Soft-Down (SSSD)					Soft-Start-Soft-Down (SSSD)				
	[V]	[A]		[kVA]		[V]	[A]		[kVA]		[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	1,000	HF	400	2P	400	1,000	HF	693	3P	400	1,000	HF	693
1P	400	1,500	HF	600	2P	400	1,500	HF	1,039	3P	400	1,500	HF	1,039
1P	400	2,100	HF	840	2P	400	2,000	HF	1,385	3P	400	1,850	HF	1,281
1P	400	2,900	HF	1,160	2P	400	2,750	HF	1,905	3P	400	2,600	HF	1,801
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	1,000	HF	500	2P	500	1,000	HF	866	3P	500	1,000	HF	866
1P	500	1,500	HF	750	2P	500	1,500	HF	1,300	3P	500	1,500	HF	1,300
1P	500	2,100	HF	1,050	2P	500	2,000	HF	1,732	3P	500	1,850	HF	1,602
1P	500	2,900	HF	1,450	2P	500	2,750	HF	2,381	3P	500	2,600	HF	2,251
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	1,400	HF	966	2P	690	1,400	HF	1,673	3P	690	1,400	HF	1,673
1P	690	2,000	HF	1,380	2P	690	1,850	HF	2,210	3P	690	1,700	HF	2,031
1P	690	2,600	HF	1,794	2P	690	2,400	HF	2,868	3P	690	2,200	HF	2,629

# TYPE RANGE

## Thyro-P VSC



Thyro-P 1P..VSC 2



Thyro-P 1P..VSC 3

Thyro-P 1P..VSC 2					Thyro-P 1P..VSC 3				
two step VSC connection					three step VSC connection				
Voltage sequence control with phase-angle firing (VSC_VAR)					Voltage sequence control with phase-angle firing (VSC_VAR)				
	[V]	[A]		[kVA]		[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	1,000	HF	500	1P	500	1,000	HF	500
1P	500	1,500	HF	750	1P	500	1,500	HF	750
1P	500	2,100	HF	1,050	1P	500	2,100	HF	1,050
1P	500	2,900	HF	1,450	1P	500	2,900	HF	1,450
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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	1,400	HF	966	1P	690	1,400	HF	966
1P	690	2,000	HF	1,380	1P	690	2,000	HF	1,380
1P	690	2,600	HF	1,794	1P	690	2,600	HF	1,794



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