



THYRO-A®
DIGITAL THYRISTOR SCR POWER CONTROLLERS
8 TO 1500 A





Thyro-A®

Digital Thyristor SCR Power Controllers

With high-capacity digital technology, the communication-enabled Thyro-A® SCR power controller enables precise energy delivery at a high level of availability.

WIDE PERFORMANCE SCOPE

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. For standard processes, adjustments can be made on the unit itself, which eases handling and speeds commissioning. Interfacing at the automation level enables expanded functionality. All measurement, status, and set point communications may be processed via SPS or the process computer. Stand-alone operations or direct combination with process controls are also possible.

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)

INTEGRATION WITH AUTOMATION SYSTEMS

- › Serial design system interface for connection to an optional bus module (PROFIBUS® DPV1, Modbus® RTU, DeviceNet™, CANopen®, PROFINET®, Modbus® TCP, EtherNet/IP®)
- › Interface option for connection to Thyro-Tool PC software
- › Secure separation of control and power units

ANALOG CONTROL

- › Analog set point 0(4)...20 mA; 0...5 V, 0...10 V
- › Adjustable control characteristic
- › Activation with dual point controller:
 - OFF = 0...3 V
 - ON = 3...24 V

LOAD SIDE

- › Power semiconductor with
 - High resistance against short-circuit currents
 - High blocking voltage of power semiconductors
- › For ohmic loads as well as transformer loads
- › Suitable for transformer-type loads due to an integrated soft-start, phase-angle firing of the 1st half-wave and channel separation
- › Optimized load control due to the implementation of up to:
 - Five control types
 - Three operating modes

MAINS LOAD OPTIMIZATION

- › dASM bus module: digital and dynamic operating mains load optimization of up to eight Thyro-A and Thyro-AX SCR power controllers
- › Internal mains load optimization
- › Thyro-Power Manager

FEATURES

- › Wear-free operations
- › Precise, reliable performance
- › Easy handling
- › Compact package
- › DIN rail mounting (up to 60 A; for 1- and 2-phase devices)
- › Integrated protection against contact
- › Rated voltages up to 600 V
- › Rated 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

SUMMARY 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 operating modes: TAKT, VAR	
Rated Voltage ...H 3		
...230...	230 V -57% +10%	
...400...	400 V -57% +10%	
...500...	500 V -57% +10%	
Rated Voltage ...H RL3 und H RLP3		
...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 A, 30 A, 45 A, 60 A, 100 A, 130 A, 170 A, 280 A, 350 A, 495 A, 650 A, 1000 A, 1400 A, 1500 A	
Load Types		
Types	Ohmic loads employed at R_{warm}/R_{cold} ratio 6:1 Limitation of on $3 \times I_{nom}$ 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, dASM bus module	
Functional Features		
...F...	Forced ventilation	
...H 3	Set point inputs	2 set point inputs, secured (SELV, PELV) 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

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
- › Approval in accordance with UL 508
- › S.C.C.R. according to UL 508 A (100 kA short-circuit test), accredited 8 to 350 A
- › Canadian National Standard C22.2 No. 14
- › CE conformity



THYRO-A SERIES

...H RL3 (additional to ...H 3 features)	Control types	$V_{\text{eff}} / V_{\text{eff}}^2 / I_{\text{eff}} / I_{\text{eff}}^2$
	Load monitoring	Via an adjustable response threshold
	Limitations	Current limitation I_{eff} / \hat{I} VAR current peak limitation to $\hat{I} = 3 \times I_{\text{nom}}$
	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 $R_{\text{warm}}/R_{\text{cold}}$ ratio of up to 6 (only deployed for H RL3 and H RLP3)
	Operational display	Via LEDs and relay output (exchanger, indications adjustable)
...H RLP3 (additional to ...H RL3 features)	Control types	$V_{\text{eff}} / V_{\text{eff}}^2 / I_{\text{eff}} / I_{\text{eff}}^2 / P$

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 A rated current
	H Semiconductor fuse
	F Forced ventilation
	R Failure indicator relay
	L Load monitoring, incl. analog output
	P Performance control
	3 Additional Thyro-A identification

**THYRO-A 1A H 3/H RL3/H RLP3
SINGLE-PHASE POWER CONTROLLER**

...H 3	...H RL3	...H RLP3	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 RLP3
DUAL-PHASE POWER CONTROLLER FOR THREE PHASE LOADS
WITH THREE-PHASE CIRCUIT**

...H 3	...H RL3	...H RLP3	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 RLP3
THREE-PHASE POWER CONTROLLER**

...H 3	...H RL3	...H RLP3	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	136	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



For international contact information, visit advanced-energy.com.