



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 dosing at a high level of availability.

WIDE PERFORMANCE SCOPE

Highly flexible interfacing for the load and power supply side enables Thyro-A[®] modules to precisely and reliably control power in a significantly 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 PC software Thyro-Tool Family
- › Secure separation of control and power units

ANALOG CONTROL

- › Analog set point 0(4)...20 mA; 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 inductive mixed 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

FEATURES

- › Wear-free operations
- › High performance
- › Easy handling
- › Compact package
- › DIN rail mounting (up to 60 A; for 1- and 2-phase devices)
- › 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 semi-conductor fuses
- › LED status indicators



SUMMARY SPECIFICATIONS

THYRO-A SERIES		
Operating Modes		
TAKT (full waves 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, VT	
Rated Voltage ...H 1		
...230...	230 V -57% +10%	
...400...	400 V -57% +10%	
...500...	500 V -57% +10%	
Rated Voltage ...H RL1 und H RLP1		
...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	
Functional Features		
...F...	Forced ventilation	
...H 1	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	U_{eff} / U_{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
- › RoHS conformity 5/6

THYRO-A SERIES

...H RL1 (additional to ...H 1 features)	Control types	$U_{eff} / U_{eff}^2 / I_{eff} / I_{eff}^2$
	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 RL1 and H RLP1) Limitation to $\hat{I} = 3 \times I_{nom}$ (for H RL1 and H RLP1 in VAR)
	Operational display	Via LEDs and relay output (exchanger, indications adjustable)
...H RLP1 (additional to ...H RL1 features)	Control types	$U_{eff} / U_{eff}^2 / I_{eff} / I_{eff}^2 / P$

System Interface

Optional bus module for Profibus® DPV1, Modbus® RTU, DeviceNet™, CANopen®, Profinet®, Modbus® TCP, Ethernet/IP®
For interfacing PC software Thyro-Tool Family via PC adapter

Type Key Example

Type Key	Thyro-A 2A 400-280 HF RLP1	
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	Semi-conductor fuse
	F	Forced ventilation
	R	Failure indicator relay
	L	Load monitoring, incl. analog output
	P	Performance control
1	Additional Thyro-A identification	

**THYRO-A 1A H 1/H RL1/H RLP1
SINGLE-PHASE POWER CONTROLLER**

...H 1	...H RL1	...H RLP1	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	131	127	0.7
			16	3.7	6.4	8	-	30	45	131	127	0.7
			30	6.9	12	15	-	47	45	131	127	0.7
			45	10	18	22.5	-	52	52	190	182	1.7
			60	14	24	30	-	80	52	190	182	1.7
			100	23	40	50	-	105	75	190	190	1.9
			130	30	52	65	-	150	125	320	237	4
			170	39	68	85	-	210	125	320	237	4
...F...	...F...	...F...	280	64	112	140	-	330	125	370	237	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 1/H RL1/H RLP1
DUAL-PHASE POWER CONTROLLER FOR THREE PHASE LOADS
WITH THREE-PHASE CIRCUIT**

...H 1	...H RL1	...H RLP1	Current (A)	Unit Rating (kVA)			Power Loss (W)	Dimensions (mm)			Approx. Weight (kg)
				400 V	500 V	600 V		W	H	D	
			16	11	14	-	60	90	131	127	1.4
			30	21	26	-	94	90	131	127	1.4
			45	31	39	-	96	104	190	182	3.4
			60	42	52	-	160	104	190	182	3.4
			100	69	87	-	210	150	190	190	3.8
			130	90	112	-	300	250	320	237	8
			170	118	147	-	420	250	320	237	8
...F...	...F...	...F...	280	194	242	-	660	250	393	237	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 1/H RL1/H RLP1
THREE-PHASE POWER CONTROLLER**

...H 1	...H RL1	...H RLP1	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	132	127	2.1
			16	11	14	-	90	135	132	127	2.1
			30	21	26	-	141	135	132	127	2.1
			45	31	39	-	144	156	190	182	5.1
			60	42	52	-	240	156	190	182	5.1
			100	69	87	-	315	225	190	190	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	397	241	15
...F...	...F...	...F...	350	242	303	-	1170	375	430	261	25.5
...F...	...F...	...F...	495	343	429	514	1822	276	407	345	30
...F...	...F...	...F...	650	450	563	675	2192	276	407	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

