

THV-10 SERIES

Power Controller Single Phase Thyristor Unit

AC150A, AC200A







Supports high capacity load currents of 150A and 200A.

Easy and accurate setting

Single phase power controller THV-10 has an LED display to show set values and input signals, and front keys for easy setting and monitoring. Setting can also be made with an external setting unit (variable resistor).

Three types of control modes are selectable

Phase control

The wave form of the load power is switched at a desired phase angle $\boldsymbol{\theta}$ to provide smooth control



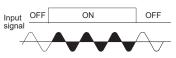
○ Zero-cross control (Continuous proportional)

Power is switched on and off when the supply voltage is at 0V. This system suppresses high frequency noise inherent to



OZero-cross control (Input synchronization system)

Supply voltage is switched on and off according to the voltage pulse or contact signals from a controller.



Communication with a PC via USB port (Loader communication)

The THV-10 has a standard loader port to connect a PC USB port via COM-KG (USB communication converter).
Using PROTEM2 software on the PC, parameter setting can be easily

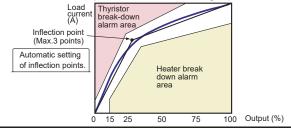
done from a PC.

Setting data support tool USB

communication converter COM-KG-1 Loader 1m communication

Detects heater break of non-linear load

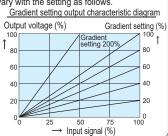
Heater break alarm can be used at up to three inflection points in accordance with heater characteristics. The unit can be used with a load with large resistance changes by temperature (e.g. lamp heaters). There is no need of calculation for inflection points as automatic setting is possible.



Standard Functions

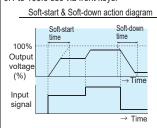
Gradient setting

The relation between the setting input and the output voltage can be set. Gradient setting is possible via front keys or an external setter. Control characteristics may vary with the setting as follows



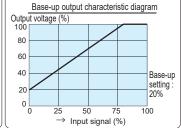
Ramp function (Soft-start & Soft-down)

Even if setting input changes abruptly, output changes slowly to suppress inrush current. Ramp-up (Soft-start) and ramp-down (Soft-down) time can be set in the range of 0.1 to 100.0 sec via front keys.



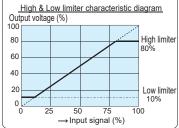
Base-up setting (Output bias)

Output bias can be set via front keys. (Base-up setting is valid when lower output limiter is set to 0.0)



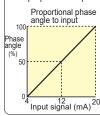
Output limiter (High & Low)

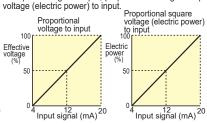
Highest and lowest output values can be



Output modes

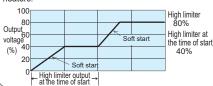
When phase control is selected for linear load (R: resistor), output mode can be selected among Proportional phase angle to input, proportional voltage to input and proportional square voltage (electric power) to input.





Output limiter High at start-up

This function limits the highest output for the period of a preset time after power-ON and control mode change from Stop to Run. It makes the THV-10 Series suitable for heaters which cause rush current flow, such as Halogen lamp, Tungsten, Platinum, and Molybdenum



Event input

Can assign a function (see below) to the external contact input. Function swtitching can be made from external contact input

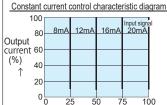
In use/Unused

Phase control/Zero-cross control (Continuous proportional)
RUN/STOP External manual/Internal Manual Heater break alarm : Use/Unuse Soft-up/Soft\down :Use/Unuse Setting data lock : Use/Unuse Over current alarm: Use/Unuse

Optional Functions

Constant current control (For phase control only)

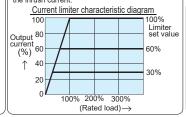
This function maintains the output current constant when a load or a power supply fluctuates. It makes the THV Series suitable for heaters of which resistance greatly changes by temperature change, such as Platinum, Molybdenum, Tungsten, and Kanthal heaters



Load current limiter (For phase control only)

This function limits the load current value to the heater. The setting range is 30 to 100% of the rated current.

(Note)
If the load has a large inrush current, use soft-start function along with this function to suppress the inrush current. This function alone can not prevent the inrush current.



Alarm output

The alarm types are Power frequency abnormal, Thyristor break alarm. Heater break alarm and FAIL. Alarm output will go on, when any of them goes in alarm status. (Alarm output : 1 poi

(Alarm output : 1 points, Energized/De-energized is selectable. FAIL is De-energized (Fixed.)

Heater break alarm

This function measures load current and compares it with a heater break alarm set value. Alarm will be activated if the load current goes into alarm ranges. Maximum two alarm set points can be set for the heater break alarm, which could be used for heater-deterioration alarm and heater-break alarm.

For phase control, heater break alarm does no work when the load current is less than 15% of maximum load current

Over-current alarm (For phase control only)

The alarm goes on when the load current exceeds 120% of the rated current.

Protection function for control of primary side of a transformer (For phase control only)

If momentary power failure occurs during execution of the control of primary side of a transformer, inrush current is generated. Protection function for control of primary side of a transformer is to protect the thyristor from the inrush current.

To control the primary side of the transformer, it is recommended to use the THV-10 with a protection function for control of primary side of a transformer.

Specifications

: 150A, 200A AC Rated current

Control method Phase control/ Zero-cross control (Selectable) Applicable load : Phase control : Linearity (R:Resistor) load, Control of primary side of a transformer

Zero-cross control: Linearity (R:Resistor) load

Input signal Current input 4 to 20mA DC (Input impedance : 50Ω)

Voltage input 1 to 5V DC (Input impedance : 30k Ω) Voltage input 0 to 10V DC (Input impedance Voltage pulse input 0/12V DC (Input impedance : 30kΩ)

Input sampling cycle 0.5 cycle of power cycle 1A (at 98% output of rated voltage) 0 to 98% of rated voltage Min. load current Output voltage range

Power OFF leakage current: Approx. 27mA AC (load voltage 200V rms, 60Hz, Ta=25°C)

Power supply voltage for Load Rating: 100 to 240V AC (Including power supply voltage variation)
Fower supply voltage at Rating: 100 to 240V AC (Including power supply voltage variation)
Fower frequency: 85 to 264V AC (Including power supply voltage variation)
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Allowable power frequency variation Power supply voltage for load 50±1Hz, 60±1Hz Power supply voltage for control 50±2Hz, 60±2Hz : Less than 12.5VA (at 100V AC), Rush current 21A or less Less than 22.0VA (at 240V AC), Rush current 55A or less : Gradient setting : 0.0 to 200.0% [Front key] 0 to 100% [External setting unit] Output limiter (High) : 0.0 to 100.0% [Front key] Output limiter (Low) : 0.0 to 100.0% [Front key] Power consumption

Output setting

Output limiter at start-up (High) : 0.0 to 100.0% [Front key]

Output limiter time at start-up

: 0.0 to 600.0 sec [Front key]
Base-up setting (Output bias): -9.9 to 100.0% [Front key]
Manual setting: 0.0 to 100% [Front key]

0 to 100% [External setting unit]

a) Proportional phase angle • Proportional voltage • Proportional Output mode

square voltage

b) Constant current control a): Standard function, b): Optional function

Cooling method : Natural convection

Ambient temperature: -15 to +55°C (Guaranteed operation range)

Ambient humidity

: 5 to 95%RH (Non-condensing) Absolute humidity : MAX.W.C 29g/m³ dry air at 101.3kPa

Dielectric voltage : Between main circuit terminals/power terminals for control

and heat sink: 2500V AC for one minute.

Between main circuit terminals/heat sink and input terminals

2500V AC for one minute.

Between power terminals for control and input terminals

: 2300V AC for one minute.

Insulation resistance : Between main circuit terminals/power terminals for control and heat sink : $20M\Omega$ or more (500V DC)

Between main circuit terminals/heat sink and input terminals

 $20M\Omega$ or more (500V DC)

Between power terminals for control and input terminals : $20M\Omega$ or more (500V DC)

: a) Data check, Back-up check, A/D converter check, Watch dog-timer, Power supply voltage check

b) Action at abnormality

Thyristor output OFF, FAIL output open

Mounting method : Vertical mounting

Self-diagnostic

function

: Approx. 3.7kg (150A, 200A) Weight : • Auto/Manual selection Standard functions

(External manual setting unit is optional)

Gradient setting (External setting unit is optional)

 Soft-up/Soft-down: 0.0 to 100.0sec
 Digital input (DI): 1 points, Non-voltage contact input (Phase control/Zero-cross control (Continuous proportional), RUN/STOP, Auto/Manual, Heater break alarm : Use/Unuse, Soft-up/Soft\down :Use/Unuse Setting data lock: Use/Unuse, Over current alarm: Use/Unuse (Selectable)

 Heat sink temperature abnormality : THV-10 output OFF when the heat sink temperature exceeds

approx. 120°C.
• ON/OFF control (External setting units are optional)
• Loader communication : ANSI/RKC standard protocol

Optional functions : • Alarm output : 1 point

Open collector output, Sink type Maximum load current : 100mA Load voltage: Less than 30V DC Energized/De-energized is selectable. (FAIL is de-energized only)

(Heater break alarm, Thyristor break alarm, Power frequency abnormal, Over current alarm, FAIL) * Selectable

Heater break alarm

Current measuring accuracy

±5% of rated load current or ±2A (Whichever is larger)

Load current limiter

Setting range : 0.0 to 165.0A (150A type) 0.0 to 220.0A (200A type)

Compliance with Standards : UL : UL60947-4-1 [POLLUTION DEGREE 2] cUL : C22.2 No.60947-4-1

[POLLUTION DEGREE 2] CE marking: LVD: EN60947-4-3
POLLUTION DEGREE 2,

EMC : EN60947-4-3
• A specified noise filter must be used SOSHIN ELECTRIC CO., LTD

HF3150C-SZC (150A) Leak current 7mA NF3200C-VZ (200A) Leak current 10mA

*1 : If momentary power failure occurs during execution of the control of primary side of a transformer, inrush current is generated. Protection function for control of primary side of a transformer is to protect the thyristor from the inrush current.

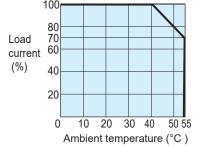
Table of Stability

Table of Stability							
Function	Operating condition	Stability					
Constant current variation	Power supply variation : Within ±10% Load variation : 2 times	Within ±10% of rated current					

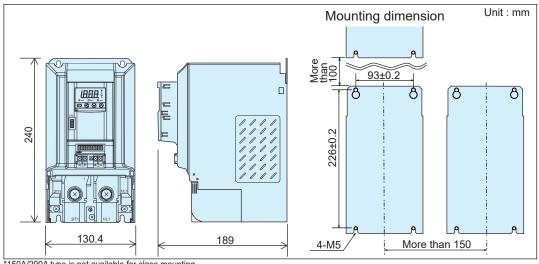
Table of internal calorific value

Rated load current (A) 150 200 Internal calorific value (W 200 250

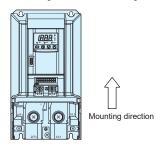
· Temperature characteristics of load current



External Dimensions



· Install the instrument as illustrated in the drawing to increase the cooling effect.



*150A/200A type is not available for close mounting.

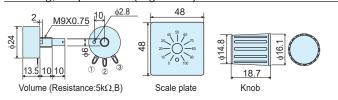
Model and Suffix Code

Specifications	Specifications Model and Suffix Code						
Туре	Single phase 100 to 240V AC THV-10			- *			
Control method	Control method Phase control/Zero-cross control (programmable, default: phase control)						
Rated load current	AC150A AC200A		150 200				
*1 Input signal	signal *1 0 to 10V DC 1 to 5V DC 4 to 20mA DC Voltage pulse input 0/12V DC						
Heater break alarm Current limiter Constant current control	urrent limiter Onstant current Heater break alarm, Current limiter, Constant current control, Protection function for control of primary side of a transformer				N H B		
Alarm output	Alarm output Alarm output 1 point * Connector for Input/Output (Plug) is necessary, Specify accessories code (-9).		N A				
*2,*3 Accessories	Setter (Volume, knob, Scale plate) 1 unit + Connector for Input/Output (Plug) Setter (Volume, knob, Scale plate) 2 units + Connector for Input/Output (Plug) UL/CE Marking type Fuse unit (Fast-blow fuse + Holder [1 circuit type])			-1 -2 -7 -9			

- *1: Input signal is programmable. When contact input is required, specify the connector for input as an accessory (Either of -1, -2, or -9).
- *2 : Setters are for external gradient setting, external manual setting, and external high/low setting for on/off control. Use two units of setter in the following cases;
 - When external gradient setting and external manual setting are required.
 - High/low setting for on/off control is used.
- *3: It is possible to specify more than one accessories by adding suffix code at the end. Example: -1-7: Setter (Volume, knob, Scale plate) 1 unit + UL/CE Marking type Fuse unit (Fast-blow fuse + Holder [1 circuit type]) Connector for Input/Output (Plug) -1-2-9 cannot be specified simultaneously.

Accessories

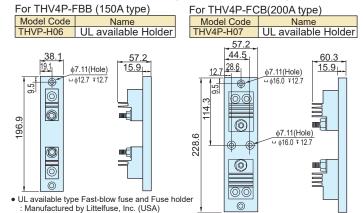
• External setter (knob) used fo gradient setting, manual input setting, Output limiter (High&Low): THV1P-S01



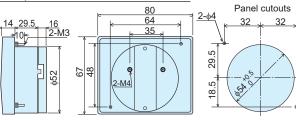
• Fuse Holder

Holder for THV4P-FBB/FCB

(UL available) Screw Mounting or DIN rail mounting



• Output voltmeter : THVP-V01/V02



Model Code

- Please refer to the following codes to order accessories.
- The rating of the fast-blow fuse may be different from the current rating of the THV-10 main unit.

Name		Code	Note			
Setter		THV1P-S01				
Output voltmeter			Manufactured by Daiichi Electronics Co., Ltd. : LSK-8CH 1			
		THVP-V02	Manufactured by Daiichi Electronics Co., Ltd.: LSK-8CH 300\			
Connector for						
Input/Output (Plug)		THV4P-C01				
UL available *1	150A	THV4P-FBB	JLLS200X (200A)			
Fast-blow fuse	200A	THV4P-FCB	JLLS250X (250A)			
UL available	150A	THV4P-H06	LFT602001CS			
Fuse holder	200A	THV4P-H07	LFT604001CS			



- Before operating this product, read the instruction manual carefully to avoid incorrect operation. This product is intended for use with industrial machines, test and measuring equipment. It is not designed for use with medical equipment.

 If it is possible that an accident may occur as a result of the failure of the product or some other this possible that an accident may occur as a result of the failure of the product or some other this possible that an accident may occur as a result of the failure of the product or some other this possible than accident may occur as a result of the failure of the product or some other accident may be a failured by the product of the pro

when installing this product, avoid the following:
Direct exposure to sunlight. Direct contact with water.
Corrosive environments.
Vibration or shock.
Areas subject to electrical noise caused by inductive interference, static electricity or magnetic fields

Caution for imitated products

As products imitating our product now appear on the market, be careful that you don't purchase these imitated products. We will not warrant such products nor bear the responsibility for any damage and/or accident caused by their use.



RKC INSTRUMENT INC.

(RIKA KOGYO CO.,LTD)

HEAD OFFICE: 16-6, KUGAHARA 5 CHOME OHTA-KU TOKYO 146-8515 JAPAN

PHONE: 03-3751-9799 (+81 3 3751 9799) Email: info@rkcinst.co.jp

FAX: 03-3751-8585 (+81 3 3751 8585)

https://www.rkcinst.com/