

TS1 (1-phase)

Power thyristor

thermokon[®]
HOME OF SENSOR TECHNOLOGY

Datasheet

Subject to technical alteration
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Application

Power thyristors are used as actuators for industrial power controls (e.g. fans, pumps, lamps, heating registers, industrial furnaces). Their solid and compact construction ensures reliable control and high efficiency.

Types available

Power thyristor – phase

TS1 1-ph <Amp>

Power thyristor – oscillation

TS1 SP 1-ph <Amp>

<Amp>: 2 A | 4 A | 6 A | 8 A | 10 A | 12 A

Security Advice – Caution



The installation and assembly of electrical equipment should only be performed by authorized personnel.

The product should only be used for the intended application. Unauthorised modifications are prohibited! The product must not be used in relation with any equipment that in case of a failure may threaten, directly or indirectly, human health or life or result in danger to human beings, animals or assets. Ensure all power is disconnected before installing. Do not connect to live/operating equipment.



CAUTION! Risk of electric shock due to live components within the enclosure, especially devices with mains voltage supply (usually between 90..265 V).

Please comply with

- Local laws, health & safety regulations, technical standards and regulations
- Condition of the device at the time of installation, to ensure safe installation
- This data sheet and installation manual

Notes on Disposal



As a component of a large-scale fixed installation, Thermokon products are intended to be used permanently as part of a building or a structure at a pre-defined and dedicated location, hence the Waste Electrical and Electronic Act (WEEE) is not applicable. However, most of the products may contain valuable materials that should be recycled and not disposed of as domestic waste. Please note the relevant regulations for local disposal.

Technical Data

Output switch contact		floating normally open contact for 250 V ~ / 3 A or 24 V = / 3 A power output for ohmic and inductive load:
	TS1 1Ph 02	2 A, max. 0,5 kW
	TS1 1Ph 04	4 A, max. 1,0 kW
	TS1 1Ph 06	6 A, max. 1,5 kW
	TS1 1Ph 08	8 A, max. 2,0 kW
	TS1 1Ph 10	10 A, max. 2,5 kW
	TS1 1Ph 12	12 A, max. 2,8 kW
Power supply		230 V ~
Power consumption	TS1 1Ph 02	typ. 2,5 W
	TS1 1Ph 04	typ. 4,5 W
	TS1 1Ph 06	typ. 6,5 W
	TS1 1Ph 08	typ. 9 W
	TS1 1Ph 10	typ. 11 W
	TS1 1Ph 12	typ. 13 W
Inputs		set point signal 0..10 V = or 0..20 mA (switchable with DIP-switch) potentiometer input 2,5..10 kΩ
Display		LED Mains: green LED U out 100%: green
Functions		phase-angle control (optional: oscillation package)
Enclosure		PA
Protection		IP40 according to EN 60529
Connection electrical		terminal block, max. 2,5 mm ²
Ambient condition		0..+45 °C
Weight		500 g
Mounting		prepared for mounting on DIN rail TS35 (35x7,5 mm) according to EN 60715
Notes	TS1 3Ph 06 08 10 12	with heat sink

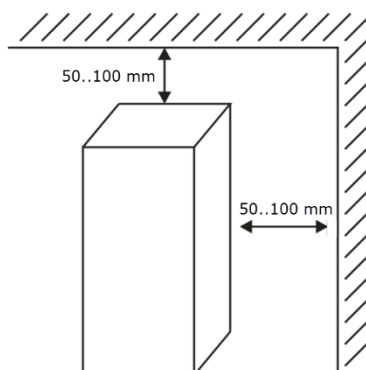
Mounting Advices

A sufficient cooling (e.g. forced air cooling) is of paramount importance. Temperature is not allowed to exceed 45 °C. The device has to be mounted on a vertical area, so that a sufficient air circulation is guaranteed. Moreover, the thyristor has to be installed in dry rooms.

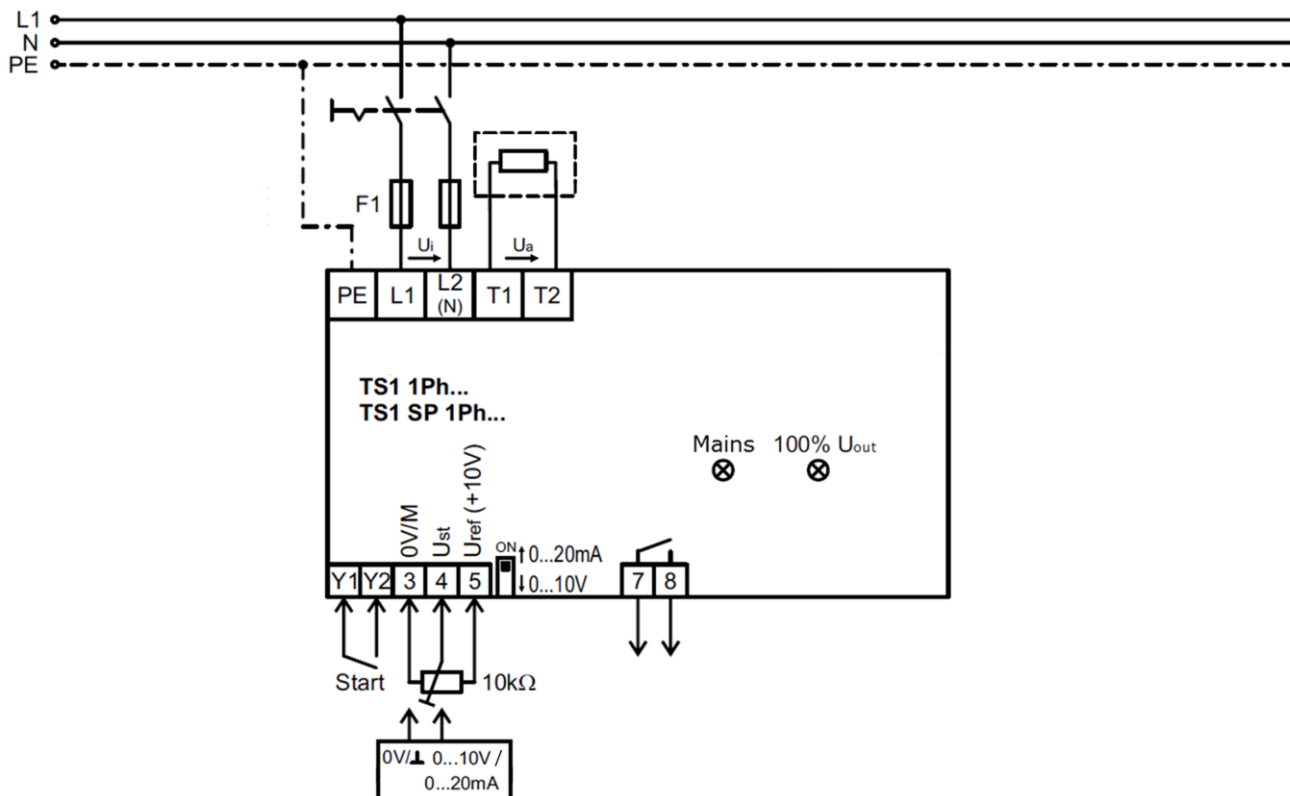
Further onsite conditions:

- Protection against dust and humidity
- Protection against aggressive atmosphere
- Free of vibrations

In order to avoid any interferences of the cooling, no further components should be installed around the thyristor within a distance from 50 to 100 mm.



Connection Plan



Clamp

Description

L1 L2 (N)	230 V ~ / 50 Hz
T1 T2	Load connection
Y1 Y2	Start / activation
3 4	Set point signal 0..10 V / 0..20 mA with 500 Ω resistor
5	Reference voltage (10 V) for potentiometer control
7 9	Relay switching output: the relay switched on if the output voltage reaches 100%.

LED

Description

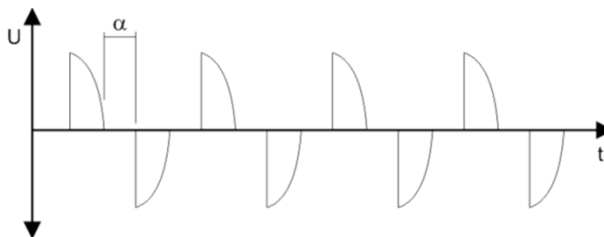
Mains	Flashing if power supply is connected.
100% Uout	Flashing if output voltage has reached 100%.

General Information

The power thyristors series TS1 are available with phase angle control or oscillation package.

Phase angle control:

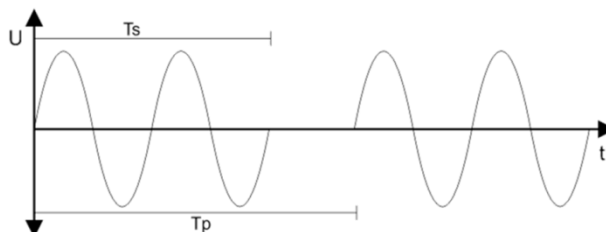
The phase angle control can be used for almost any ohmic and inductive consumers and is the most common way to control the power consumption of a consumer. The consumer is connected to the supply network via the power thyristor. The thyristors are controlled in such a way, that the consumer is not supplied with the complete sinusoidal oscillation but only a part (depending on the steering angle α), whereas the voltage average value can be adjusted continuously.



α = control angle

Oscillation control:

In principle, the oscillation control is used with inert consumers like for example heaters. Contrary to the phase angle control, complete sinusoidal waves are switched through to the consumer with the oscillation control. The control of the average voltage value is made by switching through a certain number of oscillations (depending on the switch-on time T_s) within a certain time slot (clock cycle T_p).



T_s = turn-on time / T_p = pulse period time

Commissioning

First of all, all electrical connections should be setup, according to the attached circuit diagrams. According to the VDE regulations, the Thyristors must be connected to the supply net in that way, that they can be separated from the net by means of corresponding clearing instruments (e.g. main switch, contactor, protective power switch).

Cabling: The net and consumer lead wires as well as the control circuit must be lead in separate cables. In order to avoid any interferences, it is advisable to wire the electronic signal lines separated from the load leads and/or the contactor control circuit and to twist the coming and going wires of the signal line.

Protection:

The net protection depends on the recommended respectively the used conductor cross section and must be made according to DIN 57100 Part 430/VDE 0100 Part 430/6.81.

EMC: According to the EMC-Norms power thyristors are belonging to assemblies, which do not have an intended purpose on their own. The devices present a functional unit of a complete system. The control electronics of the power thyristors is designed according to the valid EMV requirements. The builder of a plant/system has to fit the system with a suppressor (anti-interference) by means of suitable throttles and decoupling filters.

Dimensions (mm)

