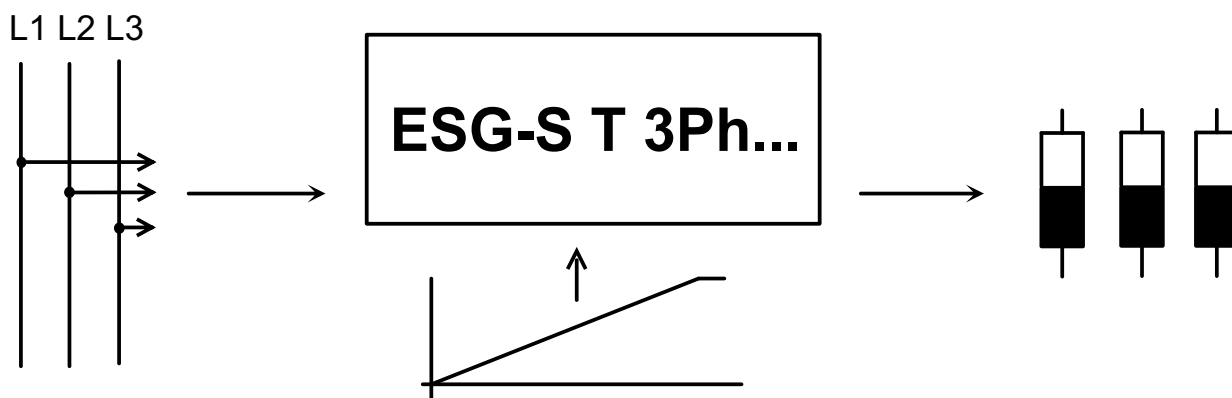




Start-up instructions

Thyristor controller Type: ESG-S T 3Ph... Three phase controller W3C



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1. General information

The thyristor controller is more and more used in sectors in which bigger loads of ohm and inductive loads have to be regulated.

Due to its modular, compact construction and its controlling by a continual control signal, these wattage regulators become a perfect device for industrial control of wattage input. The power element of the thyristor controller consists of six antiparallel connected thyristors, the isolated cooling system and the electronic regulation and watching.

Type description:

ESG-S T 3Ph...	three phase controller, phase angle
ESG-S T 1Ph...	alternating current controller, phase angle

Voltage supply:

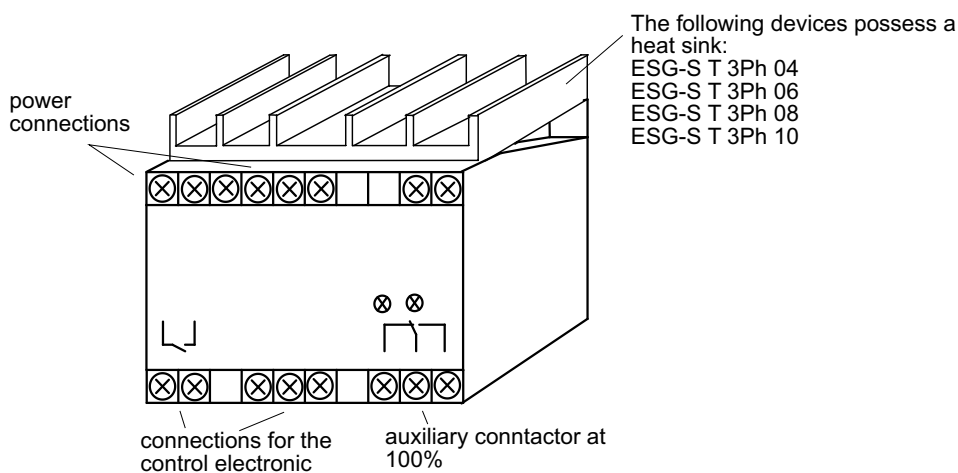
Different values of mains voltage are balanced so that any voltage variability of the load is avoided.

Construction:

The thyristor controller agrees with VDE 0558 part 1 and VDE 0160 table 4.

The thyristor controller ESG-S T 3Ph... is integrated within a plastic housing (ABS). It consists of three basic elements:

- power element with cooling system and thyristor switching facility
- control unit with electronic starting and control system (diagnostic indicator, regulation port etc.)



2. Installation of the thyristor controller ESG-S T 3Ph...

The built-in device according to IP 40 has to be mounted in a housing or a switchboard panel. Take care of adequate cooling (separate ventilation, for instance). The environment temperature must not exceed the value of 50°C. The device is to be mounted on a vertical plane, avoiding that the ventilating pipes of the cooling element are not placed vertical. The device has to be mounted in a dry room.

Further conditions to the operating area:

- protection from dust and moisture
- protection from aggressive atmosphere
- free from vibrations

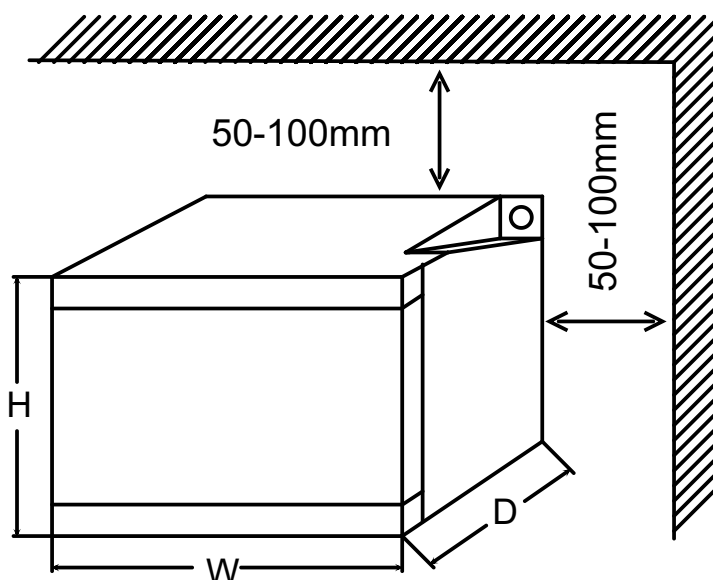
No other devices should be placed closer than 50-100mm to the device in order to provide adequate cooling.

The housing equipment according to IP 54 can be placed in locations which are not protected from dust and moisture.

Wiring the device:

Build mains connection (L1, L2, L3) via fused circuit breakers with usual fuses. The wiring for power supply and the wiring for control have to be laid in separate conduits or shield ducts.

It is essential to the electric installation to comply to the stipulations of the VDE (German Electrical Engineers Association), specifically to VDE 0100, VDE0113, VDE 160.



3. Operation

To begin with, all electrical connections have to be established according to the circuit diagrams L1, L2, L3, T1 (U), T2 (V), T3 (W). The thyristor controller has to be connected to the mains according to the electric regulations (Low Voltage Directive) so that they can be separated by disconnecting switches (e.g. load interrupter, contactor etc.) from the mains.

Cabling must be performed by personnel who are qualified to work low voltage electrical equipment. Before any connection or disconnection, make sure that the power and control cables and wires are isolated from the voltage sources.

Recommended connection:

The mains connections, the connection to the load and the control connections have to be laid in separate cables. In order to avoid faults the electronic control connections should be separated from the power wires and/or contactor control wires and one should twist the control wires. In order to reduce risks related to the effects of electromagnetic interference depending on the installation of the product please consider the rules for electromagnetic compatibility.

Fuses:

The net-lateral security depends on the recommended and/or the used cross-section of a wire and has to be made according to DIN 57100 part 430/VDE 0100 part 430/6.81 (Low Voltage Directive).

The “supervision circuit” permits electronic controlling of current excess, short circuit, asymmetric power distribution, motor temperature and provides a malfunction report exit corresponding with a simultaneous LED display.

The control electronics synchronously turn off the current of the power element.

4. Meaning of the clamp connections

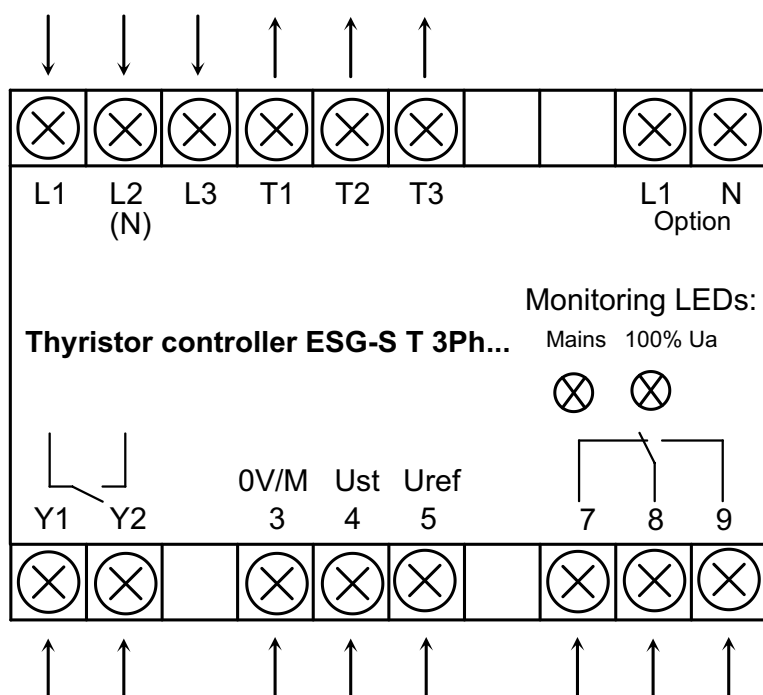
Control voltage:	
L1, L2, L3	connection of 400V/50Hz (optional: any other voltages can be realized upon request)
Option	external supply voltage, monitoring for temperature exceedance

Power output terminals:	
T1, T2, T3	load (cf. table "Survey of the individual types", p. 7)

Activation terminals:		
Y1, Y2	activated	closed
	ready	open

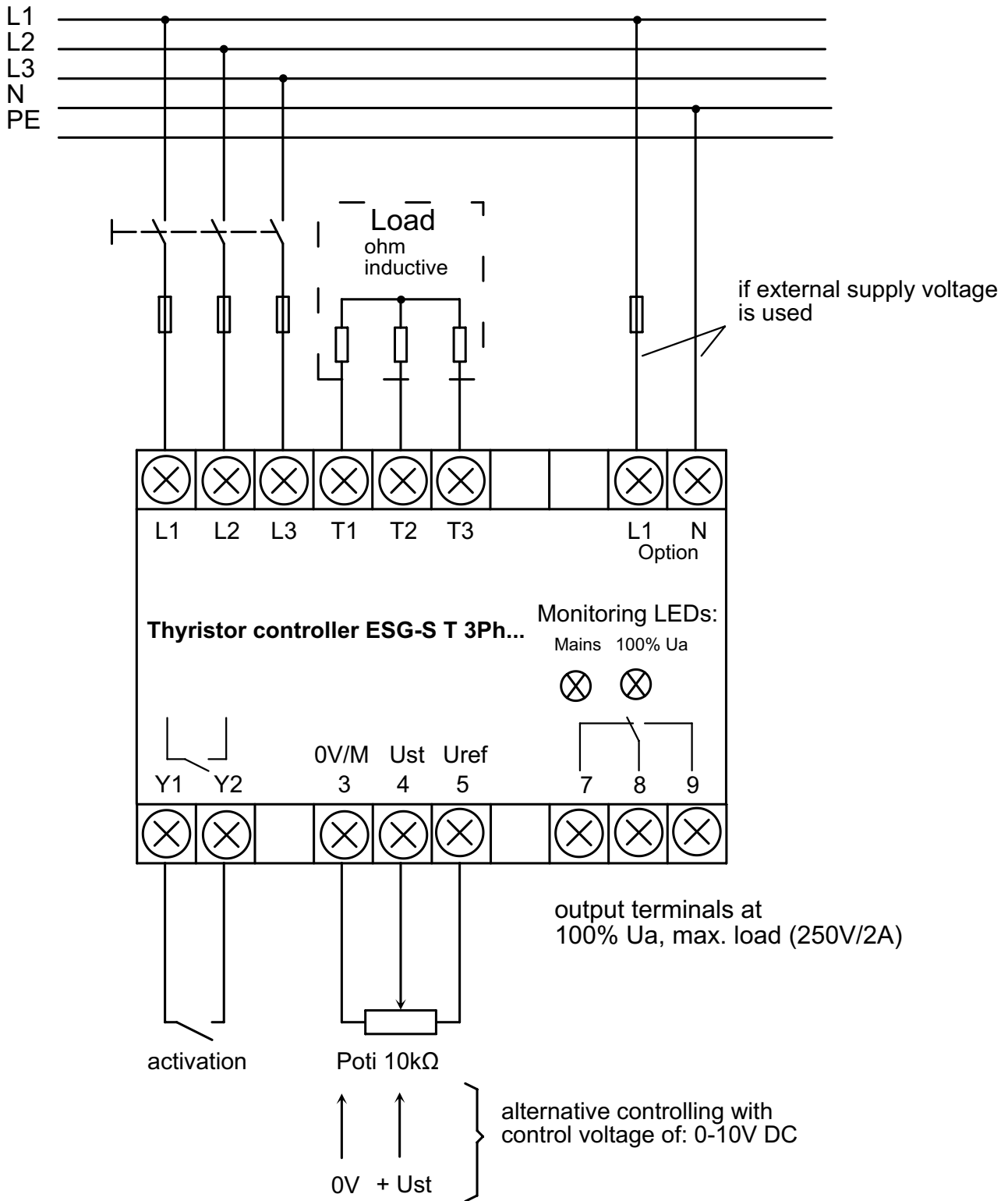
Control input terminals:	
3, 4	setpoint signal 0-10V DC
5	reference voltage 10V/20mA DC (voltage supply for potentiometer control)

Relay output terminals:	
7, 8, 9	relay output (activated if 100% of output voltage is reached)



Meaning of the LEDs	
Mains	mains voltage is available, device is ready for use
100% U_a	device has reached full conduction

5. Basic circuit

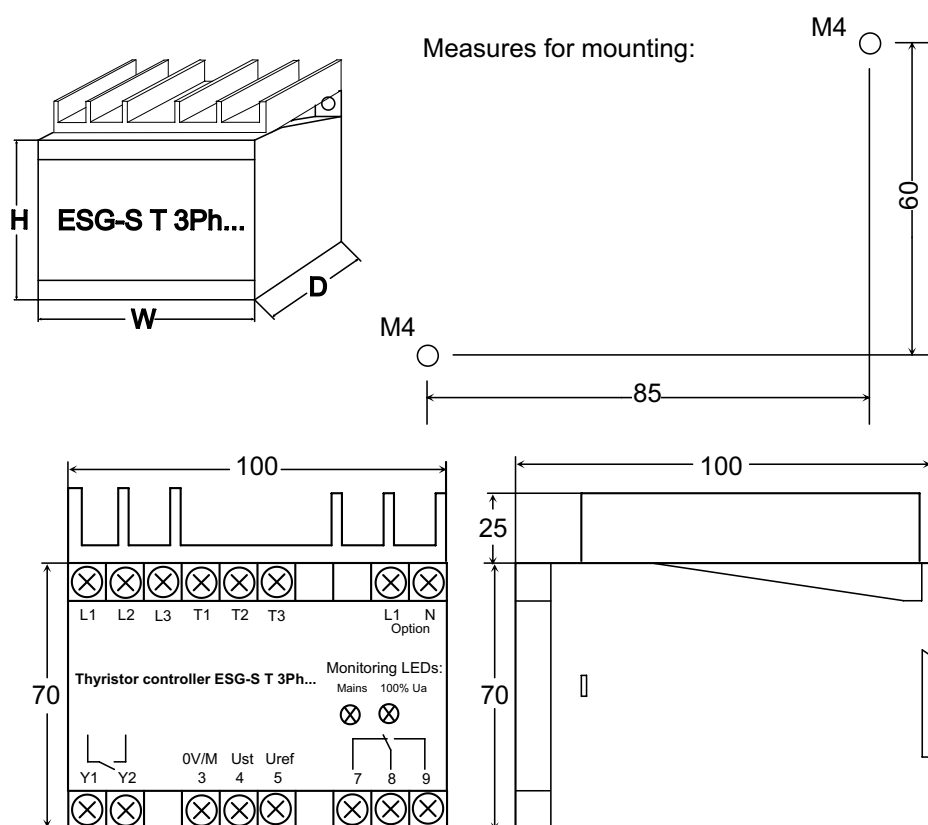


6. Survey of the individual types

Type	Max. current load [A]	Rec. semi-conductor fuses [A]	Mains fuse [A]	Rec. cross section [mm ²]	Max. power [kW]	Weight [kg]	Dimensions (WyHxD) [mm]
ESG-S T 3Ph 02	2	2	6	1,5	1,2	0,5	100x95x100
ESG-S T 3Ph 04	4	4	6	1,5	2,5	0,5	100x95x100
ESG-S T 3Ph 06	6	6	10	1,5	4,0	0,6	100x95x100
ESG-S T 3Ph 08	8	6	10	2,5	5,0	0,6	100x95x100
ESG-S T 3Ph 10	10	8	16	2,5	6,5	0,6	100x95x100

Errors and technical modifications excepted (Date: 2008/08)

The given values refer to the operation voltage of 3x400V AC. The values given for overload refer to a surrounding temperature exceed of max. 50°C and an installation altitude of 1000m.



7. Technical data

Voltage of power circuit	400V AC or 230V AC (optional supply)
Mains voltage	3x400V AC
Max. current load	cf. table "Survey of the individual types", p. 7 (2-10A)
Frequency	48-62Hz, self-synchronizing
Test voltage	according to VDE 0160, Tab. 6 / DIN EN50178 table 18
Kind of protection	<ul style="list-style-type: none"> • housing: IP 40 • clamps: IP 20 (VBG 4) arbitrary
Moisture class	F according to DIN 40040
Ambient temperature	<ul style="list-style-type: none"> • operation: 0-45°C • storage: -10-70°C
Vibration resistance	4G
Mounting	proposed to be mounted on a DIN rail (DIN 46277-3; 35x7,5mm) or on switchboard panel
Housing	ABS (Terulan) 877 T, UL 94 HB
Indicating operation state	<ul style="list-style-type: none"> • operation: LED „green“ • level 100%: LED „green“
Meldekontakt	level 100% 250V AC 2A; 24V DC, 3A
CE-marking	Declaration of Conformity 73/23/EEC (Low voltage directive) EMC Directive 89/336 EU for industrial environments
Regulations	VDE 0160, EN 60204, IEC 947-4-2
Inputs	<ul style="list-style-type: none"> • 0-10V DC • 0-20mA DC • potentiometer input: 2,5kΩ-10kΩ

Errors and technical modifications excepted (Date: 2008/08)