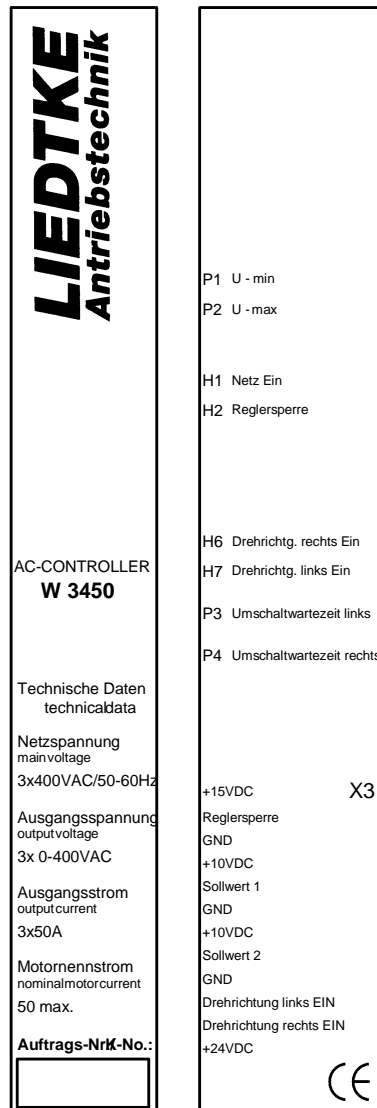




Technical device manual

AC power controller W3450



Before installation and before begin operation read this manual.
It contains important safety information regarding the protection of the user as well as information for the proper use of this device!



Important safety information

The device may only be installed and connected by an electrically skilled person with the aid of this manual. National standards and safety regulations must be observed (see DIN V VDE V 0100534... or IEC 60364-5 534:...).

The device must be checked for external damage prior to installation. If any damage or other defects are detected in this check, the device must not be installed.

Its use is only permitted within the limits shown and stated in these manual. The device and the equipment connected to can be destroyed by loads exceeding the values stated. Opening or otherwise tampering with the device invalidates the warranty.

The manufacturer does not take over any responsibility for any consequences resulting from incorrect or negligent installation, change of existing parameters of the devices or the false combination with peripheral components.

A device-independent auto power ON/OFF must be guaranteed.

Fuses may only be replaced by fuses of the same type.

The operation of the device is only permitted with connected protective conductor.

In case of an error it might occur that for safety reasons the device shuts down by itself and causes the motor to stop. The removal of the defect can lead to an automatic restart of the drive.

If, for safety reasons, this is not permissible, then the operator of the system has to prevent an auto-restart by using appropriate measures.

For reference and actual lines you have to use shielded lines.

To this please also note the hints for an EMC-proper installation.

In the devices are used components which are sensitive to electrostatic discharges.

During the operation, installation and maintenance, measures have to be taken in order to avoid electrostatic discharges.

Lacquer-sealed potentiometers are basic settings of the device and may not be changed.

Lacquer-sealed screws serve for important safety functions and may not be opened.

Attention:

As a basic principle the device has to be made dead before any contact.

In case of non-observance there is the possibility of an electrical shock.



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Appendix:

Terminal diagrams and wiring diagram for control stage and power supply
Overview terminals, potentiometer, LED

This manual was prepared according to the best of our knowledge and belief.
LIEDTKE is not liable for possible errors and reserves the right to make technical changes without prior notice.



1. Product description

1.1 General description of the AC power controller (standard function)

The AC power controller of the Type W3450 is a compact devices to adjust the torque and the tensile force on the AC winder.

The device is designed for the installation in a switch-cabinet.
The device complies with the protection class IP20.

The output voltage can be adjusted steplessly variable through a three phase-angle control from an adjustable minimum voltage (main feature) up to the approximate mains voltage via a potential-free reference input (0...10VDC).

Via a further floating reference input it is possible to connect a correction voltage.

Potential free inputs for:

- control inhibit
- set point 1
- set point 2
- reversal of rotation



1.2 Ambient conditions

Housing: Switch-board installation, Protection class IP20

Operating environmental temperature: **0 ... +40°C**

Performance-reduction: Performance-reduction 2% per °C at environmental temperatures over +40°C.

Storage temperature range: -25°C ... +85°C

Transport temperature range: -25°C ... +85°C

Relative humidity: min. 15% relative humidity
max. 80% rel. humidity; not condensing
A bedewing is not permitted ¹⁾

Installation height:	Height	operating temperatures
	1000m	+40°C
	1500m	+36°C
	1500m	+32°C
	1500m	+28°C
1500m	+24°C	

Installation position: vertical; distance to other components always at least 30mm.

Air pollution degree: 1 acc. to IEC 664

1) In case of need use the heating of a switch-cabinet to avoid a condensation or use an aeration to avoid that the admissible operating environmental temperature range from 0° to +40°C will be exceeded. For this we recommend the installation of a frost / temperature controller.



1.3 Connecting data

Mains supply voltage: 3 x 400VAC* / +/-10%
*Special voltages are possible on request
Mains frequency: 50-60Hz (automatic adaptation)

Electrical device data:

Motor voltage: approx. 0V up to approx. 3 x 400VAC
adjustable via a three phase-angle control

The motor voltage can be adjusted with the aid of two potentiometers to the minimum and maximum value; (The potentiometers are operable from the front).

Motor current: approx. 0 to 50A (at short-time load max. 50A)

Control inhibit: switched with internal or external +24VDC signal

Reference input 1: 0 up to +10VDC

Reference input 2: 0 up to +10VDC

Note: If you use both reference inputs then please make sure that the sum of the reference values does not exceed +10VDC.

1.4 Device protection

Note: In order to avoid damages to the device or to external components it is absolutely necessary only to use the type of fuse mentioned in the following.

The internal fuses are located in fuse retainers on the board and are thought for the protection of the internal electronics.

Fuse type: 1A MT - size 6.3 x 32 mm

Principally, the power supply has to be protected externally.

For the protection of the semiconductors the following fuse types have to be built in mains-sided:

The device may be protected at a maximum with semiconductor fuses of the type **63A FF** (3x) .

Below this value the mains-sided protection may be adjusted to the used motor.



2. Notes on connecting and wiring

2.1 Control terminals

Terminal strip: **X3** (potential free range)

Type of terminal: pluggable screw terminal – 12 poles
cable cross-section max. 1 mm²

Terminal-No.:	Function:
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Term. 1	Control inhibit (internal supply voltage +15VDC)
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Term. 2	(Variant 1) Input for internal control inhibit (+15VDC via contact of term.1 – term. 3 has to be bridged to term. 9). (Variant 2) Input for the external control signal of the control inhibit (+24VDC external with external GND at terminal 3)
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Attention: 1-Signal corresponds to the controller release

Term. 3	GND in case of external control inhibit
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Term. 4	+10VDC - potential free
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Term. 5	Input for set point 1
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Term. 6	Device GND - potential free
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Term. 7	+10VDC - potential free
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Term. 8	Input for set point 2
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Term. 9	Device mass (GND) - potential free
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Note: If you use both set point inputs then the sum of the set points may not exceed +10VDC.

Term. 10	Direction of rotation left
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Term. 11	Direction of rotation right
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Term. 12	+24VDC - potential free
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2.2 Power terminals

Type

of terminal: Series terminals
 Cable cross-section max. 2.5 mm²
 Cable cross-section max. 6,0 mm²

Terminal

designation: **Connection Control section – Pre- Fuse 4AT**
Function

PE : Protective conductor - **IMPORTANT !!**
 L1 : Connection Phase L1
 L2 : Connection Phase L2
 L3 : Connection Phase L3

Terminal

designation: **Connection Power section**
Function

L1 : Connection Phase L1
 L2 : Connection Phase L2
 L3 : Connection Phase L3

U : Motor connection U
 V : Motor connection V
 W : Motor connection W

PE : Protective conductor - **VERY IMPORTANT !**
Absolute Connecting up !
Operation without Protecting conductor not legal.

2.3 Hints for an EMC-suitable installation

In order to observe the electromagnetic compatibility please note the appropriate guidelines and instructions.

This applies especially to: - installation
 - earthing
 - filtration
 - shielding

The next user is responsible for the observance of the EMC- guideline in case of industrial use. If all components / plant components meet the CE- immunity requirement, then no electromagnetic impairments have to be expected.

Additionally we are offering the corresponding interference filters.
 Please only use those interference filters assigned to the devices.
 Ask our Sales Team to help you to select the right filter.

3. Function setting

3.1 Trim potentiometer

Note: The potentiometers which are accessible from the outside, are – as their names applies – provided for the optimisation of the controller. They can be freely adjusted within their permitted adjustment ranges. Please take note that the critical values for the device regarding output voltage and output current will not be exceeded. This can lead to damages at the device. The internal potentiometers are factory settings and may not be changed. All potentiometers have their lowest value at the left end-stop or set the function to zero.

Potentiometer:	Function:
P1:	minimum voltage at the motor (=basic tension force)
P2:	rated voltage at the motor (=maximum tension force)

3.2 Adjusting the basic tension force

With the front-sided operable potentiometer **P1** a basic tension can be adjusted at set point zero (both set point potentiometers at left end-stop). For this the potentiometer **P1** will be turned until after the desired basic tension has been reached.

3.3 Adjusting the maximum tension force

With the front-sided operable potentiometer **P2** there can be adjusted the maximum tension force at set point +10V. For this the potentiometer **P2** will be turned until after the desired tension force has been reached. Hereby it has to be observed, that the max. output voltage may lie approx. 10...20V below the mains supply voltage.

Additionally it has to be secured that the maximum device current of **50A** never will be exceeded. If necessary the output voltage will have to be reduced in order to adjust the current limit to the maximum permissible value.



4. Displays

4.1 Light-emitting diodes

Description:

Function:

H1 (green)
mains ON

Lights if the mains voltage is switched in
and the internal supply voltage is in order.

H2 (red)
Control inhibit

Goes off if the controller has been released.
Lights if the controller is blocked.

H6 (green)

Lights in case of rotation direction right

H7 (green)

Lights in case of rotation direction left

5. Reversal of rotation

For the function reversal of rotation the terminals X3:10 up to X3:12 are used.
switch-over time with relay: **3 sec.** (from Oct.2004)

5.1 Control terminals

Terminal strip: **X3** (potential free range)

Type of terminal: plug-in screw terminal – 12 poles
Cable cross-section max. 1 mm²

Terminal-No.: **Function:**

Term. 1 Control inhibit (internal supply voltage +15VDC)

Term. 2 (Variant 1) Input for internal control inhibit
(+15VDC via contact of term.1 – term. 3 has to be bridged to term. 9).
(Variant 2) Input for the external control signal of the control inhibit
(+24VDC external with external GND at terminal 3)

Attention: 1-Signal corresponds to controller release

Term. 3 GND in case of external control inhibit

Term. 4 +10VDC - potential free

Term. 5 Input for set point 1

Term. 6 device mass (GND) – potential free

Term. 7 +10VDC - potential free

Term. 8 Input for set point 2

Term. 9 device mass (GND) – potential free

Note: If you use both set point inputs, the sum of the set points may not exceed +10VDC.

Term. 10 Input for direction of rotation left

Term. 11 Input for direction of rotation right

Term. 12 +24VDC for controlling the reversal of rotation



5.2 Function and adjustment

Note: The function „reversal of rotation“ is internally interconnected with the control inhibit, that means **only if the control inhibit is opened** the reversal of rotation can be activated.

If the AC controller disposes of the additional function „reversal of rotation“, then the direction of rotation of the AC winder can be switched over via an external connected change-over contact.

For this a DC-voltage (24V) provided at the terminal X3-12 will be switched to the terminals X3-10 or X3-11 (change-over contact).

Please take care that always only one input will be activated.

Sequence of functions

After switching on the mains voltage the Controller always disposes of an internal pre-defined direction of rotation. If the direction of rotation is internally defined with „d.o.r. left“, then the LED **H7** will light after a short switch-over time delay.

The desired direction of rotation can be selected by using the toggle switch at the term. X3-10 up to X3-12. After a short switch-over time delay this direction of rotation is now active and the corresponding LED lights.

After closing the control inhibit, the Controller can be adjusted to the desired output voltage by using the set point potentiometer.



Sequences of functions and adjustment with reversal of rotation

On the first adjustment the potentiometers **P3** and **P4** (time delay until the switching over) should be set on right end-stop. (Max. time delay).

The actually active direction of rotation will be displayed by the light-emitting diodes **H6** and **H7**.

Starting status - direction of rotation left / toggle switch in position X3-11

Control inhibit OPEN

Switch on the mains voltage

LED **H1** (mains ON) and LED **H7** (direction of rotation left) are lighting

Control inhibit CLOSE

The direction of rotation left is active (toggle switch in position X3-11)

Motor turns with d.o.r. left.

Control inhibit OPEN

Close toggle switch to X3-10

At the end of the internal time delay two internal load relays will change the direction of rotation.

LED **H7** goes off and LED **H6** lights

CLOSE control inhibit

Motor turns to the other direction

OPEN control inhibit

Close toggle switch to X3-11

At the end of the internal time delay two internal load relays will change the direction of rotation.

LED **H6** goes off and LED **H7** lights

Adjustment of the Potentiometer P3 and P4 (switch-over time delay)

Should the drive after a performed internal reversing switch-over not come to a standstill, then, after closing the control inhibit, the drive will first be slowed down in the actually active direction before it can be accelerated in the new direction of rotation.

If a slowing down of the drive is not desired then one has to extend the switch-over time delay with the aid of the potentiometers **P3** and **P4**.

Note:

Both potentiometers should be adjusted symmetrically in order to obtain the same switch-over times for both directions of rotation.