

Operating and adjustment instruction

Controller M3301



Controller M3301

List of contents Controller M3301

	Page
List of contents Controller M3301.....	2
Important Safety Instructions.....	3
1. Product description of Controller M3301	4
2. Design Controller M3301	4
3. Connection Controller M3301	5
4. Function specification of Controller M3301	6
4.1 Reference input	6
4.2 Setting maximum moment	6
4.3 Setting minimum moment	6
4.4 Additional input	6
4.5 Quick stop.....	6
4.6 Thermal protection.....	7
4.7 Control inhibit.....	7
4.8 Remanence compensation	7
5. Putting into operation.....	8
5.1 Preparatory works.....	8
5.2 Adjustment maximum moment	8
5.3 Adjustment minimum moment	8
5.4 Activating remanence compensation	8
6. Summaries.....	9
6.1 Terminals.....	9
6.2 Potentiometer, LED	9

Anhang:

- I.) Data sheet: 4.1530
- II) Wiring diagram: 4.1530



Important Safety Instructions

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 0100543... or IEC 60364-5 543...).

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 be not installed.

Its use is only permitted within the limits shown and started 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 device or the false combination with peripheral components.

A device- independent power shutdown must be guaranteed.

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

For reference and actual signals you have to use shielded cable.

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

In this devices are used components which are sensitive to electrostatics discharges.

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

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.

This manual was prepared according tot he 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 of Controller M3301

The Controller M3301 is used as constant current controller for magnetic powder-brake/ -clutch. Magnetic powder brakes/ clutches being supplied by the Controller M3301 do not show any torque change caused by heating. Due to the Constant current control, the output current is widely independent from the load Resistance.

2. Design Controller M3301

Structure of the device:

Plastic case IP20, 45mm width for DIN mounting rail, Net potential-free.

Technical Data:

- Output current max. 1 A
- Output tension max. 24 VDC
- Voltage supply **24 V DC, 1,3A**
- Control inhibit (RSP)
- Setpoint voltage 0...+10 VDC
- Setpoint integrator + / - adjustable
- Add-on Setpoint 0...+10 VDC
- min./ max moment current limit adjustable
- connection for a external ammeter
- Quick-stop function
- Remanence compensation able to be activated
- Thermal link via external Sensor
- Potential-free thermal relay contact (NC/NO)
- LED- display On/Off, control inhibit, quick- stop und thermal link

Option:

PID-controller Z4 to realise a closed loop control system for tension-/ pressure-/ dancer regulation.



3. Connection Controller M3301

The Controller M3301 must be for connected to DC- voltage 24 VDC!!!

Connection:

0VDC	Terminal 1 or 2
+24VDC	Terminal 3 or 4

The device can operate with an external isolation transformer,
with following data:

input tension 230 VAC 50/60 Hz,

output tension 24VDC, performance min. 1,3A

The brake/ clutch is connected via the terminals 7 und 8.

The cable should have a minimum cross-section of 1.5 mm² .

Terminal 5 und 6 are provided for an external ammeter.

In case of no ammeter please use a jumper.

The reference potentiometer will be connected between terminal 11 (+10 V DC), and
terminal 13 (0V/ GND). The slider is connected to terminal 12 (setpoint input -> slider)
Optionally use terminal 12 for an external reference value input.

Important: Ground of external signals is connected with terminal 13 (GND)

The control inhibit is connected via terminal 15 and 11 (+10VDC) or 4 (+24VDC)

The connection of the quick stop function is made via terminal 16 and 11 (+10VDC) or
4 (+24VDC).

The temperature sensor, if necessary, is connected via terminal 21 and one of the
terminal at the brake or clutch. For connection to external controls of over
temperature, a potential-free relay contact (changeover contact) is available
(terminal 22, 23, 24).

Parallel to the main reference value an additional reference value may be fed via
terminal 14. It works in a transfer circuit (highest value is true).Function

Setting effect via Potentiometer **P2**

Reference point 0V at terminal 13 (GND).



4. Function specification of Controller M3301

4.1 Reference input

The reference input at terminal 12 serves to drive the current source of the Controller M3301. This supplies a max. Output current of 2A at a maximum reference value of 10 VDC.

4.2 Setting maximum moment

The maximum moment of the brake/ clutch at a set point value of 10 V can be adjusted via potentiometer **P1**. Maximum current is 1 A.

4.3 Setting minimum moment

The minimum moment of the brake/ clutch is a setpoint value of 0 V can be adjusted via potentiometer **P3**.

The adjusted range is 0...20% of max. Moment

If remanence compensation is activated the minimum moment must be = 0.
(potentiometer **P3** on left limit)

4.4 Additional input

The device has an additional input at terminal 14.

The influence of the additional reference value can be adjusted with the help of potentiometer **P2** and acts on the current via a transfer circuit.

4.5 Quick stop

The Controller M3301 have a quick stop function (connection 10...24VDC on terminal 16). If this function activated, the minimum Moment – adjusted via potentiometer **P1** – will be reached immediately.

The status of quick stop function will be shown via red LED „STP“ on the Front panel.

Quick stop active – LED lit

Quick stop inactive – LED off

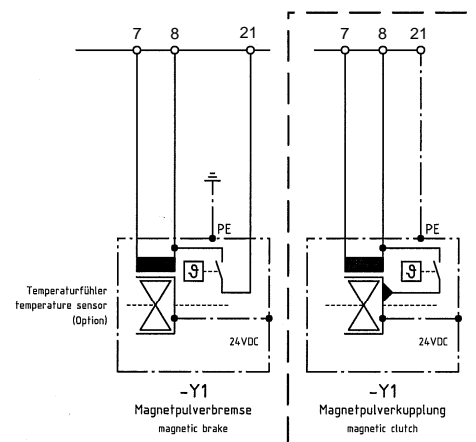
4.6 Thermal protection

The Controller M3301 is equipped with an integrated temperature breaker for the connected brake/clutch. The temperature is captured by a sensor located at the brake/ clutch (the sensor is separate order). If the sensor is realizing an over temperature M3301 is locked at once.

The activation of the thermal protection will be shown via red LED „Temp“ on the Front panel. After cooling down the brake/ clutch the device is ready for operation again.

IMPORTANT ! By connecting of the magnetic particle- **clutch** the supply and set point voltage must be ground isolated ! With magnetic particle **clutch** one connection of the temperature sensor is connected on the coil, the other directly to the Housing of the clutch. The Electric circuit runs via the Housing and the machine components when the thermal protection is tripped. Therefore the Housing must be connected electrical conductive in a suitable way with terminal 21 via the mechanical- machine Components to get the function.

With magnetic **brake** one connection of the temperature sensor is connected with the coil, the other directly to terminal 21
 Recommendation: use 4-wire Cable.



4.7 Control inhibit

The control inhibit will be activated on terminal 15 (+10...24VDC = active) and locks the current flow by the connected consumer. The status of the control inhibit will be shown via the red LED „RSP“ on the Front panel.

Control inhibit active – LED be lit
 Control inhibit inactive– LED go out

4.8 Remanence compensation

The Controller M3301 is fit with a remanence compensation. (Activation see Pt.5.4) Because of magnetizing the iron core a little magnetism is remaining, also if the coil is not energized (= remanence magnetism). This permanent magnetism has the same effect as mechanical friction.

If the remanence compensation is activated the minimum moment must be = 0 (Potentiometer **P3** on left limit).



5. Putting into operation

5.1 Preparatory works

Before switching on the supply voltage, all connections have to be checked for a correct terminal assignment according to the terminal diagram.

The supply voltage is switched on.

The yellow LED „On“ on the Front plate must be lit. If not, then you have to check the supply voltage as well as the connected periphery as to short circuits or interruptions.

5.2 Adjustment maximum moment

The maximal admissible current of the respective brake/ clutch can be seen from

The data sheet and has to be adjusted at the max. reference value with the potentiometer **P1**. For that there can be used the measuring device integrated in the front panel or an ampere meter put in series to the brake/ clutch.

(e.g. make use of terminal 5 and 6).

5.3 Adjustment minimum moment

This setting is made at a reference value = 0 V.

In some cases it may be of disadvantage, if the moment of the brake/ clutch reached the value 0 (example: control applications).

In this case the minimal current can be adjusted by means of the potentiometer **P3**. The maximal value is 20 % of max. current.

5.4 Activating remanence compensation

The remanence compensation is deactivated when delivered.

The activating has to be executed by the 4- times switch S1 on the underside.

Switch	Function
S1.1	6 mA
S1.2	12 mA
S1.3	50 mA
S1.4	Aktivating compensation

note: If this function is activated the minimum moment must be = 0
(Potentiometer **P3** on left limit).

6. Summaries

6.1 Terminals

Terminal	Function
1	Voltage supply (-) 0VDC (GND)
2	Voltage supply (-) 0VDC (GND)
3	Voltage supply (+) 24VDC
4	Voltage supply (+) 24VDC
5	Connection (-) Ammeter 0...1A
6	Connection (+) Ammeter 0...1A
7	Connection (+) for magnetic particle brake/ clutch
8	Connection (-) for magnetic particle brake/ clutch
11	Output power supply unit +10VDC
12	Input reference value (0...+10VDC)
13	GND for electronic
14	input for 2 nd reference value (0...+10VDC)
15	Input for control inhibit (+10...24VDC)
16	Input for quick stop (+10...24VDC)
17	NC
18	NC
21	Input for thermal protection
22	Relay output Thermal protection/Supply control NO
23	Relay output Thermal protection/Supply control NC)
24	Relay output Thermal protection/Supply control COM)

*Note: Terminals 1 and 2 also 3 and 4 for voltage supply are linked internal.
 Connection at both sides is possible.*

6.2 Potentiometer, LED

LED		Potentiometer	
Control inhibit	Red	P1	max. moment
On/Off	Yellow	P2	additional input
Quick stop	Red	P3	min. moment
Thermal-protection	Red		