

Quick Installation Guide

Putting into operation

- ☐ Compare the Nameplate of the Inverter with the following data
 - Main voltage
 - Motor rated current. Inverter rated current greater / equal Motor rated current.
 - Command voltage.
- ☐ Check the Break resistor: Compare Power and Resistance Value! (Refer Tabelle 6) / Nameplate of the Inverter.
- ✗ For Wiring issues refer to the Main- and Encoder connection diagram.

NOTE: Pay attention on different Encoder Types! For Encoders with 9- pol- SUB- D Connector different Coding cards are necessary (HG90THY or ET2R). Specify the Type of Encoderconnection within your order.

- ✗ The ambience temprature of the cabinet must not be higher than 45°C. Pay attention on the power loss of the Inverter. Make sure that cooling is sufficient.
- ✗ If the Inverter is mounted outside the cabinet make sure that the control cable is shielded.
- ✗ Following cables have to be shielded:
Motor supply, Breaking resistor cable, Encoder and Motortemperature sensor cable. Shielding: copper or tin-plated braid; both sides with good PE connection.
- ✗ Always equip inductive control elements (e.g. Main contactor, Motorbreak) with an EMC Filter.
- ✗ Fusing: Use low voltage HRC fuses as Mains protection. The maximum current is the double of the inverter rated current.
- ✗ Motor protection: If the Motor has no Thermistor connect terminal 19/20.
- ✗ Main Contactor: Use terminal 7/8/9 to control the Main Contactor. Never switch on main contactor together with main switch!



ATTENTION: Complete destruction of the Inverter is possible, if main contactor is activated before the electronic board is switched to the mains! First the main voltage has to be supplied (terminal L1,L2) to the controller board.



DANGER: High voltages dangerous to life! Through the buffering of the intermediate circuit capacitors some componets are still under high voltage for at least five minutes even after the main power supply has been switched off. The front cover must be folded in and fastend by screws during and after starting up the controller and when it is in operation!

SPEED	SPEED CURVE	START / STOP	DRIVE	INTERFACE	OPERATION PARAMETER	CONTROL PARAMETER
SPEED adjustment speed Vn 0010,0rpm 0,014m/s	SPEED CURVE acceleration 1,00m/s^2	START / STOP start retardation 0250ms	DRIVE feedbacksystem async. open-loop	INTERFACE relay V03 threshold:0,30m/s	OPERATION PARAMETER password: -off-	CONTROL PARAMETER attenuation contr. 000%
SPEED inspection speed Vi 0250,0rpm 0,353m/s	SPEED CURVE jerk-acceleration 1,00m/s^3	START / STOP braking distance Vi>0 010mm	DRIVE feedbacksystem pulses pr:02500	INTERFACE relay V08 threshold:0,80m/s	OPERATION PARAMETER date / time 01.01.2002 07:00:00	CONTROL PARAMETER attenuation start 000%
SPEED run-in speed V1 0100,0rpm 0,141m/s	SPEED CURVE deceleration 1,00m/s^2	START / STOP direct run-in - off -	DRIVE feedbacksystem puls input:A-B	INTERFACE programm.-relay threshold:V<Vx	OPERATION PARAMETER softwareversion Rev.S1.06 DSP:12 MICOVERF2000 - xxA	CONTROL PARAMETER attenuation accel. 000%
SPEED interim speed V2 0500,0rpm 0,707m/s	SPEED CURVE jerk-deceleration 1,00m/s^3		DRIVE rotation field -right-	INTERFACE programm.-relay threshold:1,00m/s	OPERATION PARAMETER display-language -english-	CONTROL PARAMETER attenuation travel 000%
SPEED final speed V3 0800,0rpm 1,131m/s	SPEED CURVE braking distance V2 optimize -off-	START / STOP torque-compensat. 025%	DRIVE motor name-plate nom. speed:1450rpm	INTERFACE Lift-Bus DCP3		CONTROL PARAMETER attenuation decel. 000%
SPEED final speed V4 1340,0rpm 1,895m/s	SPEED CURVE braking distance V3 optimize -off-	START / STOP slip-compensat. 010%	DRIVE motor name-plate nom. freq.:50,0Hz			
	SPEED CURVE braking distance V4 optimize -off-		DRIVE motor name-plate nom. current:038,0A			
			DRIVE motor name-plate cosphi:0,83			
			DRIVE winch transmission:1/22,5			
			DRIVE winch drive wheel:500mm			
			DRIVE winch suspension:1/1			

MENU STRUCTURE asynchron - Motor



***DANGER:** It must be ensured that the elevator cannot be used by persons before and during start and until it has been certified by the appropriate authorities! If necessary, barriers and warning signs must be provided on each floor. Moreover, under all circumstances the external door control system must be switched off through the elevator control system.*

Entry of main data

- You have to know about the Display and Menu structure! If you have Questions about that, please read Chapter 5 of the Main Manual.
- ✎ When the controller is switched on (eg. Connected it to the mains power supply), it runs a selvetest for a few seconds. After that the Display shows the main menu with the internal date and time.



***CAUTION:** The drive and the controller can be damaged through false initial settings! You must proceed and go through the following setting steps before the first run.*

- ✖ Go to DRIVE in main menu
- ✖ Enter the Encoder Increments per Revolution (Encoder Nameplate)
- ✖ Enter the Motor nominal speed from the Motor Nameplate. Be sure to read the value for the nominal speed (e.g. 1,450rpm), and not the synchronous speed (e.g. 1,500rpm)
- ✖ Nominal Frequency: Motor Nameplate.
- ✖ Nominal Current: Motor Nameplate.
- ✖ CosPhi: Motor Nameplate.
- ✖ Transmission: Gear Nameplate.
- ✖ Drive Wheel: read or measure the diameter of the Drive Wheel.
- ✖ Enter the Suspension of the Lift.
- ✖ Enter the Inspection speed.

Leave all other parameters unchanged for now.

Inspection run

- ✖ Check the connection between control system and controller: now start a run with Vi
- Check the direction of travel! Wrong direction: Change the rotation field from left to right in the DRIVE menu.
- ✖ If the error "WRONG DIRECTION" occurs: Change the puls input from A-B to B-A in the DRIVE menu.

Normal run start-up

- ✘ Adjustment of final Speed V4: The final speed should be near the rated speed of the motor. (e.g.: 1440rpm - 1,6m/s).
- ✘ Check the run in speed: The drive unit should run for a minimum of one or two seconds with the V1 speed (check on the display). If not, check the retardation path values. Increase DECELERATION in the SPEED CURVE main menu.

If the red LED turns on during any travel situation, the following values have to be reduced dependend on the travel situation: final speed (If the red LED turns on at high speed travel), Acceleration (If the red LED turns on at acceleration) or Deceleration (If the red LED turns on at deceleration). Possibly the shaft switches have to be set with a greater distance!

Calibration run

The following measuring run serves to determin the breaking path and is to be carried out at the final speed V4. Or respectively V2 or V3. Check the connection between control system and MICOVERT 2000!

- ✘ Menu SPEED CURVE: select the MEASURE setting in the BREAKING DISTANCE-V4 Menu.
- ✘ Carry out a run UP or DOWN at final speed.
- ✘ Repeat the previous steps for the interim speeds V2 and V3 if you need these.
- ✘ After succesfull competition of the Measure runs you can reduce the DECELERATION and JERK-DECELERATION until the display shows "BREAKING DISTANCE Vx" in the last line. Recommended values: 0.6 to 1.2 m/s² or m/s³.

Setting the stopping accuracy

Mainmenu: START / STOP – Breaking distance V1>0. Enter the distance between the levelling switch and the Stopp position in mm.

- ☐ If the cabin stops to late or to soon, change the Breaking distance.
- ☐ If you can feel a jerk while stopping: Change the run in speed V1.

NOTE: Always run into the same stopping position!

Now check the breaking path for each floor level and direction.

Checking the breaking path

- ✖ Now check the breaking path for each floor level and direction.
- ✎ When doing this note the display in the COMMANDS / RELAYS Menu. The following messages must appear one after the other:

MAG	Magnetization of the Motor
0>V4	Acceleration to final speed
V4	Constant speed
V4>1	Deceleration from V4 to run-in speed V1

V1	<i>run in speed for about 0.3 to 1 second!</i>
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V1>0	Final deceleration to speed 0
STOP	Hold of the drive

<i>NOTE: If the period of the run in speed is different for different floors, then the position of the deceleration switch must be corrected.</i>

Checking the stopping accuracy

Now check the stopping accuracy on all floors.

- ✖ Run into all floors both UP and DOWN.
- ☐ Check the stopping accuracy and if necessary correct the levelling switch to adjust the stopping accuracy.

Starting behaviour

- ☐ Check whether the drive starts up with brake on.
- ✖ If so, increase the RETARDATION in the START/STOP menu (value in milliseconds) to avoid start up with brake applied.

Inspection run

Finally to conclude the setting of the controller carry out runs with different loads to check whether optimal comfort and driving capacity are given.

In this respect particular attention is to be paid to the acceleration and deceleration behaviour measured on travel sensations.

Cabin jerking at start

- ☐ Mechanic Break opens with delay: START / STOP – increase the “Start retardation”.
- ☐ Drive turn backwards: CONTROLLER PARAMETER – decrease attenuation start.

Cabin jerking at stop

- ☐ Decrease RUN IN SPEED - V1.

For diagnostic and adjustment error purpose read chapter 7 of the main manual!

NOTE: As soon as the position of the shaft switches has been altered a new measuring run must be carried out to enable the controller to note the altered well data.

Rope vibration

Noticable vibrations of the cabin can be eliminated, by increasing the attenuation in the CONTROLLER PARAMETER Main menu.

The attenuations are separated in these parts:

- ✗ Attenuation Controller: takes effect over the whole travel distance.
- ✗ Attenuation Start: only takes effect during start.
- ✗ Attenuation Acceleration: only takes effect during acceleration.
- ✗ Attenuation Travel: only takes effect during constant speed.
- ✗ Attenuation Deceleration: only takes effect during deceleration.

Adjustment of V2 and V3

Now the speeds V2 and V3 can be set until the display shows BREAKING DISTANCE V2 or BREAKING DISTANCE V3, respectively.

Direct run in

- ☐ Set menu START / STOP – direct run in –on–

The direct run in function eliminates the run in time to zero. Therefore the following conditions must be achieved:

- ✗ The shaft switches must be positioned exactly the same for each floor within 1-2mm tolerance.
- ✗ A digital shaft copy system should be preferred.
- ✗ The cycle time in the PLC should be less than 5ms, i.e. the shaft switch information must be passed to the controller in between 5ms.

If these conditions are not fulfilled, the option direct run-in must not be activated, because the elevator will not stop exactly because of the inaccurate shaft information.

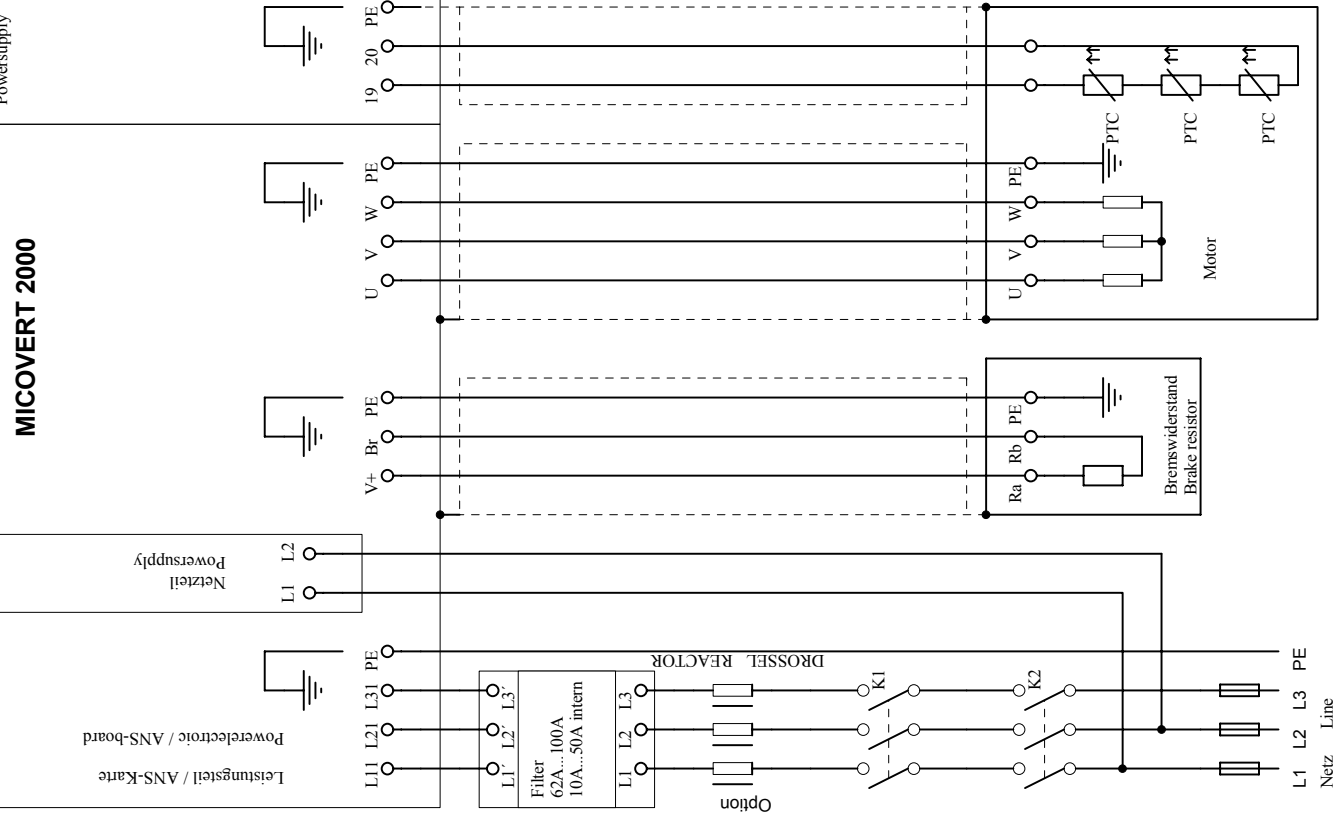
MICOVERT 2000

Leistungsteil / ANS-Karte
Powerelectronic / ANS-board

Netzteil
Powersupply

Netzteil
Powersupply

LCD-Karte
LCD-board



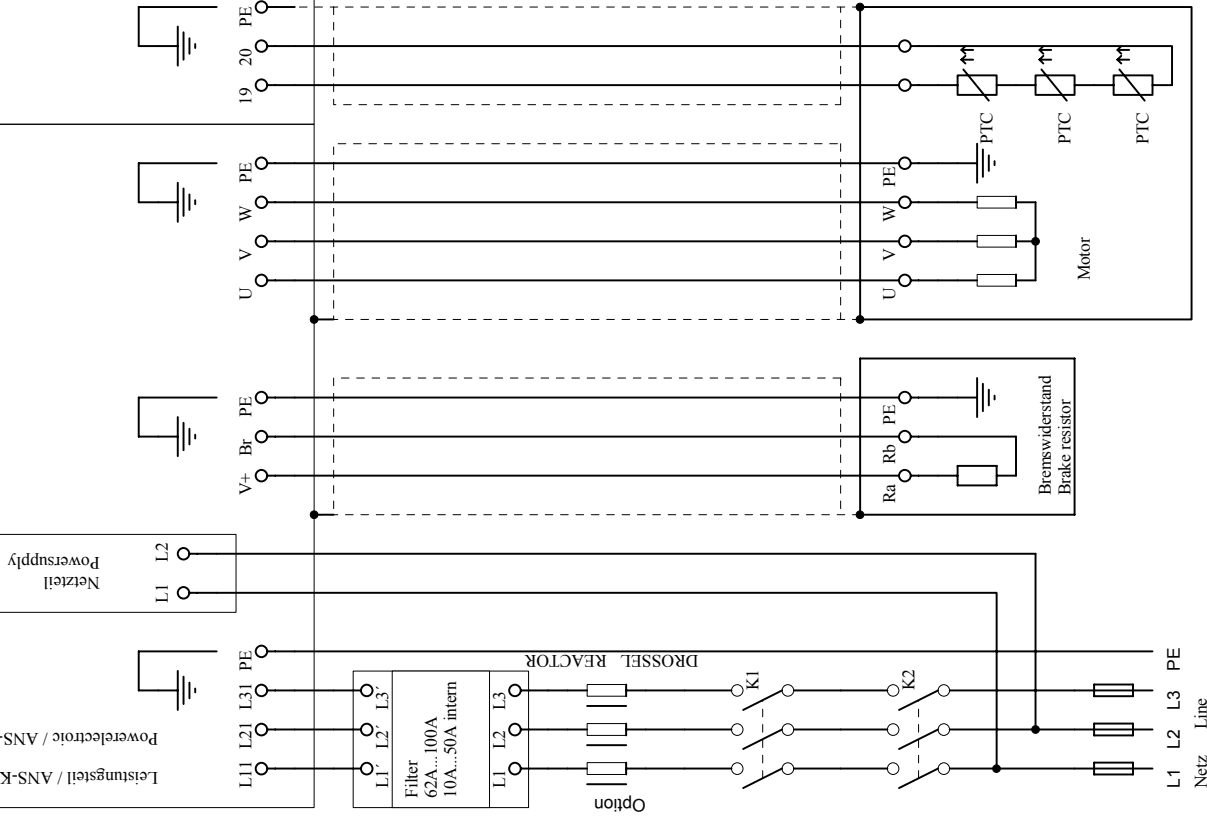
FAHRT
TRAVEL

HAUPTSCHÜTZ
MAIN CONTACTOR

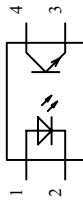
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$V < 0,3 m/s$

PROG.

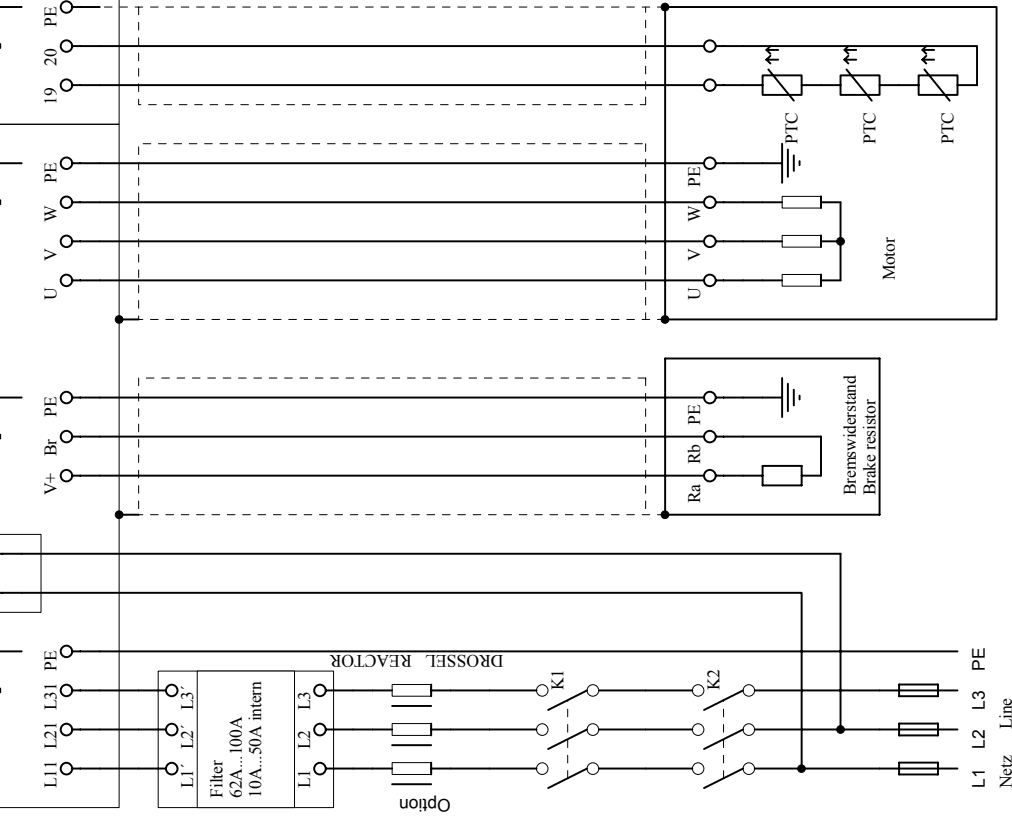


Kommandoeingänge potential free
Command inputs potential free



AB / DOWN

AUF / UP



Externe Kommando-Spannung
Extern command voltage

0V

+24V

PE

21

22

23

24

25

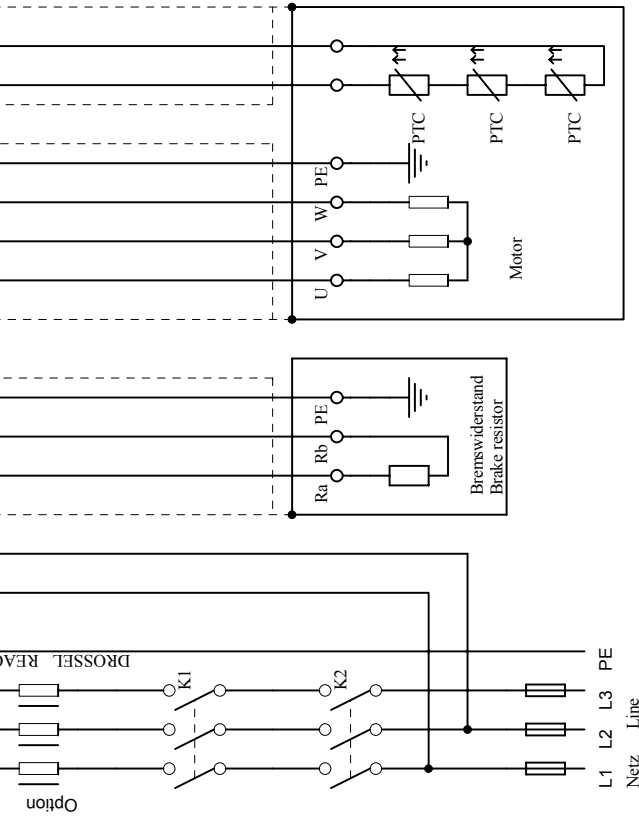
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MICOVERT 2000 Anschlussbild Connection diagram

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Size: A4

Number: 02

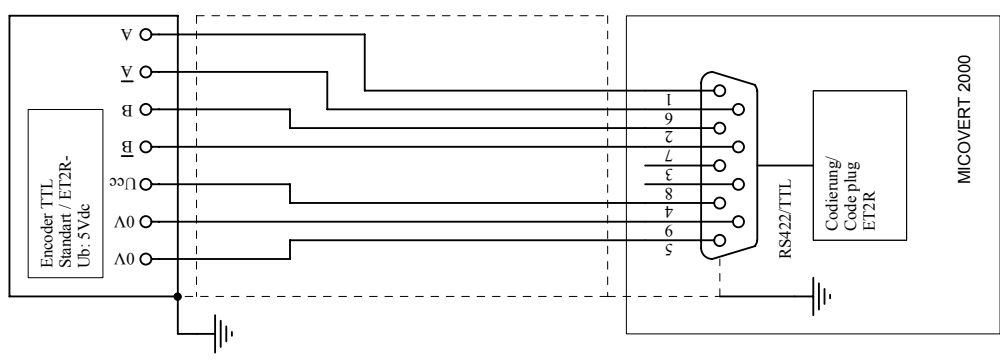
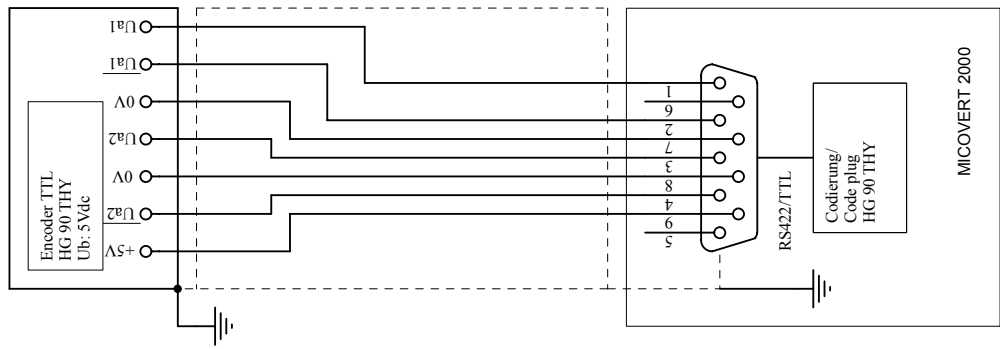
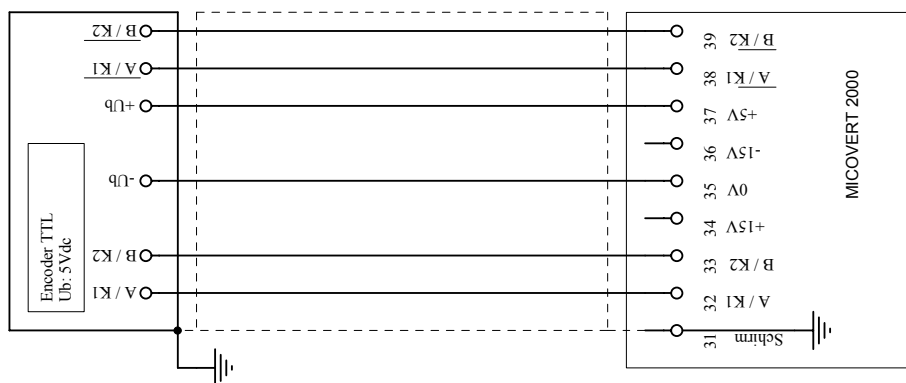
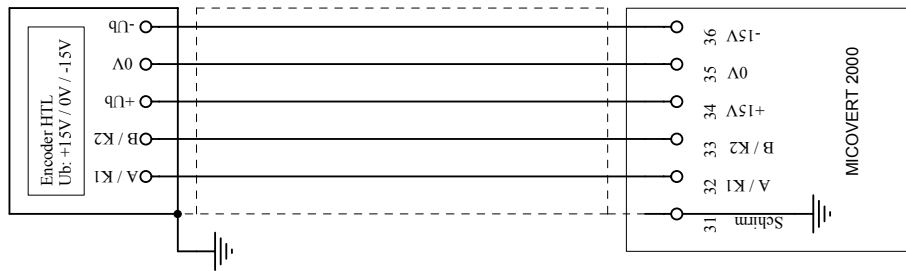
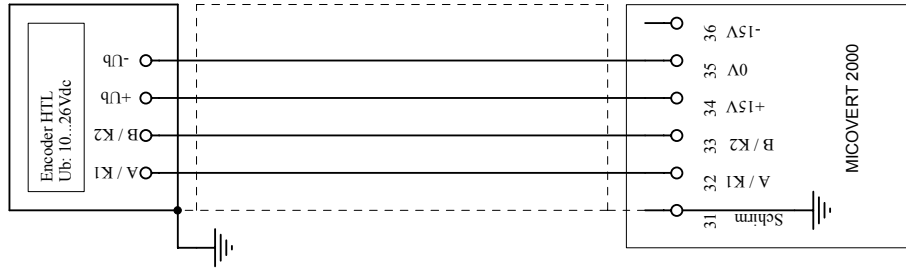
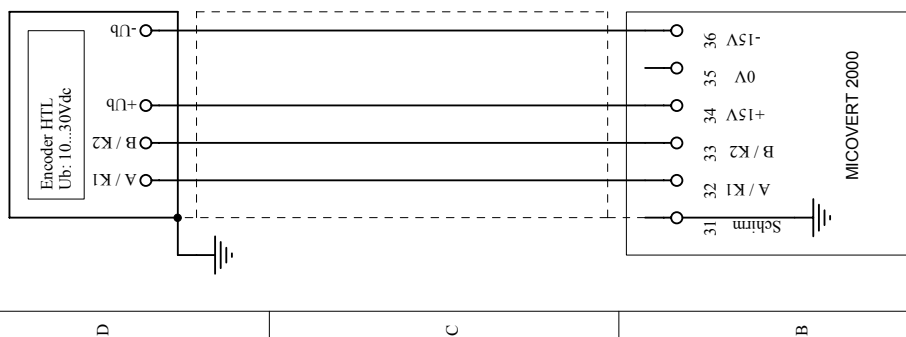
Revision: 02

Date: 19-Mar-2003

Sheet of: 4

File: I:\Entwicklung\Schaltpläne\Fu2000\Anfbrn By:

1 2 3 4 5 6



MICOVERT 2000 / 2001
Encoderanschluß
Encoderconnection

Title		Anschlussbild Encoder MICOVERT 2000	
Size	Number	Revision	
B		02	
Date:	20-Mar-2003	Sheet of	6
File:	I:\Entwicklung\Schaltpläne\Fu2000\02.dwt	Drawn By:	

Description of Faults

LED indicators

To the right of the display you will find one green and one red LED, which are used to provide important signals supplementary to information on the display.

GREEN LED: This LED is always on as long as there are no serious faults in the controller or in its vicinity. If a bus connection (like DCP) is used instead of the terminal, the green LED is blinking when a connection problem occurs.

RED LED: The red LED is on continuously during each fault message until no command signal is applied and until the fault has been eliminated. The red LED lights up briefly if the controller is operating in the voltage or current limit range.

! red LED ERROR lights up during travel ◆ overload !

Possibility A: during acceleration

※ SPEED CURVE main menu: Reduce ACCELERATION and JERK ACCELERATION!

Possibility B: during constant run with V4

☐ Mechanical brake not released, drive is blocked. Check mechanical brake.

☐ Check parameters in DRIVE main menu!

※ Main menu SPEED: reduce V4!

☐ Check parameters in DRIVE main menu!

Possibility C: during deceleration

※ Main menu SPEED CURVE: reduce DECELERATION and JERK DECELERATION!

☐ Check brake resistance! Type? Connections? Capacity?

☐ Command V1 is switched off too soon.

Display messages

This section describes the system messages that may appear on the controller's LC display.

Help is available in the case of irregular controller behaviour and for any problems in connection with critical lifts.

Faults are indicated by plain text fault messages in the first display line. The message will not disappear until the cause of the fault has been eliminated or the wrong setting has been changed, or until a new start is made, respectively.

**ERROR - 01
overcurrent -HW**

- ✘ Hardware current monitoring was activated.
- ☐ Check all parameters in the menu 'DRIVE'
- ☐ Motor blocked, brake not released
- ☐ Check the encoder connection (fig. 8,9). The cable shield must be connected on both ends.
- ☐ Motor nominal current must be less or equal controller nominal current (see motor and controller rating plate!).
- ☐ Check the star-delta connection of the motor
- ☐ Check for no short-circuit on output U, V, W
- ☐ Increase 'CONTROL. PARAMETER – attenuation controller'

**ERROR – 04
overcurrent -B**

- ✘ Hardware current monitoring of brake transistor was activated.
- ☐ Brake resistor is short-circuited.
- ☐ Brake resistor is too low-resistance.
- ☐ Earth fault in the cable to the brake resistor or in the brake resistor.

**ERROR – 05
overcurrent -U**

**ERROR – 06
overcurrent -V**

**ERROR – 07
overcurrent -W**

- ✘ Software current monitoring of the motor was activated.
- ☐ Check all parameters in the menu 'DRIVE'
- ☐ Motor blocked, brake not released
- ☐ Check the encoder connection (fig. 8,9). The cable shield must be connected on both ends.
- ☐ Motor nominal current must be less or equal controller nominal current (see motor and controller rating plate!).
- ☐ Check the star-delta connection of the motor
- ☐ Check for no short-circuit on output U, V, W
- ☐ Increase 'CONTROL. PARAMETER – attenuation controller'

**ERROR – 08
temperature -IGBT**

- ✘ The controller's power resistors or heat sink overheats.
- ☐ The ambient temperature in the control cabinet must not exceed 45°C!
- ☐ Check the controller current during empty run: Rated current of the controller may not be exceeded during final speed!

ERROR – 09 **temperature -recti.**

- ✖ Rectifier or heat sink of controller overheats.
- ☐ The ambient temperature of the control cabinet must not exceed 45°C!
- ☐ Check the controller current during empty run: Rated current of the controller may not be exceeded during final speed!

ERROR – 10 **Int.-overvoltage**

- ✖ Interim circuit voltage is too high:
- ☐ Compare mains voltage with controller rating plate. Voltages must be identical.
- ☐ Brake resistor is not connected or wrongly dimensioned (see Chapter 4.6.1).
Take a look at the converter plate.
- ☐ Decrease 'SPEED CURVE – deceleration' and
'SPEED CURVE – deceleration'

ERROR – 11 **Int.-undervoltage**

- ✖ Interim circuit voltage is too low:
- ☐ Safety circuit or mains contactor opens on travelling
- ☐ Compare mains voltage with controller rating plate. Voltages must be identical.
- ☐ Control system provides run command, but main contactor does not make.

ERROR – 12 **contactor-start**

- ✖ After applying a run command + release, the main contactor does not make.
- ☐ Check the wiring for activation of the main contactor: After closing the "main contactor" output relay of the controller, the main contactor needs to be activated.
- ☐ At least one phase of the main controller supply is missing (L11, L21, L31).

ERROR – 13 **contactor-travel**

- ✖ The main contactor drops out during the run or before termination of braking.

- ☐ On travel stop mains contactor must still have power for at least 0.5 sec.
- ☐ Check the wiring for activation of the main contactor: As long as the " main contactor " output relay of the controller is closed, the main contactor needs to be activated.
- ☐ At least one phase of the main controller supply is missing (L11, L21, L31).

ERROR – 14 **no release**

- ※ Release "Direction UP" and "Direction DOWN" has disappeared during run or before end of braking.
- ☐ Check the commands and release signals as per run diagram.
- ☐ Safety circuit has opened during run.
- ☐ Inspection run at a speed other than Vi.

ERROR – 15 **release UP+DOWN**

- ※ Release "Direction UP" and "Direction DOWN" are applied simultaneously.
- ☐ Check the commands and release signals as per run diagram.

ERROR – 16 **motor temperature**

- ※ Motor PTC thermistor was activated.
- ☐ Wrong PTC thermistor installed in the motor.
- ☐ Motor PTC thermistor is not properly connected to controller terminals 19, 20.
- ☐ If the motor PTC thermistor is external checked, then the controller terminals 19, 20 must be short circuit.
- ☐ Motor is really too hot!

ERROR – 17 **wrong direction**

- ※ Menu DRIVER/TACHO INPUT: Change from A-B to B-A.
- ☐ Check digital tacho and its connection cable.
- ☐ Check the mechanical link between the tacho-generator and the motor shaft.

ERROR – 18 **variance**

- ※ Motor speed cannot keep up with the set run curve.
Possibility A: Message while starting or during a run
- ☐ Compare the pulse number setting (DRIVE menu) with the tacho pulses and correct if necessary.
- ☐ Compare the motor data setting (DRIVE menu) with the motor rating plate and correct if necessary.
- ☐ Check encoder and encoder coupling!

❑ Motor rating is inadequate.

❑ Mains voltage is too low.

Possibility B: Message during deceleration.

❑ Check brake resistor (see Chapter 4.6).

※ Brake path too short (see Figure 11).

※ Main menu SPEED CURVE: Reduce JERK DECELERATION / DECELERATION.

Possibility C: Message during stop (during the length of the levelling flag)

❑ Main contactor or mechanical brake is switched off too soon. The mechanical brake must only be applied when lift is at standstill! Main contactor must remain made for approx. 0.5 seconds after standstill.

ERROR – 19 encoder failure

※ no pulses from the tacho

Possibility A: Motor does not start up.

❑ Mechanical brake is not released.

❑ Line between controller and motor is broken.

❑ Star point missing from motor winding.

Possibility B: Motor starts up but is switched off by the controller after a few seconds.

❑ No tacho pulses in at least one tacho input pulse line.

❑ Check tacho-generator!

❑ Check tacho-generator connections!

❑ Check the tacho-generator coupling!

ERROR – 20 Int. precharge

※ Internal intermediate circuit voltage is too low approx. 5 seconds after mains voltage is switched on.

❑ Mains voltage is too low.

❑ Controller is designed for higher mains voltage: Compare controller rating plate with mains voltage.

❑ Earth fault on brake resistor or brake resistor line.

ERROR - 21 release direction

※ Release "Direction UP" and "Direction DOWN" change during run.

❑ Check the commands and release signals as per run diagram.

ERROR – 22 earth connection

※ One or more motor phase has connection to earth.

❑ Check motor and motor wires.

**ERROR – 23
INTERNAL driver**

- ※ The voltages for the IGBT's are down.
- ☐ Contact Micotrol service.

**ERROR – 24
EEPROM check**

- ※ The checksum in the EEPROM is wrong.
- ☐ Look at any value and press ENTER two times.
- ☐ Separate the regulator for 10sec from mains and then restart.
- ☐ Contact Micotrol service.

**ERROR – 25
repeated error**

- ※ A certain error has three times in follow arisen.
(the attitude which errors are reacted can only in work with MICOTROL be made and must thus when ordering be indicated. If necessary contact service!)
- ☐ Separate the regulator for 10sec from mains and then restart.
- ☐ Contact Micotrol service.

Unexpected running characteristics

Drive starts up with a jolt

Possibility A: On an empty up run

- ✘ Motor must not start up against an applied brake! If necessary, extend the starting delay (START/STOP menu).

Possibility B: On an empty down run.

- ☐ In the case of a 2:1 suspension with rollers on the side of the cabin, make sure that the cabin guide system is working properly otherwise the cabin will be pulled at first on just one side upon start.
- ☐ The use of guide rolls is advisable for perfect starting at speeds higher than 1.6 m/s.

Cabin/drive vibrates while running in

- ✘ Increase ATT. DECEL. (CONTROLLER PARAMETERS menu) until you can no longer feel any vibrations in the cabin.

Jolting while stopping.

Possibility A: When passing the levelling switch.

- ☐ Reduce the BRAKING RAMP (SPEED CURVE menu), e.g. from 0.1m/s² to 0.05m/s². You must then adjust the stopping accuracy, however, with V1 (SPEED menu).

Possibility B: When at standstill.

- ☐ Main contactor drops out too soon (see description of FAULT SET/ACTUAL DIFFERENCE, 2nd possibility).
- ☐ Mechanical brake engages too soon.
- ☐ UP or DOWN command is switched off too soon. UP or DOWN must be retained for at least 0.5 seconds after standstill is reached.

Controller faults

If controller faults and disturbances cannot be eliminated, by changing the parameters and data entries, there is generally no chance of repairing the controller successfully on site. Customer repairs to the main board are not possible because they require special instrumentation, which is only available in our testing laboratory.

PLEASE NOTE: We draw express attention to the fact that repairs to the main board should only be carried out by our service technicians, as there is a risk of destroying expensive digital components. IGBT power semi-conductors are only to be replaced by MICOTROL!

Replacement of EPROMS

In certain special cases it may be necessary to replace the programmable memory component (EPROM) in consultation with MICOTROL. This might be necessary in special cases of application where use is made of modified software.

In these cases, proceed as follows:

- ✗ Disconnect the controller from mains.
- ✗ Remove the front panel.
- ✗ MICOTROL will let you know which EPROM is to be replaced. Carefully pull it up and out of the socket, preferably using the clamp-type tool designed specially for the purpose. First note which way the notch on the top of the component is pointing!
- ✗ Insert the replacement IC in the correct direction (notch). Work carefully so that all the legs slide into the socket without buckling.

Servicing and spare parts

Servicing

The MICOVERT series of controllers require no maintenance. The electronic components used display long-term stability and are subject to no wear. Servicing is confined, therefore, to checking the terminals regularly to ensure that they are done up tight and examining the relay contacts on the output relays for signs of arc erosion.

To prevent leakage current and flashover you should remove any dust which may collect on the chips and heat sinks. Pay special attention to the heat sink fins and the external fans where present.

Replacement parts

No repairs may be carried out to the main board on-site and none of its components may be replaced without risk of destroying the sensitive digital components. All work on the main board should be carried out at the factory in Alzenau, Germany. Replacement parts for defective components should be obtained only from MICOTROL. We guarantee that the components are suitable for the purposes and have been tested.

<i>PLEASE NOTE: Power semi-conductors may only be replaced by MICOTROL!</i>

For service purposes or questions you can reach us with the following phone numbers:

Telephone: +49 (0)6023 5056 **80**

Fax: +49 (0)6023 5056 **99**

e-mail: info@micotrol.de