

Technical specification

4-Q-motor control unit digital type DLR 24/xx - 466

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Technical data with reservation of technical changes.



1. Brief instruction DLR 24/xx - 466 with 19-pin spring clamp terminal

1. Select modes:
 - put jumper 1 on 1-2 for internal reference value (potentiometer 1) or on 2-3 for external reference.
 - put jumper 2 on 1-2 for reference value max. 5V (important for internal reference value) or on 2-3 for 10V target value input.
 - put jumper 3 on 1-2 for 12V motor or on 2-3 for 24V motor.
 - put DIP switch 1 and 2 ON for inverted enables (no need of connecting terminal 15, 16 und 18)
 - put DIP switch 3 to 8 Off

2. Turn potentiometer 2 (Imax) for current limitation to the right position.

3. Potentiometer 3 (IxR) compensation to left position.

4. Connection of the control wires see Connection plan, page 5.

5. Connect DC motor to terminals 3 and 4.

6. Connect power supply to terminal 1 Plus (ca. 10 – 36V DC), on terminal 2 GND.

7. Now turn on power supply.

8. LED green (power on) illuminates on the pcb.

9. With potentiometer 1 (n ref) the target value for motor speed can be adjust from 0 to 100%, if jumper 1 was put on 1-2.

10. Motor direction can be changed witch a voltage (5 – 36V DC) on terminal 19 (e.g. bridge from clamp 17 to 19)

2. General information

The digital, load-independent 4-Q motor speed controllers of the DLR 24 /xx-466 series are cost-effective compact devices with the dimensions of 140 x 125 x 52 mm for stepless speed control for any type of brushed DC motors in the low voltage range up to a maximum of 10 A motor power. The input voltage range is from 10 to 36V DC, this allows direct battery or on-board power supply. A DC power supply of the SNT 24/xx series can also be used. Stepless speed control can be realized either via an internal/external potentiometer or an external reference voltage 0 to 5V DC or 0 to 10V DC (via jumper 1 and 2 pre-selectable). The motor power can be steplessly limited using an internal potentiometer as overload protection. Customer-specific programming is possible as special function.

2.1. Technical features

- Power supply 10V DC – 36V DC (with inverse-polarity protection)
- High clock rate $f > 20$ kHz, this results in low-noise operation
- electric connection via spring clamp terminals
- high level of effectiveness by using Power mosfets
- Mounting: mounted with screws or on a 35 mm mounting rail

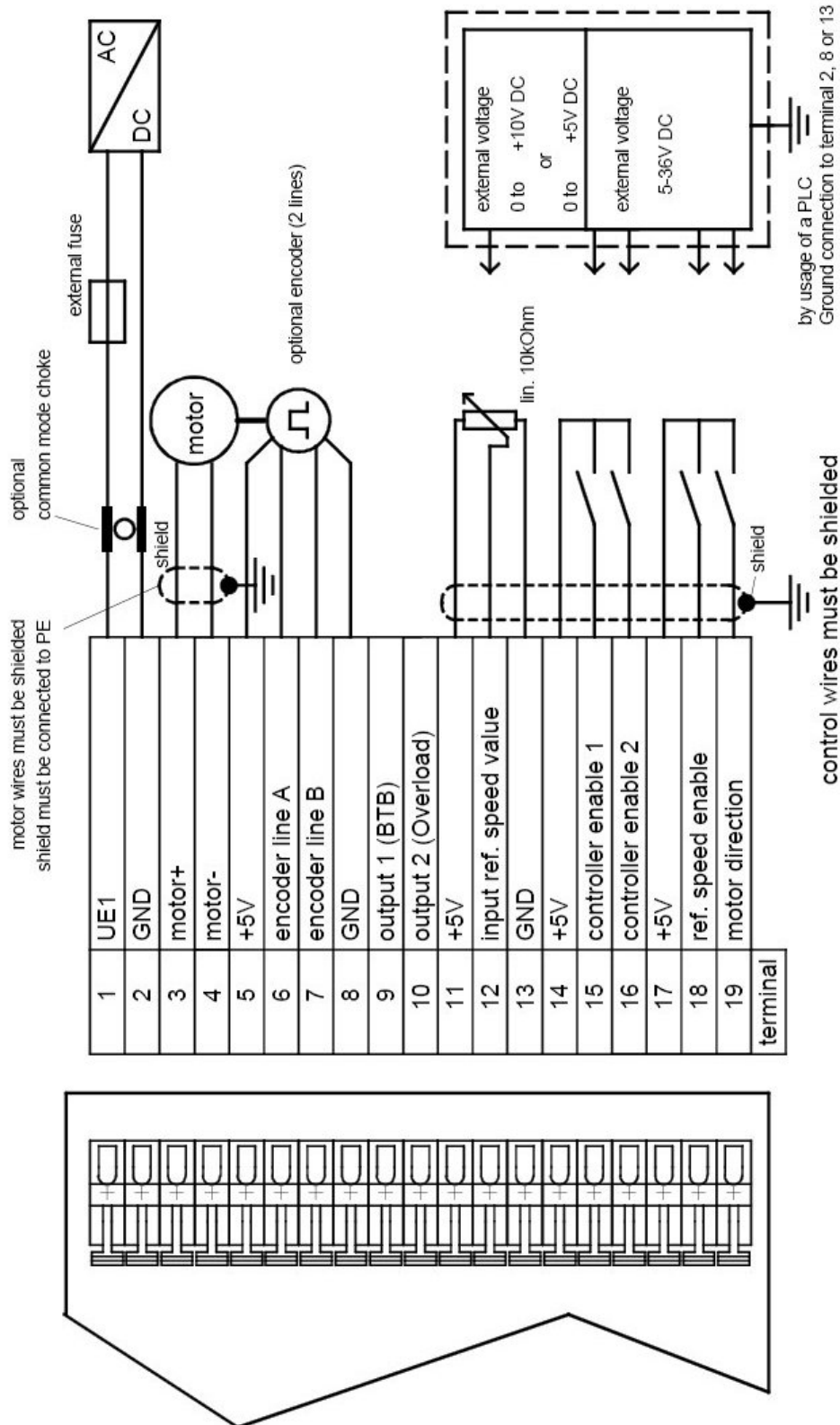
2.2. Accessories

- Suppressor diodes via supply voltage (e.g. at automotive applications) for high inductions peaks
- Ref. value potentiometer: 1 gear or 10 gears. (10kOhm)
- Power supply SNT 24/ 05:

Primary:	230 V / 50 Hz
Secondary:	24VDC / 5A
Dimensions:	L/W/H 100x65,5x125
- Power supply SNT 24/ 10:

Primary:	230 V / 50 Hz.
Secondary:	24VDC / 10A
Dimensions:	L/W/H 125,5x100x125

4.2 Connection plan



5. Setting parameters

- ref. Speed value:
- external via 0..10V DC interface or
 - external via 0..5V DC interface or
 - external 10kOhm potentiometer (see Connection plan) or
 - usage of the internal potentiometer 1 (n ref.)

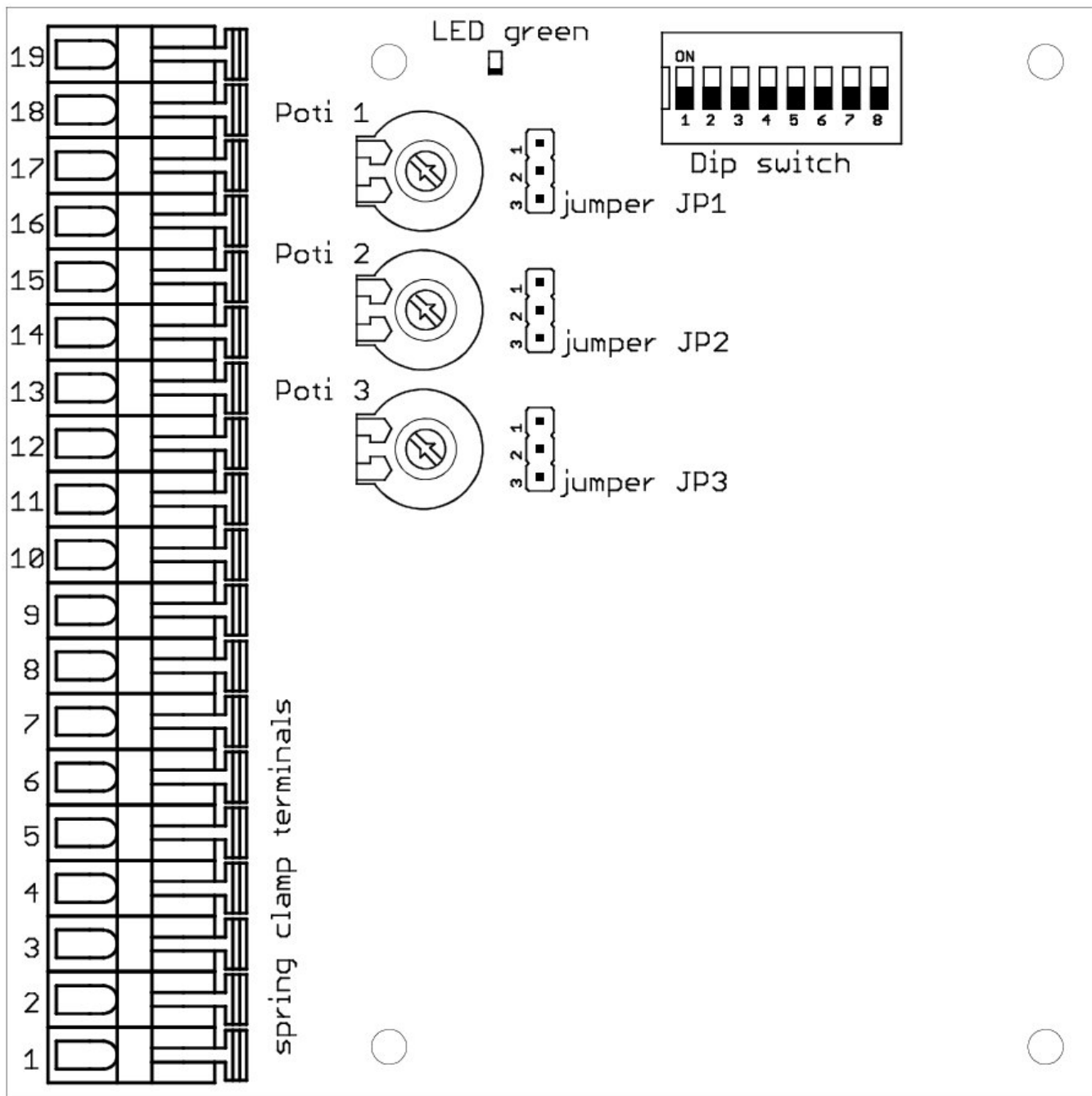
- Controller enable:
- for activation of the directions (see Connection plan)

- Motor voltage:
- limitable to max. 12V DC or 24V DC (see table, max. 90% of the power supply)

jumper	position 1-2	position 2-3
JP1	ref. Speed value intern	ref. speed value extern
JP2	ref. Speed value 0 to 5V DC	ref. speed value 0 to 10V DC
JP3	12V DC motor	24V DC motor

- Current limitation:
- overload protection of the motor or drive using adjustable current limitation potentiometer 2 (Imax)

- I x R compensation:
- speed feedback by EMF with IxR compensation. Pre-selection with potentiometer 3 (IxR)



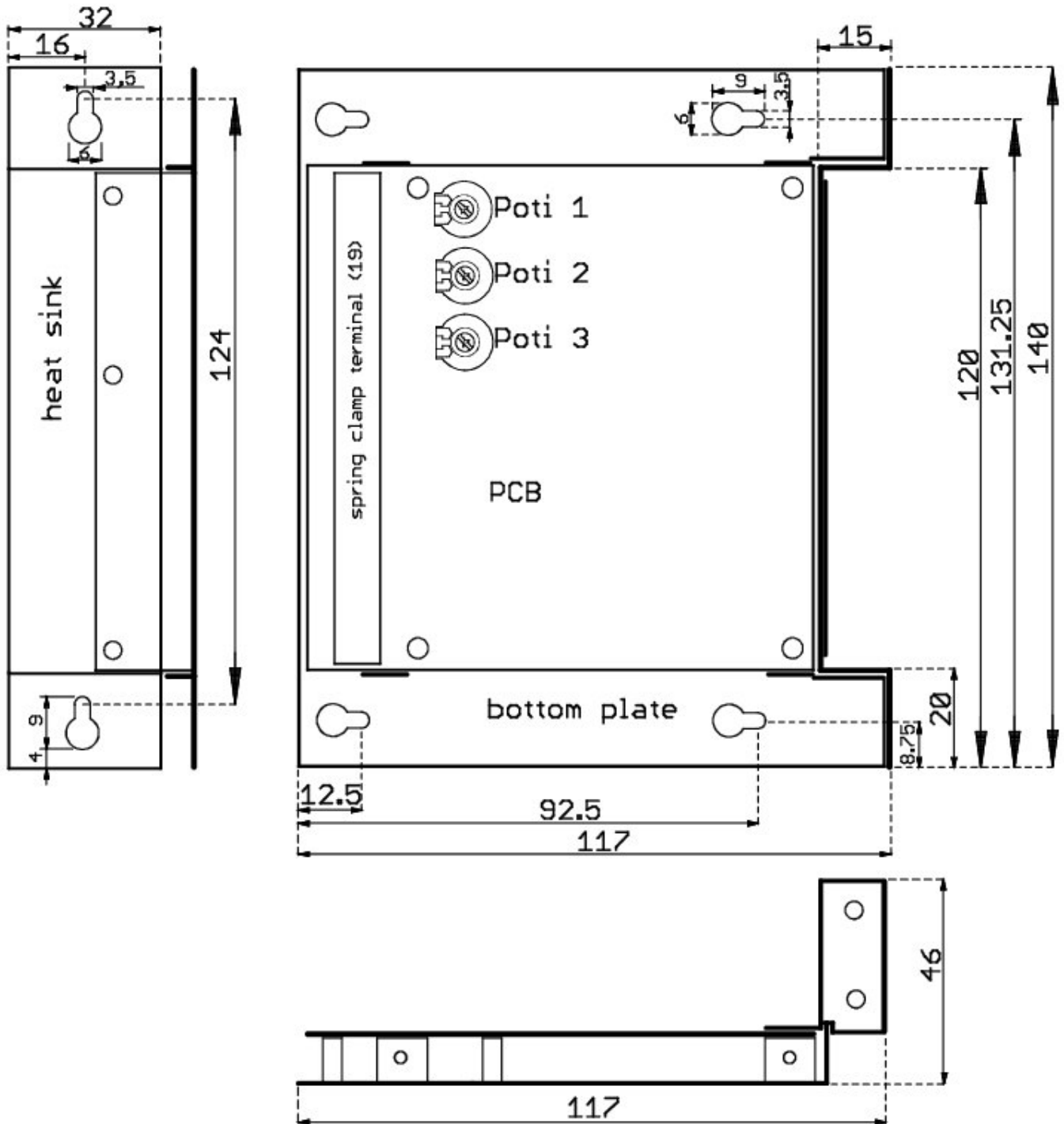
5.1. Overview DIP switch

Different modes are selectable by using the DIP-switch (mode changes works only, when the power supply is turned off and on).

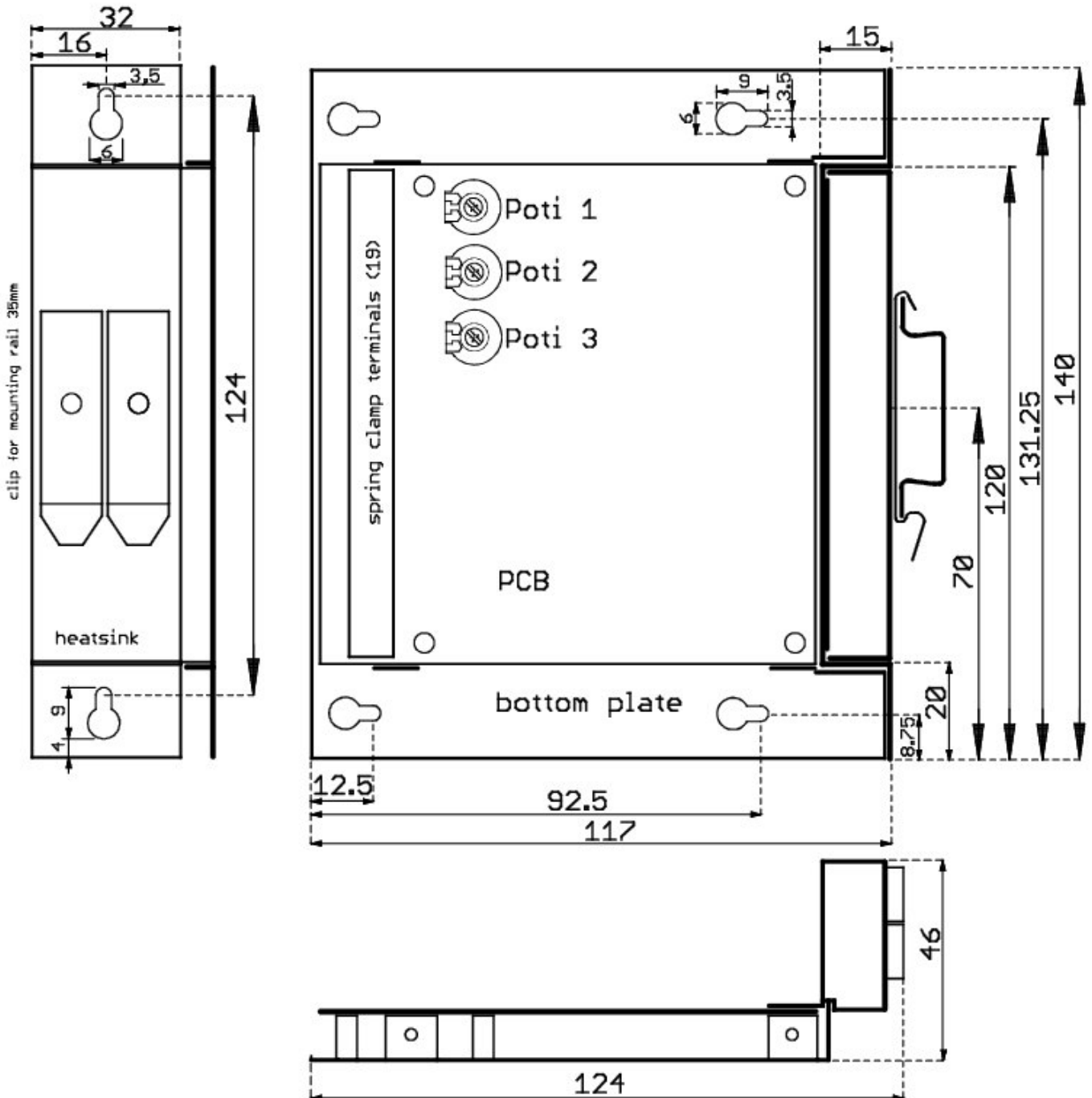
DIP 1	Off	Controller enable not inverted (terminals 15 and 16 must be connected, for working motor in the wanted direction)
DIP 1	ON	Controller enable inverted (terminals 15 and 16 must not be connected, for working motor in the wanted direction)
DIP 2	Off	ref. Speed enable not inverted (terminal 18 must be connected, for a working ref. Speed value)
DIP 2	ON	Ref. Speed enable inverted (terminal 18 must not be connected, for a working ref. Speed value)
DIP 3	Off	Ref. Speed Value 0 to 5V/10V means motor voltage: 0 to +12V/+24V (motor voltage)
DIP 3	ON	Ref. Speed value 0 to 5V/10V means motor voltage: -12V/-24V to +12V/+24V (half speed value -> motor voltage=0VDC)
DIP 4	Off	Ramp for motor voltage 1 sec., when DIP5 and DIP 6 are Off
DIP 4	ON	Ramp for motor voltage 2 sec., when DIP5 and DIP6 are Off
DIP 5	Off	Ramp for motor voltage 1 sec., when DIP4 and DIP6 are Off
DIP 5	ON	Ramp for motor voltage 3 sec., when DIP4 and DIP6 are Off
DIP 6	Off	Ramp for motor voltage 1 sec., when DIP4 and DIP5 are Off
DIP 6	ON	Ramp for motor voltage 5 sec., when DIP4 and DIP5 are Off
DIP 7	Off	No motor turn off after 3 sec. motor Overload (on current limit)
DIP 7	ON	Motor turn off after 3 sec. motor Overload (on current limit)
DIP 8	Off	No function
DIP 8	ON	No function

6. Scale drawings

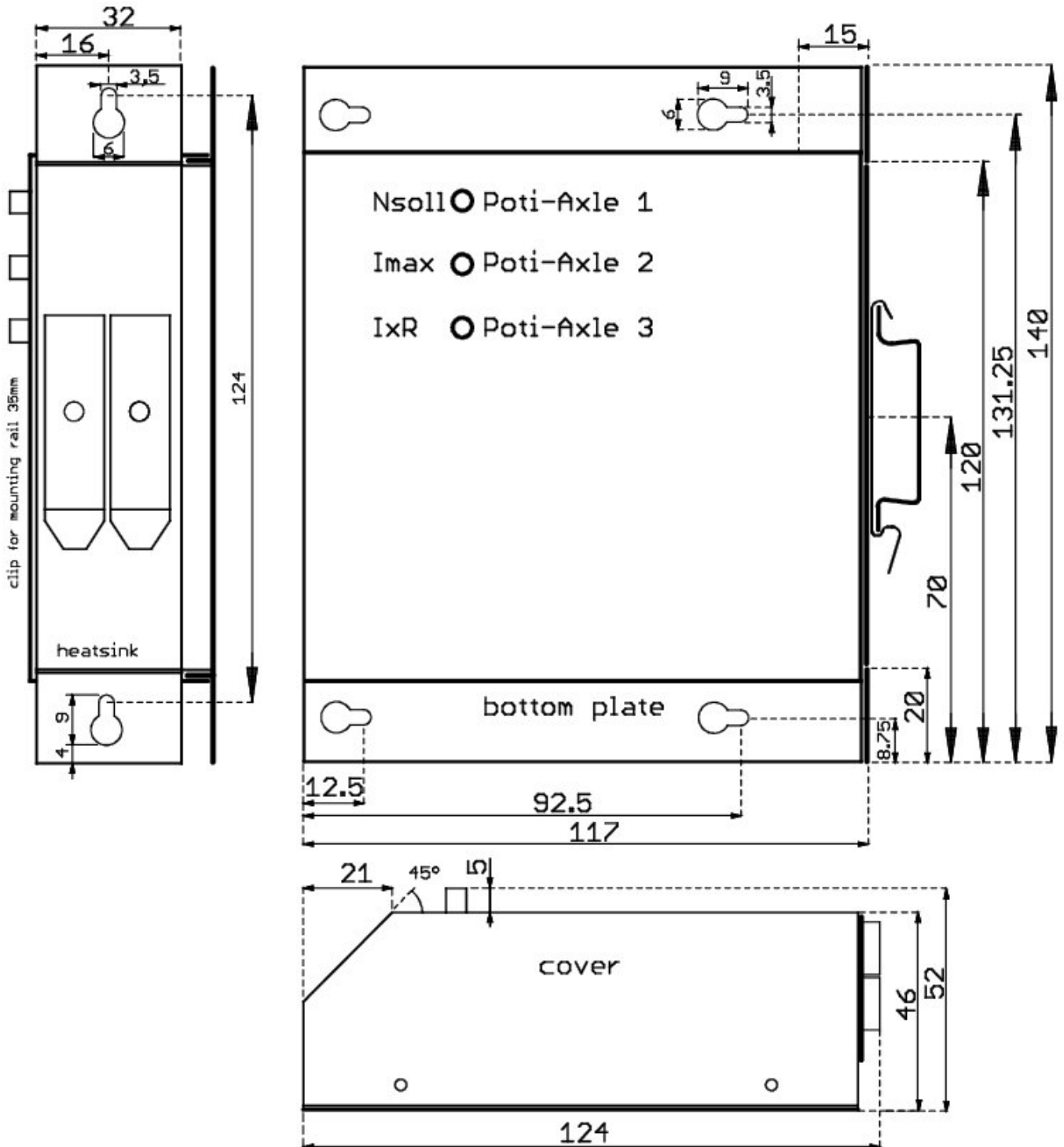
6.1. DLR 24/xx/P



6.2. DLR 24/xx/M



6.3. DLR 24/xx/G



7. Notes and recommendations on using EPH motor control cards

Notes and recommendations on the use of EPH motor control cards in electric drive systems in accordance with the respectively applicable EC machine directives 98/37/EG, EMC directive 2004/108/EG and low voltage directive 2006/95/EG

In its application the machine directive required the CE labelling of complete machines only.

In the sense of the user these components cannot be operated independently and are produced for further processing by industry, trade or components which are competent in EMC.

The components are only for intended usage. For this the staff must be competent in electrics and EMC to guarantee correct installation, start-up and maintenance.

EPH speed controllers are electrical devices of power electronics for the control of the energy flow (protection class IP 00). They are intended for use in machines for speed control of electric motors.

In order to comply with the low voltage directive 2006/95/EG for complete units, EPH Elektronik also provides cases with increased protection class (at least IP 20) as an alternative to the pcb-types.

The user must ensure that the devices and the associated components and systems are installed and connected in compliance with the local legal and technical regulations.

For Germany the regulation of VDE and the professional association apply. Regulations of the EMC and low voltage guidelines must also be observed.

Machines and systems must also be equipped with device-independent monitoring and safety installations. The user must ensure that after a device fails, in the event of external use, failure of the controlling and steering unit, etc. operation is moved to a safe mode.

The instruction manual must have been read and understood by specialist staff before installation and launch. We are happy to help with any queries in the event of any obscurity. Installation work may only be conducted by specialist electric staff taking into account the safety provisions.

Installation works may only be conducted in without power supply; protective devices and covers must be properly installed before use.

The devices are archived under their serial number with their examination details.

Please understand that we reserve the right to make changes to this manual, as the products are subject to constant improvement.

7.1. Delivery

On receipt or unpacking of the device immediately examine it for transport damage. In the event of damage, immediately contact the freight forwarder, initiate a detailed survey. This also applies if the packaging is not damaged.

7.2. Installation, launch and safety measures



ESD-protection / Installation instructions

**Attention during installation of the electronic board!
It must be warranted on your part that there is
sufficient ESD-protection.**

An power supply is required to supply the DLR24/xx - 466 controller device. If this mains adaptor is supplied with voltages >50V AC or 75 V DC, the following points must be observed:

The installation may be carried out by qualified specialist staff only. Local regulations on installing electric systems and accident prevention regulations must be observed.

The existing safety regulations must be applied to protect people and property (VDE, device safety directives, IEC etc.).

Protection: When activating the controller device/mains adaptor high starting currents can occur due to the loading process in the internal bus capacitor. Sufficient protection on the end of the mains input must be observed (e.g. power circuit breaker 16A C characteristics).

residual current: As heat losses against PE can occur due to EMC-related fault clearance modules, no residual current circuit breaker must be used in front of the controller device/mains adaptor.

protective earth: The power supply must not be operated without active earth connection which must comply with the local regulations.

Beware, danger of life!

Parts of the controller card are on the intermediate circuit voltage (up to 48V DC) and result in live voltage for about 5 minutes after deactivating the current.

Touching the terminals, lines and device parts can cause serious injury or death!

7.3. EMC measures

Ensure that the controller devices are suitable for use in the required EMC environment.

EPH Elektronik supplies special mains filters and bodies aligned with the respective controller which guarantee a best possible stability noise immunity, low interference emission, simple assembly and installation as well as the required electric safety.

EMC security is, however, only provided if, apart from an EMC-suitable housing and the recommended mains filter, a proper installation with shielded motor and control lines between the super ordinate control, controller and motor is adhered to.

The shield must be earthed on the biggest possible scale and using the shortest route. The shield must be laid on the housing using a respective metal fitting for housing executions.

- Remove the varnish and the insulation between the installation points
- Ensure largest possible scales of metal connections
- Anodised or yellow dichromated surfaces have a high HF resistance, this is why the surface must be sanded down accordingly.
- Cables to the controlling device should be as short as possible and laid separately from other mains lines

- Only shielded lines may be used (industry lines with shield mesh wire).
- Ensure that the protection line connection (PE) is connected correctly. The mains filter must be connected to the earth potential.
- Using the accessories: Input reactor type EPH : EDMB.20.0 001 the EN 55011/1998+A1+A2 standard (limit class A) is complied with.

7.4. Low voltage directive 2006/95/EG

“Within a voltage range of 50 and 1000V AC voltage or of 75 and 1500V DC voltage no danger to humans, farm animals or property may be caused by electric equipment.”

EPH Elektronik supplies installation housing with increased protection type in IP 20 for the protection against direct contact in accordance with the low voltage directive 2006/95/EG, which is also suitable for installation platform fitting.

Please refer to the supplier for further recommendations and queries.

7.5. Motors with capacity fault clearance

For motors from the automotive range with respective capacity fault clearance modules these may have to be removed, as pulse width-modulated control causes pulse-shaped currents which destroy the devices.

8. Manufacturer's declaration

We, EPH Elektronik Produktions- und Handelsgesellschaft mbH

Rudolf-Diesel-Straße 18
74354 Besigheim-Ottmarsheim

Hereby declare that the product

4-Q- transistor controller digital type DLR 24/xx - 466

is intended solely for installation in a machine/electric device and that the launch is prohibited until it has been ascertained whether the machine/electric device, in which this product is to be installed, complies with the provisions of the EC guideline in its applicable edition.

The transistor controllers comply with the EMC directive 2004/108/ EEC if properly installed and used and when using a separate mains filter and housing.

The following test specifications were carried out to assess its electromagnetic compatibility:

Transient emissions: EN 55011/1998+A1+A2 (Grenzwertklasse A)

Stability: EN 61000-6-2/2005

