

fig. 7: Connections

Not used Inputs may stay open, there is no need to connect to an external potential

**Specifications**

**Protection of the device**

protection IP 00 ( DIN 0530 )  
protection against shortcircuit, overtemperature and undervoltage

**Weight**

nominal current	1 A/Ph	4 A/Ph	6 A/Ph	8 A/Ph	12 A/Ph
weight	0,2 kg	0,52 kg	0,77 kg	1,1 kg	1,1 kg

**Ambient conditions**

ambient temperature: 0°C to 50°C  
maximum heatsink temperature: 85°C  
forced draft: necessary for amplifier boards with nominal current of 8A and 12A

**Noise radiation**

in case of correct installation and shielding or/and filtering of the lines and signals according to EN55011 class B

Available types:

Example: SE P05.06.120

SE P05 . [ ] . [ ]

Nominal current / phase A	01	Nominal Supply voltage VDC
	02	
	04	
	06	
	08	
	12	

2A is only available with 24 VDC  
1A is only available with 85 VDC

**Stepping motor control amplifier board series SE P05...V1**

- Resolutions adjustable and extern switchable
- Excellent truth microstepping over the entire velocity range, especially by using Zebotronics stepping motors
- Very smooth running and low of vibrations over the entire velocity range by using a high resolution
- Electrical and mechanical compatible to standard Zebotronics amplifier boards (SE 11... , SE... , SE...V..)
- Protected against shortcircuit, over temperature and undervoltage
- Voltage supply range from 24 VDC to 240 VDC
- Phase current range from 0 A / Ph. to 12 A / Ph.
- Constant torques in all pre-selected resolutions
- Resolutions from 200 to 12800 steps per revolution

**Dimensions**

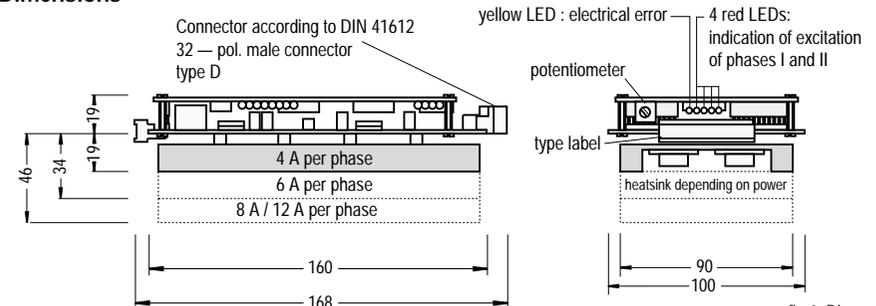


fig. 1: Dimensions

**Adjustments**

All adjustments are made via solder bridges on the backside of the logic board.

Marker	Signification	Standard adjustment
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R	Open: Automatical current reduction 50 % at standstill Closed: No current reduction	open
L	Open: HIGH – active Closed: Low – active	open
SPS	Open: »TTL«-Input level Closed: »SPS«-Input level see also fig. 6 (input signals)	open
S0	Internal function	
S1	Internal function	
C0 – C3	Selection of step angle ( see table )	open
C4	Internal function	
W	Selection of step angle - the step angles in the step angle table column »Pin2-active« is active, Pin a2 is out of function	open

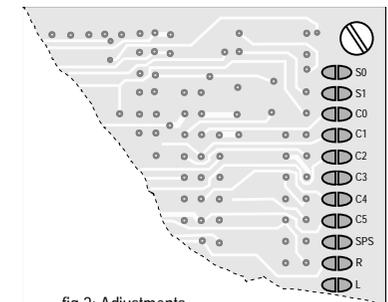


fig. 2: Adjustments

## HIGH – active ( marking »L« open )

A signal is activated when a driving voltage is connected to the input of the signal ( see fig. 6 for voltage levels ).  
The rising edge of the pulse-signal is significant.

## LOW – active ( marking »L« closed )

A signal is activated when the input of the signal is connected to electrical GND ( see fig. 6 for voltage levels ).  
Low-active functions only with an open marker SPS – »TTL«-level for the input signals.  
The falling edge of the pulse-signal is significant.

## Automatic current reduction ( marking »R« open )

The total phase current – adjustable via potentiometer – is set for nominal operation. If marker »R« is open, then the phase current will be reduced by 50% at standstill of the motor. The first arriving pulse increases the phase current again to the adjusted nominal value.  
By activated Reset input, the current reduction will not be activated.

## Step angle adjustment on the board

Using the marking C0, C1, C2 und C3 various step angles can be pre-selected. With the input signal »step angle« at Pin a2 the step angle can be switched externally between two values. During motion switching to any other selected stepping mode is possible within the motor start-stop – frequency.

Resolution extern switchable steps per revolution		Markings for selection of step angle			
PIN a2		X = Marking closed else = Marking open			
not active	active	C3	C2	C1	C0
2000	200	X	X	X	X
	400	X	X	X	
2500	500	X	X		X
	800	X	X		
3200	800	X	X		
	1000	X			X
4000	800	X		X	
	1000	X			X
5000	500	X			
	1000		X	X	X
8000	800		X	X	
	2000		X		X
10000	400		X		
	1000			X	X
12800	2000			X	
	800				X
	1600				

## Supply voltage

**Maximum allowed supply voltage:** Nominal voltage of power amplifier card plus 15% ( mains fluctuations! )  
The nominal output voltage of the power pack unit ( = supply voltage of power amplifier card ) may not be higher than the nominal supply voltage of the power amplifier card.

E.g.: Calculation of a power pack unit for a SE P05.06.120:

Output voltage of power pack = 120 VDC ( and not (!) 138 VDC = 120 VDC + 15% )

## working range - supply voltage (see Ready signal fig.5)

(Nominal-) supply voltage power amplifier card [VDC]	U <sub>B</sub> [VDC]	U <sub>M</sub> [VDC]
24	18	16
60	43	32
85	43	32
120	50	38
240	120	100

U<sub>B</sub> and U<sub>M</sub> +/- 5%

series SE P05...V1

## Current adjustment

Ex factory the amplifier board is set to the nominal current. The motor phase current may be changed.  
For adjusting the phase current a voltmeter must be used, which is connected according to the drawing below.  
1V corresponds to the nominal current of the amplifier board. Meaning that at an amplifier board type SE P05.04.60 the phase current is set to 4A/Phase if the voltmeter shows 1V. A measured voltage of 0.5V corresponds to 2A/Phase.  
The phase current can be adjusted via the potentiometer on the board's frontside.

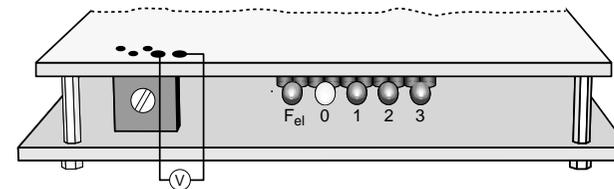


fig.: 3  
current  
adjustment  
and condition  
indication

measured voltage	%	set phase current				measured voltage	[A/Ph]	
		[A/Ph]	[A/Ph]	[A/Ph]	[A/Ph]			
1250 mV	125%	2,5	5	7,5	15	1250 mV	125%	10
1000 mV	100%	2	4	6	12	1000 mV	100%	8
750 mV	75%	1,5	3	4,5	9	750 mV	75%	6
500 mV	50%	1	2	3	6	500 mV	50%	4
max. adjustable current in amperé / phase (+ 5%)		2.8	5.6	8.4	14.5			11.2

## Output signal – Ready signal

An electrical error (undervoltage – see fig. 5 – , short circuit or overtemperature) deletes the signal.  
In non error condition the contact is closed.

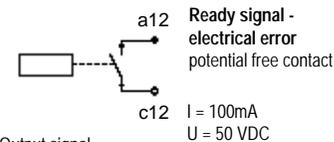


fig. 4: Output signal

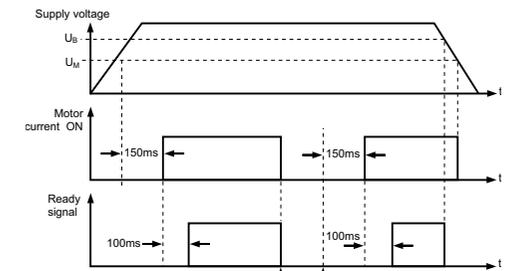
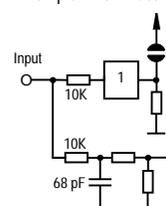


fig. 5: Timing Ready signal

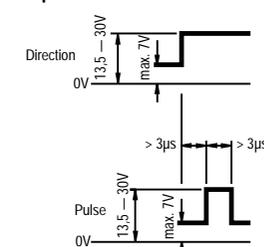
## Input signals

### Input circuit

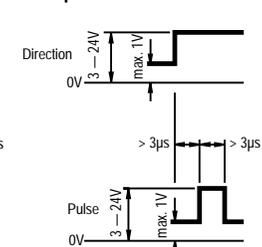
Example: HIGH - active



### Inputs SPS-level



### Inputs TTL-level



rising time max.: 1 µs , falling time max.: 1 µs , pulse frequency max.: 200 kHz

fig.6: circuits for input signals

series SE P05...V1