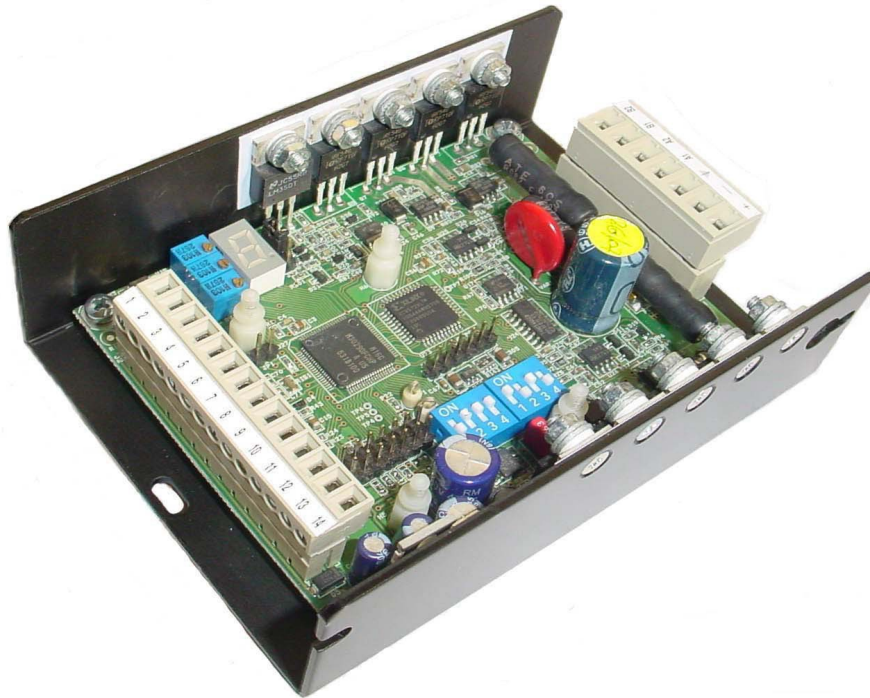ACP&D Limited

EUROSTEP - ESHx 00

CHARACTERISTICS:

Stepping motor drive, power supply from"24 to 85 Vdc, current up to 3A (ESH1), 7A (ESH3) and 10A (ESH4).
NPN/PNP optoisolated inputs and outputs compatibles with TTL, 0-12V or 0-24V level.

POWER SUPPLY:

PARAMETER		VALUE
Vdc nom.	[V]	From 24 to 85
Vdc max.	[V]	90
Vdc min.	[V]	20
I max.	[A]	ESH1=3, ESH3=7, ESH4=10
I min.	[A]	ESH1=0.1, ESH3=1, ESH4=1
Working temperature	[°C]	0-45

DEFINITIONS:

Vdc nom: Suggested nominal voltage value with unstabilized source

Vdc max: Maximum dc working voltage of the drive. Above such value, maximum voltage protection occurs, and drive working is inhibited
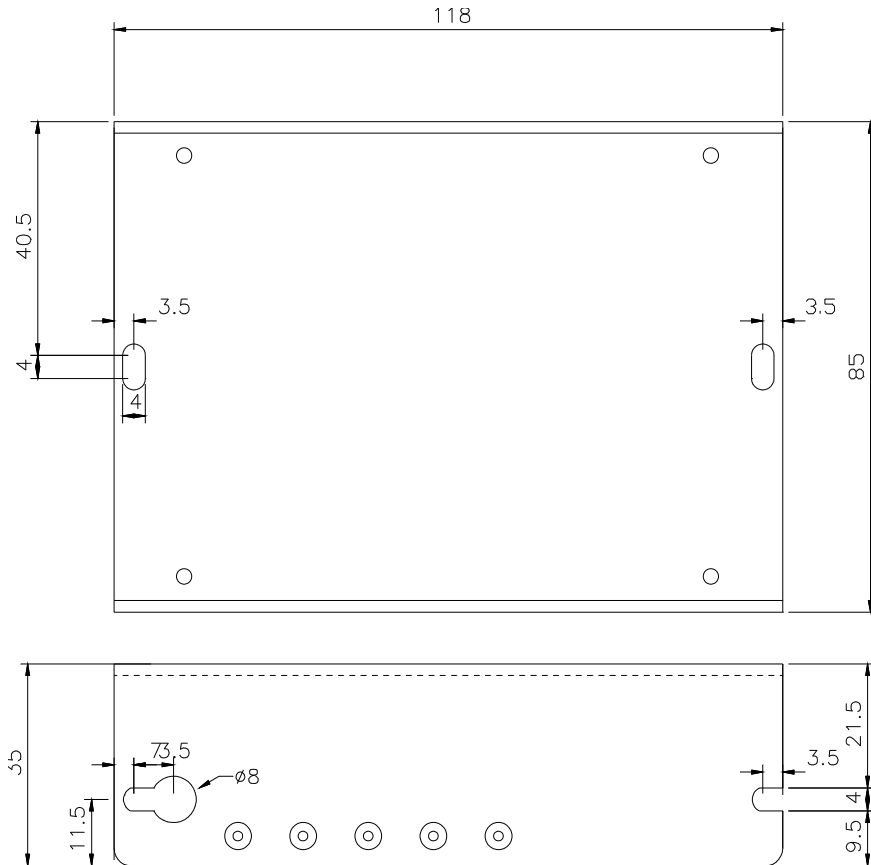
Vdc min: Minimum dc working voltage of the drive. Below such value, minimum voltage protection occurs, and drive working is inhibited
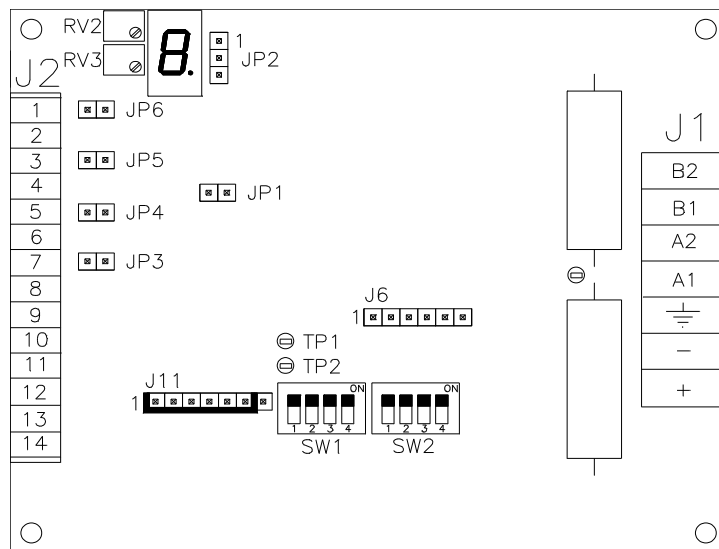
I max: Maximum phase current

I min: Minimum phase current

NOTE: For more than 50°C on the heatsink we suggest forced ventilation.

MECHANICAL DIMENSIONS:

LAYOUT:

PROTECTIONS AND SEGNALATIONS

Drive is provided with protections against overtemperature, overvoltage, undervoltage, short-circuits among outputs and also among outputs and the positive power pole. If one of the mentioned conditions occurs, drive disables the power bridge and shows an error condition on the display. To reset alarm condition use DISABLE input.

'o'   - Power supply overvoltage (Vdc max)
'u'   - Power supply undervoltage (Vdc min)
't'   - Thermic protection event occurred
'c'   - Overcurrent protection event occurred
'd'   - Drive disabled (input ENABLE/DISABLE active)
'q' o 'P' - Detect disconnected motor Phase

If drive is ready, display shows the letter 'r' (ready).

INPUTS:

SIGNAL	FUNCTION
STEP-IN J2-7(L), J2-8(H)	Execute the step on the LOW/HIGH transition of this signal. Use a square wave with duty-cycle of 50% Signal absence for 50 ms determines the automatic current reduction (stand-by condition). Minimum pulse width 5μs, maximum frequency 60KHz LEVEL SETTING: JP3 open → signal input 12..24V, JP3 close → signal input TTL compatible
DIRECTION J2-5(L), J2-6(H)	Select the motor wise. Signals must be stable for at least 50 microseconds before and 50 microseconds after the low/high transition of the STEP-IN signal. LEVEL SETTING: JP4 open → signal input 12..24V, JP4 close → signal input TTL compatible
CURR. RED. J2-1(L), J2-2(H)	It reduces the motor current. The percentage of reduction can be set through SW2: SW2-1 = ON → 50% reduction of the regulated current (no reduction on stand by) SW2-1 = OFF → 25% reduction of the regulated current (25% reduction on stand by) NOTE: this dip set the automatic reduction with motor hold too LEVEL SETTING: JP6 open → signal input 12..24V, JP6 close → signal input TTL compatible
ENABLE/ DISABLE J2-3(L), J2-4(H)	This input can be used as ENABLE or DISABLE through jumper JP2: JP2 on pos.1-2 → DISABLE: When the input is activated current motor will come disallowed. JP2 on pos.2-3 → ENABLE: When the input is deactivated current motor will come disallowed. LEVEL SETTING: JP5 open → signal input 12..24V, JP5 close → signal input TTL compatible

OUTPUTS:

SIGNAL	FUNCTION
OUT1 J2-9(L), J2-10(H)	OUTPUT STEPS: Every front correspond to one step executed **(5 mA max current)**
DRIVE-OUT J2-11(L), J2-12(H)	DRIVER-READY Driver in protection : Output deactivated Driver ready : Output activated **(100 mA max current)**

MOTOR CURRENT REGULATION:
For setting current proceed as follows:
- Set SW2-4 to ON (current regulation mode).
- Turn RV2 trimmer until display shows the required current (CW to increase).
- Set SW2-4 to OFF (Run mode).

Table for setting current values and relating values shown on the display of drive:

ESH1:

1=0.1A,	**1.**=0.2A,	**2**=0.3A,	**2.**=0.4A,	**3**=0.5A,	**3.**=0.6A,
4=0.7A,	**4.**=0.8A,	**5**=0.9A,	**5.**=1A,	**6**=1.1A,	**6.**=1.2A,
7=1.3A,	**7.**=1.4A,	**8**=1.5A,	**8.**=1.6A,	**9**=1.7A,	**9.**=1.8A,
0=1.9A,	**0.**=2A,	**A**=2.1A,	**A.**=2.2A,	**b**=2.3A,	**b.**=2.4A,
c=2.5A,	**c.**=2.6A,	**d**=2.7A,	**d.**=2.8A,	**e**=2.9 A,	**e.**=3 A

ESH3: **1** = 1 A, **1.** = 1.5 A, .., **7** = 7 A
ESH4: **1** = 1 A, **1.** = 1.5 A, .., **7** = 7 A, **0** = 10 A

RESOLUTION SETTINGS:
Resolution setting through DIP-SWITCHES:

SW1-1	SW1-2	SW1-3	RESOLUTION [steps/rev.]
OFF	OFF	OFF	200 (full step)
ON	OFF	OFF	400 (1 / 2 of step)
OFF	**ON**	OFF	800 (1 / 4 of step)
ON	**ON**	OFF	1000 (1 / 5 of step)
OFF	OFF	**ON**	1600 (1 / 8 of step)
ON	OFF	**ON**	2000 (1 / 10 of step)
OFF	**ON**	**ON**	3200 (1 / 16 of step)
ON	**ON**	**ON**	4000 (1 / 20 of step)

AUTOMATIC CURRENT REDUCTION WHEN MOTOR IS STOPPED:

When the motor is stopped, the current is automatically can be reduced through DIP-SWITCH DIP2-1:

SW2-1 = ON   → no current reduction
SW2-1 = OFF   → 25% set current reduction

MOTOR RESONANCE REDUCTION:

This drive is provided by an innovative system to reduce motor resonance.
This function can be enabled through SW2-2:
SW2-2 ON: motor resonance reduction ON
SW2-2 OFF: motor resonance reduction OFF

FIXED SETTINGS:

SW1-4: set OFF, SW2-3: set OFF

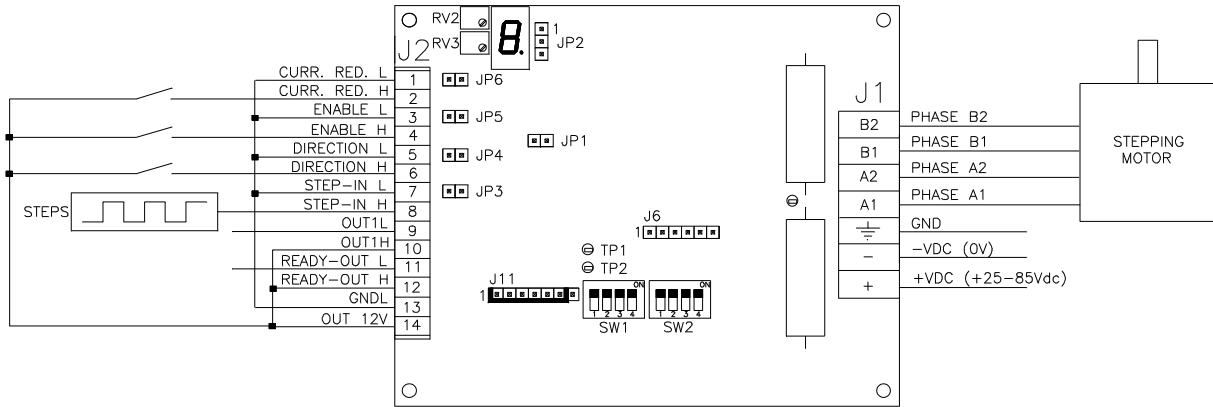## TRIMMER, JUMPER FUNCTIONS:

RV2 - current setting, RV3 - internal use
JP1, J6, J11 - internal use
JP3, JP4, JP5, JP6 - inputs level setting
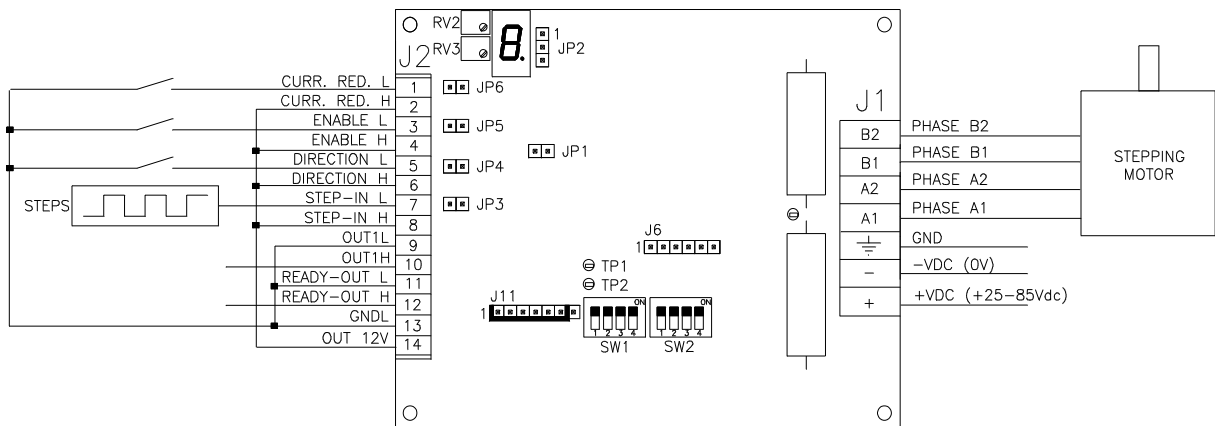JP2 - enable/disable selection

WIRING DIAGRAM

PNP INPUTS AND OUTPUTS:

In this diagram is used internal +12V (max 150 mA) but you can use an external power supply from 12 to 24 Vdc.

NPN INPUTS AND OUTPUTS:

In this diagram is used internal +12V (max 150 mA) but you can use an external power supply from 12 to 24 Vdc.