

INSTALLATION

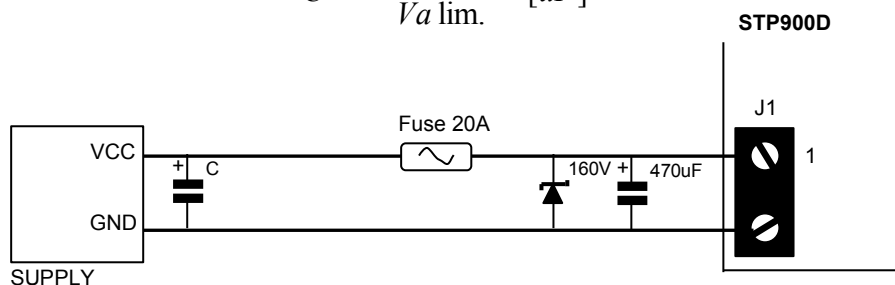
The power supply terminals should be connected with a capacitor of at least 470uF. The capacitor pins must be as close as possible to the driver screw terminals.

In case of a rapid deceleration or during the braking time, especially with large inertial loads, the motor could become a generator of a consistent electrical power: this energy must be conveniently resented to the power supply. If the power supply unit is not able to absorb this energy, the supply voltage could raise over the maximum allowed level, with the risk of damaging the driver or the generator. To prevent this problem, we suggest to connect a 160V zener diode between the positive pin and the ground. This zener should have a power dissipation capability of more than 5W. A suitable fuse must be connected between the zener diode and the power supply.

As a general rule of thumb, the supply current is about 2/3 of the driver set current.

We suggest to connect an additional capacitor between the general power supply conductors (the value can be determined using the following formula:

$$C = \frac{80,000 * I_{a \text{ lim}}}{V_{a \text{ lim}}} [\mu F]$$



Wirings diagram

PRECAUTIONS FOR ELECTROMAGNETIC COMPATIBILITY

1. Separate the phases and the power supply wires from the signal cables
2. Keep the connections as short as possible and use shielded cables for control signals
3. Do not insert capacitors, inductors or any electronic component on the motor wiring
4. Connect only one side of the cable shields
5. Connect the motor case to an efficient ground point
6. Use an appropriate size for power wires

SAFETY

It is the responsibility of the user to be sure this unit is used in compliance with the safety requirements. For further information, please call our technical department.

Astel

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STP900D-120_UM_EN_1_1_0



STP900D-120

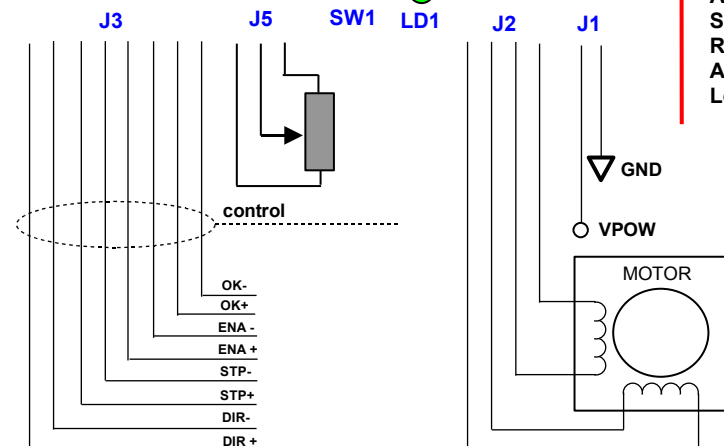
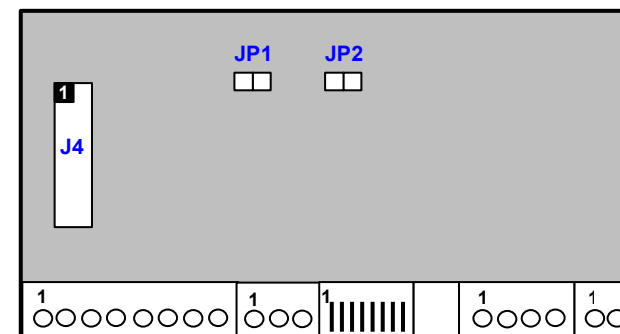
STEPPER MOTOR DRIVER 9A - 120V

STP900D is a compact, high performances stepper driver board with built-in step generator, suitable for medium power motors. A wide range of accessories is available for your custom application.

CHARACTERISTICS

- Microprocessor controlled
- 8 preset current levels up to 9A rms
- Optocoupled inputs
- Automatic stand-still current reduction
- Built-in step generator (VCO)
- Dip-switches for settings
- Short-circuit, over temperature and over voltage built-in protection
- Automatic optimized current recirculation
- Compact size, wall format

Vdc min	40 V
Vdc nom	120 V
Vdc max	150 V
Irms min	2 A (rms)
Irms max	9 A (rms), 12.7A (peak)
VCO range (±20%)	10-500 Hz
	200Hz-4KHz
Max STEP freq.	35KHz
Step resolution	1/1, 1/2, 1/4 step
Chopping frequency	30KHz
Operating temperature	0° - 50° C
Motor inductance	> 0.5 mh
Dimensions	170 x 100 x 65 mm



APPLICATIONS:

Positioning systems
 Automatic machinery
 Servosystems
 Robots
 Axis control
 Low cost systems

CONNESSIONI:

J1. POWER SUPPLY

PIN	SIGNAL	DESCRIPTION
1	VPOW	Power supply Positive terminal (40 -150V)
2	GND	Ground -

J2. MOTOR CONNECTIONS

PIN	SIGNAL	I/O	DESCRIPTION
1	A1	O	Motor winding A, pin 1
2	A2	O	Motor winding A, pin 2
3	B1	O	Motor winding B, pin 1
4	B2	O	Motor winding B, pin 2

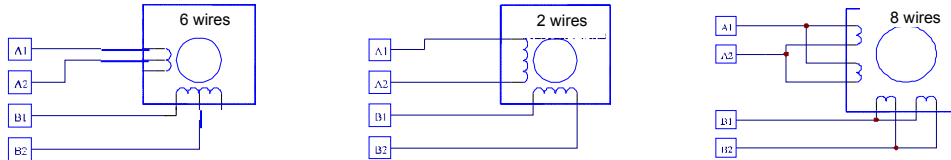
J3. OPTOCOUPLED INPUT SIGNALS (input voltage: 5 +24 Vdc)

PIN	SEGNALE	I/O	DESCRIZIONE
1	DIR +	I	Direction – This level input controls the direction of the motor shaft rotation (see NOTE2). This signal shall be valid at least 20us before changing the STEP and must remain stable more than 20us after the last step pulse. The clockwise or counterclockwise rotation depends on motor connections. The motor can runs, even if DIR command is inactive or not connected
2	DIR -	I	
3	STEP +	I	Step -The motor advances in the given direction, when this signal change from INACTIVE level to ACTIVE (see NOTE 2) Suggested duty-cycle : 50%.
4	STEP -	I	
5	ENA +	I	Enable – If this signal is active, the driver is enabled. If ENA is not connected or inactive the driver is disabled (see NOTE 2)
6	ENA -	I	
7	OK+	O	Drive-OK – this output is a transistor signal (npn or pnp configurable; see NOTE 2) which turns off in the event of a fault (the driver will de-energise).
8	OK-	O	

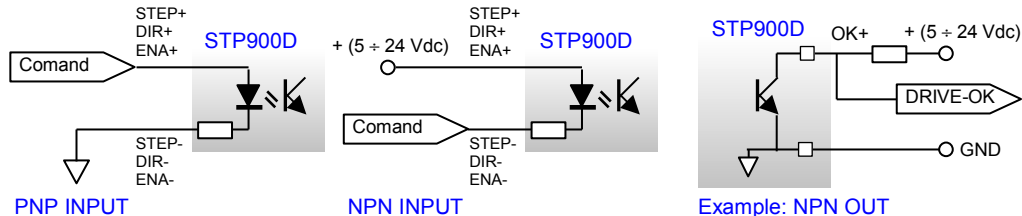
J5. STEP GENERATOR (VCO)

PIN	SIGNAL	I/O	DESCRIPTION
1	RIF+	I	VCO positive terminal
2	CTRL	I	VCO control input (see “OSCILLATOR”)
3	RIF-	I	VCO negative terminal

NOTE1: Depending on motor type, connect the windings (4, 6 or 8 wires) as follow:



NOTE 2: Control signals wiring examples (optocoupled signals):



NOTE3: J4 connector is used with plug-in boards

SETTINGS

RESOLUTION

6	7	RISOLUZIONE
OFF	OFF	Full-step (200 steps/rev typ.) WAVE
OFF	ON	¼ step (800 steps/rev typ.)
ON	OFF	½ step (400 steps/rev typ.)
ON	ON	Full-step (200 steps/rev typ.) 2 PH-ON

Step generator: frequency range

1	VCO RANGE (± 20%)
DIP-SWITCH	
ON	10Hz / 500Hz
OFF	200Hz /4KHz

CURRENT SELECTION

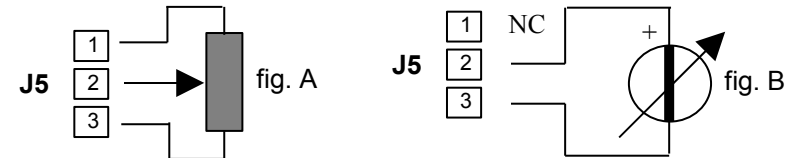
2	3	4	Nominal current
OFF	OFF	OFF	2 A
ON	OFF	OFF	3 A
OFF	ON	OFF	4 A
ON	ON	OFF	5 A
OFF	OFF	ON	6 A
ON	OFF	ON	7 A
OFF	ON	ON	8 A
ON	ON	ON	9 A

DIAGNOSTIC

LD1	FUNCTION
ON	OK: correct behaviour
OFF	Driver disabled or power off (ENA+, ENA- inactive)
SLOW BLINKING	Error: driver fault
FAST BLINKING	Initialization sequence

OSCILLATOR (VCO)

When this switch (8) is in the ON position, the step signal is internally generated. The generator should be disabled when an external step is used. The generator frequency can be modified connecting to J5 an external potentiometer (R > 1kΩ fig.A) or supplying an external voltage on pins 2-3 (fig. B). This external voltage should be between 0V (min. Freq.) and 12Vcc (max freq.)



NOTE4. POWER BRIDGE RECIRCULATION MODE

STP900D adopts an innovative power bridge current recirculation technique which optimizes the performances of the driver (less power dissipation, best torque uniformity control, less shaft vibrations and motor noise).

The adaptative algorithm controls the current path in the bridge switching between the suitable REGENERATIVE and NOT REGENERATIVE mode.

AUTOMATIC CURRENT REDUCTION

When the switch (5) is ON, the driver reduces the winding current at about the 70% of set current after 250ms from the last step

DIP-SWITCH settings

