Datasheet of the Digital Stepper Drive

NM-8078

20-72VDC, 7.8A Peak, Ultra Smoothness, Fault Output

Version 0.0.1

Features

- Super-low motor noise offers excellent quietness
- Self-test and Auto-configuration technology offers optimum performance for different motors
- Options to set output current and micro step resolutions via DIP switch
- Automatic idle-current reduction
- Over-current, over-voltage and short-circuit protections
- Fault out prevents damages to your machines or the materials
- Soft-start with no "jump" when powered on

Descriptions

By implementing the latest motion control technologies, NM-8078 DSP-based stepper drive delivers excellent performance not available before. Unique features of sensorless stall detection, extra smoothness and excellent high speed performance make this stepper drive deliver servo-like performance at the cost of stepper drives. It is capable of delivering high performance without damages to your machine or the materials.

Applications

NM-8078 stepper drive is suitable for driving a wide range of 2-phase stepper motors, from NEMA frame size 17 to 34. Typical applications include CNC routers, laser cutters, laser markers, medical equipments, X-Y tables, measurement equipments, etc.

Specifications

Electrical Specifications

Parameter	Min	Typical	Max	Unit
Input Voltage	20	60	80	VDC
Output Current	0.5	-	7.8 (Peak)	A
Pulse Input Frequency	0	-	200	kHz
Logic Signal Current	7	10	16	mA
Isolation Resistance	500	-	-	MΩ

Operating Environment

Cooling	Natural Cooling or Forced cooling	
Operating Environment	Environment	Avoid dust, oil fog and corrosive gases
	Storage Temperature	-20℃ — 65℃ (-4°F — 149°F)
	Ambient Temperature	0℃ — 50℃ (32°F — 122°F)
	Humidity	40%RH — 90%RH
	Operating Temperature (Heat Sink)	70℃ (158°F) Max
Storage Temperature	-20℃ — 65℃ (-4°F — 149°F)	
Weight	276 g (9.73 oz)	

Mechanical Specifications
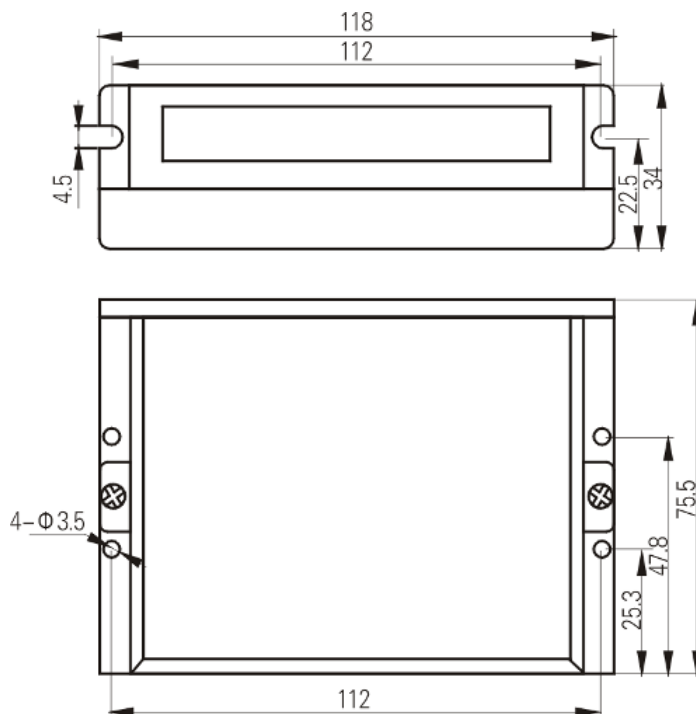
Protection Indications

The green indicator turns on when power-up. When drive protection is activated, the red LED blinks periodicity to indicate the errors.

Priority	Time(s) of Blink	Sequence wave of RED LED	Description
1st	1	🔴 ⚪ ⚪ ⚪ ⚪	Over-current protection
2nd	2	🔴 🔴 ⚪ ⚪ ⚪	Over-voltage protection

Connectors and Pin Assignment

NM-8078 has three connectors, connector for control signals connections, connector for status signal connections and connector for power and motor connections.

Control Signal Connector – Screw Terminal			
Pin	Name	I/O	Description
1	PUL+	I	Pulse Signal: This input represents pulse signal, each rising or falling edge active. 4.5-5V when PUL-HIGH, 0-0.5V when PUL-LOW. For reliable response, pulse width should be longer than 2.5µs.
2	PUL-	I	
3	DIR+	I	Direction Signal: This signal has low/high voltage levels, representing two directions of motor rotation. For reliable motion response, DIR signal should be ahead of PUL signal by 5µs at least. 4.5-5V when DIR-HIGH, 0-0.5V when DIR-LOW. Please note that rotation direction is also related to motor-driver-encoder wiring match. Exchanging the connection of two wires for a coil to the driver will reverse motion direction.
4	DIR-	I	
5	ENA+	I	Enable Signal: This signal is used for enabling/disabling the driver. In default, high level (NPN control signal) for enabling the driver and low level for disabling the driver. Usually left UNCONNECTED (ENABLED). Please note that PNP and Differential control signals are on the contrary, namely Low level for enabling. The active level of ENA signal is software configurable.
6	ENA-	I	

Connectors and Pin Assignment (Continued)

Status Signal Connector – Screw Terminal			
Pin	Name	I/O	Description
1	FLT+	O	Fault Signal: OC output signal, active when one of the following protection is activated: over-voltage and over current. This port can sink or source 20mA current at 24V. In default, the resistance between FLT+ and FLT- is low impedance in normal operation and become high when drive goes into error.
2	FLT-	O	

Power and Motor Connector- Screw Terminal			
Pin	Name	I/O	Description
1	A+	O	Motor Phase A+
2	A-	O	Motor Phase A-
3	B+	O	Motor Phase B+
4	B-	O	Motor Phase B-
5	+Vdc	I	Power Supply Input (Positive), 20-72VDC recommended, leaving rooms for voltage fluctuation and back-EMF.
6	GND	GND	Power Ground (Negative)

DIP Switches

Current Settings (SW1-SW3)

Peak	RMS	SW1	SW2	SW3
Default		on	on	on
1.40A	1.00A	off	on	on
2.8A	2.0A	on	off	on
3.1A	2.2A	off	off	on
4.9A	3.5A	on	on	off
5.6A	4.0A	off	on	off
7.0A	5.0A	on	off	off
7.8A	5.5A	off	off	off

Notes: Due to motor inductance, the actual current in the coil may be smaller than the dynamic current setting, particularly under high speed condition.

Full Current (SW4)

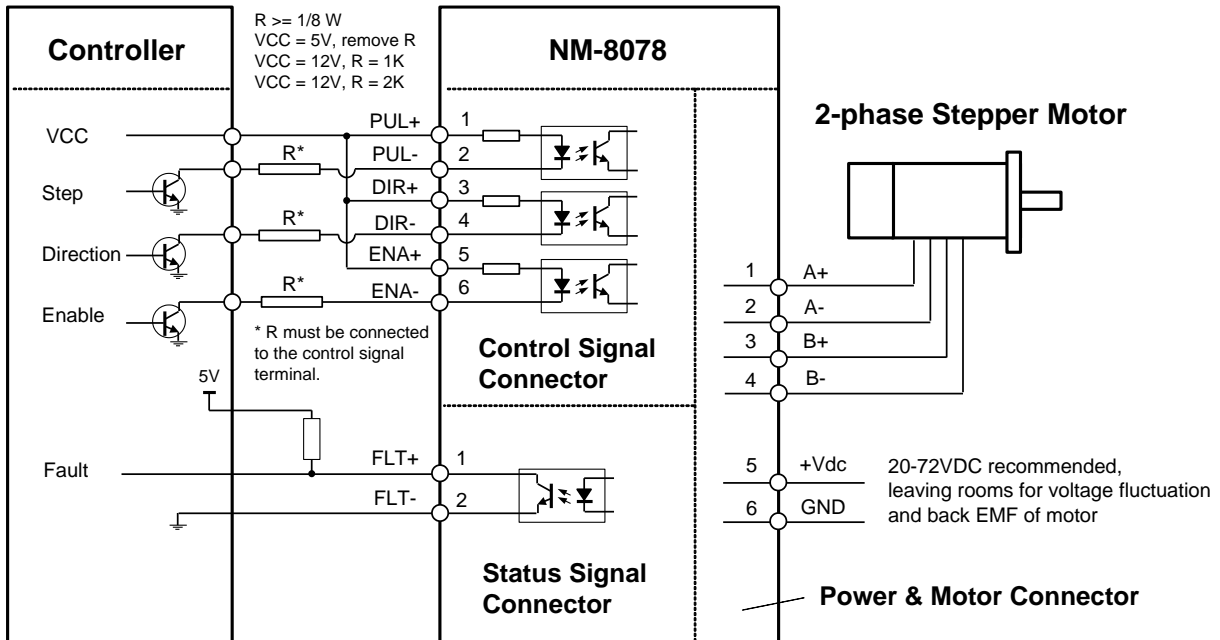|	On	Off
SW4	Full current is on or auto-current-reduction is turned off when motor is stop.	Full current is off or auto-current-reduction is turned on when motor is stop. The standstill current is half of the current setting. Set it on when lower motor heating is preferred.

DIP Switches (Continued)

Micro Step Settings (SW5-SW8)

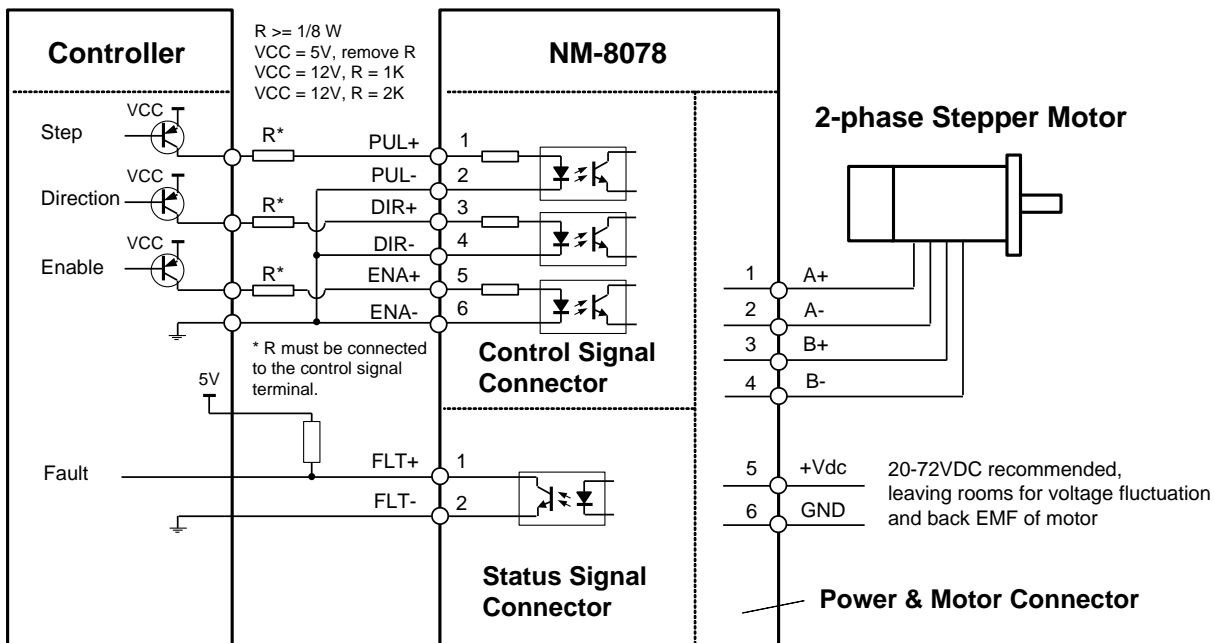| Steps/Revolution	SW5	SW6	SW7	SW8
200	on	on	on	on
400	off	on	on	on
800	on	off	on	on
1600	off	off	on	on
3200	on	on	off	on
6400	off	on	off	on
12800	on	off	off	on
25600	off	off	off	on
1000	on	on	on	off
2000	off	on	on	off
4000	on	off	on	off
5000	off	off	on	off
8000	on	on	off	off
10000	off	on	off	off
20000	on	off	off	off
25000	off	off	off	off

Typical Connections
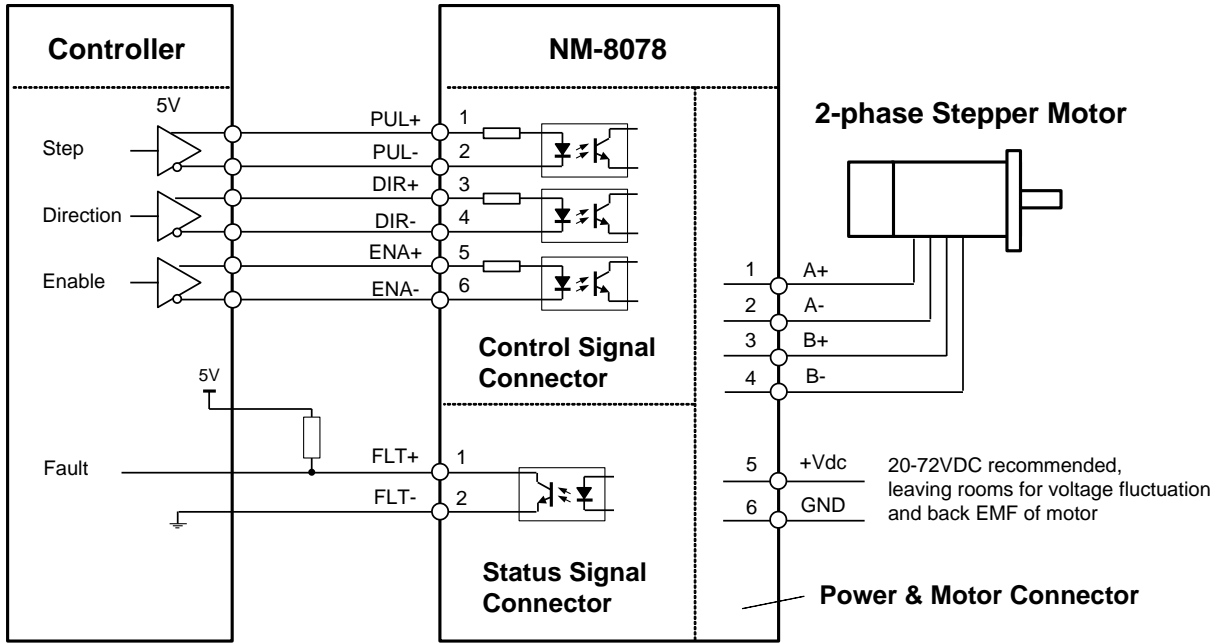
Connections to controller of differential output

Connections to controller of sinking output

Typical Connections (Continued)

Controller

R >= 1/8 W
VCC = 5V, remove R
VCC = 12V, R = 1K
VCC = 12V, R = 2K

NM-8078

2-phase Stepper Motor

Step — VCC — R* — PUL+ — 1
PUL- — 2
Direction — VCC — R* — DIR+ — 3
DIR- — 4
Enable — VCC — R* — ENA+ — 5
ENA- — 6

* R must be connected to the control signal terminal.

Control Signal Connector

1 — A+
2 — A-
3 — B+
4 — B-

5V

Fault — FLT+ — 1
FLT- — 2

5 — +Vdc
6 — GND

20-72VDC recommended, leaving rooms for voltage fluctuation and back EMF of motor

Status Signal Connector

Power & Motor Connector

Connections to controller of sourcing output