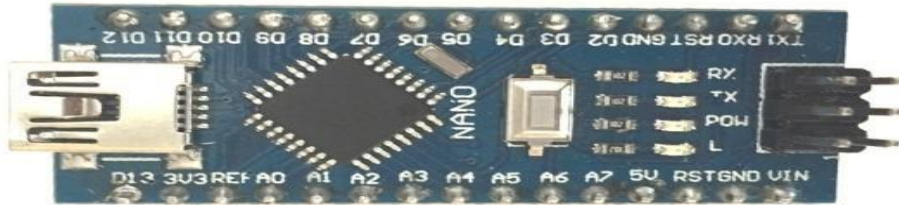
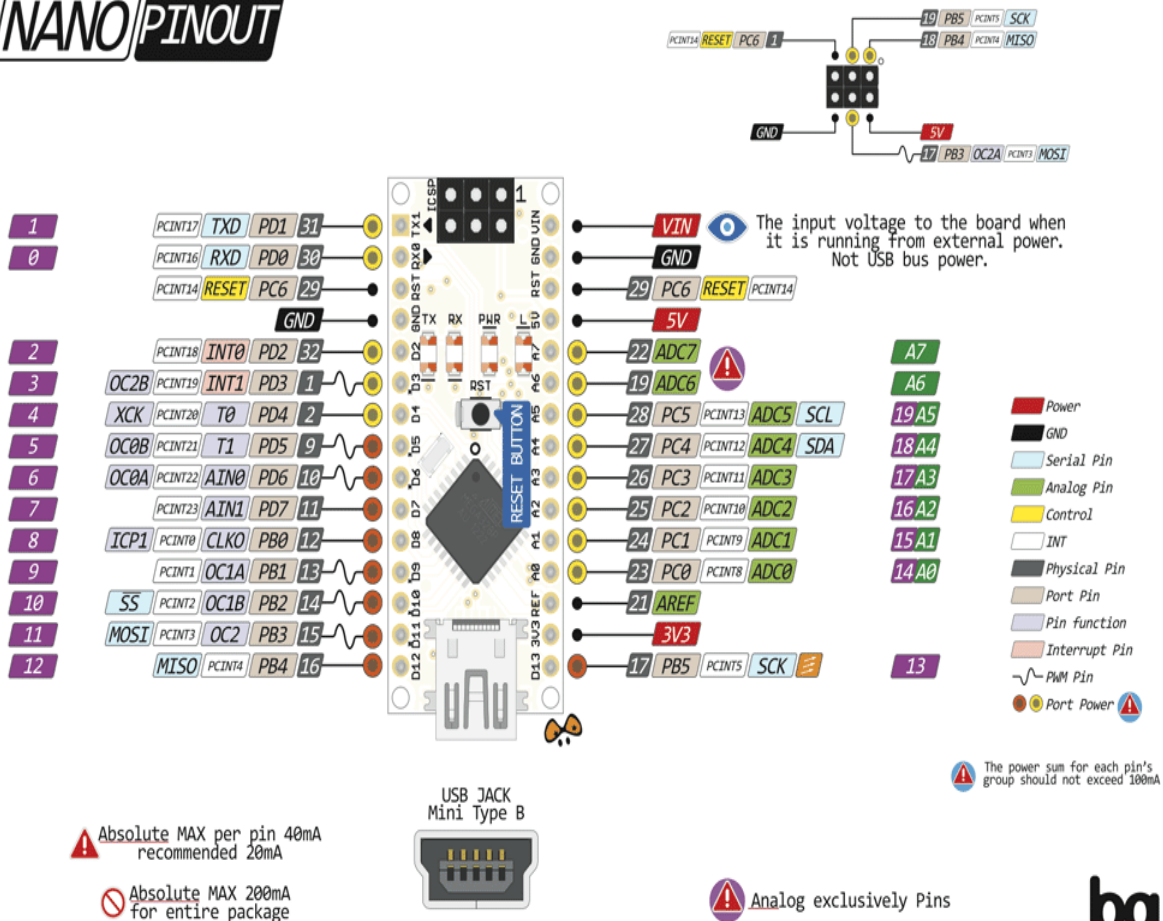


# LAMPIRAN

## 1. Datasheet Arduino Nano



### NANO PINOUT



## Arduino Nano Pin Configuration

Pin Category	Pin Name	Details
Power	<b>Vin, 3.3V, 5V, GND</b>	<p><b>Vin:</b> Input voltage to Arduino when using an external power source (6-12V).</p> <p><b>5V:</b> Regulated power supply used to power microcontroller and other components on the board.</p> <p><b>3.3V:</b> 3.3V supply generated by on-board voltage regulator. Maximum current draw is 50mA.</p> <p><b>GND:</b> Ground pins.</p>
Reset	<b>Reset</b>	Resets the microcontroller.
Analog Pins	<b>A0 – A7</b>	Used to measure analog voltage in the range of 0-5V
Input/Output Pins	<b>Digital Pins D0 - D13</b>	Can be used as input or output pins. 0V (low) and 5V (high)
Serial	<b>Rx, Tx</b>	Used to receive and transmit TTL serial data.
External Interrupts	<b>2, 3</b>	To trigger an interrupt.
PWM	<b>3, 5, 6, 9, 11</b>	Provides 8-bit PWM output.
SPI	<b>10 (SS), 11 (MOSI), 12 (MISO) and 13 (SCK)</b>	Used for SPI communication.
Inbuilt LED	<b>13</b>	To turn on the inbuilt LED.
IIC	<b>A4 (SDA), A5 (SCA)</b>	Used for TWI communication.
AREF	<b>AREF</b>	To provide reference voltage for input voltage.

## Arduino Nano Technical Specifications

Microcontroller	ATmega328P – 8 bit AVR family microcontroller
Operating Voltage	5V
Recommended Input Voltage for Vin pin	7-12V
Analog Input Pins	6 (A0 – A5)
Digital I/O Pins	14 (Out of which 6 provide PWM output)
DC Current on I/O Pins	40 mA
DC Current on 3.3V Pin	50 mA
Flash Memory	32 KB (2 KB is used for Bootloader)
SRAM	2 KB
EEPROM	1 KB
Frequency (Clock Speed)	16 MHz
Communication	IIC, SPI, USART

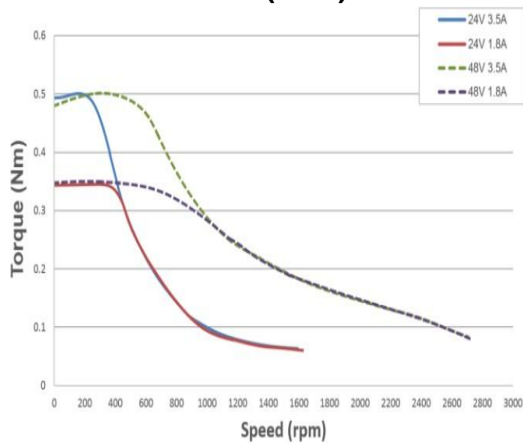


## 2. Datasheet MOTOR STEPPER

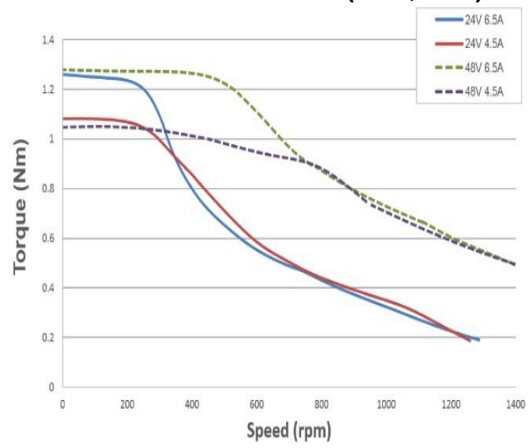


		IP 20			IP20			IP65			IP20		IP65	
NEMA		17S	17M	17L	23S	23M	23L	23S	23M	23L	34M	34L	34M	34L
Input Power, Nominal ( $\pm 10\%$ )	VDC	14-48	14-48	14-48	14-48	14-48	14-48	14-48	14-48	14-48	14-48	14-48	14-75	14-75
Auxiliary Input Power, Nominal ( $\pm 10\%$ )	VDC	6-24	6-24	6-24	6-24	6-24	6-24	6-24	6-24	6-24	6-24	6-24	6-24	6-24
Auxiliary Input Power, Maximum	W	1	1	1	1	1	1	1	1	1	1	1	1	1
Detent Torque	mNm	15	25	25	40	70	120	40	70	120	250	350	250	350
Thrust Load Limit	kg	0.28	0.36	0.6	0.6	1.0	1.5	0.6	1.0	1.5	2.7	3.8	2.7	3.8
Overhung Load Limit (from shaft end)	N	20	20	20	50	50	50	50	50	50	260	260	260	260
Rotor Inertia	g·cm <sup>2</sup>	57	82	123	260	460	750	260	460	750	1850	2750	1850	2750
Holding torque at continuous current	Nm	0.35	0.45	0.65	1.1	1.8	2.6	1.1	1.8	2.6	3.5	5.5	5	7.7
Holding torque at peak current	Nm	0.5	0.6	1.05	1.3	2.1	3.25	1.3	2.1	3.25	4.5	7	6.3	9
Continuous Output Current	A	1.8	1.8	1.8	4.5	4.5	4.5	4.5	4.5	4.5	7	7	7	7
Peak Output Current (application dependent)	A	3.5	3.5	3.5	6.5	6.5	6.5	6.5	6.5	6.5	11.5	11.5	11.5	11.5
Step Angle	deg	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Magnetic Encoder, Resolution	ppr	4096	4096	4096	4096	4096	4096	4096	4096	4096	4096	4096	4096	4096
Circuit Loss	W	6	6	6	6	6	6	6	6	6	6	6	6	6
Weight	kg	0.37	0.44	0.59	0.80	1.13	1.75	0.84	1.18	1.83	3.05	4.30	3.30	4.50
Connection Hardware Screw Size/Torque	Nm	0.63	0.63	0.63	3	3	3	3	3	3	5.2	5.2	5.2	5.2
Under-Voltage Trip, Nominal	VDC	Logic												
Over-Voltage Trip	VDC	Logic												

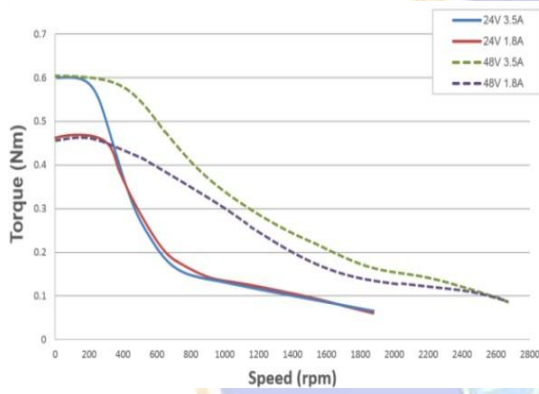
**NEMA 17 Short (IP20)**



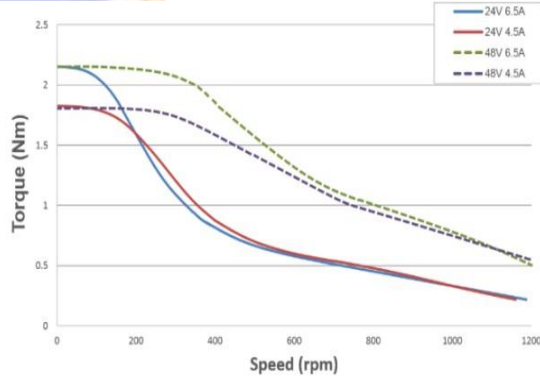
**NEMA 23 Short (IP20, IP65)**



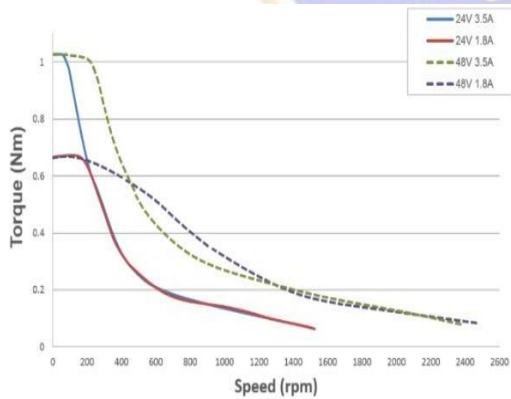
**NEMA 17 Medium (IP20)**



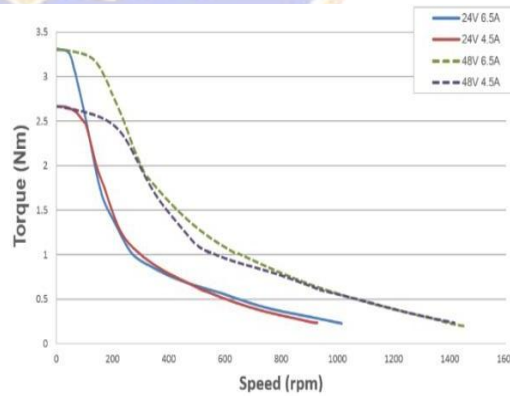
**NEMA 23 Medium (IP20, IP65)**



**NEMA 17 Long (IP20)**



**NEMA 23 Long (IP20, IP65)**



## Ordering Info

	IS	T	- 23M	1	2	CO	1	0	- 0
<b>Integrated Stepper Motor</b>									
<b>Type</b>									
T	<b>High torque</b>								
<b>Frame Size and Length</b>									
17S	<b>NEMA 17 Short</b>								
17M	<b>NEMA 17 Medium</b>								
17L	<b>NEMA 17 Long</b>								
23S	<b>NEMA 23 Short</b>								
23M	<b>NEMA 23 Medium</b>								
23L	<b>NEMA 23 Long</b>								
34M	<b>NEMA 34 Medium</b>								
34L	<b>NEMA 34 Long</b>								
<b>Shaft</b>									
1	<b>Single flat</b>								
2	<b>Double flat</b>								
3	<b>Keyway</b>								
4	<b>Full</b>								
<b>Connector and Degree of Protection</b>									
2	<b>Crimp connectors, IP20</b>								
6	<b>M-connectors, IP65 (Frame size 23, 34 only)</b>								
<b>Communication</b>									
CO	<b>CANopen</b>								
EC	<b>EtherCAT</b>								
<b>Feedback</b>									
1	<b>Standard - 12-bit absolute single turn</b>								
<b>Brake</b>									
0	<b>Without brake</b>								
<b>Options</b>									
<b>Standard:</b>									
0	<b>Frame size 17, 14-48V, 1.8A Frame size 23, 14-48V, 4.5A Frame size 34, 14-75V, 7A</b>								
1	<b>Frame size 34, 14-48V, 4.5A (IP20 only)</b>								



## Available Part Numbers

NEMA 17 CANopen

**IST-17S12CO10-0**

**IST-17M12CO10-0**

**IST-17L12CO10-0**

NEMA 23 CANopen

**IST-23S12CO10-0**

**IST-23M12CO10-0**

**IST-23L12CO10-0**

**IST-23S16CO10-0**

**IST-23M16CO10-0**

**IST-23L16CO10-0**

NEMA 23 EtherCAT

**IST-23S16EC10-0**

**IST-23M16EC10-0**

**IST-23L16EC10-0**

NEMA 34 CANopen

**IST-34M22CO10-1**

**IST-34L22CO10-1**

**IST-34M26CO10-0**

**IST-34L26CO10-0**

NEMA 34 EtherCAT

**IST-**

**34M26EC10-0**

**IST-34L26EC10-**

**0**



