NOVARA
TECHNOLOGIES

NBL series Brushless DC Motor
General Catalog

A

NBL Series
Brushless DC Motor

Description

Novara's NBL series brushless DC motors offer high performance, long life and low maintenance for applications requiring stable velocity control over a wide speed range. With frame sizes ranging from 42mm (NEMA 17) to 110mm (NEMA 42), 3-phase and 8-pole brushless motors are provided with hall signals for commutation and velocity loop feedback. Three designs are available to optimize your application's performance to the most cost-effective solution; transmission type, high torque type and high efficiency type. In addition to our standard models, custom-design brushless DC motors with a comprehensive accessory line of encoders, brakes, planetary and right angle gear reduction to meet your specific application needs.

A brief comparison among Novara's three different types of brushless DC motors are provided as follows:

Features	Novara's BLDC Motor Type		
	NBLT series Transmission Type	NBLH series High Torque Type	NBLE series High Efficiency Type
Frame Size	☐42mm ○57mm ☐60mm ○62mm	☐42mm ○57mm ☐57mm ☐60mm ○62mm ☐70mm ☐80mm ☐86mm	☐42mm ☐60mm ☐80mm ☐110mm
Magnet Type	Bonded neodymium	Sintered neodymium	Splicing neodymium
Efficiency	No less than 65%	No less than 75%	No less than 85%

Applications

Novara's NBL Series Brushless DC motors are widely used in kinds of applications, such as medical equipment, home appliances, building controls, automotive, robotics, industrial automation, and so on.

Part Number

NBL □ □□ □ □ □□ – □ □□

Novara BLDC Motor

Motor Type
T: Transmission series
H: High Torque series
E: High Efficiency series

Frame Size (mm)

Motor Structure
A: Aluminum Case
B: Bare Core

Mechanical Profile
S: Square Front Bell, Square End Bell
R: Round Front Bell, Round End Bell
F: Square Front Bell, Round End Bell

Body Length (mm)

Rated Voltage
1: 12 VDC
2: 24 VDC
3: 36 VDC
4: 48 VDC
5: 160 VDC
6: 310 VDC
7: 560 VDC

Rated Speed
10: 1000 rpm
20: 2000 rpm
30: 3000 rpm
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Standard Versions

Model	Motor Type	Frame Size	Motor Structure	Rated Torque	Rated Power
NBLT42BS Series	Transmission Type	□42mm	Bare Core	Up to 0.3N.m	Up to 94W
NBLT57BR Series	Transmission Type	○57mm	Bare Core	Up to 0.43N.m	Up to 180W
NBLT57BF Series	Transmission Type	○57mm	Bare Core	Up to 0.43N.m	Up to 180W
NBLT60AS Series	Transmission Type	□60mm	Aluminum Case	Up to 0.375N.m	Up to 117W
NBLT62AR Series	Transmission Type	○62mm	Aluminum Case	Up to 0.375N.m	Up to 117W
NBLH42BS Series	High Torque Type	□42mm	Bare Core	Up to 0.3N.m	Up to 94W
NBLH57BS Series	High Torque Type	□57mm	Bare Core	Up to 0.6N.m	Up to 188W
NBLH57BR Series	High Torque Type	○57mm	Bare Core	Up to 0.6N.m	Up to 188W
NBLH57BF Series	High Torque Type	○57mm	Bare Core	Up to 0.6N.m	Up to 188W
NBLH60AS Series	High Torque Type	□60mm	Aluminum Case	Up to 1.27N.m	Up to 400W
NBLH62AR Series	High Torque Type	○62mm	Aluminum Case	Up to 1.27N.m	Up to 400W
NBLH70AS Series	High Torque Type	□70mm	Aluminum Case	Up to 1.5N.m	Up to 470W
NBLH80AS Series	High Torque Type	□80mm	Aluminum Case	Up to 1.8N.m	Up to 565W
NBLH86AS Series	High Torque Type	□86mm	Aluminum Case	Up to 2.1N.m	Up to 660W
NBLE42AS Series	High Efficiency Type	□42mm	Aluminum Case	Up to 0.32N.m	Up to 100W
NBLE60AS Series	High Efficiency Type	□60mm	Aluminum Case	Up to 1.27N.m	Up to 400W
NBLE80AS Series	High Efficiency Type	□80mm	Aluminum Case	Up to 2.4N.m	Up to 750W
NBLE110AS Series	High Efficiency Type	□110mm	Aluminum Case	Up to 6.0N.m	Up to 1800W

NBLT42BS Series

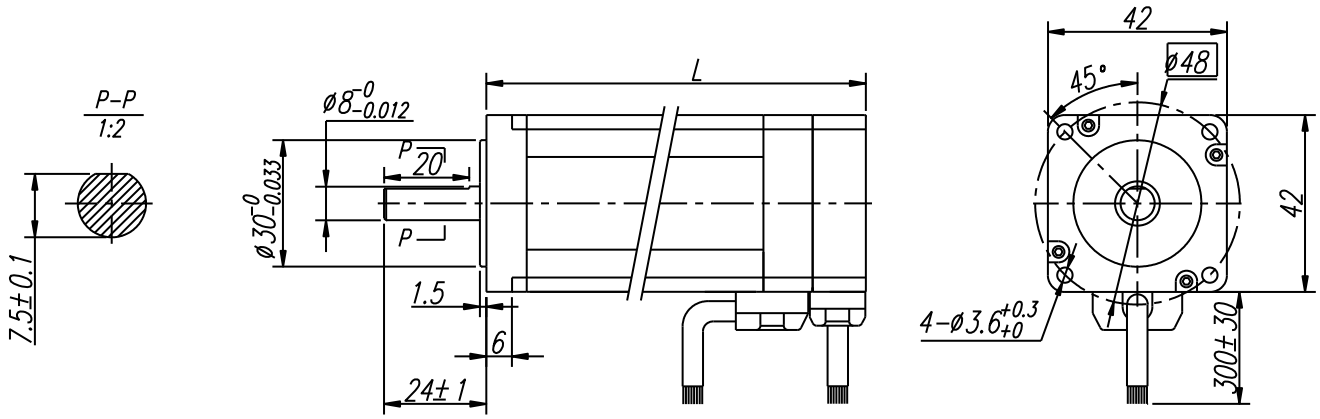
☐42mm | Transmission Type | Bare Core

Winding Connection	Delta
Hall Effect Angle	120 ° Electric Angle
Shaft Run Out	0.025 mm
Ambient Temperature	-20 °C ~ +50 °C
Insulation Resistance	100 MΩ Min., 500VDC
Dielectric Strength	500 VDC for one minute

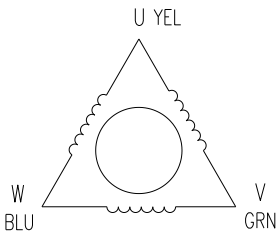
Specifications

Model	NBLT42BS58-230	NBLT42BS78-230	NBLT42BS98-230
No. of Phases	3	3	3
No. of Poles	8	8	8
Rated Voltage (VDC)	24	24	24
Rated Power (W)	31	63	94
Rated Current (A)	2.0	4.0	6.0
Peak Current (A)	6.0	12.0	18.0
Rated Torque (N.m)	0.1	0.2	0.3
Peak Torque (N.m)	0.3	0.6	0.9
Rated Speed (rpm)	3000	3000	3000
Rotor Inertia (g.cm^2)	37	42	49
Torque Const. (N.m/A)	0.05	0.05	0.05
Back EMF Const. (V/Krpm)	5.235	5.235	5.235
Line-Line Resistance (Ω)	1.5	0.9	0.5
Line-Line Inductance (mH)	1.3	0.6	0.3
Length (mm)	58	78	98
Weight (kg)	0.4	0.9	1.3

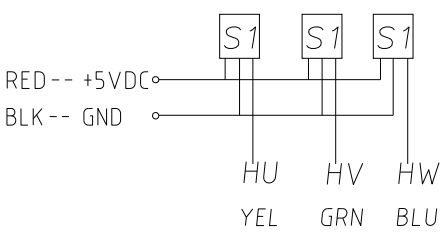
Mechanical Dimension



Winding Diagram



Hall Sensor



NBLT57BR Series

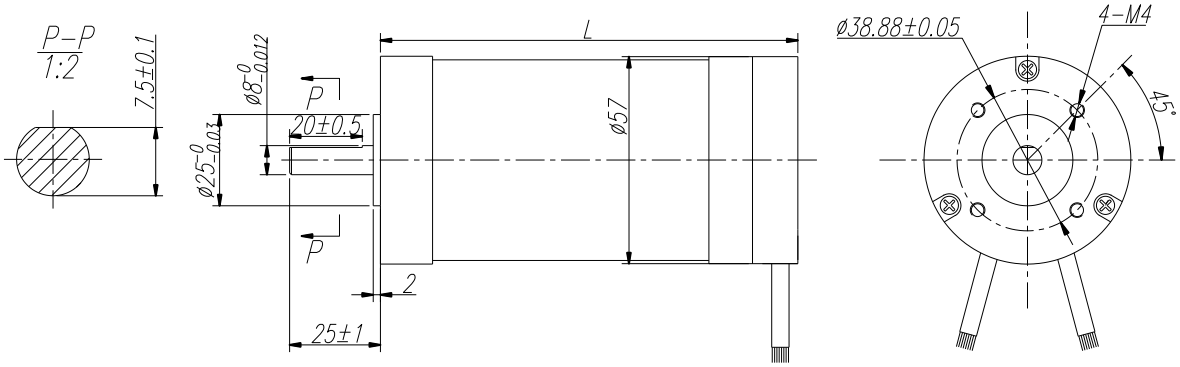
〇57mm | Transmission Type | Bare Core

Winding Connection	Delta
Hall Effect Angle	60 ° Electric Angle
Shaft Run Out	0.025 mm
Ambient Temperature	-20 °C ~ +50 °C
Insulation Resistance	100 MΩ Min., 500VDC
Dielectric Strength	500 VDC for one minute

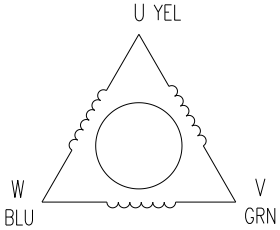
Specifications

Model	NBLT57BR45-340	NBLT57BR55-340	NBLT57BR75-340	NBLT57BR95-340	NBLT57BR115-340
No. of Phases	3	3	3	3	3
No. of Poles	4	4	4	4	4
Rated Voltage (VDC)	36	36	36	36	36
Rated Power (W)	23	46	92	133	180
Rated Current (A)	1.17	2.27	3.6	5.5	6.9
Peak Current (A)	3.5	6.8	11.5	16.5	20.5
Rated Torque (N.m)	0.05	0.11	0.22	0.32	0.43
Peak Torque (N.m)	0.16	0.39	0.7	1.0	1.27
Rated Speed (Rpm)	4000	4000	4000	4000	4000
Rotor Inertia (g.cm^2)	30	75	119	173	230
Torque Const. (N.m/A)	0.052	0.06	0.06	0.063	0.063
Back EMF Const. (V/Krpm)	5.55	6.6	6.6	6.6	6.6
Line-Line Resistance (Ω)	4.3	1.63	0.64	0.45	0.33
Line-Line Inductance (mH)	8.6	4.4	2.0	1.5	0.95
Length (mm)	45	55	75	95	115
Weight (kg)	0.33	0.44	0.72	0.95	1.2

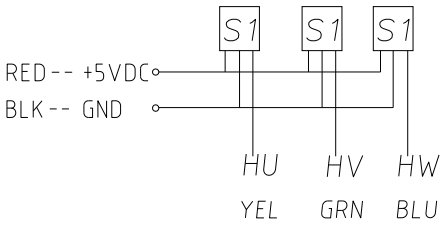
Mechanical Dimension



Winding Diagram



Hall Sensor



NBLT57BF Series

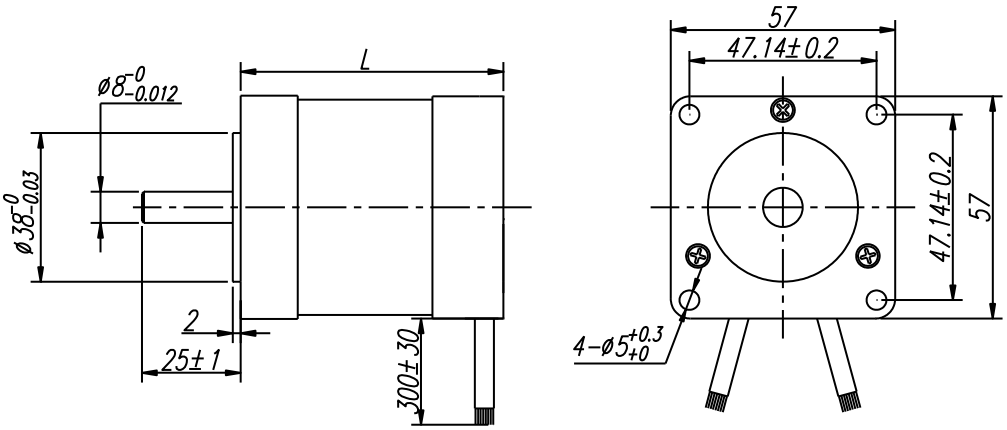
〇57mm | Transmission Type | Bare Core

Winding Connection	Delta
Hall Effect Angle	60 ° Electric Angle
Shaft Run Out	0.025 mm
Ambient Temperature	-20 °C ~ +50 °C
Insulation Resistance	100 MΩ Min., 500VDC
Dielectric Strength	500 VDC for one minute

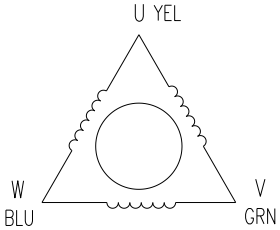
Specifications

Model	NBLT57BF45-340	NBLT57BF55-340	NBLT57BF75-340	NBLT57BF95-340	NBLT57BF115-340
No. of Phases	3	3	3	3	3
No. of Poles	4	4	4	4	4
Rated Voltage (VDC)	36	36	36	36	36
Rated Power (W)	23	46	92	133	180
Rated Current (A)	1.17	2.27	3.6	5.5	6.9
Peak Current (A)	3.5	6.8	11.5	16.5	20.5
Rated Torque (N.m)	0.05	0.11	0.22	0.32	0.43
Peak Torque (N.m)	0.16	0.39	0.7	1.0	1.27
Rated Speed (Rpm)	4000	4000	4000	4000	4000
Rotor Inertia (g.cm^2)	30	75	119	173	230
Torque Const. (N.m/A)	0.052	0.06	0.06	0.063	0.063
Back EMF Const. (V/Krpm)	5.55	6.6	6.6	6.6	6.6
Line-Line Resistance (Ω)	4.3	1.63	0.64	0.45	0.33
Line-Line Inductance (mH)	8.6	4.4	2	1.5	0.95
Length (mm)	45	55	75	95	115
Weight (kg)	0.33	0.44	0.72	0.95	1.2

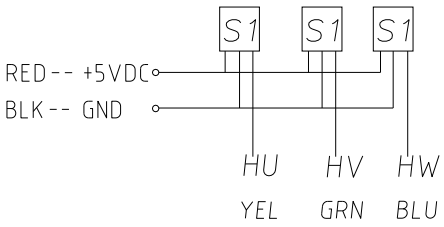
Mechanical Dimension



Winding Diagram



Hall Sensor



NBLT60AS Series

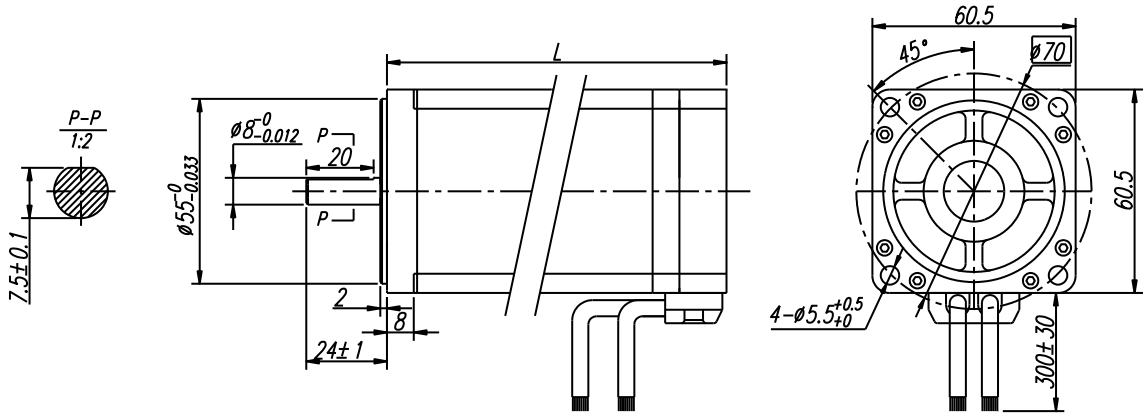
☐60mm | Transmission Type | Aluminum Case

Winding Connection	Delta
Hall Effect Angle	120 ° Electric Angle
Shaft Run Out	0.025 mm
Ambient Temperature	-20 °C ~ +50 °C
Insulation Resistance	100 MΩ Min., 500VDC
Dielectric Strength	500 VDC for one minute

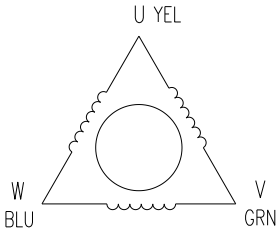
Specifications

Model	NBLT60AS75-230	NBLT60AS95-230	NBLT60AS115-230
No. of Phases	3	3	3
No. of Poles	8	8	8
Rated Voltage (VDC)	24	24	24
Rated Power (W)	39	78	117
Rated Current (A)	2.5	5.0	7.5
Peak Current (A)	7.5	15	22.5
Rated Torque (N.m)	0.125	0.25	0.375
Peak Torque (N.m)	0.375	0.75	1.125
Rated Speed (rpm)	3000	3000	3000
Rotor Inertia (kg.cm^2)	0.33	0.43	0.52
Torque Const. (N.m/A)	0.05	0.05	0.05
Back EMF Const. (V/Krpm)	5.235	5.92	5.92
Line-Line Resistance (Ω)	1.35	0.675	0.45
Line-Line Inductance (mH)	0.9	0.45	0.3
Length (mm)	75.5	95.5	115.5
Weight (kg)	0.95	1.3	1.65

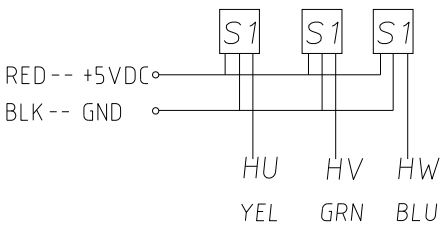
Mechanical Dimension



Winding Diagram



Hall Sensor



NBLT62AR Series

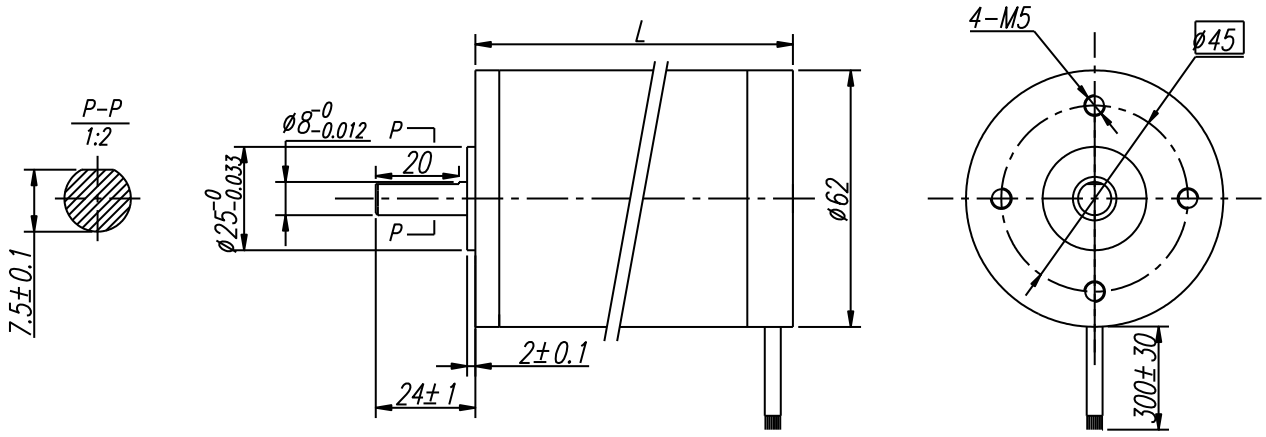
〇62mm | Transmission Type | Aluminum Case

Winding Connection	Delta
Hall Effect Angle	120 ° Electric Angle
Shaft Run Out	0.025 mm
Ambient Temperature	-20 °C ~ +50 °C
Insulation Resistance	100 MΩ Min., 500VDC
Dielectric Strength	500 VDC for one minute

Specifications

Model	NBLT62AR56-230	NBLT62AR76-230	NBLT62AR96-230
No. of Phases	3	3	3
No. of Poles	8	8	8
Rated Voltage (VDC)	24	24	24
Rated Power (W)	39	78	117
Rated Current (A)	2.5	5.0	7.5
Peak Current (A)	7.5	15	22.5
Rated Torque (N.m)	0.125	0.25	0.375
Peak Torque (N.m)	0.375	0.75	1.125
Rated Speed (rpm)	3000	3000	3000
Rotor Inertia (kg.cm^2)	0.33	0.43	0.52
Torque Const. (N.m/A)	0.05	0.05	0.05
Back EMF Const. (V/Krpm)	5.235	5.92	5.92
Line-Line Resistance (Ω)	1.35	0.675	0.45
Line-Line Inductance (mH)	0.9	0.45	0.3
Length (mm)	56.5	76.5	96.5
Weight (kg)	0.95	1.3	1.65

Mechanical Dimension



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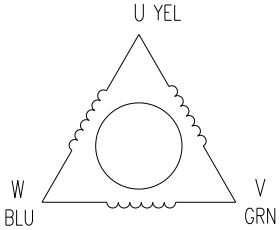

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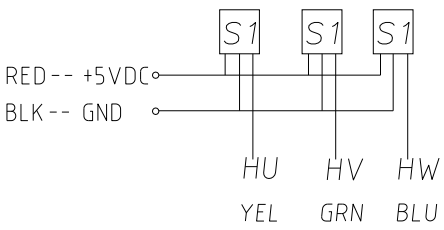


NBLH42BS Series

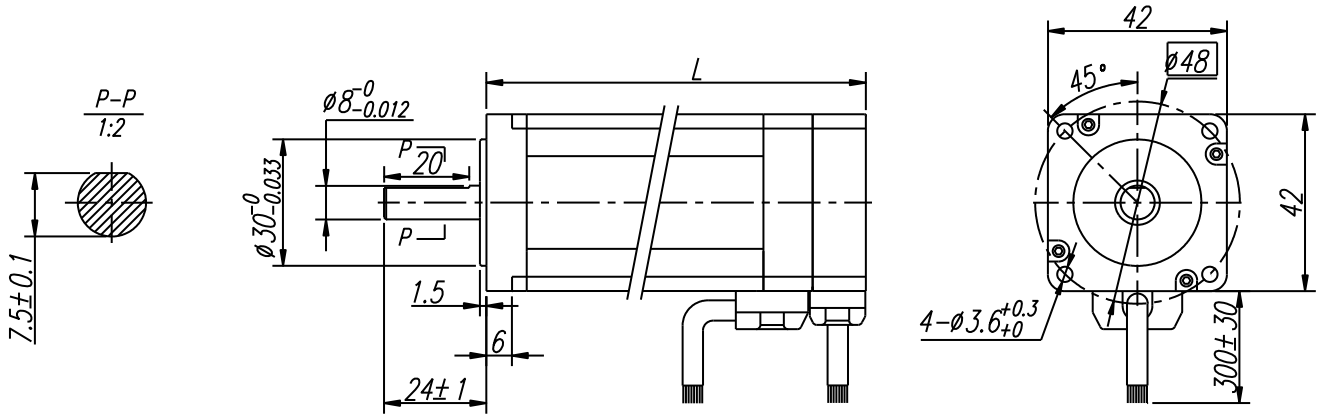
☐42mm | High Torque Type | Bare Core

Winding Connection	Delta
Hall Effect Angle	120 ° Electric Angle
Shaft Run Out	0.025 mm
Ambient Temperature	-20 °C ~ +50 °C
Insulation Resistance	100 MΩ Min., 500VDC
Dielectric Strength	500 VDC for one minute

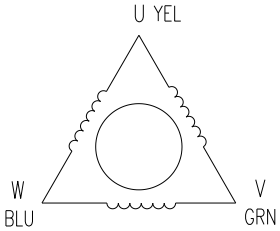
Specifications

Model	NBLH42BS60-430	NBLH42BS80-430	NBLH42BS100-430
No. of Phases	3	3	3
No. of Poles	8	8	8
Rated Voltage (VDC)	48	48	48
Rated Power (W)	31	63	94
Rated Current (A)	0.87	1.74	2.61
Peak Current (A)	2.6	5.2	7.8
Rated Torque (N.m)	0.1	0.2	0.3
Peak Torque (N.m)	0.3	0.6	0.9
Rated Speed (rpm)	3000	3000	3000
Rotor Inertia (g.cm^2)	39	45	52
Torque Const. (N.m/A)	0.115	0.115	0.115
Back EMF Const. (V/Krpm)	12	12	12
Line-Line Resistance (Ω)	1.9	1.4	0.8
Line-Line Inductance (mH)	1.5	1.1	0.6
Length (mm)	60	80	100
Weight (kg)	0.4	0.9	1.3

Mechanical Dimension



Winding Diagram



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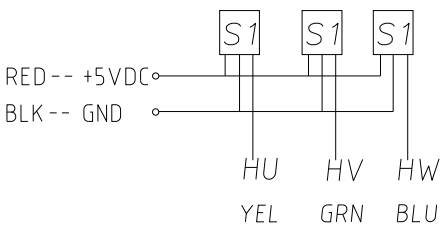


NBLH57BS Series

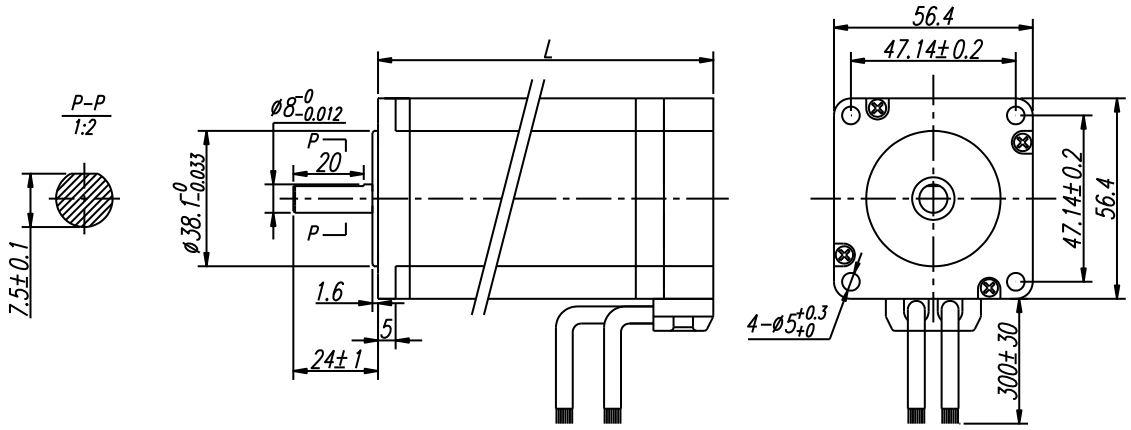
☐57mm | High Torque Type | Bare Core

Winding Connection	Delta
Hall Effect Angle	60 ° Electric Angle
Shaft Run Out	0.025 mm
Ambient Temperature	-20 °C ~ +50 °C
Insulation Resistance	100 MΩ Min., 500VDC
Dielectric Strength	500 VDC for one minute

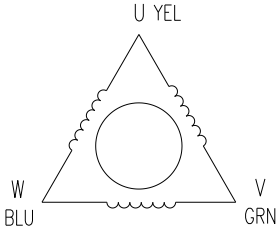
Specifications

Model	NBLH57BS58-430	NBLH57BS78-430	NBLH57BS98-430
No. of Phases	3	3	3
No. of Poles	8	8	8
Rated Voltage (VDC)	48	48	48
Rated Power (W)	63	125	188
Rated Current (A)	1.6	3.3	5.0
Peak Current (A)	4.8	9.9	15.0
Rated Torque (N.m)	0.2	0.4	0.6
Peak Torque (N.m)	0.6	1.2	1.8
Rated Speed (Rpm)	3000	3000	3000
Rotor Inertia (kg.cm^2)	0.42	0.63	0.91
Torque Const. (N.m/A)	0.125	0.121	0.120
Back EMF Const. (V/Krpm)	13.08	12.71	12.56
Line-Line Resistance (Ω)	1.11	0.93	0.52
Line-Line Inductance (mH)	0.91	0.65	0.43
Length (mm)	58	78	98
Weight (kg)	1.0	1.4	1.8

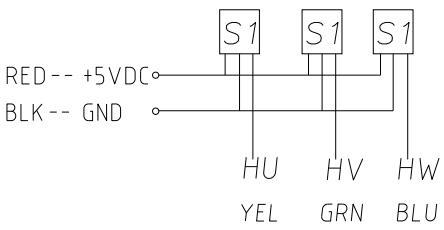
Mechanical Dimension



Winding Diagram



Hall Sensor



NBLH57BR Series

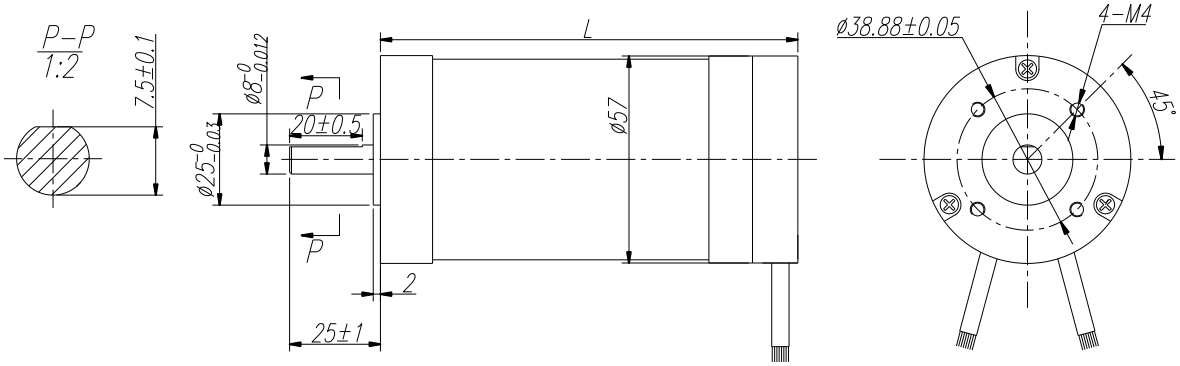
○57mm | High Torque Type | Bare Core

Winding Connection	Delta
Hall Effect Angle	60 ° Electric Angle
Shaft Run Out	0.025 mm
Ambient Temperature	-20 °C ~ +50 °C
Insulation Resistance	100 MΩ Min., 500VDC
Dielectric Strength	500 VDC for one minute

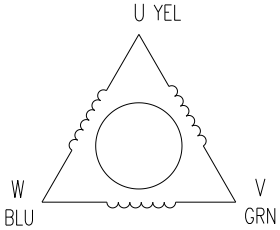
Specifications

Model	NBLH57BR52-330	NBLH57BR72-330	NBLH57BR92-330	NBLH57BR112-330
No. of Phases	3	3	3	3
No. of Poles	4	4	4	4
Rated Voltage (VDC)	36	36	36	36
Rated Power (W)	47	94	140	188
Rated Current (A)	1.8	3.5	5.3	7.0
Peak Current (A)	5.4	10.5	15.9	21.0
Rated Torque (N.m)	0.15	0.3	0.45	0.6
Peak Torque (N.m)	0.45	0.9	1.35	1.8
Rated Speed (Rpm)	3000	3000	3000	3000
Torque Const. (N.m/A)	0.083	0.085	0.085	0.086
Length (mm)	52	72	92	112
Weight (kg)	0.5	0.8	1.1	1.3

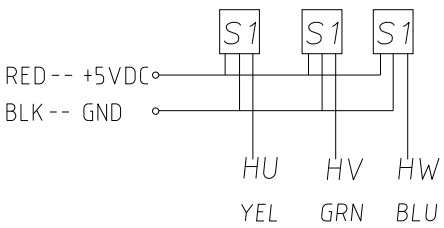
Mechanical Dimension



Winding Diagram



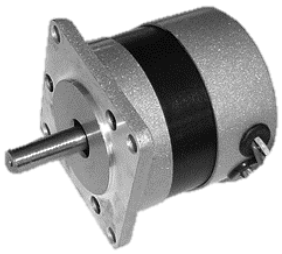
Hall Sensor



NBLH57BF Series

○57mm | High Torque Type | Bare Core

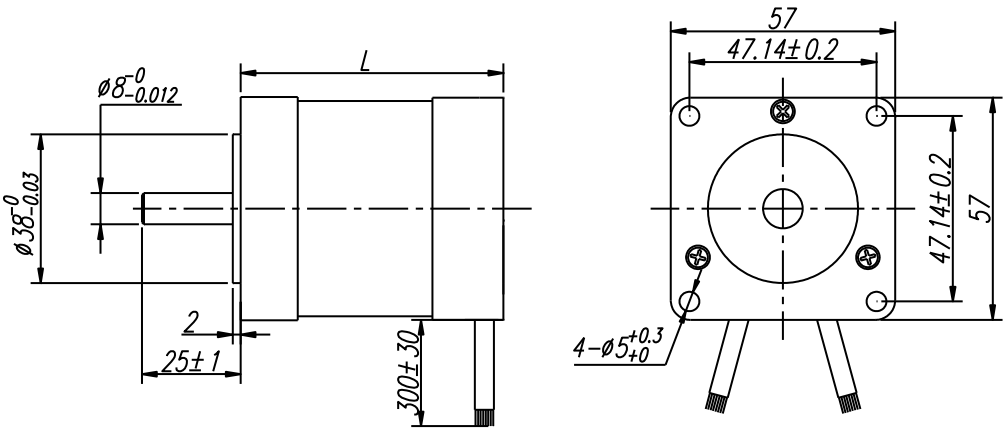
Winding Connection	Delta
Hall Effect Angle	60 ° Electric Angle
Shaft Run Out	0.025 mm
Ambient Temperature	-20 °C ~ +50 °C
Insulation Resistance	100 MΩ Min., 500VDC
Dielectric Strength	500 VDC for one minute



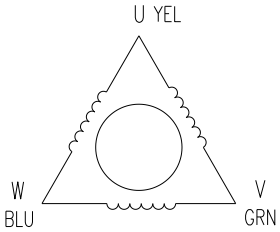
Specifications

Model	NBLH57BF52-330	NBLH57BF72-330	NBLH57BF92-330	NBLH57BF112-330
No. of Phases	3	3	3	3
No. of Poles	4	4	4	4
Rated Voltage (VDC)	36	36	36	36
Rated Power (W)	47	94	140	188
Rated Current (A)	1.8	3.5	5.3	7.0
Peak Current (A)	5.4	10.5	15.9	21.0
Rated Torque (N.m)	0.15	0.3	0.45	0.6
Peak Torque (N.m)	0.45	0.9	1.35	1.8
Rated Speed (Rpm)	3000	3000	3000	3000
Torque Const. (N.m/A)	0.083	0.085	0.085	0.086
Length (mm)	52	72	92	112
Weight (kg)	0.5	0.8	1.1	1.3

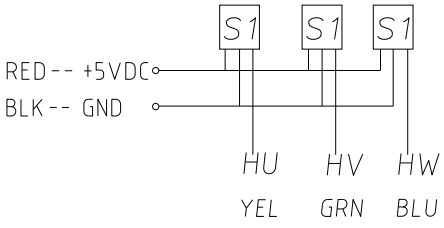
Mechanical Dimension



Winding Diagram



Hall Sensor



NBLH60AS Series

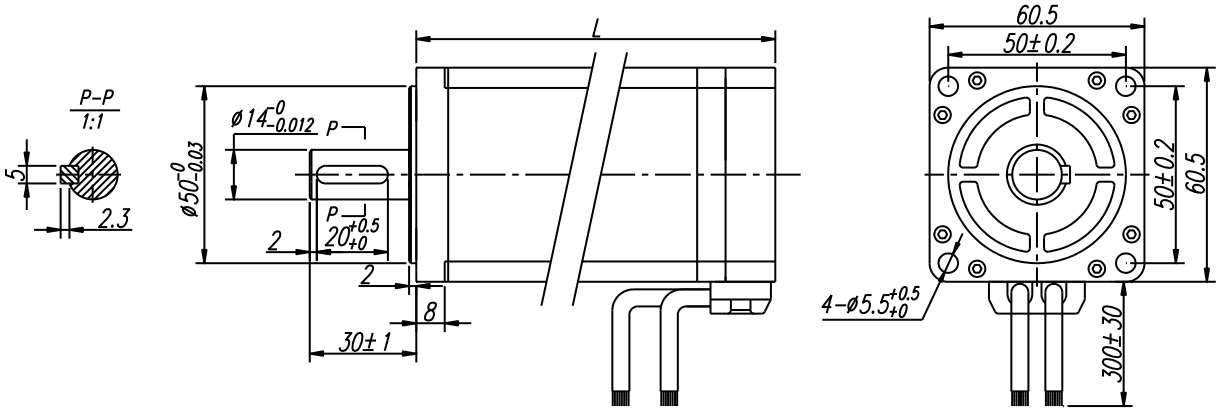
☐60mm | High Torque Type | Aluminum Case

Winding Connection	Star
Hall Effect Angle	120 ° Electric Angle
Shaft Run Out	0.025 mm
Ambient Temperature	-20 °C ~ +50 °C
Insulation Resistance	100 MΩ Min., 500VDC
Dielectric Strength	500 VDC for one minute

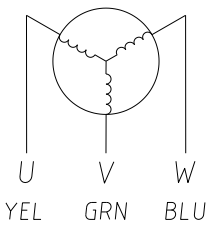
Specifications

Model	NBLH60AS85-430	NBLH60AS85-630	NBLH60AS115-430	NBLH60AS115-630	NBLH60AS145-430	NBLH60AS145-630
No. of Phases	3	3	3	3	3	3
No. of Poles	8	8	8	8	8	8
Rated Voltage (VDC)	48	310	48	310	48	310
Rated Power (W)	125	125	250	250	400	400
Rated Current (A)	4	0.98	7.5	2.0	11	3.1
Peak Current (A)	12	2.95	22.5	6.0	33	9.3
Rated Torque (N.m)	0.4	0.4	0.8	0.8	1.27	1.27
Peak Torque (N.m)	1.2	1.2	2.4	2.4	3.81	3.81
Rated Speed (rpm)	3000	3000	3000	3000	3000	3000
Rotor Inertia (kg.cm^2)	0.75	0.75	0.95	0.95	1.15	1.15
Torque Const. (N.m/A)	0.1	0.408	0.107	0.4	0.115	0.409
Back EMF Const. (V/Krpm)	10.47	42.73	11.17	42.88	12.08	42.89
Line-Line Resistance (Ω)	1.5	11.2	0.6	9.7	0.3	5.3
Line-Line Inductance (mH)	1.3	10.5	0.65	7.3	0.3	4.0
Length (mm)	85.5	85.5	115.5	115.5	145.5	145.5
Weight (kg)	0.9	0.9	1.4	1.4	1.9	1.9

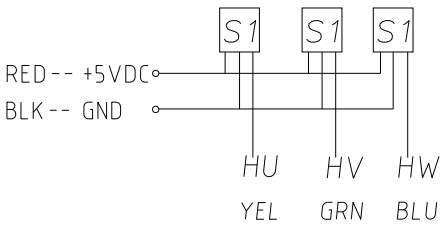
Mechanical Dimension



Winding Diagram



Hall Sensor



NBLH62AR Series

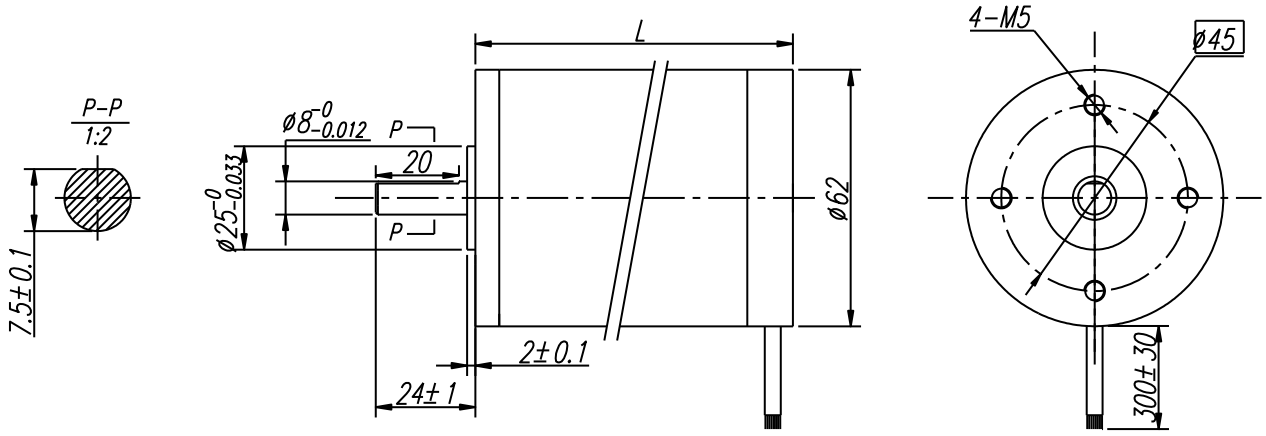
○62mm | High Torque Type | Aluminum Case

Winding Connection	Star
Hall Effect Angle	120 ° Electric Angle
Shaft Run Out	0.025 mm
Ambient Temperature	-20 °C ~ +50 °C
Insulation Resistance	100 MΩ Min., 500VDC
Dielectric Strength	500 VDC for one minute

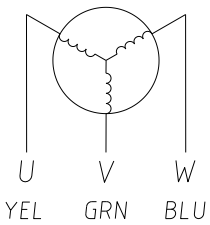
Specifications

Model	NBLH62AR85-430	NBLH62AR85-630	NBLH62AR115-430	NBLH62AR115-630	NBLH62AR145-430	NBLH62AR145-630
No. of Phases	3	3	3	3	3	3
No. of Poles	8	8	8	8	8	8
Rated Voltage (VDC)	48	310	48	310	48	310
Rated Power (W)	125	125	250	250	400	400
Rated Current (A)	4	0.98	7.5	2.0	11	3.1
Peak Current (A)	12	2.95	22.5	6.0	33	9.3
Rated Torque (N.m)	0.4	0.4	0.8	0.8	1.27	1.27
Peak Torque (N.m)	1.2	1.2	2.4	2.4	3.81	3.81
Rated Speed (rpm)	3000	3000	3000	3000	3000	3000
Rotor Inertia (kg.cm^2)	0.75	0.75	0.95	0.95	1.15	1.15
Torque Const. (N.m/A)	0.1	0.408	0.107	0.4	0.115	0.409
Back EMF Const. (V/Krpm)	10.47	42.73	11.17	42.88	12.08	42.89
Line-Line Resistance (Ω)	1.5	11.2	0.6	9.7	0.3	5.3
Line-Line Inductance (mH)	1.3	10.5	0.65	7.3	0.3	4.0
Length (mm)	85.5	85.5	115.5	115.5	145.5	145.5
Weight (kg)	0.9	0.9	1.4	1.4	1.9	1.9

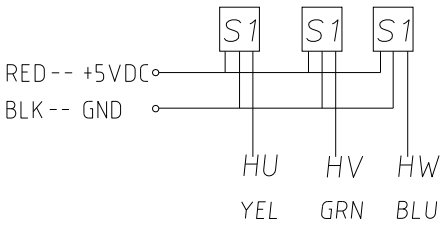
Mechanical Dimension



Winding Diagram



Hall Sensor



NBLH70AS Series

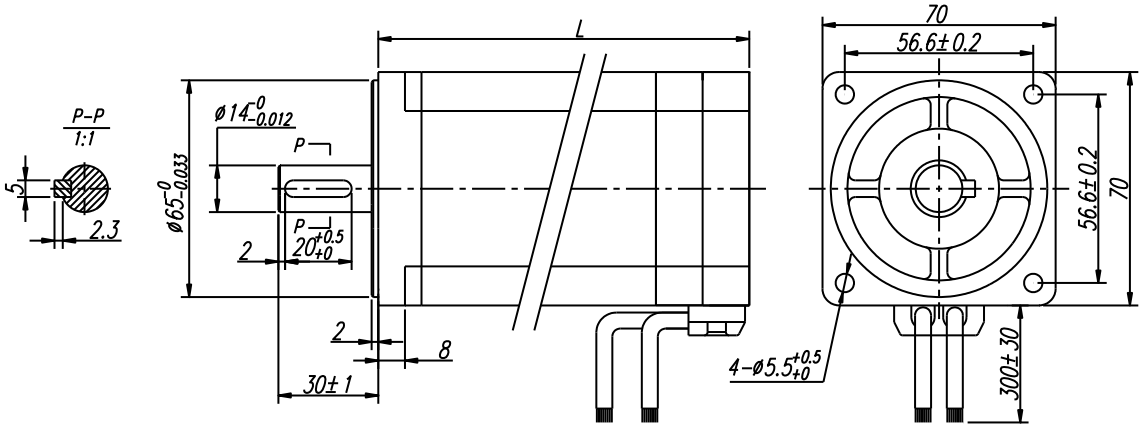
☐70mm | High Torque Type | Aluminum Case

Winding Connection	Star
Hall Effect Angle	120 ° Electric Angle
Shaft Run Out	0.025 mm
Ambient Temperature	-20 °C ~ +50 °C
Insulation Resistance	100 MΩ Min., 500VDC
Dielectric Strength	500 VDC for one minute

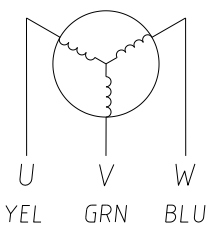
Specifications

Model	NBLH70AS100-430	NBLH70AS100-630	NBLH70AS130-430	NBLH70AS130-630	NBLH70AS160-630
No. of Phases	3	3	3	3	3
No. of Poles	8	8	8	8	8
Rated Voltage (VDC)	48	310	48	310	310
Rated Power (W)	157	157	314	314	471
Rated Current (A)	4.1	1.2	8.5	2.5	3.6
Peak Current (A)	12.3	3.6	25.4	7.5	10.8
Rated Torque (N.m)	0.5	0.5	1.0	1.0	1.5
Peak Torque (N.m)	1.5	1.5	3.0	3.0	4.5
Rated Speed (rpm)	3000	3000	3000	3000	3000
Rotor Inertia (kg.cm^2)	0.86	0.86	1.12	1.12	1.36
Torque Const. (N.m/A)	0.122	0.42	0.117	0.4	0.416
Back EMF Const. (V/Krpm)	12.76	43.62	12.31	43.88	43.62
Line-Line Resistance (Ω)	0.93	24	0.45	14.2	8
Line-Line Inductance (mH)	0.85	48	0.42	23	16
Length (mm)	99	99	129	129	159
Weight (kg)	1.35	1.35	2.0	2.0	2.6

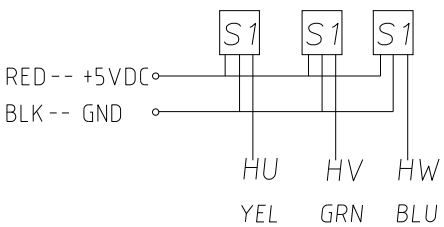
Mechanical Dimension



Winding Diagram



Hall Sensor



NBLH80AS Series

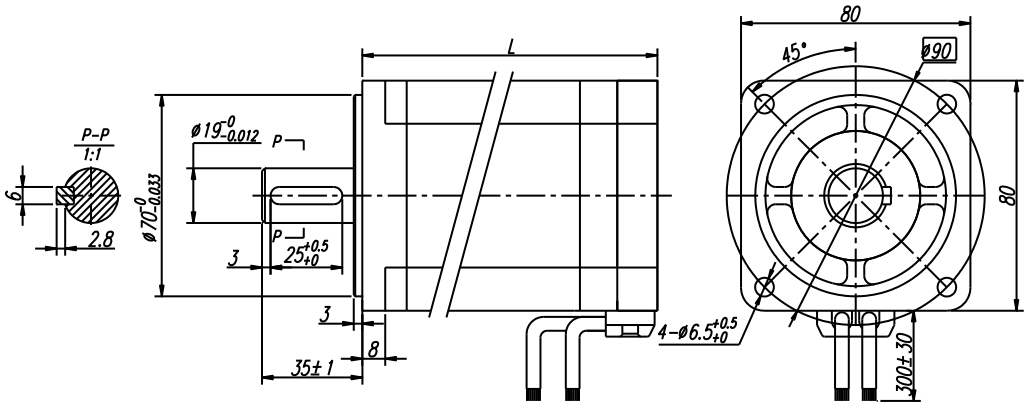
☐80mm | High Torque Type | Aluminum Case

Winding Connection	Star
Hall Effect Angle	120 ° Electric Angle
Shaft Run Out	0.025 mm
Ambient Temperature	-20 °C ~ +50 °C
Insulation Resistance	100 MΩ Min., 500VDC
Dielectric Strength	500 VDC for one minute

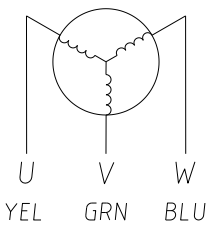
Specifications

Model	NBLH80AS103-430	NBLH80AS103-630	NBLH80AS133-630	NBLH80AS163-630
No. of Phases	3	3	3	3
No. of Poles	8	8	8	8
Rated Voltage (VDC)	48	310	310	310
Rated Power (W)	188	188	376	565
Rated Current (A)	5.0	1.5	2.96	4.5
Peak Current (A)	15.0	4.5	8.89	13.5
Rated Torque (N.m)	0.6	0.6	1.2	1.8
Peak Torque (N.m)	1.8	1.8	3.6	5.4
Rated Speed (rpm)	3000	3000	3000	3000
Rotor Inertia (kg.cm^2)	1.2	1.2	1.8	2.3
Torque Const. (N.m/A)	0.12	0.4	0.41	0.4
Back EMF Const. (V/Krpm)	12.56	41.88	42.00	41.88
Line-Line Resistance (Ω)	0.5	6.1	5.2	4.5
Line-Line Inductance (mH)	0.4	5.3	4.1	3.2
Length (mm)	103	103	133	163
Weight (kg)	1.9	1.9	2.7	3.5

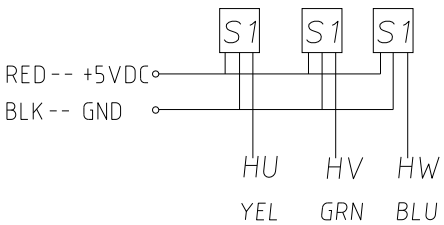
Mechanical Dimension



Winding Diagram



Hall Sensor



NBLH86AS Series

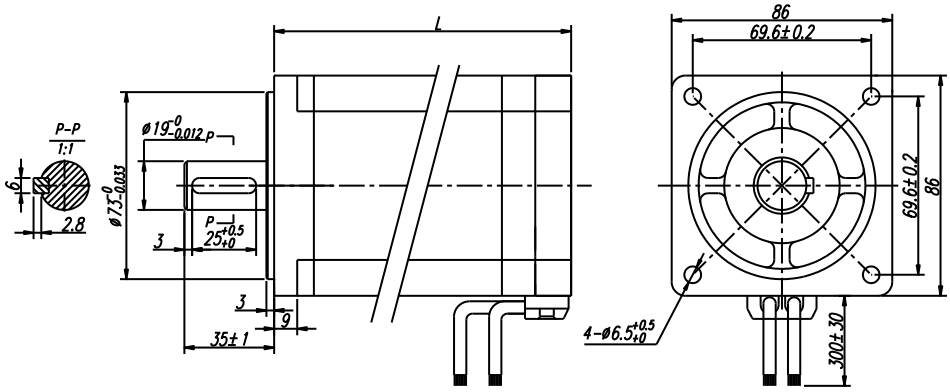
☐86mm | High Torque Type | Aluminum Case

Winding Connection	Star
Hall Effect Angle	120 ° Electric Angle
Shaft Run Out	0.025 mm
Ambient Temperature	-20 °C ~ +50 °C
Insulation Resistance	100 MΩ Min., 500VDC
Dielectric Strength	500 VDC for one minute

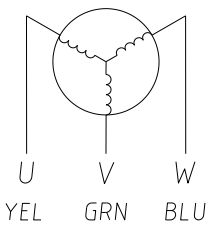
Specifications

Model	NBLH86AS103-430	NBLH86AS103-630	NBLH86AS133-630	NBLH86AS163-630
No. of Phases	3	3	3	3
No. of Poles	8	8	8	8
Rated Voltage (VDC)	48	310	310	310
Rated Power (W)	220	220	440	660
Rated Current (A)	5.8	1.7	3.42	5.2
Peak Current (A)	17.4	5.1	10.26	15.6
Rated Torque (N.m)	0.7	0.7	1.4	2.1
Peak Torque (N.m)	2.1	2.1	4.2	6.3
Rated Speed (rpm)	3000	3000	3000	3000
Rotor Inertia (kg.cm^2)	1.6	1.6	2.1	2.6
Torque Const. (N.m/A)	0.12	0.411	0.409	0.403
Back EMF Const. (V/Krpm)	12.6	43.03	42.85	42.28
Line-Line Resistance (Ω)	0.6	7.2	3.6	2.4
Line-Line Inductance (mH)	0.5	18.6	9.3	6.2
Length (mm)	103	103	133	163
Weight (kg)	2.0	2.0	3.0	4.0

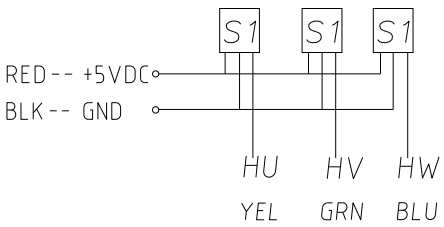
Mechanical Dimension



Winding Diagram



Hall Sensor



NBLE42AS Series

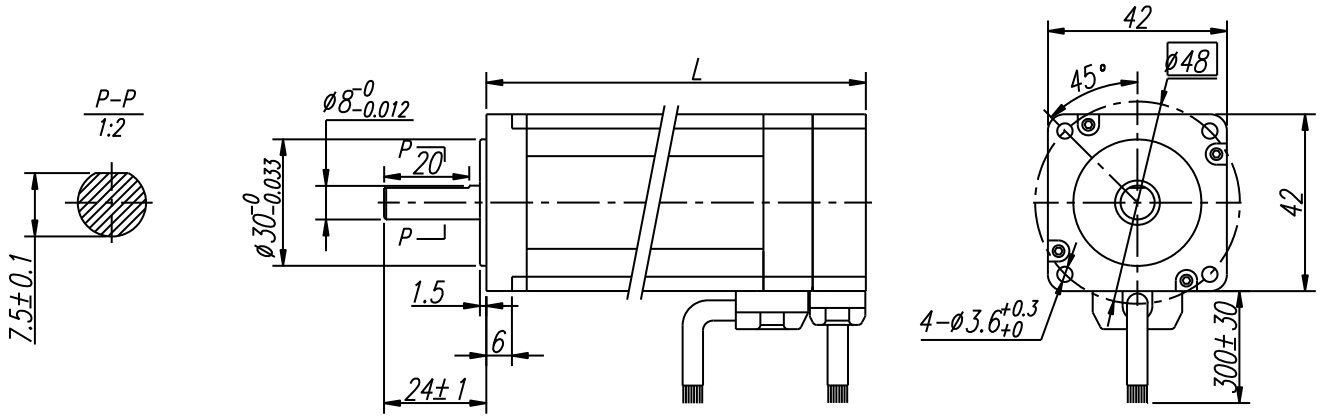
☐42mm | High Efficiency Type | Aluminum Case

Winding Connection	Star
Hall Effect Angle	120 ° Electric Angle
Shaft Run Out	0.025 mm
Ambient Temperature	-20 °C ~ +50 °C
Insulation Resistance	100 MΩ Min., 500VDC
Dielectric Strength	500 VDC for one minute

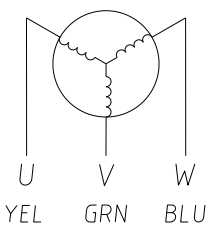
Specifications

Model	NBLE42AS70-630	NBLE42AS90-630
No. of Phases	3	3
No. of Poles	8	8
Rated Voltage (VDC)	310	310
Rated Power (W)	50	100
Rated Current (A)	0.65	1.2
Peak Current (A)	1.95	3.6
Rated Torque (N.m)	0.16	0.32
Peak Torque (N.m)	0.48	0.96
Rated Speed (rpm)	3000	3000
Rotor Inertia (g.cm^2)	31	59
Torque Const. (N.m/A)	0.265	0.265
Back EMF Const. (V/Krpm)	16	16
Line-Line Resistance (Ω)	16.6	5.53
Line-Line Inductance (mH)	14	6
Length (mm)	70	90
Weight (kg)	0.5	0.73

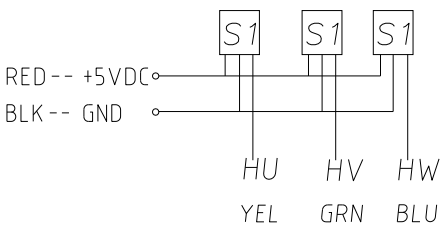
Mechanical Dimension



Winding Diagram



Hall Sensor



NBLE60AS Series

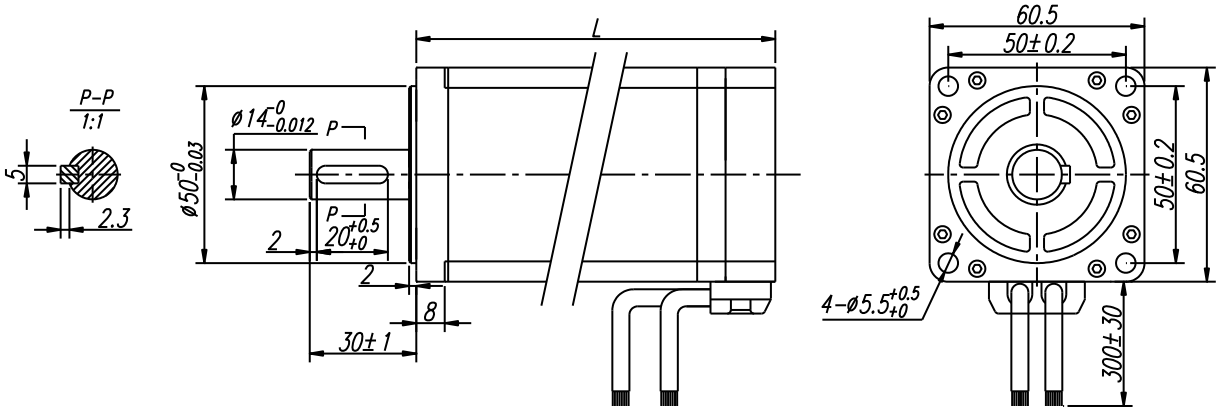
☐60mm | High Efficiency Type | Aluminum Case

Winding Connection	Star
Hall Effect Angle	120 ° Electric Angle
Shaft Run Out	0.025 mm
Ambient Temperature	-20 °C ~ +50 °C
Insulation Resistance	100 MΩ Min., 500VDC
Dielectric Strength	500 VDC for one minute

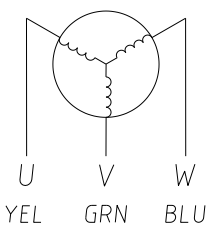
Specifications

Model	NBLE60AS90-630	NBLE60AS120-630
No. of Phases	3	3
No. of Poles	8	8
Rated Voltage (VDC)	310	310
Rated Power (W)	200	400
Rated Current (A)	1.5	2.8
Peak Current (A)	4.5	8.4
Rated Torque (N.m)	0.637	1.27
Peak Torque (N.m)	1.911	3.8
Rated Speed (rpm)	3000	3000
Rotor Inertia (kg.cm^2)	0.8	1.0
Torque Const. (N.m/A)	0.42	0.5
Back EMF Const. (V/Krpm)	28	28
Line-Line Resistance (Ω)	11.6	5.83
Line-Line Inductance (mH)	22	12.23
Length (mm)	89	119
Weight (kg)	1.1	1.35

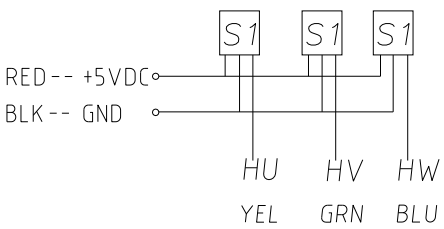
Mechanical Dimension



Winding Diagram



Hall Sensor



NBLE80AS Series

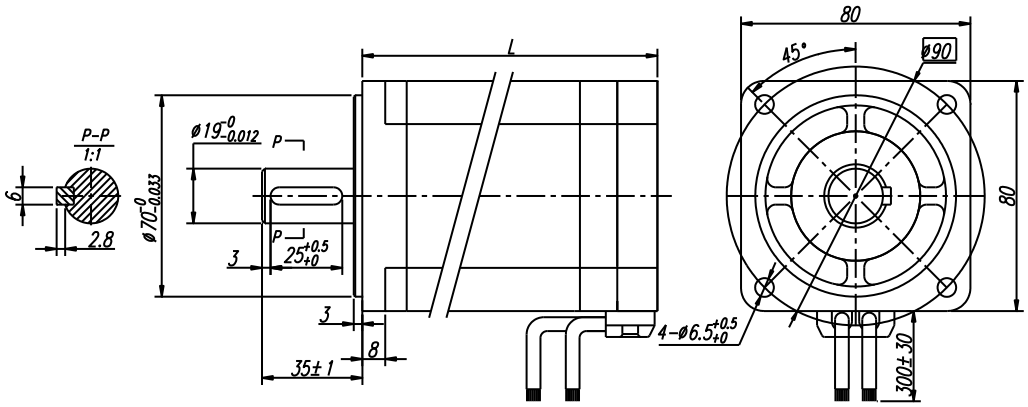
☐80mm | High Efficiency Type | Aluminum Case

Winding Connection	Star
Hall Effect Angle	120 ° Electric Angle
Shaft Run Out	0.025 mm
Ambient Temperature	-20 °C ~ +50 °C
Insulation Resistance	100 MΩ Min., 500VDC
Dielectric Strength	500 VDC for one minute

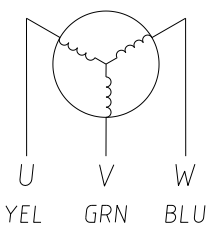
Specifications

Model	NBLE80AS103-630	NBLE80AS133-630
No. of Phases	3	3
No. of Poles	8	8
Rated Voltage (VDC)	310	310
Rated Power (W)	400	750
Rated Current (A)	3.1	5.7
Peak Current (A)	9.3	17
Rated Torque (N.m)	1.27	2.39
Peak Torque (N.m)	3.8	7.1
Rated Speed (rpm)	3000	3000
Rotor Inertia (kg.cm^2)	1.1	1.82
Torque Const. (N.m/A)	0.41	0.42
Back EMF Const. (V/Krpm)	42.9	43.9
Line-Line Resistance (Ω)	4.44	2.88
Line-Line Inductance (mH)	7.93	6.4
Length (mm)	103	133
Weight (kg)	1.8	2.9

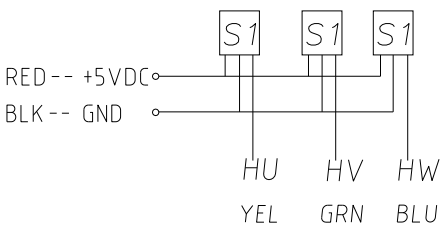
Mechanical Dimension



Winding Diagram



Hall Sensor



NBLE110AS Series

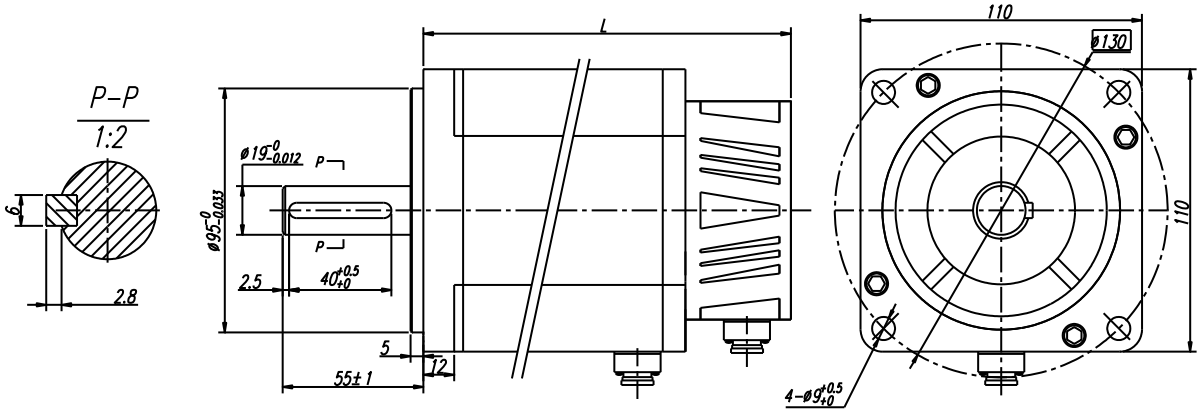
☐110mm | High Efficiency Type | Aluminum Case

Winding Connection	Star
Hall Effect Angle	120 ° Electric Angle
Shaft Run Out	0.025 mm
Ambient Temperature	-20 °C ~ +50 °C
Insulation Resistance	100 MΩ Min., 500VDC
Dielectric Strength	500 VDC for one minute

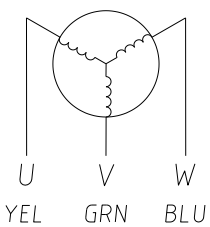
Specifications

Model	NBLE110AS160-630	NBLE110AS190-630	NBLE110AS220-630
No. of Phases	3	3	3
No. of Poles	8	8	8
Rated Voltage (VDC)	310	310	310
Rated Power (W)	600	1200	1800
Rated Current (A)	2.5	5.0	6.0
Peak Current (A)	7.5	15.0	18.0
Rated Torque (N.m)	2.0	4.0	6.0
Peak Torque (N.m)	6.0	12.0	18.0
Rated Speed (rpm)	3000	3000	3000
Rotor Inertia (kg.cm^2)	3.1	5.4	7.6
Torque Const. (N.m/A)	0.8	0.8	1.0
Back EMF Const. (V/Krpm)	56	54	60
Line-Line Resistance (Ω)	3.6	1.09	0.81
Line-Line Inductance (mH)	8.32	3.3	2.59
Length (mm)	159	189	219
Weight (kg)	4.5	5.5	6.7

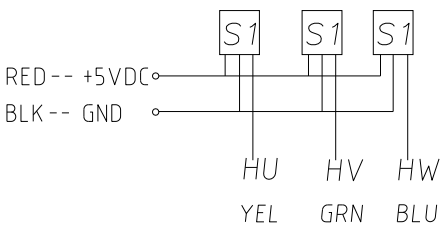
Mechanical Dimension



Winding Diagram



Hall Sensor



B

NBLR Series
Brushless DC Motor Drive

Description

Novara's NBLR series Brushless DC motor drives are high-performance, high-precision, high-reliability brushless drives, powering up to 400W brushless DC motors. By the high-efficiency MOS power component, they could offer smooth output torque, excellent overload capacity and velocity control. They also could make the motor run with low temperature rise, low noise, low vibration and long lifetime.

Applications

Together with Novara's BLDC motors, Novara's NBLR series Brushless DC motor drives are suitable for applications where require high stability, quick response, high speed, high reliability, such as medical equipment, home appliances, building controls, automotive, robotics, industrial automation, and so on.

Part Number

NBLR — **Novara's Brushless DC Motor Drive**

□□ — **Series Number**
05, 10, ...

Standard Versions

Model	Input Voltage	Max. Output Current	Max. Continuous Power	Input Analog Voltage	Size	Weight
	VDC	A	W	V	mm	Kg
NBLR05	12-48	4	150	0-5	92×57×21	0.09
NBLR10	12-48	10	400	0-5	118×76×34	0.25

Operating and Storage Environment

Operating Environment	**Ambient temperature**	0 to +50 °C (+32 to +122 °F) (non-freezing)
	Humidity	90% or less (non-condensing)
	Altitude	Up to 1000 m (3300 ft.) above sea level
	Surrounding atmosphere	No corrosive gas, dust, water or oil
Storage environment	**Ambient temperature**	-10 to +70 °C (+14 to +158 °F) (non-freezing)
	Humidity	90% or less (non-condensing)
	Altitude	Up to 3000 m (10000 ft.) above sea level
	Surrounding atmosphere	No corrosive gas, dust, water or oil
Heat sinking method		Natural Cooling

NBLR05

Brushless DC Motor Drive

Introduction

Novara's NBLR05 series Brushless DC motor drives are high-performance, high-precision, high-reliability brushless drives, powering up to 150W brushless DC motors. By the high-efficiency MOS power component, they could offer smooth output torque, excellent overload capacity and velocity control. They also could make the motor run with low temperature rise, low noise, low vibration and long lifetime.

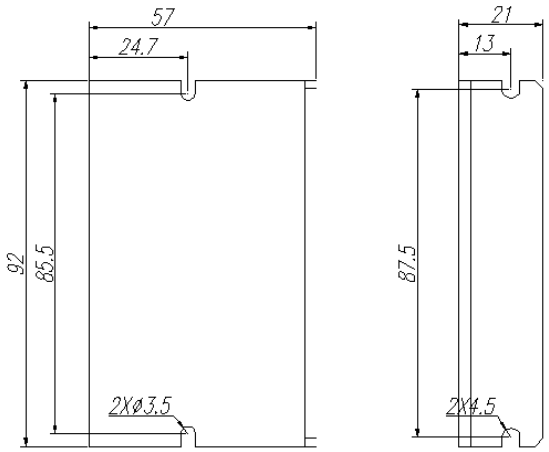
Features

- MOS power component technology
- 12~48VDC voltage input, power up to 150W
- Easy operation with on-board potentiometer or external analog
- Speed open-loop mode or speed closed-loop mode
- Strong protection
- Compact size

Technical Specifications

Technical Specification	**Max. Continuous Power**	150W
	Power Supply Voltage	12~48VDC
	Max. Output Current	4A
	I/O Input Voltage	5~24V
	Chopping Frequency	20KHz
	Input Analog Voltage	0-5VDC
	Protection Function	Under-voltage, over-voltage, over-load, over-current, etc.

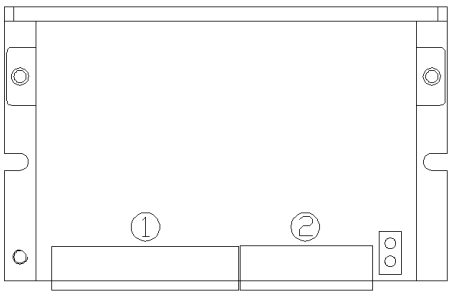
Mechanical Drawing and Installation



Drive Interfaces

① Power Supply, Motor Winding and Hall Sensor Connector

Pin	Function	Description
1	V+	Positive terminal of 12~48V power supply
2	V-	GND terminal of 12~48V power supply
3	U	Motor Winding U
4	V	Motor Winding V
5	W	Motor Winding W
6	HV	+5V Hall sensor power
7	HA	Hall sensor HA
8	HB	Hall sensor HB
9	HC	Hall sensor HC
10	GND	Signal ground



② Control Signal I/O

Pin	Function	Description
1	RUN/STOP	When enabled*, motor runs
2	CW/CCW	when enabled*, CCW rotation (view from motor shaft end), else CW rotation
3	BRAKE	When enabled*, the motor stops quickly
4	F-OUT	Drive output frequency (Pulse no. per revolution (equal as the magnetic pole pair no.), duty cycle 50%. E.g., 5 pulses for BLDC motor with 5-pair magnetic poles)
5	VRH	+5V, max. current of 100mA
6	VRM	External analog voltage 0~5VDC control (only effective when SW1 is set to be OFF)
7	COM (0V)	signal common terminal 0V (internal power supply 0V)

Introduction

Novara's NBLR10 series Brushless DC motor drives are high-performance, high-precision, high-reliability brushless drives, powering up to 400W brushless DC motors. By the high-efficiency MOS power component, they could offer smooth output torque, excellent overload capacity and velocity control. They also could make the motor run with low temperature rise, low noise, low vibration and long lifetime.

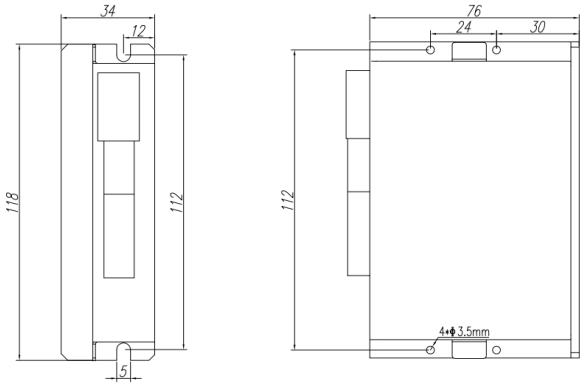
Features

- MOS power component technology
- 12~48VDC voltage input, power up to 400W
- Easy operation with on-board potentiometer or external analog
- Speed open-loop mode or speed closed-loop mode
- Strong protection
- Compact size

Technical Specifications

Technical Specification	**Max. Continuous Power**	400W
	Power Supply Voltage	12~48VDC
	Max. Output Current	10A
	I/O Input Voltage	5~24V
	Chopping Frequency	20KHz
	Input Analog Voltage	0-5VDC
	Protection Function	Under-voltage, over-voltage, over-load, over-current, etc.

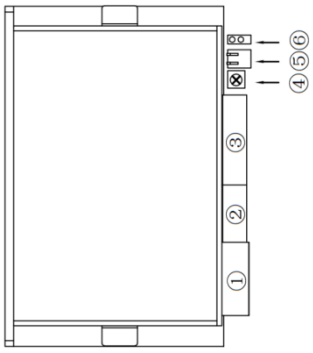
Mechanical Drawing and Installation



Drive Interfaces

① Power Supply and Motor Winding Connector

Pin	Function	Description
1	DC+	Positive terminal of 12~48V power supply
2	DC-	GND terminal of 12~48V power supply
3	U	Motor Winding U
4	V	Motor Winding V
5	W	Motor Winding W



② Hall Sensor Connector

Pin	Function	Description
1	Ha	Hall sensor Ha
2	Hb	Hall sensor Hb
3	Hc	Hall sensor Hc
4	Hall V+	+5V Hall sensor power
5	Hall V-	Signal ground

③ Control Signal I/O

Pin	Function	Description
1	RUN/STOP	When enabled*, motor runs
2	CW/CCW	when enabled*, CCW rotation (view from motor shaft end), else CW rotation
3	BRAKE	When enabled*, the motor stops quickly
4	F-OUT	Drive output frequency (Pulse no. per revolution (equal as the magnetic pole pair no.), duty cycle 50%. E.g., 5 pulses for BLDC motor with 5-pair magnetic poles)
5	ALARM	Motor alarm signal. When system runs error, this terminal output low level
6	VRH	+5V, max. current of 100mA
7	VRM	External analog voltage 0~5VDC control or 5V PWM (>5KHz) control (only effective when SW1 is set to be OFF)
8	COM (0V)	signal common terminal 0V (internal power supply 0V)

Memo