Datasheet of the High Voltage Easy Servo Drive

KL-110-80H

70-130VAC, 8.0A Peak, Closed-loop, No Tuning

Version 1.4

Features

- Hybrid servo control technology to combine advantages of open-loop stepper systems and brushless servo systems
- Closed-loop controls to eliminate lose of steps, stall or movement synchronization
- High starting torque and quick response
- Smooth motor movement with no vibration
- Excellent respond time, quick acceleration, and very high high-speed torque (30% over open-loop)
- Load-dependent dynamic current output from drive to motor to significantly motor heating deduction
- Input voltage from 70 to 130 VAC; MAX 8.0A peak current output from drive to motor
- Micro step resolution value from 200-51,200 (increased by 1) via software configuration
- Isolated control inputs of Pulse, Direction and Enable
- No tuning for plug and play setup
- On-board HMI for easy setup and configuration
- In-position and fault outputs to external motion controllers for complete system controls.
- Over voltage, over-current, and position-error protection
- Servo control for stepper motors with encoders up to NEMA 42

Description

By taking direct 110 / 120 or 220 / 230 VAC input, KL series high voltage easy servo drives can power large NEMA 34 and 42 easy servo motors and offer huge torque to applications with motion control systems.

KL series easy servo drives are based on the latest DSP technology and advanced control algorithm of combing brushless servo and stepper systems. They are featured with closed position loop, offering huge torque, excellent acceleration & quick response, no torque reservation, high standstill stiffness, extra low noise & heating, smooth motor movement, no hunting, no overshooting for almost zero settling time, and no tuning for almost all applications.

Applications

Due to combining the features of both brushless servo drives and stepper drives, KL series easy servo drives are suitable for both upgrading conventional stepper systems, and replacing brushless servo systems which have closed loop and high torque requirements.

KL series easy servo drives can also be implemented as high performance open loop stepper drives with direct 110 / 120 and / or 220 /230 VAC input.

K L easy servo drives and matching easy servo motors have been successfully implemented by many OEM clients in applications such as CNC routers, plasma, milling machines, engravers, packaging machines, printing equipments.

Specifications

Electrical Specifications

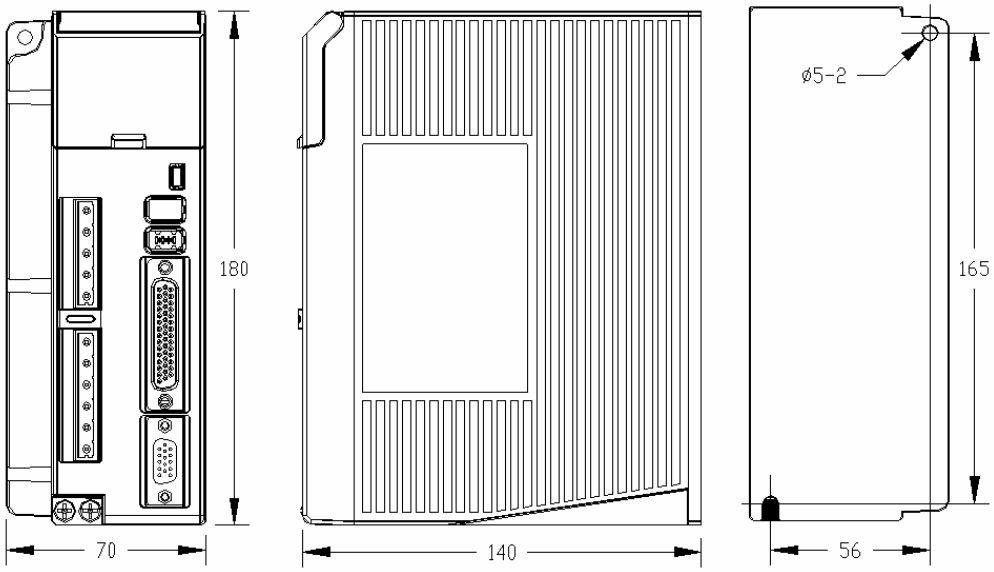
Parameters	KL-110-80H
Operating Voltage	70 - 130 VAC
Maximum Continuous Current	8.0 A
MAX Step Frequency	200KHz or 500KHz (Software Configuration)
Step, Direction and Enable Voltage	5 – 24 V
Logic Signal Input Current	7 – 20 mA

Control Specifications

Parameters	KL-110-80H
Command Input	Step/Direction, CW/CCW
Enable/Disable Input	Differential
Alarm Signal Output	Isolated OC Output
Configuration Interface	On-board HMI or RS232 communication
Regeneration Resistor	No

Mechanical Specifications

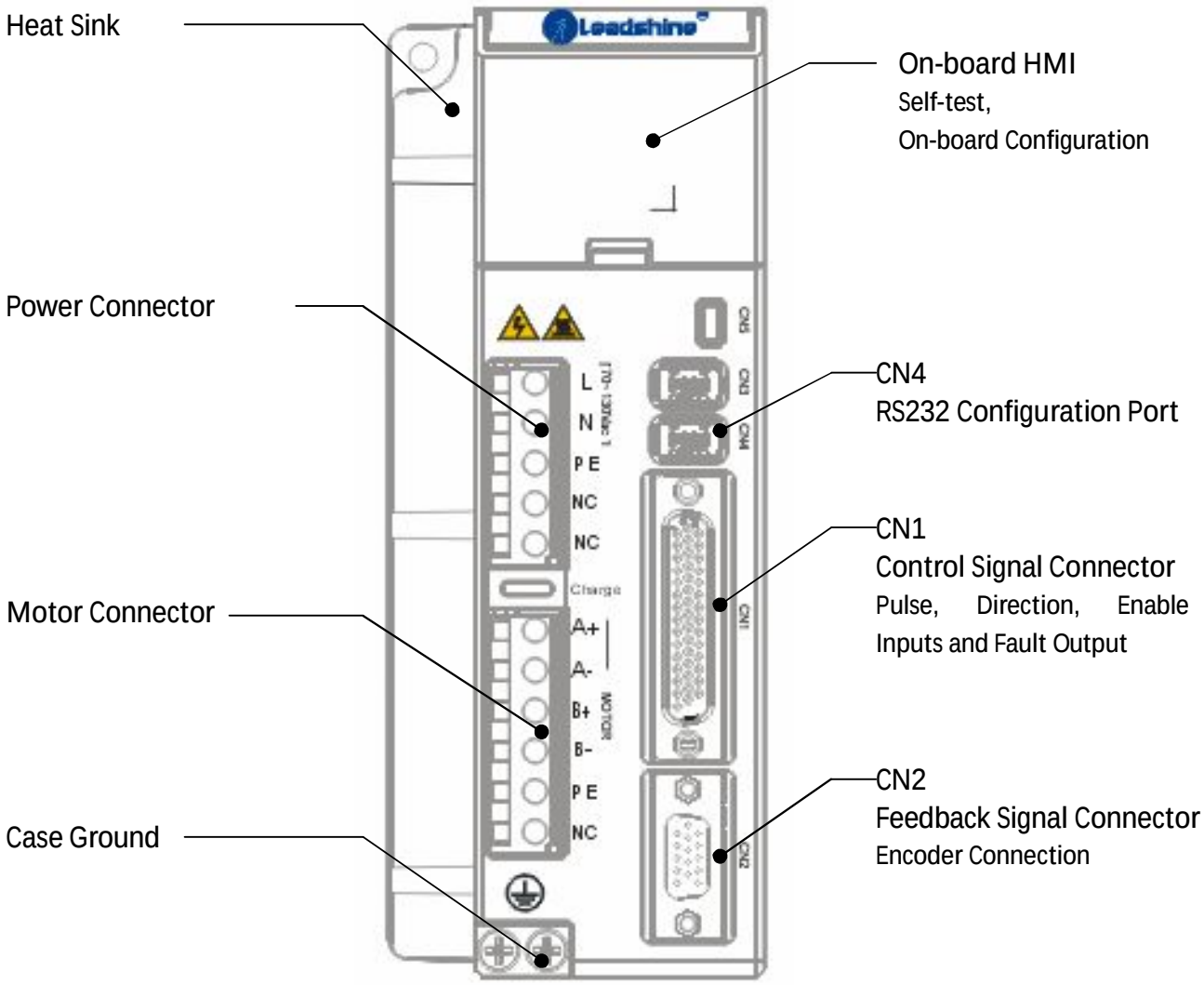
Parameters	KL-110-80H
Size	180mm * 140mm* 70mm
Weight	1500 g



Operating Environment

Cooling	Natural cooling or Forced cooling
Ambient Temperature	0 – 40 °C
Humidity	40% RH to 90% RH, No Condensation
Vibration	5.9 m/s^2 MAX
Storage Temperature	-20 °C to 80 °C

Drive Appearance and Interfaces



Connectors and Pin Assignments

CN1 – Control Signal Connector			
D-Sub, 26 Pin, Female			
Pin	Name	I/O	Description
1	NC	-	No connection.
2	NC	-	No Connection.
3	PUL+	I	Pulse signal: In single pulse (pulse/direction) mode, this input represents pulse signal, each rising or falling edge active (software configurable); In double pulse mode (software configurable), this input represents clockwise (CW) pulse, active both at high level and low level. 5-24V when PUL-HIGH, 0-0.5V when PUL-LOW. For reliable response, pulse width should be longer than 2.5uS(200K bandwidth) or 1uS(500K bandwidth)
4	PUL-	I	
5	DIR+	I	Direction Signal: In single-pulse mode, this signal has low/high voltage levels, representing two directions of motor rotation. In double-pulse mode (software configurable), this signal is counter-clock (CCW) pulse, active both at high level and low level. For reliable motion response, DIR signal should be ahead of PUL signal by 5μs at least. 5-24V when DIR-HIGH, 0-0.5V when DIR-LOW. The direction signal's polarity is software configurable.
6	DIR-	I	
7	ALM+	O	Alarm Signal: OC (Open Collector) output signal, activated when one of the following protection is activated: over-voltage, over current, braking error and position following error. They can sink or source MAX 100mA current at 5V. The active impedance of alarm signal is software configurable.
8	ALM-	O	
9	NC	-	No connection.
10	NC	-	No connection.
11	ENA+	O	Enable Signal: This signal is used for enabling/disabling the driver. By default, high level (NPN control signal) for enabling the driver and low level for disabling the driver. It is usually left UNCONNECTED (ENABLED). Please note that the PNP and Differential control signals are on the contrary, namely Low level for enabling. The active level of ENA signal is software configurable.
12	ENA-	O	
13	NC	-	No connection.
14	NC	-	No connection.
15	NC	-	No connection.
16	NC	-	No connection.
17	NC	-	No connection.
18	NC	-	No connection.
20	NC	-	No connection.
21	NC	-	No connection.
22	NC	-	No connection.

CN1 – Control Signal Connector			
D-Sub, 26 Pin, Female			
Pin	Name	I/O	Description
23	NC	-	No connection.
24	NC	-	No connection.
25	NC	-	No connection.
26	NC	-	No connection.
27	NC	-	No connection.
28	NC	-	No connection.
29	NC	-	No connection.
30	NC	-	No connection.
31	NC	-	No connection.
32	NC	-	No connection.
33	NC	-	No connection.
34	NC	-	No connection.
35	NC	-	No connection.
36	NC	-	No connection.
37	NC	-	No connection.
38	NC	-	No Connection.
39	NC	-	No connection.
40	NC	-	No connection.
41	NC	-	No connection.
42	NC	-	No connection.
43	NC	-	No connection.
44	NC	-	No connection.
	FG	-	Ground Terminal for shield

CN2 – Feedback Signal (Encoder) Connector			
HDD15, 15Pin, Female			
Pin	Name	I/O	Description
1	EA+	I	Encoder A+ input
2	EB+	I	Encoder B+ input
3	EGND	I/O	+5V output return ground
4	NC	I	No Connection.
5	NC	I	No Connection.
6	FG	I	Ground terminal for shield
7	NC	I	No Connection
8	NC	I	No Connection
9	NC	I	No Connection.
10	NC	I	No Connection.
11	EA-	I	Encoder A- input
12	EB-	I	Encoder B- input
13	+5V	O	+5V power output for encoder, MAX 100mA.
14	NC	I	No Connection.
15	NC	I	No Connection.

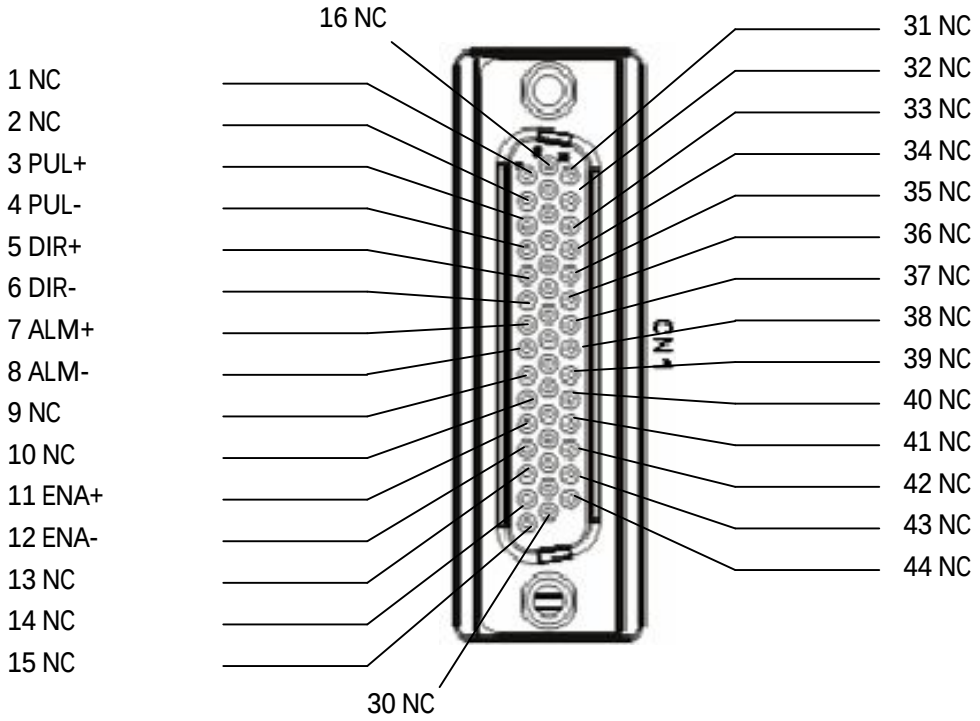
CN4 – RS232 Communication Connector			
RS232		Can be connected to PC for drive configuration or servo tuning. Recommended twisted shielded c able and cable length < 2 meter.	
Pin	Name	I/O	Description
1	GND	GND	Ground.
2	TxD	O	RS232 transmit.
3	+5V	O	Reserved +5V power output (Note: Do not connect it to RS232 port)
4	RxD	O	RS232 receive.
5	NC	-	NC
6	NC	-	NC

Power Connector:			
Pin	Name	I/O	Description
1	L	I	Power supply input connected to 70- 130VAC.
2	N	I	
3	PE	-	Case ground
4	NC	-	No connection.
5	NC	-	No connection.

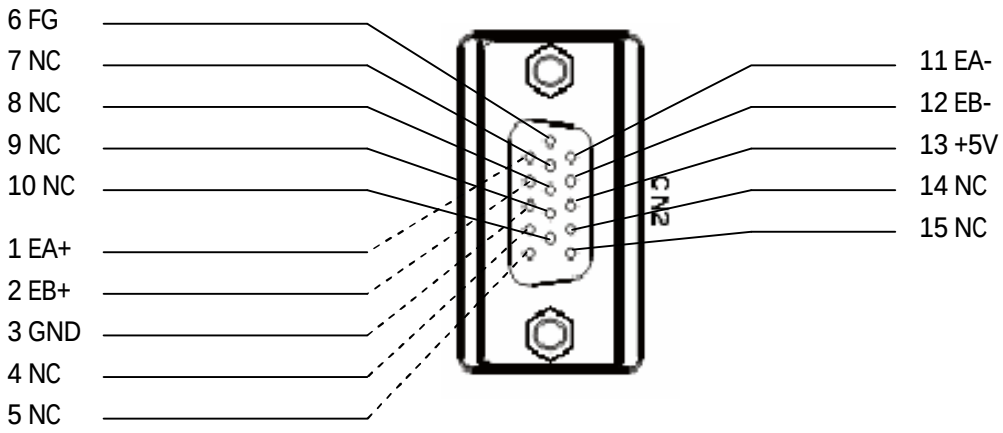
Motor Connector			
Pin	Name	I/O	Description
1	A+	O	Motor phase A+
2	A-	O	Motor phase A-
3	B+	O	Motor phase B+
4	B-	-	Motor phase B-
5	PE	-	Case ground
6	NC	-	No connection

Connector Pin-Out

CN1 – Control Signal Connector

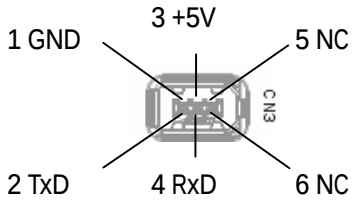


CN2 – Feedback Signal Connector

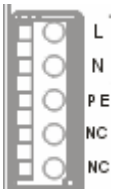


Connector Pin-Out (Continued)

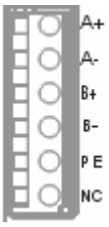
CN4 – RS232 & RS485 Connector



CN5 –Power Connector

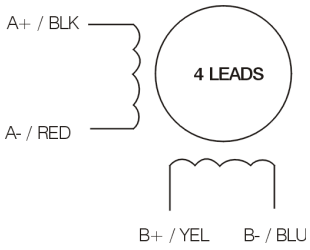


CN6 – Motor Connector



Easy Servo Motors

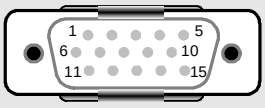
			Wiring Diagram
Step Angle (°)	1.8	1.8	
Holding Torque (N.m)	8.0	12.0	
Phase Current (A)	5.0	5.5	
Phase Resistance (Ohm)	-	-	
Phase Inductance (mH)	-	-	
Shaft Inertia (g.cm^2)	-	-	
Weight (Kg)	4.0	5.6	
Encoder (lines / Rev.)	1000	1000	



Motor Encoder Cable Pin-Out

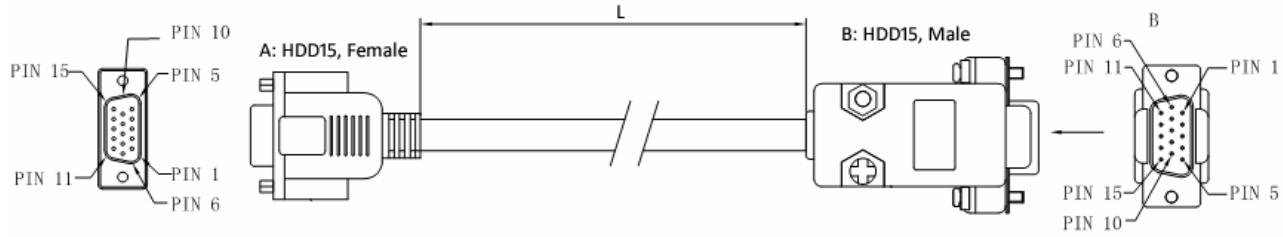
Pin	Name	Wire Color	I/O	Description
1	EA+	Black	O	Channel A+ output
2	VCC	Red	I	+5V power input
3	GND	White	GND	Ground
11	EB+	Yellow	O	Channel B+ output
12	EB-	Green	O	Channel B- output
13	EA-	Blue	O	Channel A- output

HDD15 Male



Motor Encoder Extension Cable

CABLEG



Pin Assignments

A: HDD15 Female Pin	Wire Color	B: HDD15 Male Pin	Name	Description
1	Black	1	EA+	Channel A+
2	Red	13	VCC	+5V power input
3	White	3	GND	+5V GND
11	Yellow	2	EB+	Channel B+
12	Green	12	EB-	Channel B-
13	Blue	11	EA-	Channel A-

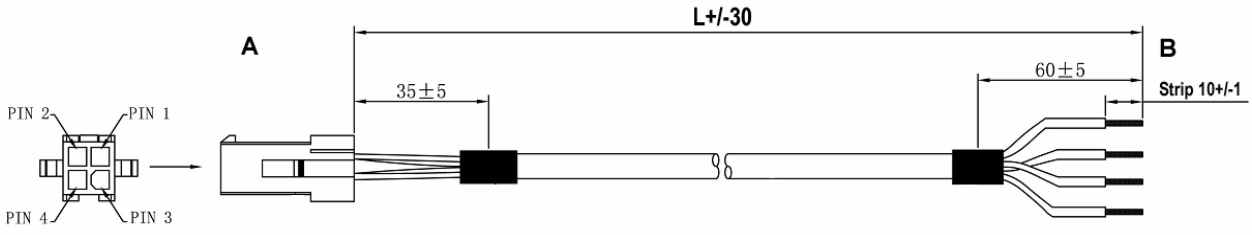
Cable Length

Part Number	L	Matching Motor
CABLEG-BM3M0	3.0m	ES-MH23480, ES-MH234120
CABLEG-BM8M0	8.0m	
CABLEG-BM10M0	10.0m	
CABLEG-BM12M0	12.0m	

Note: The encoder extension cable must be connected between the ES-MH2 motor and the ES-DH1208. You can not connect the motor's encoder cable to the ES-DH1208 directly.

Motor Power Extension Cable

CABLEH-RZXMX



Motor Power Extension Cable (Continued)

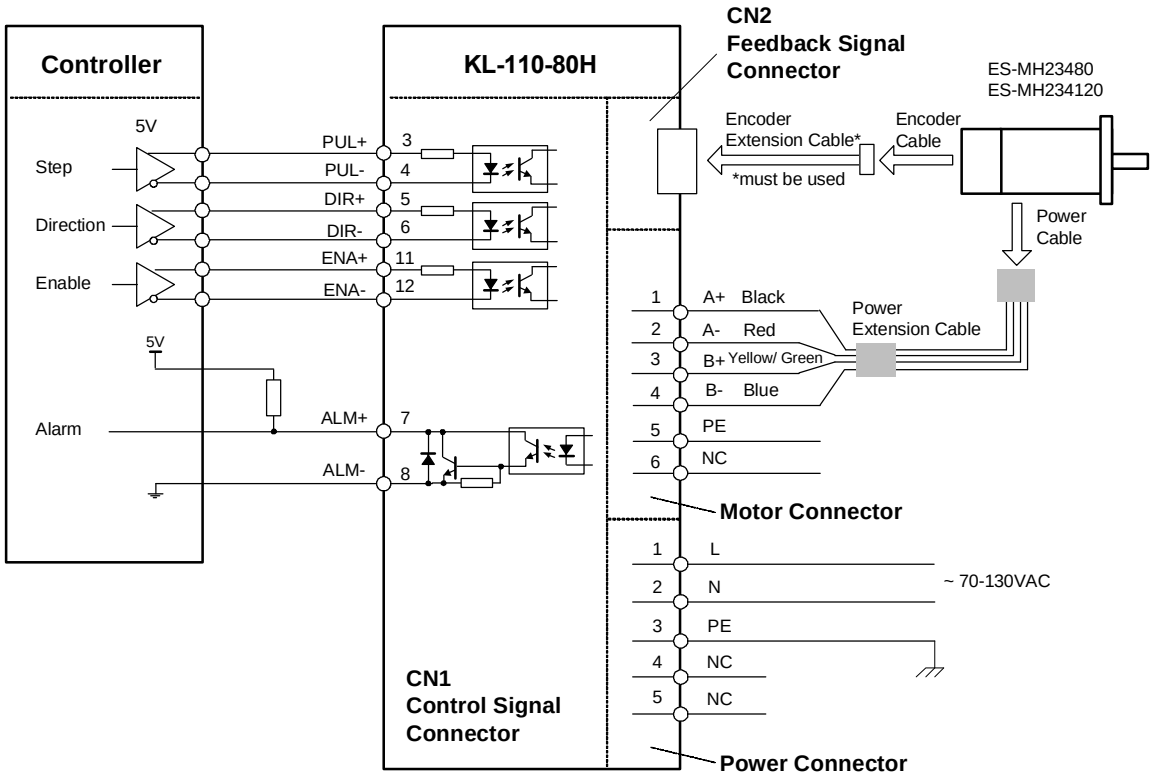
Pin Assignments

A	B	Name	Description
Pin	Wire Color		
1	Blue	B-	Motor Phase B-
2	Red	A-	Motor Phase A-
3	Black	A+	Motor Phase A+
4	Yellow / Green	B+	Motor Phase B+

Cable Length

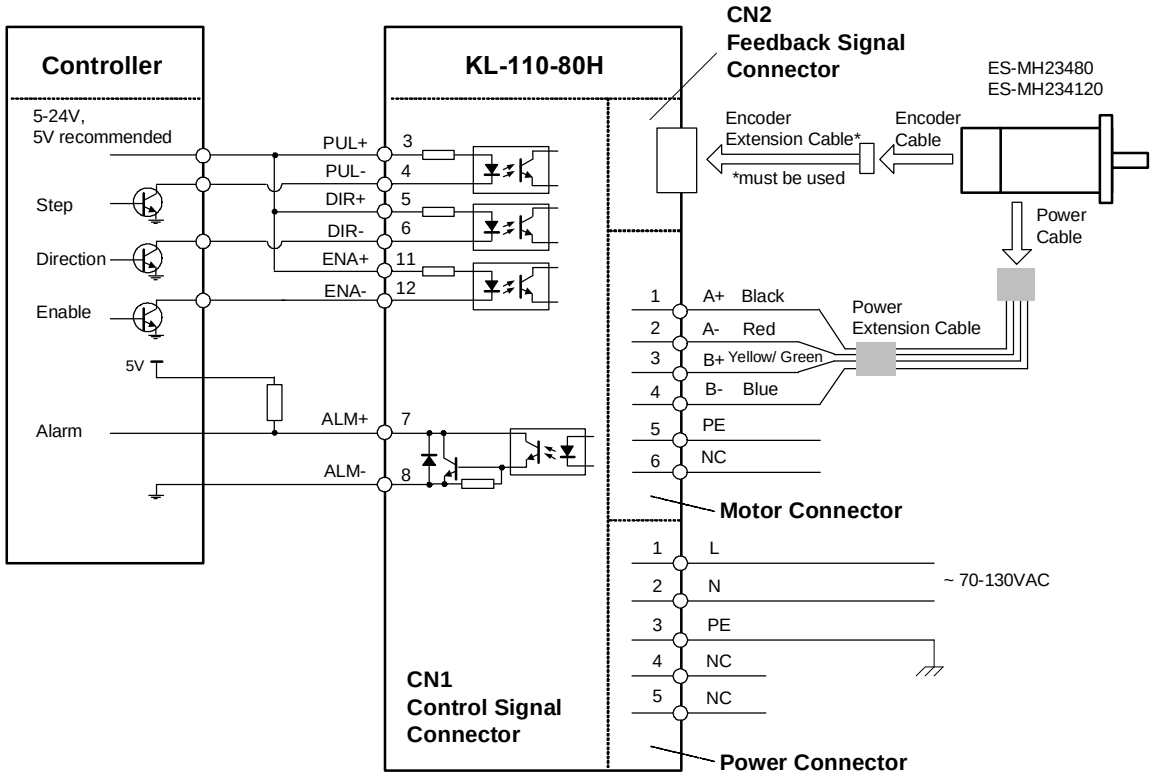
Part Number	L
CABLEH-RZ3M0	3.0m
CABLEH-RZ5M0	5.0m
CABLEH-RZ10M0	10.0m

Typical Connections

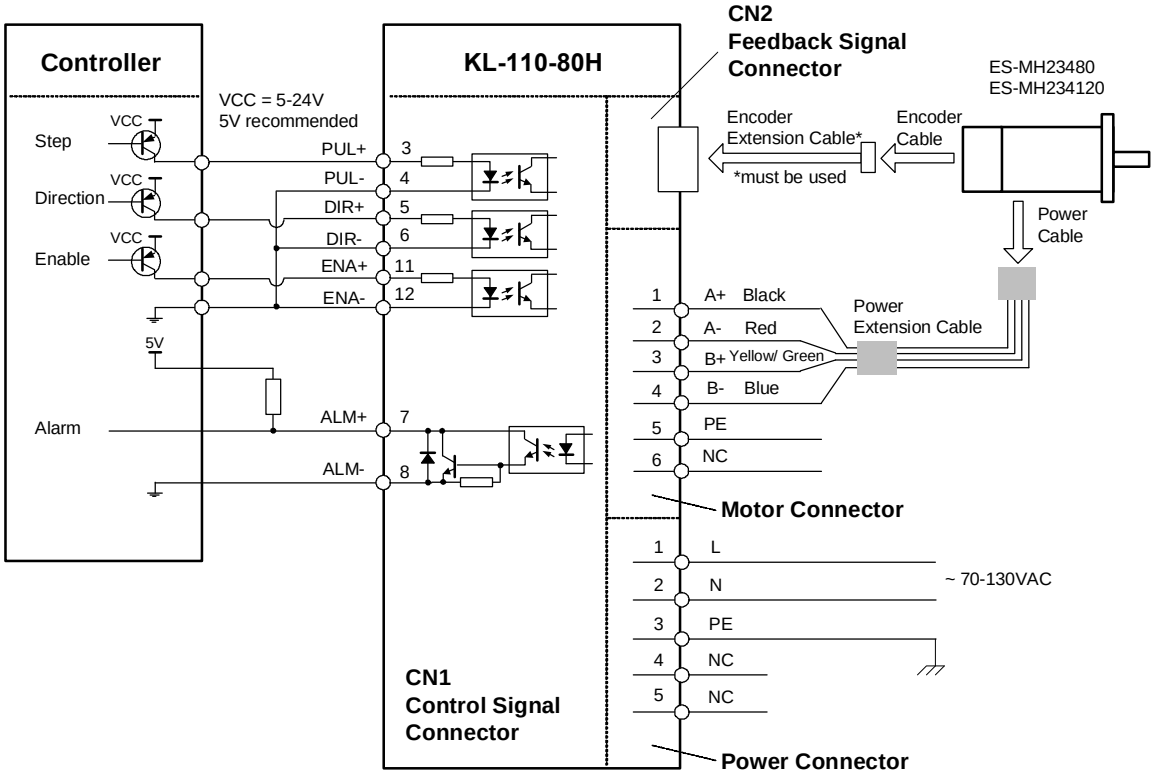


Connections to controller of differential output

Typical Connections (Continued)



Connection to controller of sinking output



Connection to controller of sourcing output