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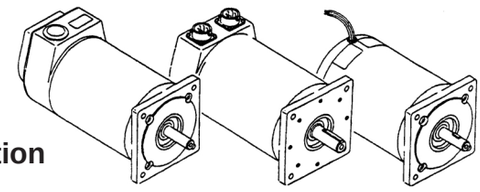
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Find the *Kollmorgen / Pacific Scientific E34HRFT-LNS-NS-02* at our website: *Click HERE*

INSTALLATION BULLETIN

NEMA 23, 34 & 42 Hybrid Step Motors

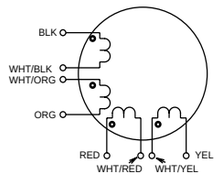
- **Power Connections**
- **Phase Sequencing Tables**
- **Encoder Options**
- **Installation Guidelines**
- **Warranty/Return Authorization**



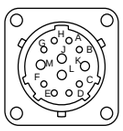
Power Connections: 8 flying leads, 8 terminals or MS connector.

The 8-lead motor is the most versatile configuration. It may be connected by the user in choice of 8-lead, 4-lead (series or parallel) or 6-lead configuration.

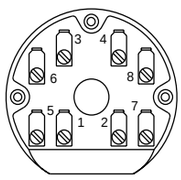
CONNECTION	DRIVER CONNECTION	LEAD COLOR	TERMINAL #	MS PIN OUT
4-LEAD BIPOLAR	A	BLACK (BLK)	1	A
SERIES	$\overline{A}$	ORANGE (ORG)	3	B
	B	RED	2	C
	$\overline{B}$	YELLOW (YEL)	4	D
	NONE	WHT/BLK & WHT/ORG	6 & 5	E & F
	NONE	WHT/RED & WHT/YEL	8 & 7	G & H
4-LEAD BIPOLAR	A	BLK & WHT/ORG	1 & 5	A & F
PARALLEL	$\overline{A}$	ORG & WHT/BLK	3 & 6	B & E
	B	RED & WHT/YEL	2 & 7	C & H
	$\overline{B}$	YEL & WHT/RED	4 & 8	D & G
6-LEAD UNIPOLAR	A	BLACK (BLK)	1	A
	B	ORANGE (ORG)	3	B
	C	RED	2	C
	D	YELLOW (YEL)	4	D
	+V	WHT/BLK & WHT/ORG	6 & 5	E & F
	+V	WHT/RED & WHT/YEL	8 & 7	G & H
GROUND[3]		GREEN/YELLOW		M



8-Lead Configuration



MS Connector
NEMA 34 and 42



Terminal Board
NEMA 34 and 42

MOTOR POWER CONNECTOR
MS3122E14-12P

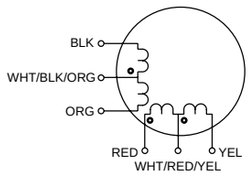
SUGGESTED MATING CONNECTOR	
PAC SCI P.N.	**MS P.N.**
SZ00009	MS3116F14-12S

NOTE:
1. MS Pins J, K, L not used. Pin M is ground.
2. See phase sequencing tables.
3. Only the NEMA 23 flying lead motors DO NOT have the grn/yel ground wire.

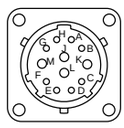
Power Connections: 6 flying leads, 6 terminals or MS connector.

The 6-lead motor is normally used with unipolar drives. In some cases, the 6-lead motor can be used in a 4-lead series configuration for use with bipolar drives.

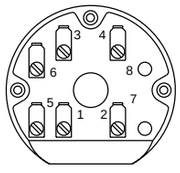
CONNECTION	DRIVER CONNECTION	LEAD COLOR	TERMINAL #	MS PIN OUT
6-LEAD UNIPOLAR	A	BLACK (BLK)	1	A
	B	ORANGE (ORG)	3	B
	C	RED	2	C
	D	YELLOW (YEL)	4	D
	+V	WHT/BLK/ORG	5	J
	+V	WHT/RED/YEL	6	L
4-LEAD BIPOLAR	A	BLACK (BLK)	1	A
SERIES	$\overline{A}$	ORANGE (ORG)	3	B
	B	RED	2	C
	$\overline{B}$	YELLOW (YEL)	4	D
	NONE	WHT/BLK/ORG	5	J
	NONE	WHT/RED/YEL	6	L
GROUND		GREEN/YELLOW		M



6-Lead Configuration



MS Connector
NEMA 34 and 42



Terminal Board
NEMA 34 and 42

MOTOR POWER CONNECTOR
MS3122E14-12P

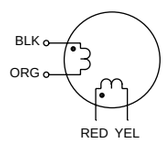
SUGGESTED MATING CONNECTOR	
PAC SCI P.N.	MS P.N.
SZ00009	MS3116F14-12S

NOTE:
1. Terminals 7 and 8 are not used.
2. MS Pins E, F, G, H, K not used.
3. See phase sequencing tables.

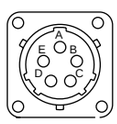
Power Connections: 4 flying leads, 4 terminals or MS connector.

The 4-lead motor is for use with bipolar drives.

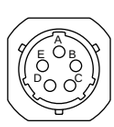
CONNECTION	DRIVER CONNECTION	LEAD COLOR	TERMINAL #	MS PIN OUT
4-LEAD BIPOLAR	A	BLACK	1	A
	$\overline{A}$	ORANGE	3	B
	B	RED	2	C
	$\overline{B}$	YELLOW	4	D
GROUND		GREEN/YEL		E



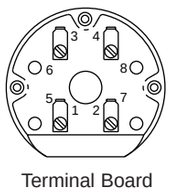
4-Lead Configuration



MS Connector
NEMA 34 and 42



MS Connector
NEMA 23



Terminal Board

MOTOR POWER CONNECTOR	
NEMA 34 & 42	NEMA 23
MS3122E14-5P	MS3121F14-5P

SUGGESTED MATING CONNECTOR NEMA 23, 34 & 42	
PAC SCI P.N.	MS P.N.
SZ00007	MS3116F14-5S

Phase Sequencing Tables:

DRIVER CONNECTION

STEP	A	$\overline{A}$	B	$\overline{B}$
1	+	—	0	0
2	+	—	+	—
3	0	0	+	—
4	—	+	+	—
5	—	+	0	0
6	—	+	—	+
7	0	0	—	+
8	+	—	—	+

CCW ↓ ↑ CW

BIPOLAR HALF STEP
PHASE SEQUENCING

DRIVER CONNECTION

STEP	A	$\overline{A}$	B	$\overline{B}$
1	+	—	—	+
2	—	+	—	+
3	—	+	+	—
4	+	—	+	—
1	+	—	—	+

CCW ↓ ↑ CW

BIPOLAR FULL STEP
PHASE SEQUENCING

STEP	A	B	C	D
1	GND	0	GND	0
2	0	GND	GND	0
3	0	GND	0	GND
4	GND	0	0	GND
1	GND	0	GND	0

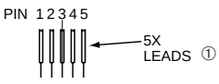
CCW ↓ ↑ CW

UNIPOLAR FULL STEP
PHASE SEQUENCING

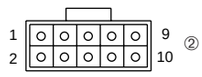
NOTES:
1. 0 = OFF OR OPEN.
2. + = POSITIVE CURRENT FLOW.
3. — = NEGATIVE CURRENT FLOW.

NEMA 23 Encoder Option

The standard encoder is the Agilent Technologies HEDS 5600 Series.



PIN	COLOR	FUNCTION
1	BLACK	GROUND
2	BLUE	Z
3	WHITE	A
4	RED	+5V
5	BROWN	B

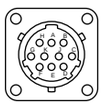


PIN	FUNCTION
1	N/C
2	+5V
3	GROUND
4	N/C
5	$\overline{A}$
6	A
7	$\overline{B}$
8	B
9	$\overline{Z}$
10	Z

Notes:
① Leads are terminated with Agilent Technologies HEDS-8903 connector
② Suggested mating connector: BERG 65-692-001 or equivalent

NEMA 34, NEMA42 Encoder Options

With integral optical encoder.

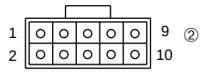


ENCODER CONNECTOR ①

PIN	FUNCTION
A	CHANNEL A
B	CHANNEL $\overline{A}$
C	CHANNEL B
D	CHANNEL $\overline{B}$
E	CHANNEL Z
F	CHANNEL $\overline{Z}$
G	+ 5 VDC
H	5 VDC RTN
K	N/C
J	N/C

MOTOR FEEDBACK CONNECTOR
MS3122E12-10P

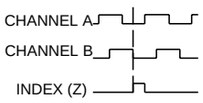
SUGGESTED MATING CONNECTOR	
PAC SCI P.N.	MS P.N.
SZ00008	MS3116F12-10S



PIN	FUNCTION
1	N/C
2	+5V
3	GROUND
4	N/C
5	$\overline{A}$
6	A
7	$\overline{B}$
8	B
9	$\overline{Z}$
10	Z

MATING CONNECTOR NOT OFFERED SUGGESTED MFR. PART NUMBERS
BERG P/N 65846-010 MOLEX P/N 22-55-2102

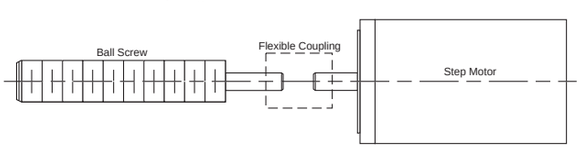
ENCODER OUTPUT
FOR CW DIRECTION OF ROTATION WHEN VIEWED FROM MOTOR DRIVE SHAFT END. (COMPLEMENTS NOT SHOWN) MIN. EDGE SEPARATION 45¡. INDEX GATED TO $\overline{A}$ AND $\overline{B}$.



Notes:
① NEMA 34, NEMA 42 system construction with MS connector
② NEMA 34, regular construction only

Installing the motor

1. Mounting
   - Mount the motor tightly against a metal surface with good thermal conductivity, such as aluminum or steel.
   - Secure the motor firmly using hexagonal socket screws and nuts or an equivalent method.
2. Alignment of the load
   - When connecting the load to the shaft, assure that the longitudinal axes of both load and shaft are aligned. Use of a flexible coupling or similar device is recommended.



   - When machining the motor shaft, or connecting it to a pulley or other device, do not subject to shaft to a thrust load, overhanging load or shock.

CAUTION

1. Do not disassemble the motor, drop it or subject it to shock
   - Disassembly results in a considerable reduction in motor performance. Dropping it or subjecting it to shock may cause internal damage. Any of the above conditions may void the warranty.
2. Do not subject the motor to any of the following conditions:
   - Locations where strong vibrations or shock occur
   - Dusty locations (unless IP65)
   - Locations where water, oil or other liquids are likely to come in contact with the motor (unless IP65)
   - Locations where the ambient temperature is outside the permissible temperature range of -20°C (-4°F) to +40°C (+104°F)
3. Temperature rise
   - The temperature of the motor's outer surface should not exceed +140°C (+284°F).

Warranty Policy / Return Authorization

1. Pacific Scientific warrants motor to be free from defects in material and workmanship for two years from the date of manufacture as determined by the date code on the product label. The warranty does not include damage resulting from misapplication, or damage resulting from abuse, overload or overheat conditions, or from failure to provide adequate maintenance.

2. Prior to returning any products for repair, authorization must first be received from the Danaher Motion Customer Support Group (Phone 815-226-3100, Fax 815-226-3148). The Customer Support Group will issue a Return Material Authorization number which must be referenced on the packing slip and on the outside of the shipping container of the returned product(s). Returns without a valid Return Material Authorization number will not be accepted.

PACIFIC SCIENTIFIC

DanaherMotion

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