

SureStep™ STEPPING MOTORS

Bipolar Step Motors:

STP-MTRL-14026(x), 14034(x)
 STP-MTR-17040(x), 17048(x), 17060(x), 23055(x),
 23079(x), 34066(x)
 STP-MTRH-23079(x), 34066(x), 34097(x), 34127(x)

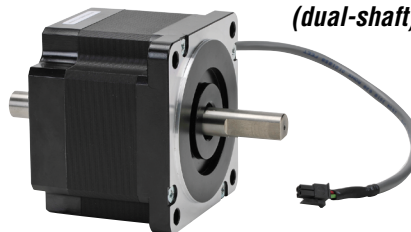
Motor Extension Cables:

STP-EXT-0xx, STP-EXTH-0xx, STP-EXTL-0xx

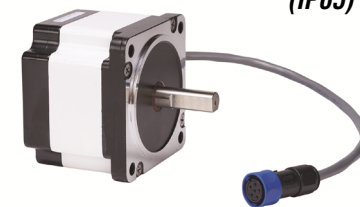
STP-MTR-xxxxxE
(encoder mount)



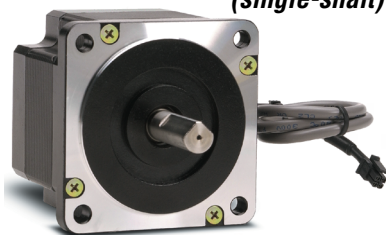
STP-MTR-xxxxxD
(dual-shaft)



STP-MTR-xxxxxW
(IP65)



STP-MTR-xxxxx
(single-shaft)



Note: SureStep™ motors are all connectorized four lead bipolar step motors.

WARNING

To minimize the risk of potential safety problems, you should follow all applicable local and national codes that regulate the installation and operation of your equipment. These codes vary from area to area. It is your responsibility to determine which codes should be followed, and to verify that the equipment, installation, and operation are in compliance with the latest revision of these codes.

Equipment damage or serious injury to personnel can result from the failure to follow all applicable codes and standards. We do not guarantee the products described in this publication are suitable for your particular application, nor do we assume any responsibility for your product design, installation, or operation.

If you have any questions concerning the installation or operation of this equipment, or if you need additional information, please call our technical support group at 770-844-4200.

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SureStep™ Series Specifications – Connectorized Bipolar Stepping Motors

Bipolar Stepping Motors	Low Torque Motors			High Torque Motors					Higher Torque Motors				
	STP-MTRL-14026(x)	STP-MTRL-14034(x)	STP-MTR-17040(x)	STP-MTR-17048(x)	STP-MTR-17060(x)	STP-MTR-23055(x)	STP-MTR-23079(x)	STP-MTR-34066(x)	STP-MTRH-23079(x)	STP-MTRH-34066(x)	STP-MTRH-34097(x)	STP-MTRH-34127(x)	
NEMA Frame Size	14	14	17	17	17	23	23	34	23	34	34	34	
* Maximum Holding Torque	(lb-in)	0.5	1.25	3.81	5.19	7.19	10.37	17.25	27.12	17.87	27.12	50.00	80.50
	(oz-in)	8	20	61	83	115	166	276	434	286	434	800	1288
	(N-m)	0.06	0.14	0.43	0.59	0.81	1.17	1.95	3.06	2.02	3.06	5.65	9.10
Rotor Inertia	(oz-in ²)	0.06	0.08	0.28	0.37	0.56	1.46	2.60	7.66	2.60	7.66	14.80	21.90
	(kg-cm ²)	0.0003	0.00035	0.05	0.07	0.10	0.27	0.48	1.40	0.48	1.40	2.71	4.01
Rated Current (A/phase)	0.35	0.8	1.7	2.0	2.0	2.8	2.8	2.8	5.6	6.3	6.3	6.3	
Resistance (Ω/phase)	8.5	7.66	1.6	1.4	2.0	0.75	1.1	1.1	0.4	0.25	0.3	0.49	
Inductance (mH/phase)	5.77	6.92	3.0	2.7	3.3	2.4	3.8	6.6	1.2	1.5	2.1	4.1	
Insulation Class	130°C [266°F] Class B; 300V rms												
Basic Step Angle	1.8°												
Shaft Runout	0.002 in [0.051 mm]												
Max Shaft Radial Play @ 1-lb load	(in [mm])	0.001 in [0.025 mm]											
Perpendicularity	0.003 in [0.076 mm]												
Concentricity	0.003 in [0.051 mm]												
* Maximum Radial Load (lb [kg])			6.0 [2.7]			15.0 [6.8]		39.0 [17.7]		15.0 [6.8]		39.0 [17.7]	
* Maximum Thrust Load (lb [kg])			6.0 [2.7]			13.0 [5.9]		25.0 [11.3]		13.0 [5.9]		25.0 [11.3]	
Storage Temperature Range	-20°C to 100°C [-4°F to 212°F]												
Operating Temperature Range	-20°C to 50°C [-4°F to 122°F] (motor case temperature should be kept below 80°C [176°F])												
Operating Humidity Range	55% to 85% non-condensing												
Product Material	steel motor case; stainless steel shaft(s)												
Environmental Rating	IP40 (IP65 for "W" motors)												
Weight (lb [kg]) (E models)	0.25 [0.11] (0.3 [0.1])	0.35 [0.15] (0.4 [0.2])	0.6 [0.3] (0.7 [0.3])	0.7 [0.3] (0.8 [0.4])	0.9 [0.4] (0.9 [0.4])	1.5 [0.7] (1.5 [0.7])	2.2 [1.0] (2.4 [1.1])	3.9 [1.7]	2.4 [1.1] (2.4 [1.1])	3.9 [1.7]	5.9 [2.7]	8.4 [3.8]	
Agency Approvals	CE												
Accessory Extension Cable	STP-EXTL-0xx		STP-EXT-0xx STP-EXTW-0xx (for W motors)					STP-EXTH-0xx STP-EXTHW-0xx (for W motors)					
* For dual-shaft motors (STP-MTR-xxxxxD): The sum of the front and rear Torque Loads, Radial Loads, and Thrust Loads must not exceed the applicable Torque, Radial, and Thrust load ratings of the motor.													

SureStep™ STEPPING MOTORS

SureStep™ Motor / Drive Recommended Compatibility

Motor ⁽¹⁾⁽²⁾			Recommended Drive ⁽¹⁾					
Model # (1)(2)	Rated Amps	Extension Cable ⁽²⁾	STP-DRV-4035 ⁽¹⁾ (3.5A max output)	STP-DRV-4830 (3.0A max output)	STP-DRV-4845 (4.5A max output)	STP-DRV-4850 ⁽¹⁾ (5.0A max output)	STP-DRV-6575 ⁽¹⁾ (7.5A max output)	STP-DRV-80100 ⁽¹⁾ (10.0A max output)
STP-MTRL-14026(x)	0.35	STP-EXTL-0xx	✓	✓	-	✓	-	-
STP-MTRL-14034(x)	0.8	STP-EXTL-0xx	✓	✓	✓	✓	-	-
STP-MTR-17040(x)	1.7	STP-EXTx-0xx	✓	✓	✓	✓	✓	✓
STP-MTR-17048(x)	2.0		✓	✓	✓	✓	✓	✓
STP-MTR-17060(x)	2.0		✓	✓	✓	✓	✓	✓
STP-MTR-23055(x)	2.8		✓	✓	✓	✓	✓	✓
STP-MTR-23079(x)	2.8		✓	✓	✓	✓	✓	✓
STP-MTR-34066(x)	2.8	STP-EXTHx-0xx	✓	✓	✓	✓	✓	✓
STP-MTRH-23079(x)	5.6		✓	✓	✓	✓	✓	✓
STP-MTRH-34066(x)	6.3		✓	✓	✓	✓	✓	✓
STP-MTRH-34097(x)	6.3		✓	✓	✓	✓	✓	✓
STP-MTRH-34127(x)	6.3		✓	✓	✓	✓	✓	✓

1) The combinations above will perform according to the published speed/torque curves. However, any STP motor can be used with any STP drive. Using a motor with a current rating higher than the drive's output rating will proportionally limit the motor torque.

2) MTR motors have connectors compatible with the EXT extension cables.
 MTRH motors have connectors compatible with the EXTH extension cables.
 MTRL motors have connectors compatible with the EXTL extension cables.
 W-series motors have connectors compatible with the EXTW and EXTHW extension cables.

Connecting the Motor

WARNING: When connecting a step motor to a drive or indexer, be sure that the motor power supply is switched off. Never disconnect the motor while the drive is powered up. Never connect the motor leads to ground or directly to the power supply. (See the Typical Wiring Diagram for the step motor lead color code of AUTOMATIONDIRECT supplied motors.)

Mounting the Motor

We recommend mounting the motor to a metallic surface to help dissipate heat generated by the motor. The motor can be mounted in any orientation (horizontal or vertical).

Torque vs Speed Curves

The torque vs speed curves are published in the SureStep User Manual, which is available for free download from our website.

(www.automationdirect.com)

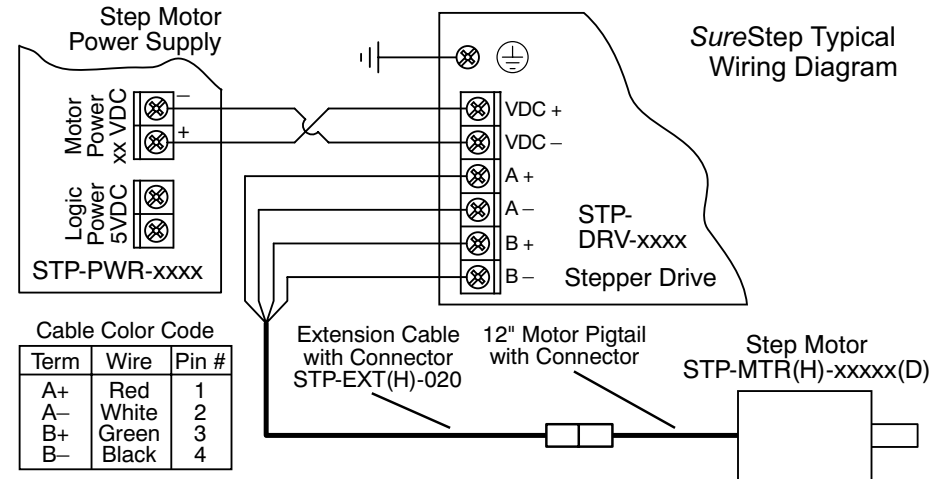
Design and Installation Tips

Allow sufficient time to accelerate the load and size the step motor with a 100% torque safety factor. DO NOT disassemble step motors because motor performance will be reduced and the warranty will be voided. DO NOT connect or disconnect the step motor during operation. Mount the motor to a surface with good thermal conductivity, such as steel or aluminum, to allow heat dissipation. Use a flexible coupling with "clamp-on" connections to both the motor shaft and the load shaft to prevent radial and thrust loading on bearings from minor misalignment.



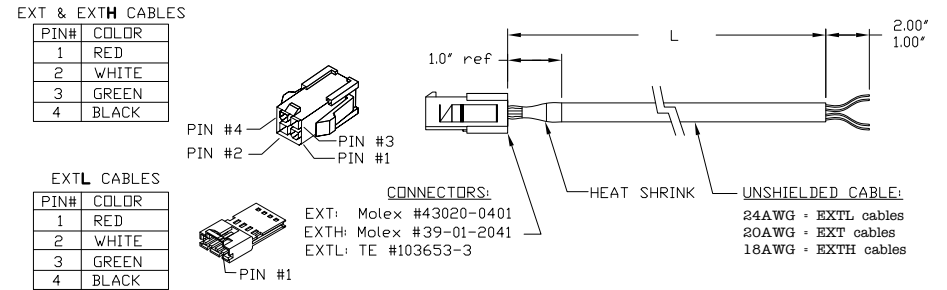
Motor Extension Cable

Typical Motor Wiring Diagram

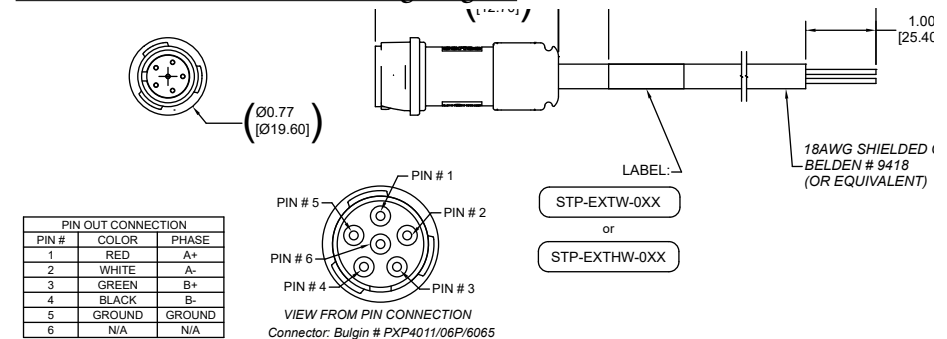


Term	Wire	Pin #
A+	Red	1
A-	White	2
B+	Green	3
B-	Black	4

Extension Cable Wiring Diagram



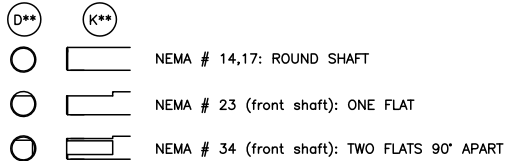
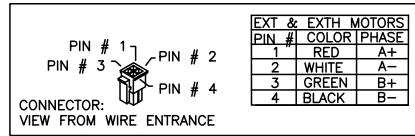
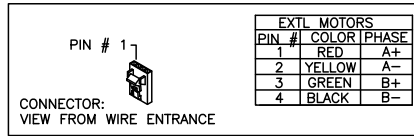
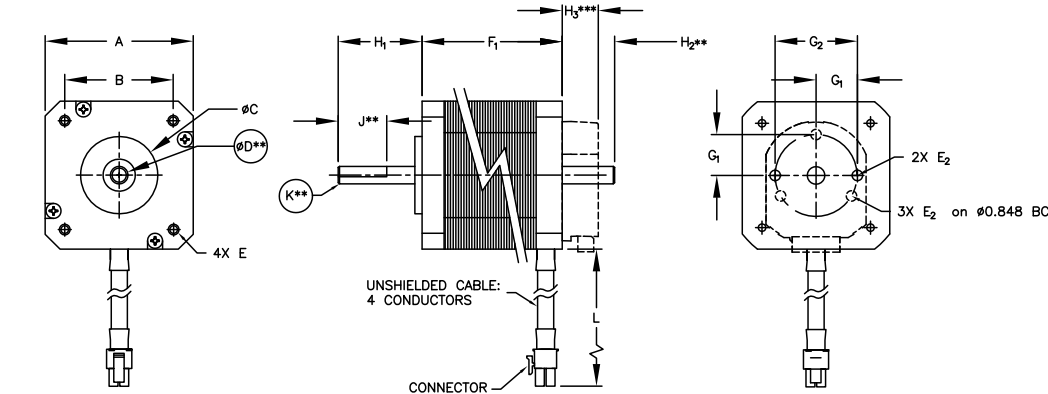
"W" Motor Extension Cable Wiring Diagram



Dimensions & Cabling – Connectorized Step Motors

STP-MTRx-xxxx Typical Dimension Diagram

Note: See table on page 5 for dimension values

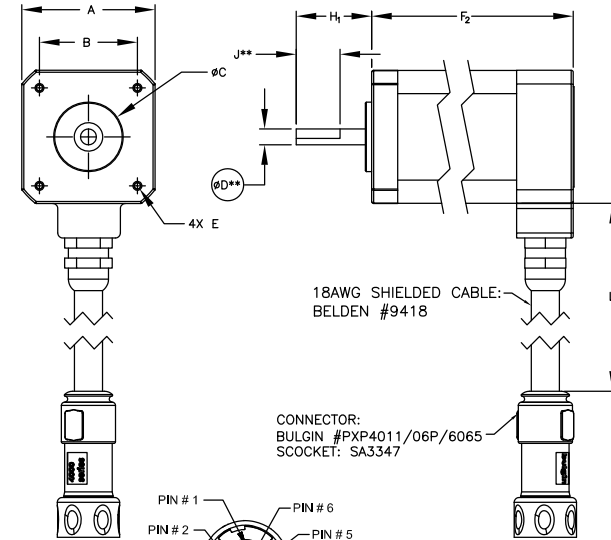


** Dimension H2 applies only to dual-shaft (D) and encoder (E) motors.
Dimension D is the same for both front and rear shafts of dual-shaft and encoder motors.
Dimensions J & K do NOT apply to rear shafts of dual-shaft and encoder motors
(all rear shafts are round style).

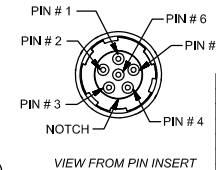
See <http://automationdirect.com> for programmable AMT Series modular encoders from CUI Devices and fixed-resolution SureStep-MTRA-ENCxx encoders.

STP-MTR-xxxxW Typical Dimension Diagram

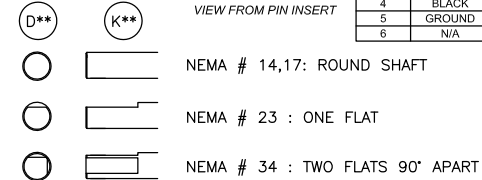
Note: See table on page 5 for dimension values



CONNECTOR:
BULGIN #PXP4011/06P/6065
SCOCKET: SA3347



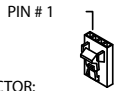
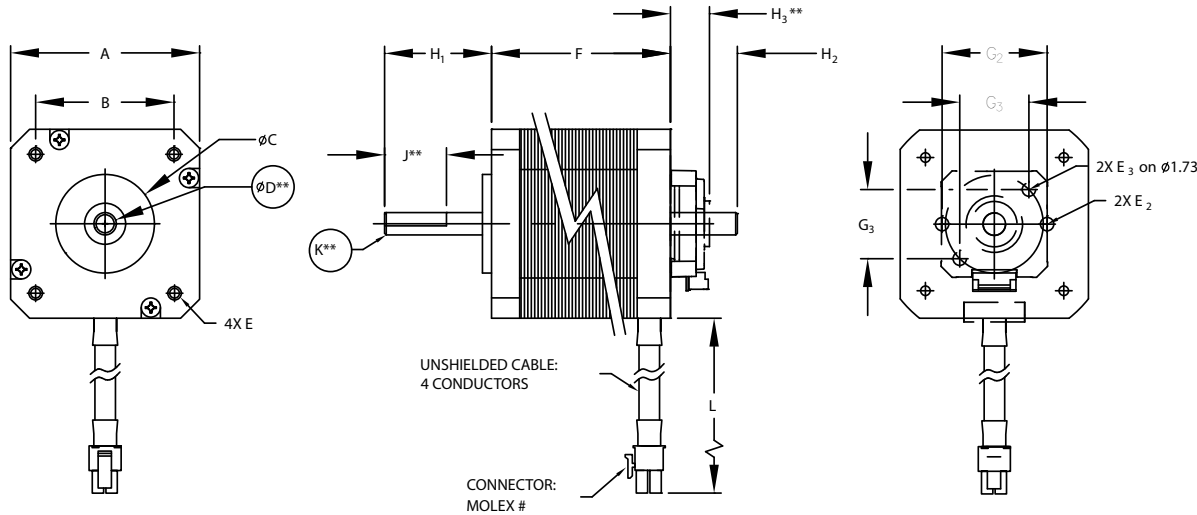
PIN OUT CONNECTION		
PIN #	COLOR	PHASE
1	RED	A+
2	WHITE	A-
3	GREEN	B+
4	BLACK	B-
5	GROUND	GROUND
6	N/A	N/A



Dimensions & Cabling – Connectorized Step Motors

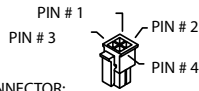
STP-MTRx-34xxx Typical Dimension Diagram

Note: See table on next page for dimension values



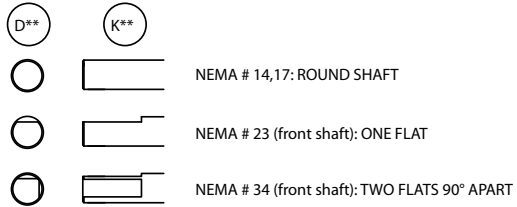
CONNECTOR:
VIEW FROM WIRE ENTRANCE

EXTL MOTORS		
PIN #	COLOR	PHASE
1	RED	A+
2	YELLOW	A-
3	GREEN	B+
4	BLACK	B-



CONNECTOR:
VIEW FROM WIRE ENTRANCE

EXT & EXTH MOTORS		
PIN #	COLOR	PHASE
1	RED	A+
2	WHITE	A-
3	GREEN	B+
4	BLACK	B-



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 ** Dimension D is the same for both front and rear shafts of dual-shaft and encoder motors.
 ** Dimensions J & K do NOT apply to rear shafts of dual-shaft and encoder motors (all rear shafts are round style).

See <http://automationdirect.com> for programmable AMT Series modular encoders from CUI Devices and fixed-resolution SureStep-MTRA-ENCxx encoders.

Note: See diagrams on previous page

SureStep™ Series Dimensions & Cabling – Connectorized Bipolar Stepping Motors													
Dimensions (in [mm]*)	Low Torque Motors		High Torque Motors						Higher Torque Motors				
	STP-MTRL -14026(x)	STP-MTRL -14034(x)	STP-MTR -17040(x)	STP-MTR -17048(x)	STP-MTR -17060(x)	STP-MTR -23055(x)	STP-MTR -23079(x)	STP-MTR -34066(x)	STP-MTRH -23079(x)	STP-MTRH -34066(x)	STP-MTRH -34097(x)	STP-MTRH -34127(x)	
A	1.39 [35.3]	1.39 [35.3]	1.67 [42.3]			2.25 [57.2]		3.39 [86.1]	2.25 [57.2]	3.39 [86.1]			
B	1.02 [25.9]	1.02 [25.9]	1.22 [31.0]			1.86 [47.2]		2.74 [69.6]	1.86 [47.2]		2.74 [69.6]		
C	Ø 0.87 [22.1]					Ø 1.50 [38.1]		Ø 2.88 [73.0]		Ø 1.50 [38.1]			
D**	Ø 0.20 [5.0]					Ø 0.25 [6.4]		Ø 0.50 [12.7]		Ø 0.25 [6.4]		Ø 0.50 [12.7]	
E	4-40 thread 0.15 [3.8] min depth		M3 x 0.5 thread 0.15 [3.8] min depth			Ø 0.20 [5.1] through		Ø 0.26 [6.6] through	Ø 0.20 [5.1] through		Ø 0.26 [6.6] through		
E²	M2.5 x 0.45 thread	M2.5 x 0.45 thread	M2.5 x 0.45 thread		M2 x 0.4 thread	4-40		n/a	4-40		n/a		
E³	n/a							M3 x 0.5 thread on a 1.73 in. bolt circle	n/a		M3 x 0.5 thread on a 1.73 in. bolt circle		
F₁**	1.02 [25.9]	1.34 [34.0]	1.58 [40.1]	1.89 [48.0]	2.34 [59.5]	2.22 [56.4]	3.10 [78.7]	2.64 [67.1]	3.10 [78.7]	2.64 [67.1]	3.82 [97.0]	5.00 [127.0]	
F₂**	n/a		1.90 [48.3]	2.24 [56.9]	2.67 [67.8]	2.33 [59.1]	3.19 [81.0]	2.64 [67.1]	3.19 [81.0]	2.64 [67.1]	3.82 [97.0]	5.00 [127.0]	
G¹	0.375	0.375	0.375	0.375	0.411	0.906	0.906	0.906	0.906	0.906	0.906	0.906	
G²	0.75	0.75	0.75	0.75	n/a	1.812	1.812	1.812	1.812	1.812	1.812	1.812	
G³	n/a							1.22 [31]		n/a		1.22 [31]	
H₁	0.60 [15.2]	0.60 [15.2]	0.94 [24.0]			0.81 [20.6]		1.46 [37.1]	0.81 [20.6]		1.46 [37.1]		
H₂**	0.51 [13.0]	0.51 [13.0]	0.51 [13]			0.51 [13]		1.13 [28.7]	0.51 [13]		1.13 [28.7]		
H₃**	0.40							n/a		0.40		n/a	
J**	n/a					0.59 [15.0]		0.98 [25.0]	0.59 [15.0]		0.98 [25.0]		
K**	n/a					0.23 [5.8]		0.45 [11.4]	0.23 [5.8]		0.45 [11.4]		
L	12.0	12.0	12 [305]						12 [305]				
Conductor	(4) #26 AWG		(4) #20 AWG (5) #18 AWG (for W motors)					(4) #18 AWG (5) #18 AWG (for W motors)					
Connector	Tyco Elec. # 104257-3		Molex # 43025-0400 PXP4010/06S/6065 (for W motors)					Molex # 39-01-3042 PXP4010/06S/6065 (for W motors)					
Pin	Tyco Elec. # 1-104480-5		Molex # 43030-0007 Socket: SA3347 (for W motors)					Molex # 39-00-0039 Socket: SA3347 (for W motors)					
* mm dimensions are for reference purposes only.													
** Dimension D (shaft diameter) is the same for both front and rear shafts of dual-shaft and encoder motors. Dimension H2 applies only to dual-shaft (D) and encoder (E) motors. Dimensions J & K do NOT apply to rear shafts of dual-shaft or encoder motors (all rear shafts are round style). Dimension H3 applies only to "E" models with the encoder pre-mounted. Dimension F2 applies to "W" models only.													