Мо	del	Nun	nber
41	15	K-C	)5A

## **ROTARY TRANSFORMER TORQUE SENSOR**

[1] [1][3] [3] [3] [3]

[4][3]

[2] [3] Revision: D ECN #: 43820

Measurement Range(Full Scale Capacity)         600 in-lb         68 Nm           Sensitivity(± 15 %)(output at rated capacity)         2.5 mV/V         2.5 mV/V           Non-Linearity         ≤ 0.05 % FS         ≤ 0.05 % FS           Hysteresis         ≤ 0.05 % FS         ≤ 0.05 % FS           Non-Repeatability         ≤ 0.03 % FS         ≤ 0.03 % FS           Environmental         1800 in-lb         200 Nm           Overload Limit         1800 in-lb         200 Nm           Temperature Range(Compensated)         +70 to +170 °F         +21 to 77 °C           Temperature Effect on Output(Maximum)         ± 0.002 %Reading/°F         ± 0.0036 %Reading/°C           Temperature Effect on Zero Balance(Maximum)         ± 0.002 %FS/°F         ± 0.0036 %Reading/°C           Electrical         350 Ohm         350 Ohm         350 Ohm           Bridge Resistance         350 Ohm         350 Ohm         3.28 kHz           Excitation Frequency         3.28 kHz         3.28 kHz         3.28 kHz           Excitation Voltage         2 to 10 VAC rms         2 to 10 VAC rms         >5,000,000 kohm         >5,000,000 kohm           Zero Balance         ≤ 2 % FS         ≤ 2 % FS         5 0 mA         50 mA         50 mA           Physical         Size (Shaft Length x Housing Lengt	Performance	ENGLISH	SI
Sensitivity(± 15 %)(output at rated capacity)   2.5 mV/V   2.5 mV/V   Non-Linearity   ≤ 0.05 % FS   ≤ 0.05 % FS   ≤ 0.05 % FS   Non-Repeatability   ≤ 0.03 % FS   ≤ 0.05 % FS   Non-Repeatability   ≤ 0.03 % FS   ≤ 0.03 % FS   ≤ 0.03 % FS   Environmental     1800 in-lb   200 Nm     200 Nm	Measurement Range(Full Scale Capacity)	600 in-lb	<del></del>
Hysteresis		2.5 mV/V	2.5 mV/V
Non-Repeatability         ≤ 0.03 % FS         ≤ 0.03 % FS           Environmental         1800 in-lb         200 Nm           Temperature Range(Operating)         -65 to 285 °F         -54 to 141 °C           Temperature Range(Compensated)         +70 to +170 °F         +21 to 77 °C           Temperature Effect on Output(Maximum)         ± 0.002 %Reading/°F         + 20.0036 %Reading/°C           Temperature Effect on Zero Balance(Maximum)         ± 0.002 %FS/°F         ± 0.0036 %Reading/°C           Temperature Effect on Zero Balance(Maximum)         ± 0.002 %FS/°F         ± 0.0036 %Reading/°C           Temperature Effect on Zero Balance(Maximum)         ± 0.002 %FS/°F         ± 0.0036 %Reading/°C           Temperature Effect on Zero Balance(Maximum)         ± 0.002 %FS/°F         ± 0.0036 %Reading/°C           Temperature Effect on Zero Balance(Maximum)         ± 0.002 %FS/°F         ± 0.0036 %Reading/°C           Electrical         350 Ohm         350 Ohm         350 Ohm           Saze kHz         3.28 kHz         3.28 kHz         3.28 kHz         2 to 10 VAC rms           Insulation Resistance         > 5,000,000 kohm         > 6,00 in         15	Non-Linearity	≤ 0.05 % FS	≤ 0.05 % FS
Environmental			
Overload Limit         1800 in-lb         200 Nm           Temperature Range(Operating)         -65 to 285 °F         -54 to 141 °C           Temperature Range(Compensated)         +70 to +170 °F         +21 to 77 °C           Temperature Effect on Output(Maximum)         ± 0.002 %Reading/°F         ± 0.0036 %Reading/°C           Temperature Effect on Zero Balance(Maximum)         ± 0.002 %FS/°F         ± 0.0036 %Reading/°C           Electrical         Bridge Resistance         350 Ohm         350 Ohm           Bridge Resistance         3 28 kHz         3.28 kHz         3.28 kHz           Excitation Frequency         3.28 kHz         3.28 kHz         3.28 kHz           Excitation Voltage         2 to 10 VAC rms         2 to 10 VAC rms           Insulation Resistance         > 5,000,000 kohm         > 5,000,000 kohm           Zero Balance         ≤ 2 % FS         ≤ 2 % FS           Bridge Current(at 5 VAC)         50 mA         50 mA           Physical         Size (Shaft Length x Housing Length x Housing Height)         9.56 in x 8.25 in x         242.82 mm x 209.55 mm x           Size (Shaft Length x Housing Length x Housing Height)         9.56 in x 8.25 in x         6.00 in         152.40 mm           Weight         47 lb         21.3 kg         Splined         Splined		≤ 0.03 % FS	≤ 0.03 % FS
Temperature Range(Operating)         -65 to 285 °F         -54 to 141 °C           Temperature Range(Compensated)         +70 to +170 °F         +21 to 77 °C           Temperature Effect on Output(Maximum)         ± 0.002 %Reading/°F         ± 0.0036 %Reading/°C           Temperature Effect on Zero Balance(Maximum)         ± 0.002 %FS/°F         ± 0.0036 %Reading/°C           Electrical         Bridge Resistance         350 Ohm         350 Ohm           Bridge Resistance         3.28 kHz         3.28 kHz           Excitation Frequency         3.28 kHz         3.28 kHz           Excitation Voltage         2 to 10 VAC rms         2 to 10 VAC rms           Insulation Resistance         >5,000,000 kohm         >5,000,000 kohm           Zero Balance         ≤ 2 % FS         ≤ 2 % FS           Bridge Current(at 5 VAC)         50 mA         50 mA           Physical         Size (Shaft Length x Housing Length x Housing Height)         9.56 in x 8.25 in x         242.82 mm x 209.55 mm x           Size (Shaft Length x Housing Length x Housing Height)         9.56 in x 8.25 in x         242.82 mm x 209.55 mm x           Weight         47 lb         21.3 kg           Mounting         Splined         Splined           Sensing Element         Strain Gage         Black Oxided Steel           Sh			
Temperature Range(Compensated)         +70 to +170 °F         +21 to 77 °C           Temperature Effect on Output(Maximum)         ± 0.002 %Reading/°F         ± 0.0036 %Reading/°C           Temperature Effect on Zero Balance(Maximum)         ± 0.002 %FS/°F         ± 0.0036 %FS/°C           Electrical         Bridge Resistance         ± 0.002 %FS/°F         ± 0.0036 %FS/°C           Bridge Resistance         350 Ohm         350 Ohm         350 Ohm           Excitation Frequency         3.28 kHz         3.28 kHz         3.28 kHz           Excitation Voltage         2 to 10 VAC rms         2 to 10 VAC rms         2 to 10 VAC rms           Insulation Resistance         >5,000,000 kohm         >5,000,000 kohm         >5,000,000 kohm         >5,000,000 kohm           Zero Balance         ≤ 2 % FS         ≤ 2 % FS         ≤ 2 % FS           Bridge Current(at 5 VAC)         50 mA         50 mA         50 mA           Physical           Size (Shaft Length x Housing Length x Housing Height)         9.56 in x 8.25 in x         242.82 mm x 209.55 mm x           6.00 in         152.40 mm         152.40 mm           Weight         47 lb         21.3 kg           Mounting         Splined         Splined           Sensing Element         Steal         Black Oxided Steel <td></td> <td></td> <td></td>			
Temperature Effect on Output(Maximum)         ± 0.002 %Reading/°F         ± 0.0036 %Reading/°C           Temperature Effect on Zero Balance(Maximum)         ± 0.002 %FS/°F         ± 0.0036 %Reading/°C           Electrical         350 Ohm         350 Ohm           Bridge Resistance         3.28 kHz         3.28 kHz           Excitation Frequency         3.28 kHz         3.28 kHz           Excitation Voltage         2 to 10 VAC rms         2 to 10 VAC rms           Insulation Resistance         >5,000,000 kohm         >5,000,000 kohm           Zero Balance         ≤ 2 % FS         ≤ 2 % FS           Bridge Current(at 5 VAC)         50 mA         50 mA           Physical         Size (Shaft Length x Housing Length x Housing Height)         9.56 in x 8.25 in x         242.82 mm x 209.55 mm x           Size (Shaft Length x Housing Length x Housing Height)         9.56 in x 8.25 in x         242.82 mm x 209.55 mm x           6.00 in         152.40 mm         152.40 mm           Weight         47 lb         21.3 kg           Mounting         Splined         Splined           Sensing Element         Strain Gage         Strain Gage           Housing Material         Black Oxided Steel         Black Oxided Steel           Shaft Material         Side         Side	Temperature Range(Operating)	-65 to 285 °F	-54 to 141 °C
Temperature Effect on Zero Balance(Maximum)         ± 0.002 %FS/°F         ± 0.0036 %FS/°C           Electrical         350 Ohm         350 Ohm           Bridge Resistance         350 Ohm         350 Ohm           Excitation Frequency         3.28 kHz         3.28 kHz           Excitation Voltage         2 to 10 VAC rms         2 to 10 VAC rms           Insulation Resistance         >5,000,000 kohm         >5,000,000 kohm           Zero Balance         ≤ 2 % FS         ≤ 2 % FS           Bridge Current(at 5 VAC)         50 mA         50 mA           Physical           Size (Shaft Length x Housing Length x Housing Height)         9.56 in x 8.25 in x         242.82 mm x 209.55 mm x                6.00 in             152.40 mm                Weight             47 lb             21.3 kg                Mounting              Splined              Splined                Sensing Element              Strain Gage              Strain Gage                 Housing Material              Black Oxided Steel              Black Oxided Steel                 Shaft Material              Steel              Steel                 Electrical Connector              MS3102A-14S-5P              MS3102A-14S-5P                 Electrical Connection	Temperature Range(Compensated)	+70 to +170 °F	+21 to 77 °C
Electrical           Bridge Resistance         350 Ohm         350 Ohm           Excitation Frequency         3.28 kHz         3.28 kHz           Excitation Voltage         2 to 10 VAC rms         2 to 10 VAC rms           Insulation Resistance         >5,000,000 kohm         >5,000,000 kohm           Zero Balance         ≤ 2 % FS         ≤ 2 % FS           Bridge Current(at 5 VAC)         50 mA         50 mA           Physical           Size (Shaft Length x Housing Length x Housing Height)         9.56 in x 8.25 in x         242.82 mm x 209.55 mm x           6.00 in         152.40 mm         152.40 mm           Weight         47 lb         21.3 kg           Mounting         Splined         Splined           Sensing Element         Strain Gage         Strain Gage           Housing Material         Black Oxided Steel         Black Oxided Steel           Shaft Material         Steel         Steel           Electrical Connector         MS3102A-14S-5P         MS3102A-14S-5P           Electrical Connection Position         Side         Side           Torsional Stiffness         120,000 in-lb/radian         13,600 N-m/radian           Rotating Inertia         0.0051 in-lb sec2         0.0006 N-m sec2     <			
Bridge Resistance         350 Ohm         350 Ohm           Excitation Frequency         3.28 kHz         3.28 kHz           Excitation Voltage         2 to 10 VAC rms         2 to 10 VAC rms           Insulation Resistance         >5,000,000 kohm         >5,000,000 kohm           Zero Balance         ≤ 2 % FS         ≤ 2 % FS           Bridge Current(at 5 VAC)         50 mA         50 mA           Physical           Size (Shaft Length x Housing Length x Housing Height)         9.56 in x 8.25 in x         242.82 mm x 209.55 mm x           Meight         47 lb         21.3 kg           Mounting         Splined         Splined           Sensing Element         Strain Gage         Strain Gage           Housing Material         Black Oxided Steel         Black Oxided Steel           Shaft Material         Steel         Steel           Electrical Connector         MS3102A-14S-5P         MS3102A-14S-5P           Electrical Connection Position         Side         Side           Torsional Stiffness         120,000 in-lb/radian         13,600 N-m/radian           Rotating Inertia         0.0051 in-lb sec2         0.0006 N-m sec2		± 0.002 %FS/°F	± 0.0036 %FS/°C
Excitation Frequency         3.28 kHz         3.28 kHz           Excitation Voltage         2 to 10 VAC rms         2 to 10 VAC rms           Insulation Resistance         >5,000,000 kohm         >5,000,000 kohm           Zero Balance         ≤ 2 % FS         ≤ 2 % FS           Bridge Current(at 5 VAC)         50 mA         50 mA           Physical           Size (Shaft Length x Housing Length x Housing Height)         9.56 in x 8.25 in x         242.82 mm x 209.55 mm x           6.00 in         152.40 mm         47 lb         21.3 kg           Mounting         Splined         Splined         Splined           Sensing Element         Strain Gage         Strain Gage           Housing Material         Black Oxided Steel         Black Oxided Steel           Shaft Material         Steel         Steel           Electrical Connector         MS3102A-14S-5P         MS3102A-14S-5P           Electrical Connection Position         Side         Side           Torsional Stiffness         120,000 in-lb/radian         13,600 N-m/radian           Rotating Inertia         0.0051 in-lb sec2         0.0006 N-m sec2	Electrical		
Excitation Voltage         2 to 10 VAC rms         2 to 10 VAC rms           Insulation Resistance         >5,000,000 kohm         >5,000,000 kohm           Zero Balance         ≤ 2 % FS         ≤ 2 % FS           Bridge Current(at 5 VAC)         50 mA         50 mA           Physical           Size (Shaft Length x Housing Length x Housing Height)         9.56 in x 8.25 in x         242.82 mm x 209.55 mm x           6.00 in         152.40 mm         152.40 mm           Weight         47 lb         21.3 kg           Mounting         Splined         Splined           Sensing Element         Strain Gage         Strain Gage           Housing Material         Black Oxided Steel         Black Oxided Steel           Shaft Material         Steel         Steel           Electrical Connector         MS3102A-14S-5P         MS3102A-14S-5P           Electrical Connection Position         Side         Side           Torsional Stiffness         120,000 in-lb/radian         13,600 N-m/radian           Rotating Inertia         0.0051 in-lb sec2         0.0006 N-m sec2			
Insulation Resistance         >5,000,000 kohm         >5,000,000 kohm           Zero Balance         ≤ 2 % FS         ≤ 2 % FS           Bridge Current(at 5 VAC)         50 mA         50 mA           Physical           Size (Shaft Length x Housing Length x Housing Height)         9.56 in x 8.25 in x         242.82 mm x 209.55 mm x           6.00 in         152.40 mm         152.40 mm           Weight         47 lb         21.3 kg           Mounting         Splined         Splined           Sensing Element         Strain Gage         Strain Gage           Housing Material         Black Oxided Steel         Black Oxided Steel           Shaft Material         Steel         Steel           Electrical Connector         MS3102A-14S-5P         MS3102A-14S-5P           Electrical Connection Position         Side         Side           Torsional Stiffness         120,000 in-lb/radian         13,600 N-m/radian           Rotating Inertia         0.0051 in-lb sec2         0.0006 N-m sec2	1 ' '		**
Zero Balance         ≤ 2 % FS         ≤ 2 % FS           Bridge Current(at 5 VAC)         50 mA         50 mA           Physical           Size (Shaft Length x Housing Length x Housing Height)         9.56 in x 8.25 in x         242.82 mm x 209.55 mm x           6.00 in         152.40 mm           Weight         47 lb         21.3 kg           Mounting         Splined         Splined           Sensing Element         Strain Gage         Strain Gage           Housing Material         Black Oxided Steel         Black Oxided Steel           Shaft Material         Steel         Steel           Electrical Connector         MS3102A-14S-5P         MS3102A-14S-5P           Electrical Connection Position         Side         Side           Torsional Stiffness         120,000 in-lb/radian         13,600 N-m/radian           Rotating Inertia         0.0051 in-lb sec2         0.0006 N-m sec2			
Bridge Current(at 5 VAC)         50 mA         50 mA           Physical           Size (Shaft Length x Housing Length x Housing Height)         9.56 in x 8.25 in x 6.00 in         242.82 mm x 209.55 mm x 152.40 mm           Weight         47 lb         21.3 kg           Mounting         Splined         Splined           Sensing Element         Strain Gage         Strain Gage           Housing Material         Black Oxided Steel         Black Oxided Steel           Shaft Material         Steel         Steel           Electrical Connector         MS3102A-14S-5P         MS3102A-14S-5P           Electrical Connection Position         Side         Side           Torsional Stiffness         120,000 in-lb/radian         13,600 N-m/radian           Rotating Inertia         0.0051 in-lb sec2         0.0006 N-m sec2			
Physical           Size (Shaft Length x Housing Length x Housing Height)         9.56 in x 8.25 in x 6.00 in         242.82 mm x 209.55 mm x 152.40 mm           Weight         47 lb         21.3 kg           Mounting         Splined         Splined           Sensing Element         Strain Gage         Strain Gage           Housing Material         Black Oxided Steel         Black Oxided Steel           Shaft Material         Steel         Steel           Electrical Connector         MS3102A-14S-5P         MS3102A-14S-5P           Electrical Connection Position         Side         Side           Torsional Stiffness         120,000 in-lb/radian         13,600 N-m/radian           Rotating Inertia         0.0051 in-lb sec2         0.0006 N-m sec2		,, , ,	,,,,
Size (Shaft Length x Housing Length x Housing Height)         9.56 in x 8.25 in x 6.00 in         242.82 mm x 209.55 mm x 152.40 mm           Weight         47 lb         21.3 kg           Mounting         Splined         Splined           Sensing Element         Strain Gage         Strain Gage           Housing Material         Black Oxided Steel         Black Oxided Steel           Shaft Material         Steel         Steel           Electrical Connector         MS3102A-14S-5P         MS3102A-14S-5P           Electrical Connection Position         Side         Side           Torsional Stiffness         120,000 in-lb/radian         13,600 N-m/radian           Rotating Inertia         0.0051 in-lb sec2         0.0006 N-m sec2	, ,	50 mA	50 mA
6.00 in   152.40 mm	1 7		
Weight         47 lb         21.3 kg           Mounting         Splined         Splined           Sensing Element         Strain Gage         Strain Gage           Housing Material         Black Oxided Steel         Black Oxided Steel           Shaft Material         Steel         Steel           Electrical Connector         MS3102A-14S-5P         MS3102A-14S-5P           Electrical Connection Position         Side         Side           Torsional Stiffness         120,000 in-lb/radian         13,600 N-m/radian           Rotating Inertia         0.0051 in-lb sec2         0.0006 N-m sec2	Size (Shaft Length x Housing Length x Housing Height)		
Mounting         Splined         Splined           Sensing Element         Strain Gage         Strain Gage           Housing Material         Black Oxided Steel         Black Oxided Steel           Shaft Material         Steel         Steel           Electrical Connector         MS3102A-14S-5P         MS3102A-14S-5P           Electrical Connection Position         Side         Side           Torsional Stiffness         120,000 in-lb/radian         13,600 N-m/radian           Rotating Inertia         0.0051 in-lb sec2         0.0006 N-m sec2	l		
Sensing Element         Strain Gage         Strain Gage           Housing Material         Black Oxided Steel         Black Oxided Steel           Shaft Material         Steel         Steel           Electrical Connector         MS3102A-14S-5P         MS3102A-14S-5P           Electrical Connection Position         Side         Side           Torsional Stiffness         120,000 in-lb/radian         13,600 N-m/radian           Rotating Inertia         0.0051 in-lb sec2         0.0006 N-m sec2	_ ~	*** ***	•
Housing Material  Steel Shaft Material  Electrical Connector  Electrical Connection Position  Torsional Stiffness  Rotating Inertia  Black Oxided Steel  Black Oxided Steel  Steel  Steel  Steel  MS3102A-14S-5P  MS3102A-14S-5P  Side  Side  Side  120,000 in-lb/radian  13,600 N-m/radian  0.0051 in-lb sec2  0.0006 N-m sec2	, · ·	•	•
Shaft Material         Steel         Steel           Electrical Connector         MS3102A-14S-5P         MS3102A-14S-5P           Electrical Connection Position         Side         Side           Torsional Stiffness         120,000 in-lb/radian         13,600 N-m/radian           Rotating Inertia         0.0051 in-lb sec2         0.0006 N-m sec2	, ~	· ·	•
Electrical Connector         MS3102A-14S-5P         MS3102A-14S-5P           Electrical Connection Position         Side         Side           Torsional Stiffness         120,000 in-lb/radian         13,600 N-m/radian           Rotating Inertia         0.0051 in-lb sec2         0.0006 N-m sec2	_ ~	Black Oxided Steel	Black Oxided Steel
Electrical Connection Position Side Side Torsional Stiffness 120,000 in-lb/radian 13,600 N-m/radian Rotating Inertia 0.0051 in-lb sec2 0.0006 N-m sec2	Shaft Material	Steel	Steel
Torsional Stiffness 120,000 in-lb/radian 13,600 N-m/radian Rotating Inertia 0.0051 in-lb sec2 0.0006 N-m sec2	Electrical Connector	MS3102A-14S-5P	MS3102A-14S-5P
Rotating Inertia 0.0051 in-lb sec2 0.0006 N-m sec2	Electrical Connection Position	Side	Side
1 9	Torsional Stiffness	120,000 in-lb/radian	13,600 N-m/radian
Maximum Speed 15,000 RPM 15,000 RPM	Rotating Inertia	0.0051 in-lb sec2	0.0006 N-m sec2
	Maximum Speed	15,000 RPM	15,000 RPM

## **OPTIONAL VERSIONS**

Optional versions have identical specifications and accessories as listed for the standard model except where noted below. More than one option may be used.

## NOTES:

[1]Nominal.

[2]Recommended 10 VAC RMS.

[3]FS - Full Scale.

[4]Over compensated operating temperature range. [5]See PCB Declaration of Conformance PS062 for details.

## SUPPLIED ACCESSORIES:

Model 180-019A 5-socket mating connector for Series 3100, 4100, 4200 torque sensors Model 8113-105A Relay activated precision shunt calibration module

Entered: AP	Engineer: PE	Sales: KWW	Approved: JSD	Spec Number:
Date: 2/12/2015	Date: 2/12/2015	Date: 2/12/2015	Date: 2/12/2015	18485



PCB Load & Torque, Inc. 24350 Indoplex Circle Farmington Hills, MI 48335 **UNITED STATES** 

Phone: 866-684-7107 Fax: 716-684-0987

E-Mail: ltinfo@pcbloadtorque.com

Web site:

http://www.pcbloadtorque.com



All specifications are at room temperature unless otherwise specified.

In the interest of constant product improvement, we reserve the right to change specifications without notice.