# QUAD RING KIT II SENSORS

## INSTALLATION/SPECIFICATION/WIRING GUIDE

### 5 - 24 VOLT OPEN COLLECTOR

### INSTALLATION

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RINGS 56C & 143TC

ASSEMBLY NOTES

1. METAL MOTOR RING SHOULD BE MOUNTED FLUSH AND TIGHTLY FASTENED TO MOTOR FACE WITH BOLTS PROVIDED.

2. SENSOR HOUSING SHOULD BE FULLY INSERTED AND TIGHTLY SEATED INTO MOUNTED MOTOR RING (IF MOUNTING HOLES OF SENSOR HOUSING AND MOTOR RING DON'T ALIGN PROPERLY ROTATE SENSOR HOUSING 180° AND REINSTALL.) PLACE GASKET ON TOP SENSOR HOUSING WITH WIRES OF SENSOR THRU CENTER SLOT OF GASKET. CONDUIT BOX TO BE SECURED WITH (2) 8-32 X 1 1/2 LG SCREWS.

3. 60 TOOTH GEAR TO BE MOUNTED ON MOTOR SHAFT WITH THE FRONT FACE OF THE 60 TOOTH GEAR ALIGNED WITH THE FRONT FACE OF THE SENSOR HOUSING. SECURE 60 TOOTH GEAR LOCATION WITH SET SCREWS PROVIDED, SEE FIGURE #5. FRONT HUB OF 60 TOOTH GEAR WILL PROTRUDE APPROXIMATELY .020 BEYOND FRONT FACE OF THE MOTOR RING WHEN PROPERLY INSTALLED.

APPLICATION NOTES

1. LONG MOUNTING BOLTS TO BE USED IN MULTIPLE RING APPLICATIONS.

2. IN APPLICATIONS WHERE CONDUIT BOX IS NOT REQUIRED, SHORTER SCREWS ARE NECESSARY TO PROPERLY SECURE SENSOR HOUSING INTO THE MOTOR RING.
1. METAL MOTOR RING SHOULD BE MOUNTED FLUSH AND TIGHTLY FASTENED TO MOTOR FACE WITH BOLTS PROVIDED.

2. PLACE GASKET ON TOP OF SENSOR HOUSING WITH WIRES OF SENSOR THRU CENTER SLOT OF GASKET. SENSOR HOUSING SHOULD BE FULLY INSERTED AND TIGHTLY SEATED INTO MOUNTED MOTOR RING (IF MOUNTING HOLES OF SENSOR HOUSING DON'T ALIGN PROPERLY, ROTATE SENSOR HOUSING 180° AND REINSTALL). INSERT SPACER WITH HOLES IN ALIGNMENT WITH SENSOR MOUNTING HOLES, ROUTING WIRES THRU CENTER SLOT. CONDUIT BOX TO BE SECURED WITH (2) #8-32x3.0 LONG SCREWS.

3. 60 TOOTH GEAR TO BE MOUNTED ON MOTOR SHAFT WITH THE FRONT FACE OF THE 60 TOOTH GEAR ALIGNED WITH THE FRONT FACE OF THE SENSOR HOUSING. SECURE 60 TOOTH GEAR LOCATION WITH SET SCREWS PROVIDED (SEE FIGURE 5).

APPLICATION NOTES

1. LONG MOUNTING BOLTS TO BE USED IN MULTIPLE RING APPLICATIONS.

2. IN APPLICATIONS WHERE CONDUIT BOX IS NOT REQUIRED, SHORTER SCREWS ARE NECESSARY TO PROPERLY SECURE SENSOR HOUSING INTO THE MOTOR RING.
ASSEMBLY NOTES

1. METAL MOTOR RING SHOULD BE MOUNTED FLUSH AND TIGHTLY FASTENED TO MOTOR FACE WITH BOLTS PROVIDED.

2. SENSOR HOUSING SHOULD BE FULLY INSERTED AND TIGHTLY SEATED INTO MOUNTED MOTOR RING (IF MOUNTING HOLES OF SENSOR HOUSING AND MOTOR RING DONT ALIGN PROPERLY ROTATE SENSOR HOUSING 180° AND REINSTALL). PLACE GASKET ON TOP SENSOR HOUSING WITH WIRES OF SENSOR THRU CENTER SLOT OF GASKET. CONDUIT BOX TO BE SECURED WITH (2) M4 X 35 mm LG SCREWS.

3. 60 TOOTH GEAR TO BE MOUNTED ON MOTOR SHAFT WITH THE FRONT FACE OF THE 60 TOOTH GEAR ALIGNED WITH THE FRONT FACE OF THE SENSOR HOUSING. SECURE 60 TOOTH GEAR LOCATION WITH SET SCREWS PROVIDED. SEE FIGURE 5. FRONT HUB OF 60 TOOTH GEAR WILL PROTRUDE APPROXIMATELY .020 (~ .5 mm) BEYOND FRONT FACE OF THE MOTOR RING WHEN PROPERLY INSTALLED.

APPLICATION NOTES

- LONGER MOUNTING BOLTS MAY BE NEEDED IN MULTIPLE RING APPLICATIONS.
- IN APPLICATIONS WHERE CONDUIT BOX IS NOT REQUIRED, SHORTER SCREWS ARE NECESSARY TO PROPERLY SECURE SENSOR HOUSING INTO THE MOTOR RING.
**OPEN COLLECTOR WITH PULLUP**

**SENSOR HOUSING DIMENSIONS**

**OUTPUT CHANNEL SCHEMATIC**

**OUTPUT CHANNEL WAVEFORMS**

**SPECIFICATIONS**

- **Cycles per Revolution:** 60 cycles each channel
- **Sensing Speed Range:** Zero speed to 10,000 RPM (shaft speed)
- **Gap Adjustment:** None required
- **Operating Temperature:** -40° to 125°C
- **Supply Voltage (VCC):** 5 to 24 VDC ± 5%
- **Supply Current:**
  - ltyp 20 mA/Imax 35 mA @ 5 V
  - ltyp 25 mA/Imax 45 mA @ 12 V
  - ltyp 30 mA/Imax 50 mA @ 15 V
  - ltyp 35 mA/Imax 60 mA @ 24 V
- **Switching Frequency Limit:** 100 kHz
- **Output Drive Capability:** 250 mA per channel continuous
  - lout 1.6 mA @ 5 V
  - lout 4 mA @ 12 V
  - lout 5 mA @ 15 V
  - lout 8 mA @ 24 V
- **Minimum Resistance for External Pull Up Resistor:**
  - 20 Ohms @ 5 V
  - 50 Ohms @ 12 V
  - 60 Ohms @ 15 V
  - 100 Ohms @ 24 V

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SENSOR HOUSING DIMENSIONS

SENSING SPEED RANGE:
ZERO SPEED TO 10,000 RPM (SHAFT SPEED)

SUPPLY VOLTAGE (VCC):
5 TO 24 VDC ± 5%

SUPPLY CURRENT:
Ityp 20mA/Imax 25mA @ 5V
Ityp 25mA/Imax 45mA @ 12V
Ityp 30mA/Imax 50mA @ 15V
Ityp 35mA/Imax 60mA @ 24V

SWITCHING FREQUENCY LIMIT:
100 kHz

OUTPUT DRIVE CAPABILITY:
250 mA PER CHANNEL CONTINUOUS
Iout 1.6 mA @ 5 V
Iout 4 mA @ 12 V
Iout 5 mA @ 15 V
Iout 8 mA @ 24 V

MINIMUM RESISTANCE FOR EXTERNAL PULL UP RESISTOR:
20 Ohms @ 5 V
50 Ohms @ 12 V
60 Ohms @ 15 V
100 Ohms @ 24 V

OUTPUT TRANSISTOR VCE:
30V MAXIMUM

OPEN-COLLECTOR WITHOUT PULLUPS
NOTE: THE +12V AUXILIARY POWER SUPPLY PROVIDED FROM THE CONTROL MAY BE USED TO POWER THE SENSORS IF AN EXTERNAL POWER SUPPLY IS USED, IT MUST BE CONNECTED BETWEEN THE RED (VDC) AND BLACK (COM) WIRES OF THE SENSOR EVEN WHEN AN EXTERNAL POWER SOURCE IS USED TO POWER THE SENSOR, THE BLACK WIRE MUST BE CONNECTED TO THE COMMON (COM) OF THE CONTROL SHIELDED CABLE IS RECOMMENDED CONNECT SHIELD TO EARTH GROUND AT ONE END ONLY
OPEN COLLECTOR WITH PULLUPS

ML-TRIM

+5V AUX PWR +5V AUX COM
J4
1
2
LEAD_FQ
3
BLU
BLK
NC
BRN
FDBK_FQ
4
BLU
BLK
NC
BRN
COM
5

+5V OUT
+ VDC
SENSOR
LEAD
+ VDC
SENSOR
FEEDBACK

ML-DRIVE

+5V AUX PWR +5V AUX COM
J3
1
2
LEAD_FQ
3
BLU
BLK
NC
BRN
FDBK_FQ
4
BLU
BLK
NC
BRN
COM
5

+5V OUT
+ VDC
SENSOR
LEAD
+ VDC
SENSOR
FEEDBACK

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NOTE: THE +5V AUXILIARY POWER SUPPLY PROVIDED FROM THE CONTROL MAY BE USED TO POWER THE SENSORS. IF THE AUX POWER SUPPLY OR AN EXTERNAL POWER SUPPLY IS USED, IT MUST BE CONNECTED BETWEEN THE RED (VDC) AND BLACK (COM) WIRES OF THE SENSOR. WHEN EITHER POWER SOURCE IS USED TO POWER THE SENSOR, THE BLACK WIRE MUST BE CONNECTED TO THE COMMON (COM) OF THE CONTROL SHIELDED CABLE IS RECOMMENDED CONNECT SHIELD TO EARTH GROUND AT ONE END ONLY
OPEN COLLECTOR WITHOUT PULLUPS

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OPEN COLLECTOR WITHOUT PULLUPS

ML-TRIM

+5V AUX PWR
+5V AUX COM

LEAD_FQ

FDBK_FQ

COM

J4

+5V OUT

1

2

J5

WHT/BLU
BLK
NC
WHT/BRN
WHT/BLU
BLK
NC
WHT/BRN

SENSOR

LEAD

SENSOR

FEEDBACK

J3

+5V OUT

1

2

J4

WHT/BLU
BLK
NC
WHT/BRN
WHT/BLU
BLK
NC
WHT/BRN

SENSOR

LEAD

SENSOR

FEEDBACK

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NOTE: THE +5V AUXILIARY POWER SUPPLY PROVIDED FROM THE CONTROL MAY BE USED TO POWER THE SENSORS IF THE AUX POWER SUPPLY AN EXTERNAL POWER SUPPLY IS USED, IT MUST BE CONNECTED BETWEEN THE RED (VDC) AND BLACK (COM) WIRES OF THE SENSOR WHEN EITHER POWER SOURCE IS USED TO POWER THE SENSOR, THE BLACK WIRE MUST BE CONNECTED TO THE COMMON (COM) OF THE CONTROL SHIELDED CABLE IS RECOMMENDED CONNECT SHIELD TO EARTH GROUND AT ONE END ONLY