Digital Ring Kits - NEMA C Frame

Description

Electro-Sensor's Digital Ring Kit provides digital feedback from motors with NEMA C face end bells. It can generate pulses down to zero speed, and transmit without amplification up to 1500 feet. This is an ideal pulse generator for speed monitoring, motor control, counting, process control, cut-to-length, and ratio/draw controlling applications.

The Digital Ring Kits can be quickly and easily installed on NEMA C face motors or between a motor and gear box. Each kit features a non-contacting digital pulse generator system. This system includes a 199SM magnet wheel (120 magnets of alternating polarity) with a mounting hub bored to the exact motor shaft size, and the option of a Hall effect, magnetoresistive, quadrature, or line driver sensor.

The Digital Ring Kit System includes a cast aluminum mounting ring with a removable gasketed junction box, and all mounting hardware. Motor frame size and the number of pulses per revolution needed (60 or 120) must be specified when ordering.

The DRK Ring Kit provides a 60-pulse per revolution signal when used with the #1101RK hall effect sensor, or 120-pulse per revolution signal when used with the #1102RK magnetoresistive sensor.

The QDRK Quadrature Ring Kit provides a 60-pulse per revolution quadrature signal, for use with electronic control equipment requiring rotational-direction information. Two signals, 90° out-of-phase, are produced by the sensor. When the leading edge of signal A precedes the leading edge of signal B, shaft rotation is forward. When the opposite is true, the monitored shaft is rotating in reverse.

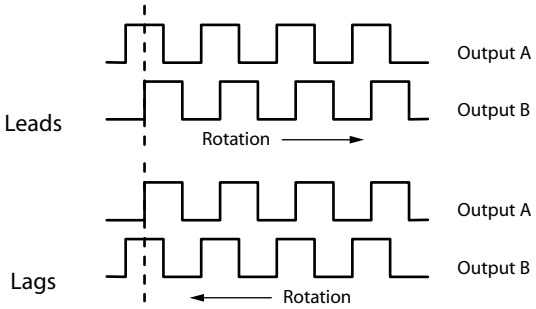
The Line Driver option provides a 60-pulse per revolution differential signal, for use with electronic control equipment requiring rotational-direction information. Two sets of differential square wave output pulses offset from each other by 90°. The pulses lead or lag each other depending on the direction of shaft rotation.

Digital Output (DRK Series)

Provides one square wave output pulse train.

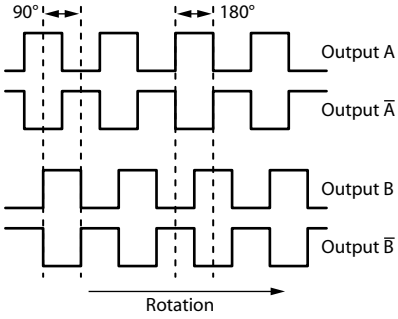
Quadrature Output (QDRK Series)

Provides two square wave output pulses offset from each other by 90°. The pulses lead or lag each other depending on the direction of shaft rotation.

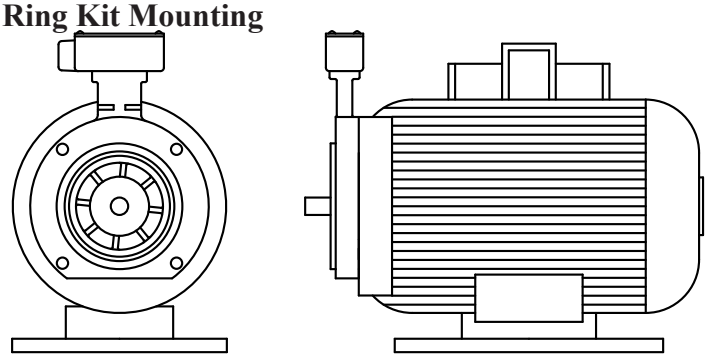


Line Driver Output Option (QDRKLD Only)

Provides two sets of differential square wave output pulses offset from each other by 90°. The pulses lead or lag each other depending on the direction of shaft rotation.



Ring Kit Mounting



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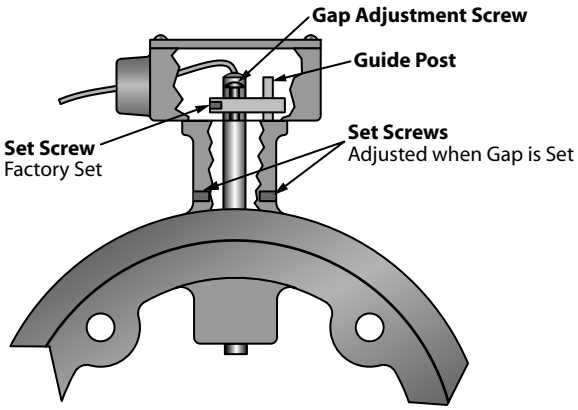
Quadrature Sensor Adjustment (QDRK/QDRKLD Series)

All Ring Kits are factory gapped to 0.020", and aligned for a 90° phase shift. To adjust the gap distance between the magnet ring and the sensor, use the following steps (see figure 1):

1. With the mounting ring and magnet wheel mounted, set the gap adjustment screw so that it extends approximately 1/8" below the adjustment block.
2. Place the sensor with the guide post fitting into the guide hole and the barrel of the sensor down the neck of the ring. The sensor face should be resting on the magnet wheel.
3. Apply a slight downward pressure on the sensor and turn the gap adjustment screw clockwise until it rests on the base of the junction box.
4. With continued pressure on the sensor, adjust the gap adjustment screw 3/4 turn clockwise, raising the face of the sensor slightly off the magnet ring, and tighten the set screws on the neck of the Ring Kit. This procedure will result in the sensor being gapped to approximately 0.020". The kit is now ready to run.



Electrical Connections

All Wire connections on standard ring kits for all 1100 and 1200 series sensors.

Signal	Wire
Supply	Red
Channel A	White
Channel B	Green*
DC Common & Shield	Black & Shield

*** Bi-Directional ring kits only**

All Wire connections on Line Driver ring kits.

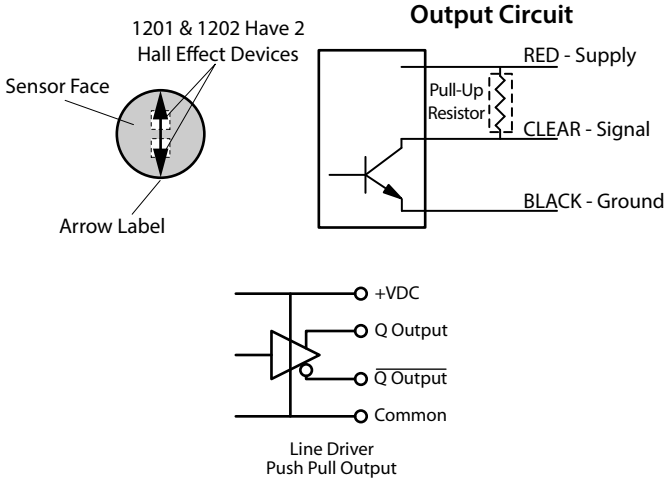
Signal	Terminal
+6-24 Vdc*	TB1-1
DC Common & Shield	TB1-2
Channel A	TB1-3
Channel $\overline{A}$	TB1-4
Channel B	TB1-5
Channel $\overline{B}$	TB1-6

Note: *If rotation is incorrect, for QDRK, simply swap channel A and channel B connections. For QDRKLD: swap either the A and $\overline{A}$ connections or the B and $\overline{B}$ connections, but not both.*

The Digital Ring Kit is designed for use with devices that have an internal pull-up resistor. If the device receiving the signal from the sensor does not have a pull-up resistor, a resistor must be placed between the sensor supply voltage and the sensor signal output. Two pull-ups are required for 1201 and 1202 sensors.

The Line Driver Ring Kit has the necessary pull-up resistor built into the line driver interface board.

Supply Voltage	Resistor Value	Resistor Wattage
5V - 11V	1K	1/4 Watt
12V - 15V	2.2K	1/4 Watt
16V - 24V	4.7K	1/4 Watt



Note: *Exercise caution when wiring the sensor. Damage will occur if the **SIGNAL** and **SUPPLY** wires are shorted.*

ELECTRO-SENSORS

DRK Series Specifications:

Model 1101RK Sensor, 60 PPR Hall-Effect Model 1102RK Sensor, 120 PPR Magnetoresistive	
Supply Voltage	5-24VDC @ 10mA
Output Type	NPN open collector, sink 20mA max.
Operating Frequency	0-20KHz
Sensing Distance	0.040" maximum 0.020" recommended
Sensor Body Material	304 Stainless steel
Operating Temperature	-20°C to +60°C (consult factory for higher temperature ranges)
Cable	3-Conductor shielded, 10'
NEMA Rating	4
Model 1201, 1202 Quadrature Sensor, 60 PPR	
Supply Voltage	5-24VDC @ 16mA
Output Type	NPN open collector sink 20mA max per channel
Signal	Quadrature, ±15° from 90° phase shift
Operating Frequency	0-20KHz
Sensing Distance	0.040" maximum 0.020" recommended
Sensor Body Material	304 Stainless steel
Operating Temperature	-20°C to +60°C (consult factory for higher temperature ranges)
Cable	4-conductor shielded, 10'
Line Driver Output Option	
Supply Voltage	6-24VDC
Output Type	Quadrature Differential Line Driver (422) A, $\overline{A}$, B, $\overline{B}$
Operating Frequency	0-20KHz
Sensing Distance	0.040" maximum 0.020" recommended
Quiescent Current	15mA Max (includes sensor)
Drive capability	Typically 100mA @ 24VDC
Sensor Body Material	304 Stainless steel
Operating Temperature	-20°C to +60°C
Cable	N/A Internal Terminal Block

Mounting Ring and Junction Box	
Material	Cast Aluminum
Conduit Entrance	1/2 inch NPT
199SM Magnet Wheel	
Material	Ferrous Nylon
Number of Magnets	120 alternating North & South Poles (120ppr w/Magnetoresistive Sensor 60ppr w/Hall-Effect Sensor)
Hub Material	Cast Aluminum
Attachment Method	2 Set-Screws, 90° Apart
Max. Operating Speed	10,000 rpm
Bore Sizes	5/8", 7/8", 1-1/8", 1-3/8", 1-5/8" (Standard). Special Bores up to 3" maximum are available.
Operating Temperature	-20°C to +60°C (consult factory for higher temperature ranges)

Spare Parts List	Part No.	Model No.
Standard sensor w/10ft	775-110003	1101RK
Magnetoresistive sensor w/10ft	775-110006	1102RK
Magnet wheel	Specify bore	199SM
Shielded cable 3-conductor	610-000200	213A
Small Quadrature sensor w/10ft	775-120101	1201
Large Quadrature sensor w/10ft	775-120201	1202
Shielded cable 4-conductor	610-000500	
Small Line Driver Sensor	775-120122	1201QLD
Large Line Driver Sensor	775-120212	1202QLD

Specifications are subject to change without notice.

Dimensional Drawings

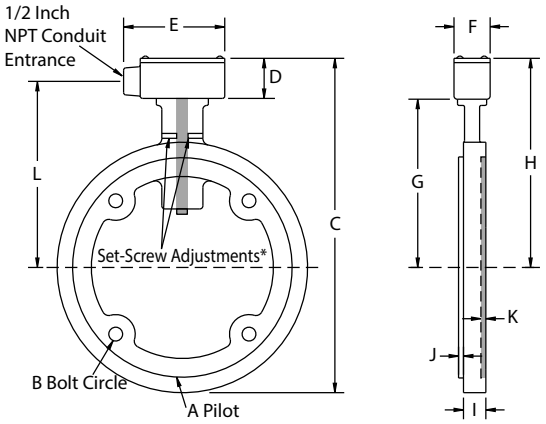


Figure : Large C Face Ring Kit (*DRK*-LG)

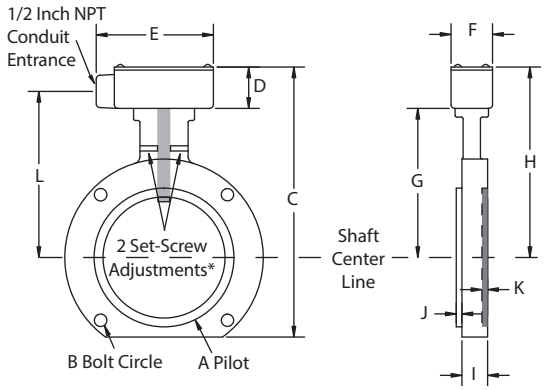
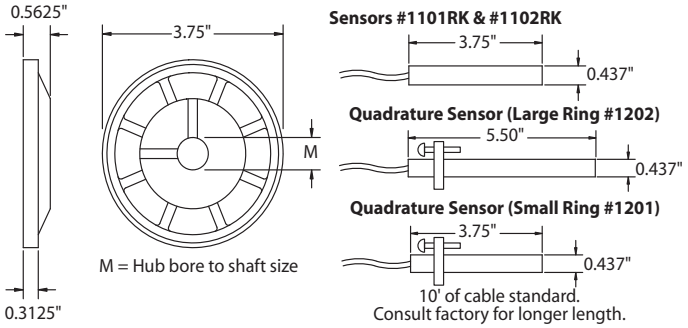


Figure : Small C Face Ring Kit (*DRK*-SM)

NEMA Frame	Hub Size "Dim M"	Sensor Technology		
		Single Channel	Quad Channel	Line Driver
56C	5/8 (0.625)	DRK-SM	QDRK-SM	QDRKLD-SM
143TC, 145TC	7/8 (0.875)			
182C, 184C	7/8 (0.875)			
182TC, 184TC	1-1/8 (1.125)	DRK-LG	QDRK-LG	QDRKLD-LG
213TC, 215TC	1-3/8 (1.375)			
254UC, 256UC	1-3/8 (1.375)			
254TC, 256TC	1-5/8 (1.625)			



Ring Kit Dimensions for All Applications												
Kit	A	B	C	D	E	F	G	H	I	J	K	L
DRK-SM	4.50	5.875	9.04	1.52	3.85	1.39	4.86	6.38	0.78	0.12.	0.16	5.485
DRK-LG	8.50	7.25	12.81	1.52	3.85	1.39	6.47	8.00	0.86	0.19	0.21	7.095