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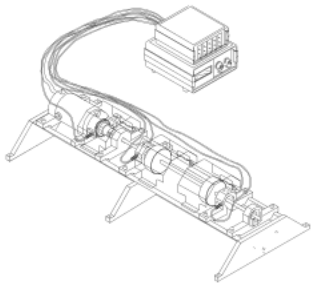
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Find the *GE / Bently Nevada RK 4* at our website: *Click HERE*

RK 4 Rotor Kit

Bently Nevada™ Asset Condition Monitoring



Description

The RK 4 Rotor Kit closely simulates actual rotating machine behavior. Its unique geometry and its ability for users to isolate and control individual machine characteristics make it useful as both a teaching tool and as a laboratory tool for theoretical research.

Machine malfunctions and experiments that can be demonstrated include, but are not limited to:

- rotor unbalance - both single plane and multiplane
- shaft rub condition
- oil whirl and oil whip instabilities
- shaft perturbation

In addition to machinery behavior, the rotor kit can be used to teach the fundamentals of proximity probe placement, gapping, and troubleshooting. It can also help technicians learn how to read and interpret proximity probe signals using an oscilloscope.

Performance and Features

The RK 4 Rotor Kit has a V-frame design that has been developed to provide better control of the housing dynamic stiffness properties. The mechanical tolerances have also been tightened, resulting in more accurate machine behavior modeling. The RK 4 Rotor Kit motor can closely hold the desired speed with changes in loading conditions. This has been accomplished by incorporating a direct current motor and high performance control circuitry. The motor can run in either a clockwise or counter-clockwise direction and has adjustable slow roll speed capability. It can be controlled remotely by using a ±5 volt control input, such as a signal generator or dc power supply, to drive the motor speed control device. Rotor speed is displayed on a digital tachometer with a large LCD readout.

The RK 4 Rotor Kit consists of:

- A mechanical base (including motor, coupling, rotor shaft, two balance wheels, two journal bearings and bearing blocks, six proximity probes, three probe mounts, a rub screw, and three safety covers).
- A Proximitor® assembly that contains five Proximitor units.
- A direct current motor speed control device.

The motor speed control device provides power for both the rotor kit and the Proximitor assembly. A measurement and diagnostic tool, such as an oscilloscope or other diagnostic instrument, should be ordered separately in order to observe the RK 4 machine behavior.

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An optional Oil Whirl/Whip kit can be ordered. The Oil whirl kit consists of:

- A high pressure oil pump assembly.
- An oil whirl bearing assembly.
- A rotor kit shaft with oil bearing journal.
- A load frame.

Fluid-induced instabilities (both oil whirl and whip) as well as basic journal bearing behavior can be demonstrated using the oil whirl/whip kit. The oil whirl bearing is made from transparent plastic, allowing the user to view the oil film development during operation. The load frame is used to remove the effect of gravity on the rotor and to position the rotor to any desired eccentricity ratio.

An optional perturbator kit is also available. The Unbalance Perturbator Option applies a precise rotating force to the Rotor Kit shaft independent of the shaft rotative speed. Perturbation testing is a powerful experimental technique used to identify rotor system parameters. The Unbalance Perturbator Option is a 3-in-1 tool that allows the user to perform nonsynchronous, synchronous, and static perturbation experiments on the RK 4 Rotor Kit, with or without the Oil Whirl Option.

The kit includes:

- A mechanical base (including motor, coupling, drive assembly, drive belts, and two proximity probes for motor speed control and Keyphasor® signal pickup).
- A perturbator disk assembly.
- A motor speed control unit.

Specifications

Basic Rotor Kit

Power:

95 to 125 Vac, single phase,
or 190 to 250 Vac, single phase,
50 to 60 Hz at 3.0 A maximum.

Fuse Rating:

250 V at 3 A slow-blow.

Buffered Proximitor Assembly Outputs:

200 mV/mil.

Max Speed:

10,000 rpm, typical.

Max Ramp Rate:

±15,000 rpm/min. typical.

Mechanical Base Dimensions

Height:

165 mm (6.5 in)

Width:

340 mm (13.4 in)

Depth:

789 mm (30.8 in)

Motor Speed Control Dimensions

Height:

115 mm (4.5 in)

Width:

260 mm (10.3 in)

Depth:

325 mm (12.8 in)

Proximitor Assembly Dimensions

Height:

86 mm (3.4 in)

Width:

154 mm (6.1 in)

Depth:

158 mm (6.2 in)

Shaft diameter:

10 mm (0.4 in)

Weight

Rotor Kit Base:

14.5 kg (32 lb)

Proximitor Assembly:

0.9 kg (2 lb)

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Motor Speed Control:

2.7 kg (6 lb)

Oil Whirl/Whip Kit

Oil Pump Power:

95 to 125 Vac, single phase

50 to 60 Hz at 1.5 A maximum; or

190 to 250, single phase,

50 to 60 Hz at 0.75 A maximum.
User-selectable input voltage.

Oil Pump Fuse Rating:

95 to 125 Vac:

250 V 3.0 A slow-blow;

190 to 250 Vac:

250 V 1.5 A slow-blow.

User-selectable fuse.

Oil Pump Dimensions

Height:

145 mm (5.7 in)

Width:

317 mm (12.5 in)

Depth:

292 mm (11.5 in)

Perturbator Kit

Power:

95 to 125 Vac, single phase,

or 190 to 250 Vac, single phase,

50 to 60 Hz at 3.0 A maximum.

Fuse Rating:

250 V at 3 A slow-blow.

Max Speed:

10,000 rpm, typical.

Max Ramp Rate:

±15,000 rpm/min, typical.

Perturbator Mechanical Base Dimensions

Height:

165 mm (6.5 in)

Width:

254 mm (10.0 in)

Depth:

305 mm (12.0 in)

Motor Speed Control Dimensions

Height:

115 mm (4.5 in)

Width:

260 mm (10.3 in)

Depth:

325 mm (12.8 in)

Ordering Information

Rotor Kit

123456-AXX-BXX

A: Oil Whirl/Whip Kit

0 0	Not required
0 1	Required

B: Perturbator Kit

0 0	Not Required
0 1	Required

Accessories

Spare Manuals

126376-01

RK 4 Rotor Kit

137482-01

Oil Whirl/Whip Kit

141121-01

Unbalance Perturbator Option

Spare Probes

330903-00-03-10-02-00

Spare 3300 NSv Probe, M8X1, without armor

(Vibration, Keyphasor probes)

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330903-00-02-01-02-00

Spare 3300 NSv Probe, M8X1, without armor

(Speed Probe)

Additional Oil Whirl/Whip Option

126379

Oil Whirl/Whip Kit

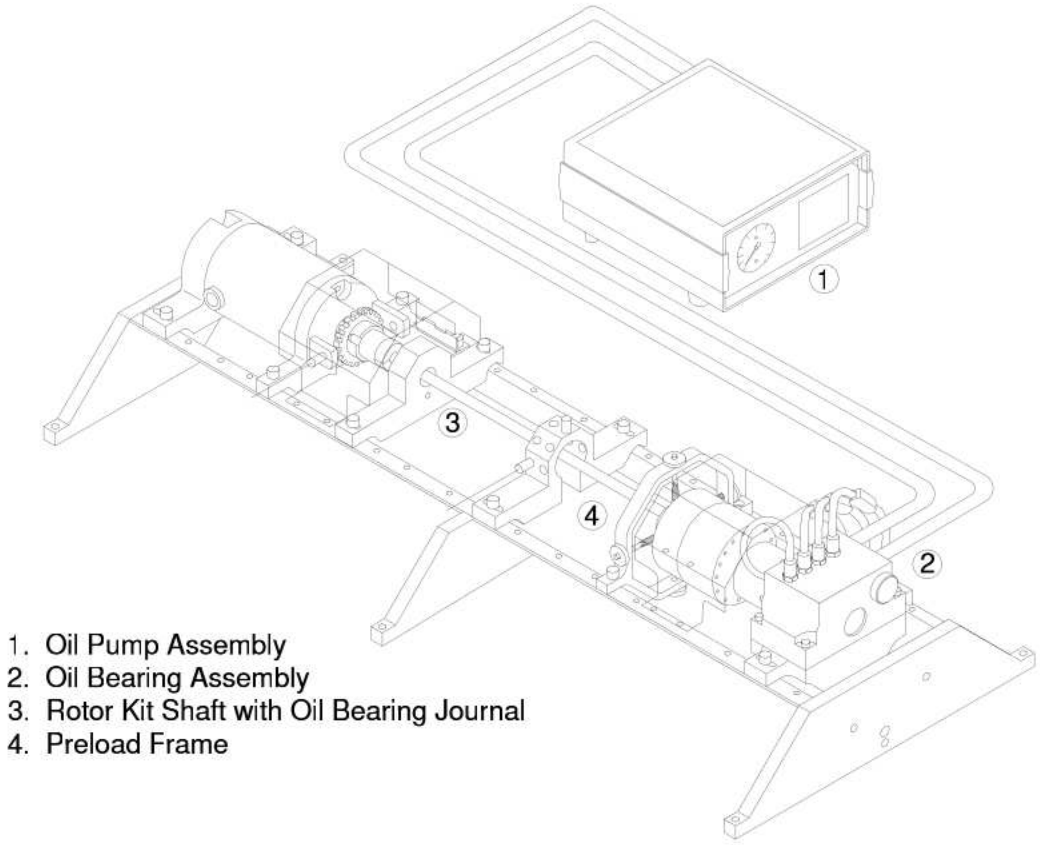
Additional Perturbator Option

140054

Unbalance Perturbator Option

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Option Diagrams



1. Oil Pump Assembly
2. Oil Bearing Assembly
3. Rotor Kit Shaft with Oil Bearing Journal
4. Preload Frame

Figure 1: RK 4 Rotor Kit Base with Oil Whirl Option

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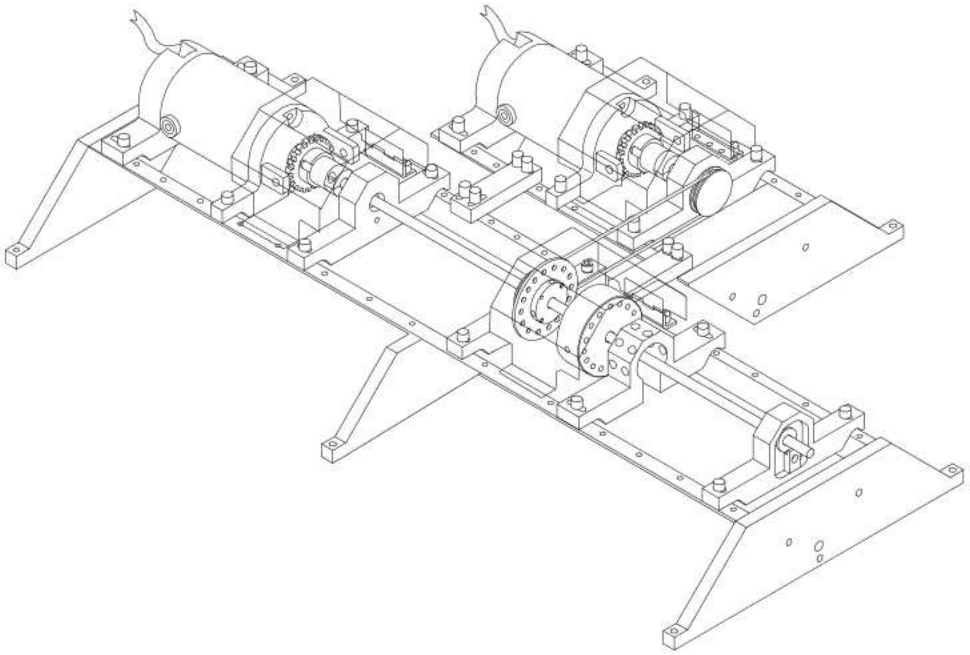


Figure 2: RK 4 Rotor Kit Base with Perturbator Option

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