



CMCP600 Series Bearing Fault Demonstrator



Features:

- 1700/1400 RPM AC Motor
- Quick Bearing Change Out
- Fault Induced Bearing Included (0.004" Outer Race Slice)
- Good Bearing Included
- Easy to Use
- Fast and Repeatable Results
- Carrying Case Included
- Spare Bearings Available

Product Overview

The CMCP600 is designed to demonstrate Vibration measurement techniques that illustrate bearing fault analysis in rolling element bearings. Simple to use, the CMCP600 provides fast, reliable and repeatable results. The included fault bearing has a 0.004" outer race flaw. Accelerometers easily mount to the bearing housing for desktop demonstration of data collection and vibration analysis techniques. Excellent for displaying demodulation or Acceleration Enveloping vibration analysis.

Specifications

| | |
|-----------------------|--|
| Motor Size: | 1/9 Horsepower |
| Power Requirements: | 110 VAC 60Hz (-01 Option) 220 VAC 50Hz (-02 Option) |
| Max Current: | 4 Amps |
| Max RPM: | 1700 RPM (110VAC) 1400 RPM (220VAC) |
| Weight: | 23 Lbs (10.4kg) |
| Dimensions: | 5"x7.75"x7" (12.7x19.7x17.8mm) |
| Sensor Mounting Hole: | ¼-28 UNF Female |
| Material: | Anodized Aluminum |
| Approvals: | CE Approved |

Bearing Specifications

| | |
|--------------------|---|
| Bearings Supplied: | 1 each New "Good" Bearing 1 each Fault Induced Bearing (0.004" Outer Race Slice) |
| Part Number: | Nachi 6559469 |
| Type: | Double Row Angular Contact Bearing |
| Overall Diameter: | 2.44" (62mm) |
| Bore Diameter: | 1.574" (40.00mm) |
| Number of Balls: | 28 (14 Per Row) |
| Ball Diameter: | 0.252" (6.4mm) |
| Contact Angle: | 25° |

Ordering Information:

| CMCP600 | -XX | Description |
|---------|-----|--|
| | -01 | 110Vac 60Hz Powered, 1700 RPM, Demonstration Kit |
| | -02 | 220Vac 50Hz Powered, 1400 RPM Demonstration Kit |

Operation Instructions

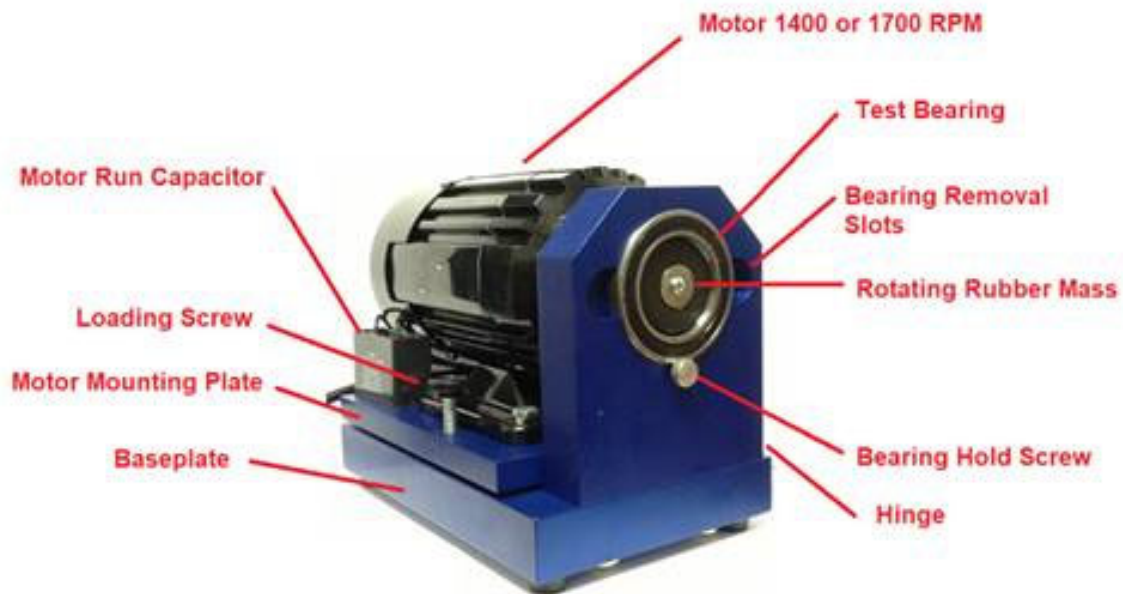
The CMCP600 is designed to demonstrate different types of bearing flaws. The Motor runs at a constant speed either 1400 RPM (50 Hz 220 VAC) or 1700 RPM (60 Hz 110 VAC). The motor shaft is fitted with a Rubber Mass that when loaded (raised) will spin the inner race of the bearing. Loading is accomplished by adjusting the Loading Screw to tilt the Motor Mounting Plate which has a hinge on the opposite side and bring the spinning rubber mass in contact with the Inner Race. The amount of loading can be adjusted with the Loading Screw.

When the system is in the unloaded position with the Motor Mounting Plate against the Baseplate the Bearing can be easily changed out using the finger slots to grip the bearing. Good (No Flaw) Bearings are available along with bearings with a 0.004" Inner Race or Outer Race Flaw.

As the Bearing will only be loaded in the Vertical direction it is always best to install with Outer Race Flaw in the Vertical direction.

Directions:

1. Install Accelerometer Sensor in Vertical or 45 Degree Position
2. Install Bearing to be Tested with Flaw in Load Area
3. Tighten Bearing Hold Screw
4. Start Motor
5. Adjust Loading Screw to desired loading.



CMCP601M Battery Powered Mini Rotor Kit



Features:

- Battery Powered
- 10+ Hours of Runtime @3600 RPM
- Swappable Rolling Element and Journal Bearings
- Flawed Ball Bearings Included
- 0 to 5,500 RPM Variable Speed
- Internal Speed Sensor with Pulse Output
- Custom Carry Case
- Lightweight and Compact
- Stainless Steel Mass

Product Overview

The CMCP601M Mini Rotor Kit is designed for easy transport, setup, and use. With a long battery life of 10+ hours, it makes it easy to demonstrate and train in the use vibration sensors such as Proximity Probes, Accelerometers and Velocity Sensors using Vibration Analyzers or other Monitoring Systems. To extend runtime the charger may be used concurrently with the battery.

At 10" (254 mm) Long, the CMCP601M is designed to be both smaller and lighter than our popular CMCP601M Series. The CMCP601M is not designed to experience any Critical Speeds and accelerates and decelerates smoothly from 0 to 5,500 RPM. Eighteen, 10-32 Threaded Balancing Holes are provided on the rotating mass at 20° apart to allow the user to create an imbalance or to make balance corrections. A balance weight kit with assorted weights is provided with the kit.

The CMCP601M features swappable Rolling Element and Journal Bearing modules. Each kit is provided with two journal bearings, two new rolling element bearings and two flaw induced rolling element bearings.

Two flaw induced rolling element bearings are provided with the kit, one with a 0.004" outer race slice and the other with a 0.004" inner race slice. Fast Changeout of the bearing is done simply by loosening the setscrew in the bearing adapter and inserting another bearing module. Bearing Modules are also included with Smooth Bore/Journal Bearings for demonstrating dampening with Case Mounted Sensors or Proximity Probes.

Items Included

- Basic Rotor Kit Base
- Motor Stand with Brushless 50-Watt Motor
- Battery Pack with Fuel Gauge
- 100-240VAC Charger and Adapter Cables
- Two (2) Bearing Stands
- Two (2) New REB Bearings
- Two (2) Fault Induced Bearings
- Two (2) Sleeve Bearing Modules
- Mass with Balancing Holes
- Long Shaft
- Short Shaft for Overhung Setups
- Shaft Coupling
- Balance Weight Kit
- Mass Bracket for Transit
- Hard Travel Case



CMCP601M Shown in Travel Case

Motor/Controller Specifications:

Power Requirement: 10 to 28 Vdc
Speed Range: Adjustable from 0 to 5,500 RPM
Motor Type: 1Q Brushless DC Motor
Motor Size: 50-Watt
Speed Sensors: Internal Speed Sensor, Wired to nX BNC Output
Speed Sensor Output: TTL (0-5VDC)
Pulses Per Revolution: 6

Battery and Charger Specifications:

Battery Output: 22.2 Vdc, 6 Amps
Battery Life: >10 Hours (@3,600 RPM)
Charger Output: 25.2 Vdc, 2 Amps
Charging Time: 5 Hours
Power/Charging Cable: 2.1mm Jack Splitter Cable

Rolling Element Bearing Specifications:

Bearing Type: 6002
Bearing Diameter: 1.26" (32.0mm)
Bearing Bore Diameter: 0.588" (14.94mm)
Ball Diameter: 0.157" (4mm)
Number of Balls: 9
Cage: Open Frame
Induced Flaw #1: 0.004" Outer Race Slice
Induced Flaw #2: 0.004" Inner Race Slice

Mechanical Specifications:

Rotor Kit Dimensions: 10.75"x3"x4" (273x76x102mm)
Weight: 4.0 Lbs. (1.8kg)
Long Shaft Length: 7.5" (190.5mm) Short
Shaft Length: 3.5" (88.9mm)
Max Bearing Block Span: 6.0" (152.4mm)
Mass Diameter: 3.0" (76.2mm)
Mass Weight: 1.0 Lb. (0.45kg)
Balancing Weight Holes: 18 (20° Apart)
Balancing Weight Thread: 10-32 UNF
Sensor Mounting Holes: 3 each ¼-28 UNF Mounting Holes Per Bearing
Proximity Probe Brackets: Two Brackets for ¼-28 UNF Probes

Shipping Information:

Travel Case Size: 17"x13"x7" (432x330x178mm)
Weight: 14 Lbs. (6.35kg)

Ordering Information:

CMCP601M Battery Powered Mini Rotor Kit, Complete Kit

Accessories:

CMCP601M-REB Spare Rolling Element Bearing Module, No Flaw
CMCP601M-REBIF Spare Rolling Element Bearing Module with Inner Race Flaw
CMCP601M-REBOF Spare Rolling Element Bearing Module with Outer Race Flaw
CMCP601M-JBM Spare Journal Bearing Module
CMCP-BAT-22.2 Spare Li-Ion Battery and Charger



Alternate Images



Battery, Charger and Cables



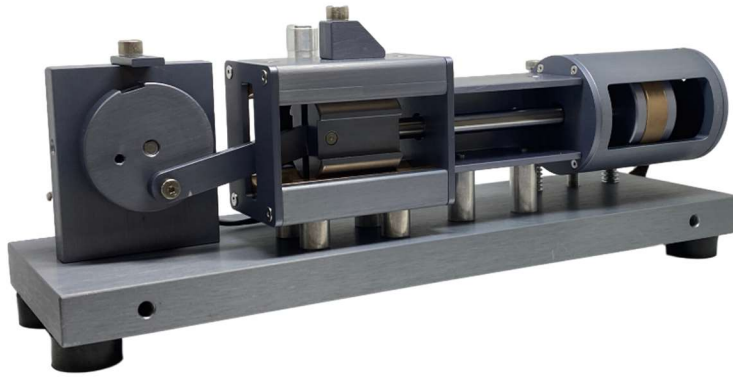
Balance Weight Kit and Bearing Modules



CMCP601M

CMCP601R

Reciprocating Compressor Demonstration Kit



Features:

- 0 to 300 RPM
- Adjustable Height Cylinder
- Rod Drop and Runout
- Crosshead Vibration
- Crosshead Pin Reversal
- Motor/Gear Vibration
- Cylinder End Vibration
- Loose Piston Nut
- Portable Demonstration Kit
- Battery or Charger Powered

Product Overview

The CMCP601R Reciprocating Compressor Demonstration Kit is designed to demonstrate vibration monitoring techniques used on Reciprocating Machinery. Fully equipped with sensors the CMCP601R can be equipped with Accelerometers on the Motor/Gear, Crosshead and Cylinder End along with Proximity Probes in the Distance Piece for Rod Drop and Rod Runout. A mounting bracket and machined Flywheel Notch are provided for a Proximity Probe Keyphasor or other type of once per turn reference signal. Two shaft connecting rod holes are provided for adjusting the total stroke distance.

The Battery Powered DC Motor has an adjustable speed of 0 to 300 RPM (0 to 5.0 Hz). The Cylinder is independently mounted on two vertical spring-loaded linear bearings and height (alignment) can easily be adjusted to demonstrate both Rod Drop and Rod Run Out. The Crosshead has both upper and lower Oil Infused Bronze Bearings (Slippers) and the Piston rides on actual Wear Ring Stock. The Connecting Rod has Bronze Bearings on both ends and connects the Flywheel (Crank) to the Crosshead Pin. Stroke can be adjusted on the Flywheel between 1", and 1.25" (25.4 and 31.75 mm).

The CMCP601R Reciprocating Compressor Demonstration Kit comes complete with: Reciprocating Compressor Kit, Carrying Case, Rechargeable Li-Ion Battery and Charger.

Motor/Controller Specifications

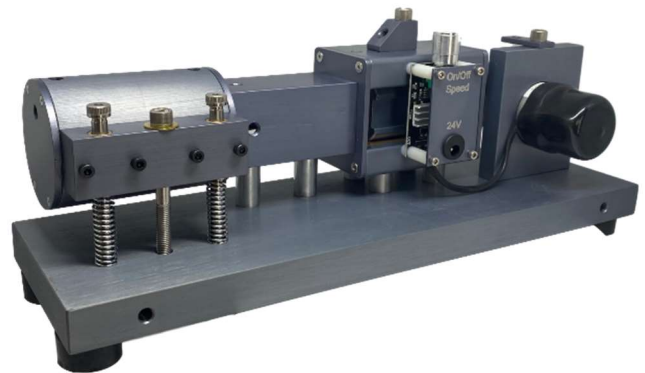
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|---------------|-----------------------------------|
| Speed Range: | 0 to 300 RPM |
| Rotation: | Clockwise |
| Stroke: | 1", 1.25" (25.4mm, 31.75mm). |
| Voltage: | 24 VDC |
| Motor Torque: | 4 N.cm |
| Current Draw: | 120 mA Full Speed, 200 mA Startup |
| Controller: | 80 Watts, 3 Amps Max |

Battery and Charger Specifications

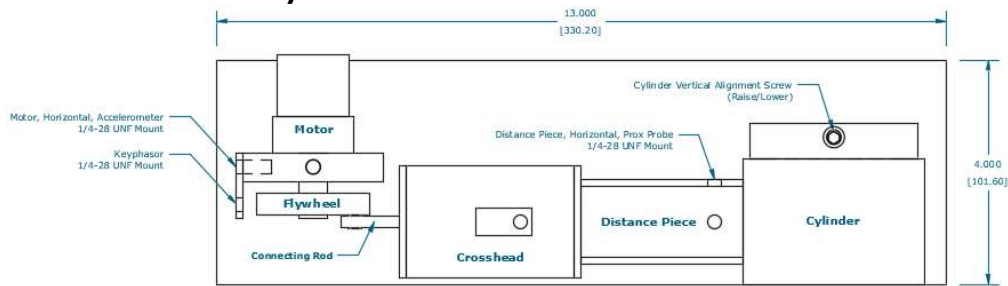
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|-----------------------|--------------------------------|
| Battery Output: | 22.2 VDC, 3.2 Amps |
| Battery Life: | >20 Hours Continuous Operation |
| Charger Output: | 25.2 VDC, 2 Amps |
| Power/Charging Cable: | 2.1 mm Jack/Splitter Cable |

Mechanical Specifications

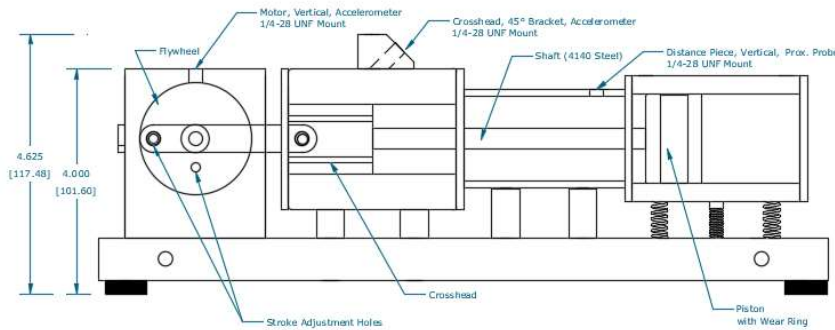
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|---------------------|-------------------------|
| Base Material: | Aluminum, Anodized Gray |
| Piston Rod: | 4000 Series Steel |
| Wear Ring Material: | Bronze Filled PTFE |



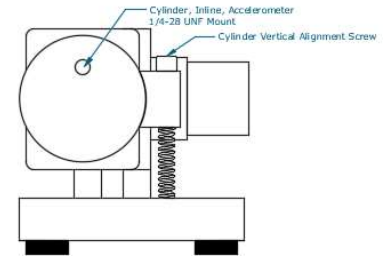
Dimensions and Layout



Top View



Side View



Non-Driven End View

Sensor Mounting Locations

| | |
|-------------------|--|
| Motor Mount: | (2) Vertical and Horizontal (Accelerometers) |
| Keyphasor: | (1) Once per Turn, Flywheel (Proximity Sensor) |
| Crosshead: | (1) Vertical or 45° Mount (Accelerometer) |
| Distance Piece: | (2) Vertical and Horizontal (Proximity Probes) |
| Cylinder: | (1) Axial, In Line with Piston (Accelerometer) |
| Mounting Threads: | (All) 1/4-28 UNF |

Dimensions and Weight

| | |
|-------------------------|---|
| Rotor Kit Dimensions: | 13" L x 4" W x 5.1" H (330 x 102 x 130 mm) |
| Travel Case Dimensions: | 17.5" L x 14.2" x 7.1" H (444.5 x 360.6 x 180.3 mm) |
| Weight: | 14 Lbs. (6.35kg) |

Optional Sensor Accessory Kit Contents

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|------------------------------|--------------------|
| 1x Battery Pack | (CMCP-Bat-22.2) |
| 2x Sensor Power Module | (CMCP300P) |
| 1x Proximator Mounting Plate | (CMCP300P-PLATE-M) |

Optional Sensor Kit Contents

| | |
|-----------------------------|--|
| 3x Accelerometers | (CMCP1100-05-00-00) Motor Mount Horizontal, Crosshead and Cylinder End |
| 2x Proximity Probes Systems | (5mm, 200mV/mil Output) Keyphasor and Rod Drop/Runout |

Ordering Information

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|------------------|--|
| CMCP601R | Reciprocating Compressor Demonstration Kit Includes Reciprocating Compressor, Battery Pack, Battery Charger and Travel Case |
| CMCP601R-ACCKIT | Optional Sensor Accessory Kit (Includes Additional Battery, 2 CMCP300P Interface Modules and Proximator Plate) |
| CMCP601R-SENSORS | Optional Sensor Kit Includes Three Accelerometers and Two Proximity Probes |
| CMCP-BAT-22.2 | Li-Ion Battery and Charger |