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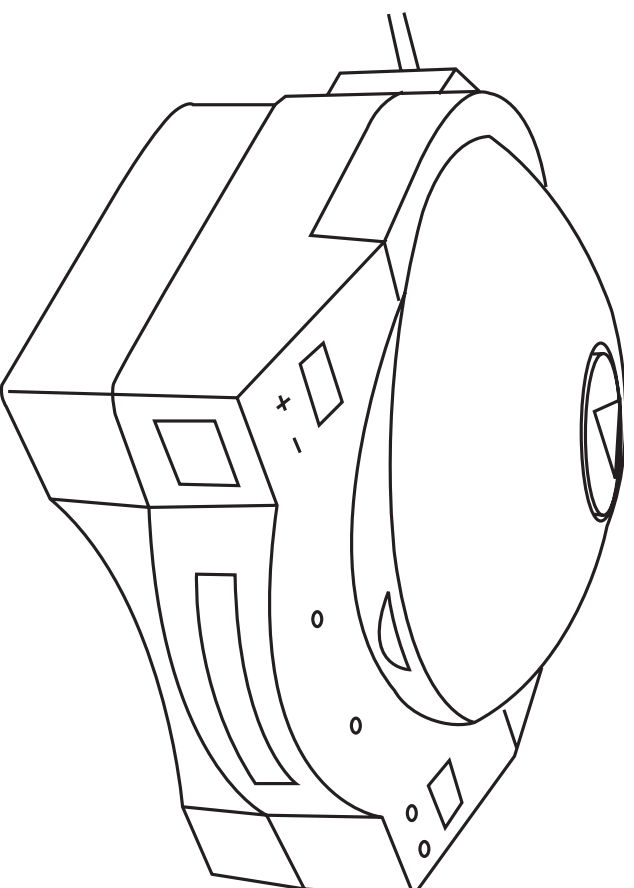
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Force 1418, Force 1618 and Force 1624 Microcentrifuges



Operation Manual

Congratulations on your Microcentrifuge selection. This microcentrifuge has been carefully designed and constructed for easy operation and proven durability. Digital displays, quiet operation, simple controls, autoclavable rotors and rotor covers are a few of this microcentrifuge's features.

Check the contents of the shipping carton. You should find the following items:

- Centrifuge
- Power cord
- Rotor - Force 1418 and Force 1618 - 18 x 1.5 ml rotor
Force 1624 - 24 x 1.5 ml rotor
- Rotor cover
- Wrench
- Operation manual

Follow the instructions for selecting a location for the installation of your micro-centrifuge.

To take advantage of the many features of this unit, carefully read this manual. It contains step-by-step procedures, examples and other vital information for proper care and operation of your microcentrifuge.



CAUTION

Safety Warnings

Use of this product in a manner not specified by the manufacturer may impair any safety protection provided by the equipment and may result in physical damage and/or personal injury. Please read all operating instructions in the Operation Manual prior to use of this device. See Good Laboratory Safety Precautions listed below.

Good Laboratory Safety Precautions

Good laboratory practice requires that the following safety precautions be observed.

- **Always tighten rotor nut with wrench before starting unit.**
- A boundary area of 300mm around the centrifuge should be marked and laboratory management procedures should require that no person or any hazardous materials or breakable items be located within this boundary while the centrifuge is operating.
- An emergency switch for disconnection of the AC (mains) power to the centrifuge, in case of malfunction, is required. This switch must be located away from the centrifuge, preferable outside the room in which the centrifuge is housed or adjacent to the exit from that room.
- Always wear OSHA approved, wraparound eye protection. Observe appropriate safety precautions for the materials being centrifuged as detailed by the Material Safety Data Sheets.
- The centrifuge must not be used with flammable or explosive materials, nor with materials which could chemically interact.

RCF Quick Reference (approx.) for 1.5ml tubes

| RPM | 1418 | 1618 | 1624 |
|-------|-------|-------|--------|
| 1000 | 82 | 82 | 91 |
| 2000 | 326 | 326 | 362 |
| 3000 | 735 | 735 | 815 |
| 4000 | 1306 | 1306 | 1449 |
| 5000 | 2040 | 2040 | 2264 |
| 6000 | 2938 | 2938 | 3260 |
| 7000 | 3999 | 3999 | 4437 |
| 8000 | 5223 | 5223 | 5796 |
| 9000 | 6611 | 6611 | 7335 |
| 10000 | 8161 | 8161 | 9056 |
| 11000 | 9875 | 9875 | 10958 |
| 12000 | 11752 | 11752 | 13040 |
| 13000 | 13793 | 13793 | 16019* |
| 14000 | NA | 15996 | NA |

*Value given is for the maximum speed of the centrifuge, 13,300 rpm.

Accessories

The following accessories are available for the Force 1418, 1618 and 1624 centrifuges.

Adapters

Each adapter holds one tube.

Adapter for 500µl tubes, pack of 6

Adapter for 250/400µl tubes, pack of 6

Adapter for 200µl thermal cycling tubes, pack of 6

Operating Specifications

- Ambient operating temperature: 4° to 40°C
- Operating humidity 0% to 95% humidity, noncondensing.
- The weight of the centrifuge, unloaded rotor and rotor cover is approximately 11 lb (5.0 kg) for the Force 1418 and Force 1618, and 11.75 lb (5.3 kg) for the Force 1624.

Electrical/Fuse Ratings

- 120 volt unit: 120V~, 50/60Hz, 1.5A 2.5AT Fuse
- 230 volt unit: 230V~, 50/60Hz, 0.8A 1.25AT Fuse
- 100 volt unit: 100V~, 50/60Hz, 1.5A 2.5AT Fuse

Manual Lid Lock Release

Should a power failure occur while the centrifuge is in operation, the lid of the centrifuge will remain locked until power is restored. However, it is possible to gain access to valuable samples by releasing the lid lock manually.

1. Locate the plastic release button on the front of the centrifuge.
2. Pry the button out of the centrifuge housing.
3. A wire is attached to the button. Once the button is free of the housing, tug firmly on the button and wire to release the lid lock.
4. The lid of the centrifuge can now be opened and samples removed.
5. Before operating the centrifuge again, replace the release button.

NOTE: Do not attempt to operate the manual release while the rotor is spinning.

Cleaning and Maintenance

- There are no user serviceable parts within the unit. Opening the case will void the warranty.
- The unit should be wiped down after each use with a soft cloth. Periodic cleaning of the rotor and chamber should be performed to keep the unit in proper operating condition. Clean any spills immediately.
- Disconnect electrical power from the microcentrifuge before cleaning.
- Do not immerse the body of the centrifuge in any liquid
- Use mild soap or diluted bleach and a soft cloth. Do not use chemical solvents for cleaning.
- The removable rotor and rotor cover may be autoclaved at 121°C.
- Before using any cleaning or decontamination method, except those recommended by the manufacturer, verify with the manufacturer that the proposed method will not damage the equipment

Note: An excessive buildup of dirt and grime in the centrifuge may affect operation of the unit. It is the responsibility of the user to maintain the centrifuge in the proper manner. Failure to do so may affect the warranty coverage.

To Calculate Separation Acceleration & RPM:

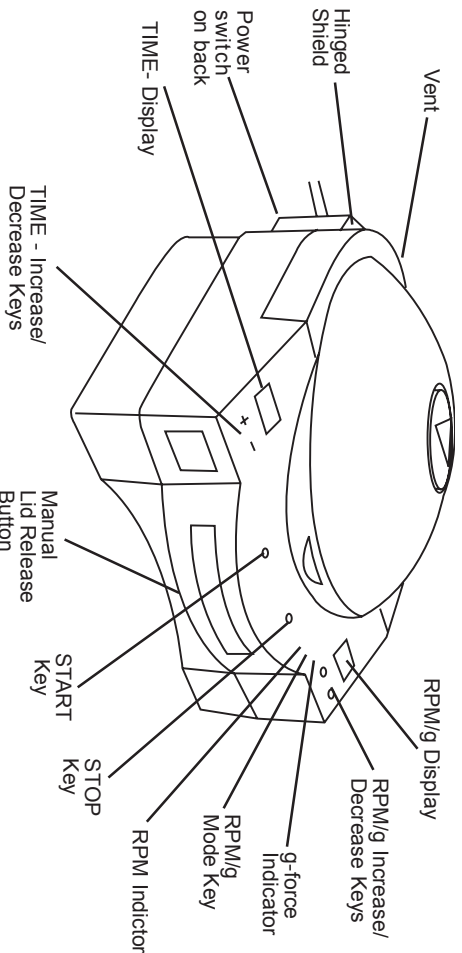
$$RCF = 11.18 \times r \times (n/1000)^2$$

Where: r = radius in cm and

n = speed in rpm

The centrifugal radius of the 18 x 1.5ml rotor is 7.3cm and of the 24 x 1.5ml rotor, 8.1cm. The centrifugal radius of the rotors is reduced when using 0.5ml and 0.2ml adapters. For the 18 place rotor, the radius when using 0.5ml adapters is 6.6cm and when using 0.2ml adapters, it is 6.1cm. The centrifugal radius of the 24 place rotor with 0.5ml adapters is 7.4cm and 6.9cm when using 0.2ml adapters.

- Do not expose the centrifuge, rotor, rotor cover or accessories to materials or processes which could cause chemical or mechanical damage.
- Thoroughly inspect the centrifuge, rotor and accessories for mechanical and chemical damage *prior to each use*. Mechanical damage can often be visually observed, and includes cracks, scratches or gouges on the centrifuge lid or rotor. Chemical damage can often be visually observed and includes crazing, peeling or similar deterioration of the inner cavity, lid, rotor or surfaces.
- **DO NOT USE THE CENTRIFUGE OR ROTOR IF DAMAGE IS EVIDENT. REPLACE DEFECTIVE PARTS IMMEDIATELY.**
- Do not dispose of the centrifuge by incineration.
- Use only manufacturer-approved accessories with the unit.
- Sample tubes used must be compatible with the maximum Relative Centrifugal Force (RCF) rating of the centrifuge. Sample tubes have a limited life and should be used per the sample tube manufacturer's recommendations. Do not mix the sample tube types within a rotor. The weight of each sample should be within 5% of all other samples. To maintain balance, equally distribute loaded sample tubes in the rotor.
- The rotor cover provided is not intended to be a bioseal (as defined by IEC 1010-2-020) for containment of pathogenic microbiological specimens during use.
- **Do not move the centrifuge during operation, as the unit may become unbalanced and the rotor may become dislodged.**
- While a small amount of vibration during rotor acceleration or deceleration is normal, immediately stop the centrifuge if excessive vibration is evident at any time.
- Do not obstruct any air inlet or exhaust vent on the centrifuge.
- The centrifuge is not designed to spin more than 2.5 grams of fluid per sample tube.





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