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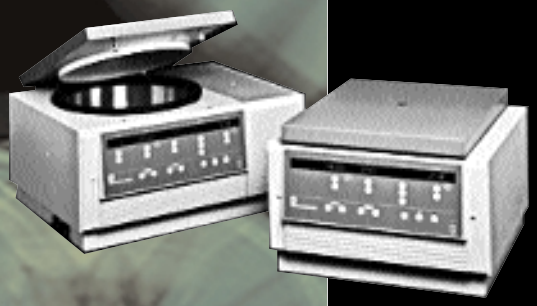
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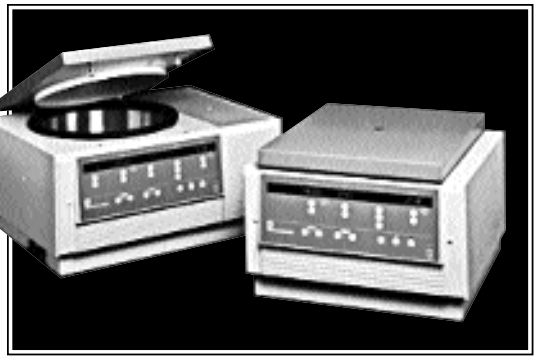
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# 3 Liter Programmable Centrifuges

Forma Scientific, Inc.





*Model 5682 and Model 5681*

## FORMA SCIENTIFIC'S COMPLETE LINE OF PROGRAMMABLE CENTRIFUGES

Since 1950, the name Forma Scientific has represented high quality, reliable laboratory equipment for a wide variety of applications. In our continuing effort to meet the needs of customers, we have added a complete line of centrifuges to our family of products. These multi-purpose and high performance centrifuges are fully programmable, providing ease of operation for even the most complicated separations.

Forma's benchtop centrifuges incorporate the latest technological advancements to ensure your desired parameters are constantly monitored and maintained. These units provide a temperature range from -5°C to +40°C*, with extended speed ranges to 5,100 RPM (up to 4,550 xg).

## UNIQUE FEATURES

- Fully automatic runs can be replicated and are selected simply by choosing one of the 35 user-defined programs.
- For running more complicated separations, simply program the rotor number and enter the desired speed, time and temperature* by using the up/down arrow keys.
- Audible/visual self-diagnostic alarms ensure program parameters are maintained. Should a deviation occur during run cycle, operator will be alerted to message displayed on control panel.
- The Enviro-Scan™ Microprocessor provides a sensi-touch keypad that is "glove-friendly" and stores up to 35 programs which can be retrieved in seconds.
- Models provide self-diagnostic messages and alert the operator of the need for routine maintenance.
- Extended speed range of 500 to 5,100 RPM, settable in increments of 10 or 100 RPM. Can also be directly set in RCF.
- Temperature range on refrigerated model is adjustable from -5°C to +40°C in 1°C increments. Temperature uniformity is ±1°C (from 4°C to ambient).
- To bring chamber temperature to the desired setting, the refrigerated unit features rapid temperature conditioning. By spinning the rotor at pre-set speeds, chamber will warm or cool to set temperature and alert operator by sounding three audible beeps.
- Unique rotor combinations achieve higher g-forces, allowing runs to complete in up to 50% less time.
- High quality steel cabinet ensures safety and durability, while rigid design minimizes operating noise level.
- Interlocking fail-safe system requires lid to be closed and latched before unit can be operated. A yellow light is illuminated when lid is open.
- Rotor/radius function enables operator to choose rotor selection by number or rotor radius in centimeters. Radius can be modified to match your accessory combination. Display illuminates when rotor is selected.

Our 3 liter centrifuges are available with the widest variety of rotor/accessory combinations on the market today. Accessories include High Speed Sealed Rotors, General Purpose Sealed Rotors, Swinging Bucket Rotors, High Force Angle Rotors and Fixed Angle Rotors. All have been designed to accommodate hundreds of accessory combinations.

Forma Scientific continues to reinforce its commitment as a global leader in laboratory equipment with our ISO 9001 registration. In addition, all Forma Centrifuges are built to the international standards of IEC 1010-2-020 and are CSA Certified. In an effort to preserve the earth's ozone layer, we have also made the commitment to use only Non-CFC refrigerants in our refrigerated centrifuges.

**On Refrigerated Model 5682*



*Model 5688*

## FORMA SCIENTIFIC'S FLOOR MODEL PROGRAMMABLE CENTRIFUGES

Forma Scientific's floor model multi-purpose and high performance centrifuges are fully programmable, providing ease of operation for even the most complicated separations.

These floor model centrifuges incorporate the latest technological advancements to ensure your desired parameters are constantly monitored and maintained. These units provide a temperature range from -5°C to +40°C*, with extended speed ranges to 5,100 RPM (up to 4,550 xg).

## UNIQUE FEATURES

- All units feature the Enviro-Scan™ Microprocessor Control System which incorporates a digital LED readout, audible/visual alarm indicators and an ergonomically designed, "glove-friendly", tactile touch keypad. This control system keeps the operator continually informed of the status of the centrifuge operation.
- Fully automatic runs can be replicated and are selected simply by choosing one of the 35 user-defined programs. For running more complicated separations, simply program the rotor number and enter the desired speed, time and temperature* by using the up/down arrow keys.
- Audible/visual self-diagnostic alarms ensure program parameters are maintained. Should a deviation occur during run cycle, operator will be alerted to message displayed on control panel.
- Extended speed range of 500 to 5,100 RPM, settable in increments of 10 or 100 RPM. Can also be directly set in RCF.
- Temperature range on refrigerated models is adjustable from -5°C to +40°C in 1°C increments. Temperature uniformity is ±1°C (from 4°C to ambient).
- To bring chamber temperature to the desired setting, the refrigerated models feature rapid temperature conditioning. By spinning the rotor at pre-set speeds, chamber will warm or cool to set temperature and alert operator by sounding three audible beeps.
- High quality steel cabinet ensures safety and durability, while rigid design minimizes operating noise level.
- Interlocking fail-safe system requires lid to be closed and latched before unit can be operated. A yellow light is illuminated when lid is open.
- Compact, portable floor models are provided with locking casters for ease of mobility.
- Units come complete with a convenient, lockable storage drawer for your centrifuge accessories.
- Unique rotor combinations achieve higher g-forces, allowing runs to complete in up to 50% less time.
- Rotor/radius function enables operator to choose rotor selection by number or rotor radius in centimeters. Radius can be modified to match your accessory combination. Display illuminates when rotor is selected.

**On Refrigerated Models 5688 and 5689.*

# MODEL 5681, 5682, 5687, 5688, and 5689 SPECIFICATIONS

**MAXIMUM SPEED**

| | |
|---|---|
| Fixed Angle Rotor | 5,100 RPM |
| Windshield Rotor | 4,600 RPM |

**MAXIMUM FORCE**

| | |
|---|---|
| Fixed Angle Rotor | 4,190 xg |
| Windshield Rotor | 4,550 xg |

**MAXIMUM NO. OF TUBES** 296 x .025ml

**MAXIMUM SAMPLE VOLUME** 3 liters (4 x 750ml)

**OPERATOR CONTROLS**

| | |
|---|---|
| Rotor Chamber Temperature (Model 5682, 5688, and 5689) | -5°C to +40°C by 1°C (+23°F to +104°F) |
| Rotation | 500-6,000 RPM by 10 and 100 RPM |
| RCF | 50-4,550 xg, by 1 xg, 10 xg and 100 xg |
| RPM/RCF | To enter RPM or RCF |
| Auto-Reset Timer | At-Start mode (timed run begins when start control pushed)<br>At-Speed mode (timed run begins at set speed)<br>Hold (not timed runs) |
| Spin Duration | 1-59 seconds by 1 second<br>1-4:45 minutes by 15 seconds<br>5-360 minutes by 1 minute<br>Momentary operation mode<br>Hold mode (indefinite duration) |
| Rotor Number/Radius | Enables RCF control, and modify rotor radius for RCF control at any point within tube |

**ACCEL RATE CONTROL** Five settings

**DECEL RATE CONTROL** Five settings and coast

**CONSTRUCTION**

| | |
|---|---|
| Interior | Steel cabinet with interlocking, mechanically latched lid |

**ALARMS**

| | | |
|---|---|---|
| Temperature | Audible/visual | |
| Diagnostic Display (shown in RPM display) | Balance - | unbalanced |
| | Lid - | not latched |
| | Head - | no rotor |
| | Error - | mechanical/electrical malfunction messages displayed (up to seven available) |
| | Brush - | brushes need replaced |
| | PFail - | power failure occurred during run |
| | Line Lo/Hi - | improper voltage configuration |

**HEAT OUTPUT**

| | |
|---|---|
| Model 5681 and 5687 | 2150 BTU/hr. (nominal) |
| Model 5682, 5688, and 5689 | 3000 BTU/hr. (nominal) |

**REPEATABILITY**

| | |
|---|---|
| Temperature Control (Model 5682, 5688, and 5689) | ± 1°C in the range from 4°C to ambient |
| Rotation | to 10 RPM |
| Spin Time | Exact |

**DISPLAY** Temperature, Speed, Time, Program, Rotor (indicated by numbers) Acceleration, Brake, Start, Stop, Open (indicated by lights)

**REFRIGERATION** Refrigerants used in the Model 5682, 5688, and 5689 are Non-CFC, Non-flammable and commercially available

**ELECTRICAL**

| | |
|---|---|
| Model 5681 | 100, 120, 220, 240V, 50/60Hz, 1 PH, 10A (user-selectable) |
| Model 5682 | 120V, 60Hz, 1PH, 15A |
| Model 5687 (with 3-prong plug) | 100, 120, 220, 240V, 50/60Hz, 1 PH, 10A (user-selectable) |
| Model 5688 (with 3-prong plug) | 120V, 60 Hz, 1 PH, 15A |
| Model 5689 (with 3-wire cord) | 200, 220, 240V, 50/60 Hz, 1 PH, 10A |
| Cord Set | 6 ft. |

**CERTIFICATION**

CSA (Std. C22.2 No.151)
CE Mark
IEC 1010-2-020

**DIMENSIONS**

| | Model 5681 | Model 5682 |
|---|---|---|
| Height (cover open) | 36.0” (91.4cm) | 36.0” (91.4cm) |
| Height (cover closed) | 17.0” (43.2cm) | 17.0” (43.2cm) |
| Width | 23.0” (58.4cm) | 30.0” (76.2cm) |
| Depth | 24.0” (61.0cm) | 24.0” (61.0cm) |

| | Model 5687, 5688, and 5689 |
|---|---|
| Height (cover open) | 58.0” (147.3cm) |
| Height (cover closed) | 35.5” (90.2cm) |
| Width | 23.0” (58.4cm) |
| Depth | 24.0” (61.0cm) |

**WEIGHTS**

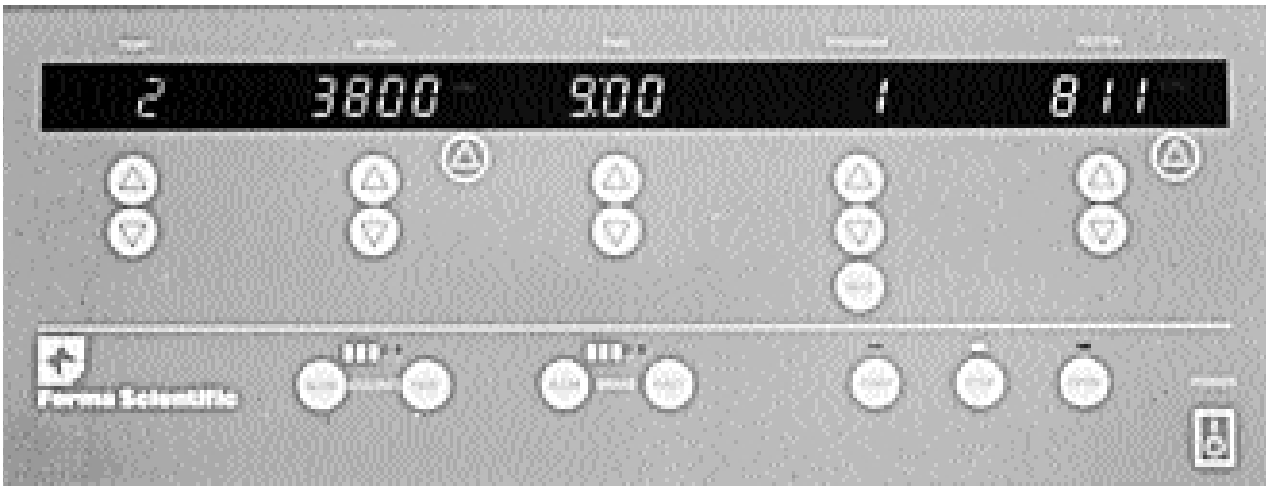
| | Model 5681 | Model 5682 |
|---|---|---|
| Net | 200 lbs. (91.0 kg) | 270 lbs. (122.6 kg) |
| Shipping | 245 lbs. (111.2 kg) | 315 lbs. (143.0 kg) |

| | Model 5687, 5688, and 5689 |
|---|---|
| Net | 370 lbs. (168 kg) |
| Shipping | 450 lbs. (204 kg) |

## ENVIRO-SCAN MICROPROCESSOR CONTROL SYSTEM

Standard on all Forma Centrifuges, the Enviro-Scan Microprocessor incorporates a digital LED readout, audible and visual alarm indicators and an ergonomically designed, “glove-friendly” tactile touch keypad. This control system keeps the operator continually informed of the status of the centrifuge operation.

| | |
|---|---|
| TEMP | On refrigerated unit, temperature can be set between -5°C and +40°C in 1°C increments. Display will flash between the setpoint and the actual temperature. A 1.5 second audible beep will sound if temperature deviates 5°C from the set temperature. |
| SPEED/G-FORCE | This dual function indicator and control allows the user to select desired RPM or set the required g-force directly. Display shows either selected RPM or RCF and never requires calibration. |
| TIME | Time can be set from 1 second to 360 minutes. System counts down from setpoint in the normal timed mode; counts up in the time hold or momentary spin mode. |
| PROGRAM | Internal memory stores up to 35 user-defined programs. When needed, a separate memory allows programs to be modified per run or changed and stored in the permanent memory. Non-volatile memory retains programming even if power is turned off. |
| ROTOR/RADIUS | Dual function allows scrolling through rotor menu to choose appropriate rotor, or to modify the radius of rotation to match your selected rotor/accessory combination. |
| ACCELERATE/BRAKE RATE CONTROL | Select from five acceleration and five deceleration rates, plus coast. |
| START | Pressing the start button begins a programmed run or repeats a run. Green light flashes until 95% of set speed is achieved, then remains “on” until end of run. |
| STOP | Pressing stop button terminates run at any point during the run cycle. During deceleration, red light flashes and then remains “on” when rotor has stopped. Three audible beeps are also sounded. |
| OPEN | Unlatches the lid before or after run cycle, but is disabled during the run. Yellow light is illuminated when lid is open. |
| RAPID TEMP CONDITION | Unique feature on refrigerated unit provides rapid cooling or rapid warming of the chamber area. Once the chamber has reached the desired setpoint, the rotor will brake to a rest and alert the user with an audible three beep signal. |



# THREE LITER, SWINGING BUCKET ROTOR SYSTEMS

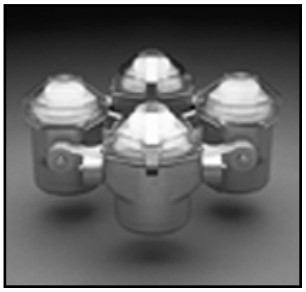


5800218 High Speed Sealed Rotor includes transparent sealed windshield lid and four Forma 5803218 Sealed Buckets.*
4 x 750ml - to 4600 RPM/4550 xg



5800228 General Purpose Sealed Rotor includes four Forma 5800372 Sealed Buckets.* 4 x 750ml - to 3400 RPM/2500 xg

**Order Centrac Adapters or microplate carriers separately.*



5800216 Economical Rotor includes four Forma 5800316 Buckets with clip-on domes.*
4 x 750 ml to 3400 RPM/2550 xg

## CENTRAC ADAPTERS

| SAMPLE CONTAINER | MAX. DIAM. (mm) | CATALOG NO. | NUMBER OF TUBES 5800218 Rotor | 5800228 Rotor | 5800216 Rotor |
|---|---|---|---|---|---|
| 0.25 and 0.4ml Microtubes | 6.1 | 5805774 [1,2] | 296 | 296 | 296 |
| 0.5ml and B-D Microtainers | 8.1 | " | " | " | " |
| 0.25 and 0.4ml Microtubes | 6.1 | 5805737 [2] | 148 | 148 | 148 |
| 0.5ml and B-D Microtainers | 8.1 | " | " | " | " |
| 5ml (10 x 75/12 x 75mm) | 12.4 | " | " | " | " |
| 1.5ml Microtubes | 11.0 | 5805827 [2] | 108 | 108 | 108 |
| 7-10ml (13 x 75mm Coag/13 x 100mm Vacutainer) | 14.5 | " | " | " | " |
| 15ml (16 x 125mm Vacutainer | 18.0 | 5805719 | 28 | 52 | 76 |
| 12ml (16 x 75-100mm Vacutainer) | " | " | 76 | 76 | 76 |
| 20ml (16 x 150mm Vacutainer) | " | " | - | 4 | 12 |
| 15ml Uri-System/Kova urine tubes | 17.8 | 5805712 | 24 | 48 | 48 |
| 15ml (Falcon/Corning conical) | " | " | " | " | " |
| 15ml (Falcon/Corning, Uri-System/Kova) | 17.4 | 5805703 [3] | 12 | 12 | 12 |
| 10-15ml (16 x 100 - 125mm Vacutainer) | 17.4 | " | " | " | " |
| 50ml (Falcon/Corning conical) | 29.4 | " | " | " | " |
| 50ml (Falcon/Corning conical) | 29.6 | 5805805 | 20 | 20 | 20 |
| 50ml (Falcon/Corning conical) | " | 5805807 [4] | - | - | 28 |
| 50ml (round/conical) | 29.6 | 5805707 | 28 | 28 | 28 |
| 100ml (Corning 8460-100, 8422-100) & | 44.8 | 5805704 | - | - | 8 |
| 50ml (Corning 8422-50, 8300-50) | 29.5 | " | - | - | 8 |
| 140ml (Bellco 304500140 conical) [5] | 63.4 | 5805780 | - | - | 4 |
| 175/225ml (Falcon 2076/2075) [6] | " | " | 4 | 4 | 4 |
| 250ml (Corning 25350-250 conical) [7] | " | " | - | - | 4 |
| 250ml (IEC 2502, 2504) | " | " | 4 | 4 | 4 |
| 500ml | 77.1 | 5805781 | " | " | 4 |
| 750ml (IEC 2273) | 98.3 | - | 4 | 4 | 4 |
| Blood Bags [8] | N/A | 5802077 | 4 | - | - |
| Blood Bags [8] | " | 5802039 | - | 4 | 4 |
| Microplates (86 x 128mm) | N/A | 5805784 [9] | 4 | - | - |
| Microplates (86 x 128mm) | N/A | 5805782 [10] | - | 8 | 8 |
| 1 x Deep Well Plates (86 x 128 x 53mm) | N/A | 5805785 [10] | - | 4 | 4 |
| 2 x Deep Well Plates (86 x 128 x 53mm) | N/A | 5805789 [12] | - | 8 | 8 |
| Microscope slides (25.4 x 76.2mm) | N/A | 5805799 [11] | 4 | 4 | 4 |

The clip-on domes of the 5800216 Rotor control aerosols and reduce windage.

Sealed

Omit dome

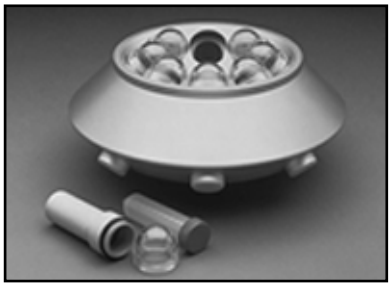


Forma's Model 5681 and 5682 will accommodate literally hundreds of accessory combinations.

**1** Double Stacking Adapter
**2** Adapter includes microtube inserts
**3** Order three Forma 5807323 Sealed Buckets per 5805703 Adapter for 15 ml tubes or three Forma 5800323 Sealed Buckets for 50 ml tubes
**4** Triple level adapter
**5** For Bellco 3045-10140
**6** For Falcon 2090 Conical Cushions
**7** Order Forma 5805793 Conical Cushions
**8** Use triple/quad packs without adapter
**9** Speed limited to 4000 RPM
**10** Speed limited to 3500 RPM
**11** Order one Forma 5801024 Cytobucket™ per adapter
**12** Speed limited to 2500 RPM

## FIXED ANGLE ROTOR

| ROTOR | DESCRIPTION | RPM | RCF | RADIUS |
|---|---|---|---|---|
| **5801825** | 8 x 50ml, 5800825 Rotor with 5800323 Shields | 5100 | 4190 | 14.4 |



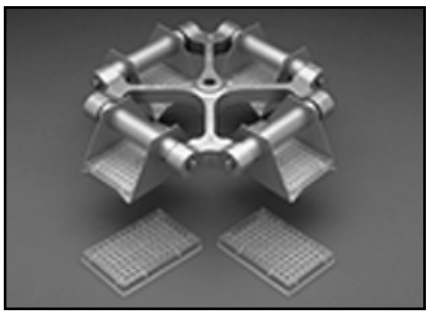
5801825 SPUTUM ROTOR
8 x 50ml - to 5100 RPM/4190 xg

Forma's 5801825 Sealed Angle Rotor provides rapid, positive separation for TB Sputum sample preparation and includes eight Forma 5800323 Sealed Shields for 50ml plastic conical culture tubes.

## SWINGING BUCKET ROTORS

| ROTOR | DESCRIPTION | RPM | RCF | RADIUS |
|---|---|---|---|---|
| **5800216** | 4 x 750ml Centrac with 5800316 Sealed Buckets | 3400 | 2550 | 19.7 |
| **5852161** | Deepwell Microplate Rotor System, includes 5800216 Rotor with four each 5806785 Deepwell Carriers | 3500 | 2340 | 17.1 |
| **5852165** | Falcon/Corning Conical Culture Rotor System, includes 5800216 Rotor complete with buckets plus four each 5805805 and four each 5805712 Adapters | 3400 | 2410 | 18.9 |
| **5800218** | 4 x 750ml Centrac with 5803218 Sealed Buckets | 4600 | 4550 | 19.2 |
| **5800228** | 4 x 750ml Centrac with 5800372 Sealed Buckets | 3400 | 2500 | 19.3 |
| **5852285** | Sealed Falcon/Corning Conical Tissue Culture Rotor System, includes 5800228 Rotor and four each 5805805 and four each 5805712 Adapters | 3400 | 2410 | 18.7 |
| **5852288** | Vacutainer Blood Tube Rotor System, includes 5800228 Rotor complete with buckets plus four each 5805719 and four each 5805827 Adapters | 3400 | 2410 | 18.7 |
| **5852842** | 4 x 250ml Ultrac with 5800384 Sealed Buckets | 3800 | 3200 | 19.8 |
| **5852691** | 8 x 50ml, 5800269 Rotor with 5800325 Rings, 5800320 Shields, and 5800315 Cushions | 3800 | 3200 | 19.8 |
| **5852693** | 8 x 50ml, 5800269 Rotor with 5800350 Rings, 5800323 Shields, and 5800315 Cushions | 3700 | 3030 | 19.8 |
| **5859211** | 6 x 50ml, 5800921 Rotor with 5800325 Rings, 5800320 Shields, and 5800315 Cushions | 4600 | 4000 | 17.0 |
| **5859213** | 6 x 50ml, 5800921 Rotor with 5800350 Rings, 5800323 Shields | 4400 | 3680 | 17.0 |
| **5845216** | 8 x Microplates, 5800216 Rotor with 5805782 Microplate Carriers | 3400 | 2210 | 17.1 |

*Order Centrac Adapters or microplate carriers separately*



5845216 MICROPLATE ROTOR
8 x Microplates - to 3500 RPM/2340 xg

Forma provides a dedicated microplate rotor for applications in the blood bank or research laboratory. Two plates can be stacked on each swing-out carrier and can be easily removed for loading at the bench.

- Includes carriers for standard 86 x 128mm microplates in a variety of well configurations.
- Optional 5800316 or 5800372 Buckets extend the system's versatility and can be added at any time.



- Cell Culture Incubators
- Ultra-Low Temperature Freezers
- Laminar Airflow and Biological Safety Cabinets
- Cryopreservation Equipment
- Blood Bank Equipment
- Monitor/Alarm System
- Orbital Shakers
- Programmable Centrifuges
- Lab Washers and Dryer
- Lab Refrigerators and Freezers, Chromatography Refrigerators
- Custom-Designed Equipment

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