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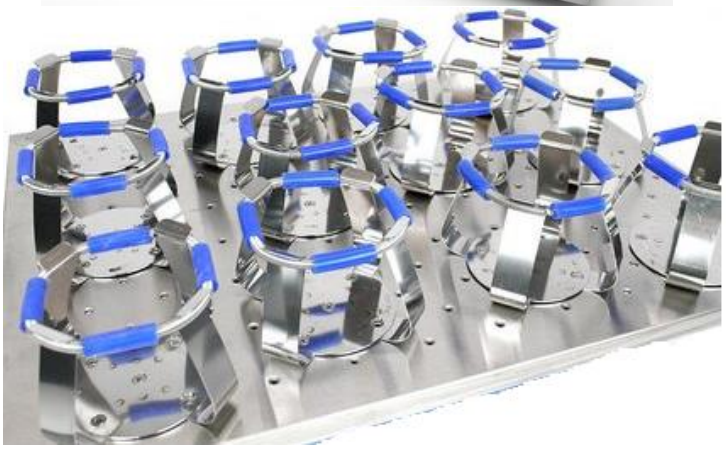
Professional Manufacturer of Test Equipment

MAKE-RESOTECH
MODEL NO. : RESOTECH-GALAXY2607

APPLICATION

- MICROBIAL CELL CULTURES
- ENTOMOLOGY STUDIES
- SOLUBILITY TESTS
- METABOLISM STUDIES
- STABILITY TESTS
- HEMATOLOGICAL STUDIES
- FOOD PROCESSING
- QUALITY CONTROL AND ANALYSIS
- MIXING OF REAGENTS AND VARIOUS OTHER LABORATORY APPLICATIONS



Shaking stackable are highly versatile equipment's that are designed for all kinds of laboratory shaking and stackable applications, including microbial cell cultures, entomology studies, solubility tests, metabolism studies, stability tests, hematological studies, food processing, quality control and analysis, mixing of reagents and various other laboratory applications.

The equipment features an advanced shaking mechanism, designed for minimum noise, vibration free shaking that provides precise control of the rotation speed for adequate agitation and mixing of the samples. These high quality stackable shakers are suitable for timed as well as continuous, heavy duty applications.

They come equipped with various platforms and variable flask and tube support for accommodating various types and sizes of vessels, including flasks, beakers, bottles and test tubes. These equipment's are commonly employed as culture stackable shakers and are used for incubation, fermentation and cross-breeding of bacteria for environmental studies and medical research. They use orbital agitation at variable speeds for maintaining adequate cell aeration for optimum cell cultures.

CONSTRUCTION DETAILS

- Our stackable shakers are double walledconvection heated and cooled units. Outer body of our stackable shakers are constructed out of thick
- M.S sheet powder coated... The inner chamber is made of heavy gauge stainless steel sheet of SS- 304 grade. The gap between the walls is filled high grade mineral glass wool, which ensures maximum thermal efficiency in our stackable shakers.
- The heaters are placed between the first and the second wall of the stackable shaker, which avoids the direct contact of heaters from the third (Stainless Steel inside chamber) walls. The heat to the inside chamber is given indirectly through forced air circulation, provided by the heavy-duty blower placed between the walls of the stackable. This system helps to control the temperature with higher sensitivity (+/- 0.5o c or less).
- The unit is mounted on a sturdy M S steel frame and provided with castor wheels for easy movement inside the laboratory.

- Temperature Range: The temperature range inside thestackable shaker is 0 to 80^0 C
- Temperature Control: Temperature is controlled through, microprocessor based programmable electronic PID temperature controller cum indicator, which controls the temperature of the orbital shaker.
- Forced Air Circulation System: The uniformity oftemperature is maintained throughout the chamber of the stackable shaker with an efficient air circulation

- Required clamps: 2L flask (6 nos.), 1L flask (8 nos.), 500ml (10 nos.),250ml (10 nos.), 100/125ml (10 nos.), Falcon tube stand 50ml (4 nos.)

. However this can be modified to suit the individual customer's requirements.

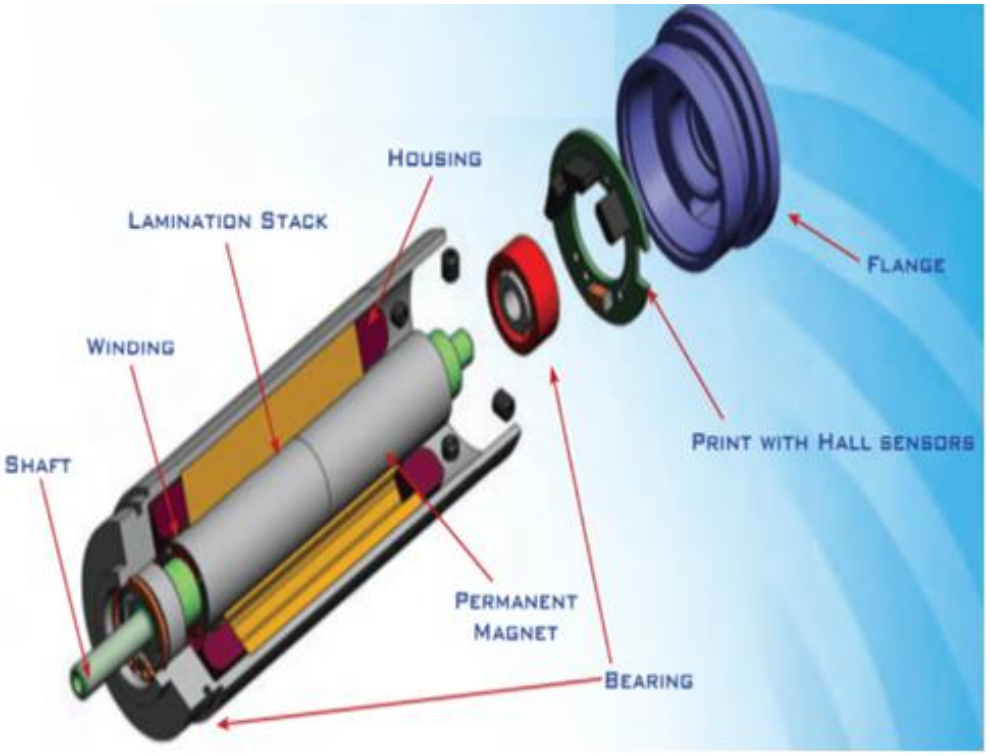
- Shaking System: The efficient and diligent shaking system of our stackable shaker has an orbital shaking movement which is powered by a reliable **DC motor** of suitable power and wattage.
- Speed: The shaking speed of our standard model variable speed stackable shaker is between 20 RPM to 500 RPM. However we can customize the speeds as per the individual requirements of the user.
- Speed Control: The orbital shaking in our orbital shakers is controlled by an **DC drive** which in turn is controlled through microprocessor based digital speed controller cum RPM indicator with great accuracy.
- Heating: The heaters are placed between the first and the second wall of the orbital shaker, which avoids the direct contact of heaters from the third (Stainless Steel inside chamber) walls. The heat to the inside chamber is given indirectly through forced air circulation, provided by the heavy-duty blower placed between the walls of the stackable.
- Humidity (optional): Humidity generation provision can be incorporated as an optional feature if desired by the customer. The humidity is generated by means of

- Aerosol humidity generator with efficient humidity controller cum indicator.
- Front Panel: Front panel of our units comprises of on/off switches heating, cooling and mains indicator lamps, temperature controllers and voltmeters.
- Refrigeration system: An energy efficient cooling unit

HOW DOES A BRUSHLESS DC MOTOR WORK?

Conventional DC motors use a stationary magnet with a rotating armature combining the commutation segments and brushes to provide automatic commutation. In comparison, the brushless DC motor is a reversed design: the permanent magnet is rotating whereas the windings are part of the stator and can be energized without requiring a commutator-and-brush system. The commutation of the brushless DC motor is made electronically and can be done either by looking at the back-EMF of the motor or by using a position sensor.

Brushless DC Motor Diagram



ADVANTAGES OF BRUSHLESS DC MOTORS

Even while operating at extremely high speeds, brushless DC motors achieve a long, trouble-free life, as there is no mechanical commutation. They have mainly linear motor characteristics, with excellent speed and position control. In

brushless motors, static windings are attached to the motor housing, resulting in improved heat dissipation and overload capability. Brushless motors are high efficiency.

INDUSTRIAL AUTOMATION

Brushless DC motors are used in industrial nut runners and screwdrivers, air pumps, conveyors, and electronic assembly devices.

- Industrial nut runners
- Industrial screwdrivers
- Air pumps
- Conveyors
- Electronic assembly
- Electric grippers

AEROSPACE & DEFENSE

The longevity and reliability of BLDC motors make them a good choice for aircraft on-board instrumentation, gyroscopes, and satellites. They are also commonly used in valves, fuel metering systems and electric actuators.

- Aircraft on board instrumentation
- Gyroscope
- Satellites
- Valves
- Fuel metering system
- Electric actuator
- Detection and service robots

BRUSHLESS DC & BRUSH DC MOTOR DRIVES

Drives are selected according to the movement needed. The first question to answer before selecting the drive is to define if the movement is a spindle

application (constant speed) or an incremental motion. Then it's important to define movement made by the motor.

- Point-to-point
- Point-to-point following a trajectory
- Point-to-point following a velocity profile

To make the motion, we need to define the torque and speed the motor will have to deliver, and thereby the current and voltage needed by the driver. The motor can be driven with simple voltage applied to the coil – voltage drive – or the current can be controlled in the coil – current drive. Usually voltage drive is used for simple applications, mainly one working point. Current source allows control of the torque delivered by the motor. The current can be controlled either by a linear amplifier or, as with most drivers today, PWM to regulate the current.

Drives for DC and Brushless DC motors

A simple way to drive a DC motor at constant speed is to use RI compensation. (The Porte cap Team can help you to design such drives.) For more complex applications, Porte cap has developed a drive for DC and brushless DC that can deliver up to 12A peak and work up to 48V. Such drives can receive consign through RS232 or CAN open. Feedback needed are encoder signal and hall sensors for the brushless DC commutation. This driver can be operated in current, velocity or position mode.

Drivers for Steppers

There are many ways to drive steppers. A drive for a stepper usually requires input direction and pulses. For each pulse the drive will generate current in each motor phase to move the rotor of one step or micro step. According to the drive, the motor can be driven in full step, half step or micro stepping (according the current applied in each phase). Simple drives do not use current regulation in the coil – they are equivalent to voltage drive; we call them L/R type. For such drive it can be an advantage to add a resistance to decrease the electrical time constant. More complex drive use current regulated in each coil through a

PWM. With current adjusted in each coil, the motor can be driven in micro steps. Today another way to drive a stepper is a servo motor; this give all the advantages of a stepper and of the servo. (The Porte cap Team will be pleased to assist you if you are interested to trying this option.)

Features:

- Three times the capacity of a floor shaker in virtually the same footprint
- Built for both sensitive eukaryotic culture applications—with contamination-reducing HEPA filtration, coved corner design, single-piece chamber and tight temperature uniformity—and for demanding prokaryotic culture applications
- Rugged construction, wide speed range and no limits on “hard shake” speed, even when stacked three-high

Microprocessor Control/Monitoring System:

- Run and set points displayed simultaneously
- Tracks total accumulated time on motor and drive systems
- Audible/visual over- and under temperature tracking alarms ensure product protection
- Separate adjustable over temperature safety alarm with independent probe provides additional backup on heated units
- Audible/visual, high/low rpm tracking alarms alert to speed deviations
- Alarms can be silenced temporarily and ring back as a reminder of unresolved alarm conditions
- Remote alarm contacts for convenient monitoring from another location
- Nonvolatile memory saves settings during a power outage and automatically restarts the unit after power is restored
- RS-232 port is standard and permits computer interface and monitoring of time, temperature and speed
- Controlled acceleration circuitry provides smooth start-up and stopping to eliminate splashing and wetting of flask closures
- Functions can be calibrated easily through the keypad and sealed control panel

Control Panel:

- Backlit two-line, 40-character LCD alphanumeric display of actual (run) and setpoint parameters and alarm condition
- Icons/buttons allow easy programming of set parameters

- Time: Counts upward, showing total operating hours and minutes for the run
- Speed: Displays the actual platform speed (rpm) and speed set points
- Temp C: Displays the actual temperature inside the chamber and temperature set points

Construction:

- Electronic components and HEPA filter easily accessed from the front during regular maintenance or service
- Flip-down handle/latch on quick-release base (included) prevents shaker from running if platform is not secured
- Insulated, fold-down door with slide-out platform provides 100% sample access
- Wide-view window and xenon light provide high visibility for harvesting
- Top platform height is under 61 in. (154.9cm) when units are stacked three high
- Heavy-gauge cold-rolled steel exterior
- Type 304 stainless-steel chamber with coved corners and built-in drain; holds 2L Erlenmeyer flasks, has xenon light with switch
- Magnetic door gasket for tight seal
- Stacking kit is included with each shaker at no additional cost

Mechanics

- Heavy-duty, eccentric drive mechanism allows extended speed ranges from 25 to 400rpm ±1rpm with minimal vibration, even when shakers are stacked three high
- Durable, dynamically balanced orbital shaker mechanism ensures optimum oxygenation and nutrient mixing, reduced cell clumping, and prevention of splashing and flask wetting
- Triple counterbalanced mechanism provides optimum handling of full or unbalanced loads, regardless of flask placement
- Cool-running, brushless, 1/3hp DC motor ensures continuous maintenance-free operation

- Forced laminar airflow through the HEPA filter provides excellent temperature uniformity, reduces risk of cross-contamination

Ordering Information:

Platform not included. Optional single and double shaker stands and freestanding chart recorder is available.

Includes:

Stacking kit with each shaker.

Recommended for:

- Bacterial suspensions
- Hybridizations
- Solubility studies
- Diagnostic test
- Extraction procedures
- Washing procedures
- General mixing
- Protein expression
- Staining and distaining
- Plasmid purification

CONDENSING UNIT

(1) AIR-COOLED CONDENSOR

Air-cooled condenser is internally grooved finned copper tubes used for high heat transfer area, which not only reduce power consumption, but also bring down the condensation faster. This unit is designed. & verdigris & reduces the resistance, saves energy consumption and ensure good heat exchange.

(A.) COMPRESSOR:

HERMETIC COMPRESSOR Single stage Reciprocating Compressor. Give the High Efficiency compared to sealed compressors, Less Power Consumption , Accessible for repairing, low noise level, Less Vibrations, Wide Voltage Range, Designed for Extremely High Ambient ,Full warranty etc.

COOLING SYSTEM

The compressor is mounted perfectly to ensure recommended level of sound and vibration.

(B.) REFRIGERATION CONTROL

(A).LOW AND HIGH PRESSURE SWITCH

Which ensures the compressor and refrigeration system when low pressure will occurs it trip off the compressor? This is the only operator friendly switch can easily reset.

(B).HAND SHUT OFF VALVE

Is the only Condensing Unit, which is equipped with it. This valve is used for pump down the total gas in to the condenser & receiver in the faulty condition.

(C).LIQUID DRYER

Which is equipped in the liquid line for ministration of moisture in the liquid. It will collect all the moisture inside the refrigeration line as well as gas.

(E). SOLENOID VALVE

In most refrigeration applications, in order to automatically control the flow of fluids in a system, it is necessary to be able to start or stop the flow in the refrigerant circuit. An electrically operated solenoid valve is usually used for this purpose. Its basic function is the same as a manually operated shutoff valve, but it can be positioned in remote locations, and may be conveniently controlled by simple electrical switches.

(F). OIL SEPARATOR OF STAINLESS STEEL 304

The oil separator intercepts the oil mixed with compressed gas and returns it into the crankcase of the compressor, thus assuring an efficient lubrication of its moving parts. Also, it improves the overall efficiency in the system.

(G). SUCTION ACCUMULATOR

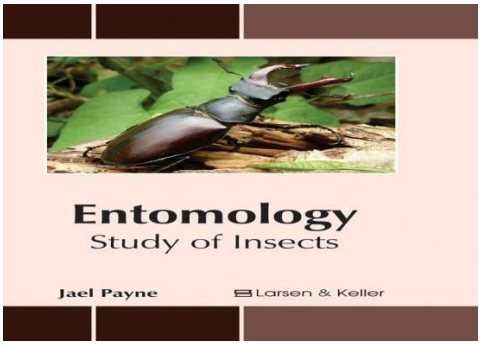
Maximum Efficiency of the relief device (expansion valve) because it is supplied with sub cooled Liquid.

TECHNICAL SPECIFICATION

Technical specification		
Temperature variation (time)	± °C	0.5
Temperature deviation (spatial)	± °C	0.5
Readability/ Set ability	°C	0.5
Temperature range	°C	0°C to 80°C
Sensor thermocouple		PT 100
Controller		PID Controller
Display		LCD
Speed range		20 to 500 rpm
Shaking orbital diameter(amplitude)		25mm
Sensor thermocouple		PT 100
Automatic setting		Yes
Adjustable limits		Yes
Temperature and speed alarm		Yes
Automatic de-icing system		Yes
Timer (1-999 minutes or hours)		Yes
Real Time Program		Yes
Printer Report Program		Yes
Serial Data Port	RS232	yes
Inspection window in door		yes
Automatic start run after power interruption		Provided (yes)
Standard/ max		3
Dimensions	mm	Model Specific
Access Port 30 mm		optional
Inspection window in door with cover		optional
Castors, lockable		Yes
Stabilizer		Servo stabilizer
Nominal voltage	V	230, 1~
Frequency	Hz	50/60
Warranty		5 Years

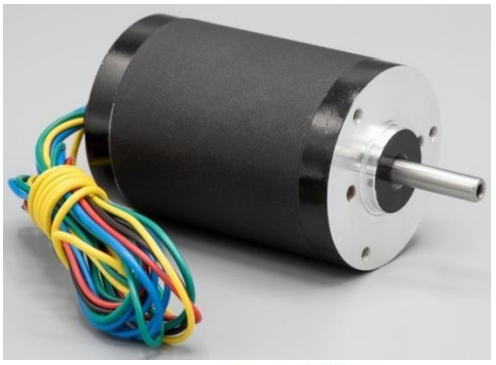
APPLICATION

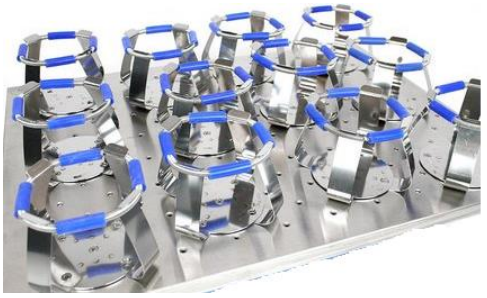
- Microbial cell cultures
- entomology studies
- solubility tests
- metabolism studies
- stability tests
- hematological studies
- food processing
- quality control and analysis
- mixing of reagents and various other laboratory applications



SPECIAL FEATURE

1. Advanced shaking mechanism for adequate agitation and aeration
2. Suitable for timed as well as continuous applications
3. Digital PID microprocessor based controllers for precise temperature control
4. Easy to read, digital LED/LCD display for actual and set parameters
5. An over-temperature protection feature with independent thermostat
6. Beltless Drum Mechanism for increased efficiency
7. Brushless DC motor for reduced noise and trouble-free, long-lasting operation
8. Can be timed or runs in continuous mode
9. Timer for setting operating time up to 99.9 hours
10. An interlock stops motion when the door is open
11. Shelf located at upper part of chamber, and Shaker at lower part of chamber
12. Variable Flask & Tube Support
13. Light Bank for illumination





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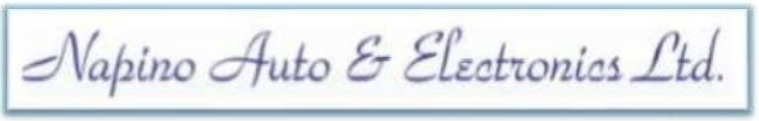
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