



CAT

Ingenieurbüro
M. Zipperer GmbH

When good ideas become even better products

Shakers & Mixers

Ingenieurbüro **CAT**
M. Zipperer GmbH
Etzenbach 16
D 79219 Staufen

Telefon 076 36 / 78 03-0
Telefax 076 36 / 78 03-45
info@cat-ing.de · www.cat-ing.de



S 20

S 20D

S 20 with various shaking attachments

Ingenieurbüro CAT: For over 36 years your partner for innovation: Along with standard laboratory equipment we also manufacture high-quality dispensing systems. Our quality management systems which comply to DIN EN 9001 ensure high quality products. Customer focus and service are our continuing strengths. In case of special applications, please contact us and our team will see what it can do for you.

Shaker S 20

The Ingenieurbüro CAT shaker S 20 is a multi-use shaker which consists of a main drive unit and five different attachments for shaking various sizes and shapes of laboratory containers. Each attachment is sold separately making the shaker versatile for a wide range of individual laboratory needs.

Drive Unit

The heart of the drive unit is a strong brushless motor. The motor speed is measured opto-electronically and is electronically feed-back controlled. The drive unit is driven by an eccentric mechanism with a 3 mm lift (peak to peak). The rotary movement of the eccentric shaft is transmitted to the shaking base by strong ball bearings. Four tubular connecting pieces prevent the platform from turning as well. Contrary to the traditional one-point holders these silicon connecting pieces fit symmetrically to the center of rotation, ensuring a uniform horizontally circular movement at each point of the shaking platform.

The unit includes the shaking base with three mounting screws to securely hold any one of the different attachments. A three-positioned switch allows for functions of "OFF", "Continuous Operation" or "Timer Operation". The timer may be set from 1 - 60 minutes. A knob for shaking frequency allows for the setting from 100 to 1100 rpm.

S - Shaking Platform Attachment

This large platform (200 x 400mm) has a special adhesive mat which securely holds Petri dishes, microtiter plates and other small beakers during shaking, without the need for fasteners. The adhesive mat can be easily cleaned with soap and water for long lasting use. Additional attachments for the S 20 make the instrument suitable for other shaking tasks as well.

Max. shaking frequency:

Dimensions: 400 x 200 x 30 mm, 1100 rpm, weight 0.7 kg,

Part No. 60684-00

U - Universal Shaking Attachment

This comes with one fixed and one flexible elastic rubber roller to hold Erlenmeyer flasks, flat-bottom flasks, round and square bottles and various other containers. All containers are firmly held in place for any constant, slow or fast speed setting. Additional attachments for the S 20 make the instrument suitable for other shaking tasks as well.

Max. shaking frequency:

Dimensions: 350 x 150 x 125 mm, 500 rpm, weight: 0.7 kg,

Part No. 60686-00.

V - Shaking for 4 Erlenmeyer Flasks or Round-bottom Flasks

This holds up to four Erlenmeyer flasks (500 ml each) or round-bottom flasks for slow to intensive, constant rotary motion. It is designed to provide a favourable low center of mass because of the lateral arrangements of the flasks. Additional attachments for the S 20 make the instrument suitable for other shaking tasks as well.

Max. shaking frequency:

Dimensions: 370 x 150 x 45 mm, 500 rpm, weight: 1 kg,

Part No. 60685-00



S 50



R - Test Tube Shaking Adaptor

This adaptor provides for extremely slow to intensive, constant rotary motion for shaking up to 36 test tubes of up to 16 mm diameter. The two screws at the side allow for setting the angle of the test tubes from vertical to approximately 45° inclination. Additional attachments for the S 20 make the instrument suitable for other shaking tasks as well.

Max. shaking frequency:

Dimensions: 190 x 140 x 145 mm, 800 rpm, weight: 0.6 kg, Part No. 60687-00

E - Shaking Adaptor for Single Hand Held Vessels

This attachment is suitable for shaking several test tubes or small round-bottom flasks up to 100 ml, while held in one hand - ideal for the simple and quick laboratory shaking need. Additional attachments for the S 20 make the instrument suitable for other shaking tasks as well.

Max. shaking frequency:

Dimensions: 137 x 132 x 44 mm, 1100 rpm, weight: 0,160 kg, Part No. 60683-00

Shaker S 20D



All above described features also apply to this unit apart from shaking frequency, which is from 100 – 800 ⁻¹, the speed now is shown on a display and the unit comes with a digital built-in timer.

With this unit all above mentioned attachments may be used. Please note the recommended maximum shaking frequency for each attachment as described above.

Shaker S 50



This "wrist arm shaker" comes with two side arms and 8 three-prong alloy clamps to take up to Erlenmeyer flasks à 1000 ml or 8 Erlenmeyer flasks à 500 ml for vigorous shaking needs. It simulates hand shaking movement and is designed for continuous run. With the analogue timer up to 60 minutes shaking action can be covered. The shaking frequency can be set from 50 to 800 rpm.

The main switch has 3 positions:

- " 0 " = unit off
- " | " = continuous run
- " || " = unit is operated by timer

Two yellow lamps indicate timed operation. After the set time has elapsed the shaking motion will stop.

All joints of this unit have a ball bearing therefore no special maintenance is needed. The carbon brushes of the motor are designed for longevity.



VM 2



VM 4



VM 3



VM 2 Test Tube Shaker



This small shaker is highly qualified for mixing operations of liquids in test tubes from the smallest size up to 30 mm in diameter. The shaking frequency is steplessly adjustable from 0-45Hz 100 - 2800 rpm. The strong brushless motor with a precision center balanced drive unit provides for quiet and trouble-free operation. The case is made of a stainless steel top and an acid proof steel body. With its dimensions of only 110 x 100 mm this unit finds space in every lab.

Single-hand control: In switch position II, simply apply with slight pressure the test tube in the vertical direction on the receiving cup. The shaking motion is then activated according to the set speed. The motor is turned off as soon as the test tube is lifted from the receiving cup.

Continuous run: In switch position I the unit can be switched to continuous operation. The motor speed is steplessly adjustable, max. speed 2800 rpm.

VM 3 Test Tube Shaker



This shaker comes with the same technical features as VM 2 but bigger dimensions 156 x 150 x 110 mm (W x D x H).

Simply apply with slight pressure the test tube in the vertical direction on the receiving cup. The shaking motion is then activated according to the speed set. The motor is turned off as soon as the test tube is lifted from the receiving cup. The top cover is made of stainless steel and the housing of the motor is coated with an acid resistant finish.

VM 4, Universal Small Laboratory Shaker



Opto-electronically controlled small shaker with a wide speed range from 100 - 2800 rpm. Orbital shaking motion with soft-start. Continuous operation controlled by a built-in timer to be set between 1 and 60 minutes. Second operation mode for single-hand touch down operation to shake test tubes or small Erlenmeyer beakers.

One universal attachment for test tubes up to 30 mm in the center and foam bore holes 16 x 8 mm diameter, 6 x 10 mm diameter and 4 x 15 mm diameter for centrifuge tubes and other small vessels.

The same universal platform will also hold one microtiter plate. This avoids the use of different attachments which are never there when you need them.

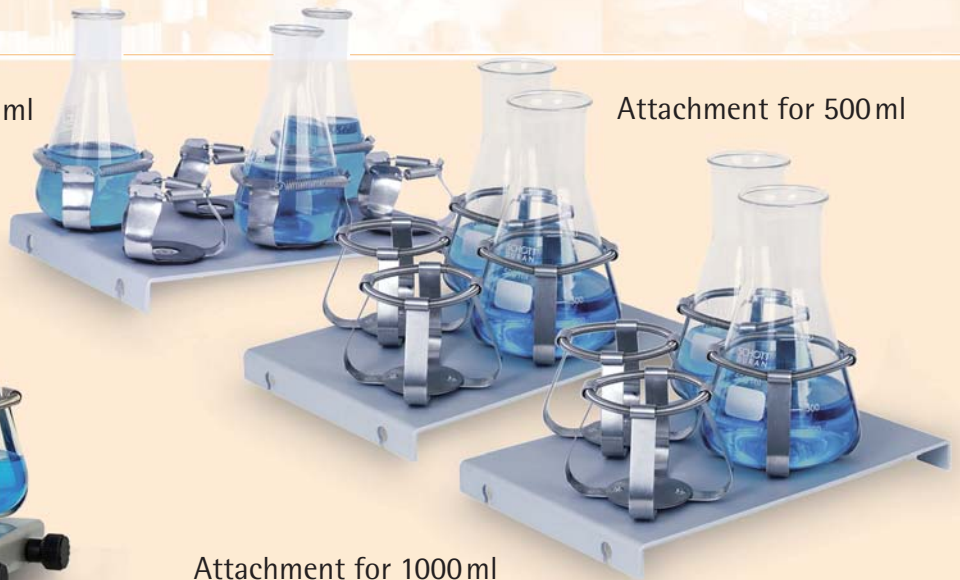
At low speed the foam platform can hold small beakers or dishes for soft shaking motions.

VM 4 universal attachment
 for test tubes



Attachment for 250 ml

Attachment for 500 ml



Attachment for 1000 ml

S 26



Attachment for separating funnel



reciprok



orbital

Shaker S 25



The microprocessor technique of this shaker provides for data transfer via the RS 232 interface for full computer control. The special indexing mechanism stops the shaking platform always at a defined position.

The powerful laboratory shaker with linear reciproke motion and 20 mm stroke is especially designed to shake separation funnels, flasks for biological cultures and Erlenmeyer flasks in sizes of 250, 500 and 1000 ml. For further details on other attachments please contact our sales department.

The unit is driven by a brushless external rotor motor. These maintenance free and sparkless motors are designed for continuous operation. The speed can be set from 40 – 200 rpm in steps of 10 rpm and is optoelectronically sensed and feedback controlled by a micro controller.

The shaker contains of a two line alpha-numeric display with 16 characters each to show speed and time of operation. The front panel allows for easy setting and control of speed and time in a wide range up to 99 days, 23 hours and 59 minutes in steps of 1 minute. After the set time has elapsed the microprocessor shuts the unit off.

Maximum load: 1.5 kg

Standard attachments are available for:

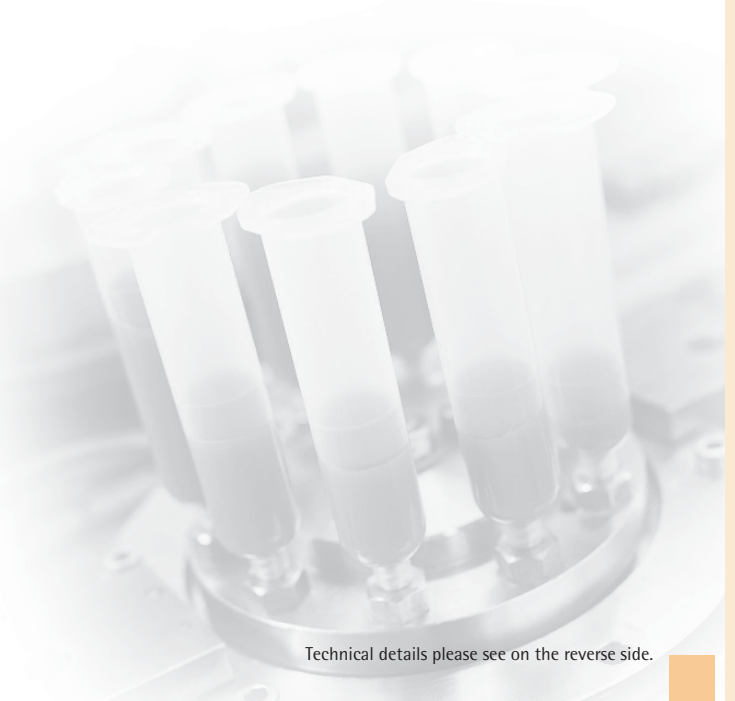
- Erlenmeyer flasks and other flasks
- separation funnels and flasks for biological cultures
- small test-tubes, centrifuge vessels and micro plates

Shaker S 26



This unit is an orbital shaker which is built the same way as shaker S 25 but with a speed range from 50 -1100 rpm.

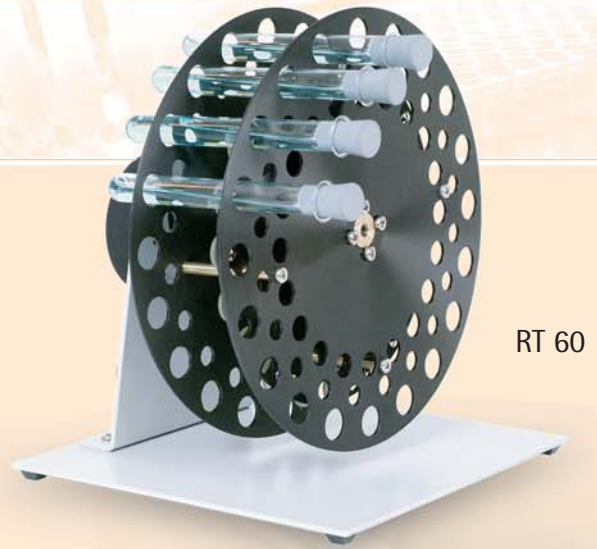
There are also various shaking attachments available as described above.



Technical details please see on the reverse side.



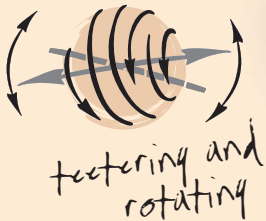
RM 10 with exchangeable roll
(RM 10W-80V and RM 10W-30V)



RT 60



RM 5 with exchangeable roll
(RM 5W-40, RM 5W-30V and RM 5W-80V)



RM 5 and RM 10 Multi-Axle-Rotating-Mixer



Five respectively 10 synchronized rotating PVC rollers provide a uniform and gentle swaying mixing of test tubes. Sufficient space allows for numerous test tubes to be placed horizontally along the surface of the oscillating rollers for simultaneous gentle and homogeneous mixing. A rotating mixer with horizontal motion only is also available.

This kind of mixer is especially designed for the uniform mixing of medical laboratory tests of blood, haematological determinations and other cell suspension samples. In addition it prevents sedimentation in samples such as dyes, paints, oil and cosmetics, etc. Ten models are available. RM 5-80, RM 5-40, RM 5-6 and RM 5-V, RM 5 with rolls to be taken out, RM 10W-W 1-30 and RM 10V-W 10-80.

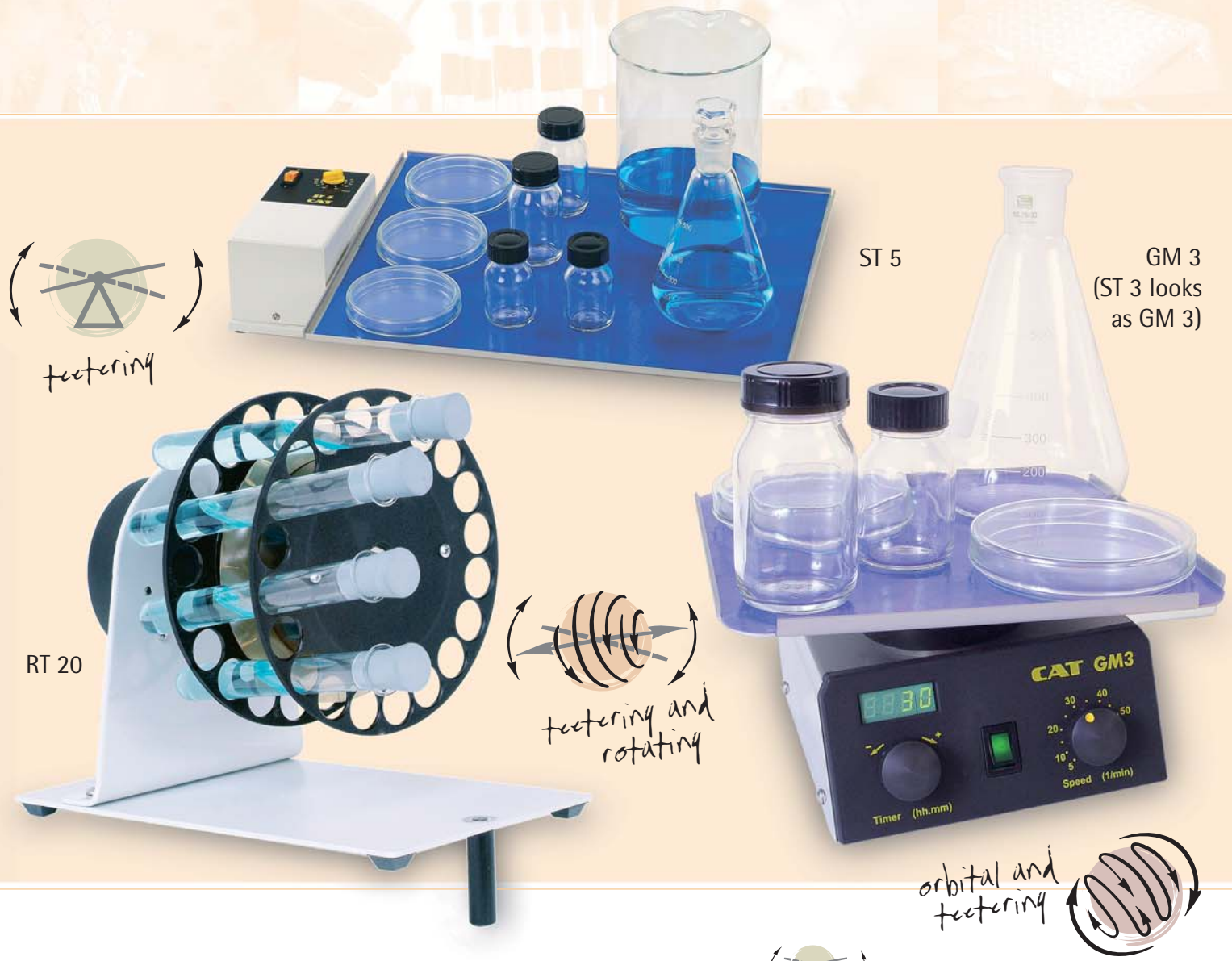
RT 60 Rotating/ Swaying Mixer



The principal of this mixer is that during the rotating of the test tubes the axis of rotation changes, also causing a gentle waving motion and mixing of the test sample from the top of the test tube to the bottom and then back. The rotation of the wheel is set at 6 rpm ensuring a uniform and gentle mixing of the test samples.

This rotating mixer has a well balanced body for safe mixing of test tubes inserted in the rotating wheel. The test tubes are held by elastic clamps to secure them in place during the mixing process. The rotating wheel provides 60 holes with 3 different diameters to hold test tubes of the following sizes: 20 holes, diameter 10 mm, 20 holes, diameter 12.5 mm, 20 holes, diameter 15.5 mm.

Type	Part No.	Rotating/Swaying Mixer	Number of Rolls	Material of Rolls	Speed rpm	Length of Rolls	Dimension W x D x H mm	Maximum Load kg	Weight kg	Remarks
RT 60	60202-00 (230V)	60202-01 (115V)			5/6		220x200x250		1,8	Outer∅ wobbling plate 220 mm
RT 20	60201-00 (230V)				5/6		180x200x120		1,2	Outer∅ wobbling plate 130 mm
Type	Art. Nr.	Multi-Axle-Rotating Mixer	Number of Rolls	Material of Rolls	Speed rpm	Length of Rolls	Dimension W x D x H mm	Maximum Load kg	Weight kg	Remarks
RM 5-40	60205-00 (230V)	60205-01 (115V)	5	PVC	35	320 mm	436x177x105	2	3,713	
RM 5-30V	60207-00 (230V)	60207-01 (115V)	5	PVC	1-30	320 mm	436x177x105	2	3,781	
RM 5-80V	60207-80 (230V)	60207-81 (115V)	5	PVC	10-80	320 mm	436x177x105	2	3,781	
RM 5K-30	60205-10 (230V)		5	PVC	30	210 mm	325x177x105	2	3,03	
		60205-11 (115V)	5	PVC	36	210 mm	325x177x105	2	3,03	
RM 5W-40	60205-30 (230V)	60205-31 (115V)	5	PVC	36	320 mm	436x177x105	2	3,78	removable rolls
RM 5W-30V	60207-40 (230V)		5	PVC	1-30	320 mm	436x177x105	2	3,78	removable rolls
RM 5W-80V	60207-50 (230V)		5	PVC	10-80	320 mm	436x177x105	2	3,78	removable rolls
RM 10W-80V	60207-90 (230V)	60202-91 (115V)	10	PVC	10-80	320 mm	436x358x105		7,6	removable rolls
RM 10W-30V	60207-10 (230V)	60207-11 (115V)	10	PVC	2-30	320 mm	436x358x105		7,6	removable rolls



RT 20

ST 5

GM 3
(ST 3 looks as GM 3)

The rotating wheel is screwed into place counter clockwise and can be easily unscrewed for any laboratory purpose. The stand is coated with an acid resistant finish. Both the stand and rotating wheel are built for long lasting use and resistant against many chemical and solution spills.

RT 20 Rotating/Swaying Mixer

This is a smaller version of the model RT 60 and is suitable for up to 20 test tubes with a range of diameter from 10 up to 15.5 mm.

Shaker ST 3

The ST 3 rocking shaker has an adjustable speed from 5 - 50 rpm and digital display. The unit comes with an illuminated "ON/OFF" switch and a platform (210x210 mm) with a special anti-slip, adhesive mat for holding and gently rocking Petri dishes, microtiter plates and other small containers. As an option a plastic platform which can be detached and cleaned is also available. The speed is electronically feed-back controlled within a range of 5 - 50 oscillations per minute for continuous use. The rocker platform is designed to pivot in the middle axis and can be adjusted to give an angular tilt of 5 or 7°. The built in timer covers up to 99 hours.

Shaker ST 5

The ST 5 rocking shaker comes with an illuminated "ON/OFF" switch and a large platform (410 x 340mm) with a special anti-slip, adhesive mat for holding and gently rocking Petri dishes, microtiter plates and other small containers. The speed is electronically feed-back controlled with a range of 10 - 100 rpm oscillations per minute for continuous use. The rocker platform is designed to pivot in the middle axis and can be adjusted to give an angular tilt of 3, 6, 9 and 12°.

Shaker ST 5D


Same unit as above but with digital speed display.

Shaker GM 3

The soft 3D-movement of this shaker is ideal for low foaming agitation as well as DNA extraction. The angular tilt can be set at 5 or 7°. The dimension of the platform is 210 x 210 mm and holds Petri dishes, microtiter plates and other small containers. A detachable plastic platform is optionally available. The set shaking frequency (5 - 50 rpm) can be read from the display. The built in timer covers up to 99 hours.


No. 8SH.MI.E/A



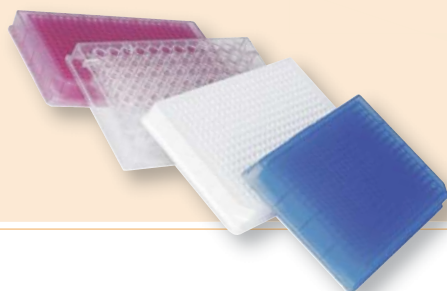
SK 10  orbital
Cooling/Heating Shaker
via bath thermostat
Operating temperature range
minus 5 to 50° C
Shaking frequency: 100-800 rpm

SH 10  orbital
Heating Shaker
Operating temperature
range roomtemperature
to 95°C
Shaking frequency:
200-1200 rpm



SH 26  orbital
Heating Shaker for 4 MTP's (horizontal circular motion)
Operating temperature range roomtemperature to 95°C
Shaking frequency: 50-1100 rpm

SH 25  reciproc
Heating Shaker for 4 MTP's (linear-reciproke)
Operating temperature range roomtemperature to 95°C
Shaking frequency: 40-200 rpm



Ingenieurbüro **CAT** has developed a range of heating and cooling **stirring-shakers** where we do not heat up the complete shaking unit but only the samples.

Our series of **SH 10** and **SK 10** is based on the "footprint" of a microtiter plate. The units are only slightly bigger than a microtiter plate and therefore are especially suitable for automated applications since an incubation cover is not needed and only the sample is thermally treated.

The bigger unit, **SH 26**, can be equipped with **4** microtiter plates at once and heat, cool and shake all 4 together. Both units are driven by robust brushless motors. Shaking frequency and shaking orbit may be adapted in house according to customer's requirements. The desired temperatures are measured by PT100 probes and precisely monitored respectively controlled by our PID controllers. It is possible to program user specified temperature ramps. All units come with RS 323 interface. An optional indexing mechanism stops the unit at a preset position of the orbit.

Type	Part No.	Shaking Motion	Stroke mm	Shaking frequency	Ind. Safety Circuit	Dimension W x D x H mm	Weight kg	Remarks
Temperete Shakers								
S 26	60386-00	horiz. circular motion	3	50-1100				Digital display, Timer, RS 323, Indexing
S 25	60385-00	linear-reciproke	20	40-200				Digital display, Timer, RS 323, Indexing
Standard Shakers								
S 50	60285-00 (230V)	60285-01 (115V)	rotary motion	50-800	1	240x240x230	8,2	analogue Timer
S 20	60283-00 (230V)	60283-01 (115V)	horiz. circular motion	100-1100	1	140x180x125	4	Timer, several shaking adaptors available
S 20D	60284-00 (230V)		horiz. circular motion	100-800		140x180x125	4	Timer, several shaking adaptors available
ST 5	60281-00 (230V)	60281-01 (115V)	teetering motion	10-100	1	520x350x100	3,8	angular tilt at 3, 6, 9, or 12°
ST 5D	60282-00 (230V)		teetering motion	10-100		520x350x100	3,8	angular tilt at 3, 6, 9, or 12°
ST 3	60381-00 (230V)		teetering motion	5-50				angular tilt at 3, 6, 9, or 12°
GM 3	60382-00 (230V)		3D motion	5-50				Display, digitaler Timer
Vortex-Shakers								
VM 4	60208-00 (230V)	60208-01 (115V)	horiz. circular motion	100-2800		156x150x110	1,9	Timer, continuous or touch operation
VM 3	60203-00 (230V)	60203-01 (115V)	horiz. circular motion	100-2800		156x150x110	1,7	Continuous or touch operation
VM 2	60204-00 (230V)	60204-01 (115V)	horiz. circular motion	100-2800		110x100x90	1,1	Continuous or touch operation