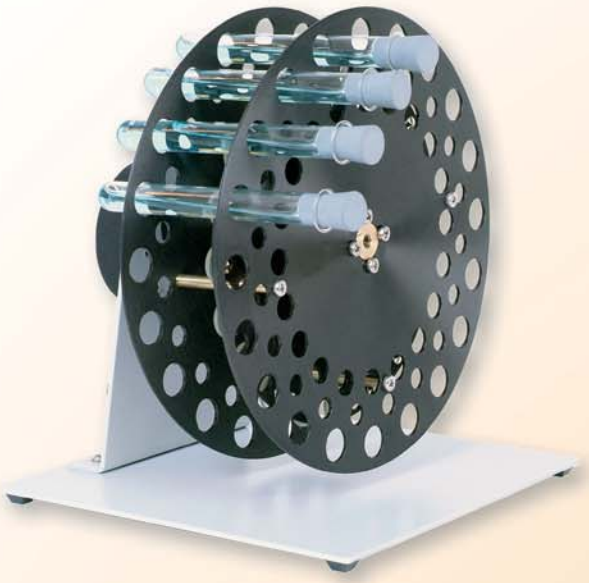
CAT

Ingenieurbüro M. Zipperer GmbH

深圳市方艺仪器科技有限公司
地址：深圳市福田区新洲广场华丰大厦2008
电话：0755-61305656 传真：0755-61305668
Email：tanyg@szfangyi.com 联系人：谭先生





When good ideas become even better products:

Shakers and Mixers from CAT

- thousand fold approved mixing technique
- mixing with reciprocating, swaying, rotating and oscillating movements
- for small test-tubes and big bottles
- brushless drive motors – longevity
- microprocessor controlled speed regulation
- timer functions

Ingenieurbüro CAT
M. Zipperer GmbH
D 79219 Staufen
Telefon 0 76 36/78 03-0
Telefax 0 76 36/78 03-45
info@cat-ing.de · www.cat-ing.de

M-Zert
Zertifiziertes QM-System
DIN EN ISO 9001:2000
Zertifikat-Nr.03006



S20-V



S20-U



S20-S

S20-R

S20 with various shaking attachments



Dear Madam, dear Sir,

CAT has a long history and much experience in developing and manufacturing lab equipment for shaking and mixing applications. So the development of the now worldwide known roller mixer RM5 originates at **CAT**. Meanwhile there exist enhancements with electronically controlled speed, small units for surgeries as well as units with 10 rolls, where single rolls may be removed to mix the content of larger bottles. Further specials are the heated shakers which are on the market for over 10 years by now. Whilst the shaking units of other manufacturers have to be put into an incubator to warm up the samples we have specialised in electronically controlled heating of our shaking platforms. This means we do not heat up the complete shaking unit but only the sample. The clear advantage of that is that our units are installed in a Lab atmosphere and work there. A whole series of such units is described in an extra brochure. Please feel free and ask for our leaflet which informs you on heating and cooling devices SH10 and SK10 as well as heating shakers SH 25 and SH26 or have a look at our website www.cat-ing.de.

On the following pages you will find a detailed overall view of our various mixers and shakers for your lab respectively pilot plant. The development and manufacturing according to ISO of all the units is based on close contact with our customers and our long experience.

Yours,
Manfred Zipperer

Shaker S20

The CAT shaker S20 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 S20 make the instrument suitable for other shaking tasks as well.
Max. shaking frequency:
1000 rpm, weight 0.7 kg, Cat.No. 60684-00



S50

U- Universal Shaking Adaptor

This adaptor 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 S20 make the instrument suitable for other shaking tasks as well.
Max. shaking frequency:
500 rpm, dimensions: 350 x 150 x 125 mm, weight: 0.7 kg, Cat.No. 60686-00.

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

This adaptor 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 S20 make the instrument suitable for other shaking tasks as well.
Max. shaking frequency:
500 rpm, dimensions: 370 x 150 x 45 mm, weight: 1 kg, Cat.No. 60684-00

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 S20 make the instrument suitable for other shaking tasks as well.
Max. shaking frequency:
800 rpm, dimensions: 190 x 140 x 145 mm, weight: 0.6 kg, Cat.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 S20 make the instrument suitable for other shaking tasks as well.
Max. shaking frequency:
1000 rpm, dimensions: 137 x 132 x 44 mm, weight: 0,160 kg, Cat.No. 60683-00

Shaker S20D

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 S50

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 we set from 50 to 800 rpm.

The main switch has 3 positions:

“ 0 “ = unit off
“ I “ = continuous run
“ II “ = 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 longlivety.

Technical details please see on the reverse side.



VM2



VM4



VM3

VM2 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 $^{-1}$). 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.

VM3 Test Tube Shaker

This shaker comes with the same technical features as VM2 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.

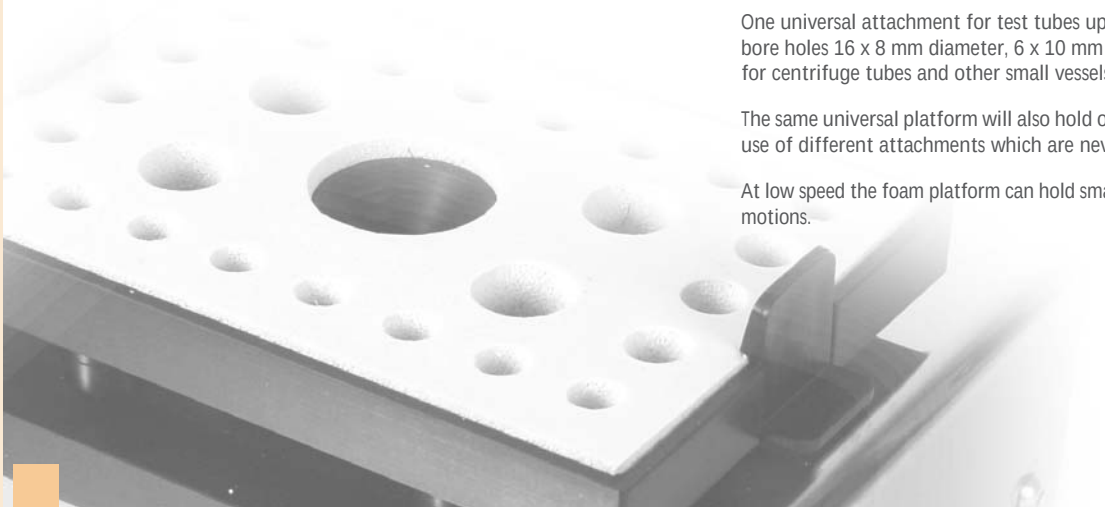
VM4, Universal Small Laboratory Shaker

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.





Shaker S25

The microprocessor technique of this shaker provides for data transfer via the RS232 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 $^{-1}$ in steps of 10 $^{-1}$ 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 S26

This unit is an orbital shaker which is built the same way as shaker S25 but with a speed range from 50 -1100 $^{-1}$.

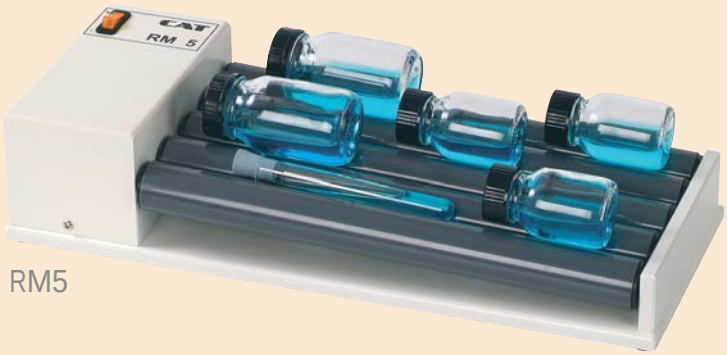
There are also various shaking attachments available as described above.

CAT LabControl for Windows®

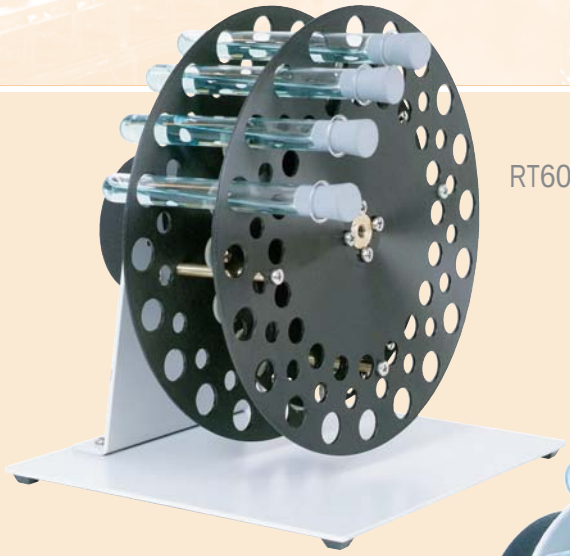
CAT LabControl for Windows® enables full control and documentation of parameters such as temperature, motor speed and switch-off time. This powerful package can be used with all CAT units with RS232 interface.



Technical details please see on the reverse side.



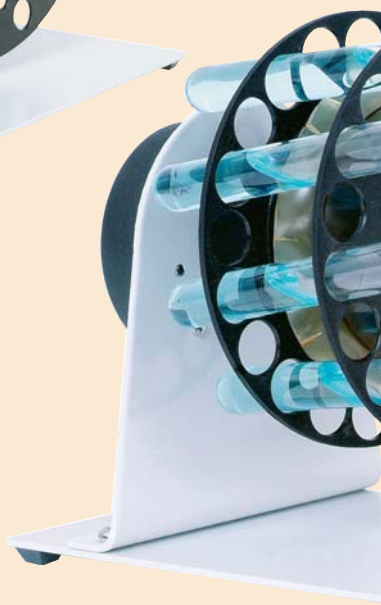
RM5



RT60



RM5 with exchangeable roll



RM5 and RM10 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. Eight models are available. RM5-80, RM5-40, RM5-6 and RM5-V, RM5 with rolls to be taken out, RM10V-W 1-30 and RM10V-W 10-80.

RT60 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.

		Number of Rolls	Material of Rolls	Speed rpm	Length of Rolls	Dimension W x D x H mm	Maximum Load kg	Weight kg	Remarks
Type	Part No.	Rotating/Swaying Mixer							
RT60	60202-00			5/6		220x200x250		1,8	Outer diameter wobbling plate 220 mm
RT20	60201-00			5/6		180x200x120		1,2	Outer diameter wobbling plate 130 mm
Type	Part No.	Multi-Axle-Rotating Mixer							
RM5-80	60207-80	5	PVC	10-80	324 mm	436x177x105	2	3,781	
RM5-40	60205-00	5	PVC	36	324 mm	436x177x105	2	3,713	
RM5-6	60206-00	5	PVC	5/6	324 mm	436x177x105	2	3,298	
RM5-V	60207-00	5	PVC	1-30	324 mm	436x177x105	2	3,781	
RM5-30	60205-10	5	PVC	30-32	214 mm	325x177x105	2	3,03	
RM5-40 W	60295-30	5	PVC	36	324 mm	436x177x105	2	3,78	removable rolls
RM10V-W 10-80	60207-90	10	PVC	10-80	324 mm	436x358x105		7,6	removable rolls
RM10V-W 1-30	60207-10	10	PVC	1-30	324 mm	436x358x105		7,6	removable rolls



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.

RT20 Rotating/Swaying Mixer

This is a smaller version of the model RT60 and is suitable for up to 20 test tubes with a range of diameter from 10 up to 15.5 mm.

Shaker ST3

The ST3 rocking shaker has an adjustable speed from 3 - 50 $^{-1}$ and digital display. The unit comes with an illuminated “ON/OF“ switch and a platform (217 x 217 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 3 - 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 and 7°. The built in timer covers up to 99 hours.

Shaker ST5

The ST5 rocking shaker comes with an illuminated “ON/OF“ switch and a large platform (420 x 350mm) 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 $^{-1}$ 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 ST5D

Same unit as above but with digital speed display.

Shaker GM3

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 and 7°. The dimension of the platform is 217 x 217 mm and holds Petri dishes, microtiter plates and other small containers. A detachable plastic platform is optionally available. The set shaking frequency (3 - 50 $^{-1}$) can be read from the display. The built in timer covers up to 99 hours.

Technical details please see on the reverse side.

Please ask for special literature.



SK10

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





SH10

Heating Shaker
Operating temperature range roomtemperature to 90°C
Shaking frequenzy: 200-1200 rpm



SH26

Heating Shaker for 4 MTP's (horizontal circular motion)
Operating temperature range roomtemperature to 90°C or 120°C
Shaking frequenzy: 50-1100 rpm

SH25

Heating Shaker for 4 MTP's (linear-reciproke)
Operating temperature range roomtemperature to 90°C or 120°C
Shaking frequenzy: 40-200 rpm

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 SH10 and SK10 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, SH26, 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 Pt 100 probes and precisely monitored respectively controlled by our PID controllers. It is possible to program user specified temperature ramps. All units come with RS232 interface. An optional indexing mechanism stops the unit at a preset position of the orbit.

The whole series of above units is described in an extra brochure. Please feel free and ask for our leaflet which informs you on heating and cooling devices SH10 and SK10 as well as heating shakers SH25 and SH26 or have a look at our website **www.cat-ing.de**.

		Shaking Motion	Stroke mm	Shaking frequency	Independent Safety Circuit	Dimension W x D x H mm	Weight kg	Remarks
Type	Part No.	Temperete Shakers						
S26	60386-00	horizontal circular motion	3	50-1100				Digital display, Timer, RS323, Indexing
S25	60385-00	linear-reciproke	20	40-200				Digital display, Timer, RS323, Indexing
Type	Part No.	Standard Shakers						
S50	60285-00	rotary motion		50-800	1	240x240x230	8,2	analogue Timer
S20	60283-00	horizontal circular motion	3	100-1100	1	140x180x125	4	Timer, serveral shaking adaptors available
S20D	60289-00	horizontal circular motion	3	100-800		140x180x125	4	Timer, serveral shaking adaptors available
ST5	60281-00	teetering motion		10-100	1	520x350x100	3,8	angular tilt at 3, 6, 9, or 12°
ST5D	60282-00	teetering motion		10-100		520x350x100	3,8	angular tilt at 3, 6, 9, or 12°
ST3	60381-00	teetering motion		3-50				angular tilt at 3, 6, 9, or 12°
GM3	60382-00	3D motion		3-50				Display, digitaler Timer
Type	Part No.	Vortex-Shakers						
VM4	60208-00	horizontal circular motion	3	100-2800		156x150x110	1,9	Timer, continuous or touch operation
VM3	60203-00	horizontal circular motion	5	100-2800		156x150x110	1,7	Continuous or touch operation
VM2	60204-00	horizontal circular motion	5	100-2800		110x100x90	1,1	Continuous or touch operation

Technical details are subject to change without prior notice.