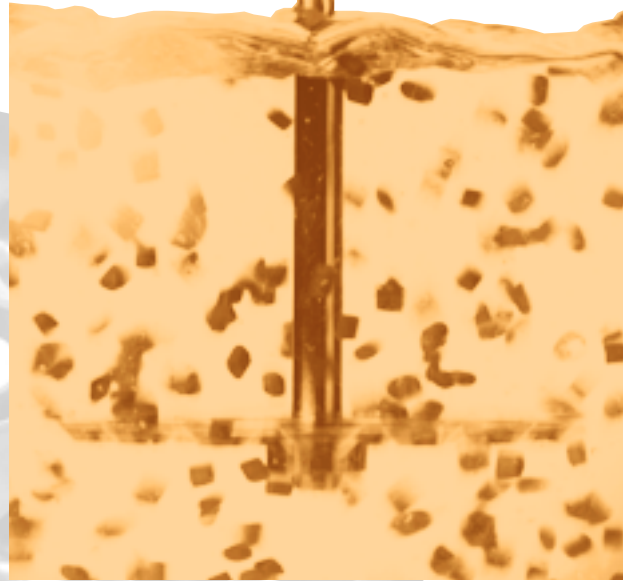


**Where  
liquids are  
trembling!**



**Vibrating Mixer  
Industrial types**

**Mixing liquids  
by vibration**

Graber + Pfenninger GmbH  
CH-8712 Stäfa  
Switzerland

Postal address:  
P.O. Box 59  
CH-8714 Feldbach  
Switzerland

Phone +41 55 244 56 41  
Fax +41 55 244 57 46  
E-mail [info@gandp.ch](mailto:info@gandp.ch)

### The Mixing Device Without Rotation

The Vibrating Mixer is a universal apparatus for mixing liquids in open or closed vessels, under vacuum or pressure and also under sterile conditions.

The electro-magnetic drive operates at 50 or 60 cycles and transmits the vibration to a mixing device, e.g. a stirrer, attached to the power unit by a special clamp coupling device. The amplitude/mixing effect can be regulated by an electronical thyristor control system from zero to max. 4 mm.

Depending on the medium and the required mixing effect, the liquid flow direction is determined by the cones in the stirrer plate. If their wider diameter is at the bottom, you will get an upward mixing flow direction (stirrer type A); if the wider diameter is on the top, the mixing flow direction is downward (stirrer type B).

As standard execution the stirrers are made in 316 stainless steel, LC. They are also available in Hastelloy B or C, titanium, polypropylene or PVC.

The Vibrating Mixers operate over long periods of time without overheating or variations in the amplitude/mixing effect.

#### Ideally suited for the following applications:

- Pharmaceutical and cosmetic industry: Insuline production; blood fractionations; preparation of sterile solutions; mixing of injectable suspensions in sterile vessels for ampoule filling; vaccine/oil emulsions
- Food and beverage industry: Mixing of soft drinks; addition of flavors, salt, sugar, vitamins and colors; blending alcoholic beverages; agitations of milk
- Chemical industry: Mixing of photographic developer; suspending of solids such as filter aids in liquids; precipitation of solids during neutralization; gas/liquid batch reaction as hydrogenations and chlorination; agitation under vacuum or pressure
- Microbiological/biochemical industry: Anaerobic fermentations; submerge culture of mammalian and plant cells; protein solutions.

#### Most advantages of the Vibrating Mixer

are due to the fact that no rotation occurs:

- No vortex, therefore no foam built up
- No friction, therefore no lubrication
- No rotary mechanical seals, therefore no problems under sterile conditions.

And of course:

- Violent mixing action, therefore no overheating of liquid
- Homogenous distribution and emulsion
- Faster chemical reactions
- Simple installation, low energy consumption, long life time.



tested  
and conform



1

**Picture 1**

Immune-gammaglobuline vessels, equipped with Vibrating Mixers type 4.



2

**Picture 2**

150 liter sterile vessel for medium storage under sterile conditions, equipped with Vibrating Mixer type 2 and special stirrer shaft sealing unit with shaft clamp device.

**Picture 3**

Stirrer shaft sealing unit for sterile applications under pressure up to 75 PSIG/vacuum (left) and sealing unit standard design for pressure-free sterile applications.



3

**Picture 4**

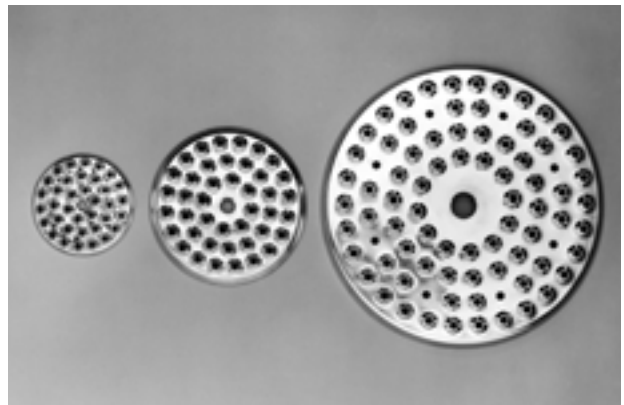
Special stirrer for Vibrating Mixer type 4 for sterile applications, ferrit-free welded, mirror-polished, anodine-polished, in ss 316 LC.



4

**Picture 5**

Stirrer plates standard design for Vibrating Mixers type 2, 3 and 4.



5

**Mixing Volumes**

The Vibrating Mixers are available in 4 sizes:

Type 1 for mixing volumes from 0,1 to 20 liters

Type 2 for mixing volumes from 10 to 200 liters

Type 3 for mixing volumes from 50 to 1'000 liters

Type 4 for mixing volumes from 200 to 10'000 liters.

The necessary size is determined according to the required mixing action, the specific weight of the liquid, its viscosity and the vessel volume.

## Function Principle

The mixing effect occurs by vibration transmitted to a perforated mixing plate equipped with several conical holes. Due to the Bernoulli effect, this vibration causes the liquid to be pumped upward or downward through the cones.

### Plate Stirrer Type A

The cones point upward and the liquid jet-flow goes to the surface. It is used in several applications such as agitation, emulsification and homogenization, with varying liquid levels.

If two liquid phases with different specific weights have to be emulsified, the mixing plate must always be immersed in the liquid phase with the higher specific weight. The optimum distance from the mixing plate to the vessel bottom varies between 20 and 150 mm.

### Plate Stirrer Type B

The cones point downward, therefore the liquid jet-flow is towards the vessel bottom. This stirrer type is used for suspending solids in liquids and when no air or gas from the liquid surface enters the liquid.

### Plate Stirrer Type B with Gas Dispersion

The same stirrer plate is used as in type B described above. Additionally, the stirrer shaft is equipped with a gas connection nozzle and the gas is injected into the liquid under the stirrer plate. Due to the liquid flow, an optimal gas dispersion effect is reached. This stirrer type is used to saturate liquids with CO<sub>2</sub> or nitrogen.

Plate stirrer type A

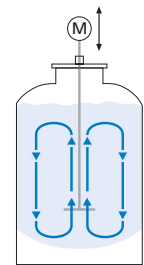
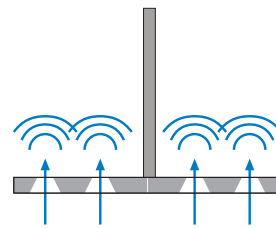


Plate stirrer type B

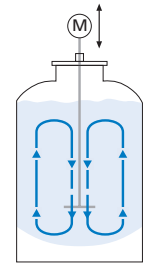
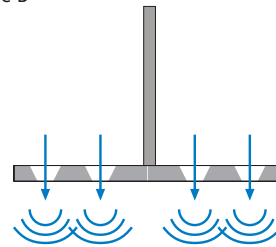
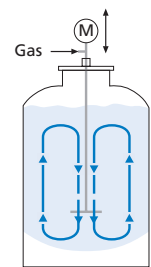
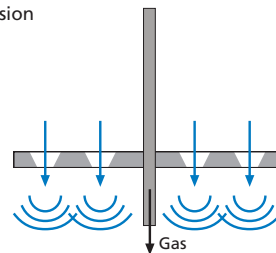
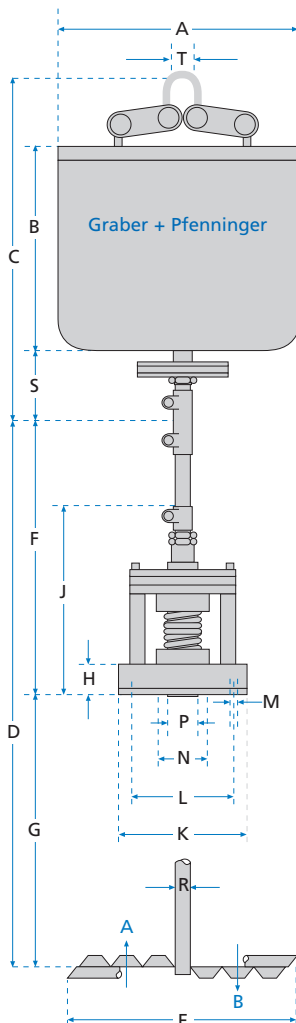


Plate stirrer type B with gas dispersion



## Dimensional Sketch (all dimensions in mm)



### Vibrating Mixer

A	Housing, external dimensions (W x D)
B	Housing, height
C	Vibrator overall length
D	Stirrer standard length, approx.
E	Dia. standard stirrer plate with rim cone
F	Length of stirrer top part for 75 PSIG and pressure-free seal
G	Length below flange sealing unit
H	Sealing unit flange thickness
J	Height of seal 75 PSIG and pressure-free
K	Flange dia. of sealing unit
L	Bolt circle dia.
M	Number of screws and dia.
N	Inner dia. cover discs
P	Stirring flange dia.
R	Standard shaft dia.
S	Drive shaft length
T	Inner dia. suspension rings

### Weights in kg:

Vibrating Mixer without stirrer	12
Standard stirrer	0,7
Sealing unit 75 PSIG	7,2
Sealing unit pressure-free	2,3

### Power supply:

Alternating current	230 V / 2,5 amp
50 or 60 cycles	1 phase / neutr.
Protection	IP 65

### Mixing capacity (liters)

### Remarks:

Type 4 with central suspension or frame suspension  
Types 2 and 3 with central suspension  
A: upward pumping effect  
B: downward pumping effect

All data are subject to change without notice.

### Type 2

260 x 117
217
360
900
150

### Type 3

273 x 150
246
450
1000
215

### Type 4

456 x 276
375
~670
2000
400

270 / 160

as required

25

220 / 110

140

110

4x14

50

32

15

80

15

270 / 180

as required

25

220 / 120

165

125

4x14

60

34

20

90

15

340 / 220

as required

30

285 / 170

265

225

8x18

90

65

34

110

40

115

10 – 20

20

9,2

230 V / 3,5 amp

1 phase / neutr.

IP 65

400 V / 4 amp

2 phases

IP 65

50 – 1000

200 – 10000