

移液产品简单操作 · Easy Handling!



Transferpette® S -8/-12

F I R S T C L A S S · B R A N D



3 操作手册

29 Operating Manual

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请仔细阅读以下内容!

该装置可能与有害的物质、操作和设备一起使用。本手册不可能提示这些应用中所有的潜在安全风险。用户有责任在使用前咨询并建立恰当的安全与健康规程，并决定规章限制的适用性。

1. 每位用户在操作之前必须阅读并理解本操作手册并在使用时遵循相关指导。
2. 遵循有害防护与安全指导的通用规章；比如，穿着防护服，佩戴防护镜与手套。
当操作具有感染性或者有危害的样品时，须遵守所有适用的规章并采取预防措施。
3. 请遵循试剂供应商的所有安全说明。
4. 仅移取符合本仪器“使用与操作限制”规定的液体。请遵守“禁止操作”指导（参见第6页）！如有疑问，请联络厂方或经销商。
5. 确保操作不会伤害使用者或者其他人员。避免溅撒。只能使用合适的容器。
6. 使用有危害的样品时避免接触吸头吸嘴。
7. 操作此仪器绝对不可过度用力！
8. 请仅使用原厂配件。切勿试图对本仪器进行任何技术改造。不要对本仪器进行超过操作手册描述范围的拆卸。
9. 使用前请检查仪器有无可见损伤。如果仪器在操作时有潜在的故障迹象（比如，活塞移动困难，泄漏），请立即停止移液。咨询本手册的“故障诊断”（参见25页），有必要的请联系供应商。

使用限制

用途

本移液器基于空气活塞原理，用于移取一般密度和粘度的水相溶液。

使用限制

该仪器移取液体极限如下：

- 仪器及试剂温度范围+15 °C 至+40 °C (59 °F至 104 °F)
当使用温度超出此范围时请咨询生产商。
- 蒸汽压最高为500 mbar。
- 黏度：260 mPa s (260 cps)。

操作限制

粘稠与高粘性的液体可能会影响移液体积的精准度。当液体温度与室温的差值超过 $\pm 1\text{ °C}/\pm 1.8\text{ °F}$ 时也会影响移液体积的精准度。

禁止操作

用户有责任确认拓展应用与本仪器的兼容性。

该仪器不可用于：

- 与 PP 或 FKM 不兼容的液体
- 与聚丙烯不兼容的液体
- 攻击聚苯硫醚 (Polyphenyl sulfide) 的液体
50 μl , 100 μl , 200 μl 与 300 μl 型号
- 高蒸汽压的液体

量程调节拨轮

移液按钮

吸头脱卸仪器

Easy Calibration 易校准功能

序列号在吸头脱卸按钮后面。

量程改变防护 (量程锁)

指托和移液器标签

量程显示

显示屏上的数字从上至下读取，白色破折号表示十进制小数点。

可在Transferpette® S -8/-12移液器指托内的标签上书写标记。

从指托上取下标签窗，在标签上添加文字说明，然后重新将标签和标签窗插入指托。

握杆



标签窗

多道移液仓

吸头锥

(图为Transferpette® S 八通道移液器)

提示:

只有使用高品质吸头才能获得优质的分析结果。我们推荐使用BRAND原厂吸头。更多信息，请参见13页的精度表。

1. 安装吸头

请根据量程范围或颜色标识使用正确规格的吸头。确保吸头安装稳妥。吸头为一次性物品！



2. 量程设定

- 将量程锁向上拨开解除啮合（解锁）。
- 旋转量程调节拨轮，选择所需的量程。调节过程中请避免扭曲和粗鲁的旋转拨轮。
- 将量程锁向下拨重新啮合（锁定）。提示：量程锁拨下会收紧但不会锁死量程调节拨轮。



3. 对齐多道移液仓

多通道移液仓可双向自由转动。



4. 吸取样品

- 将移液按钮按至第一个停顿。
- 竖直手握分液器并将移液器吸头浸入液体。

| 量程范围 | 浸入深度 (mm) | 等待时间 (s) |
|--|----------------|-------------|
| 0.1 μl - 1 μl | 1 - 2 | 1 |
| > 1 μl - 100 μl | 2 - 3 | 1 |
| > 100 μl - 1000 μl | 2 - 4 | 1 |
| > 1000 μl | 3 - 6 | 3 |



- c) 让移液按钮缓慢滑回。为使液体到达尖端位置，吸头应浸入液体并保持几秒

5. 排出样品

- a) 将吸头贴在容器壁上。以相对于容器壁 30-45° 的角度手握移液器。



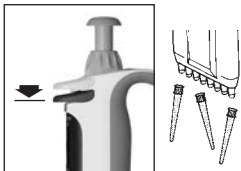
- b) 将移液按钮缓慢按至第一个停顿并保持。

对于血清和高黏度或低表面张力的液体，请保持足够长的等待时间，以提高准确度。

- c) 吹出动作可完全排空吸头。将移液按钮向下按至第二个停顿。



- d) 同时，将吸头贴在容器壁上擦去残液。
e) 将吸头从容器壁移开，并让移液按钮滑回。



6. 退除吸头

手持移液器悬置于合适的废弃处置容器上方，然后将吸头脱卸键按到底。

提示：

依据 ISO 8655，在实际进行移液过程之前，应用样品液体润洗一次吸头。

重要提示！

请勿在吸头内装有液体的情况下将仪器水平放置。液体可能进入并污染仪器。移液器应该不带吸头储存，使用随附的挂架或者桌面旋转挂架呈垂直状态安放。

根据使用情况，我们建议每3至12个月对仪器进行一次检查。可根据具体需要对检查周期时间进行调整。
依据DIN EN ISO 8655第6部分，使用重力法按下列步骤对移液器进行测试。

1. 设定标称量程

将量程设定为仪器上所示的最大量程（操作程序参见第8页）。

2. 调整移液器状态

在测试之前调整移液器状态，安装一支吸头，使用测试液体（蒸馏水）进行五次吸液和排液操作。

3. 执行测试

提示：

根据 DIN EN ISO 8655-2 建议，每次测试完应该更换吸头。但根据 DAkkS 指导 DKD-R8-1，可不必更换吸头。

- a) 安装一个新的移液器吸头，并用测试液体对吸头进行一次预润洗。

提示：

必须对各通道进行单独测试。

- b) 用分析天平称量所移取液体的量。（请遵循天平制造商的操作手册说明。）
- c) 吸取测试液体，并将其排至称量容器内。
- d) 建议每个通道在三个量程段（标称量程的100 %、50 %、10 % 体积）进行 3-10 次移液和称量操作，以便进行统计分析。

检查体积

计算 (标称量程)

x_i = 称量结果

n = 称量次数

Z = 校正因子

(如 1,0029 $\mu\text{l}/\text{mg}$
(20 °C, 1013 hPa))

$$\text{平均值 } \bar{x} = \frac{\sum x_i}{n}$$

$$\text{平均体积 } \bar{V} = \bar{x} \cdot Z$$

准确度*

$$\mathbf{A\%} = \frac{\bar{V} - V_0}{V_0} \cdot 100$$

V_0 = 标称量程

偏差系数*

$$\mathbf{CV\%} = \frac{100 s}{\bar{V}}$$

标准偏差

$$\mathbf{s} = Z \cdot \sqrt{\frac{\sum (x_i - \bar{x})^2}{n - 1}}$$

*) = 计算准确度 (A%) 和偏差系数 (CV%) : A %和CV %依据统计控制的公式进行计算。

提示:

测试指南 (SOP) 和EASYCAL™ 4.0校准软件的试用版可登录 www.brand.de 下载。

Transferpette® S-8/-12 移液器

| 量程范围 µl | 体积 µl | A* ≤ ± % | CV* ≤ % | 最小增量 µl | 建议吸头类型 µl |
|------------|----------|-------------|------------|------------|--------------|
| 0.5 - 10 | 10 | 1.6 | 1.0 | 0.01 | 0.5 - 20 |
| | 5 | 2 | 2 | | |
| | 1 | 8 | 6 | | |
| 5 - 50 | 50 | 0.8 | 0.4 | 0.1 | 2 - 200 |
| | 25 | 1.4 | 0.8 | | |
| | 5 | 6 | 3 | | |
| 10 - 100 | 100 | 0.8 | 0.3 | 0.2 | 2 - 200 |
| | 50 | 1.4 | 0.6 | | |
| | 10 | 4 | 2 | | |
| 20 - 200 | 200 | 0.8 | 0.3 | 0.2 | 2 - 200 |
| | 100 | 1.4 | 0.6 | | |
| | 20 | 4 | 1.5 | | |
| 30 - 300 | 300 | 0.6 | 0.3 | 0.2 | 5 - 300 |
| | 150 | 1.2 | 0.6 | | |
| | 30 | 3 | 1.5 | | |

* A = 准确度, CV = 偏差系数

DE-M  20 °C
Ex

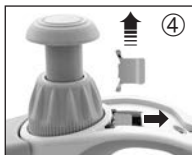
标称 (额定) 量程 (即仪器的最大量程) 的最终测试值, 为使用蒸馏水在室温 (20 °C/68 °F), 平顺稳定地操作测得。依照 DIN EN ISO 8655-2。

调整 - 易校准

该仪器用水溶液校准。若移液器操作明显不准确，或者必须针对不同密度和黏度的溶液或者特殊形状的吸头对仪器进行调整时，则可使用易校准技术进行调整。



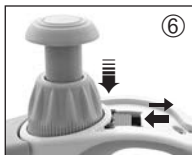
1. 检查体积，确定实际值（参见11页）。
2. 取下标签窗和标签。将扣钩向前推，稍微提起，然后向后拉。



3. 使用镊子或者吸头取下保护膜片（可弃置该保护膜片）。
4. 将红色调整滑块向后完全拉开，提起量程调节拨轮（断开耦合）然后释放调整滑块。
5. 在量程调节拨轮位于解锁 (UNLOCK)的情况下，设置至先前测得的实际值。建议每次调整完成之后检查量程。



6. 再次将调整滑块向后完全拉开，将量程调节拨轮向下推，然后释放调整滑块。重新插入标签和标签窗。



提示：

工厂设置的更改通过标签窗内露出的调整滑块的红色进行提示。

依据DIN EN 285标准，整个Transferpette® S-8/-12 移液器可在121℃ (250 °F)、2 bar (30 psi)条件下进行至少15分钟的高温高压灭菌。

1. 退除吸头。
2. 对整个移液器（无需进一步拆卸）进行高温高压灭菌。
3. 等待Transferpette® S-8/-12 移液器完全冷却并晾干。

提示:

用户必须确认高温高压灭菌的有效性。采用真空灭菌最可靠。建议使用灭菌袋。

注意:

在进行高温高压灭菌之前，必须将量程设定为有效数字的位置（例如：11.25或11.26，而不是两者之间的某个位置），且量程锁处于完全打开状态。

若经常对移液器进行高温高压灭菌，应使用随包装附赠的硅油润滑活塞，以保证移动平滑。灭菌之后，如有必要，可拧紧移液器手柄和移液器下半支机身。



UV 紫外灭菌

该仪器可耐受通常的紫外灭菌灯照射。UV紫外照射可能导致一些颜色改变。

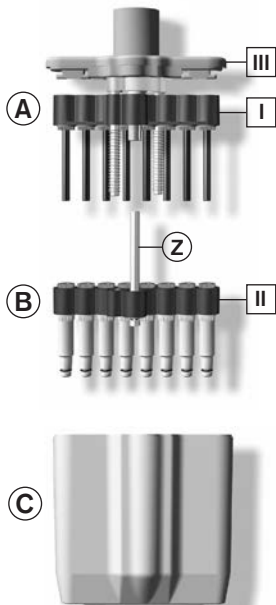
保养与清洁

多道移液仓的三个主要组件可以很方便地拆卸，以便保养、清洁或更换部件。操作步骤如图中所示。

提示： 有关更换单个吸头锥上的V形环（O形环）的详细描述，请参见零备件随附的说明书。

多道移液仓的主要组件

- A** 活塞单元，包括活塞支架 [I] 和插入此单元的活塞，可单独旋下来进行清洁或更换。
- B** 吸头锥单元，包括吸头锥支架 [II] 和与其相连的中央导杆 (Z)，以及吸头锥和密封圈，可单独旋下来进行清洁或更换。
- C** 多道移液仓外壳，通过两个转锁紧固件连接至活塞单元的多道移液仓外壳盖 [III]。



保养

为确保功能正常，请定期保养和清洁 Transferpette® S-8/-12 移液器。

检查内容

1. 检查吸头锥、活塞和密封圈是否被损坏和污染。
2. 测试移液器的密封性。我们推荐使用 BRAND 移液器泄漏检测仪 PLT 进行测试。
替代方法：吸入样品，然后垂直手持移液器保持约 10 s。若在吸头吸嘴有液滴形成，请参阅第 25 页的“故障诊断”。

清洁说明

1. 用肥皂液或异丙醇清洗各吸头锥、活塞和吸头锥支架/活塞支架（仅限这些组件）。然后用蒸馏水冲洗。
2. 等待组件完全干燥与冷却。吸头锥内残留的湿气会导致准确度降低。
3. 为活塞涂上薄薄一层随附的硅油。推荐仅使用氟性全合成特种（润滑）脂润滑中央导杆（Z）！

从多道移液仓上卸下握柄

1. 退掉吸头。
2. 将多道移液仓其向下拉到底断开多道移液仓与握柄的内部连接，然后顺时针转动。

注意：

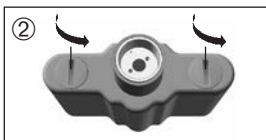
操作不当会损坏仪器！



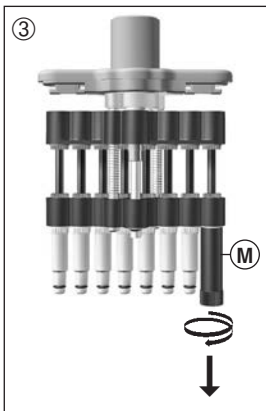
拆卸多道移液仓

取下吸头锥和密封圈进行清洁或更换

针对清洁与更换配件

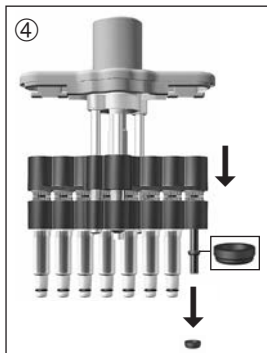


1. 将多道移液仓从握柄上旋下。
2. 将移液仓外壳盖上的两个转锁转动90°(可以使用一个硬币), 将仓壳褪下。



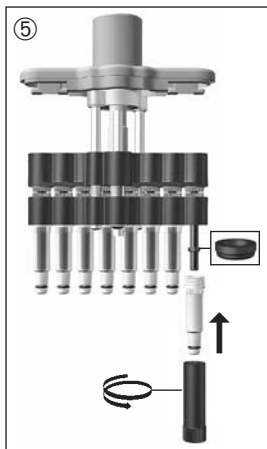
3. 将安装工具 (M) (岁包装附赠) 套住吸头锥, 将吸头锥旋下。





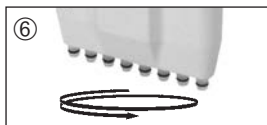
4. 将活塞单元向下推到底。取下吸头锥后，密封圈可能位于吸头锥内部，或者在取下吸头锥之后套在活塞上。取下密封圈，进行检查和清洁，如有必要，更换新的密封圈。根据需要，使用随附的硅油稍微润滑活塞。

Transferpette® S -8/-12 30-300 μ l 移液器需从活塞上取下额外的压力环进行清洁。



5. 将密封圈平面朝上推至活塞上。
(Transferpette® S -8/-12 30-300 μ l 移液器需先换上额外的压力环。)
使用安装工具安装并拧紧经过清洁或者新的吸头锥。

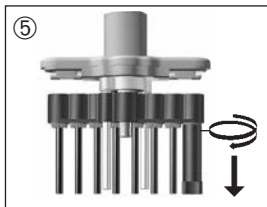
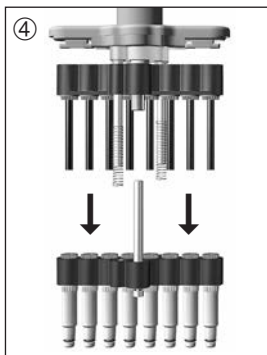
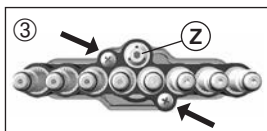
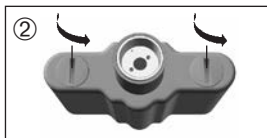
6. 重新组装多道移液仓。必须逆时针将多道移液仓旋入握柄，直至听到卡入位的咔哒声。
检查移液器气密性、活动性和准确性(参见 17 页“保养”)。



► 20页继续

取下活塞

针对清洁与更换配件

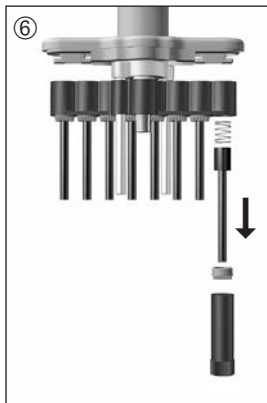


1. 将多道移液仓从握柄上旋下。
2. 将移液仓外壳盖上的两个转锁转动90°(可以使用一个硬币), 将仓壳褪下。
3. 取下吸头锥单元上的两个外部Phillips螺丝。

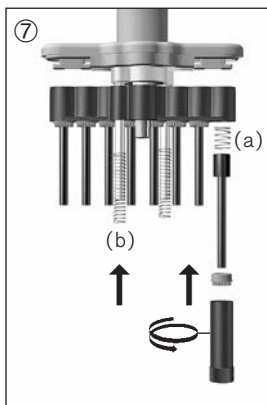
注意:

请勿拧松中央导杆 (Z)

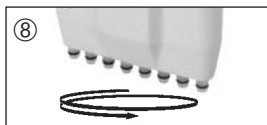
4. 将活塞与吸头锥单元分开。取下压力弹簧。
5. 将安装工具套在活塞螺帽上并拧松活塞螺帽。



6. 取下螺帽，拔出活塞与活塞弹簧。



7. 活塞弹簧 (a) 与将经过清洁的或者新的活塞插入。将活塞螺帽旋上，并用安装工具紧固。装上压力弹簧 (b)。



8. 安装多道移液仓。必须逆时针将多道移液仓旋入握柄，直至听到卡入位的咔哒声。检查移液器气密性、活动性和准确性 (参见17页"保养")。

包含物品

确认您的产品包装盒内有：Transferpette® S-8道 或者 -12 道移液器，2个预装BRAND适配吸头的吸头盒，硅油，1个挂架，1个加样槽，1个安装工具，1组FKM密封圈以及本操作手册。

Transferpette® S-8 移液器

| 量程 | 产品描述 | 货号 |
|-------------|--------|---------|
| 0,5 - 10 µl | M8-10 | 7037 00 |
| 5 - 50 µl | M8-50 | 7037 06 |
| 10 - 100 µl | M8-100 | 7037 08 |
| 20 - 200 µl | M8-200 | 7037 10 |
| 30 - 300 µl | M8-300 | 7037 12 |

Transferpette® S-12 移液器

| 量程 | 产品描述 | 货号 |
|-------------|---------|---------|
| 0,5 - 10 µl | M12-10 | 7037 20 |
| 5 - 50 µl | M12-50 | 7037 26 |
| 10 - 100 µl | M12-100 | 7037 28 |
| 20 - 200 µl | M12-200 | 7037 30 |
| 30 - 300 µl | M12-300 | 7037 32 |

桌面移液器架,可悬挂 6 支 Transferpette® S 或者 Transferpette® S-8/-12移液器。

货号 7048 05

桌面移液器架,可安置 1 支 Transferpette® S-8/-12移液器。

货号 7034 40

移液器挂架,可悬挂 1 支 Transferpette® S 或者 1支Transferpette® S-8/-12移液器。

货号 7048 10



Transferpette® S-8/-12 移液器的其它附件

| 产品描述 | 货号 |
|---|---------|
| 标签窗, 1个/包装 | 7046 50 |
| 空白标签, 5个/包装 | 7046 51 |
| 硅油 | 7036 77 |
| 氟性全合成特种 (润滑) 脂 | 7036 78 |
| 加样槽, PP材质。 容量 60 ml, 可 121°C 高压湿热灭菌。 | |
| 未灭菌, 有盖。10个/包。 | 7034 59 |
| 无菌, 无盖, 独立包装。100个/包。 | 7034 11 |
| 无菌, 无盖。5个/袋, 200个/包。 | 7034 09 |
| PLT unit 移液器检漏仪 | 7039 70 |

零备件

配件会因标称量程型号不同而稍有不同。（图中所示为 Transferpette® S -8/-12, 10-100 µl 移液器的零备件）



| 量 程 | A | B* | C | D |
|-------------|---------|---------|---------|---------|
| 0,5 - 10 µl | 7056 59 | 7056 77 | 7033 80 | 7033 40 |
| 5 - 50 µl | 7056 66 | 7056 81 | 7034 91 | 7033 43 |
| 10 - 100 µl | 7056 62 | 7056 82 | 7034 91 | 7033 44 |
| 20 - 200 µl | 7056 63 | 7056 83 | 7034 91 | 7033 45 |
| 30 - 300 µl | 7056 64 | 7056 84 | 7034 91 | 7033 46 |

* 含密封垫圈、V形环和安装工具

Transferpette® S -8/-12 30-300 µl 移液器含额外的压力环。

| 题 | 可能的原因 | 应对方法 |
|------------------------|------------------------|----------------------|
| 吸头滴液 (仪器渗漏) | 吸头不匹配 | 请仅使用高品质吸头 |
| | 吸头未插紧 | 将吸头压紧 |
| 仪器不吸液或吸液太少； 排液体积过低。 | 密封圈被污染 | 清洗密封圈 |
| | 密封圈或吸头锥损坏 | 更换密封圈或活塞套管 |
| | 活塞被污染或损坏 | 清洗或更换活塞 |
| 吸液太慢 | 活塞套管堵塞 | 清洗活塞套管 |
| 排液体积太大 | 在吸样品之前按压移液按钮过度，压至吹出位置。 | 请正确操作。 参见第8页‘移液’。 |
| 活塞移动困难 | 活塞被污染或者需要润滑 | 清洗并润滑活塞。 |

仪器送修

重要！ 未经同意运输有毒害的物品是违反联邦法律的。

- 请仔细完整地清洁仪器并去除污染。
- 必须附上故障与使用试剂的准确描述。若缺失使用试剂的相关信息，则不能对仪器进行维修。
- 运输费用与风险由发送者承担。

除美国与加拿大外：

- 填写"无健康危害申明"并发给您的供应商或生产商。向您的供应商或生产商索要此表格。此表格可在www.brand.de下载。

在美国与加拿大：

- 在寄回仪器之前联系BrandTech Scientific, Inc. 获取返修的授权号码。
- 仅接受寄回清洁的并去除污染的仪器，必须附上返修授权号码并粘贴在外包装显眼的位置，寄回返修授权号码对应的地址。

BRAND GMBH + CO KG

Otto-Schott-Straße 25
97877 Wertheim (Germany)

Tel.: +49 9342 808-0
Fax: +49 9342 808-98000
E-Mail: info@brand.de
www.brand.de

USA and Canada:

BrandTech® Scientific, Inc.
11 Bokum Road
Essex, CT 06426-1506 (USA)

Tel.: +1-860-767 2562
Fax: +1-860-767 2563
www.brandtech.com

India:

BRAND Scientific Equipment Pvt. Ltd.
303, 3rd Floor, 'C' Wing, Delphi
Hiranandani Business Park, Powai
Mumbai - 400 076 (India)

Tel.: +91 22 42957790
Fax: +91 22 42957791
E-Mail: info@brand.co.in
www.brand.co.in

中国：

普兰德 (上海) 贸易有限公司
上海市斜土路2899甲号光启文化广场
B栋506室。200030

电话: +86 21 6422 2318
传真: +86 21 6422 2268
电子邮件: info@brand.cn.com
www.brand.cn.com

校准服务

ISO 9001与GLP要求定期检查体积计量仪器。我们建议每隔3-12个月进行检查。时间间隔由使用的要求决定。如使用频繁或经常具有侵蚀性的试剂，间隔应该短一些。具体的测试指南可在www.brand.de 或 www.brandtech.com下载。

BRAND也提供厂方的校准服务或BRAND具有的DAkkS校准服务。只需寄回需要校准的仪器与需要哪种校准服务的申请。您可在数日内重新获得经过校准的仪器与相应的厂方校准证书或者是DAkkS校准证书。需要了解更多信息，请联系您的经销商或者BRAND。完整的订购信息可在www.brand.de下载（参见技术文档）。

担保信息

我们不能承担由于不当拿取，使用，服务，操作或未授权的仪器维修产生的结果，我们同样不能承担由于正常易损件如活塞，密封垫圈，阀门的磨损或者玻璃破损而产生的结果，我们也不能承担由于不按照操作手册指导的操作而产生的结果。我们不能承担由于进行任何操作手册未描述的操作与使用或由于非原装配件的使用而产生的结果。

美国与加拿大

担保信息请看www.brandtech.com.

丢弃

请遵照当地现行法律对仪器和吸头进行丢弃处理。

如有技术变更，恕不另行通知。

对于印刷或排版错误，我方不承担任何责任。

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Please read the following carefully!

This instrument may sometimes be used with hazardous materials, operations, and equipment. It is beyond the scope of this manual to address all of the potential safety risks associated with its use in such applications. It is the responsibility of the user of this pipette to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

- 1.** Every user must read and understand this operating manual prior to using the instrument and observe these instructions during use.
- 2.** Follow general instructions for hazard prevention and safety instructions; e.g., wear protective clothing, eye protection and gloves. When working with infectious or other hazardous samples, all appropriate regulations and precautions must be followed.
- 3.** Observe all specifications provided by reagent manufacturers.
- 4.** Only use the instrument for pipetting liquids that conform to the specifications defined in the limitations of use and operating limitations. Observe operating exclusions (see page 32). If in doubt, contact the manufacturer or supplier.
- 5.** Always use the instrument in such a way that neither the user nor any other person is endangered. Avoid splashes. Use only suitable vessels.
- 6.** Avoid touching the tip orifices when working with hazardous samples.
- 7.** Never use force on the instrument!
- 8.** Use only original spare parts. Do not attempt to make any technical alterations. Do not dismantle the instrument any further than is described in the operating manual!
- 9.** Before use check the instrument for visible damages. If there is a sign of a potential malfunction (e.g., piston difficult to move, leakage), immediately stop pipetting. Consult the 'Troubleshooting' section of this manual (see page 50), and contact the manufacturer if needed.

Limitations of Use

Purpose

The pipette is an air-displacement system for pipetting aqueous solutions with medium density and viscosity.

Limitations of Use

The instrument is intended for the pipetting of liquids within the following limitations:

- Temperature of both the instrument and solution should be between +15 °C to +40 °C (59 °F to 104 °F). Consult the manufacturer for use in temperatures outside of this range.
- Vapor pressure up to 500 mbar
- Viscosity: 260 mPa s (260 cps)

Operating Limitations

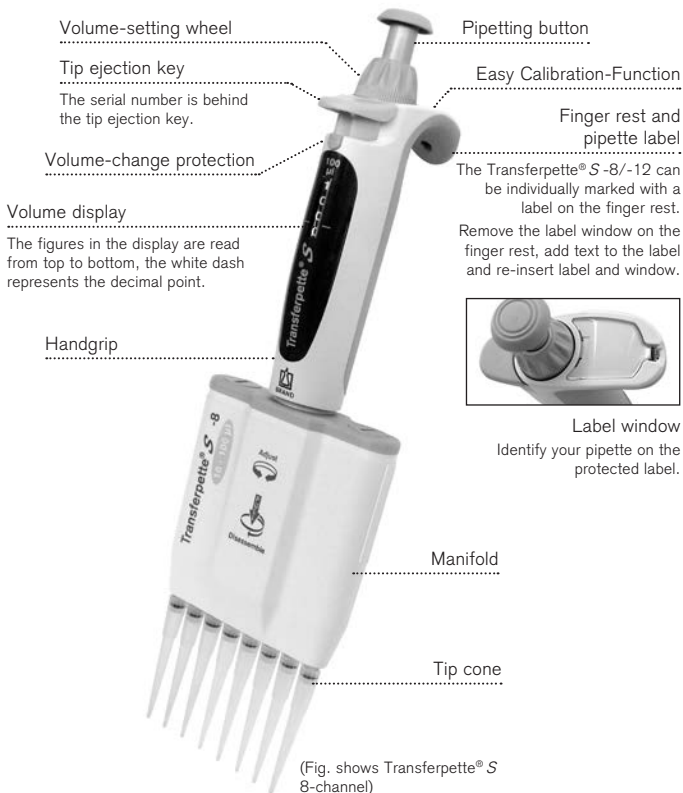
Viscous and highly adhesive liquids may impair volumetric accuracy. Volumetric accuracy may also be impaired when pipetting liquids that differ from ambient temperature by more than ± 1 °C/ ± 1.8 °F.

Operating Exclusions

The user has to ensure the compatibility of the instrument with the intended application.

This instrument cannot be used:

- for liquids incompatible with polypropylene and FKM
- for liquids attacking polycarbonate (viewing window)
- for liquids attacking polyphenyl sulfide (50 μ l, 100 μ l, 200 μ l and 300 μ l models)
- for liquids of a very high vapor pressure



Note:

Optimum analysis results can only be obtained with quality tips. We recommend pipette tips from BRAND. For further information, refer to the accuracy table on page 39.

1. Fitting the tips

Use the correct tips according to the volume range or the color code. Ensure that the tips are securely seated.

Pipette tips are disposables items!



2. Volume setting

- Push the volume-change protection upward to disengage (UNLOCK).
- Select the desired volume by rotating the volume-setting wheel. Avoid twisting and abrupt rotating motions during this adjustment.
- Push the volume-change protection down to re-engage (LOCK). Note: The volume-change protection tightens but does not lock volume-setting wheel.



3. Align the manifold

The manifold can turn freely in both directions.



4. Aspirate sample

- Press pipetting button to the first stop.
- Hold the pipette vertically and immerse the tips into the liquid.

| Volume range | Immersion depth in mm | Waiting time in s |
|------------------------------|-----------------------|-------------------|
| 0.1 μ l - 1 μ l | 1 - 2 | 1 |
| > 1 μ l - 100 μ l | 2 - 3 | 1 |
| > 100 μ l - 1000 μ l | 2 - 4 | 1 |
| > 1000 μ l | 3 - 6 | 3 |



- c) Let the pipetting button slide back slowly. In order for the liquid to reach its end position, leave the tips immersed for a few seconds.

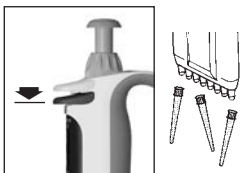
5. Discharge sample



- a) Place the pipette tips against the wall of the vessel. Hold the pipette at an angle of 30-45° relative to the container wall.
- b) Press the pipetting button slowly to the first stop and hold it down. For serum and liquids of high viscosity or low surface tension, observe adequate waiting time to improve accuracy.



- c) The blow-out stroke empties the tips completely: Press the pipetting button down to the second stop.
- d) While doing this, wipe the pipette tips against the wall of the container.
- e) Remove the pipette tips from the container wall and let the pipetting button slide back.



6. Ejecting the tips

Hold the manifold over a suitable disposal container and press the tip ejection key to the stop.

Note:

ISO 8655 prescribes rinsing the pipette tips once with the sample liquid prior to the actual pipetting process.

Important!

Don't lay the instrument horizontal when the tips are filled. Liquid may enter and contaminate the instrument. The instrument should be stored without tips, placed upright in the supplied shelf/rack mount or bench top rack.

Depending on use, we recommend inspection of the instrument every 3 to 12 months. The cycle can, however, be adjusted to individual requirements.

The gravimetric testing of the pipette volume is performed according to the following steps and is in accordance with DIN EN ISO 8655, Part 6.

1. Set nominal volume

Set volume to the maximum volume indicated on the instrument (see page 34 for procedure).

2. Condition the pipette

Condition the pipette before testing by using pipette tips to aspirate and discharge the test liquid (distilled H₂O) five times.

3. Carry out the test

Note:

According to DIN EN ISO 8655-2, it is recommended to replace the tips after each measurement. This rule may be waived in accordance with the DAkkS guideline DKD-R8-1.

- a) Aspirate liquid and pipette it into the weighing vessel.

Note:

Each individual channel must be tested separately.

- b) Weigh the pipetted quantity with an analytical balance. (Please follow the operating manual instructions from the balance manufacturer.)
- c) Calculate the volume, taking the temperature of the test liquid into account.
- d) 3-10 pipettings and weighings per channel in three volume ranges (100%, 50%, 10% of nominal volume) are recommended for statistical analysis.

Checking the Volume

Calculation (for nominal volume)

x_i = Weighing results

n = Number of weighings

Z = Correction factor

(e.g., 1.0029 $\mu\text{l}/\text{mg}$
at 20 °C, 1013 hPa)

$$\text{Mean value } \bar{x} = \frac{\sum x_i}{n}$$

$$\text{Mean volume } \bar{V} = \bar{x} \cdot Z$$

Accuracy*

$$\text{A\%} = \frac{\bar{V} - V_0}{V_0} \cdot 100$$

V_0 = Nominal volume

Coefficient of Variation*

$$\text{CV\%} = \frac{100 s}{\bar{V}}$$

Standard Deviation

$$s = Z \cdot \sqrt{\frac{\sum (x_i - \bar{x})^2}{n - 1}}$$

*) = Calculation of accuracy (A%) and variation coefficient (CV%):
A% and CV% are calculated according to the formulas for statistical control.

Note:

Testing instructions (SOPs) and a demo version of the EASYCAL™ 4.0 calibration software are available for download at www.brand.de.

Transferpette® S-8/-12

| Volume range μl | Volume step μl | A* ≤ ± % | CV* ≤ % | Increment μl | Rec. type of tips, μl |
|--------------------|-------------------|-------------|------------|-----------------|--------------------------|
| 0.5 - 10 | 10 | 1.6 | 1.0 | 0.01 | 0.5 - 20 |
| | 5 | 2 | 2 | | |
| | 1 | 8 | 6 | | |
| 5 - 50 | 50 | 0.8 | 0.4 | 0.1 | 2 - 200 |
| | 25 | 1.4 | 0.8 | | |
| | 5 | 6 | 3 | | |
| 10 - 100 | 100 | 0.8 | 0.3 | 0.2 | 2 - 200 |
| | 50 | 1.4 | 0.6 | | |
| | 10 | 4 | 2 | | |
| 20 - 200 | 200 | 0.8 | 0.3 | 0.2 | 2 - 200 |
| | 100 | 1.4 | 0.6 | | |
| | 20 | 4 | 1.5 | | |
| 30 - 300 | 300 | 0.6 | 0.3 | 0.5 | 5 - 300 |
| | 150 | 1.2 | 0.6 | | |
| | 30 | 3 | 1.5 | | |

* A = Accuracy, CV = Coefficient of Variation

DE-M  20 °C
Ex

Final test values related to the nominal capacity (maximum volume) or the indicated volume steps indicated on the instrument, obtained when instrument and distilled water are equilibrated at ambient temperature (20 °C/68 °F) and with smooth operation. According to DIN EN ISO 8655.

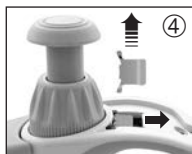
Adjustment – Easy Calibration

The instrument is permanently adjusted for aqueous solutions. If the pipette operation is clearly inaccurate, or if the instrument must be adjusted for solutions of different densities and viscosities or specially-shaped pipette tips, adjustments can be made using the Easy Calibration Technique.



1. Check the volume, determine actual value (see page 37).

2. Remove the label window and the label. Push the hook forward, raise it slightly and then pull it back.



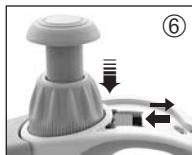
3. Using a paperclip or an unused pipette tip, remove the protective film (this protective film can be discarded).

4. Push the red adjustment slider completely back, raise the volume-setting wheel (decoupling) and release the adjustment slider.



5. Set the previously determined actual value (adjustment value) with the volume-setting wheel in the UNLOCK position.

A volume check is recommended after every adjustment.



6. Push the adjustment slider completely back again, push the volume-setting wheel downwards and release the adjustment slider. Re-insert the label and the label window.

Note:

The change to the factory settings is indicated by the red adjustment slider now visible in the label window.

The Transferpette® S-8/-12 is completely autoclavable at 121 °C (250 °F), 2 bar absolute (30 psi), with a holding time of at least 15 minutes according to DIN EN 285.

1. Eject the pipette tips.
2. Autoclave the complete pipette without any further disassembling.
3. Allow the Transferpette® S-8/-12 to completely cool and dry.

Note:

The effectiveness of the autoclaving must be verified by the user. Maximum reliability is obtained with vacuum sterilization. We recommend the use of sterilization bags.

Attention:

Prior to autoclaving, the volume adjustment must be set on an available numbered volume (e.g., 11.25 or 11.26 but not between), with the volume-change protection set fully unlocked (UNLOCK).

If the pipette is autoclaved frequently, the pistons should be oiled with the supplied silicone oil in order to preserve smooth movement.

If necessary after autoclaving, tighten the connection between the hand grip and the manifold.

**UV sterilization**

The unit can withstand the usual output of a UV sterilization lamp. The effects of the UV may cause some color change.

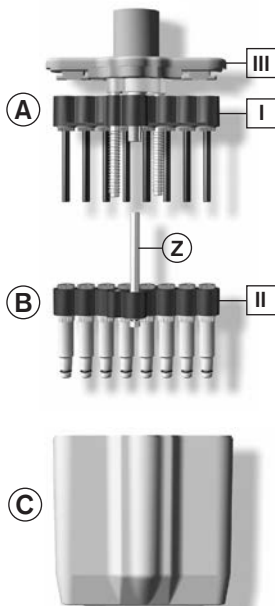
Servicing and Cleaning

The three main components of the manifold can be easily separated and disassembled for servicing, cleaning or replacing parts. The procedures are illustrated on the following pages.

Note: The changing of the V-rings/O-rings on the individual nose cones is described in detail in the instructions enclosed with the spare part.

The main components of the manifold

- A Piston unit** with piston support bar [I] and pistons inserted in this unit, which can be unscrewed individually for cleaning or replacement.
- B Nose cone assembly** with nose cone support bar [II] and central guide rod (Z), which is attached to this, and the nose cones and seals, which can be unscrewed individually for cleaning or replacement.
- C Manifold housing**, which is connected to the manifold housing cover [III] of the piston unit with two turn-lock fasteners.



Servicing

In order to assure proper functioning, the Transferpette® S-8/-12 should be serviced and cleaned at regular intervals.

What is to be inspected?

1. Inspect nose cones, pistons and seals for damage and contamination.
2. Test the sealing of the instrument. We recommend using the BRAND leak testing instrument PLT unit.

Alternatively: to do this aspirate a sample, and then hold the instrument in a vertical position for about 10 sec. If a drop forms at the tip orifices, see the troubleshooting guide, page 51.

Cleaning instructions

1. Clean single nose cones, pistons and nose cone support bar/piston support bar (**these components only**) with soap solution or isopropyl alcohol. Afterwards, rinse with distilled water.
2. Let these parts dry and cool down completely. Residual moisture in the nose cones may result in a loss of accuracy.
3. Lubricate the piston with a very thin coating of the silicone oil supplied. For the central guide rod (Z) only use the recommended fluorstatic grease!

Disconnecting handle from manifold

1. Eject the pipette tips.
2. To disconnect the manifold, pull it downward as far as possible, and **only then** turn it clockwise. After one rotation, it should no longer be pulled downward while it is being turned.

Attention:

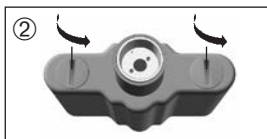
Improper handling can damage the unit!



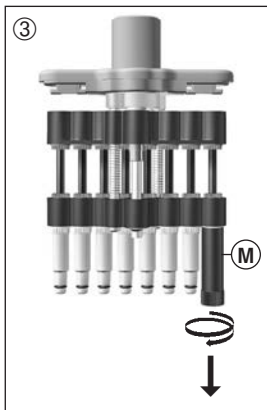
Disassembling the Manifold

Removing of nose cones and seals

for cleaning or replacing



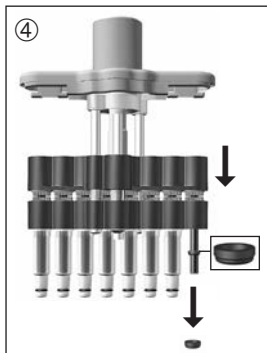
1. Disconnect the manifold from the handle.
2. Turn both closures of the manifold housing cover 90° (e.g., using a coin) and slide off the housing.



3. Push the mounting tool (M) (supplied with the pipette) on the nose cone and unscrew it.

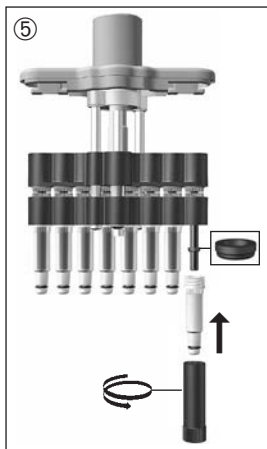


Disassembling the Manifold



4. Push the piston unit down to the bottom. The seal will either remain inside the nose cone or will stay on the piston after the nose cone is removed. Remove the seal, inspect it and clean or replace if necessary. If required, lubricate the piston lightly with the supplied silicone oil.

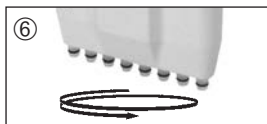
(In the Transferpette® S-8/-12 30-300 µl unit, remove the additional pressure ring from the piston for cleaning.)



5. Push the seal on the piston with its flat side facing upward.

(In the Transferpette® S-8/-12 30-300 µl unit, first replace the additional pressure ring!)

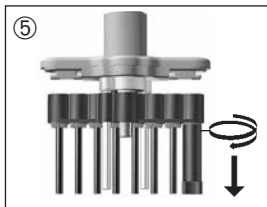
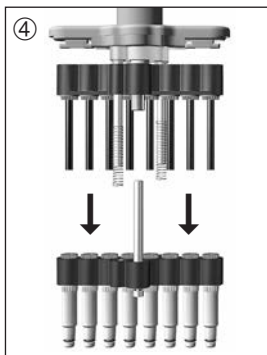
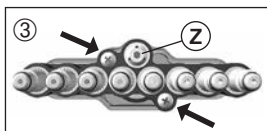
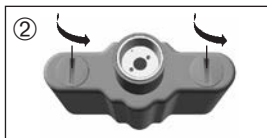
Use the mounting tool to mount and tighten the cleaned or new nose cone.



6. Reassemble the manifold. The manifold must be screwed into the handle counter-clockwise, until it audibly snaps into place. Check the instrument for tightness (see page 43, "Servicing").

► Continued on page 46

Removing of pistons



for cleaning or replacing

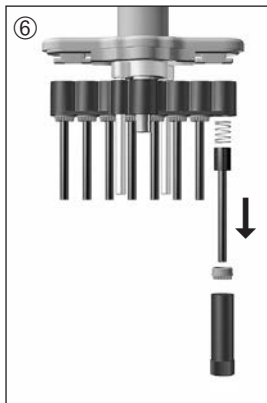
1. Disconnect the manifold from the handle.
2. Turn both closures of the manifold housing cover 90° (e.g., using a coin) and slide off the housing.
3. Remove both outer Phillips screws on the nose cone assembly.

Attention:

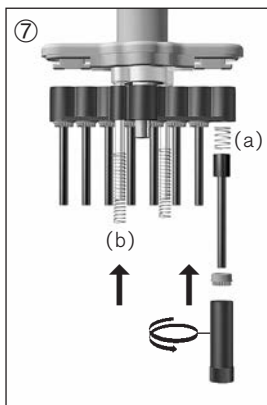
Do not loosen the central guide rod (Z)!

4. Pull the piston and nose cone assembly apart and separate. Remove stroke springs.
5. Place the mounting tool on the piston nut and unscrew the piston nut.

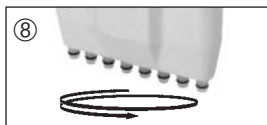
Disassembling the Manifold



- 6.** Remove the piston nut and pull out the piston with piston spring.



- 7.** Insert the piston spring (a) and cleaned or new piston. Screw on the piston nut and tighten with the mounting tool. Replace the stroke springs (b).



- 8.** Reassemble the manifold. The manifold must be screwed counter-clockwise into the handle so that it audibly snaps into place. Check the instrument for tightness, mobility and accuracy (see page 43, "Servicing").

Ordering Information

Items supplied

Confirm that your package includes: Transferpette® S -8 or -12 pipette, 2 x TipBox, filled with compatible pipette tips, container of silicone oil, 1 shelf/rack mount, 1 reagent reservoir, 1 mounting tool, 1 set of sealing rings made of FKM and this operating manual.

Transferpette® S -8

| Capacity | Description | Cat. No. |
|-------------|-------------|----------|
| 0.5 - 10 µl | M8-10 | 7037 00 |
| 5 - 50 µl | M8-50 | 7037 06 |
| 10 - 100 µl | M8-100 | 7037 08 |
| 20 - 200 µl | M8-200 | 7037 10 |
| 30 - 300 µl | M8-300 | 7037 12 |

Transferpette® S -12

| Capacity | Description | Cat. No. |
|-------------|-------------|----------|
| 0.5 - 10 µl | M12-10 | 7037 20 |
| 5 - 50 µl | M12-50 | 7037 26 |
| 10 - 100 µl | M12-100 | 7037 28 |
| 20 - 200 µl | M12-200 | 7037 30 |
| 30 - 300 µl | M12-300 | 7037 32 |

**Bench-top rack for 6 Transferpette® S
or 3 Transferpette® S-8/-12 pipettes**

Cat. No. 7048 05

**Bench-top rack for 1 Transferpette® S
-8/-12 pipette**

Cat. No. 7034 40

**Shelf/rack mount for 1 Transferpette® S
or 1 Transferpette® S-8/-12 pipette**

Cat. No. 7048 10



Additional accessories for Transferpette® S-8/-12

| Description | Cat. No. |
|---|----------|
| Label window , pack of 1 | 7046 50 |
| Blank labels , pack of 5 | 7046 51 |
| Silicone oil | 7036 77 |
| Fluorstatic grease | 7036 78 |
| Reagent reservoir , PP. Capacity 60 ml. Autoclavable (121 °C) | |
| non-sterile, with lid. Pack of 10. | 7034 59 |
| sterile, without lid. Packed individually. Pack of 100. | 7034 11 |
| sterile, without lid. 5 per bag. Pack of 200. | 7034 09 |
| PLT unit Pipette leak testing unit | 7039 70 |

Spare Parts

Parts will differ slightly depending on nominal volume of instrument.
 (Fig. shows spare parts for Transferpette® S-8/-12, 10-100 µl).



| Capacity | A | B* | C | D |
|-------------|---------|---------|---------|---------|
| 0.5 - 10 µl | 7056 59 | 7056 77 | 7033 80 | 7033 40 |
| 5 - 50 µl | 7056 66 | 7056 81 | 7034 91 | 7033 43 |
| 10 - 100 µl | 7056 62 | 7056 82 | 7034 91 | 7033 44 |
| 20 - 200 µl | 7056 63 | 7056 83 | 7034 91 | 7033 45 |
| 30 - 300 µl | 7056 64 | 7056 84 | 7034 91 | 7033 46 |

* incl. seal, V-ring and mounting tool.

Transferpette® S-8/-12 30-300 µl with additional pressure ring.

| Problem | Possible cause | Corrective action |
|---|--|---|
| Tip dripping (instrument leaks) | Unsuitable tip | Only use high-quality tips |
| | Tip not seated tightly | Press tip on firmly |
| The instrument does not aspirate or aspirates too little; the discharged volume is too low. | Seal contaminated | Clean seal |
| | The seal or cone is damaged | Replace seal or shaft |
| | The piston is contaminated or damaged | Clean or replace piston |
| Aspiration is too slow | Shaft clogged | Clean shaft |
| Discharged volume is too large | Pipetting button pressed too far into the blow-out position before sample uptake | Operate properly. See 'Pipetting', page 34. |
| Piston is difficult to move | The piston is contaminated or needs oil | Clean and oil the piston |

Return for repair

Important!

Transporting of hazardous materials without a permit is a violation of federal law.

- Clean and decontaminate the instrument carefully.
- It is essential always to include an exact description of the type of malfunction and the media used. If information regarding media used is missing, the instrument cannot be repaired.
- Shipment is at the risk and the cost of the sender.

Outside the U.S. and Canada:

- Complete the "Declaration on Absence of Health Hazards" and send the instrument to the manufacturer or supplier. Ask your supplier or manufacturer for the form. The form can also be downloaded from www.brand.de.

In the U.S. and Canada:

- Contact BrandTech Scientific, Inc. and obtain authorization for the return **before** sending your instrument for service.
- Return only cleaned and decontaminated instruments, with the Return Authorization Number prominently displayed on the outside of the package to the address provided with the Return Authorization Number.

BRAND GMBH + CO KG

Otto-Schott-Straße 25
97877 Wertheim (Germany)

Tel.: +49 9342 808-0
Fax: +49 9342 808-98000
E-Mail: info@brand.de
www.brand.de

USA and Canada:

BrandTech® Scientific, Inc.
11 Bokum Road
Essex, CT 06426-1506 (USA)

Tel.: +1-860-767 2562
Fax: +1-860-767 2563
www.brandtech.com

India:

BRAND Scientific Equipment Pvt. Ltd.
303, 3rd Floor, 'C' Wing, Delphi
Hiranandani Business Park, Powai
Mumbai - 400 076 (India)

Tel.: +91 22 42957790
Fax: +91 22 42957791
E-Mail: info@brand.co.in
www.brand.co.in

China:

BRAND (Shanghai) Trading Co., Ltd.
Guangqi Culture Plaza
Room 506, Building B
No. 2899, Xietu Road
Shanghai 200030 (P.R. China)

Tel.: +86 21 6422 2318
Fax: +86 21 6422 2268
E-Mail: info@brand.cn.com
www.brand.cn.com

Calibration Service

ISO 9001 and GLP-guidelines require regular examinations of your volumetric instruments. We recommend checking the volume every 3-12 months. The interval depends on the specific requirements on the instrument. For instruments frequently used or in use with aggressive media, the interval should be shorter. The detailed testing instruction can be downloaded on www.brand.de or www.brandtech.com.

BRAND also offers you the possibility to have your instruments calibrated by the BRAND Calibration Service or the BRAND-owned DAkkS Calibration Service. Just send in the instruments to be calibrated, accompanied by an indication of which kind of calibration you wish. Your instruments will be returned within a few days together with a test report (BRAND Calibration Service) or with a DAkkS Calibration Certificate. For further information, please contact your dealer or BRAND. Complete ordering information is available for download at www.brand.de (see Technical Documentation).

Warranty

We shall not be liable for the consequences of improper handling, use, servicing, operating or unauthorized repairs of the instrument or the consequences of normal wear and tear especially of wearing parts such as pistons, seals, valves and the breakage of glass as well as the failure to follow the instructions of the operating manual. We are not liable for damage resulting from any actions not described in the operating manual or if non-original spare parts or components have been used.

U.S. and Canada:

Information for warranty please see www.brandtech.com.

Disposal

For the disposal of instruments and tips, please observe the relevant national disposal regulations.

Subject to technical modification without notice.

We will not be held responsible for printing or typographical errors.



普兰德® (上海) 贸易有限公司

地址：上海市徐汇区肇家浜路789号均瑶国际广场12楼F1。

电话：+86 21 6422 2318 · 传真：+86 21 6422 2268

普兰德公司网址：www.brand.cn.com · 电子邮件地址：info@brand.cn.com

BRAND GMBH + CO KG · Postfach 11 55 · 97861 Wertheim · Germany

Tel.: +49 9342 808-0 · Fax: +49 808-98000 · E-Mail: info@brand.de

Internet: www.brand.de