

移液产品 · 简单操作！



Transferpette® S

空气活塞式移液器

F I R S T C L A S S · B R A N D



3 操作手册

27 Operating Manual

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请仔细阅读下列内容!

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21页），有必要的话请联系供应商。

使用限制

用途

本移液器基于空气活塞系统，用于移取中等密度与中低粘度的水相溶液。

使用限制

该仪器移取液体极限如下：

- 操作温度范围从+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 $\pm 1\text{ }^{\circ}\text{C}/\pm 1.8\text{ }^{\circ}\text{F}$ 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：

- 与聚丙烯不兼容的液体
- 与聚碳酸酯（观察窗）不兼容的液体
- 高蒸汽压力的液体
- 对于会腐蚀氟橡胶 (FKM) 和聚醚醚酮 (PEEK) 的液体
- 对于会腐蚀聚苯硫醚 (PPS) 的液体（针对可变容量为 50 μl 的仪器）



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13,14页的精度表。

- 2 ml, 5 ml和10 ml仪器仅可在安装有PE滤芯的情况下使用 (参见16页)。
- 吸头为一次性物品!



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。



2. 量程设定

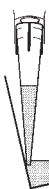
- 将量程锁向上拨开解除啮合 (解锁)。
- 旋转量程调节拨轮, 选择所需的量程。调节过程中请避免扭曲和粗鲁的旋转拨轮。
- 将量程锁向下拨重新啮合 (锁定)。提示: 量程锁拨下会收紧但不会锁死量程调节拨轮。



3. 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。

4. 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。



5. 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。然后弃置该吸头。

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。
- 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) 建议对三个量程范围（标称量程的100%、50%、10%）各至少进行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, 可调量程

量程范围 μl	体积 μl	A* ≤ ± %	CV* ≤ %	最小增量 μl	建议吸头类型 μl
0.1 - 1	1	2	1.2	0.001	0.1 - 20
	0.5	4	2.4		
	0.1	20	12		
0.1 - 2.5	2.5	1.4	0.7	0.002	0.5 - 20
	1.25	2.5	1.5		
	0.25	12	6		
0.5 - 10	10	1	0.5	0.01	0.5 - 20
	5	1.6	1		
	1	7	4		
2 - 20	20	0.8	0.4	0.02	2 - 200
	10	1.2	0.7		
	2	5	2		
5 - 50	50	0,8	0,3	0,05	2 - 200
	25	1,2	0,5		
	5	4	2		
10 - 100	100	0.6	0.2	0.1	2 - 200
	50	0.8	0.4		
	10	3	1		
20 - 200	200	0.6	0.2	0.2	2 - 200
	100	0.8	0.3		
	20	3	0.6		
100 - 1000	1000	0.6	0.2	1	50 - 1000
	500	0.8	0.3		
	100	3	0.6		
500 - 5000	5000	0.6	0.2	5	500 - 5000
	2500	0.8	0.3		
	500	3	0.6		
1000 - 10000	10000	0.6	0.2	10	1000 - 10000
	5000	0.8	0.3		
	1000	3	0.6		

* 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。

Transferpette® S, 固定量程型

量程范围 μl	A* ≤ ± %	CV* ≤ %	建议吸头类型 μl
10	1	0.5	0.5 - 20
20	0.8	0.4	2 - 200
25	0.8	0.4	2 - 200
50	0.8	0.4	2 - 200
100	0.6	0.2	2 - 200
200	0.6	0.2	2 - 200
500	0.6	0.2	50 - 1000
1000	0.6	0.2	50 - 1000
2000	0.8	0.3	500 - 5000

* A = 准确度, CV = 偏差系数



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。

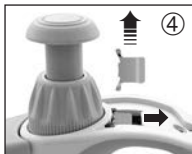
该仪器用水溶液校准。若移液器操作明显不准确，或者必须针对不同密度和黏度的溶液或者特殊形状的吸头对仪器进行调整时，则可使用易校准技术进行调整。



1. 检查体积，确定实际值（参见10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。

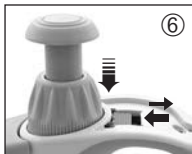
5. 设置调整值：

- Transferpette® S, 可调量程：在量程调节拨轮位于解锁 (UNLOCK) 的情况下，设置至测得的实际值。

- Transferpette® S, 固定量程型：通过按+/-方向转动的方式设定量程。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。

灭菌

依据DIN EN 285标准，整个Transferpette® S移液器可在121 °C (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。

如果经常实行高压灭菌，为了确保更好的畅通性，需要使用随附的硅润滑脂润滑活塞和密封垫。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。

用于Transferpette® S 2 ml, 5 ml +10 ml 量程移液器的滤芯

疏水PE滤芯可以保护移液器防止液体侵入。

如果滤芯变湿或被污染，请更换滤芯。

- 请使用螺丝刀等扁平工具。
- 在不损坏吸头锥的情况下取下滤芯。

请在进行高温高压灭菌之前取下滤芯！

该仪器可以在无滤芯的情况下使用。

保养

检查吸头锥是否损坏。

检查活塞和密封垫圈是否被污染。

对仪器的活塞密封性进行测试。进行此测试时，安装一个系头，并吸取样品。将仪器垂直握持，让样品在吸头内保持约10 s。若在吸头吸嘴有液滴形成，请参见22页的故障诊断。

拆卸和清洗

1. 从握杆上拧下移液器下半支 (S)。
2. 从移液器下半支机身上旋下吸头脱卸套管上部 (A)。
3. 将活塞套管 (B、C和D)从吸头脱卸套管 (E)拉出。
4. 拧松活塞单元 (B)。

提示： 活塞保持与活塞单元 (B) 连接。

5. 取下带弹簧的密封圈(C)(Transferpette® S 1 μl 和10 μl 量程的移液器的密封环是不可取下的)
6. 用温和的肥皂液或异丙醇清洁所示部件，然后用蒸馏水冲洗。
7. 将所有部件晾干(最高温度120 °C/ 248 °F)。
8. 为活塞和密封垫涂上薄薄一层硅润滑脂。
9. 待部件冷却至室温时，按与上述步骤相反的顺序重新组装部件。活塞单元和吸头脱卸套管的上部 (A、B) 只需拧至手感紧固即可。



(仅供参考，请以实物为准)

保养

检查吸头锥是否损坏。

检查活塞和O形密封圈是否被污染。

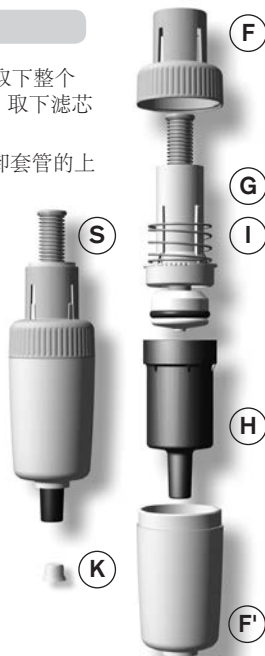
对仪器的活塞密封性进行测试。我们推荐使用BRAND的移液器泄漏检测仪PLT进行测试。或者：进行此测试时，安装一个系头，并吸取样品。将仪器垂直握持，让样品在吸头内保持约10s。若在吸头吸嘴有液滴形成，请参见22页的故障诊断。

拆卸和清洗

1. 转动吸头脱卸套管上部 (F)，从握杆上取下整个下半支机身 (S)，然后从活塞套管 (H) 取下滤芯 (K)。
2. 拧松并将吸头脱卸套管 (F') 与吸头脱卸套管的上部 (F) 分离。
3. 拧松并卸下带吸头脱卸弹簧 (I) 的活塞单元 (G) 和活塞套管 (H)。
4. 从活塞单元上取下O形环密封圈，并进行清洗。

提示： 请勿进一步拆卸活塞单元(G)!

5. 用温和的肥皂液或异丙醇清洗活塞单元(G)和活塞套管(H)，然后用蒸馏水冲洗。
6. 将所有部件晾干（最高温度120 °C/248 °F）并等待部件冷却。
7. 小心对O形密封圈内外侧进行润滑，并将其安装在活塞上。
8. 按与上述步骤相反的顺序重新组装各部件。



(仅供参考，请以实物为准)

Transferpette® S, 固定量程型

量程	产品描述	货号
10 µl	F-10	7047 08
20 µl	F-20	7047 16
25 µl	F-25	7047 20
50 µl	F-50	7047 28
100 µl	F-100	7047 38
200 µl	F-200	7047 44
500 µl	F-500	7047 54
1000 µl	F-1000	7047 62
2000 µl	F-2000	7047 64

Transferpette® S, 可调量程

量程	产品描述	货号
0,1 - 1 µl	D-1	7047 68
0,1 - 2,5 µl	D-2,5	7047 69
0,5 - 10 µl	D-10	7047 70
2 - 20 µl	D-20	7047 72
5 - 50 µl	D-50	7047 73
10 - 100 µl	D-100	7047 74
20 - 200 µl	D-200	7047 78
100 - 1000 µl	D-1000	7047 80
0,5 - 5 ml	D-5000	7047 82
1 - 10 ml	D-10000	7047 84

桌面移液器架

(可挂6支Transferpette® S 移液器)

货号 7048 05

液器架挂架

(可挂1支Transferpette® S 移液器)

货号 7048 10



大量程至1000 µl 的Transferpette® S移液器

为采用玻璃活塞的 Transferpette® S 移液器 (至 SN 08N) 重新订购活塞单元和带弹簧的密封垫之前,

请联系 info@brand.de。

各仪器的部件会因标称量程不同而略有不同。

(图中所示为Transferpette® S 20-200 µl移液器的零备件)



Transferpette® S, 固定量程型

量程	A	B	C	D	E
10 µl	7055 10	7046 01	-	7046 21*	7046 38
20 µl	7055 10	7046 02	7046 10	7046 22	7046 39
25 µl	7055 10	7046 08	7046 14	7046 22	7046 40
50 µl	7055 10	7046 54	7046 61	7046 23	7046 41
100 µl	7055 10	7046 54	7046 61	7046 23	7046 42
200 µl	7055 10	7046 55	7046 62	7046 24	7046 43
500 µl	7055 10	7046 56	7046 63	7046 25	7046 44
1000 µl	7055 10	7046 56	7046 63	7046 25	7046 45

* 密封圈永久固化于活塞套管内-不可取下。

Transferpette® S, 可调量程

量程	A	B	C	D	E
0,1 - 1 µl	7055 10	7046 00	-	7046 20*	7046 30
0,1 - 2,5 µl	7055 10	7046 16	-	7046 18*	7046 49
0,5 - 10 µl	7055 10	7046 01	-	7046 21*	7046 31
2 - 20 µl	7055 10	7046 02	7046 10	7046 22	7046 32
5 - 50 µl	7055 10	7046 15	7046 17	7046 59	7046 65
10 - 100 µl	7055 10	7046 54	7046 61	7046 23	7046 33
20 - 200 µl	7055 10	7046 55	7046 62	7046 24	7046 34
100 - 1000 µl	7055 10	7046 56	7046 63	7046 25	7046 35

* 0,1-1 µl / 0,1 - 2,5 µl / 0,5-10 µl 含密封圈

Transferpette® S, 2 ml, 5 ml 和 10 ml 量程移液器

各仪器的部件会因标称量程不同而略有不同。
(图中所示为Transferpette® S 5 ml 移液器的零备件)。



Transferpette® S, 可调量程

量程	F + F'	G	H	I
2 ml	7046 66	7046 06	7032 47	7046 26
0,5 - 5 ml	7046 36	7046 06	7032 47	7046 26
1 - 10 ml	7046 37	7046 07	7046 28	7046 26

Transferpette® S 移液器的其它附件

产品描述	货号
滤芯, 适用于Transferpette® S 5 ml 移液器, 25个/包装。	7046 52
滤芯, 适用于Transferpette® S 10 ml 移液器, 25个/包装。	7046 53
适用于最高容量为 1000 µl、采用不锈钢和玻璃活塞的 Transferpette® S 移液器的硅润滑油	7055 02
适用于最高容量为 1000 µl、采用灰色活塞的 Transferpette® S 移液器的硅润滑油	7036 82
硅油, 适用于Transferpette® S 5 ml/10 ml 量程移液器	7036 77
标签窗, 1个/包装。	7046 50
空白标签, 5个/包装。	7046 51
PLT unit 移液器检漏仪	7039 70

问题	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
	2 ml, 5 ml 和 10 ml 量程移液器内的滤芯被污染	更换滤芯
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。

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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 the reagent manufacturers' information.
- 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 30). 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.** Only use 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 46), 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 low to medium viscosity.

Limitations of Use

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

- use temperature from +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.

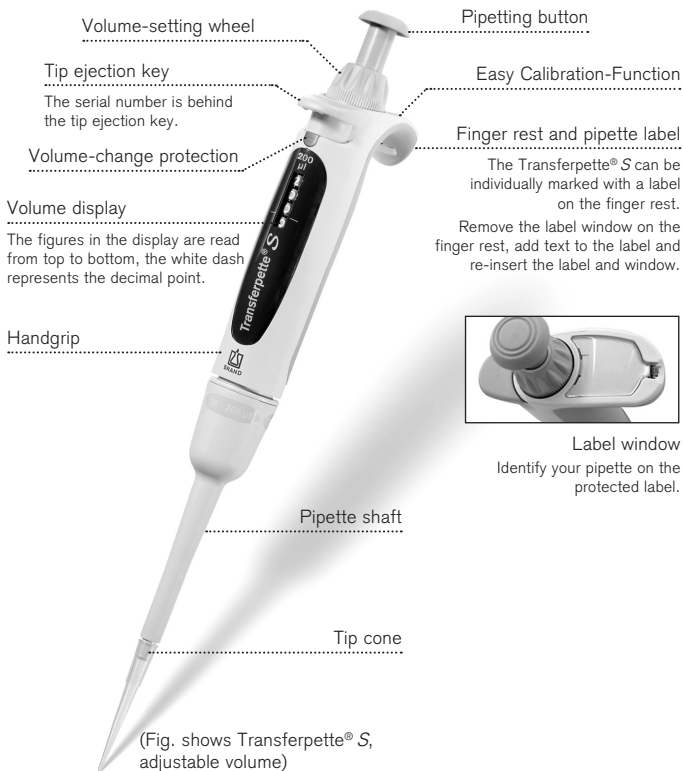
Operating Exclusions

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

This instrument cannot be used:

- for liquids incompatible with polypropylene
- for liquids incompatible with polycarbonate (inspection window)
- for liquids of a very high vapor pressure
- for liquids incompatible with FKM and polyetheretherketone
- for liquids attacking polyphenyl sulfide (PPS) (50 μ l pipet, adjustable volume)

Operating and Control Elements



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 pages 37 and 38.

Pipetting

- 2 ml, 5 ml and 10 ml instruments should only be used with the PE filter installed (see page 40).
- Pipette tips are disposables items!



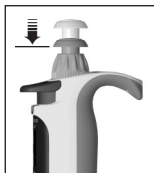
1. Fitting the tip

Use the correct tip according to the volume range or the color code. Ensure that the tip is securely seated.



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. Aspirate sample

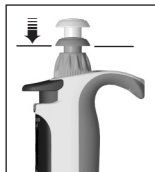
- Press pipetting button to the first stop.
- Hold the pipette vertically and immerse the tip into the liquid.

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 tip immersed for a few seconds.

4. Discharge sample



- a) Place the pipette tip 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 tip completely: Press the pipetting button down to the second stop.
- d) While doing this, wipe the pipette tip against the wall of the container.
- e) Remove the pipette tip from the container wall and let the pipetting button slide back.



5. Ejecting the tip

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

Note:

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

Important!

Don't lay the instrument horizontal when the tip is filled. Liquid may enter and contaminate the instrument. The instrument should be stored without tip, 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 32 for procedure).

2. Condition the pipette

Condition the pipette before testing by using a pipette tip to aspirate and discharge the test liquid (distilled H₂O) five times. After this, discard the pipette tip.

3. Carry out the test

Note:

According to DIN EN ISO 8655-2, it is recommended to replace the tip 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.
- 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) At least 10 pipettings and weighings 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, adjustable volume

Volume range μl	Volume step μl	A* $\leq \pm \%$	CV* $\leq \%$	Increment μl	Recommended type of tip, μl
0.1 - 1	1	2	1.2	0.001	0.1 - 20
	0.5	4	2.4		
	0.1	20	12		
0.1 - 2.5	2.5	1.4	0.7	0.002	0.5 - 20
	1.25	2.5	1.5		
	0.25	12	6		
0.5 - 10	10	1	0.5	0.01	0.5 - 20
	5	1.6	1		
	1	7	4		
2 - 20	20	0.8	0.4	0.02	2 - 200
	10	1.2	0.7		
	2	5	2		
5 - 50	50	0.8	0.3	0.05	2 - 200
	25	1.2	0.5		
	5	4	2		
10 - 100	100	0.6	0.2	0.1	2 - 200
	50	0.8	0.4		
	10	3	1		
20 - 200	200	0.6	0.2	0.2	2 - 200
	100	0.8	0.3		
	20	3	0.6		
100 - 1000	1000	0.6	0.2	1	50 - 1000
	500	0.8	0.3		
	100	3	0.6		
500 - 5000	5000	0.6	0.2	5	500 - 5000
	2500	0.8	0.3		
	500	3	0.6		
1000 - 10000	10000	0.6	0.2	10	1000 - 10000
	5000	0.8	0.3		
	1000	3	0.6		

* A = Accuracy, CV = Coefficient of Variation



Final test values related to the nominal capacity (maximum volume) indicated on the instrument, and the indicated volume steps 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.

Accuracy Table

Transferpette® S, Fixed volume

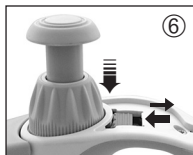
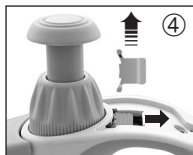
Volume range μl	A* $\leq \pm \%$	CV* $\leq \%$	Recommended type of tip, μl
10	1	0.5	0.5 - 20
20	0.8	0.4	2 - 200
25	0.8	0.4	2 - 200
50	0.8	0.4	2 - 200
100	0.6	0.2	2 - 200
200	0.6	0.2	2 - 200
500	0.6	0.2	50 - 1000
1000	0.6	0.2	50 - 1000
2000	0.8	0.3	500 - 5000

* A = Accuracy, CV = Coefficient of Variation

DE-M  20 °C
Ex

Final test values related to the nominal capacity (maximum volume) 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.

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 35).
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 adjustment value:
 - Transferpette® S, adjustable volume: with the volume-setting wheel in the UNLOCK position, set to the previously determined actual value.
 - Transferpette® S, fixed volume: set the volume by rotating in the +/- direction. 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.

Autoclaving

The Transferpette® S 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 tip.
2. Autoclave the complete pipette without any further disassembling.
3. Allow the Transferpette® S 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, piston and seal should be greased with the supplied silicone grease in order to preserve smooth movement. If necessary after sterilization, tighten the connection between the hand grip and the pipette shaft.

UV sterilization

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

2 ml, 5 ml + 10 ml Filter Transferpette® S

A hydrophobic PE filter is used as a safeguard against liquid entering the pipette.

Change the filter if it becomes wet or contaminated.

- Use a flat object such as a screwdriver.
- Remove the filter without damaging the tip cone.

Remove the filter before autoclaving!

The instrument can be operated without a filter.

Servicing

Inspect the pipette tip cone for damage.

Inspect the piston and seal for contamination.

Test the instrument's piston seal. To do this, affix a tip, and aspirate a sample. Hold the instrument vertically, with the sample in the tip for approximately 10 s. If a drop forms at the tip orifice, see the troubleshooting guide on page 46.

Disassembly and cleaning

1. Unscrew the pipette shaft (S) from the hand grip.
2. Unscrew the upper part of the ejector (A) from the pipette shaft.
3. Pull the shaft (B, C and D) out of the lower part (E) of the ejector.
4. Unscrew the piston unit (B).

Note: Piston remains connected with piston unit (B)!

5. Remove the seal with spring (C) (this is non-removable on 1 µl, 2.5 µl and 10 µl Transferpette® S models)
6. Clean the parts shown with a mild soap solution or isopropanol and then rinse with distilled water.
7. Allow the parts to dry (max. 120 °C/248 °F).
8. Grease piston and seal with a very thin layer of supplied silicone grease.
9. Assemble the ambient temperature parts in reverse order from above. Piston unit and upper part of the ejector (A, B) should only be hand-tight.



Servicing

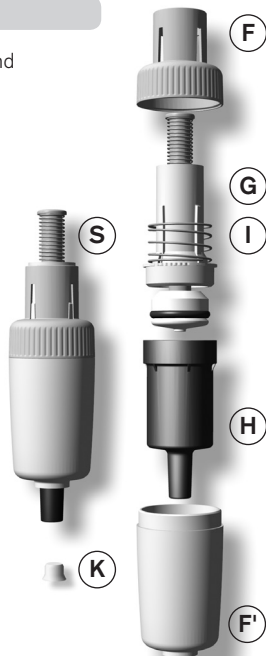
Inspect the pipette tip cone for damage.

Inspect the piston and O-Ring-seal for contamination.

Test the instrument's piston seal. We recommend using the BRAND leak testing instrument PLT unit. Alternatively: to do this, affix a tip, and aspirate a sample. Hold the instrument vertically, with the sample in the tip for approximately 10 s. If a drop forms at the tip orifice, see the troubleshooting guide on page 46.

Disassembly and cleaning

1. Remove the entire shaft (S) from the hand grip by rotating at the upper end of the ejector (F) and remove the filter (K) from the bottom part of the shaft (H).
 2. Separate the bottom part of the ejector (F') by unscrewing it from the upper part of the ejector (F).
 3. Unscrew and dismantle the piston unit (G) with the ejector spring (I) and the bottom part of the shaft (H).
 4. Remove the O-Ring-seal from the piston unit and clean it.
- Note:** Do not disassemble piston unit (G) any further!
5. Clean piston unit (G) and lower part of pipette shaft (H) with a soap solution or isopropanol and then rinse with distilled water.
 6. Allow the parts to dry (max. 120 °C/ 248 °F) and to cool down.
 7. Carefully lubricate the inside and outside of the O-ring and mount it on the piston.
 8. Assemble the individual components in the reverse order from that described above.



(For illustration purpose only)

Transferpette® S, fixed volume

Capacity	Description	Cat. No.
10 µl	F-10	7047 08
20 µl	F-20	7047 16
25 µl	F-25	7047 20
50 µl	F-50	7047 28
100 µl	F-100	7047 38
200 µl	F-200	7047 44
500 µl	F-500	7047 54
1000 µl	F-1000	7047 62
2000 µl	F-2000	7047 64

Transferpette® S, adjustable volume

Capacity	Description	Cat. No.
0.1 - 1 µl	D-1	7047 68
0.1 - 2.5 µl	D-2.5	7047 69
0.5 - 10 µl	D-10	7047 70
2 - 20 µl	D-20	7047 72
5 - 50 µl	D-50	7047 73
10 - 100 µl	D-100	7047 74
20 - 200 µl	D-200	7047 78
100 - 1000 µl	D-1000	7047 80
0.5 - 5 ml	D-5000	7047 82
1 - 10 ml	D-10000	7047 84

Bench-top rack for 6 Transferpette® S pipettes

Cat. No. 7048 05

Shelf/rack mount for 1 Transferpette® S pipette

Cat. No. 7048 10

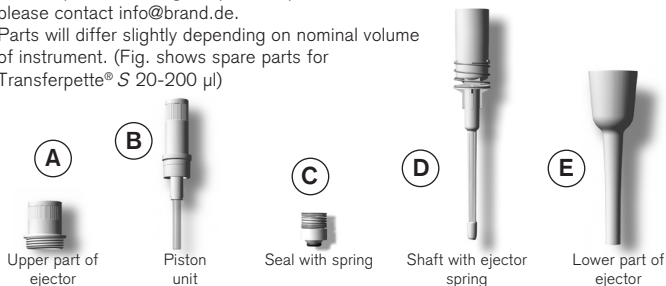


Spare Parts

Transferpette® S up to 1000 µl

Before reordering a piston unit or seal and spring for your Transferpette® S with glass piston (up to serial number 08N), please contact info@brand.de.

Parts will differ slightly depending on nominal volume of instrument. (Fig. shows spare parts for Transferpette® S 20-200 µl)



Transferpette® S, fixed volume

Capacity	A	B	C	D	E
10 µl	7055 10	7046 01	–	7046 21*	7046 38
20 µl	7055 10	7046 02	7046 10	7046 22	7046 39
25 µl	7055 10	7046 08	7046 14	7046 22	7046 40
50 µl	7055 10	7046 54	7046 61	7046 23	7046 41
100 µl	7055 10	7046 54	7046 61	7046 23	7046 42
200 µl	7055 10	7046 55	7046 62	7046 24	7046 43
500 µl	7055 10	7046 56	7046 63	7046 25	7046 44
1000 µl	7055 10	7046 56	7046 63	7046 25	7046 45

* The seal is permanently built into the shaft – it cannot be removed.

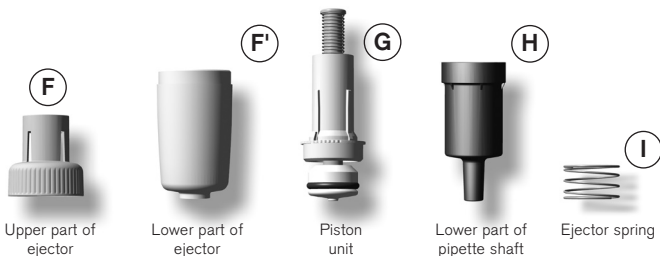
Transferpette® S, adjustable volume

Capacity	A	B	C	D	E
0.1 - 1 µl	7055 10	7046 00	–	7046 20*	7046 30
0.1 - 2.5 µl	7055 10	7046 16	–	7046 18*	7046 49
0.5 - 10 µl	7055 10	7046 01	–	7046 21*	7046 31
2 - 20 µl	7055 10	7046 02	7046 10	7046 22	7046 32
5 - 50 µl	7055 10	7046 15	7046 17	7046 59	7046 65
10 - 100 µl	7055 10	7046 54	7046 61	7046 23	7046 33
20 - 200 µl	7055 10	7046 55	7046 62	7046 24	7046 34
100 - 1000 µl	7055 10	7046 56	7046 63	7046 25	7046 35

* 0.1-1 µl / 0.1 - 2.5 µl / 0.5-10 µl including seal

Transferpette® S, 2 ml, 5 ml und 10 ml

Parts will differ slightly depending on nominal volume of instrument.
(Fig. shows spare parts for Transferpette® S 5 ml).



Transferpette® S, adjustable volume

Capacity	F + F'	G	H	I
2 ml	7046 66	7046 06	7032 47	7046 26
0.5 - 5 ml	7046 36	7046 06	7032 47	7046 26
1 - 10 ml	7046 37	7046 07	7046 28	7046 26

Additional accessories for Transferpette® S

Description	Cat. No.
Filter for Transferpette® S 5 ml, pack of 25.	7046 52
Filter for Transferpette® S 10 ml, pack of 25.	7046 53
Silicone oil for Transferpette® S up to 1000 µl with stainless steel piston and glass piston	7055 02
Silicone grease for Transferpette® S up to 1000 µl with grey piston	7036 82
Silicone grease for Transferpette® S 5 ml/10 ml	7036 77
Label window , pack of 1	7046 50
Blank labels , pack of 5	7046 51
PLT unit Pipette leak testing unit	7039 70

Troubleshooting

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
	The filter in the 2 ml, 5 ml and 10 ml models is contaminated	Change the filter
Discharged volume is too large	Pipetting button pressed too far into the blow-out position before sample uptake	Operate properly. See 'Pipetting', page 32.
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.

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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.



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