移液产品 · 简单操作!

BRAND

Dispensette®
瓶口分液器

FIRST CLASS · BRAND

3 操作手册

31 Operating Manual

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安全指导

该设备可能与有害的物质、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。

⚠ 请仔细阅读下列内容。

1. 所有使用者在操作之前必须阅读并理解本操作手册。
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。
3. 请遵守试剂供应商提供的所有说明。
4. 移取可燃试剂时，请采取措施防止静电放电，如勿将可燃试剂排入塑料容器内；勿用干布擦拭该仪器。
5. 该仪器仅可用作移液操作，请严格遵守规定的使用限制和操作限制。请遵守禁止操作（参见第6页)！如有疑问，请联系厂方或者经销商。
6. 请始终以对使用者及他人均安全的方式使用该仪器。进行分液操作时，排液管必须始终朝向远离使用者或其他任何人的方向。避免飞溅。仅将液体排至合适的容器内。
7. 旋盖未取下时，请勿按压活塞。
8. 在活塞腔装有液体时，请勿取下排液管或SafetyPrime™ 安全回流阀。
9. 试剂可能会积聚在排液管的盖内。因此，旋盖需定期清理。
10. 当使用较小的试剂瓶,或使用延长分液管时，请使用合适的试剂瓶底座以防翻倒。
11. 安装于试剂瓶上的分液器决不可握着活塞套(外壳)或阀门模块移动。活塞腔破裂或松动可能导致由化学品引起的人身伤害（参见11页，图6)。
12. 使用该仪器时请不要过度用力。上下移动活塞时应平滑轻缓。
13. 仅使用原厂附件与配件。请勿试图对本仪器进行任何技术改造。不要进行超出本操作手册描述范围的拆卸!
14. 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，阀门黏住或泄漏)，请立即停止分液。咨询本手册的"故障诊断"(参见29页)，有必要的话请联系供应商。

功能和使用限制

Dispensette®瓶口分液器设计用于直接从试剂瓶中进行移液。Dispensette®有三种型号：Dispensette® III基础型瓶口分液器、Dispensette® Organic有机型瓶口分液器和Dispensette® HF氢氟酸型瓶口分液器。根据模组不同，又有下列三种类型：数字可调型、游标式可调型和固定量程型。该仪器符合DIN EN ISO 8655-5范围要求，具有Conformity资格认证，并可选配SafetyPrime™回流阀。

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Dispensette® III 基础型（红色标识）

数字可调型


游标式可调型


固定量程型

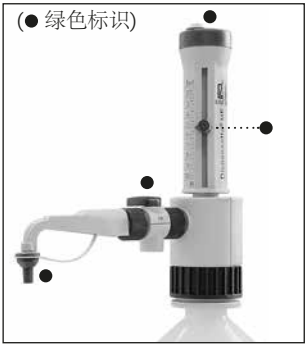
Dispensette® 有机型（黄色标识）

数字可调型


游标式可调型


固定量程型

Dispensette® 氢氟酸型（绿色标识）



游标式

正确操作设备时，移取的试剂仅会与以下耐化学腐蚀的材料接触：

Dispensette® III 基础型瓶口分液器
硼硅酸盐玻璃、氧化铝-陶瓷、ETFE、FEP、PFA、PTFE、**铂铱合金**、PP *(旋盖)*。
Dispensette® Organic 有机型
硼硅酸盐玻璃、氧化铝-陶瓷、ETFE、FEP、PFA、PTFE、钽、PP **(旋盖)。**
Dispensette® HF 氢氟酸型
氧化铝-陶瓷、ETFE、FEP、PFA、PTFE、**铂铱合金**、PP（旋盖）。

若对耐化学腐蚀性有更高的要求，请使用PTFE旋盖和EFTE/PTFE瓶口接头（附件，参见26-28页）。

功能和使用限制

使用限制

该仪器为液体试剂的移取而设计，请遵循以下物理极限：

- 仪器及试剂温度范围+15 °C 至+40 °C（59 °F 至 104 °F）
- 蒸汽压最高为 600 mbar。300 mbar以上请缓慢吸取，防止液体沸腾。
- 最大运动黏度至500 mm^2/s（动力黏性[mPas] = 运动粘度[mm^2/s] x密度[g/cm^3]）
- 密度： Dispensette® III 基础型/ Dispensette® Organic有机型：最高至2.2 g/cm^3，Dispensette® HF氢氟酸型最高至3.8 g/cm^3

操作限制

一些会形成沉淀的液体可能会使活塞移动困难或者导致堵塞（如结晶溶液或浓碱溶液）。
移取可燃试剂时，请采取措施防止静电放电，如勿将可燃试剂排入塑料容器内；勿用干布擦拭该仪器。

Dispensette® 瓶口分液器针对一般实验室应用设计，符合DIN EN ISO 8655等相关标准。在进行特殊应用(例如痕量物质分析、食品部门等）时，用户需确认相关应用与本设备的兼容性。不具备针对药物/制药/食品加工领域中特殊应用的许可

禁止操作

Dispensette® III 基础型瓶口分液器不得用于下列物质：

- 攻击氧化铝-陶瓷、ETFE、FEP、PFA和PTFE的液体（如叠氮化纳*）。
- 攻击硼硅酸盐玻璃的液体（如氢氟酸）。
- 可被铂铱合金催化分解的液体（如：H_2O_2）
- > 20 %的盐酸和> 30 %的硝酸
- 四氢呋喃
- 三氟乙酸
- 爆炸性液体（如二硫化碳）。
- 悬液（如炭悬液），其中的固体颗粒可能会堵塞或损坏该仪器
- 攻击PP（旋盖）的液体

Dispensette® Organic有机型瓶口分液器不得用于下列物质：

- 攻击氧化铝-陶瓷、钽、ETFE、FEP、PFA和PTFE的液体（如叠氮化纳*）。
- 攻击硼硅酸盐玻璃的液体（如氢氟酸）。
- 碱溶液和盐溶液
- 爆炸性液体（如二硫化碳）。
- 悬液（如炭悬液），其中的固体颗粒可能会堵塞或损坏该仪器
- 攻击PP（旋盖）的液体

Dispensette® HF 氢氟酸型瓶口分液器不得用于下列物质：

- 攻击氧化铝-陶瓷、ETFE、PFA、FEP和PTFE的液体（如叠氮化纳*）。
- 可被铂铱合金催化分解的液体（如：H_2O_2）
- 碱溶液和盐溶液
- 爆炸性液体（如二硫化碳）。
- 悬浮液（如炭悬液），其中的固体颗粒可能会堵塞或损坏该仪器
- 攻击PP（旋盖）的液体

* 可耐受叠氮化钠溶液的最大浓度为0.1%。

储存条件

请将仪器及附件放置在清洁，阴凉，干燥的环境下储存。
储存温度：-20 °C至+50 °C (-4° F 至 122° F)

推荐应用范围

Dispensette® III 基础型瓶口分液器（红色标识）：该仪器应用范围广泛，可移取腐蚀性试剂，包括浓酸（如H_3PO_4、H_2SO_4）、碱（如NaOH、KOH）、盐溶液以及许多有机溶剂。

Dispensette® Organic有机型瓶口分液器（黄色标识）是移取有机试剂，包括氯化（chlorinated）烃或氟化（fluorinated）烃类（hydrocarbons）(例如，三氯三氟乙烷（trichlorotrifluoroethane）、二氯甲烷（dichloromethane）等)、高浓度酸(例如，盐酸（HCl）、硝酸（HNO_3）等)、三氟乙酸（TFA）、四氢呋喃（THF）、过氧化物（peroxides）等的理想选择。

Dispensette® HF氢氟酸型瓶口分液器（绿色标识）可用来移取氢氟酸（HF）（最大可承受的氢氟酸浓度为52 %）。当填充试剂时，确保每两周至少操作一次仪器。
如需移取溴，请将PP材质的旋盖更换成PTFE材质的旋盖，如有必要，请使用ETFE/PTFE材质的瓶口接头。此外，推荐使用密封套件（参见28页“附件”）。

注意：

关于如何选择合适的移液器，请遵守相应的操作限制以及下一页的“分液器选择指南” 表。

分液器选择指南

试剂	Disp. III	Disp. Organ.
乙醛	+	+
乙酸（冰醋酸), 100%	+	+
乙酸, 96%	+	+
乙酸酐		+
丙酮	+	+
乙腈	+	+
苯乙酮		+
氯乙酰		+
乙酰丙酮	+	+
丙烯酸	+	+
丙烯腈	+	+
己二酸	+	
烯丙醇	+	+
氯化铝	+	
氨基酸	+	
氨水, 20%	+	+
氨水, 20-30%		+
氯化铵	+	
氟化铵	+	
硫酸铵	+	
醋酸戊酯	+	+
戊醇	+	+
氯戊烷		+
苯胺	+	+
氯化钡	+	
苯甲醛	+	+
苯	+	+
挥发油 (石油醚) bp 70-180 °C		+
苯酰氯	+	+
苯甲醇	+	+
苯甲胺	+	+
苄基氯	+	+
硼酸, 10%	+	+
溴苯	+	+
溴萘	+	+
丁二醇	+	+
正丁醇	+	+
乙酸丁酯	+	+
丁基甲醚	+	+
丁胺	+	+
丁酸	+	+
碳酸钙	+	
氯化钙	+	
氢氧化钙	+	
次氯酸钙	+	
四氯化碳		+
氯萘	+	+
氯乙醛, 45%	+	+
氯乙酸	+	+
氯丙酮	+	+
氯苯	+	+
氯丁烷	+	+
氯仿		+
氯磺酸		+
铬酸, 50%	+	+
铬酸洗液	+	
硫酸铜	+	
甲酚		+
枯烯 (异丙苯)	+	+

试剂	Disp. III	Disp. Organ.
环己烷		+
环己酮	+	+
环戊烷		+
癸烷	+	+
1-癸醇	+	+
二苄醚	+	+
二氯乙酸		+
二氯苯	+	+
二氯乙烷		+
二氯乙烯		+
二氯甲烷		+
柴油（燃料油), bp 250-350 °C		+
二乙醇胺	+	+
乙醚		+
二乙胺	+	+
1.2-二乙苯	+	+
乙二醇	+	+
二甲亚砜 (DMSO)	+	+
二甲基苯胺	+	
二甲基甲酰胺 (DMF)	+	+
1.4-二氧六烷		+
苯基醚	+	+
精油		+
乙醇	+	+
乙醇胺	+	+
乙酸乙酯	+	+
乙苯		+
二氯乙烷		+
氟乙酸		+
甲醛, 40%	+	
甲酰胺	+	+
甲酸, 100%		+
丙三醇	+	+
乙二醇	+	+
羟基乙酸, 50%	+	
燃用油（柴油), bp 250-350 °C		+
庚烷		+
己烷		+
己酸	+	+
己醇	+	+
氢碘酸	+	+
氢溴酸		+
盐酸, 20%	+	+
盐酸, 20-37%		+
过氧化氢, 35%		+
异戊醇	+	+
异丁醇	+	+
异辛烷		+
异丙醇 (2-丙醇)	+	+
异丙醚	+	+
乳酸	+	
甲醇	+	+
苯甲醚	+	+
苯甲酸甲酯	+	+
甲基丁基醚	+	+
甲基乙基酮	+	+
甲酸甲酯	+	+
甲基丙基甲酮	+	+
二氯甲烷		+

试剂	Disp. III	Disp. Organ.
矿物油（机油）	+	+
氯乙酸	+	+
硝酸, 30%	+	+
硝酸, 30-70% *		+
硝基苯	+	+
油酸	+	+
草酸	+	
正戊烷		+
过氧乙酸		+
高氯酸	+	+
四氯乙烯		+
石油,bp 180-220 °C		+
石油醚,bp 40-70 °C		+
苯酚	+	+
苯乙醇	+	+
苯基联胺	+	+
磷酸, 85%	+	+
磷酸, 85% + 硫酸, 98%, 1:1	+	+
哌啶，氮杂环己烷	+	+
氯化钾	+	
重铬酸钾	+	
氢氧化钾	+	
高锰酸钾	+	
丙酸	+	+
丙二醇	+	+
吡啶, 氮杂苯	+	+
丙酮酸	+	+
水杨酸	+	+
闪烁液	+	+
醋酸银	+	
硝酸银	+	
醋酸钠	+	
氯化钠	+	
重铬酸钠	+	
氟化钠	+	
氢氧化钠, 30%	+	
次氯酸钠	+	
硫酸, 98%	+	+
酒石酸	+	
四氯乙烯		+
四氢呋喃 (THF)		+
羟化四甲铵 ***	+	
甲苯		+
三氯乙酸		+
三氯苯		+
三氯乙烷		+
三氯乙烯		+
三氯三氟乙烷		+
三乙醇胺	+	+
三甘醇	+	+
三氟乙烷		+
三氟乙酸 (TFA)		+
松节油		+
尿素	+	
二甲苯		+
氯化锌, 10%	+	
硫酸锌, 10%	+	

* 请使用ETFE/PTFE材质的瓶口接头
** 请使用PTFE密封圈

氢氟酸 (HF): 仅Dispensette®HF 氢氟酸型瓶口分液器为设计用于移取氢氟酸(HF)的分液器（最大可承受的氢氟酸浓度为52%)。

以上推荐均建立于先前的实验结果之上。 请始终遵守仪器的操作手册及试剂供应商的操作规范。除了上表所列的试剂，我们的瓶口分液器还可广泛用于其他有机或非有机盐溶液（例如，生物学缓冲液）、表面活性剂、细胞培养基的移液操作。如您使用的试剂未列于上表，请向BRAND咨询。
1112/12 更新。

进液阀密封垫圈
(用于高温高压灭菌)

吸液管和回流管

安装工具

第一步

所有的组件都在包装内吗?

确认您的产品包装盒内有:

Dispensette® 瓶口分液器、排液管、伸缩式吸液管、SafetyPrime™ 安全回流阀和回流管（选配)、安装工具及不同类型的瓶口接头、FKM材质O型环（用于高温高压灭菌)、一份性能证书和本操作手册。

标称量程, ml	接头 适配瓶口螺纹	吸液管* 长度 , mm
Dispensette® III 基础型, Dispensette® Organic 有机型	**PP 材质**	
0,5	GL 25, GL 28/S 28, GL 32	125-240
1, 2, 5, 10	GL 25, GL 28/S 28, GL 32, GL 38, S 40	125-240
25, 50, 100	GL 32, GL 38, S 40	170-330
Dispensette® HF 氢氟酸型	**ETFE/ PTFE 材质**	
10	GL 32 (ETFE), S 40 (PTFE)	125-240

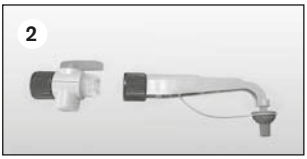
组装

警告!

请穿着防护服并佩戴防护手套和防护眼镜！请遵守所有安全指导，使用限制和操作限制（参见4-6页)。

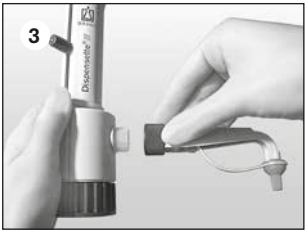
1. 检查密封垫圈

在安装SafetyPrime™安全回流阀或排液管时，请确保已插入密封垫圈



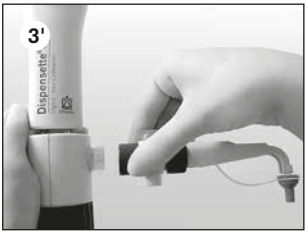
2. 安装SafetyPrime™ 安全回流阀 (选配)

将SafetyPrime™安全回流阀推入排液管约2mm，并用手拧紧锁紧螺母（图2)。确保SafetyPrime™ 安全回流阀已安装恰当牢固。



3. 安装排液管

将排液管（可选配SafetyPrime™安全回流阀，图3）推入阀门模块约2mm，并用手拧紧锁紧螺母（图3)。确保回流管已安装恰当牢固。

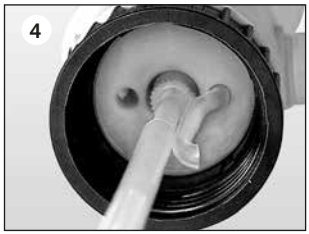


提示：

回流阀和排液管须与型号相对应。请注意颜色标识。两天之后，拧紧锁紧螺母。

4. **安装吸液管和回流管**

根据试剂瓶高度调整伸缩式吸液管的长度，并进行安装。若使用SafetyPrime™安全回流阀（选配），还必须安装回流管。将回流管开口朝外（图4）。



5. **将该仪器安装在瓶口上，并对齐**

将分液器（GL 45螺纹）旋在试剂瓶上，通过转动阀门模块的方法（图5），使排液管与试剂瓶标签对齐。对于小试剂瓶，为防止翻倒，请使用试剂瓶底座。

提示：

请为其它螺纹规格的试剂瓶选择合适的接头。

Dispensette® III 基础型和Dispensette® Organic 有机型：
该仪器随包装附赠的接头为聚丙烯（PP）材质，仅可用于不攻击PP的试剂。若对耐化学腐蚀性有更高的要求，请使用EFTE/PTFE瓶口接头（参见54页“附件”）。

Dispensette® HF 氢氟酸型:
该仪器随包装附赠的接头为ETFE和PTFE材质。

6. 移动该仪器

若该仪器已安装于试剂瓶上，移动时应始终按右图所示的姿势持握该仪器(图6)！

警告!

接触该仪器或试剂瓶时，特别是使用危险液体(如氢氟酸)时，请始终佩戴防护手套。

吸液

警告!

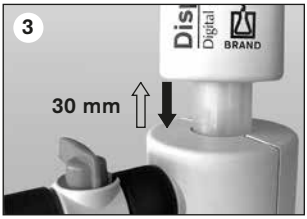
旋盖未取下时，切勿按压活塞！防止试剂飞溅！试剂可能会从排液管和旋盖滴漏。

提示：

初次使用该仪器之前，请确保使用所取试剂仔细润洗并弃置所移取的前几段样品。注意避免飞溅。

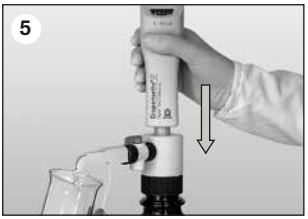
带SafetyPrime™ 安全回流阀的仪器：

1. 打开排液管旋盖（图1）。安全起见，将排液管管口靠在一个合适容器的内壁上。
2. 将回流阀设在"回流"状态（图2）。
3. 轻柔地将活塞向上拉出约30 mm并快速将其向下推至终点。重复该动作5次（图3）。
4. 将回流阀设为"排液"状态（图2）。
5. 为了避免溅撒，将排液管管口靠在合适容器的内壁上，将液体充入排液管直至管中没有气泡，擦去排液管外粘附液体。（图5）。



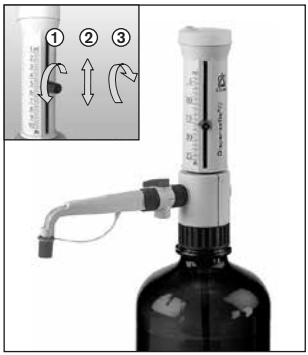
不带SafetyPrime™ 安全回流阀的仪器:

1. 打开排液管旋盖(图1)。**为防止飞溅，请将排液管口贴在合适接收容器的内壁上。**
2. 进液时，请缓慢将活塞向上拉出约 30 mm并快速将其向下推至终点。重复该步骤大约5次，直至排液管中没有气泡（图6）。



1. 设定分液体积

数字可调型：将量程调节拨轮旋转至所需量程（机械计数器）



游标式可调型：将量程选择指针旋松半圈（1），将指针设至所需体积（1），然后重新拧紧量程选择指针（3）。

固定量程型 量程固定，不能改变。

2. 排液

警告!

请穿着防护服并佩戴防护手套和防护镜！液体可能会在旋盖内积聚。为防止飞溅，请缓慢进行移液操作。请遵守所有安全指导，使用限制和操作限制（参见4-5页）。

a) 取下排液管旋盖。

b) 若使用配有SafetyPrime™安全回流阀的仪器时，请将阀门转至"排液"位置。

c) 请将排液管口贴在合适接收容器的内壁上。

d) 轻柔地将活塞拉起至顶点，然后用最小力缓慢匀速将活塞向下压至终点(图d)。

e) 将贴在接收容器内壁上的排液管擦干。

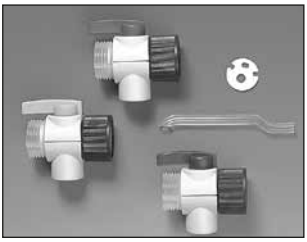
f) 重新将旋盖装在排液管上(图f)。

注意！

使用后，请将活塞始终保持在最低位置。

附件

下列选配件可用于Dispensette®瓶口分液器：



SafetyPrime™ 安全回流阀

SafetyPrime™安全回流阀（参见27页"附件"）可使仪器在不损失试剂的情况下进行吸液操作。请始终使用与仪器型号相对应的安全回流阀。安装信息，请参见第10页"组装"（图2）。

延长分液管

如需连续分液，可使用延长分液管（参见27页"附件"）。该仪器的标称准确度和偏差系数仅在体积>2ml，轻柔地移动活塞于上下终点之间的条件下获得。
延长分液管的盘管可延长达800mm。
整个盘管必须呈规则环状，不得出现扭曲缠绕。

与试剂接触部件的材质为：
硼硅酸盐玻璃、氧化铝-陶瓷、ETFE、PTFE、铂铱合金。
请勿使用
- 攻击硼硅酸盐玻璃的液体（如氢氟酸）。
- 过氧化物（如：H_2O_2），因为其可被铂铱合金催化分解。

此外，还应遵守该仪器的操作限制。
进行安装时 请将分液管托架装在阀门模块（图a）上，并安装接收管。将配有延长分液管的排液管滑推入阀门模块约2mm，并用手拧紧锁紧螺母。请使用瓶架（图b）(参见28页附件)。

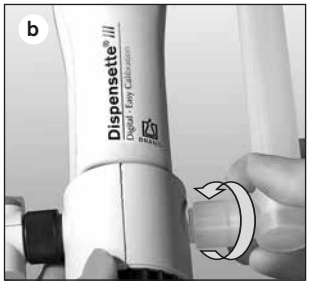
警告！

排液管不应有明显损坏（如：打结扭曲等）。每次使用延长分液管之前请仔细检查！如需移取腐蚀性液体，除常规注意事项外，应采取安全防护措施。建议使用防护罩。必须使用试剂瓶底座支撑试剂瓶。为防止试剂从管中溅撒，请牢牢握住排液管手柄，并在使用后将其放回托架上的接收管。清洗时，请小心对排液管进行冲洗。请勿拆卸！

干燥管

对于对湿气和CO_2敏感的试剂，有必要使用装有合适吸附试剂（另外购买）的干燥管（参见28页'附件'）。

进行安装时 请拧下通气盖（图a）并拧入装有吸附试剂的干燥管(图b)。 将PTFE密封圈放置在试剂瓶口螺纹上（图c），并将分液器拧在试剂瓶上。



提示：

如有必要，请使用PTFE胶带密封干燥管螺纹、试剂瓶和/或瓶口接头。

用于阀门模块的密封圈

对于高度挥发性试剂，建议使用PTFE密封圈封闭瓶口与阀门模块的连接处（参见28页"附件"）。

进行安装时，将PTFE密封圈放置在试剂瓶螺口上或已旋上的瓶口转接环上（图c），然后将分液器拧在试剂瓶上。

排气帽，用于带 Luer 式接头的微滤器

对于无菌介质，建议在微滤组件上使用带有Luer接头的排气帽。这样可以减少由置换空气产生的污染（见28页"附件"）。

进行安装时 请拧下通气盖（图a）并拧入带有Luer接头的排气帽(图d)。将PTFE密封圈放置在试剂瓶瓶口螺纹上(图c)，并将分液器拧在试剂瓶上。将滤器（市场上可以买到）插入Luer接头（图f)。

排液管包含用于安装微滤器的 Luer-Lock 接头

带有Luer Lock接头的排液管可用来连接进行无菌过滤的微滤器。与试剂接触部件的材质为：
硼硅酸盐玻璃、氧化铝-陶瓷、ETFE、FEP、PFA、PTFE、铂铱合金、PP (Luer Lock接头)。

请勿使用：

- 攻击硼硅酸盐玻璃的液体（如氢氟酸）。
- 过氧化物（如：H_2O_2），因为其可被铂铱合金催化分解的。

此外，还应遵守该仪器和微滤器的操作限制。

确保正确插入密封垫圈。

进行安装时，将带有Luer Lock接头的排液管（可选配SafetyPrime™安全回流阀）推入阀门模块约2mm，并用手拧紧锁紧螺母（见第10页的图3和3'）。确保排液管（可选配SafetyPrime™安全回流阀）安装妥当牢固。将无菌滤器（市场上可以买到）插入Luer Lock接头。

提示：

操作无菌试剂时请遵守下列说明。流阻较高会导致液体从活塞腔上缘渗漏。为最大限度地防止渗漏，建议在进行分液操作时用力轻缓并使用较大面积的滤膜。

根据标称量程（即仪器的最大量程），使用仪器与蒸馏水在室温(20 °C/68°F),平顺稳定地操作测得的误差极限。测试符合DIN EN ISO 8655-6范围要求。

数字可调 • 易校准型，受第5,957,330号美国专利保护。

Dispensette® 瓶口分液器误差极限

标称量程 ml	A* ≤ ± %	µl	CV* ≤ %	µl
0,5	1,0	5	0,2	1
1	0,5	5	0,1	1
2	0,5	10	0,1	2
5	0,5	25	0,1	5
10	0,5	50	0,1	10
25	0,5	125	0,1	25
50	0,5	250	0,1	50
100	0,5	500	0,1	100

*A = 准确度, CV = 偏差系数

对于某支仪器选定的某个体积，其A和CV值依据其标称量程与选定体积进行计算。

例如
确定量程42ml，仪器规格50ml

$$\mathbf{A\%} = \frac{50\ ml}{42\ ml} \cdot 0{,}5\% = 0{,}6\%$$

$$\mathbf{CV} = \frac{50\ ml}{42\ ml} \cdot 0{,}1\% = 0{,}12\%$$

提示：

误差极限符合DIN EN ISO 8655-5范围要求。单次测量的最大误差极限可通过EL = A + 2 CV 进行计算(如：量程为10ml：50 µl + 2 x 10 µl = 70 µl)。

检查体积（校准）

根据使用情况，我们建议每隔3-12个月对本仪器进行一次重力法测试。测试的时间间隔可根据情况自行调整。完整的测试步骤（SOP）可以在www.brand.de下载。此外，也可以在更短的时间间隔内进行简单的检查操作，比如将标称体积的液体排入容量瓶中（三刻度容量瓶，DKD校准）。为了符合GLP或ISO评估与记录，我们建议使用BRAND的EASYCAL™校准软件进行校准测试。可在www.brand.de上下载试用版。

根据DIN EN ISO 8655-6进行重力法体积测试（测试条件，参见45页的"误差极限"）操作如下：

1. 准备仪器

清洁仪器（参见48-51页"清洁"），装入蒸馏水，然后小心进行吸液操作。

2. 检查体积

a) 建议用蒸馏水在三个量程范围（100%、50%, 10%)各进行10次分液操作。
b) 进液时，请轻柔地将活塞向上拉至设定体积的顶点。
c) 排液时，将活塞轻缓匀速向下压至终点。
d) 擦净排液管的排液口。
e) 用分析天平称量所移取液体的重量。（请遵守天平制造商的操作手册进行操作。）
f) 计算移取的液体体积。因子Z结合了温度和空气浮力。

3. 计算

平均体积

x_i = 称量结果
n = 称量次数

Z = 校正因子
(如： 20 °C时为1.0029 µl/mg, 1013 hPa)

平均值 $\bar{x} = \frac{\Sigma\, x_i}{n}$

平均体积 $\bar{V} = \bar{x} \cdot Z$

准确度*

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

V_0 = 标称量程

标准偏差

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

偏差系数*

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

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

长时间使用之后，可能需要对仪器进行调整。

- 校准标称量程（参见18页）。
- 计算平均体积（称量结果）（参见18页）。
- 调整仪器（依据计算出的平均体积）。
- 调整之后，需要进一步校准确认调整是否合适。

例如：
设置为10 ml 体积，移出液体进行重力测试为9.9 ml。

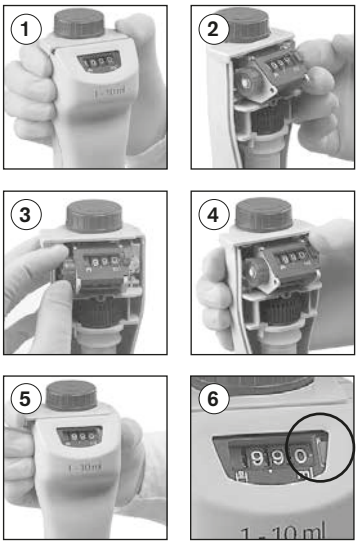
数字可调型

1. 拉出上部扣板，打开前仓盖（图1）。
2. 抬起红色校准板释放齿轮。此操作会使覆盖其上的塑料片撑断(图2)
3. 拉出红色拨轮使齿轮组断开连接，将显示设为真实排出体积(比如9.90 ml）(图3)。
4. 推回红色拨轮并将红色校准板推回原来位置（图4)。
5. 盖上前仓盖，将扣板向右滑动（图5)。完成调整之后，无需再进一步校准。出厂设置的改变可由红色校准板自动提示(图6)。

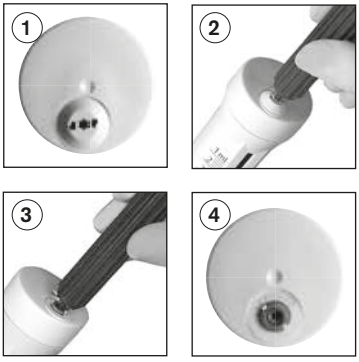
游标式可调型

1. 将安装工具的插脚插入盖板内（图1)，转动安装工具打开盖板（图2)。
2. 将安装工具的插脚插入调整螺丝（图3)，向左转动增加分液体积，或者向右转动减少分液体积（如：实际值为9.97ml，需要向左转动约1/2周)。
3. 出厂设置的改变可通过红色环暴露来指示（图4)。

数字可调型



游标式可调型



调整范围

标称量程	数字可调型 最大. +/-	游标式可调型/ 固定量程型 最大 +/-	旋转一圈相当于
0,5 ml	-	5 µl	~ 3 µl
1 ml	-	6 µl	~ 15 µl
2 ml	24 µl	12 µl	~ 15 µl
5 ml	60 µl	30 µl	~ 35 µl
10 ml	120 µl	60 µl	~ 65 µl
25 ml	300 µl	150 µl	~ 130 µl
50 ml	600 µl	300 µl	~ 265 µl
100 ml	-	600 µl	~ 400 µl

清洁

在下列情况下，必须清洗该仪器，以确保正确操作：

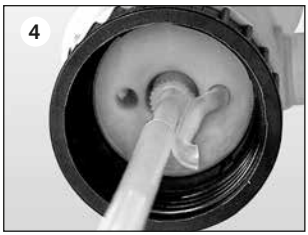
- 活塞活动困难时立即进行清洗
- 更换试剂之前
- 长期保存之前
- 拆卸仪器之前
- 进行高温高压灭菌之前
- 更换阀门之前
- 使用会发生沉积的液体（如结晶性液体）时需要定期清洗。
- 液体在旋盖内积聚时需要定期清洗。

警告！ 活塞腔、阀门、伸缩式吸液管和排液管内可能会含有试剂！在活塞腔装有液体时，切勿取下排液管或SafetyPrime™安全回流阀。请将阀门和管口朝向远离您身体的方向。请穿着防护服并佩戴防护镜和合适的手部防护。

清洗

为正确清洗和去除所有沉淀，灌洗之后必须拉出活塞腔的活塞。

1. 将仪器拧在空瓶上，通过排液操作完全排空活塞（图1）。若仪器配有SafetyPrime™安全回流阀，则必须设置在“排液”和“回流”条件下排空安全回流阀。
2. 将仪器拧在装有合适清洗剂的瓶上（如去离子水），通过完全进液并完全排空的方式对仪器进行多次灌洗。
3. 若仪器配有SafetyPrime™安全回流阀，还须设置“回流”状态灌洗该安全回流阀（图3）。
4. 拔出回流管和伸缩式吸液管。



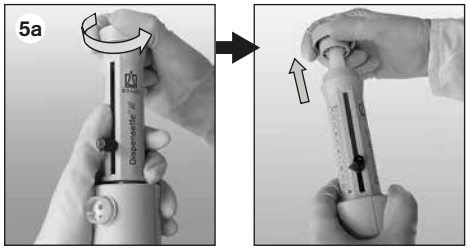
提示：

切勿互换仪器活塞！

5. 拧松活塞。

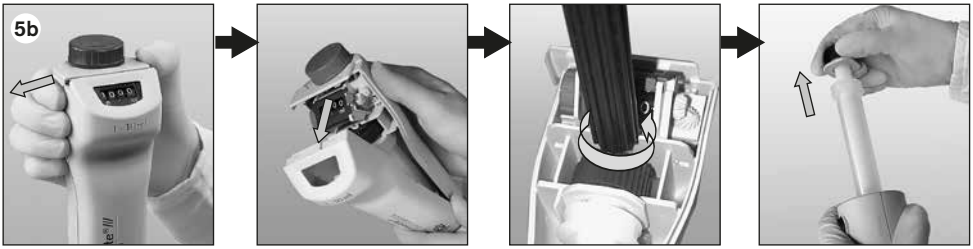
a) 游标式可调型和固定量程型

牢牢握住外壳，向左转动活塞座将其完全旋出。
小心拔出活塞。
请勿取下外壳！



b) 数字可调型

请仅在最大量程设置下进行组装和拆卸。



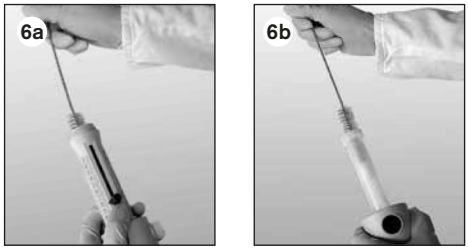
将扣板向左移，取下前仓壳。

将安装工具的插脚插入承插孔，逆时针转动安装工具，拧松活塞。然后小心拔出活塞。

6. 用瓶刷清洗活塞和活塞腔（游标式可调型和固定量程型见图6a，数字可调型见图6b）。如有必要，小心清除玻璃量筒边缘的沉积物。

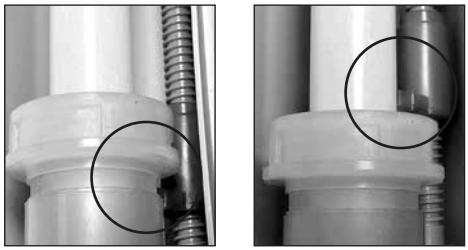
7. 然后用去离子水冲洗仪器的所有部件。

8. 将活塞完全插入活塞腔，并重新组装该仪器。



提示：

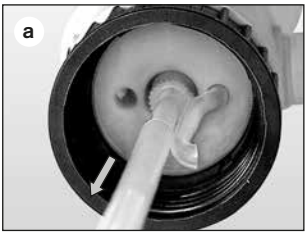
数字可调型
红色卡块必须位于活塞腔下方。

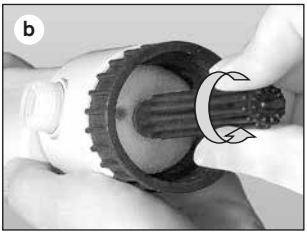


正确！
卡块嵌于活塞腔下方。

错误！
卡块嵌于在活塞腔上方。

清洗/更换阀门





1. **进液阀**

a) 拔出回流管和伸缩式吸液管（图a）。

b) 使用安装工具拧松进液阀（图b）。

c) 若密封圈被污染或损坏，请用弯嘴镊子小心将其取下（图c）。

d) 插入清洁的密封圈或新密封圈。

e) 用手将清洁过（比如使用超声波清洗器清洗）的或新的进液阀旋入然后使用安装工具将其拧紧。

2. **排液阀**

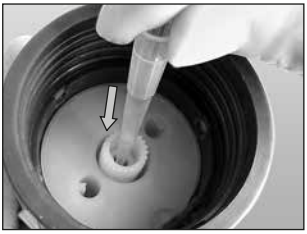
排液阀整合在排液管中。清洗方式参见20页。如有必要，取下排液管进行清洗，比如使用超声波清洗器。清洗完安装，或安装新排液管参见第10页。

3. **SafetyPrime™ 安全回流阀**

清洗请参见20页。如有必要，取下回流阀进行清洗，比如使用超声波清洗。将清洗完或新的回流阀装回分液器，参见第10页。

提示：

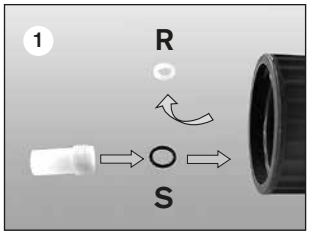
若仪器不能吸液，并且向上拉活塞时有明显的弹性阻力，则可能是阀门小球被粘柱。
此种情况下，用较轻的压力松开阀门小球，例如用200 µl 塑料吸头(见右图)。



依据DIN EN 285，本仪器可在121 ℃(250 °F)、2 bar(30 psi)条件下进行至少15分钟高温高压灭菌。进行高温高压灭菌之前，必须仔细清洗仪器（参见20-22页）。将活塞拉出活塞腔（参见21页）。若与安装的吸液管共同进行高温高压灭菌，推荐使用橄榄型管嘴的进液阀（第27页）。

1. 首次高温高压灭菌之前

取下内置的非弹性PTFE垫圈（R），换上随包装附赠的FKM材质的弹性O型垫圈（S）。



R = Dichtring **S** = elastischer O-Ring

提示：

FKM的耐化学腐蚀能力有限！

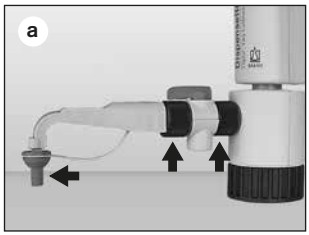
2. 高温高压灭菌

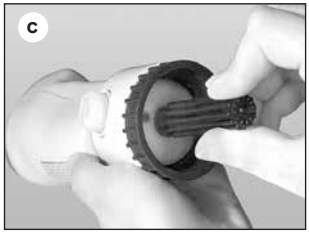
a) 拧松螺钉连接件（图a）。

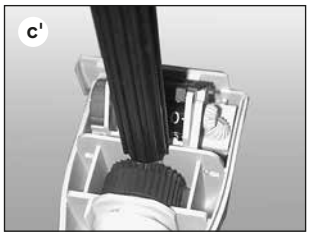
b) 拉出回流管和伸缩式吸液管。

c) 确认进液阀安装牢固（图c）。如果安装了硬质PTFE密封圈，还必须拧松进液阀。
在数字可调型分液器中，请确认活塞牢固安装（图c'）。

d) 将活塞推到底，断开吸液管和回流管，进行高温高压灭菌。避免接触金属表面。安装工具也可进行高温高压灭菌。







提示：

在仪器冷却至室温之前，请勿重新组装该仪器（冷却时间约为2小时）。
每次高温高压灭菌之后，请检查所有部件是否有变形或损坏。如有必要，请进行更换。
使用者有责任确保进行有效的高温高压灭菌。

Dispensette® III, 数字可调 · 易校准型

量程 ml	分刻度 ml	不带SafetyPrime™安全回流阀 货号	带SafetyPrime™ 安全回流阀 货号
0,2 - 2	0,01	4700 320	4700 321
0,5 - 5	0,02	4700 330	4700 331
1 - 10	0,05	4700 340	4700 341
2,5 - 25	0,1	4700 350	4700 351
5 - 50	0,2	4700 360	4700 361

Dispensette® III, 游标式可调型

量程 ml	分刻度 ml	不带SafetyPrime™安全回流阀 货号	带SafetyPrime™ 安全回流阀 货号
0,05 - 0,5	0,01	4700 100	4700 101
0,2 - 2	0,05	4700 120	4700 121
0,5 - 5	0,1	4700 130	4700 131
1 - 10	0,2	4700 140	4700 141
2,5 - 25	0,5	4700 150	4700 151
5 - 50	1,0	4700 160	4700 161
10 - 100	1,0	4700 170	4700 171

Dispensette® III, 固定量程型

量程 ml	不带SafetyPrime™安全回流阀 货号.	带SafetyPrime™ 安全回流阀 货号
1	4700 210	4700 211
2	4700 220	4700 221
5	4700 230	4700 231
10	4700 240	4700 241
特殊固定量程：0.5-100 ml (请在订购时特别注明)	4700 290	4700 291

注意:

提供物品参见第10页。.

Dispensette® Organic,数字可调 · 易校准型

量程 ml	分刻度 ml	不带SafetyPrime™安全回流阀 货号	带SafetyPrime™ 安全回流阀 货号
0,5 - 5	0,02	4730 330	4730 331
1 - 10	0,05	4730 340	4730 341
2,5 - 25	0,1	4730 350	4730 351
5 - 50	0,2	4730 360	4730 361

Dispensette® Organic, 游标式可调型

量程 ml	分刻度 ml	不带SafetyPrime™安全回流阀 货号	带SafetyPrime™ 安全回流阀 货号
0,5 - 5	0,1	4730 130	4730 131
1 - 10	0,2	4730 140	4730 141
2,5 - 25	0,5	4730 150	4730 151
5 - 50	1,0	4730 160	4730 161
10 - 100	1,0	4730 170	4730 171

Dispensette® Organic, 固定量程型

量程 ml	不带SafetyPrime™安全回流阀 货号	带SafetyPrime™ 安全回流阀 货号
5	4730 230	4730 231
10	4730 240	4730 241
特殊固定量程：2-100 ml (请在订购时特别注明)	4730 290	4730 291

Dispensette® HF, 游标式可调型

量程 ml	分刻度 ml	不带SafetyPrime™安全回流阀 货号	带SafetyPrime™ 安全回流阀 货号
1 - 10	0,2	4700 040	4700 041

瓶口接头 PP或ETFE/PTFE材质。ETFE/PTFE材质的接头有更强的耐化学腐蚀能力。

外螺纹	适配瓶口螺纹/磨口	材质	货号
GL 32	GL 25	PP	7043 25
GL 32	GL 28/ S 28	PP	7043 28
GL 32	GL 30	PP	7043 30
GL 32	GL 45	PP	7043 45
GL 45	GL 32	PP	7043 96
GL 45	GL 35	PP	7044 31
GL 45	GL 38	PP	7043 97
GL 45	S* 40	PP	7043 43
GL 45	S* 54	PP	7044 30
GL 40	S* 60	PP	7043 48
GL 32	GL 25	ETFE	7043 75
GL 32	GL 28/ S 28	ETFE	7043 78
GL 32	GL 30	ETFE	7043 80
GL 32	GL 45	ETFE	7043 95
GL 45	GL 32	ETFE	7043 98
GL 45	GL 38	ETFE	7043 99
GL 45	S* 40	PTFE	7043 91
GL 32	NS 19/26	PP	7044 19
GL 32	NS 24/29	PP	7044 24
GL 32	NS 29/32	PP	7044 29

* 锯齿螺纹

排液管，带整合阀门
1个/包装。

产品描述	标称量程 ml	形状	长度 mm	货号
用于Dispensette® III 基础型	0,5, 1, 2, 5, 10	细排液头	90	7079 15
	5, 10	标准	90	7079 16
	25, 50, 100	标准	120	7079 17
	25, 50, 100	细排液头	120	7079 18
用于Dispensette® Organic 有机型	0,5, 1, 2, 5, 10	细排液头	90	7079 35
	5, 10	标准	90	7079 36
	25, 50, 100	标准	120	7079 37
	25, 50, 100	细排液头	120	7079 38
用于Dispensette®HF氢氟酸型	10	标准	90	7079 19

进液阀含密封垫圈用于 Dispensette® HF
1个/包。

货号	6622

SafetyPrime™ 安全回流阀
1个/包。

产品描述	货号
用于 Dispensette® III 1-100 ml	7060 80
用于 Dispensette® III 0,5 ml	7060 81
用于 Dispensette® Organic	7060 90
用于 Dispensette® HF	7060 85

进液阀含密封垫
1个/包

产品描述	标称量程 ml	货号
用于 Dispensette® III, Dispensette® Organic	0,5, 1, 2, 5, 10	6697
用于 Dispensette® III, Dispensette® Organic	25, 50, 100	6698

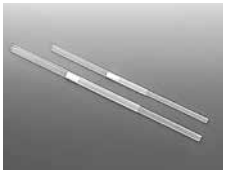
延长分液管
PTFE，材质，长度为 800 mm，带安全手柄。
1个/包

标称量程 ml	排液管外径 mm	内径 mm	货号
1, 2, 5, 10	3	2	7079 25*
25, 50, 100	4,5	3	7079 26*

* 不适用于HF（氢氟酸）与Peroxide（过氧化物

橄榄形管嘴进液阀 PEEK材质。
推荐用于需与进液管一起经常高压灭菌的情况。请遵循PEEK的化学耐性使用！
1个/包

产品描述	标称 量程 ml	货号
用于 Dispensette® III, Dispensette® Organic	0,5, 1, 2, 5, 10	6637
用于 Dispensette® III, Dispensette® Organic	25, 50, 100	6638



伸缩式吸液管 FEP材质。可调节以适合各种型号的试剂瓶。
1个/包

标称量程 ml	外径 mm	长度 mm	货号
0,5, 1, 2, 5, 10	6	70-140	7042 02
		125-240	7042 03
		195-350	7042 08
		250-480	7042 01
25, 50, 100	7,6	170-330	7042 04
		250-480	7042 05

密封垫圈
PTFE材质。零备密封垫圈，适用于排液管，SafetyPrime™回流阀及进液阀。各5个/包。

货号 6696

进液密封垫圈
FKM（氟橡胶）材质，仅适用于高温高压灭菌。5个/包。

货号 6694

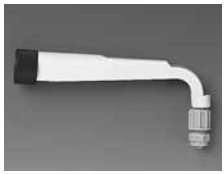
排气帽，用于带 Luer 式接头的微滤器
PP材质。排气帽及密封圈(PTFE材质)。各1个/包。

货号 7044 95

排液管包含用于安装微滤器的Luer-Lock接头 FEP / PP材质。1个/包。

货号 7079 28*

* 不适用于HF(氢氟酸)与Peroxide(过氧化物)



试剂瓶架
PP材质。全塑料材质适用于腐蚀性环境（比如在通风橱中酸雾环境下)。支撑杆 300mm，基座 220 x160 mm，重量 1130 g。1个/包。

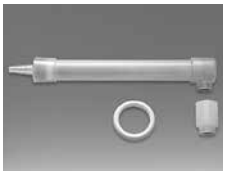
货号 7042 75

用于阀门模块的密封垫圈
PTFE材质，用于高度挥发的试剂。1个/包。

货号 7044 86

Drying tube
Drying tube and seal, without drying agent. Pack of 1.

Cat. No. 7079 30



回流管
1个/包。

货号 8317

校准和安装工具
1个/包。

货号 6687

旋盖，带塑料挂绳
1个/包。

产品描述	标称量程 ml	货号
PP, 材质，红色，用于 Dispensette® III 基础型	0,5, 1, 2, 5, 10	7060 11
	25, 50, 100	7060 12
PP, 材质，黄色，用于, Dispensette® Organic 有机型	0,5, 1, 2, 5, 10	7060 13
	25, 50, 100	7060 14
PP, 材质，绿色, 用于, Dispensette® HF	10	7060 15
PTFE材质*，白色, 用于 Dispensette® 所有型号	0,5, 1, 2, 5, 10	7060 16
	25, 50, 100	7060 17

* PTFE材质，适用于耐化学腐蚀性要求较高的情况

问题	可能的原因	应对方法
活塞移动困难	形成结晶，脏污	立即停止移液。以转动的方式拧松活塞，但不要拆卸活塞。遵循所有清洁指导（参见20-22页）操作。
无法进液	**量程设置为最小体积**	**设定量程至所需体积（参见13页）。**
	进液阀堵塞	清洗进液阀，然后使用200 µl弹性吸头松开阀门小球（若其被粘结）（参见22页）。如有必要，更换阀门及密封垫圈。
无法排液	排液阀堵塞	清洗排液阀。如有必要，更换排液管。（参见22页）。
仪器内有气泡	蒸气压力较高的试剂过快吸入	缓缓吸入试剂。
	未插入密封垫圈，锁紧螺母未锁紧。	再次检查密封垫圈是否安装到位，排液管与SafetyPrime™安全回流阀的锁紧螺母是否安装稳妥并锁紧。
	仪器未吸液	对仪器进行吸液操作（参见12页）。
	吸液管松动或损坏	将进液管安装牢固。如有必要，从上端切去约1cm并重新连接，或者更换进液管。
	阀门未安装牢固或损坏	进行清洗程序（参见20-22页）。使用安装工具拧紧阀门。如有必要，更换阀门及密封垫圈。
	未安装回流管	安装回流管（参见10页，图3）。
移液体积太少	排液管松动	将排管安装牢固。
	吸液管松动或损坏	进行清洗程序（参见20-22页）。将进液管安装牢固。如有必要，从管的上端切去约1cm并重新连接，或者更换进液管（见第22页）。
	进液阀松动或损坏	进行清洗程序（参见20-22页）。使用安装工具拧紧阀门。如有必要，更换阀门及密封垫圈。
仪器与试剂瓶之间有液体渗漏	未安装回流管	安装回流管（参见10页，图3）。
	在未使用密封套件的情况下移取挥发性试剂	安装密封套件（参见15页）。

如果仪器发生的问题通过“故障诊断”指南或更换配件无法解决，那么仪器需要送修。

由于安全原因，送修仪器必须事先清洁与去除污染！

仪器送修

a) 请仔细清洁仪器并去除污染。

b) 填写“无健康危害申明”（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）。

c) 将申明表与仪器一同寄给经销商或生厂商，准确描述故障情况与所使用的试剂。

相应的运输费用与风险由发送者承担。

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。如使用频繁或经常使用具有侵蚀性的试剂，间隔应该短一些。具体的测试指南可在www.brand.de下载。BRAND也提供厂方的校准服务或BRAND具有的DKD 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DKD/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）。

* 基于法律要求，,自2010年1月1日，DKD授权已经转变为DAkkS授权（Deutsche Akkreditierungsstelle GmbH）。

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。

丢弃

请仅在正确清洗之后按正确的方式对该仪器进行处置。

如有技术变更，恕不另行通知。如有错误，不在此限。

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Safety Instructions

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 instrument to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

⚠ Please read the following carefully!

1. Every user must read and understand this operating manual before operation.
2. Follow general instructions for hazard prevention and safety instructions; e.g., wear protective clothing, eye protection and gloves.
3. Observe all specifications provided by reagent manufacturers.
4. When dispensing inflammable media, make sure to avoid the buildup of static charge, e.g., do not dispense into plastic vessels; do not wipe instruments with a dry cloth.
5. Use the instrument only for dispensing liquids, with strict regard to the defined limitations of use and operating limitations. Observe operating exclusions (see page 34)! If in doubt, contact the manufacturer or supplier.
6. Always use the instrument in such a way that neither the user nor any other person is endangered. When dispensing, the discharge tube must always point away from you or any other person. Avoid splashes. Only use suitable vessels.
7. Never press down the piston when the discharge tube closure is attached.
8. Never remove the discharge tube or the SafetyPrime™ recirculation valve while the dispensing cylinder is filled.
9. Reagents can accumulate in the screw cap of the discharge tube. Thus, the screw cap should be cleaned regularly.
10. For small bottles, and when using the flexible discharge tube, use a bottle stand to prevent tipping over.
11. Never carry the mounted instrument by the cylinder sleeve or the valve block. Breakage or loosening of the cylinder may also lead to personal injury from chemicals (see page 39, Fig. 6).
12. Never use force on the instrument. Use smooth gentle movements to operate the piston upwards and downwards.
13. Use only original manufacturer's accessories and spare parts. Do not attempt to make any technical alterations. Do not dismantle the instrument any further than is described in the operating manual!
14. Always check the instrument for visible damage before use. If there is a sign of a potential malfunction (e.g., piston difficult to move, sticking valves or leakage), immediately stop dispensing. Consult the 'Troubleshooting' section of this manual (see page 57), and contact the manufacturer if needed.

Functions and Limitations of Use

The bottle-top dispenser Dispensette® is designed for dispensing liquids directly from the reservoir bottle. The Dispensette® is offered in three models: Dispensette® III, Dispensette® Organic and Dispensette® HF. Depending on the instrument's model the following types are available: digital, analog-adjustable and fixed-volume. The instruments are, according to the requirements of the DIN EN ISO 8655-5, conformity certified and optionally equipped with SafetyPrime™ recirculation valve.

Functions and Limitations of Use

Dispensette® III (red color code)

Digital · Easy Calibration

Analog-adjustable

Fixed-volume

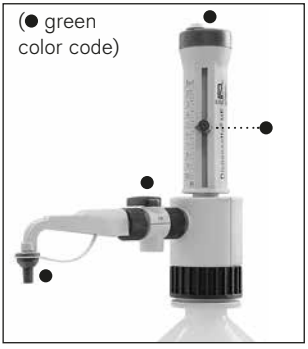
Dispensette® Organic (yellow color code)

Digital · Easy Calibration

Analog-adjustable

Fixed-volume

Dispensette® HF (green color code)



Analog-adjustable

When the instrument is correctly used, the dispensed liquid comes into contact with only the following chemically resistant materials:

Dispensette® III
Borosilicate glass, Al_2O_3-ceramic, ETFE, FEP, PFA, PTFE, platinum-iridium, PP (screw cap).

Dispensette® Organic
Borosilicate glass, Al_2O_3-ceramic, ETFE, FEP, PFA, PTFE, tantalum, PP (screw cap).

Dispensette® HF
Al_2O_3-ceramic, ETFE, FEP, PFA, PTFE, platinum-iridium, PP (screw cap).

If a higher chemical resistance is required, please use a PTFE screw cap and a EFTE/PTFE bottle adapter (Accessories, pages 54-56).

Limitations of Use

This instrument is designed for dispensing liquids, observing the following physical limits:

- +15 °C to +40 °C (59 °F to 104 °F) of instrument and reagent
- vapor pressure up to max. 600 mbar. Aspirate slowly above 300 mbar, in order to prevent the liquid from boiling.
- kinematic viscosity up to 500 mm^2/s (dynamic viscosity [mPas] = kinematic viscosity [mm^2/s] x density [g/cm^3])
- Density: Dispensette® III / Dispensette® Organic: up to 2.2 g/cm^3 and Dispensette® HF up to 3.8 g/cm^3

Operating Limitations

Liquids, which form deposits may make the piston difficult to move or may cause jamming (e.g., crystallizing solutions or concentrated alkaline solutions).
When dispensing inflammable media, make sure to avoid to buildup of static charge, e.g., do not dispense into plastic vessels; do not wipe instruments with a dry cloth.

The Dispensette® is designed for general laboratory applications and complies with the relevant standards, e.g. DIN EN ISO 8655. Compatibility of the instrument for a specific application (e.g., trace material analysis, food sector etc.) must be checked by the user. Approvals for specific applications in the medicinal / pharmaceutical / foodstuff processing areas are not available.

Operating Exclusions

Dispensette® III never use with:

- liquids attacking Al_2O_3-ceramic, ETFE, FEP, PFA and PTFE (e.g., dissolved sodium azide*)
- liquids attacking borosilicate glass (e.g., hydrofluoric acid)
- liquids which are decomposed catalytically by platinum-iridium (e.g., H_2O_2)
- hydrochloric acid > 20 % and nitric acid > 30 %
- tetrahydrofuran
- trifluoroacetic acid
- explosive liquids (e.g., carbon disulfide)
- suspensions (e.g., of charcoal) as solid particles may clog or damage the instrument
- liquids attacking PP (screw cap)

Dispensette® Organic never use with:

- liquids attacking Al_2O_3-ceramic, tantalum, ETFE, FEP, PFA and PTFE (e.g., dissolved sodium azide*)
- liquids attacking borosilicate glass (e.g., hydrofluoric acid)
- bases and saline solutions
- explosive liquids (e.g., carbon disulfide)
- suspensions (e.g., of charcoal) as solid particles may clog or damage the instrument
- liquids attacking PP (screw cap)

Dispensette® *HF* never use with:

- liquids attacking Al_2O_3-ceramic, ETFE, PFA, FEP and PTFE (e.g., dissolved sodium azide*)
- liquids which are decomposed catalytically by platinum-iridium (e.g., H_2O_2)
- bases and saline solutions
- explosive liquids (e.g., carbon disulfide)
- suspensions (e.g., of charcoal) as solid particles may clog or damage the instrument
- liquids attacking PP (screw cap)

* Dissolved sodium azide permitted up to a concentration of max. 0.1%.

Storage Conditions

Store the instrument and accessories only in cleaned

condition in a cool and dry place.

Storage temperature: -20 °C to +50 °C (-4° F to 122° F).

Recommended Application Range

Dispensette® III (color code red): Its broad range of application permits bottle dispensing of aggressive reagents, including concentrated acids such as H_3PO_4, H_2SO_4, bases like NaOH, KOH, saline solutions, as well as many organic solvents.

Dispensette® Organic (yellow color code) is ideal for dispensing of organic solvents including chlorinated and fluorinated hydrocarbons (e.g., trichlorotrifluoroethane and dichloromethane), concentrated acids (e.g., HCl and HNO_3), trifluoroacetic acid (TFA), tetrahydofuran (THF) and peroxides.

Dispensette® HF (green color code) is designed to dispense hydrofluoric acid (HF) up to a concentration of max. 52 %. Always operate instrument at least once every second week when filled.

For dispensing bromine, exchange the PP screw cap of the tube closure by a PTFE screw cap and, if necessary, use an ETFE/PTFE bottle adapter. Additionally the usage of the closure set is recommended (Accessories page 56).

Note:

For guidelines on selecting the right dispenser observe the corresponding Operating Exclusions and the “Dispenser selection chart” on the next page.

Dispenser Selection Chart

Reagent	Disp. III	Disp. Organ.
Acetaldehyde	+	+
Acetic acid (glacial), 100%	+	+
Acetic acid, 96%	+	+
Acetic anhydride		+
Acetone	+	+
Acetonitrile	+	+
Acetophenone		+
Acetyl chloride		+
Acetylacetone	+	+
Acrylic acid	+	+
Acrylonitrile	+	+
Adipic acid	+	
Allyl alcohol	+	+
Aluminium chloride	+	
Amino acids	+	
Ammonia, 20%	+	+
Ammonia, 20 - 30%		+
Ammonium chloride	+	
Ammonium fluoride	+	
Ammonium sulfate	+	
n-Amyl acetate	+	+
Amyl alcohol (Pentanol)	+	+
Amyl chloride (Chloropentane)		+
Aniline	+	+
Barium chloride	+	
Benzaldehyde	+	+
Benzene (Benzol)	+	+
Benzine (Gasoline)		+
Benzoyl chloride	+	+
Benzyl alcohol	+	+
Benzylamine	+	+
Benzylchloride	+	+
Boric acid, 10%	+	+
Bromobenzene	+	+
Bromonaphthalene	+	+
Butanediol	+	+
1-Butanol	+	+
n-Butyl acetate	+	+
Butyl methyl ether	+	+
Butylamine	+	+
Butyric acid	+	+
Calcium carbonate	+	
Calcium chloride	+	
Calcium hydroxide	+	
Calcium hypochlorite	+	
Carbon tetrachloride		+
Chloro naphthalene	+	+
Chloroacetaldehyde, 45%	+	+
Chloroacetic acid	+	+
Chloroacetone	+	+
Chlorobenzene	+	+
Chlorobutane	+	+
Chloroform		+
Chlorosulfonic acid		+
Chromic acid, 50%	+	+
Chromosulfuric acid	+	
Copper sulfate	+	
Cresol		+
Cumene (Isopropyl benzene)	+	+

Reagent	Disp. III	Disp. Organ.
Cyclohexane		+
Cyclohexanone	+	+
Cyclopentane		+
Decane	+	+
1-Decanol	+	+
Dibenzyl ether	+	+
Dichloroacetic acid		+
Dichlorobenzene	+	+
Dichloroethane		+
Dichloroethylene		+
Dichloromethane		+
Diesel oil (Heating oil)		+
Diethanolamine	+	+
Diethyl ether		+
Diethylamine	+	+
1.2 Diethylbenzene	+	+
Diethylene glycol	+	+
Dimethyl sulfoxide (DMSO)	+	+
Dimethylaniline	+	
Dimethylformamide (DMF)	+	+
1.4 Dioxane		+
Diphenyl ether	+	+
Ethanol	+	+
Ethanolamine	+	+
Ethyl acetate	+	+
Ethylbenzene		+
Ethylene chloride		+
Fluoroacetic acid		+
Formaldehyde, 40%	+	
Formamide	+	+
Formic acid, 100%		+
Glycerol	+	+
Glycol (Ethylene glycol)	+	+
Glycolic acid, 50%	+	
Heating oil (Diesel oil)		+
Heptane		+
Hexane		+
Hexanoic acid	+	+
Hexanol	+	+
Hydriodic acid	+	+
Hydrobromic acid		+
Hydrochloric acid, 20%	+	+
Hydrochloric acid, 20-37%		+
Hydrogen peroxide, 35%		+
Isoamyl alcohol	+	+
Isobutanol	+	+
Isooctane		+
Isopropanol (2-Propanol)	+	+
Isopropyl ether	+	+
Lactic acid	+	
Methanol	+	+
Methoxybenzene	+	+
Methyl benzoate	+	+
Methyl butyl ether	+	+
Methyl ethyl ketone	+	+
Methyl formate	+	+
Methyl propyl ketone	+	+
Methylene chloride		+
Mineral oil (Engine oil)	+	+

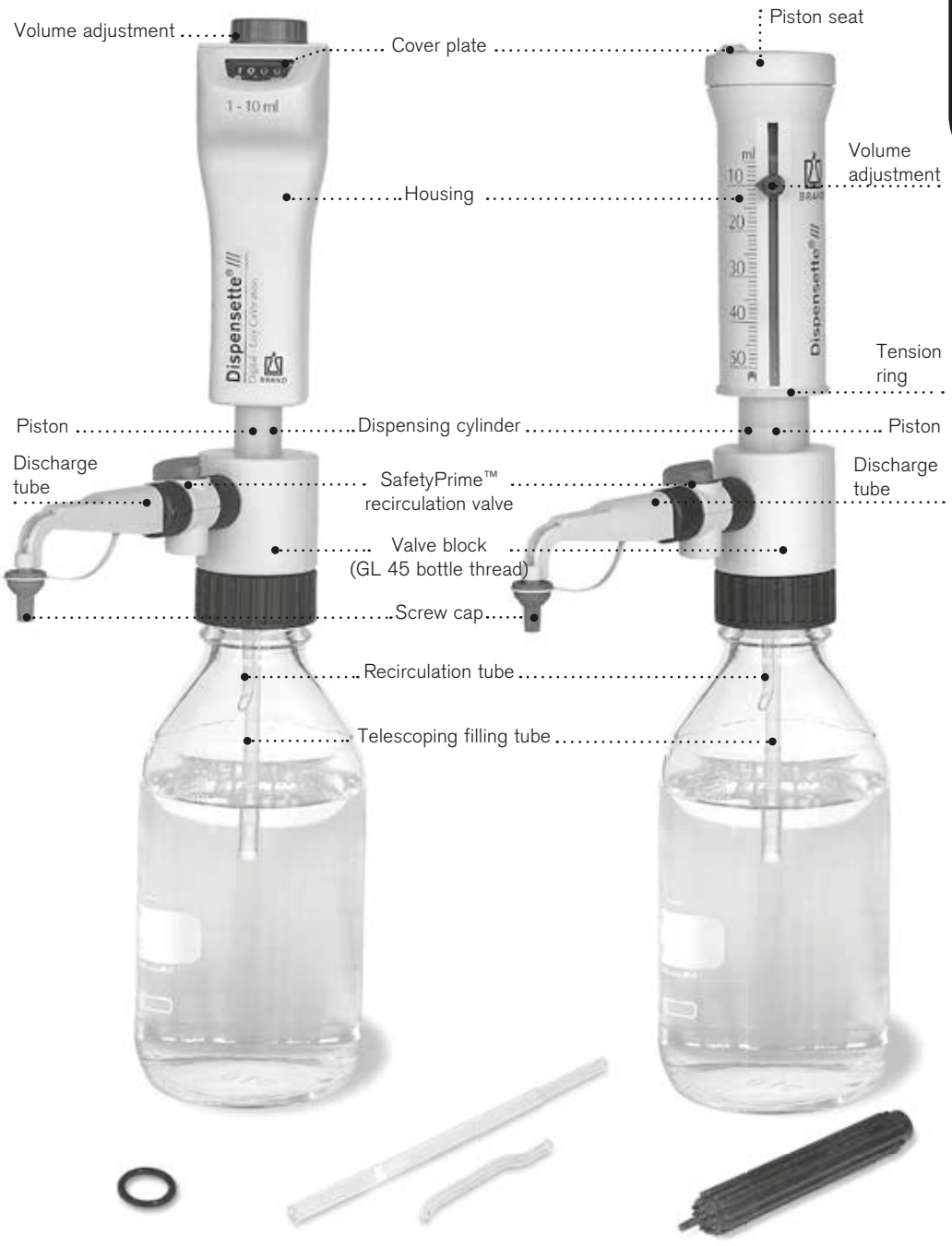
Reagent	Disp. III	Disp. Organ.
Monochloroacetic acid	+	+
Nitric acid, 30%	+	+
Nitric acid, 30-70%		+*
Nitrobenzene	+	+
Oleic acid	+	+
Oxalic acid	+	
n-Pentane		+
Peracetic acid		+
Perchloric acid	+	+
Perchloroethylene		+
Petroleum		+
Petroleum ether		+
Phenol	+	+
Phenylethanol	+	+
Phenylhydrazine	+	+
Phosphoric acid, 85%	+	+
Phosphoric acid, 85% + Sulfuric acid, 98%, 1:1	+	+
Piperidine	+	+
Potassium chloride	+	
Potassium dichromate	+	
Potassium hydroxide	+	
Potassium permanganate	+	
Propionic acid	+	+
Propylene glycol (Propanediol)	+	+
Pyridine	+	+
Pyruvic acid	+	+
Salicylaldehyde	+	+
Scintilation fluid	+	+
Silver acetate	+	
Silver nitrate	+	
Sodium acetate	+	
Sodium chloride	+	
Sodium dichromate	+	
Sodium fluoride	+	
Sodium hydroxide, 30%	+	
Sodium hypochlorite	+	
Sulfuric acid, 98%	+	+
Tartaric acid	+	
Tetrachloroethylene		+
Tetrahydrofuran (THF)***		+
Tetramethylammonium hydroxide	+	
Toluene		+
Trichloroacetic acid		+
Trichlorobenzene		+
Trichloroethane		+
Trichloroethylene		+
Trichlorotrifluoro ethane		+
Triethanolamine	+	+
Triethylene glycol	+	+
Trifluoro ethane		+
Trifluoroacetic acid (TFA)		+
Turpentine		+
Urea	+	
Xylene		+
Zinc chloride, 10%	+	
Zinc sulfate, 10%	+	

* use ETFE/PTFE bottle adapter
** use PTFE seal

Hydrofluoric acid (HF): Only the Dispensette® HF is specifically designed to dispense hydrofluoric acid (maximum permitted concentration 52%).

The above recommendations reflect testing completed prior to publication. Always follow instructions in the operating manual of the instrument as well as the reagent manufacturer's specifications. In addition to these chemicals, a variety of organic and inorganic saline solutions (e.g., biological buffers), biological detergents and media for cell culture can be dispensed. Should you require information on chemicals not listed, please feel free to contact BrandTech, Inc. Status as of: 0212/11

Operating Elements



Filling seal for autoclaving application

Filling and recirculation tube

Mounting tool

Is everything in the package?

Confirm that your package includes:
Bottle-top dispenser Dispensette®, discharge tube, telescoping filling tube, SafetyPrime™ recirculation valve and recirculation tube (optional), mounting tool, different bottle adapters, O-ring FKM (for autoclaving), a performance certificate and this operating manual.

Nominal volume, ml	Adapters for bottle thread	Filling tube Length, mm
Dispensette® III, Dispensette® Organic	**PP**	
0,5	GL 25, GL 28, GL 32	125-240
1, 2, 5, 10	GL 25, GL 28, GL 32, GL 38, S 40	125-240
25, 50, 100	GL 32, GL 38, S 40	170-330
Dispensette® HF	**ETFE/ PTFE**	
10	GL 32 (ETFE), S 40 (PTFE)	125-240

Assembly

Warning:

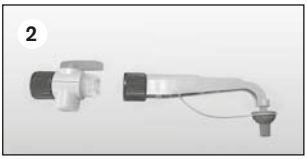
Wear protective clothing, eye protection and gloves! Follow all safety instructions and observe limitations of use and operating limitations (page 32-34).

1. Check sealing washer(s)

Before mounting the SafetyPrime™ recirculation valve or the discharge tube make sure that the sealing washer is inserted.

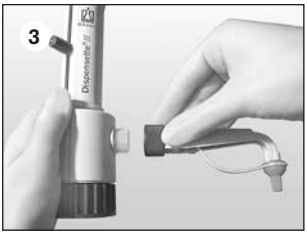
2. Mounting the SafetyPrime™ recirculation valve (optional)

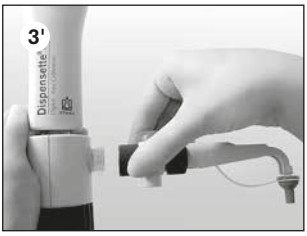
Push the SafetyPrime™ recirculation valve approx. 2 mm into the discharge tube and firmly finger-tighten the locking nut (Fig. 2). Check the SafetyPrime™ recirculation valve for a tight fit.



3. Mounting the Discharge tube

Push the discharge tube (optional with SafetyPrime™ recirculation valve, Fig. 3') approx. 2 mm into the valve block and firmly finger-tighten the locking nut (Fig. 3). Check the discharge tube for a tight fit.



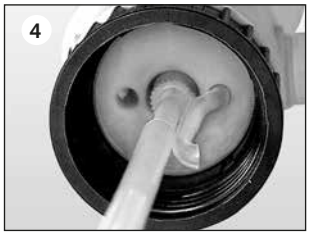


Note:

Recirculation valve and discharge tube must correspond to the model. Pay attention to the color code. After two days tighten up the locking nut.

4. Mounting the filling tube and recirculation tube

Adjust the length of the telescoping filling tube to the bottle height and attach it. If a SafetyPrime™ recirculation valve (optional) is used, the recirculation tube must also be mounted. Insert the recirculation tube with the opening pointing outward (Fig. 4).



5. Mounting and aligning the instrument on a bottle

Screw the instrument (GL 45 thread) onto the reagent bottle and then align the discharge tube with the bottle label. By turning the valve block. (Fig. 5). To prevent tipping over use a bottle stand for small bottles.

Note:

For bottles with other thread sizes, select a suitable adapter.

Dispensette® III and Dispensette® Organic:
The adapters supplied with the instrument are made of polypropylene (PP), and can only be used for media which do not attack PP.
If a higher chemical resistance is required, please use a EFTE/PTFE bottle adapter (Accessories, page 54).

Dispensette® HF:
The adapters supplied with the instrument are made of ETFE and PTFE.

6. Transporting the instrument

When mounted to a reagent bottle, always carry the instrument as shown in the figure (Fig. 6)!

Warning:

Always wear protective gloves when touching the instrument or the bottle, especially when using dangerous liquids (e.g. HF).

Priming

Warning:

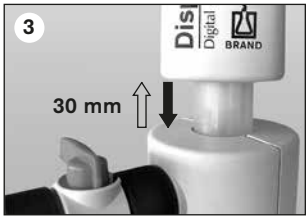
Never press down the piston when the screw cap is screwed on! Avoid splashing the reagent! The reagent can drip out from the discharge tube and screw cap.

Note:

Before using the instrument for the first time, ensure it is rinsed carefully and discard the first few samples dispensed. Avoid splashes.

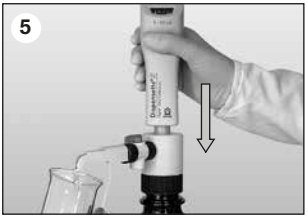
Instruments with SafetyPrime™ recirculation valve:

1. Open the screw cap of the dispensing tube (Fig. 1). For safety, hold the discharge tube orifice on the inner wall of a suitable receiving vessel.
2. Set valve to 'Recirculate' (Fig. 2).
3. For priming gently pull up the piston approx. 30 mm and push it down rapidly until the lower stop. Repeat this procedure 5 times (Fig. 3).
4. Turn valve to 'Dispense' (Fig. 4).
5. To avoid splashes when priming hold the discharge tube on the inner wall of a suitable receiving vessel and dispense liquid to prime the discharge tube until it is bubble-free. Wipe away any remaining drops from the discharge tube. (Fig. 5).



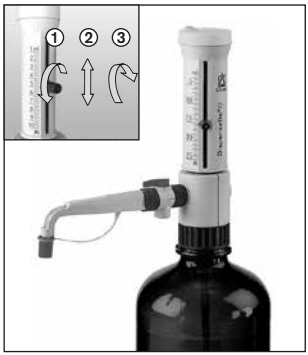
Instruments without SafetyPrime™ recirculation valve:

1. Open the screw cap of the discharge tube (see instrument with SafetyPrime™ recirculation valve Fig. 1).
   To avoid splashes, hold discharge tube orifice on the inner wall of a suitable receiving vessel.
2. For priming pull up the piston approx. 30 mm and push it down rapidly until the lower stop.
   Repeat this procedure approximately 5 times until the discharge tube is bubble-free (Fig. 6).



1. Setting the volume

Digital: Rotate the volume-setting wheel until the desired volume is indicated (mechanical counter).



Analog-adjustable: Loosen the volume selector thumb screw one-half turn (1), set the pointer to the desired volume (2) and then retighten the volume thumb screw (3).

Fixed-volume: The volume is non-adjustable and cannot be changed.

2. Dispensing

Warning!

Wear protective clothing, eye protection and gloves! Liquid may accumulate in the screw cap. To avoid splashes dispense slowly. Follow all safety instructions and observe limitations of use and operating limitations (page 32-33).

a) Remove screw cap from the discharge tube.

b) When using instruments equipped with the SafetyPrime™ recirculation valve, turn the valve to "Dispensing".

c) Hold the discharge tube orifice on the inner wall of a suitable receiving vessel.

d) Gently lift the piston until the upper stop and then depress piston slowly and steadily with minimal force until the lower stop (Fig. d).

e) Wipe off the discharge tube against the inner wall of the receiving vessel.

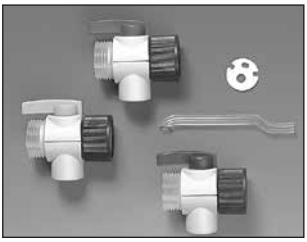
f) Reattach screw cap to discharge tube (Fig. f).

Attention:

After use, always leave the piston in the down position.

Accessories

The following optional accessories are available for the bottle-top dispenser Dispensette®:



SafetyPrime™ recirculation valve

The SafetyPrime™ recirculation valve (see accessories, page 55) enables priming of the instrument without loss of medium. Always use the designated recirculation valve that corresponds to the instrument model. For assembly, see “Assembly” on page 10 (Fig. 2).

Flexible discharge tube

For serial dispensing the flexible discharge tube can be used (Accessories page 55). The specified accuracy and coefficient of variation of the instrument are only obtained for volumes > 2 ml and by gently approaching the upper and lower stops.
The coil of the tubing can be stretched to a length of the 800 mm max..The entire coil must lie in regular loops and must not be twisted.

The parts in contact with the media are made of:
Borosilicate glass, Al_2O_3-ceramic, ETFE, PTFE, platinum-iridium.
Never use for:
- liquids attacking borosilicate glass (e.g., hydrofluoric acid)
- Peroxides, as they are decomposed catalytically by platinum-iridium (e.g., H_2O_2).

Additionally the Operating Exclusions of the instrument apply.

For mounting, attach the tube holder onto the valve block (Fig. a) and mount the receiver tube. Slide the dispensing tube with the flexible discharge tube approx. 2 mm further on the valve block, and tighten the lock nut hand-tight. Use a bottle stand (Fig. b) (see accessories, page 56).

Warning:

There should be no visible damage to the discharge tube (e.g. kinks or the like). Each time you are going to use the tubing, examine it carefully! To dispense aggressive liquids, you should take safety measures in addition to the normal precautions. We recommend use of a protective shield. The bottle must be supported using a bottle stand. To help avoid reagent splashing from the tube, always grip the tube firmly by the handle and replace into the holder after use. For cleaning rinse the tube carefully. Do not dismantle!

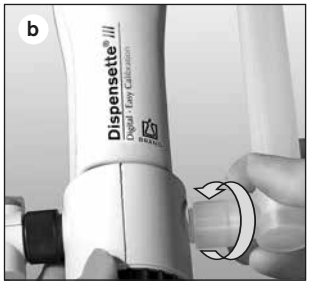
Drying tube

Use of a drying tube, filled with a suitable absorbent (purchased separately), might be necessary for moisture- and CO_2- sensitive media ('Accessories', page 56).

For mounting, unscrew the air vent cap (Fig. a) and screw the filled drying tube in (Fig. b). Place the PTFE sealing ring on the bottle thread (Fig. c) and screw the instrument onto the bottle.

Note:

If necessary, seal the threads of the drying tube, the bottle and/or the bottle adapter with PTFE tape.



Sealing ring for valve block

For highly volatile media we recommend to seal the connection from valve bloc to bottle with the PTFE sealing ring (see accessories, page 44).

For mounting, place the PTFE sealing ring on the bottle thread or the screwed-on adapter (Fig. c) and screw the instrument onto the bottle.

Air vent cap for micro filter with Luer-cone

For sterile media we recommend the air vent cap with Luer-cone to attach a micro filter. This provides increased protection against contamination by displacement air (see accessories, page 56).

For mounting, unscrew the air vent cap (Fig. a) screw in the air vent cap with a Luer cone (Fig. d). Place the PTFE sealing ring on the bottle thread (Fig. c) and screw the instrument onto the bottle. Insert a commercially available sterile filter into the Luer cone (Fig. f).

Discharge tube with Luer-Lock attachment for micro filter

The dispensing tube with a Luer Lock attachement enables the connection of a microfilter for sterile filtration. The parts which come in contact with the medium are:
Borosilicate glass, Al_2O_3-ceramic, ETFE, FEP, PFA, PTFE, platinum-iridium and PP (Luer-Lock attachment).

Never use for:
- liquids attacking borosilicate glass (e.g., hydrofluoric acid)
- Peroxides, as they are decomposed catalytically by platinum-iridium (e.g., H_2O_2).

Additionally observe the Operating Exclusions of the instrument and micro filter.
Make sure that the sealing washer is inserted.

For mounting, push the dispensing tube with the Luer Lock (optionally with the SafetyPrime™ recirculation valve) approx. 2 mm into the valve block, and firmly finger-tighten the locking nut (page 38, Figs. 3 and 3'). Check the discharge tube (eventually the SafetyPrime™ recirculation valve) for a tight fit. A commercially available sterile filter can be mounted onto the Luer Lock connector.

Note:

Please follow general instructions when handling sterile media. The increased flow resistance can lead to liquid leaking at the upper edge of the dispensing cylinder. To keep any leaking of liquid to a minimum, we recommend using gentle force when dispensing and the use of a filter with a large filter surface.

Error Limits

Error limits 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). Testing takes place according DIN EN ISO 8655-6 with a completely filled instrument and with uniform and smooth dispensing.

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Error limits Dispensette®

Nominal volume ml	A* ≤ ± %	µl	CV* ≤ %	µl
0,5	1.0	5	0.2	1
1	0.5	5	0.1	1
2	0.5	10	0.1	2
5	0.5	25	0.1	5
10	0.5	50	0.1	10
25	0.5	125	0.1	25
50	0.5	250	0.1	50
100	0.5	500	0.1	100

* A = Accuracy, CV = Coefficient of Variation

For the instrument with the chosen fixed volume, the values of A and CV are calculated in accordance with the nominal volume for the instrument size used.

For example
Fixed volume 42 ml, instrument size 50 ml

$$\mathbf{A\%} = \frac{50\ \text{ml}}{42\ \text{ml}} \cdot 0.5\% = 0.6\%$$

$$\mathbf{CV} = \frac{50\ \text{ml}}{42\ \text{ml}} \cdot 0.1\% = 0.12\%$$

Note:

The error limits are well within the limits of DIN EN ISO 8655-5. The maximum error limit for a single measurement can be calculated EL = A + 2 CV (e.g. for volume 10 ml: 50 µl + 2 x 10 µl = 70 µl).

Checking the Volume (Calibration)

Depending on use, we recommend that gravimetric testing of the instrument be carried out every 3-12 months. This time frame should be adjusted to correspond with individual requirements. The complete testing procedure (SOP) can be downloaded at www.brand.de. In addition, you can also carry out function checks at shorter intervals, e.g. dispensing the nominal volume into a volumetric test flask (volumetric flask with 3 marks, DKD calibrated). For GLP- and ISO-compliant evaluations and documentation, we recommend the EASYCAL™ calibration software from BRAND. A demo version can be downloaded from www.brand.de.

Gravimetric volume testing according to DIN EN ISO 8655-6 (for measurement conditions, see 'Error Limits', page 45) is performed as follows:

1. Preparation of the instrument

Clean the instrument ('Cleaning', page 48-51), fill it with distilled H_2O and then prime it carefully.

2. Check the volume

a) 10 dispensing operations with distilled H_2O in 3 Volume ranges (100 %, 50 %, 10 %) are recommended.

b) For filling pull up the piston gently until the upper stop of the volume set.

c) For discharge depress piston slowly and steadily without force until the lower stop.

d) Wipe off the tip of discharge tube.

e) Weigh the dispensed quantity on an analytical balance. (Please follow the operating manual of the balance manufacturer.)

f) Calculate the dispensed volume. The Z factor takes account of the temperature and air buoyancy.

3. Calculations

Mean volume

x_i = results of weighings
n = number of weighings

Z = correction factor (e. g., 1.0029 µl/mg at 20 °C, 1013 hPa)

Mean value $\overline{x} = \frac{\Sigma\, x_i}{n}$

Mean volume $\overline{V} = \overline{x} \cdot Z$

Accuracy*

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

V_0 = nominal volume

Standard deviation

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

Coefficient of variation*

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

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

After a long period of usage an adjustment of the instrument might be necessary.

- Calibrate for example at nominal volume (see page 46).
- Calculate mean volume (result of weighing) (see page 46).
- Adjust the instrument (to the calculated mean volume).
- After the adjustment, further calibration is necessary to confirm appropiate adjustment.

Example:
Gravimetric testing yields a delivered volume of 9.90 ml with a set volume of 10 ml.

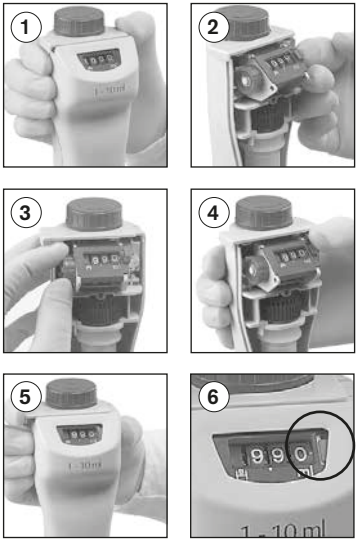
Type Digital

1. Open housing by sliding the latch to the left and removing the front (Fig. 1).
2. Lift gear lock lever to release. With this action, the adjustment cover plate breaks off (Fig. 2).
3. Pull the red knob to disengage the gears and set the display to actual delivered volume (e.g., 9.90 ml) (Fig. 3).
4. Reposition red knob and gear lock lever to their original positions (Fig. 4).
5. Replace housing and slide the latch to the right (Fig. 5). Alteration of factory setting is indicated by a red recalibration flag (Fig. 6).

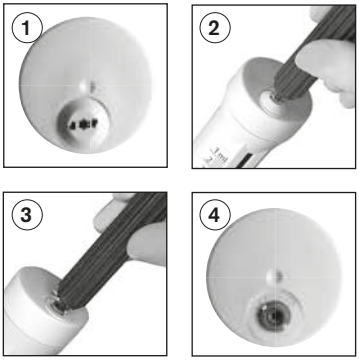
Type Analog-adjustable

1. Insert the pin of the mounting tool into the cover plate (Fig. 1), and break it off with a rotating motion (Fig. 2).
2. Insert the pin of the mounting tool into the adjustment screw (Fig. 3) and rotate to the left in order to increase the dispensing volume, or rotate to the right to decrease the dispensing volume (e.g. for an actual value of 9.97 ml, rotate approx. 1/2 turn to the left).
3. The change in the adjustment is indicated by an exposed red ring (Fig. 4).

Digital



Type Analog-adjustable



Adjustment range

Nominal volume	Digital max. +/-	Analog/Fix max. +/-	One rotation corresponds to
0.5 ml	-	5 µl	~ 3 µl
1 ml	-	6 µl	~ 15 µl
2 ml	24 µl	12 µl	~ 15 µl
5 ml	60 µl	30 µl	~ 35 µl
10 ml	120 µl	60 µl	~ 65 µl
25 ml	300 µl	150 µl	~ 130 µl
50 ml	600 µl	300 µl	~ 265 µl
100 ml	-	600 µl	~ 400 µl

Cleaning

The instrument must be cleaned in the following situations to assure correct operation:

- immediately when the piston is difficult to move
- before changing the reagent
- prior to long term storage
- prior to dismantling the instrument
- prior to autoclaving
- prior to changing the valve
- regularly when using liquids which form deposits (e.g., crystallizing liquids)
- regularly when liquids accumulate in the screw cap

Warning! The cylinder, valves, telescoping filling tube and discharge tube contain reagent! Never remove the discharge tube or the SafetyPrime™ recirculation valve while the dispensing cylinder is filled. Point the valves and tube openings away from your body. Wear protective clothing, eye protection and appropriate hand protection.

Cleaning

For proper cleaning and removal of any deposits, the piston must always be pulled out of the cylinder after rinsing.

1. Screw the instrument onto an empty bottle and empty it completely by dispensing (Fig. 1).If the instrument is equipped with SafetyPrime™ recirculation valve, it must be emptied in the "dispensing" and “recirculating” setting.

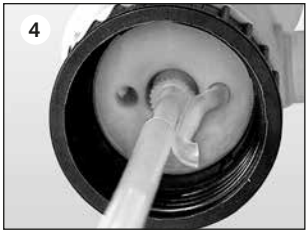
2. Screw the instrument onto a bottle filled with a suitable cleaning agent (e.g. deionized water) and rinse the instrument several times by completely filling and emptying it.

3. If the instrument is equipped with a SafetyPrime™ recirculation valve, after rinsing the instrument, it must also be rinsed in the “recirculating” setting (Fig. 3).

4. Pull out the recirculation tube and the telescoping filling tube.

Note:

Never exchange pistons between instruments!



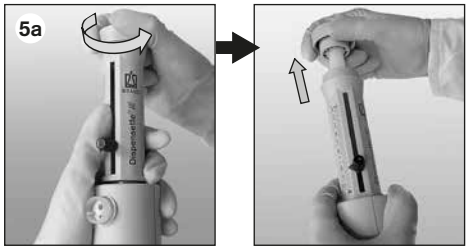
5. Loosen piston.

a) Analog-adjusted and fixed-volume model

Hold the housing securely and unscrew the piston completely by turning it to the left.

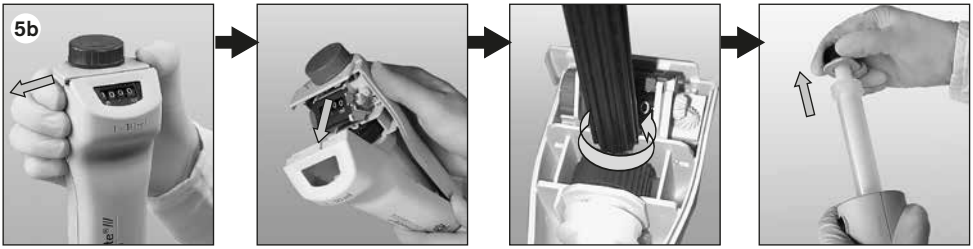
Carefully pull out the piston.

Do not remove the housing!



b) Digital type

Carry out assembly and dismantling at the maximum volume setting only.



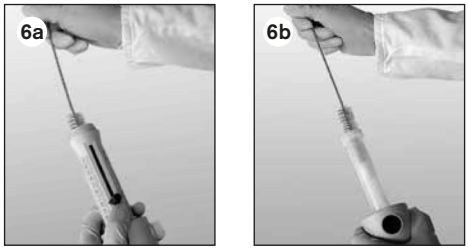
Move the latch to the left and remove the cylinder sleeve.

Place the tip of the mounting tool in the receiving hole, and turn the mounting tool counter-clockwise to loosen the piston mount. Then carefully pull out the piston.

6. Clean piston and cylinder with a bottle-brush (Analog an fix type see Fig. 6a, Digital type see Fig. 6b). If necessary carefully remove deposits at the edge of the glass cylinder.

7. Then flush all parts of the instrument with deionized water.

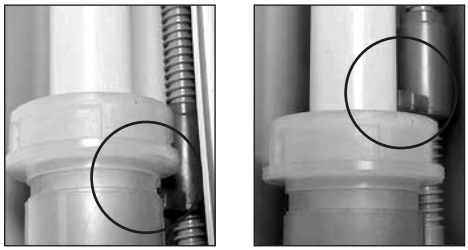
8. Insert the piston completely into the cylinder and then reassemble the instrument.



Note:

Digital type

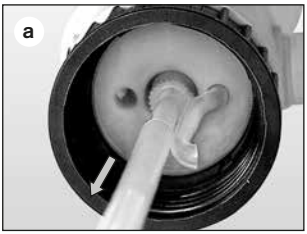
The red stop segment must engage underneath the cylinder.

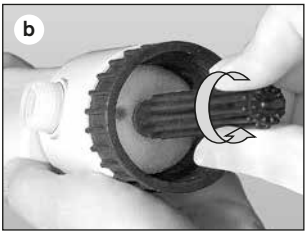


Right!
Catch is inserted **below** the cylinder.

Wrong!
Catch is inserted **above** the cylinder.

Cleaning/replacing the valves





1. Filling valve

a) Pull out the recirculation tube and the telescoping filling tube (Fig. a).

b) Use the mounting tool to unscrew the filling valve (Fig. b).

c) If the sealing ring is contaminated or damaged, carefully remove it with a pair of curved forceps (Fig. c).

d) Insert cleaned or new sealing ring.

e) Screw in the cleaned (e.g., in an ultrasonic bath) or new filling valve first by hand and then tighten it with the mounting tool.

2. Discharge valve

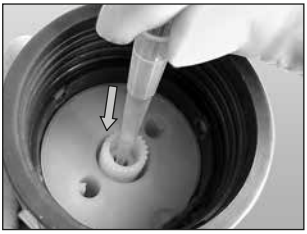
The discharge valve is incorporated in the discharge tube. For celaning see page 48. If necessary remove discharge tube and clean it e.g. in an ultrasonic bath. Mount cleaned or new discharge tube see page 38.

3. SafetyPrime™ recirculation valve

For celaning see page 48. If necessary remove recirculation volve and clean it e.g. in an ultrasonic bath. Mount cleaned or new recirculation valve see page 38.

Note:

If the instrument does not fill up, and if some elastic resistance is evident when the piston is pulled upward, then it is possible that the ball valve is merely stuck.
In this case, loosen the ball valve using light pressure, for example, with a 200 µl plastic pipette tip (see the figure at the side).



Autoclaving

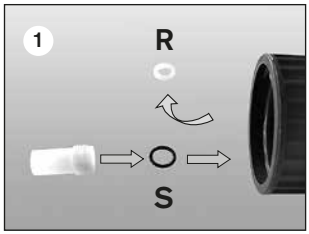
This instrument is autoclavable at 121 °C (250 °F), 2 bar absolute (30 psi) with a holding time of at least 15 minutes according to DIN EN 285. Before autoclaving, the instrument must be cleaned carefully (page 48-50). Lift the piston out of the cylinder (page 49).For autoclaving with mounted filling tube, the filling valve with olive-shaped nozzle is recommended (page 55).

1. Prior to the first autoclaving

Remove built-in inelastic PTFE-sealing ring (R) and replace with the supplied elastic sealing ring made of FKM (S).

Note:

FKM has limited chemical resistance!



R = seal **S** = elastic O-ring

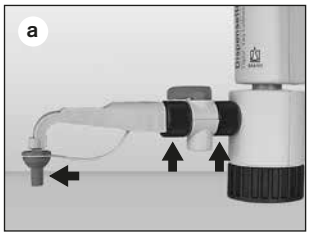
2. Autoclaving

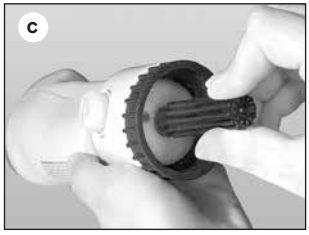
a) Loosen screw connections (Fig. a).

b) Pull out the recirculation tube and the telescoping filling tube.

c) Check that the filling valve is securely seated (Fig. c). If the rigid PTFE ring has been installed, the filling valve must also be loosened.
In the digital model, check that the piston mount is securely seated (Fig. c').

d) Autoclave the instrument with the piston pushed all the way downward, and with the filling tube and recirculation tube disconnected. Avoid contact with metallic surfaces. The mounting tool can also be autoclaved.





Note:

Do not reassemble the instrument until it has cooled down to room temperature (Cooling time approx. 2 hours).
After every autoclaving, inspect all parts for deformities or damage. If necessary, replace them.

It is the user's responsibility to ensure effective autoclaving.

Dispensette® III, Digital · Easy Calibration

Capacity ml	Subdivision ml	without SafetyPrime™ recirculation valve Cat. No.	with SafetyPrime™ recirculation valve Cat. No.
0.2 - 2	0.01	4700 320	4700 321
0.5 - 5	0.02	4700 330	4700 331
1 - 10	0.05	4700 340	4700 341
2.5 - 25	0.1	4700 350	4700 351
5 - 50	0.2	4700 360	4700 361

Dispensette® III, Analog-adjustable

Capacity ml	Subdivision ml	without SafetyPrime™ recirculation valve Cat. No.	with SafetyPrime™ recirculation valve Cat. No.
0.05 - 0.5	0.01	4700 100	4700 101
0.2 - 2	0.05	4700 120	4700 121
0.5 - 5	0.1	4700 130	4700 131
1 - 10	0.2	4700 140	4700 141
2.5 - 25	0.5	4700 150	4700 151
5 - 50	1.0	4700 160	4700 161
10 - 100	1.0	4700 170	4700 171

Dispensette® III, Fixed-volume

Capacity ml	without SafetyPrime™ recirculation valve Cat. No.	with SafetyPrime™ recirculation valve Cat. No.
1	4700 210	4700 211
2	4700 220	4700 221
5	4700 230	4700 231
10	4700 240	4700 241
Special fixed volumes: 0.5-100 ml (please state when ordering)	4700 290	4700 291

Note:

Items supplied see page 38.

Dispensette® Organic, Digital · Easy Calibration

Capacity ml	Subdivision ml	without SafetyPrime™ recirculation valve Cat. No.	with SafetyPrime™ recirculation valve Cat. No.
0.5 - 5	0.02	4730 330	4730 331
1 - 10	0.05	4730 340	4730 341
2.5 - 25	0.1	4730 350	4730 351
5 - 50	0.2	4730 360	4730 361

Dispensette® Organic, Analog-adjustable

Capacity ml	Subdivision ml	without SafetyPrime™ recirculation valve Cat. No.	with SafetyPrime™ recirculation valve Cat. No.
0.5 - 5	0.1	4730 130	4730 131
1 - 10	0.2	4730 140	4730 141
2.5 - 25	0.5	4730 150	4730 151
5 - 50	1.0	4730 160	4730 161
10 - 100	1.0	4730 170	4730 171

Dispensette® Organic, Fixed-volume

Capacity ml	without SafetyPrime™ recirculation valve Cat. No.	with SafetyPrime™ recirculation valve Cat. No.
5	4730 230	4730 231
10	4730 240	4730 241
Special fixed volumes: 2-100 ml (please state when ordering)	4730 290	4730 291

Dispensette® HF, Analog

Capacity ml	Subdivision ml	without SafetyPrime™ recirculation valve Cat. No.	with SafetyPrime™ recirculation valve Cat. No.
1 - 10	0.2	4700 040	4700 041

Bottle adapters PP or ETFE/PTFE. Adapters of ETFE/PTFE offer higher chemical resistance.

Outer thread	for bottle thread/ ground joint	Material	Cat. No.
GL 32	GL 25	PP	7043 25
GL 32	GL 28/ S 28	PP	7043 28
GL 32	GL 30	PP	7043 30
GL 32	GL 45	PP	7043 45
GL 45	GL 32	PP	7043 96
GL 45	GL 35	PP	7044 31
GL 45	GL 38	PP	7043 97
GL 45	S* 40	PP	7043 43
GL 45	S* 54	PP	7044 30
GL 40	S* 60	PP	7043 48
GL 32	GL 25	ETFE	7043 75
GL 32	GL 28/ S 28	ETFE	7043 78
GL 32	GL 30	ETFE	7043 80
GL 32	GL 45	ETFE	7043 95
GL 45	GL 32	ETFE	7043 98
GL 45	GL 38	ETFE	7043 99
GL 45	S* 40	PTFE	7043 91
GL 32	NS 19/26	PP	7044 19
GL 32	NS 24/29	PP	7044 24
GL 32	NS 29/32	PP	7044 29

* buttress thread

Discharge tubes with integrated valve
Pack of 1.

Description	Nominal volume ml	Shape	Length mm	Cat. No.
for Dispensette® III	0.5, 1, 2, 5, 10	fine tip	90	7079 15
	5, 10	standard	90	7079 16
	25, 50, 100	standard	120	7079 17
	25, 50, 100	fine tip	120	7079 18
for Dispensette® Organic	0.5, 1, 2, 5, 10	fine tip	90	7079 35
	5, 10	standard	90	7079 36
	25, 50, 100	standard	120	7079 37
	25, 50, 100	fine tip	120	7079 38
for Dispensette® HF	10	standard	90	7079 19

Filling valve with sealing washer for Dispensette® HF
Pack of 1.

Cat. No. 6622

SafetyPrime™ recirculation valves
Pack of 1.

Description	Cat. No.
for Dispensette® III 1-100 ml	7060 80
for Dispensette® III 0.5 ml	7060 81
for Dispensette® Organic	7060 90
for Dispensette® HF	7060 85

Filling valve with sealing washer
Pack of 1.

Description	Nominal volume ml	Cat. No.
for Dispensette® III, Dispensette® Organic	0.5, 1, 2, 5, 10	6697
for Dispensette® III, Dispensette® Organic	25, 50, 100	6698

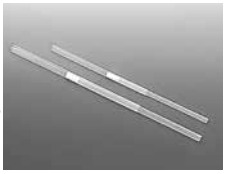
Flexible discharge tubing
PTFE, coiled, length 800 mm, with safety handle. Pack of 1.

Nominal volume ml	Discharge tube Outer Ø mm	Inner Ø mm	Cat. No.
1, 2, 5, 10	3	2	7079 25*
25, 50, 100	4,5	3	7079 26*

* not suitable for HF and Peroxide

Filling valve with olive-shaped nozzle made of PEEK
For frequent autoclaving with the filling tube mounted, this filling valve with tube nozzle is recommended. Observe limited chemical resistance of PEEK! Pack of 1.

Description	Nominal volume ml	Cat. No.
for Dispensette® III, Dispensette® Organic	0.5, 1, 2, 5, 10	6637
for Dispensette® III, Dispensette® Organic	25, 50, 100	6638



Telescoping filling tubes
FEP. Adjusts to various bottle heights. Pack of 1.

Nominal volume ml	Outer Ø mm	Length mm	Cat. No.
0.5, 1, 2, 5, 10	6	70-140	7042 02
		125-240	7042 03
		195-350	7042 08
		250-480	7042 01
25, 50, 100	7,6	170-330	7042 04
		250-480	7042 05

Seals
PTFE. Spare seals for discharge tube, SafetyPrime™ and filling valve.
Pack of 5 each type.

Cat. No. 6696

Sealing ring for filling valve
FKM (Fluororo elastomer), only for autoclaving applications
Pack of 5.

Cat. No. 6694

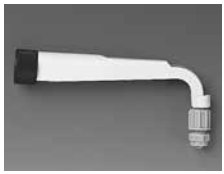
Air vent cap for micro filter with Luer-cone
PP. Air vent cap and PTFE-sealing ring.
Pack of 1 each.

Cat. No. 7044 95

Discharge tube with Luer-Lock attachment for micro filter
FEP/PP. Pack of 1.

Cat. No. 7079 28*

* not suitable for HF and Peroxide



Bottle Stand
PP. Support rod 300 mm, Base plate 220 x 160 mm.
Pack of 1

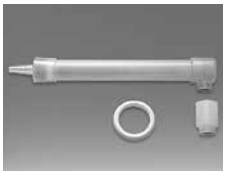
Cat. No. 7042 75

Sealing ring for valve block
PTFE, for highly volatile reagents.
Pack of 1.

Cat. No. 7044 86

Drying tube
Drying tube and seal, without drying agent.
Pack of 1.

Cat. No. 7079 30



Recirculation tube
Pack of 1.

Cat. No. 8317

Calibrating-, mounting-tool
Pack of 1.

Cat. No. 6687

Screw cap with fastener
Pack of 1.

Description	Nominal volume ml	Cat. No.
PP, red, for Dispensette® III	0,5, 1, 2, 5, 10	7060 11
	25, 50, 100	7060 12
PP, yellow, for Dispensette® Organic	0,5, 1, 2, 5, 10	7060 13
	25, 50, 100	7060 14
PP, green, for Dispensette® HF	10	7060 15
PTFE*, white, for Dispensette® all typs	0,5, 1, 2, 5, 10	7060 16
	25, 50, 100	7060 17

* PTFE, if higher chemical resistance is requested

Problem	Possible cause	Corrective action
Piston difficult to move	Formation of crystals, dirty	Stop dispensing immediately. Loosen piston with circular motion, but do not disassemble. Follow all cleaning instructions (page 48-50).
Filling not possible	Volume adjusted to minimum setting	Set to required volume (see page 41).
	Filling valve stuck	Clean the filling valve.If the valve is stuck use a 200 µl pipette tip to loosen it (see page 50). If necessary replace the filling valve with sealing washer.
Dispensing not possible	Discharge valve stuck	Clean discharge valve. If necessary replace discharge tube. (see page 50).
Air bubbles in the instrument	Reagent with high vapor pressure has been drawn in too quickly	Slowly draw in reagent.
	Seal not inserted, knurled locking nuts not firmly connected	Double check that seal is in place, and that the knurled locking nuts at the discharge tube and the SafetyPrime™ recirculation valve are firmly seated and finger tight.
	The instrument has not been primed	Prime the instrument (see page 41).
	Filling tube is loose or damaged	Push the filling tube on firmly. If necessary cut off approx. 1 cm of tube at the upper end and re-connect it or replace filling tube.
	Valves not firmly connected or damaged	Cleaning procedure (see page 48-50). Tighten the valves using the mounting tool. If necessary, replace the valves and sealing washers.
	Backflow tube not connected	Connect backflow tube (see page 38, Fig. 3).
Dispensed volume is too low	Discharge tube is loose	Push the discharge tube on firmly.
	Filling tube is loose or damaged	Cleaning procedure (see page 48-50). Push the filling tube on firmly. IIf necessary, cut off approx. 1 cm of the tube at the upper end and re-connect it or replace filling tube (see page 50).
	Filling valve is loose or damaged	Cleaning procedure (see page 48-50). Tighten the valves using the mounting tool. If necessary, replace filling valves and sealing washers.
Leaking liquid between instrument and bottle	Backflow tube not connected	Connect backflow tube (see page 38, Fig. 3).
	Volatile reagent dispensed without closure set	Mount closure set (see page 43).

If a problem cannot be fixed by following the troubleshooting guide, or by replacing spare parts, then the instrument must be sent in for repair.

For safety reasons, instruments returned for checks and repairs must be clean and decontaminated!

Return for Repair

a) Clean and decontaminate the instrument carefully.

b) Complete the 'Declaration on Absence of Health Hazards' (ask your supplier or manufacturer for the form. The form can also be downloaded from www.brand.de).

c) Send the completed form along with the instrument to the manufacturer or to the dealer with an exact description of the type of malfunction and the media used.

The return transport of the instrument is at risk and cost of the sender.

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.
BRAND also offers you the possibility to have your instruments calibrated by the BRAND Calibration Service or the BRAND-owned DKD 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 DKD/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).

* Based on the legal requirements the DKD Accreditation is successively transformed to the DAkkS Accreditation (Deutsche Akkreditierungsstelle GmbH), starting from January 1, 2010.

Warranty

We shall not be liable for the consequences of improper handling, use, servicing, operation 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 parts have been used.

Disposal

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

Subject to technical modification without notice. Errors excepted.

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