

METROHM LTD. CH-9101 Herisau (Switzerland)

Dosimat

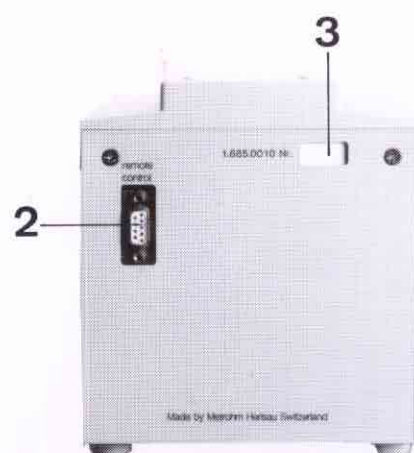
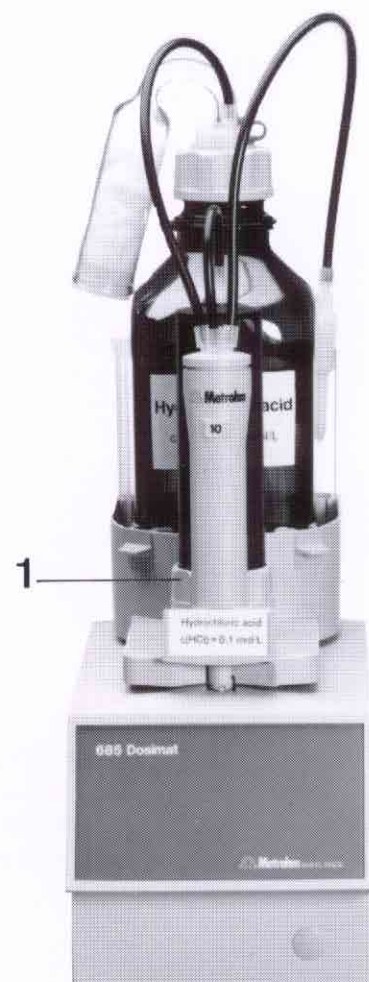
685

Series 01 ...

Instructions for Use of 685 Dosimat

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1. Overview

Front view of instrument:



Exchange Unit

Rear view of instrument:



Remote control
for the connection of a Control unit



Rating plate
with fabrication, series and instrument number

2. Exchange Unit

The Exchange Units are available in brown or clear glass with light protection. The models with light protection or in brown glass should be used for light-sensitive reagents (silver nitrate, Karl Fischer, etc.).

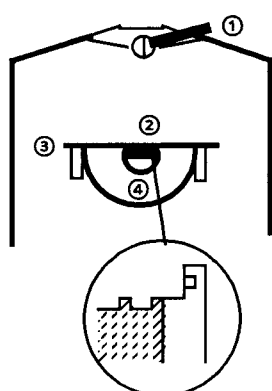
Accuracy data:

Burette volume V_{bur} (in ml)	Abs. error rel. to nominal value $\pm \Delta V$ (in ml)	Reproducibility error Accuracy $\pm \Delta V$ (in ml)	Resolution of the display ΔV (in ml)
1.000	0.003	0.001	0.001
5.000	0.015	0.005	0.001
10.000	0.02	0.005	0.001
20.000	0.03	0.01	0.002
50.000	0.05	0.04	0.005

Note:

In gravimetric checks of the dispensed volume, the air buoyancy (ca. 0.1%) must be taken into account in the weighing. Consideration should also be given to evaporation.

2.1 Setting up the 6.3011.XXX/6.3012.XXX Exchange Units



Before mounting the Exchange Unit, check that stopcock switch ① is on the right and coupling ② is parallel to ridge ③ and even with rings ④. The coupling can be adjusted with the 6.2739.010 key.

- Remove packing plate below the reagent bottle.
- Mount retaining clips for reagent bottle, see Fig. 3-1, page 10.

Fig. 2-1: Bottom of Exchange Unit

If you do not wish to use the reagent bottle supplied, convert your Exchange Unit as follows:

Snap in the reagent bottle retaining clips so that the reagent bottle sits snugly in the Exchange Unit. For different original reagent bottles, you need a special bottle siphon and possibly a threaded adapter. The following bottle siphons are available:

for bottles with GL45 thread, e.g. Riedel-de Haën (1 L), Baker (bottle siphon included in the standard equipment)	6.1602.100
for bottles with S40 thread, e.g. Merck	6.1602.110
for bottles with 32 mm thread, e.g. Fluka, Riedel-de Haën (500 mL)	6.1602.100 + 6.1618.000
for bottles with 28 mm thread, e.g. Fisher	6.1602.100 + 6.1618.010

- Screw the appropriate bottle siphon onto the reagent bottle.
- If necessary, replace the 6.1602.100 bottle siphon with the combination you need.

The holder on the right serves to hold the burette tip; in the holder on the left you can store, for instance the electrode associated with the reagent.

2.2 Assembly of the 6.3006.XXX/6.3007.XXX Exchange Units

See also Fig. 3-2, page 11.

- The instrument without Exchange Unit is set to zero.
- Mount Exchange Unit (without glass cylinder) from the front on the sliding plate and push right back.
- Allow piston spindle to run out by ca. 2 cm.
- Carefully grease PTFE piston (see section 2.5), assemble coupling and carefully slide glass cylinder over it from above ensuring exact axial alignment. (If the PTFE piston slips out of the coupling, the 6.1546.010 piston rod can be used to shift the piston in the glass cylinder.)
- Center cylinder in the slot of the exchange support.
- Clamp cylinder with 6.2035.00 flange and 6.1549.00 clamping ring moderately tightly. (For 50 mL units, use 6.1551.000 plastic flange.)
- Fit remaining components of Exchange Unit.
 - . Tubing connections:

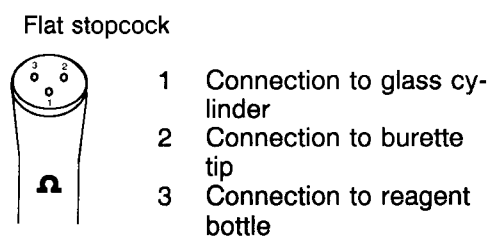


Fig. 2-2: Stopcock tubing connections

- . Tighten screw nipple by hand. Nipples should be tightened with the 6.2739.000 key only at inaccessible locations and not too tightly (tightening force ca. 100 p ~ 1 N with 5 cm key). The tubing must not be pinched.
- Let piston move to zero position.

2.3. First-time filling

- Fill the reagent bottle with the titrant.
- Insert a cotton wool plug in the adsorption tube and add a suitable protective agent. Cover with another cotton wool plug and close with cover.

Repeat dispensing and filling process in both directions until the glass cylinder together with the connections up to the burette tip is filled. To allow air to escape better, hold burette tip up. Experience has shown that small air bubbles do not cause any disturbance as they remain connected to the wall even when the piston moves quickly.

2.4 Changing the Exchange Unit

When the Exchange Unit is mounted or removed, the burette must be in the zero position (filled + drive play taken up), otherwise the exchange support will be mechanically arrested by the piston spindle.

All Exchange Units are adjusted such that the spindle is even with the sliding plate when in the zero position thereby ensuring universal interchangeability.

If an Exchange Unit can not be mounted, the coupling of the PTFE piston must be adjusted with the aid of the 6.2739.010 Key in the case of the 6.3011.XXX/6.3012.XXX models or with the 6.1546.010 Piston Rod with the other models.

2.5 Maintenance

It is best to store the burette tip in the same solvent as the reagent to prevent crystallisation of reagent: Fill glass holder with solvent, pass burette tip through the bulb stopper and place in the glass holder. In the case of KF reagent, use methanol as storage solution. **Warning:** Before dispensing check that the burette tip is not blocked!

Emptying and cleaning:

- Discharge as much titrant as possible.
- Burette in the zero position, disconnect connections to bottle and burette tip.
- With 6.3011.XXX and 6.3012.XXX Exchange Units, remove light protection.
- Undo attachment of the glass cylinder and let spindle run out until the piston can be disengaged.
- Completely empty cylinder with the aid of the 6.2739.010 Key or 6.1546.010 piston rod and carefully pull out piston.
- Rinse and clean individual parts properly. (Especially ensure that no reagent remains in the threaded hole of the PTFE tubing connections.)

PTFE piston

The PTFE piston must be handled with care to avoid damaging the lip seals. Residual grease should be wiped off with a soft, lint-free cloth. Carefully apply fresh grease with your finger to the lip seals and in the spaces. Wipe off leading edge to ensure that the reagent does not come into contact with the grease. When inserting the piston in the glass cylinder, ensure that it is introduced straight and not at an angle.

SISCO 3000 (Swedish Iron & Steel Corp.) grease - this is not silicon grease (!), the name refers to the manufacturer - has well proved its worth since our tests have shown that it is not only inert to all titrants in normal use, but also has a favourable viscosity.

A worn piston must be replaced immediately to prevent titrant leaking out and corroding the drive spindle.

Stopcock

The stopcock needs no maintenance. If a defect is suspected, it is best to return it to the manufacturer for checking unopened (improper handling can render the stopcock completely useless). It is thus advisable to keep a 6.1542.0X0 stopcock as a spare at all times.

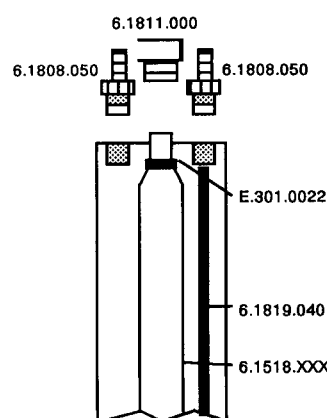
Removing the stopcock:

- . Switch lever to "↑" ≙ dispensing.
- . Unscrew nipples of the tubing connections.
- . Pull out 6.1542.0X0 stopcock upwards (pull hard!).

Refitting:

- . Switch lever to "↑" ≙ dispensing.
- . For PTFE stopcock: Align marking on shaft and housing of stopcock.
- . Insert stopcock from above in the holder and press down until the quick-release coupling engages.
- . Screw in screw nipples.

2.6 Mounting the thermostat jacket of the 6.3011.XXX/6.3012.XXX Exchange Units



1. Undo tubing connection of 6.1518.XXX glass cylinder.
2. Remove light protection.
3. Unscrew 6.1811.000 screw fitting at glass fitting.
4. Roll O-ring upwards out of groove on glass fitting. Do not use any hard objects to remove the O-ring, otherwise the edge of the glass fitting can splinter! If all else fails, cut O-ring. Ordering number for new O-ring: E.301.0022.
5. Lightly grease inside of 6.1536.010 thermostat jacket at the bottom and mount.
6. Lightly grease O-ring and attach to glass fitting.
7. Attach upper part of 6.1811.000 screw fitting to glass fitting.
8. Make connection to stopcock.
9. Insert 6.1819.040 PTFE tubing in thermostat jacket and attach thermostat tubing using 6.1808.050 coupling.

Fig.2-3Thermostat jacket

2.7 6.3006.113 Micromodel - 1 mL

Assembly:

See also Fig. 3-3, page 12

- Dosimat without Exchange Unit is in the zero position.
- Mount Exchange Unit (without glass cylinder) from the front on the sliding plate and push right back.
- Allow piston spindle of Dosimat to run out by ca. 2 cm
- Mount 6.3022.113 Exchange Set and screw tightly.
- Join coupling of the piston spindle to that of the exchange set and move piston spindle of the Dosimat into the zero position.
- Fasten fitting with 6.2035.000 metal flange and V.911.0040 knurled nuts using 6.2035.000 metal flange.
- Turn glass piston until curve is aligned towards the handle.
- Attach remaining components of the Exchange Unit.
- . Tubing connections:.

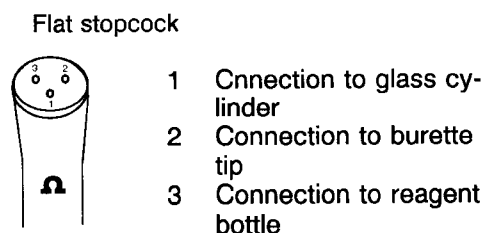


Fig. 2-4: Stopcock tubing connections

- . Tighten tubing connections firmly by hand. Use 6.2739.000 key at all inaccessible positions and tighten using a moderate amount of force (tubing must not be pinched).
- Warning:** Solids block the capillary tubing! Never pull on the tubing!
- Move piston to zero position.

Filling:

- Fill the reagent bottle with titrant.
- Insert a cotton wool plug in the adsorption tube and add a suitable protective agent. Cover with cotton wool and close with cover.

Repeat dispensing and filling process in both directions until the glass cylinder together with the connections up to the burette tip is filled. Drive any air bubbles to the top by lightly tapping the glass cylinder. If the air bubbles do not move, the Exchange Unit must be disassembled and the glass piston carefully degreased and dried.

Cleaning:

- Undo tubing connection to reagent bottle, repeat "dispensing" and "filling" until the piston is as empty as possible.
- Undo tubing connection to glass piston.
- Remove Exchange Unit from Dosimat.
- Unscrew knurled nuts and remove piston and fitting.
- Unscrew exchange set from fitting and disassemble Exchange Unit into its parts.
- Clean all parts thoroughly and dry (ensure that no reagent remains in the threaded holes of the tubing connections).
- If need be, replace 6.2712.000 Seal (round part pointing upwards).

3. Appendix

3.1 Technical specifications

Dosification	
Volume of a burette cylinder	1, 5, 10, 20 or 50 ml
Resolution	10 000 steps per burette cylinder
Materials	
Housing	polybutyleneterephthalate (PBTP)
Keypad covers	polycarbonate (PC)
Ambient temperature	
Nominal operational range	5 ... 40 °C
Storage, transport	– 20 ... 70 °C
Safety specifications	Designed and tested in accordance to IEC publication 348, safety class I. This manual contains some information and warnings which have to be followed by the user to ensure safe operation and to retain the apparatus in safe condition.
Dimensions with Exchange Unit	
Width	150 mm
Height	450 mm
Depth	275 mm
Weight	app. 1.6 kg

3.2 Warranty

The warranty regarding our products is limited to rectification free of charge in our workshops of defects that can be proved to be due to material, design or manufacturing faults which appear within 12 months from the day of delivery. Transport costs are chargeable to the orderer.

For day and night operation, the warranty is valid for 6 months.

Glass breakage in the case of electrodes or other glass parts is not covered by the warranty. Checks which are not a result of material or manufacturing faults are also charged during the warranty period. For parts of outside manufacture insofar as these constitute an appreciable part of our instrument, the warranty stipulations of the manufacturer in question apply.

With regard to the guarantee of accuracy, the technical specifications in the Instructions for Use are authoritative.

Concerning defects in material, construction or design as well as the absence of guaranteed features, the orderer has no rights or claims except those mentioned above.

If damage of the packaging is evident on receipt of a consignment or if the goods show signs of transport damage after unpacking, the carrier must be informed immediately and a written damage report demanded. Lack of an official damage report releases METROHM from any liability to pay compensation.

If any instruments and parts have to be returned, the original packaging should be used if at all possible. This applies above all to instruments, electrodes, burette cylinders and PTFE pistons. Before embedding in wood shavings or similar material, the parts must be packed in a dustproof package (for instruments, use of a plastic bag is imperative). If open assemblies are enclosed in the scope of delivery that are sensitive to electromagnetic voltages (e.g. data interfaces etc.) these must be returned in the associated original protective packaging (e.g. conductive protective bag). (Exception: assemblies with built-in voltage source belong in a non-conductive protective packaging). For damage which arises as a result of non-compliance with these instructions, no warranty responsibility whatsoever will be accepted by METROHM.

3.3 Scope of delivery and ordering designations

3.3.1 685 Dosimat

685 Dosimat 2.685.0010

including the following accessories:

1 Key for exchange units 6.2739.010

1 Instructions for Use for 685 Dosimat 8.685.1003

Options

Accessories to separate order and on payment of extra charge:

649 Magnetic Stirrer

Magnetic Swingout Stirrer 649 2.649.0040

Cables

Cable 685 Dosimat - 726 Titroprocessor, 729 Dosimat Interface,
693 VA Prozessor, 746 VA Trace Analyzer 6.2134.000

Cable 685 Dosimat - 736 Titrino 6.2134.030

3.3.2 Exchange Units

Burette cylinder volume 5 mL

Light protection, burette tip with microvalve 6.3012.153

Amber glass, burette tip with microvalve 6.3007.153

Amber glass, burette tip without microvalve 6.3006.153

Burette cylinder volume 10 mL

Light protection, burette tip with microvalve 6.3012.213

Amber glass, burette tip with microvalve 6.3007.213

Amber glass, burette tip without microvalve 6.3006.213

Burette cylinder volume 20 mL

Light protection, burette tip with microvalve 6.3012.223

Amber glass, burette tip with microvalve 6.3007.223

Amber glass, burette tip without microvalve 6.3006.223

Burette cylinder volume 50 mL

Light protection, burette tip without microvalve 6.3011.253

Amber glass, burette tip without microvalve 6.3006.253

Accessories, see Fig. 3-1 und 3-2.

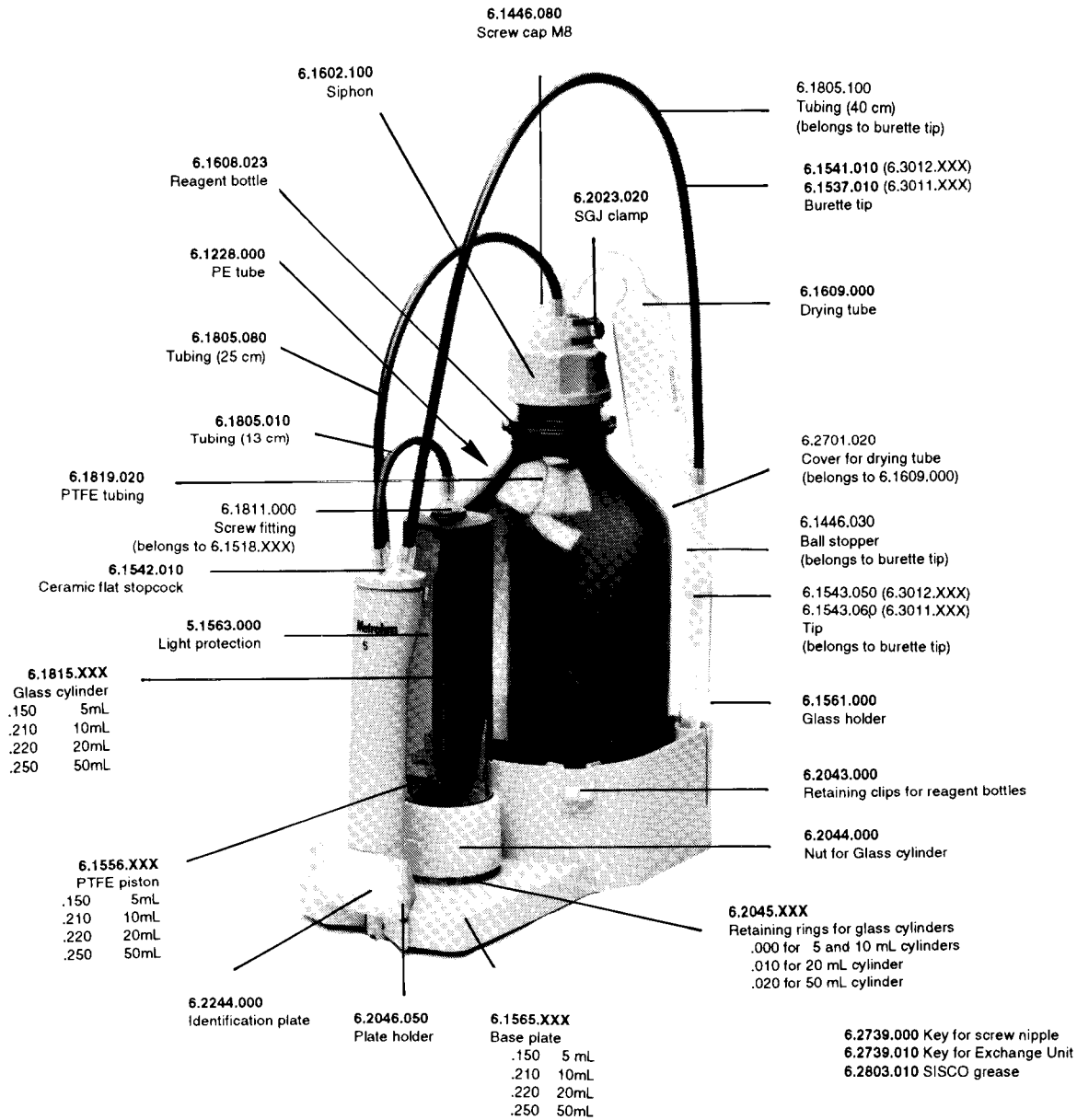


Fig. 3-1: Standard accessories and ordering designations for the 6.3011.253 und 6.3012.XXX Exchange Units

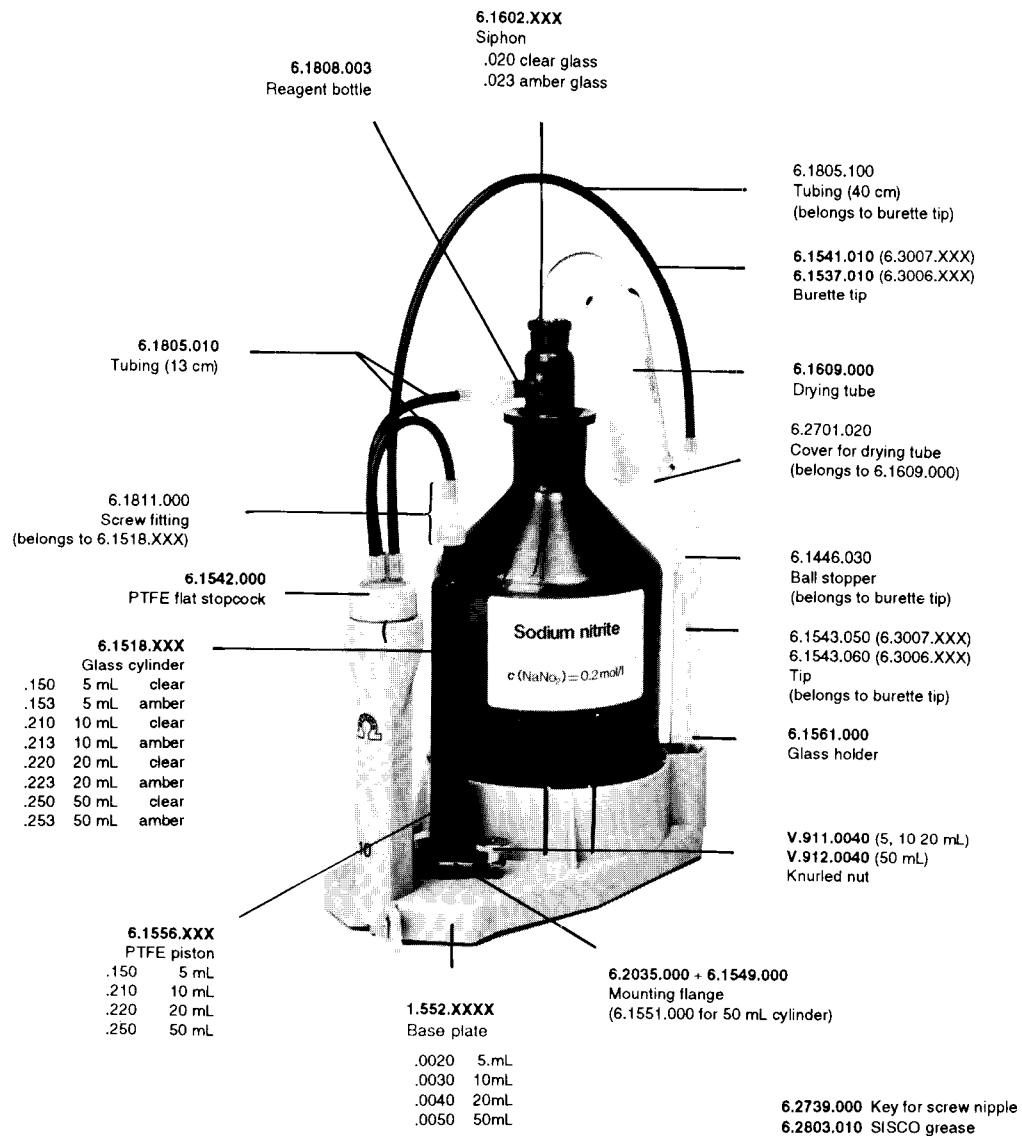


Fig. 3-2: Standard accessories and ordering designations for the 6.3006.XXX and 6.3007.XXX Exchange Units

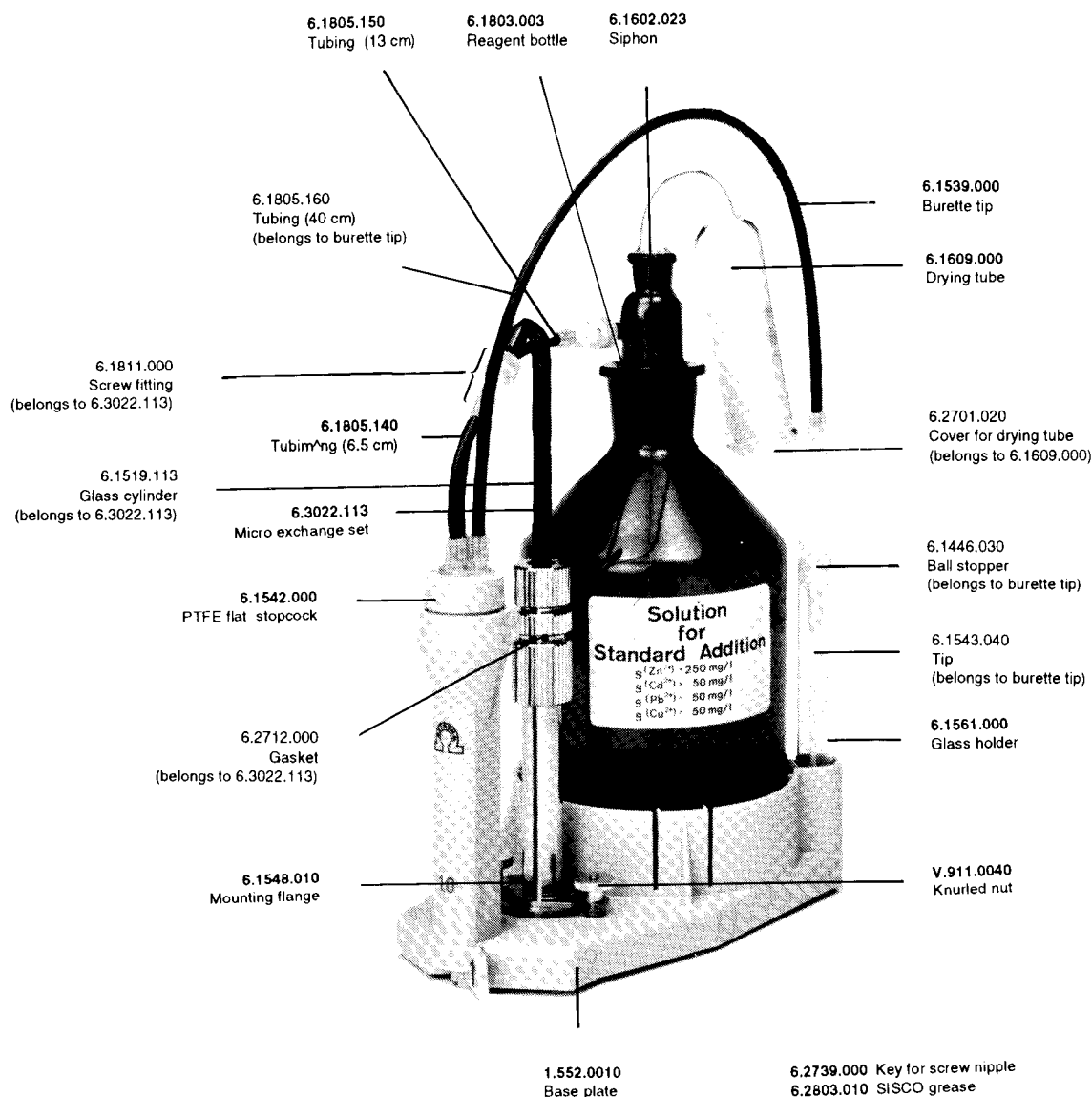


Fig. 3-3: Standard accessories and ordering designations for the 6.3006.113 1 mL Exchange Unit

Options for Exchange Units

Accessories to separate order and on payment of extra charge:

Bottles and accessories:

Siphon with GL 45 thread (bottles from Riedel de Haën, ...)

Siphon with S40 thread (bottles from Merck ...)

Amber glass bottle with GL 45 thread

Bottle made of PE with thread GL45

Bottle made of PP with ground-glass joint SGJ 29

Siphon for bottles with SGJ 29

Thread adapter 32 mm/GL 45

Thread adapter 28 mm/GL 45

6.1602.120

6.1602.130

6.1608.023

6.1608.040

6.1608.004

6.1602.023

6.1618.000

6.1618.010

Tubing and accessories:

The standard screw fitting of the Exchange Units has M6 thread size. On change to M8 thread, the 6.1808.040 Thread Adapter is needed.

Extension tubing with screw nipples, M6 thread	
Length 80 cm	6.1805.110
Length 150 cm	6.1805.030
additional lengths, see Accessories catalogue	
Extension tubing with screw nipples, M8 thread	
Length 50 cm	6.1805.200
Length 25 cm	6.1805.210
Connecting sleeve for tubing extensions (tubing with M6 thread)	6.1808.000
T-connection for tubing with M6 thread	6.1808.060
T-connection for tubing with M8 thread	6.1808.070
Coupling with M6 thread and stub for tubing with internal diameter app. 3 mm	6.1808.020
Coupling with M8 thread and stub for tubing with internal diameter app. 3 mm	6.1808.050
Screw cap, seals tubing with M6 thread together with 6.1808.000 Connecting Sleeve	6.1446.040
Screw fitting for glass cylinder and tubing with M6 thread	6.1811.000
Screw fitting for glass cylinder and tubing with M8 thread	6.1811.010

Tubing connections with larger internal diameter and M8 thread at Exchange Unit:

For the connection bottle-stopcock:

Stopper, M6 thread	6.1446.040
PTFE tubing	6.1819.030
Tubing with screw nipples, 25 cm, M8 thread	6.1805.210
Thread adapter with M6 outer thread, M8 inner thread	6.1808.040
For the connection stopcock-tip:	
Thread adapter with M6 outer thread, M8 inner thread	6.1808.040
Tubing with screw nipples, 50 cm, M8 thread	6.1805.200
Tip, M8 thread	6.1543.120

Burette tips:

Earthing for burette tip	6.1808.030
Tip without anti-diffusion valve	6.1543.060
Tip with anti-diffusion valve	6.1543.050

Miscellaneous:

Thermostat jacket for 6.3011.XXX and 6.3012.XXX Exchange Units with M8 thread	6.1563.010
PTFE tubing for thermostat jacket, 105 mm	6.1819.040
Coupling for thermostat jacket tubing	6.1808.050
Coupling for 6.1542.010 Ceramic Flat Stopcock in 6.3006.XXX and 6.3007.XXX Exchange Units	6.1564.000
SISCO 300 grease, 1 oz. (28.35 g)	6.2803.000



EC Declaration of Conformity

The METROHM AG company, Herisau, Switzerland hereby certifies, that the instrument:

685 Dosimat

meets the requirements of EC Directives 89/336/EWG and 73/23/EWG.

Source of the specifications:

- | | |
|------------|---|
| EN 50081-1 | Electromagnetic compatibility, basic specification
Emitted Interference |
| EN 50082-1 | Electromagnetic compatibility, basic specification
Interference Immunity |

Description of the instrument:

Universal dispenser for liquid handling in laboratories, for titration and dosing tasks.

Herisau, December 5, 1995

Dr. J. Frank

Development Manager

Ch. Buchmann

Production and
Quality Assurance Manager