Our Calibration Syringes, having a known calibrated volume as a standard, provide an easy and reliable method of calibrating and measuring the accuracy of respiratory volume measuring equipment in the field on a regular basis to satisfy your quality assurance program.

The 3 Liter size Syringe has been recommended as a minimum standard by the "Report of 1977 Snow Bird Workshop on Standardization of Spirometry", as the minimum volume to test spirometers. Our 7 liter size is the largest size Syringe, known to us, to be commercially available. This larger size is very useful in checking your Spirometer through a full 7 liters in a single uninterrupted complete volume stroke.

**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Model Series</th>
<th>5520</th>
<th>5510</th>
<th>5550</th>
<th>5540</th>
<th>5530</th>
<th>5570</th>
<th>4900</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Volume</td>
<td>10ml</td>
<td>100ml</td>
<td>1/2L</td>
<td>1L</td>
<td>3L</td>
<td>3L</td>
<td>7L</td>
</tr>
<tr>
<td>Smallest Graduation (ml)</td>
<td>2</td>
<td>20</td>
<td>50</td>
<td>50</td>
<td>100</td>
<td>3000</td>
<td>100</td>
</tr>
<tr>
<td>Volume Stroke (inch)</td>
<td>3</td>
<td>5</td>
<td>6.1/4</td>
<td>12.38</td>
<td>14.3/4</td>
<td>14.3/4</td>
<td>15</td>
</tr>
<tr>
<td>Cylinder Bore (ID)(inch)</td>
<td>7/8</td>
<td>1.27</td>
<td>1.14</td>
<td>2.1/2</td>
<td>2.1/2</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Weight (lbs.)</td>
<td>.17</td>
<td>.39</td>
<td>1.7</td>
<td>2</td>
<td>5</td>
<td>5.3</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>(grams)</td>
<td>75</td>
<td>175</td>
<td>771</td>
<td>907</td>
<td>2268</td>
<td>2411</td>
</tr>
</tbody>
</table>

**ADJUSTABLE POSITIVE STOP FOR SETTING VOLUME**

These stops allow accurate repetitive duplication of your selected volume.

1/2, 1, 3 & 7 Liter Syringes -

- The volume stop is easily located on the graduated piston rod for the desired volume.
- A socket-hex wrench is supplied for tightening the volume-stop.
- The volume stop can be set throughout the entire 1/2, 1, 3 & 7 Liter range.
- The 5570 Series 3 Liter Syringe is factory set to 3L and is not adjustable.

100cc and 10cc Miniature Syringes -

- The method of setting the volume stop is unlike the 1/2, 1, 3 & 7 Liter Syringes.
- Each volume graduation on the piston rod has a groove which engages with a spring loaded detent, in the volume stop, for locating the desired volume. A screw, in the volume stop, is then tightened with a socket-hex wrench to securely hold the stop.
- These volume stops can only be set at the following graduations:
  5510 Series - 20ml, 40ml, 60ml, 80ml, & 100ml
  5520 Series - 2ml, 4ml, 6ml, 8ml, & 10ml

**OUTLET PORT ADAPTERS**

- They thread into the end plate, making it convenient to use the various standards or custom OD / ID size connections. Some 5570 Series 3L Syringe and some 5530 Series Syringes have integrally molded outlet adapters and are not removable.
- The 1/2, 1, 3 & 7 liter sizes have the same thread and are therefore interchangeable.
- The Miniature 100ml and 10ml Model end plates have different size threads for the outlet port adapters, therefore these outlet port adapters can NOT be interchanged.

**QUALITY ASSURANCE**

- Traceable to the National Institute of Standards and Technology (NIST).
- The accuracy of each syringe is ± 1/2 of 1% full scale.
- Quality Assurance guidelines recommend that inspection and recalibration procedures of the syringe accuracy be performed three to four times a year, once a year at a minimum.

**CONSTRUCTION**

- 1/2, 1, 3 & 7 Liter cylinders are aluminum with hard anodize.
- 100 & 10 ml cylinders are acrylic plastic.
- Piston Seals are PTFE or nitrile rubber.
- Piston rods are aluminum (black anodize), stainless steel or polyamide thermoplastic.
- End plates, port adapters are POM, PET or PBT plastic.

**MAINTENANCE / SERVICE (RE-CALIBRATION)**

- Lubrication of seal should only be required once a year for the typical lab.
- For any re-conditioning, recalibration, replacing piston seals or replacing end cap o-rings, we encourage your returning syringe to us.
- The cost is nominal. We will Quote you a firm price after an evaluation of your Syringe. Contact Hans Rudolph, inc. for a Return Authorization Number (RAN).
- A Rental Program is available if your system must stay up and running. Contact Hans Rudolph, inc office for information.
- CAUTION: United States law restricts this device to sale by or on the order of a physician.
- WARNING: Refer to Instructions for Use, Document No. 691203, shipped with product.
ORDERING INFORMATION
P/N-Model No.

5520 Series 10ml Syringe - 1/2"(1.3cm) Diameter Cylinder. Has 2ml graduations with positive adjustable locking stop. Full volume stroke is 3"(7.6cm).
112380-5520A 10ml Syringe with 200271 Outlet 15mmOD/10.5mmID tapers
112381-5520B 10ml Syringe with 200272 Outlet 22mmOD/15mmID tapers

Replacement Outlet Port Adapters for 10 ml Series
200271 Outlet Adapter 15mm OD/10.5mmID tapers
200272 Outlet Adapter 22mmOD/15mmID tapers

5550 Series 1/2L Syringe - 1/2"(6.35cm) diameter cylinder. Has 0.5 ml graduations with positive adjustable locking stop. Full volume stroke is 5" (12.7cm).
112378-5510A 100ml Syringe with 200269 Outlet, 15mmOD/10.5mmID tapers
112379-5510B 100ml Syringe with 200270 Outlet, 22mmOD/15mmID tapers
Replacement Outlet Port Adapters For 100ml Syringes
200269 Outlet Adapter 15mm OD/10.5mmID tapers
200270 Outlet Adapter 22mmOD/15mmID tapers

5510 Series 100ml Syringe - 1 1/4"(3.2cm) diameter cylinder. Has 20ml graduations with positive adjustable locking stop. Full volume stroke is 5" (12.7cm).

5550 Series 1/2L Syringe - 1/2"(6.35cm) diameter cylinder. Has 50ml graduations with adjustable locking stop. Full volume stroke is 12.38" (31.45cm).
112742-5550 1/2 Liter Syringe with 200264 Outlet. 1 3/8"(33.5mm)OD/ 1 1/8"(28.6mm)ID
112743-5550A 1/2 Liter Syringe with 200265 Outlet, 3 3/4"(44.5mm)OD/ 1 1/8"(28.6mm)ID (Long OD tapered outlet)
112744-5550B 1/2 Liter Syringe with 200266 Outlet, 22mmOD/15mmID tapers
112745-5550C 1/2 Liter Syringe with 200267 Outlet, Fits over 2"(50.8mm)OD with 0-Ring slip fit
112746-5550D 1/2 Liter Syringe with 200268 Outlet, 1 1/8"(28.6mm)OD/22mmID taper

5540 Series 1L Syringe - 2 1/2"(6.35cm) diameter cylinder. Has 50 ml graduations with adjustable locking stop. Full volume stroke is 6 1/4"(15.78cm).
112706-5540 1 Liter Syringe with 200264 Outlet, 1 3/8"(33.5mm)OD/ 1 1/8"(28.6mm)ID
112707-5540A 1 Liter Syringe with 200265 Outlet 1 3/4"(44.5mm)OD/ 1 1/8"(28.6mm)ID (Long OD tapered outlet)
112708-5540B 1 Liter Syringe with 200266 Outlet, 22mmOD/15mmID tapers
112709-5540C 1 Liter Syringe with 200267 Outlet, Fits over 2"(50.8mm)OD with 0-Ring slip fit
112710-5540D 1 Liter Syringe with 200268 Outlet, 1 1/8"(28.6mm)OD/22mmID taper

5530 Series 3L Syringe - 4"(10.2cm) diameter cylinder. Has 100 ml graduations with adjustable locking stop. Full volume stroke is 14 3/4"(37.5cm).
112028-5530 3 Liter Syringe with Integral Outlet 1 3/8"(35mm) OD/ 1 1/8"(28.6mm)ID
112231-5530A 3 Liter Syringe with 200265 Outlet 1 3/4"(44.5mm)OD/1 1/8" (28.6mm)ID (Long OD tapered outlet)
112232-5530B 3 Liter Syringe with 200266 Outlet 22mmOD/15mmID tapers
112233-5530C 3 Liter Syringe with 200267 Outlet Fits over 2"(50.8mm)OD with 0-Ring slip fit
112256-5530D 3 Liter Syringe with Integral Outlet 1 1/8"(28.6mm)OD/22mmID taper

5570 Series 3L Syringe - 4"(10.2cm) diameter cylinder. Factory set for 3,000 Liter volume stroke displacement - Not adjustable.
113391-5570 3 Liter Syringe with Integral Outlet 1 3/8"(35mm) OD/ 1 1/8"(28.6mm)ID
113638-5570A 3 Liter Syringe with 200265 Outlet 1 3/4"(44.5mm)OD/1 1/8" (28.6mm)ID (Long OD tapered outlet)
113631-5570B 3 Liter Syringe with 200266 Outlet 22mmOD/15mmID tapers
113392-5570D 3 Liter Syringe with Integral Outlet 1 1/8"(28.6mm)OD/22mmID taper

4900 Series 7L Syringe - 6"(15.2cm) diameter cylinder. Has 100ml graduations with adjustable locking stop. Full volume stroke is 15"(38.1cm).
112099-4900 7 Liter Syringe with 200264 Outlet 1 3/8"(33.5mm)OD/ 1 1/8" (28.6mm)ID
112234-4900A 7 Liter Syringe with 200265 Outlet 1 3/4"(44.5mm)OD/1 1/8" (28.6mm)ID (Long OD tapered outlet)
112235-4900B 7 Liter Syringe with 200266 Outlet 22mmOD/15mmID tapers
112236-4900C 7 Liter Syringe with 200267 Outlet Fits over 2"(50.8mm)OD with 0-Ring slip fit
112568-4900D 7 Liter Syringe with 200268 Outlet 1 1/8"(28.6mm)OD/22mmID taper

Replacement Outlet Port Adapters for 1/2, 1, 3, & 7 Liter Syringes
200264 Outlet Adapter 1 3/8"(33.5mm)OD/ 1 1/8" (28.6mm)ID
200265 Outlet Adapter 1 3/4"(44.5mm)OD/1 1/8" (28.6mm)ID taper (Long OD tapered outlet)
200266 Outlet Adapter 22mmOD/15mmID tapers
200267 Outlet Adapter 2"(50.8mm)ID 0-ring slip fits over 2"(50.8mm)OD
200268 Outlet Adapter 1 1/8" (28.6mm)OD/22mmID taper

Replacement Parts for Syringes
171171 "T" Allen Wrench. For Series 5520 and 5510
171125 "T" Allen Wrench. For Series 5550, 5540, and 4900
171129 "T" Allen Wrench. For Series 5550
171115 Setting Collar, stainless steel, For Series 5550, 5540, and 4900
200232 Setting Collar, ball plunger, stainless steel. For Series 5520 & 5510
171126 Knob. For Series 5550, 5540, and 4900
171168 Knob. For Series 5520 and 5510


IN-COMING CALIBRATION REPORT - on returned calibration syringe. This report must be requested at time of obtaining Return Authorization Number (RAN). 5-7 Data points will be checked with pass or fail indications.

CERTIFICATE OF CALIBRATION - Provides National Institute of Technology (NIST) traceability to Hans Rudolph, inc. syringe test standards and actual volume calibration data (5-7 points) on your syringe with stated accuracy.

NIST TRACEABILITY of your Rudolph Volume Calibration Syringe with 5 to 10 times greater accuracy than standard certificate of calibration. Hans Rudolph, inc. will certify the volume displacement of any specified reading(s) per your request. The price includes standard certificate of recalibration/calibration. The price is per graduation mark (contact HR for special pricing on 5 or more points per syringe).

CLEANING
This product requires special cleaning and care, which is described in our Instructions for Use 691203.

APPLICABLE STANDARDS FOR MEDICAL TAPERED CONNECTIONS: 7.5mm, 10.5mm, 15mm, 22mm & 30mm

The 15mm, 22mm and 30mm tapered male and female diameter fitting connections are manufactured in accordance with the applicable standards as follows:
- ISO (The International Organization for Standardization) 5356-1 conical connectors, cones and sockets.

GENERAL INFORMATION
- Packaged: Individually polyethylene bagged and shipped clean, non-sterile.

REFERENCE