

# Nebulizers

## Burgener Parallel Path Nebulizers

- Greatly reduced maintenance
- Direct replacement for concentric nebulizers
- Complete with fittings and ready to install

Burgener nebulizers use the patented, enhanced parallel path method which produces a superior mist when compared to other pneumatic nebulizers. You'll notice increased stability and greater sensitivity. Teflon\*gas and sample capillaries are employed for purity. Non-stick materials minimize salting and reduce clogging. All nebulizers are shipped with the appropriate fittings for your instrument at no additional charge. Provide us with your model number when you place your order. Your nebulizer will be ready to install when it arrives.

### Teflon Mira Mist

Enhanced Parallel Path Teflon Nebulizer. Can operate on 0.2 ml/min to 2.5 ml/min. Excellent mist, and can handle high level of particulates in sample. Fits regular chambers as a direct replacement for glass concentric nebulizers. Operates on standard pressures of 35 - 45 psi. The Teflon Mira Mist can be used for any liquid. Salting is very rare, but can occur over long periods of time, especially with high Sodium levels in the solution. Such salting can be cleared easily with a dip in 5 - 10% HF.

### TMM 3500

### PEEK Mira Mist

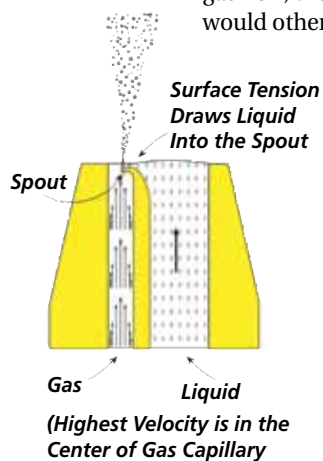
Works for most samples, but not concentrated acids, and not some organic solvents. Still has Teflon capillaries for the samples and for the gas. Standard pressure (45 psi), low sample flow, enhanced parallel path design. Can operate on 0.2 ml/min to 2.5 ml/min. Excellent mist, and can handle high level of particulates in sample. Fits regular chambers as a direct replacement for glass concentric nebulizers.

### PMM 4000

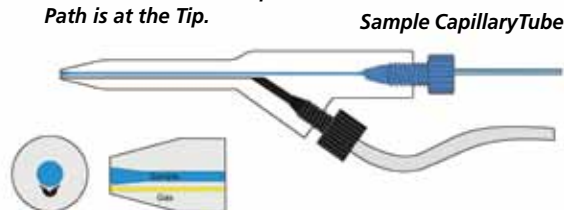


### Outline of Enhanced Parallel Path method

By adding a tiny spout that directs the liquid into the center of the gas flow, the liquid is impacted with 9 to 100 times the energy it would otherwise have, and the droplets produced are much smaller.



No Plugging:  
Greatest Width in Sample  
Path is at the Tip.



Enhanced Parallel Path Method:  
The Gas Orifice is Beside the Sample Path

The enhanced Parallel Path Method  
enables nebulizers to run over very  
large ranges of flow rates.

### T 2100

Enhanced Parallel Path Teflon Nebulizer. Huge Sample Capillary: 750 microns / 1/32 inch. Designed as replacement for T2002 and BTN. Essentially unpluggable with un-dissolved particles. Can operate on 0.5 ml/min to 3.0 ml/min. Excellent mist, but not quite as good as Mira Mist, but better than most concentrics. Can handle very high levels of particles in samples. Fits regular chambers as a direct replacement for glass concentric nebulizers. Operates on standard pressures of 30 - 45 psi.

The T 2100 can be used for any liquid. Salting is very rare, but can occur over long periods of time, especially with high Sodium levels in the solution. Such salting can be cleared easily with a dip in 5 - 10% HF,

### T 2100

### Ari Mist

Very low sample flow, enhanced parallel path design. Standard pressure (40 - 50 psi). Black PEEK body, Teflon sample and gas capillaries. Can operate on 0.050 ml/min to 1.0 ml/min. Good for ICP and ICP/MS. Only for samples that are particulate free. Fits regular chambers as a direct replacement for glass concentric nebulizers.

### AM 5000



### Ari Mist HP

Very low sample flow, enhanced parallel path design. Higher Pressure (80 psi). Brown PEEK body, Teflon sample and gas capillaries. Can operate on 0.005 ml/min to 1.0 ml/min. Good for LC/ICP/MS. Only for samples that are particulate free. Fits regular chambers as a direct replacement for glass concentric nebulizers. When run at less than 10 ul/min it provides similar results to direct injection nebulizers, without the difficulties of direct injection.

### AM HP 5500



### ENYA Mist

Ultra low sample flow, enhanced parallel path design. Standard Pressure (50 psi). Our lowest flow ICP/MS nebulizer. Runs from 200 nanoliters/minute to 50 ul/min. Designed for ICP/MS - HPLC interface, tiny samples, and for Split flow applications - simple addition of a T connection allows 500 ul/min pumped to nebulizer, with 10 - 20 ul/min delivered to nebulizer. Produces very low oxides in ICP/MS. Can NOT handle high levels of particulates in samples. Fits regular chambers as a direct replacement for glass concentric nebulizers. Straight chambers are better than cyclonics - sample drops are lost in cyclonics on the wall beside the injection point.

### EM 6000



### T 2002

Our old original standard nebulizer and fits most chambers, combine these sentences. Best results are with Cyclonic Chambers. For most applications, the T2100 is a better nebulizer since it handles larger particles, lasts longer, and provides virtually the same intensities and stability.

### T2002

Catalogue #	Style Nebulizer	Operating Pressure At 1L/min	Sample Flow Rate $\mu$ L/min
TMM 3500	Teflon Mira Mist	50psi	250 to 2500 uL/min
PMM 4000	PEEK Mira Mist	50psi	250 to 2500 uL/min
T 2100	T 2100	45psi	500 to 3000 ul/min
AM5000	Ari Mist	50psi	50 to 1500 ul/min
AM HP 5500	Ari Mist HP	80psi	5 to 1500 ul/min
EM 6000	ENYA Mist	50psi	0.2 to 50 uL/min
MM CE	Mira Mist CE	80psi	2 to 2500 uL/min
T2002	T 2002	50psi	500 to 2000 uL/min

# Nebulizer Accessories



Burgener Research Inc.

## Mira Mist and Ari Mist Fittings

Mira Mist and Ari Mist nebulizers use 2 mm gas lines and UpChurch finger tight fittings for the gas lines and for the sample lines. Although this allows for simple attachment of GC/LC/CE systems, it is not standard for nebulizers. To ensure simple attachments to your instruments, we have an extensive array of fittings available.

## Mira Mist and Ari Mist Gas & Sample Line Fittings

Gas line fittings are usually included with the nebulizer. Please note that we try to send the correct fittings with the nebulizers, but there are many to select from, and we sometimes send the wrong one. Please use the following list to correctly identify your gas fittings and call us for a replacement.

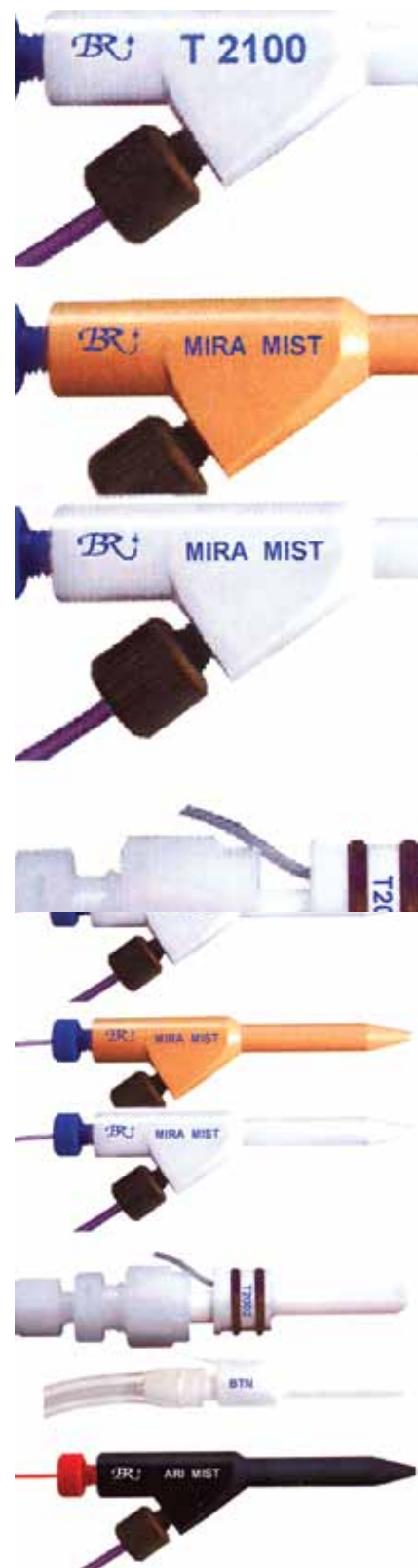
Description	Catalogue #
Agilent / HP	BRG 200 & P652-Kel-F
JY	BRG 204
GBC	BRG 306
Finnigan	BRG 306
Leeman	BRG 306
PE / Sciex Elan ICP/MS (1/4" Swagelok gas lines)	BRG 206
PE Optima 3000 series	BRG 206
PE Optima 2000, 4000 & 5000 series	BRG 308
Spectro	BRG 309
Thermo Elemental - TJA ICP (Luer Lock fitting)	BRG 305
Thermo Elemental - iCAP 6000 series ICP	BRG 204
Thermo Elemental - VG Elemental ICP/MS pre 2002	BRG 307
Thermo Elemental - VG Elemental ICP/MS 2002+ (X series)	BRG 204
Varian - ICP	BRG 306

### 10/32 to Swagelok

- 1/8" Adapter for 1/8" gas lines. **BRG 103**
- 4 mm Adapter for 4 mm gas lines. **BRG 104**
- 1/4" Adapter for 1/4" gas lines. **BRG 106**

### 10/32 to Straight Tube

- 4 mm FEP Adapter for Agilent instruments. **BRG 200**
- 1/8" Adapter. **BRG 203**
- 4mm Adapter for JY, VG X-series, Thermo ICP/MS instruments. **BRG 204**
- 4 mm Adapter as supplied with JY nebulizers. Not for other instruments. **BRG 214**
- 1/4" Adapter for PE Optima 3000 series, PE Sciex ICP/MS. **BRG 206**



# Nebulizer Accessories



## 10/32 to Quick Release

- Luer Lock / Quick Release **BRG 304**
- Luer Lock / Quick Release for TJA / Thermo ICP **BRG 305**
- Quick Release for Finnigan, GBC, Leeman, Varian. **BRG 306**
- Quick Release for non X series VG Elemental / Thermo ICP/MS. **BRG 307**
- Quick Release for PE Optima 2000 and 4000 series. **BRG 308**
- Quick Release for Spectro. **BRG 309**

## 4mm Festo/Pisco Pneumatic Quick Release

- Quick Release for 4 mm gas line. Same style as on many glass nebulizers such as GE EzyLok. Replaces MM 1020 gas line & BRG 204. 4 mm gas line not included. **BRG 404**

## 2 mm Gas Line

- 2 mm gas line with UpChurch fingertight fittings for Mira Mist and Ari Mist nebulizers. **MM 1020**
- Black PEEK UpChurch fingertight fitting for 2mm OD gas or sample lines. Used as the standard fitting for our MM 1020 gas lines. **BRC 20**

## Alternative Adapters for Gas or Sample Lines - Standard UpChurch Parts.

Description	Catalogue #
Kef-F Natural UpChurch fingertight fitting for 1/16" (0.0625") OD sample lines.	F100N
PEEK Natural UpChurch fingertight fitting for 1/16" (0.0625") OD sample lines.	F120
M6 Upchurch fitting for 2 mm gas or sample lines. Fits in P650 UpChurch adapter. Needs a P342 ferrule.	P 307
1/4 28 Upchurch fitting for 1/8" gas or sample lines. Fits in P652 UpChurch adapter. Needs a P300 ferrule.	P 308
Ferrule for P308 Upchurch fitting for 1/8" gas or sample lines.	P 300
Ferrule for P307 Upchurch fitting for 2mm gas or sample lines.	P 342
M6 Upchurch Adapter for 1/8", 2mm and 1/16" gas or sample lines. Fits in place of the MM 1020 gas line or in place of the sample line. If bought from UpChurch directly, the small bit protruding at the tip must be cut off. Allows M6 fittings to be used to attach gas and sample lines directly to the nebulizer.	P 650
1/4 28 Upchurch Adapter for 1/8" and 1/16" gas or sample lines. Fits in place of the MM 1020 gas line or in place of the sample line. If bought from UpChurch directly, the small bit protruding at the tip must be cut off. Allows 1/4 28 fittings to be used to attach gas and sample lines directly to the nebulizer.	P 652
Kel-F 1/4 - 28 Upchurch Adapter for 1/16" sample lines for Agilent Instruments. Allows 1/4 28 fittings to be used to attach gas and sample lines directly to the nebulizer.	P 652-Kel-F
Kel-F 10/32 Upchurch Fingertight fitting for 0.020" sample lines. If bought from UpChurch directly, the small bit protruding at the tip must be cut off.	M 100

# Nebulizer Accessories



## Sample Line Fittings

Description	Catalogue #
Red UpChurch fingertight fitting for 0.035" OD sample lines.	BRC 1
Yellow UpChurch fingertight fitting for 0.044" OD sample lines.	BRC 2
Blue UpChurch fingertight fitting for 0.044" OD sample lines.	BRC 3
KelF Natural UpChurch fingertight fitting (UpChurch part # F100N) for 0.0625" OD sample lines.	BRC 4
PEEK Natural UpChurch fingertight fitting (UpChurch part # F120) for 0.0625" OD sample lines.	BRC 5
Black UpChurch fingertight fitting for 0.045" OD sample lines.	BRC 7
KelF Natural UpChurch fingertight fitting for 0.062" OD sample lines.	BRC 8
Black PEEK UpChurch fingertight fitting for 2mm OD gas or sample lines. Used as the standard fitting for our MM 1020 gas lines.	BRC 20

## Sample Lines

Description	Catalogue #
3 meters of .035" OD X .008" ID Red Teflon Tubing for sample lines.	BRC 101
3 meters of .044" OD X .020" ID Clear PTFE Tubing for sample lines.	BRC 102
3 meters of .044" OD X .018" ID Clear Polyethylene Tubing for sample lines.	BRC 103
3 meters of 1/16" (.0625") OD X .020" ID PTFE Tubing for sample lines.	BRC 104
3 meters of 2mm OD X 1mm ID PTFE Tubing for gas lines.	BRC 105
3 meters of .062" OD X .030" ID HP PFA Tubing for sample lines.	BRC 106
3 meters of .045" OD X .025" ID HD Polyethylene Tubing for T2100 sample lines.	BRC 107
3 meters of .062" OD X .030" ID FEP Tubing for T2100 sample lines.	BRC 108
30 meters of .035" OD X .008" ID Red Teflon Tubing for sample lines.	BRC 111
30 meters of .044" OD X .020" ID Clear PTFE Tubing for sample lines.	BRC 112
30 meters of .044" OD X .018" ID Clear Polyethylene Tubing for sample lines.	BRC 113
30 meters of 1/16" (.0625") OD X .020" ID PTFE Tubing for sample lines.	BRC 114
30 meters of 2mm OD X 1mm ID PTFE Tubing for gas lines	BRC 115
30 meters of .062" OD X .030" ID HP PFA Tubing for T2100 sample lines.	BRC 116
30 meters of .045" OD X .025" ID HD Polyethylene Tubing for T2100 sample lines.	BRC 117
30 meters of .062" OD X .030" ID Clear FEP Tubing for T2100 sample lines.	BRC 118

## Sample Lines & Fittings

Description	Catalogue #
0.5 meters of .035" OD X .008" ID Red PTFE Tubing with attached BRC 1 fitting for sample lines.	BRC 201
10 Pack of BRC 201: 0.5 meters of .035" OD X .008" ID Red PTFE Tubing with attached BRC 1 fitting for sample lines.	BRC 201X
0.5 meters of .044" OD X .020" ID Clear PTFE Tubing with attached BRC 2 fitting for sample lines.	BRC 202
10 Pack of BRC 202: 0.5 meters of .044" OD X .020" ID Clear PTFE Tubing with attached BRC 2 fitting for sample lines.	BRC 202X
0.5 meters of .044" OD X .018" ID Clear Polyethylene Tubing with attached BRC 3 fitting for sample lines.	BRC 203
10 Pack of BRC 203: 0.5 meters of .044" OD X .018" ID Clear Polyethylene Tubing with attached BRC 3 fitting for sample lines.	BRC 203X
0.5 meters of .062" OD X .020" ID Clear Teflon Tubing with attached F100N fitting for sample lines.	BRC 204
10 Pack of BRC 204: 0.5 meters of .062" OD X .020" ID Clear Teflon Tubing with attached F100N fitting for sample lines.	BRC 204X
0.5 meters of .062" OD X .030" ID HP PFA Tubing with attached F100N fitting for sample lines.	BRC 206
10 Pack of BRC 206: 0.5 meters of .062" OD X .030" ID HP PFA Tubing with attached F100N fitting for sample lines.	BRC 206X
0.5 meters of .045" OD X .025" ID HD Polyethylene Tubing with attached BRC 7 fitting for T2100 sample lines.	BRC 207
10 Pack of BRC 207: 0.5 meters of .045" OD X .025" ID HD Polyethylene Tubing with attached BRC 7 fitting for T2100 sample lines.	BRC 207X
0.5 meters of .062" OD X .030" ID FEP Tubing with attached BRC 8 fitting for T2100 sample lines.	BRC 208
10 Pack of BRC 208: 0.5 meters of .062" OD X .030" ID FEP Tubing with attached BRC 8 fitting for T2100 sample lines.	BRC 208X
0.5 meters of .062" OD X .020" ID PTFE with attached UpChurch 1/4-28 Kel-F fitting for 1/16" sample lines and P652-Kel-F adapter.	BRC 2000

# Nebulizer Accessories



## T2002, Trace and Legere Fittings

The T2002, Trace and Legere Nebulizers have Swagelok or barb attachments for the gas lines, and all use the same capillary tubing for the sample lines (0.42" - 0.44" OD). The T2002 ships with 1/4", 1/8" and 4 mm Swageloks for European customers, and with only the 1/4" and 1/8" fittings for US customers. Surge Suppressors are available for the T2002 and Trace Nebulizers. They are not necessary for most systems, but are useful for some pumps and chambers.

3 meters of .044" OD X .020" ID Clear PTFE Tubing for sample lines.	<b>BRC 102</b>
3 meters of .044" OD X .018" ID Clear Polyethylene Tubing for sample lines.	<b>BRC 103</b>
30 meters of .044" OD X .020" ID Clear PTFE Tubing for sample lines.	<b>BRC 112</b>
30 meters of .044" OD X .018" ID Clear Polyethylene Tubing for sample lines.	<b>BRC 113</b>
Surge Suppressor for reducing variations in sample flow due to the peristaltic pump.	<b>BRC S1</b>
10 pack of Surge Suppressor for reducing variations in sample flow due to the peristaltic pump.	<b>BRC SIX</b>

## Chambers and Chamber Adapters

Burgener Nebulizers will fit most chambers without adapters. Generally, if you are presently using a glass concentric nebulizer, you can use the same adapters for Burgener Nebulizers. However, if you have been using larger crossflow nebulizers, or have older style chambers, then you will need an adapter. All of our adapters are PTFE.

### Teflon® Chamber Adapters

Adapter for Mira Mist & Ari Mist & T2100 for Scott Double Pass Chambers. Fits 35mm exterior chambers.	<b>TADP-5</b>
Adapter for T2002 for Scott Double Pass Chambers. Fits 35mm exterior chambers.	<b>TADP-3</b>
General adapter for 0.94 inch interior chambers. Used on TCR-1, and some Burgener Research glass chambers.	<b>TABG-1</b>

### Teflon® Chambers

For most applications, glass chambers are preferred. Glass chambers are readily available, inexpensive, and transparent allowing you to see if the system is operating properly. For samples requiring HF acids, Teflon® chambers are preferred.

Mini Teflon® Chamber. For Mira Mist CE, Ari Mist, at micro flows only (	<b>MC CE</b>
Teflon® Scott Double Pass Chamber. Standard Scott type chamber, 100% Teflon, no "O" rings. The nebulizer adapter is available as a press fit version with no "O" rings or with "O" rings for glass nebulizers. Works with standard 35 mm adapters and cross flow nebulizers. The Drain is available at various angles.	<b>TSDP 01</b>

### Glass Chambers

For most applications, glass chambers are preferred. Glass chambers are readily available, inexpensive, and transparent allowing you to see if the system is operating properly. For samples requiring HF acids, Teflon® chambers are preferred.

Mini Glass Chamber. For Mira Mist CE, Ari Mist, at micro flows only	<b>MGC CE2</b>
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