

# Absolute Filter II

## Minipleat ULPA Filter

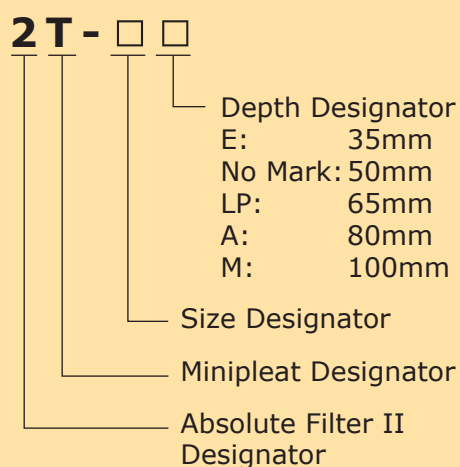
### ABSOLUTE FILTER II MINIPLEAT

|                      |                  |
|----------------------|------------------|
| <b>Model</b>         | <b>2T-□□</b>     |
| <b>Test Standard</b> | <b>0.1-0.2μm</b> |
| <b>Efficiency</b>    | <b>99.999%+</b>  |

**Scan Tested**

- Low pressure drop, low energy consumption
- Space-saving, light-weight design

### Model Designators



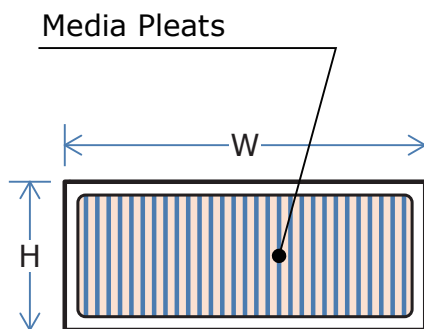
### Component Materials / Usage Conditions

| Models              |                                             | All                                       |
|---------------------|---------------------------------------------|-------------------------------------------|
| Component Materials | Media                                       | Glass Fiber                               |
|                     | Separator                                   | Hot Melt Resin                            |
|                     | Frame                                       | Aluminum                                  |
|                     | Frame Finish                                | Anodized Aluminum + Clear Acrylic Coating |
|                     | Sealant                                     | Urethane Resin                            |
|                     | Gasket                                      | Chloroprene                               |
| Usage Conditions    | Max. Continuous Usage Temperature (°C)      | 60                                        |
|                     | Max. Peak Temperature (°C)                  | 80                                        |
|                     | Max. Peak Humidity (%RH at No Condensation) | 100                                       |

## Standard Specifications

| Model     | Rated Airflow<br>(m³/min) | Pressure Drop (Pa) |       | External Dimensions (mm) |       |       | Weight<br>(kg) |
|-----------|---------------------------|--------------------|-------|--------------------------|-------|-------|----------------|
|           |                           | Initial Max        | Final | Height                   | Width | Depth |                |
| 2T-110E   | 1.1                       | 127                | 294   | 305                      | 305   | 35    | 0.8            |
| 2T-320E   | 2.3                       |                    |       | 610                      | 305   |       | 1.2            |
| 2T-600E   | 5                         |                    |       | 610                      | 610   |       | 2              |
| 2T-320    | 3.3                       | 147                |       | 610                      | 305   | 50    | 1.7            |
| 2T-600    | 7                         |                    |       | 610                      | 610   |       | 2.8            |
| 2T-1200   | 14.4                      |                    |       | 610                      | 1219  |       | 5              |
| 2T-320LP  | 4.7                       |                    |       | 610                      | 305   | 65    | 2              |
| 2T-600LP  | 10                        |                    |       | 610                      | 610   |       | 3.4            |
| 2T-1200LP | 20.6                      |                    |       | 610                      | 1219  |       | 6.2            |
| 2T-320A   | 4.7                       | 132                |       | 610                      | 305   | 80    | 2.3            |
| 2T-600A   | 10                        |                    |       | 610                      | 610   |       | 3.9            |
| 2T-1200A  | 20.6                      |                    |       | 610                      | 1219  |       | 7              |
| 2T-320M   | 4.9                       | 108                |       | 610                      | 305   | 100   | 3.4            |
| 2T-600M   | 10.3                      |                    |       | 610                      | 610   |       | 5.5            |
| 2T-1200M  | 21.1                      |                    |       | 610                      | 1219  |       | 9.8            |

## Available Sizes (mm)



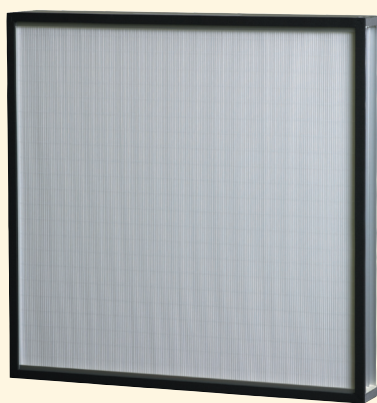
| Depth | Max Height | Max Width |
|-------|------------|-----------|
| 35    | 610        | 610       |
| 50    | 610        | 1219      |
| 65    | 762        | 1219      |
| 80    | 915        | 1524      |
| 100   | 915        | 1524      |

For horizontal airflows, install filters with pleats perpendicular to the ground. Please contact us regarding availability of custom sizes.

# Absolute Filter

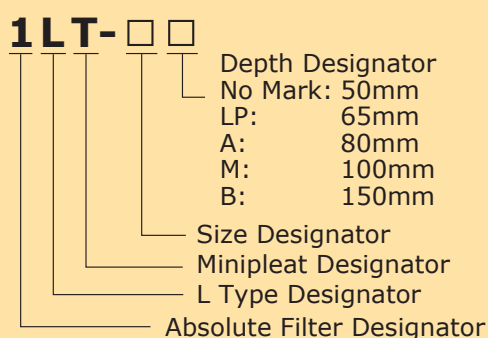
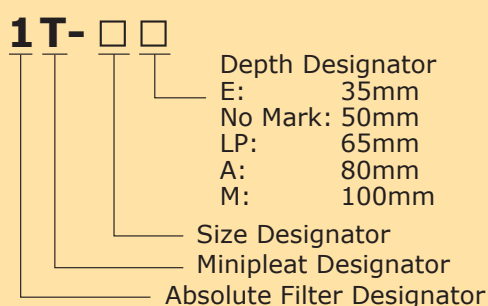
## Minipleat HEPA Filter

### ABSOLUTE FILTER MINIPLEAT



- Space-saving, light-weight design
- Easily installable compact size

### Model Designators



### Scan-Tested Models

|           |            |
|-----------|------------|
| 1T-600S   | 1LT-600SLP |
| 1T-600SLP | 1LT-600AS  |
| 1T-600AS  | 1LT-600MS  |
| 1T-600MS  | 1LT-600BS  |

| Model         | 1T-□□         |             | 1LT-□□            |             |
|---------------|---------------|-------------|-------------------|-------------|
|               | Standard Type |             | High Airflow Type |             |
| Test Standard | 0.3μm         |             |                   |             |
| Efficiency    | 99.97%+       | 99.99%+     | 99.97%+           | 99.99%+     |
|               | —             | Scan-Tested | —                 | Scan-Tested |

### Component Materials / Usage Conditions

| Models              |                                             | All                                       |
|---------------------|---------------------------------------------|-------------------------------------------|
| Component Materials | Media                                       | Glass Fiber                               |
|                     | Separator                                   | Hot Melt Resin                            |
|                     | Frame                                       | Aluminum                                  |
|                     | Frame Finish                                | Anodized Aluminum + Clear Acrylic Coating |
|                     | Sealant                                     | Urethane Resin                            |
|                     | Gasket                                      | Chloroprene                               |
| Usage Conditions    | Max. Continuous Usage Temperature (°C)      | 60                                        |
|                     | Max. Peak Temperature (°C)                  | 80                                        |
|                     | Max. Peak Humidity (%RH at No Condensation) | 100                                       |

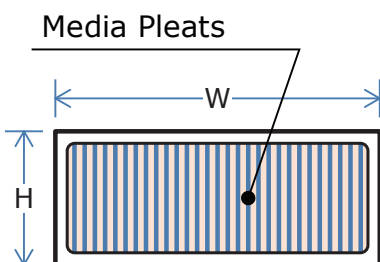
## Standard Specifications

| Model     | Rated Airflow<br>(m³/min) | Pressure Drop (Pa) |       | External Dimensions (mm) |       |       | Weight<br>(kg) |
|-----------|---------------------------|--------------------|-------|--------------------------|-------|-------|----------------|
|           |                           | Initial Max        | Final | Height                   | Width | Depth |                |
| 1T-110    | 2.2                       | 147                | 294   | 305                      | 305   | 50    | 1.1            |
| 1T-320    | 4.7                       |                    |       | 610                      | 305   |       | 1.7            |
| 1T-600    | 10                        |                    |       | 610                      | 610   |       | 2.8            |
| 1T-110LP  | 2.2                       | 98                 |       | 305                      | 305   | 65    | 1.3            |
| 1T-320LP  | 4.7                       |                    |       | 610                      | 305   |       | 2.0            |
| 1T-600LP  | 10                        |                    |       | 610                      | 610   |       | 3.4            |
| 1T-1200LP | 20.6                      |                    |       | 610                      | 1219  |       | 6.1            |
| 1T-320A   | 4.7                       | 88                 |       | 610                      | 305   | 80    | 2.2            |
| 1T-600A   | 10                        |                    |       | 610                      | 610   |       | 3.8            |
| 1T-1200A  | 20.6                      |                    |       | 610                      | 1219  |       | 6.9            |
| 1T-320M   | 4.9                       | 74                 |       | 610                      | 305   | 100   | 3.3            |
| 1T-600M   | 10.3                      |                    |       | 610                      | 610   |       | 5.4            |
| 1T-1200M  | 21.1                      |                    |       | 610                      | 1219  |       | 9.7            |

## High Airflow Specifications

| Model      | Rated Airflow<br>(m <sup>3</sup> /min) | Pressure Drop (Pa) |       | External Dimensions (mm) |       |       | Weight<br>(kg) |
|------------|----------------------------------------|--------------------|-------|--------------------------|-------|-------|----------------|
|            |                                        | Initial Max        | Final | Height                   | Width | Depth |                |
| 1LT-110    | 3.8                                    | 249                | 498   | 305                      | 305   | 50    | 1.1            |
| 1LT-320    | 8                                      |                    |       | 610                      | 305   |       | 1.8            |
| 1LT-600    | 16.9                                   |                    |       | 610                      | 610   |       | 3              |
| 1LT-110LP  | 5                                      |                    |       | 305                      | 305   | 65    | 1.3            |
| 1LT-320LP  | 11.8                                   |                    |       | 610                      | 305   |       | 2.0            |
| 1LT-600LP  | 25                                     |                    |       | 610                      | 610   |       | 3.3            |
| 1LT-1200LP | 50                                     |                    |       | 610                      | 1219  |       | 6.2            |
| 1LT-320A   | 12.8                                   |                    |       | 610                      | 305   | 80    | 2.3            |
| 1LT-600A   | 27                                     |                    |       | 610                      | 610   |       | 3.9            |
| 1LT-1200A  | 55.4                                   |                    |       | 610                      | 1219  |       | 6.9            |
| 1LT-320M   | 15.1                                   |                    |       | 610                      | 305   | 100   | 3.3            |
| 1LT-600M   | 32                                     |                    |       | 610                      | 610   |       | 5.4            |
| 1LT-1200M  | 65.6                                   |                    |       | 610                      | 1219  |       | 9.7            |
| 1LT-320B   | 14.8                                   | 200                | 400   | 610                      | 305   | 150   | 3.9            |
| 1LT-600B   | 31.2                                   |                    |       | 610                      | 610   |       | 6.8            |
| 1LT-1200B  | 64.1                                   |                    |       | 610                      | 1219  |       | 12.5           |

## Available Sizes (mm)



| Depth | Max Height | Max Width |
|-------|------------|-----------|
| 35    | 610        | 610       |
| 50    | 610        | 1219      |
| 65    | 610        | 1219      |
| 80    | 762        | 1524      |
| 100   | 915        | 1524      |
| 150   | 610        | 1219      |

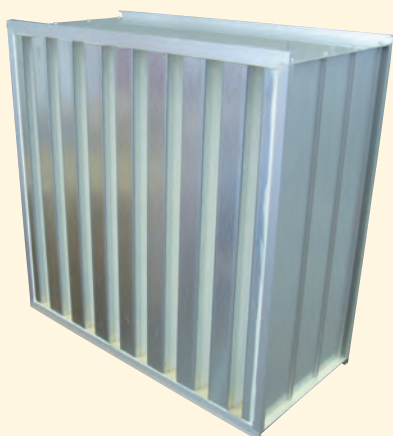
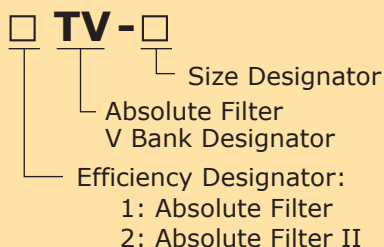
For horizontal airflows, install filters with pleats perpendicular to the ground.

Please contact us regarding availability of custom sizes.

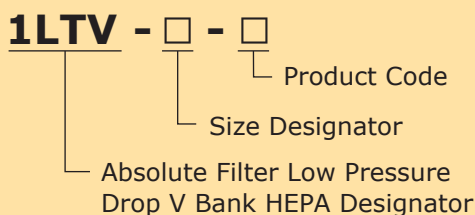


- Airflows equivalent to medium/high efficiency filters
- GIGA Series V Bank Filters also available

### Model Designators



### Model Designators



## Absolute Filter V Bank High Airflow V Type Filter

### ABSOLUTE FILTER V BANK

| Model         | 1TV-□□  | 2TV-□□    |
|---------------|---------|-----------|
| Test Standard | 0.3μm   | 0.1-0.2μm |
| Efficiency    | 99.97%+ | 99.999%+  |

### Component Materials / Usage Conditions

| Models              |                                             | □TV-□                                     |
|---------------------|---------------------------------------------|-------------------------------------------|
| Component Materials | Media                                       | Glass Fiber                               |
|                     | Separator                                   | Hot Melt Resin                            |
|                     | Frame                                       | Aluminum                                  |
|                     | Frame Finish                                | Anodized Aluminum + Clear Acrylic Coating |
|                     | Sealant                                     | Urethane Resin                            |
|                     | Plate                                       | Aluminum                                  |
| Usage Conditions    | Gasket                                      | EPDM                                      |
|                     | Max. Continuous Usage Temperature (°C)      | 60                                        |
|                     | Max. Peak Temperature (°C)                  | 80                                        |
|                     | Max. Peak Humidity (%RH at No Condensation) | 100                                       |

## Absolute Filter V Bank Low Pressure Drop

### ABSOLUTE FILTER LOW PRESSURE DROP V-BANK

| Model         | 1LTV-□□ |
|---------------|---------|
| Test Standard | 0.3μm   |
| Efficiency    | 99.97%+ |

### Component Materials / Usage Conditions

| Models              |                                             | 1LTV-□                                    |
|---------------------|---------------------------------------------|-------------------------------------------|
| Component Materials | Media                                       | Glass Fiber                               |
|                     | Separator                                   | Hot Melt Resin                            |
|                     | Frame                                       | Aluminum                                  |
|                     | Frame Finish                                | Anodized Aluminum + Clear Acrylic Coating |
|                     | Sealant                                     | Urethane Resin                            |
|                     | Plate                                       | SGCC                                      |
| Usage Conditions    | Gasket                                      | Chloroprene                               |
|                     | Max. Continuous Usage Temperature (°C)      | 60                                        |
|                     | Max. Peak Temperature (°C)                  | 80                                        |
|                     | Max. Peak Humidity (%RH at No Condensation) | 100                                       |

### HEPA High Airflow Type

| Model   | Rated Airflow<br>(m³/min) | Pressure Drop (Pa) |       | External Dimensions (mm) |       |       | Weight<br>(kg) |  |
|---------|---------------------------|--------------------|-------|--------------------------|-------|-------|----------------|--|
|         |                           | Initial Max        | Final | Height                   | Width | Depth |                |  |
| 1TV-200 | 56.6                      | 249                | 498   | 610                      | 610   | 292   | 15             |  |
| 1TV-212 | 60                        |                    |       | 305*                     | 610*  |       | 8              |  |
| 1TV-100 | 28.3                      |                    |       |                          |       |       |                |  |
| 1TV-106 | 30                        |                    |       |                          |       |       |                |  |

\* Half size vertical or horizontal types available.

### ULPA High Airflow Type

| Model   | Rated Airflow<br>(m <sup>3</sup> /min) | Pressure Drop (Pa) |       | External Dimensions (mm) |       |       | Weight<br>(kg) |
|---------|----------------------------------------|--------------------|-------|--------------------------|-------|-------|----------------|
|         |                                        | Initial Max        | Final | Height                   | Width | Depth |                |
| 2TV-180 | 50                                     | 275                | 550   | 610                      | 610   | 292   | 15             |
| 2TV-90  | 25                                     |                    |       | 305*                     | 610*  |       | 8              |

\* Half size vertical or horizontal types available.

### HEPA Low Pressure Drop Type

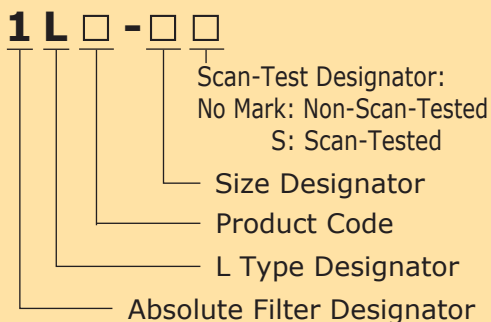
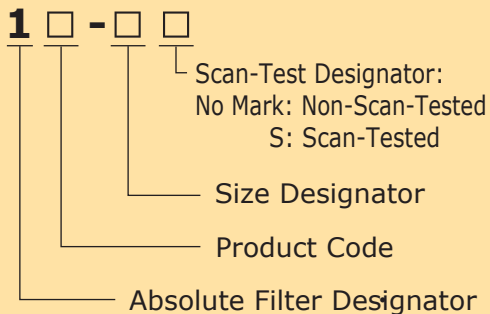
| Model        | Rated<br>Airflow<br>(m³/min) | Pressure Drop (Pa) |       | External Dimensions (mm) |       |       | Efficiency<br>(%) | Weight<br>(kg) |  |
|--------------|------------------------------|--------------------|-------|--------------------------|-------|-------|-------------------|----------------|--|
|              |                              | Initial Max        | Final | Height                   | Width | Depth |                   |                |  |
| 1LTV-200     | 56                           | 170±15             | 500   | 610                      | 610   | 292   | 99.97+            | 18.5           |  |
| 1LTV-200-JQT | 70                           | 227±20             |       |                          |       |       | 99.96+            |                |  |
| 1LTV-100     | 26                           | 170±15             |       | 305*                     | 610*  |       | 99.97+            | 9.5            |  |
| 1LTV-100-JQT | 32                           | 227±20             |       |                          |       |       | 99.96+            |                |  |

\* Half size vertical or horizontal types available.



- Standard Type:  
Low pressure drop, low energy consumption
- L Type:  
High airflow/space-saving design

## Model Designators



# Absolute Separator HEPA Filter Standard / L Type (High Airflow)

## ABSOLUTE FILTER

| Model         | 1□-□□         |             | 1L□-□□            |             |
|---------------|---------------|-------------|-------------------|-------------|
|               | Standard Type |             | High Airflow Type |             |
| Test Standard | 0.3μm         |             |                   |             |
| Efficiency    | 99.97%+       | 99.99%+     | 99.97%+           | 99.99%+     |
|               | -             | Scan-Tested | -                 | Scan-Tested |

## Component Materials / Usage Conditions

| Product Code        |                                             | A              | D        |
|---------------------|---------------------------------------------|----------------|----------|
| Component Materials | Media                                       | Glass Fiber    |          |
|                     | Separator                                   | Paper          | Aluminum |
|                     | Frame                                       | Plywood        |          |
|                     | Sealant                                     | Urethane Resin |          |
|                     | Gasket                                      | Chloroprene    |          |
| Usage Conditions    | Max. Continuous Usage Temperature (°C)      | 60             |          |
|                     | Max. Peak Temperature (°C)                  | 80             |          |
|                     | Max. Peak Humidity (%RH at No Condensation) | 85             | 100      |

| Product Code        |                                             | BA                                        | EA       |
|---------------------|---------------------------------------------|-------------------------------------------|----------|
| Component Materials | Media                                       | Glass Fiber                               |          |
|                     | Separator                                   | Paper                                     | Aluminum |
|                     | Frame                                       | Aluminum                                  |          |
|                     | Frame Finish                                | Anodized Aluminum + Clear Acrylic Coating |          |
|                     | Sealant                                     | Urethane Resin                            |          |
|                     | Gasket                                      | Chloroprene                               |          |
| Usage Conditions    | Max. Continuous Usage Temperature (°C)      | 60                                        |          |
|                     | Max. Peak Temperature (°C)                  | 80                                        |          |
|                     | Max. Peak Humidity (%RH at No Condensation) | 85                                        | 100      |

| Product Code        |                                             | EU              |
|---------------------|---------------------------------------------|-----------------|
| Component Materials | Media                                       | Glass Fiber     |
|                     | Separator                                   | Aluminum        |
|                     | Frame                                       | Stainless Steel |
|                     | Sealant                                     | Urethane Resin  |
|                     | Gasket                                      | Chloroprene     |
| Usage Conditions    | Max. Continuous Usage Temperature (°C)      | 60              |
|                     | Max. Peak Temperature (°C)                  | 80              |
|                     | Max. Peak Humidity (%RH at No Condensation) | 100             |

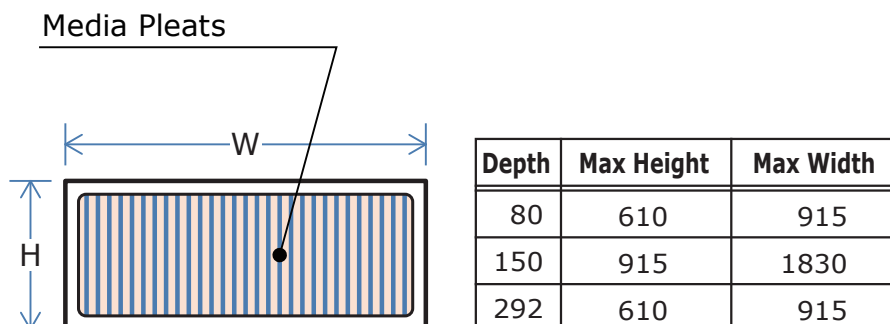
## Standard Specifications

| Model   | Rated Airflow<br>(m <sup>3</sup> /min) | Pressure Drop (Pa) |       | External Dimensions (mm) |       |       | Weight<br>(kg) |
|---------|----------------------------------------|--------------------|-------|--------------------------|-------|-------|----------------|
|         |                                        | Initial Max        | Final | Height                   | Width | Depth |                |
| 1□-140  | 4                                      | 249                | 498   | 610                      | 305   | 80    | 2              |
| 1□-250  | 9.2                                    |                    |       | 610                      | 610   |       | 3.2            |
| 1□-390  | 11                                     |                    |       | 610                      | 762   |       | 4              |
| 1□-110  | 3.9                                    |                    |       | 305                      | 305   | 150   | 2              |
| 1□-320  | 8.5                                    |                    |       | 610                      | 305   |       | 3.2            |
| 1□-600  | 18                                     |                    |       | 610                      | 610   |       | 5.2            |
| 1□-830  | 22                                     |                    |       | 610                      | 762   |       | 7.8            |
| 1□-200  | 6.4                                    |                    |       | 305                      | 305   | 292   | 4.3            |
| 1□-450  | 15                                     |                    |       | 610                      | 305   |       | 6.8            |
| 1□-1000 | 32                                     |                    |       | 610                      | 610   |       | 11.3           |
| 1□-1250 | 40                                     |                    |       | 610                      | 762   |       | 13.5           |

## Low Pressure Drop Type Specifications

| Model   | Rated Airflow<br>(m <sup>3</sup> /min) | Pressure Drop (Pa) |       | External Dimensions (mm) |       |       | Weight<br>(kg) |
|---------|----------------------------------------|--------------------|-------|--------------------------|-------|-------|----------------|
|         |                                        | Initial Max        | Final | Height                   | Width | Depth |                |
| 1L□-25  | 7                                      | 249                | 498   | 610                      | 305   | 80    | 2.2            |
| 1L□-60  | 15                                     |                    |       | 610                      | 610   |       | 3.6            |
| 1L□-70  | 20                                     |                    |       | 610                      | 762   |       | 4.2            |
| 1L□-20  | 6                                      |                    |       | 305                      | 305   | 150   | 2.2            |
| 1L□-40  | 12                                     |                    |       | 610                      | 305   |       | 3.4            |
| 1L□-100 | 28                                     |                    |       | 610                      | 610   |       | 5.7            |
| 1L□-130 | 36                                     |                    |       | 610                      | 762   |       | 8              |
| 1L□-35  | 10                                     |                    |       | 305                      | 305   | 292   | 4.7            |
| 1L□-75  | 22                                     |                    |       | 610                      | 305   |       | 7.5            |
| 1L□-180 | 50                                     |                    |       | 610                      | 610   |       | 12.9           |
| 1L□-210 | 60                                     |                    |       | 610                      | 762   |       | 15.6           |

## Available Sizes (mm)



For horizontal airflows, install filters with pleats perpendicular to the ground.  
Please contact us regarding availability of custom sizes.



# Filter Holding/Mounting Frames

## Mounting Frames

| Model           | External Dimensions (mm) |       |       | Applicable Filters |
|-----------------|--------------------------|-------|-------|--------------------|
|                 | Height                   | Width | Depth |                    |
| <b>4NA-450</b>  | 680                      | 375   | 50    | 1□-450             |
| <b>4NA-600</b>  |                          | 680   |       | 1□-600             |
| <b>4NA-830</b>  |                          | 832   |       | 1□-830             |
| <b>4NA-980</b>  |                          | 985   |       | 1□-980             |
| <b>4NA-1000</b> |                          | 680   |       | 1□-1000            |
| <b>4NA-1250</b> |                          | 832   |       | 1□-1250            |

• Available in galvanized sheet iron or stainless steel. Please specify when ordering.

## Holding Frames

| Model          | External Dimensions (mm) |       |       | Applicable Filters           |
|----------------|--------------------------|-------|-------|------------------------------|
|                | Height                   | Width | Depth |                              |
| <b>4N-1000</b> | 625                      | 625   | 325   | CP, AP, N2-CP and CP-J Types |
| <b>4N-600</b>  |                          |       | 180   |                              |
| <b>4N-450</b>  |                          | 325   | 325   |                              |
| <b>4N-320</b>  |                          |       | 180   |                              |
| <b>9N-320</b>  | 625                      | 320   | 100   | ADM Type                     |
| <b>9N-600</b>  |                          | 625   |       |                              |

• Available in baked finish sheet metal or stainless steel. Please specify when ordering.

# HEPA / ULPA Filter Standards

| ISO 29463-1 : 2011                                                                                                        |       |                |                 |                |                 |                                                                              |                        |                                                                    |                                 |                                  |                          |                                |                                     | EN1822-1:<br>2009     |  |
|---------------------------------------------------------------------------------------------------------------------------|-------|----------------|-----------------|----------------|-----------------|------------------------------------------------------------------------------|------------------------|--------------------------------------------------------------------|---------------------------------|----------------------------------|--------------------------|--------------------------------|-------------------------------------|-----------------------|--|
| Class                                                                                                                     | Group | Overall Value  |                 | Local Value    |                 | Overall Efficiency Test                                                      |                        | Local Efficiency Test<br>(As agreed between supplier and customer) |                                 |                                  |                          |                                |                                     |                       |  |
|                                                                                                                           |       | Efficiency (%) | Penetration (%) | Efficiency (%) | Penetration (%) |                                                                              |                        |                                                                    |                                 |                                  |                          |                                |                                     |                       |  |
| ISO 15                                                                                                                    | E     | ≥95            | ≤5              | —              | —               | ●                                                                            | ●                      | Group E filters not tested for classification.                     |                                 |                                  |                          |                                |                                     | E11                   |  |
| ISO 20                                                                                                                    |       | ≥99            | ≤1              | —              | —               | ●                                                                            | ●                      |                                                                    |                                 |                                  |                          |                                |                                     | —                     |  |
| ISO 25                                                                                                                    |       | ≥99.5          | ≤0.5            | —              | —               | ●                                                                            | ●                      |                                                                    |                                 |                                  |                          |                                |                                     | E12                   |  |
| ISO 30                                                                                                                    |       | ≥99.9          | ≤0.1            | —              | —               | ●                                                                            | ●                      |                                                                    |                                 |                                  |                          |                                |                                     | —                     |  |
| ISO 35                                                                                                                    | H     | ≥99.95         | ≤0.05           | ≥99.75         | ≤0.25           | ●                                                                            | ●                      | ●                                                                  | ●                               | ●                                | ●                        | ●                              | H13                                 |                       |  |
| ISO 40                                                                                                                    |       | ≥99.99         | ≤0.01           | ≥99.95         | ≤0.05           | ●                                                                            | ●                      | ●                                                                  | ●                               | —                                | —                        | —                              |                                     |                       |  |
| ISO 45                                                                                                                    |       | ≥99.995        | ≤0.05           | ≥99.975        | ≤0.025          | ●                                                                            | ●                      | ●                                                                  | ●                               | —                                | —                        | H14                            |                                     |                       |  |
| ISO 50                                                                                                                    | U     | ≥99.999        | ≤0.001          | ≥99.995        | ≤0.005          | ●                                                                            | ●                      | ●                                                                  | —                               | —                                | ●                        | —                              | —                                   | —                     |  |
| ISO 55                                                                                                                    |       | ≥99.9995       | ≤0.0005         | ≥99.9975       | ≤0.0025         | ●                                                                            | ●                      | ●                                                                  | —                               | —                                | ●                        | —                              | —                                   | U15                   |  |
| ISO 60                                                                                                                    |       | ≥99.9999       | ≤0.0001         | ≥99.9995       | ≤0.0005         | ●                                                                            | ●                      | ●                                                                  | —                               | —                                | ●                        | —                              | —                                   | —                     |  |
| ISO 65                                                                                                                    |       | ≥99.99995      | ≤0.00005        | ≥99.99975      | ≤0.00025        | ●                                                                            | ●                      | ●                                                                  | —                               | —                                | ●                        | —                              | —                                   | U16                   |  |
| ISO 70                                                                                                                    |       | ≥99.99999      | ≤0.00001        | ≥99.9999       | ≤0.0001         | ●                                                                            | ●                      | ●                                                                  | —                               | —                                | ●                        | —                              | —                                   | —                     |  |
| ISO 75                                                                                                                    |       | ≥99.999995     | ≤0.000005       | ≥99.9999       | ≤0.0001         | ●                                                                            | ●                      | ●                                                                  | —                               | —                                | ●                        | —                              | —                                   | U17                   |  |
| Test Methods:<br>Efficiency/Leak Tests: At Rated Airflow<br>Efficiency Tests: At MPPS<br>(Most Penetrating Particle Size) |       |                |                 |                |                 | ISO29463-4                                                                   | ISO29463-5             | ISO 29463-4                                                        |                                 |                                  |                          |                                |                                     | E10 omitted           |  |
|                                                                                                                           |       |                |                 |                |                 | Test with Movable Probe                                                      | Test with Static Probe | Annex C<br>Scan Test at MPPS                                       | Annex A<br>Oil Thread Leak Test | Annex B<br>Photo-meter Leak Test | Annex E<br>PSL Leak Test | Annex F<br>0.3-0.5µm Leak Test | Annex G<br>Photo-meter Overall Test | Scan Tests per EN1822 |  |
|                                                                                                                           |       |                |                 |                |                 | ● : Statistical efficiency test may be performed.<br>● : Each filter tested. |                        |                                                                    |                                 |                                  |                          |                                |                                     |                       |  |

| IEST-RP-CC001.4 : 2005 |                  |                            |                            |                                   |              |                         |                         |                                             |  |
|------------------------|------------------|----------------------------|----------------------------|-----------------------------------|--------------|-------------------------|-------------------------|---------------------------------------------|--|
| Type                   | Penetration Test |                            |                            | Leak Test (IEST-RP-CC034.2)       |              |                         |                         |                                             |  |
|                        | Method           | Aerosol                    | Min. Efficiency Rating (%) | Equipment                         | Aerosol      | Factory Penetration (%) | in situ Penetration (%) | Comments                                    |  |
| HEPA (A)               | MIL-STD-282      | Thermal DOP<br>(0.3µm MMD) | 99.97                      | None                              |              |                         |                         | Two-Flow Leak Test                          |  |
| HEPA (B)               |                  |                            | 99.97                      |                                   |              |                         |                         |                                             |  |
| HEPA (C)               |                  |                            | 99.99                      | Photometer                        | Polydisperse | 0.01                    | 0.01                    |                                             |  |
| HEPA (D)               |                  |                            | 99.999                     |                                   |              | 0.005                   | 0.01                    |                                             |  |
| HEPA (E)               |                  |                            | 99.97                      | None                              |              |                         |                         | Two-Flow Leak Test                          |  |
| ULPA (F)               | IEST-RP-007      | Open                       | *99.9995                   | Particle Counter                  | Open         | 0.0025                  | 0.005                   | Media Testing at MPPS                       |  |
| S.ULPA (G)             | IEST-RP-021      |                            | *99.9999                   |                                   |              | 0.001                   | 0.002                   |                                             |  |
| HEPA (H)               | IEST-RP-007      |                            | *99.97                     | Photometer                        | Polydisperse | –                       | –                       | Two-Flow Leak Test                          |  |
| HEPA (I)               |                  |                            | *99.97                     | None                              | Open         | –                       | –                       |                                             |  |
| HEPA (J)               |                  |                            | *99.99                     | Particle Counter<br>or Photometer | Polydisperse | 0.01                    | 0.01                    | When Photometer/<br>Aerosol Generator used. |  |
| ULPA (K)               |                  |                            | *99.995                    |                                   | Thermal      | 0.008                   | 0.01                    |                                             |  |

\*Arrestance Efficiency: Lower result of tests at 0.1-0.2µm and 0.2-0.3µm particles.  
Two-Flow Leak Test: 100% and 20% of Rated Airflow

## Coarse Particle and Medium Efficiency Filter Standards

### •USA

| ASHRAE 52.2 : 2007 |                                         |             |              |                        |
|--------------------|-----------------------------------------|-------------|--------------|------------------------|
| MERV               | Efficiency by Average Particle Size (%) |             |              | Average Arrestance (%) |
|                    | E1<br>0.3~1µm                           | E2<br>1~3µm | E3<br>3~10µm |                        |
| 1                  | —                                       | —           | E3<20        | Aavg<65                |
| 2                  | —                                       | —           | E3<20        | 65≤Aavg<70             |
| 3                  | —                                       | —           | E3<20        | 70≤Aavg<75             |
| 4                  | —                                       | —           | E3<20        | 75≤Aavg                |
| 5                  | —                                       | —           | 20≤E3<35     | —                      |
| 6                  | —                                       | —           | 35≤E3<50     | —                      |
| 7                  | —                                       | —           | 50≤E3<70     | —                      |
| 8                  | —                                       | —           | 70≤E3        | —                      |
| 9                  | —                                       | E2<50       | 85≤E3        | —                      |
| 10                 | —                                       | 50≤E2<65    | 85≤E3        | —                      |
| 11                 | —                                       | 65≤E2<80    | 85≤E3        | —                      |
| 12                 | —                                       | 80≤E2       | 90≤E3        | —                      |
| 13                 | E1<75                                   | 90≤E2       | 90≤E3        | —                      |
| 14                 | 75≤E1<85                                | 90≤E2       | 90≤E3        | —                      |
| 15                 | 85≤E1<95                                | 90≤E2       | 90≤E3        | —                      |
| 16                 | 95≤E1                                   | 95≤E2       | 95≤E3        | —                      |

| Equip.         | Particle Counter |           |                               |
|----------------|------------------|-----------|-------------------------------|
| Test Particles | MERV1~4          | Dust Load | ASHRAE Dust                   |
|                |                  | Aerosol   |                               |
|                | MERV5~16         | Dust Load | KCL(solid Potassium Chloride) |
|                |                  | Aerosol   |                               |
|                |                  | Generator | Atomizer                      |

### •EUROPE

| EN 779:2012 |                                           |               |                     |
|-------------|-------------------------------------------|---------------|---------------------|
| Class       | Ave. Eff. (%)                             | Min. Eff.     | Final Pressure Drop |
|             | Am: Synthetic Dust<br>Em: 0.4µm Particles | Ef: 0.4µm Ct. |                     |
| G1          | 50≤Am<65                                  | —             | 250Pa               |
| G2          | 65≤Am<80                                  | —             |                     |
| G3          | 80≤Am<90                                  | —             |                     |
| G4          | 90≤Am                                     | —             |                     |
| M5          | 40≤Em<60                                  | —             | 450Pa               |
| M6          | 60≤Em<80                                  | —             |                     |
| F7          | 80≤Em<90                                  | 35≤Ef         |                     |
| F8          | 90≤Em<95                                  | 55≤Ef         |                     |
| F9          | 95≤Em                                     | 70≤Ef         |                     |

| Equip. Particle Counter |           |                           |
|-------------------------|-----------|---------------------------|
| Am Method Particles     | Dust Load | ASHRAE Dust               |
|                         | Aerosol   |                           |
| Em Method Particles     | Dust Load | DEHS                      |
|                         | Aerosol   |                           |
|                         | Generator | Nebulizer + Laskin Nozzle |

### •JAPAN

| JIS B 9908 : 2011 |                                                              |                                                                                |                              |                     |
|-------------------|--------------------------------------------------------------|--------------------------------------------------------------------------------|------------------------------|---------------------|
| Method            | Category                                                     | Main Test Equipment                                                            | Aerosol                      | Final Pressure Drop |
| Type 1            | Particle Arrestance (0.3µm) Pesre Drop                       | Filter unit with initial arrestance 90%+ at ave. size 0.3µm                    | Poly-disperse PAO or similar | —                   |
| Type 2            | Particle Arrestance (by size) Dust Load Pressure Drop        | Filter unit with initial arrestance up to 99% at ave. size 0.4µm               | Per JIS-11 (solid)           | 375Pa               |
|                   | Arrestance after ESD removal                                 |                                                                                | PAO or similar               | —                   |
| Type 3            | Particle Arrestance (gravimetric) Dust Load Pressure Drop    | Filter unit with initial (gravimetric) arrestance up to 98% at ave. size 0.4µm | Per JIS-11 (solid)           | 250Pa               |
| Type 4            | Particle Arrestance (0.5-1µm) Ozone Generation Pressure Drop | Electric Dust Collector                                                        | Poly                         | —                   |

0.7µm Particles per JIS B 9908:2011:

Tests have shown that colorimetric tests results per JIS B 9908:2001 are equivalent to 0.7µm.

| Equip.                | Particle Counter |                                     |
|-----------------------|------------------|-------------------------------------|
| Type 2 Test Particles | Dust Load        | Per JIS-11                          |
|                       | Aerosol          | Per JIS-11                          |
|                       | Generator        | Rotary Brush Fluidized Bed Gasifier |

# Atmospheric Particles

