

Type C NIOSH Approval No.  
 TC-19C-0505 Continuous-Flow Class - F30 Series Flow Control  
 TC-19C-0506 Continuous-Flow Class - F40 Series Flow Control  
 TC-19C-0507 Continuous-Flow Class - AC1000 Series Flow  
 Control  
 TC-19C-0508 Continuous-Flow Class - HC2400 Series Flow  
 Control

**READ ALL INSTRUCTIONS AND WARNINGS BEFORE USING THIS  
 RESPIRATOR. SAVE THIS MANUAL FOR FUTURE USE.**

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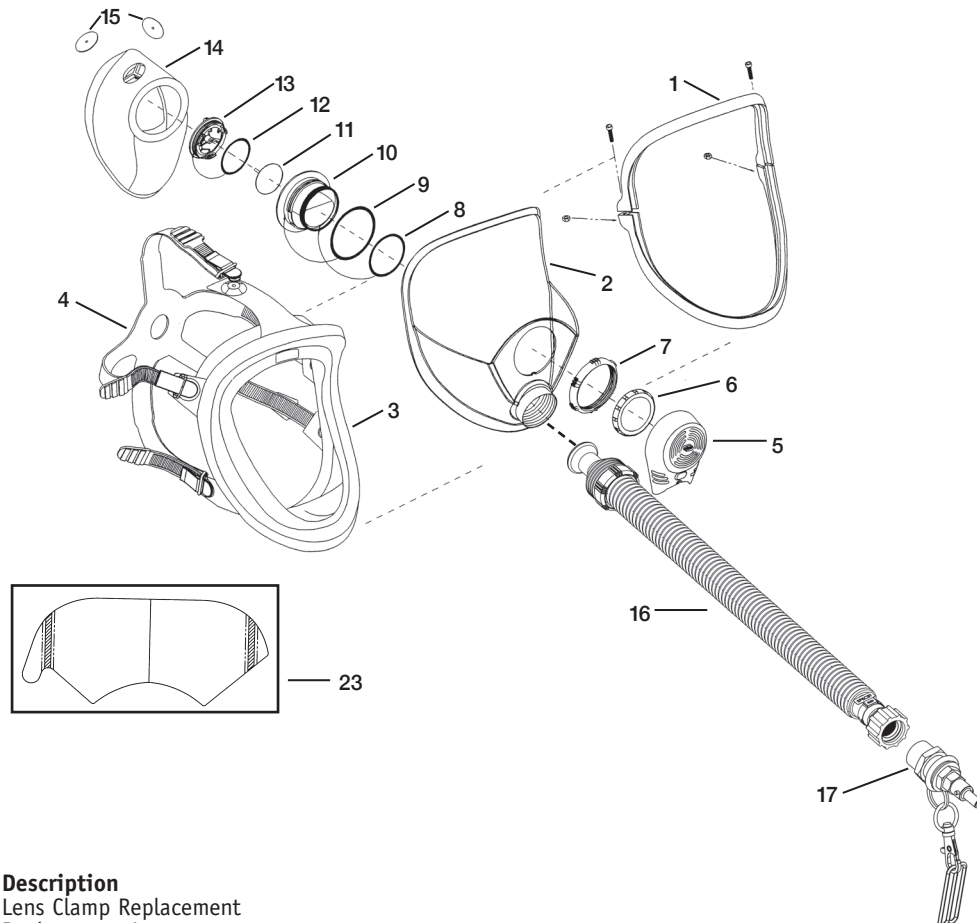


# Spectrum Series® Continuous Flow Airline Respirator Instruction Manual



| ALTERNATE AIR HOSES |       |      |      |      |       |       |       |       |       |      |        |         |       |         |          |       |      |     |     | ALTERNATE BELTS |     | ALTERNATE AIRLINE FITTINGS |     |      |     |     |     |        |        |        |      | ACCESSORIES |    |     |       | CAUTIONS/LIMITATIONS <sup>2</sup> |   |   |            |            |
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| 54511               | 54510 | 5454 | 5457 | 5458 | 46919 | 46918 | 46917 | 46915 | 46913 | 4696 | 469650 | 4696100 | 46916 | V2050ST | V20100ST | 36501 | 4612 | V11 | V12 | V13             | V14 | V18                        | V19 | V19B | V37 | V38 | V17 | S19432 | S19442 | S19443 | 3902 | S19448      | PL | LNK | AFW45 | LC                                |   |   |            |            |
| X                   | X     | X    | X    | X    | X     | X     | X     | X     | X     | X    | X      | X       | X     | X       | X        | X     | X    | X   | X   | X               | X   | X                          | X   | X    | X   | X   | X   | X      | X      | X      | X    | X           | X  | X   | X     | X                                 | X | X | ABCDEJMNOS |            |
| X                   | X     | X    | X    | X    | X     | X     | X     | X     | X     | X    | X      | X       | X     | X       | X        | X     | X    | X   | X   | X               | X   | X                          | X   | X    | X   | X   | X   | X      | X      | X      | X    | X           | X  | X   | X     | X                                 | X | X | X          | ABCDEJMNOS |
| X                   | X     | X    | X    | X    | X     | X     | X     | X     | X     | X    | X      | X       | X     | X       | X        | X     | X    | X   | X   | X               | X   | X                          | X   | X    | X   | X   | X   | X      | X      | X      | X    | X           | X  | X   | X     | X                                 | X | X | X          | ABCDEJMNOS |
| X                   | X     | X    | X    | X    | X     | X     | X     | X     | X     | X    | X      | X       | X     | X       | X        | X     | X    | X   | X   | X               | X   | X                          | X   | X    | X   | X   | X   | X      | X      | X      | X    | X           | X  | X   | X     | X                                 | X | X | X          | ABCDEJMNOS |

## SPECTRUM AIRLINE RESPIRATOR



| Cat. No. | Description                           |
|----------|---------------------------------------|
| 1.       | LCK Lens Clamp Replacement            |
| 2.       | RLS Replacement Lens                  |
| 3.       | FKL & FKS Facepiece Flange            |
| 4.       | HSK Headstrap with Buckles and Slides |
| 5.       | MCK Mask Cover                        |
| 6.       | SEK Speaker Diaphragm                 |
| 7.       | SEK Outer Locking Ring                |
| 8.       | SEK O-ring Speaker Diaphragm*         |
| 9.       | SEK O-ring Speaker/Exhalation*        |
| 10.      | SEK Speaker/Exhalation Body           |
| 11.      | 6059 Exhalation Valve*                |
| 12.      | EVO O-ring for Exhalation Valve Seat* |
| 13.      | EVO Exhalation Valve Seat             |
| 14.      | LNK Nosecup                           |
| 15.      | LNK Inhalation Valve Flaps*           |
| 16.      | SPECBT Breathing Tube                 |
| 17.      | F30 Series Adjustable Flow            |
| 18.      | F40 Series Adjustable Flow            |
| 19.      | F35 Series For Free Air-Pumps         |
| 20.      | AC1000 Series Cool Tube               |
| 21.      | HC2400 Series Hot/Cold Tube           |
| 22.      | LC Mylar Lens Covers (25/pkg.)        |



\*Packaged as replacement parts in quantities of 4 or 5 (See page 6).

# Spectrum Series® Continuous Flow Airline Respirator Instruction Manual

## GENERAL INFORMATION

Bullard's Spectrum-CF airline respirator, when properly used, provides a continuous flow of air from a remote air source to the respirator wearer. Spectrum-CF respirators offer protection from airborne contaminants that are not immediately dangerous to life or health (IDLH), or that do not exceed concentrations allowed by applicable OSHA, EPA, NIOSH or ACGIH regulations and recommendations for continuous-flow or pressure-demand class airline respirators.

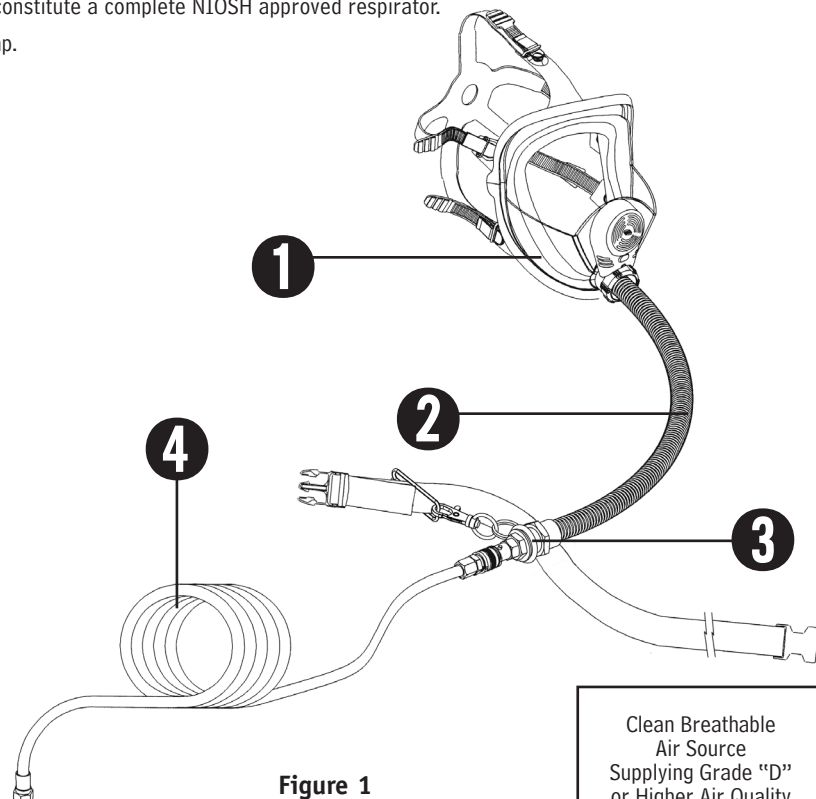
Spectrum-CF airline respirators are approved by NIOSH Type C, Continuous-Flow Class) to provide respiratory protection in general purpose applications, including spray painting, tank cleaning, chemical and pesticide handling, and other industrial or agricultural applications. The Spectrum-CF is NOT to be used in confined spaces or in IDLH conditions.

Spectrum-CF respirators are compatible with breathing air sources such as air compressors or Bullard Free-Air® Pumps. Bullard offers the appropriate approved breathing tube assembly and air supply hose to connect the Spectrum-CF respirator to these breathing air sources. This respirator is available in two mask sizes. A probed mask kit is available for quantitative fit testing. Contact Bullard or our local authorized distributor for more information about other accessories for Spectrum-CF respirators.

## COMPONENT CONCEPT

The Spectrum-CF airline respirator consists of four components: full-face mask, breathing tube, flow control devices, and air supply hose. All must be present and properly assembled to constitute a complete NIOSH approved respirator.

1. Full-Face Mask with Headstrap.
2. Breathing Tube
3. Flow Control Device
4. Air Supply Hose



### ▲ WARNING

Failure to use complete NIOSH-approved Bullard system. Basic parts are listed on the NIOSH Approval Label on Pages 2 and 3.

**▲ WARNING**

1. This respirator, when properly fitted and used, significantly reduces, but does not completely eliminate, the breathing of contaminants by the respirator wearer. You may obtain better respiratory protection from other types of respiratory protection equipment such as a valve-operated pressure-demand airline respirator or a pressure-demand self-contained breathing apparatus respirator.
2. Before using this respirator, be sure your employer has determined that airborne contaminant concentrations do not exceed those allowed by applicable OSHA, MSHA, EPA, NIOSH or ACGIH regulations and recommendations, or any other applicable regulations for continuous-flow airline and pressure-demand airline respirators. Federal law requires that your employer measure and monitor airborne contaminant levels in the work area.
3. Improper respirator use may damage your health and/or cause your death. Improper use may also cause certain life-threatening delayed lung disease such as silicosis, pneumoconiosis or asbestosis.
4. DO NOT wear this respirator if any of the following conditions exist:
  - Atmosphere is immediately dangerous to your life or health (IDLH).
  - You CANNOT escape without the aid of the respirator.
  - Atmosphere contains less than 19.5% oxygen.
  - Work area is poorly ventilated.
  - Unknown contaminants are present.
  - Contaminant concentrations are in excess of regulations or recommendations (as described in item 2 above).
5. Bullard recommends that you DO NOT wear this respirator until you have passed a complete physical exam (perhaps including a lung x-ray), conducted by qualified medical personnel, and have been trained in the respirator's use, maintenance and limitations by a qualified individual (appointed by your employer) who has extensive knowledge of the Bullard Spectrum respirator.
6. DO NOT modify or alter this respirator in any manner. Use only NIOSH approved Bullard Spectrum components and replacement parts manufactured by Bullard for use with this respirator. Failure to use NIOSH approved Bullard system.
7. Inspect all components of this respirator system daily for signs of wear, tear or damage that might reduce the degree of protection originally provided. Immediately replace worn or damaged components with NIOSH approved Bullard system.
8. Be certain your employer has determined that the breathing air source provides at least Grade D breathable air. This respirator must be supplied with clean breathable air at all times.
9. DO NOT connect the respirator's air supply hose to nitrogen, oxygen, toxic gases, inert gases or other unbreathable, non-Grade D air sources. To prevent this, airline couplings used for this respirator shall be incompatible with outlet for other gas systems. Check the air source before using the respirator. Failure to connect to the proper air source may result in serious injury or your death.
10. DO NOT use this respirator in poorly ventilated areas or confined spaces such as tanks, small rooms, tunnels or vessels, unless the confined space is well ventilated and contaminant concentrations are below the upper limit recommended for this respirator. In addition, follow all procedures for confined space entry, operation and exit as defined in applicable regulations and standards, including 29 CFR 1910.146.
11. If you have any questions concerning the use of this respirator, or if you are not sure whether the atmosphere you are working in is immediately dangerous to life or health (IDLH), ask your employer. All instructions for the use and care of this product must be supplied to you by your employer as recommended by the manufacturer and as required by Federal Law (29 CFR 1910.134).
12. DO NOT use this respirator for abrasive blasting or underwater diving.

**CAUTIONS AND LIMITATIONS**

- A. Not for use in atmospheres containing less than 19.5 % oxygen.
- B. Not for use in atmospheres immediately dangerous to life or health.
- C. Do not exceed maximum use concentrations established by regulatory standards.
- D. Air-line respirators can be used only when the respirators are supplied with respirable air meeting the requirements of CGA G-7.1 Grade D or higher quality.
- E. Use only the pressure ranges and hose lengths specified in the User's Instructions.
- J. Failure to properly use and maintain this product could result in injury or death.
- M. All approved respirators shall be selected, fitted, used and maintained in accordance with MSHA, OSHA and other applicable regulations.
- N. Never substitute, modify, add or omit parts. Use only exact replacement parts in the configuration specified by the manufacturer.
- O. Refer to User's Instructions, and/or maintenance manuals for information on use and maintenance of these respirators.
- S. Special or Critical User's Instruction, and/or specific use limitations apply. Refer to User's Instructions before donning.

For technical assistance, call or write:

**Bullard**

1898 Safety Way  
Cynthiana, KY 41031-9303  
Toll-Free: 800-827-0423  
Phone: 859-234-6611  
Facsimile: 859-234-6858

# Spectrum Series® Continuous Flow Airline Respirator Instruction Manual

## OPERATIONS

### Limitations of Use

#### RESPIRATORY

This respirator is NIOSH approved (Continuous-Flow Class) for Type C applications. It can be worn for general purposes including: spray painting; tank cleaning; chemical and pesticide handling; and other industrial or agricultural applications.

This respirator is not approved for use in any atmosphere immediately dangerous to life or health (IDLH), or from which the wearer cannot escape without the aid of the respirator. This respirator is not approved for abrasive blasting.

#### HEAD

Spectrum respirators DO NOT provide head protection. Wear approved head protection if head protection is required.

#### FACE

This respirator's lens meets ANSI Z87.1-1989 faceshield requirements for impact, penetration and optics. The lens provides LIMITED FACE PROTECTION. The Spectrum lens is not shatterproof.

#### EYES

Spectrum respirators provide LIMITED EYE PROTECTION from flying particles and splash per ANSI Z87.1979. Primary eye protection should be worn when necessary.

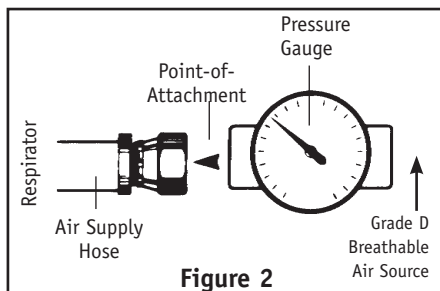


Figure 2

### Breathing Air Requirements

#### AIR QUALITY

##### ▲ WARNING

THIS RESPIRATOR MUST BE SUPPLIED WITH CLEAN, BREATHABLE AIR, GRADE D OR BETTER, AT ALL TIMES. THIS RESPIRATOR DOES NOT PURIFY AIR OR FILTER OUT CONTAMINANTS.

Respirable, breathable air must be supplied to the point-of-attachment of the approved Bullard air supply hose. The point-of-attachment is the point at which the air supply hose connects to the air source. A pressure gauge attached to the air source is used to monitor the pressure of air provided to the respirator wearer (See Figure 2).

Supplied breathing air must AT A MINIMUM meet the requirements for Type 1 gaseous air described in the Compressed Gas Association Commodity Specification G-7.1 (Grade D or higher quality), as specified by Federal Regulations 42 CFR, Part 84.141 (b) and 29 CFR 1910.134 (i).

The requirements for Grade D breathable air include:

- Oxygen ..... 19.5-23.5%
- Hydrocarbons (condensed)  
in mg/m<sup>3</sup> of gas ..... 5 mg/m<sup>3</sup> max.
- Carbon monoxide ..... 10 ppm max.
- Carbon dioxide ..... 1,000 ppm max.
- Odor ..... lack of noticeable odor\*
- No toxic contaminants at levels that make air unsafe to breathe.

\*Specific measurement of odor in gaseous air is impractical. Air may normally have a slight odor. The presence of a pronounced odor should render the air unsatisfactory.

Contact the Compressed Gas Association (1725 Jefferson Davis Highway, Arlington, VA 22202) for complete details on commodity Specifications G-7.1

#### AIR SOURCE

Locate the source of supplied air, whether it is an air compressor or an ambient air pump, such as a Bullard Free-Air® pump, in a clean air environment. Locate the air source far enough from your work site to ensure the air remains contaminant-free. Always use an inlet filter on the air source. Use suitable filters and carbon monoxide monitors and alarms, like Bullard's CAB Series of CO monitors, as necessary to assure clean, breathable air at all times. The air should be regularly sampled to be sure that it meets Grade D requirements.

#### Breathing Air Pressure

Air pressure must be continually monitored at the point-of-attachment while operating this respirator. A reliable air pressure gauge must be present to permit you to continually monitor pressure during actual respirator operation.

##### ▲ WARNING

FAILURE TO SUPPLY THE MINIMUM REQUIRED PRESSURE AT THE POINT-OF-ATTACHMENT FOR YOUR HOSE LENGTH AND TYPE WILL REDUCE AIRFLOW AND MAY CAUSE INJURY, DISEASE OR DEATH.

The Breathing Air Pressure Tables (See page 8) define the air pressure ranges necessary to provide Spectrum-CF respirators with a volume of air that falls within the required range of 4-15 cfm (Ref. 42 CFR, Part 84, Subpart J.84.150) when operated in continuous-flow mode. Make sure you understand the information in the Breathing Air Pressure Table (see page 8) before using this respirator.

1. Refer to approval labels on page 2-3.
2. Refer to pressure table on page 8.
3. Locate your flow control device (column 3).
4. Make sure you have not exceeded the maximum number of hose sections (column 4).
5. Set the air pressure at the point-of-attachment within the required pressure range (column 5) for your breathing tube assembly and air supply hose type and length. Accurate pressure readings can only be attained when air is flowing into the respirator.



## Breathing Air Supply Hoses and Hose Fittings

NIOSH-approved Bullard air supply hose(s) MUST be used between the breathing tube connection fitting on the wearer's belt and the point-of-attachment to the air supply (see Figure 1). NIOSH-approved Bullard system MUST be used to connect V20 hose lengths together. When connecting lengths of V10 hose, only use Bullard V11 hose-to-hose adaptors. Secure connection(s) until wrench-tight and leak-free.

Total connected hose length and number of hoses MUST be within the ranges specified on the Breathing Air Pressure Table (see page 8) and the respirator's NIOSH approval label (see pages 2 and 3). The breathing tube connection fitting MUST be secured to the belt that is supplied with this respirator. Securing the air entry connection fitting helps prevent the air supply hose from snagging, disconnecting or pulling the respirator off your face.

## BREATHING AIR PRESSURE TABLES

| V10 Hose       |                 |                                 |                  |                       |                        |                        |                         |                         |                         |                         |                         |
|----------------|-----------------|---------------------------------|------------------|-----------------------|------------------------|------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| Air Source     | Usage           | Flow Control Device Part Number | Coupling Design  | 25' Max 1 Hose Length | 50' Max 2 Hose Lengths | 75' Max 3 Hose Lengths | 100' Max 3 Hose Lengths | 150' Max 3 Hose Lengths | 200' Max 5 Hose Lengths | 250' Max 5 Hose Lengths | 300' Max 5 Hose Lengths |
| Compressed Air | Constant Flow   | F30/F30B/F30S                   | Ind. Interchange | 9-14                  | 12-17                  | 14-20                  | 15-22                   | 17-25                   | 20-31                   | 25-31                   | 25-39                   |
|                |                 | F31                             | Schrader         | 8-13                  | 10-17                  | 12-18                  | 13-20                   | 17-24                   | 19-30                   | 24-30                   | 25-38                   |
|                |                 | F32/F33/F34                     | Snap-Tite        | 7-11                  | 9-14                   | 11-15                  | 12-17                   | 15-22                   | 17-28                   | 23-28                   | 24-36                   |
|                |                 | F37                             | CEJN             | 4-6                   | 6-10                   | 9-13                   | 10-15                   | 14-20                   | 16-26                   | 22-26                   | 23-35                   |
|                | Adjustable Flow | F38                             | Bayonet          | 12-19                 | 15-22                  | 16-24                  | 17-25                   | 20-29                   | 22-33                   | 27-34                   | 28-40                   |
|                |                 | F40/F40B/F40S                   | Ind. Interchange | 13-18                 | 16-20                  | 17-22                  | 18-24                   | 21-27                   | 23-33                   | 28-33                   | 28-41                   |
|                |                 | F41                             | Schrader         | 14-18                 | 16-20                  | 17-22                  | 18-24                   | 21-28                   | 23-33                   | 28-33                   | 29-41                   |
|                |                 | F42/F43/F44                     | Snap-Tite        | 12-15                 | 15-19                  | 16-20                  | 17-22                   | 20-25                   | 22-32                   | 27-31                   | 27-39                   |
|                | Cooling Mode    | F47                             | CEJN             | 10-12                 | 13-15                  | 14-18                  | 15-19                   | 19-24                   | 20-30                   | 25-29                   | 26-37                   |
|                |                 | F48                             | Bayonet          | 17-24                 | 18-26                  | 20-28                  | 21-29                   | 24-32                   | 25-37                   | 30-37                   | 31-44                   |
|                |                 | AC100030/AC100030B/AC100030S    | Ind. Interchange | 43-48                 | 45-51                  | 46-52                  | 47-53                   | 49-55                   | 51-58                   | 57-58                   | 56-64                   |
|                |                 | AC100031                        | Schrader         | 41-48                 | 44-50                  | 45-50                  | 46-52                   | 48-54                   | 49-57                   | 56-57                   | 55-63                   |
|                |                 | AC100032/AC100033/AC100034      | Snap-Tite        | 40-46                 | 42-48                  | 43-48                  | 44-50                   | 46-52                   | 48-56                   | 54-56                   | 54-61                   |
|                |                 | AC100037                        | CEJN             | 39-45                 | 41-46                  | 43-47                  | 43-48                   | 46-51                   | 47-54                   | 55                      | 54-61                   |
|                |                 | AC100038                        | Bayonet          | 43-49                 | 44-52                  | 46-53                  | 47-53                   | 49-55                   | 50-59                   | 58                      | 56-64                   |
|                |                 | HC240030/HC240030B/HC240030S    | Ind. Interchange | 42-47                 | 46-50                  | 47-51                  | 48-53                   | 51-56                   | 53-60                   | 61                      | 60-68                   |
|                | Heating Mode    | HC240031                        | Schrader         | 43-46                 | 45-49                  | 47-51                  | 48-52                   | 52-55                   | 54-60                   | 60                      | 62-68                   |
|                |                 | HC240032/HC240033/HC240034      | Snap-Tite        | 42-45                 | 45-49                  | 47-50                  | 48-51                   | 50-55                   | 53-59                   | 60                      | 61-67                   |
|                |                 | HC240037                        | CEJN             | 38-42                 | 41-44                  | 42-46                  | 44-47                   | 47-51                   | 50-56                   | 57                      | 57-64                   |
|                |                 | HC240038                        | Bayonet          | 45-50                 | 48-52                  | 49-54                  | 51-54                   | 54-59                   | 56-63                   | 63                      | 63-71                   |
|                |                 | HC240030/HC240030B/HC240030S    | Ind. Interchange | 42-52                 | 46-55                  | 47-56                  | 48-57                   | 51-60                   | 54-65                   | 64-65                   | 59-72                   |
|                |                 | HC240031                        | Schrader         | 41-50                 | 44-52                  | 46-54                  | 47-55                   | 51-59                   | 53-64                   | 62-64                   | 61-72                   |
|                |                 | HC240032/HC240033/HC240034      | Snap-Tite        | 40-50                 | 43-52                  | 45-53                  | 46-54                   | 49-58                   | 51-60                   | 60                      | 59-70                   |
|                |                 | HC240037                        | CEJN             | 38-47                 | 41-49                  | 43-51                  | 44-52                   | 48-56                   | 50-61                   | 60-61                   | 58-69                   |
|                | HC240038        | Bayonet                         | 46-55            | 49-57                 | 51-59                  | 52-60                  | 55-64                   | 58-68                   | 66-68                   | 65-76                   |                         |

| V20 Hose    |               |                                 |                  |     |                        |     |                         |      |                         |      |                         |
|-------------|---------------|---------------------------------|------------------|-----|------------------------|-----|-------------------------|------|-------------------------|------|-------------------------|
| Air Source  | Usage         | Flow Control Device Part Number | Coupling Design  | 25' | 50' Max 1 Hose Lengths | 75' | 100' Max 1 Hose Lengths | 150' | 200' Max 2 Hose Lengths | 250' | 300' Max 3 Hose Lengths |
| Ambient Air | Constant Flow | F35/F35B/F35S                   | Ind. Interchange |     | 3-4                    |     | 4-6                     |      | 7-9                     |      | 9-13                    |



# Spectrum Series® Continuous Flow Airline Respirator Instruction Manual

## SPECTRUM RESPIRATOR ASSEMBLY

### Putting Respirator On (Donning)

1. Remove components from the shipping package.
2. Lace the belt through the slot on the flow control device.
3. Connect the larger end of the breathing tube into the mask by threading finger tight.
4. Connect the small diameter end of the breathing tube to the threads on the flow control device.
5. Connect the NIOSH-approved Bullard system to the air source supplying Grade D breathing air.
6. Buckle the belt to your waist and adjust for comfort.
7. Don the mask per the instructions below:

### Mask

8. Release the headstraps to the full outward position by pulling the headstrap quick release tabs forward. When fully extended, tabs should be located at the headstrap latches.
9. Grasp the headstrap harness with thumbs through the straps. Spread outward.
10. Push the top of the facepiece flange up the forehead, brushing hair upward from the face seal area (See Figure 3). Continue up and over the head until the harness is centered at the rear of the head, and the chin rests in the chin cup.

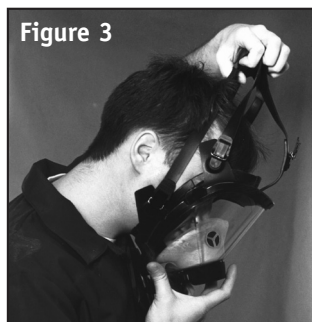


Figure 3

11. Pull both lower straps at the same time towards the rear (See Figure 4). Tighten the two temple straps. Tighten the top head strap if necessary.



Figure 4

12. Adjust headstraps until the facepiece fits securely and evenly.
13. Perform a negative pressure fit check:
  - A) With facepiece on and secured, place your finger over the quick-disconnect nipple located at the end of the breathing tube (See Figure 5).
  - B) Inhale until the mask collapses inward slightly (indicating there is negative pressure). Hold your breath for five seconds.
  - C) The mask is deemed to be in proper position if it remained collapsed while the breath was held, and no inward leakage of outside air was detected.
  - D) If the mask doesn't collapse or if an inward leak is detected, re-adjust mask on face and repeat above steps until the test is passed.

### ▲ WARNING

IF YOU CANNOT OBTAIN A PROPER FIT, TRY ANOTHER MASK SIZE AND GO THROUGH THE SAME STEPS OUTLINED ABOVE. IF A PROPER FIT IS STILL NOT ACHIEVED, ANOTHER RESPIRATOR MAY NEED TO BE SELECTED.

14. With the air flowing, connect the quick-disconnect fitting on the respirator's flow control device to the quick-disconnect coupler on the air supply hose (See Figure 6). Once fitting is secured, release coupling sleeve to lock fitting together. Pull on both hoses to make sure they are attached securely.

15. Adjust the air pressure at the "point-of-attachment" to within the approved pressure range. See the Breathing Air Pressure Table on page 8 for the approved pressure range.
16. With the air flowing into your respirator, you are now ready to enter the work area.

### ▲ WARNING

THE MASK COVER MUST BE USED WHEN OPERATING THIS RESPIRATOR. THIS PART PROTECTS THE EXHALATION VALVE FROM OUTSIDE INTERFERENCE (ITEM 5, PAGE 4).

### Taking Respirator Off (Doffing)

1. When finished working, leave the work area wearing the respirator with the air still flowing.
2. Once completely outside the contaminated area, remove the respirator by lifting the tabs on the latches. Disconnect the air supply hose using the quick-disconnect coupling.

### ! NOTE:

If using V20 or V20R Series (1/2" I.D.) air supply hose, the quick-disconnect coupler does not have a shut off valve (unless indicated by SHUTOFF suffix). Therefore, the air will continue to flow freely after it has been disconnected from the respirator.



Figure 5

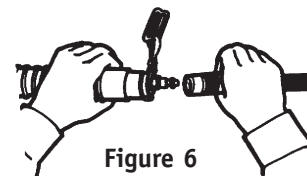


Figure 6

### ▲ WARNING

LEAVE WORK AREA IMMEDIATELY IF:

- Any respirator component becomes damaged.
- Airflow into respirator stops or slows down.
- Air pressure gauge drops below the minimum specified in Breathing Air Pressure Table (page 8).
- Breathing becomes difficult.
- You become dizzy, nauseous, too hot, too cold or ill.
- You taste, smell or see contaminants inside respirator facepiece.
- Your vision becomes impaired.

### ▲ WARNING

IN A CONTAMINATED ENVIRONMENT, RESPIRABLE CONTAMINANTS CAN REMAIN SUSPENDED IN AIR FOR MORE THAN ONE HOUR AFTER WORK ACTIVITY CEASES, EVEN THOUGH YOU MAY NOT SEE THEM. PROPER WORK PRACTICE REQUIRES YOU TO WEAR THE RESPIRATOR UNTIL YOU ARE OUTSIDE THE CONTAMINATED AREA. IF YOU SET THE RESPIRATOR DOWN IN A CONTAMINATED ENVIRONMENT, CONTAMINANTS, DIRT AND DUST COULD GET INTO THE RESPIRATOR. WHEN YOU PUT THE RESPIRATOR BACK ON, YOU COULD BREATHE IN CONTAMINANTS UPON REUSE.



## INSPECTION, CLEANING AND STORAGE

This respirator and all of its component parts and assemblies should be inspected for damage or excessive wear before and after each use to ensure proper functioning. Immediately remove the respirator from service and replace parts or assemblies that show any sign of failure or excessive wear that might reduce the degree of protection.

Use only complete NIOSH-approved Bullard system. Refer to the parts list for correct part numbers.

The respirator should be cleaned, inspected and sanitized at least weekly or more often if subjected to heavy use. Respirators used by more than one person must be cleaned, inspected and sanitized after each use. If not cleaned, contamination may cause illness or disease.

REMEMBER, THE AIR YOU BREATHE WILL NOT BE CLEAN UNLESS THE RESPIRATOR YOU WEAR IS CLEAN.

### Mask

Immerse the facepiece in warm water (about 120 degrees F) with mild detergent or a germicidal disinfecting detergent. The respirator body and parts may be scrubbed gently with a cloth or soft brush. All foreign matter must be removed carefully from all surfaces of the exhalation valve flap and seat.

Wipe any areas still showing accumulations of foreign matter with a cloth moistened in a detergent or a solvent such as mineral spirits until clean.

Stubborn accumulations of paints, lacquers or enamels may be removed with a cloth containing a paint, enamel or lacquer stripping agent. Once the dirt or paint is loosened, it may be gently rubbed or brushed off. DO NOT USE VOLATILE SOLVENTS FOR CLEANING THIS RESPIRATOR OR ANY PARTS OR ASSEMBLIES. STRONG CLEANING AND DISINFECTING AGENTS, AND MANY SOLVENTS, CAN DAMAGE THE SILICONE RUBBER AND PLASTIC PARTS. DO NOT LEAVE SOLVENTS AND STRONG CLEANING AND SANITIZING AGENTS IN CONTACT WITH SILICONE RUBBER OR PLASTIC SURFACES ANY LONGER THAN NECESSARY TO LOOSEN THE ACCUMULATIONS OF DIRT OR CONTAMINANTS.

Rinse the respirator in clean, warm water (about 120 degrees F). Shake to remove excess water, and allow to air-dry away from direct heat, sunlight or contaminants.

### Breathing Tube

INSPECTION: Inspect the breathing tube for tears, cracks, holes or excessive wear that might reduce the degree of protection originally provided. Be sure the quick-disconnect fitting is screwed tightly into the breathing tube so no air can escape.

If any signs of excessive wear are present, replace the breathing tube assembly immediately or remove the respirator from service.

CLEANING: Hand-sponge breathing tube with warm water and mild detergent, rinse and air-dry. Do not get water inside the breathing tube. After cleaning, once again carefully inspect breathing tube for signs of damage.

### Air Supply Hose

INSPECTION: The hose(s) should be inspected closely for abrasions, corrosion, cuts, cracks and blistering. Make sure the hose fittings are crimped tightly to the hose so that air cannot escape. Make sure the hose has not been kinked or crushed by any equipment that may have rolled over it.

If any of the above signs are present or any other signs of excessive wear are detected, replace the air supply hose(s) immediately or remove the respirator from service.

CLEANING: The air supply hose(s) should be hand-sponged with warm water and mild detergent, rinsed and air-dried. Do not get water inside the air supply hose. After cleaning, once again carefully inspect air supply hose(s) for signs of damage.

### ▲ WARNING

REFER TO APPROVAL LABEL ON PAGES 2-3.

### Storage

After reusable respirator components have been cleaned and inspected, place them in a clean plastic bag or an airtight container. Store the respirator and parts where they will be protected from contamination, distortion and damage from elements such as dust, direct sunlight, heat, extreme cold, excessive moisture and harmful chemicals. Store the respirator so it is protected from distortion from the weight or pressure of surrounding objects.

### FIT TESTING

According to OSHA's Respiratory Standard, 29 CFR 1910.134, all tight-fitting facepieces must now be fit tested, regardless of the mode of operation. This includes all respirator models in the Spectrum Series. Users must pass either a qualitative or quantitative fit test, and fit testing must be performed in the negative pressure mode. Bullard's QNFT45 fit test kit converts the Spectrum facepiece to the negative pressure mode, and can be used for either type of fit testing. The instruction sheet that accompanies the kit provides guidance on its proper use.

The options for qualitative challenge agents include: isoamyl acetate (banana oil), irritant smoke, saccharin and Bitrex (denatonium benzoate). Quantitative options include generated aerosol, ambient aerosol CNC (Portacount method), or controlled negative pressure (Dynatech Nevada Fit Tester 3000 method). The minimum fit factor for a full-face respirator is 500.

Fit testing shall be performed prior to initial use, whenever a different respirator is used, and at least annually thereafter. An additional fit test must also be performed whenever there are changes in the employee's physical condition that could affect respirator fit, such as dental changes or an obvious change in body weight.

# Spectrum Series® Continuous Flow Airline Respirator Instruction Manual

## PARTS AND ACCESSORIES FOR SPECTRUM RESPIRATORS

### 1a. Respirator Assemblies - includes full face mask, breathing tube, flow control device, and belt. For Use With Compressed Air

| Large/Med Mask | Small Mask     | Description  |
|----------------|----------------|--|
| SPEC30L        | SPEC30S        | Constant Flow Assembly with F30 Industrial Interchange (Hansen Compatible) Nipple            |
| SPEC31L        | SPEC31S        | Constant Flow Assembly with F31 Schrader Nipple  |
| SPEC32L        | SPEC32S        | Constant Flow Assembly with F32 Snap-Tite Nipple   |
| SPEC33L        | SPEC33S        | Constant Flow Assembly with F33 Snap-Tite Brass Nipple                                       |
| SPEC34L        | SPEC34S        | Constant Flow Assembly with F34 Snap-Tite Stainless Nipple                                   |
| SPEC37L        | SPEC37S        | Constant Flow Assembly with F37 CEJN Nipple  |
| SPEC38L        | SPEC38S        | Constant Flow Assembly with F38 Bayonet Nipple   |
| SPEC40L        | SPEC40S        | Adjustable Flow Assembly with F40 Industrial Interchange Nipple                              |
| SPEC41L        | SPEC41S        | Adjustable Flow Assembly with F41 Schrader Nipple  |
| SPEC42L        | SPEC42S        | Adjustable Flow Assembly with F42 Snap-Tite Nipple   |
| SPEC43L        | SPEC43S        | Adjustable Flow Assembly with F43 Snap-Tite Brass Nipple                                     |
| SPEC44L        | SPEC44S        | Adjustable Flow Assembly with F44 Snap-Tite Stainless Nipple                                 |
| SPEC47L        | SPEC47S        | Adjustable Flow Assembly with F47 CEJN Nipple  |
| SPEC48L        | SPEC48S        | Adjustable Flow Assembly with F48 Bayonet Nipple   |
| SPECAC100030L  | SPECAC100030S  | AC1000 Series Cool Tube Assembly with Industrial Interchange (Hansen Compatible) Nipple      |
| SPECAC100031L  | SPECAC100031S  | AC1000 Series Cool Tube Assembly with Schrader Nipple  |
| SPECAC100032L  | SPECAC100032S  | AC1000 Series Cool Tube Assembly with Snap-Tite Nipple                                       |
| SPECAC100033L  | SPECAC100033S  | AC1000 Series Cool Tube Assembly with Snap-Tite Brass Nipple                                 |
| SPECAC100034L  | SPECAC100034S  | AC1000 Series Cool Tube Assembly with Snap-Tite Stainless Nipple                             |
| SPECAC10037L   | SPECAC10037S   | AC1000 Series Cool Tube Assembly with CEJN Nipple  |
| SPECAC10038L   | SPECAC10038S   | AC1000 Series Cool Tube Assembly with Bayonet Nipple   |
| SPECHC2400030L | SPECHC2400030S | HC2400 Series Hold/Cold Tube Assembly with Industrial Interchange (Hansen Compatible) Nipple |
| SPECHC2400031L | SPECHC2400031S | HC2400 Series Hold/Cold Tube Assembly with Schrader Nipple                                   |
| SPECHC2400032L | SPECHC2400032S | HC2400 Series Hold/Cold Tube Assembly with Snap-Tite Nipple                                  |
| SPECHC2400033L | SPECHC2400033S | HC2400 Series Hold/Cold Tube Assembly with Snap-Tite Brass Nipple                            |
| SPECHC2400034L | SPECHC2400034S | HC2400 Series Hold/Cold Tube Assembly with Snap-Tite Stainless Nipple                        |
| SPECHC2400037L | SPECHC2400037S | HC2400 Series Hold/Cold Tube Assembly with CEJN Nipple                                       |
| SPECHC2400038L | SPECHC2400038S | HC2400 Series Hold/Cold Tube Assembly with Bayonet Nipple                                    |

### 1b. Respirator Assemblies - includes full face mask, breathing tube, flow control device, and belt For Use With Bullard Free Air Pumps or Compressed Air

|         |         |   |
|---------|---------|---|
| SPEC35L | SPEC35S | Constant Flow Assembly with F35 Industrial Interchange (Hansen Compatible) Nipple |
|---------|---------|---|



## PARTS AND ACCESSORIES FOR SPECTRUM RESPIRATORS

### 2. Replacement Breathing Tubes

SPECBT Breathing Tube

### 3. Flow control devices (includes nylon belt)

|           |   |
|-----------|---|
| F30       | Industrial Interchange (Hansen Compatible) Nipple                                   |
| F31       | Schrader Nipple   |
| F32       | Snap-Tite Nipple  |
| F33       | Snap-Tite Brass Nipple  |
| F34       | Snap-Tite Stainless Nipple  |
| F37       | CEJN Nipple   |
| F38       | Bayonet Nipple  |
| F40       | Industrial Interchange Nipple   |
| AC100030  | AC1000 Series Cool Tube with Industrial Interchange (Hansen Compatible) Nipple      |
| AC100031  | AC1000 Series Cool Tube with Schrader Nipple  |
| AC100032  | AC1000 Series Cool Tube with Snap-Tite Nipple                                       |
| AC100033  | AC1000 Series Cool Tube with Snap-Tite Brass Nipple                                 |
| AC100034  | AC1000 Series Cool Tube with Snap-Tite Stainless Nipple                             |
| AC100037  | AC1000 Series Cool Tube with CEJN Nipple  |
| AC100038  | AC1000 Series Cool Tube with Bayonet Nipple   |
| AC100040  | AC1000 Series Cool Tube with Industrial Interchange Nipple                          |
| HC2400030 | HC2400 Series Hold/Cold Tube with Industrial Interchange (Hansen Compatible) Nipple |
| HC2400031 | HC2400 Series Hold/Cold Tube with Schrader Nipple                                   |
| HC2400032 | HC2400 Series Hold/Cold Tube with Snap-Tite Nipple                                  |
| HC2400033 | HC2400 Series Hold/Cold Tube with Snap-Tite Brass Nipple                            |
| HC2400034 | HC2400 Series Hot/Cold Tube with Snap-Tite Stainless Nipple                         |
| HC2400037 | HC2400 Series Hot/Cold Tube with CEJN Nipple  |
| HC2400038 | HC2400 Series Hold/Cold Tube with Bayonet Nipple                                    |
| HC240040  | HC2400 Series Hot/Cold Tube with Industrial Interchange Nipple                      |

### 4. Breathing Air Supply Hoses For use with Compressed Air V10 Series Starter Hoses (3/8" I.D.) - include 1/2" coupler, V13 hose to pipe adaptor, V17 nipple

|         |  |
|---------|--|
| 4696    | 25' length, Industrial Interchange (Hansen Compatible) Fittings  |
| 469650  | 50' length, Industrial Interchange (Hansen Compatible) Fittings  |
| 4696100 | 100' length, Industrial Interchange (Hansen Compatible) Fittings |
| 46913   | SAR Comp Air Supply Hose V10 3/8" ID Starter Schrader 25' Black  |
| 46915   | SAR Comp Air Supply Hose V10 3/8" ID Starter Snap-Tite 25' Black |
| 46916   | SAR Comp Air Supply Hose V10 3/8" ID Starter Snap-Tite 25' Green |
| 46917   | SAR Comp Air Supply Hose V10 3/8" ID Starter Snap-Tite 50' Green |
| 46918   | SAR Comp Air Supply Hose V10 3/8" ID Starter Snap-Tite 25' Blue  |
| 46919   | SAR Comp Air Supply Hose V10 3/8" ID Starter Snap-Tite 50' Blue  |

### V10 Series Extension Hoses - include V11 hose-to-hose adaptor and V13 hose-to-pipe adaptor

|       |  |
|-------|--|
| 5454  | 25' length   |
| 5457  | 50' length   |
| 5458  | 100' length  |
| 54510 | SAR Comp Air Supply Hose V10 3/8" ID Extension 25' Green |
| 54511 | SAR Comp Air Supply Hose V10 3/8" ID Extension 50' Green |
| 54512 | SAR Comp Air Supply Hose V10 3/8" ID Extension 100' Blue |
| 54513 | SAR Comp Air Supply Hose V10 3/8" ID Extension 50' Blue  |
| 54514 | SAR Comp Air Supply Hose V10 3/8" ID Extension 25' Blue  |

### V20 Series Starter Hoses (1/2" I.D.) - include 1/2" coupler on one end, 1/2" male nipple on other

|          |             |
|----------|-------------|
| V2050ST  | 50' length  |
| V20100ST | 100' length |

### 5. Accessories and Kits

|         |   |
|---------|---|
| LCK     | Lens Clamp Replacement Kit - includes upper and lower clamps with screws and nuts |
| RLS     | Lens Replacement  |
| FKML    | Facepiece Flange, Medium/Large  |
| FKS     | Facepiece Flange, Small   |
| HSK     | Headstrap Kit, includes 5 buckles and slides                                      |
| MCK     | Mask Cover Kit  |
| SEK     | Speaker Diaphragm kit   |
| EVO     | Exhalation Valve Kit - includes valve seat and o-ring                             |
| LNK     | Nose Cup Kit - includes 2 inhalation valve flaps                                  |
| 6059    | Exhalation Valves - package of 5  |
| AFW45   | Wipes, Anti-Fog - package of 10   |
| PL      | Spectacle Frame Assembly  |
| LCK     | Lens Covers, Mylar (package of 25)  |
| SPECIVK | Inhalation Valve Kit - package of 5   |



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## For use with Bullard Airline Respirators

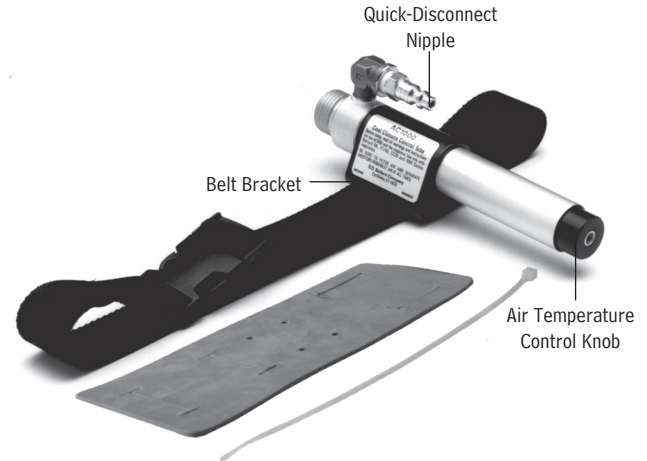
**Includes:** AC1000 Cool Tube, belt bracket, nylon belt and heat shield.

**Function:** The AC1000 is designed to supply a continuous flow of cool air to certain Bullard supplied air respirators. Please consult the NIOSH approval matrix in your respirator user manual to verify that the AC1000 is NIOSH approved for your specific configuration. All Bullard parts must be present and properly assembled to constitute a NIOSH-approved respirator.



**NOTE**

The AC100035 is designed to operate at low pressures.



**⚠ WARNING**

Before using this product, read and follow all directions and warnings, including those in the respirator instruction manual. Failure to follow these instructions could result in death or serious injury.

**⚠ WARNING**

This climate control system is not recommended for cooling the air supply when the air temperature is less than 70°F. Since the system may cool the incoming air by more than 30°F, it is possible for ice to form in the breathing tube and reduce the airflow. Failure to observe this warning could result in death or serious injury.

### Air Quality Requirements

Respirable air must be supplied to the point-of-attachment of the BULLARD air supply hose that is part of the NIOSH approved system. The point-of-attachment is where the air supply hose connects to the fitting that contains a pressure gauge used to monitor the pressure of the air provided to you.

Locate the source of supplied air in a clean environment far enough from your work site to ensure the air remains contaminant-free. Always use an inlet filter on your air source and any monitors and alarms as necessary to assure clean, breathable air at all times.

Supplied breathing air **MUST** meet or exceed the requirements for Type 1 gaseous air described in the Compressed Gas Association Commodity Specification G-7.1 (Grade D or higher quality) as specified by Federal Law 42 CFR, Part 84, Subpart J, 84.141(b) and 29 CFR 1910.134(i)(1)(ii). The requirements for Grade D breathable air include:

|  |                          |
|--|--------------------------|
| Oxygen.....  | 19.5-23.5%               |
| Hydrocarbons in mg/m <sup>3</sup> of gas.....                    | 5 mg/m <sup>3</sup> max. |
| Carbon monoxide.....   | 10 ppm max.              |
| Carbon dioxide.....  | 1,000 ppm max.           |
| Odor .....   | No pronounced odor*      |
| No toxic contaminants at levels that make air unsafe to breathe. |                          |

\* Specific measurement of odor in gases is impractical. Air normally may have a slight odor. The presence of a prolonged odor should render the air unsatisfactory.

Refer to C.G.A. Commodity Specification G-7.1 for complete details, or contact the Compressed Gas Association (1235 Jefferson Davis Highway, Arlington, VA 22202 or [www.cganet.com](http://www.cganet.com)).

**⚠ WARNING**

The respirator's air source must supply clean, breathable air, Grade D or better, at all times. The respirator does not purify air or filter out contaminants. Connecting the respirator to a line supplying nitrogen or other harmful gases could cause death or serious injury. Failure to follow these instructions could result in death or serious injury.

### Air Pressure

Continually monitor the air pressure at the point-of-attachment while operating the respirator. A reliable air pressure gauge must be present to monitor the pressure.

**⚠ WARNING**

Failure to supply the minimum required pressure at the point-of-attachment for your hose length will reduce airflow and could result in death or serious injury.

It is important to operate the Bullard climate control device in the prescribed pressure range for the particular Bullard respirator you are using. Operating the correct pressure range will insure that the correct air flow is delivered to the respirator and will maintain the NIOSH approval. Refer to your respirator user manuals' Breathing Air Pressure Table to determine the correct pressure that should be used with the climate control device. This table defines the pressure ranges necessary to provide the respirator with a volume of Grade D air that falls within the U.S. Government required range of 6-15 cfm (or 170-425 lpm). (See 42 CFR, Part 84, Subpart J, 84.150)

The **Breathing Air Pressure Table** defines the air pressure ranges necessary to provide the respirator with a volume of air that falls within the required range of 6-15 cubic feet per minute (cfm) or 170-425 liters per minute (lpm). Be sure you understand the information in the BREATHING AIR PRESSURE TABLE before using the respirator.

## Air Supply Hose

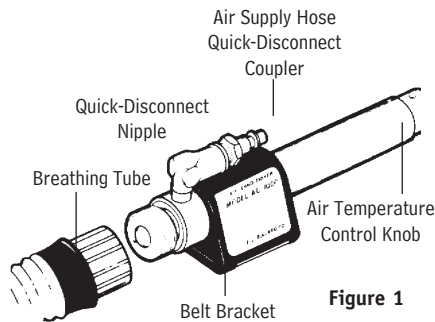
To maintain your Bullard respirator's NIOSH approval, use only approved Bullard V10 Series hose(s) in lengths of 25 to 300 feet, or Bullard V5 Series hose in lengths of 25 or 50 feet, between the AC1000's quick-disconnect fitting and the point-of-attachment to the hose. Bullard V11 hose-to-hose adaptors **MUST** be used to connect V10 hose lengths together. Secure connection(s) until wrench tight and leak free. The ACL00035 is compatible only with Bullard V20 Series Air Supply Hose.

### **⚠ WARNING**

Use of any other air supply hose voids NIOSH approval on the entire respirator assembly and could reduce the airflow to the respirator. Failure to observe this warning could result in death or serious injury.

## Preparation and Use of the AC1000

1. In an uncontaminated atmosphere screw the hose connector fitting on the end of the breathing tube to the fitting on the AC1000. Tighten hose connectors firmly (**Figure 1**).
2. Lace the belt supplied with the Cool Tube through the belt bracket. Slots are provided for wearing the tube either vertically or horizontally on the waist. See Heat Shield instructions.
3. With the approved Bullard air supply hose connected to the air source and with air flowing into the hose, connect the quick-disconnect coupler on the air supply hose to the quick-disconnect nipple on the AC1000 Cool Tube.
4. Adjust the air pressure at the point-of-attachment to within the approved pressure range (**Figure 2**). See the Air Pressure section on the front page.
5. Don the respirator by following the directions in your respirator instruction manual. If you do not have instructions, contact Bullard Customer Service at the address or phone numbers given below.
6. To obtain cooler air, turn the air temperature control knob counterclockwise (**Figure 1**).

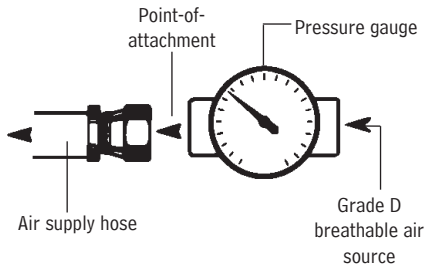


**Figure 1**

Maximum cooling is attained when knob is fully open and when there is maximum airflow out of the AC1000 exhaust port.

To obtain air that is closer to ambient temperature, turn air temperature control knob clockwise. If knob is fully closed, your respirator will receive air at ambient temperature.

7. When finished working, leave the work area wearing the respirator. With the air still flowing into the hood, remove the hood and then disconnect the air supply hose using the quick-disconnect coupler attached to the AC1000 Cool Tube.



**Figure 2**

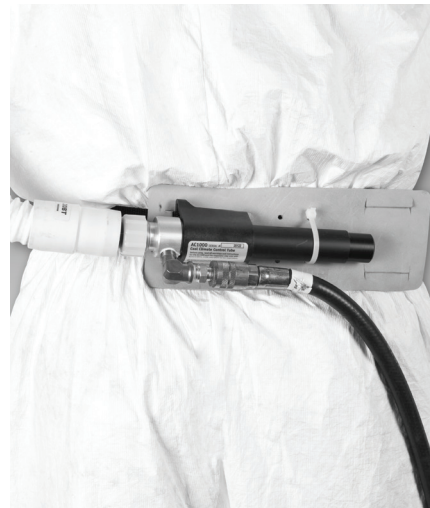
## Heat Shield Instructions

The climate control heat shield is designed to work with the Bullard AC1000, HC2400, or ACL99 climate control devices.

### Assembly

The heat shield is designed to work with the standard nylon belt (part # 4612) supplied with the climate control devices.

1. Determine whether the climate control device will be worn vertically or horizontally on the waist.
2. If the device will be worn in the horizontal position, align the tube on the heat shield as shown in **Figure 3**. If the tube will be worn in the vertical position, align the tube on the heat shield as shown in **Figure 4**.
3. Lace the belt supplied with your climate control device through both the heat shield slots and the climate control belt bracket slots.
4. Use plastic zip tie to secure the climate control unit to the heat shield.



**Figure 3**



**Figure 4**

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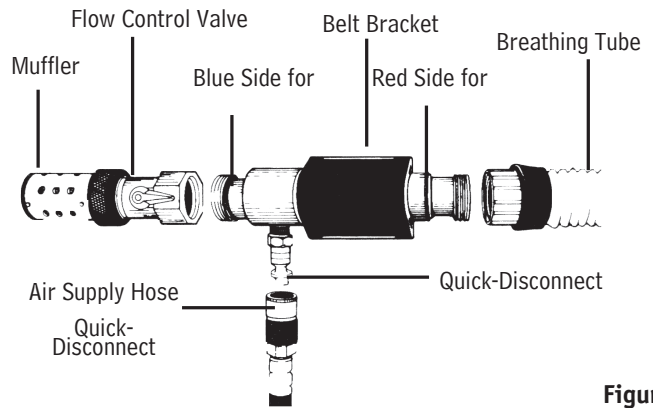
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**Figure 1**

## Includes: Hot/Cold Tube, Flow Control Valve, Belt Bracket, Belt and Heat Shield

### Function

The HC2400 is NIOSH approved, as part of certain Bullard supplied air respirator systems, to supply a continuous flow of warm or cool air. Please consult the NIOSH approval matrix in your respirator user manual to verify that the HC2400 is NIOSH approved for your specific configuration. All Bullard parts must be present and properly assembled to constitute a NIOSH-approved respirator.



#### NOTE

HC2400 cannot be used with a low pressure air source such as an ambient air pump.

#### ▲ WARNING

Before using this product read and follow all directions and warnings including those in the respirator instruction manual.

Connecting the respirator to a line supplying Nitrogen or other harmful gases could cause death or serious injury.

This climate control system is not recommended for cooling the air supply when the air temperature is less than 70°F (21°C). Since the system may cool the incoming air by more than 30°F (17°C), it is possible for ice to form in the breathing tube and reduce the airflow.

Failure to follow these instructions could result in death or serious injury.

## Air Quality, Air Pressure and Air Supply Hose Length Requirements

### Air Quality

#### ▲ WARNING

The respirator's air source must supply clean, breathable air Grade D, or better, at all times. The respirator DOES NOT purify air or filter out contaminants.

Failure to observe this warning could result in death or serious injury.

Respirable air must be supplied to the point-of-attachment of the Bullard air supply hose. The point-of-attachment is where the air supply hose connects to the fitting that contains a pressure gauge used to monitor the pressure of the air provided to you.

Locate the source of supplied air in a clean environment far enough from your work site to ensure the air remains contaminant-free. Always use an inlet filter on your air source and any monitors and alarms as necessary to assure clean, breathable air at all times.

Supplied breathing air MUST meet or exceed the requirements for Type 1 gaseous air

described in the Compressed Gas Association Commodity Specification G-7.1 (Grade D or higher quality) as specified by Federal Law 42 CFR, Part 84, Subpart J, 84.141(b).

The requirements for Grade D breathable air include:

- Oxygen ..... 19.5-23.5%
- Hydrocarbons (condensed) in mg/m<sup>3</sup> of gas ..... 5 mg/m<sup>3</sup> max.
- Carbon monoxide ..... 10 ppm max.
- Carbon dioxide ..... 1,000 ppm max.
- Odor ..... No detectable odor
- No toxic contaminants at levels that make air unsafe to breathe.

Refer to C.G.A. Commodity Specification G-7.1 for complete details, or contact the Compressed Gas Association (1235 Jefferson Davis Highway, Arlington, VA 22202).

### Air Pressure

Continually monitor the air pressure at the point-of-attachment while operating the respirator. A reliable air pressure gauge must be present to monitor the pressure.

#### ▲ WARNING

Failure to supply the minimum required pressure at the point-of-attachment for your hose length will reduce airflow and could result in death or serious injury.

It is important to operate the Bullard climate control device in the prescribed pressure range for the particular Bullard respirator you are using. Operating the correct pressure range will insure that the correct air flow is delivered to the respirator and will maintain the NIOSH approval. Refer to your respirator user manuals' Breathing Air Pressure Table to determine the correct pressure that should be used with the climate control device. This table defines the pressure ranges necessary to provide the respirator with a volume of Grade D air that falls within the U.S. Government required range of 6-15 cfm (or 170-425 lpm). (See 42 CFR, Part 84, Subpart J, 84.150)

The **Breathing Air Pressure Table** defines the air pressure ranges necessary to provide the respirator with a volume of air that falls within the required range of 6-15 cubic feet per minute (cfm) or 170-425 liters per minute (lpm).

Be sure you understand the information in the **Breathing Air Pressure Table** before using the respirator. To use the table, follow the steps identified below:

1. Confirm the air source and climate control device .
2. Confirm your choice of Bullard air supply hose(s) to use with your Cool Tube.
3. Determine that your air supply hose does not exceed the maximum approved hose length or number of hose sections.
4. Set the air pressure at the point-of-attachment within the required pressure range for your air supply hose length.

## Air Supply Hose

To maintain your Bullard respirator's NIOSH approval, use only approved Bullard V10 Series hose(s) in lengths of 25 to 300 feet (7.62m-91.4m), or Bullard V5 Series hose in lengths of 25 feet (7.6m) or 50 feet (15.2m), between the Hot/Cold Tube's quick-disconnect fitting and the point-of-attachment to the hose. Bullard V11 hose-to-hose adaptors **MUST** be used to connect V10 hose lengths together. Secure connection(s) until wrench tight and leak free.

Use of any other air supply hose voids NIOSH approval of the entire respirator assembly and could reduce the airflow to the respirator, possibly resulting in serious injury or death to the respirator wearer.

### ▲ WARNING

Before connecting the Hot/Cold Tube to the respirator, be sure the breathing air at least meets the minimum Grade D requirements. (See **Air Quality** section on front page.)

Compressed air must be dry enough to prevent ice buildup in the cold airstream. Ice could reduce airflow into the respirator hood.

Failure to observe these warnings could result in death or serious injury.

## Preparation and Use of the HC2400

### 1. For Warm Air:

- In an uncontaminated atmosphere screw the nylon hose connector on the end of the breathing tube onto the RED side of the HC2400 Tube.
- Screw the flow control valve and muffler onto the blue side of the HC2400 Tube (**Figure 1**). Tighten both connections firmly.

### For Cool Air:

- In an uncontaminated atmosphere unscrew the nylon hose connector on the end of the breathing tube from the hose threads on the RED side of the HC2400 Tube.
- Unscrew the muffler and flow control valve from the blue side of the Hot/Cold Tube. Then screw the flow control valve and muffler to the RED side. Tighten firmly.
- Screw the nylon hose connector on the end of the breathing tube onto the BLUE side of the HC2400 Tube (**Figure 1**). Tighten firmly.

### ▲ WARNING

For adequate air flow, attach the muffler and flow control valve to the end of the hot/cold tube that is opposite the breathing tube end.

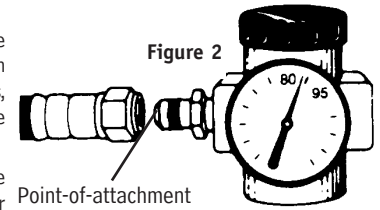
Failure to observe this warning could result in death or serious injury.

### DO NOT USE THE HC2400 WITHOUT THE MUFFLER AND FLOW CONTROL VALVE.

- Lace the belt supplied with the HC2400 through the belt bracket. Slots are provided for wearing the tube either vertically or horizontally on the waist. See Heat Shield instructions below.
- With the approved Bullard air supply hose connected to the air source and with air flowing into the hose, connect the quick-disconnect coupler on the air supply hose to the quick-disconnect nipple on the Hot/Cold Tube.

- Adjust the air pressure at the point-of-attachment (**Figure 2**) to within the approved pressure range. See the Respirator Breathing Air Pressure table in the respirator user manual.

- Put the hood on by following the directions in your respirator instruction manual. If you do not have instructions, contact Bullard Customer Service at the address or phone numbers below.



- Turn flow control valve to adjust the flow and temperature of incoming air (**Figure 1**).

Maximum cooling or warming is attained when knob is fully open and when there is maximum airflow out of the HC2400 exhaust port. To obtain air that is closer to ambient temperature, turn air temperature control knob counterclockwise. If knob is fully closed, your respirator will receive air at ambient temperature.

- When finished working, leave the work area wearing the respirator. With the air still flowing into the hood, remove the hood and then disconnect the air supply hose using the quick-disconnect coupler attached to the Hot/Cold Tube.

## Heat Shield Instructions

The climate control heat shield is designed to work with the Bullard AC1000, HC2400, CT, HCT, or ACL99 climate control devices.

### Assembly

The heat shield is designed to work with the standard nylon belt (part #4612) supplied with the climate control devices or the vinyl belt (part #36501).

- Determine whether the climate control device will be worn vertically or horizontally on the waist.
- If the device will be worn in the horizontal position, align the tube on the heat shield as shown in **Figure 3**. If the tube will be worn in the vertical position, align the tube on the heat shield as shown in **Figure 4**.
- Lace the belt supplied with your climate control device through both the heat shield slots and the climate control belt bracket slots.

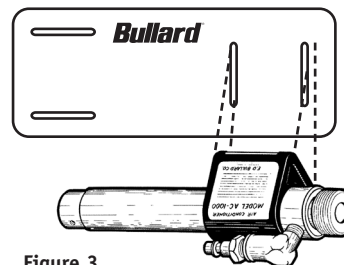


Figure 3

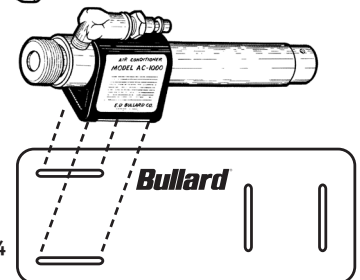


Figure 4