



# CC20 Series Airline Respirator User Manual

Type C Continuous-Flow Class – Approval No. TC-19C-154



Bullard CC20 Respiratory Systems provide a continuous flow of air from a remote air source via airline. The flow of air is delivered to the respirator wearer through a patented air delivery system. CC20 Series 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, MSHA, EPA, NIOSH or ACGIH regulations and recommendations, or any other applicable regulations for continuous flow airline respirators.

CC20 Series airline respirators are approved by NIOSH (TC-19C-154 Type C). Bullard has determined that these respirators may be used to provide respiratory protection in general purpose applications, including pharmaceutical manufacturing, chemical and pesticide handling, tank cleaning, spray painting and other industrial or agricultural applications in which hazardous compounds are present.

Bullard hoods are available in 13 different styles and sizes, including a loose-fitting facepiece style with a partial facial seal. Bullard hoods will accommodate limited facial hair without compromising the level of protection. Facial hair must not interfere with or protrude under the facial seal on the 20LF or 20LF2 style hoods.

The hood covers are held in place by snap-in replaceable suspensions or, in the case of the loose-fitting facepiece hoods, a sewn-in elastic suspension. Breathing air is supplied from a breathing tube connected to the back of the hood.

CC20 Series respirators are compatible with breathing air sources such as breathing air compressors or Bullard Free-Air® Pumps. Bullard offers the appropriate approved breathing tube, flow control device and air supply hose to connect the CC20 Series respirator to these breathing air sources.

CC20 Series respirators are approved by NIOSH for use with optional Bullard climate control devices. Contact Bullard or its local authorized distributor for more information about these and other accessories for CC20 Series respirators.

All Bullard parts must be present and properly assembled to constitute a NIOSH approved respirator.

For technical assistance, contact Bullard Technical Support at 877-BULLARD (285-5273) or 859-234-6616.

## NOTE

Bullard CC20 hoods are also NIOSH approved for certain PAPR configurations. Please refer to your Bullard PAPR manual or call Customer Service at 877-BULLARD (285-5273).

## WARNING

Read all instructions and warnings before using these respirators. Failure to follow these instructions could result in death or serious injury. Save this manual for future reference.

The CC20 Series Airline Respirators are not approved for abrasive blasting.

The CC20 respirator's air source must supply clean, breathable air, Grade D or better, at all times. The CC20 respirator does not purify air or filter out contaminants. Connecting the CC20 respirator to a line supplying nitrogen or other harmful gases could cause death or serious injury.



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# CC20 Approval Label



**Type C Continuous Flow Supplied-Air Respirator**  
**This respirator is approved only in the following configurations:**

TC-	PROTECTION1	MODEL	ALTERNATE HOOD	ALTERNATE SUSPENSION/ HARD HAT	BREATHING TUBE	ALTERNATE FLOW CONTROL DEVICE
19C-154	SA/CF	CC20	CC20 SERIES HOODS 20TJN 20TGN 20STGN 20TCSN 20TCH 20SICH 20TPN 20PCN 20LFL 20LFM 20LF2L 20LF2M 20LF2S 20TGT 20RT 30XXP 30XXR 51XXP 51XXR 20BT RTBT 20LFT 20LFTXS 20LFTXL 20LFTXL F30 F30B F30S F31 F32 F33 F34 F35 F35B F35S F37 F40 F40B F40S F41 F42 F43 F44 F47 AC100030 AC100030B AC100030S AC100031 AC100032 AC100033 AC100034 AC100037 AC100035B AC100030B HC240030B HC240030S HC240031 HC240032 HC240033 HC240034 HC240037 HC240035B DC5040 DC5040B DC5040S			

## 1. PROTECTION

CF= CONTINUOUS FLOW SA= SUPPLIED - AIR

## 2. CAUTIONS AND LIMITATIONS

- A - Not for use in atmosphere containing less than 19.5 percent 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 limitationa apply. Refer to User's Instructions before donning.

# CC20 Series Airline Respirator User Manual

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## Component Concept

### CC20 Airline Respirators

Bullard CC20 Series airline respirators consist of five components (Figure 1); all must be present and properly assembled to constitute a complete NIOSH approved respirator.

- ① **Respirator Hood:** Available in a variety of styles (including loose-fitting facepiece) and in two Tychem®-based materials.

20TJ	Tychem QC basic hood and headband suspension
20TP	Tychem QC basic hood and headband, with solvent-resistant polyester lens
20TIC	Tychem QC hood with inner bib and headband
20TPC	Tychem QC hood with inner bib and headband, with solvent-resistant polyester lens
20TICH*	Tychem QC hood with inner bib for use with head protection
20TICS	Tychem QC hood with taped and sealed seams, with inner bib, long outer bib, and headband suspension
20SIC	Tychem SL hood with taped and sealed seams, with inner bib, long outer bib, and headband suspension
20SICH*	Tychem SL hood with taped and sealed seams, with inner bib and long outer bib for use with head protection
20LFM	Tychem QC loose-fitting facepiece hood, facial seal, sewn-in suspension, lightweight breathing tube, small/medium (approx. head sizes 6 1/2 - 7)
20LFL	Tychem QC loose-fitting facepiece hood, facial seal, sewn-in suspension, lightweight breathing tube, large (approx. head sizes 7 1/8 - 8)
20LF2S	Tychem QC narrow profile loose-fitting facepiece hood, facial seal, sewn-in suspension, lightweight breathing tube, small (approx. head sizes 6 - 7)
20LF2M	Tychem QC narrow profile loose-fitting facepiece hood, facial seal, sewn-in suspension, lightweight breathing tube, medium (approx. head sizes 7 - 8)
20LF2L	Tychem QC narrow profile loose-fitting facepiece hood, facial seal, sewn-in suspension, lightweight breathing tube, large (approx. head sizes 8 - 9)

\*Requires one of the following Bullard hard hat models: C30, C30R, S51 or S51R.

#### NOTE

Optional accessories include 20LCL lens covers, 20RT ratchet headband suspension, 20NC or ES42 chin strap.

- ② **Headband Suspension or Head Protection:** Hard hat models C30, C30R, S51 or S51R or suspension models 20TG and 20RT. 20LFM, 20LFL, 20LF2S, 20LF2M AND 20LF2L have sewn-in elastic headband suspensions.

- ③ **Breathing Tube for CC20 Respirators:**

20BT, RTBT	For 20TJ, 20TIC, 20TICH, 20TICS, 20SIC, and 20SICH
20LFBT	For 20LFM, 20LFL, 20LF2S, 20LF2M, 20LF2L
20LFBTXXL	For 20LFM, 20LFL, 20LF2S, 20LF2M, 20LF2L
20LFBTXXS	For 20LFM, 20LFL, 20LF2S, 20LF2M, 20LF2L

- ④ **Flow Control Device:** Connects respirator hood to air supply hose. Available with a choice of quick-disconnect fittings, constant or adjustable airflow control and optional climate control devices.

Flow Control Device*										
Without Climate Control Devices				With Climate Control Devices						
				Cold Only				Hot/Cold		
Constant			Adjustable							
PART NO.	F30	F34	F40	F42	AC100030	AC100034	DC5040	DC5042	HC240030	HC240033
	F30B	F35	F40B	F43	AC100030B	AC100035B	DC5040B	DC4043	HC240030B	HC240034
	F30S	F35B	F40S	F44	AC100030S	AC100037	DC5040S	DC5044	HC240030S	HC240035B
	F31	F35S	F41	F47	AC100031	Frigitron 2000	DC5041	DC5047	HC240031	HC240037
	F32	F37			AC100032	Frigitron 2000B			HC240032	
	F33				AC100033	Frigitron 2000S				

\*All flow control devices require the 20BT breathing tube to constitute complete breathing tube assemblies. Breathing tube must be purchased separately.

- ⑤ **Air Supply Hose:** Connects breathing tube to air source supplying clean breathable air.

Hose for High Pressure Compressed Air Source		Hose for Low Pressure Ambient Air Pump
<b>V5</b> 3/8" Coiled I.D. Hose V5 Starter/Extension Hose  Available in 25 and 50 foot lengths with a variety of 1/4" and 1/2" quick-disconnect fitting styles and materials. See parts list (page 18) for details.		<b>V20</b> 1/2" I.D. Hose V20 Starter/Extension Hose  Available in 50 and 100 foot lengths with 1/2" quick-disconnect Industrial Interchange fittings. See parts list (page 18) for details.
<b>V10</b> 3/8" I.D. Hose 469 Starter Hose 545 Extension Hose  Available in 25, 50, and 100 foot lengths with a variety of 1/4" quick-disconnect fitting styles and materials. See parts list (page 18) for details.		

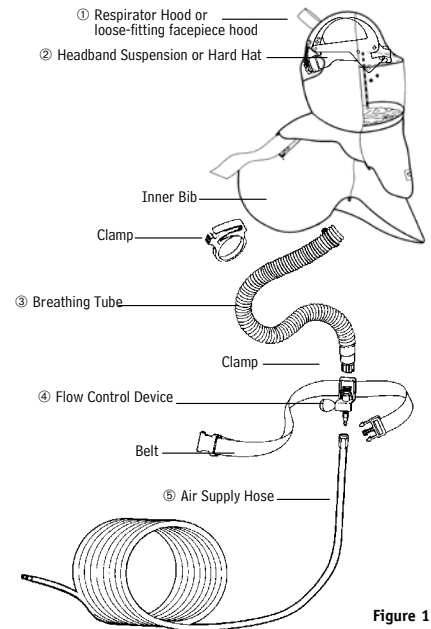


Figure 1

Clean Breathable Air Source Supplying Grade "D" or Higher Air Quality  
(See Breathing Air Requirements on page 7.)

# CC20 Series Airline Respirator

## User Manual

### WARNING

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

1. Improper respirator use could result in death or serious injury. Improper use may also cause certain life-threatening delayed lung diseases such as silicosis, pneumoconiosis or asbestosis.
2. This respirator, when properly fitted and used, significantly reduces, but does not completely eliminate, the breathing of contaminants by the respirator wearer. Where excessive airborne contaminant levels are found, 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.
3. Regulations require that the employer provide training to the user on the proper use, maintenance and limitations of this equipment. Each person using this respirator must first read and understand this entire instruction manual. The CC20 Series respirators should only be used in accordance with these operating and maintenance instructions. If you have any questions concerning the use of this respirator, ask your employer or call Bullard Technical Support at 877-BULLARD (285-5273).
4. Before using these respirators, be sure your employer has determined that ambient airborne contaminant concentrations do not exceed those allowed by applicable OSHA, MSHA, EPA, NIOSH or ACGIH regulations and recommendations, or any other applicable regulations. Before using the above respirator, Federal law requires that the employer shall identify and evaluate the respiratory hazard(s) in the workplace, and that this evaluation shall include a reasonable estimate of employee exposures to respiratory hazard(s), and an identification of the contaminant's chemical state and physical form.
5. DO NOT wear this respirator if any of the following ambient conditions exist:
  - Atmosphere is immediately dangerous to your life or health (IDLH). IDLH is defined in 29 CFR 1910.134(b).
  - 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 4 above).
6. There are users, environments and chemicals for which these respirators are not suitable. It is the responsibility of the user and the employer to determine that these respirators are appropriate for the intended use. These respirators should not be used around heat, open flames, sparks or in any potentially flammable or explosive environment. CC20 materials will burn and will melt. DuPont Tychem® spunbonded olefin apparel fabrics have "Class 1 - Normal Flammability" characteristics, as tested according to the Flammable Fabrics Act. "Class 1" fabrics will burn and do not provide thermal protection if a fire or explosion should occur.

CC20 materials may create static electricity under low relative humidity. Surface resistance and charge dissipation are proportional to the amount of antistatic agent on the fabric and the ambient relative humidity. Since the antistatic agent is water soluble, it can be washed off with water. In addition, other clothing items that are not anti-static treated might be a potential source of static formation and discharge. Contact your employer or DuPont at 1-800-44-TYVEK on this material.
7. Bullard recommends that you DO NOT wear these respirators until you have passed a complete physical exam (including a chest x-ray), conducted by qualified medical personnel.
8. Do not modify or alter these respirators in any manner. Use only CC20 components and replacement parts manufactured by Bullard and approved by NIOSH for use with this respirator. Failure to use Bullard components and replacement parts approved by NIOSH for use with this respirator voids NIOSH approval of the entire respirator, invalidates all Bullard warranties, and could result in death or serious injury, lung disease or exposure to other hazardous or life-threatening conditions.
9. Inspect all components of these respirator systems during cleaning and before and after each use for signs of wear, tear or damage that might reduce the degree of protection originally provided. Immediately replace worn or damaged components with Bullard CC20 components approved by NIOSH for use with this respirator, or remove the respirator from service. (See INSPECTION, CLEANING AND STORAGE section for instructions on proper maintenance of CC20 Series Series respirators.)
10. DO NOT connect the respirators' air supply hose to nitrogen, oxygen, toxic or inert gases. To prevent this, airline couplings used for this respirator shall be incompatible with outlets for other gas systems. Failure to connect to the proper air source could result in death or serious injury. Be certain your employer has determined that the breathing air source provides at least Grade D breathable air.
11. DO NOT use these respirators in poorly ventilated areas, areas where oxygen is less than 19.5%, or in 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. The procedures for confined space entry, operation and exit are defined in applicable regulations and standards, including 29 CFR 1910.146.
12. DO NOT use these respirators for abrasive blasting or underwater diving.
13. DO NOT reach your hand into the hood head cover in atmospheres containing air contaminants. Leave the contaminated area and clean hands before reaching inside the hood.



## Cautions & Limitations

### For CC20 Airline Respirators

- 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 - Airline respirators can be used only when 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 instruction manual.
- 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 as specified by the manufacturer.
- O - Refer to users instructions, and/or maintenance manuals for information on use and maintenance of these respirators.
- S - Special or critical User's Instructions and/or specific use limitations apply. Refer to User's Instructions before donning.

## Operations

### Protection

#### Respiratory

The CC20 respirator is NIOSH approved (TC-19C-154) as a Type C continuous-flow supplied air respirator. It can be worn for general purpose applications, including pharmaceutical manufacturing, chemical and pesticide handling, tank cleaning, spray painting, and other industrial or agricultural applications in which hazardous compounds are present.

The CC20 respirators are 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. IDLH is defined in 29 CFR 1910.134(b).

#### Head

CC20 Series respirator hoods with the 20TG or 20RT headband suspension DO NOT provide head protection. If head protection is required, order the 20TICH or 20SICH model.

The 20TICH and 20SICH hoods, when used with a Bullard model S51 or C30 hard hat, meet ANSI Standard Z89.1-2003 Type I, Classes E & G requirements for protective headwear for industrial workers. These hard hats are designed to provide limited head protection by reducing the force of falling objects striking the top of the hard hat shell.

#### Face

The 20TICH and 20SICH models meet ANSI Z87.1-2003 impact and penetration requirements for face protection. The 0.040" acetate lens provides limited face protection from flying particles or spray of hazardous liquids, but is not shatterproof.

#### Eyes

CC20 Series respirators DO NOT provide eye protection. Wear approved safety glasses or goggles at all times when eye protection is required.

#### Ears

CC20 Series respirators DO NOT provide hearing protection. Use properly fitted earmuffs, earplugs or other protection when exposed to high noise levels.

# CC20 Series Airline Respirator

## User Manual

### CC20 Breathing Air Requirements

#### Air Quality

##### ⚠ WARNING

The CC20 respirator must be supplied with clean, breathable air, Grade D or better, at all times. This respirator does NOT purify or filter out contaminants. Failure to heed these warnings could result in death or serious injury.

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 3).

Supplied breathing air must AT MINIMUM meet the requirements for Type 1 gaseous air described in the ANSI/Compressed Gas Association Commodity Specification G-7.1 for Grade D or higher quality as specified by Federal regulations 42 CFR, Part 84.141(b) and 29CFR1910.134(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 .....	*
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) or [www.cganet.com](http://www.cganet.com) for complete details on Commodity Specification G-7.1.

#### Air Source

Locate the source of supplied air, whether it is a breathing 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 your air source.

Use suitable after-cooler/dryers with filters, and carbon monoxide monitors and alarms, like the Bullard Series of CO monitors and filters, as necessary for compressed air.

Compressed air should be regularly sampled to be sure that it meets Grade D requirements.

### CC20 Breathing Air Pressure

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

##### ⚠ WARNING

Failure to supply the minimum required pressure at the point-of-attachment for your hose length and CC20 respirator type will reduce airflow and could result in death or serious injury.

### Special or Critical User's Instructions

The Breathing Air Pressure Table (see page 8) defines the air pressure ranges necessary to provide CC20 Series respirators with a volume of air that falls within the required range of 6-15 cfm or 170-425 lpm (Ref. 42 CFR, Part 84, Subpart J, 84.150).

Make sure you understand the information in the Breathing Air Pressure Table before using this respirator.

1. Determine the type of air source you are using (Column 1), then find your flow control valve/climate control device (Column 2).
2. Be sure your Bullard air supply hose (Column 3) is approved for use with your flow control valve/climate control device.
3. Determine that your Bullard air supply hose is within the approved length (Column 4).
4. Make sure you have not exceeded the maximum number of hose sections (Column 5).
5. Set the air pressure at the point-of-attachment within the required pressure range (Column 6) for your flow control valve/climate control device, and air supply hose type and length.

### CC20 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.

NIOSH approved Bullard quick-disconnect fittings MUST be used to connect V5 or V20 hose lengths together. When connecting lengths of V10 hose, only use Bullard V11 hose-to-hose adapters. 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).

The breathing tube connection fitting MUST be secured to the belt that is supplied with this respirator. Securing the breathing tube connection helps prevent the air supply hose from snagging, disconnecting or pulling the respirator hood off your head.

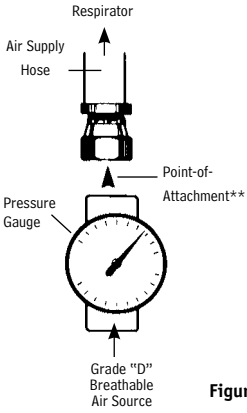


Figure 3

\*\*Use either a V13 hose-to-hose pipe adapter or a quick-disconnect coupler to attach the air supply hose.



## S - Special or Critical Users Instructions

### CC20 Breathing Air Pressure Table

This table defines the air pressure ranges necessary to provide CC20 Series respirators with a volume of air that falls within the required range of 6-15 cfm or 170-425 lpm according to U.S. Government regulations (42 CFR, Part 84, Subpart J, 84.150, Table 8).					
1	2	3	4	5	6
Air Source	Flow Control Valve/ Climate Control Device	Air Supply Hose	Air Supply Hose Length (feet)	Maximum Number of Hose Sections	Required Pressure Range (psig air)
Stationary or Portable Air Compressor	F30, F30B, F30S, F31, F32, F33, F34, F37	V10	25	1	14-15
			50	2	15-18
			75-150	3	19-29
			200	5	25-34
			250-300	5	31-39
	F35, F35B	V5	25	1	12-18
			50	2	19-23
	F40, F40B, F40S, F41, F42, F43, F44, F47	V10	25	1	22-25
			50	2	24-27
			75-150	3	27-37
			200	5	33-40
			250-300	5	38-45
		V5	25	1	22-26
			50	2	25-30
	AC100030, AC100030B, AC100030S, AC100031, AC100032, AC100033, AC100034, AC10035B, AC100037	V10	25-50	2	55-65
			75-150	3	60-70
			175-300	5	65-75
	DC5040, DC5040B, DC5040S, DC5041, DC5042, DC5043, DC5044, DC5047	V5	25	1	55-65
			50	1	56-69
		V10	50	2	48-52
			75-150	3	59-72
			200	3	80-84
			250	3	85-92
			300	5	90-98
	HC2400030, HC2400030B, HC2400030S, HC2400031, HC2400032, HC2400033, HC2400034, HC2400035B, HC240007	V5	25	1	53-57
			50	2	67-71
		V10	25	1	59-61
			50	2	63-65
			75-150	3	68-75
			200	4	77-79
			250	5	80-82
			300	5	84-86
		V5	25	1	65-66
			50	1	68-69
Bullard Free-Air® Pumps	F35, F35b, F35s	V20	25	1	3-5
			50	1	4-6
			100	2	6-8
			200	2	10-15
			300	3	13-18
	Frigitron 2000 Frigitron 200B Frigitron 2000S	V20	50	1	16-22
			100	2	18-25
			200	2	22-30
			300	3	25-34



## CC20 Respirator Assembly

### Adjusting and Installing Headband Suspension in Hood

(If using 20TICH or SICH models, see page 10.)

To change the headband size, unlock the four pins from the sizing holes. Place the headband on your head. Pull down, allowing headband to expand until it feels comfortable. The headband will automatically adjust to your size. Lock into place by pushing the four pins into the sizing holes (Figure 4).

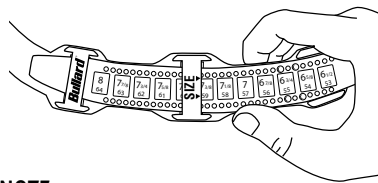


Figure 4

#### NOTE

If using the optional 20RT ratchet headband suspension, refer to the instruction sheet provided with the 20RT.

### Adjust Crown Straps for Vertical Fit

To improve suspension comfort, adjust crown straps vertically by repositioning the crown strap posts in the crown straps. Vertical adjustment makes the headband ride higher or lower on the wearer's head. To adjust, push crown strap post from slot, move to new slot, and snap in to secure. Move key to desired vertical position. Repeat for other crown strap post (Figure 7).

#### NOTE

20LF and 20LF2 series loose-fitting facepiece hoods have a sewn-in headband.

#### NOTE

If the hood rises off your head during use, first verify proper air pressure, then select a different hood for your application, or use the optional chin strap.

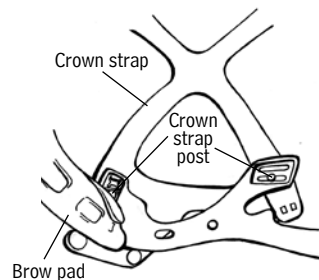


Figure 5

## Adjusting and Installing Hard Hat in Respirator Hood\*

1. Assemble and adjust the standard Bullard hard hat suspensions RS4PC or RS6PC or the optional ratchet suspensions RS4RC or RS6RC by following the directions on instruction sheet attached to headband on hard hat. Read all hard hat warning labels and instructions. The following Bullard hard hat models are NIOSH approved for use with CC20 Series respirator hoods: C30, C30R, S51 and S51R.
2. If desired, install and adjust optional ES42 hard hat chinstrap.
3. Before inserting hard hat into hood, remove the two adhesive-backed Velcro® strips attached to the Velcro piece that is sewn into the hood (see Figures 7 & 8).
4. Peel the backing off the longer Velcro tab and apply it to the inside center rear of the hard hat, about 1/4" up from the edge. Apply shorter Velcro tab to the underside of the brim of the hard hat (see Figure 7).
5. Insert hard hat into respirator hood with cap visor facing front of hood (see Figure 6).
6. Tuck cap brim on top of front elastic Velcro band sewn into hood (see Figure 7).
7. Loop the Velcro strip sewn inside the hood around the back of the cap and affix it to the corresponding Velcro tab previously installed inside the hard hat in step 4 (see Figure 8).
8. Remove protective plastic from plastic lens of respirator hood. If desired, apply optional 20LC or 20LCL adhesive-backed lens covers designed to protect the respirator's plastic lens. Apply 2-3 lenses at a time. When lens becomes soiled, remove by pulling tab at edge of lens cover to clear your vision.

\* The 20TICH and 20SICH model respirator hoods require a hard hat or a suspension.



Figure 6

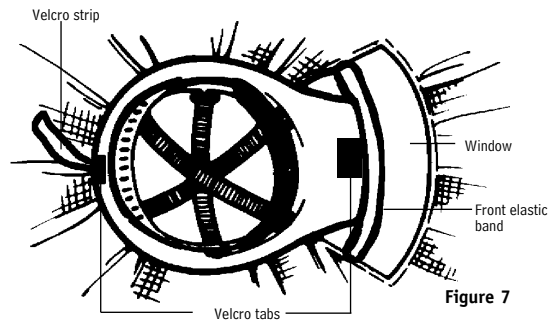


Figure 7

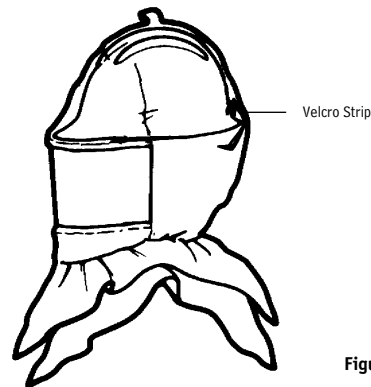


Figure 8

# CC20 Series Airline Respirator User Manual

## Installing Breathing Tube Assembly in Hoods (20BT or RTBT)

1. Remove nylon clamp from plastic anchor plate on hood (see Figure 9). Do not remove foam from inside the breathing tube, used with CC20 Series Airline Respirators. The foam helps reduce the noise level of incoming air.

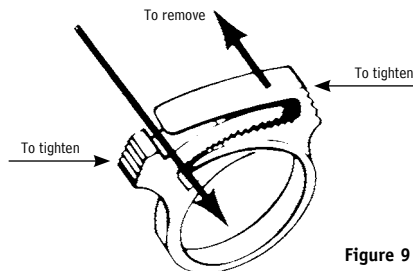


Figure 9

2. Insert the open end of the breathing tube approximately five inches into hood's air entry sleeve (see Figure 10).

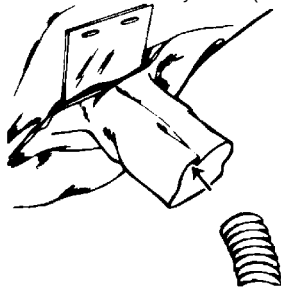


Figure 10

3. Install nylon clamp over air entry sleeve and breathing tube, inserting clamp locks through two holes in plastic anchorplate that is sewn into hood. Locks should face away from user's neck (see Figure 11).

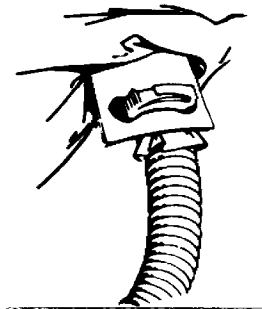


Figure 11

4. Engage clamp locks and squeeze together until tight.
5. For CC20 Series Airline Respirators, attach other end of breathing tube to flow control device on belt by screwing nylon hose connector on flow control device.



### NOTE

Refer to PAPR manual for connection of breathing tube to PAPR blower.

## Installing Breathing Tube Assembly in Loose-Fitting Facepieces

1. The 20LFM, 20LFL, 20LF2S, 20LF2M and 20LF2L loose-fitting facepieces have a sewn-in breathing tube connector on the back. The 20LFBT breathing tube has a special connector on the hood end with bayonet type pins.
2. Insert the bayonet connector of the 20LFBT breathing tube in the hood connector and turn clockwise until it locks in place (see Figure 12).



Figure 12

## Using Climate Control Devices for CC20 Series Airline Respirators

CC20 Series Airline Respirators are approved by NIOSH for use with four optional Bullard climate control devices: AC1000 Series, DC50 Series, HC2400 Series and Frigatron 2000 Series.

### ⚠ WARNING

Climate control devices are not approved for use with Powered Air-Purifying Respirators. Failure to heed these instructions could result in death or serious injury.

1. Follow the instructions supplied with your climate control device.
2. Screw nylon hose connector on end of breathing tube to hose thread on climate control device.
3. Firmly tighten hose connector by hand (see Figure 13).

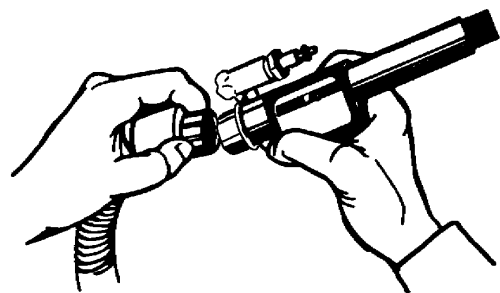


Figure 13

4. Lace belt supplied with respirator through belt loop bracket on climate control device.

## CC20 Respirator Use

### ⚠ WARNING

Do not put on or remove these respirators in a hazardous atmosphere except for emergency escape purposes. Failure to heed these warnings could result in death or serious injury.

### Donning the CC20 Respirator

Before using your CC20 Series respirator, assemble the respirator using the instructions given on pages 9-11.

1. Connect NIOSH approved Bullard air supply hose to an air source supplying Grade D breathable air as defined on page 7. Turn on breathing air source.
2. With air flowing, connect breathing tube assembly to air supply hose (see Figure 14). Connect quick-disconnect fitting on breathing tube assembly to quick-disconnect coupler on air supply hose. Once fitting is secured, release coupling sleeve to lock fittings together. Pull on both hoses to make sure they are attached securely.

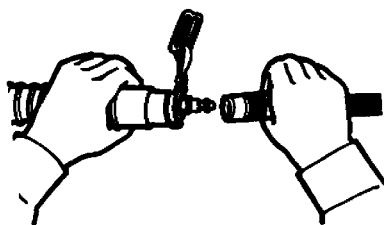


Figure 14

3. Adjust air pressure at point-of-attachment to within the approved pressure range (see Figure 15). See the Breathing Air Pressure Table (page 8) for approved pressure ranges.

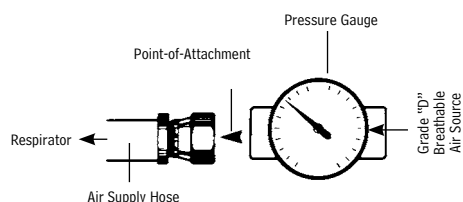


Figure 15

4. With air still flowing, put on CC20 Series respirator hood.
5. Position headband suspension or hard hat for a comfortable fit. (See instructions on page 9 for proper sizing).
6. If using an optional chin strap, pull elastic strap under your chin. Adjust for a secure and comfortable fit.
7. If using the Bullard loose-fitting facepiece hoods: Available in large 20LF2L or 20LFL, medium 20LF2M or 20LFM, and small 20LF2S. Select the size that fits most comfortably and matches your head size. Remove the protective cover from the visor. Pull the hood over your head and adjust the headband around your head and the elasticized edge of the faceseal under your chin. Make sure that the breathing tube is not twisted after donning.
8. Tuck inner bib of hood (except on 20TJ, 20TP, 20LFM, 20LFL, 20LF2S, 20LF2M and 20LF2L) into shirt or protective clothing for additional splash and overspray protection (see Figure 16).



Figure 16

9. Pull respirator outer bib over collar of shirt or protective clothing. If you are using the 20SIC, 20SICH, or 20TICH model, pull the long outer bib down on the outside of clothing and tie at the sides.
10. With breathing tube assembly attached to the hood, fasten belt at waist or hip level and adjust for comfort.
11. Recheck air pressure and adjust if necessary.
12. With air flowing into your respirator, you are now ready to enter work area.

### Removing the CC20 Respirator

When finished working, leave work area wearing respirator and with air still flowing. Once outside contaminated area, remove respirator and then disconnect the air supply hose using the quick-disconnect fittings.

### ⚠ NOTE

If using V20 Series (1/2" I.D.) air supply hose, the hose quick-disconnect coupler does not have a shut-off valve. Therefore, air will continue to flow freely after disconnecting hose from respirator.

# CC20 Series Airline Respirator

## User Manual

### Inspection, Cleaning and Storage

#### WARNING

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

LEAVE WORK AREA IMMEDIATELY IF:

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

#### WARNING

Do not store respirator in your work area or leave it unattended in a contaminated environment. Respirable contaminants can remain suspended in the air for several hours 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 place or store the respirator 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. Failure to heed these instructions could result in death or serious injury.

Bullard CC20 Series respirators have a limited service life. Therefore, a regular inspection and replacement program must be conducted.

The Bullard CC20 Series respirators and all 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 originally provided.

Use only CC20 components and replacement parts manufactured by Bullard and approved by NIOSH for use with these respirators.

Since respirator use and the quality of maintenance performed vary with each job site, it is impossible to provide a specific time frame for respirator replacement.

Inspect all components of this respirator system during cleaning and before and after each use for signs of wear, tear or damage that might reduce the degree of protection originally provided. 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.

#### WARNING

The air you breathe will not be clean unless the respirator you wear is clean. Failure to heed this warning could result in death or serious injury.

### Hood and Headband Suspension

#### Inspection

Inspect the hood material for rips, tears, or damage from excessive wear that might reduce the degree of protection originally provided. Inspect the inner neck cuff for elasticity. The respirator's plastic lens should be inspected for cracks, scratches or any other signs of damage.

Disassemble the breathing tube from the hood by removing the nylon hose clamp. To remove the hose clamp, slide the locks sideways in opposite directions.

Remove the headband suspension and optional chin strap from the hood, except on loose-fitting facepiece hoods, remove the breathing tube by turning the connector on the tube counter-clockwise and pulling out. Inspect headband suspension for cracks, frayed or cut crown straps, torn headband or size adjustment slots, loss of pliability, or other signs of excessive wear. Check the chin strap for loss of elasticity, cuts, and cracked hanger clips.

If damage is detected, replace immediately with Bullard replacement part(s) or remove the respirator from service.

#### Cleaning

Bullard does not recommend laundering the hood. When the hood becomes dirty, it should be discarded and replaced. The respirator's plastic lens, headband suspension, and optional chin strap should be hand-sponged with warm water and mild detergent, rinsed, and air-dried. Mineral spirits may be used to remove paints or coatings from the solvent-resistant lens of the 20 TP and 20TPC hoods. After cleaning and before reassembling, once again carefully inspect parts for signs of damage.

#### CAUTION

Do not use volatile solvents for cleaning this respirator or any parts and assemblies, with the exception that mineral spirits may be used to clean the solvent-resistant lens of the 20TP and 20TPC hoods. Strong cleaning and disinfecting agents, and many solvents, can damage the plastic parts and reduce the protective properties of the respirator. Failure to heed these instructions may result in minor or moderate injury and/or equipment damage.

## Hard Hat

### Inspection

Inspect the hard hat shell for nicks, gouges, cracks, and any damage due to impact, rough treatment, or wear.

Remove the headband suspension and optional chin strap from the hard hat. Inspect the headband suspension for cracks, frayed or cut crown straps, torn headband and size adjustment slots, loss of pliability or other signs of excessive wear. Check the chin strap for loss of elasticity, cuts, and cracked hanger clips.

If damage is detected, replace part(s) immediately with Bullard replacement parts or remove the hard hat from service.

### Cleaning

The hard hat shell, headband suspension, and optional chin strap should be hand cleaned with warm water and mild detergent, rinsed and air-dried. After cleaning and before reassembling, once again carefully inspect parts for signs of damage.

## Breathing Tube

### Inspection

Inspect the breathing tube for tears, cracks, holes, or excessive wear that might reduce the degree of protection originally provided. If any signs of excessive wear are present, replace the breathing tube immediately or remove the respirator from service.

### Cleaning

To clean the breathing tube, hand-sponge with warm water and mild detergent, being careful not to get water inside. Rinse and air-dry. After cleaning, once again carefully inspect breathing tube for signs of damage.

## Flow Control Valve/ Climate Control Device

### Inspection

Be sure the hose thread is screwed tightly into the breathing tube so no air can escape during use. Check the adjustment knob on the flow control device for cracks and other damage.

### Cleaning

To clean, hand-sponge with warm water and mild detergent, being careful not to get water inside. After cleaning, once again carefully inspect flow control valve/climate control device for signs of damage. If any signs of excessive wear are present, replace the flow control valve/climate control device or remove the respirator from service.

### CAUTION

Do not cut or remove the foam that is inside the CC20 Series Airline Respirator breathing tube. The foam helps reduce the noise level of the incoming air supply. It does not filter or purify your breathing air. NIOSH has approved this respirator with the foam in place. Failure to follow these instructions may result in minor or moderate injury and/or equipment damage.

## Air Supply Hoses

### Inspection

Air supply hose(s) should be inspected closely for abrasions, corrosion, cuts, cracks and blistering. Be sure the hose fittings are crimped tightly to the hose so that no air can 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 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

Only use air supply hoses that are NIOSH approved for use with the CC20 respirator. Other hoses could reduce airflow and protection, and expose the wearer to life-threatening conditions. Failure to follow these instructions could result in death or serious injury.

## Storage

After reusable respirator components have been cleaned and inspected, place them in a plastic bag or an airtight container.

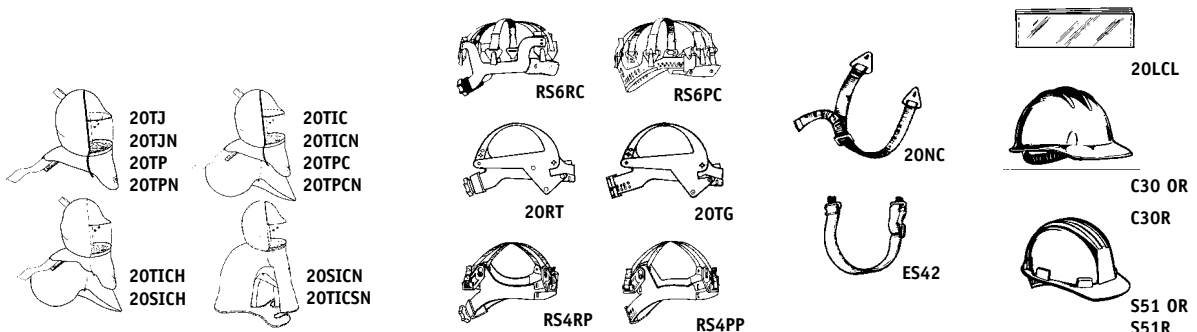
Store the respirator and parts where they will be protected from contamination, distortion and damage from elements such as dust, direct sunlight, heat, extreme cold, excessive moisture and harmful chemicals.

# CC20 Series Airline Respirator User Manual

## Parts and Accessories

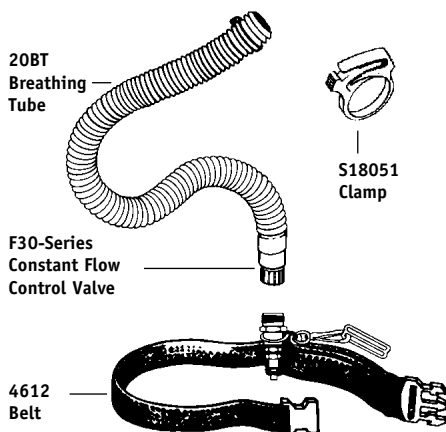
CC20 Series airline respirators consist of five components – respirator hood, headband suspension or head protection, breathing tube, flow control device, and air supply hose.

CATALOG NUMBER	DESCRIPTION	CATALOG NUMBER	DESCRIPTION
<b>Respirator System</b>		20TICH	Tychem QC, hard hat not included
CC20SYS	Includes 20TIC35 respirator assembly, Free-Air® pump and V20100ST air supply hose, and 20LCL lens covers	20SICH	Tychem SL, with taped and sealed seams, hard hat not included
<b>Respirator Assemblies</b>		<b>Hood with inner bib and long outer bib, for use with headband suspension</b>	
<b>For use with compressed air</b>		20TICS	Tychem QC with taped and sealed seams, and 20TG headband suspension
CC20TJ30	Includes 20TJN hood, 20TG headband suspension and V30 breathing tube assembly	20TICSN	Tychem QC with taped and sealed seams, no headband suspension
CC20TIC30	Includes 20TCN hood, 20TG headband suspension and V30 breathing tube assembly	20SIC	Tychem SL, with taped and sealed seams, and 20TG headband suspension
CC20TICH30	Includes 20TICH hood, 20TG headband suspension and V30 breathing tube assembly	20SICN	Tychem SL, with taped and sealed seams, no headband suspension
CC20LF30	Includes 20LFL hood and X30 breathing tube assembly	20LFM	Tychem QC, facial seal, sewn-in suspension, medium
<b>For use with Bullard Free-Air® pumps</b>		20LFL	Tychem QC, facial seal, sewn-in suspension, large
CC20TJ35	Includes 20TJN hood, 20TG suspension and V35 breathing tube assembly	20LF2S	Tychem QC, narrow profile, facial seal, sewn-in suspension, small
CC20TIC35	Includes 20TCN hood, 20TG suspension and V35 breathing tube assembly	20LF2M	Tychem QC, narrow profile, facial seal, sewn-in suspension, medium
CC20TICH35	Includes 20TICH hood, 20TG suspension and V35 breathing tube assembly	20LF2L	Tychem QC, narrow profile, facial seal, sewn-in suspension, large
CC20LF35	Includes 20LFL hood and X35 breathing tube assembly	<b>Accessory Items for All Hoods</b>	
<b>Respirator Hoods</b>		20LCL	Mylar lens covers (25/pkg)
<b>Basic style hood, for use with headband suspension</b>		<b>Headband Suspensions and Hard Hats</b>	
20TJ	Tychem QC with 20TG headband suspension	20TG	Standard headband suspension
20TJN	Tychem QC, no headband suspension	20RT	Flex-Gear® ratchet headband suspension
20TP	Tychem QC, with solvent-resistant polyester lens, 20TG headband suspension	C30	Hard hat with standard suspension, white
20TPN	Tychem QC with solvent-resistant polyester lens, no suspension	C30R	Hard hat with ratchet suspension, white
<b>Hood with inner bib, for use with headband suspension</b>		S51	Hard hat with standard suspension, white
20TIC	Tychem QC, with 20TG headband suspension	S51R	Hard hat with ratchet suspension, white
20TICN	Tychem QC, no headband suspension	<b>Accessories for Headband Suspension and Hard Hats</b>	
20TPC	Tychem QC, with solvent-resistant polyester lens, 20TG headband suspension	RS6PC	Standard replacement suspension for C30 hard hat
20TPCN	Tychem QC with solvent-resistant polyester lens, no suspension	RS6RC	Replacement ratchet suspension for C30R hard hat
<b>Hood with inner bib, for use with Bullard hard hat</b>		RS4PC	Standard replacement suspension for S51 hard hat
		RS4RC	Replacement ratchet suspension for S51R hard hat
		20NC	Chin strap for 20TG and 20RT headband suspension
		ES42	Chin strap for C30 and S51 hard hats

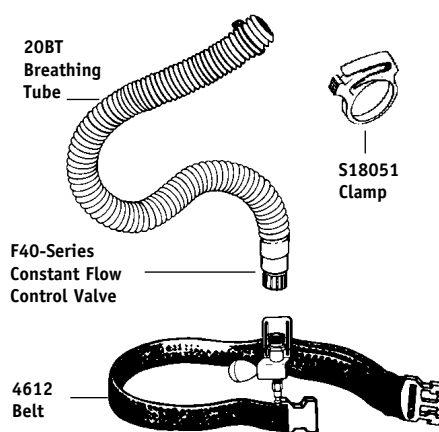


CATALOG NUMBER	DESCRIPTION	CATALOG NUMBER	DESCRIPTION
<b>Breathing Tubes</b>			
RTBT	Disposable breathing tube with clamp		
20BT	Breathing tube with clamp for CC20 only		
20LFBT	Breathing tube (lightweight) with clamp for 20LF and 20LF2 Series hoods only, airline mode		
20LFBTXL	Extra large breathing tube assembly		
20LFBTXS	Extra small breathing tube assembly		
<b>Breathing Tube Assemblies for CC20 Series Airline Respirators</b>			
Include breathing tube, airflow control device, quick-disconnect nipple and belt. (Note: 20BT + F30 = V30)			
<b>Constant Flow Breathing Tube Assemblies</b>			
For use with Breathing Air Compressors			
V30	With 1/4" Industrial Interchange steel (Hansen compatible) quick-disconnect nipple		
V31	With 1/4" Schrader steel quick-disconnect nipple		
V32	With 1/4" Snap-Tite steel quick-disconnect nipple		
V33	With 1/4" Snap-Tite brass quick-disconnect nipple		
<b>Constant Flow Breathing Tube Assemblies</b>			
For use with 20LFM and 20LFL Loose-Fitting Facepiece Hoods			
X30	With 1/4" Industrial Interchange steel (Hansen compatible) quick-disconnect nipple		
X31	With 1/4" Schrader steel quick-disconnect nipple		
X32	With 1/4" Snap-Tite steel quick-disconnect nipple		
X33	With 1/4" Snap-Tite brass quick-disconnect nipple		
<b>Constant Flow Breathing Tube Assemblies</b>			
For use with Bullard Free-Air Pumps			
V35	With 1/2" Industrial Interchange, steel (Hansen compatible) quick-disconnect nipple		
X35	For 20LF and 20LF2 Series hoods with 1/2" Industrial Interchange, steel (Hansen compatible) quick-		
	disconnect nipple		
		<b>Adjustable Flow Breathing Tube Assemblies</b>	
		For use with Breathing Air Compressors	
		V40	With 1/4" Industrial Interchange, steel (Hansen compatible) quick-disconnect nipple
		V41	With 1/4" Schrader steel quick-disconnect nipple
		V43	With 1/4" Snap-Tite, brass quick-disconnect nipple
		X40	For 20LFM and 20LFL hoods with 1/4" Industrial Interchange, steel (Hansen compatible) quick-disconnect nipple
		<b>Replacement Parts for Breathing Tube Assemblies</b>	
		S18051	Nylon breathing tube clamp
		4612	Belt, Nylon webbing

**V30 Series Breathing Tube Assembly**



**V40 Series Breathing Tube Assembly**

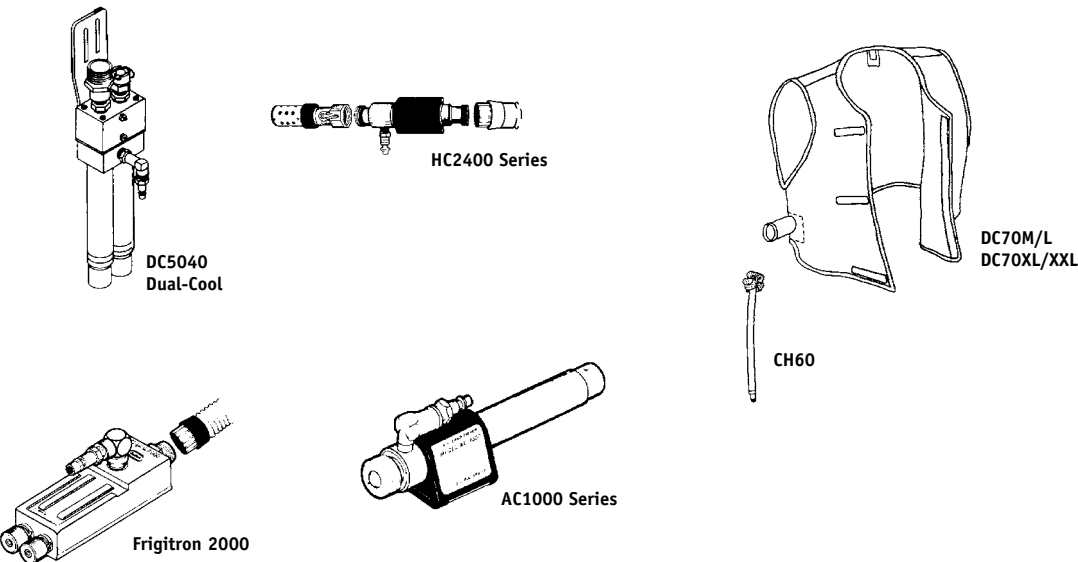




# CC20 Series Airline Respirator

## User Manual

CATALOG NUMBER	DESCRIPTION	CATALOG NUMBER	DESCRIPTION
<b>Flow Control Devices for CC20 Series</b>		<b>Dual-Cool™ - Climate Control Device</b>	
<b>Airline Respirators</b>		DC5040 With 1/4" Industrial Interchange steel (Hansen compatible) quick-disconnect nipple. Includes CH60 connector hose and nylon belt (Order vest separately)	
<b>Flow Control Valves</b>		DC70M/L Medium/Large cooling vest	
F30	Constant flow control valve with 1/4" Industrial Interchange (Hansen compatible) quick-disconnect nipple (other industrial fittings available)	DC70XL/XXL Extra Large/XX-Large cooling vest	
F40	Adjustable flow control valve with 1/4" Industrial Interchange (Hansen compatible) quick-disconnect nipple (other industrial fittings available)	<b>Replacement Parts for Climate Control Assemblies</b>	
F35	Constant flow control valve with 1/2" Industrial Interchange (Hansen compatible) quick-disconnect nipple	MV2400	Muffler/valve assembly for HC2400
<b>Climate Control Assemblies for CC20 Series</b>		CH60	Connector hose for use with DC5040
<b>Airline Respirators</b>		<b>Climate Control Assembly</b>	
For use with Breathing Air Compressors		For use with Bullard EDP30 or ADP20 Free-Air Pump	
<b>Cold Tubes – Adjustable Flow</b>		<b>Cool Tube - Adjustable Flow</b>	
AC1000	With 1/4" Industrial Interchange steel (Hansen compatible) quick-disconnect nipple	Frigitron® 2000 With 1/2" Industrial Interchange steel (Hansen compatible) quick-disconnect nipple.	
AC100031	With 1/4" Schrader steel quick-disconnect nipple		
AC100032	With 1/4" Snap-Tite steel quick-disconnect nipple		
<b>Hot/Cold Tubes - Adjustable Flow</b>			
HC2400	With 1/4" Industrial Interchange steel (Hansen compatible) quick-disconnect nipple		
HC240031	With 1/4" Schrader steel quick-disconnect nipple		
HC240032	With 1/4" Snap-Tite steel quick-disconnect nipple		





## Air Supply Hoses and Fittings for CC20 Series Airline Respirators

### V10 Series Starter Hose Kits

For use with Breathing Air Compressors

Include 25' (7.6m), 3/8" I.D. rubber hose with 1/4" female quick-disconnect coupler and V13 adapter fitting (3/8" hose-to-3/8" pipe)

4696	With 1/4" Industrial Interchange steel (Hansen compatible) quick-disconnect coupler
46913	With 1/4" Schrader steel quick-disconnect coupler
46915	With 1/4" Snap-Tite steel quick-disconnect coupler

### V10 Series Extension Hose Kits

For use with Breathing Air Compressors

Include 3/8" I.D. rubber hose, V11 hose-to-hose adapter fitting and V13 hose-to-pipe fitting (3/8" hose-to-3/8" pipe)

5454	25' (7.6 m) Extension hose kit
5457	50' (15.2 m) Extension hose kit
5458	100' (30.5 m) Extension hose kit

### V20 Series Hoses

For use with Bullard Free-Air Pumps

Include 1/2" I.D. rubber hose with 1/2" Industrial Interchange (Hansen compatible) female quick-disconnect coupler and 1/2" male quick-disconnect nipple

V2050ST	50' (15.2 m)
V20100ST	100' (30.5 m)
V2025STSHUTOFF	25' (7.62 m)
V2050STSHUTOFF	50' (15.2M)

### V5 Series Coiled Hoses

For use with Breathing Air Compressors

Include 3/8" I.D. Nylon coiled hose with 1/4" female quick-disconnect coupler and 1/4" male quick-disconnect nipple.

V52530	25' (7.6 m) with 1/4" Industrial Interchange steel (Hansen compatible) fittings
V55030	50' (15.2 m) with 1/4" Industrial Interchange steel (Hansen compatible) fittings
V52531	25' (7.6 m) with 1/4" Schrader steel quick-disconnect fittings
V55031	50' (15.2 m) with 1/4" Schrader steel quick-disconnect fittings
V52532	25' (7.6m) with 1/4" Snap-Tite steel fittings
V55032	50' (15.2 m) with 1/4" Snap-Tite steel fittings
V52533	25' (7.6m) with 1/4" Snap-Tite brass fittings
V55033	50' (15.2 m) with 1/4" Snap-Tite brass fittings
V52533FF	25' (7.6m) with 1/4" Snap-Tite brass fittings
V55033FF	50' (15.2 m) with 1/4" Snap-Tite brass fittings
V52533FS	25' (7.6m) with 1/4" Snap-Tite brass fittings
V55033FS	50' (15.2 m) with 1/4" Snap-Tite brass fittings
V52535BLACK	25' (7.6 m) with 1/2" Industrial Interchange steel (Hansen compatible) fittings
V55035BLACK	50' (15.2 m) with 1/2" Industrial Interchange steel (Hansen compatible) fittings

### V5 Series Kink-Free Hoses \* XXX is designation RED, GRN, BLK, YLW, BLU

For use with Breathing Air Compressors

Include 3/8" I.D. Nylon coiled hose with 1/4" female quick-disconnect coupler and 1/4" male quick-disconnect nipple.

V5KF2530XXX	25' (7.6 m) with 1/4" Industrial Interchange steel (Hansen compatible) fittings
V5KF5030XXX	50' (15.2 m) with 1/4" Industrial Interchange steel (Hansen compatible) fittings
V5KF2531XXX	25' (7.6 m) with 1/4" Schrader steel quick-disconnect fittings
V5KF5031XXX	50' (15.2 m) with 1/4" Schrader steel quick-disconnect fittings
V5KF2532XXX	25' (7.6m) with 1/4" Snap-Tite steel fittings
V5KF5032XXX	50' (15.2 m) with 1/4" Snap-Tite steel fittings

### V5 Series Kink-Free Hoses (continued)

V5KF2533XXX	25' (7.6m) with 1/4" Snap-Tite brass fittings
V5KF5033XXX	50' (15.2 m) with 1/4" Snap-Tite brass fittings
V5KF2533XXXFF	25' (7.6m) with 1/4" Snap-Tite brass fittings
V5KF5033XXXFF	50' (15.2 m) with 1/4" Snap-Tite brass fittings
V5KF2533XXXFS	25' (7.6m) with 1/4" Snap-Tite brass fittings
V5KF5033XXXFS	50' (15.2 m) with 1/4" Snap-Tite brass fittings
V5KF2535XXX	25' (7.6 m) with 1/2" Industrial Interchange steel (Hansen compatible) fittings
V5KF5035XXX	50' (15.2 m) with 1/2" Industrial Interchange steel (Hansen compatible) fittings

### Quick-Disconnect Nipples, Couplers and Adapters

For use with V10 hoses only

#### Nipples

#### 1/4" Industrial Interchange (Hansen compatible)

S9841	With 1/4" Female NPT
V17	With 3/8" Female NPT

#### 1/4" Schrader

S19432	With 1/4" Female NPT
S19433	With 3/8" Female NPT

#### 1/4" Snap-Tite

S19442	With 1/4" Female NPT
S17651	With 3/8" Female NPT

#### Couplers (Shut-Off Type)

#### 1/4" Industrial Interchange (Hansen compatible)

V14	With 1/4" Female NPT
V15	With 3/8" Male NPT

#### 1/4" Schrader

V18	With 1/4" Female NPT
S17603	With 1/4" Male NPT
S17601	With 3/8" Male NPT

#### 1/4" Snap-Tite

V19	With 1/4" Female NPT
S17615	With 3/8" Female NPT
S17611	With 1/4" Male NPT
S17614	With 3/8" Male NPT

#### Hose Adapters

V11	Hose-to-hose, 3/8" hose to 3/8" hose
V12	Hose-to-pipe, 3/8" hose to 1/4" pipe
V13	Hose-to-pipe, 3/8" hose to 3/8" pipe

### Other Available Flow Control Assemblies (without breathing tube) for CC20 Series Airline Respirators

#### Adjustable Flow

F40	1/4" Industrial Interchange
F40B	1/4" Industrial Interchange (Brass)
F40S	1/4" Industrial Interchange (Stainless Steel)
F41	1/4" Schrader
F42	1/4" Snap-Tite, steel
F43	1/4" Snap-Tite, brass
F44	1/4" Snap-Tite, stainless steel
F47	1/4" CEJN

#### Constant Flow

F30	1/4" Industrial Interchange
F30B	1/4" Industrial Interchange (Brass)
F30S	1/4" Industrial Interchange (Stainless Steel)
F31	1/4" Schrader
F32	1/4" Snap-Tite, steel
F33	1/4" Snap-Tite, brass
F34	1/4" Snap-Tite, stainless steel
F35	1/2" Industrial Interchange
F37	1/4" CEJN
F35B	1/2" Industrial Interchange (Brass)
F35S	1/2" Industrial Interchange (Stainless Steel)

# CC20 Series Airline Respirator

## User Manual

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### Adjustable Cool Tubes

Cold Only	Hot/Cold	Dual-Cool	Coupling Type	
AC100030	HC240030	DC5040	1/4" Industrial Interchange	1/4" Snap-Tite, steel
AC100030B	HC240030B	DC5040B	1/4" Industrial Interchange (Brass)	1/4" Snap-Tite, brass
AC100030S	HC240030S	DC5040S	1/4" Industrial Interchange (Stainless Steel)	1/4" Snap-Tite,
AC100031	HC240031	DC5041	1/4" Schrader	stainless steel
AC100032	HC240032	DC5042		1/4" CEJN
AC100033	HC240033	DC5043		
AC100034	HC240034	DC5044		
AC100037	HC240037	DC5047		
AC100035B	HC240035B			
FRIGITRON2000				
FRIGITRON2000B				
FRIGITRON2000S				

### Return Authorization

The following steps must be completed before Bullard will accept any returned goods. Please read carefully.

Follow the steps outlined below to return goods to Bullard for repair or replacement under warranty or for paid repairs:

1. Contact Bullard Technical Support by telephone or in writing at:

**Bullard**  
1898 Safety Way  
Cynthiana, KY 41031-9303  
Toll-free: 877-BULLARD (285-5273)  
Phone: 859-234-6616

In your correspondence or conversation with Technical Support, describe the problem as completely as possible. For your convenience, your technical support specialist will try to help you correct the problem over the phone.

2. Verify with your technical support specialist that the product should be returned to Bullard. Technical Support will provide you with written permission and a return authorization number as well as the labels you will need to return the product.
3. Before returning the product, decontaminate and clean it to remove any hazardous materials which may have settled on the product during use. Laws and/or regulations prohibit the shipment of hazardous or contaminated materials. Products suspected to be contaminated will be professionally discarded at the customer's expense.
4. Ship returned products, including those under warranty, with all transportation charges pre-paid. Bullard cannot accept returned goods on a freight collect basis.
5. Returned products will be inspected upon return to the Bullard facility. Bullard Technical Support will telephone you with a quote for required repair work which is not covered by warranty. If the cost of repairs exceeds stated quote by more than 20%, your technical support specialist will call you for authorization to complete repairs. After repairs are completed and the goods have been returned to you, Bullard will invoice you for actual work performed.



**Americas:**  
**E.D. Bullard Company**  
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Cynthiana, KY 41031-9303  
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Tychem is a registered trademark of E.I. DuPont de Nemours & Company.  
Velcro is a registered trademark of Velcro USA.

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# EVAHL Series Hazardous Location Powered Air-Purifying Respirator User Manual

(for use with Loose-Fitting Headtops)

## EVAHL1 - Powered Air-Purifying Respirator

Powered Air-Purifying Respirator with High Efficiency (HE) Filters - Approval No. TC-21C-0922 (PAPRFC3)

Powered Air-Purifying Respirator with OV-AG-HE Filter Cartridges for organic vapors, chlorine, hydrogen chloride, sulfur dioxide, chlorine dioxide, hydrogen fluoride and particulates - Approval No. TC-23C-2765 (PAPRFC4)

Powered Air-Purifying Respirator with AM-FM-MA-AG-HE Filter Cartridges for ammonia, formaldehyde, methylamine, chlorine, hydrogen chloride, sulfur dioxide, chlorine dioxide, hydrogen fluoride and particulates - Approval No. TC-23C-3097 (PAPRFC5)



## 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.
  - F. Do not use respirator if airflow is less than four cfm (115 lpm) for tight fitting face pieces or six cfm (170 lpm) for hoods and/or helmets.
  - H. Follow established cartridge and canister change schedules or observe ESLI to ensure that cartridges and canisters are replaced before breakthrough.
  - I. Contains electrical parts that may cause ignition in flammable or explosive atmospheres.
  - J. Failure to properly use and maintain this product could result in injury or death.
  - L. Follow the manufacturer's user instructions for changing cartridges and/or filters.
  - 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 Bullard replacement parts in the configuration as specified by the manufacturer.
  - O. Refer to User's Instructions and/or maintenance manuals for information on use and maintenance of these respirators.
  - P. NIOSH does not evaluate respirators for use as surgical masks.
- \* At very high work rates, the pressure in the respirator may become negative at peak inhalation flow.

## Respirator Program Management

Occupational use of respirators must be in compliance with applicable health and safety standards. By United States regulation, employers must establish a written respiratory protection program meeting the requirements of the Occupational Safety and Health Administration (OSHA) Respiratory Protection standard 29 CFR 1910.134 and any applicable OSHA substance specific standards.

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### ⚠ WARNING

Use strictly in accordance with instructions, labels and limitations pertaining to the EVAHL Series respirator.

1. The EVAHL Series respirator does not supply oxygen. Use only in adequately ventilated areas containing at least 19.5% oxygen.
  2. Do not use when concentrations of contaminants are immediately dangerous to life or health (IDLH).  
This term is defined in 29CFR 1910.134 (b).
  3. Do not use these respirators for respiratory protection during abrasive blasting or clean up.
  4. Do not use in circumstances where the airborne concentration level of contaminant exceeds maximum use concentration for this type of respirator as established by regulatory standards.
  5. Leave area immediately if:
    - Breathing becomes difficult
    - Dizziness or other distress occurs
    - You taste or smell the contaminant
    - Unit becomes damaged
    - Battery alarm activates
    - Low Flow alarm activates
  6. This apparatus must not be worn with the blower unit switched off. If the blower is switched off, a rapid build-up of carbon dioxide and depletion of oxygen may occur, which could result in death or serious injury.
  7. Never alter or modify this respirator. Use only Bullard EVAHL Series components and replacement parts approved for use with this respirator.
  8. This device is not immune to highly powered RFI/EMI emissions.
- Failure to follow these warnings could result in death or serious injury.

## EVAHL Series - Principle of Operation

The EVAHL Series Powered Air-Purifying Respirator (PAPR) System is configured in six parts:

1. The blower and belt assembly:  
EVAHL1 Blower Unit  
EVABELT1 or EVABELT2 Comfort Belt, Decon Belt  
PA1AFI Air Flow Indicator
2. The battery pack (Part No. EVAHLBAT1). One fully charged pack will power the blower for approximately 4 to 10 hours depending upon factors such as speed, cartridge selected and cartridge loading.
3. The breathing tube, which is available in three different types and three lengths:  
PAHBT Powered Air Hood Breathing Tube Assembly (standard length - 26")  
PAHBTXS Powered Air Hood Breathing Tube Assembly (short length - 22")  
PAHBTXL Powered Air Hood Breathing Tube Assembly (long length - 32")  
PA1BT Hood breathing tube assembly with clamp (standard length - 26")  
PA1BTXS Hood breathing tube assembly with clamp (short length - 22")  
PA1BTXL Hood breathing tube assembly with clamp (long length - 32")  
PA20LFBT Loose fitting facepiece breathing tube assembly (standard length - 32")  
PA20LFBTXS Loose fitting facepiece breathing tube assembly (short length - 26")  
PA20LFBTXL Loose fitting facepiece breathing tube assembly (long length - 38")
4. The High Efficiency Particulate Arrestance (HEPA) filter or chemical filter cartridge.
5. The hood with headband suspension (except for the RT Series) and/or hard hat, or loose fitting facepiece. The following hood models may be used with the EVAHL Series blower unit:  
RT1, RT1T Hood with long inner and outer bib (NIOSH approved for use without a headband suspension)  
RT2, RT2T Hood with long inner and outer bib (NIOSH approved for use without a headband suspension)  
RT3, RT3T Hood with long inner and outer bib (NIOSH approved for use without a headband suspension)  
RT4, RT4T Hood with long inner and outer bib (NIOSH approved for use without a headband suspension)  
20TJN, 20TJNT Hood  
20TICN, 20TICNT Hood with inner bib  
20TICH, 20TICHT Hood for use with Bullard hard hat  
20TICSN, 20TICSNT Hood with taped and sealed seams  
20SICN, 20SICNT Hood with taped and sealed seams  
20SICVN, 20SICVNT Hood with taped and sealed seams and PVC lens  
20SICH, 20SICHT Hood with taped and sealed seams for use with Bullard hard hat  
20SICVH, 20SICVHT Hood with taped and sealed seams and PVC lens for use with Bullard hard hat  
20LFM Loose fitting facepiece, medium size  
20LFL Loose fitting facepiece, large size  
20LFXL Loose fitting facepiece, extra large size  
20LF2S Loose fitting facepiece (narrow profile), small size  
20LF2M Loose fitting facepiece (narrow profile), medium size  
20LF2L Loose fitting facepiece (narrow profile), large size
6. The Battery Charger:  
EVAHSMC Quick charger, single port  
EVAHLGC Gang charger, six port

The blower unit draws in ambient air through the cartridges. The purified air is blown into the wearer's hood through the breathing tube. A flow indicator is provided to check that there is an adequate volume of air available to the wearer prior to use. The system is designed to operate at a minimum air flow of approximately 7 cubic feet of air per minute (198 liters per minute) in the hood under normal use on the standard speed setting, and 8.5 cubic feet of air per minute (240 liters per minute) in the hood under normal use on the high speed setting. A feedback loop from the Mass Flow Sensor to the impeller continually monitors and adjusts the air flow to keep it constant at the design set point.

The units are designed for use at temperatures from 23°F to 129°F (-5°C to 55°C).

A high temperature alarm will sound at 122°F (50°C).

The battery pack mounts in a compartment on the back of the blower. A fully charged battery pack will power the blower for approximately 4 to 10 hours depending upon factors such as speed selected, cartridge selected, and filter/cartridge loading.

The EVAHL Series Blower is equipped with two alarms: A 77 db continuous alarm will sound when the air flow falls below approximately 185 lpm and a 77db intermittent chirp alarm will activate to indicate that the battery has approximately 15 minutes of remaining capacity.

## Type C Airline Respirators - CC20 Series (TC-19C-154), RT Series (TC-19C-412)

Most of the same headpieces approved for use with the CC20 and RT Series of supplied air respirators (SAR) are also approved for use with the EVAHL Series of powered air-purifying respirators. CC20 and RT Series respirators provide a high level of respiratory protection and user comfort over long work periods, in a wide variety of hazardous environments.

The CC2 and RT SAR air flow control devices and other components are described in the CC20 and RT Series User Instructions.

## Battery Pack

One fully charged battery pack will power the blower for approximately 4 to 10 hours depending upon factors such as speed selected, cartridge selected and filter/cartridge loading.

### ⚠ WARNING: EXPLOSION HAZARD

- Only use Bullard battery part number: EVAHLBAT1. Substitution of any other battery pack may impair suitability for Division 2.
- Do not charge battery packs in hazardous locations.
- Only charge using Bullard Desktop battery pack chargers.
- Do not insert or remove the battery pack unless the area is known to be free of ignitable concentrations.

### ⓘ NOTE

The battery has built-in short circuit protection. In the event of a short circuit, an internal polyfuse will trip. The fuse will reset itself within 5-10 seconds allowing the battery to resume normal operation.

To charge the battery pack, do the following:

- Use a flat head tool to release the battery from the blower. (See Figure 1.)
- Place battery into the charging port of the battery charger. (See Figure 2.)
- Connect the battery charger to a 110-volt AC electrical outlet.
- Charge the battery pack for approximately 4 hours. While the battery is charging, the light on the charger will remain red. The charger light will illuminate green when charging is complete.

Table-top gang chargers with 6 ports are also available.

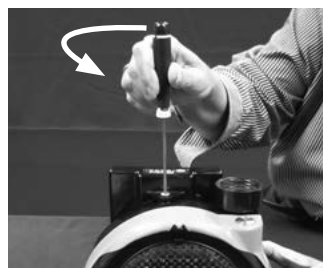


Figure 1



Figure 2

# EVAHL Series Hazardous Location Powered Air-Purifying Respirator Blower Assembly User Manual

## Battery Storage

Storage of Li Polymer batteries is relatively easy. Unlike Nickel batteries, they lose a very small amount of power (less than 0.5% per day) and therefore can be charged and stored ready for use. If long-term storage is required, it is best to store the battery in a cool place not below -5°C/23°F with at least 40% charge still remaining.

### NOTE

Discharging and re-charging the battery fully at least once every 3 months is suggested to ensure the longest possible life of the battery. Do not leave on the charger for more than 30 consecutive days.

## To maximize battery life, these guidelines should be followed:

- Remove the battery from the blower unit when not in use.
- Charge the battery before it is completely discharged. The low battery alarm indicates that the battery needs to be charged. The battery is designed with a circuit to protect the battery. It will not allow the battery to be discharged below a safe voltage for the cells, regardless of airflow, without the alarm sounding. When the battery reaches the voltage cutoff it will automatically cease operation.
- Always charge the batteries at room temperature or cooler. At higher temperatures, the battery pack may not accept a full charge. If the battery pack feels hot, let it cool for 30 minutes before charging.
- Do not charge battery packs in an enclosed cabinet without ventilation.

## Battery Fuel Gauge:

EVAHL Battery Packs are equipped with an on-board fuel gauge to indicate the amount of remaining capacity left in the battery pack. To check the remaining capacity, simply depress the button labeled "Push" and LEDs will illuminate indicating the level of battery capacity remaining. When fully charged all four LEDs will illuminate green, and when 25% or less charge is available a single LED will illuminate red.



Figure 3

## Pre-Operational Inspection

Prior to each work shift, perform the following Pre-Operational Inspection to ensure proper operation and to ensure that the unit is completely assembled.

### 1. Belt Mounted Blower Unit, Part No. EVAHL1

- Check that the unit is clean and undamaged.
- Inspect for deterioration, physical damage and improper assembly.

### 2. Filter/Cartridges

- Inspect the filter/cartridge for any physical damage
- Check the label to ensure the filter/cartridge has not exceeded its "use-by" date.
- Inspect the gasket on the filter for any physical damage.

### NOTE

Each filter comes with a permanent gasket.

- Ensure that the correct filter/cartridge is appropriate for the contaminant.
- Consult the NIOSH approval label and your own in-plant safety professional if you have any questions as to the suitability and efficiency of the Air-Purifying Element.
- Screw the cartridge into the port until hand-tight and the locking tab is secure. (Refer to Mounting and Replacing Filters on Blower Unit on page 4)

### 3. Battery Pack

- Check that the battery is not damaged.
- Check the Fuel Gauge to determine sufficient charge is available.
- Place the battery pack in the battery compartment on the blower.
- Use flat head tool to secure the battery. (See Figure 4)

### WARNING

Lock the battery release before placing the blower in service. The blower shall not be used in a hazardous location with the release unlocked.

### 4. Hood with Suspension or Hard Hat, or Loose Fitting Facepiece

- The hood is constructed of one of the following materials: Tychem 2000 (QC) or Tychem 4000 (SL).
- Depending on the model of the hood selected, it may be used with either a headband suspension or a hard hat (Note: RT Series hoods are part of NIOSH approved respirator assemblies when used without a headband suspension or a hard hat).
- The loose fitting facepiece is constructed of Tychem 2000 (QC) and features an internal suspension.
- Inspect the hood or loose fitting facepiece for any physical damage.

## Mounting the Breathing Tube on the Blower

- Ensure that a rubber gasket is in place in the breathing tube coupler on the blower unit.
- Screw one end of breathing tube into the blower unit. (Hand tight is sufficient.) (See Figure 5).
- Ensure that neither the breathing tube nor the filter is blocked.
- Ensure that the on/off Switch is in the off position.
- Switch on the blower by pressing the on/off button for 1-2 seconds confirmed by a short beep.
- If the Low Battery Alarm sounds at this time, the battery needs to be recharged. See instructions on page 2 regarding properly charging the battery.
- If the Low Flow Alarm sounds at this time, the hood, breathing tube and filter should be checked for leakage.



Figure 4



Figure 5



## Checking Airflow with the Airflow Indicator (PA1AFI - sold separately)

With the blower switched ON and the filters/cartridges mounted, take the free end of the breathing tube in one hand, hold it upright and place the Airflow Indicator into the end of the tube. (See Figure 6). Apply a light downward pressure to the Airflow Indicator to get a reasonable seal at the breathing tube end. Ensure that the air outlet holes in the Airflow Indicator tube are not blocked. Two hands may be used if preferred, one to hold the breathing tube and one to hold the Airflow Indicator. The position of the ball in the Airflow Indicator should be observed. If any part of the ball is below the PASS LINE on the Airflow Indicator, check for:

- Blower malfunction.
- Clogged or damaged Air-Purifying filter elements on the HE filter. See "Mounting and Replacing Cartridges on the Blower Unit" on page 4.
- Low battery or battery malfunction.

If the ball is completely above the PASS LINE on the Airflow Indicator, then the system is ready for use.



Figure 6

### ⚠ WARNING

If the blower malfunctions during use in a hazardous area: Remain calm and **LEAVE** the hazardous area immediately.

**DO NOT** use a blower that fails the flow test (air flow indicator sold separately).

Use **ONLY** Bullard filter/cartridges which comply with and have the NIOSH approval label and which are appropriate for the contaminant.

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

## EVAHL Series PAPR Air-Purifying Elements

### Principle of Operation

The following filter/cartridge protection classification applies when used with any of the hoods or loose fitting facepieces.

Protection	Filter/Cartridge Type	NIOSH / ANSI Color Code for Cartridge Label
HE	PAPRFC3	Magenta
OV/CL/HC/SD/CD/HF/HE	PAPRFC4	Olive and Magenta
AM/FM/MA/CL/HC/SD/CD/HF/HE	PAPRFC5	Olive and Magenta

HE particulate filters are 99.97% effective against all particulate aerosols. The following abbreviations are approved by NIOSH to indicate the particulates, gases, or vapors which are removed by the gas/vapor cartridges: HE High Efficiency Particulate; OV Organic Vapor; AM Ammonia; CD Chlorine Dioxide; CL Chlorine; FM Formaldehyde; HC Hydrogen Chloride; HF Hydrogen fluoride; MA Methylamine; SD Sulfur Dioxide

### ⚠ WARNING

Use only the filter/cartridge(s) described in the above table. Do not change cartridges while in a hazardous atmosphere. Incorrect cartridge selection will invalidate all performance statements and approvals for this equipment. Follow established cartridge change schedules to ensure that cartridges are replaced before breakthrough occurs. Failure to follow these warnings could result in death or serious injury.

\* Do not fit filters directly to the hood.

## Mounting and Replacing Filters on the Blower Unit

High efficiency particulate filters must be replaced when retained particles clog the filters and reduce air flow below acceptable levels, as indicated by testing with the Air Flow Indicator as described at left.



Figure 7

### To Replace Filters

- Remove the air-purifying element from its packaging, and inspect for damage. If in doubt do not use.
- Check that the air-purifying element has not exceeded its "use-by" date.
- Check that the filter connecting thread and gasket are in good condition.
- Check that the air-purifying element is appropriate to the hazard. If in doubt consult your respirator program administrator or supervisor.
- Check that the threads in the blower unit port are in good condition and clear of contaminant.
- Screw the air-purifying elements into the receptacles (see Figure 8) until the cartridge is hand tight. **DO NOT OVERTIGHTEN.**
- Check to see that the locking tab is secure. (see Figure 9)

### To Replace Combination Filter/Cartridge

- Follow the steps above, but beware that the filter locking tab is beneath the filter rim. (see Figure 10)



Figure 8



Figure 9



Figure 10

## Installing and Removing the Belt on the Blower Unit

### To install the belt

- With the blower filter side down, orient the lever locks as shown in Figure 11
- Lay belt over blower as shown in Figure 12
- Rotate lever locks until they are oriented as shown in Figure 13



Figure 11



Figure 12



Figure 13

### To Remove the Belt

- With the blower filter side down, orient the lever locks as shown in Figure 12
- Remove belt from blower



# EVAHL Series Hazardous Location Powered Air-Purifying Respirator Blower Assembly User Manual

## NOTE

Plastic insert may be removed for cleaning as shown in Figure 14-15 .  
See back page for more information on cleaning.



Figure 14



Figure 15

## Donning the Blower and Respirator

### Initial Donning

Prepare to don the blower, battery and hood in a safe, hazard-free area and do the following:

- Ensure that the filter/cartridges used are suitable for the contaminant in question and are compatible with the EVAHL Blower Unit.
- Check that the filter/cartridge is properly mounted on the blower unit.
- Place the battery in the battery compartment on the back of the blower.
- Fit the blower and belt around the user's waist and adjust the belt for a comfortable fit (suspenders are also available).
- Remove the belt and blower to install the hood or loose fitting facepiece and corresponding breathing tube.

## WARNING

The use of any filter/cartridge not approved with the EVAHL blower unit may put the user at risk and could result in death or serious injury.

## Donning the EVAHL with the CC20 Series Hood

### Adjusting and Installing Headband Suspension in Hood

## NOTE

20LF and 20LF2 series loose-fitting facepiece hoods have a sewn-in headband.

## NOTE

The 20SICH, 20TICH and GRH Hoods may use a hard hat or suspension.

## NOTE

RT Series hoods do not use a suspension.

1. Adjust headband before installing into hood.
2. Turn ratchet until it is at its largest size.
3. Place suspension on head.
4. Adjust ratchet knob until snug and comfortable fit achieved. (Figure 16)
5. Remove from head.
6. Place suspension into hood.

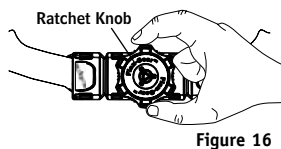


Figure 16

7. Snap 4 white buttons of suspension into 4 white buttons on hood. (Figure 17)

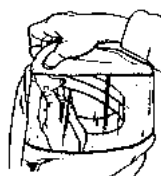


Figure 17

## Adjust Crown Straps for Vertical Fit

To improve suspension comfort, adjust crown straps vertically by repositioning the crown strap posts in the crown straps. Vertical adjustment makes the headband ride higher or lower on the wearer's head. To adjust, push crown strap post from slot, move to new slot, and snap in to secure. Move key to desired vertical position. Repeat for other crown strap post (Figure 18).

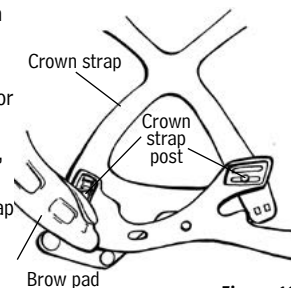


Figure 18

## NOTE

If the hood rises off your head during use, first verify proper air pressure, then select a different hood for your application, or use the optional chin strap.

## Adjusting and Installing Hard Hat in Respirator Hood (20SICH & 20TICH)

1. Assemble and adjust the standard Bullard hard hat suspensions RS4PC or RS6PC or the optional ratchet suspensions RS4RC or RS6RC by following the directions on instruction sheet attached to headband on hard hat. Read all hard hat warning labels and instructions. The following Bullard hard hat models are approved for use with CC20 Series hoods as part of a NIOSH approved respirator assembly: C30, C30R, S51 and S51R.
2. If desired, install and adjust optional ES42 hard hat chinstrap.
3. Before inserting hard hat into hood, remove the two adhesive-backed Velcro® strips attached to the Velcro piece that is sewn into the hood (see Figures 20 & 21).
4. Peel the backing off the longer Velcro tab and apply it to the inside center rear of the hard hat, about 1/4" up from the edge. Apply shorter Velcro tab to the underside of the brim of the hard hat (see Figure 20).
5. Insert hard hat into respirator hood with cap visor facing front of hood (see Figure 19).
6. Tuck cap brim on top of front elastic Velcro band sewn into hood (see Figure 20).
7. Loop the Velcro strip sewn inside the hood around the back of the cap and affix it to the corresponding Velcro tab previously installed inside the hard hat in step 4 (see Figure 21).
8. Remove protective plastic from plastic lens of respirator hood. If desired, apply optional 20LCL adhesive-backed lens covers designed to protect the respirator's plastic lens. Apply 2-3 lenses at a time. When lens becomes soiled, remove by pulling tab at edge of lens cover to clear your vision.



Figure 19

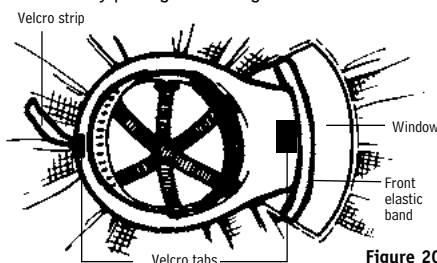


Figure 20

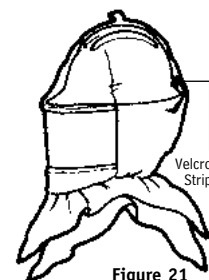


Figure 21

## Installing Breathing Tube Assembly in CC20 Hoods

For hoods without a threaded port at the rear, Breathing Tubes PA1BT, PA1BTXS and PA1BTXL will attach to the hood with a clamp as follows:

1. Remove nylon clamp from plastic anchor plate on hood (see Figure 22).
2. Insert the open end of the breathing tube approximately five inches into hood's air entry sleeve (see Figure 23). Do not insert breathing tube into hood air entry sleeve more than 6 inches as it may cause a flow restriction.
3. Install nylon clamp over air entry sleeve and breathing tube, inserting clamp locks through two holes in plastic anchor plate that is sewn into hood. Locks should face away from user's neck (see Figure 24). The air entry sleeve seams should be on the top and bottom of the breathing tube when properly installed and worn.
4. Engage clamp locks and squeeze together until tight. Air entry sleeve should not be twisted or restricted (see Figure 25). If so, then remove the clamp and repeat steps 2-4.

For hoods with a threaded port at the rear (designated with a "T" suffix), Breathing Tubes PAHBT, PAHBTXS, PAHBTXL will attach to the hood by the threading into the port at the rear (See Figure 23A).

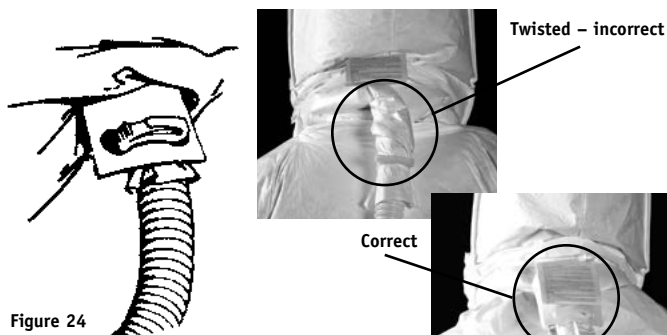


Figure 24

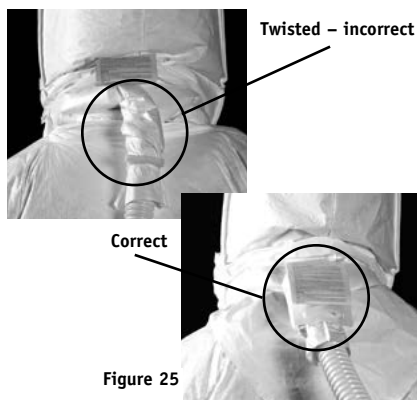


Figure 25

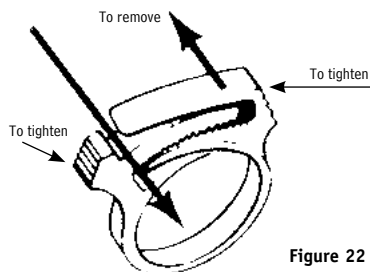


Figure 22

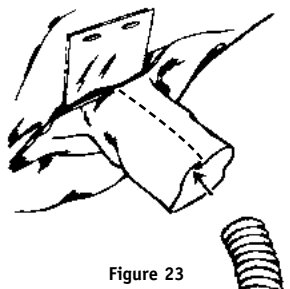


Figure 23

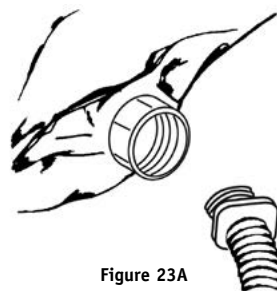


Figure 23A

4. Tuck inner bib of hood into shirt or protective clothing if using hood with inner bib (see Figure 26).
5. Pull respirator outer bib over collar of shirt or protective clothing.
6. Ensure that the neck cuff is down below the chin and that the air outlets of the cuff (see Figure 27) are not restricted. If the neck cuff is not below the chin, then pull down before continuing (See Figure 27).

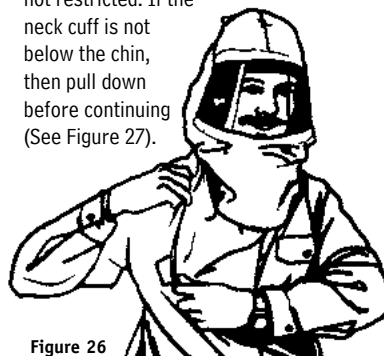


Figure 26

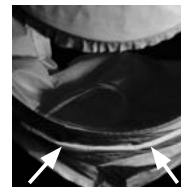


Figure 27



Incorrect



Correct

Figure 28

## RT Series Hood Use Installing Breathing Tube Assembly in RT Series Respirator Hoods

For hoods without a threaded port at the rear, Breathing Tubes PA1BT, PA1BTXS and PA1BTXL will attach to the hood with a clamp as follows:

1. Remove nylon clamp from the breathing tube (see Figure 23).
2. Insert the open end of the breathing tube approximately five inches into hood's air entry sleeve (see Figure 29). Do not insert breathing tube into hood air entry sleeve more than 6 inches as it may cause a flow restriction.
3. Install nylon clamp over air entry sleeve and breathing tube. If desired, 2 or more clamps may be used (see Figure 30). The air entry sleeve seams should be on the sides of the breathing tube when properly installed and worn.
4. Engage clamp locks and squeeze together until tight. Air entry sleeve should not be twisted or restricted (see Figure 31). If so, then remove the clamp and repeat steps 2-4.
5. With PAPR blower unit running, put on RT Series respirator hood. Pull the hood over your head until the neck cuff is securely around your neck.

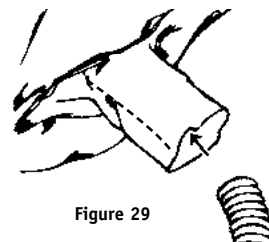


Figure 29

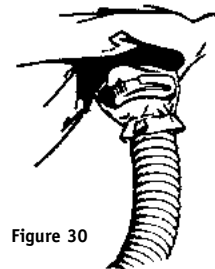
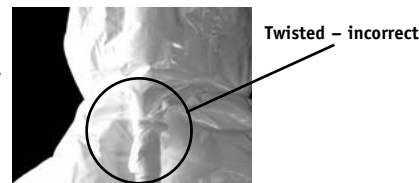


Figure 30



Twisted - incorrect

Correct



Figure 31

6. Ensure that the neck cuff is down below the chin and that the air outlets of the cuff are not restricted. If the neck cuff (see Figure 27) is not below the chin, then pull down before continuing (See Figure 28).

### ⚠ WARNING

Do not put on or remove these respirators in a hazardous atmosphere except for emergency escape purposes. Failure to heed these warnings could result in death or serious injury.

## Donning the CC20 and EVAHL

1. With PAPR Blower Unit Running, put on CC20 Series respirator hood.
2. Position headband suspension or hard hat for a comfortable fit.
3. If using an optional chin strap, pull elastic strap under your chin. Adjust for a secure and comfortable fit.

# EVAHL Series Hazardous Location Powered Air-Purifying Respirator Blower Assembly User Manual

## ⚠ WARNING

The user should ensure that the neck cuff is unrestricted all around the neck to allow proper inflation and reduce restrictions.

Battery run time will be reduced by a restricted or improperly donned hood.

For hoods with a threaded port at the rear (designated with a "T" suffix), Breathing Tubes PAHBT, PAHBTXS, PAHBTXL will attach to the hood by the threading into the port at the rear (See Figure 24A).

## ❗ NOTE

The RT3 and RT4 hoods have an adjustable velcro strap near the top of the lens that allows the user to customize the curvature of the lens to his/her personal preference. This strap may be removed if desired.

- Make sure that the breathing tube is not twisted after donning.
- Tuck inner bib of hood into shirt or protective clothing (see Figure 26).
- Pull respirator outer bib over collar of shirt or protective clothing. Pull the long outer bib down on the outside of clothing and secure with tie down straps or tape (if employer operating procedures will allow.)

## Loose-Fitting Facepiece Use Installing Breathing Tube Assembly in Loose-Fitting Facepieces



Figure 32

- The 20LFM, 20LFL, 20LFXL, 20LF2S, 20LF2M and 20LF2L loose-fitting facepieces have a sewn-in breathing tube connector on the back. The PA20LFBT breathing tube has a special connector on the hood end with bayonet type pins.
- Insert the bayonet connector of the PA20LFBT breathing tube in the hood connector and turn clockwise until it locks in place (see Figure 32).

Available in extra large 20LFXL, large 20LF2L or 20LFL, medium 20LF2M or 20LFM, and small 20LF2S. Select the size that fits most comfortably and matches your head size. Remove the protective cover from the visor. Pull the hood over your head and adjust the headband around your head and the elasticized edge of the face seal under your chin. Make sure that the breathing tube is not twisted after donning.











## Final Donning:

- Attach the other end of breathing tube to blower unit (if not already attached) by screwing adapters together.
- Remove any protective film covering the lens of the headpiece.
- Put on the belt and blower assembly and make any final adjustments to the belt as necessary, keeping the breathing tube and hood behind the head.
- Turn the blower on by depressing and holding the on/off switch (Figure 33) for approximately 1 second indicated by a short beep.
- Buckle the belt onto the waist (blower unit should be in the lower back of the wearer).
- Don the headpiece.
- Choose speed setting (see below).
- Place the hood on the head making any final adjustments to the fit as required at this time to ensure a comfortable and stable fit.
- Tuck inner bib into coveralls or shirt if using a hood with inner bib.



Figure 33

## Final Donning

	Front	Back
CC20 Single Bib		
CC20 Double Bib		
RT Series		
20LFL		
20LF2L		

## ⚠ WARNING

Do not enter a hazardous area until you are sure that the blower and hood are fully operational and the blower is running. The user should periodically leave the hazardous area to check the airflow through the system. If the low battery or low flow alarm should sound, or if the user experiences any difficulty in breathing, or senses any taste or any odors from the hazard, the user should leave the hazardous area immediately. Failure to observe these warnings could result in death or serious injury.

## Speed Selection

The EVAHL Blower is equipped with the ability for the user to select one of two speeds for operation.

When the unit is initially turned on, the blower will operate at approximately 8.5 cfm = 240 lpm (high speed). Note: The battery life is reduced at the higher speed. Pressing the on/off switch will change the speed to approximately 7 cfm = 198 lpm (low speed).

Pressing the on/off switch additional times will toggle the unit between the two speeds.

## ❗ NOTE

Speed change is confirmed by a short beep.

## Low Battery Alarm and Low Flow Alarm

The EVAHL1 Blower unit is equipped with a Low Battery Alarm and a Low Flow Alarm.

The Low Battery Alarm will sound an intermittent 77 dba electronic beep indicating that there are approximately 15 minutes of remaining battery capacity. The delays between beeps will get shorter and shorter as time runs out.

The Low Flow Alarm will sound a continuous 77 dba electronic beep indicating that the flow to the hood has dropped below the design specification of 185 lpm = 6.5 CFM (Note: The NIOSH minimum required flow is 170 lpm = 6 CFM).

When either of these alarms sounds, the user should immediately do the following:

Leave the hazard area

Remove the headpiece

Disconnect the breathing tube from the hood

Check the airflow with the airflow indicator (see page 4).

Check the operation of the low-flow alarm by blocking the end of the breathing tube. The device will first ramp up to compensate and if correct flow cannot be achieved, the alarm will sound within 5 seconds.

If the airflow indicator indicates insufficient airflow, the battery should be fully charged (see "Battery Pack" on page 2), and/or the filter/cartridge should be replaced.

## NOTE

The EVAHL1 blower is provided with a circuit to protect the battery. It will not allow the battery to be discharged below a safe voltage for the cells, regardless of airflow, without the Alarm sounding. When the battery reaches the voltage cutoff it will automatically cease operation. When the Low Battery Alarm sounds and the filter cartridges are not clogged, the battery should be recharged to protect the battery and thereby prolong the working life of the unit. If the ball in the Airflow Indicator is BELOW or PARTLY BELOW the PASS LINE with a fully charged battery, the filter cartridges may need to be changed.

## Doffing the Respirator

Prepare to doff the blower, battery and hood in a safe, hazard-free area and do the following (in conjunction with your employer's standard operating procedures):

- Remove the hood.
- Turn the blower off by holding down the on/off switch for 5 seconds. This is confirmed by a long beep and a shut down of the motor.
- Remove the waist belt.
- Disconnect the hood from the breathing tube.
- Disconnect the breathing tube from the blower.
- Clean and inspect components as necessary.
- Place battery on charger (as desired).
- Place components in storage.

## WARNING

The use of any filter/cartridge not approved with the EVAHL1 blower unit may put the user at risk and could result in death or serious injury.

## Troubleshooting

The following guide will assist you in troubleshooting to locate possible issues with your respirator:

Circumstance	Possible Cause(s)	Solution
Low Battery Alarm is sounding	Low Voltage	Charge the battery
	Blower malfunction	Return blower for analysis
Low Flow Alarm is sounding	Clogged/damaged air-purifying filter element	Replace the filter/cartridge
	Battery Low	Re-charge the battery
	Blower malfunction	Leave hazardous area immediately and check equipment. If the problem persists and no damage is found, return equipment for repair. Replace breathing tube and/or hood.
	Hood neck cuff is restricting flow	Adjust neck cuff position
Smell or taste contaminant	Equipment damaged	Leave hazardous area immediately and check equipment
	Filter needs to be replaced	Replace filter
	Low airflow	Leave hazardous area immediately and check equipment If the problem persists and no damage is found, return equipment for repair
Blower unit does not run full service life	Damaged Battery	Return battery for analysis
	Malfunctioning Battery Charger	Return charger for analysis
	Hood neck cuff is restricting flow	Adjust neck cuff position



# EVAHL Series Approval Label



EVAHL Series Powered Air-Purifying Respirator  
This respirator is approved only in the following configurations:

**BULLARD**  
1898 Safety Way  
CYNTHIANA, KY 41031 USA  
877-BULLARD (285-5273)



RESPIRATOR COMPONENTS		CAUTIONS AND LIMITATIONS <sup>2</sup>	
TC-	PROTECTION <sup>1</sup>	ACCESSORIES	
		ALTERNATE CHARGER ASSEMBLIES	
		ALTERNATE BELT ASSEMBLIES	
		BATTERY	
		ALTERNATE CARTRIDGE ASSEMBLY	
		FILTER ASSEMBLY	
		BLOWER UNIT ASSEMBLY	
		ALTERNATE BREATHING TUBES	
		ALTERNATE SUSPENSION / HARD HAT ASSEMBLIES	
		ALTERNATE HOOD ASSEMBLIES	
21C-0922	HE		
23C-2765	OV/CD/CL/HC/HF/SD/HE		
23C-3097	AM/CL/HC/MA/FM/HF/SD/CD/HE		

## 1 Protection

HE - High Efficiency Particulate Air Filter for Powered Air Purifying Respirators

OV - Organic Vapor

AM - Ammonia

CD - Chlorine Dioxide

CL - Chlorine

FM - Formaldehyde

HC - Hydrogen Chloride

HF - Hydrogen Fluoride

MA - Methylamine

SD - Sulfur Dioxide

## 2 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.

F. Do not use this respirator if airflow is less than four cfm (115 lpm) for tight-fitting facepieces or six cfm (170 lpm) for hoods and / or helmets.

H. Follow established cartridge and canister change schedules or observe ESLI to ensure that cartridges and canisters are replaced before breakthrough occurs.

I. Contains electrical parts that may cause ignition in flammable or explosive atmospheres.

J. Failure to properly use and maintain this product could result in injury or death.

L. Follow the manufacturer's instructions for changing cartridges and / or filters.

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.

P. NIOSH does not evaluate respirators for use as surgical masks.



## Cleaning

### ⚠ WARNING

Avoid contaminant entry into the breathing tube, as this will compromise respiratory protection and could result in death or serious injury. Consult your local safety professional if you suspect that contaminant has entered the breathing tube.

When cleaning the equipment, do the following:

- Ensure water does not enter filter/cartridges. Replace wet filter/cartridges.
- DO NOT use gasoline, organic-based solvents, or chlorinated degreasing fluids (such as trichloroethylene), as they will cause damage.
- DO NOT immerse the equipment in water or other cleaning fluid, as this may cause contamination in the breathing tube and blower interior that will be difficult to remove.
- Use a lint-free cloth moistened in a mild solution of soap and warm water to clean the outer surface of the equipment.

Failure to observe the instructions and warnings in this manual invalidates all performance statements and approvals for this equipment and could result in death or serious injury.

The following chemicals have been tested and approved as cleaning agents for the blower housing, belt and battery:

- A. Process NPD (L256) from Steris
- B. Spor Klenz (undiluted) from Steris
- C. Clorox liquid bleach at 10% concentration
- D. Sani-Cloth HB wipes
- E. 100% Methanol
- F. 70% IPA

Once filter/cartridges have reached the end of their useful life, discard in accordance with federal, state, and local guidelines, and in conformance with plant safety regulations.

Consult the appropriate CC20 or RT Series Hood User Manual for cleaning instructions for the hood components.

## Storage

When the blower is completely dry, store in a clean, dry area, away from direct sunlight and sources of direct heat.

The storage temperature should be between 23° F to 129° F (-5° C to 54° C) with humidity less than 90% RH.

Consult the appropriate CC20 or RT Series Hood User Manual for storage instructions on hood components

## One Year Limited Warranty

Bullard warrants to the original purchaser that the EVAHL Powered Air-Purifying Respirator and Loose-Fitting Facepiece or Hood will be free of defects in material and workmanship under normal use and service for a period of one (1) year from the date of purchase. Bullard's obligation under this warranty is limited to repairing or replacing, at its option, articles that are returned within the warranty period and that are, after examination, shown to Bullard's satisfaction to be defective, subject to the following limitations;

- a) EVAHL Powered Air-Purifying Respirator and Loose-Fitting Facepiece or Hood must be returned to the Bullard factory with shipping charges prepaid.
- b) EVAHL Powered Air-Purifying Respirator and Loose-Fitting Facepiece or Hood must not be altered from its original factory configuration.
- c) EVAHL Powered Air-Purifying Respirator and Loose-Fitting Facepiece or Hood must not have been misused, subjected to negligent use, or damaged in transport.
- d) The date of purchase is within the one year warranty period. (A copy of the purchaser's original invoice showing the date of purchase is required to validate warranty coverage.)

In no event shall Bullard be responsible for damages for loss of use or other indirect, incidental, consequential or special costs, expenses or damages incurred by the purchaser, notwithstanding that Bullard has been advised of the possibility of such damages.

ANY IMPLIED WARRANTIES, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO ONE (1) YEAR FROM THE DATE OF PURCHASE OF THIS PRODUCT.

Some states do not allow the exclusion or limitation of incidental or consequential damages, or allow limitations on how long an implied warranty lasts, so the above limitations or exclusion may not apply to you. This warranty gives you specific

## Return Authorization

The following steps must be completed before Bullard will accept any returned goods. Please read carefully.

Follow the steps outlined below to return goods to Bullard for repair or replacement under warranty or for paid repairs:

1. Contact Bullard Sales Support by telephone or in writing at:

**Bullard**  
1898 Safety Way  
Cynthiana, KY 41031-9303  
Toll-free: 877-BULLARD (285-5273)  
Phone: 859-234-6616

In your correspondence or conversation with Sales Support, describe the problem as completely as possible. For your convenience, your sales support specialist will try to help you correct the problem over the phone.

2. Verify with your sales support specialist that the product should be returned to Bullard. Sales Support will provide you with written permission and a return authorization number as well as the labels you will need to return the product.
3. Before returning the product, decontaminate and clean it to remove any hazardous materials which may have settled on the product during use. Laws and/or regulations prohibit the shipment of hazardous or contaminated materials. Products suspected to be contaminated will be professionally discarded at the customer's expense.
4. Ship products to be returned, including those under warranty, with all transportation charges pre-paid. Bullard cannot accept returned goods on a freight collect basis.
5. Returned products will be inspected upon return to the Bullard facility. Bullard Sales Support will telephone you with a quote for required repair work which is not covered by warranty. If the cost of repairs exceeds stated quote by more than 20%, your sales support specialist will call you for authorization to complete repairs. After repairs are completed and the goods have been returned to you, Bullard will invoice you for actual work performed.

# EVAHL Series Hazardous Location Powered Air-Purifying Respirator Blower Assembly User Manual

## Ordering Information

### Blower Assemblies

EVAHL1	Blower unit only
EVAHL2	Blower unit, belt, battery and charger
EVAHL3	Blower unit, belt, battery

### Replacement Batteries and Chargers

EVAHLSMC	Quick charger (1 port)
EVAHLGC	Table top gang charger (6 ports)
EVAHLBAT1	Lithium Polymer Battery Pack (Black)

### Replacement Cartridges

PAPRFC3	HE (6 per box)
PAPRFC4	OV/AG/HE (6 per box)
PAPRFC5	AM/FM/MA/AG/HE (6 per box)

### Respirator Hoods ("T" suffix designates thread connection)

#### Single bib hood, for use with headband suspension

20TJ, 20TJT	Tychem 2000 (QC) 20RT headband suspension
20TJN, 20TJNT	Tychem 2000 (QC) No headband suspension

#### Double bib hood for use with headband suspension

20TIC, 20TICT	Tychem 2000 (QC) 20RT headband suspension
20TICN, 20TICNT	Tychem 2000 (QC) No headband suspension
20TICS, 20TICST	Tychem 2000 (QC) 20RT headband suspension, taped and sealed seams
20TICSN, 20TICSNT	Tychem 2000 (QC) No headband suspension, taped and sealed seams
20SIC, 20SICT	Tychem 4000 (SL) 20RT headband suspension, taped and sealed seams
20SICN, 20SICNT	Tychem 4000 (SL) No headband suspension, taped and sealed seams
20SICV, 20SICVT	Tychem 4000 (SL) 20RT headband suspension, taped and sealed seams, PVC lens
20SICVN, 20SICVNT	Tychem 4000 (SL) No headband suspension, taped and sealed seams, PVC lens

#### Double bib hood for use with Bullard hard hat ("T" suffix designates thread connection)

20TICH, 20TICHT	Tychem 2000 (QC) Hard hat not included
20SICH, 20SICHT	Tychem 4000 (SL) Hard hat not included, taped and sealed seams
20SICVH, 20SICVHT	Tychem 4000 (SL) Hard hat not included, taped and sealed seams, PVC lens

#### Loose fitting facepieces with sewn-in suspension

20LFXL	Tychem 2000 (QC), Extra large
20LFL	Tychem 2000 (QC), Large
20LFM	Tychem 2000 (QC), Medium
20LF2L	Tychem 2000 (QC), Large, narrow profile
20LF2M	Tychem 2000 (QC), Medium, narrow profile
20LF2S	Tychem 2000 (QC), Small, narrow profile

#### Double bib hood for use without a headband suspension

RT1, RT1T	Tychem 2000 (QC), Inflatable neck collar
RT2, RT2T	Tychem 4000 (SL), Inflatable neck collar
RT3, RT3T	Tychem 2000 (QC), Sport neck collar
RT4, RT4T	Tychem 4000 (SL), Sport neck collar

### Accessory Items for Hoods

20LCL	Mylar lens covers, CC20 Series (25/pkg)
RTLCL	Mylar lens covers, RT Series (25/pkg)

### Headband Suspensions and Hard Hats

20TG	Standard headband suspension
20RT	Sure-Lock® ratchet headband suspension
30WHP	Hard hat with standard suspension, white
30WHR	Hard hat with ratchet suspension, white
51WHP	Hard hat with standard suspension, white
51WHR	Hard hat with ratchet suspension, white

### Accessories for Headbands Suspension and Hard Hats

RS6PC	Standard replacement suspension for 30WHP hard hat
RS6RC	Replacement ratchet suspension for 30WHR hard hat
RS4PC	Standard replacement suspension for 51WHP hard hat
RS4RC	Replacement ratchet suspension for 51WHR hard hat
20NC	Chinstrap for 20TG and 20RT headband suspension
ES42	Chinstrap for C30 and S51 hard hats

### Replacement Parts and Accessories

EVABELT1	Replacement belt
EVABELT2	Vinyl belt
PAPRSUSP1	Suspenders
EVAEXT1	Extension belt kit
PAPRSUSP1	PAPR suspenders (1 pair)
PA1AFI	Air flow indicator
PAHBT	Powered air hood breathing tube assembly; standard length
PAHBTXS	Powered air hood breathing tube assembly; short length
PAHBTXL	Powered air hood breathing tube assembly; long length
PA1BT	Hood breathing tube assembly; includes tube and clamp; standard length
PA1BTXS	Hood breathing tube assembly; includes tube and clamp; short length
PA1BTXL	Hood breathing tube assembly; includes tube and clamp; long length
PA20LFBT	Loose fitting facepiece breathing tube assembly; standard length
PA20LFBTXS	Loose fitting facepiece breathing tube assembly; short length
PA20LFBTXL	Loose fitting facepiece breathing tube assembly; long length
PA1BTS	Breathing tube/cartridge seal
S18051	Breathing tube clamp (10/pack)



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Bullard**

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Cynthiana, KY 41031-9303 • USA  
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Fax: +49-2642 9999829

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Fax: +65-6745-5176



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