## Table of Contents



| Terms and Conditions                                    |
|---|
| How to Place an Order                                   |
| Head, Face and Hearing Protection                       |
| Warnings, Regulations and Standards for Head Protection |
| Advanced Head Protection                                |
| ADVENT <sup>®</sup> Helmet                              |
| VECTOR™ Helmet10  |
| Classic Series Hard Hats and Caps                       |
| High Heat   |
| Standard Series Hard Hats and Caps                      |
| Reflective Striping                                     |
| Decoration  |
| Bump Caps   |
| Hearing Protection                                      |
| Face Protection   |
| Isotherm® Cool Vest                                     |
| Turtle Club   |
| Respiratory Protection                                  |
| Warnings, Regulations, Standards and Protection Factors |
| Research for Respirators                                |
| Powered Air Purifying Respirators (PAPRs)               |
| PA20 Series   |
| PA30 Series   |
| PA40 Series   |
| Supplied Air Respirators (SARs)96                       |
| CC20 Series   |
| RT Series   |
| PC90 Series   |
| Blasting and Grinding                                   |
| 88VX Series   |
| Lancer  |
| GR50  |
| Mask-Style Respirators                                  |
| Spectrum  |
| FAMB  |
| Air Supply Hose   |
| Body Temperature Management                             |
| Breathing Air Filtration                                |
| Airline Filters   |
| Free-Air® Pumps   |
| Part Number Product Index                               |
| Subject Index   |



## **Terms and Conditions**

### Terms and Conditions

Customer Service Policy: This statement does not supersede the terms or conditions of sale that are printed on Bullard sales orders, acknowledgements and packing slips. Instead, it is a guide to our customer service policies. Bullard reserves the right to change product specifications without notice.

Pricing: Orders must specify one destination and one shipping date. Prices are subject to change without notice. We attempt to advise our customers of price changes in advance, but cannot guarantee to do so. Orders specifying future shipment are subject to prices effective at the time of shipment. Possession of a price list does not grant the right to distributor discounts.

Minimum Order: Minimum purchase order is \$100.00. Products from other Bullard price lists may be combined to meet minimum.

Terms: Standard terms net 30 days, F.O.B. shipping point.

Freight: Title to goods passes to the buyer upon delivery to the carrier at the Bullard dock. Orders of \$2,500 or more are shipped freight prepaid by Bullard within the continental U.S. via the carrier(s) of our choice. Products from other Bullard price lists may be combined to receive free freight. Orders specifying other means of shipment are shipped collect regardless of order value. To qualify for prepaid freight, orders must specify a single destination and shipping date.

Credit Policy: We reserve the right to assess a  $1^{1}/_{2}$  percent service charge per month on overdue balances. Our credit department is authorized to hold shipments if past due balances are not paid.

Returned Goods: Refer to your Bullard distributor program for details.

Non-standard Orders: We welcome the opportunity to meet special requirements. However, special orders are accepted with the understanding that we may over-ship and bill accordingly by as much as 10% of the order, due to the special nature of the product.

Drop Shipments: In certain situations, drop shipments may be made to authorized distributor locations or other locations within a distributor's recognized territory. Please contact Bullard Customer Service for details.

Information Support Policy: Bullard provides distributors with catalogs, price lists, promotional literature and other printed material. Generally, this information is provided to the distributor at no cost. However, Bullard reserves the right to charge a distributor when literature requests exceed reasonable levels based on the distributor's annual sales volume. All Bullard literature can also be downloaded from our website at no additional cost at **www.bullard.com**.

## How To Place An Order

Now there are more ways than ever to place an order with Bullard!

### by Fax

You can fax us any time – 24 hours a day. Faxed orders are processed promptly and you will receive a Sales Order confirmation back after the order has been entered into our system.

### by Mail

Send orders via mail to Bullard Customer Service if you have an account set up with us. Note the mailing address for Bullard below.

#### in Person

Your Bullard Regional Sales Manager will visit your facility and listen to your needs. They can help you decide on the combination of safety products that will best serve you and provide a quotation, technical information, product availability and ordering information.

### by Phone

Call us anytime between 8:00 a.m. and 5:00 p.m. E.S.T, Monday through Friday, and one of our experienced Customer Service Representatives will assist you with placing your order. Special order requirements? Just contact a Bullard Customer Service Representative to discuss the options. Telephone orders must be followed with an e-mail or faxed copy of the purchase order.

### by E-mail

E-mail your orders to orders@bullard.com.

### by EDI

Transaction sets are received as soon as they are sent, so the response turnaround is almost immediate. You can even use your own part numbers!

### Bullard

1898 Safety Way Cynthiana, KY 41031-9303 Toll free: 877-BULLARD (285-5273) Tel: 859-234-6616 Fax: 859-234-8987 www.bullard.com

### Bullard GmbH

Lilienthalstrasse 12 53424 Remagen Germany Tel: +49-2642 999980 Fax : +49-2642 9999829 www.bullardextrem.com

### **Bullard Asia Pacific**

Cisco Centre 20 Jalan Afifi, #08-03 Singapore 409179 Tel: +65-6745-0556 Fax: +65-6745-5176 www.bullard.com





## Warnings, Regulations and Standards for Head Protection

OSHA 29 CFR 1910.135 requires head protection if any aspect of the work environment presents a risk of head injury.

#### ANSI Z89.1-2003 developed requirements for industrial head protection relating to 1) Impact Protection; 2) Penetration Protection and 3) Electrical Insulation Protection.

This fifth revision of the standard provides performance and testing requirements for industrial helmets, commonly known as hard hats, and is a revision of ANSI Z89.1-1997, which established the types and classes of protective helmets, depending on the type of hazard encountered. The 1997 version included specifications for helmets designed to offer protection from lateral impact, or top-only impact, giving employers and users the flexibility to specify the helmet that best meets the needs of their specific workplace.

Industrial head protective helmets meeting the requirements of the 2003 standard are classified as Type I for top protection or Type II for top and lateral impact protection. Both types are tested for impact attenuation and penetration resistance. Type II helmet performance requirements include criteria for impact energy attenuation from impacts from the front, back and sides, as well as the top, off-center penetration resistance and chin strap retention. The three classes indicate the helmet's electrical insulation rating, and is unchanged from 1997.

#### Types of Hard Hats

Type I - Conventional hard

hats that are designed to

spine.

Type II - New designs that offer additional impact reduce the force of impact to protection to the front, sides, the top of the head, neck and and back, as well as the top of the head.

Class E (electrical) are tested to withstand 20,000 volts.

Classes of Hard Hats

Class G (general) helmets are tested at 2200 volts.

Class C (conductive) provides no electrical protection.

#### CAN/CSA Z94.1-2005 is the National Standard for Canada

This is the fifth edition of CSA Z94.1, Industrial Protective Headwear - Performance, selection, care and use. It supersedes the previous editions published in 1992, 1977 and 1966 under the title Industrial Protective Headwear. It also supersedes the Preliminary Standard, published in 1965, and replaces the protective headwear requirements specified in CSA Z94-1948, Code for Head and Eye Protection.

#### The following Bullard hard hats and helmets meet the revised ANSI Z89.1-2003 and/or CSA Z94.1-2005 standards:

| Bullard Model | Standard                          | Type and Class                              |
|---------------|-----------------------------------|---|
| C30           | ANSI Z89.1-2003                   | Type I, Class E & G                         |
| C33           | ANSI Z89.1-2003                   | Type I, Class E & G                         |
| 911C          | ANSI Z89.1-2003                   | Type I, Class E & G                         |
| 911H          | ANSI Z89.1-2003                   | Type I, Class E & G                         |
| S51           | ANSI Z89.1-2003<br>CSA Z94.1-2005 | Type I, Class E & G<br>Type 1, Class E & G  |
| S61           | ANSI Z89.1-2003                   | Type I, Class E & G                         |
| S62           | ANSI Z89.1-2003                   | Type I, Class C                             |
| \$71          | ANSI Z89.1-2003                   | Type I, Class E & G                         |
| Advent®       | ANSI Z89.1-2003                   | Type II, Class E & G                        |
| Vector™       | ANSI Z89.1-2003<br>CSA Z94.1-2005 | Type II, Class E & G<br>Type 2, Class E & G |

#### **WARNING**

Hard hats are designed to provide limited protection to the head by reducing the force of falling objects striking the top of the hard hat shell. While limited protection is provided in other parts of the shell, this hard hat was not designed to provide front, side or rear impact protection. Avoid contact with electrical wires. NEVER ALTER OR MODIFY THE SHELL OR SUSPENSION SYSTEM. ALWAYS USE **BULLARD REPLACEMENT PARTS.** 

Inspect your hard hat shell and suspension regularly. Check for cracks, frayed straps and any signs of damage before each use. Replace the hard hat immediately if you notice any signs of wear, damage, abuse or environmental degradation. If the hard hat has sustained a forcible blow (impact), dispose of it immediately, even if damage is not visible. Failure to follow these warnings could result in death or serious injury.

## Warnings, Regulations and Standards for Face and Hearing Protection

#### ANSI Z87.1-2003 - American National Standard for Eye and Face Protection

Perhaps the most significant change affecting all eye and face protectors is the introduction of a two-level classification for impact protection. "Basic impact" lenses are tested to withstand the impact of a 1-inch ball dropped from 50 inches, plus a penetration test for plastic lenses. "High impact" lenses, and all frames, have to pass more stringent high mass and high velocity impact tests. There are changes in marking to indicate the level of impact protection. Minimum thickness requirements have been eliminated, except for non-plano lenses (2 mm).

Employers must now decide when they need basic or high impact protectors for their employees. ISEA recommends the use of only high impact protectors (Z87+) whenever eye protection is worn. The standard requires that all frames and lenses carry a manufacturer's mark or logo, plus other markings to indicate the level of protection. Faceshields are marked Z87 to indicate Basic Impact, or Z87+ to indicate High Impact. Other markings are "S" for special purpose lenses, and LIGHT, MEDIUM, DARK to indicate luminous transmittance of a faceshield window. Bullard visors conform to ANSI Z87.1-2003 standard when used in combination with Bullard approved headgear or faceshield brackets under the following classification by model number:

| Bullard<br>Model | Material | Classification        | Bullard<br>Model | Material      | Classification   |
|------------------|----------|-----------------------|------------------|---------------|------------------|
| 640              | Acetate  | Z87 Basic Impact      | 840ME            | Polyester     | Z87 Basic Impact |
| 640G             | Acetate  | Z87 DARK Basic Impact | 680P             | Polycarbonate | Z87+ High Impact |
| 840M             | Acetate  | Z87 Basic Impact      | 840P             | Polycarbonate | Z87+ High Impact |
| 840MH            | Acetate  | Z87 Basic Impact      | 840PX2           | Polycarbonate | Z87+ High Impact |
| 840MX2           | Acetate  | Z87 Basic Impact      | 860P             | Polycarbonate | Z87+ High Impact |
| 840MG            | Acetate  | Z87 DARK Basic Impact | 880P             | Polycarbonate | Z87+ High Impact |
| 860H             | Acetate  | Z87 Basic Impact      | WS60PM           | Polycarbonate | Z87+ High Impact |
| CS40             | Acetate  | Z87 Basic Impact      | 8S24             | Mesh Screen   | Z87 Basic Impact |
| 1040             | Acetate  | Z87 Basic Impact      |                  |               |                  |

#### ANSI S3.19-1974 – American National Standard for Hearing Protection

ANSI S3.19-1974, Method for the Measurement of Real-Ear Protection of Hearing Protectors and Physical Attenuation of Earmuffs, is the standard currently used and cited in 40 CFR 211. It describes a laboratory test procedure where test subjects are given hearing tests, then are tested again with the Hearing Protection Device (HPD) in place. The difference between how they hear with and without the HPD, with some statistical corrections thrown in, should be a good reflection of how much protection the devices provide.

Each model in the Bullard NRZone® and SafeCom® Series of hearing muffs and accessories meet or exceed ANSI S3.19-1974.

## **Advanced Head Protection - ADVENT® Helmet**

### The ADVENT. Designed Specifically for Emergency Response Services.

The ADVENT helmet offers paramedics, emergency medical technicians, industrial hazard response teams and search and rescue personnel a revolutionary new concept in head protection. Available in two models, ADVENT offers a variety of special benefits.

#### **Highly Protective**

ADVENT offers top, front, side and rear impact and penetration protection. This level of head protection is essential for emergency response professionals who are involved in everything from vehicle extrication to rope rescue. ADVENT meets or exceeds all requirements of ANSI Z89.1-2003, Type II, Class E & G.

#### Comfortable

At just over 25 ounces (709g), ADVENT is half the weight of conventional firefighter helmets and is the same weight as many climbing helmets. Its compact design with no rear brim improves freedom of movement both in and out of emergency vehicles and confined spaces. A crown pad and a soft replaceable, foam-backed vinyl brow pad provide extra comfort.

#### Easy Adjustment

ADVENT's adjustable ratchet suspension (ADRTSL) makes it easy to size instantly.

#### Economical

ADVENT is affordable - less than half the price of conventional fire helmets.

#### Adaptable

ADVENT can be equipped with a variety of accessories, including faceshields, ear/neck protectors and hearing protectors.

#### Easy to Customize

ADVENT is designed as part of the professional's standard uniform. Both models are available in five colors and may be customized with pad printed logos, decals and reflective strips.



## **Advanced Head Protection - ADVENT® Helmet**

### Revolutionary Construction, Advanced Levels of Protection.

- 1. Inner Shell of ABS Helps protect by distributing forces of impact over a wide area.
- **2. Eight-point Suspension System** Adds stability and comfort.
- **3. Expanded Polystyrene Foam Core** Reduces the possibility of serious head injury by helping absorb forces of impact.
- 4. Sure-Lock<sup>®</sup> Ratchet Headband Makes sizing quick, comfortable, and easy.
- **5. Expanded Polyethylene Crown Cushion** Helps prevent head contact with the shell in the event of top impact.
- **6. Ventilation Channels** Help keep wearers cooler and more comfortable.
- **7. Outer Shell of Thermoplastic** Provides superior impact and penetration protection over a wide range of temperatures.
- 8. Permanently Attached Chinstrap
  - Increases stability and security, with quick-release buckle. (ADVENT A2 is available with a 3-point cradle chinstrap.)
- **9. Vinyl Crown and Brow Pad** Provides enhanced comfort.

A1

A2

ADVENT Helmet with 2-point chinstrap

- Polycarbonate alloy shell
- Meets or exceeds ANSI Z89.1-2003 Type II, Class E & G requirements
- EPS foam impact liner
- EPS foam crown cushion
- ABS inner shell
- 8-point Sure-Lock® ratchet suspension (ADRTSL)
- 2-point chinstrap with dielectric quick-release buckle (A110)
- Case quantity: 10; minimum quantity: 1

#### ADVENT Helmet with 3-point cradle chinstrap

- Same as Model A1 above with
- 3-point cradle chinstrap
- Dielectric quick-release buckle
- Case quantity: 10; minimum quantity: 1





(1)

3)

7)

5

8

-D b Q 0 -P 0 3

## Advanced Head Protection - VECTOR<sup>™</sup> Helmet

### The VECTOR Helmet... designed to meet CSA and ANSI Type II Standards.

The Bullard VECTOR helmet provides impact protection for the top, front, back and side of the head. VECTOR helmets are lightweight, comfortable, affordably priced and designed to accommodate numerous accessories. In addition to the advanced features, the helmet is easy to customize with company logos, slogans and reflective markings.

#### Protection

VECTOR helmets use a full inner shock liner to absorb impacts from the top, front, back and side. The shock liner is carefully engineered to provide advanced protection with minimal weight. Combined with its heavy-duty polyethylene shell and optional self-sizing suspension or Sure-Lock<sup>®</sup> ratchet suspension, VECTOR offers advanced protection at a competitive price. A two-point chinstrap and heavy-duty polycarbonate faceshield are available as options.

#### Comfort

VECTOR helmets offer lateral and top impact protection with only slight weight addition over conventional hard hats. Either the selfsizing VT600 suspension or optional VTRT600 Sure-Lock ratchet suspension ensures a secure and comfortable fit for virtually all head sizes and shapes. The standard Sportek<sup>™</sup> brow pad is the most absorbent and comfortable brow pad available.

#### Easy to Customize

VECTOR helmets can be decorated with your company's logo using up to six colors in as many as eight different locations. Available colors include: white, yellow, orange, red, Kentucky blue, navy blue, forest green, hi-viz orange and hi-viz yellow.

#### Value

VECTOR helmets offer advanced head protection and comfort at an affordable price. The lightweight VECTOR helmets are compliant with ANSI Z89.1-2003 Type II and CSA Z94.1-2005, Type II requirements. The Sportek brow pad, comfortable suspension, built-in goggle strap retaining slots and Bullard unsurpassed reputation for quality make VECTOR helmets a superior value in industrial head protection.



Order Now: 877-BULLARD • www.bullard.com

## Advanced Head Protection - VECTOR<sup>™</sup> Helmet

### Advanced Levels of Protection

- 1. **Outer Shell of Polyethylene** comfortable lightweight design for maximum comfort.
- 2. **Expanded Polystyrene Foam Core** reduces the possibility of serious head injury by helping to absorb the forces of impact.
- 3. Four-point Suspension System straps are angled to fit the head for superior comfort.
- 4. **Ventilation Channels** help keep wearer cooler and more comfortable.
- 5. Sizing Mechanism choose from either the Sure-Lock® ratchet or self-sizing suspension.

#### VECTOR-C

VECTOR-CRT

### Helmet with self-sizing suspension

- High-density polyethylene shell
- Meets or exceeds ANSI Z89.1-2003 Type II, Class E & G requirements and CSA Z94.1-2005, Type II, Class E & G
- EPS foam impact liner
- 4-point self-sizing suspension (VT600)

Helmet with Sure-Lock<sup>®</sup> ratchet suspension

• 4-point Sure-Lock ratchet suspension (VTRT600)

Same as Model VECTOR-C above with

• Case quantity: 10

• Case quantity: 10



Available in White, Yellow, Red, Kentucky Blue, Navy Blue, Forest Green, Orange, Hi-Viz Orange and Hi-Viz Yellow.



(1)

2

3)

4

5)

## **Advanced Head Protection**

## **ADVENT®** Replacement Parts and Accessories

#### ADRTSL Suspension for ADVENT

- 8-point Sure-Lock<sup>®</sup> ratchet suspension
- Foam-backed vinyl brow and crown pad (A101)



A101

#### Brow Pad

- Foam-backed ventilated vinyl
- For ADRTSL-Advent suspension



### **VECTOR®** Replacement Parts and Accessories

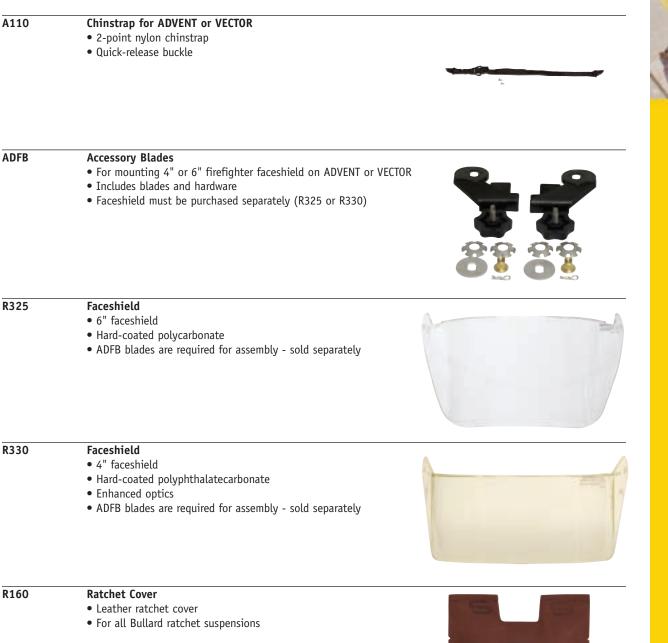
| VT600   | <ul> <li>Suspension for VECTOR</li> <li>4-point self-sizing suspension</li> <li>Sportek™ brow pad (TT3)</li> <li>Three vertical adjustments in front and rear</li> <li>Includes built-in goggle strap retaining slots</li> </ul>      |  |
|---------|---|--|
| VTRT600 | <ul> <li>Suspension for VECTOR</li> <li>4-point Sure-Lock ratchet suspension</li> <li>Sportek brow pad (TT3)</li> <li>Three vertical adjustments in front and rear</li> <li>Includes built-in goggle strap retaining slots</li> </ul> |  |
| VTS     | Foam Liner for Vector<br>• Expanded polystyrene (EPS) foam liner replacement  |  |
| ттз     | Brow Pad<br>• Sportek replacement brow pad  |  |

• For 4-point VT600, VTRT600 suspensions



## **Advanced Head Protection**

### **ADVENT®** and **VECTOR<sup>™</sup>** Replacement Parts



For additional accessories, see the Classic/Standard Series section on pages 15-25. For Bullard bracket and visor offerings, see the Face Protection section on pages 41-47.



## **Advanced Head Protection**

Customization for ADVENT<sup>®</sup> and VECTOR<sup>m</sup>

OR145 3" (7.6 cm) Star of Life decal



0R308

7" x 4" (17.8 cm x 10.2 cm) Crescent, Emergency Medical Technician



OR309

7" x 4" (17.8 cm x 10.2 cm) Crescent, Safety Officer



OR310

7" x 4" (17.8 cm x 10.2 cm) Crescent, Paramedic



For additional customization options, please see to the Decoration section on pages 26-33.

## **Classic Series Hard Hats and Caps**

# Bullard Classic Series hard hats and caps continue to be the most comfortable hard hat in the industry.

#### Comfort

Featuring a wider profile than most hard hats, Classic caps and hats offer increased protection from rain, snow, dust and harmful ultraviolet (UV) rays. The six-point suspension, standard in all Classic Series products, has 1" (2.54 cm) wide nylon straps, providing increased balance and comfort. The full-profile shell also enhances ventilation.

Select either the RS6PC self-sizing suspension or the RS6RC Flex-Gear<sup>®</sup> non-slip ratchet suspension. Both suspensions feature an exclusive replaceable, cotton brow pad for superior absorbency and comfort. Snap-on replacement brow pads are available in cotton, vinyl and Polartec<sup>®</sup> cooling materials. Vertical adjustments can be made in the front and rear (without removing the suspension) for a truly customized fit.

#### Versatility

With a variety of shell styles and material offerings, each Classic Series hard cap and hat offers unique benefits to the wearer. Cap style models come equipped with accessory slots for mounting a variety of attachments including faceshields, welding helmets, earmuffs and headsets. Full-brim models offer additional sun and glare protection and enhanced ventilation. Choose from polyethylene or high-heat material options.

Brow pads on all Classic Series hard hats are replaceable. Replacement brow pads can easily be snapped on in place of or over the original pad. This feature, combined with the choice of vinyl, cotton or a special cooling material, ensures the right comfort level and protection for the wearer.

#### Meets OSHA and ANSI Requirements

Models C30, C33, 911C and 911H conform to all OSHA and ANSI Z89.1-2003, Type I, Class E & G requirements, including impact, penetration and electrical.

#### Decoration

No other manufacturer offers more decorating flexibility and capability than Bullard. Bullard uses state-of-the-art technology to imprint your company logo or safety slogan in up to six colors in virtually any lateral position on the shell. No other manufacturer offers a decoration program that is as easy, fast and reliable.

Worker visibility can be increased with Scotchlite<sup>®</sup> reflective stripes or small reflective strips in a multitude of colors. Bullard offers a variety of shell colors and can match other colors for companies requiring specific shades.





## **Classic Series Hard Hats and Caps**

| C30  | Cap<br>• High-density polyethylene shell<br>• Full profile, wide brim<br>• Accessory slots for attachments<br>• 6-point self-sizing suspension with large, absorbent cotton brow pad (RS6PC)<br>• Replacement brow pads available (RBPCOTTON, RBPVINYL, RBPCOOL)<br>• Meets or exceeds ANSI Z89.1-2003, Type I, Class E & G requirements<br>• Case quantity: 20; minimum order: 20 |
|------|--|
| C3OR | Cap<br>Same as C30 model above with<br>• 6-point Flex-Gear® ratchet suspension with large, absorbent cotton brow pad (RS6RC)<br>• Replacement brow pads available (RBPCOTTON, RBPVINYL, RBPCOOL)<br>• Case quantity: 20; minimum order: 20   |
| C33  | Hat<br>• High-density polyethylene shell<br>• Full profile, full brim<br>• 6-point self-sizing suspension with large, absorbent cotton brow pad (RS6PC)<br>• Replacement brow pads available (RBPCOTTON, RBPVINYL, RBPCOOL)<br>• Meets or exceeds ANSI Z89.1-2003, Type I, Class E & G requirements<br>• Case quantity: 10; minimum order: 20                                      |
| C33R | Hat<br>Same as Model C33 above with<br>• 6-point Flex-Gear ratchet suspension with large, absorbent cotton brow pad (RS6RC)<br>• Replacement brow pads available (RBPCOTTON, RBPVINYL, RBPCOOL)<br>• Case quantity: 10; minimum order 20   |

For additional customization options and shell color chart, see the Decoration section on pages 26-32. For Bullard faceshield bracket and visor offerings, see the Face Protection section on pages 41-47. For Bullard earmuff offerings, see the Hearing Protection section on pages 37-40.

## **Classic Series High Heat Hard Hats and Caps**

To meet the demands of high heat environments, Bullard produces hats and caps in technologically advanced thermoplastic materials. Constructed from the same materials as our rugged firefighter helmets, Bullard's Model 911C and 911H are ideal for utilities, welding, foundries and steel mills. Select either the ESULTRA self-sizing suspension or the ESRTSL Sure-Lock<sup>®</sup> non-slip ratchet suspension. Both suspensions feature 1" (2.54 cm) wide nylon straps and an exclusive Sportek<sup>™</sup> terrycloth-like removable brow pad for superior absorbency and comfort. Vertical adjustment hanger keys on the front and rear positions of the headband form the basis for a truly customized fit. Hard hats and caps can be printed with company logos or safety slogans in up to six colors in virtually any lateral position on the shell. Worker visibility can be increased with Scotchlite<sup>®</sup> reflective stripes or small reflective strips in a variety of colors and a broad range of reflectivity.

Models 911C and 911H Helmets meet or exceed ANSI Z89.1-2003, Type I, Class E & G requirements.



• Sportek brow pad (TT2)

• Case quantity: 10; minimum order: 10

Refer to the Decoration section on pages 26-32 for additional customization options and shell color chart. Refer to the Face Protection section on pages 41-47 for Bullard faceshield bracket and visor offerings. Refer to the Hearing Protection section on pages 37-40 for Bullard earmuff offerings.

911HR

## "The Standard" Series

### The Standard...setting the standard for comfort, style and versatility.

The Standard by Bullard takes style and comfort to a new level. A low-profile shell, along with the Bullard three-rib design and patented suspension system, provide maximum comfort with a look workers prefer.

#### Comfort

The Standard Series of hats is available with two nylon suspension options: self-sizing or ratchet. Both suspension styles have large, pillowed, replaceable brow pads. Models S61, S62 and S71 come standard with a cotton brow pad. Model S51 comes standard with a poly brow pad.

The Bullard patented Flex-Gear<sup>®</sup> ratchet suspension is designed with built-in flex points that allow the ratchet housing to conform to the back of the worker's head, ensuring a snug, comfortable fit. The nape cushion adds to the comfort and overall fit of the suspension.

Easy to adjust vertical height settings, two front and two rear, provide a customized fit which will increase wear time and worker compliance. All vertical height adjustment settings ensure that the hard hat remains centered on the head.

The Standard is also offered in a vented design (Model S62). The vented model offers increased air circulation, resulting in optimal worker comfort.

The Standard Series also includes a full-brim style (S71) for additional protection from exposure to sun and rain.

#### Style

The low-profile shell design of the Standard cap combines a perfect fit with a look that workers prefer. The sleek, trim shell profile is the most stylish in the industry.

Hard hat colors can be used to identify different job functions, trades or departments within an organization. With this in mind, Bullard has chosen 16 of the most popular shell colors for its standard color offering. Many custom and special colors are also available upon request. Contact Bullard's Customer Service department for details.

#### Versatility

The Standard Series hard hats come equipped with accessory slots for mounting a variety of attachments including faceshields, welding helmets, earmuffs and headsets.

Brow pads on all Standard Series hard hats are replaceable. Replacement brow pads can easily be snapped on in place of or over the original pad. This feature, combined with the choice of vinyl, cotton or a special cooling material, ensures the right comfort level and protection for the wearer.

#### **Meets OSHA and ANSI Requirements**

Bullard models S51, S61 and S71 conform to all OSHA and ANSI Z89.1-2003, Type I, Class E & G requirements, including impact, penetration and electrical insulation. Bullard Model S62 (vented) conforms to all OSHA and ANSI Z89.1-2003, Type I, Class C requirements, including impact and penetration.

#### Decoration

Bullard uses state-of-the-art technology to imprint your company's logo or safety slogan. Whether the design is one color or six, it can be reproduced accurately, quickly and inexpensively. Your company's logo can be printed in up to eight locations around the hard hat. Reflective or non-reflective stripes can also be applied to increase worker visibility. No other manufacturer offers a decoration program that is as easy, fast or reliable.

## The Standard Series Hard Hats and Caps

| 551 | Сар   |   |
|-----|---|---|
|     | <ul> <li>High-density, polyethylene shell with flat front, low-profile design</li> </ul>  | S51R  |
|     | Accessory slots for attachments   |   |
|     | Rain trough brim  |   |
|     | • 4-point self-sizing suspension with poly brow pad (RS4PP)   |   |
|     | Replacement brow pads available (RBPCOTTON, RBPVINYL, RBPCOOL)  |   |
|     | • Meets or exceeds ANSI Z89.1-2003, Type I, Class E & G   | Constant of the local division of the local |
|     | and CSA z94.1-2005, Type 1, Class E & G requirements<br>• Case quantity: 20; minimum order: 20                                      | TT I  |
|     | • Case quantity: 20; minimum order: 20  | -   |
| 51R | Сар   |   |
|     | Same as S51 model above with  |   |
|     | <ul> <li>4-point Flex-Gear<sup>®</sup> ratchet suspension with poly brow pad (RS4RP)</li> </ul>                                     |   |
|     | Replacement brow pads available (RBPCOTTON, RBPVINYL, RBPCOOL)  |   |
|     | • Case quantity: 20; minimum order: 20  |   |
| 51  | Cap   | 61R   |
|     | <ul> <li>High-density, polyethylene shell with rounded front, low-profile design</li> </ul>   |   |
|     | Accessory slots for attachments   |   |
|     | • 4-point self-sizing suspension with large, absorbent cotton brow pad (RS4PC)  | and the second second   |
|     | Replacement brow pads available (RBPCOTTON, RBPVINYL, RBPCOOL)  | and the second se   |
|     | Meets or exceeds ANSI Z89.1-2003, Type I, Class E & G requirements  | and the second second   |
|     | • Case quantity: 20; minimum order: 20  |   |
| 51R | Сар   |   |
|     | Same as Model S61 above with  |   |
|     | • 4-point Flex-Gear ratchet suspension with large, absorbent cotton brow pad (RS4RC)  |   |
|     | <ul> <li>Replacement brow pads available (RBPCOTTON, RBPVINYL, RBPCOOL)</li> </ul>  |   |
|     | • Case quantity: 20; minimum order: 20  |   |
| 62  | (an   |   |
| 02  | Cap <ul> <li>Vented shell</li> </ul>  | S62R  |
|     | High-density, polyethylene shell with rounded front, low-profile design   |   |
|     | Accessory slots for attachments   |   |
|     | • 4-point self-sizing suspension with large, absorbent cotton brow pad (RS4PC)  |   |
|     | Replacement brow pads available (RBPCOTTON, RBPVINYL, RBPCOOL)  |   |
|     | Meets or exceeds ANSI Z89.1-2003, Type I, Class C requirements  |   |
|     | • Case quantity: 20; minimum order: 20  |   |
|     |   |   |
| 52R | Сар   |   |
|     | Same as Model S62 above with  |   |
|     | • 4-point Flex-Gear ratchet suspension with large, absorbent cotton brow pad (RS4RC)  |   |
|     | <ul> <li>Replacement brow pads available (RBPCOTTON, RBPVINYL, RBPCOOL)</li> <li>Gasa supertities 20, minimum orders 20,</li> </ul> |   |
|     | • Case quantity: 20; minimum order: 20  |   |
| 1   | Hat   | S71R  |
|     | <ul> <li>High-density, polyethylene shell with a full, brim, low-profile design</li> </ul>  | 57 IN   |
|     | • 4-point self-sizing suspension with large, absorbent cotton brow pad (RS4PC)  |   |
|     | Replacement brow pads available (RBPCOTTON, RBPVINYL, RBPCOOL)  |   |
|     | Meets or exceeds ANSI Z89.1-2003, Type I, Class E & G requirements  |   |
|     | • Case quantity: 10; minimum order: 20  |   |
| 71R | Hat   |   |
|     | Same as Model S71 above with  | -   |
|     | • 4-point Flex-Gear ratchet suspension  |   |
|     | with large, absorbent cotton brow pad (RS4RC)   |   |
|     | • Replacement brow pads available (RBPCOTTON, RBPVINYL, RBPCOOL)  |   |
|     | • Case quantity: 10; minimum order: 20  |   |
|     |   |   |
|     | onal customization options and shell color chart, see the Decoration section on pages   |   |
|     | d faceshield bracket and visor offerings, see the Face Protection section on pages 4  |   |

For Bullard earmuff offerings, see the Hearing Protection section on pages 37-40.

Head

**Protection** 

### **Classic Series Replacement Parts and Accessories**

#### **Replacement Suspensions for Models C30 and C33**

#### RS6PC 6-pt. Suspension

- 6-point self-sizing suspension
- Large, absorbent cotton brow pad
- Replacement brow pads available (RBPCOTTON, RBPVINYL, RBPCOOL)
- Vertical height adjustments (two front, three rear)
- For Models C30 and C33



#### RS6RC 6-pt. Suspension

- 6-point Flex-Gear<sup>®</sup> ratchet suspension
- Large, absorbent cotton brow pad
- Replacement brow pads available (RBPCOTTON, RBPVINYL, RBPCOOL)
- Flex-points and nape cushion
- Large, easy-to-turn ratchet knob
- Vertical height adjustments (two front, three rear)
- For Models C30 and C33



| Replacement | Suspensions for Models 3000, 303, 911C and 911H |
|-------------|---|
| ECHI TD A   |   |

#### ESULTRA 6-pt. Suspension

#### • 6-point self-sizing suspension

- Replaceable Sportek<sup>™</sup> brow pad (TT1)
- Four vertical adjustment positions in front
- Five vertical adjustment positions in rear
- Includes goggle strap retaining slots
- Quadrapost sizing
- For Models 911C and 911H



#### 6-pt. Suspension

- 6-point Sure-Lock<sup>®</sup> ratchet suspension
- Replaceable Sportek brow pad (TT2)
- Two vertical adjustment positions in front and rear
- Includes goggle strap retaining slots
- For Models 911C and 911H



Please Note: Models 3000 and 303 were replaced by Models C30 and C33 in December 2006.

### Standard Series Replacement Parts and Accessories

#### Replacement Suspensions for Models S51, S61, S62 and S71

#### RS4PC 4-pt. Suspension

- 4-point self-sizing suspension
- Large cotton brow pad
- Replacement brow pads available (RBPCOTTON, RBPVINYL, RBPCOOL)
- Vertical height adjustments (two front, two rear)
- For Models S51, S61, S62 and S71

#### RS4RC

#### 4-pt. Suspension

- 4-point Flex-Gear<sup>®</sup> ratchet suspension
- Large cotton brow pad
- Replacement brow pads available (RBPCOTTON, RBPVINYL, RBPCOOL)
- Flex-points and nape cushion
- Large, easy-to-turn ratchet knob
- For Models: S51, S61, S62 and S71



RS4RP

#### 4-pt. Suspension

- 4-point self-sizing suspension
- Large poly brow pad
- Replacement brow pads available (RBPCOTTON, RBPVINYL, RBPCOOL)
- Vertical height adjustments (two front, two rear)
- For Models S51, S61, S62 and S71



#### 4-pt. Suspension

- 4-point Flex-Gear ratchet suspension
- Large poly brow pad
- Replacement brow pads available (RBPCOTTON, RBPVINYL, RBPCOOL)
- Flex-points and nape cushion
- Large, easy-to-turn ratchet knob
- For Models S51, S61, S62 and S71





Head Protection

## **Classic and Standard Series Replacement Parts and Accessories**

| RBPCOTTON | <ul> <li>Brow Pad</li> <li>Large, absorbent cotton replacement brow pad</li> <li>Fits all Bullard suspensions</li> </ul>   |            |
|-----------|--|------------|
| RBPVINYL  | <ul> <li>Brow Pad</li> <li>Vinyl replacement brow pad</li> <li>Snap on - fits all Bullard suspensions</li> </ul>   |            |
| RBPCOOL   | <ul> <li>Brow Pad</li> <li>Polartec<sup>®</sup> replacement brow pad</li> <li>Wicking material moves sweat away from the worker's brow</li> <li>Fits all Bullard suspensions</li> </ul>  |            |
| Π1        | <ul> <li>Sportek<sup>™</sup> Replacement Brow Pad</li> <li>For 6-point ESULTRA self-sizing suspension</li> </ul>   |            |
| Π2        | Sportek <sup>™</sup> Replacement Brow Pad<br>• For 6-point ESRTSL ratchet suspension   |            |
| R160      | <ul> <li>Ratchet Cover</li> <li>Leather ratchet cover</li> <li>Fits all Bullard ratchet suspensions</li> </ul>   |            |
| ES42      | <ul> <li>Chinstrap</li> <li>Elastic chinstrap</li> <li>For Models C30, C33, 911C, 911H, S51, S61, S62, S71, 3000, 302RT, 303 and MK2V</li> </ul>   |            |
| R50       | <ul> <li>Chinstrap</li> <li>Nomex<sup>®</sup> chinstrap with postman's slide fastener</li> <li>For Models C30, C33, 911C, 911H, S51, S61, S62, S71, 3000, 302RT, 303 and MK2V</li> </ul> |            |
| GC100     | Goggle Clips<br>• Self-adhesive<br>• Set of three  | 10 (f) (f) |
| 30013     | Slot Plugs<br>• Flexible plugs for hard hat accessory slots<br>• Set of two<br>• For Models C30, S51, S61, S62, 3000 and 302RT   |            |

### **Classic and Standard Series Hot Weather and UV Accessories**

Bullard offers hard hat wearers a variety of inexpensive accessories that help block the sun's dangerous ultraviolet rays, keep workers cool and enhance their productivity on the job. While Bullard's hard hats and caps shade the worker's head from direct sunlight, these accessories provide added protection from the discomforts associated with overexposure to the sun.

| CSS        | <ul> <li>Sunshade</li> <li>100% cotton sunshade</li> <li>For all helmets, hard hats and caps</li> <li>Protects neck from sun exposure and UV radiation</li> <li>Attaches with three Velcro<sup>®</sup> strips that are provided</li> </ul> |  |
|------------|--|--|
| SS5        | <ul> <li>Sun Shield</li> <li>"See through" front for overhead visibility</li> <li>Extends hat brim 360 degrees to protect face, neck and ears from sun exposure</li> <li>Fits Models C30, 911C, S51, S61, S62 and 3000</li> </ul>          |  |
| <u>556</u> | <b>Sun Shield</b><br>Same as Model SS5 above<br>• Fits Models C33, S71, 911H and 3000  |  |
| UBG        | <ul> <li>Underbrim Anti-Glare Decal</li> <li>Reduces glare</li> <li>For all helmets, hard hats and caps</li> </ul>   |  |

For Bullard faceshield bracket and visor offerings, see the Face Protection section on pages 41-47. For Bullard earmuff offerings, see the Hearing Protection section on pages 37-40. For additional personal cooling options, see the Isotherm<sup>®</sup> section on pages 48-49.

### **Reflective Striping for Classic and Standard Series Hats and Caps**

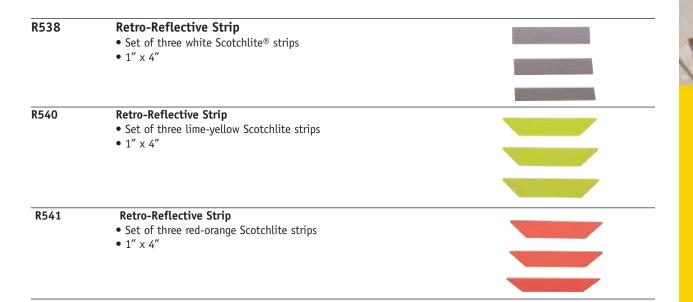
Single color reflective Scotchlite<sup>®</sup> brand stripes are available for improved visibility and work group identification. Bullard offers striping in two locations - around the brim and between the ribs (two stripes) of the hat.

Standard stripe colors for ST1R, ST2R and STRSS are white (silver), red, orange, yellow, green and blue. To receive stripe pricing and delivery for multi-colored stripes or special requirements, please contact Bullard Customer Service. An application fee will apply (per hat) if Bullard applies the striping.

#### **Striping Options for Classic Series**

| ST1R        | Reflective Stripe (available colors listed above)  |  |
|-------------|--|--|
|             | • Reflective single-color stripe for application around brim of cap/hat • 1 $^{1}\!/_{16}\!''$ wide x 23" long   |  |
| ST1R500     | <ul><li>Highly Reflective Strip</li><li>500 CPL silver stripe for application around brim of cap/hat</li></ul>   |  |
|             | • 1 <sup>1</sup> / <sub>16</sub> " wide x 23" long   |  |
| ST1RORG175  | <ul> <li>Fluorescent Reflective Stripe</li> <li>175 CPL orange stripe for application around brim of cap/hat</li> <li>1 <sup>1</sup>/<sub>16</sub>" wide x 23" long</li> </ul>                                 |  |
| ST2R        | <ul> <li>Single-color Stripes (available colors listed above)</li> <li>Reflective single-color stripe for application between ribs of cap/hat</li> <li>1 <sup>3</sup>/<sub>4</sub>" wide x 17" long</li> </ul> |  |
| Striping Op | otions for Standard Series   |  |
| STRSS       | <ul> <li>Reflective Stripe (available colors listed above)</li> <li>Reflective single-color stripe for application around brim of cap/hat</li> <li>1" wide x 21 <sup>1</sup>/<sub>2</sub>" long</li> </ul>     |  |
| STRSS500    | <ul> <li>Highly Reflective Strip</li> <li>500 CPL silver stripe for application around brim of cap/hat</li> <li>1" wide x 21 1/2" long</li> </ul>  |  |
| STRSSORG175 | <ul> <li>Fluorescent Reflective Stripe</li> <li>175 CPL orange stripe for application around brim of cap/hat</li> <li>1" wide x 21 <sup>1</sup>/<sub>2</sub>" long</li> </ul>                                  |  |

### **Reflective Strips for Classic and Standard Series Hats and Caps**



#### **Candle Power of Reflective Stripes**

| Bullard Model<br>Number | Stripe<br>Daytime Color | Stripe<br>Reflected Color | Typical<br>Brightness<br>(Candle Power) |
|-------------------------|-------------------------|---------------------------|---|
| STRSS/ST1R/ST2RWHT      | White                   | White                     | 100                                     |
| STRSS/ST1R/ST2RRED      | Red                     | Red                       | 20                                      |
| STRSS/ST1R/ST2RORG      | Orange                  | Orange                    | 25                                      |
| STRSS/ST1R/ST2RYLW      | Yellow                  | Yellow                    | 60                                      |
| STRSS/ST1R/ST2RGRN      | Green                   | Green                     | 15                                      |
| STRSS/ST1R/ST2RBLU      | Blue                    | Blue                      | 10                                      |
| ST1R500                 | Silver                  | White                     | 500                                     |
| STRSS500                | Silver                  | White                     | 500                                     |
| ST1RORG175              | Fluorescent Red-Orange  | White                     | 175                                     |
| STRSSORG175             | Fluorescent Red-Orange  | White                     | 175                                     |
| R538                    | Silver                  | White                     | 500                                     |
| R540                    | Fluorescent Lime-Yellow | White                     | 175                                     |
| R541                    | Fluorescent Red-Orange  | White                     | 175                                     |

For additional customization options and a hard hat shell color chart, refer to the Decoration section on pages 26-32.

### Put your hard hat to work for you!

The hard hat is one of the most recognized pieces of safety equipment on any work site. Take advantage of this opportunity to advertise company products or services, improve worker visibility and identify worker differentiation. Whether you supply camera-ready artwork or your logo on a business card or letterhead, Bullard will create a hard hat that comes alive to promote your organization's unique identity.

Custom decoration has never been easier. With Bullard's quick and easy decoration program there are no artwork charges, no set-up charges, and proofs are provided free of charge for every new logo. There is only a 20 piece minimum, and our delivery is the quickest in the industry. Submit your artwork today and use your hard hat to its fullest potential!

Pad printed logos are permanent and will not peel, crack or fade like a decal or sticker. Bullard uses the latest technology available to print clear, crisp logos in up to six different colors per logo - up to eight different locations around the cap - on any Bullard helmet, hat or cap. We also offer a variety of Scotchlite<sup>®</sup> striping options in various colors and reflectivity. Stripes can be applied around the brim or between the ribs of the hat. Decorative stripe colors are available to accent your custom logo, or use fluorescent and highly reflective stripes to improve worker visibility.



## Hard Hat Shell Color Selection Chart

| STANDARD<br>COLORS | Abbrev. | PMS<br>Color | ADVENT       | VECTOR       | \$51,<br>\$61, \$62<br>\$71 | 911C,<br>911H | C30,<br>C33, MK2V |
|--------------------|---------|--------------|--------------|--------------|-----------------------------|---------------|-------------------|
| White              | WH      | n/a          | ~            | $\checkmark$ | ~                           | $\checkmark$  | √                 |
| Yellow             | YL      | 109C         | $\checkmark$ | $\checkmark$ | $\checkmark$                | $\checkmark$  | $\checkmark$      |
| Fire Engine Red    | RD      | 186C         | $\checkmark$ | $\checkmark$ | ✓                           | $\checkmark$  | ✓                 |
| Kentucky Blue      | KB      | 301U         | $\checkmark$ | $\checkmark$ | $\checkmark$                | $\checkmark$  | $\checkmark$      |
| Orange             | OR      | 173C         | ✓            | $\checkmark$ | $\checkmark$                | $\checkmark$  | √                 |
| Forest Green       | FG      | 3425C        |              | $\checkmark$ | $\checkmark$                |               | $\checkmark$      |
| Chocolate Brown    | СВ      | 469          |              |              | ~                           |               | ✓                 |
| Dove Gray          | DG      | 424C         |              |              | $\checkmark$                |               | $\checkmark$      |
| Tan                | TN      | 729C         |              |              | ✓                           |               | ✓                 |
| Hi-Viz Orange      | HO      | 811C         |              | $\checkmark$ | $\checkmark$                |               | $\checkmark$      |
| Hi-Viz Yellow      | HY      | <b>387</b> C |              | $\checkmark$ | ✓                           |               | ✓                 |
| Hi-Viz Green       | XX      | 361C         |              |              | $\checkmark$                |               | $\checkmark$      |
| Kelly Green        | KG      | 348C         |              |              | ✓                           |               | ✓                 |
| Pacific Blue       | PB      | 300C         |              |              | $\checkmark$                |               | $\checkmark$      |
| Light Pink         | LP      | 1895C        |              |              | ✓                           |               | ~                 |
| Gull Gray          | GG      | 428C         |              |              | *                           |               | *                 |
| Sky Blue           | SK      | 2985C        |              |              | *                           |               | *                 |
| Slate Blue         | SL      | 549C         |              |              | *                           |               | *                 |
| Navy               | NB      | 2757C        |              | $\checkmark$ | *                           |               | *                 |
| Black              | BK      | n/a          |              |              | $\checkmark$                |               | $\checkmark$      |



Head Protection

 $\checkmark$  - Cap/hat available in this color at a standard four business day lead time.

 $\star$  - Cap/hat available in this color at an extended 10 business day lead time.

**Special colors available:** 500 piece minimum. Call the Bullard Customer Service Department for pricing and lead time. Must furnish PMS number or color match sample.

### **Brilliant Headgear!**

#### **High-Visibility Colors:**

The Bullard line of long-lasting, hi-visibility fluorescent shell colors make workers more visible than ever. In choosing a color it is important to consider the work surroundings. Available in hi-viz orange, green and yellow, you can select the most appropriate contrasting color for the job site to ensure that workers get noticed. These true fluorescent colors are visible under a black light and provide the greatest visible color impact.



### Logo Size Chart (by hat model)

| Hat/Cap Model                                   | Dimensions     | Maximum Size       |                    |                    |  |
|---|----------------|--------------------|--------------------|--------------------|--|
|   |                | Front              | Side               | Back               |  |
| Advent <sup>®</sup> A1, A2, Vector <sup>™</sup> | Width (length) | 3"                 | 4"                 | 3"                 |  |
|   | Height         | 3"                 | 1 ³/4"             | 3"                 |  |
| C30, C33,                                       | Width (length) | 2 <sup>3</sup> /4" | 4"                 | 2 <sup>3</sup> /4" |  |
| 911C, 911H                                      | Height         | 2 1/2"             | 1 ³/4"             | 2 1/2"             |  |
| S61, S62  | Width (length) | 2 <sup>1</sup> /4" | 3 <sup>1</sup> /4" | 2"                 |  |
|   | Height         | 2"                 | 1 <sup>1</sup> /2" | 2"                 |  |
| S71   | Width (length) | 2"                 | 3 <sup>3</sup> /4" | 2 <sup>3</sup> /4" |  |
|   | Height         | 2"                 | 1 ³/4"             | 1 3/4"             |  |
| S51   | Width (length) | 2 1/8"             | 4"                 | 2 <sup>3</sup> /4" |  |
|   | Height         | 2 3/4"             | 1 ³/4"             | 2 1/2"             |  |
| MK2V  | Width (length) | 3"                 | N/A                | N/A                |  |
|   | Height         | 2"                 | N/A                | N/A                |  |

Models S61, S62 and S71 have a low profile with more curvature, which may require that some logos be printed smaller than listed above. Bullard will print all logos to maximum size allowed based on the logo design and shape. Bullard must receive artwork before exact logo size can be determined.

Note: The size may vary on square or rectangular logos.

The location of the logo must be specified on the Bullard decoration order form. Artwork is reduced or enlarged proportionately to the maximum width or height to achieve the optimal logo size, unless a specific, smaller size is requested. Lines under 1/32" should be avoided.



### **Quick and Easy Program**

The Bullard decoration program is the best in the industry. It has never been easier to customize your hard hat or cap! Here's why:

#### Minimums

Only 20 piece minimum order required for custom logo work on all Bullard hats and caps. Twenty pieces must be made up of same cap or hat model and color.

#### Pricing

No hidden charges! No set-up charges! No artwork charges!

#### Delivery

We will ship your custom hard hat order in four business days or less. Note that decorated hat orders are not entered into the Bullard sales order system until final approval on artwork is received. Our proofing system helps to ensure accurate logo work and customer satisfaction.

#### Logo Colors

Our advanced pad print technology allows us to print crisp, clear logos in up to six colors.

#### **Printing Locations**

The most common locations for printing logos are the front, back and/or sides of the cap. Have another location you want printed? Contact our Customer Service Department for more details on our capabilities.

#### A Variety of Cap and Hat Models

Decorate any Bullard model you choose! See the logo size chart for on the opposite page for the imprint area size of each model.

#### Mixing Cap Colors or Models on an Order

- Colors: A minimum order of 20 pieces is required per cap/hat color. Colors can be mixed (with minimums of 20 per color) to meet a larger logo price break, providing that the logo and configuration remain the same.
- Models: Cap and hat models cannot be mixed to meet a logo price break.

#### Logo Archiving

Bullard will archive logos for up to 24 months. If a logo has not been used within two years, we request that new artwork be submitted.

#### Submitting New Artwork

All new artwork must be submitted with a completed Decoration Order Form (see next page). Make copies of this page for future orders, or visit our website at www.bullard.com to download a copy anytime you need it.

To ensure that the logo is reproduced to your expectations, provide the following information on the Order Form: hat style and color, position(s) of the logo(s) on the hat, PMS color or a sample for matching of all the colors in the logo and any special instructions for printing. Omission of any of this information will result in additional time required to return a proof to you. Electronic, camera-ready artwork is preferred. Electronic, camera-ready art is defined as a digital file of the logo that has been prepared for printing letterhead, t-shirts, or used in an advertisement or brochure. Artwork may be submitted via e-mail to **bullardart@bullard.com** or supplied on a compact disc and mailed to Bullard, 1898 Safety Way, Cynthiana, KY 41031, Attn: Customer Service.

# Electronic submission of a camera-ready file will result in the quickest turnaround of your proof.

#### Acceptable & Preferred File Types: Camera-Ready Artwork

Deliver superior customized hard hats to your customers...with stunning logos advertising their companies! Bullard offers quick three-day turnaround times for cameraready artwork proofs. Please submit electronic vector files to Bullard Art at bullardart@bullard.com. Providing cameraready artwork will give you the sharpest logos with the fastest lead times. Camera-ready files are high-resolution (300 dpi) Mac-based files with the following extensions:

• **.EPS** • **.FH** • **.AI** • **.PDF** (Please Note: PDF files are considered camera-ready only when saved in editable text and graphics format.)

#### Tips for getting camera-ready artwork:

1. Ask your customer for **vector or line art** or the original art used to print business cards, signs, letterhead, etc.

2. Ask for art that can been **converted to points and paths**, and includes any embedded files.

3. Remember, in most cases, neither you nor your customer may be able to open the file. That's usually the file we need.

#### Non Camera-Ready Artwork

We want to reproduce your customer's logo in the highest quality possible. However, if you cannot obtain camera-ready artwork, we can re-create a logo for you from the following files. Please Note: The file types listed below will require a longer lead time of five days for proofs:

• .TIFF • .JPEG • .PDF

You may still mail hard copy samples of the artwork, such as letterhead, business cards or camera-ready art on high quality paper (not inkjet or laser print outs). However, these samples should be clear, simple one-color designs or multi-color designs if the colors do not touch. A higher quality sample will produce the best reproduction.

Proofs can be returned to you via e-mail, UPS or FedEx, or in the case of a black and white proof, via fax. The proof will provide information on the final printed size of the logo, hat style, imprint colors and position on the hat.

Note that ink color may vary slightly when printed on different hard hat colors. We do not recommend printing light colors on dark color hats. The hat color may show through the ink and result in a less than desirable reproduction of the logo.

A sample "capability" cap with our logo capabilities can be ordered at no charge to the customer.

Reordering is a breeze! Bullard assigns "pad print" numbers that are unique to every logo we produce. Your new pad print logo number will be sent to you in the form of an order acknowledgement. Simply refer to these pad print numbers and the logo description on future orders to ensure that the correct logo is retrieved.



| It's your life and you're worth it™  | PECORATIO  | N ORDER   | FORM  |
|--|--|---|---|
| Distributor:   | Contact:   |   | PO#:  |
| .ogo:  | F  | <b>F</b> / \  |   |
|  | HAT INFOR  |   |   |
|  | _ Color:   |   | tchet 🗌 Standard  |
|  | LOGO INFO  | ·   |   |
|  | LOGO AND TEXT ON EACH L  |   |   |
| Front  | Back   | Left  | Right   |
| (000)  | (000)  |   |   |
| Colors   | Colors   |   |   |
|  |  |   |   |
|  |  |   |   |
|  |  |   |   |
|  |  |   |   |
|  |  |   |   |
|  |  |   |   |
|  | REFLECTIVE   |   |   |
| ST1R (around brim)   | Colors:  |   | for pricing and minimums)   |
| ST2R (between ribs)  | Location:  |   |   |
|  | BULLARD  |   |   |
| Part No.   |  |   | 50#   |
| I  |  |   |   |
| Prod. Desc.  |  |   |   |
|  | Qty.   | Bullard Contact:  |   |
| Ship Date  | Qty.   | Bullard Contact:  |   |
| Ship Date  | -  |   | :   |
| Ship Date  | Color:   | Location  | :   |
| Ship Date And Print #:<br>Pad Print #:<br>Pad Print #:<br>Pad Print #:   | Color:   | Location:<br>Location:  | :   |
| Ship Date Pad Print #:  | Color:<br>Color:<br>Color:   | Location:<br>Location:<br>Location:   | :   |
| Ship Date Ship D | Color:<br>Color:<br>Color:<br>Color:<br>Color:   | Location:<br>Location:<br>Location:<br>Location:  | :   |
| Ship Date Ship D | Color:<br>Color:<br>Color:<br>Color:<br>Color:<br>Color:                               | Location:<br>Location:<br>Location:<br>Location:<br>Location:                           | :<br>:<br>:<br>:  |
| Prod. Desc.  | Color:<br>Color:<br>Color:<br>Color:<br>Color:<br>Color:<br>Color:                     | Location:<br>Location:<br>Location:<br>Location:<br>Location:<br>Location:              | :<br>:<br>:<br>:<br>:   |
| Ship Date Ship D | Color:<br>Color:<br>Color:<br>Color:<br>Color:<br>Color:<br>Color:<br>Color:<br>Color: | Location:<br>Location:<br>Location:<br>Location:<br>Location:<br>Location:<br>Location: | :         :           :         :           :         :           :         :           :         :           :         : |

### Bulard BULLARD USE ONLY Bullard Sales Order No.: It's your life and you're worth it Ship To #: \_\_\_\_\_ FIRST BASE BUMP CAP Logo No.: \_\_\_\_\_ **CUSTOM EMBROIDERY ORDER FORM** Logo Desc.: \_\_\_\_\_ CONTACT INFORMATION Account: Customer P.O. #:\_\_\_\_\_ Contact: \_\_\_\_\_ Phone: \_\_\_\_\_ Address: \_\_\_\_\_ Fax: \_\_\_\_\_ Date Submitted: HAT INFORMATION Cap Style: FB2000 (ventilated) Cap Shell Color: \_\_\_\_\_ FB2001 (non-ventilated) LOGO INFORMATION **ATTENTION! DRAW HOW LOGO** Maximum Logo Size: **AND TYPE ARE TO** Width: 4 1/2" **APPEAR ON CAP.** Height: 2 1/2" Description of front logo (include name of font used in logo if you are not supplying camera-ready artwork): Colors in Logo (Six color maximum, reference Pantone Colors):

#### FAX BACK COMPLETED FORM WITH PURCHASE ORDER TO BULLARD CUSTOMER SERVICE AT (FAX) 800-877-1858

|                     | BULLARD US | ONLY               |  |
|---------------------|------------|--------------------|--|
| Add Part No.        |            | Product Type Qty   |  |
|                     |            |                    |  |
| I.S. Rep:           | Ext:       | Date Issued:       |  |
| Customer Bill-To #: | C          | ustomer Ship-To #: |  |

## **Decoration for Hard Hats and Caps**

0

Head Protection

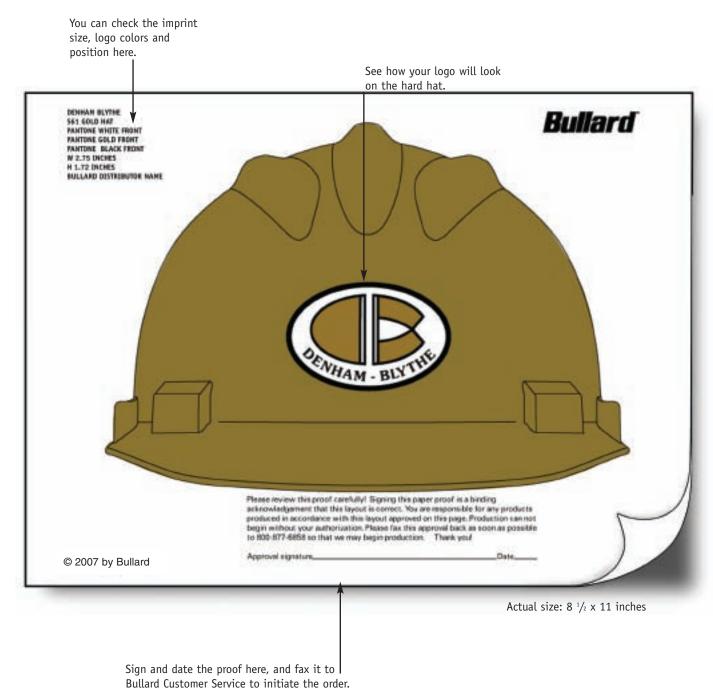
### **Stock Logos**

If you don't have your own artwork to use on your decorated Bullard hard hat, you might find something in our selection of stock logos. Just indicate the number on your deco order form and tell us where to imprint the art.



### Proofing your decorated hard hat

You'll always receive a paper proof of your deco hard hat before we print them. Whether you receive it via e-mail, fax or mail, we'll wait for your signed approval before we print the first hat.





Head Protection

## **Bump Caps**

Designed for industries such as meat and food processing, utility meter reading, pest control, fruit harvesting and auto repair, models MK2V and First Base<sup>™</sup> offer a variety of user options. Bullard bump caps provide limited protection against minor bumps and abrasions, but are not designed for applications requiring ANSI approved head protection.

#### MK2V

Made from high-density polyethylene, the MK2V is ventilated, lightweight and durable. An adjustable inner suspension accommodates different head sizes. This cap can be used with a faceshield bracket (GL5) and visor when face protection is required.

The MK2V can be decorated with company logos or safety slogans in up to six colors on the front of the cap.

#### **First Base**

The First Base bump cap combines comfort and protection for the wearer in the style of a baseball cap. It has a lightweight design and benefits in strength and protection from a molded ABS inner liner. An inner foam pad is also included to provide all-day user comfort. The simple one-size-fits-all adjustment ensures a superior fit for all workers.

Model FB2000 comes standard with eight large eyelet holes for superior ventilation. A non-vented model (FB2001) is also available. Monogramming is available for a fully customized look.



## **Bump Caps**

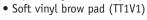
### MK2V

- MK2V Bump Cap
  - Ventilated plastic shell
  - 4-point adjustable suspension system (MKHB)
  - Soft vinyl brow pad
  - Faceshield bracket available (GL5)
  - Case quantity: 25



### **MK2V Replacement Parts**

- МКНВ
- 4-point Suspension
- 4-point adjustable suspension





GL5

#### Dielectric Bracket

- Front mounting nylon bracket
- For MK2V bump cap only

Ы

For additional customization options and shell color chart, see the Decoration section on pages 26-33. For Bullard faceshield bracket and visor offerings, see the Face Protection section on pages 41-47.

## **Bump Caps**

### First Base

FB2000

Ventilated Cap • Eight large, sewn eyelet holes • ABS liner • Foam pad

FB2001

Non-ventilated cap • ABS liner • Foam pad



Available in 10 colors: Navy Blue, Royal Blue, Dark Green, Red, Yellow, White, Hi-Viz Orange, Khaki, Grey and Black.



### **First Base Replacement Parts**

FBFOAM Foam Pad for First Base Bump Cap



#### **Custom Embroidery Available**

- 24 piece minimum on custom embroidered caps
- Logos of up to six colors (up to 8,000 stitch count) can be embroidered on front of cap
- Embroidered sample provided for approval
- One time digitization fee on initial order contact Customer Service for details

See the Embroidery Order Form on page 31.

## Hearing Protection from Bullard

Hearing protection is effective only when the correct product is used and workers wear it all of the time. When choosing hearing protectors, the noise levels, as well as the amount of time spent in the environment, must be taken into consideration. Failure to choose the correct level of protection or failure to wear the protector 100% of the time can result in irreversible damage to the user's hearing.

Designed to compliment Bullard head protection products, both SafeCom and NRZone muffs guarantee quality fit and performance. Bullard hearing protection is available in both cap mount and neckband muff styles. Accessories and replacement parts are also available.

### SafeCom®

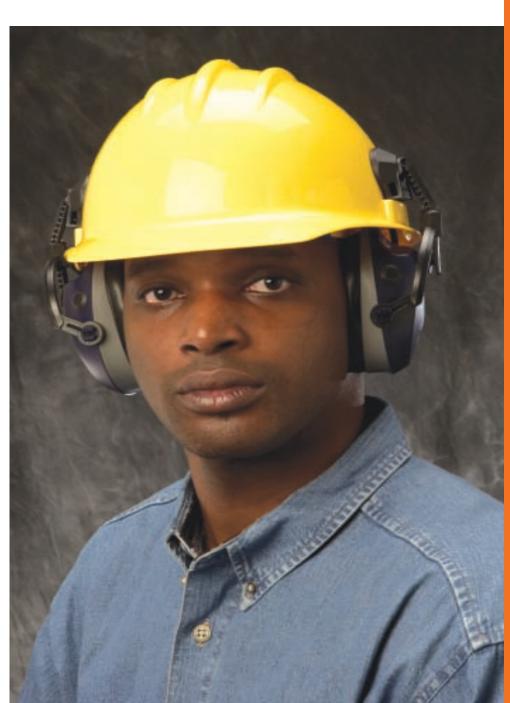
Electronic hearing protection including models COM23 and COM25B, allows wearers to hear surrounding sounds and communicate with those around them without removing the earmuff. The low/high tone control allows for alteration of the sound for optimum clarity.

The most important considerations when choosing hearing protection are noise reduction and worker wear time. With Bullard's SafeCom electronic protectors, 100% wear time can be assured with a level of protection to meet the requirements of the environment. With SafeCom, wearers are able to hear surrounding sounds such as conversations and important warning signals, and communicate with those around them, without removing the ear muff. The built-in electronic protection system (EPS) prevents noise levels beyond 82 dB(A) from going through the speaker. Built in speakers allow lower level sounds to enter the muff with a maximum amplification of 12dB(A). The low/high tone control allows for alteration of the sound for optimum clarity.

#### NRZone®

Passive hearing protection, including Models ZON22, ZON25 and ZON26B, is for use in various noise work environments. NRZone offers a high level of comfort and performance. Available in both cap mount and neckband styles, Bullard's NRZone muffs ensure that the wearer will be fully protected.

All Bullard hearing protection models are totally dielectric and meet or exceed ANSI S3.19-1974 requirements.





P

a

P

0

3

Order Now: 877-BULLARD www.bullard.com

## SafeCom®

| COM23 | Сар | Mount | Hearing | Muff |
|-------|-----|-------|---------|------|

- NRR 23
- Meets or exceeds ANSI S3.19-1974
- CSA Class B
- Hard hat not included



COM25B

- Neckband Hearing Muff • NRR 25
- Meets or exceeds ANSI S3.19-1974
- CSA Class A



### **NR Zone**

#### **ZON22** Cap Mount Hearing Muff • NRR 22 • Meets or exceeds ANSI S3.19-1974 • CSA Class B • Hard hat not included

| ZON25 | Cap Mount Hearing Muff                               |
|-------|--|
|       | • NRR 25   |
|       | <ul> <li>Meets or exceeds ANSI S3.19-1974</li> </ul> |
|       | <ul> <li>CSA Class A</li> </ul>                      |
|       | <ul> <li>Hard hat not included</li> </ul>            |

Hard hat not included





ZON26B Neckband Hearing Muff • NRR 26 • Meets or exceeds ANSI S3.19-1974 • CSA Class A



## SafeCom® Replacement Parts and Accessories



P

### **NRZone®** Replacement Parts and Accessories

НКР

- **Hygiene Kit**Includes two replacement ear cushions and two inner foam
- For use with passive NRZone units



### SafeCom and NRZone Replacement Parts and Accessories

DEP

Disposable Earpads100 pair/per box



НМСС

#### Hearing Muff Carrying Case

- For use with ZON26B or COM25B hearing protectors
- Muffs not included



## Headgear, Brackets and Visors

### Sentinel<sup>™</sup> Series Headgear

For the ultimate value in lightweight, comfortable face protection, Bullard Sentinel Series headgear is the obvious choice. All Sentinel Series headgear include two sizing features for enhanced comfort. The ratchet adjusts the headband to sizes 6 <sup>1</sup>/<sub>2</sub>" to 8", and it will not slip from the selected size. The crown strap conforms to the shape of the head. The brow pad, made of Sportek<sup>™</sup> and offered exclusively by Bullard, pulls moisture away from the skin, creating a drier, more comfortable fit. Brow pads are hand washable and replaceable. Sentinel easily accommodates both primary eye protection and half-facepiece style respirators.

### Hard Hat Mounted Face Protection

When the job calls for both head and face protection, choose from our complete line of nylon or gold anodized aluminum brackets. Brackets are available in several mounting styles that attach securely to Bullard hard hats and caps.

Dielectric brackets are formed from lightweight, durable nylon and are ideal for general duty applications. Bullard Gold Line<sup>®</sup> brackets are constructed from rugged, gold anodized aluminum. They are highly resistant to corrosion and heat, and are ideal for chemical handling and high-heat industrial applications.

#### Visors

Bullard visors conform to ANSI Z87.1-2003 standard for eye and face protection when used in combination with Bullard headgear or faceshield.



### Sentinel Headgear

#### SENTINEL1 Faceshield Headgear

- Faceshield sold separately
- Standard headgear with black ABS crown protector
- Sure-Lock<sup>®</sup> ratchet sizing with Sportek<sup>™</sup> brow pad (TT3)
- For use with Bullard faceshields, EXCEPT 840MX2 and 840PX2
- Meets or exceeds ANSI Z87.1-2003



#### SENTINEL2 Faceshield Headgear

- Faceshield sold separately (840MX2 or 840PX2 only)
- Standard headgear with black ABS crown and chin protector combination
- Sure-Lock ratchet sizing with Sportek<sup>™</sup> brow pad (TT3)
- Meets or exceeds ANSI Z87.1-2003



CP1

#### Chin Protector

- Black ABS replacement chin protector
- For use with Sentinel 2



CP2

#### Chin Protector

- Clear polycarbonate replacement chin protector
- For use with Sentinel 2



For Bullard visor offerings, see the Face Protection section on pages 45-47.

### **Nylon Brackets**



For Bullard visor offerings, see the Face Protection section on pages 45-47.

### **Aluminum Brackets**

100G Gold Line<sup>®</sup> Bracket • Front mounting aluminum bracket • For cap style Models C30, S51, S61, S62 and 911C 110G Gold Line Bracket • Back mounting aluminum bracket • For cap style Models C30, 302RT, 911C, FH911C and S51 112G **Gold Line Bracket** • Front mounting aluminum bracket • For full-brim hat Models C33, 911H, FH911H and S71 500M **Gold Line Bracket** • Front mounting aluminum bracket with blades for accessory slot attachment • For cap style Models C30 and 302RT GL5 Dielectric Bracket • Front mounting nylon bracket • For MK2V bump cap only

### **Faceshield Visors**

### **Flat Acetate Visors** 1040 Visor • 10" x 15" x .040" • Clear flat acetate visor for all Bullard brackets • Meets ANSI Z87.1-2003 Basic Impact Testing Requirements 640 Visor • 6" x 15" x .040" • Clear flat acetate visor for all Bullard brackets • Meets ANSI Z87.1-2003 Basic Impact Testing Requirements 640G Visor • 6" x 15" x .040" • Dark green flat acetate visor for all Bullard brackets • 14± 4 percent visible light transmittance Meets ANSI Z87.1-2003 Basic Impact Testing Requirements 840M Visor • 8" x 15" x .040" • Clear flat acetate visor for all Bullard brackets • Meets ANSI Z87.1-2003 Basic Impact Testing Requirements 840MG Visor • 8" x 15" x .040" • Dark green flat acetate visor for all Bullard brackets • 14± 4 percent visible light transmittance • Meets ANSI Z87.1-2003 Basic Impact Testing Requirements 840MX2 Visor • 7" x 15" x .040" • Clear flat acetate visor for use with Sentinel 2 headgear • Meets ANSI Z87.1-2003 Basic Impact Testing Requirements



- Visor
  - 9" x 19 3/4" x .040"
  - Clear flat acetate visor for all Bullard brackets
  - Specially designed for chemical splash applications
  - Meets ANSI Z87.1-2003 Basic Impact Testing Requirements



Face Protection

### **Faceshield Visors**

#### **Heat-Formed Acetate Visors** Visor

#### 840MH

- 8" x 15" x .040"
- Clear heat-formed acetate visor for all Bullard brackets
- Meets ANSI Z87.1-2003 Basic Impact Testing Requirements

860H

#### Visor

• 8" x 15" x .060"

Heat-Formed Polycarbonate Visors

• 6" x 15" x .080"

Visor

- Clear heat-formed acetate visor for all Bullard brackets
- Meets ANSI Z87.1-2003 High Impact Testing Requirements

#### 840P

680P

#### Visor • 7" x 15" x .040"

· Clear heat-formed polycarbonate visor for all Bullard brackets

· Clear heat-formed polycarbonate visor for all Bullard brackets • Meets ANSI Z87.1-2003 High Impact Testing Requirements

• Meets ANSI Z87.1-2003 High Impact Testing Requirements

#### 840PX2

#### Visor • 7" x 15" x .040"

- Clear heat-formed polycarbonate visor
- For use with Sentinel 2 headgear
- Meets ANSI Z87.1-2003 High Impact Testing Requirements

- Visor • 8" x 15" x .060"
- Clear heat-formed polycarbonate visor for all Bullard brackets
- Meets ANSI Z87.1-2003 High Impact Testing Requirements







### **Faceshield Visors**

### **Heat-Formed Polycarbonate Visors**

#### 880P

• 8" x 15" x .080"

Visor

- Clear heat-formed polycarbonate visor for all Bullard brackets
- Meets ANSI Z87.1-2003 High Impact Testing Requirements



#### WS60PM

- Visor • 9" x 19 3/4" x .060"
- Clear polycarbonate visor NOT heat-formed • Meets ANSI Z87.1-2003 High Impact Testing Requirements

### **Mesh Screen Visor**

#### 8S24

• 8" x 15" x 24 mesh

Visor

- Mesh black steel screen with aluminum band visor fits all Bullard brackets
- Meets ANSI Z87.1-2003 Basic Impact Testing Requirements



#### Flat Polyester Visor

#### 840ME

• 8" x 15" x .040"

Visor

- Clear flat polyester visor for all Bullard brackets
- Meets ANSI Z87.1-2003 Basic Impact Testing Requirements



b



## **ISOTHERM®** Cool Vest

### The future of body temperature management.

### **ISOTHERM Cool Vest**

Bullard revolutionary ISOTHERM technology offers unparalleled cooling power. Unlike ice or gel packs that steadily lose their effectiveness, Bullard ISOTHERM Cool Vests will remain at a CONSTANT 55° F for hours of cooling. ISOTHERM can help reduce the chance of heat-related illnesses that sometimes occur in today's difficult work environments. ISOTHERM is lightweight, quickly recharged and does not leave condensation. It uses a simple, interchangeable, front/back cool pack system that provides continuous cooling to the worker's upper body. The vests are easily adjustable for maximum comfort and flexibility.

The ISOTHERM 2 provides cooling for approximately 2<sup>1</sup>/<sub>2</sub> hours. The period of cooling depends solely on work activity and environmental conditions. Vest material is flame retardant. Fits medium to extra-large sizes. Weight: 6.5 lbs. (2.9kg)

#### **ISOTHERM Replacement Packs**

No waiting. No down time. Keep extra cool packs ready for instant on-site changes. Made of specially engineered plastic, ISOTHERM packs are designed to expand up to 400% without damage. The cooling agent within the pack is a safe, non-toxic and non-carcinogenic formulation. Cool packs may be re-energized thousands of times providing hours of safe, controlled body temperature management. Placed in a cooler of ice water, the cool packs will fully recharge in approximately 20 minutes. However, ice water is not necessary as the phase change technology actually begins recharging the packs whenever they are placed in an environment that is cooler than 55° F.



## **ISOTHERM Cool Vest**

#### ISO2HY

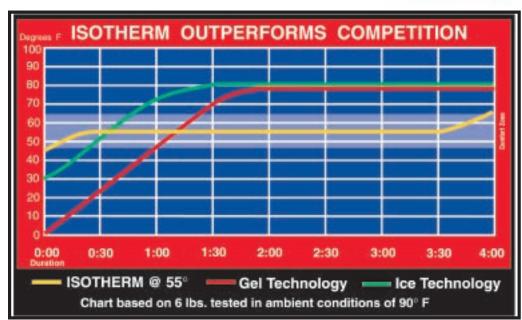
#### Isotherm 2 Hi-Viz Yellow • Large cooling vest, fits medium to large sizes

- Includes vest and one set of packs
- Hi-viz yellow, flame retardant fabric
- ISO2HYXL Isotherm 2 Hi-Viz Yellow Extra-Large
  - Extra-large cooling vest, fits exra-large sizes
  - Includes vest and one set of packs
  - Hi-viz yellow, flame retardant fabric



## **ISOTHERM Cool Vest**

| IS02   | <ul> <li>Isotherm 2</li> <li>Large cooling vest, fits medium to large sizes</li> <li>Includes vest and one set of packs</li> <li>Dark blue, flame retardant fabric</li> </ul>             |  |
|--------|---|--|
| ISO2XL | <ul> <li>Isotherm 2 Extra-Large</li> <li>Extra-large cooling vest, fits exra-large sizes</li> <li>Includes vest and one set of packs</li> <li>Dark blue flame retardant fabric</li> </ul> |  |
| ISO2P  | Replacement Packs <ul> <li>For ISO2, large vest</li> <li>One set of two packs (front and back)</li> </ul>   |  |
| ISO2V  | Replacement Vest<br>• ISO2, large vest<br>• Includes vest only<br>• Dark blue, flame retardant fabric   |  |



Constant Temperature Phase-Change Technology Outperforms Ice and Gel Packs by Hours

## The Turtle Club

### Founded 1946

#### The Turtle Club: For People Who Do Things Right!

Most news is made when things go wrong, but shouldn't employees get recognition for doing things right? That's the reason the Turtle Club was founded. This organization is dedicated to saving lives and preventing injuries by promoting the acceptance and use of hard hats. Industrial accidents can happen anytime, anywhere, so wearing required head protection can reduce the risk of serious injury. The Turtle Club honors men and women who escaped injury because they were wearing hard hats at the time of industrial accidents.

#### A Different Kind of Safety Incentive

Safety professionals are always looking for new ways to promote safety both on and off the job. While incentives and awards programs are excellent, most focus on accident prevention. The Turtle Club is a participatory program for workers that have proven to be a valuable adjunct to traditional industry head protection safety efforts.

#### Over 50 Years and Still Going Strong

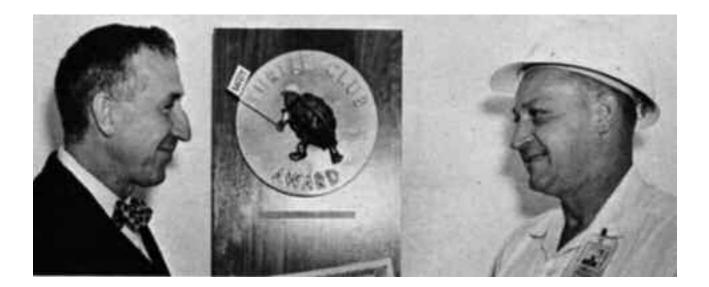
The Turtle Club was founded in 1946 by C. R. "Rusty" Rustemeyer, Safety Director at Canadian Forest Products, Ltd. In 1950, Mr. Edward W. Bullard, Sr., was then appointed the Turtle Club sponsor. This appointment was particularly appropriate since, in 1919, Mr. Bullard developed the industry's first universally accepted hard hat, the original "Hard Boiled" hat. Today the club's international sponsor is Mr. E. D. "Jed" Bullard, grandson of E. W. Bullard. Because of Jed Bullard's commitment and efforts, interest in the club remains active, and membership continues to grow.

#### **A Tradition Continues**

Membership requirements for The Turtle Club are the same today as they were in 1946. Men and women who have escaped serious injury by wearing hard hats can be nominated for membership by their supervisor or company safety director. Each new member receives a new hard hat, membership certificate, membership card, Turtle Club pin and Turtle Club decal. There are no dues or membership fees.

#### A Dedication to Safety

Members of the club pledge to "Practice safety, wear head protection when necessary and to conscientiously encourage others to do so." This pledge, though more than 50 years old, is just as important today as it was five decades ago.



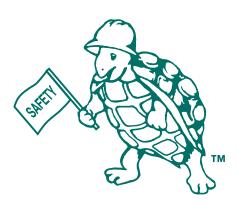
## The Turtle Club

### For People Who Do Things Right!

Below is the testimonial Bullard received from Mr. Rick Hamilton:



Rick Hamilton (left) shown receiving the Bullard Turtle Club Award from Craig Lindsay (right) with Pacesetter Sales (Bullard's Canadian Sales Representative Group). In addition to the Turtle Club hat, Rick also received a membership certificate, membership card, Turtle Club pin and Turtle Club decal.



"Hi there. My name is Rick Hamilton, I am writing in regards to your hard hat. I am a West Coast regards to your hard hat. I am a West Coast Faller and I live and work on Vancouver Islands Faller and I live and work on Vancouver Islands Faller and I live and work on Vancouver Islands Faller and I live and work on Vancouver Islands British Columbies Canada. I was wearing a Bullard Hard hat while I was working on Bullard Hard hat while I was work the read of the right Unear frecture through the roof of the right inear frecture through the heat. I would have been about it. Without the hest. I would have been about it. Without the hest I would have been killed. I just wanted to thare my story and killed. Just wanted to thare my story and Killed. The for your superior hard hats: The heat for your superior hard hats. Bullar Hard hat we for your superior hard hats.





## **Respiratory Protection**

#### **Respirator Types**

Bullard manufactures a variety of NIOSH approved respirators, including Supplied Air Respirators (SAR), Powered Air Purifying Respirators (PAPR) and Combination Supplied Air Self-Contained Breathing Apparatus (SAR/SCBA).

#### **Key Respiratory Terms**

**<u>APF</u>** - The workplace level of respiratory protection that a respirator or class of respirators is expected to provide to employees when the employer implements a continuing, effective respiratory protection program.

**IDLH** – Immediately Dangerous to Life and Health means an atmosphere that poses an immediate threat to life, would cause irreversible adverse health effects or would impair an individual's ability to escape from a dangerous atmosphere.

<u>MUC</u>: - Maximum use concentration (MUC) means the maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected when wearing a respirator, and is determined by the assigned protection factor of the respirator or class or respirators and the exposure limit of the hazardous substance. MUC = APF x PEL or IDLH concentration (whichever is lower).

NIOSH – National Institute for Occupational Safety & Health (www.cdc.gov/niosh) is a research organization that approves respirators.

**<u>OSHA</u>** – Occupational Health & Safety Administration (www.osha.gov) is an enforcement agency that ensures workplaces are following the standards detailed in 29CFR1910.134 and other standards.

#### Agencies

There are numerous agencies that are involved in one or more of the following: testing & approving respirators, establishing standards and enforcing standards. These agencies include: American National Standards Institute (ANSI), Compressed Gas Association (CGA), National Institute of Occupational Health (NIOSH), Mine Safety Health Administration (MSHA) and Occupational Safety & Health Administration (OSHA). NIOSH, under the jurisdiction of the U.S. Department of Public Health and the Center for Disease Control (CDC), is the primary agency for testing and approving respirators. OSHA, under the U.S. Department of Labor, is the primary agency for enforcing respiratory protection standards.

#### Standards

Breathing Air – The primary standard for breathing air is Grade D, as set by the Compressed Gas Association (www.cganet.com):

| •Oxygen 19.5% - 23.5% | •Hydrocarbons or condensed oil 5 mg/m3 max |
|-----------------------|--|
|                       |  |

- •Carbon Monoxide (CO) 10 ppm max
- •Carbon Dioxide (CO2) 1,000 ppm max
- •No noticeable tastes or smells •No toxic contaminants at levels that make the air unsafe to breathe

**Respirator System Approval** - All Bullard respirators are approved by NIOSH (www.cdc.gov/niosh) in accordance with Title 42 Code of Federal Regulations Part 84. These approvals are assigned only to complete systems; components may not be altered or mixed between manufacturers without voiding NIOSH approval.

**<u>Respirator Protection Programs</u>** - In any workplace where respirators are necessary to protect the health of the employee or whenever respirators are required by the employer, the employer shall establish and implement a written respiratory protection program. These requirements are detailed in the OSHA (www.osha.gov) respiratory protection standard Title 29 Code of Federal Regulations Part 1910.134</u>

and includes procedures for: selecting respirators; medical evaluations; fit testing; proper use; cleaning, storing and maintaining; ensuring proper air quality; training and evaluating effectiveness.

#### **Respirator Selection**

According to OSHA, it is the responsibility of the employer to evaluate workplace hazards (if any) and implement appropriate controls to protect the worker. When engineering and/or administrative controls aren't technically or financially feasible, PPE may be used to protect the worker. When respiratory PPE is needed, the following steps may be helpful as you select a respirator:

- 1. Analyze the hazard
- 2. Assess physical characteristics of work area
- 3. Assess the demands of the work
- Evaluate respirator capabilities and limitations
- 5. Select an air source
- 6. Select a head top

| Product<br>Application<br>Matrix | 88VX | Lancer | CC20 | PA20 | PA30 | PA40 | GR50 | PC90 | Spectrum | FAMB | <b>Climate Control</b> | 41 Series | Free-Air Pumps |
|----------------------------------|------|--------|------|------|------|------|------|------|----------|------|------------------------|-----------|----------------|
| Abrasive Blasting                | Х    | X      |      |      |      |      |      |      |          |      | X                      | Х         | X              |
| Painting                         |      |        | X    |      | Х    | Х    |      |      | Х        | Х    | X                      | Х         | Х              |
| Chemicals                        |      |        | X    |      | Х    | Х    |      | Х    | Х        |      | X                      | Х         | Х              |
| Pharmaceuticals                  |      |        | Х    | Х    | Х    | Х    |      | Х    | Х        | Х    | Х                      | Х         | Х              |
| Healthcare                       |      |        | Х    | Х    | Х    |      |      |      |          |      | X                      |           | Х              |
| Industrial                       |      |        | Х    | Х    | Х    | Х    | Х    |      | Х        | Х    | Х                      | Х         | Х              |
| Potent Compounds                 |      |        | Х    |      | Х    | Х    |      | Х    | Х        |      | Х                      |           |                |
| Grinding/Welding                 |      |        |      |      |      |      | Х    |      |          | Х    | Х                      | Х         | Х              |
| Confined Space                   |      |        |      |      |      |      |      |      | Х        |      |                        |           |                |
| Domestic Preparedness            |      |        | Х    | Х    | Х    | Х    |      |      | Х        |      | Х                      |           | Х              |

## **Respiratory Protection**

#### **Protection Factors & Protection Factor Research**

Assigned Protection Factors (APFs) provide employers with key information about a respirator's expected ability to reduce the level of hazardous particles, gases and vapors present in the work environment that reach the worker's breathing zone. Proper respirator selection is based on the respirator's APF number, the concentration of the hazard and fit testing. These are components of an OSHA-compliant respiratory protection program. The OSHA recognized APFs for different types of respirators are found in the table below:

|        |            | 이 집에서 가장에서 가장하는 것이다. |           |
|--------|------------|----------------------|-----------|
| TABLE  | 1ASSIGNED  | PROTECTION           | EACTORS5  |
| I MELE | L-ROOIDHED | IL RUTEUTION         | I HUIDHUN |

| Type of respirator 1.2   | Quarter<br>mask | Half mask | Full tace-<br>piece | Helmal/<br>hood | Loosa-fitting<br>facepiece |
|--|-----------------|-----------|---------------------|-----------------|----------------------------|
| 1. Air-Punitying Resourator  | 5               | ≥10       | 50                  |                 | Community and              |
| 2. Powered Air-Puntying Respirator (PAPR)  |                 | 50        | 1,000               | *25/1,000       | 25                         |
| Demand mode  |                 | 10        | 50                  |                 |                            |
| Continuous flow mode   |                 | 50        | 1,000               | *25/1,000       | 25                         |
| Pressure-demand or other positive-pressure mode  |                 | 50        | 1,000               |                 |                            |
| Demand mode  |                 | 10        | 50                  | 50              |                            |
| <ul> <li>Pressure-demand or other positive-pressure mode (e.g., open/<br/>closed circuit)</li> </ul> |                 |           | 10.000              | 10,000          |                            |

Notes:

<sup>1</sup>Employers may select respirators assigned for use in higher workplace concentrations of a hazardous substance for use at lower concentrations of that substance, or when required respirator use is independent of concentration. <sup>4</sup> The assigned protection factors in Table 1 are only effective when the employer implements a continuing, effective respirator program as re-

<sup>4</sup>The assigned protection factors in Table 1 are only effective when the employer implements a continuing, effective respirator program as required by this section (29 CFR 1910.134), including training, fit testing, maintenance, and use requirements. <sup>4</sup>This APF category includes filtering faceplaces, and half masks with elastomeric faceplaces.

\*The employer must have evidence provided by the respirator manufacturer that testing of these respirators demonstrates performance at a level of protection of 1,000 or greater to receive an APF of 1,000. This level of performance can best be demonstrated by performing a WPF or SWPF study or equivalent testing. Absent such testing, all other PAPRs and SARs with helmets/hoods are to be treated as loose-fitting face-piece respirators, and receive an APF of 25.

\*These APFs do not apply to respirators used solely for escape. For escape respirators used in association with specific substances covered by 29 CFR 1910 subpart Z, employers must refer to the appropriate substance-specific standards in that subpart. Escape respiratom for other IDLH atmospheres are specified by 29 CFR 1910.134 (d)(2)(ii).

Employers select respirators by comparing the exposure level found in the workplace and the maximum concentration of the contaminant in which a particular type of respirator can be used (the Maximum Use Concentration or MUC). Employers generally determine the MUC by multiplying the respirator's Assigned Protection Factor (APF) by the contaminant's exposure limit (PEL). If the workplace level of the contaminant is expected to exceed the respirator's MUC, the employer must choose a respirator with a higher APF. This can be determined with the following equation: PEL X APF = MUC. The numbers listed on this chart are the numbers that OSHA enforces to the best of our knowledge. For this reason, be sure to consult regulatory standards and/or your local OSHA representative. The Assigned Protection Factors herein do not constitute a recommendation by Bullard for the use of any respirator herein for any hazard.

Footnote 4 in essence states that in order to use an APF of 1000, the respirator manufacturer shall provide evidence to the employer that the respirator demonstrates performance at a level of protection equal to or greater than 1000. Bullard has long been a leader in protection factor research. See pages 57 and 97 for the hood/helmet type respirators that have proven APFs of 1000 and the study that validates it.



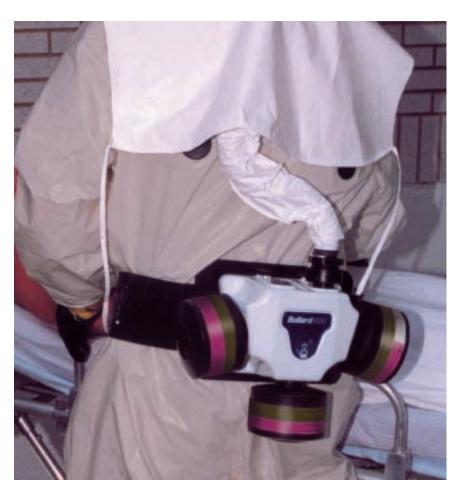
Consult product literature and instruction manuals for information on the proper function, use and maintenance of these respirators. Before using a Bullard respirator, Federal Law requires the employer to identify and evaluate the respiratory hazard(s) in the workplace including a reasonable estimate of employee exposure to respiratory hazard(s) and an identification of the contaminant's chemical state and physical form. Do not exceed maximum use concentrations established by OSHA, EPA, NIOSH, ACGIH or other regulatory standards.

In accordance with Title 42 Code of Federal Regulations Part 84 and 29 CFR 1910.134, respirator repairs or adjustments shall be made using only Bullard NIOSH approved parts designed for the respirator. Use of any other parts on these respirators VOIDS NIOSH APPROVAL. Failure to follow these instructions could result in death or serious injury.









## Powered Air Purifying Respirators (PAPRs)

Powered Air Purifying Respirators (PAPRs) use a battery-powered fan to draw in ambient air through filter cartridges. The purified air is then delivered to the user's hood, helmet or facepiece via a breathing tube. A flow indicator is provided to check that there is an adequate volume of air available to the wearer prior to use. There are many different PAPR configurations available to best meet the needs of your working environment.

### Applications

Bullard PAPR systems are versatile enough to be used in a wide variety of industries including:

- Pharmaceutical Manufacturing
- •Healthcare
- Powder Coating
- Nuclear
- •Chemical Processing
- Utilities

#### **Superior Protection**

Bullard has been a leader in personal protective equipment since 1898 and in respiratory protection for more than 70 years. This experience has helped Bullard design and manufacture innovative PAPRs that deliver up to 33 percent more than the NIOSH requirement and have been recognized by OSHA with Assigned Protection Factors (APFs) of up to 1000. Bullard PAPRs can be configured with filter cartridges for particulate hazards (HEPA), organic vapor, acid gas and particulate combinations, as well as nuclear, biological and chemical hazards (NBC). Bullard PAPRs are available with "in-the-ear" low voltage alarms and/or intrinsically safe certification.

### **Superior Comfort**

Bullard PAPRs are designed for maximum comfort while providing superior protection and value. In general, PAPRs are more comfortable than negative pressure air purifying respirators (APRs) due to the cooling effect of the air flow and the freedom of working without an airline tether. However, Bullard PAPRs take comfort to the next level with some of the most compact, lightweight and ergonomically balanced units available today. Bullard loose-fitting hoods further enhance worker comfort by accommodating facial hair and eyewear with some of the largest viewing lenses in the industry.

#### **Superior Value**

Bullard PAPRs complete the trifecta of superior protection, comfort and value with features that give the lowest total cost of ownership. First of all, the 10-hour run time allows the wearer to complete an entire shift without stopping for a battery changeout. Next, NiMH battery technology with available gang charging options eliminates the concerns of battery management and "memory" issues with NiCad technology. Furthermore, the Tychem® hoods used with Bullard PAPRs are also compatible with Bullard Supplied Air Respiratory Systems (SAR), allowing inventory to be consolidated and reduced to a single hood type if necessary. These hoods do not require fit testing, thus eliminating costly equipment, testing administration and record keeping. Finally, Bullard PAPRs have been designed with careful consideration for fast and easy decontamination. In summary, Bullard has engineered superior value into each component of the PAPR system.

### **Bullard Product Assigned Protection Factors**

|               | Bullard Product  | Respirator Type   | NIOSH TC #                       | APF   | 3rd Party Validation |  |
|---------------|--|---|----------------------------------|-------|----------------------|--|
| Γ             | PA20 with 20LFL/20LFM  | Powered Air Purifying Respirator (PAPR) with Loose-Fitting<br>Facepiece | 21C-0765                         | 25    | OSHA Standard 2006   |  |
| espirators    | PA30 with CC20 Series*   | Powered Air Purifying Respirator (PAPR) with Loose-Fitting Hood         | 21C-0773<br>23C-2236<br>23C-2237 | 1,000 | RDECOM Study 2003    |  |
| Purifying Re: | PA30 with RT Series  | Powered Air Purifying Respirator (PAPR) with Loose-Fitting Hood         | 21C-0773<br>23C-2236<br>23C-2237 | 1,000 | RDECOM Study 2004    |  |
| Powered Air F | PA30IS with CC20 Series*   | Powered Air Purifying Respirator (PAPR) with Loose-Fitting Hood         | 21C-0796<br>23C-2306<br>23C-2307 | 1,000 | RDECOM Study 2006    |  |
| Pov           | PA30IS with RT Series  | Powered Air Purifying Respirator (PAPR) with Loose-Fitting Hood         | 21C-0796<br>23C-2306<br>23C-2307 |       | RDECOM Study 2006    |  |
|               | For more information or a copy of one of the studies, please contact Bullard at 877-BULLARD. |   |                                  |       |                      |  |

\* Inner bib models.



Р 0

≶

P

-

P

a

τ

-

ー

<

бu

Resp

r a

0

S

## **PAPR Selection Chart**





No Alarm







•PA1 - 8-10 to hour Battery and Low Voltage Alarm

•PA2 - 6-hour Battery, •PA3 •PA3IS - Intrinsically Safe

•PA4



•PA1SB - Nylon Standard Belt, Comfort Pad





•20TJN - Tychem QC Single Bib Hood •20TPN - With Solvent-Resistant Lens



•20TICN - Tychem QC Double Bib Hood •20TPCN - With Solvent-Resistant Lens



•20SICN - Tychem SL Double Bib Hood w/Taped Seams •20TICSN - Tychem QC Double Bib Hood w/Taped Seams

•20SICH - Tychem SL Double Bib Hood w/Taped Seams for Hard Hats •20TICH - Tychem QC Double Bib Hood for Hard

Choose Breathing Tube

**Choose Filter Cartridge** 



•20LFM - Loose-Fitting Facepice, Medium •20LFL - Loose-Fitting facepiece, Large



•RT1 - Tychem QC Double Bib Hood with Extra-Large Lens •RT2 - Tychem SL Saranex Coated Double Bib Hood with Extra-Large Lens and Taped Seams



•PASPEC - Full Facepiece, for PA4 0nly

•20RT - Adjustable Ratchet Headband Suspension



•20TG - Adjustable Headband Suspension



Hats

•C30 - 6-point Self-Sizing Suspension, Full Profile •C30R - With 6-point Flex-Gear Ratchet Suspension



Suspension, Low Profile •S51R - With 4-point Flex-Gear Ratchet Suspension



•20NC - Chinstrap, for Hoods



•ES42 - Chinstrap, for Hard Hats



•PA1BT - 26" Breathing Tube Assembly for Hoods

•PA1FG3 - Filter/Gasket

Assembly for PA1/PA2





•PA3HE - High Efficiency Particulate (HEPA) Filter





•PAFLFBTXS - 26" Breathing Tube for Loose-Fitting Facepiece



•PA3NBC - AG/AM/MA/FM/HE

•PA3OVAGHE - Organic Vapor

### Easy to Use, Comfortable, Reliable

The PA20 Series Powered Air-Purifying Respirator (PAPR) offers workers a constant, reliable flow of air for up to 10 hours. Using a high efficiency particulate (HEPA) filter, the PA20 protects the wearer from particulate hazards encountered in a wide variety of job applications. The PA20 is approved by NIOSH for use with a range of Tychem<sup>®</sup> hoods and loose-fitting facepieces.

#### **Superior Protection**

- Advanced HEPA protection
- Up to 33 percent more air than the NIOSH requirement
- 77dba "in-the-ear" audible low voltage alarm

### **Superior Comfort**

- Compact, ergonomically balanced and lightweight
- Cooling effect of air flow reduces heat stress
- Accommodates facial hair
- Accommodates eyewear
- No hose to tether

#### **Superior Value**

- NiMH battery technology
- Up to 10-hour run time
- Hoods compatible with SAR
- No fit testing required when used with a loose-fitting facepiece or hood
- Easy to decon
- Gang chargers available





System: PA1 Blower Unit and 20TIC Hood





### Order Now: 877-BULLARD • www.bullard.com

### **PA20 Systems**

A complete PA20 Series Respirator consists of the following three components:

- 1. Respirator hood or loose-fitting facepiece with suspension
- 2. Breathing tube assembly
- 3. PA1 or PA2 blower assembly

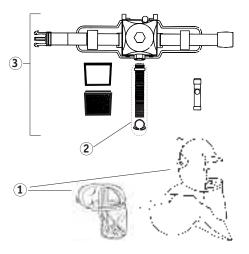
All of these components must be present and properly assembled to constitute a NIOSH approved respirator.

Approval No. TC-21C-0765 for High Efficiency (HE) Particulate Protection

#### PA20 Series Assemblies (HEPA only protection)

|           | LFL Loose-Fitting Facepiece<br>lude blower with internal battery, charger and air flow indicator |
|-----------|--|
| PA20LFLDB | 8 to 10-hour Battery with Decon Belt and Low Voltage Alarm                                       |
| PA20LFLSB | 8 to 10-hour Battery with Standard Comfort Belt and Low Voltage Ala                              |

| PA20LFLDB2 | 6-hour Battery with Decon Belt            |
|------------|---|
| PA20LFLSB2 | 6-hour Battery with Standard Comfort Belt |





#### PAPRs with 20TJ Single Bib Hoods

- Assemblies include blower with internal battery, charger and air flow indicator

| PA2OTJDB<br>PA2OTJSB<br>Alarm | 8 to 10-hour Battery with Decon Belt and Low Voltage Alarm<br>8 to 10-hour Battery with Standard Comfort Belt and Low Voltage |
|-------------------------------|---|
| PA20TJDB2                     | 6-hour Battery with Decon Belt  |
| PA20TJSB2                     | 6-hour Battery with Standard Comfort Belt   |



### PA20 Series Assemblies (HEPA only protection)

#### PAPRs with 20TIC Tychem QC Double Bib Hood Systems - Assemblies include blower with internal battery, charger and air flow indicator

| PA2OTICDB  | 8 to 10-hour Battery with Decon Belt and Low Voltage Alarm            |
|------------|---|
| PA2OTCISB  | 8 to 10-hour Battery with Standard Comfort Belt and Low Voltage Alarm |
| PA2OTICDB2 | 6-hour Battery with Decon Belt  |
| PA2OTICSB2 | 6-hour Battery with Standard Comfort Belt                             |



- Assemblies include blower with internal battery, charger and air flow indicator

PA20TICHDBC30R 8 to 10-hour Battery with Decon Belt, Low Voltage Alarm and C30R Hard Hat Included PA20TICHDBS51R 8 to 10-hour Battery with Decon Belt, Low Voltage Alarm and S51R Hard Hat Included

| PA20TICHSBC30R | 8 to 10-hour Battery with Standard Comfort Belt, Low Voltage Alarm and |
|----------------|--|
|                | C3OR Hard Hat Included   |
| PA20TICHSBS51R | 10-hour Battery with Standard Comfort Belt, Low Voltage Alarm and      |
|                | S51R Hard Hat Included   |

PA2OTICHDB2C3OR 6-hour Battery with Decon Belt and C3OR Hard Hat Included PA2OTICHDB2S51R 6-hour Battery with Decon Belt and S51R Hard Hat Included

PA20TICHSB2C30R 6-hour Battery with Standard Comfort Belt and C30R Hard Hat Included PA20TICHSB2S51R 6-hour Battery with Standard Comfort Belt and S51R Hard Hat Included

PAPRs with 20SIC Saranex Coated Tychem SL Double Bib Hood for Hard Hat Systems

- Assemblies include blower with internal battery, charger and air flow indicator

| PA2OSICDB  | 8 to 10-hour Battery with Decon Belt and Low Voltage Alarm            |
|------------|---|
| PA2OSICSB  | 8 to 10-hour Battery with Standard Comfort Belt and Low Voltage Alarm |
| PA2OSICDB2 | 6-hour Battery with Decon Belt  |
| PA2OSICSB2 | 6-hour Battery with Standard Comfort Belt                             |

PAPRs with 20SICH Tychem QC Double Bib Hood for use with Hard Hat Systems with Taped and Sealed Seams

- Assemblies include blower with internal battery, charger and air flow indicator

PA20SICHDBC30R 8 to 10-hour Battery with Decon Belt, Low Voltage Alarm and C30R Hard Hat Included PA20SICHDBS51R 8 to 10-hour Battery with Decon Belt, Low Voltage Alarm and S51R Hard Hat Included

PA20SICHSBC30R 8 to 10-hour Battery with Standard Comfort Belt, Low Voltage Alarm and C30R Hard Hat Included PA20SICHSBS51R 8 to 10-hour Battery with Standard Comfort Belt, Low Voltage Alarm and S51R Hard Hat Included

PA20SICHDB2C30R 6-hour Battery with Decon Belt and C30R Hard Hat Included PA20SICHDB2S51R 6-hour Battery with Decon Belt and S51R Hard Hat Included

PA20SICHSB2C30R 6-hour Battery with Standard Comfort Belt and C30R Hard Hat Included PA20SICHSB2S51R 6-hour Battery with Standard Comfort Belt and S51R Hard Hat Included



### **PA20 Series Replacement Headpieces**

# 20LFLLoose-Fitting Facepiece, Large20LFMLoose-Fitting Facepiece, Medium

- Loose-Fitting Facepiece, MediumSewn in suspension
- Sewir III sus
  Latex-free
- Quick-attach twist lock connection
- Five per package



| 20SIC  | Tychem SL Double Bib Hood with Taped Seams, Pinlock Suspension |  |
|--------|--|--|
| 20SICR | Tychem SL Double Bib Hood with Taped Seams, Ratchet Suspension |  |
| 20SICN | Tychem SL Double Bib Hood with Taped Seams, No Suspension      |  |
|        | • 19" long outer bib   |  |
|        | • Five per package   |  |



| 20SICH     | Tychem SL Double Bib Hood with Taped Seams, Hard Hat Not Included |
|------------|---|
| 20SICHC30  | Same as 20SICH with C30 Hard Hat Included                         |
| 20SICHC30R | Same as 20SICH with C30R Hard Hat Included                        |
| 20SICHS51  | Same as 20SICH with S51 Hard Hat Included                         |
| 20SICHS51R | Same as 20SICH with S51R Hard Hat Included                        |
|            | <ul> <li>For use with Bullard hard hat</li> </ul>                 |
|            | • O" long outer hib   |

- 9" long outer bib
- Five per package



| 20TIC<br>20TICR | Tychem QC Double Bib Hood With Inner Bib, Pinlock Suspension<br>Tychem QC Double Bib Hood With Inner Bib, Ratchet Suspension |
|-----------------|--|
| 20TICN          | Tychem QC Double Bib Hood With Inner Bib, No Suspension  |
|                 | <ul> <li>9" long outer bib</li> <li>10 per package</li> </ul>  |



## PA20 Series Replacement Headpieces

| 20TICH     | Tychem QC Double Bib Hood, for Use with Bullard Hard Hat (not included) |   |
|------------|---|---|
| 20TICHC30  | Tychem QC Double Bib Hood, with C30 Hard Hat Included                   |   |
| 20TICHC30R | Tychem QC Double Bib Hood, with C30R Hard Hat Included                  |   |
| 20TICHS51  | Tychem QC Double Bib Hood, with S51 Hard Hat Included                   | A STATE OF THE OWNER |
| 20TICHS51R | Tychem QC Double Bib Hood, with S51R Hard Hat Included                  | A CONTRACTOR  |
|            | • 9" long outer bib   | A WELL  |
|            | • Five per package  |   |
| 20TICS     | Tychem QC Double Bib Hood with Taped Seams, Pinlock Suspension          |   |
|            | • 19" long outer bib  |   |
|            | • Five per package  |   |
| 20TICSR    | Tychem QC Double Bib Hood with Taped Seams, Ratchet Suspension          | - California  |
|            | • 19" long outer bib  | the t   |
|            | • Five per package  | -   |
| 20TICSN    | Tychem QC Double Bib Hood with Taped Seams, No Suspension               |   |
|            | • 19" long outer bib  | A   |
|            | • 10 per package  |   |
|            |   |   |

| 20TJ  | Tychem QC Single Bib Hood, Pinlock Suspension |
|-------|---|
| 20TJR | Tychem QC Single Bib Hood, Ratchet Suspension |
| 20TJN | Tychem QC Single Bib Hood, No Suspension      |
|       | • 10 per package                              |



| 20TP  | Tychem QC Single Bib Hood for Painting, Solvent Resistant Lens, Pinlock Suspension | 1             |
|-------|--|---------------|
| 20TPR | Tychem QC Single Bib Hood for Painting, Solvent Resistant Lens, Ratchet Suspension |               |
| 20TPN | Tychem QC Single Bib Hood for Painting, Solvent Resistant Lens, No Suspension      | Provide State |
|       | • 10 per package   | P-STORE -     |



| 20TPC<br>20TPCR<br>20TPCN | Tychem QC Double Bib Hood for Painting, Solvent Resistant Lens, Pinlock Suspension<br>Tychem QC Double Bib Hood for Painting, Solvent Resistant Lens, Ratchet Suspension<br>Tychem QC Double Bib Hood for Painting, Solvent Resistant Lens, No Suspension |   |
|---------------------------|---|---|
|                           | • 10 per package  | F |



## PA20 Series Headpiece Replacement Parts

| 20RT      | <b>Adjustable Ratchet Headband Suspension</b><br>• Sportek <sup>™</sup> brow pad  |   |
|-----------|---|---|
| 20TG      | <b>Adjustable Headband Suspension</b><br>• Sportek <sup>™</sup> brow pad  |   |
| Π3        | <b>Sportek™ Brow Pad</b><br>• Sportek™ replacement brow pad for 20TG and 20RT suspension  | s |
| RBPCOTTON | <ul> <li>Brow Pad</li> <li>Large, absorbent cotton replacement brow pad</li> <li>Fits all Bullard suspensions</li> </ul>  |   |
| RBPVINYL  | <ul> <li>Brow Pad</li> <li>Vinyl replacement brow pad</li> <li>Snap on - fits all Bullard suspensions</li> </ul>  |   |
| RBPCOOL   | <ul> <li>Brow Pad</li> <li>Polartec<sup>®</sup> replacement brow pad</li> <li>Wicking material moves sweat away from the worker's brow</li> <li>Fits all Bullard suspensions</li> </ul> |   |
| 20NC      | Elastic Chinstrap<br>• For 20TG and 20RT suspensions<br>• 10 per package  |   |

### **PA20 Series Head Protection**

#### C30

## Hard Hat

- High-density polyethylene shell
- Full profile, wide brim
- Accessory slots for attachments
- 6-point self-sizing suspension with large, absorbent cotton brow pad (RS6PC)
- Replacement brow pads available (RBPCOTTON, RBPVINYL, RBPCOOL)
- Meets or exceeds ANSI Z89.1-2003, Type I, Class E & G requirements
- Color: white

#### C30R

#### Hard Hat

Same as Model C30 above with

- 6-point Flex-Gear<sup>®</sup> ratchet suspension with large, absorbent cotton brow pad (RS6RC)
- Replacement brow pads available (RBPCOTTON, RBPVINYL, RBPCOOL)
- Color: white



S51

#### Hard Hat

- High-density, polyethylene shell
- Flat front, low-profile design
- Accessory slots for cap attachments
- Rain trough brim
- 4-point self-sizing suspension with poly brow pad (RS4PP)
- Replacement brow pads available (RBPCOTTON, RBPVINYL, RBPCOOL)
- Meets or exceeds ANSI Z89.1-2003, Type I, Class E & G requirements
- Color: white

S51R

#### Hard Hat

Same as Model S51 above with

- 4-point Flex-Gear ratchet suspension with poly brow pad (RS4RP)
- Replacement brow pads available (RBPCOTTON, RBPVINYL, RBPCOOL)
- Color: white



J

### **PA20 Series Head Protection Replacement Parts**

| RS6PC | <ul> <li>6-pt. Suspension</li> <li>6-point self-sizing suspension</li> <li>Large, absorbent cotton brow pad</li> <li>Replacement brow pads available (RBPCOTTON, RBPVINYL, RBPCOOL)</li> <li>Vertical height adjustments (two front, three rear)</li> <li>For Models C30 and C33</li> </ul>   |  |
|-------|---|--|
| RS6RC | <ul> <li>6-pt. Suspension</li> <li>6-point Flex-Gear ratchet suspension</li> <li>Large, absorbent cotton brow pad</li> <li>Replacement brow pads available (RBPCOTTON, RBPVINYL, RBPCOOL)</li> <li>Flex-points and nape cushion</li> <li>Large, easy-to-turn ratchet knob</li> <li>Vertical height adjustments (two front, three rear)</li> <li>For Models C30R and C33R</li> </ul> |  |
| RS4PC | <ul> <li>4-pt. Suspension</li> <li>4-point self-sizing suspension</li> <li>Large cotton brow pad</li> <li>Replacement brow pads available (RBPCOTTON, RBPVINYL, RBPCOOL)</li> <li>Vertical height adjustments (two front, three rear)</li> <li>For Model S51</li> </ul>   |  |
| RS4RC | <ul> <li>4-pt. Suspension</li> <li>4-point Flex-Gear ratchet suspension</li> <li>Large cotton brow pad</li> </ul>   |  |

- Replacement brow pads available (RBPCOTTON, RBPVINYL, RBPCOOL)
- Flex-points and nape cushion
- Large, easy-to-turn ratchet knob
- For Model S51



#### ES42

• Elastic chinstrap

Chinstrap

• For Models C30 and S51





### **PA20 Series Breathing Tubes and Accessories**



### **PA20 Series Replacement Blowers**

PA1Blower Unit with 10-hour Battery and Low Voltage Alarm, Standard Belt Assembly and Air Flow IndicatorPA1WDBSame as PA1 with Decon BeltPA1BUPA1 Replacement Blower Unit (blower & battery only)



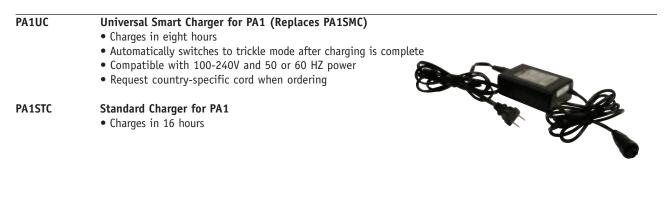
PA2 PA2BU PAPR, 6-hour Assembly with Standard Belt and Air Flow Indicator Replacement Blower Unit (blower & battery only)



PA1FG3 Filter/Gasket Assembly (three per package) PA1FGBP Filter/Gasket Assembly (36 per package)



## **PA20 Series Batteries and Chargers**



#### PA1GC

- 5-unit Gang Charger for PA1Charges in eight hours
- Automatically switches to trickle mode after charging is complete



### **PA20 Series Batteries and Chargers**



## PA20 Series Belts

| PA1SB  | <ul> <li>Nylon Standard Belt/Comfort Pad</li> <li>Nylon construction</li> <li>Adjustable for waist sizes between 28" and 60"</li> <li>7" wide in lumbar region for comfort</li> <li>Extra pad in lumbar region for increased comfort</li> </ul> |  |
|--------|---|--|
| PA1EB  | <b>Nylon Extension Belt for PA1SB</b><br>• Allows PA1SB to adjust for waist sizes up to 69"   |  |
| PA1DB  | <ul> <li>Vinyl Decon Belt</li> <li>Smooth vinyl construction wipes down easily</li> <li>Adjustable for waist sizes between 28" and 60"</li> <li>7" wide in lumbar region for comfort</li> </ul>   | Market and a second sec |
| PA1DEB | <ul> <li>Vinyl Extension Belt for PA1DB</li> <li>Allows PA1DEB to adjust for waist sizes up to 69"</li> </ul>   |  |



### **PA20 Series Replacement Components and Accessories**



Р 0

#### Protection, Comfort, Value

The PA30 Series protects workers against gases, vapors and/or particulates when used according to Bullard's instructions. It accomplishes this, in part, by drawing ambient air through a filter/cartridge and supplying that air through a breathing tube into the worker's headpiece.

Customer driven product development, as well as the incorporation of the latest technologies, culminate in the unique design and comfort features of the PA30 Series.

#### **Optional Blower Units**

Bullard offers the user a choice of either PA3 or PA3IS blower units to fit the application. Both units incorporate Bullard advanced technology in batteries, superior design features, patented worker alarm systems and independently proven high protection performance. Additonally, the PA3IS blower is designed to be used in environments requiring intrinsically safe (IS) performance. The PA3IS meets the widest range of IS criteria for PAPRs on the market today with its Factory Mutual (FM) approvals for Class I, Div I, Groups C and D; Class II, Div II, Groups E, F and G; Class III, Div I, Hazardous Locations.

### "Decon-Friendly" Housing

A smooth finish, sealed and gasketed design, and downward sloping configuration for easy "run-off" ensure that the blower will withstand the most rigorous of decon procedures. An optional decon belt completes the package.

### **Battery Design**

Other manufacturers' external PAPR battery designs may result in uneven weight distribution while also creating an additional "snag" hazard and decon concern. The battery packs on the PA30 are engineered *inside* the profile of the housing, with care taken to allow for easy removal and change-out. The batteries are gasketed and the battery compartment is independent of the airflow chamber in order to maintain blower integrity.

### **Battery Performance and Durability**

The Bullard PA30 Series uses rechargeable Nickel Metal Hydride (NiMH) batteries that do not suffer the "memory" problems of NiCad battery technology. NiMH batteries contribute to the lightweight design of the PA30, while providing the worker up to 10 hours of battery performance.

This superior performance holds true for both the PA3 and PA3IS battery systems. Bullard innovative battery design for the PA3IS unit does not sacrifice any performance qualities, which is extraordinary when compared to other systems incorporating IS technology.

### **Charger Technology**

Due to the combined characteristics of the NiMH batteries and the unique design of the Bullard chargers, the NiMH batteries will be kept at peak performance even if left on charge for long periods of time. The Bullard PA3SMC, PA3GC, PA3ISC and PA3ISGC chargers offer a trickle charge feature, as well as voltage and temperature monitoring, which help assure that the batteries will be ready next week, next month, even next year!

### Low Voltage Alarms

In addition to the standard safeguards of a rotometer-style indicator that is used to check airflow prior to donning, Bullard has incorporated advanced technology low voltage alarms into the PA3 and PA3IS blower systems. The PA3 uses an electronic alarm and the PA3IS uses a mechanical alarm, with both set below the 80 dBA NIOSH maximum, yet loud enough for the wearer to hear. With these patented designs, the alarm is positioned inside the breathing tube and the signal travels into the hood alerting the worker that he needs to exit the contamination area and replace or recharge the battery.

### **Sealed Power Switch**

The power switch is conveniently located for the worker to reach but is not easy to accidentally switch off or on. The sealed design provides yet another assurance to workers that they are receiving the best protection a PAPR can offer.

### **Headtop Options**

The Bullard PA30 Series of PAPRs is approved for use with a wide range of headtops, including the Bullard industry-leading high performance Tychem® hoods and Tychem loose-fitting facepieces. The Spectrum full facepiece is available in a PAPR configuration as a PA40 Series PAPR. All headtops are also available in supplied air configurations, allowing you to use one headpiece for both supplied air or powered air. Visit www.bullard.com to view the full range of headpieces and other options.

### **Proven Protection**

As early as 1994, Bullard has sponsored or been involved with third party independent Protection Factor studies proving the reliability of its Supplied Air Respiratory (SAR) and PAPR products. In the well-documented ORC Study (Industrial Hygiene Association Journal, Vo. 62, pages 595-604, Sept.-Oct. 2001) Bullard SAR hoods performed at the highest level of all manufacturer's SAR hoods tested. Studies conducted in 2004 at RDECOM U.S. Army Research and Development Command) facilities showed that the PA30 PAPR respirator systems performed at the same high levels as the Bullard SAR hoods in the ORC Study. For more detailed information on this Protection Factor Research, please contact Bullard, or visit our website at www.bullard.com.



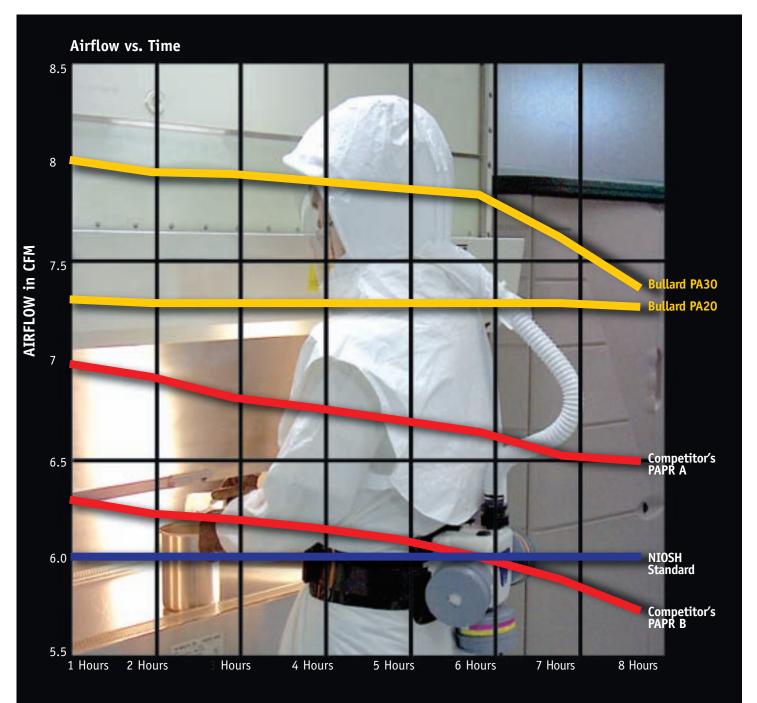
Р 0

≶

P

Bullard PAPRs provide maximum airflow throughout the entire shift.

# **Greater Airflow = Greater Comfort**



## PA30 Systems

A complete PA30 Series Respirator consists of the following three components:

- 1. Respirator Hood or Loose-Fitting Facepiece with Suspension
- 2. Breathing Tube Assembly
- 3. PA3 Blower Assembly

All of these components must be present and properly assembled to constitute a NIOSH approved respirator.

Approval No. TC-21C-0773 for High Efficiency (HE) Particulate Protection Approval No. TC-23C-2237 OVAGHE Organic Vapor, Acid Gas, High Efficiency Approval No. TC-23C-2236 NBC Nuclear, Biological, Chemical

PA30 Series Hospital Systems (Nuclear, Biological, Chemical Protection)

- assemblies include PA3H blower, SICVN hood, ratchet suspension, decon belt, low voltage alarm, air flow indicator and three NBC cartridges

| PA30PREP   | Hospital Preparedness PAPR System, One NiMH Battery and Quick Charger |
|------------|---|
| PA30PREPLI | Hospital Preparedness PAPR System, 10-year Shelf-life                 |
|            | Lithium Battery (single-use, no charger)                              |
| PA30PREPNC | Hospital Preparedness PAPR System with One NiMH Battery, No Charger   |

#### PA30 Series Assemblies (HEPA, Organic Vapor, Acid Gas Protection)

- assemblies include PA3 blower, breathing tube, one hood, quick charger, low voltage alarm and air flow indicator

- filter cartridges not included

#### PAPRs with 20TJ Single Bib Hoods

- PA30TJDB20TJ Single Bib Hood System with Decon BeltPA30TJSB20TJ Single Bib Hood System with Standard Comfort Belt
  - Includes two batteries
    - 8-10 hour run time
- PA30ISTJDB20TJ Single Bib Hood System with Decon BeltPA30ISTJSB20TJ Single Bib Hood System with Standard Comfort Belt• Intrinsically safe blower
  - Includes one battery
  - 6-7 hour run time







### PA30 Series Assemblies (HEPA, Organic Vapor, Acid Gas Protection)

PAPRs with 20TIC Tychem QC Double Bib Hood System

- assemblies include PA3 blower, breathing tube, one hood, quick charger, low voltage alam and air flow indicator
- filter cartridges not included

| PA3OTICDB<br>PA3OTICSB     | <ul> <li>20TIC Double Bib Hood System with Decon Belt</li> <li>20TIC Double Bib Hood System with Standard Comfort Belt</li> <li>Includes two batteries</li> <li>8-10 hour run time</li> </ul> |
|----------------------------|---|
| PA30ISTICDB<br>PA30ISTICSB | 20TIC Double Bib Hood System with Decon Belt<br>20TIC Double Bib Hood System with Standard Comfort Belt<br>• Intrinsically safe blower<br>• Includes one battery                              |

• 6-7 hour run time



PAPRs with 20TICH Tychem QC Double Bib Hood for Hard Hat System

- assemblies include PA3 blower, breathing tube, one hood, quick charger, low voltage alarm and air flow indicator
- filter cartridges not included

| PA30TICHDBC30R | Double Bib Hood Systen | , Decon Belt, with C30R Hard Hat Included |
|----------------|------------------------|---|
| PA30TICHDBS51R | Double Bib Hood System | , Decon Belt, with S51R Hard Hat Included |

PA3OTICHSBC3OR Double Bib Hood System, Standard Comfort Belt, with C3OR Hard Hat Included PA3OTICHSBS51R Double Bib Hood System, Standard Comfort Belt, with S51R Hard Hat Included • Includes two batteries

• 8-10 hour run time

PA30ISTICHDBC30R Double Bib Hood System, Decon Belt, with C30R Hard Hat Included PA30ISTICHDBS51R Double Bib Hood System, Decon Belt, with S51R Hard Hat Included

PA30ISTICHSBC30R Double Bib Hood System, Standard Comfort Belt, with C30R Hard Hat Included PA30ISTICHSBS51R Double Bib Hood System, Standard Comfort Belt, with S51R Hard Hat Included

- Intrinsically safe blower
- Includes one battery
- 6-7 hour run time

PAPRs with 20SIC Saranex Coated Tychem SL Double Bib Hood Systems

- assemblies include PA3 blower, breathing tube, one hood, quick charger, low voltage alarm and air flow indicator - filter cartridges not included

| PA3OSICDB<br>PA3OSICSB     | 20SIC Double Bib Saranex Coated Hood System with Decon Belt<br>20SIC Double Bib Saranex Coated Hood System with Standard Comfort Belt<br>• Includes two batteries<br>• 8-10 hour run time                             |  |
|----------------------------|---|--|
| PA3OISSICDB<br>PA3OISSICSB | 20SIC Double Bib Saranex Coated Hood System with Decon Belt<br>20SIC Double Bib Saranex Coated Hood System with Standard Comfort Belt<br>• Intrinsically safe blower<br>• Includes one battery<br>• 6-7 hour run time |  |



## PA30 Series Assemblies (HEPA, Organic Vapor, Acid Gas Protection)

PAPRs with 20SICH Saranex Coated Tychem SL Double Bib Hood for use with Hard Hat Systems

- assemblies include PA3 blower, breathing tube, one hood, quick charger, low voltage alarm and air flow indicator - filter cartridges not included

PA30SICHDBC30RDouble Bib Saranex Coated Hood, Decon Belt, with C30R Hard Hat IncludedPA30SICHDBS51RDouble Bib Saranex Coated Hood, Decon Belt, with S51R Hard Hat Included

PA30SICHSBC30R Double Bib Saranex Coated Hood, Standard Comfort Belt, with Hard Hat Included PA30SICHSBS51R Double Bib Saranex Coated Hood, Standard Comfort Belt, with S51R Hard Hat Included • Includes two batteries

8-10 hour run time

PA30ISSICHDBC30R Double Bib Saranex Coated Hood, Decon Belt, with C30R Hard Hat Included PA30ISSICHDBS51R Double Bib Saranex Coated Hood, Decon Belt, with S51R Hard Hat Included

PA30ISSICHSBC3OR Double Bib Saranex Coated Hood, Standard Comfort Belt, with C3OR Hard Hat Included

- PA30ISSICHSBS51R Double Bib Saranex Coated Hood, Standard Comfort Belt, with S51R Hard Hat Included
  - Intrinsically safe blower
  - Includes one battery
  - 6-7 hour run time

PAPRs with 20TP Tychem QC Single Bib Hood for Painting, Solvent Resistant Lens

- assemblies include PA3 blower, breathing tube, 1 hood, quick charger, low voltage alarm and air flow indicator

- filter cartridges not included

| PA30TPDB<br>PA30TPSB     | 20TP Single Bib Hood for Painting System with Decon Belt<br>20TP Single Bib Hood for Painting System with Standard Comfort Belt<br>• Includes two batteries<br>• 8-10 hour run time |  |
|--------------------------|---|--|
| PA30ISTPDB<br>PA30ISTPSB | 20TP Single Bib Hood for Painting System with Decon Belt<br>20TP Single Bib Hood for Painting System with Standard Comfort Belt<br>• Intrinsically safe blower                      |  |

- Includes one battery
- 6-7 hour run time

PAPRs with 20TPC Tychem QC Double Bib Hood for Painting, Solvent Resistant Lens

- assemblies include PA3 blower, breathing tube, 1 hood, quick charger, low voltage alarm and air flow indicator

- filter cartridges not included
  - PA30TPCDB<br/>PA30TPCSB20TPC Double Bib Hood for Painting System with Decon Belt<br/>20TPC Double Bib Hood for Painting System with Standard Comfort Belt<br/>• Includes two batteries<br/>• 8-10 hour run timePA30ISTPCDB<br/>PA30ISTPCSB20TPC Double Bib Hood for Painting System with Decon Belt<br/>20TPC Double Bib Hood for Painting System with Standard Comfort Belt<br/>• Intrinsically safe blower<br/>• Includes one battery
    - 6-7 hour run time



### PA30 Series Assemblies (HEPA, Organic Vapor, Acid Gas Protection)

PAPRs with 20TICS Tychem QC Double Bib Hood with Taped Sealed Seams

- assemblies include PA3 blower, breathing tube, one hood, quick charger, low voltage alarm, and air flow indicator
- filter cartridges not included

| PA3OTICSDB<br>PA3OTICSSB | <ul> <li>20TICS Extra-Long Double Bib Hood System with Decon Belt</li> <li>20TICS Extra-Long Double Bib Hood System with Standard Comfort Belt</li> <li>Includes two batteries</li> <li>8-10 hour run time</li> </ul> |
|--------------------------|---|
| PA30ISTICSDB             | 20TICS Extra-Long Double Bib Hood System with Decon Belt  |

- PA30ISTICSSB 20TICS Extra-Long Double Bib Hood System with Decon Bett PA30ISTICSSB 20TICS Extra-Long Double Bib Hood System with Standard Comfort Belt • Intrinsically safe blower
  - Includes one battery
  - 6-7 hour run time



PAPRs with RT1 Tychem QC Double Bib Hood with Extra-Large Lens, No Suspension Required

- assemblies include PA3 blower, breathing tube, one hood, quick charger, low voltage alarm, and air flow indicator
- filter cartridges not included

| PA3ORT1DB<br>PA3ORT1SB     | <ul> <li>RT1 Extra-Large Lens Double Bib Hood System with Decon Belt</li> <li>RT1 Extra-Large Lens Double Bib Hood System with Standard Comfort Belt</li> <li>Includes two batteries</li> <li>8-10 hour run time</li> </ul>                                 | 1  |
|----------------------------|---|----|
| PA30ISRT1DB<br>PA30ISRT1SB | <ul> <li>RT1 Extra-Large Lens Double Bib Hood System with Decon Belt</li> <li>RT1 Extra-Large Lens Double Bib Hood System with Standard Comfort Belt</li> <li>Intrinsically safe blower</li> <li>Includes one battery</li> <li>6-7 hour run time</li> </ul> | 5. |

PAPRs with RT2 Saranex Coated Tychem SL Double Bib Hood with Extra-Large Lens, No Suspension Required - assemblies include PA3 blower, breathing tube, one hood, quick charger, low voltage alarm,

and air flow indicator

- filter cartridges not included

| PA3ORT2DB<br>PA3ORT2SB     | <ul> <li>RT2 Extra-Large Lens Double Bib Hood System with Decon Belt</li> <li>RT2 Extra-Large Lens Double Bib Hood System with Standard Comfort Belt</li> <li>Includes two batteries</li> <li>8-10 hour run time</li> </ul>                                 |
|----------------------------|---|
| PA30ISRT2DB<br>PA30ISRT2SB | <ul> <li>RT2 Extra-Large Lens Double Bib Hood System with Decon Belt</li> <li>RT2 Extra-Large Lens Double Bib Hood System with Standard Comfort Belt</li> <li>Intrinsically safe blower</li> <li>Includes one battery</li> <li>6-7 hour run time</li> </ul> |



## PA30 Series Assemblies (HEPA, Organic Vapor, Acid Gas Protection)

#### PAPRs with 20LFL Loose-Fitting Facepiece

- assemblies include PA3 blower, breathing tube, one loose-fitting facepiece, quick charger, low voltage alarm and air flow indicator
- filter cartridges not included
  - PA30LFLDB20LFL Loose-Fitting Facepiece System with Decon BeltPA30LFLSB20LFL Loose-Fitting Facepiece System with Standard Comfort Belt
    - Includes two batteries
    - 8-10 hour run time

#### PA30ISLFLDB 20LFL Loose-Fitting Facepiece System with Decon Belt

- PA30ISLFLSB 20LFL Loose-Fitting Facepiece System with Standard Comfort Belt
  - Intrinsically safe blower
  - Includes one battery
  - 6-7 hour run time

### **PA30 Series Replacement Headpieces**

- 20LFL Loose-Fitting Facepiece, Large
- 20LFM
- Loose-Fitting Facepiece, Medium
  - Sewn in suspension
  - Latex-free
  - Quick-attach twist lock connection
  - Five per package





| 20SICTychem SL Double Bib Hood with Taped Seams, Pinlock Suspension20SICRTychem SL Double Bib Hood with Taped Seams, Ratchet Suspension20SICNTychem SL Double Bib Hood with Taped Seams, No Suspension20SICVTychem SL Double Bib Hood with Taped Sealed Seams, Vinyl Lens,<br>Pinlock Suspension20SICVRTychem SL Double Bib Hood with Taped Seams, Vinyl Lens,<br>Ratchet Suspension20SICVRTychem SL Double Bib Hood with Taped Seams, Vinyl Lens,<br>Ratchet Suspension20SICVNTychem SL Double Bib Hood with Taped Seams, Vinyl Lens,<br>No Suspension |
|---|
| 20SICNTychem SL Double Bib Hood with Taped Seams, No Suspension20SICVTychem SL Double Bib Hood with Taped Sealed Seams, Vinyl Lens,<br>Pinlock Suspension20SICVRTychem SL Double Bib Hood with Taped Seams, Vinyl Lens,<br>Ratchet Suspension20SICVNTychem SL Double Bib Hood with Taped Seams, Vinyl Lens,<br>No Suspension  |
| 20SICVTychem SL Double Bib Hood with Taped Sealed Seams, Vinyl Lens,<br>Pinlock Suspension20SICVRTychem SL Double Bib Hood with Taped Seams, Vinyl Lens,<br>Ratchet Suspension20SICVNTychem SL Double Bib Hood with Taped Seams, Vinyl Lens,<br>No Suspension   |
| Pinlock Suspension<br>20SICVR Tychem SL Double Bib Hood with Taped Seams, Vinyl Lens,<br>Ratchet Suspension<br>20SICVN Tychem SL Double Bib Hood with Taped Seams, Vinyl Lens,<br>No Suspension   |
| Ratchet Suspension<br>20SICVN Tychem SL Double Bib Hood with Taped Seams, Vinyl Lens,<br>No Suspension  |
| No Suspension   |
| <ul><li>19" long outer bib</li><li>Five per package</li></ul>   |



| 20SICH     | Tychem SL Double Bib Hood with Taped Seams - for Use with Bullard Hard Hat |
|------------|--|
| 20SICHC30  | Same as 20SICH with C30 Hard Hat Included                                  |
| 20SICHC30R | Same as 20SICH with C30R Hard Hat Included                                 |
| 20SICHS51  | Same as 20SICH with S51 Hard Hat Included                                  |
| 20SICHS51R | Same as 20SICH with S51R Hard Hat Included                                 |
|            | • 9" long outer bib  |
|            | • Five per package   |
|            |  |





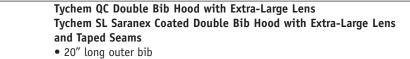
## **PA30 Series Replacement Headpieces**

| 20SICVH     | Tychem SL Extra-Long Double Bib Hood With Taped Seams |
|-------------|---|
|             | and Vinyl Lens - for Use with Bullard Hard Hat        |
| 20SICVHC30  | same as 20SICVH with C30 Hard Hat included            |
| 20SICVHC30R | same as 20SICVH with C30R Hard Hat included           |
| 20SICVHS51  | same as 20SICVH with S51 Hard Hat included            |
| 20SICVHS51R | same as 20SICVH with S51R Hard Hat included           |
|             | • 19" long outer bib                                  |
|             | • Five per package                                    |
|             |   |

| 20TIC  | Tychem QC Double Bib Hood, Pinlock Suspension |
|--------|---|
| 20TICR | Tychem QC Double Bib Hood, Ratchet Suspension |
| 20TICN | Tychem QC Double Bib Hood, No Suspension      |
|        | • 9" long outer bib                           |
|        | • 10 per package                              |







- No suspension required
- 10 per package

RT1

RT2



| 20TICH     | Tychem QC Double Bib Hood, for Use with Bullard Hard Hat (Not Included) |
|------------|---|
| 20TICHC30  | Tychem QC Double Bib Hood, C30 Hard Hat Included                        |
| 20TICHC30R | Tychem QC Double Bib Hood, C30R Hard Hat Included                       |
| 20TICHS51  | Tychem QC Double Bib Hood, S51 Hard Hat Included                        |
| 20TICHS51R | Tychem QC Double Bib Hood, S51R Hard Hat Included                       |
|            | • 9" long outer bib   |
|            | Five per package  |
|            | B-  |



Tychem QC Single Bib Hood, Pinlock Suspension

Tychem QC Single Bib Hood, Ratchet Suspension

Tychem QC Single Bib Hood, No Suspension

• 10 per package

## **PA30 Series Replacement Headpieces**

20TJ

20TJR

20TJN

| 20TICS<br>20TICSR | Tychem QC Double Bib Hood With Taped Seams, Pinlock Suspension<br>Tychem QC Double Bib Hood With Taped Seams, Ratchet Suspension<br>• 19" long outer bib    |  |
|-------------------|---|--|
| 20TICSN           | <ul> <li>Five per package</li> <li>Tychem QC Double Bib Hood With Taped Seams, No Suspension</li> <li>19" long outer bib</li> <li>10 per package</li> </ul> |  |



| 20TP  | Tychem QC Single Bib Hood for Painting, Solvent Resistant |               |
|-------|---|---------------|
|       | Lens, Pinlock Suspension                                  |               |
| 20TPR | Tychem QC Single Bib Hood for Painting, Solvent Resistant |               |
|       | Lens, Ratchet Suspension                                  |               |
| 20TPN | Tychem QC Single Bib Hood for Painting, Solvent Resistant | 1             |
|       | Lens, No Suspension                                       | 6.0           |
|       | • 10 per package  | College State |
|       |   | free .        |



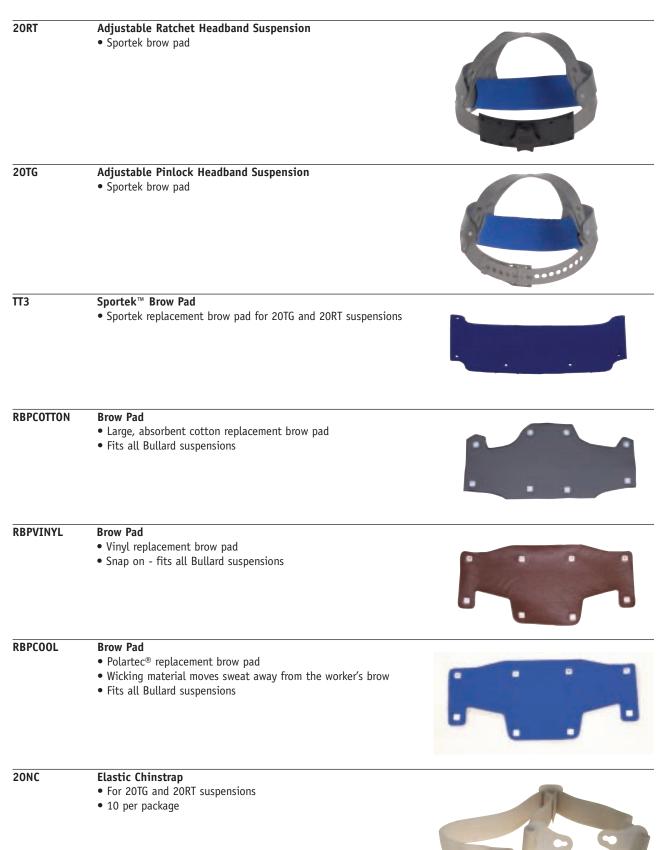
J





S

## **PA30 Series Headpiece Replacement Parts**



### **PA30 Series Head Protection**

#### Hard Hat

C30

- High-density polyethylene shell
- Full profile, wide brim
- Accessory slots for attachments
- 6-point self-sizing suspension
  - with large, absorbent cotton brow pad (RS6PC)
- Replacement brow pads available (RBPCOTTON, RBPVINYL, RBPCOOL)
   Meets or exceeds ANSI Z89.1-2003, Type I, Class E & G requirements
- Color: white



#### Hard Hat

Same as Model C30 above with

- $\bullet$  6-point Flex-Gear® ratchet suspension
- with large, absorbent cotton brow pad (RS6RC) • Color: white





#### S51

#### Hard Hat

- High-density, polyethylene shell
- Flat front, low-profile design
- Accessory slots for cap attachments
- Rain trough brim
- 4-point self-sizing suspension with poly brow pad (RS4PP)
- Replacement brow pads available (RBPCOTTON, RBPVINYL, RBPCOOL)
- Meets or exceeds ANSI Z89.1-2003, Type I, Class E & G requirements
- Color: white

S51R

### Hard Hat

Same as Model S51 above with

- 4-point Flex-Gear ratchet suspension with poly brow pad (RS4RP)
- Color: white



## **PA30 Series Head Protection Replacement Parts**

| RS6PC | <ul> <li>6-pt. Suspension</li> <li>6-point self-sizing suspension</li> <li>Large, absorbent cotton brow pad</li> <li>Replacement brow pads available (RBPCOTTON, RBPVINYL, RBPCOOL)</li> <li>Vertical height adjustments (two front, three rear)</li> <li>For Models C30 and C33</li> </ul>   |  |
|-------|---|--|
| RS6RC | <ul> <li>6-pt. Suspension</li> <li>6-point Flex-Gear<sup>™</sup> ratchet suspension</li> <li>Large, absorbent cotton brow pad</li> <li>Replacement brow pads available (RBPCOTTON, RBPVINYL, RBPCOOL)</li> <li>Flex-points and nape cushion</li> <li>Large, easy-to-turn ratchet knob</li> <li>Vertical height adjustments (two front, three rear)</li> <li>For Models C30R and C33R</li> </ul> |  |
| RS4PC | <ul> <li>4-pt. Suspension</li> <li>4-point self-sizing suspension</li> <li>Large cotton brow pad</li> <li>Replacement brow pads available (RBPCOTTON, RBPVINYL, RBPCOOL)</li> <li>Vertical height adjustments (two front, two rear)</li> <li>For Model S51</li> </ul>   |  |
| RS4RC | <ul> <li>4-pt. Suspension</li> <li>4-point Flex-Gear<sup>®</sup> ratchet suspension</li> <li>Large cotton brow pad</li> <li>Replacement brow pads available (RBPCOTTON, RBPVINYL, RBPCOOL)</li> <li>Flex-points and name cushion</li> </ul>   |  |

- Hex-points and nape cushion
  Large, easy-to-turn ratchet knob
- For Model S51R

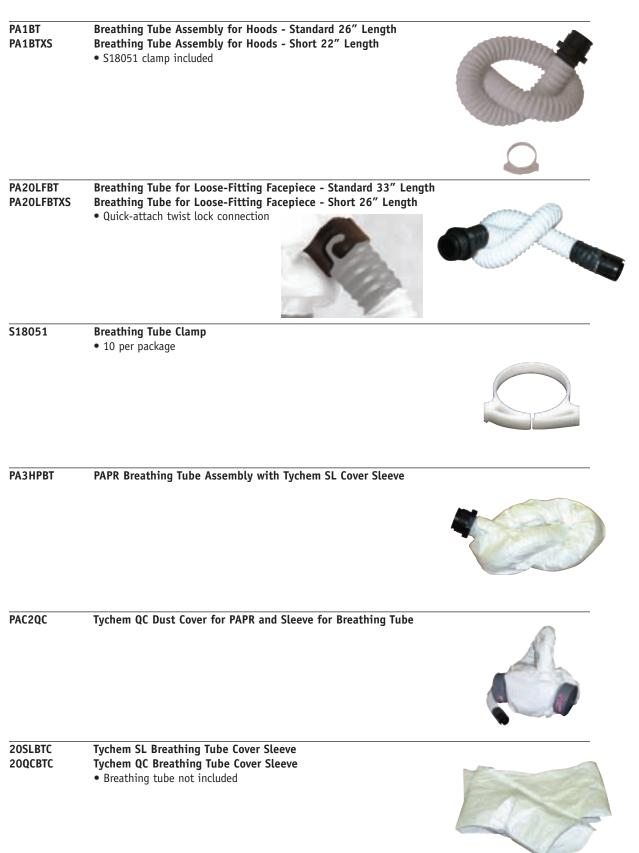


### ES42 Chinstrap

- Elastic chinstrap
- For Models C30 and S51



### **PA30 Series Breathing Tubes and Accessories**



╼

### **PA30 Series Replacement Blowers**

| PA3     | Blower Assembly with Standard belt, One NiMH battery and Air                                      | Flow Indicator |
|---------|---|----------------|
| PA3DB   | Same as PA3 with Decon Belt   |                |
| PA3BU   | Blower Unit Only  |                |
| PA3IS   | Intrinsically Safe Blower Assembly with Standard Belt,<br>One NiMH battery and Air Flow Indicator |                |
| PA3ISDB | Same as PA3IS with Decon Belt   |                |
| PA3ISBU | Intrinsically Safe Blower Unit Only   |                |
|         |   |                |



### **PA30 Series Replacement Filters**

#### PA3HE

#### High Efficiency Particulate (HEPA) Filters

- Six per package
- PA3PG plug required for use with PA3HE filters (sold separately)
- High efficiency particulate
- Purple label
- 99.97% efficient for .3 microns



#### PA30VAGHE OV/AG/HE Filters

- Six per package
- Organic vapors, Chlorine, Chlorine Dioxide, Sulfur Dioxide, Hydrogen Chloride, Hydrogen Fluoride and High Efficiency Particulate
- Yellow/purple label



### PA3NBC

#### AG/AM/MA/FM/HE Filters

- Six per package
- Chlorine, Chlorine Dioxide, Sulfur Dioxide, Hydrogen Chloride, Hydrogen Fluoride, Ammonia, Methylamine, Formaldehyde and High Efficiency Particulate
- Tan/purple label



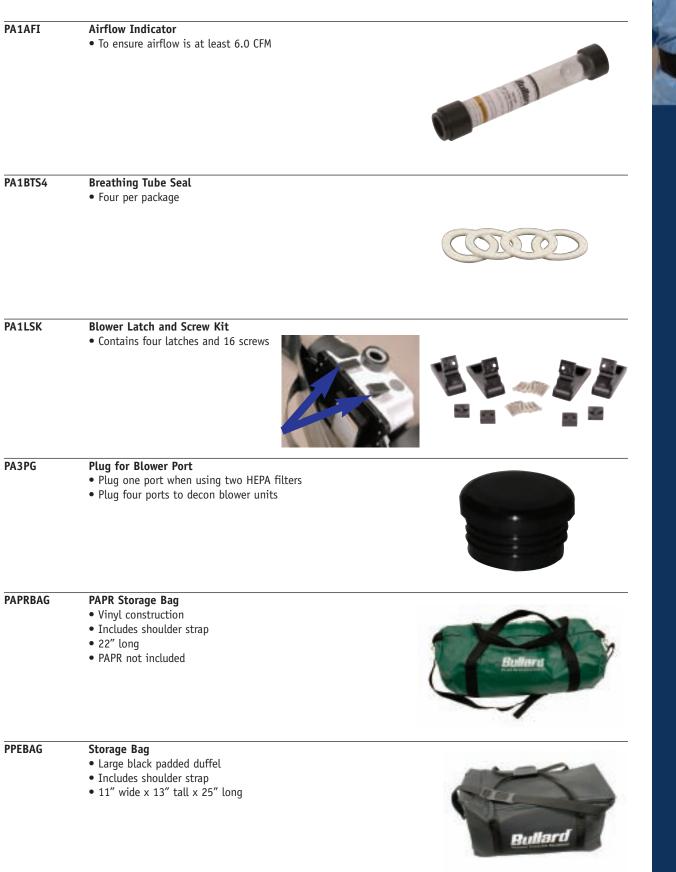
## **PA30 Series Batteries and Chargers**



## PA30 Series Belts

| PA1SB  | <ul> <li>Nylon Standard Belt/Comfort Pad</li> <li>Nylon construction</li> <li>Adjustable for waist sizes between 28" and 60"</li> <li>7" wide in lumbar region for comfort</li> <li>Extra pad in lumbar region for increased comfort</li> </ul> |  |
|--------|---|--|
| PA1EB  | <b>Nylon Extension Belt for PA1SB</b><br>• Allows PA1SB to adjust for waist sizes up to 69"   |  |
| PA1DB  | <ul> <li>Vinyl Decon Belt</li> <li>Smooth vinyl construction wipes down easily</li> <li>Adjustable for waist sizes between 28" and 60"</li> <li>7" wide in lumbar region for support</li> </ul>   |  |
| PA1DEB | <b>Vinyl Extension Belt for PA1DB</b><br>• Allows PA1DB to adjust for waist sizes up to 69"   |  |

**PA30 Series Replacement Components and Accessories** 



### Protection, Comfort, Value

The PA40 Series protects workers against particulates when used according to Bullard instructions. It accomplishes this, in part, by drawing ambient air through a filter or cartridge and supplying that air through a breathing tube into the worker's headpiece.

Customer-driven product development, as well as the incorporation of the latest technologies, culminate in the unique design and comfort features of the PA40 Series.

### "Decon-Friendly" Housing

A smooth finish, sealed and gasketed design, and downward sloping configuration for easy "run-off" ensure that the blower will withstand the most rigorous of decon procedures. An optional decon belt completes the package.

#### **Battery Design**

Other companies' external PAPR battery designs may result in uneven weight distribution, while also creating an additional "snag" hazard and decon concern. The battery packs on the PA40 are engineered inside the profile of the housing, with care taken to allow for easy removal and change-out. The batteries are gasketed and the battery compartment is independent of the airflow chamber in order to maintain blower integrity.

#### **Battery Performance and Durability**

The Bullard PA40 Series uses rechargeable Nickel Metal Hydride (NiMH) batteries that do not suffer the "memory" problems of NiCad battery technology. NiMH batteries contribute to the lightweight design of the PA40, while providing the worker up to 10 hours of battery performance.

#### **Charger Technology**

Due to the combined characteristics of the NiMH batteries and the unique design of the Bullard chargers, the NiMH batteries will be kept at peak performance even if left on charge for long periods of time. The Bullard PA3SMC and PA3GC chargers offer a trickle charge feature, as well as voltage and temperature monitoring, which help assure that the batteries will be ready next week, next month, even next year!

#### Low Voltage Alarms

In addition to the standard safeguards of a rotometer-style indicator which is used to check airflow prior to donning, Bullard has incorporated advanced technology low voltage alarms into the PA3 and PA3IS Blower systems. The PA3 uses an electronic alarm while the PA3IS uses a mechanical alarm, with both set below the 80 dBA NIOSH maximum, yet loud enough for the wearer to hear. With these patented designs, the alarm is positioned inside the breathing tube and the sound travels into the hood, alerting the worker that he needs to exit the contamination area and replace or recharge the battery.

### **Spectrum Facepiece**

The Spectrum facepiece features lightweight silicone double flange seals, creating a secure, comfortable fit. The low profile design allows ease of movement while reducing fatigue. The optically-correct lens provides unparalled peripheral vision while the clear silicone nosecup helps minimize the closed-in feeling that many respirator wearers experience. The Specturm facepiece has a minimal number of snaptogether parts that require no special tools and are easy to stock and replace.



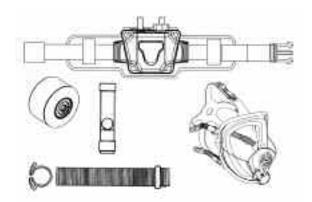
## **PA40 Systems**

A complete PA40 Series Respirator consists of the following three components:

- 1. Full Facepiece
- 2. Breathing Tube Assembly
- 3. PA4 Blower Assembly

All of these components must be present and properly assembled to constitute a NIOSH approved respirator.

Approval No. TC-21C-0774 for High Efficiency (HE)Particulate Protection



### PA40 Series Assemblies (Tight Fitting, Full Facepiece PAPR)

PAPRs with Spectrum Full Facepiece

- assemblies include PA4 blower, Spectrum facepiece, breathing tube, charger, two NiMH batteries and air flow indicator

| PA40SPECSB | PA4, Spectrum Facepiece with Standard Belt |
|------------|--|
| PA40SPECDB | PA4, Spectrum Facepiece with Decon Belt    |





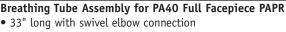
╼ 0 ٤ ቦ -P d  $\blacktriangleright$ -J -\_\_\_\_. ー < Ы G ア P S D -. b -0 -S

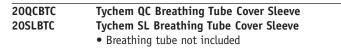
### **PA40 Series Replacement Facepieces**

| PASPECML | Spectrum Full Facepiece - Medium/Large for Use with PA40 |     |
|----------|--|-----|
| PASPECS  | Spectrum Full Facepiece - Small for Use with PA40        |     |
|          | • Optically correct (no distortion)                      |     |
|          | Convertible to SAR                                       |     |
|          | <ul> <li>Includes nose cup (LNK)</li> </ul>              |     |
|          |  |     |
|          |  | ALL |
|          |  |     |

## **PA40 Series Breathing Tubes and Components**

| PA4BT | Breathing Tube Assembly                        |
|-------|--|
|       | <ul> <li>33" long with swivel elbow</li> </ul> |





Tychem QC Dust Cover for PAPR and Sleeve for Breathing Tube



PA1BTS4

Breathing Tube Seal • Four per package





### **PA40 Series Replacement Blowers**

| PA4   | PA4 Blower Assembly, One NiMH Battery, Standard Comfort Belt and Air Flow Indicator |
|-------|---|
| PA4DB | PA4 Blower Assembly, One NiMH battery, Decon Belt, Air Flow Indicator               |
| PA4BU | Blower Unit Only  |





### NiMH Battery Pack for PA3, PA4 and PA5

- Nickel Metal Hydride Technology
- 4-5 hour run time per battery
- Rechargeable



1 M

PA3BPC

**Battery Port Cover** • For PA3, PA4 and PA5 blowers when using a single battery



#### PA3GC

- Gang Charger • Five port
  - Charges in four hours
  - Trickle charge feature
  - Inickle charge feature
     Conditioning feature
  - Conditioning feature



PA3SMC

- **Quick Charger for PA3 & PA4** • Two port
- Charges in four hours
- Trickle charge feature



╺

## PA40 Series Belts

| PA1SB  | <ul> <li>Nylon Standard Belt/Comfort Pad</li> <li>Nylon construction</li> <li>Adjustable for waist sizes between 28" and 60"</li> <li>7" wide in lumbar region for comfort</li> <li>Extra pad in lumbar region for increased comfort</li> </ul> |  |
|--------|---|--|
| PA1EB  | <b>Nylon Extension Belt for PA1SB</b><br>• Allows PA1SB to adjust for waist sizes up to 69"   |  |
| PA1DB  | <ul> <li>Vinyl Decon Belt</li> <li>Smooth vinyl construction wipes down easily</li> <li>Adjustable for waist sizes between 28" and 60"</li> <li>7" wide in lumbar region for support</li> </ul>   |  |
| PA1DEB | <b>Vinyl Extension Belt for PA1DB</b><br>• Allows PA1DB to adjust for waist sizes up to 69"   |  |

**PA40 Series Replacement Components and Accessories** 

PA4AFI PA4 Airflow Indicator • To ensure airflow is at least 4.0 CFM



#### PAPRBAG

- PAPR Storage Bag
   Vinyl construction
- Includes shoulder strap
- 22" long
- PAPR not included



#### PPEBAG

• Large black padded duffel

Storage Bag

- Includes shoulder strap
- 11"wide x 13" tall x 25" long



PA3PG

#### Plug for Blower Port

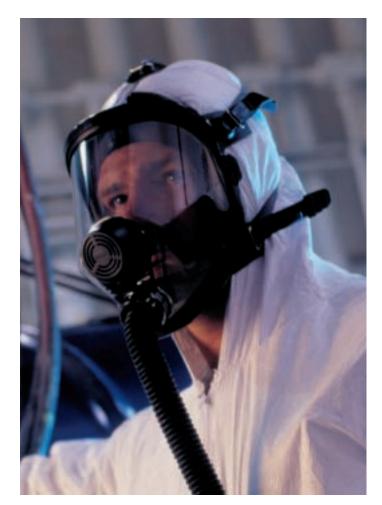
- Plug one port when using two HEPA filters
- Plug four ports to decon blower units



R e

S

pirators

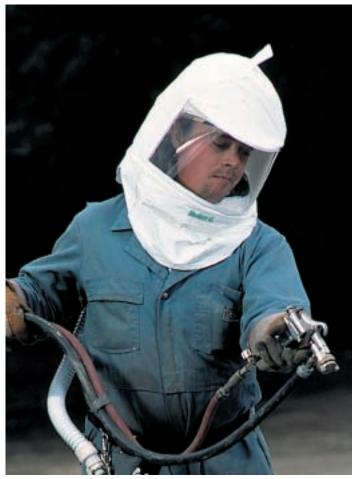












# Supplied Air Respirators (SARs)

### What is a Supplied Air Respirator?

Supplied Air Respirators deliver breathable air to the worker from a clean air source. The air can come from a variety of sources including high pressure compressors, low-pressure pumps or bottled air cylinders. In addition, Supplied Air Respirators can be configured with a variety of head tops including loose-fitting hoods, helmets, tight-fitting masks (full and half) or loose-fitting facepieces.

### Supplied Air Respirator Advantages

There are many advantages to utilizing a Bullard Supplied Air Respirator System, including the ability to protect against a wide array of contaminants without any filter cartridges to purchase or replace. In addition, Bullard Supplied Air Respirators can be configured with heating/cooling tubes to increase worker comfort by as much as 30 degrees F. Finally, Bullard offers the largest selection of available head tops including loose-fitting hoods that do not require fit testing.

### Configuring a Supplied Air Respirator System

There are many choices to make when piecing together various components of a Supplied Air Respirator System. The following steps may help simplify this intimidating task:

- •Choose Air Source (Free Air Pump or Compressor)
- •Choose Head Top
- •Choose Suspension and/or Hard Hat
- •Choose Breathing Tube
- •Choose Flow Control
- •Choose Cooling Vest (optional)

### **Bullard Product Assigned Protection Factors**

|      | Bullard Product  | Respirator Type  | NIOSH TC # | APF   | 3rd Party Validation |
|------|--|--|------------|-------|----------------------|
|      | Lancer   | Supplied Air Respirator with Loose-Fitting Helmet                  | 19C-309    | 1,000 | Caldwell Study 1994  |
| Air  | 77 Series  | Supplied Air Respirator with Loose-Fitting Helmet                  | 19C-84     | 1,000 | LLNL Study 1995      |
| ed / | 88 Series  | Supplied Air Respirator with Loose-Fitting Helmet                  | 19C-293    | 1,000 | LLNL Study 1995      |
| Iddr | CC20 Series*   | Supplied Air Respirator with Loose-Fitting Hood                    | 19C-154    | 1,000 | ORC Study 1997       |
| N    | RT Series  | Supplied Air Respirator with Loose-Fitting Hood                    | 19C-412    | 1,000 | RDECOM Study 2004    |
|      | PC/CS90  | Supplied Air Respirator with Loose-Fitting Hood & Containment Suit | 19C-280    | 1,000 | Caldwell Study 1994  |
|      | For more information or a copy of one of the studies, please contact Bullard at 877-BULLARD. |  |            |       |                      |

\* Inner bib models.

### Simple, Effective, Ultra-Light

The CC20 Series Tychem<sup>®</sup> hoods provide a wide variety of simple, effective and economical options for on-the-job respiratory protection. The result is better protection, improved productivity and greater comfort that combines to produce the best value on the market. These hoods are available for use in a CC20 Series Airline Respirator configuration or PA20 and PA30 Series Powered Air Purifying Respirator configuration. These hoods are approved by NIOSH and recommended by Bullard for use in Type C applications. CC20 Series hoods are used in a wide variety of industries including:

- Pharmaceutical manufacturing
- Chemical and pesticide handling
- Spray painting and coating operations
- Nuclear operations

#### **Proven Performance**

In a 1996 study of hood-style respirators coordinated by the Organization Resources Counselors (ORC), the Bullard Model 20TIC hood was surveyed to be the *number one hood used in the pharmaceutical industry*.

The most commonly used hoods were then used in a simulated workplace protection factor study (SWPF). The Bullard Model 20TIC hood was also the top-performing loose-fitting hood among a variety of competitors. All measurements in the SWPF study were above 150,000 resulting in a study Assigned Protection Factor (APF) of 10,000! This research has resulted in OSHA recognizing a 1,000 APF for the Bullard 20TIC hood.

For a summary of this research, call Bullard Customer Service at 1-800-827-0423.

### **Unique Air Delivery System**

A patented neck cuff design helps maintain positive pressure inside the hood to aid in keeping contaminants out. As air enters the hood, the inner collar inflates, providing a snug, comfortable fit around the neck and continuous flow of air to the worker's breathing zone.

### Lightweight, Comfortable and Economical

CC20 Series hoods are lighter and more comfortable than tight-fitting full facepiece respirators. Covering the entire head, face and neck, the hood provides splash and overspray protection and makes clean-up quick and easy.

A wide angle lens offers the largest field of vision among Tychem hood style respirators on the market, optimizing worker productivity and safety.

Available in a variety of styles, the hood is constructed of either Tychem QC or Tychem SL depending on the job application. Taped and sealed seams are also available to provided additional protection for liquid penetration encountered on-the-job or during decontamination.

#### **Reusable or Disposable**

CC20 Series respirator hoods are durable enough to reuse, yet economical enough to discard after each use, depending on the work application.

#### No Fit Testing

The hood does not require fit testing nor extensive recordkeeping. It easily accommodates beards, prescription eyewear or safety glasses.

### Powered Air or Supplied Air

The hood is available for use as a supplied air respirator (CC20 Series) or powered air respirator (PA20 and PA30 Series). A versatile hood suitable for almost any application.

# **CC20 Series Airline Respirator Selection Chart**



•20TJN - Tychem QC Single Bib Hood •20TPN - With Solvent-Resistant Lens



•20TICN - Tychem QC Double Bib Hood •20TPCN - With Solvent-Resistant Lens



1. Choose Head Top

•20SICN - Tychem SL Double Bib Hood w/Taped Seams •20TICSN - Tychem QC Double Bib Hood w/Taped Seams



•20SICH - Tychem SL Double Bib Hood w/Taped Seams, for Hard Hats •20TICH - Tychem QC Double Bib. Hood for Hard Hats



•20LFM - Loose-Fitting r Facepice, Medium •20LFL - Loose-Fitting Facepiece, Large

#### 2. Choose Suspension or Hard Hat



•20RT - Adjustable Ratchet Headband Suspension



•20TG - Adjustable Headband Suspension



•C30 - 6-point Self Sizing Suspension, Full Profile •C30R - 6-point Flex-Gear Ratchet Suspension



•**S51** - 4-point Self-Sizing Suspension, Low Profile •**S51R** - 4-point Flex-Gear Ratchet Suspension



•20BT - Breathing Tube for Hoods



•20LFLBT - Breathing Tube for Loose-Fitting Facepieces



1/4" Continuous Flow •F30, F30B, F30S -Industrial Interchange •F31 - Schrader •F32 - Snap-Tite Steel •F33 - Snap-Tite Brass •F34 - Snap-Tite Stainless •F37 - CEJN



1/4" Adjustable Flow •F40, F40B, F40S -Industrial Interchange •F41 - Schrader •F42 - Snap-Tite Steel •F43 - Snap-Tite Stainless •F44 - CEJN





1/2" Continuous Flow for Free-Air Pumps •F35, F35B, F35S -Industrial Interchange



Cool Tubes for Compressed Air •AC100030, AC100030B, AC100030S - 1/4" Industrial Interchange •AC100031 - Schrader •AC100032 - Snap-Tite Steel •AC100033 - Snap-Tite Brass •AC100034 - Snap-Tite Stainless •AC100037 - CEJN

6.



Cool Tubes for Free-Air® Pumps •FRIGITRON2000 - 1/2" Industrial Interchange •FRIGITRON200B - Brass

•FRIGITRON200B - Bra •FRIGITRON200S - Stainless Steel

Choose Belt and/or Accessories



Hot/Cold Tubes •HC240030, HC240030B, HC240030S - 1/4" Industrial Interchange •HC240031 - Schrader •HC240032 - Snap-Tite Steel •HC240033 - Snap-Tite Brass •HC240034 - Snap-Tite Stainless



5. Choose Cooling Vest System



•DC7OML - Med/Lg Cool Vest •DC7OXLXXL - XL/XXL Cool Vest •DC705XL - 5XL Cool Vest



- •DC5040, DC5040B, DC5040S -DUAL-C00L<sup>®</sup> Industrial Interchange
- •DC5041 DUAL-COOL
- Schrader •DC5042 - DUAL-COOL Snap-Tite Steel
- DC5043 DUAL-COOL Snap-Tite Brass
   DC5044 - DUAL-COOL Snap-
- Tite Stainless Steel
- •DC5047- DUAL-COOL CEJN





•20NC - Chinstrap for Hoods



•ES42 - Chinstrap fo Hard Hats



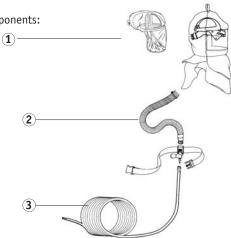
## **CC20** Systems

A complete CC20 Series Airline Respirator consists of the following three components:

- 1. Respirator Hood or Loose-Fitting Facepiece with suspension
- 2. Breathing Tube with Flow Control Device
- 3. Breathing Air Supply Hose

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

Approval No. TC-19C-154



### CC20 Series Constant Flow Respirator Systems for Use with Compressed Air

- (Hansen compatible) nipple
- 4612 nylon belt
- CC20TIC30RT Tychem QC Double Bib Hood System • Same as above with 20RT ratchet suspension



## CC20 Series Constant Flow Respirator Systems for use with Compressed Air

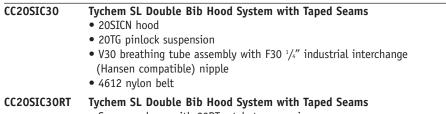
#### CC20TICH30 Tychem® QC Double Bib Hood System with Bullard Hard Hat • 20TICH hood

Model C30 hard hat

 V30 breathing tube assembly with F30 <sup>1</sup>/<sub>4</sub>" industrial interchange (Hansen compatible) nipple

- 4612 nylon belt
- CC20TICH30RT Tychem QC Double Bib Hood System for Use with Bullard Hard Hat • Same as above with C30R hard hat with Flex-Gear® suspension
- CC20TICH30S51 Tychem QC Double Bib Hood System for Use with Bullard Hard Hat • Same as above with S51 hard hat with pinlock suspension

CC20TICH30S51R Tychem QC Double Bib Hood System - for Use with Bullard Hard Hat • Same as above with S51R hard hat with Flex-Gear suspension



• Same as above with 20RT ratchet suspension





#### CC20LF30

#### Tychem QC Loose-Fitting Facepiece System

- 20LFL loose-fitting facepiece with sewn in suspension • X30 breathing tube assembly with 1/4'' industrial interchange
- (Hansen compatible) nipple
- 4612 nylon belt





## **CC20 Series Constant Flow Respirator Systems for use with Free-Air® Pumps**

| CC20SYS     | <ul> <li>One-Worker Respirator System</li> <li>CC20TIC35 respirator assembly</li> <li>EDP10 Free-Air pump</li> <li>V20100ST air supply hose</li> <li>20LCL lens covers (One pack of 25)</li> </ul>                                       |  |
|-------------|--|--|
| CC20TJ35    | <ul> <li>Tychem® QC Single Bib Hood System</li> <li>20TJN hood</li> <li>20TG pinlock suspension</li> <li>V35 breathing tube assembly with F35 1/2" industrial interchange (Hansen compatible) nipple</li> <li>4612 nylon belt</li> </ul> |  |
| CC2OTJ35RT  | Tychem QC Single Bib Hood System<br>• Same as above with 20RT ratchet suspension   |  |
| CC2OTIC35   | <ul> <li>Tychem QC Double Bib Hood System</li> <li>20TICN hood</li> <li>20TG pinlock suspension</li> <li>V35 breathing tube assembly with F35 1/2" industrial interchange (Hansen compatible) nipple</li> <li>4612 nylon belt</li> </ul> |  |
| CC2OTIC35RT | <b>Tychem QC Double Bib Hood System</b><br>• Same as above with 20RT ratchet suspension  |  |
| CC20LF35    | <b>Tychem QC Loose-Fitting Facepiece System</b><br>• 20LFL loose-fitting facepiece with sewn in suspension   |  |
|             | • X35 breathing tube assembly with $\frac{1}{2}$ industrial interchange  |  |

- (Hansen compatible) nipple
- 4612 nylon belt



## **CC20 Series Replacement Headpieces**

#### 20LFL Loose-Fitting Facepiece, Large 20LFM

20SIC

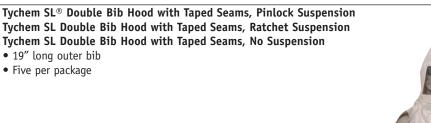
20SICR

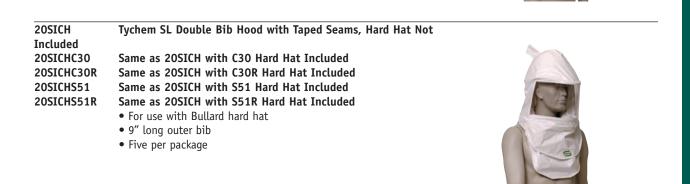
**20SICN** 

- Loose-Fitting Facepiece, Medium • Sewn in suspension
- Latex-free
- Quick-attach twist lock connection
- Five per package

• 19" long outer bib • Five per package







**20TIC** Tychem QC<sup>®</sup> Double Bib Hood with Inner Bib, Pinlock Suspension 20TICR Tychem QC Double Bib Hood with Inner Bib, Ratchet Suspension 20TICN Tychem QC Double Bib Hood with Inner Bib, No Suspension • 9" long outer bib • 10 per package





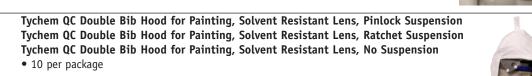
### **CC20 Series Replacement Headpieces**

| 20TICH     | Tychem® QC Double Bib Hood, for Use with Bullard Hard Hat (Not Included) |                   |
|------------|--|-------------------|
| 20TICHC30  | Tychem QC Double Bib Hood, Includes C30 Hard Hat                         |                   |
| 20TICHC30R | Tychem QC Double Bib Hood, Includes C30R Hard Hat                        |                   |
| 20TICHS51  | Tychem QC Double Bib Hood, Includes S51 Hard Hat                         | The second second |
| 20TICHS51R | Tychem QC Double Bib Hood, Includes S51R Hard Hat                        | A CAN             |
|            | • 9" long outer bib  | 1 Martin          |
|            | • Five per package   |                   |

| 20TICS  | Tychem QC Double Bib Hood with Taped Seams, Pinlock Suspension |
|---------|--|
|         | • Five per package   |
| 20TICSR | Tychem QC Double Bib Hood with Taped Seams, Ratchet Suspension |
|         | • Five per package   |
|         | • 19" long outer bib   |
| 20TICSN | Tychem QC Double Bib Hood with Taped Seams, No Suspension      |
|         | • 19" long outer bib   |
|         | • 10 per package   |

| 20TJ  | Tychem QC Single Bib Hood, Pinlock Suspension |
|-------|---|
| 20TJR | Tychem QC Single Bib Hood, Ratchet Suspension |
| 20TJN | Tychem QC Single Bib Hood, No Suspension      |
|       | • 10 per package                              |







**20TPC** 

20TPCR

20TPCN



### **CC20 Series Head Protection**

### C30 Hard Hat

- High-density polyethylene shell
- Full profile, wide brim
- Accessory slots for attachments
- 6-point self-sizing suspension
- with large, absorbent cotton brow pad (RS6PC)
- Replacement brow pads available (RBPCOTTON, RBPVINYL, RBPCOOL)
- Meets or exceeds ANSI Z89.1-2003, Type I, Class E & G requirements
- Color: white

Hard Hat





#### C30R

- Same as Model C30 above with
- 6-point Flex-Gear<sup>®</sup> ratchet suspension with large, absorbent cotton brow pad (RS6RC)
- Color: white



#### S51

#### Hard Hat

- High-density, polyethylene shell
- Flat front, low-profile design
- Accessory slots for cap attachments
- Rain trough brim
- 4-point self-sizing suspension with poly brow pad (RS4PP)
- Replacement brow pads available (RBPCOTTON, RBPVINYL, RBPCOOL)
- Meets or exceeds ANSI Z89.1-2003, Type I, Class E & G requirements
- Color: white



#### S51R

- Hard Hat Same as Model S51 above with
- 4-point Flex-Gear ratchet suspension with poly brow pad (RS4RP)
- Color: white



## **CC20 Series Head Protection Replacement Parts**

| RS6PC | <ul> <li>6-pt. Suspension</li> <li>6-point self-sizing suspension</li> <li>Large, absorbent cotton brow pad</li> <li>Replacement brow pads available (RBPCOTTON, RBPVINYL, RBPCOOL)</li> <li>Vertical height adjustments (two front, three rear)</li> <li>For Models C30 and C33</li> <li>Hard hat not included</li> </ul>  |  |
|-------|---|--|
| RS6RC | <ul> <li>6-pt. Suspension</li> <li>6-point Flex-Gear® ratchet suspension</li> <li>Large, absorbent cotton brow pad</li> <li>Replacement brow pads available (RBPCOTTON, RBPVINYL, RBPCOOL)</li> <li>Flex-points and nape cushion</li> <li>Large, easy-to-turn ratchet knob</li> <li>Vertical height adjustments (two front, three rear)</li> <li>For Models C30R and C33R</li> <li>Hard hat not included</li> </ul> |  |
| RS4PC | <ul> <li>4-pt. Suspension</li> <li>4-point self-sizing suspension</li> <li>Large cotton brow pad</li> <li>Replacement brow pads available (RBPCOTTON, RBPVINYL, RBPCOOL)</li> <li>Vertical height adjustments (two front, two rear)</li> <li>For Model S51</li> <li>Hard hat not included</li> </ul>  |  |
| RS4RC | <ul> <li>4-pt. Suspension</li> <li>4-point Flex-Gear ratchet suspension</li> <li>Large Cotton brow pad</li> <li>Replacement brow pads available (RBPCOTTON, RBPVINYL, RBPCOOL)</li> <li>Flex-points and nape cushion</li> <li>Large, easy-to-turn ratchet knob</li> <li>For Model S51R</li> <li>Hard hat not included</li> </ul>  |  |

### ES42

• Elastic chinstrap

Chinstrap

• For Models C30R and S51R

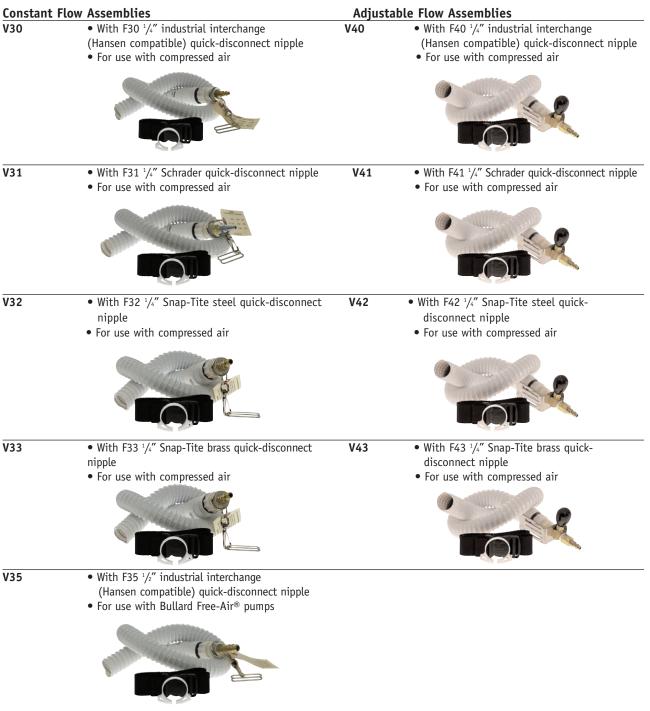


S σ ס -P D  $\mathbf{P}$ -고 ቦ S σ b **H** 0 -S



## **CC20 Series Breathing Tube Assemblies for Hoods**

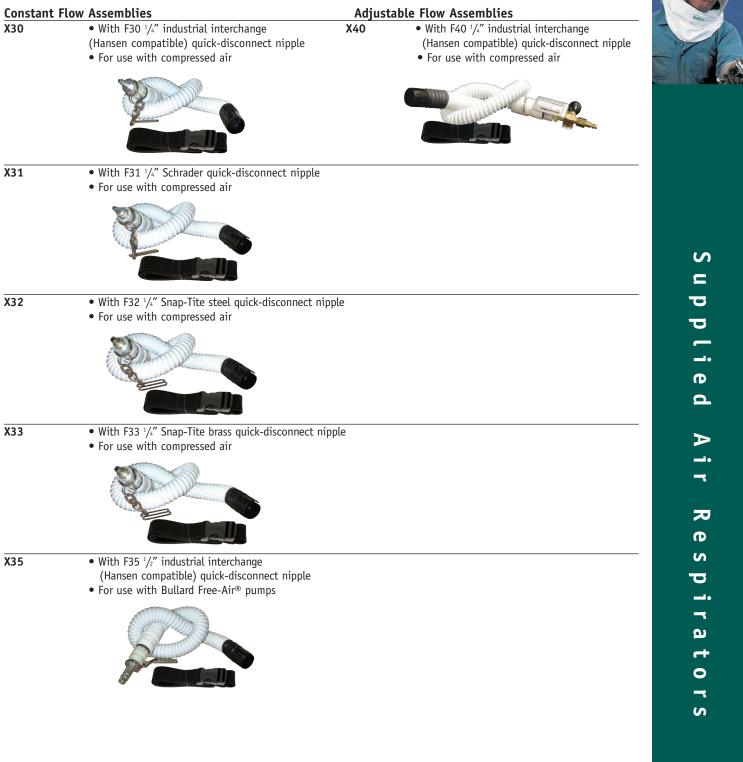
- assemblies include 20BT breathing tube, 4612 nylon belt and S18051 clamp



For heating and cooling options, see the Body Temperature Management section on pages 182-187.

# CC20 Series Breathing Tube Assemblies for Loose-Fitting Facepieces

- assemblies include 20LFBT breathing tube and 4612 nylon belt



For heating and cooling options, see the Body Temperature Management section on pages 182-187.

# **CC20 Series Breathing Tube Replacement Parts**

| F30<br>F30B<br>F30S<br>F30SD | Constant Flow Control Valve<br>Constant Flow Control Valve, Brass with Nylon Belt<br>Constant Flow Control Valve, Stainless Steel with Nylon Belt<br>Constant Flow Control Valve, Stainless Steel with Decon Belt<br>• 1/4" industrial interchange (Hansen compatible) quick-disconnect nipple<br>• Threaded hose connector<br>• Connects to 88VXBT, L99BT, 20BT or 20LFBT<br>• For use with compressed air |
|------------------------------|---|
| F31                          | Constant Flow Control Valve<br>• Same as above with '/4'' Schrader quick-disconnect nipple  |
| F32                          | Constant Flow Control Valve<br>• Same as F30 above with 1/4" Snap-Tite steel quick-disconnect nipple  |
| F33                          | Constant Flow Control Valve<br>• Same as F30 above with <sup>1</sup> /4" Snap-Tite brass quick-disconnect nipple  |
| F34                          | Constant Flow Control Valve<br>• Same as F30 above with 1/4" Snap-Tite stainless steel quick-disconnect nipple  |

# **CC20 Series Breathing Tube Replacement Parts**

• For use with Bullard Free-Air<sup>®</sup> pumps

### Constant Flow Control Valve, Steel Constant Flow Control Valve, Brass Constant Flow Control Valve, Stainless Steel • 1/2" industrial interchange (Hansen compatible) quick-disconnect nipple • Threaded hose connector • Nylon belt • Connects to 88VXBT, L99BT, 20BT or 20LFBT



F37

F35

F35B

F35S

### **Constant Flow Control Valve**

- $\bullet$  Same as F35 above with  ${}^{\scriptscriptstyle 1}\!/\!{}^{\prime\prime}$  CEJN quick-disconnect nipple
- For use with compressed air



| F40    | Adjustable Flow Control Valve, Steel, Nylon Belt   |  |
|--------|--|--|
| F40B   | Adjustable Flow Control Valve, Brass, Nylon Belt   |  |
| F40S   | Adjustable Flow Control Valve, Stainless Steel, Nylon Belt   |  |
| F40VDB | Adjustable Flow Control Valve, Vinyl Decon Belt  |  |
|        | • <sup>1</sup> / <sub>4</sub> " industrial interchange (Hansen compatible) quick-disconnect nipple |  |
|        | Threaded hose connector  |  |
|        | Comments to CONVET LOOPT COPT on COLEPT  |  |

- Connects to 88VXBT, L99BT, 20BT or 20LFBT
- For use with compressed air

### F41 Adjustable Flow Control Valve

- Same as F40 above with 1/4" Schrader quick-disconnect nipple
- Nylon belt



S L

# **CC20 Series Breathing Tube Replacement Parts**

| F42 | Adjustable Flow Control Valve• 1/4" Snap-Tite steel quick-disconnect nipple• Threaded hose connector• Nylon belt• Connects to 88VXBT, L99BT, 20BT or 20LFLBT• For use with compressed air |
|-----|---|
| F43 | Adjustable Flow Control Valve<br>• Same as F42 above with '/4" Snap-Tite brass quick-disconnect nipple  |
| F44 | Adjustable Flow Control Valve<br>• Same as F42 above with '/4" Snap-Tite stainless steel quick-disconnect nipple  |
| F45 | Adjustable Flow Control Valve<br>• Same as F42 above with '/4" Industrial Interchange brass<br>quick-disconnect nipple  |
| F47 | Flow Control Valve • Same as F42 above with 1/4" CEJN quick-disconnect nipple   |

| 20BT               | ries Breathing Tube Replacement Parts Breathing Tube for Hoods • Nipple not included • S18051 clamp |         |
|--------------------|---|---------|
| 20LFBT             | <b>Breathing Tube for Loose-Fitting Facepieces</b> <ul> <li>Nipple not included</li> </ul>          |         |
|                    |   |         |
| S18051             | <b>Breathing Tube Clamp</b> <ul> <li>10 per package</li> </ul>                                      | Suppli  |
| 4612               | Nylon Belt  | ed Ai   |
| 36501              | Vinyl Decon Belt  | r Respi |
| 20QCBTC<br>20SLBTC | Tychem <sup>®</sup> QC Breathing Tube Cover<br>Tychem SL Breathing Tube Cover                       | rat     |

20

# **Innovative and Proven**

Similar to the proven design of the Bullard CC20, the top performing hood in the OSHA-acknowledged ORC Study, the RT Series hood family represents a significant improvement in the realm of Tychem<sup>®</sup> hood respiratory protection. In addition to the recognized benefits of hood-style respirators (no fit testing, no facial hair issues and eyewear accommodation), the RT Series offers several unique, customer-driven features that make it stand out from other Tychem hoods.

### Patent-pending Air Delivery System

Air flows into the neck cuff and is then directed through a three-channel air delivery system that delivers the air over the user's head, down the front of the lens and into the breathing zone. This unique air delivery method provides for a positive seal, minimizes fogging of the lens, minimizes dry eyes and nasal passages, and provides a reservoir of breathing air to help maintain positive pressure.

### **Panoramic View**

The domed feature of the RT Series hood lens, provides added visibility and allows more light in minimizing the "closed-in," claustrophobic feeling sometimes experienced in other respirator hoods. A latex-free elastic band located in the neck cuff promotes curvature of the lens as well as aiding in the neck cuff's inflation.

### Long Inner and Outer Bibs

The 20" long outer bibs of the RT Series provide splash protection and feature Velcro<sup>®</sup> straps that connect the front and rear outer bibs providing a custom fit, eliminating the possibility of the bib "flipping up" during bending or scooping operations and provide added stability to the hood.

Inner bibs add an additional barrier between the worker and the contaminants. They are long enough to tuck in (front and rear) with less chance to work loose during movement of the arms and shoulders. With the bibs tucked in, the excess air flowing out of the respirator will travel across the user's body, creating a cooling effect. Independent front and rear inner bibs eliminate the shoulder fit issue seen with many hoods.

### Tychem SL (Saranex<sup>®</sup>) Visual

The RT Series Hood is available in either white Tychem QC (RT1) or gray Tychem SL (RT2).

The RT2, constructed of gray Tychem SL features taped and sealed seams to minimize the potential for any inward leakage at the

sewn seams. Tychem SL is Saranex coated and provides excellent permeation characteristics against more caustic chemicals. The gray color allows for users to quickly and easily identify the hood appropriate for the task, and it allows for supervisors to visually confirm that their employees are wearing the appropriate hood.

### **Ultimate Disposability**

The RT Series Hood is available as a stand-alone replacement hood for those applications that allow for decontamination and reuse of the breathing tube. For those applications or processes that do not allow for decontamination, the RT Series is available fully assembled with a disposable lightweight breathing tube. Individually packaged with the breathing tube already attached, the user needs only to don the hood and connect the flow control device. After exiting from the area, the user may dispose of the complete assembly.

# RT Series Hoods Perform in SWPF Study

At Bullard's request, the US Army's RDECOM (Research Development and Engineering Command) Center performed a simulated workplace protection factor (SWPF) study using the well-respected ORC Study protocol. Exercises were chosen to simulate activities that may be seen in a pharmaceutical manufacturing application. Using 15 test subjects, with 10 exercises in four different trials, the RT Series Hood was shown to have 5th percentile SWPFs in excess of 100,000!

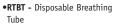


# **RT** Series Airline Respirator Selection Chart





•20BT - Breathing Tube for Hoods





•RT1 - Tychem QC Double Bib •RT2 - Tychem SL (Saranex coated) Double Bib Hood with Taped Seams

1/4" Continuous Flow

•F30, F30B, F30S -

•F31 - Schrader

Industrial Interchange

•F32 - Snap-Tite Steel

•F33 - Snap-Tite Brass



**Cool Tubes for Compressed Air** •AC100030, AC100030B, AC100030S - Industrial Interchange •AC100031 - Schrader •F34 - Snap-Tite Stainless •AC100032 - Snap-Tite Steel



Hot/Cold Tubes •HC240030, HC240030B, HC240030S - Industrial Interchange •HC240031 - Schrader •HC240032 - Snap-Tite Steel



•4612 - Nylon Belt

•36501 - Decon Belt



•HS - Heat Shield

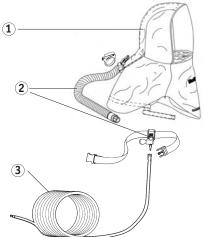
# **RT Systems**

A complete RT Series Airline Respirator consists of the following three components:

- 1. Respirator Hood
- 2. Breathing Tube with Fitting or Optional Climate Control Assembly
- 3. Breathing Air Supply Hose

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

Approval No. TC-19C-412, Type C, Continuous Flow Class



# RT Series Constant Flow Respirator Systems for Compressed Air

### RT130

### Constant Flow Respirator Assembly

- RT1 Tychem QC double bib hood system extra-large lens
- No suspension required
- V30 breathing tube assembly with F30 <sup>1</sup>/<sub>4</sub>" industrial interchange (Hansen compatible) nipple and 4612 nylon belt
- For use with compressed air



### RT230

### **Constant Flow Respirator Assembly**

- RT2 Tychem SL (gray, Saranex coated) double bib hood system extra-large lens
- Taped seams
- No suspension required
- V30 breathing tube assembly with F30 <sup>1</sup>/4" Industrial Interchange (Hansen compatible) nipple and 4612 nylon belt
- For use with compressed air



# **RT Series Disposable Respirator Systems**

### RT1DA Constant Flow Disposable Assembly

- RT1 Tychem QC double bib hood system extra-large lens
- No suspension required
- RTBT lightweight disposable breathing tube assembly
- Preassembled and individually bagged
- Flow control device sold separately



### RT2DA

### **Constant Flow Disposable Assembly**

- RT2 Tychem SL (gray, Saranex coated) double bib hood system extra-large lens
- No suspension required
- RTBT lightweight disposable breathing tube assembly
- Preassembled and individually bagged
- Flow control device sold separately



### RT1

- Tychem QC Double Bib Hoods • Inner bib, 20" long outer bib
- Bib retention straps
- Extra-large lens
- No suspension required
- 10 per package



### Tychem SL (Saranex coated) Double Bib Hoods

- Inner bib, 20" long outer bib, taped seams
- Bib retention straps
- Gray color for visual indication of Tychem SL
- Extra-large lens
- No suspension required
- Five per package





# **RT Series Breathing Tube Assemblies**

| V30       | <ul> <li>Constant Flow Breathing Tube Assembly for Hoods</li> <li>20BT breathing tube</li> <li>F30 <sup>1</sup>/<sub>4</sub>" industrial interchange (Hansen compatible) quick-disconnect nipple</li> <li>4612 nylon belt</li> <li>\$18051 Clamp</li> <li>For use with compressed air</li> </ul> |                               |
|-----------|--|-------------------------------|
| V31       | <ul> <li>Constant Flow Breathing Tube Assembly for Hoods</li> <li>20BT breathing tube</li> <li>F31 <sup>1</sup>/<sub>4</sub>" Schrader quick-disconnect nipple</li> <li>\$18051 Clamp</li> <li>For use with compressed air</li> </ul>  |                               |
| V32       | <b>Constant Flow Breathing Tube Assembly for Hoods</b><br>Same as V31 above with:<br>• F32 <sup>1</sup> /4" Snap-Tite steel quick-disconnect nipple  |                               |
| V33       | <b>Constant Flow Breathing Tube Assembly for Hoods</b><br>Same as V32 above with:<br>• F33 <sup>1</sup> / <sub>4</sub> " Snap-Tite brass quick-disconnect nipple   |                               |
| V34       | <b>Constant Flow Breathing Tube Assembly for Hoods</b><br>Same as V32 above with:<br>• F34 <sup>1</sup> / <sub>4</sub> " Snap-Tite stainless steel quick-disconnect nipple   |                               |
| For heati | ng and cooling options, see the Body Temperature Manageme  | ent section on pages 182-187. |

# **RT Series Breathing Tube Replacement Parts**

### F30

- Constant Flow Control Valve

  '/4" industrial interchange (Hansen compatible) quick-disconnect nipple
- Threaded hose connector
- 4612 nylon belt
- Connects to 88VXBT, L99BT, 20BT, RTBT or 20LFBT
- For use with compressed air





### F31

- Constant Flow Control Valve
- 1/4" Schrader quick-disconnect nipple
- Threaded hose connector
- 4612 nylon belt
- Connects to 88VXBT, L99BT, 20BT, RTBT or 20LFBT
- For use with compressed air





### F32

### Constant Flow Control Valve

- 1/4" Snap-Tite steel quick-disconnect nipple
- Threaded hose connector
- 4612 nylon belt
- Connects to 88VXBT, L99BT, 20BT, RTBT or 20LFBT
- For use with compressed air





### Constant Flow Control Valve

- 1/4" Snap-Tite brass quick-disconnect nipple
- Threaded hose connector
- 4612 nylon belt
- Connects to 88VXBT, L99BT, 20BT, RTBT or 20LFBT
- For use with compressed air



### F34

### Constant Flow Control Valve

- $\frac{1}{4}$ " Snap-Tite stainless steel quick-disconnect nipple
- Threaded hose connector
- 4612 nylon belt
- Connects to 88VXBT, L99BT, 20BT, RTBT or 20LFBT
- For use with compressed air



For heating and cooling options, see the Body Temperature Management section on pages 182-187.



d d n S

P

Q

ス

P

S

D

rato

S

# **RT Series Breathing Tube Replacement Parts**

| 20BT               | <b>Breathing Tube for Hoods</b> <ul> <li>Nipple not included</li> <li>\$18051 clamp</li> </ul> |  |
|--------------------|--|--|
| RTBT               | <b>Disposable Breathing Tube</b><br>• Nipple not included<br>• S18051 clamp                    |  |
| S18051             | <b>Breathing Tube Clamp</b><br>• 10 per package  |  |
| 4612               | Nylon Belt   |  |
| 36501              | Vinyl Decon Belt   |  |
| 20QCBTC<br>20SLBTC | Tychem QC Breathing Tube Cover<br>Tychem SL Breathing Tube Cover                               |  |

# Respiratory and Full Body Dermal Protection.

The Bullard PC90 Series Airline Respirator stands apart from other Type C, continuous flow respirators as a NIOSH approved airline respirator that includes a full body containment suit. Designed especially for potent-compound applications, the PC90 respirator provides the wearer with respiratory protection from airborne contaminants and full-body dermal protection to help prevent contaminants from being absorbed by the skin. This exclusive system also helps protect products against contamination during the manufacturing process – an important safeguard in many industries.

# **Complete coverage**

The lightweight, parka-style hood and full-body suit create a strong and tear-resistant physical barrier to airborne contaminants. As a positive pressure device, air pushes outward from the worker, helping protect the worker's respiratory tract and entire body from exposure to airborne contaminants.

# **Durable Material**

The parka-style hood and suit are constructed of high strength, dust-free Tychem<sup>®</sup> SL, a Tyvek<sup>®</sup> based material that is laminated with Saranex 23-P. Seams are serged, then taped and sealed to further prevent the entry of airborne contaminants.

# **Enhanced Worker Comfort and Productivity**

The PC90 is made of a lightweight, supple material for easy bending and stretching. For cooling on the job, the respirator is approved for use with the Bullard DC60 DUAL-COOL<sup>®</sup>, a climate control system that features separate air entries to deliver air to a cooling vest and to the hood, dropping air temperature by as much as  $30^{\circ}$  F ( $17^{\circ}$ C).

# **Reusable or Disposable**

The PC90 parka and containment suit are durable enough for limited reuse, yet inexpensive enough to discard after each use, depending on the work application. They are easily decontaminated in air or water decontamination showers.

# **Unique Air Delivery System**

As air enters the hood, the inner air trough inflates, providing a snug, comfortable fit around the neck and a continuous flow of air directly to the worker's breathing zone. Excess air exits from the hood and funnels into the containment suit. The air moves over the body to provide some cooling and exits through one-way exhaust valves.

# **No Fit Testing**

Hood-style respirators do not require fit testing and elaborate record keeping. The parka-style hood easily accommodates beards, prescription eyewear or safety glasses.



Order Now: 877-BULLARD • www.bullard.com

# **PC90 Airline Respirator Selection Chart**



•PC90ML - Medium/Large Respirator Parka



Large Respirator Parka



•PC90XL - Extra-Large/XX-•PC90XXXL - XXX-Large Respirator Parka

### **Choose Containment Suit** 2.



•CS90S - Small Containment Suit •CS90M - Medium Containment Suit •CS90L - Large Containment Suit •CS90XL - Extra-Large Containment Suit

•CS90XXL - XX-Large Containment Suit

•CS90XXXL - XXX-Large Containment Suit



# 4. Choose Breathing Tube with Flow Control



- •C40 Adjustable Flow, 1/4" Industrial Interchange •C41 - Adjustable Flow Breathing Tube Assembly, 1/4" Schrader •C42 - Adjustable Flow Breathing Tube Assembly, 1/4" Snap-Tite Steel •C43 - Adjustable Flow
- Breathing Tube Assembly, 1/4" Snap-Tite Brass



# 5. Choose Cooling Vest System



•DC70ML - Med/Lg Cool Vest •DC70XLXXL - XL/XXL Cool Vest •DC705XL - 5XL Cool Vest



- •DC6040, DC6040B, DC6040S -DUAL-COOL<sup>®</sup> Industrial Interchange
- •DC6041 DUAL-COOL Schrader •DC6042 - DUAL-COOL Snap-Tite
- Steel •DC6043 - DUAL-COOL Snap-Tite Brass
- •DC6044 DUAL-COOL Snap-Tite Stainless Steel
- •DC6047 DUAL-COOL CEJN

# 6. Choose Belt and/or Accessories



•4612 - Nylon Belt •36501 - Decon Belt •20NC - Chinstrap

# **PC90 Series Systems**

A complete PC90 Series Airline Containment Respirator consists of the following five components: (1)-

- 1. Parka-style Respirator Hood
- 2. Suspension
- 3. Containment Suit
- 4. Breathing Tube Assembly with Optional Climate Control Device
- 5. Breathing Air Supply Hose

All of these components must be present and properly assembled to constitute a NIOSH approved respirator.

Approval No. TC-19C-280, Type C, Continuous Flow Class

# **PC90 Series Parkas**

| PC90ML<br>PC90XL<br>PC90XXL | Medium/Large Respirator Parka<br>Extra-Large Respirator Parka<br>XX-Large Respirator Parka<br>• Tychem SL material<br>• Seams are taped and thermally sealed<br>• Includes sewn in lens |  |
|-----------------------------|---|--|
|                             | <ul> <li>Seams are taped and thermally sealed</li> </ul>  |  |
| PC90 Se                     | ries Headband Suspensions   |  |

20RT

Adjustable Ratchet Headband Suspension • Sportek<sup>™</sup> brow pad

20TG

Adjustable Pinlock Headband Suspension • Sportek<sup>™</sup> brow pad



(2)

(3)

(4)

(5)

20NC

- **Elastic Chinstrap** 
  - For 20TG and 20RT suspensions
  - 10 per package





S σ J \_ P Q  $\mathbf{D}$ -10 -고 P S J -لم 1 0 -S

# **PC90 Series Containment Suits**

| CS90S    | Small Containment Suit       |
|----------|------------------------------|
| CS90M    | Medium Containment Suit      |
| CS90L    | Large Containment Suit       |
| CS90XL   | Extra-Large Containment Suit |
| CS90XXL  | XX-Large Containment Suit    |
| CS90XXXL | XXX-Large Containment Suit   |
|          | Tuchom SL material           |

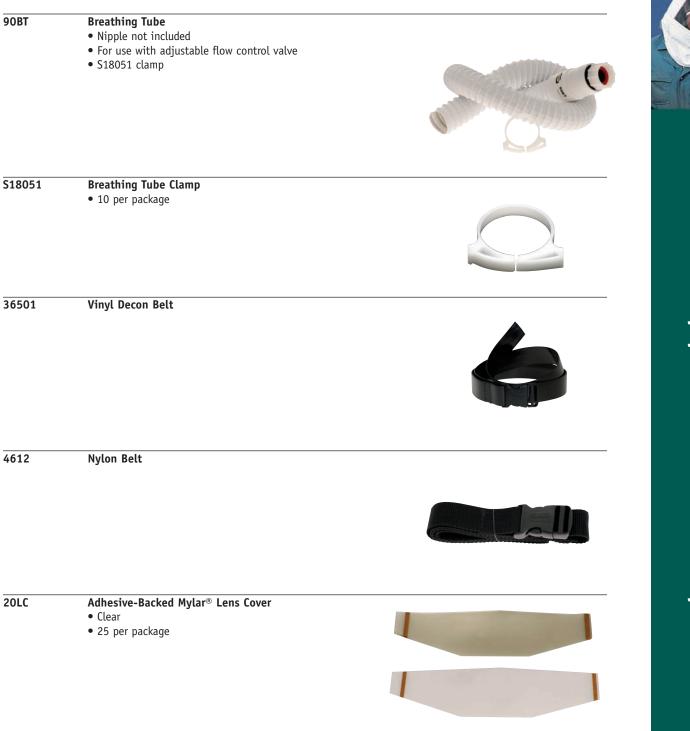
- Tychem SL material
- Seams are taped and thermally sealed
- Four air exhaust valves
- Includes sewn in glove liners, elastic stirrups and elastic neck closure with barrel cinch



# PC 90 Series Breathing Tube Assemblies

| C40 | <ul> <li>Adjustable Flow Breathing Tube Assembly, Industrial Interchange</li> <li>90BT breathing tube</li> <li>1/4" industrial interchange (Hansen compatible) nipple with adjustable flow control valve</li> <li>Vinyl decon belt</li> <li>\$18051 clamp</li> <li>For use with compressed air</li> </ul> |
|-----|---|
| C41 | <ul> <li>Adjustable Flow Breathing Tube Assembly, Schrader</li> <li>Same as above with <sup>1</sup>/<sub>4</sub>" Schrader nipple with adjustable flow control valve</li> </ul>   |
| C42 | <ul> <li>Adjustable Flow Breathing Tube Assembly, Snap-Tite Steel</li> <li>Same as above with <sup>1</sup>/<sub>4</sub>" Snap-Tite nipple, steel<br/>with adjustable flow control valve</li> </ul>  |
| C43 | <ul> <li>Adjustable Flow Breathing Tube Assembly, Snap-Tite Brass</li> <li>Same as above with <sup>1</sup>/4" Snap-Tite nipple, brass<br/>with adjustable flow control valve</li> </ul>   |

# **PC90 Series Replacement Parts and Accessories**



# **Blasting and Grinding Respirators**

Bullard has been a leader in the abrasive blasting and grinding industry since the 1930s when it developed the supplied air abrasive blasting respirator for the construction of the Golden Gate Bridge. Since then, Bullard has continued to develop respiratory protection products for not only abrasive blasters, but also for industrial grinding.

# **Abrasive Blasting**

Abrasive blasting respirators are defined as Type CE by NIOSH according to 42CFR84 as follows:

84.130 Supplied-air respirators; description.

(f) "Type "CE" supplied-air respirators. A type "C" supplied-air respirator equipped with additional devices designed to protect the wearer's head and neck against impact and abrasion from rebounding abrasive material, and with shielding material such as plastic, glass, woven wire, sheet metal, or other suitable material to protect the window(s) of facepieces, hoods and helmets which do not unduly interfere with the wearer's vision and permit easy access to the external surface of such window(s) for cleaning."

Bullard offers abrasive blasters two choices in respiratory protection: 88VX and Lancer.

The 88VX is rated as a continuous flow Type CE abrasive blasting respirator, complete with a durable cape to protect the wearer's head and neck against abrasive rebound, as well as a durable helmet which meets the ANSI head protection standard requirements. The helmet has both an inner lens and an outer lens to meet the requirements of 42CFR.130 explained above. The 88VX has been recognized by OSHA to meet a 1,000 APF for use in Lead in Construction.

The Lancer has the same style protective helmet and cape system as the 88VX, but also carries the additional rating for pressure demand since it includes a tight fitting half mask inside the helmet. This configuration meets the OSHA's recommended assigned protection factor of 1,000.

### Grinding

Bullard was one of the first to offer a hood-style respirator designed specifically with grinding operations in mind. The GR50 is lightweight and fully protective with a Nomex outer hood, flame retardant inner bib and the ability to integrate a hard hat.

### Solutions

Whether blasting or grinding, Bullard can provide the appropriate respiratory protection.



Order Now: 877-BULLARD • www.bullard.com

# The most popular blasting respirator in the industry.

- 1,000 Assigned Protection Factor
- Comfortable Fit
- Wide Field of Vision
- Abrasive Rebound Protection to Head, Neck and Upper Torso

The Bullard 88VX Series airline respirators offer advancements in comfort and reliable respiratory protection for abrasive blasters and painters.

The 88VX Respirator is NIOSH approved as a Type C and CE Continuous Flow Class Respirator (Approval No. TC-19C-293).

# The 88VX<sup>™</sup> Series Advantage

# **Advanced Protection**

88VX Series airline respirators provide advanced protection in the harsh exposures of blasting and painting. The snug, yet comfortable, sewn in neck cuff provides a physical barrier to airborne contaminants and helps maintain positive pressure within the helmet. A new double lining in the neck area now enhances durability and protection.

# **Comfortable Fit**

A lightweight inner shell with an adjustable headband suspension holds the respirator firmly and comfortably on the wearer's head. Airflow is channeled directly to the user's breathing zone for easy breathing. The helmet easily accommodates beards, prescription eye wear or safety glasses. No fit testing is required.

# **Head Protection**

The helmet provides top impact and penetration protection. The helmet and cape help protect the worker's entire head, face and upper body from abrasive rebound, airborne contaminants and messy overspray.

# **Optimum Visibility**

The wide-angle faceshield lens and headband suspension system are positioned for optimum visibility. With the translucent yellow helmet, workers don't experience a closed-in feeling.

# **Overall Convenience**

88VX respirator components are easily replaceable, saving you lost time on the job as well as the inconvenience of having to replace the entire respirator assembly.

# **Climate Control**

Optional climate control assemblies permit workers to warm or cool incoming air to maximize comfort and improve productivity.

Q

# **Features and Benefits**

# Injection-molded inner shell

Key slots for suspension are molded in the shell to provide a better fit. The shell is also lightweight, compact and portable.

### Latch design on window frame and helmet

Stronger, lower profile provides more tension on window and protection for the interior cape hook.

# Forest green window frame gasket material

More durable, enhanced resistance to temperature variations, better conformity to window frame. Easier to install into hood and replace inner lens.

### Forest green window frame material

More flexible and durable with a better gasket seal. Easier to install outer lens.

# Breathing tube with more flexible coating and forest green cuffs

More flexible and durable, reducing the amount of strain on the helmet and thus the user's neck.

### Cape design with double lining above neck

Double lining enhances durability, comfort and protection.

### Latch position behind window frame

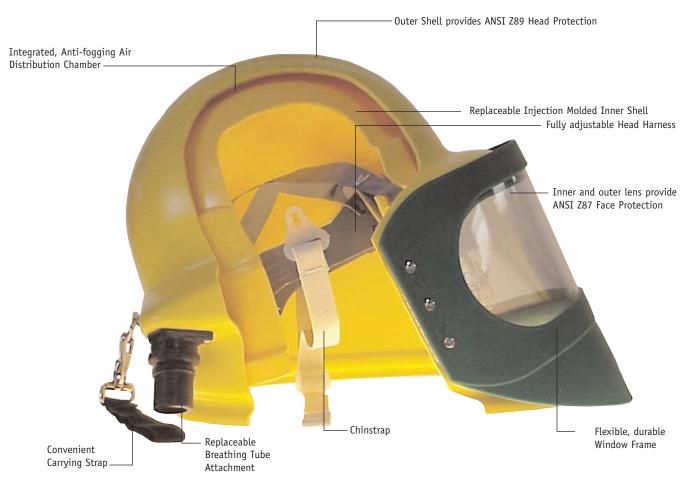
Reduces difficulty of attaching cape to helmet and prevents accidental opening.

# Breathing tube positioning loops on back of cape to retain the breathing tube

Reduced snagging hazard on breathing tube.

### Mylar<sup>®</sup> cover lens with new pull-tab design

Easier to pull off used cover lens.



# **88VX Series Airline Respirator Selection Chart**





•88VXTG - Adjustable Pinlock Suspension •88VXRT - Adjustable Ratchet Suspension

# 3. Choose Breathing Tube



•88VXBT - Nipple not included



•F30, F30B, F30S -Constant Flow Control Valve, 1/4" Industrial Interchange •F31 - Schrader •F32 - Snap-Tite Steel •F33 - Snap-Tite Brass •F34 - Snap-Tite Stainless



•F35, F35B, F35S for Free-Air Pumps -Constant Flow Control Valve, 1/2" Industrial Interchange



4. Choose Flow Control Device

Cool Tubes for Compressed Air •AC100030, AC100030B, AC100030S - 1/4" Industrial Interchange •AC100031 - Schrader •AC100032 - Snap-Tite Steel

- •AC100033 Snap-Tite
- Brass •AC100034 - Snap-Tite
- Stainless
- •AC100037 CEJN



Cool Tubes for Free-Air® Pumps •FRIGITRON2000 - 1/2" Industrial Interchange •FRIGITRON2000B -Brass •FRIGITRON2000S -Steel



•46VX - 28" Nylon Cape •13VX - 38" Nylon Cape •21VX - 38" Nylon Cape



•21821 - 38" "Golden Gate" Nylon Cape •36VX - 38" Length Parka

•36XLVX - 38" Length Park •36XLVX - 38" Length Parka



•DC70ML - Med/Lg Cool Vest •DC70XLXXL - XL/XXL Cool Vest

•DC705XL - 5XL Cool Vest



•DC5040 - DUAL-COOL® Industrial Interchange

- •DC5041 DUAL-COOL Schrader
- •DC5042 DUAL-COOL Snap-Tite Steel •DC5044 - DUAL-COOL Snap-Tite
- Stainless
- •DC5047 DUAL-COOL CEJN

 7. Choose Belt and/or Accessories

 Image: Constraint of the state of th

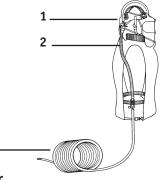
# Order Now: 877-BULLARD • www.bullard.com

A complete 88VX<sup>™</sup>Series Airline Respirator consists of the following three components:

- 1. Respirator Helmet and Cape
- 2. Breathing Tube with Fitting or Optional Climate Control Assembly
- 3. Breathing Air Supply Hose

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

Approval No. TC-19C-293, Type C and CE, Continuous Flow Class



3

# 88VX<sup>™</sup> Series Respirator Assemblies for use with Compressed Air

| Respirators with 46VX | Nylon Cape - 28" Length  |
|-----------------------|--|
| 88VX3230              | F30 Constant Flow 1/4" Industrial Interchange Fitting                            |
| 88VXR3230             | Rectangular Window Version of 88VX3230   |
| 88VX3240              | F40 Adjustable Flow 1/4" Industrial Interchange Fitting                          |
| 88VX3230H             | F30 Constant Flow 1/4" Industrial Interchange Fitting with 4696 Starter Hose 25' |
| 88VX3231              | F31 Constant Flow 1/4" Schrader Fitting  |

All systems above include:

- Breathing tube assembly
- Inner and outer lens with Mylar lens cover (package of five)



# Respirators with 13VX Nylon Cape - 38" Length88VX1330F30 Constant Flow 1/4" Industrial Interchange Fitting

System above includes:

- Breathing tube assembly
- Inner and outer lens with Mylar lens cover (package of five)



# Respirators with 21VX Nylon Cape - 38" Length88VX2130F30 Constant Flow 1/4" Industrial Interchange Fitting88VXR2130Rectangular Window Version or 88VX2130

88VX2140 F40 Adjustable Flow 1/4" Industrial Interchange Fitting

All systems above include:

- Breathing tube assembly
- Inner and outer lens with Mylar lens cover (package of five)



# 88VX<sup>™</sup> Series Respirator Assemblies for Use with Compressed Air

Respirators with 36VX Hibernia Parka (Tan) - 38" length88VX3630F30 Constant Flow 1/4" Industrial Interchange Fitting88VX36XL3088VX3630 with Extra-Large Parka

All systems above include:

- Breathing tube assembly
- Inner and outer lens with Mylar<sup>®</sup> lens cover (package of five)



### 88VX<sup>™</sup> Series Respirator Assemblies for use with Bullard Free-Air<sup>®</sup> Pumps Complete Respirator Work System 88VXSYS 88VX3235 Respirator with 46VX Nylon Cape - 28″ length

S 88VX3235 Respirator with 46VX Nylon Cape - 28" length ADP20 Free-Air Pump V2050ST Air Supply Hose FRIGITRON2000 climate control device

- All systems above include:
- Breathing tube assembly
- Inner and outer lens with Mylar lens cover (package of five)



### Respirators with 46VX Nylon Cape - 28" length

88VX3235 F35 Constant Flow 1/2" Industrial Interchange Fitting
 88VX3235H100 F35 Constant Flow 1/2" Industrial Interchange Fitting with
 V20100ST Supply Hose, 100'

All systems above include:

- Breathing tube assembly
- Inner and outer lens with Mylar lens cover (package of five)





# 88VX<sup>™</sup> Breathing Tube Assemblies

### **Constant Flow Breathing Tube Assemblies**

- EVX30 F30 <sup>1</sup>/<sub>4</sub>" Industrial Interchange (Hansen compatible) Quick-Disconnect Nipple
- EVX31 F31 <sup>1</sup>/<sub>4</sub>" Schrader Quick Disconnect Nipple
- EVX32 F32 <sup>1</sup>/<sub>4</sub>" Snap-Tite Steel Quick Disconnect Nipple
- EVX33 F33 1/4" Snap-Tite Brass Quick Disconnect Nipple
- EVX37 F37 <sup>1</sup>/<sub>4</sub>" CEJN Quick Disconnect Nipple
- EVX38 F38 <sup>1</sup>/<sub>4</sub>" Bayonet Quick Disconnect Nipple
  - All above include:
  - 88VXBT breathing tube
  - 4612 nylon belt



### Adjustable Flow Breathing Tube Assemblies

- EVX40 F30 1/4" Industrial Interchange (Hansen compatible) Quick-Disconnect Nipple
- EVX41 F31 <sup>1</sup>/<sub>4</sub>" Schrader Quick Disconnect Nipple
- EVX42 F32 <sup>1</sup>/<sub>4</sub>" Snap-Tite Steel Quick Disconnect Nipple
- EVX43 F33 1/4" Snap-Tite Brass Quick Disconnect Nipple
- EVX47 F37 <sup>1</sup>/<sub>4</sub>" CEJN Quick Disconnect Nipple
- EVX48 F38 1/4" Bayonet Quick Disconnect Nipple
  - All above include:
  - 88VXBT breathing tube
  - 4612 nylon belt

### **Constant Flow Breathing Tube Assembly**

EVX35 F35 1/4" Industrial Interchange (Hansen compatible) Quick-Disconnect Nipple

### All above include: • 88VXBT breathing tube

- OOVADI Diedliiniy lu
- 4612 nylon belt



### **Cool Tube Assembly for 88VX<sup>™</sup> Series Respirators**

### AC1000 Cool Tube Assembly

- 1/4" industrial interchange (Hansen compatible) quick-disconnect nipple
- Adjustable temperature control
- 4612 nylon belt
- Approved for use with 88VX, CC20 and GR50 Series respirators
- For use with compressed air



For additional heating and cooling control options, see the Body Temperature Management section on pages 182-187.

# 88VX<sup>™</sup> Series Replacement Valves for Breathing Tube Assemblies for use with Compressed Air

F30

Constant Flow Control • '/<" Industrial Interchange (Hansen compatible) quick-disconnect nipple • Threaded hose connector

- Connects to 88VXBT, L99BT, 20BT or 20LFBT
- Nylon belt





# Blasting and Grinding

### F32

F31

### Constant Flow Control

- 1/4" Snap-Tite steel quick-disconnect nipple
- Threaded hose connector

**Constant Flow Control** 

• Threaded hose connector

• 1/4" Shrader quick-disconnect nipple

• Connects to 88VXBT, L99BT, 20BT or 20LFBT

- Connects to 88VXBT, L99BT, 20BT or 20LFBT
- Nylon belt

• Nylon belt



### Constant Flow Control

- 1/4" Snap-Tite brass quick-disconnect nipple
- Threaded hose connector
- Connects to 88VXBT, L99BT, 20BT or 20LFBT
- Nylon belt



F33

### **Constant Flow Control**

- 1/4" CEJN steel quick-disconnect nipple
- Threaded hose connector
- Connects to 88VXBT, 20BT or 20LFBT
- Nylon belt

### F38

- Constant Flow Control Valve
- <sup>1</sup>/<sub>4</sub>" Bayonet steel quick-disconnect nipple
- Threaded hose connector
- Connects to 88VXBT
- Nylon belt
- No ball bearings to "jam up"



# 88VX<sup>™</sup> Series Replacement Valves for Breathing Tube Assemblies for use with Compressed Air

| F40 | <ul> <li>Adjustable Flow Control</li> <li>1/4" Industrial Interchange (Hansen Compatible) quick-disconnect nipple</li> <li>Threaded hose connector</li> <li>Connects to 88VXBT, 20BT or 20LFBT</li> <li>Nylon belt</li> </ul> |  |
|-----|---|--|
| F41 | Adjustable Flow Control<br>• 1/4" Schrader quick-disconnect nipple<br>• Threaded hose connector<br>• Connects to 88VXBT, 20BT or 20LFBT<br>• Nylon belt   |  |
| F42 | Adjustable Flow Control<br>• '/4" Snap-tite steel quick-disconnect nipple<br>• Threaded hose connector<br>• Connects to 88VXBT, 20BT or 20LFBT<br>• Nylon belt  |  |
| F47 | Adjustable Flow Control Valve<br>• 1/4" CEJN stainless steel quick-disconnect nipple<br>• Threaded hose connector<br>• Connects to 88VXBT, 20BT or 20LFBT<br>• Nylon belt   |  |

# 88VX<sup>™</sup> Series Replacement Valves for Breathing Tube Assemblies for use with Bullard Free-Air Pumps

F35

- **Constant Flow Control** • 1/4" Industrial Interchange (Hansen Compatible) quick-disconnect nipple
- Threaded hose connector
- Connects to 88VXBT, L99BT, 20BT or 20LFBT
- Nylon belt





| 46VX           | <ul> <li>28" Length Nylon Cape (Tan)</li> <li>Includes snap hooks</li> <li>Includes breathing tube straps</li> <li>Includes additional nylon liner in neck cuff area</li> </ul>  |  |
|----------------|--|--|
| 13VX           | <ul> <li>38" Length Nylon Cape (Tan)</li> <li>Includes snap hooks</li> <li>Includes breathing tube straps</li> <li>Includes additional nylon liner in neck cuff area</li> </ul>  |  |
| 21VX           | <ul> <li>38" Length Nylon Cape (Tan)</li> <li>Includes cinch straps/fabric ties</li> <li>Includes breathing tube straps</li> <li>Includes additional nylon liner in neck cuff area</li> </ul>  |  |
| 21821          | <ul> <li>38" Length "Golden Gate" Nylon Cape (Tan)</li> <li>Cut-off cap sleeves</li> <li>Includes cinch straps/fabric ties</li> <li>Includes breathing tube straps</li> <li>Includes additional nylon liner in neck cuff area</li> </ul>   |  |
| 36VX<br>36XLVX | <ul> <li>38" Length Hibernia Parka (Tan)</li> <li>38" Length Hibernia Parka Extra-Large Size (Tan)</li> <li>Nylon cape with long sleeves</li> <li>Includes belt straps</li> <li>Includes breathing tube straps</li> <li>Includes additional nylon liner in neck cuff area</li> </ul> |  |

# 88VX<sup>™</sup> Series Replacement Parts and Accessories Adjustable Pinlock Headband Suspension • Sportek<sup>™</sup> brow pad 88VXRT Adjustable Ratchet Headband Suspension • Sportek<sup>™</sup> brow pad TT3 **Brow Pad** • Sportek<sup>™</sup> replacement brow pad for 88VXTG and 88VXRT headband suspensions TT3VI **Brow Pad** • Vinyl replacement brow pad for 88VXTG and 88VXRT headband suspensions 99PL Inner Shell/Air Plenum • Does not include headband suspension or chinstrap 20NC **Elastic Chinstrap** • For use with 88VX Series and 99PL only

• 10 per package

# 88VX<sup>™</sup> Series Airline Respirator

88VXTG







# **88VX<sup>™</sup> Series Airline Respirator** 88VX<sup>™</sup> Series Replacement Parts and Accessories 88CS Elastic Chinstrap • For use with 88PL only • 10 per package 88CA **Replacement Carrying Strap** Maintenance Kit - Door/Gasket/Latch Assembly 88VXAK • Includes 88VX Series door with catch, gasket, inner lens, bail and hinge pin in a preassembled kit ready for mounting 88VXRAK Maintenance Kit - Rectangular Door/Gasket/Latch Assembly • Includes 88VX Series door with catch, gasket, inner lens, bail and hinge pin in a preassembled kit ready for mounting 88VXBAIL **Replacement Bail for Latch Assembly** • 10 per package

88VXHP

**Replacement Hinge Pins for Latch Assembly** • 10 per package

# **88VX<sup>™</sup> Series Replacement Parts and Accessories**

| 001A 3           |  |         | 7.11   |
|------------------|--|---------|--------|
| BFW              | <ul> <li>Box Front Window Frame</li> <li>Accommodates rectangular glass lens (77GLT)</li> <li>Catch, bail and hinge pin in a preassembled kit;<br/>ready for mounting</li> </ul> | Bullard |        |
| 77GLT            | <b>Box Front Glass Lens</b><br>• For use with 77BFW and BFW  |         |        |
| 77LG             | <b>Box Front Lens Gasket</b><br>• For use with 77BFW and BFW   |         | Bla    |
| G4613            | 88VXR Window Frame Gasket<br>• Rectangular gasket  |         | sting  |
| G7713<br>88VX™ S | 88VX Window Frame Gasket<br>• Oval gasket<br>eries Mylar® Lens   |         | and Gr |
| 7714             | Adhesive-backed Mylar® Lens Cover<br>• Clear<br>• Rectangular<br>• 25 per package  |         | inding |
| 88VXLC           | Perforated Edge Mylar Lens Cover<br>• Clear<br>• 25 per package  |         |        |

# 88VX<sup>™</sup> Series Replacement Lenses

|              | Acetate, For Use with 77/88 Series              |  |
|--------------|---|--|
| P771B        | • 25 per package                                |  |
| B771B        | • Eight packages of 25 lenses                   |  |
|              | • Oval  |  |
|              | • .040" thick                                   |  |
| Inner Lens - | Acetate, For Use with 88VXR/46 Series           | ANULA COMPANY TOWARD COMPANY   |
| B461B        | • 20 packages of 25 lenses                      | and the second second second second  |
| 54015        | • Rectangular                                   |  |
|              | • .040" thick                                   |  |
|              | • .040 LINCK                                    | *  |
|              |   |  |
| Outer Lens - | Acetate, For Use with 77/88 Series              |  |
| P771040      | • 25 per package                                | A DESCRIPTION OF A DESC |
| B771040      | • Eight packages of 25 lenses                   |  |
|              | • Oval  |  |
|              | • .040" thick                                   |  |
|              | 0+0 thick                                       |  |
| Outor Long   | Acetate, For use with 46 Series                 |  |
| B461040      |   | And the second division of the second divisio |
| D401040      | • 20 packages of 25 lenses                      |  |
|              | Rectangular                                     |  |
|              | • .040" thick                                   | 7  |
| Outer Lens - | PETG, For Use with 77/88 Series                 |  |
| P771020      | • 50 per package                                |  |
| B771020      | • Eight packages of 50 lenses                   | A CONTRACTOR OF  |
| B771020      | • Oval  |  |
|              | • .020" thick                                   |  |
|              | •.020 thick                                     | L BERTER B   |
| B771E040     | <ul> <li>Eight packages of 25 lenses</li> </ul> |  |
| D771L040     | • Oval  |  |
|              | • .040" thick                                   |  |
|              | •.040 LINCK                                     |  |
| P771R        | • 50 per package                                |  |
| B771R015     | • 10 packages of 50 lenses                      | All the second se  |
| 57710015     | • Rectangular                                   | of the particular of the local division of   |
|              | • .015" thick                                   |  |
|              | •.015 thick                                     |  |
| B771D015     | <ul> <li>10 packages of 50 lenses</li> </ul>    |  |
| 07710015     | • Rectangular                                   |  |
|              | • .015" thick                                   |  |
|              | Protective film on both sides of lens           |  |
|              | Protective film on both sides of tens           |  |
| Outer Lens - | PETG, For Use with 88VX Series                  |  |
| B771R020     | Seven packages of 50 lenses                     |  |
| 57711010     | • Rectangular                                   |  |
|              | • .020" thick                                   |  |
|              | • .020 thek                                     | and the second   |
|              |   |  |
| 0.1          |   |  |
|              | PETG, For Use with 46 Series or 88VXR Series    |  |
| B461R015     | • 10 packages of 50 lenses                      | supervised in the second se  |
|              | Rectangular                                     |  |
|              | • .015″ thick                                   |  |
|              |   | and the second se  |
|              |   |  |

# **LANCER Series Airline Respirator**

The Bullard Lancer Series was designed to meet OSHA's Interim Final Standard for Lead in Construction by combining a Type CE helmet-style respirator with a Pressure Demand Class tight-fitting half mask.

# 1,000 APF

Lancer offers abrasive blasters a helmet-style respirator that meets the requirements for respiratory protections of 1,000 times the Permissible Exposure Limit (PEL).

# **Better Vision and Integral Head Protection**

Unlike full-facepiece blasting respirators, Lancer provides the wearer with the same large field of vision found on the Bullard 88 Series respirator. Additionally, Lancer provides integral head protection and meets ANSI Standard Z89.1-1969 (except weight).

# Comfortable

Lancer maintains many of the same attributes found in a standard loose-fitting hood. Abrasive rebound protection to head and neck; keeps grit out of eyes, and off skin and hair. Optional cooling is available with the Lancer ACL99 Cool Tube. The Lancer helmet is lightweight for maximum comfort and wearability. Lancer has an adjustable suspension that holds the respirator firmly and comfortably on the wearer's head. Airflow is channeled directly to the user's breathing zone for easy breathing. Lancer's design allows the user to wear safety glasses or protective goggles.

# **Unique Air Delivery System**

With the Lancer unique air delivery system, air travels through Lancer breathing tube, inflates the air delivery system air trough and is delivered directly to the integrated half mask. The air delivery system helps maintain positive pressure inside the helmet. Along with the knitted neck cuff, the inflatable air trough conforms to the user's neck and acts as an additional barrier to contaminants.

# **Compatible with Different Air Sources**

Lancer respirators are compatible with compressors as well as Bullard's low-pressure Free-Air<sup>®</sup> ambient breathing pumps.



# LANCER Series Airline Respirator Selection Chart

# 1. Choose Window Style (Helmet is Included)



•Oval Window (Standard) •Rectangular Window (Optional) •Box Front Window (Optional)

### 3. Choose Breathing Tube



•L99BT - Clamp included, nipple not included



4. Choose Flow Control Device

•F30 - Constant Flow Control

Valve, 1/4" Industrial

Interchange



•F35 - Constant Flow Control Valve, 1/2" Industrial Interchange



•88VXRT - Adjustable

Ratchet Suspension

**Choose Suspension** 

2.

•88VXTG - Adjustable

Pinlock Suspension

•ACL99 - Cool Tube Assembly, 1/4" Industrial Interchange



•0032 - Nylon Parka

•0072 - Nylon Poncho

# 6. Choose Belt and/or Accessories



•4612 - Nylon Belt

•HS - Heat Shield



•20NC - Chinstrap

Order Now: 877-BULLARD • www.bullard.com

# LANCER Series Airline Respirator

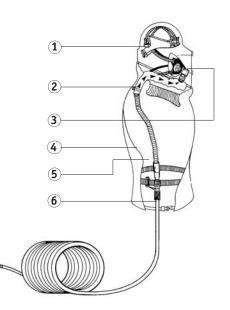
# LANCER Series Airline Respirator

A complete Lancer<sup>®</sup> Series Airline Respirator assembly consists of the following six components:

- 1. Respirator Helmet
- 2. Air Delivery System
- 3. Half Mask
- 4. Outer Cape
- 5. Breathing Tube with fitting or Optional Climate Control Assembly
- 6. Breathing Air Supply Hose

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

Approval No. TC-19C-309, Type C, Pressure Demand Class, and Type CE





# b S C 3 g b Ы Q G -\_\_\_\_ 3 Q J Q

# Lancer Airline Respirator Systems

# 511SM30 Small Half Mask Respirator Assembly 511MD30 Medium Half Mask Respirator Assembly 511LG30 Large Half Mask Respirator Assembly • Helmet with suspension and air delivery system (ADS) • L30 breathing tube assembly with F30 1/4" industrial interchange (Hansen compatible) nipple and belt • Inner and outer lens

- Outer cape (poncho style)
- For use with compressed air

# LANCER Series Airline Respirator

# Lancer Series Breathing Tubes & Replacement Parts

| L99BT | Breathing Tube   |       |
|-------|--|-------|
|       | <ul> <li>Nipple not included</li> <li>Clamp included</li> </ul>  | S CCC |
| F30   | <ul> <li>Constant Flow Control Valve</li> <li>'/4" Industrial Interchange (Hansen compatible)<br/>quick-disconnect nipple</li> <li>Threaded hose connector</li> <li>Connects to 88VXBT, L99BT, 20BT or 20LFBT</li> <li>4612 nylon belt</li> <li>For use with compressed air</li> </ul>                     |       |
| F35   | <ul> <li>Constant Flow Control Valve</li> <li>1/2" Industrial Interchange (Hansen compatible)<br/>quick-disconnect nipple</li> <li>Threaded hose connector</li> <li>Connects to 88VXBT, L99BT, 20BT or 20LFBT</li> <li>4612 nylon belt</li> <li>For use with Bullard Free-Air<sup>®</sup> pumps</li> </ul> |       |
| ACL99 | <ul> <li>Cool Tube Assembly</li> <li>1/4" Industrial Interchange (Hansen compatible)<br/>quick-disconnect nipple</li> <li>4612 nylon belt</li> <li>Approved for use with Lancer® Series respirator</li> <li>For use with compressed air</li> </ul>   |       |
| ADS   | <b>Air Delivery System</b> <ul> <li>Breathing tube not included</li> </ul>   |       |
| 4612  | Nylon Belt   |       |



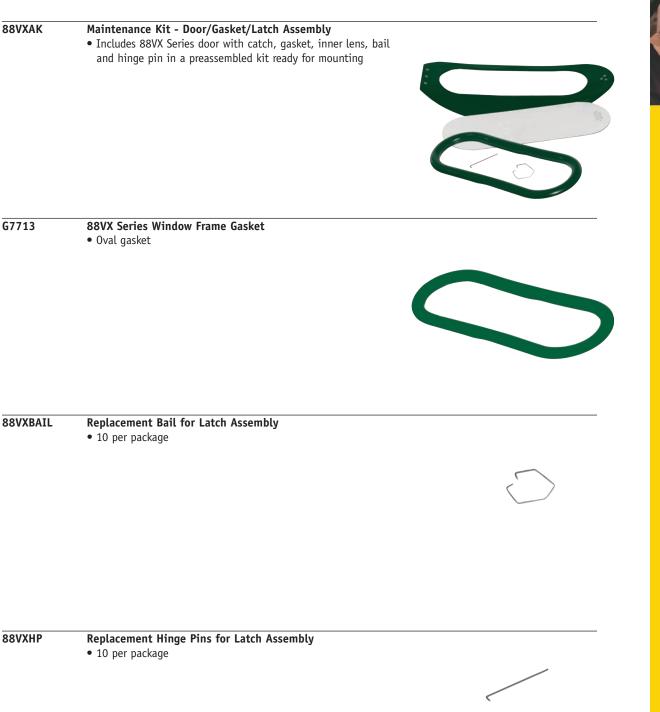
## Lancer Series Replacement Capes & Suspensions



## Lancer Series Replacement Masks



## Lancer Series Replacement Parts



## Lancer Series Mylar Lens



Adhesive-backed Mylar® Lens Cover

- Clear
- Rectangular
- 25 per package



88VXLC

#### Perforated Edge Mylar® Lens Cover

- Clear
- 25 per package



## Lancer Series Replacement Lenses

#### Inner Lens - Acetate

P771B

- Oval
- .040" thick
- 25 per package

#### B771B

- Oval
- .040" thick
- 8 packages of 25 lenses



#### Outer Lens - Acetate P771040

- Oval
- .040" thick
- 25 per package

#### B771040

- Oval
- .040" thick
- Eight packages of 25 lenses







## Lancer Series Replacement Lenses

• .020" thick

• Seven packages of 50 lenses

| Outer Lens -<br>P771020 | PETG, For use with 77/88 Series                           |   |
|-------------------------|---|---|
|                         | • Oval  |   |
|                         | • .020" thick   |   |
|                         | • 50 per package  |   |
| B771020                 |   |   |
|                         | • Oval  |   |
|                         | • .020" thick   |   |
|                         | <ul> <li>Eight packages of 50 lenses</li> </ul>           |   |
| B771E040                | 5 1 5   |   |
|                         | • Oval  |   |
|                         | • .040" thick   |   |
|                         | <ul> <li>Eight packages of 25 lenses</li> </ul>           |   |
|                         |   |   |
| P771R                   |   |   |
| F / / IN                | Rectangular   |   |
|                         | • .015" thick   |   |
|                         | • 50 per package  |   |
| B771R015                | so per package  |   |
| 277210225               | Rectangular   |   |
|                         | • .015" thick   | 1.00  |
|                         | • 10 packages of 50 lenses                                |   |
| B771D015                | Facing  | and the second se |
|                         | Rectangular   |   |
|                         | • .015" thick   |   |
|                         | <ul> <li>Protective film on both sides of lens</li> </ul> |   |
|                         | • 10 packages of 50 lenses                                |   |
| B771R020                |   |   |
|                         | Rectangular   |   |
|                         |   |   |



## **Enhanced Comfort and Protection for Grinding Operations**

Offering both respiratory and dermal protection, the Bullard GR50 is the first hood-style airline respirator designed especially to meet the challenges that are encountered in grinding operations. The lightweight outer hood, made from Nomex<sup>®</sup>, protects the operator's entire head, face and neck from sparks and airborne particulates. The inner bib, made from flame-retardant cotton, is an added protective barrier. Applications in which the GR50 airline respirator can be used include grinding and metalworking.

For workers who use compressed breathing air, the Bullard GR50 is complete with Nomex respirator hood, breathing tube and a choice of belt-mounted airline quick-disconnect fittings. The GR50 can also be used with convenient and low-cost Bullard Free-Air® pumps. Bullard V10 and V20 air supply hoses, sold separately, are available with point-of-attachment fittings for breathing air compressor systems or ambient air pumps.

#### **Breathing Protection**

Continuous airflow is delivered through a unique neck cuff, maintaining positive pressure inside the hood to help keep contaminants out.

#### **Comfortable and Durable**

Weighing only 12 oz. (340 g), the GR50 from Bullard is a lightweight alternative for workers accustomed to wearing heavier helmettype respirators during grinding.

#### Head Protection and Climate Control Options

When worn with a Bullard hard hat, the hood meets ANSI Z89.1-2003 requirements for protective headwear. A variety of climate control devices allow workers to cool incoming air to meet their comfort requirements, helping to boost productivity.

#### Flexible Hood and Window

In operations performed in tight spaces, the flexible hood and window enhance worker mobility. The inner window, made of .040'' (1 mm) acetate so it stands up to a variety of chemicals.

#### **No Fit-Testing**

One size fits all, so fit testing is not required. The hood easily accommodates beards, hearing protection, prescription eyewear or safety glasses.

#### **Maximum Visibility**

Wide-angle faceshield and headband suspension system are positioned to create the maximum viewing area. Replacement outer lens helps protect inner lens from sparks and debris, extending the usable life of the product.



Order Now: 877-BULLARD • www.bullard.com

# **GR50** Airline Respirator Selection Chart

1. Choose Head Top



•GRH - Nomex® Grinding Hood



•20RT - Adjustable Ratchet Headband Suspension



2. Choose Suspension or Hard Hat

•20TG - Adjustable Pinlock Headband Suspension



•C30 - 6-point Self-Sizing Suspension, Full Profile •C30R - 6-point Flex-Gear<sup>®</sup> Ratchet Suspension



•S51 - 4-point Self-Sizing Suspension, Low Profile •S51R - 4-point Flex-Gear Ratchet Suspension

#### 3. Choose Breathing Tube



•20BT - Breathing Tube for Hoods





1/4" Continuous Flow •F40, F40B, F40S -•F30, F30B, F30S -Industrial Interchange •F31 - Schrader •F41 - Schrader •F42 - Snap-Tite Steel •F32 - Snap-Tite Steel •F33 - Snap-Tite Brass •F43 - Snap-Tite Brass •F34 - Snap-Tite Stainless •F47 - CEJN •F35, F35B, F35S - 1/2"

Industrial Interchange for

Free-Air Pumps

•F37 - CEJN



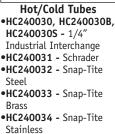
**Cool Tubes for Compressed Air** •AC100030, AC100030B, AC100030S - 1/4" Industrial Interchange •AC100031 - Schrader •F44 - Snap-Tite Stainless •AC100032 - Snap-Tite Steel

•AC100033 - Snap-Tite Brass •AC100034 - Snap-Tite Stainless

•AC100037 - CEJN



**Cool Tubes for** Free-Air<sup>®</sup> Pumps •FRIGITRON2000 - 1/2" Industrial Interchange •FRIGITRON2000B - Brass •HC240031 - Schrader •FRIGITRON2000S - Steel •HC240032 - Snap-Tite



•HC240037 - CEJN

#### **Choose Cooling Vest** 5.



•DC70ML - Med/Lg Cool Vest •DC70XLXXL - XL/XXL Cool Vest •DC705XL - 5XL Cool Vest



Industrial Interchange

•DC5040 - DUAL-COOL® Industrial Interchange

•DC5041 - DUAL-COOL Schrader •DC5042 - DUAL-COOL Snap-Tite Steel

•DC5047 - DUAL-COOL CEJN

#### 6. Choose Belt and/or Accessories



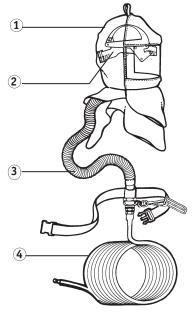




## **GR50 Airline Respirator Systems**

Bullard's GR50 Airline Respirator consists of four components; all must be present and properly assembled to constitute a complete NIOSH-approved respirator. **Approval Number TC-19C-329, Type C.** 

- 1. Respirator Hood
- 2. Headband or Head Protection
- 3. Breathing Tube Assembly
- 4. Air Supply Hose



| GR5030 | Constant Flow Respirator with V30 Breathing Tube Assembly                      |  |
|--------|--|--|
|        | • GRH hood   |  |
|        | • 20TG suspension  | and the second sec |
|        | • F30 <sup>1</sup> / <sub>4</sub> " industrial interchange (Hansen compatible) |  |
|        | quick-disconnect nipple and nylon belt   | A COM  |
|        | • MB1 outer lens   |  |
|        | • For use with compressed air  |  |

GR50SYS

#### **GR50 Series Airline Respirator System**

- GR5035 respirator assembly
- EDP10 Free-Air® pump
- V20100ST air supply hose



#### GR5035

Constant Flow Respirator with V35 Breathing Tube Assembly • GRH hood

- 20TG suspension
- F35 <sup>1</sup>/<sub>2</sub>" industrial interchange (Hansen compatible) quick-disconnect nipple and nylon belt
- MB1 outer lens
- For use with Bullard Free-Air® pumps

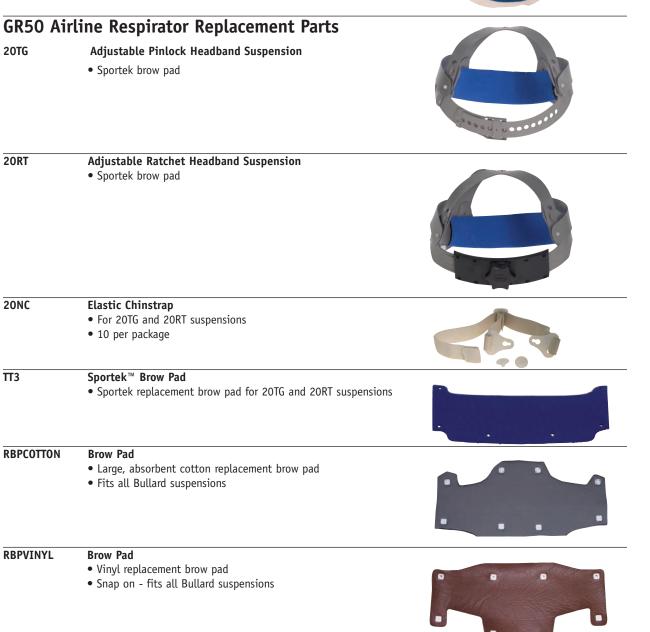


## GR50 Airline Respirator Replacement Respirator Hood

GRH

Nomex Grinding Hood
Includes MB1 outer lens
12" long outer bib





| RBPCOOL | Brow pad   |     |
|---------|--|-----|
|         | <ul> <li>Polartec<sup>®</sup> replacement brow pad</li> </ul>                | 0 0 |
|         | <ul> <li>Wicking material moves sweat away from the worker's brow</li> </ul> |     |
|         | <ul> <li>Fits all Bullard suspensions</li> </ul>                             |     |





Grinding

## GR50 Series Head Protection

#### Hard Hat

- High-density polyethylene shell
- Full profile, wide brim
- Accessory slots for attachments
- 6-point self-sizing suspension with large, absorbent cotton brow pad (RS6PC)
- Replacement brow pads available (RBPCOTTON, RBPVINYL, RBPCOOL)
- Meets or exceeds ANSI Z89.1-2003, Type I, Class E & G requirements
- Color: white



#### C30R

## Hard Hat

- Same as Model C30 above with • 6-point Flex-Gear<sup>®</sup> ratchet suspension
- with large, absorbent cotton brow pad (RS6RC) • Color: white



| <ul> <li>High-density, polyethylene shell</li> </ul>                          |
|---|
| • Flat front, low-profile design  |
| <ul> <li>Accessory slots for cap attachments</li> </ul>                       |
| Rain trough brim  |
| <ul> <li>4-point self-sizing suspension with poly brow pad (RS4PP)</li> </ul> |
| • Replacement brow pads available (RBPCOTTON, RBPVINYL, RBPCOOL)              |
| • Meets or exceeds ANSI Z89.1-2003, Type I, Class E & G requirements          |

• Color: white

Hard Hat

Hard Hat



#### S51R

S51

- Same as Model S51 above with
- 4-point Flex-Gear ratchet suspension with poly brow pad (RS4RP)
- Color: white



## **GR50** Airline Respirator Head Protection Replacement Parts

| RS6PC | <ul> <li>6-pt. Suspension</li> <li>6-point self-sizing suspension</li> <li>Large, absorbent cotton brow pad</li> <li>Replacement brow pads available (RBPCOTTON, RBPVINYL, RBPCOOL)</li> <li>Vertical height adjustments (two front, three rear)</li> <li>For Models C30 and C33</li> <li>Hard hat not included</li> </ul>   |  |
|-------|--|--|
| RS6RC | <ul> <li>6-pt. Suspension</li> <li>6-point Flex-Gear<sup>™</sup> ratchet suspension</li> <li>Large, absorbent cotton brow pad</li> <li>Replacement brow pads available (RBPCOTTON, RBPVINYL, RBPCOOL)</li> <li>Flex-points and nape cushion</li> <li>Large, easy-to-turn ratchet knob</li> <li>Vertical height adjustments (two front, three rear)</li> <li>For Models C30R and C33R</li> <li>Hard hat not included</li> </ul> |  |
| RS4PC | <ul> <li>4-pt. Suspension</li> <li>4-point self-sizing suspension</li> <li>Large cotton brow pad</li> <li>Replacement brow pads available (RBPCOTTON, RBPVINYL, RBPCOOL)</li> <li>Vertical height adjustments (two front, two rear)</li> <li>For Model S51</li> <li>Hard hat not included</li> </ul>   |  |
| RS4RC | <ul> <li>4-pt. Suspension</li> <li>4-point Flex-Gear<sup>®</sup> ratchet suspension</li> <li>Large cotton brow pad</li> <li>Replacement brow pads available (RBPCOTTON, RBPVINYL, RBPCOOL)</li> <li>Flex-points and nape cushion</li> <li>Large, easy-to-turn ratchet knob</li> <li>For Model S51R</li> <li>Hard hat not included</li> </ul>   |  |

- Chinstrap
  - Elastic chinstrap
  - For Models C30R and S51R



| The second second        | GR50 Airline Respirator Breathing Tubes & Parts |   |  |  |  |
|--------------------------|---|---|--|--|--|
| Blasting and<br>Grinding | V30   | <ul> <li>Constant Flow Breathing Tube Assembly</li> <li>20BT breathing tube</li> <li>F30 <sup>1</sup>/<sub>4</sub>" industrial interchange (Hansen compatible) quick-disconnect nipple</li> <li>4612 nylon belt</li> <li>\$18051 clamp</li> <li>For use with compressed air</li> </ul>  |  |  |  |
|                          | V40   | <ul> <li>Adjustable Flow Breathing Tube Assembly</li> <li>20BT breathing tube</li> <li>F40 <sup>1</sup>/<sub>4</sub>" industrial interchange (Hansen compatible)<br/>quick-disconnect nipple with adjustable flow control valve</li> <li>4612 nylon belt</li> <li>\$18051 clamp</li> <li>For use with compressed air</li> </ul> |  |  |  |
|                          | V35   | <ul> <li>Constant Flow Breathing Tube Assembly</li> <li>20BT breathing tube</li> <li>F35 <sup>1</sup>/<sub>2</sub>" industrial interchange (Hansen compatible) quick-disconnect nipple</li> <li>4612 nylon belt</li> <li>\$18051 clamp</li> <li>For use with Bullard Free-Air<sup>®</sup> pumps</li> </ul>                      |  |  |  |
|                          | F30   | <ul> <li>Constant Flow Control Valve</li> <li>1/4" industrial interchange (Hansen compatible)<br/>quick-disconnect nipple</li> <li>Threaded hose connector</li> <li>Connects to 88BT, L99BT, 20BT or 20FLBT</li> <li>4612 nylon belt</li> <li>For use with compressed air</li> </ul>  |  |  |  |
|                          | F40   | <ul> <li>Adjustable Flow Control Valve</li> <li>1/4" industrial interchange (Hansen compatible)<br/>quick-disconnect nipple</li> <li>Threaded hose connector</li> <li>Connects to 88BT, L99BT, 20BT or 20FLBT</li> <li>4612 nylon belt</li> <li>For use with compressed air</li> </ul>  |  |  |  |
|                          | F35   | <ul> <li>Constant Flow Control Valve</li> <li>1/2" industrial interchange (Hansen compatible)<br/>quick-disconnect nipple</li> <li>Threaded hose connector</li> <li>Connects to 88BT, L99BT, 20BT or 20FLBT</li> <li>4612 nylon belt</li> <li>For use with Bullard Free-Air<sup>®</sup> pumps</li> </ul>                        |  |  |  |

For heating and cooling options, see the Body Temperature Management section on pages 182-187.



Order Now: 877-BULLARD • www.bullard.com

## Comfort, Low Profile, Outstanding Visibility, Simplicity

Finally there's a respirator that fits — your face, your needs and your high expectations. Introducing Spectrum Series full-face mask airline respirators from Bullard. Integrating intelligent features with innovative design, Bullard is moving respiratory protection to a whole new level. The Spectrum Series offers outstanding comfort, low profile fit, unparalleled visibility and simplicity.

With the addition of the Spectrum Series, Bullard can meet all of a customer's airline respirator needs — from continuous flow hood and helmet airline respirators to tight-fitting facepiece airline/ESCBA respirators. The four full facepiece models in the Spectrum Series include:

- Continuous flow
- Pressure demand
- Pressure demand with 5-minute cylinder
- Pressure demand with 10-minute cylinder

#### **Spectrum Comfort**

Spectrum's lightweight silicone flange seals softly against the user's face without feeling slippery, while the double flange provides a secure and comfortable fit across a wide range of facial sizes and contours.

#### **Spectrum Low Profile**

The low profile full facepiece allows ease of movement of the user's head. The low profile design is lightweight, thus reducing fatigue. The facepiece allows ease of movement of the user's head. Spectrum's low profile headstraps reduce the time to put on the

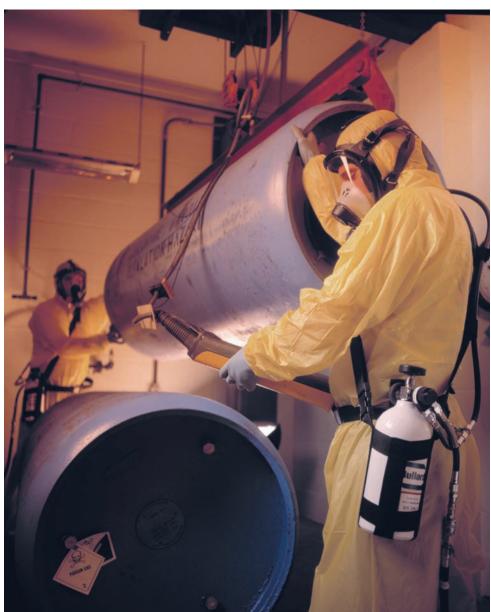
facepiece, are extremely easy to adjust and enhance overall comfort.

#### **Spectrum Visibility**

Spectrum is designed with an optically correct lens that provides unparalleled peripheral vision. The clear silicone nosecup allows more light into the mask, minimizing the closedin feeling many respirator wearers' experience.

#### **Spectrum Simplicity**

With a minimal number of snaptogether parts, no special tools are required making assembly and maintenance quick and efficient. All respirator models incorporate a single platform design, simplifying stocking requirements.



Order Now: 877-BULLARD • www.bullard.com

## Spectrum Series Continuous Flow Airline Respirator

A complete Spectrum Series<sup>®</sup> Continuous Flow Airline Respirator consists of the following three components:

- 1. Full Facepiece
- 2. Breathing Tube Assembly
- 3. Breathing Air Supply Hose

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

Approval No. TC-19C-322, Type C, Continuous Flow Class

Approval No. TC-19C-321, Type C, Pressure Demand Class





#### Spectrum Series® Airline Respirator System

- SPEC35L respirator assembly
- EDP10 Free-Air® pump
- V20100ST hose
- LC lens covers



#### Spectrum-CF Respirator Assembly SPECCFML Medium/Large Facepiece SPECCFS Small Facepiece

- BT100 breathing tube assembly with <sup>1</sup>/<sub>4</sub>" industrial interchange (Hansen compatible) nipple, adjustable flow control valve and nylon belt
- For use with compressed air

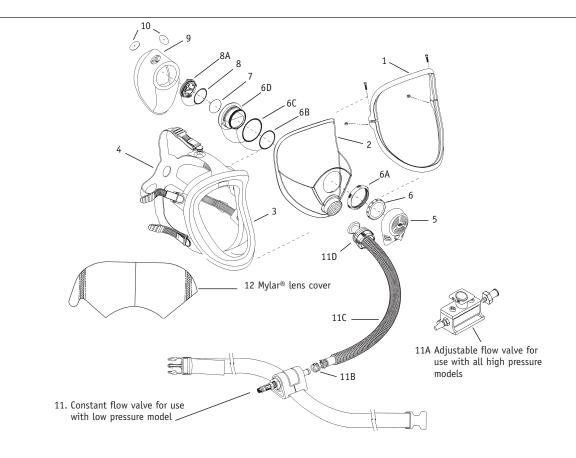


SPEC35L SPECCFM SPEC35S SPECCFS • BT135

- Spectrum-CF Respirator Assembly SPECCFML Medium/Large Facepiece SPECCFS Small Facepiece • BT135 breathing tube assembly with 1/2" industrial
  - interchange (Hansen compatible) nipple and nylon belt
  - For use with Bullard Free-Air® pumps

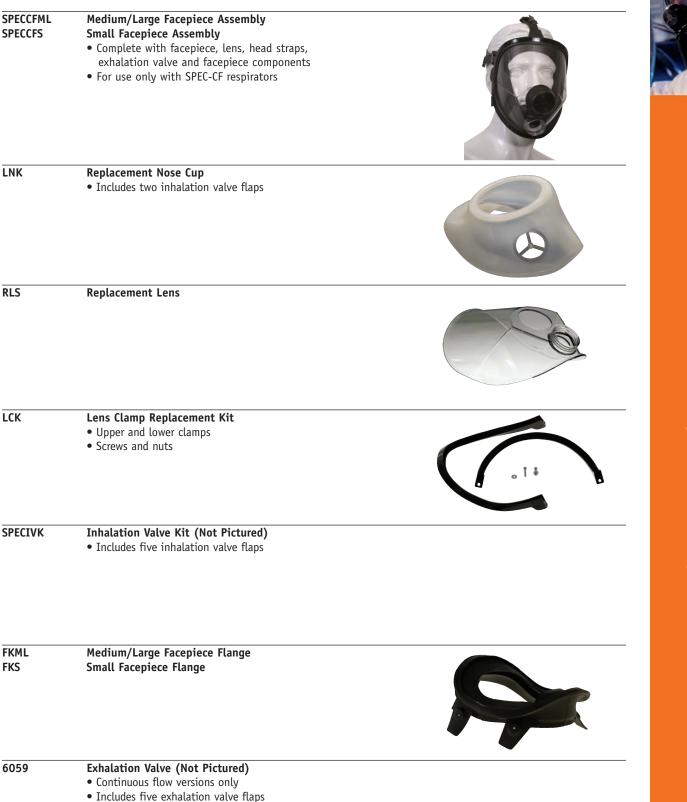


## Spectrum Series Continuous Flow Replacement Parts



|    | Cat. No.   | Description                       | Cat. No.    | Description                      |
|----|------------|-----------------------------------|-------------|----------------------------------|
| 1. | LCK        | Lens Clamp Replacement            | 8. EVO      | O-ring for Exhalation Valve Seat |
| 2. | RLS        | Replacement Lens                  | 8A          | Exhalation Valve Seat            |
| 3. | FKML & FKS | Facepiece Flange                  | 9. LNK      | Nose Cup                         |
| 4. | HSK        | Headstrap with Buckles and Slides | 10. SPECIVK | Inhalation Valve Flaps           |
| 5. | МСК        | Mask Cover                        | 11. BTXXX   | Breathing Tube Assembly          |
| 6. | SEK        | Speaker Diaphragm                 | 11A         | Flow Control Valve               |
|    | 6A         | Outer Locking Ring                | 11B         | Hose Clamp                       |
|    | 6B         | 0-ring Speaker Diaphragm          | 11C         | Breathing Tube                   |
|    | 6C         | 0-ring Speaker/Exhalation         | 11D         | Breathing Tube Adapter           |
|    | 6D         | Speaker/Exhalation Body           | 12. LC      | Mylar <sup>®</sup> Lens Covers   |
| 7. | 6059       | Exhalation Valve                  |             |                                  |

## **Spectrum Series Continuous Flow Facepiece Components**



# Spectrum Series Continuous Flow Facepiece Components

| HSK   | Headstrap Kit  |  |
|-------|--|--|
|       | • Includes five buckles and five slides  |  |
| мск   | Mask Cover<br>• Includes five inhalation valve flaps   |  |
| SEK   | <ul> <li>Speaker/Exhalation Kit</li> <li>Speaker/exhalation body</li> <li>Speaker diaphragm</li> <li>Outer locking ring</li> <li>O-ring for speaker diaphragm</li> <li>O-ring for speaker/exhalation body</li> </ul> |  |
| EVO   | Exhalation Valve Seat and O-Ring   |  |
| PL    | Spectacle Frame Assembly   |  |
| LC    | Mylar® Lens Covers<br>• 25 per package   |  |
| AFW45 | Anti-Fog Lens Wipes<br>• 10 per package  | and the second s |

FOG

## Spectrum Series Continuous Flow Breathing Tubes

| BT100 | <ul> <li>Adjustable Flow Breathing Tube Assembly - Industrial Interchange</li> <li>1/4" industrial interchange with adjustable flow control valve<br/>(Hansen compatible) nipple</li> <li>4612 nylon belt</li> <li>For use with compressed air</li> </ul> |  |
|-------|---|--|
| BT101 | <ul> <li>Adjustable Flow Breathing Tube Assembly - Schrader</li> <li>1/4" Schrader nipple with adjustable flow control valve</li> <li>4612 nylon belt</li> <li>For use with compressed air</li> </ul>   |  |
| BT102 | <ul> <li>Adjustable Flow Breathing Tube Assembly - Snap-Tite</li> <li><sup>1</sup>/<sub>4</sub>" Snap-Tite steel nipple with adjustable flow control valve</li> <li>4612 nylon belt</li> <li>For use with compressed air</li> </ul>                       |  |
| BT103 | Adjustable Flow Breathing Tube Assembly - Snap-Tite<br>• Same as BT102 except with brass nipple   |  |
| BT108 | Adjustable Flow Breathing Tube Assembly<br>• <sup>1</sup> /4" Bayonet steel nipple with adjustable flow control valve<br>• 4612 nylon belt<br>• For use with compressed air   |  |

BT135

Constant Flow Breathing Tube Assembly - Industrial Interchange

- 1/2" industrial interchange (Hansen compatible) nipple
- 4612 nylon belt
  For use with Bullard Free-Air<sup>®</sup> pumps



\_\_\_\_.

-

ىم **~**+ 0 -ທ

## **Spectrum Series Pressure Demand Airline Respirator**

A complete Spectrum Series<sup>®</sup> Pressure Demand Airline Respirator consists of the following four components:

- 1. Full Facepiece
- 2a. Second Stage Regulator Assembly (PD Only)
- 2b. First and Second Stage Regulator Assembly (PDE Only)
- 3a. Harness Assembly
- 3b. Harness Assembly Including 5- or 10-minute Cylinder (PDE Only)
- 4. Air Supply Hose

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

Approval No. TC-19C-354, Type C, Pressure Demand Class SPEC-PD

Approval No. TC-13F-387, Combination SCBA and Type C Pressure SPEC-PDE-5 **Demand Class** 

SPEC-PDE-10 Approval No. TC-13F-388, Combination SCBA and Type C Pressure Demand Class

#### SPECPDLA **SPECPDSA**

#### Spectrum-PD Respirator Assembly SPECPDML Medium/Large Facepiece SPECPDML Small Facepiece • PDR45 pressure demand regulator

Spectrum-PDF5 Respirator Assembly

- BHA belt harness assembly
- CA30 coupler assembly



| SPECPDE5L | SPECPDML Medium/Large Facepiece   |
|-----------|---|
| SPECPDE5S | SPECPDS Small Facepiece   |
|           | • RA45B regulator assembly (including 1st and 2nd stage regulators with bypass) |
|           | Harness assembly (including 5-minute ESCBA cylinder)                            |
|           | CA30 coupler assembly   |
|           |   |
|           |   |
|           |   |

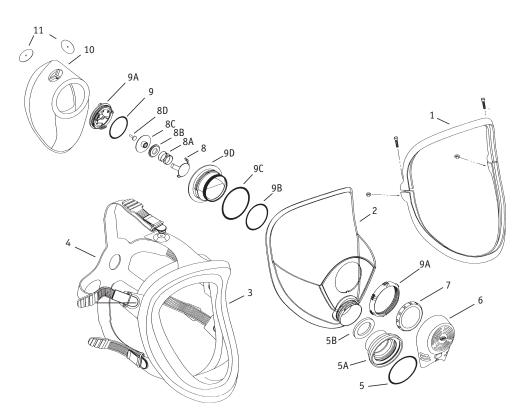
#### Spectrum-PDE10 Respirator Assembly SPECPDE10L SPECPDML Medium/Large Facepiece SPECPDE10S SPECPDS Small Facepiece

- RA45B regulator assembly (including 1st and 2nd stage regulators with bypass)
- Harness assembly (including 10-minute ESCBA cylinder)
- CA30 coupler assembly





## **Spectrum Series** Spectrum Series Pressure Demand Facepiece Replacement Parts



|    | Cat. No.   | Description                     |     | Cat. No. | Description                      |
|----|------------|---------------------------------|-----|----------|----------------------------------|
| 1. | LCK        | Lens Clamp                      | 8.  | EVPDK    | Spring Retainer                  |
| 2. | RLS        | Replacement Lens                |     | 8A       | Spring, PD*                      |
| 3. | FKML & FKS | Facepiece Flange                |     | 8B       | Plate                            |
| 4. | HSK        | Headstrap with Buckles & Slides |     | 8C       | Exhalation Valve Flap            |
| 5. | RAK        | O-ring, Regulator Adapter       |     | 8D       | Stem                             |
|    | 5A         | Regulator Adapter               | 9.  | EVPDK    | O-ring for Exhalation Valve Seat |
|    | 5B         | Gasket, Lens Port               |     | 9A       | Exhalation Valve Seat            |
| 6. | MCK        | Mask Cover                      | 10. | LNK      | Nose Cup                         |
| 7. | SEK        | Speaker Diaphragm               | 11. | SPECIVK  | Inhalation Valve Flap            |
|    | 7A         | Outer Locking Ring              |     |          |                                  |
|    | 7B         | O-ring , Speaker Diaphragm      |     |          |                                  |
|    | 7C         | O-ring , Speaker/Exhalation     |     |          |                                  |
|    | 7D         | Speaker/Exhalation Body         |     |          |                                  |



## **Spectrum Series Pressure Demand Facepiece Components**

| SPECPDML<br>SPECPDS | <ul> <li>Medium/Large Facepiece Assembly</li> <li>Small Facepiece Assembly</li> <li>Complete with facepiece, lens, head straps, exhalation valve and facepiece components</li> <li>For use with SPEC-PD respirators</li> </ul> |   |
|---------------------|--|---|
| RAK                 | Facepiece Components<br>• O-ring for regulator adapter<br>• Regulator adapter<br>• Lens port gasket  |   |
| RLS                 | Replacement Lens   |   |
| EVPDK               | Exhalation Valve Kit<br>• Spring retainer<br>• Spring<br>• Plate<br>• Exhalation valve flap and stem   |   |
| LCK                 | <ul> <li>Lens Clamp Replacement Kit</li> <li>Upper and lower clamps</li> <li>Screws and nuts</li> </ul>  |   |
| FKML<br>FKS         | Medium/Large Facepiece Flange<br>Small Facepiece Flange  |   |
| НЅК                 | <b>Headstrap Kit</b> <ul> <li>Includes five buckles and five slides</li> </ul>   | Ŕ |

# **Spectrum Series** Spectrum Series Pressure Demand Facepiece Components

| LNK     | <b>Replacement Nose Cup</b> <ul> <li>Includes two inhalation valve flaps</li> </ul>  |  |
|---------|--|--|
| SPECIVK | <ul><li>Inhalation Valve Kit (Not Pictured)</li><li>Includes five inhalation valve flaps</li></ul>   |  |
| мск     | Mask Cover<br>• Includes five inhalation valve flaps   |  |
| JEK     | <ul> <li>Speaker/Exhalation Kit</li> <li>Speaker/exhalation body</li> <li>Speaker diaphragm</li> <li>Outer locking ring</li> <li>O-ring for speaker diaphragm</li> <li>O-ring for speaker/exhalation body</li> </ul> |  |
| ΞVO     | Exhalation Valve Seat and O-Ring   |  |
| L       | Spectacle Frame Assembly   |  |
| .c      | Mylar <sup>®</sup> Lens Covers<br>• 25 per package   |  |
| AFW45   | Anti-Fog Lens Wipes<br>• 10 per package  | Page and the a |

## Spectrum Series Pressure Demand Regulators & Cylinders

| FSR45   | <ul> <li>First Stage Regulator</li> <li>Includes CA30 coupler assembly</li> <li>For use only with SPEC-PDE respirators</li> </ul>                                |         |
|---------|--|---------|
| PDR45   | <ul> <li>Second Stage Regulator without Bypass</li> <li>Includes CA30 coupler assembly</li> <li>For use only with SPEC-PD respirators</li> </ul>                 |         |
| PDR45B  | <ul> <li>Second Stage Regulator with Bypass</li> <li>Includes CA30 coupler assembly</li> <li>For use only with SPEC-PDE</li> </ul>                               |         |
| RA45B   | <ul> <li>First Stage Regulator and Second Stage Regulator<br/>with Bypass</li> <li>Includes CA30 coupler assembly</li> <li>For use only with SPEC-PDE</li> </ul> |         |
| CYL455  | <b>5-Minute Escape Cylinder with Valve</b><br>• Additional shipping charges may apply  |         |
| CYL4510 | <b>10-Minute Escape Cylinder with Valve</b><br>• Additional shipping charges may apply   | Gattero |
| CYL5H   | <ul> <li>5-Minute Escape Cylinder with Valve and Holster</li> <li>For use with SPECPDE5L</li> <li>Additional shipping charges may apply</li> </ul>               |         |

## Spectrum Series Pressure Demand Coupler Assemblies

| CA30         | 1/ II Industrial International Ordel, Discourse of Coursian Assembly  |                                |          |
|--------------|---|--------------------------------|----------|
| CA3U         | <ul> <li>'/4" Industrial Interchange Quick-Disconnect Coupler Assembly</li> <li>Male threaded (Hansen compatible) nipple</li> <li>Female threaded coupler with ball lock and adapter<br/>which connects the respirator to the airline extension hose</li> </ul>                                   | Martin F. M. Conserved (24.50) |          |
| CA31         | <ul> <li>1/4" Schrader Quick-Disconnect Coupler Assembly</li> <li>Male threaded nipple</li> <li>Female threaded coupler with adapter,<br/>which connects the respirator to the airline extension hose</li> </ul>  |                                |          |
| CA32         | <ul> <li>1/4" Snap-Tite Steel Quick-Disconnect Coupler Assembly</li> <li>Male threaded nipple</li> <li>Female threaded coupler with adapter,<br/>which connects the respirator to the airline extension hose</li> </ul>   |                                | Mask St  |
| CA33<br>CA34 | <ul> <li>1/4" Snap-Tite Brass Quick-Disconnect Coupler Assembly</li> <li>1/4" Snap-Tite Stainless Steel Quick-Disconnect Coupler Assembly</li> <li>Male threaded nipple</li> <li>Female threaded coupler with adapter,<br/>which connects the respirator to the airline extension hose</li> </ul> |                                | yle Resp |
| CA37         | <ul> <li>1/4" CEJN Steel Quick-Disconnect Coupler Assembly</li> <li>Male threaded nipple</li> <li>Female threaded coupler with special orifice adapter,<br/>which connects the respirator to the airline extension hose</li> </ul>  |                                | irat     |

• Use only with orifice adapter



## **Spectrum Series Pressure Demand Accessories**

PCC45

**Protective Cleaning Cap** • Five per package

**Replacement Shoulder Harness** • 4611 Fire retardant nylon belt

- Buckle connector
- Shoulder strap



4611

BHA

Fire Retardant Nylon Belt



EH45

5" Extension Hose for Regulator



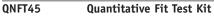
ILS45

In-Line Screen for 2nd Stage Regulator Hose

- 25 per package
- Spacer and screen



# Spectrum Series Fit Testing Accessories: Pressure Demand and Continuous Flow



- Fit test adapter
  - Facepiece sampling adapter
  - 1/8" barbed mask probe
  - One HEPA filter cartridge





 $\leq$ ىم S ト S < P ア P S 5 -, -ല **~**+ 0 -ທ



- Fit Test Refill Kit
- 15 feet of Tygon tubing
- 25 suction cups and 25 clips



HFC45

Replacement HEPA Filter Cartridges

- For quantitative or qualitative fit testing (except for isoamyl acetate)
- Four per carton



A comfortable positive pressure airline respirator, Bullard FAMB presents a simple means of supplying clean air to workers. Available with both pressure demand and continuous flow approvals, FAMB provides a continuous airflow to workers operating in environments that are contaminated with dusts, mists, gases and vapors.

FAMB airline respirators are approved by MSHA/NIOSH for use in Type C applications, including:

- Spray painting and coating operations
- Chemical and pesticide handling
- Wood finishing

#### **FAMB Comfort**

The Bullard FAMB half mask, available in three sizes, features a soft, flexible silicone facepiece that conforms to the worker's face. The double exhalation valve system offers minimal breathing resistance and reduces worker fatigue, increasing productivity.

#### Low Air Pressure Requirement

Specifically designed for use with low pressure air sources such as Bullard Free-Air<sup>®</sup> pumps, the respirator operates efficiently at air pressures between 1.5-20 psig (103-138 kPa), depending on hose length. FAMB respirators are also approved for use with high pressure air sources, such as breathing air compressors.

#### **More Protection**

The FAMB respirator provides a higher degree of protection than negative pressure air purifying respirators. Because FAMB is an airline respirator, there is no need to maintain or buy expensive filter cartridges.

#### Wide Field of Vision

The low-profile facepiece allows a wide field of vision and easily accommodates workers wearing prescription or safety glasses. FAMB can be worn under faceshields, visors and some welding helmets.



## FAMB Half Mask Airline Respirator

A complete FAMB Series Airline Respirator consists of the following three components:

1. Half Mask

FAMBSYS

- 2. Breathing Tube Assembly with Flow Control Device
- 3. Breathing Air Supply Hose

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

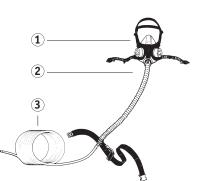
Approval No. TC-19C-315, Type C, Pressure Demand Class

Approval No. TC-19C-155, Type C, Continuous Flow Class

FAMB35M respirator
EDP10 Free-Air<sup>®</sup> Pump

• V20100ST air supply hose

FAMB Series Airline Respirator System







|         | Half Mask Respirator  |  |
|---------|---|--|
| FAMB30S | Small Silicone Facepiece  |  |
| FAMB30M | Medium Silicone Facepiece   |  |
| FAMB30L | Large Silicone Facepiece  |  |
|         | • Cradle suspension and breathing tube                            |  |
|         | • 1/4" industrial interchange (Hansen compatible) nipple and belt | and the second sec |
|         | • For use with compressed air                                     |  |
|         |   |  |

 Half Mask Respirator

 FAMB35S
 Small Silicone Facepiece

 FAMB35M
 Medium Silicone Facepiece

 FAMB35L
 Large Silicone Facepiece

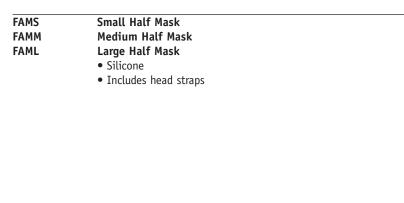
 • Cradle suspension and breathing tube
 • 1/2" industrial interchange (Hansen compatible) nipple and belt

 • For use with Bullard Free-Air® Pumps



# Mask Style Respirators

## FAMB Series Half Mask Respirator Components



FAMCB

Cradle Headband Strap



FAMEVC2 Exhalation Valve Covers • Two per package



FAMEVF10 Exhalation Valve • 10 per package



## FAMB Series Half Mask Fit Testing Accessories



Bullard offers a variety of hoses and fittings to deliver breathable air to the worker from a clean air source.

#### **V5** Series

Bullard V5 Series hose offers the user a coiled option that assists in workplace cleanliness by keeping the hose off of the floor. Constructed of nylon with  $3/8^{\circ}$  I.D. V5 Series hose is available in 25- or 50-foot lengths of red or green.

#### V10 Series

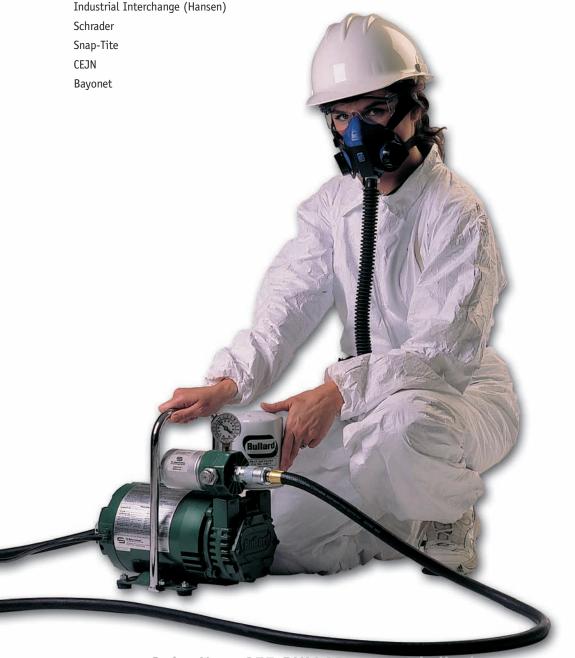
Bullard V10 Series hose is intended for use with compressed air and has an inside diameter of 3/8". Constructed of strong yet flexible rubber reinforced to prevent crushing or kinking, V10 Series hose is available in 25-, 50- and 100-foot sections configurable up to 300 feet in total length.

#### V20 Series

Bullard V20 Series hose is intended for use with Bullard Free-Air<sup>®</sup> Pumps and has an inside diameter of  $\frac{1}{2}$ ". Constructed of strong yet flexible rubber reinforced to prevent crushing or kinking, V20 Series hose is available in 50- and 100 foot sections configurable up to 300 feet in total length.

#### **Fittings**

Bullard offers five different types of fittings to ensure breathing air supply fittings are incompatible with fittings for non-breathing air gases such as nitrogen, natural gas and argon. These fittings include:



## V5 Coiled Hose for Compressed Air

## 25 Foot Lengths

| V52530<br>V52530GREEN | <ul> <li>V5 Industrial Interchange Hose (Red)</li> <li>V5 Industrial Interchange Hose (Green)</li> <li>1/4" industrial interchange (Hansen compatible)<br/>quick-disconnect coupler and nipple</li> <li>For use with compressed air only. Not for use with Bullard Free-Air® pumps</li> </ul>         |  |
|-----------------------|---|--|
|                       | • For use with Bullard CC20, GR50, PC90, RT and 88VX Series respirators   |  |
| V52531                | <ul> <li>V5 Schrader Hose (Red)</li> <li><sup>1</sup>/<sub>4</sub>" Schrader quick-disconnect coupler and nipple</li> <li>For use with compressed air only. Not for use with Bullard Free-Air<sup>®</sup> pumps</li> <li>For use with Bullard CC20, GR50, PC90 and 88VX Series respirators</li> </ul> |  |
| V52532                | <ul> <li>V5 Snap-Tite Hose (Red)</li> <li>1/4" Snap-Tite H-Series steel quick-disconnect coupler and nipple</li> <li>For use with compressed air only. Not for use with Bullard Free-Air® pumps</li> <li>For use with Bullard CC20, GR50, PC90, RT and 88VX Series respirators</li> </ul>             |  |
| V52533                | <ul> <li>V5 Snap-Tite (Brass) Hose (Red)</li> <li>1/4" Snap-Tite H-Series brass quick-disconnect coupler and nipple</li> <li>For use with compressed air only. Not for use with Bullard Free-Air® pumps</li> <li>For use with Bullard CC20, GR50, PC90, RT and 88VX Series respirators</li> </ul>     |  |

## 50 Foot Lengths

| 50 Foot Lengths       |  |  |  |  |
|-----------------------|--|--|--|--|
| V55030<br>V55030GREEN | <ul> <li>V5 Industrial Interchange Hose (Red)</li> <li>V5 Industrial Interchange Hose (Green)</li> <li><sup>1</sup>/<sub>4</sub>" industrial interchange (Hansen compatible)<br/>quick-disconnect coupler and nipple</li> <li>For use with compressed air only. Not for use with Bullard Free-Air<sup>®</sup> pumps.</li> <li>For use with Bullard CC20, GR50, PC90, RT and 88VX Series respirators</li> </ul> |  |  |  |
| V55031                | <ul> <li>V5 Schrader Hose (Red)</li> <li><sup>1</sup>/<sub>4</sub>" Schrader quick-disconnect coupler and nipple</li> <li>For use with compressed air only. Not for use with Bullard Free-Air<sup>®</sup> pumps</li> <li>For use with Bullard CC20, GR50, PC90, RT and 88VX Series respirators</li> </ul>  |  |  |  |
| V55032                | <ul> <li>V5 Snap-Tite Hose (Red)</li> <li><sup>1</sup>/<sub>4</sub>" Snap-Tite H-Series steel quick-disconnect coupler and nipple</li> <li>For use with compressed air only. Not for use with Bullard Free-Air<sup>®</sup> pumps</li> <li>For use with Bullard CC20, GR50, PC90, RT and 88VX Series respirators</li> </ul>   |  |  |  |
| V55033<br>V55033GREEN | <ul> <li>V5 Snap-Tite Hose (Red)</li> <li>V5 Snap-Tite Hose (Green)</li> <li><sup>1</sup>/4" Snap-Tite H-Series brass quick-disconnect coupler and nipple</li> <li>For use with compressed air only. Not for use with Bullard Free-Air<sup>®</sup> pumps</li> <li>For use with Bullard CC20, GR50, PC90, RT and 88VX Series respirators</li> </ul>   |  |  |  |



## V10 3/8" ID Hose for Compressed Air

## Starter Hoses

| 25 Foot        | Lengths  |
|----------------|--|
| 4696<br>46916  | <ul> <li>V1025ST Industrial Interchange Hose Kit (Black)</li> <li>V1025ST Industrial Interchange Hose Kit (Green)</li> <li>1/4" industrial interchange (Hansen compatible) quick-disconnect coupler</li> <li>V13 hose-to-pipe adapter fitting (3/8" hose to 3/8" pipe)</li> <li>For use with compressed air only. Not for use with Bullard Free-Air® pumps</li> <li>For use with Bullard CC20, GR50, PC90, RT, FAMB, Spectrum CF and 88VX series respirators</li> <li>Quick-disconnect nipple sold separately</li> </ul> |
| 46913          | <ul> <li>V1025ST Schrader Hose Kit (Black)</li> <li><sup>1</sup>/<sub>4</sub>" Schrader quick-disconnect coupler</li> <li>V13 hose-to-pipe adapter fitting (<sup>3</sup>/<sub>8</sub>" hose to <sup>3</sup>/<sub>8</sub>" pipe)</li> <li>For use with compressed air only. Not for use with Bullard Free-Air® pumps</li> <li>For use with Bullard CC20, GR50, PC90, RT, FAMB, Spectrum CF and 88VX series respirators</li> <li>Quick-disconnect nipple sold separately</li> </ul>  |
| 46915          | <ul> <li>V1025ST Snap-Tite Hose Kit (Black)</li> <li>1/4" Snap-Tite quick-disconnect coupler</li> <li>V13 hose-to-pipe adapter fitting (3/8" hose to 3/8" pipe)</li> <li>For use with compressed air only. Not for use with Bullard Free-Air® pumps</li> <li>For use with Bullard CC20, GR50, PC90, RT, FAMB, Spectrum CF and 88VX series respirators</li> <li>Quick-disconnect nipple sold separately</li> </ul>  |
| 50 Foot        | Lengths  |
| 46917<br>46919 | <ul> <li>V1050ST Snap-Tite Hose Kit (Green) (Not Pictured)</li> <li>V1050ST Snap-Tite Hose Kit (Blue) (Not Pictured)</li> <li><sup>1</sup>/<sub>4</sub>" Snap-Tite quick-disconnect coupler</li> <li>V13 hose-to-pipe adapter fitting (<sup>3</sup>/<sub>8</sub>" hose to <sup>3</sup>/<sub>8</sub>" pipe)</li> <li>For use with compressed air only. Not for use with Bullard Free-Air® pumps</li> <li>For use with Bullard CC20, GR50, PC90, FAMB, Spectrum CF and 88VX series respirators</li> </ul>                  |

• Quick-disconnect nipple sold separately

## **Extension Hoses**

### **25 Foot Lengths**

| 5454  | V1025EXT Hose Kit (Black) |  |
|-------|---------------------------|--|
| 54510 | V1025EXT Hose Kit (Green) |  |

- V1025EXT Hose Kit (Green)
  - V11 hose-to-hose adapter fitting
  - V13 hose-to-pipe adapter fitting ( $\frac{3}{8}$ " hose to  $\frac{3}{8}$ " pipe)
  - For use with compressed air only. Not for use with Bullard Free-Air® pumps

#### **50 Foot Lengths**

| 5457  | V1050EXT Hose Kit (Black)  |
|-------|--|
| 54511 | V1050EXT Hose Kit (Blue)   |
| 54513 | V1050EXT Hose Kit (Green)  |
|       | <ul> <li>V11 hose-to-hose adapter fitting</li> </ul>                         |
|       | • V13 hose-to-pipe adapter fitting (3/8" hose to 3/8" pipe)                  |
|       | • For use with compressed air only. Not for use with Bullard Free-Air® pumps |

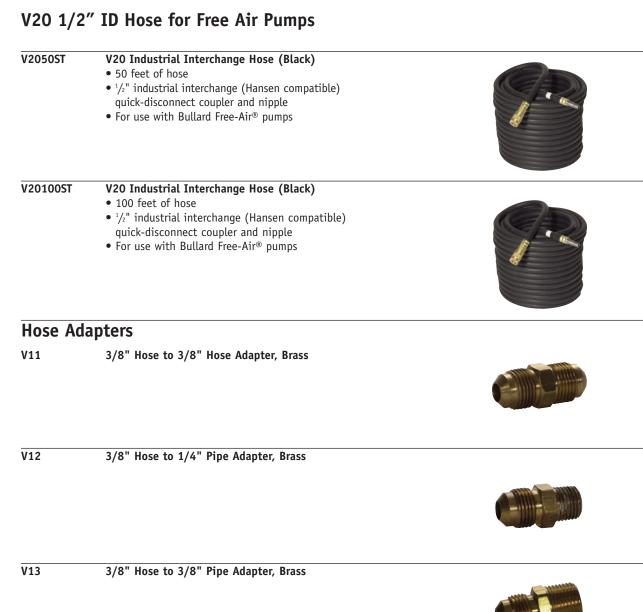
#### **100 Foot Lengths**

| 5458  | V10100EXT Hose Kit (Black) |
|-------|----------------------------|
| 54512 | V10100EXT Hose Kit (Blue)  |

- V11 hose-to-hose adapter fitting
  - V13 hose-to-pipe adapter fitting (<sup>3</sup>/<sub>8</sub>" hose to <sup>3</sup>/<sub>8</sub>" pipe)
  - For use with compressed air only. Not for use with Bullard Free-Air® pumps







## **Breathing Air Supply Hose - Quick Disconnect Couplers**

| V14         | <ul> <li>Industrial Interchange Female Coupler</li> <li>1/4" Industrial Interchange (Hansen compatible)<br/>quick-disconnect coupler</li> <li>Includes shut-off with 1/4" female pipe thread (NPT)</li> <li>V12 hose to pipe adapter required to connect to V10 extension hose</li> </ul> |  |
|-------------|---|--|
| V15         | <ul> <li>Industrial Interchange Female Coupler</li> <li><sup>1</sup>/<sub>4</sub>" Industrial Interchange (Hansen compatible)<br/>quick-disconnect coupler</li> <li>Includes shut-off with <sup>3</sup>/<sub>8</sub>" male pipe thread (NPT)</li> </ul>                                   |  |
| V18         | <ul> <li>Schrader Female Coupler</li> <li>1/4" Schrader quick-disconnect coupler</li> <li>Includes shut-off with 1/4" female pipe thread (NPT)</li> <li>V12 hose to pipe adapter required to connect to V10 extension hose</li> </ul>   |  |
| V19<br>V19B | <ul> <li>Snap-Tite Female Coupler, Steel</li> <li>Snap-Tite Female Coupler, Brass</li> <li>1/4" Snap-Tite quick-disconnect coupler</li> <li>Includes shut-off with 1/4" female pipe thread (NPT)</li> <li>V12 hose to pipe adapter required to connect to V10 extension hose</li> </ul>   |  |
| V27         | <ul> <li>Industrial Interchange Coupler</li> <li>1/4" Industrial Interchange coupler assembly</li> <li>Includes V12 hose to pipe adapter</li> </ul>   |  |
| 3914        | <ul> <li>CEJN Coupler</li> <li>1/4" CEJN quick-disconnect coupler</li> <li>Includes shut-off with 1/4" female pipe thread (NPT)</li> <li>Includes special orifice adapter which connects respirator to the airline extension hose. Use only with orifice adapter</li> </ul>               |  |
| 3421        | <ul> <li>Bayonet Coupler</li> <li>1/4" Bayonet quick-disconnect coupler</li> <li>Includes shut-off with 1/4" female pipe thread (NPT)</li> </ul>  |  |

# **Breathing Air Supply Hose**

# Breathing Air Supply Hose - Quick Disconnect Nipples

| V17               | <ul> <li>Industrial Interchange Nipple</li> <li><sup>1</sup>/<sub>4</sub>" Industrial Interchange (Hansen compatible) steel<br/>male quick-disconnect nipple with <sup>3</sup>/<sub>8</sub>" female pipe thread (NPT)</li> <li>Requires V13 hose adapter to connect to Bullard V10 air supply hose</li> </ul> |   |
|-------------------|---|---|
| <del>519432</del> | <ul> <li>Schrader Nipple</li> <li>1/4" Schrader steel male quick-disconnect nipple with 1/4" female pipe thread (NPT)</li> <li>Requires V12 hose adapter to connect to Bullard V10 air supply hose</li> </ul>   |   |
| S19442            | <ul> <li>Snap-Tite Steel Nipple</li> <li><sup>1</sup>/<sub>4</sub>" Snap-Tite steel male quick-disconnect nipple with <sup>1</sup>/<sub>4</sub>" female pipe thread (NPT)</li> <li>Requires V12 hose adapter to connect to Bullard V10 air supply hose</li> </ul>   |   |
| 519443            | <ul> <li>Snap-Tite Brass Nipple</li> <li>1/4" Snap-Tite brass male quick-disconnect nipple with 1/4" female pipe thread (NPT)</li> <li>Requires V12 hose adapter to connect to Bullard V10 air supply hose</li> </ul>   |   |
| 3902              | <b>CEJN Nipple</b> <ul> <li>1/4" CEJN steel male quick-disconnect nipple with 1/4"</li> <li>female pipe thread (NPT)</li> <li>Requires V12 hose adapter to connect to Bullard V10 air supply hose</li> </ul>  | s till i der bla Affig med ja 1 hannen.<br>Hennen soner sind an de ja 1 hannen. |
| 3420              | <ul> <li>Bayonet Nipple</li> <li><sup>1</sup>/<sub>4</sub>" Bayonet steel male quick-disconnect nipple with <sup>1</sup>/<sub>4</sub>" female pipe thread (NPT)</li> <li>Requires V12 hose adapter to connect to Bullard V10 air supply hose</li> </ul>   |   |



#### Order Now: 877-BULLARD • www.bullard.com

# Bullard Climate Control Devices help increase worker comfort and productivity.

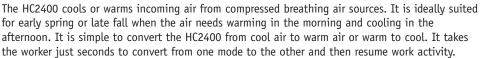
Bullard offers six belt-mounted, climate-control devices for use with Bullard airline respirators. Each system enables a worker to adjust and control the temperature of air delivered to the respirator. On extremely hot summer days, air exiting a typical breathing air compressor can exceed 300°F (150°C). Air exiting a Bullard Free-Air® pump can exceed 200°F (100°C). Even with properly installed aftercoolers and in-line filters, the air entering a respirator could exceed ambient temperatures. If workers breathe excessively warm air for prolonged periods of time, they may experience discomfort, fatigue and possibly dehydration. During winter months, excessively cold air can have similar effects. Eventually all of these conditions may reduce worker productivity. Bullard optional climate-control devices help correct these uncomfortable working conditions for wearers of Bullard airline respirators.

#### **Cool Tubes**

The Bullard line of cool tubes includes the AC1000, AC1000DC, ACL99 and FRIGITRON<sup>®</sup> 2000 which is designed for use with Bullard ambient air pumps. Each of these cool incoming air from compressed breathing air sources

by as much as 20°-30°F (11°-17°C) and feature adjustable airflow control valves that allow the user to adjust the incoming air temperature to a level best suited to individual comfort.

#### Hot/Cold Tubes



When used in the cool mode, the Hot/Cold Tube decreases the incoming air temperature by as much as  $30^{\circ}F$  ( $17^{\circ}C$ ). When warm air is desired, the incoming air temperature may be increased by up to  $30^{\circ}F$  ( $17^{\circ}C$ ).

The HC2400 also features an adjustable airflow control valve that allows users to regulate the temperature of incoming air to a comfortable level.

#### DC50 and DC60 Series DUAL-COOL®

The DC50 Series provides superior cooling to Bullard respirators, while also sending cool air to the vest for upper torso cooling. The DUAL-COOL will cool incoming air from compressed breathing sources by as much as  $30^{\circ}$ F ( $17^{\circ}$ C). Separate control knobs allow the worker to adjust the temperature of air to each zone.

Specially engineered for use with the PC90 Series airline containment respirator, the DC60 DUAL-COOL cools air by as much as 30°F (17°C). This air-supplied system combines a breathing tube, dual-cool tube, cooling vest and one breathing air-supply hose to cool workers and maximize productivity.

The DC60 Series features separate air entries to deliver air to the vest and to the breathing zone. Separate control knobs allow the worker to adjust the temperature of air to each air entry.

#### **Body Temperature Management - Complete Assemblies**

|                       |                                   | Climate Control Devices |         |             | -        |          |        |
|-----------------------|-----------------------------------|-------------------------|---------|-------------|----------|----------|--------|
|                       |                                   | AC1000*                 | HC2400* | Frigitron** | DC6040** | DC5040** | ACL99* |
|                       | CC20                              | •                       | •       | •           |          | •        |        |
|                       | GR50                              | •                       | •       | •           |          | •        |        |
| <u> </u>              | 88VX                              | •                       | ٠       | •           |          | •        |        |
| Bullard<br>Respirator | PC90                              |                         |         |             | •        |          |        |
| Bull                  | Lancer®                           |                         |         |             |          |          | •      |
| <u> </u>              | RT                                | •                       | •       |             |          |          |        |
| Air<br>Flow           | Adjustable                        | •                       | ٠       | •           | •        | •        |        |
| Air Source            | Breathing Air<br>Compressor       | •                       | ٠       |             | •        | ٠        | •      |
|                       | Ambient Air Pump<br>(ADP20/EDP30) |                         |         | •           |          |          |        |







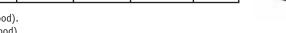






\* Consumes approximately 15 CFM (including the hood).

\*\*Consumes approximately 20 CFM (including the hood).



# Cool Tubes: AC1000 Assemblies & Accessories

| AC1000   | Cool Tube Assemblies<br>1/4" Industrial Interchange (Hansen Compatible)<br>Quick-Disconnect Nipple |  |          |
|----------|--|--|----------|
| AC100031 | 1/4" Schrader steel quick-disconnect nipple  |  |          |
| AC100032 | 1/4" Snap-tite steel quick-disconnect nipple   | Concernation of the second sec |          |
| AC100033 | 1/4" Snap-tite brass quick-disconnect nipple   |  |          |
| AC100037 | 1/4" CEJN steel nipple   | Law Add Young<br>and the state and the state   |          |
|          | <ul> <li>Adjustable temperature control</li> </ul>   | A CONTRACTOR OF THE OWNER  |          |
|          | • 4612 nylon belt  |  |          |
|          | <ul> <li>Approved for use with 88VX, CC20, RT (except AC100033 and</li> </ul>                      |  |          |
|          | AC100037) and GR50 Series respirators  |  |          |
|          | • For use with compressed air  |  |          |
| AC100038 | 1/4" Bayonet Steel Quick-Disconnect Nipple   |  |          |
|          | <ul> <li>Adjustable temperature control</li> </ul>   |  | B        |
|          | • 4612 nylon belt  |  | 0        |
|          | • Approved for use with 88VX Series respirators only   |  |          |
|          | • For use with compressed air  |  | d d      |
|          |  |  | <b>Y</b> |
| AC1000DC | Cool Tube Assembly for Use with DC70 Vest  |  |          |
| ACTOODE  | • 1/4" Industrial Interchange (Hansen compatible) steel nipple                                     |  |          |
|          | Adjustable temperature control   |  | P        |
|          | • 4612 nylon belt  |  | E        |
|          | • CH1000 connector hose and belt   |  |          |
|          | <ul> <li>For use with compressed air</li> </ul>  |  | σ        |
|          |  |  | P        |
|          |  |  |          |
|          |  |  | ي<br>م   |
| HS       | <ul> <li>Leather Heat Shield</li> <li>For use with AC1000, HC2400 and ACL99 assemblies</li> </ul>  |  |          |
|          | • TOT USE WITH ACTOOD, TIC2400 and ACL99 assemblies  | Gullard  | t<br>u   |
|          |  |  | 7        |
|          |  |  | P        |
| 4611     | Fire Retardant Belt  |  | 3        |
|          |  |  | ىم       |
|          |  |  | 3        |
|          |  |  | ച        |
| 4612     | Nylon Belt   |  | Ð        |
|          |  |  | P        |
|          |  |  |          |
|          |  |  | 3        |
|          |  |  | P        |
| 36501    | Vinyl Decon Belt   |  | 3        |
|          |  |  | . t      |
|          |  |  |          |

# Frigitron2000 Assemblies & Accessories

| FRICITRON      | 2000 Cool Tube Assembly for Bullard Free-Air® Pumps  |        |
|----------------|--|--------|
|                | <ul> <li>1/2" Industrial Interchange (Hansen compatible)<br/>quick-disconnect nipple</li> <li>Adjustable temperature control</li> <li>4612 nylon belt</li> <li>Approved for use with 88VX, CC20 and GR50 Series respirators</li> <li>For use with Bullard Free-Air® Pumps (ADP20 and EDP30 models only)</li> </ul> |        |
| 4611           | Fire Retardant Belt  |        |
| 4612           | Nylon Belt   |        |
| 36501<br>ACL99 | Vinyl Decon Belt Assemblies & Accessories  |        |
| ACL99          | <ul> <li>Cool Tube Assembly</li> <li>1/4" Industrial Interchange (Hansen compatible)<br/>quick-disconnect nipple</li> <li>4612 nylon belt</li> <li>Approved for use with Lancer® Series Respirator</li> <li>For use with compressed air</li> </ul>   |        |
| HS             | <b>Leather Heat Shield</b><br>• For use with AC1000, HC2400 and ACL99 assemblies   | Gutary |
| 4611           | Fire Retardant Belt  |        |

4612 Nylon Belt

36501

Vinyl Decon Belt



# Hot/Cold Tubes Assemblies & Accessories

| ποιγτοια   | Tudes Assemblies & Accessories  |            |
|--|---|------------|
| HC2400<br>HC240031<br>HC240032<br>HC240033<br>HC240037 | <ul> <li>Hot/Cold Tube Assemblies</li> <li>1/4" Industrial Interchange (Hansen compatible) Quick-Disconnet</li> <li>1/4" Schrader Steel Quick-Disconnect Nipple</li> <li>1/4" Snap-Tite Steel Quick-Disconnect Nipple</li> <li>1/4" CEJN stainless Quick-Disconnect Nipple</li> <li>1/4" CEJN stainless steel nipple</li> <li>Adjustable temperature control</li> <li>4612 nylon belt</li> <li>Approved for use with 88VX, CC20, RT (except AC100033 and AC100037)and GR50 Series respirators</li> <li>For use with compressed air</li> </ul> | ect Nipple |
| HC240038   | Hot/Cold Tube Assembly for use with 88VX Respirator Only<br>1/4" Bayonet Steel Quick-Disconnect Nipple  |            |
| MV2400   | HC2400 Muffler/Valve Assembly   |            |
| HC2400BB   | HC2400 Belt Bracket   | And State  |
| HS   | <b>Leather Heat Shield</b><br>• For use with AC1000, HC2400 and ACL99 assemblies  |            |
| 4611   | Fire Retardant Belt   |            |
| 4612   | Nylon Belt  |            |
| 36501  | Decon Belt  |            |

# Cooling Vests & Components: DC65 Series

| DC65ML    | Medium/Large Cooling Vest                               |
|-----------|---|
|           |   |
| DC65XLXXL | Extra-Large/XX-Large Cooling Vest                       |
|           | <ul> <li>For use with PC90 Series respirator</li> </ul> |



|        | DUAL-COOL <sup>™</sup> Assemblies                                |                       |
|--------|--|-----------------------|
| DC6040 | 1/4" Industrial Interchange (Hansen compatible) Qui              | ick-Disconnect Nipple |
| DC6041 | 1/4" Schrader Quick-Disconnect Nipple                            |                       |
| DC6042 | 1/4" Snap-Tite Steel Quick-Disconnect Nipple                     | *****                 |
| DC6043 | 1/4" Snap-Tite Brass Quick-Disconnect Nipple                     | and the second        |
|        | <ul> <li>Adjustable temperature control</li> </ul>               |                       |
|        | <ul> <li>Must be used with DC65 vests</li> </ul>                 |                       |
|        | <ul> <li>CH60 connector hose</li> </ul>                          |                       |
|        | <ul> <li>Approved for use with PC90 Series respirator</li> </ul> |                       |
|        | <ul> <li>Pass through style connection</li> </ul>                |                       |
|        | <ul> <li>For use with compressed air</li> </ul>                  | CLUON                 |

#### **DC70 Series**

#### DC70ML Medium/Large Cooling Vest DC70XLXXL Extra-Large/XX-Large Cooling Vest

- For use with 88VX, CC20 and GR50 Series respirators
- Can be used without respirator when coupled with
  - AC1000DC Cool Tube Assembly



# Cooling Vests & Components: DC5040 Series

| Cooling Vests & Components: DC5040 Series                |   |            |  |
|--|---|------------|--|
| DC5040<br>DC5041<br>DC5042<br>DC5043<br>DC5044<br>DC5047 | DUAL-COOL <sup>™</sup> Assemblies<br>1/4" Industrial Interchange (Hansen compatible) Quick-Disconne<br>1/4" Schrader Quick Disconnect Nipple<br>1/4" Snap-Tite Steel Quick Disconnect Nipple<br>1/4" Snap-Tite Brass Quick Disconnect Nipple<br>1/4" CEJN Quick Disconnect Nipple<br>• Adjustable temperature control<br>• CH60 connector hose and 4612 nylon belt<br>• Must be used with DC70 vests<br>• Approved for use with 88VX, CC20 and GR50 Series respirators<br>• For use with compressed air | ect Nipple |  |
| DC5048   | DUAL-COOL <sup>™</sup> Assembly for use with 88VX Respirator Only<br>1/4" Bayonet Steel Quick Disconnect Nipple   |            |  |
| CH1000   | AC1000DC Connector Hose   |            |  |
| CH60   | DC5040 DUAL-COOL <sup>™</sup> Connector Hose  |            |  |
| Cooling  | Vest Accessories  |            |  |
| HS   | <b>Leather Heat Shield</b><br>• For use with AC1000, HC2400 and ACL99 assemblies  | (Bullard)  |  |
| 4611   | Fire Retardant Belt   |            |  |
| 4612   | Nylon Belt  |            |  |
| 36501  | Decon Belt  |            |  |

#### 41 Series Airline Filters help deliver cleaner air for up to six workers.

#### **Versatile Application**

Bullard Airline Filters can be used in conjunction with other compressor safeguards such as carbon monoxide monitoring to supply Grade D breathing air to supplied-air respirators. They may also be used to supply drier, cleaner air to tools and pneumatic systems to reduce down-time and repair costs.

#### **Heavy Duty**

The 41 Series Airline Filters are constructed of heavy gauge steel to withstand rugged industrial environments.

#### **High Capacity**

41 Series Airline Filters contain large disposable filter cartridges allowing longer periods of filtration.

#### Light Weight for Easy Portability

Each model weighs approximately 23 pounds (10.5 kg).

#### Efficient

The 41 Series Filter cartridges are specifically designed to effectively trap and remove oil particulates, odor and organic vapors using a multi-layer filtering system. Compressor-supplied air enters the filter and travels through six layers of filter material before exiting through the outlet port. Carded cotton, felt material, activated charcoal and activated alumina work in sequence to supply cleaner air to workers or equipment.

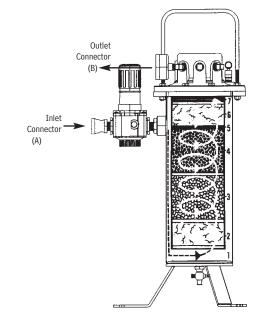


Order Now: 877-BULLARD • www.bullard.com

#### Replaceable filter cartridge (7-stage operation)

Cartridges effectively trap and remove impurities with little pressure loss. The supplied-air enters the compressor at inlet connector (A), travels through six layers of filter material and exits outlet connector (B). Filter materials work in sequence to trap and hold water, oil, particulates, odors and organic vapors so that cleaner air is delivered to workers or equipment.

- 1. Water is removed by condensation of air in outer cylinder
- 2. Carded cotton removes particulates
- 3. Activated alumina adsorbs oil and moisture
- 4. Activated charcoal removes odors and moisture
- 5. Felt material removes particulates
- 6. Carded cotton removes particulates
- 7. Respiratory felt at final stage acts as a final filter before air is transferred to worker or air driven tools



| Specifications   |   |  |                              |   |                                     |
|--|---|--|------------------------------|---|-------------------------------------|
| Airline Filter   | Model 41A                               | Model 41P2                               | Model 41P6                   | Model 41P6WM                            | Model 41P2E                         |
| Max. Air Flow Rate                                     | 100 cfm* (2830 lpm)                     | 75 cfm (2120 lpm)                        | 75 cfm (2120 lpm)            | 75 cfm (2120 lpm)                       | 75 cfm (2120 lpm)                   |
| Inlet Connection                                       | 1" NPT (Fem.)                           | 1" NPT (Fem.)                            | 1" NPT (Fem.)                | 1" NPT (Fem.)                           | 3/4" (19 mm) NPT (Fem.)             |
| Outlet Connection                                      | 1" NPT (Fem.)                           | 2 outlets<br>³⁄8" NPT (Fem.)             | 6 outlets<br>³∕₀" NPT (Fem.) | 6 outlets<br>³∕ଃ" NPT (Fem.)            | 2 outlets<br>1/4" (6 mm) BPT (Fem.) |
| Relief Valve   | _                                       | 125 psig (8.6 bar)                       | 125 psig (8.6 bar)           | 125 psig (8.6 bar)                      | 125 psig (8.6 bar)                  |
| Tank Diameter  | 5 <sup>1</sup> / <sub>2</sub> " (14 cm) | 5 <sup>1</sup> /2" (14 cm)               | 5 <sup>1</sup> /2" (14 cm)   | 5 <sup>1</sup> / <sub>2</sub> " (14 cm) | 5½" (14 cm)                         |
| Height   | 19" (48 cm)                             | 23 <sup>1</sup> / <sub>2</sub> " (60 cm) | 25 <sup>1</sup> /4" (64 cm)  | 22" (56 cm)                             | 23 <sup>1</sup> /2" (60 cm)         |
| Weight   | 19 lb. (8.6 kg)                         | 22 lb. (10 kg)                           | 24 lb. (10.9 kg)             | 28 lb. (12.7 kg)                        | 22 lb. (10 kg)                      |
| *At maximum recommended pressure of 100 psig (6.9 bar) |   |  |                              |   |                                     |

# 41 Series Filter Assemblies

| 41A    | <pre>Single Outlet     1" NPT inlet, 1" NPT outlet     Includes 41AF filter cartridge     Does not include regulator, pressure gauge, or relief valve     Shipping weight: 22 lbs. Cube: 2.9</pre>   |  |
|--------|--|--|
| 41P2   | <ul> <li>2-Outlet</li> <li>1" NPT inlet, 1/4" and 3/6" NPT (female) outlets</li> <li>Includes 41AF filter cartridge</li> <li>Regulator adjustable between 0-100 psig</li> <li>Relief valve set at 125 psig</li> <li>Pressure gauge</li> <li>Shipping weight: 27 lbs. Cube: 2.9</li> </ul>  |  |
| 41P6   | <ul> <li>6-Outlet</li> <li>1" NPT inlet, <sup>3</sup>/<sub>8</sub>" NPT (female) outlets</li> <li>Includes 41AF filter cartridge</li> <li>Regulator adjustable between 0-100 psig</li> <li>Relief valve set at 125 psig</li> <li>Pressure gauge</li> <li>Shipping weight: 27 lbs. Cube: 2</li> <li>Handle (41HK) must be ordered separately</li> </ul> |  |
| 41P6WM | <ul> <li>6-Outlet, Wall Mount</li> <li>Same as Model 41P6 above with:</li> <li>Galvanized steel wall mount bracket (no legs)</li> <li>Shipping weight: 31 lbs. Cube: 2.9</li> </ul>  |  |
| 41AF   | Filter Cartridge<br>• Filter cartridge for 41A, 41P2, 41P6 and 41P6WM<br>• Shipping weight: 6 lbs. Cube: .6  |  |

| 41P2M   | <ul> <li>41P2 Manifold Assembly for 41P2 Filter</li> <li>Steel manifold plate</li> <li>Regulator adjustable between 0-100 psig</li> <li>Relief valve set at 125 psig</li> <li>Pressure gauge</li> <li>Shipping weight: 7.0 lbs.</li> </ul>  |  |
|---------|---|--|
| 41P6UPK | <ul> <li>41P6 Manifold Assembly for 41P6 Filter</li> <li>Steel manifold plate</li> <li>Regulator adjustable between 0-100 psig</li> <li>Relief valve set at 125 psig</li> <li>Pressure gauge</li> <li>Shipping weight: 10.0 lbs.</li> </ul> |  |
| 41RG    | Regulator Gauge<br>• For 41P2 and 41P6<br>• 0-160 psi   | BULLET THE REPORT OF THE REPOR |
| 41PRV   | <ul> <li>Pressure Relief Valve</li> <li>For 41P2 and 41P6</li> <li>125 psig activation</li> </ul>   |  |
| 41P2R   | <b>41P2 Regulator and Gauge Assembly</b><br>• For use with flat top design only   |  |
| V15     | <ul> <li>Industrial Interchange Female Coupler</li> <li>1/4" Industrial Interchange (Hansen compatible)<br/>quick-disconnect coupler</li> <li>Includes shut-off with 3/8" male pipe thread (NPT)</li> </ul>                                 |  |
| 41KB2   | Replacement Knob for 41P2   |  |
| 41HK    | Handle Kit<br>• For use with all 41 Series Airline Filters  |  |

Breathing

A i r

Filtration

#### Reliable, Economical Air Sources for Airline Respirators.

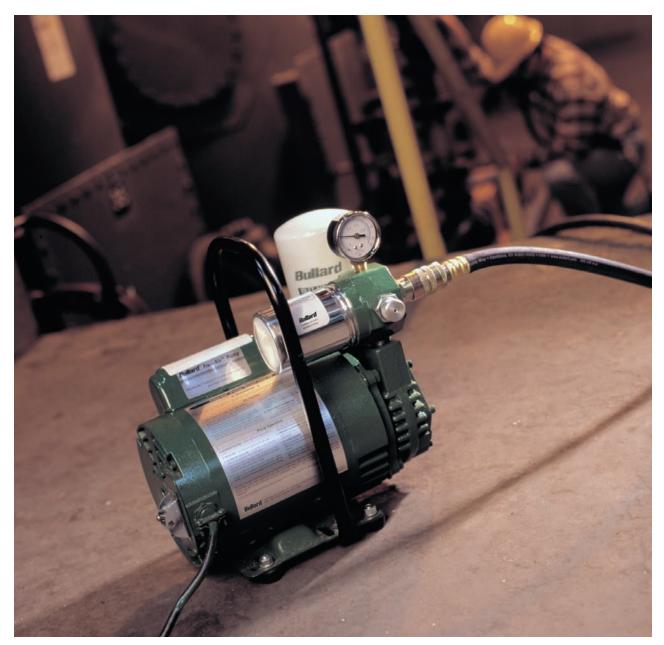
Easy to operate and maintain, Bullard Free-Air pumps offer a low cost way to supply clean, breathable air to workers in contaminated environments. They are an economical air source when compressed air is not available and an inexpensive way to add breathing capacity when a compressed air source is at its maximum utilization.

#### Economical

Bullard Free-Air pumps are efficient and economical. They are portable and can be moved quickly and easily from jobsite to jobsite. Plus, they require no expensive plumbing or installation. Bullard Free-Air pumps are oil-less so they do not produce carbon monoxide, oil vapor or oil mist. Since CO monitors, temperature alarms, airline filters and complicated calibration equipment aren't necessary, Free Air pumps are frequently a more cost effective alternative to compressed air.

#### Easy-To-Use

Bullard Free-Air pumps are reliable and easy to use. They are available in both electric and air driven models. Electric models have low power requirements; simply plug-in, set the proper air pressure and go to work. The air driven model is ideal for both general purpose and hazardous duty use. Used with optional extension hose kits, the breathable air inlet can be located up to 300 feet away from the pump.



Order Now: 877-BULLARD • www.bullard.com

#### **Air Driven Pumps**

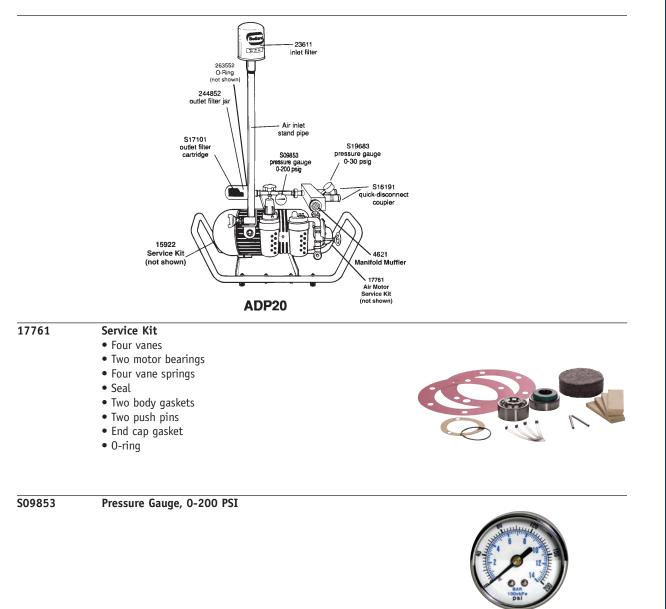


#### Air-Driven, Oil-Less Air Pump

- Supplies air to four hood-style respirators or six half or full face mask respirators
- 30 CFM at 5 psi with minimum 85 cfm at 95 psi incoming drive air pressure
- Intrinsically safe
- Pressure gauge (0-30 psig)
- Two 1/2" Industrial Interchange (Hansen compatible) quick-disconnect couplers
- Shipping Weight: 100 lbs.



#### **ADP20 Replacement Parts**



#### **ADP20 Replacement Parts**

4621

ADP20 Manifold Muffler



# ADP20 Replacement Parts

| 23611  | <ul> <li>Inlet Filter</li> <li>Change every 500 hours or as required</li> <li>One required for EDP10, EDP16TE/HAZ, ADP20; two required for EDP30 &amp;</li> </ul>  | EDP50                 |
|--------|--|-----------------------|
| 244852 | Outlet Filter Jar  |                       |
| 263552 | Outlet Filter Assembly O-Ring  | $\bigcirc$            |
| 517101 | <ul> <li>Outlet Filter</li> <li>Carbofine (change every 200 hours or as required)</li> <li>One required for EDP10, EDP16TE/HAZ, ADP20; 4 required for EDP30; eight required for EDP50</li> </ul>               |                       |
| 517931 | Cleaning Solvent, 14 oz. Aerosol Can   |                       |
| V22    | <ul> <li>Quick-Disconnect Coupler Adapter</li> <li>Converts pump's quick-disconnect coupler to double <sup>3</sup>/<sub>8</sub>" female NPT</li> </ul>   |                       |
| /23    | <ul> <li>Quick-Disconnect Adapter</li> <li>Converts pump's quick-disconnect coupler to single 3/6" female NPT</li> </ul>   | and the second second |
| V24    | <ul> <li>Quick-Disconnect Coupler Splitter/Adapter</li> <li>Converts pump's quick-disconnect coupler to<br/>double 1/2" Industrial Interchange female couplers<br/>(one flow through, one shut-off)</li> </ul> |                       |
| V50EX  | <ul> <li>Remote Extension Hose Kit</li> <li>50-ft. length</li> <li>Connects to V50IN to extend length</li> <li>Maximum five per pump</li> <li>1 <sup>1</sup>/<sub>2</sub>" ID</li> </ul>                       |                       |
| V50IN  | <ul> <li>Remote Inlet Air Hose Kit</li> <li>50-ft. length</li> <li>Connects to pump for remote location of inlet filter</li> <li>Maximum one per pump</li> <li>1 <sup>1</sup>/<sub>2</sub>" ID</li> </ul>      |                       |

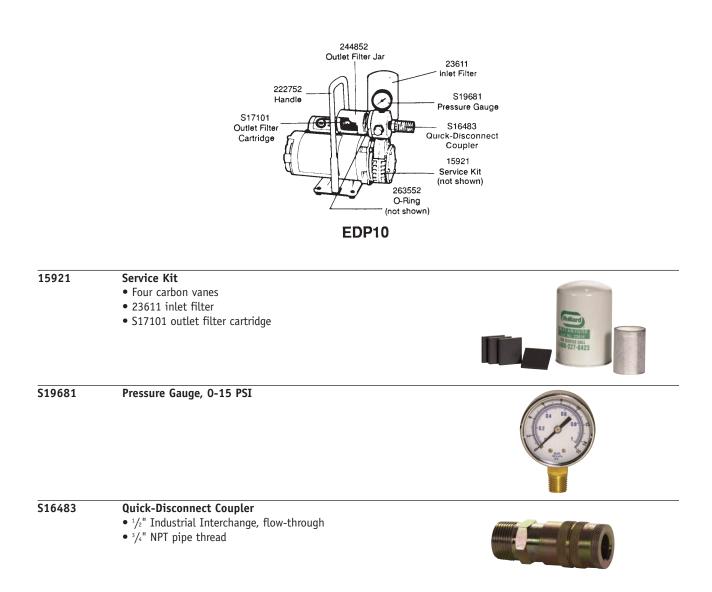
#### **Electric Driven Pumps**

#### EDP10 One to Two Person Pump

- <sup>3</sup>/<sub>4</sub> HP electric-driven, oil-less air pump with open drip-proof motor drive
- Supplies air to one hood-style or two half or full face mask airline respirators
- Carrying handle
- Inlet and outlet filter cartridges
- Pressure gauge (0-15 psig)
- Electrical cord and On/Off switch
- One <sup>1</sup>/<sub>2</sub>" Industrial Interchange (Hansen compatible) quick-disconnect coupler
- Shipping Weight: 60 lbs.



#### **EDP10 Replacement Parts**



# EDP10 Replacement Parts

| 23611  | Inlet Filter   |                              |
|--------|--|------------------------------|
|        | <ul> <li>Change every 500 hours or as required</li> <li>One required for EDP10, EDP16TE/HAZ, ADP20; two required for EDP30 &amp;</li> </ul>  | EDP50                        |
| 244852 | Outlet Filter Jar  |                              |
| 263552 | Outlet Filter Assembly O-Ring  | $\bigcirc$                   |
| 517101 | <ul> <li>Outlet Filter</li> <li>Carbofine (change every 200 hours or as required)</li> <li>One required for EDP10, EDP16TE/HAZ, ADP20; fpur required for EDP30; eight required for EDP50</li> </ul>            |                              |
| 517931 | Cleaning Solvent, 14 oz. Aerosol Can   |                              |
| V22    | <ul> <li>Quick-Disconnect Coupler Adapter</li> <li>Converts pump's quick-disconnect coupler to double <sup>3</sup>/<sub>8</sub>" female NPT</li> </ul>   |                              |
| V23    | <ul> <li>Quick-Disconnect Adapter</li> <li>Converts pump's quick-disconnect coupler to single 3/6" female NPT</li> </ul>   | The same time is the same is |
| V24    | <ul> <li>Quick-Disconnect Coupler Splitter/Adapter</li> <li>Converts pump's quick-disconnect coupler to<br/>double 1/2" Industrial Interchange female couplers<br/>(one flow-through, one shut-off)</li> </ul> |                              |
| V50EX  | <ul> <li>Remote Extension Hose Kit</li> <li>50-ft. length</li> <li>Connects to V50IN to extend length</li> <li>Maximum five per pump</li> <li>1 <sup>1</sup>/<sub>2</sub>" ID</li> </ul>                       |                              |
| V50IN  | <ul> <li>Remote Inlet Air Hose Kit</li> <li>50-ft. length</li> <li>Connects to pump for remote location of inlet filter</li> <li>Maximum one per pump</li> <li>1 <sup>1</sup>/<sub>2</sub>" ID</li> </ul>      |                              |

Breathing

A i r

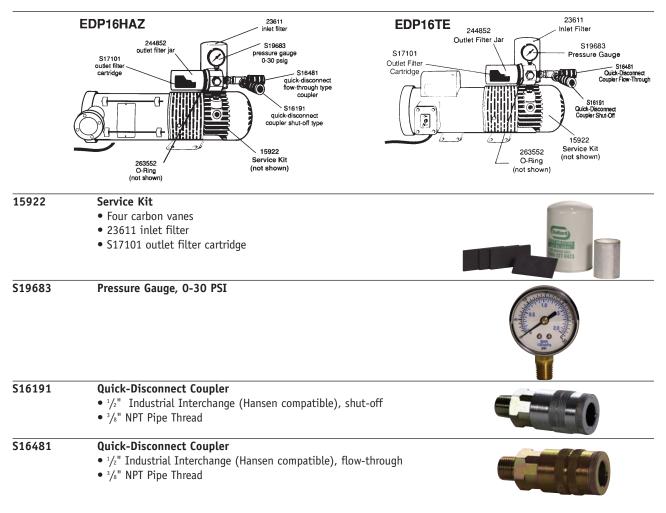
Filtration

#### **Electric Driven Pumps**

| EDP16TE  | Two to Three Person Pump   |        |
|----------|--|--------|
|          | • 1 <sup>1</sup> / <sub>2</sub> HP electric-driven, oil-less air pump with totally |        |
|          | enclosed fan-cooled motor drive (TFEC)   |        |
|          | <ul> <li>Supplies air to two hood-style or 3 half or</li> </ul>                    |        |
|          | full face mask airline respirators   | Rutler |
|          | • Inlet and outlet filter cartridges   |        |
|          | Pressure gauge (0-30 psig)   |        |
|          | • Electrical cord and On/Off switch  |        |
|          | • Two 1/2" Industrial Interchange (Hansen compatible)                              |        |
|          | guick-disconnect couplers  |        |
|          | • Shipping Weight: 100 lbs   |        |
|          | 11 5 5   |        |
| EDP16HAZ | Two to Three Person Hazardous Duty Pump (Not Pictured)                             |        |
|          | • 1 <sup>1</sup> / <sub>2</sub> HP electric-driven, oil-less air pump with         |        |
|          | hazardous-duty motor   |        |
|          | <ul> <li>Supplies air to two hood-style or three half or</li> </ul>                |        |
|          | full face mask airline respirators   |        |
|          | • Inlet and outlet filter cartridges   |        |
|          | • Pressure gauge (0-30 psig)   |        |
|          | • Starter/contactor to be supplied by user   |        |
|          | • Two 1/2" Industrial Interchange (Hansen compatible)                              |        |
|          | guick-disconnect couplers  |        |
|          |  |        |

• Shipping Weight: 100 lbs.

#### **EDP16 Replacement Parts**



# EDP16HAZ/EDP16TE Replacement Parts

| 00644          |  |            |
|----------------|--|------------|
| 23611          | <ul> <li>Inlet Filter</li> <li>Change every 500 hours or as required</li> <li>One required for EDP10, EDP16TE/HAZ, ADP20; two required for EDP30 &amp; EDP5</li> </ul>   | 50         |
| 244852         | Outlet Filter Jar  |            |
| 263552         | Outlet Filter Assembly O-Ring  | $\bigcirc$ |
| <u>\$17101</u> | <ul> <li>Outlet Filter</li> <li>Carbofine (change every 200 hours or as required)</li> <li>One required for EDP10, EDP16TE/HAZ, ADP20; four required for EDP30; eight required for EDP50</li> </ul>            |            |
| S17931         | Cleaning Solvent, 14 oz. Aerosol Can   |            |
| V22            | <ul> <li>Quick-Disconnect Coupler Adapter</li> <li>Converts pump's quick-disconnect coupler to<br/>double <sup>3</sup>/<sub>8</sub>" Female NPT</li> </ul>   |            |
| V23            | Quick-Disconnect Adapter<br>• Converts pump's quick-disconnect coupler to<br>single <sup>3</sup> / <sub>8</sub> " Female NPT   |            |
| V24            | <ul> <li>Quick-Disconnect Coupler Splitter/Adapter</li> <li>Converts pump's quick-disconnect coupler to<br/>double 1/2" Industrial Interchange female couplers<br/>(one flow through, one shut-off)</li> </ul> |            |
| V50EX          | Remote Extension Hose Kit<br>• 50-ft. length<br>• Connects to V50IN to extend length<br>• Maximum five per pump<br>• 1 <sup>1</sup> / <sub>2</sub> " ID  |            |
| V50IN          | <ul> <li>Remote Inlet Air Hose Kit</li> <li>50-ft. length</li> <li>Connects to pump for remote location of inlet filter</li> <li>Maximum one per pump</li> <li>1 1/2" ID</li> </ul>                            |            |

B r

#### **Electric Driven Pumps**

Electric Driven, Oil-less Air Pump

- All motors are open drip-proof.
  - Supplies air to:
    - Four hood-style; or
    - Six half or full face mask airline respirators; or
    - Two hood-style respirators equipped with FRIGITRON<sup>®</sup> climate control devices.
  - Respirators must be approved to operate on 30 psig or less.
  - Shipped complete with inlet and outlet filter cartridges, pressure gauges, pressure relief valves and one air supply hose quickdisconnect pod with six <sup>1</sup>/<sub>2</sub>" Industrial Interchange (Hansen compatible) quickdisconnect couplers.



- Three phase motors come standard with protective reversing starters to prevent running backwards.
- Shipping weight: 292 lbs.

NOTE: EDP30 pumps are custom built to your specifications. Contact Bullard Customer Service for lead time information.

EDP30A208 Single Phase 5 HP Motor, 208 Volt

EDP30A230 Single Phase 5 HP Motor, 230 Volt

EDP30B208 Three Phase 5 HP Motor, Reversing Starter, 208 Volt

EDP30B230 Three Phase 5 HP Motor, Reversing Starter, 230 Volt

EDP30B460 Three Phase 5 HP Motor, Reversing Starter, 460 Volt

EDP30C208 Three Phase 7.5 HP Motor, Reversing Starter, 208 Volt

EDP30C230 Three Phase 7.5 HP Motor, Reversing Starter, 230 Volt

EDP30C460 Three Phase 7.5 HP Motor, Reversing Starter, 460 Volt



# EDP30 Replacement Parts

| 519683 | Pressure Gauge, 0-30 PSI<br>• For EDP30 and EDP50 pod                       |  |
|--------|---|--|
| S19688 | <b>Pressure Gauge, 0-60 PSI</b><br>• For EDP30 and EDP50 manifold           |  |
| 52084  | EDP30 Drive Belt (Matched Pair)   |  |
| 52089  | Kamlok Adapter (Pod)<br>• 1 <sup>1</sup> /4" ID aluminum                    |  |
| 52090  | <b>Kamlok Coupler (Manifold)</b><br>• 1 <sup>1</sup> /4" ID aluminum        |  |
| 15924  | Service Kit<br>• Four carbon vanes<br>• Two bearings<br>• Two cover gaskets |  |



# EDP30 Replacement Parts

| 00644   | The function of the second   |                            |
|---------|--|----------------------------|
| 23611   | <ul> <li>Inlet Filter</li> <li>Change every 500 hours or as required</li> <li>One required for EDP10, EDP16TE/HAZ, ADP20; two required for EDP30 &amp; E</li> </ul>  | DP50                       |
| 244852  | Outlet Filter Jar  |                            |
| 263552  | Outlet Filter Assembly O-Ring  | $\bigcirc$                 |
| \$17101 | <ul> <li>Outlet Filter</li> <li>Carbofine (change every 200 hours or as required)</li> <li>One required for EDP10, EDP16TE/HAZ, ADP20; four required for EDP30; eight required for EDP50</li> </ul>                                  |                            |
| S17931  | Cleaning Solvent, 14 oz. Aerosol Can   |                            |
| V22     | <ul> <li>Quick-Disconnect Coupler Adapter</li> <li>Converts pump's quick-disconnect coupler to double <sup>3</sup>/<sub>8</sub>" Female NPT</li> </ul>   |                            |
| V23     | <ul> <li>Quick-Disconnect Adapter</li> <li>Converts pump's quick-disconnect coupler to<br/>single <sup>3</sup>/<sub>8</sub>" Female NPT</li> </ul>   | And the second distance of |
| V24     | <ul> <li>Quick-Disconnect Coupler Splitter/Adapter</li> <li>Converts pump's quick-disconnect coupler to<br/>double <sup>1</sup>/<sub>2</sub>" Industrial Interchange female couplers<br/>(one flow through, one shut-off)</li> </ul> |                            |
| V50EX   | <ul> <li>Remote Extension Hose Kit</li> <li>50-ft. length</li> <li>Connects to V50IN to extend length</li> <li>Maximum five per pump</li> <li>1 <sup>1</sup>/<sub>2</sub>" ID</li> </ul>   |                            |
| V50IN   | <ul> <li>Remote Inlet Air Hose Kit</li> <li>50-ft. length</li> <li>Connects to pump for remote location of inlet filter</li> <li>Maximum one per pump</li> <li>1 <sup>1</sup>/<sub>2</sub>" ID</li> </ul>                            |                            |

B r

#### **Electric Driven Pumps**

Electric Driven, Oil-less Air Pump

- All motors are open drip-proof.
  - Supplies air to:
    - Seven hood-style; or
    - Ten half or full face mask airline respirators.
  - Respirators must be approved to operate on 15 psig or less.
  - Shipped complete with inlet and outlet filter cartridges, pressure gauges, pressure relief valves and two air supply hose quick-disconnect pods with six 1/2" industrial interchange (Hansen compatible) quick-disconnect couplers.
  - Three phase motors come standard with protective reversing starters to prevent running backwards.





NOTE: EDP50 pumps are custom built to your specifications. Contact Bullard Customer Service for lead time information.

| EDP50A208 | Single Phase 5 HP Motor, 208 Volt                     |
|-----------|---|
| EDP50A230 | Single Phase 5 HP Motor, 230 Volt                     |
| EDP50B208 | Three Phase 5 HP Motor, Reversing Starter, 208 Volt   |
| EDP50B230 | Three Phase 5 HP Motor, Reversing Starter, 230 Volt   |
| EDP50B460 | Three Phase 5 HP Motor, Reversing Starter, 460 Volt   |
| EDP50C208 | Three Phase 7.5 HP Motor, Reversing Starter, 208 Volt |
| EDP50C230 | Three Phase 7.5 HP Motor, Reversing Starter, 230 Volt |
|           |   |

EDP50C460 Three Phase 7.5 HP Motor, Reversing Starter, 460 Volt



#### **EDP50 Replacement Parts**

S19683 Pressure Gauge, 0-30 PSI

• For EDP30 and EDP50 pod



S19688

Pressure Gauge, 0-60 PSI • For EDP30 and EDP50 manifold



S2085

EDP50 Drive Belt (Matched Pair)



S2089

Kamlok Adapter (Pod) • 1 <sup>1/4</sup>" ID aluminum



S2090

Kamlok Coupler (Manifold) • 1 <sup>1</sup>/<sub>4</sub>" ID aluminum



15924 Service Kit

- Four carbon vanes
  - Two bearings
  - Two cover gaskets



# EDP50 Replacement Parts

| 23611   | <ul> <li>Inlet Filter</li> <li>Change every 500 hours or as required</li> <li>One required for EDP10, EDP16TE/HAZ, ADP20; two required for EDP30 &amp; E</li> </ul>  | DP50                  |
|---------|--|-----------------------|
| 244852  | Outlet Filter Jar  |                       |
| 263552  | Outlet Filter Assembly O-Ring  | $\bigcirc$            |
| \$17101 | <ul> <li>Outlet Filter</li> <li>Carbofine (change every 200 hours or as required)</li> <li>One required for EDP10, EDP16TE/HAZ, ADP20; four required for EDP30; eight required for EDP50</li> </ul>            |                       |
| S17931  | Cleaning Solvent, 14 oz. Aerosol Can   |                       |
| V22     | <ul> <li>Quick-Disconnect Coupler Adapter</li> <li>Converts pump's quick-disconnect coupler to double <sup>3</sup>/<sub>8</sub>" Female NPT</li> </ul>   |                       |
| V23     | <ul> <li>Quick-Disconnect Adapter</li> <li>Converts pump's quick-disconnect coupler to<br/>single <sup>3</sup>/<sub>8</sub>" Female NPT</li> </ul>   | and the second second |
| V24     | <ul> <li>Quick-Disconnect Coupler Splitter/Adapter</li> <li>Converts pump's quick-disconnect coupler to<br/>double 1/2" Industrial Interchange female couplers<br/>(One flow-through, one shut-off)</li> </ul> |                       |
| V50EX   | <ul> <li>Remote Extension Hose Kit</li> <li>50-ft. length</li> <li>Connects to V50IN to extend length</li> <li>Maximum five per pump</li> <li>1 <sup>1</sup>/<sub>2</sub>" ID</li> </ul>                       |                       |
| V50IN   | <ul> <li>Remote Inlet Air Hose Kit</li> <li>50-ft. length</li> <li>Connects to pump for remote location of inlet filter</li> <li>Maximum one per pump</li> <li>1 <sup>1</sup>/<sub>2</sub>" ID</li> </ul>      |                       |

-

Filtration

#### Part Number Product Index

20SICVHS51 .....80

99, 103

99, 103

99.105.

122-123. 129.138.

142.151.

113, 120

99, 105,

122, 123,

151, 153

103

99, 103

113, 120

99.105.

122, 123. 151, 153

99, 104

99, 103

99, 104

99, 104

99, 104

99, 104

153

41P6WM .....190

**511MD30** .....143 

640G .....45

77LG .....139

840M .....45

840MH .....46

840MX2 .....45

88CA .....138

88VX3235H100 . . . . . . 131

88VXAK .....138,

**88VXHP** .....138, 

88VXRAK .....138

911HR .....17

AC1000 .....132,

142

| Part Nu | m | ıb | e | r |   |   |   |   |   |   |   | Pa | age Number |
|---------|---|----|---|---|---|---|---|---|---|---|---|----|------------|
| 0032    |   |    |   |   |   |   |   |   |   |   |   |    | .142, 145  |
| 0072    |   |    |   |   |   |   |   |   |   |   |   |    | .142, 145  |
|         |   |    |   |   |   |   |   |   |   |   |   |    | .43        |
|         |   |    |   |   |   |   |   |   |   |   |   |    |            |
|         |   |    |   |   |   |   |   |   |   |   |   |    | .45        |
| 1040    |   |    |   |   |   |   |   |   |   |   |   |    | .45        |
| 3420    |   |    |   |   |   |   |   |   |   |   |   |    | .181       |
| 3421    | • | •  | • | • | • | • | • | • | • | • | • | •  | .180       |
| 3902    |   |    |   |   |   |   |   |   |   |   |   |    | .181       |
| 3914    |   |    |   |   |   |   |   |   |   |   |   |    | .180       |
| 4611    |   |    |   |   |   |   |   |   |   |   |   |    | .170, 183- |
| 4011    | • | •  | • | • | • | • | • | • | • | • | • | •  | 185, 187   |
| 4610    |   |    |   |   |   |   |   |   |   |   |   |    |            |
| 4012    | • | •  | • | • | • | • | • | • | • | • | • | •  | .99, 113,  |
|         |   |    |   |   |   |   |   |   |   |   |   |    | 115, 120,  |
|         |   |    |   |   |   |   |   |   |   |   |   |    | 122, 125,  |
|         |   |    |   |   |   |   |   |   |   |   |   |    | 129, 135,  |
|         |   |    |   |   |   |   |   |   |   |   |   |    | 142, 144,  |
|         |   |    |   |   |   |   |   |   |   |   |   |    | 151, 157,  |
|         |   |    |   |   |   |   |   |   |   |   |   |    | 175, 183,  |
|         |   |    |   |   |   |   |   |   |   |   |   |    | 184, 185,  |
|         |   |    |   |   |   |   |   |   |   |   |   |    |            |
| 100-    |   |    |   |   |   |   |   |   |   |   |   |    | 187        |
|         |   |    |   |   |   |   |   |   |   |   |   |    | .194       |
| 4696    |   |    |   |   |   |   |   |   |   |   |   |    | .178       |
| 5454    | • | •  | • | • |   |   |   | • |   |   |   |    | .178       |
| 5457    |   |    |   |   |   |   |   |   |   |   |   |    | .178       |
| 5458    |   |    |   |   |   |   |   |   |   |   |   |    | .178       |
| 6059    |   |    |   |   |   |   |   |   |   |   |   |    | .161       |
| 7714    |   |    |   |   |   |   |   |   |   |   |   |    | .139, 148, |
| //14    | • | •  | • | • | • | • | • | • | • | • | • | •  |            |
|         |   |    |   |   |   |   |   |   |   |   |   |    | 157        |
| 15921   |   |    |   |   |   |   |   |   |   |   |   |    | .196       |
| 15922   |   |    |   |   |   |   |   |   |   |   |   |    | .194, 198  |
| 15924   |   | •  | • | • | • | • | • | • | • | • | • | •  | .202, 206  |
| 16483   |   | •  | • | • |   |   |   | • |   |   |   |    | .196       |
| 17761   |   |    |   |   |   |   |   |   |   |   |   |    | .193       |
| 21052   |   |    |   |   |   |   |   |   |   |   |   |    | .194       |
| 21821   |   |    |   |   |   |   |   |   |   |   |   |    | .129, 136  |
| 23611   |   | •  | • | • | • | • | • | • | • | • | • | •  | .195, 197, |
| 25011   |   | •  | • | • | • | • | • | • | • | • | • | •  |            |
|         |   |    |   |   |   |   |   |   |   |   |   |    | 199, 203,  |
|         |   |    |   |   |   |   |   |   |   |   |   |    | 207        |
| 26701   |   | •  | • | • | • | • | • | • | • | • | • | •  | .201, 205  |
| 27161   |   |    |   |   |   |   |   |   |   |   |   |    | .205       |
| 28151   |   | •  |   | • |   |   |   |   |   |   |   |    | .201, 205  |
| 28152   |   |    |   |   |   |   |   |   |   |   |   |    | .201, 205  |
| 30013   |   |    |   |   |   |   |   |   |   |   |   |    | .22        |
| 36501   |   |    |   |   |   |   |   |   |   |   |   |    | .115, 120, |
|         |   | •  | · | • | • | • | • | · | • | • | • | •  | 122, 125,  |
|         |   |    |   |   |   |   |   |   |   |   |   |    | 175, 183-  |
|         |   |    |   |   |   |   |   |   |   |   |   |    |            |
|         |   |    |   |   |   |   |   |   |   |   |   |    | 185, 187   |
| 36501   |   |    |   |   |   |   |   |   |   |   |   |    | .99, 113   |
| 46913   |   | •  | • | • | • | • | • | • | • | • | • | •  | .178       |
| 46915   |   | •  |   | • |   |   |   |   |   |   |   |    | .178       |
| 46916   |   |    |   |   |   |   |   |   |   |   |   |    | .178       |
| 46917   |   |    |   |   |   |   |   |   |   |   |   |    | .178       |
| 46919   |   |    |   |   |   |   |   |   |   |   |   |    | .178       |
| 54510   |   |    |   |   |   |   |   |   |   |   |   |    | .178       |
|         |   |    |   |   |   |   |   |   |   |   |   |    |            |
| 54511   |   |    |   |   |   |   |   |   |   |   |   |    | .178       |
| 54512   |   |    |   |   |   |   |   |   |   |   |   |    | .178       |
| 54513   |   |    |   |   |   |   |   |   |   |   |   |    | .178       |
| 21805   |   |    |   |   |   |   |   |   |   |   |   |    |            |
| 24485   | 2 |    |   | • |   |   |   |   |   |   |   |    | .195, 197, |
|         |   |    |   |   |   |   |   |   |   |   |   |    | 199, 203,  |
|         |   |    |   |   |   |   |   |   |   |   |   |    | 207        |
| 26355   | 2 |    |   |   |   |   |   |   |   |   |   |    | .195, 197, |
| 20000   | - |    | • | • | • | • | • | • | • | • | • | •  | 199, 207   |
| 1000    |   |    |   |   |   |   |   |   |   |   |   |    |            |
| 100G    |   |    |   |   |   |   |   |   |   |   |   |    |            |
|         |   |    |   |   |   |   |   |   |   |   |   |    | .44        |
|         |   |    |   |   |   |   |   |   |   |   |   |    | .44        |
| 13VX    | • | •  | • | • | • | • | • | • | • | • | • | •  | .129, 136  |
| 20BT .  |   |    |   |   |   |   |   |   |   |   |   |    | .99, 113,  |
|         |   |    |   |   |   |   |   |   |   |   |   |    | 115, 120,  |
|         |   |    |   |   |   |   |   |   |   |   |   |    | 157        |
| 20LCL   |   |    |   |   |   |   |   |   |   |   |   |    | .105, 125, |
| LULUL   | • | •  | • | • | • | • | • | • | • | • | • | •  | 157        |
| 20LFBT  |   |    |   |   |   |   |   |   |   |   |   |    |            |
| ZULFBI  |   | •  | • | • | • | · | · | • | • | • | • | ·  | .115       |

| .190       | AC100030S               |
|------------|-------------------------|
| .150       |                         |
| .190       | AC100031                |
| .191       | 129, 151,               |
|            | 183                     |
| .191       | 105                     |
| .190       | AC100032                |
| .191       | 129, 151,               |
|            |                         |
| .191       | 183                     |
| .190       | AC100033                |
| .191       | 151, 183                |
| .191       | 151, 185                |
| .190       | AC100034                |
| .191       | 151                     |
| 101        | AC100037                |
|            |                         |
| .129, 136  | 151, 183                |
| .44        | AC100038                |
|            |                         |
| .143       | AC1000DC                |
| .143       | <b>ACL99</b>            |
|            |                         |
| .143       | 184                     |
| .45        | ADFB                    |
| .46        | <b>ADP20</b>            |
|            |                         |
| .139       | ADRTSL                  |
| .139       | ADS144                  |
|            |                         |
| .45        | <b>AFW45</b>            |
| .47        | <b>APECPDSA</b>         |
|            | <b>B461040</b> 140      |
|            |                         |
| .46        | <b>B461B</b> 140        |
| .45        | <b>B461R015</b>         |
|            |                         |
| .46        | <b>B461R020</b>         |
| .46        | <b>B771020</b>          |
|            |                         |
| .46        | <b>B771040</b> 140, 148 |
| .46        | <b>B771B</b> 140, 148   |
|            | <b>B771D015</b>         |
| .47        |                         |
| .138       | <b>B771E040</b>         |
| .135       | <b>B771R015</b>         |
|            |                         |
| .138       | B771R020                |
| .130       | <b>B77D015</b>          |
|            |                         |
| .130       | <b>B77R015</b> 140      |
| .130       | <b>B77R020</b>          |
| .130       | BC1                     |
|            |                         |
| .130       | BC2                     |
| .130       | <b>BFW</b>              |
|            |                         |
| .131       | <b>BHA</b>              |
| .131       | BT100                   |
| .130       | BT101                   |
|            |                         |
| .131       | BT102                   |
| .131       | BT103                   |
| .138, 147  | BT108                   |
|            |                         |
| .138, 147  | BT135                   |
| .129, 135  | <b>C30</b>              |
| .138, 147  | 83, 99,                 |
|            |                         |
| .139, 148  | 106, 151,               |
| .130       | 154                     |
|            |                         |
| .130       | <b>C30R</b> 16, 58, 65, |
| .138       | 83, 99,                 |
| .129, 137, | 106, 151,               |
|            |                         |
| 142, 145   | 154                     |
| .131       | <b>C33</b>              |
|            |                         |
| .129, 137, |                         |
| 142, 145   | <b>C41</b>              |
| .47        | <b>C42</b>              |
|            |                         |
| .125       | <b>C43</b>              |
| .17        | CA30169                 |
|            |                         |
| .17        | <b>CA31</b>             |
| .17        | CA32169                 |
| .17        | <b>CA33</b>             |
|            |                         |
| .137       | CA34                    |
| .9         | CA37                    |
|            |                         |
| .12        | <b>CAB2</b>             |
| .13        | <b>CAB3</b>             |
| .9         | <b>CAB4</b>             |
|            |                         |
| .132, 183  | <b>CC20LF30</b> 101     |
| .99, 115,  | CC20SIC30101            |
| 129, 151   | CC20SIC30RT             |
|            |                         |
| .99, 115,  | <b>CC20TIC30</b> 100    |
| 129, 151   | CC20TIC30RT             |
|            |                         |

| Part Number      | Page Number |
|------------------|-------------|
| CC20TICH30       | 101         |
| CC2OTICH3ORT     | 101         |
| CC20TICH30S51    | 101         |
| CC2OTICH30S51R . | 101         |
| СС20ТЈ30         |             |
| CC20TJ30RT       | 100         |
| CC2OTP3ORT       | 100         |
| CH1000           | 187         |
| СН60             | 187         |
| COM23            | 38          |
| COM25B           |             |
| CP1              | 42          |
| CP2              |             |
| CS40             |             |
| CS90L            |             |
| CS90M            |             |
| CS90S            |             |
| CS90XL           |             |
| CS90XXL          |             |
| CS90XXXL         |             |
| CSS              | 23          |
| CYL4510          |             |
| CYL455           | 168         |
| CYL5H            |             |
| DC5040           |             |
|                  | 142, 151,   |
|                  | 187         |
| DC5040B          | 99          |
| DC5040S          |             |
| DC5041           |             |
|                  | 142, 151,   |
|                  | 187         |
| DC5042           |             |
|                  | 142, 151,   |
|                  | 187         |
| DC5043           |             |
| DC5044           |             |
| DC5047           |             |
|                  | 142, 151,   |
|                  | 187         |
| DC5048           | 187         |
| DC6040           |             |
| DC6040B          |             |
| DC6040S          |             |
| DC6041           |             |
| DC6042           |             |
| DC6043           |             |
| DC6044           | 122         |
| DC6047           | 122         |
| DC65ML           |             |
| DC65XLXXL        | 186         |
| DC70             |             |
| DC70ML           | 186         |
| DC70XLXXL        |             |
| DEP              | 40          |
| EDP10            |             |
| EDP16HAZ         | 198         |
| EDP16TE          | 198         |
| EDP30A208        | 200         |
| EDP30A230        | 200         |
| EDP30B208        |             |
| EDP30B230        | 200         |
| EDP30B460        |             |
| EDP30C208        | 200         |
| EDP30C230        | 200         |
| EDP30C460        | 200         |
| EDP50A208        |             |
| EDP50A230        |             |
| EDP50B208        |             |
| EDP50B230        |             |
| EDP50B460        |             |
| EDP50C208        | 204         |
| EDP50C230        | 204         |
| EDP50C460        |             |
| EH45             |             |
| ES42             |             |
|                  | 84, 99,     |
|                  | 107, 155    |
| ESRTSL           | 20          |
| ESRTSL           | 20          |
|                  |             |

| EV0  |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 | .162, 167   |
|--|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|-------------------|-----------------|---|
| EVPDK .  | :                                     | :                                     | :                                     | :                                     | :                                     | :                                     | :                                     | :                                     | :                 | :               | .166  |
| EVX30  |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 |   |
| EVX31  |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 |   |
| EVX32  |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 |   |
| EVX33  |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 |   |
| EVX35<br>EVX37   |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 |   |
| EVX38  |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 |   |
| EVX40  |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 |   |
| EVX41  | •                                     | •                                     | •                                     | •                                     | •                                     | •                                     | •                                     | •                                     | •                 | •               | .132  |
| EVX42  |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 |   |
| EVX43  |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 |   |
| EVX47<br>EVX48   |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 |   |
| F30  |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 |   |
|  |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 | 115, 119,   |
|  |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 | 129, 133,   |
|  |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 | 142, 144,   |
| E20P   |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 | 151, 156<br>.99, 110,   |
| F30D   | •                                     | •                                     | •                                     | •                                     | •                                     | •                                     | •                                     | •                                     | •                 | •               | .99, 110,<br>115, 151   |
| F30S   |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 | .110, 115,  |
|  |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 | 151   |
| F30SD  |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 |   |
| F31  | •                                     | •                                     | •                                     | •                                     | •                                     | •                                     | •                                     | •                                     | •                 | •               |   |
|  |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 | 115, 119,<br>122 151  |
| F32  |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 | 133,151<br>99 110   |
| 152  | •                                     | •                                     | •                                     | •                                     | •                                     | •                                     | •                                     | •                                     | •                 | •               | 115, 119,   |
|  |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 | 133, 151  |
| F33  | •                                     | •                                     | •                                     | •                                     | •                                     | •                                     | •                                     | •                                     | •                 | •               | .99, 110,   |
|  |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 | 115, 119,   |
| E2 /   |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 | 133, 151  |
| F34  | •                                     | •                                     | •                                     | •                                     | •                                     | •                                     | •                                     | •                                     | •                 | •               | .99, 110,<br>115, 119,  |
|  |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 | 151   |
| F35  |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 | .99, 111,   |
|  |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 | 129, 134,   |
|  |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 | 142, 144,   |
| E2 5 B   |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 | 151, 156<br>.99, 111,   |
| 1330   | •                                     | •                                     | •                                     | •                                     | •                                     | •                                     | •                                     | •                                     | •                 | •               | 151   |
| F35S   |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 | .99, 111,   |
|  |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 | 151   |
| F37  | •                                     | •                                     | •                                     | •                                     | •                                     | •                                     | •                                     | •                                     | •                 | •               | .99, 111,<br>133, 151   |
| F38  |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 | .133  |
| F40  | :                                     |                                       | :                                     | :                                     | :                                     | :                                     | :                                     | :                                     | :                 | :               | .99, 111,   |
|  |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 | 134, 151,   |
|  |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 | 156   |
| F40B   | •                                     | •                                     | •                                     | •                                     | •                                     | •                                     | •                                     | •                                     | •                 |                 | .99, 111,   |
| F405   |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 |   |
| 1405   | ٠                                     |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 | 151   |
|  |                                       | •                                     | •                                     | •                                     | •                                     | •                                     | •                                     |                                       |                   |                 | 151<br>.99, 111,  |
| F40VDB.  |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 | 151<br>.99, 111,<br>151   |
| F40VDB.<br>F41   |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                                       | •                 | •               | 151<br>.99, 111,<br>151<br>.111<br>.99, 111,  |
| F41  | •                                     | •                                     |                                       | •                                     | •                                     | •                                     | •                                     |                                       | •                 |                 | 151<br>.99, 111,<br>151<br>.111<br>.99, 111,<br>134   |
|  | •                                     | •                                     |                                       | •                                     | •                                     | •                                     | •                                     |                                       | •                 |                 | 151<br>.99, 111,<br>151<br>.111<br>.99, 111,<br>134<br>.99, 112,  |
| F41  | •                                     |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 | 151<br>.99, 111,<br>151<br>.111<br>.99, 111,<br>134<br>.99, 112,<br>134   |
| F41  | •                                     |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 | 151<br>.99, 111,<br>151<br>.111<br>.99, 111,<br>134<br>.99, 112,<br>134   |
| F41<br>F42<br>F43  |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 | 151<br>.99, 111,<br>151<br>.111<br>.99, 111,<br>134<br>.99, 112,<br>134<br>.99, 112,  |
| F41          F42          F43          F44   |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                                       | ·<br>·<br>·       |                 | 151<br>.99, 111,<br>151<br>.111<br>.99, 111,<br>134<br>.99, 112,<br>134<br>.99, 112,<br>151<br>.99, 112,<br>151   |
| F41          F42          F43          F44          F45  | ·<br>·<br>·                           |                                       |                                       |                                       |                                       |                                       |                                       |                                       | ·<br>·<br>·       | ·<br>·<br>·     | 151<br>.99, 111,<br>151<br>.111<br>.99, 111,<br>134<br>.99, 112,<br>134<br>.99, 112,<br>151<br>.99, 112,<br>151<br>.112   |
| F41          F42          F43          F44          F45  | ·<br>·<br>·                           |                                       |                                       |                                       |                                       |                                       |                                       |                                       | ·<br>·<br>·       | ·<br>·<br>·     | 151<br>.99, 111,<br>151<br>.111<br>.99, 111,<br>134<br>.99, 112,<br>134<br>.99, 112,<br>151<br>.151<br>.112<br>.99, 112,  |
| F41          F42          F43          F44          F45          F47   | ·<br>·<br>·                           | ·<br>·<br>·                           | ·<br>·<br>·                           | ·<br>·<br>·                           | ·<br>·<br>·                           |                                       |                                       | ·<br>·<br>·                           | ·<br>·<br>·       | ·<br>·<br>·     | 151<br>.99, 111,<br>151<br>.99, 111,<br>134<br>.99, 112,<br>134<br>.99, 112,<br>151<br>.99, 112,<br>151<br>.112<br>.99, 112,<br>151<br>.112   |
| F41          F42          F43          F44          F45          F47          FAMB30L         FAMB30M  | •                                     | · · · · · · · ·                       | ·<br>·<br>·                           | ·<br>·<br>·<br>·                      | ·<br>·<br>·<br>·                      | · · · · · · · · ·                     | · · · · · · · · ·                     | ·<br>·<br>·                           | · · · · · · · · · | · · · · · · · · | 151<br>.99, 111,<br>151<br>.99, 111,<br>134<br>.99, 112,<br>134<br>.99, 112,<br>151<br>.99, 112,<br>151<br>.112<br>.99, 112,<br>151<br>.112   |
| F41          F42          F43          F44          F45          F47          FAMB3OL       FAMB3OM         FAMB3OS       FAMB3OS  | •                                     | · · · · · · · · · · ·                 | · · · · · · · · · · · · · · · · · · · | · · · · · · · · · · · · · · · · · · · | · · · · · · · · · · · · · · · · · · · | · · · · · · · · · · · · · · · · · · · | · · · · · · · · · · · · · · · · · · · | · · · · · · · · · · · · · · · · · · · |                   |                 | 151<br>.99, 111,<br>151<br>.111<br>.99, 111,<br>134<br>.99, 112,<br>134<br>.99, 112,<br>151<br>.112<br>.99, 112,<br>151<br>.112<br>.99, 112,<br>134, 151<br>.173<br>.173  |
| F41          F42          F43          F44          F45          F47          FAMB30L       FAMB30M         FAMB30S       FAMB30S  | •                                     | · · · · · · · · · · · · · · · · · · · | · · · · · · · · · · · · · · · · · · · | · · · · · · · · · · · · · · · · · · · | · · · · · · · · · · · · · · · · · · · |                                       |                                       | · · · · · · · · · · · · · · · · · · · |                   |                 | 151<br>.99, 111,<br>151<br>.111<br>.99, 111,<br>134<br>.99, 112,<br>134<br>.99, 112,<br>151<br>.112<br>.99, 112,<br>151<br>.112<br>.99, 112,<br>134, 151<br>.173<br>.173<br>.173  |
| F41          F42          F43          F44          F45          F47          FAMB30L         FAMB30S         FAMB30S         FAMB30S         FAMB30S         FAMB30S  | •                                     | · · · · · · · · · · · · · · · · · · · |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 | 151<br>.99, 111,<br>151<br>.111<br>.99, 111,<br>134<br>.99, 112,<br>134<br>.99, 112,<br>151<br>.112<br>.99, 112,<br>151<br>.112<br>.99, 112,<br>134, 151<br>.173<br>.173<br>.173<br>.173  |
| F41          F42          F43          F44          F45          F47          FAMB30L       FAMB30M         FAMB30S       FAMB30S         FAMB30S       FAMB30S         FAMB30S       FAMB30S         FAMB30S       FAMB30S  | •                                     | · · · · · · · · · · · · ·             |                                       | • • • • • • • • •                     | • • • • • • • • •                     |                                       |                                       |                                       |                   |                 | 151<br>.99, 111,<br>151<br>.111<br>.99, 111,<br>134<br>.99, 112,<br>134<br>.99, 112,<br>151<br>.112<br>.99, 112,<br>151<br>.112<br>.99, 112,<br>134, 151<br>.173<br>.173<br>.173<br>.173<br>.173  |
| F41          F42          F43          F44          F45          F47          FAMB30L         FAMB30S         FAMB30S         FAMB30S         FAMB30S         FAMB30S  | · · · · · ·                           |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 | 151<br>.99, 111,<br>151<br>.99, 111,<br>134<br>.99, 112,<br>134<br>.99, 112,<br>151<br>.99, 112,<br>151<br>.112<br>.99, 112,<br>151<br>.112<br>.99, 112,<br>151<br>.173<br>.173<br>.173<br>.173<br>.173<br>.173                                   |
| F41          F42          F43          F44          F45          F47          FAMB30L         FAMB30S         FAMB30S         FAMB30S         FAMB35S         FAMB35S         FAMB35S         FAMB35S         FAMB35S         FAMB35S         FAMB35S         FAMB35S         FAMB35S  | · · · · · · · · · ·                   |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 | 151<br>.99, 111,<br>151<br>.111<br>.99, 111,<br>134<br>.99, 112,<br>134<br>.99, 112,<br>151<br>.99, 112,<br>151<br>.112<br>.99, 112,<br>151<br>.112<br>.99, 112,<br>134, 151<br>.173<br>.173<br>.173<br>.173<br>.173<br>.175<br>.175              |
| F41          F42          F43          F44          F45          F47          FAMB30L         FAMB30S         FAMB30S         FAMB30S         FAMB35S  | · · · · · · · · · · · · · · · · · · · |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 | 151<br>.99, 111,<br>151<br>.111<br>.99, 111,<br>134<br>.99, 112,<br>134<br>.99, 112,<br>151<br>.99, 112,<br>151<br>.112<br>.99, 112,<br>151<br>.112<br>.99, 112,<br>134, 151<br>.173<br>.173<br>.173<br>.173<br>.175<br>.175<br>.175<br>.146, 174 |
| F41          F42          F43          F44          F45          F47          FAMB30L       FAMB30S         FAMB30S       FAMB30S         FAMSUS       FAMSUS         FAMSUS       FAMEVC2 | · · · · · · · · · · · · · · · · · · · |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 | 151<br>.99, 111,<br>151<br>.111<br>.99, 111,<br>134<br>.99, 112,<br>151<br>.99, 112,<br>151<br>.112<br>.99, 112,<br>151<br>.112<br>.99, 112,<br>134, 151<br>.173<br>.173<br>.173<br>.173<br>.173<br>.175<br>.175<br>.146, 174                     |
| F41          F42          F43          F44          F45          F47          FAMB30L       FAMB30M         FAMB30S       FAMB30S         FAMSUS       FAMSUS         FAMEVC2       FAMEVC2                              | · · · · · · · · · · · · · · · · · · · |                                       |                                       |                                       |                                       |                                       |                                       |                                       |                   |                 | 151<br>.99, 111,<br>151<br>.111<br>.99, 111,<br>134<br>.99, 112,<br>134<br>.99, 112,<br>151<br>.112<br>.99, 112,<br>151<br>.112<br>.99, 112,<br>134, 151<br>.173<br>.173<br>.173<br>.173<br>.173<br>.175<br>.146, 174<br>.146, 174                |

| FAMM  |  |                                       |                                       | .174  |
|---|--|---------------------------------------|---------------------------------------|---|
| FAMS  |  |                                       |                                       |   |
| FB2000  |  |                                       |                                       |   |
|   |  |                                       |                                       |   |
| FB2001  |  |                                       |                                       |   |
| FBFOAM  |  |                                       |                                       |   |
| FKML  |  |                                       |                                       |   |
| FKS   |  |                                       |                                       |   |
| FRIGITRON2000.  | • •  | ·                                     | ·                                     |   |
|   |  |                                       |                                       | 151, 184  |
| FRIGITRON2000B  |  |                                       | •                                     | .99, 129,   |
|   |  |                                       |                                       | 151   |
| FRIGITRON2000S  |  |                                       |                                       | .99, 129,   |
|   |  |                                       |                                       | 151   |
| FSR45   |  |                                       |                                       | .168  |
| FTR45   |  |                                       |                                       |   |
| G4613   |  |                                       |                                       |   |
| G7713   | •••  | •                                     | •                                     | 130 147   |
| GC100   |  |                                       |                                       |   |
| GL5   |  |                                       |                                       |   |
|   |  |                                       |                                       |   |
| GR5030  |  |                                       |                                       |   |
| GR5035  | • •  | •                                     | ·                                     | .152  |
| GR50SYS   |  |                                       |                                       |   |
| GRH   |  |                                       |                                       |   |
| HC2400  |  |                                       |                                       |   |
| HC240030  | • •  | •                                     | •                                     |   |
|   |  |                                       |                                       | 151   |
| HC240030B   |  |                                       |                                       | .99, 115,   |
|   |  |                                       |                                       | 151   |
| HC240030S   | • •  |                                       |                                       |   |
|   |  |                                       | Ĩ                                     | 151   |
| HC240031  |  |                                       |                                       |   |
| 110240031   | ••   | •                                     | •                                     | 151, 185  |
| HC240032  |  |                                       |                                       |   |
| HC240032  | • •  | •                                     | •                                     |   |
| 1160/0000   |  |                                       |                                       | 151, 185  |
| HC240033  | • •  | •                                     | ·                                     |   |
|   |  |                                       |                                       | 185   |
| HC240034  |  |                                       |                                       |   |
| HC240037  | • •  | •                                     | •                                     |   |
|   |  |                                       |                                       |   |
|   |  |                                       |                                       | 185   |
| HC240038  |  |                                       |                                       |   |
| HC240038<br>HC2400BB  |  |                                       |                                       | .185  |
| HC2400BB  |  |                                       |                                       | .185<br>.185  |
|   | <br>   | •                                     | •                                     | .185<br>.185<br>.171  |
| HC2400BB<br>HFC45<br>HKE  | · ·<br>· ·   |                                       |                                       | .185<br>.185<br>.171<br>.39   |
| HC2400BB<br>HFC45<br>HKE<br>HKP   | <br><br>   |                                       | •                                     | .185<br>.185<br>.171<br>.39<br>.40  |
| HC2400BB<br>HFC45<br>HKE<br>HKP<br>HMCC   | · · ·<br>· · ·<br>· ·  |                                       |                                       | .185<br>.185<br>.171<br>.39<br>.40<br>.40   |
| HC2400BB<br>HFC45<br>HKE<br>HKP   | · · ·<br>· · ·<br>· ·  |                                       |                                       | .185<br>.185<br>.171<br>.39<br>.40<br>.40<br>.99, 115,  |
| HC2400BB<br>HFC45<br>HKE<br>HKP<br>HMCC   | · · ·<br>· · ·<br>· ·  |                                       |                                       | .185<br>.185<br>.171<br>.39<br>.40<br>.40<br>.99, 115,<br>129, 142,   |
| HC2400BB<br>HFC45<br>HKE<br>HKP<br>HMCC   | · · ·<br>· · ·<br>· ·  |                                       |                                       | .185<br>.185<br>.171<br>.39<br>.40<br>.99, 115,<br>129, 142,<br>151, 183,   |
| HC2400BB<br>HFC45<br>HKE<br>HKP<br>HMCC   | · · ·<br>· · ·<br>· ·  |                                       |                                       | .185<br>.185<br>.171<br>.39<br>.40<br>.99, 115,<br>129, 142,<br>151, 183,<br>184, 185,  |
| HC2400BB<br>HFC45<br>HKE<br>HKP<br>HKP<br>HMCC<br>HS  | · · ·<br>· ·<br>· ·  |                                       |                                       | .185<br>.185<br>.171<br>.39<br>.40<br>.99, 115,<br>129, 142,<br>151, 183,<br>184, 185,<br>187   |
| HC2400BB<br>HFC45<br>HKE<br>HKP<br>HMCC<br>HS<br>HSK  | · · ·<br>· ·<br>· ·  |                                       |                                       | .185<br>.185<br>.171<br>.39<br>.40<br>.99, 115,<br>129, 142,<br>151, 183,<br>184, 185,<br>187<br>.162, 166  |
| HC2400BB<br>HFC45<br>HKE<br>HKP<br>HMCC<br>HS<br>HSK<br>ILS45   | · · ·<br>· ·<br>· ·<br>· ·                                   | ·<br>·<br>·<br>·                      | ·<br>·<br>·<br>·                      | .185<br>.185<br>.171<br>.39<br>.40<br>.99, 115,<br>129, 142,<br>151, 183,<br>184, 185,<br>187<br>.162, 166<br>.170  |
| HC2400BB<br>HFC45<br>HKE<br>HKP<br>HMCC<br>HS<br>HSK<br>ILS45<br>IS02   | · · ·<br>· ·<br>· ·<br>· ·                                   | ·<br>·<br>·<br>·                      | ·<br>·<br>·<br>·                      | .185<br>.185<br>.171<br>.39<br>.40<br>.99, 115,<br>129, 142,<br>151, 183,<br>184, 185,<br>187<br>.162, 166<br>.170<br>.49   |
| HC2400BB<br>HFC45<br>HKE<br>HKP<br>HMCC<br>HS<br>HSK<br>ILS45<br>IS02<br>IS02P  | · · ·<br>· · ·<br>· · ·<br>· · ·                             | ·<br>·<br>·<br>·                      | · · · · · · · · · · ·                 | .185<br>.185<br>.171<br>.39<br>.40<br>.40<br>.99, 115,<br>129, 142,<br>151, 183,<br>184, 185,<br>187<br>.162, 166<br>.170<br>.49<br>.49   |
| HC2400BB<br>HFC45<br>HKE<br>HKP<br>HMCC<br>HS<br>HSK<br>ILS45<br>IS02<br>IS02P<br>IS02V   | · · ·<br>· · ·<br>· · ·<br>· · ·<br>· ·                      | ·<br>·<br>·<br>·                      | · · · · · · · · · · · · ·             | .185<br>.185<br>.171<br>.39<br>.40<br>.40<br>.99, 115,<br>129, 142,<br>151, 183,<br>184, 185,<br>187<br>.162, 166<br>.170<br>.49<br>.49<br>.49  |
| HC2400BB<br>HFC45<br>HKE<br>HKP<br>HMCC<br>HS<br>HSK<br>ILS45<br>IS02<br>IS02P<br>IS02V<br>L99BT  | · · ·<br>· · ·<br>· · ·<br>· · ·<br>· ·                      | ·<br>·<br>·<br>·<br>·                 | · · · · · · · · · · · · · · · · · · · | .185<br>.185<br>.171<br>.39<br>.40<br>.40<br>.99, 115,<br>129, 142,<br>151, 183,<br>184, 185,<br>187<br>.162, 166<br>.170<br>.49<br>.49<br>.49<br>.49<br>.142, 144  |
| HC2400BB<br>HFC45<br>HKE<br>HKP<br>HMCC<br>HS<br>HS<br>ILS45<br>IS02<br>IS02P<br>IS02P<br>L99BT<br>LC   |  | ·<br>·<br>·<br>·<br>·                 | · · · · · · · · · · · · · · · · · · · | .185<br>.185<br>.171<br>.39<br>.40<br>.40<br>.99, 115,<br>129, 142,<br>151, 183,<br>184, 185,<br>187<br>.162, 166<br>.170<br>.49<br>.49<br>.49<br>.142, 144<br>.167   |
| HC2400BB<br>HFC45<br>HKE<br>HKP<br>HMCC<br>HS<br>HSK<br>ILS45<br>IS02<br>IS02P<br>IS02V<br>L99BT  |  | ·<br>·<br>·<br>·<br>·                 | · · · · · · · · · · · · · · · · · · · | .185<br>.185<br>.171<br>.39<br>.40<br>.99, 115,<br>129, 142,<br>151, 183,<br>184, 185,<br>187<br>.162, 166<br>.170<br>.49<br>.49<br>.49<br>.142, 144<br>.167<br>.161, 162,  |
| HC2400BB<br>HFC45<br>HKE<br>HKP<br>HMCC<br>HS<br>HS<br>HSK<br>IS02<br>IS02P<br>IS02V<br>L99BT<br>LC<br>LCK  | · · ·<br>· · ·<br>· · ·<br>· · ·<br>· ·<br>· ·<br>· ·<br>· · | ·<br>·<br>·<br>·<br>·                 | · · · · · · · · · · · · · · · · · · · | .185<br>.185<br>.171<br>.39<br>.40<br>.99, 115,<br>129, 142,<br>151, 183,<br>184, 185,<br>187<br>.162, 166<br>.170<br>.49<br>.49<br>.49<br>.142, 144<br>.167<br>.161, 162,<br>166   |
| HC2400BB<br>HFC45<br>HKE<br>HKP<br>HMCC<br>HS<br>HS<br>ILS45<br>IS02<br>IS02P<br>IS02P<br>L99BT<br>LC   | · · ·<br>· · ·<br>· · ·<br>· · ·<br>· ·<br>· ·<br>· ·<br>· · | ·<br>·<br>·<br>·<br>·                 | · · · · · · · · · · · · · · · · · · · | .185<br>.185<br>.171<br>.39<br>.40<br>.99, 115,<br>129, 142,<br>151, 183,<br>184, 185,<br>187<br>.162, 166<br>.170<br>.49<br>.49<br>.49<br>.142, 144<br>.167<br>.161, 162,<br>166   |
| HC2400BB<br>HFC45<br>HKE<br>HKP<br>HMCC<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>H  |  | ·<br>·<br>·<br>·<br>·<br>·            |                                       | .185<br>.185<br>.171<br>.39<br>.40<br>.99, 115,<br>129, 142,<br>151, 183,<br>184, 185,<br>187<br>.162, 166<br>.170<br>.49<br>.49<br>.49<br>.142, 144<br>.167<br>.161, 162,<br>166<br>.175<br>.146   |
| HC2400BB<br>HFC45<br>HKE<br>HKP<br>HMCC<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>H  |  | ·<br>·<br>·<br>·<br>·<br>·            |                                       | .185<br>.185<br>.171<br>.39<br>.40<br>.99, 115,<br>129, 142,<br>151, 183,<br>184, 185,<br>187<br>.162, 166<br>.170<br>.49<br>.49<br>.49<br>.142, 144<br>.167<br>.161, 162,<br>166<br>.175<br>.146   |
| HC2400BB<br>HFC45<br>HKE<br>HKP<br>HMCC<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>H  |  | ·<br>·<br>·<br>·<br>·<br>·<br>·       |                                       | .185<br>.185<br>.171<br>.39<br>.40<br>.40<br>.99, 115,<br>129, 142,<br>151, 183,<br>184, 185,<br>187<br>.162, 166<br>.170<br>.49<br>.49<br>.49<br>.49<br>.142, 144<br>.167<br>.161, 162,<br>166<br>.175<br>.146<br>.146   |
| HC2400BB<br>HFC45<br>HKE<br>HKP<br>HMCC<br>HS<br>HS<br>HSK<br>ILS45<br>IS02 P<br>IS02V<br>L99BT<br>LC<br>LCK<br>LLMPM<br>LML<br>LMM   |  | · · · · · · · · · · · · · · · · · · · |                                       | .185<br>.185<br>.171<br>.39<br>.40<br>.40<br>.99, 115,<br>129, 142,<br>151, 183,<br>184, 185,<br>187<br>.162, 166<br>.170<br>.49<br>.49<br>.49<br>.49<br>.142, 144<br>.167<br>.161, 162,<br>166<br>.175<br>.146<br>.146   |
| HC2400BB<br>HFC45<br>HKE<br>HKP<br>HMCC<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>H  |  |                                       |                                       | .185<br>.185<br>.171<br>.39<br>.40<br>.40<br>.99, 115,<br>129, 142,<br>151, 183,<br>184, 185,<br>187<br>.162, 166<br>.170<br>.49<br>.49<br>.49<br>.142, 144<br>.167<br>.161, 162,<br>166<br>.175<br>.146<br>.146<br>.175  |
| HC2400BB<br>HFC45<br>HKE<br>HKP<br>HMCC<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS   |  |                                       |                                       | .185<br>.185<br>.171<br>.39<br>.40<br>.99, 115,<br>129, 142,<br>151, 183,<br>184, 185,<br>187<br>.162, 166<br>.170<br>.49<br>.49<br>.142, 144<br>.167<br>.161, 162,<br>166<br>.175<br>.146<br>.146<br>.175<br>.146  |
| HC2400BB<br>HFC45<br>HKE<br>HKP<br>HMCC<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>H  |  |                                       |                                       | .185<br>.185<br>.171<br>.39<br>.40<br>.99, 115,<br>129, 142,<br>151, 183,<br>184, 185,<br>187<br>.162, 166<br>.170<br>.49<br>.49<br>.142, 144<br>.167<br>.161, 162,<br>146<br>.175<br>.146<br>.175<br>.146<br>.161, 167   |
| HC2400BB<br>HFC45<br>HKE<br>HKP<br>HMCC<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>H  |  |                                       |                                       | .185<br>.185<br>.171<br>.39<br>.40<br>.99, 115,<br>129, 142,<br>151, 183,<br>184, 185,<br>187<br>.162, 166<br>.170<br>.49<br>.49<br>.142, 144<br>.167<br>.161, 162,<br>146<br>.175<br>.146<br>.146<br>.146<br>.161, 167<br>.175   |
| HC2400BB<br>HFC45<br>HKE<br>HKP<br>HMCC<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>H  |  |                                       |                                       | .185<br>.185<br>.171<br>.39<br>.40<br>.99, 115,<br>129, 142,<br>151, 183,<br>184, 185,<br>187<br>.162, 166<br>.170<br>.49<br>.49<br>.142, 144<br>.167<br>.161, 162,<br>146<br>.175<br>.146<br>.146<br>.175<br>.146<br>.161, 167<br>.175<br>.157   |
| HC2400BB<br>HFC45<br>HKE<br>HKP<br>HMCC<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>H  |  |                                       |                                       | .185<br>.185<br>.171<br>.39<br>.40<br>.40<br>.99, 115,<br>129, 142,<br>151, 183,<br>184, 185,<br>187<br>.162, 166<br>.170<br>.49<br>.49<br>.49<br>.49<br>.142, 144<br>.167<br>.161, 162,<br>166<br>.175<br>.146<br>.146<br>.146<br>.146<br>.146<br>.146<br>.146<br>.146   |
| HC2400BB<br>HFC45<br>HKE<br>HKP<br>HMCC<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>H  |  |                                       |                                       | .185<br>.185<br>.171<br>.39<br>.40<br>.40<br>.99, 115,<br>129, 142,<br>151, 183,<br>184, 185,<br>187<br>.162, 166<br>.170<br>.49<br>.49<br>.49<br>.142, 144<br>.167<br>.161, 162,<br>166<br>.175<br>.146<br>.146<br>.146<br>.146<br>.146<br>.146<br>.161, 167<br>.157<br>.162, 167<br>.35   |
| HC2400BB<br>HFC45<br>HKE<br>HKP<br>HMCC<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>H  |  |                                       |                                       | .185<br>.185<br>.171<br>.39<br>.40<br>.40<br>.99, 115,<br>129, 142,<br>151, 183,<br>184, 185,<br>187<br>.162, 166<br>.170<br>.49<br>.49<br>.49<br>.142, 144<br>.167<br>.161, 162,<br>166<br>.175<br>.146<br>.146<br>.146<br>.146<br>.146<br>.146<br>.161, 167<br>.157<br>.162, 167<br>.35<br>.35  |
| HC2400BB<br>HFC45<br>HKE<br>HKP<br>HMCC<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>H  |  |                                       |                                       | .185<br>.185<br>.171<br>.39<br>.40<br>.99, 115,<br>129, 142,<br>151, 183,<br>184, 185,<br>187<br>.162, 166<br>.170<br>.49<br>.49<br>.49<br>.49<br>.142, 144<br>.167<br>.161, 162,<br>166<br>.175<br>.146<br>.146<br>.146<br>.146<br>.146<br>.157<br>.157<br>.157<br>.157<br>.157<br>.157<br>.157<br>.35<br>.35<br>.185  |
| HC2400BB<br>HFC45<br>HKE<br>HKP<br>HMCC<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>H  |  |                                       |                                       | .185<br>.185<br>.171<br>.39<br>.40<br>.99, 115,<br>129, 142,<br>151, 183,<br>184, 185,<br>187<br>.162, 166<br>.170<br>.49<br>.49<br>.142, 144<br>.167<br>.161, 162,<br>166<br>.175<br>.146<br>.146<br>.175<br>.146<br>.161, 167<br>.157<br>.157<br>.157<br>.157<br>.157<br>.157<br>.185<br>.14  |
| HC2400BB<br>HFC45<br>HKE<br>HKP<br>HMCC<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>H  |  |                                       |                                       | .185<br>.185<br>.171<br>.39<br>.40<br>.99, 115,<br>129, 142,<br>151, 183,<br>184, 185,<br>187<br>.162, 166<br>.170<br>.49<br>.49<br>.142, 144<br>.167<br>.161, 162,<br>166<br>.175<br>.146<br>.146<br>.175<br>.146<br>.161, 167<br>.157<br>.157<br>.157<br>.157<br>.157<br>.157<br>.185<br>.14  |
| HC2400BB<br>HFC45<br>HKE<br>HKP<br>HMCC<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>H  |  |                                       |                                       | .185<br>.185<br>.171<br>.39<br>.40<br>.99, 115,<br>129, 142,<br>151, 183,<br>184, 185,<br>187<br>.162, 166<br>.170<br>.49<br>.49<br>.142, 144<br>.167<br>.161, 162,<br>166<br>.175<br>.146<br>.146<br>.175<br>.146<br>.161, 167<br>.175<br>.146<br>.161, 167<br>.157<br>.157<br>.157<br>.157<br>.185<br>.14<br>.14  |
| HC2400BB<br>HFC45<br>HKE<br>HKP<br>HMCC<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>H  |  |                                       |                                       | .185<br>.185<br>.171<br>.39<br>.40<br>.99, 115,<br>129, 142,<br>151, 183,<br>184, 185,<br>187<br>.162, 166<br>.170<br>.49<br>.49<br>.142, 144<br>.167<br>.161, 162,<br>166<br>.175<br>.146<br>.146<br>.146<br>.175<br>.146<br>.161, 167<br>.175<br>.146<br>.161, 167<br>.157<br>.162, 167<br>.35<br>.35<br>.14<br>.14<br>.14  |
| HC2400BB<br>HFC45<br>HKE<br>HKP<br>HMCC<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>HM<br>H  |  |                                       |                                       | .185<br>.185<br>.171<br>.39<br>.40<br>.40<br>.99, 115,<br>129, 142,<br>151, 183,<br>184, 185,<br>187<br>.162, 166<br>.170<br>.49<br>.49<br>.49<br>.49<br>.142, 144<br>.167<br>.161, 162,<br>166<br>.175<br>.146<br>.146<br>.146<br>.145<br>.157<br>.157<br>.157<br>.157<br>.157<br>.185<br>.14<br>.14<br>.14<br>.14   |
| HC2400BB<br>HFC45<br>HKE<br>HKP<br>HMCC<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>H  |  |                                       |                                       | .185<br>.185<br>.171<br>.39<br>.40<br>.40<br>.99, 115,<br>129, 142,<br>151, 183,<br>184, 185,<br>187<br>.162, 166<br>.170<br>.49<br>.49<br>.49<br>.49<br>.49<br>.142, 144<br>.167<br>.161, 162,<br>166<br>.175<br>.146<br>.146<br>.146<br>.146<br>.157<br>.157<br>.157<br>.157<br>.157<br>.157<br>.157<br>.142, 167<br>.35<br>.35<br>.185<br>.14<br>.14<br>.14<br>.14<br>.14<br>.14 |
| HC2400BB<br>HFC45<br>HKE<br>HKP<br>HMCC<br>HS<br>ILS45<br>IS02 P<br>IS02 P<br>IS02 V<br>L99BT<br>LC<br>LCK<br>LMPM<br>LMCOM<br>LMM<br>LMM<br>LMM PM<br>LMM<br>LMM<br>LMM PM<br>LMM<br>LMM<br>MB1<br>MK<br>MK15<br>MK15<br>MK15<br>MK15<br>MK16<br>MK16<br>MK16<br>MK17<br>MK17<br>MK18<br>MK18<br>MK18<br>MK18<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK10<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>MK19<br>M |  |                                       |                                       | .185<br>.185<br>.171<br>.39<br>.40<br>.40<br>.99, 115,<br>129, 142,<br>151, 183,<br>184, 185,<br>187<br>.162, 166<br>.170<br>.49<br>.49<br>.49<br>.142, 144<br>.167<br>.161, 162,<br>146<br>.146<br>.146<br>.146<br>.146<br>.146<br>.146<br>.146  |
| HC2400BB<br>HFC45<br>HKE<br>HKP<br>HMCC<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS<br>HS   |  |                                       |                                       | .185<br>.185<br>.171<br>.39<br>.40<br>.40<br>.99, 115,<br>129, 142,<br>151, 183,<br>184, 185,<br>187<br>.162, 166<br>.170<br>.49<br>.49<br>.49<br>.142, 144<br>.167<br>.161, 162,<br>146<br>.146<br>.146<br>.146<br>.146<br>.146<br>.146<br>.146  |

|   | .58, 68   |
|---|---|
| PA1AFI  | .71, 89   |
| PA1BP   |   |
| PA1BRP  |   |
| PA1BTS4   |   |
| PA1BTXS   |   |
| PA1BU   | .68   |
| PA1BXS  |   |
| PA1CPR  |   |
| PA1DB   | .58, 70, 88,<br>94  |
| PA1DEB  |   |
| PA1EB   |   |
| PA1FG3  | .58, 68   |
| PA1FGBP   |   |
| PA1GC   |   |
| PA1LSK  |   |
| PA1SB   | .58, 70, 88,  |
|   | 94  |
| PA1SMC  |   |
| PA1STC  |   |
| PA1WDB  |   |
| PA20BAG   |   |
| PA20LFBT  |   |
| PA20LFBTX   | .67,85  |
| PA20LFLDB   |   |
| PA20LFLDB2  | .60   |
| PA20LFLSB   | .60   |
| PA20LFLSB2<br>PA20SICDB   |   |
| PA20SICDB   |   |
| PA20SICHDB2C30R   | .61   |
| PA20SICHDB2S51R   | .61   |
| PA2OSICHDBC3OR<br>PA2OSICHDBS51R  | .61   |
| PA20SICHDBS51R  | .61   |
| PA2OSICHSB2C3OR<br>PA2OSICHSB2S51R  | .61   |
| PA20SICHSBC30R  | .61   |
| PA2OSICHSBS51R  | .61   |
| PA20SICSB   |   |
| PA20SICSB2  |   |
| PA20TCISB<br>PA20TICDB  | .01   |
| PA20TICDB2  | .61   |
| PA2OTICHDB2C3OR   |   |
|   |   |
| PA20TICHDB2S51R   | .61   |
| PA2OTICHDB2S51R<br>PA2OTICHDBC30R   | .61<br>.61  |
| PA2OTICHDB2S51R<br>PA2OTICHDBC30R<br>PA2OTICHDBS51R   | .61<br>.61<br>.61   |
| PA20TICHDB2S51R<br>PA20TICHDBC30R<br>PA20TICHDBS51R<br>PA20TICHSB2C30R  | .61<br>.61<br>.61   |
| PA2OTICHDB2S51R<br>PA2OTICHDBC30R<br>PA2OTICHDBS51R   | .61<br>.61<br>.61<br>.61  |
| PA20TICHDB2S51R<br>PA20TICHDBC30R<br>PA20TICHDBS51R<br>PA20TICHSB2C30R<br>PA20TICHSB2S51R<br>PA20TICHSBC30R<br>PA20TICHSBC51R   | .61<br>.61<br>.61<br>.61<br>.61<br>.61  |
| PA20TICHDB2S51R           PA20TICHDBC30R           PA20TICHDBS51R           PA20TICHSB2C30R           PA20TICHSB2S51R           PA20TICHSB2S51R           PA20TICHSB2S51R           PA20TICHSB2S51R           PA20TICHSB2S51R           PA20TICHSB2S51R           PA20TICHSB2S1R           PA20TICHSB2  | .61<br>.61<br>.61<br>.61<br>.61<br>.61<br>.61   |
| PA20TICHDB2S51R           PA20TICHDBC30R           PA20TICHDBS51R           PA20TICHSB2C30R           PA20TICHSB2S51R           PA20TICHSB2S51R           PA20TICHSB2S51R           PA20TICHSB2S51R           PA20TICHSB2S1R           PA20TICHSB2S1R           PA20TICHSB2S1R           PA20TICHSB53R           PA20TICHSB551R           PA20TICHSB551R           PA20TICHSB551R           PA20TICHSB551R           PA20TICHSB551R   | .61<br>.61<br>.61<br>.61<br>.61<br>.61<br>.61<br>.61<br>.60   |
| PA20TICHDB2S51R         PA20TICHDBC30R         PA20TICHDBS51R         PA20TICHSB2C30R         PA20TICHSB2S51R         PA20TICHSB2S51R         PA20TICHSB2S51R         PA20TICHSB2S51R         PA20TICHSB2S51R         PA20TICHSB2S51R         PA20TICHSB2S51R         PA20TICHSB2         PA20TICHSB2         PA20TICSB2         PA20TJDB   | .61<br>.61<br>.61<br>.61<br>.61<br>.61<br>.61<br>.61<br>.60<br>.60  |
| PA20TICHDB2S51R           PA20TICHDBC30R           PA20TICHDBS51R           PA20TICHSB2C30R           PA20TICHSB2S51R           PA20TICHSB2S51R           PA20TICHSB2S51R           PA20TICHSB2S51R           PA20TICHSB2S1R           PA20TICHSB2S1R           PA20TICHSB2S1R           PA20TICHSB53R           PA20TICHSB551R           PA20TICHSB551R           PA20TICHSB551R           PA20TICHSB551R           PA20TICHSB551R   | .61<br>.61<br>.61<br>.61<br>.61<br>.61<br>.61<br>.61<br>.60<br>.60<br>.60   |
| PA20TICHDB2S51R<br>PA20TICHDBC30R<br>PA20TICHDBS51R<br>PA20TICHSB2C30R<br>PA20TICHSB2S51R<br>PA20TICHSBC51R<br>PA20TICHSB551R<br>PA20TICSB2<br>PA20TJDB<br>PA20TJDB<br>PA20TJB2   | .61<br>.61<br>.61<br>.61<br>.61<br>.61<br>.61<br>.60<br>.60<br>.60<br>.60   |
| PA20TICHDB2S51R<br>PA20TICHDBC30R<br>PA20TICHDBS51R<br>PA20TICHSB2C30R<br>PA20TICHSB2S51R<br>PA20TICHSB2S51R<br>PA20TICHSBS51R<br>PA20TICHSBS51R<br>PA20TIDB2<br>PA20TJDB2<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB2<br>PA2BU  | .61<br>.61<br>.61<br>.61<br>.61<br>.61<br>.61<br>.60<br>.60<br>.60<br>.60<br>.68<br>.69   |
| PA20TICHDB2S51R<br>PA20TICHDBC30R<br>PA20TICHDBS51R<br>PA20TICHSB2C30R<br>PA20TICHSB2S51R<br>PA20TICHSB2S51R<br>PA20TICHSBS51R<br>PA20TICHSBS51R<br>PA20TISB2<br>PA20TJDB2<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB2<br>PA2BU<br>PA2BU<br>PA2BU<br>PA2SMC  | .61<br>.61<br>.61<br>.61<br>.61<br>.61<br>.61<br>.60<br>.60<br>.60<br>.60<br>.68<br>.68<br>.69<br>.69   |
| PA20TICHDB2S51R         PA20TICHDBC30R         PA20TICHDBS51R         PA20TICHSB2C30R         PA20TICHSB2S51R         PA20TICHSB2S51R         PA20TICHSB2S51R         PA20TICHSB2S1R         PA20TICHSB2S1R         PA20TICHSB2S1R         PA20TICHSB2         PA20TICB2         PA20TJDB2         PA20TJSB         PA20TJSB2         PA2BU         PA2SMC         PA2SMC   | .61<br>.61<br>.61<br>.61<br>.61<br>.61<br>.61<br>.60<br>.60<br>.60<br>.60<br>.60<br>.68<br>.69<br>.69<br>.69  |
| PA20TICHDB2S51R         PA20TICHDBC30R         PA20TICHDBS51R         PA20TICHSB2C30R         PA20TICHSB2S51R         PA20TICHSB2S51R         PA20TICHSB2S51R         PA20TICHSB2S51R         PA20TICHSB2S51R         PA20TICHSB2S1R         PA20TICHSB2         PA20TICSB2         PA20TJDB         PA20TJB2         PA20TJSB         PA20TJSB2         PA2BU         PA2RBAT         PA2STC         PA3   | .61<br>.61<br>.61<br>.61<br>.61<br>.61<br>.61<br>.60<br>.60<br>.60<br>.60<br>.60<br>.60<br>.68<br>.69<br>.69<br>.69<br>.58, 86  |
| PA20TICHDB2S51R         PA20TICHDBC30R         PA20TICHDBS51R         PA20TICHSB2C30R         PA20TICHSB2S51R         PA20TICHSB2S51R         PA20TICHSB2S51R         PA20TICHSB2S51R         PA20TICHSB2S51R         PA20TICHSB2S1R         PA20TICHSB2         PA20TICSB2         PA20TJDB         PA20TJSB         PA20TJSB2         PA2BU         PA2BAT         PA2SMC         PA30IS  | .61<br>.61<br>.61<br>.61<br>.61<br>.61<br>.61<br>.60<br>.60<br>.60<br>.60<br>.60<br>.69<br>.69<br>.69<br>.58, 86<br>.58   |
| PA20TICHDB2S51R         PA20TICHDBC30R         PA20TICHDBS51R         PA20TICHSB2C30R         PA20TICHSB2S51R         PA20TICHSB2S51R         PA20TICHSB2S51R         PA20TICHSB2S51R         PA20TICHSB2S51R         PA20TICHSB2S1R         PA20TICHSB2         PA20TICSB2         PA20TJDB         PA20TJB2         PA20TJSB         PA20TJSB2         PA2BU         PA2RBAT         PA2STC         PA3   | .61<br>.61<br>.61<br>.61<br>.61<br>.61<br>.61<br>.60<br>.60<br>.60<br>.60<br>.60<br>.60<br>.69<br>.69<br>.69<br>.58, 86<br>.58<br>.79   |
| PA20TICHDB2S51R         PA20TICHDBC30R         PA20TICHDBS51R         PA20TICHSB2C30R         PA20TICHSB2S51R         PA20TICHSB2S51R         PA20TICHSB2S51R         PA20TICHSB2S51R         PA20TICHSB2S51R         PA20TICHSB2S1R         PA20TICHSB2S1R         PA20TICSB2         PA20TJDB         PA20TJSB         PA20TJSB2         PA2BU         PA2RBAT         PA30IS         PA30IS         PA30ISLFLDB         PA30LFLSB  | .61<br>.61<br>.61<br>.61<br>.61<br>.61<br>.61<br>.60<br>.60<br>.60<br>.60<br>.60<br>.60<br>.69<br>.69<br>.58, 86<br>.58<br>.79<br>.79<br>.79  |
| PA20TICHDB2S51R         PA20TICHDBC30R         PA20TICHDBS51R         PA20TICHSB2C30R         PA20TICHSB2S51R         PA20TICHSB2S51R         PA20TICHSB2S51R         PA20TICHSB2S51R         PA20TICHSB2S1R         PA20TICHSB2         PA20TICHSB2         PA20TICB2         PA20TJDB         PA20TJB2         PA20TJB2         PA20TJB2         PA20TJB2         PA20TJB2         PA20TJB2         PA20TJB2         PA20TJB2         PA20TJB2         PA20TJB4         PA20TJB5         PA20TJB5         PA20TJB5         PA20TJB4         PA20TJB5         PA30IFLD5         PA30ISLFLS6  | .61<br>.61<br>.61<br>.61<br>.61<br>.61<br>.61<br>.60<br>.60<br>.60<br>.60<br>.60<br>.68<br>.69<br>.69<br>.58, 86<br>.58<br>.79<br>.79<br>.79<br>.79<br>.79  |
| PA20TICHDB2S51R         PA20TICHDBC30R         PA20TICHDBS51R         PA20TICHSB2C30R         PA20TICHSB2S51R         PA20TICHSB2S51R         PA20TICHSB2S51R         PA20TICHSB2S51R         PA20TICHSB2S1R         PA20TICHSB2S1R         PA20TICHSB2         PA20TICHSB2         PA20TJDB         PA20TJB2         PA20TJB2         PA20TJB2         PA20TJSB2         PA2BU         PA2BU         PA2BU         PA2SMC         PA30IS         PA30ISLFLDB         PA30ISLFLSB         PA30ISLFLSB         PA30ISLFLSB   | .61<br>.61<br>.61<br>.61<br>.61<br>.61<br>.60<br>.60<br>.60<br>.60<br>.60<br>.68<br>.69<br>.69<br>.58, 86<br>.58<br>.79<br>.79<br>.79<br>.79<br>.75   |
| PA20TICHDB2S51R<br>PA20TICHDBC30R<br>PA20TICHDBS51R<br>PA20TICHSB2C30R<br>PA20TICHSB2S51R<br>PA20TICHSB2S51R<br>PA20TICHSB2S51R<br>PA20TICHSB551R<br>PA20TICHSB551R<br>PA20TICHSB551R<br>PA20TICHSB51R<br>PA20TICHSB51R<br>PA20TISB2<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA30JSLFLDB<br>PA30JSLFLSB<br>PA30JSLFLSB<br>PA30JSLFLSB<br>PA30JSLFLSB<br>PA30JSLFLSB<br>PA30JSLFLSB<br>PA30JSLFLSB<br>PA30JSLFLSB<br>PA30JSL<br>PA30JSL<br>PA30JSL<br>PA30JSL<br>PA30JSL<br>PA30JSL<br>PA30JSL<br>PA30JSL<br>PA30JSL<br>PA30JSL<br>PA30JSL<br>PA30JSL<br>PA30JSL<br>PA30JSL<br>PA30JSL<br>PA30JSL<br>PA30JSL<br>PA30JSL | .61<br>.61<br>.61<br>.61<br>.61<br>.61<br>.60<br>.60<br>.60<br>.60<br>.60<br>.69<br>.69<br>.58<br>.69<br>.58<br>.79<br>.79<br>.79<br>.79<br>.79<br>.75<br>.75   |
| PA20TICHDB2S51R<br>PA20TICHDBS51R<br>PA20TICHDBS51R<br>PA20TICHSB2C30R<br>PA20TICHSB2C30R<br>PA20TICHSB2S51R<br>PA20TICHSB551R<br>PA20TICHSB551R<br>PA20TICB2<br>PA20TICB2<br>PA20TJDB<br>PA20TJDB<br>PA20TJB2<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA20TJSB<br>PA30JSLFLDB<br>PA30PREP<br>PA30PREP<br>PA30PREP<br>PA30PREP<br>PA30PREP<br>PA30PREP<br>PA30PREP<br>PA30PREP<br>PA30PREP<br>PA30PREP<br>PA30PREP<br>PA30PREP<br>PA30PREP<br>PA30PREP<br>PA30PREP<br>PA30PREP<br>PA30PREP<br>PA30PREP<br>PA30PREP<br>PA30PREP<br>PA30PREP<br>PA30PREP<br>PA30PREP<br>PA30PREP<br>PA30PREP<br>PA30PREP<br>PA30PREP<br>PA30PREP     | .61<br>.61<br>.61<br>.61<br>.61<br>.61<br>.61<br>.60<br>.60<br>.60<br>.60<br>.60<br>.60<br>.69<br>.69<br>.69<br>.58, 86<br>.58<br>.79<br>.79<br>.79<br>.79<br>.79<br>.75<br>.75   |
| PA20TICHDB2S51R         PA20TICHDBS51R         PA20TICHDBS51R         PA20TICHSB2C30R         PA20TICHSB2S51R         PA20TICHSB2S51R         PA20TICHSB2S51R         PA20TICHSB2S51R         PA20TICHSB2S51R         PA20TICHSB2S1R         PA20TICSB2         PA20TJDB         PA20TJSB         PA20TJSB         PA2BU         PA2BU         PA2BAT         PA2SMC         PA30IS         PA30ISLFLDB         PA30ISLFLSB         PA30PREP         PA30PREPNC         PA30RT1DB   | .61<br>.61<br>.61<br>.61<br>.61<br>.61<br>.60<br>.60<br>.60<br>.60<br>.60<br>.60<br>.69<br>.69<br>.58, 86<br>.58<br>.79<br>.79<br>.79<br>.79<br>.79<br>.75<br>.75<br>.75<br>.75<br>.78  |
| PA20TICHDB2S51R         PA20TICHDBC30R         PA20TICHDBS51R         PA20TICHSB2C30R         PA20TICHSB2S51R         PA20TICHSB2S51R         PA20TICHSB2S51R         PA20TICHSB2S1R         PA20TICHSB2S1R         PA20TICHSB2S1R         PA20TICHSB2S1R         PA20TICHSB2         PA20TICSB2         PA20TJDB         PA20TJB2         PA20TJB2         PA20TJB2         PA20TJB2         PA20TJB2         PA20TJB2         PA20TJB2         PA20TJB2         PA20TJB2         PA20TJB4         PA20TJB5         PA20TJB5         PA20TJB5         PA20TJB5         PA20TJB5         PA20TJB5         PA20TJB5         PA20TJB5         PA20TG         PA20TG         PA20TG         PA20TG         PA20TG         PA20TG         PA20TG         PA30ISLFLDB         PA30ISLFLDB         PA30PREPLI         PA30PREPNC         PA30ISRT1DB         PA30ISRT1DB </td <td>.61<br/>.61<br/>.61<br/>.61<br/>.61<br/>.61<br/>.60<br/>.60<br/>.60<br/>.60<br/>.60<br/>.60<br/>.68<br/>.69<br/>.69<br/>.58, 86<br/>.58<br/>.79<br/>.79<br/>.79<br/>.79<br/>.75<br/>.75<br/>.75<br/>.75<br/>.78<br/>.78<br/>.78</td>  | .61<br>.61<br>.61<br>.61<br>.61<br>.61<br>.60<br>.60<br>.60<br>.60<br>.60<br>.60<br>.68<br>.69<br>.69<br>.58, 86<br>.58<br>.79<br>.79<br>.79<br>.79<br>.75<br>.75<br>.75<br>.75<br>.78<br>.78<br>.78                                    |
| PA20TICHDB2S51R         PA20TICHDBS30R         PA20TICHSB2C30R         PA20TICHSB2S1R         PA20TICHSB2S1R         PA20TICHSB2S1R         PA20TICHSB2S1R         PA20TICHSB2S1R         PA20TICHSB2S1R         PA20TICHSB2S1R         PA20TICHSB2         PA20TICHSB2         PA20TJDB         PA20TJB2         PA20TJB4         PA20TJB5         PA20TJB5         PA20TJB5         PA20TJB4         PA20TJB5         PA20TJB5         PA20TJB4         PA20TJB5         PA20TJB5         PA30IFLD8         PA30ISLFLD8         PA30ISLFLS8         PA30PREPNI         PA30PREPNI         PA30PREPNI         PA30RT1D8         PA30ISRT158   | .61<br>.61<br>.61<br>.61<br>.61<br>.61<br>.60<br>.60<br>.60<br>.60<br>.60<br>.68<br>.69<br>.69<br>.69<br>.58, 86<br>.58<br>.79<br>.79<br>.79<br>.79<br>.79<br>.75<br>.75<br>.75<br>.75<br>.78<br>.78<br>.78<br>.78                      |
| PA20TICHDB2S51R         PA20TICHDBS31R         PA20TICHSB2C30R         PA20TICHSB2C30R         PA20TICHSB2S1R         PA20TICHSB2S1R         PA20TICHSB2S1R         PA20TICHSB2S1R         PA20TICHSB2S1R         PA20TICHSB2S1R         PA20TICHSB2         PA20TICB2         PA20TJDB         PA20TJB2         PA30ISLFLB3         PA30ISLFLB4         PA30PREPL1         PA30PA20ISRT1B <td< td=""><td>.61<br/>.61<br/>.61<br/>.61<br/>.61<br/>.61<br/>.60<br/>.60<br/>.60<br/>.60<br/>.60<br/>.69<br/>.69<br/>.69<br/>.58, 86<br/>.58<br/>.79<br/>.79<br/>.79<br/>.79<br/>.79<br/>.79<br/>.75<br/>.75<br/>.75<br/>.75<br/>.78<br/>.78<br/>.78<br/>.78</td></td<>   | .61<br>.61<br>.61<br>.61<br>.61<br>.61<br>.60<br>.60<br>.60<br>.60<br>.60<br>.69<br>.69<br>.69<br>.58, 86<br>.58<br>.79<br>.79<br>.79<br>.79<br>.79<br>.79<br>.75<br>.75<br>.75<br>.75<br>.78<br>.78<br>.78<br>.78                      |
| PA20TICHDB2S51R         PA20TICHDBS30R         PA20TICHSB2C30R         PA20TICHSB2S1R         PA20TICHSB2S1R         PA20TICHSB2S1R         PA20TICHSB2S1R         PA20TICHSB2S1R         PA20TICHSB2S1R         PA20TICHSB2S1R         PA20TICHSB2         PA20TICHSB2         PA20TJDB         PA20TJB2         PA20TJB4         PA20TJB5         PA20TJB5         PA20TJB5         PA20TJB5         PA20TJB5         PA20TJB5         PA20TJB4         PA20TJB5         PA20TJB5         PA30IFLD8         PA30ISLFLD8         PA30ISLFLS8         PA30PREPNI         PA30PREPNI         PA30PREPNI         PA30RT1D8         PA30ISRT158   | .61<br>.61<br>.61<br>.61<br>.61<br>.61<br>.60<br>.60<br>.60<br>.60<br>.60<br>.60<br>.68<br>.69<br>.69<br>.58, 86<br>.58<br>.79<br>.79<br>.79<br>.79<br>.79<br>.79<br>.75<br>.75<br>.75<br>.75<br>.75<br>.78<br>.78<br>.78<br>.78<br>.78 |

# INDEX

| Part Number Page Number |                         | <b>53000</b>         | V24 400 4         |
|-------------------------|-------------------------|----------------------|-------------------|
| A30ISRT2SB              | <b>PASPECML</b>         | <b>S2090</b>         | <b>V31</b>        |
| <b>A30SICDB</b>         | <b>PASPECS</b>          | <b>S51</b>           | <b>V32</b> 108, 1 |
| <b>A30ISSICDB</b>       | <b>PC90ML</b>           | 83, 99,              | <b>V33</b> 108, 1 |
| A30SICHDBC30R77         | <b>PC90XL</b>           | 106, 151,            | <b>V34</b> 118    |
| A30ISSICHDBC30R77       | <b>PC90XXL</b>          | 154                  | <b>V35</b> 108, 1 |
| A30SICHDBS51R77         | <b>PC90XXXL</b> 122     | <b>S51R</b>          | <b>V40</b>        |
| A30ISSICHDBS51R77       | <b>PCC45</b>            | 83, 99,              | <b>V41</b> 108    |
| A30SICHSBC30R77         | <b>PDR45</b> 168        | 106, 151,            | <b>V42</b> 108    |
| A30ISSICHSBC30R77       | PDR45B168               | 154                  | V43108            |
| A30SICHSBS51R77         | <b>PL</b>               | <b>S61</b>           | <b>V501N</b>      |
| A30ISSICHSBS51R         | PMFC                    | <b>S61R</b>          | <b>V50EX</b>      |
|                         |                         |                      |                   |
| A30SICSB                | <b>PPEBAG</b>           | <b>S62</b>           | 199, 2            |
| A30ISSICSB              | <b>QNFT45</b>           | <b>S62R</b>          | 207               |
| <b>A30TICDB</b>         | <b>R160</b>             | <b>S71</b>           | <b>V50IN</b>      |
| A30ISTICDB              | <b>R325</b> 13          | <b>S71R</b>          | 203, 2            |
| A30TICHDBC30R76         | <b>R330</b> 13          | <b>SEK</b>           | <b>V52530</b> 177 |
| A30ISTICHDBC30R76       | <b>R50</b>              | SENTINEL1            | V52530GREEN177    |
| A30TICHDBS51R76         | <b>R538</b>             | SENTINEL2            | V52531            |
| A30ISTICHDBS51R76       | <b>R540</b>             | SPEC35L              | V52532            |
| A30TICHSBC30R 76        | <b>R541</b>             | SPEC35S              | V52533            |
| A30ISTICHSBC30R76       | <b>RA45B</b>            | SPEC40L              | <b>V55030</b>     |
| A30TICHSBS51R 76        | <b>RAK</b>              | SPEC40S              | V55030GREEN       |
| A30ISTICHSBS51R76       | <b>RBPCOOL</b>          | SPECCFML             | V55031            |
| A30TICSB                | 105, 153                | SPECCFS              | <b>V55032</b>     |
| A30ISTICSB              | <b>RBPCOTTON</b>        | SPECIVK              | V55032            |
|                         |                         |                      |                   |
| A30TICSDB               | 105, 153                | SPECLSYS             | V55033GREEN       |
| A30ISTICSDB78           | <b>RBPVINYL</b>         | SPECPDE10L           | V60               |
| <b>A30TICSSB</b>        | 105, 153                | <b>SPECPDE10S</b>    | <b>VECTOR-C</b>   |
| A30ISTICSSB78           | <b>RLS</b> 161, 166     | <b>SPECPDE5L</b> 164 | <b>VECTOR-CRT</b> |
| <b>A30TJDB</b>          | <b>RS4PC</b>            | <b>SPECPDE5S</b> 164 | VT600             |
| A30ISTJDB               | 107, 155                | <b>SPECPDLA</b> 164  | VTRT60012         |
| A30TJSB                 | <b>RS4PP</b>            | <b>SPECPDML</b>      | <b>VTS</b>        |
| A30ISTJSB               | <b>RS4RC</b>            | <b>SPECPDS</b>       | WS60PM            |
| A30ISTPCB               | 107, 155                | <b>SS5</b>           | <b>X30</b>        |
| <b>A30TPCDB</b>         | <b>RS4RP</b>            | <b>SS6</b>           | <b>X31</b>        |
| A30ISTPCDB              | <b>RS6PC</b>            | ST1R                 | <b>X32</b>        |
| A30TPCSB                | 107, 155                | ST1R500              | <b>X32</b>        |
| A30TPDB                 | <b>RS6RC</b>            | ST1ROR175            | <b>X35</b>        |
| A30ISTPDB               |                         |                      | <b>X40</b>        |
|                         | 107, 155                | ST2R                 |                   |
| A30TPSB                 | <b>RT1</b>              | STRSS                | <b>ZON22</b>      |
| A30ISTPSB               | 115, 117                | STRSS500             | <b>ZON25B</b>     |
| <b>A30VAGHE</b>         | <b>RT130</b>            | STRSSORG17524        |                   |
| <b>A3BP</b>             | <b>RT1DA</b> 117        | π3                   |                   |
| <b>A3BPC</b>            | <b>RT2</b>              | 105, 137,            |                   |
| A3BU                    | 115, 117                | 145, 153             |                   |
| <b>A3DB</b>             | RT230                   | <b>TT3VI</b>         |                   |
| <b>A3GC</b>             | <b>RT2DA</b>            | <b>UBG</b>           |                   |
| <b>A3HE</b>             | <b>RTBT</b>             | <b>V11</b>           |                   |
| A3HPBT                  | <b>S09853</b>           | <b>V12</b>           |                   |
| A3IS                    | <b>S16191</b>           | V12                  |                   |
|                         |                         |                      |                   |
| A3ISBP                  | 201, 205                | V14                  |                   |
| A3ISBU                  | <b>S16481</b>           | <b>V15</b>           |                   |
| A3ISC                   | <b>S17101</b>           | <b>V17</b> 181       |                   |
| A3ISDB                  | 203, 207                | <b>V18</b>           |                   |
| A3ISGC                  | <b>S17931</b>           | <b>V19</b> 180       |                   |
| A3LBP                   | 199, 203,               | V19B180              |                   |
| A3NBC                   | 207                     | V20100ST             |                   |
| <b>A3PG</b>             | <b>S18051</b>           | <b>V2050ST</b>       |                   |
| <b>A3SMC</b>            | 125, 157                | <b>V22</b>           |                   |
| <b>A4</b>               | <b>S18052</b>           | 199, 203,            |                   |
|                         |                         | 207                  |                   |
| A40SPECDB               | <b>S19432</b>           |                      |                   |
| A40SPECSB               | <b>S19442</b>           | <b>V23</b>           |                   |
| <b>A4AFI</b>            | <b>S19443</b>           | 199, 203,            |                   |
| <b>A4BT</b>             | <b>S19681</b> 196       | 207                  |                   |
| <b>A4BU</b>             | <b>S19683</b> 194, 198, | <b>V24</b>           |                   |
| <b>A4DB</b>             | 202, 206                | 199, 203,            |                   |
| AC2QC                   | <b>S19688</b>           | 207                  |                   |
|                         |                         |                      |                   |
|                         | <b>S2084</b>            | <b>V27</b>           |                   |
| AFLFBTXS                | <b>S2084</b>            | <b>V27</b>           |                   |

# Subject Index

**41 Series Airline Filter** .188-191 **41 Series Replacement** .191 **88VX Series Airline Respirator** 

| Sova Series Antine Respirator                            |
|--|
|  |
| <i>Belt</i>  |
| Breathing Tube132  |
| Lenses   |
| Maintenance Kit138                                       |
| Replacement133-140<br>Selection Chart129                 |
| Selection Chart129                                       |
| Abrasive Blasting126-127,                                |
| 141  |
| Acid Gas Protection75, 79                                |
| <b>ADP20 Replacement</b> 193-195                         |
| Advent   |
| Replacement12  |
| Air Driven Pump193                                       |
| Airflow Chart  |
|  |
| <b>Airflow Indicator</b> 71, 89, 95                      |
| Backplate Support Kit .71                                |
| Batteries  |
| 93   |
| <b>Belt</b>  |
| 113, 120,  |
| 125, 135,  |
| 157, 170,  |
| 175, 183-  |
| 185  |
|  |
| Biological Protection75, 76, 77                          |
| <b>Biological Protection</b> 75, 76, 77<br><b>Blower</b> |
| <b>Blower</b>  |
| Blower   |

Compressed Air Hose . .177-178 **Constant Flow Respirator** Containment Suit . . . . . 124 Customization .....14 29, 32, 33 Decoration Order Form .30, 31 **Disposable Respirator System** EDP10 Replacement . . .196-206 EDP16 Replacement . .198-199 EDP30 Replacement . .201-203 EDP50 Replacement . . . 205-206 Electric Driven Pump . .196-206 Emergency Response ...8 Face Protection .....41-44, 46-47 FAMB Half Mask Airline Respirator Breathing Tubes .... 175 Components .....174 FAMB Half Mask Respirator Fit Testing First Base Bump Cap . .34, 36 Free-Air<sup>®</sup> Pumps ....192-206 **Full-Body Dermal Protection** GR50 Airline Respirator 150-157 Breathing Tube ....156 Head Protection ....154 Replacement .....153, 155-157 Selection Chart ....151 Grinding .....126, 150 Hearing Protection . . . . 37 HEPA Filter Cartridges .171 High Heat Hard Hats . .19 Hospital Preparedness .75 Hot Weather Accessories 23

Hot/Cold Tubes ......185 Isotherm Cool Vest . . . . 48, 49 Lancer Airline Respirator Breathing Tube ....144 Maintenance Kit . . . .147 Replacement .....144-149 Selection Chart ....142 167 Replacement .....40 Nuclear Protection . . . .75-77, 98 **Organic Vapor Protection** Breathing Tubes . . . . 67 Head Protection ....65 Replacement ......62-71 Breathing Tubes . . . .85 Head Protection ....83 86.89 Breathing Tubes ....92 PAPR Selection Chart . .58 PC90 Airline Containment Breathing Tube ....124 Replacement .....125 Selection Chart ....122 **Quick Disconnect Couplers** Quick Disconnect Nipples Respirator Selection . . .54

#### **RT Series Airline Respirator**

| <i>Belt</i>                             |
|---|
| Breathing Tube118                       |
| Replacement                             |
| Selection Chart115                      |
| <b>SafeCom</b>                          |
| <b>SafeCom</b>                          |
| <b>Sentinel</b>                         |
| Spectrum <sup>®</sup> Series Respirator |
|   |
| Breathing Tubes 163                     |
| Spectrum <sup>®</sup> Continuous Flow   |
|   |
| Facepiece                               |
| Replacement160                          |
| Spectrum <sup>®</sup> Pressure Demand   |
|   |
| Accessories                             |
| Coupler Assembly169                     |
| Facepiece                               |
| Regulators/Cylinders .168               |
| Replacement165                          |
| Standard Series Hard Hat                |
|   |
| Replacement20, 21, 22                   |
| Standards, Hard Hats6-7                 |
| Standards, Respiratory .54              |
| Storage Bag71, 89, 95                   |
| <b>Striping</b>                         |
| Supplied Air Respirators 97-125         |
| Terms2                                  |
| <b>Turtle Club</b>                      |
| V10 3/8" ID Hose178                     |
| V20 1/2" ID Hose179                     |
| V5 Coiled Hose177                       |
| Vector                                  |
| 14                                      |
| Replacement12                           |
| <b>Visors</b>                           |

INDEX



# Join our click. www.bullard.com

- Detailed Product Information
- Promotions and Giveaways
- Distributor Locator
- UPS Package Tracking
- Hi-Res Photo Galleries

- F.A.Q. Frequently Asked Questions
- Downloads (Manuals, Brochures, etc ...)
- Federal / Military Section
- Company and Product History
- Fully Searchable