

## Congratulations

Congratulations on the purchase of your new Bullard T4N Thermal Imager. The Bullard T4N combines advanced thermal imaging technology with our expertise in high heat, impact resistant engineered polymers to bring you the most durable thermal imager on the market. The T4N's innovative, compact design and logical, easy-to-use interface presents a truly personalized thermal imaging tool to today's firefighters.

The benefits of using thermal imaging technology as a firefighting tool encompass nearly every aspect of a firefighter's job. Thermal imaging is not, however, a technology designed to replace current firefighting tactics. Rather, it is a tool that allows the firefighter to be more effective and make better decisions. Some of the many uses for your Bullard T4N Thermal Imager include:

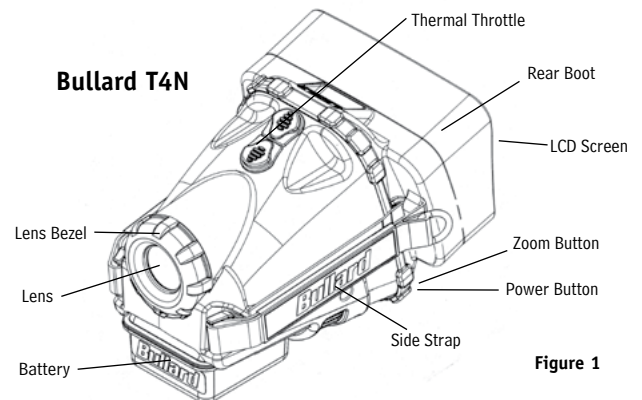
- Search and rescue
- Scene assessment
- Locating the seat of the fire
- Determining the spread of the fire
- Locating hot spots
- Identifying potential flashover situations
- Determining ventilation points
- Determining entry and exit points
- Overhaul
- Hazmat
- Wildland firefighting
- Incident investigation
- Training

### NOTE

To ensure that we are able to reach you with any product or software updates, please fill out the warranty card enclosed with your Bullard T4N Thermal Imager.



**Bullard T4N**



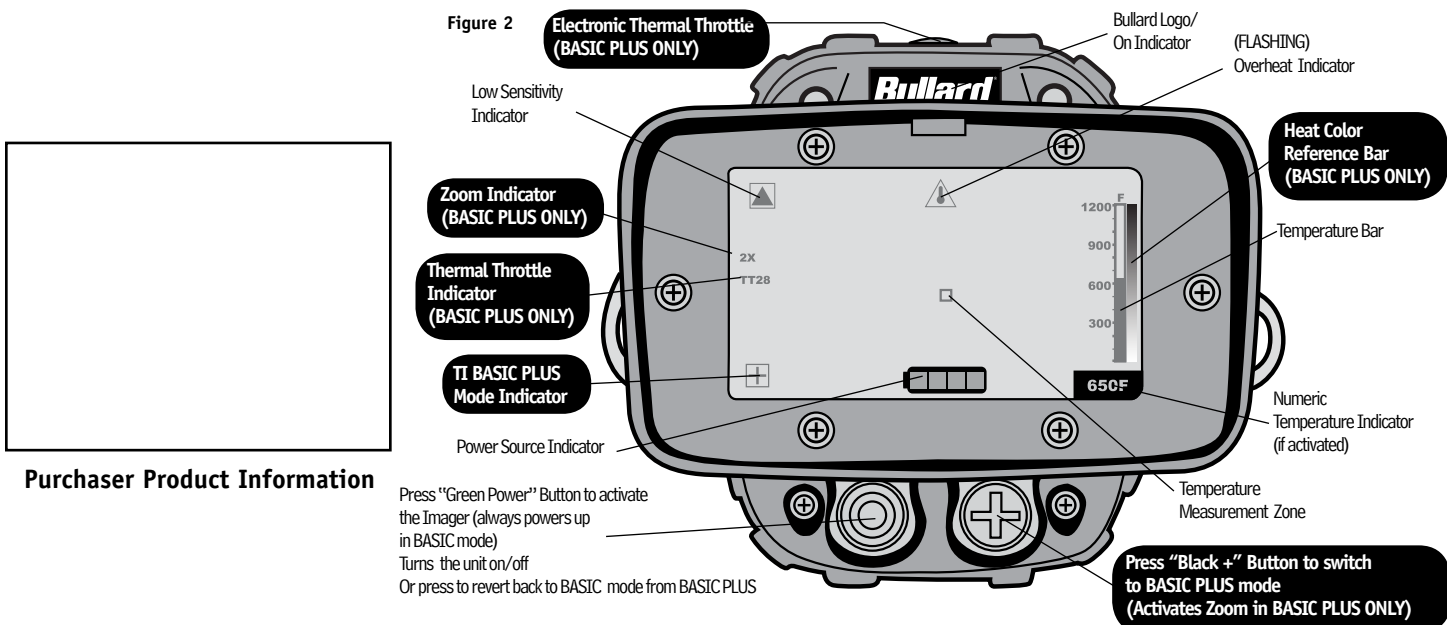
**Figure 1**

### WARNING

Read all instructions and warnings before using this product.

Your thermal imager is like any other tool. It must be used properly and safely. All users should be trained on the proper and safe use of thermal imaging prior to using the T4N Thermal Imager. This is especially important for users who may use the T4N Thermal Imager in hazardous or IDLH (Immediately Dangerous to Life and Health) environments. Failure to follow this information could result in death or serious injury.

**Figure 2**



### Purchaser Product Information

## Use and Operation

**THIS EQUIPMENT IS SUITABLE FOR USE IN CLASS I, DIVISION 2, GROUPS C, D OR NON-HAZARDOUS LOCATIONS ONLY.**

### Power

To turn on your Bullard T4N Thermal Imager, depress and release the large, green power button under the LCD display (Figure 2). Upon pressing the power button the thermal imager will display the Bullard logo and initiate a calibration sequence. The thermal image will appear within four seconds. To turn off power, depress and hold the power button for three seconds and release.

#### NOTE

You will periodically observe a momentary freeze in the image. This is normal and is a function of the self calibration shutter. The shutter will activate every 30 seconds to three minutes, depending on the environment.

### Low Sensitivity

To maximize image performance, the T4N utilizes two methods of operation. The standard operation, referred to as high sensitivity is displayed when the unit is operating in normal or moderate temperature environments. When the T4N displays hot scenes, typically fire scenes, it will switch to low sensitivity operation. This operation allows the unit to display a wider range of temperature but at lower sensitivity within the scene. In this operation, certain details may be harder to distinguish. To alert the user that the unit is operating at low sensitivity, the T4N will show a Low Sensitivity Indicator on the top left of the display. The indicator is a green triangle contained in a green box.

### Over-temperature Warning

In cases where the internal electronics of the T4N exceed operational limits, the unit will display an Over-Temperature Indicator in the top, center portion of the display. The flashing indicator is a red thermometer icon contained in a red box.

### Prior-Use Checks

Prior to using the T4N, perform the following checks.

- Ensure that there are no signs of product damage, loose screws or components, or missing parts
- Check to see that the unit powers up and displays a functioning image
- Ensure the battery indicates a full charge on the display
- Confirm that the basic features and functions work in accordance with this user manual

If the unit appears to be damaged or is not functioning properly, contact Bullard Customer Service (see "Service" section toward the end of this user manual).

## BASIC Mode

### Overview

The T4N always powers up in BASIC Mode. This is a simplified mode intended to provide easy operation as well as standardization of thermal imaging features and user interface functions with that of other thermal imagers. In BASIC Mode, the thermal image will always show a grayscale image. Cooler objects will appear as black or dark gray. Warmer objects will appear as white or light gray.

### Operation

Upon power on, the unit will display a grayscale thermal image. The battery indicator on the bottom center of the display indicates remaining battery life. The battery indicator sections will deplete from left to right as the battery drains. When only one section in the indicator remains, the T4N has approximately 30 minutes of battery life remaining. At 5 minutes remaining, the indicator will flash.

#### NOTE

The zoom feature, normally activated via the rightmost blue auxiliary button, is inactive in BASIC mode.

### Relative Heat Indicator (RHI)

The T4N is equipped with temperature measurement capability. The right side of the display will show a bar graph or Relative Heat Indicator (RHI). The RHI will indicate the approximate temperature of the object viewed within the temperature measurement zone icon, the green square in the middle of the display. Additionally, a numeric temperature indicator below the RHI bar will display the approximate temperature in a numeric value. The accuracy of the indicators is dependent on numerous factors including the distance from the object being viewed and its emissivity, which is the object's ability to radiate heat. Units are calibrated with a preset emissivity corresponding with normal construction materials. Objects with emissivities that vary greatly from this, such as metals and shiny objects, will reduce the accuracy of the temperature indication. Additionally, temperature measurement accuracy decreases as the distance from the object in the "crosshairs" increases.

#### NOTE

The RHI and numeric temperature indicator provide a quick reference to compare objects of similar emissivities to serve as a guide to pinpoint intense heat sources. Due to the inherent issues with accuracy, use this feature with caution and verify indicated heat levels through traditional means whenever possible.

## BASIC PLUS Mode

### Operation

To initiate BASIC PLUS Mode, press the black + auxiliary button on the thermal imager. When in BASIC PLUS Mode, the T4N will show a green "+" sign contained in a green box on the lower left portion of the display. To deactivate BASIC PLUS Mode and revert to BASIC Mode, press the green power button or cycle the unit's power by turning the T4N off and then back on.

### Relative Heat Indicator (RHI)

See "Relative Heat Indicator" section above.

#### NOTE

The plus mode indicator, shown as a green "+" contained in a green box will only display in BASIC PLUS Mode. No indicator will be present when the T4N is operating in the BASIC Mode.

### Super Red Hot Feature

While in BASIC PLUS Mode, the T4N features Super Red Hot high heat colorization. With the Super Red Hot feature, heat levels are identified by various color hues. Starting at 500 degrees, heated objects are tinted yellow and gradually transition to orange and then solid red as heat levels rise. The Super Red Hot feature identifies specific heat layers alerting firefighters to areas of intense heat. This feature provides an enhanced visual awareness of the hottest objects in a scene.

### Electronic Thermal Throttle®

While in BASIC PLUS Mode, The T4N incorporates a highly useful and unique feature, the Electronic Thermal Throttle. The Thermal Throttle is ideal for pinpointing hot spots during overhaul, searching for overheated electrical equipment, or clarifying objects in ambient temperature situations. To activate the Thermal Throttle option, locate the two black buttons on the top of the T4N (Figure 1). Press the down button (the button closer to the front of the imager) to activate the Thermal Throttle. The Electronic Thermal Throttle will automatically sense the hottest area in the scene and color it blue. Continuing to press the down button (or holding it down) will further engage the Thermal Throttle and will color more of the scene blue, eventually coloring even the coolest objects blue.

#### NOTE

As the throttle engages more of the scene, the blue will become lighter in hue to help differentiate objects in the scene. As you cycle through the scene, you'll see the symbol "TT" and a corresponding number in the center left portion of the display. The "TT" indicates "Thermal Throttle" mode. The number (0-100) is a point of reference to indicate the level of Thermal Throttle engagement; by itself it has no specific meaning. To lessen the amount of blue in the scene, press (or hold) the up button. Alternatively, pressing both buttons simultaneously for one second will deactivate the Thermal Throttle.

#### NOTE

The T4N Thermal Imager takes approximately eight seconds to calibrate from initial startup. During this short startup period, the Electronic Thermal Throttle or Digital Zoom will not engage.

### Digital Zoom Feature

While in BASIC PLUS Mode, the T4N enables magnification of far away scenes at both 2x and 4x zoom. With one push of the blue auxiliary button, the 2x zoom is enabled (Figure 3). A second push of the button activates the 4x zoom. A third push of the button disables the zoom function. A "2X" or "4X" will display in blue corresponding to the zoom level shown on the center left portion of the display, when the zoom feature is activated. The Digital Zoom feature also works seamlessly with Electronic Thermal Throttle and Super Red Hot.

#### NOTE

The T4N Thermal Imager takes approximately eight seconds to calibrate from initial startup. During this short startup period, the Electronic Thermal Throttle or Digital Zoom will not engage.

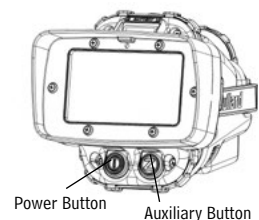


Figure 3

### WARNING

**EXPLOSION HAZARD - SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2.**

### Using the Battery Charger

The battery should be charged in the battery charger base using the AC adapter provided. Before using the AC adaptor, attach the appropriate AC plug insert on to the power pack transformer and twist to the right to lock it into place. To charge a battery, insert the battery into the charger base so that the metal contacts on the battery are aligned with the metal contacts in the charger base (Figure 4). A red light will illuminate on the charger base to indicate that the battery is charging. When the light on the charger base turns to green, the battery is fully charged. You may leave the battery in the charger base indefinitely as the battery will not overcharge and the charger base will initiate a trickle charge to maintain the battery's charge. For maximum battery life and performance, you should remove the battery from the charger base and discharge it on a monthly basis.

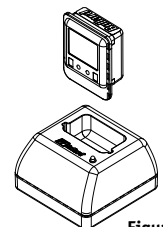


Figure 4

# Bullard T4N Thermal Imager User Manual

## WARNING

### EXPLOSION HAZARD

- Only use Bullard battery part number: NFPANIMH. Substitution of any other battery pack may impair suitability for Division 2.
- Do not charge battery packs in hazardous locations. Only charge using Bullard Desktop or Powerhouse battery pack chargers.
- Do not insert or remove the battery pack unless the area is known to be free of ignitable concentrations.
- Power Source: Nickel Metal Hydride Nominal Voltage (9.6V)

## NOTE

If you do not see the red LED illuminate when you place a battery into the charger, the battery is not charging.

## NOTE

Fully charged NiMH batteries will provide a run time of more than three hours. This run time will be less in extreme heat or extreme cold conditions and/or if a transmitter or SceneCatcher DVR is in use. To extend the potential lifespan of your batteries, fully drain and recharge each battery monthly. To help extend the life of the rechargeable batteries and prevent unexpected instances of uncharged batteries, develop a clear formalized plan for maintaining, charging, and replacing your batteries. Additionally, as with all batteries, your Bullard rechargeable battery will experience a slow drain of its charge during storage. The amount of drain varies widely based on storage conditions. For best performance, charge each of your batteries every two weeks.

	FULL power (green)	> 3 hours
	75% power (green)	app. 2.25 hours
	50% power (yellow)	app. 1.5 hours
	25% power (red)	.75 hours
	Will begin to flash when at least 5 minutes of available power source remains (red)	< 5 minutes

Figure 5

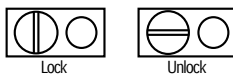


Figure 6

## Loading/Unloading the Battery

Loading and unloading the battery on the Bullard T4N is straightforward. To install a battery, ensure the release buttons are unlocked. Using a flat head screwdriver, turn the Battery Release Button Lock to the unlocked position (Figure 6). Slide the battery into the groove on the bottom of the unit until an audible click is heard, and the battery is firmly seated, then turn the Battery Release Button Lock to the locked position (Figure 6). To remove a battery, turn the Battery Release Button Lock to the unlocked position, and depress both battery release buttons simultaneously and slide the battery out of the unit (Figure 7). Since it can only be loaded one way, the battery is easily replaced in the dark.

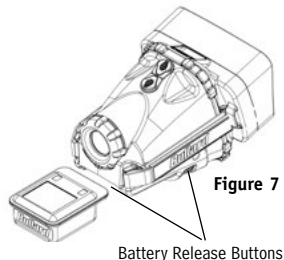


Figure 7

Battery Release Buttons

## WARNING

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

## WARNING

Do not allow the metal contacts on the label side of the battery to come in contact with a conductive surface, such as a metal table or another battery. This can complete the battery circuit and cause the battery to overheat or melt. Failure to observe this warning may result in permanent battery damage, property damage and/or serious injury.

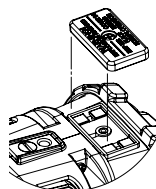


Figure 8

## Removing/Installing the Accessory Contact Cover

To remove the accessory contact cover, loosen the screw with a straight screwdriver and remove the cover (Figure 8). To reattach the accessory cover, position the cover on the T4N and tighten the screw.

## WARNING

### EXPLOSION HAZARD.

Do not remove accessory contact cover in hazardous locations. Accessory contacts only for use with Bullard TacPort™, SceneCatcher™ and Bullard Transmitter Systems in non-hazardous locations.

## WARNING

The T4N thermal imager is extremely sensitive to intense, radiant heat sources. Never point the T4N at the sun or any other source of extreme radiant heat, as this could severely damage the thermal imager.

## Removing/Installing the Side Straps

To remove either of the right or left side straps, loosen the strap and pull it through the strap loop located on either side of the LCD display (Figure 9). Remove the screw that holds the strap to the imager. To install, fasten the strap to the unit using the screw provided. Do not over-tighten. Feed the strap through the strap loop and adjust to the desired length.

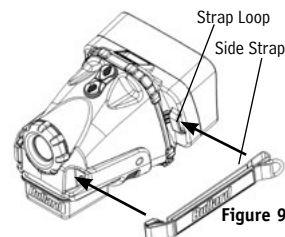


Figure 9

The side straps are designed to be field replaceable. Users can order replacements and install them without having to return the thermal imager to the factory.

## Adjusting the Side Straps

To adjust a side strap, loosen the hook and loop and set to the desired length.

## Care and Storage Instructions

The Bullard T4N Thermal Imager requires little maintenance. For best results, after each use:

- Clean the outside of the unit with mild soap or detergent
- Wipe the lens with a soft cloth
- Clean the display with a soft cloth
- Check screw tightness on side straps, cover display, and accessory contact cover
- Store your thermal imager in the optional truck mount or in the delivery case provided; consult the Bullard Powerhouse Truck Charger instruction manual for detailed instructions of installing in a vehicle.
- All thermal imagers should be maintained using a proper program

## NOTE

You can place department and company information on the T4N. When adding stickers or other markings, ensure that you do not cover the information label, the thermal imager lens / cover window, or the display. Do not engrave in the plastic material as doing so can damage the unit and jeopardize sealing.

## Cleaning the Lens

The Bullard T4N lens is recessed in an impact resistant bezel. The lens can be cleaned with a soft cloth and soapy water as required.

## Cleaning the Display Area

The display cover may become dirty through normal use. Clean the window using a surface cleaner, such as Windex®, and a soft cloth. If debris becomes trapped beneath the cover window, remove the six screws along the top, bottom and sides of the window. The inside of the cover window and on the LCD housing window may also be cleaned with a surface cleaner and a soft cloth. Be sure to use an unsoiled cloth when cleaning the window.

## Replacing the Video Display Cover Window

The display cover (Figure 10) has a scratch resistant hard coating to minimize marring. However, if heavy scratching or gouging does occur, the cover window can be replaced. To do this, simply remove the six screws along the top, bottom, and sides of the window. Remove the plastic display cover window and replace with a new one (part number T4WINDOW) making sure that the countersink slots around the mounting holes are facing outward. Do not over-tighten.



Figure 10

For additional use and care information, see "Maintenance Checklist".



## Service

If your Bullard Thermal Imager is not performing properly, please contact Bullard Customer Service at 877-BULLARD (285-5273). Outside the US & Canada, call 1-859-234-6611. Describe the problem to the Bullard representative as completely as possible. For your convenience, your representative will try to help you diagnose or correct the problem over the phone. Before returning your Bullard Thermal Imager, you should verify with your representative that the product should be returned to Bullard. Bullard Customer Service will provide you with written permission and a return authorization number.

If the return is a non-warranty repair, a Bullard Customer Service Representative or your local distributor will provide you with a repair invoice estimate. To authorize repair, you must provide a purchase order to your distributor for the amount of the estimate. Once Bullard receives authorization from your local distributor, we will issue you a return authorization number so that you can return the unit to Bullard. Bullard will repair the unit and ship it from our factory within 48 business hours. If the cost of repairs exceeds the stated quote by more than 15% or by more than \$100, a Bullard representative will re-estimate your repair and your local distributor will contact you for authorization to complete repairs. After repairs are completed and the goods have been returned to you, your distributor will invoice you for the actual repair amount.

### NOTE

Do not attempt to disassemble the sealed case of your Bullard Thermal Imager. If the unit is not functioning properly, return it to Bullard (as described in the Service section) for evaluation.

**Disassembling the unit voids all warranties.**

Prior to returning your Thermal Imager, decontaminate and clean your Thermal Imager to remove any hazardous or contaminated materials that may have settled on the product during use. Laws and/or shipping regulations prohibit the shipment of hazardous or contaminated materials. Products suspected of contamination will be professionally decontaminated at the customer's expense. Returned products will be inspected upon return to the Bullard facility. If the repair is under warranty, Bullard will repair the unit and ship it from our factory within 48 business hours.

### CAUTION

Do not use solvents or paint thinners to clean your Bullard T4N Thermal Imager as they could permanently mar the surface or degrade the protective properties of the casing. Do not intentionally submerge the unit underwater or subject the unit to high pressure water. Follow care instructions described above.

Failure to observe these instructions may result in product damage. Any damage caused by improper care is not covered under warranty.

### WARNING

The T4N thermal imager is extremely sensitive to intense, radiant heat sources. Never point the T4N at the sun or any other source of extreme radiant heat, as this could severely damage the thermal imager.

### WARNING

Do not attempt to disassemble the Bullard T4N Thermal Imager. If the unit is not functioning promptly return it to Bullard for evaluation. Disassembling the unit voids all warranties.

Do not attempt to remove the lens gasket or the rear boot. These parts provide sealing and removal will break the seal exposing the unit to potential water damage. Failure to follow these instructions could result in death, serious injury and/or product damage. Thermal Imaging is not a technology designed to replace current fire fighting tactics. Rather, it is a tool that allows the firefighter to be more effective and to make better decisions.

Firefighters cannot stop using basic firefighter safety tactics. All firefighters should receive proper training on: how thermal imagers work; the uses and limitations of thermal imagers; image interpretation; and the safety considerations for thermal imaging use.

## Product Recycling, Replacement, and Retirement

Your T4N is designed to provide a long and useful life. When replacing or retiring your T4N Thermal Imager or when disposing of batteries, please contact local recycling or waste management facilities to see if components can be recycled. When selling or transferring the T4N, make sure you act in accordance with U.S. export control laws. The infrared engine core, used in the T4N, is controlled for export outside of the United States and Canada. If you have questions about proper procedures for disposing of the unit, contact Bullard.

## Warranty

Bullard warrants to the original purchaser that the Bullard T4N and all features/accessories installed in the unit are free of defects in materials and workmanship under intended use and service for a period of one (1) year from date of manufacture. Bullard's obligation under this warranty is limited to repairing or replacing, at Bullard's option, articles that are returned within the warranty period and that, after examination, are shown to Bullard's satisfaction to be defective, subject to the following limitations:

- Article must be returned to Bullard with shipping charges prepaid.
- Article must not be altered from its original configuration.
- Article must not have been misused, abused, or damaged in transport.
- Maintenance and field replaceable items, if defective, are covered under warranty for a ninety (90) day period. These items include:

- Batteries
- Straps
- Display covers
- AC/DC adapters
- Basic accessories

Review the user manuals for Bullard accessories to obtain warranty information specific to those accessories. Since some accessories do not have user manuals, contact Bullard if you are unsure about the warranty for a particular product or accessory.

Bullard provides a limited lifetime warranty on the T4N outer shell. This warrants that the outer shell is free of defects in materials and workmanship under intended use and service for the original purchaser. Bullard's obligation under this warranty is limited to repairing or replacing, at Bullard's option, articles that after examination are shown to Bullard's satisfaction to be defective, subject to the following limitations:

- Article must not be altered from its original configuration.
- Article must not have been misused, abused, or damaged in transport.
- When the outer shell is obsolete and Bullard no longer stocks the part, the limited lifetime warranty will be terminated.

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

Any implied warranties, including warranties of merchantability and fitness for a particular purpose, are limited in duration to one (1) year from the date of manufacture of this. Some states do not allow the exclusion or limitation of incidental or consequential damages, or allow limitations on how long an implied warranty lasts, so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights, and you may have other rights which vary from state to state.

### Extended Warranty

The extended warranty has all the same terms and conditions as the one-year warranty, except it is for a period totaling two years (standard one-year warranty plus one additional year). This warranty can be purchased through any authorized Bullard distributor.

**For accessories, upgrades and replacement parts, visit [www.bullard.com](http://www.bullard.com), call 877-BULLARD or contact your local Bullard distributor.**

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