



# Tunnelling Range

Safety and hygiene solutions for the tunnelling construction and civil engineering industry.



MineARC Systems - Built for Safety.

[www.minearc.com](http://www.minearc.com)



# Company Profile

MineARC Systems is the global leader in the manufacture and supply of emergency safe refuge solutions for the mining, tunnelling, chemical processing and disaster relief industries.

With 20 years' experience, our dedication to ongoing research and development is driven by our key focus to continually offer the best and most advanced safety solutions on the market.

Our team of qualified engineers, electrical designers and technical experts form a global network across several international locations including;

- Perth, Western Australia
- Johannesburg, South Africa
- Dallas, Texas
- Santiago, Chile
- Beijing, China
- Hamburg, Germany
- Guanajuato, Mexico

This allows MineARC to provide 24 hour service and engineering support to our expanding list of clients in over 60 countries across the globe.

All MineARC Refuge Chambers and Safe Havens comply with the highest international regulations and recognised 'world's best practice' industry guidelines. Our key focus on quality control and product advancement has meant that MineARC Refuge Chambers have successfully saved lives in multiple real life industrial emergencies around the globe.

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# TunnelSAFE Refuge Chambers

The MineARC TunnelSAFE Refuge Chamber Range



Bureau Veritas ISO 9001:2008 Quality Management Systems



BSI (British Standard) BS 6164:2011 Health and Safety in Tunnelling



Member of the ITA (International Tunnelling Association)



Australian C-Tick Standards: AS4100-1998, AS3570.1-18, AS2208, AS3000, AS1716-15



Canadian Standards Association (CSA)



United States National Electrical Code (NEC) 2013/14



European CE Certified to Machinery Norms





# TunnelSAFE Gantry Design



ITA or BS EN 16191 compliant models available

Providing safety at the rear of the cutting head infrastructure, MineARC TunnelSAFE Gantry Design Refuge Chambers offer a fixed safety solution for the life of the project.

Regardless of size constraints, MineARC Engineers can custom design and manufacture each refuge chamber to meet the specific needs of the project, without compromising on occupancy potential or safety features.

## Standard Configurations

Part #		Shell	Occupancy	Duration	H (m)	W (m)	L (m)		Weight (kg)*	
ITA	BS EN						ITA	BS EN	ITA	BS EN
TS-GD1-10-ELV-24-I	TS-GD3-10-ELV-24-E	Gantry Design	10	24	2.00	1.60	5.60	7.00	4,800	5,950
TS-GD2-12-ELV-24-I	TS-GD4-12-ELV-24-E		12				6.30	7.95	5,400	6,200
TS-GD3-14-ELV-24-I	TS-GD5-14-ELV-24-E		14				7.00	9.00	5,950	6,450
TS-GD4-16-ELV-24-I	TS-GD6-16-ELV-24-E		16				7.95	9.80	6,200	6,700
TS-GD5-20-ELV-24-I	TS-GD8-20-ELV-24-E		20				9.00	11.70	6,450	7,200
TS-GD7-24-ELV-24-I	-		24				10.50	-	6,920	-
TS-GDW1-10-ELV-24-I	TS-GDW3-10-ELV-24-E	Gantry Design Wide	10	24	2.00	2.00	4.80	5.80	4,900	5,450
TS-GDW2-12-ELV-24-I	TS-GDW4-12-ELV-24-E		12				5.30	6.40	5,200	5,900
TS-GDW3-14-ELV-24-I	TS-GDW6-14-ELV-24-E		14				5.80	7.75	5,450	6,500
TS-GDW4-16-ELV-24-I	TS-GDW7-16-ELV-24-E		16				6.40	8.12	5,900	6,750
TS-GDW5-20-ELV-24-I	TS-GDW8-20-ELV-24-E		20				6.80	9.86	6,150	7,300
TS-GDW6-24-ELV-24-I	TS-GDW9-24-ELV-24-E		24				7.75	11.40	6,500	7,650

\*Indicative weights only. Custom variations will impact final refuge chamber weight.

# TunnelSAFE Rail Design



ITA or BS EN 16191 compliant models available

MineARC can custom engineer and manufacture refuge chambers to be rail mounted or fixed to a tunnelling rescue train; providing a portable safe haven for workers during routine inspections and maintenance works. As a long term safety option for the entire life of the tunnel, these chambers are robust and fully serviceable.

TunnelSAFE Rail Design Refuge Chambers can also be fitted with remote monitoring systems, or the client's own remote control system. MineARC offers full after-market care for refuge chambers, from commissioning to on-site servicing and training.

## Standard Configurations

Part #		Shell	Occupancy	Duration	H (m)	W (m)	L (m)		Weight (kg)	
ITA	BS EN						ITA	BS EN	ITA	BS EN
TS-RD1-10-ELV-24-I	TS-RD3-10-ELV-24-E	Rail Design	10	24	2.00	1.60	5.60	7.00	4,800	5,950
TS-RD2-12-ELV-24-I	TS-RD4-12-ELV-24-E		12				6.30	7.95	5,400	6,200
TS-RD3-14-ELV-24-I	TS-RD5-14-ELV-24-E		14				7.00	9.00	5,950	6,450
TS-RD4-16-ELV-24-I	TS-RD6-16-ELV-24-E		16				7.95	9.80	6,200	6,700
TS-RD5-20-ELV-24-I	TS-RD8-20-ELV-24-E		20				9.00	11.70	6,450	7,200
TS-RD7-24-ELV-24-I	-		24				10.50	-	6,920	-

\*Indicative weights only. Custom variations will impact final refuge chamber weight.



# TunnelSAFE MSV Design



ITA or BS EN 16191 compliant models available

# TunnelSAFE Drill & Blast



ITA or BS EN 16191 compliant models available

MineARC can custom engineer and manufacture refuge chambers to be mounted to a multi-service vehicle; providing a portable safe haven for workers during routine tunnel inspections and maintenance works. As a long term safety option for the entire life of the tunnel, these chambers

are robust and fully serviceable.

TunnelSAFE MSV Design Refuge Chambers can also be fitted with remote monitoring systems, or the client's own remote control system.

For drill and blast tunnelling operations, MineARC has developed a standard range of portable refuge chambers that can be positioned and repositioned with ease, providing an ongoing safety solution for the life of the project.

They offer an ideal solution for projects involving feeder tunnels and single-entry development headings, including sub-surface railway stations, hydro-power stations and other complex tunnel networks.

## Standard Configurations

Part #		Shell	Occupancy	Duration	H (m)	W (m)	L (m)		Weight (kg)	
ITA	BS EN						ITA	BS EN	ITA	BS EN
TS-SD1-08-ELV-24-I	TS-SD2-08-ELV-24-E	Standard Design	08	24	2.21	2.25	3.89	4.80	4,300	4,700
TS-SD2-12-ELV-24-I	TS-SD3-12-ELV-24-E		12				4.80	6.02	4,700	5,400
TS-SD3-16-ELV-24-I	TS-SD4-16-ELV-24-E		16				6.02	7.23	5,400	6,000
TS-SD4-20-ELV-24-I	-		20				7.23	-	6,000	-
TS-ND6-12-ELV-24-I	TS-ND4-12-ELV-24-E	Narrow Design	12	24	2.00	1.90	5.60	7.24	5,250	6,668
TS-ND7-16-ELV-24-I	TS-ND8-16-ELV-24-E		16				6.70	8.80	6,200	7,550
TS-ND5-20-ELV-24-I	TS-ND9-20-ELV-24-E		20				8.44	10.40	7,348	8,400
TS-ND8-24-ELV-24-I	TS-ND10-24-ELV-24-E		24				8.80	11.90	7,550	8,900
TS-SL1-12-ELV-24-I	TS-SL3-12-ELV-24-E	Slim Line	12	24	2.00	1.60	6.30	8.50	5,400	6,300
TS-SL2-16-ELV-24-I	TS-SL5-16-ELV-24-E		16				7.70	10.50	6,050	6,920
-	TS-SL6-18-ELV-24-E		18				-	11.50	-	7,100
TS-SL4-20-ELV-24-I	-		20				9.00	-	6,450	-
TS-SL5-24-ELV-24-I	-		24				10.50	-	6,920	-

\*Indicative weights only. Custom variations will impact final refuge chamber weight.





# TunnelSAFE Exterior



### STROBE LIGHTING

- Extra low voltage
- Green & red LED

### SIREN

- 112 dBA

### MISTING SYSTEM OPTION

- See pg 18 for details

MA 1202

### 12MM PORTHOLE WINDOW

- AS 2208
- Blast resistant upon request

### AIR VENT / CHECK VALVES

### REFLECTIVE SIGNAGE

- Safety & operational
- Optional extra: Multiple languages

### POSITIVE PRESSURE MAINTENANCE

- See pg 16 for details

### SEALING DOOR

- Outward opening
- Vacuum tested seal

### ROTATING HANDLES

- Double locking

### PAINT

- Sand blasted to 2.5 grit

### SKID BASE

- 250 x 100mm forklift slots
- Front and rear mounted tow points
- Front mounted 25mm steel plate push blocks

# TunnelSAFE Interior



Inside a MineARC TunnelSAFE Refuge Chamber, a number of vital life support systems combine to create a safe, ongoing environment for occupants. Systems include primary and secondary oxygen supplies, air conditioning and dehumidifying, positive pressure maintenance, electrical and communications, gas detection and CO/CO<sub>2</sub> absorption (referred to as 'scrubbing' systems).

MineARC TunnelSAFE Chambers use active chemicals and MineARC's Extra-Low-Voltage (ELV) Scrubbing System to 'scrub' the build-up of harmful CO<sub>2</sub> and CO from the air inside the refuge chamber.

In high enough concentrations, both CO<sub>2</sub> and CO can cause serious injury leading to a loss of consciousness and eventually, death. CO<sub>2</sub> and CO are expired by occupants as part of their normal breathing activity. Carbon Monoxide can also enter the main chamber via the compressed air intake (if it becomes compromised), and as occupants enter and/or exit the main entrance, making CO/CO<sub>2</sub> scrubbing a vital necessity.

## Extra-Low-Voltage Controller Interface

The controller interface is the operational hub of the refuge chamber. From here, all power, lighting and scrubbing can be managed with the flick of a switch.

## Optional: Standing Room Only

Designed for high personnel volume requirements.



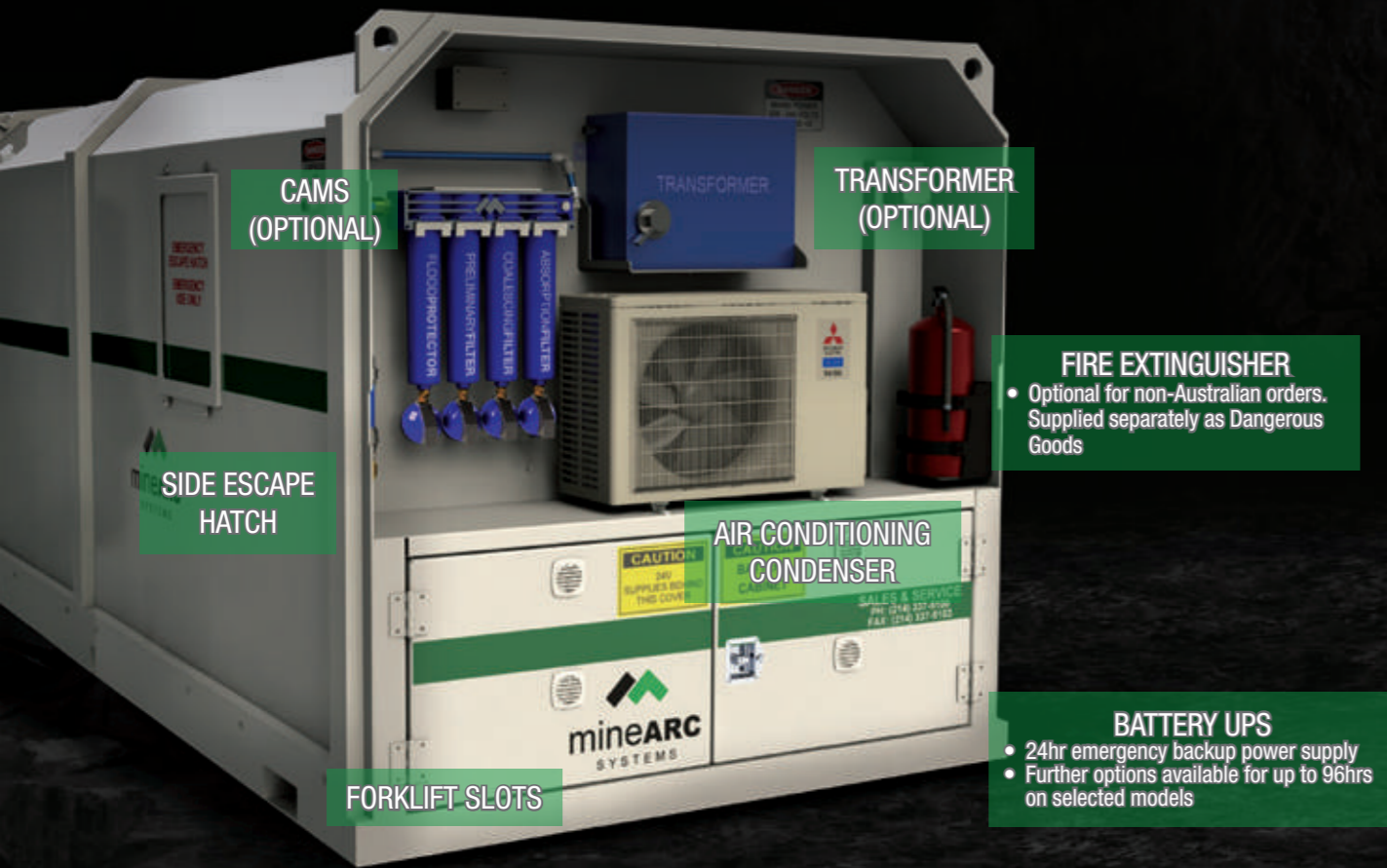


# TunnelSAFE Rear

A secure cabinet at the rear of the TunnelSAFE houses the refuge chamber's UPS battery back up (Uninterruptible Power Supply). The UPS is a fail-safe system that can power the refuge chamber's internal life support systems for a minimum of 24hrs, should mine power become cut-off.

As an optional feature, the Compressed Air Management System (CAMS) allows regulated compressed air into the refuge chamber

when the pressure inside drops below 200Pa. This process optimises mine air usage and guarantees against over-pressurisation of the refuge chamber. CAMS' gas toxicity monitor automatically diverts compressed air if oxygen levels in the airline fall below a set level (18% oxygen in free air), signifying air contamination. Additionally, the incorporated flood protection valve automatically shuts down compressed air to avoid catastrophic and costly chamber damage in the event of water ingress.



# GuardIAN Intelligence

The MineARC GuardIAN Intelligence Network



## Custom Design & Chamber Options

Virtually all aspects of a MineARC TunnelSAFE Chamber design can be customised by MineARC Engineers, including; shape, standard dimensions, blast resistance, internal features, occupancy, entry airlock/vestibule and minimum entrapment durations. MineARC can also engineer the refuge chamber to double as a control room, office area, rest station or blast room (used in drill and blast operations).

- ✓ Permanent Refuge Solutions
- ✓ 45° Angle Front Entry
- ✓ Auto-Retracting Seating
- ✓ Satellite UPS System
- ✓ Remote Monitoring & Comms



# GuardIAN Intelligence Network

## Refuge Chamber Monitoring

MineARC's GuardIAN Refuge Chamber Monitoring System enables real-time monitoring; providing confidence that a project's fleet of refuge chambers are emergency ready at all times.

GuardIAN Chamber Monitoring is an on-board system that continuously monitors all vital refuge operating systems. During standby mode GuardIAN checks for component faults and monitors refuge chamber usage or entry to the chamber.

The GuardIAN Chamber Monitoring system is hosted on an internal server within the refuge chamber so that no client software installation is required. The responsive webpage is easily accessible from any computer, tablet or smartphone and features a summary of your entire refuge chamber fleet and overall operational status, with the ability to drill down to a detailed report of each chamber.

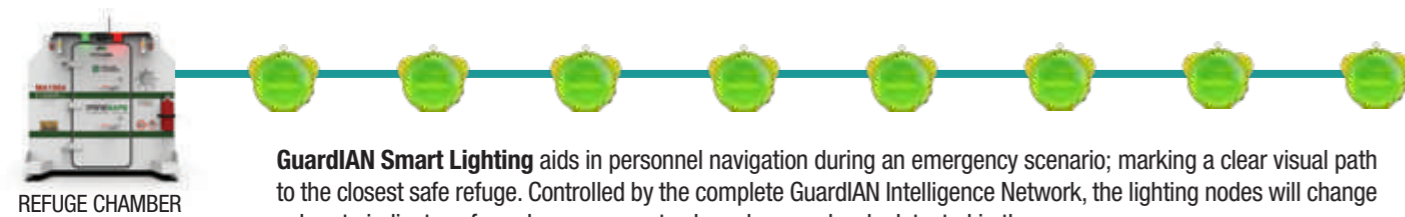


## Smart Lighting

Smart Lighting from the GuardIAN Node range gives the ability to provide a visual alert when evacuation is necessary, and assist in guiding personnel safely to the nearest available refuge chamber.

The Smart Light also doubles as a UWB tracking device, reporting on the location of all personnel underground.

Controlled and monitored via the GuardIAN Network, the Lighting Nodes can also be utilised alongside GuardIAN Gas Monitoring Nodes and GuardIAN Tracking Nodes; providing a complete safety solution for any tunnelling project.



**GuardIAN Smart Lighting** aids in personnel navigation during an emergency scenario; marking a clear visual path to the closest safe refuge. Controlled by the complete GuardIAN Intelligence Network, the lighting nodes will change colour to indicate safe or dangerous routes based on gas levels detected in the area.

# GuardIAN Intelligence Network

## Gas Monitoring

Digital Gas Monitoring Nodes from the GuardIAN range provide a remote gas monitoring solution for tunnelling projects; designed specifically to be mounted to walls and high traffic areas. Sensor technology within each node monitors gas levels in surrounding areas; designed to facilitate efficiency and safety during an emergency.

As part of the GuardIAN Intelligence Network, the gas monitoring nodes can form an expandable and adaptable web, allowing increased coverage and accuracy of atmospheric data transmitted between MineARC Refuge Chambers, personnel and the control room/office.



## Aura-PT Handheld Gas Monitor

The **Aura-PT handheld gas detector** has been designed to provide underground personnel with the ability to continuously monitor up to six gases within their immediate surroundings. Aura-PT automatically communicates dangerous gas levels back to the **GuardIAN Server** via the **GuardIAN Nodes**.

The Aura-PT can also be used as a redundancy during re-entry, allowing personnel to easily and accurately monitor gas levels as they are driving back down the decline.



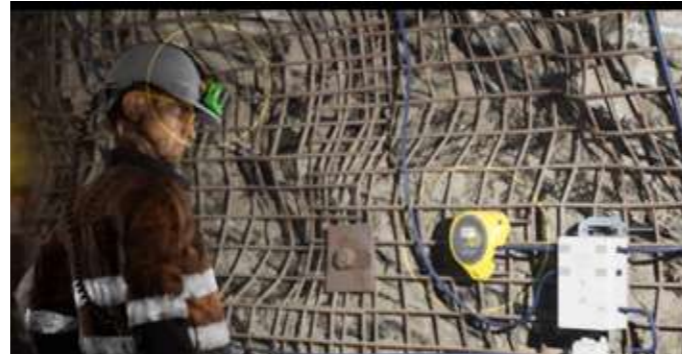


# GuardIAN Intelligence Network

## GuardIAN Tracking

GuardIAN Tracking Technology has been specifically designed to integrate with the GuardIAN Intelligence Network, allowing remotely monitoring of the location and well-being of all personnel.

A small UWB tracking chip located within MineARC's SiriUS Cap Lamp communicates via wireless with the nearest GuardIAN Node, providing location information back to the GuardIAN Network.

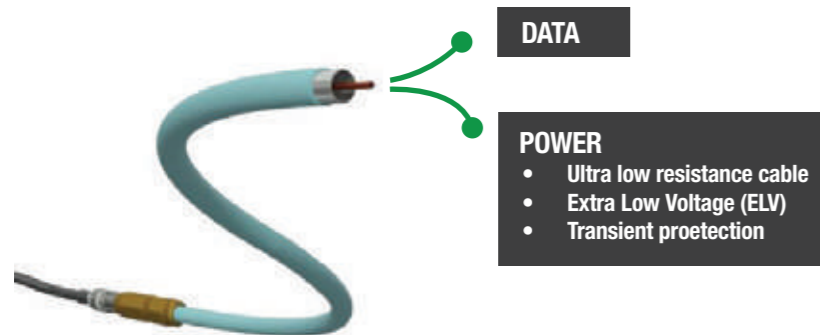


## GuardIAN Connect

Powered by RFI Technology Solutions, GuardIAN Connect is a high speed, fit for purpose, linear access layer network, allowing the connection of the GuardIAN Nodes, Smart Lighting and Refuge Chamber to the GuardIAN Intelligence Network.

Designed specifically for a harsh industrial environments, GuardIAN Connect uses a single coaxial cable to carry both power and data.

- ✓ Distributes reliable, standard-compliant power
- ✓ Full speed native Ethernet communications
- ✓ Inter-operable with preferred network equipment
- ✓ Can be installed & maintained by trades - as easy as leaky feeder

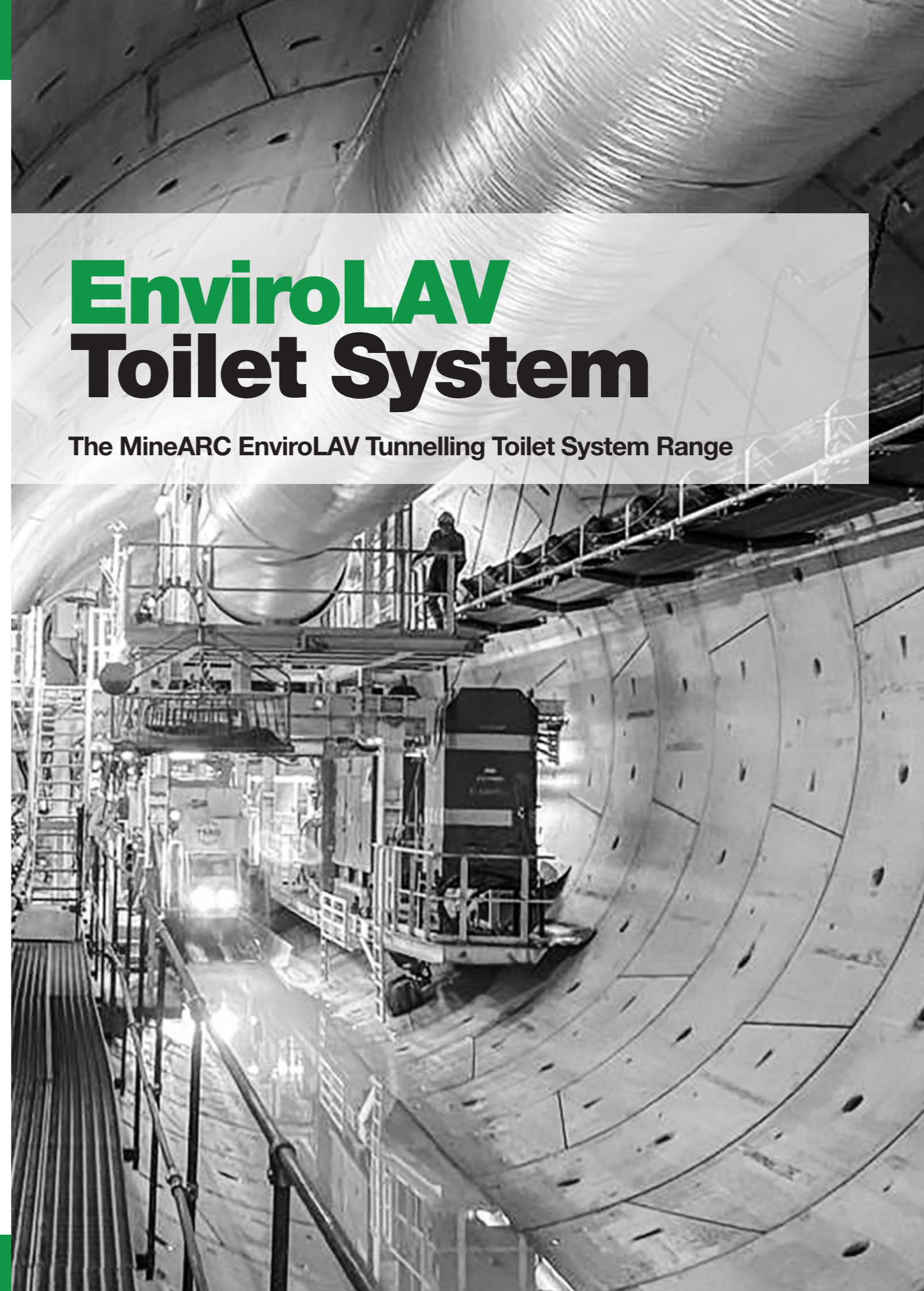


GuardIAN Connect eliminates separate distribution by enabling power to be carried over the communications cable with the data. Power centres can be consolidated every 1-2km.

Power over Ethernet (PoE+) outlets can be tapped off the GuardIAN Connect Cable wherever endpoint devices (such as the GuardIAN Node and Lighting) are required.

# EnviroLAV Toilet System

The MineARC EnviroLAV Tunnelling Toilet System Range





# EnviroLAV Features

MineARC's EnviroLAV is the perfect solution for industrial scenarios, including tunnelling construction.

Featuring an integrated waste tank, MineARC's unique EnviroZYME solution is deposited with every flush; working simultaneously with the system's aerobic technology to quickly break down waste.

Available in male, female and unisex configurations, the EnviroLAV provides the much needed option of a private toilet facility for women in industry. It's robust design means transportation and installation is a simple one-person job.



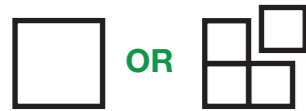
## ELECTRIC OR PNEUMATIC OPERATION

Choose an operating system based on available utilities. Depending on the location, access to power or compressed air may not be readily available. MineARC will work closely with clients to determine the best solution based on their existing site set-up.



## PEDESTAL OR SQUAT PAN FACILITIES

It is important to consider cultural factors when sourcing the right facilities. Geography and cultural preference may impact toilet design requirements. MineARC Systems can work closely with client to provide a toilet solution to best suit the needs of their personnel.



## FIXED OR MODULAR CONSTRUCTION

Access can significantly restrict toilet positioning, especially when it comes to height and footprint requirements. The EnviroLAV is available in both fixed and modular configurations, allowing easy movement of the units into place, whilst still enjoying flexibility when it comes to choice.



## MALE, FEMALE OR UNISEX CONFIGURATIONS

Accommodating the needs of all personnel onsite is essential. A site must consider how they can satisfy these requirements through the supply of single-sex, unisex or dual capacity toilets as well as additional sanitary options. Preferences may also impact the frequency of use during each shift.

# EnviroLAV Exterior



REFLECTIVE DECALS

EXTERNAL AIR VENT

INTERNALLY LOCKING DOOR

- 1.6mm steel plate
- Outward opening

PAINT

- AS/NZS 2312:2002
- Blasted to 2.5 grit
- UV protection (Optional for above ground models)

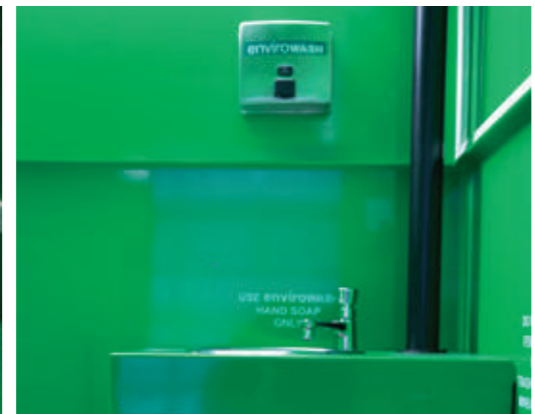
STEEL PLATE FRAME

- 3mm walls, roof & floor
- 5mm waste tank

COMPRESSED AIR OR ELECTRIC POWERED

FORK LIFT SLOTS

- 200 x 100mm
- 100mm C Channel





# EnviroLAV Interior

INTERNAL FLUORESCENT LIGHTING  
(ELECTRIC MODELS ONLY)

- Pneumatic models feature a battery powered LED

enviroLAV

ENVIROWASH  
SOAP DISPENSER



USE enviroWASH  
HAND SOAP  
ONLY

TOILET ROLL HOLDER

- Stainless steel
- Compatible with EnviroSOFT Toilet Tissue

HAND BASIN

- Stainless steel



ELECTRIC OR PNEUMATIC  
COMPRESSED AIR OPERATION

DRAIN FLOW DIVERTER  
BALL VALVE

LEFT HANDLE  
POSITION DRAINS  
TO WASTE TANK

RIGHT HANDLE  
POSITION DRAINS  
TO EXTERNA



TOILET PEDESTAL

- High durability plastic

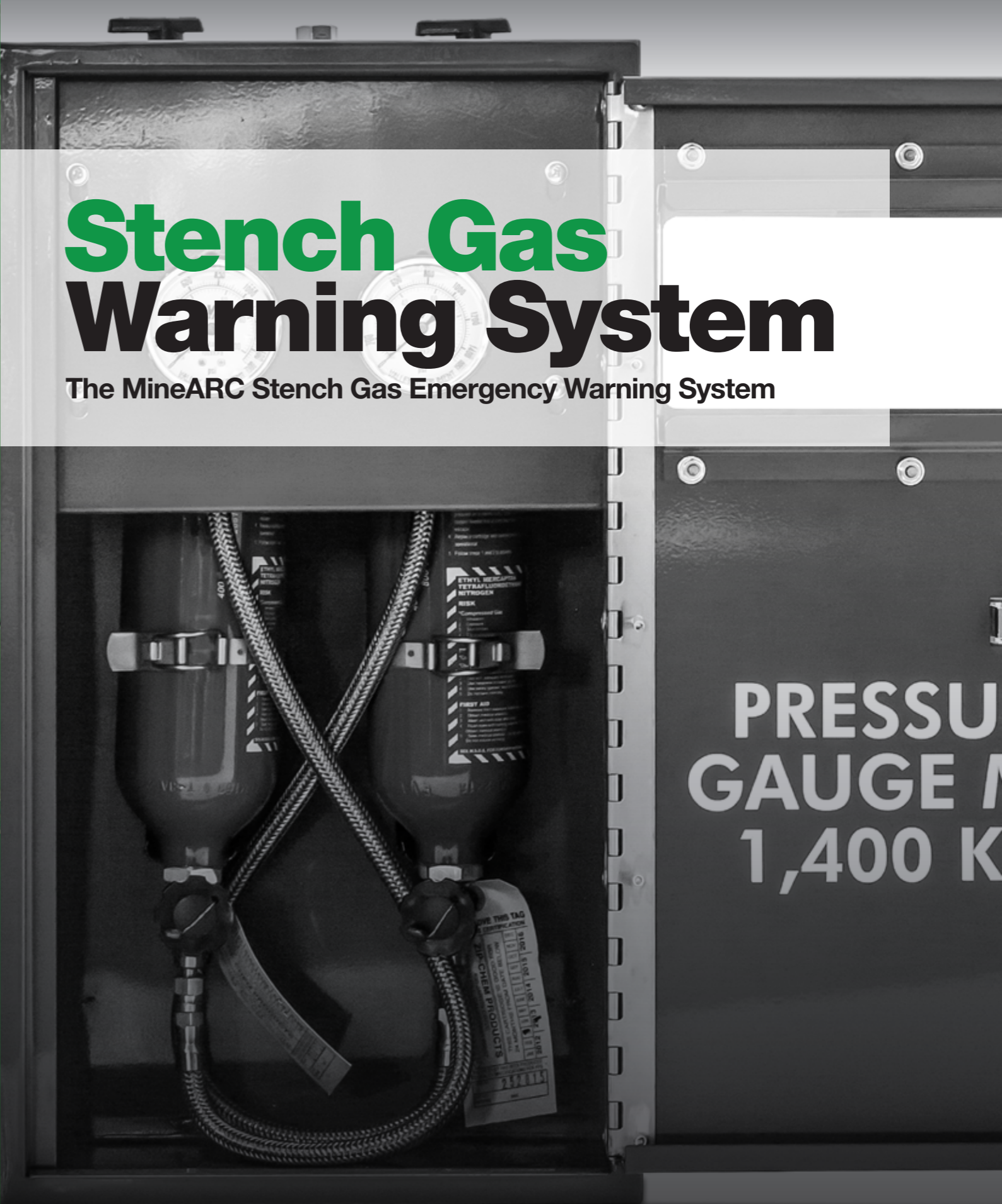


WASTE TANK PORTAL

FLUSHING FOOT PEDAL

# Stench Gas Warning System

The MineARC Stench Gas Emergency Warning System



PRESSURE  
GAUGE  
1,400 K



# Stench Gas Systems



Stench gas is commonly used as an alert gas for emergency evacuations. The powerful odour can be quickly dispersed to alert personnel of impending danger.

The MineARC Stench Gas System is designed to suit noisy locations where alarms cannot be heard. Available in either a manual or remotely operated electric configuration, the unit will send a clear and definitive odour in the event of an emergency, indicating the initiation of emergency response procedures.

MineARC also provides an anti-stench flushing agent and wintergreen used to counteract the pungent smell of stench gas once the all-clear has been given, allowing production to recommence quickly.

# Stench Gas Electric System

The electric stench gas system is MineARC's premium range, comprising a twin cylinder stench gas unit and a sub-controller that can be connected through to an existing control system or to the optional MineARC Stench Gas Master Controller.

This fully electrical system allows for safe, remote operation of the stench gas units via the sub-controller in the event of an emergency, removing the need for local activation.



## STENCH GAS UNIT



## SUB-CONTROLLER



## MASTER CONTROLLER





# Stench Gas Manual System

MineARC's standard manual stench gas unit comprises a set of twin gas cylinders housed within a durable steel cabinet with reflective signage, designed specifically for harsh conditions.

The stench gas cylinders are manually activated via gas release valves on the top of the exterior housing. Pressure gauges indicate successful release of the gas.



## STANDARD FEATURES

- Easy installation
- Dispersion line venting 10m (33ft) from your location
- Two 1L stench gas cylinders (100g Ethyl Mercaptan & R134A Propellant)
- Independent operation of cylinders
- Steel housing with reflective signage and viewing window
- Powder coated red in accordance with ANSI Z535.1
- Pressure gauge to indicate gas levels
- Stainless steel pipe work and valving
- Tamper proof tags
- Simple operation via gas release valves
- Mounting brackets with slotted holes

## STENCH GAS

MineARC Stench Gas cylinders carry 100g of Ethyl Mercaptan, a colourless organic liquid with a strong odour that, when added to an odourless gas, acts as a pungent warning agent. One MineARC Stench Gas Unit is effective in odourising approximately 1.25 million cubic metres of air, operating within a temperature range of 1 °C to 54 °C. MineARC Stench Gas is a non-flammable substance.



# SiriUS LED Cap Lamps

The MineARC SiriUS LED Cap Lamp Range





# SiriUS Cap Lamps

## Cordless Model



- CRI: >80
- W 90mm x H 55mm x D 65mm
- Approx. 240g
- Water resistance: IP68
- Battery duration: >15 hours
- Rated capacity: 10.4Ah
- Rated voltage: 3.7V
- Rated current: 2A

Mode	Lux
Spot	9,221
Mixed	4,184
Wide	227
Max	6,479

## Corded Model



- CRI: >90
- W 90mm x H 55mm x D 65mm
- Approx. 440g inc battery pack
- Water resistance: IP68
- Battery duration: >15 hours
- Rated capacity: 10.4Ah
- Rated voltage: 3.7V
- Rated current: 2A
- Cord Length: 1-1.5m

Mode	Lux
Spot	11,321
Mixed	6,206
Wide	269
Max	9,406



# SiriUS Cap Lamps

## Dual-Beam LED Lighting

The SiriUS Cap Lamp features two unique beams; working in tandem to deliver a better field of vision for personnel.

- A high-lux, intense spot beam provides focus
- A lower-lux wide beam provides a more dispersed flood light

The dual-beam operation ensures a crisper and more natural light is projected.

The inclusion of a 'MAX' mode allows for short-term, mixed light of a higher intensity. MAX is ideal for providing a brighter mix beam for a short period of time if required, without completely draining the battery.





# SiriUS-LUX

## - MineARC's Premium Range

After even more functionality? MineARC's premium SiriUS-LUX Cap Lamp range redefines wearable lighting designed for underground environments. Enjoy all the benefits of the SiriUS Cap Lamp, plus more; including automatic light adjustment, a unique modular battery, and a range of tracking options.

**AUTOMATIC LIGHT ADJUSTMENT**



**MODULAR QUICK CONNECT BATTERY**



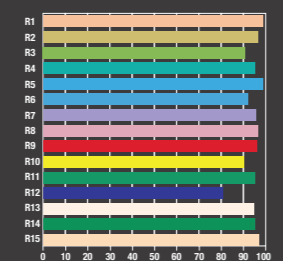
**TWO UNIQUE BEAMS FOR BETTER FIELD OF VISION**



**TRACKING OPTIONS**



**>90 COLOUR RENDERING INDEX**



# ZOLL® Defibrillators

The ZOLL Defibrillator Range





# ZOLL AED Plus Defibrillator

The latest American Heart Association (AHA) Guidelines, issued in 2010, are clear: successful defibrillation requires high-quality CPR performed at the proper depth and rate.

Whether a shock is advised or not, rescuers should focus on delivering compressions correctly; as only good CPR can restore the heart rhythm to one required for a shock to work.



## Real CPR Help® Technology

The AHA Guidelines recommend that rescuers push hard to a depth of at least 5 centimeters at a rate of 100 compressions per minute. This is easier said than done. The AED Plus removes any guess-work during the administration of CPR with the addition of *Real CPR Help®* technology - providing the best support for saving a life.

Pad sensors allow the AED see each chest compression; providing instant feedback to the user. It provides continual guidance throughout the CPR process, with prompts and a real-time bar gauge to indicate the recommended depth and rate of compressions.

- ✓ One-piece CPR-D-padz contain a pair of electrodes, which sense and report the motion of chest compressions
- ✓ Audio and text prompts relay compression quality
- ✓ Compression depth bar gauge displays the depth of each compression in real-time
- ✓ Adaptive metronome detects compression rate and guides to at least 100 per minute



RESCUER ACTIONS	AED PLUS SUPPORT MESSAGING
Not yet started?	'START CPR'
Stopped?	'CONTINUE CPR'
Too slow?	Adaptive metronome indicates requirement to speed up
Not deep enough?	'PUSH HARDER'
Performing correct CPR?	'GOOD COMPRESSIONS'
Want to see how you are doing?	Visible bar gauge indicates compression depth

Because the AED Plus can 'see' compressions being administered, users are provided with direct, useful feedback in order to improve their technique; ultimately resulting in the best possible outcome for the patient.

# ZOLL AED Plus Defibrillator

No other defibrillator on the market supports a rescuer as thoroughly as the AED Plus.

Research conducted with EMS personnel in Arizona has shown that when professionals are trained to conduct high-quality CPR using ZOLL's professional defibrillators equipped with Real CPR Help technology, the chance of survival from cardiac arrest more than doubled.

The AED Plus offers a range of features, enabling the best possible outcome, no matter the level of experience.

BACK-LIT DISPLAY SCREEN PROVIDES TEXT WITH EVERY AUDIO PROMPT

ILLUMINATED GRAPHICAL ICONS PROVIDE EASY, STEP-BY-STEP GUIDANCE



PULL-TABS EXPOSE CONDUCTIVE GEL, LIMITING CONTAMINATION

ONE-PIECE CPR-D-PADZ FOR QUICK, EASY APPLICATION



## Option: Fully Automatic Model

For those who prefer to keep things simple, the fully automatic model of the AED Plus takes charge and delivers the shock with no rescuer interaction needed.

Stay clear, and let the **Fully Automatic AED Plus** deliver its life-saving shock, following a distinct 3 second audible countdown.



# ZOLL Defibrillator Range

## Zoll AED 3



- ✓ CPR Uni-padz contain a pair of electrodes, which sense and report the motion of chest compressions
- ✓ Full colour display with graphic image prompts, compression depth gauge and cycle timer
- ✓ RapidShock analysis, minimising pauses during CPR administration
- ✓ Integrated pediatric rescue with 'child mode' - no need for more equipment
- ✓ Wifi connected to easily manage multiple units

## Zoll AED Pro



- ✓ CPR Uni-padz contain a pair of electrodes, which sense and report the motion of chest compressions
- ✓ Full colour display with graphic image prompts, compression depth gauge and cycle timer
- ✓ RapidShock analysis, minimising pauses during CPR administration
- ✓ Integrated pediatric rescue with 'child mode' - no need for more equipment
- ✓ Wifi connected to easily manage multiple units

## Zoll X-Series



- ✓ CPR Uni-padz contain a pair of electrodes, which sense and report the motion of chest compressions
- ✓ Full colour display with graphic image prompts, compression depth gauge and cycle timer
- ✓ RapidShock analysis, minimising pauses during CPR administration
- ✓ Integrated pediatric rescue with 'child mode' - no need for more equipment
- ✓ Wifi connected to easily manage multiple units

A close-up, black and white photograph of a DEZEGA SCSR defibrillator. The device is rugged and features a large, prominent speaker grille on the front. The 'DEZEGA' logo is visible on the grille. The device is shown from a slightly elevated angle, highlighting its compact and durable design.

**DEZEGA®**  
**SCSR**  
Backed by MineARC



# DEZEGA SCSRs

DEZEGA's range of portable waist and shoulder-worn self-rescuers are designed for escape from irrespirable atmospheres over long, medium and short-haul routes.

DEZEGA SCSRs contain a cartridge with chemically bound oxygen (KO<sub>2</sub>). As oxygen is released, the active cartridge substance simultaneously absorbs carbon dioxide, and thus the self-rescuer completely isolates the user's respiratory organs from the irrespirable atmosphere.

## Ci-30 KS

- ✓ 30 minute minimum duration
- ✓ EN and AU certified
- ✓ Compact design at 2.5kg weight
- ✓ Automatic starter device - begins when the lid is detached
- ✓ Moisture indication
- ✓ Rugged construction with abrasion resistant case

## CARBO-70

- ✓ 70 minute minimum duration
- ✓ GOST certified
- ✓ Compact design at 2.78kg weight
- ✓ Automatic starter device - begins when lid is removed
- ✓ Optional moisture indication
- ✓ Rugged construction with abrasion resistant case



# DEZEGA Ci-30 KS SCSR

The DEZEGA Ci-30 KS is a closed-circuit breathing apparatus, ensuring the user does not inhale outside gases after donning. The device provides the user with both an oxygen source and a carbon dioxide neutraliser (scrubber).

Chemically bound oxygen reacts with the carbon dioxide exhaled by the user; ultimately absorbing the CO<sub>2</sub> and allowing breathable air to circulate within the device.

The Ci-30 KS features an automatic starter, in which oxygen generation begins automatically when the self-rescuer is donned and exhalation is detected.

The Ci-30 KS is housed in an anti-deformation, ruggedised casing. This ensures the life-saving equipment is kept free from damage, particularly in environments with highly abrasive surfaces and narrow passageways.



The moisture indicator is a transparent capsule with hydrophobic material, installed in the self-rescuer casing on the top of the unit.

Should the indicator change colour from blue to pink, this is a sign that moisture has infiltrated the capsule; resulting in a risk of case leakage and untimely cartridge activation. The self-rescuer must then be checked with a DEZEGA testing unit.

Nominal rated duration in accordance with EN 13794:2002 and AS/NZS 1716:2012	
- Escape (35 l/min)	30 min
- Waiting for rescue (10 l/min)	90 min
Temperature of inhaled gas	50°C
Maximum breathing resistance	1 kPa
Average CO <sub>2</sub> content	1.5%
Weight carried	2.5 kg
Shelf life	10 years

This 30-minute waist belt-worn self-rescuer is made for markets that accept the European and Australian Standards.

In case of dense smoke or irritating gas emissions, it is important to protect the eyes. As such, the Ci-30 KS self-rescuer comes equipped with protective goggles with an anti-fogging coating to improve vision during an escape.



# DEZEGA CARBO-70 SCSR

The DEZEGA CARBO-70 is a closed-circuit breathing apparatus, ensuring the user does not inhale outside gases after donning. The device provides the user with both an oxygen source and a carbon dioxide neutraliser (scrubber).

Chemically bound oxygen reacts with the carbon dioxide exhaled by the user; ultimately absorbing the CO<sub>2</sub> and allowing breathable air to circulate within the device.

The CARBO-70 features an automatic starter, in which oxygen generation begins automatically when the device is opened.

The CARBO-70 is housed in an anti-deformation, ruggedised casing. This ensures the life-saving equipment is kept free from damage, particularly in environments with highly abrasive surfaces and narrow passageways.



## Optional moisture indicator

The moisture indicator is a transparent capsule with hydrophobic material, installed in the self-rescuer casing on the top of the unit.

Should the indicator change colour from blue to pink, this is a sign that moisture has infiltrated the capsule; resulting in a risk of case leakage and untimely cartridge activation. The self-rescuer must then be checked with a DEZEGA testing unit.

This 70-minute waist or shoulder-worn self-rescuer is made for markets that accept the GOST standards.

In case of dense smoke or irritating gas emissions, it is important to protect the eyes. As such, the CARBO-70 self-rescuer comes equipped with protective goggles with an anti-fogging coating to improve vision during an escape.



Nominal rated duration in accordance with GOST 12.4.292-2015 and Technical Regulation of Customs Union 019/2011	70 min 210 min
- Escape (35 l/min)	
- Waiting for rescue (10 l/min)	
Temperature of inhaled gas	45°C
Maximum breathing resistance	980 Pa
Average CO <sub>2</sub> content	1.5%
Weight carried	2.8 kg
Shelf life	7 years

# DEZEGA P-70 SCBA

Introducing the newest technology in compressed oxygen breathing apparatus; with positive pressure for rescue and firefighting works in mines, tunnels, other underground and confined spaces.

- ✓ Smallest and lightest in it's class
- ✓ State-of-the-art adjustable harness
- ✓ Comfortable breathing conditions
- ✓ Oxygen sharing system for flexible rescue tactics

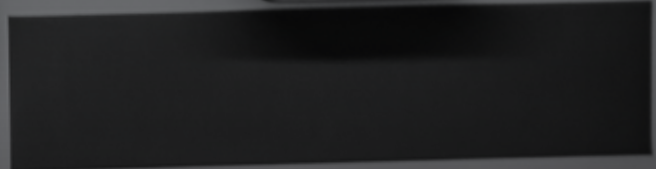






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CAMERA DI RIFUGIO  
REFUGE CHAMBER



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