Equipment Services

AEL Equipment Services is an international supplier of original equipment and aftermarket parts with services tailored to the needs of the blasting professional in both underground and surface mining.

Due to its long standing relationships with component manufacturers across the globe, AEL Equipment Services holds impressive buying power and can offer its customers competitive lead times on equipment and price options.

The division understands that their customers work in environments that leave no room for error and that they cannot afford to speculate on the consistency and safety of their equipment. It is for these reasons that each machine component is exhaustively tested with all possible risk factors in mind before and after the equipment is actually assembled.

The equipment supplied by AEL Equipment Services is designed to specification and can be customized for use on any utility vehicle provided by the customer. It further operates in the robust environments typically associated with mining. Once the machines are assembled, they are commissioned and calibrated by a team of professionals with a keen eye for detail. Only once each and every member of the team has signed off on the machine will it be licensed to manufacture explosives and be delivered to the site.

The Equipment Services Division offers a series of "state-of-the-art" Mobile Manufacturing Units (MMU's), underground mobile charging units (MCU's), portable charging units (PCU's).

AEL specializes in the manufacture and deployment of self-sufficient modular emulsion manufacturing plants. The Equipment Services Division has the capacity to erect and commission a complete emulsion plant at any green fields site globally.

VERTICAL DROP SYSTEMS

Capability to provide emulsions from surface to an underground tank farm, via pipeline up to 500m and beyond. AEL technology has provided the ability to ensure incredible safe system to improve mine costs by reducing transport and haulage times into the underground mining operations.

With local and international level access, the team is renowned for:

- Technical support
- Training
- Overall after-sales service

The division is confident that it can offer its customers the peace of mind in knowing that their equipment will be reliably supported in the field.

Modular Emulsion Plants

PRODUCT DESCRIPTION

The Modular Emulsion Manufacturing Plant consists of the process equipment to mix and emulsify the different products used. The modular concept was adopted to place plants relatively quickly and easily where it's needed. Plant size, raw material storage and operational facilities are directly dependent on the customer's needs. This can be built on a comparatively small footprint.

APPLICATION

Used in Opencast and underground mining operations with a requirement for bulk emulsions.

BENEFITS

- Proven reliability
- Integrated control systems, which guarantee constant delivery of requested product quality and quantity
- The Emulsion plants can be configured to produce any of the bulk emulsion derivatives specific to AEL
- All plants are modular and are built into 20' and 40' shipping containers for ease of transport and erection
- Low Maintenance costs
- User friendly touch screen operator HMI

FEATURES

- Pump protection-guarding against dead-heading and dry-running scenarios
- Strainers on the bin to prevent ingress of foreign objects
- Siemens PLC control

SAFETY HANDLING

- Independent electronic pump protection system monitoring and controlling operating pressures and temperatures on critical pumps
- Mechanical pump protection devices installed on all critical pumps
- Bursting discs are fitted to emulsion pumps
- Emergency stops are situated at critical locations throughout the plant
- Thermal oil Heating Units used for heat generation (system is open to atmosphere)

TECHNICAL SPECIFICATIONS

MODULAR EMULSION PLANTS

DESCRIPTION	DETAILS
Plant Capacities	
Production Capacity per 8 hour shift	10 t, 20 t, 60 t
Pumping Rates	
Production Pumping Rates	180 to 300 kg/min
Emulsion Storage	
20' ISO-Tainers	28 t
Vertical Silos	28 t, 40 t and 80 t

E Series MPU E20T

PRODUCT DESCRIPTION

A blend MPU capable of pumping or augering the full series of AEL's bulk explosive products. The bin is designed to ADR specifications with four compartments, which allow for better weight distribution. This process can be mounted on any available prime mover although we've standardised on MAN, ASTRA and SCANIA. This MPU complies with the Road traffic Act, Explosive Act and Chassis Manufacture Specifications in South Africa.

APPLICATION

Used for charging bulk emulsion in surface mining operations by pumping or augering.

BENEFITS

- Proven on-bench reliability
- Integrated control systems, which guarantee constant delivery of requested product quality and quantity
- A series of products can be applied on one bench depending on conditions
- Varying pumping and auguring rates to suit bench hole diameters and conditions
- Minimal on-bench product spills during start-up/ shut-down operations

FEATURES

- Pump protection-guarding against dead-heading and dry-running scenarios
- Strainers on the bin to prevent ingress of foreign objects
- Closed loop hydraulic control system guarantees product quality
- In-cab touch-screen user interface
- Suitable chassis with all standard safety devices selected for rugged on-bench conditions

SAFETY HANDLING

- Independent electronic pump protection system monitoring and controlling operating pressures and temperatures on critical pumps
- Bursting discs on Product and Emulsion pump
- Hand rails on all sides of the bin- prevent personnel from falling
- Reverse buzzer
- Four Emergency E-stops around the MPU
- Inspection hoods fitted on all auger couplings
- Electronic pressure switches to monitor pressure in the pipes
- Temperature probes to monitor product and hydraulic oil temperature

TECHNICAL SPECIFICATIONS

E SERIES MPU E20T

DESCRIPTION	DETAILS
MMU Capacities	
Emulsion Bin Capacity	13 t
Prill Bin Capacity	7 t
Pumping Rates	
Product Pumping Rates	250/500 kg/min
Product Augering Rate	750 kg/min
Dope	Yes
Blend	Yes
Chassis/Prime Mover	
Standard	MAN 8X4, 8x8
Other	SCANIA 8X4, 8x8 ASTRA 8X4, 8x8

E Series MPU E16T

PRODUCT DESCRIPTION

A blend MPU capable of pumping or augering the full series of AEL's bulk explosive products. This is a smaller version of a E20T MPU enabling access to areas in which the larger vehicle may not be able to access. The bin is designed to ADR specifications with four compartments which allow for better weight distribution. This process can be mounted on any available prime mover although we've standardized on MAN, ASTRA and SCANIA. This MPU complies with the Road traffic Act, Explosive Act and Chassis Manufacture Specifications in South Africa.

APPLICATION

Used for charging bulk emulsion in surface mining operations by pumping and angering.

BENEFITS

- Proven on-bench reliability
- Integrated control systems, which guarantee constant delivery of requested product quality and quantity
- A series of products can be applied on one bench depending on conditions
- Varying pumping and auguring rates to suit bench hole diameters and conditions
- Minimal on-bench product spills during start-up/ shut-down operations

FEATURES

- Pump protection-guarding against dead-heading and dry-running scenarios
- Strainers on the bin to prevent ingress of foreign objects
- Closed loop hydraulic control system guarantees product quality
- In-cab touch-screen user interface
- Suitable chassis with all standard safety devices selected for rugged on-bench conditions

SAFE HANDLING AND OPERATION

- Independent electronic pump protection system monitoring and controlling operating pressures and temperatures on critical pumps
- Bursting discs on Product and Emulsion pump
- Hand rails on all sides of the bin-prevent personnel from falling
- Reverse buzzer
- Four Emergency E-stops around the MPU
- Inspection hoods fitted on all auger couplings
- Electronic pressure switches to monitor pressure in the pipes.
- Temperature probes to monitor product and hydraulic oil temperature.

TECHNICAL SPECIFICATIONS

E SERIES MPU E16T

DESCRIPTION	DETAILS
MMU Capacities	
Emulsion Bin Capacity	10.4 t
Prill Bin Capacity	5.5 t
Pumping Rates	
Product Pumping Rates	250/500 kg/min
Product Augering Rate	750 kg/min
Dope	Yes
Blend	Yes
Chassis/Prime Mover	
Standard	MAN 6X4
Other	SCANIA 6X4 ASTRA 6X4

R Series
MPU R10T

PRODUCT DESCRIPTION

A Re-Pump MPU capable of pumping AEL's S100/S200 bulk explosives product. The bin is designed to ADR specifications. This process can be mounted on any available prime mover although we've standardized on MAN, ASTRA and SCANIA. This MPU is known for its capability to manoeuvre easily on small benches. This MPU complies with the Road traffic Act, Explosive Act and Chassis Manufacture Specifications in South Africa.

APPLICATION

Used for charging bulk emulsion in surface mining operations by pumping.

BENEFITS

- Proven on-bench reliability
- Integrated control systems, which guarantee constant delivery of requested product quality and quantity
- Varying pumping rates to suit bench hole diameters and conditions
- Minimal on-bench product spills during start-up/ shut-down operations
- Easy to manoeuvre on bench

FEATURES

- Pump protection-guarding against dead-heading and dry-running scenarios
- Strainers on the bin to prevent ingress of foreign objects
- Closed loop hydraulic control system guarantees product quality
- In-cab touch-screen user interface
- Suitable chassis with all standard safety devices selected for rugged on-bench conditions

SAFETY FEATURES

- Independent electronic pump protection system monitoring and controlling operating pressures and temperatures on critical pumps
- Mechanical pump protection devices installed on all critical pumps

SAFE HANDLING AND OPERATION

- Independent electronic pump protection system monitoring and controlling operating pressures and temperatures on critical pumps
- Bursting discs on Product and Emulsion pump
- Hand rails on all sides of the bin- prevent personnel from falling
- Reverse buzzer
- Four Emergency E-stops around the MPU
- Electronic pressure switches to monitor pressure in the pipes
- Temperature probes to monitor product and hydraulic oil temperature

TECHNICAL SPECIFICATIONS

R SERIES MPU R10T

DESCRIPTION	DETAILS
MMU Capacities	
Emulsion Bin Capacity	10 t
Prill Bin Capacity	N/A
Pumping Rates	
Product Pumping Rates	80/140/200 kg/min
Product Augering Rate	N/A
Dope	No
Blend	No
Chassis/Prime Mover	
Standard	MAN 6X4
Other	SCANIA 6X4 ASTRA 6X4

Mobile Charging Unit Jumbo 2T, 3T and 4T

PRODUCT DESCRIPTION

All MCU's are designed to operate in the demanding environments encountered during normal mining operations.

Design parameters include all necessary safety control systems, as well as ease of operation, maintenance and reliability. Units are of modular design and are able to be mounted on all utility vehicles supplied or preferred by the customer.

APPLICATION

- Used for underground Automated up-hole charging

BENEFITS

- Proven reliability in all charging applications
- Integrated control systems, which guarantee constant delivery of requested product quality and quantity
- Varying pumping rates to suit hole diameters and conditions
- Low Maintenance

FEATURES

- Pump protection-guarding against dead-heading and dry-running scenarios
- Strainers on the bin to prevent ingress of foreign objects
- Closed loop hydraulic control system guarantees product quality
- Variable densities
- Auto flushing
- Electronic data capturing

SAFETY FEATURES

- Independent electronic pump protection system monitoring and controlling operating pressures on critical pumps
- Mechanical pump protection devices installed on all critical pumps

- Emergency stops situated at critical locations
- Up-hole charging from a safe distance via remote control pendent
- Units have a meltable sight–glass on emulsion tank, which melts when exposed to excessive heat eliminating the dangers associated with confinement
- Pressure Busting discs

TECHNICAL SPECIFICATIONS

MOBILE CHARGING UNIT JUMBO 2T, 3T AND 4T

DESCRIPTION	DETAILS
MCU Capacities	
Emulsion Bin Capacity	2 t, 3 t and 4 t
Sensertiser Tank Capacity	Up to 200 l
Flushing Water Tank Capacity	Up to 290 l
Hose Lube Tank Capacity	Up to 200 l
Pumping Flow Rates	80-100 kg/min
MCU Capabilities	
Boom Reach	9 m horizontal and 11 m vertical
Hose Reach	30 m to 40 m (depending on hole depth)
Hose Length	40 m
Additional Information	
Driver	Hydraulic or Electric Power Pack
UV Used	AARD UV 80 (extended rear for 4 t unit)
Injector Mechanism	360° and angle reach adjustable

Mobile Charging Unit 0.75T to 4T

PRODUCT DESCRIPTION

All MCU's are designed to operate in the demanding environments encountered during normal mining operations.

Design parameters include all necessary safety control systems, as well as ease of operation, maintenance and reliability. Units are of modular design and are able to be mounted on all utility vehicles supplied or preferred by the customer.

APPLICATION

Used for underground development environments.

BENEFITS

- Proven reliability in all charging applications
- Integrated control systems, which guarantee constant delivery of requested product quality and quantity
- Varying pumping rates to suit hole diameters and conditions
- Low Maintenance costs

FEATURES

- Pump protection-guarding against dead-heading and dry-running scenarios
- Strainers on the bin to prevent ingress of foreign objects
- Closed loop hydraulic control system guarantees product quality

SAFETY FEATURES

- Independent electronic pump protection system monitoring and controlling operating pressures on critical pumps
- Mechanical pump protection devices installed on all critical pumps
- Emergency stops situated on electrical panel
- Units have a meltable sight-glass on emulsion tank, which melts when exposed to excessive heat eliminating the dangers associated with confinement
- Pressure Busting discs

TECHNICAL SPECIFICATIONS

MCU 0.75T TO 4T

DESCRIPTION	DETAILS
MCU Capacities	
Emulsion Bin Capacity	0.75t-4 t
Sensitiser Tank Capacity	Up to 112 l
Flushing Water Tank Capacity	Up to 90 l
Hose Lube Tank Capacity	Up to 112 l
Pumping Flow Rates	40-50 kg/min
MCU Capabilities	
Boom Reach	N/A
Hose Reach	15 m
Hose Length	15 m
Additional Information	
Driver	Hydraulic or Electric-hydraulic
UV Used	AARD UV 42 AARD UV 80 AARD UV 100 AARD CHARGE MASTER GETMAN FERMEL NORMET-Charmec GHH–Mine Machines
Injector Mechanism	N/A

Mobile Charging Unit 0.9T Landcruiser Unit

PRODUCT DESCRIPTION

All MCU's are designed to operate in the demanding environments encountered during normal mining operations.

Design parameters include all necessary safety control systems, as well as ease of operation, maintenance and reliability. Units are of modular design and are able to be mounted on all utility vehicles supplied or preferred by the customer.

APPLICATION

Underground Development and can be used for short up-holes if piston pump is replaced with PC pump as well as small scale surface operations.

BENEFITS

- Proven reliability
- Integrated control systems, which guarantee constant delivery of requested product quality and quantity
- Varying pumping rates to suit hole diameters and conditions
- Low maintenance costs
- Can be used for underground and surface operations

FEATURES

- Pump protection-guarding against dead-heading and dry-running scenarios
- Strainers on the bin to prevent ingress of foreign objects
- Closed loop hydraulic control system guarantees product quality

SAFETY FEATURES

- Independent electronic pump protection system monitoring and controlling operating pressures on critical pumps
- Mechanical pump protection devices installed on all critical pumps
- Emergency stops situated on Electrical panel
- Units have a meltable sight –glass on emulsion tank, which melts when exposed to excessive heat eliminating the dangers associated with confinement

TECHNICAL SPECIFICATIONS

MCU 0.9T LANDCRUISER UNIT

DESCRIPTION	DETAILS
MCU Capacities	
Emulsion Bin Capacity	0.9 t
Sensertiser Tank Capacity	45 l
Flushing Water Tank Capacity	45 l
Hose Lube Tank Capacity	45 l
Pumping Flow Rates	30–40 kg/min
MCU Capabilities	
Boom Reach	N/A
Hose Reach	10m to 15m (depending on hole depth)
Hose Length	10-15 m
Additional Information	
Driver	Hydraulic from PTO on Gearbox or electric from Engine
UV Used	Fitted onto a Toyota Landcruiser
Injector Mechanism	N/A

Rapid Re-loading System

To enhance the AEL offering, use is made of a rapid re-loading system whereby tankers of prill and emulsion are parked at strategically sited re-loading bays between the storage silos and the bench. MPU's requiring refilling make use of either the prill tanker, the emulsion tanker or both to refill and hence reduce the turnaround time of the MPU returning to the bench for further charging.

AEL pioneered the RRS (Rapid Reloading System) which was designed and approved locally for the benefit of the industry at large. The RRS is now widely used across South Africa in various operations and effectively reduces the loading cycle time and enables enhanced on-bench efficiency in a safe, responsible manner. This innovation allows for maximum uptime of MPU's on the bench by reducing the need for them to go off bench to a remote, static reload area.

The dual tanker design and patent resides with AEL and its service provider. This innovative idea allows for both products to be transported simultaneously in order to improve economics, orders management, and aids production by reducing off-loading times. The tanker has the ability to carry 20 tonnes of emulsion and 10 tonnes of prill in a single load. The design and implementation of the Dual Tanker has been approved by the CIE and is currently servicing the Witbank coal market.

Portable Charging Units

AEL provides the portable charging units (PCU's) for charging in narrow reef mining environments as well as development and shaft sinking for small shaft applications. The pumps have been specifically designed to pump the UG100 and UG200 non-sticky series of AEL's bulk explosives products in conjunction with a sensitiser in stoping and development blast holes.

The PCU's are robust and reliable and designed to operate in the demanding environments usually encountered in underground mining operations.

Three different pumps are available for standard and low compressed air pressure as well as hydropower.

BENEFITS

- Robust and reliable
- Allows the delivery of emulsion explosives in a narrow reef development and shaft sinking environment
- Suitable for delivery of emulsion explosives in holes up to 5 m in length of any inclination (Eliminating the necessity to use packaged explosives)
- No longer a requirement for a primer in short blast-holes (<2 m in length) with a diameter of 32 mm
- Product in hose is non-detonable
- Flexible hose/lance for use in confined spaces (optional)

FEATURES

- Hydropower and pneumatically driven pumps
- Removable cover for ease of maintenance
- Fixed ratio of emulsion to sensitiser creating constant delivery of requested quality/quantity
- Flexible hose/lance for use in confined spaces (5, 10 and 15 m lengths depending on pump selection)
- Metering system providing the delivery of a fixed mass per hole
- Easy to use and maintain. Equipment maintained in-situ

HOSE AND MIXER CONFIGURATION

PCU010

PNEUMATIC HIGH PRESSURE

PRODUCT DESCRIPTION

AEL provides the portable charging unit for charging in narrow reef mining environments and development ends. The pump has been specifically designed to deliver the UG100 and UG200 non-sticky range of AEL's bulk explosives products in conjunction with a sensitiser in stoping and development. Bulk emulsions are bagged in 25 kg polywoven bags, containing 2 x 12.5 kg bags for easier handling.

APPLICATION

The PCU010 (pneumatic High pressure) is a robust and reliable portable charging unit designed to specifically work in narrow working places where heavy equipment is difficult to manage. The pump is available for low compressed air pressure environments as found in typical narrow reef stopes.

BENEFITS

- Portable
- Robust and reliable
- Allows the application of emulsion explosives in narrow reef and development environments
- Suitable for the application of emulsion explosives in short and small diameter holes in narrow reef stoping (Eliminating the necessity to use package explosives)
- Sensitised pumped emulsion is cap sensitive
- Gassed pumped emulsion only becomes an explosive once it has been pumped into the blast-hole

BENEFITS OF MIXER CONFIGURATION

- Better mixing
- Better sensitisation quality
- Less variances in sensitised product
- Improved blast performance
- Ability to use a variety of AEL qualified gassing solutions
- Longer shelf life
- Increased emulsion sensitivity

Caution:* Changing the configuration as laid out, will impact on sensitisation quality, sensitivity in the blast-hole and emulsion blast performance

HOSE AND MIXER CONFIGURATION

FEATURES

- Pneumatic driven pump
- Easy to use and maintain
- Fixed ratio of emulsion to sensitiser creates a constant delivery of the required quality/quantity
- Flexible hose/lance configuration for use in confined spaces
- Fixed delivery mass

SAFETY FEATURES

- 40 bar bursting disc
- Pump is fully contained within an enclosed case

TECHNICAL SPECIFICATIONS

PCU010 (PNEUMATIC HIGH PRESSURE)

DESCRIPTION	DETAILS
Dry Weight	44 kg
Emulsion Tank Capacity	18 kg
Sensitiser Tank Capacity	2 l
Flow Rate	14–17 kg/min
Pumping Distance	5 m
Compressed Air Requirement (where applicable)	5 bar (nominal)

PCU010

PNEUMATIC LOW PRESSURE

PRODUCT DESCRIPTION

AEL provides the portable charging unit for charging in narrow reef mining environments and development ends. The pump has been specifically designed to deliver the UG100 and UG200 non-sticky range of AEL's bulk explosives products in conjunction with a sensitiser in stoping and development. Bulk emulsions are bagged in 25 kg polywoven bags, containing 2 x 12.5 kg bags for easier handling.

APPLICATION

The PCU010 (pneumatic low pressure) is a robust and reliable portable charging unit designed to specifically work in narrow working places where heavy equipment is difficult to manage. The pump is available for low compressed air pressure environments as found in typical narrow reef stopes.

BENEFITS

- Portable
- Robust and reliable
- Allows the application of emulsion explosives in narrow reef and development environments
- Suitable for the application of emulsion explosives in short and small diameter holes in narrow reef stoping (Eliminating the necessity to use package explosives)
- Sensitized pumped emulsion is cap sensitive
- Gassed pumped emulsion only becomes an explosive once it has been pumped into the blast hole

BENEFITS OF MIXER CONFIGURATION

- Better mixing
- Better sensitisation quality
- Less variances in sensitised product
- Improved blast performance
- Ability to use a variety of AEL qualified gassing solutions
- Longer shelf life
- Increased emulsion sensitivity

Caution:* Changing the configuration as laid out, will impact on sensitisation quality, sensitivity in the blast-hole and emulsion blast performance

HOSE AND MIXER CONFIGURATION

FEATURES

- Pneumatic driven pump
- Easy to use and maintain
- Fixed ratio of emulsion to sensitiser creates a constant delivery of the required quality/quantity
- Flexible hose/lance configuration for use in confined spaces
- Fixed delivery mass

SAFETY FEATURES

- 40 bar bursting disc
- Pump is fully contained within an enclosed case

TECHNICAL SPECIFICATIONS

PCU010 (PNEUMATIC LOW PRESSURE)

DESCRIPTION	DETAILS
Dry Weight	44 kg
Emulsion Tank Capacity	18 kg
Sensitiser Tank Capacity	2 l
Flow Rate	14–17 kg/min
Pumping Distance	5 m
Compressed Air Requirement (where applicable)	4 bar (nominal)

PCU010
HYDRO

PRODUCT DESCRIPTION

AEL provides the portable charging unit for charging in narrow reef mining environments and development ends. The pump has been specifically designed to deliver the UG100 and UG200 non-sticky series of AEL's bulk explosives products in conjunction with a sensitiser in stoping and development. Bulk emulsions are bagged in 25 kg polywoven bags, containing 2 x 12.5 kg bags for easier handling.

APPLICATION

The PCU010 (Hydro) is a robust and reliable portable charging unit designed to specifically work in narrow working places where heavy equipment is difficult to manage. The pump is Hydro driven applicable to narrow reef stopes and development ends where Hydro Power is utilized.

BENEFITS

- Portable
- Robust and reliable
- Allows the application of emulsion explosives in narrow reef and development environments
- Suitable for the application of emulsion explosives in short and small diameter holes in narrow reef stoping (Eliminating the necessity to use package explosives)
- Sensitised pumped emulsion is cap sensitive
- Gassed pumped emulsion only becomes an explosive once it has been pumped into the blast-hole

BENEFITS OF MIXER CONFIGURATION

- Better mixing
- Better sensitisation quality
- Less variances in sensitised product
- Improved blast performance
- Ability to use a variety of AEL qualified gassing solutions
- Longer shelf life
- Increased emulsion sensitivity

Caution:* Changing the configuration as laid out, will impact on sensitisation quality, sensitivity in the blast-hole and emulsion blast performance

HOSE AND MIXER CONFIGURATION

FEATURES

- Hydro Power
- Easy to operate
- Fixed ratio of emulsion to sensitiser creates a constant delivery of the required quality/quantity
- Flexible hose/lance configuration for use in confined spaces
- Fixed delivery mass

SAFETY FEATURES

- 40 bar bursting disc
- Pump is fully contained within an enclosed case

TECHNICAL SPECIFICATIONS

PCU010 (HYDRO)

DESCRIPTION	DETAILS
Dry Weight	42 kg
Emulsion Tank Capacity	18 kg
Sensitiser Tank Capacity	2 l
Flow Rate	14 to 17 kg/min
Pumping Distance	5 m-10 m
Hydro Power Requirement (where applicable)	16 Mpa (nominal) 14 to 18 Mpa Operating range

PCU011
PNEUMATIC

PRODUCT DESCRIPTION

AEL provides the portable lightweight charging unit for charging in narrow reef mining environments and development ends. The pump has been specifically designed to deliver the UG100 and UG200 non-sticky series of AEL's bulk explosives products in conjunction with a sensitiser in stoping and development. Bulk emulsions are bagged in 25 kg polywoven bags, containing 2 x 12.5 kg bags for easier handling.

APPLICATION

The PCU011 pneumatic pump is a robust and reliable portable charging unit designed to specifically work in narrow working places where heavy equipment is difficult to manage. The PCU011 can be operated with air pressures as low as 2.5 Bar.

BENEFITS

- Portable
- Robust and reliable
- Allows the application of emulsion explosives in narrow reef environments
- Suitable for the application of emulsion explosives in short and small diameter holes in narrow reef stoping (Eliminating the necessity to use package explosives)
- Sensitised pumped emulsion is cap sensitive
- Gassed pumped emulsion only becomes an explosive once it has been pumped into the blast-hole

BENEFITS OF MIXER CONFIGURATION

- Better mixing
- Better sensitisation quality
- Less variances in sensitised product
- Improved blast performance
- Ability to use a variety of AEL qualified gassing solutions
- Longer shelf life
- Increased emulsion sensitivity

Caution:* Changing the configuration as laid out, will impact on sensitisation quality, sensitivity in the blast-hole and emulsion blast performance

HOSE AND MIXER CONFIGURATION

FEATURES

- Pneumatic driven pump
- Easy to use and maintain
- Fixed ratio of emulsion to sensitiser creates a constant delivery of the required quality/quantity
- Flexible hose/lance configuration for use in confined spaces
- Fixed delivery mass

SAFETY FEATURES

- 40 bar bursting disc
- Pump is fully contained within an enclosed case

TECHNICAL SPECIFICATIONS

PCU011 (PNEUMATIC)

DESCRIPTION	DETAILS
Dry Weight	22 kg
Emulsion Tank Capacity	14 kg
Sensitiser Tank Capacity	1 l
Flow Rate	10–15 kg/min
Pumping Distance	5 m
Compressed Air Requirement (where applicable)	3 bar (nominal)

PCU011
HYDRO

PRODUCT DESCRIPTION

AEL provides the portable charging unit for charging in narrow reef mining environments and development ends. The pump has been specifically designed to deliver the UG100 and UG200 non-sticky range of AEL's bulk explosives products in conjunction with a sensitiser in stoping and development. Bulk emulsions are bagged in 25 kg polywoven bags, containing 2 x 12.5 kg bags for easier handling.

APPLICATION

The PCU011 (Hydro) is a lightweight robust and reliable portable charging unit designed to specifically work in narrow working places where heavy equipment is difficult to manage. The pump is Hydro powered, applicable to narrow reef stopes where Hydro Power is utilised.

BENEFITS

- Portable
- Robust and reliable
- Allows the application of emulsion explosives in narrow reef environments
- Suitable for the application of emulsion explosives in short and small diameter holes in narrow reef stoping (Eliminating the necessity to use package explosives)
- Sensitised pumped emulsion is cap sensitive
- Gassed pumped emulsion only becomes an explosive once it has been pumped into the blast-hole

BENEFITS OF MIXER CONFIGURATION

- Better mixing
- Better sensitisation quality
- Less variances in sensitised product
- Improved blast performance
- Ability to use a variety of AEL qualified gassing solutions
- Longer shelf life
- Increased emulsion sensitivity

Caution:* Changing the configuration as laid out, will impact on sensitisation quality, sensitivity in the blast-hole and emulsion blast performance

HOSE AND MIXER CONFIGURATION

FEATURES

- Hydro Power
- Easy to operate
- Fixed ratio of emulsion to sensitiser creates a constant delivery of the required quality/quantity
- Flexible hose/lance configuration for use in confined spaces
- Fixed delivery mass

SAFETY FEATURES

- 40 bar bursting disc
- Pump is fully contained within an enclosed case

TECHNICAL SPECIFICATIONS

PCU011 (HYDRO)

DESCRIPTION	DETAILS
Dry Weight	21 kg
Emulsion Tank Capacity	14 kg
Sensitiser Tank Capacity	1 l
Flow Rate	10–15 kg/min
Pumping Distance	5 m
Hydro Power Requirement (where applicable)	16 Mpa (nominal) 14 to 18 Mpa Operating range

MCU
SHAFT SINKING UNIT

PRODUCT DESCRIPTION

The shaft sinking unit consists of multiple PCU pumps (without the casing) mounted under the emulsion tank.

The unit is lowered below the kibble and is placed at the shaft bottom during charging. To optimize and speed up charging unit contains multiple pumping units. While one unit is in production the other can be recharged from the main emulsion bin.

APPLICATION

Shaft Sinking operations.

BENEFITS

- Proven reliability
- Integrated control systems, which guarantee constant delivery of requested product quality and quantity
- Low maintenance costs

FEATURES

- Strainers on the bin to prevent ingress of foreign objects
- Four lances can be utilised at one time

SAFETY FEATURES

- Units have a meltable sight-glass on emulsion tank, which melts when exposed to excessive heat eliminating the dangers associated with confinement
- Bursting Discs

TECHNICAL SPECIFICATIONS

MCU SHAFT SINKING UNIT

DESCRIPTION	DETAILS
MCU capacities	
Emulsion Bin Capacity	2 t
Sensitiser Tank Capacity	40 l per pump
Flushing Water Tank Capacity	N/A
Hose Lube Tank Capacity	N/A
Pumping Flow Rates	18 kg/min
MCU capabilities	
Boom Reach	N/A
Hose Reach	5 m and 1.5 m lance (1 hose per pump)
Hose Length	15 m
Additional information	
Driver	Pneumatic (utilising 4 x PCU 010 pumps)
Approximate Empty Weight	850 kg
Compressed Air Requirement	5 bar (Maximum)
Injector Mechanism	N/A

Vertical Drop System

PRODUCT DESCRIPTION

The Emulsion Vertical Drop system was developed to optimise mine efficiencies with regards to delivering base emulsion to the underground work areas. The focus was on a reduction in vehicle tramming and improvement in workforce safety by limiting vehicle movement from surface to work areas. Emulsion and sensitising agent are stored on the surface and transferred into the underground workings via dedicated vertical pipelines. The design comes with years of proven knowledge on explosives rheology and experience with installed systems. Equipment is installed underground to receive products from the surface and dispatched through the MCUs to the working front. A fully automated system is available to manage the transfer process safely and efficiently. Multiple systems can be installed in series for deeper application if required.

APPLICATION

It is a delivery system that delivers the base bulk emulsion and sensitiser directly to an underground storage facility through pipes installed in a borehole drilled from the surface.

The storage facility can be in close proximity to the underground production areas, enabling the large-scale implementation of emulsion explosives in underground mining.

BENEFITS

- Significant safety enhancement by reducing logistics flow in main arteries to the mine
- Seamless inventory control
- High level of security and control of products used to manufacture explosives
- Reduced interface with explosives
- Reduced risk of theft
- Significant increase in the lifecycle of assets used for charging
- Significant saving in maintenance, fuel and asset wear on assets used for charging
- Reduction in time and labour resources
- Reduced shaft time
- Bulk emulsion deliveries at any time (Design dependent)

FEATURES

- Pump protection-guarding against dead-heading and dry-running scenarios
- Load cells on all silo's
- PLC Control

SAFETY FEATURES

- Independent electronic pump protection system monitoring and controlling operating pressures and temperatures on critical pumps
- Mechanical pump protection devices installed on all critical pumps
- Silo overflow protection

TECHNICAL SPECIFICATIONS

VERTICAL DROP SYSTEM

DESCRIPTION	DETAILS
Capacities	
Emulsion Transfer Capacity Depth	80 m-1300 m
Storage Capacity Surface	As required
Storage Capacity Underground	As required
Level of Automation	As required
Maximum Number of Drops	As required