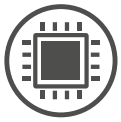
Ferrit | MONORAIL

Monorail suspended transport

Ferrit | GLOBAL MINING SOLUTIONS

MONORAIL		*Monorail suspended transport*
RAIL		*Ground rail transport*
TRACKLESS		*Wheeled transport*
MINING		*Mining activity*
SAFETY		*Mining rescue equipment*
ELECTRIC		*Monitoring and communication systems*

Ferrit | MONORAIL

Monorail suspended transport

Suspended monorail transport is among the most economical, safest and most widely used mode of transport in mines. Thanks to its safety and reliability it is very efficient and continuous in transport of people and different kinds of technological and operational material and excels particularly in transport at long mine roadways with variable inclination of up to ± 30 degrees in tunnel or roadway profiles ≥ 8 square meters. Other advantages include durability and installation method enabling system implementation without requirement for making changes in the configuration of the existing transport infrastructure. Individual components of the system can therefore be re-used, making it cheapest transport system with adaptable features.

Dead weight of measure unit of monorail track is halved compared with unit of measure of ground rail system, which brings savings even while moving its own components from liquidated workplaces to newly established ones. These benefits should be supplemented by the fact that the assembly, disassembly and maintenance of monorail track is the least demanding compared to other types of transport systems with minimal impacts of mining and geological influences to conditions of transport routes.

Monorail locomotives or manipulators driven by diesel, electric, or pneumatic motors are used on the monorail track as autonomous traction devices for manipulation and transport. Locomotives and manipulators are equipped by friction driving units. The number of driving units is individually proposed in order to match resultant traction force required by customers for transport in specific mining conditions.

Ferrit´s production program includes a complete equipment range designed for the monorail transport, starting with a track itself, monorail locomotives and manipulators, lifting and manipulating equipment, persons and injured persons transport cabins, material containers and last not least purposely designed equipment and small mechanization.

All Ferrit´s monorail products meet requirements for operation in mines classified as hazardous areas with mining gasses and coal dust explosion danger (flameproof mines) like coal mines. The exceptions are machines operated outside these areas (eg. ore mines, surface operations) which are classified as non-flameproof mines.

Key

Suitable to areas with explosion danger

Suitable to areas with no explosion danger

MINING MONORAIL LOCOMOTIVES

DIESEL LOCOMOTIVES - DLZ110F-II, DLZ210F, DLZ130F

Mining monorail diesel locomotive is a traction equipment designed for persons or material transport on monorail track in underground mines or surface operations.The locomotive is usually composed of two independent driver´s cabins, motor part (diesel-hydraulic power unit) and friction hydraulic driving units in numbers and their distribution corresponding with a weigh and a type of transported loads and parameters of the monorail track. All these components are interconnected by connecting rods.

Locomotive´s design allows to use an auxiliary equipment, such as cabins sets for a transport of persons or injured personnel, transport and lifting hydraulic equipment, containers and other devices for fast, safe and efficient transport of material.

Locomotive´s operational mode, speed, motor hours, pressure and temperature values of diesel-hydraulic aggregate are controlled by an electronic control and safety system. According to the locomotive type this system can be further equipped with audio-visual elements, such as wireless voice transmission system or a camera system monitoring current situation in front and rear of the transported set. For more control over the handling of material, mostly in material reloading areas, the locomotive can be further equipped with a remote control device, allowing the operator to leave the driver´s cabin.

The engine of the locomotive is equipped with intake and exhaust tracts protection devices preventing explosion of methane or coal dust. All electrical and electronic components entering the locomotive´s system are flameproof or intrinsically safe. Above protection measures together with used materials and production technologies allow locomotive´s operation in mining areas with methane and coal dust explosion danger.

BATTERY LOCOMOTIVES - DLZA90F

Mining monorail battery locomotive, same as its diesel variant, is a traction device designed for a transport of persons or material on the monorail track located in the underground mine or at the surface. Its electronic control system can also be equipped with functions identical to those of a diesel-powered machine. However, its main advantages include the ability to be deployed in mines with reduced ventilation air velocity, where operation of a diesel driven machine would be unthinkable. Absence of a diesel engine and a greatly reduced hydraulic system only requires minimal machine maintenance.

Specification:	DLZ 110F-II	DLZ210F	DLZ130F	DLZA90F
Power:	81 kW*	127 - 142 kW*	100 kW*	6 x 7,5 kW*
Max. traction force:	60 - 140 kN*	96 - 330 kN*	88 - 250 kN*	33 - 180 kN*
Max. speed:	7,2 km/h*	3,7 - 25 km/h*	5,0 - 12,6 km/h*	7,2 - 13,7 km/h*
Max. inclination:	30°	30°	30°	30°
Consumption:	255 g/kWh	250 g/kWh	214 g/kWh	0 g/kWh

* depending on the number of drives and machine type

MINING SUSPENDED MANIPULATORS

SA-MAN 01

Electro-hydraulic mining manipulator type SA-MAN-01 is a traction unit designed for auxiliary handling of train sets on the monorail track. Its hydraulic unit is used for powering manipulator´s drive or lifting equipment and other elements of small auxiliary mechanization (bolt drills etc.). It can work at any place of the mine within the reach of a power contactor.

DME30F

Electro-hydraulic mining manipulator type DME30F is a traction unit which compared with a manipulator type SA-MAN-01 has increased traction parameters with the ability to connect a second driving unit. Manipulator´s driving units can be equipped with pinions for operation on rack monorail track. This machine can be modified for use with a remote control.

DMZ50F

Diesel-hydraulic mining manipulator type DMZ50F is not limited by the action radius of electric cable thanks to its driving diesel engine which in addition to its primary function of material transport and handling, allows using its hydraulic unit to supply auxiliary hydraulic mechanization at places where other pressure or electric supplies are not available. The manipulator can be modified for use with a remote control and is available in versions with one or two driving units.

Specification:	SA-MAN 01	DME30F	DMZ50F
Power:	**5,5 - 7,5 kW***	**30 kW**	**36 kW**
Max. traction force:	**20 kN**	**50 kN***	**40 kN***
Max. speed:	**3 km/h**	**3,2 km/h**	**3,2 km/h**
Max. inclination:	**30°**	**30°**	**30°**

* depending on the number of drives

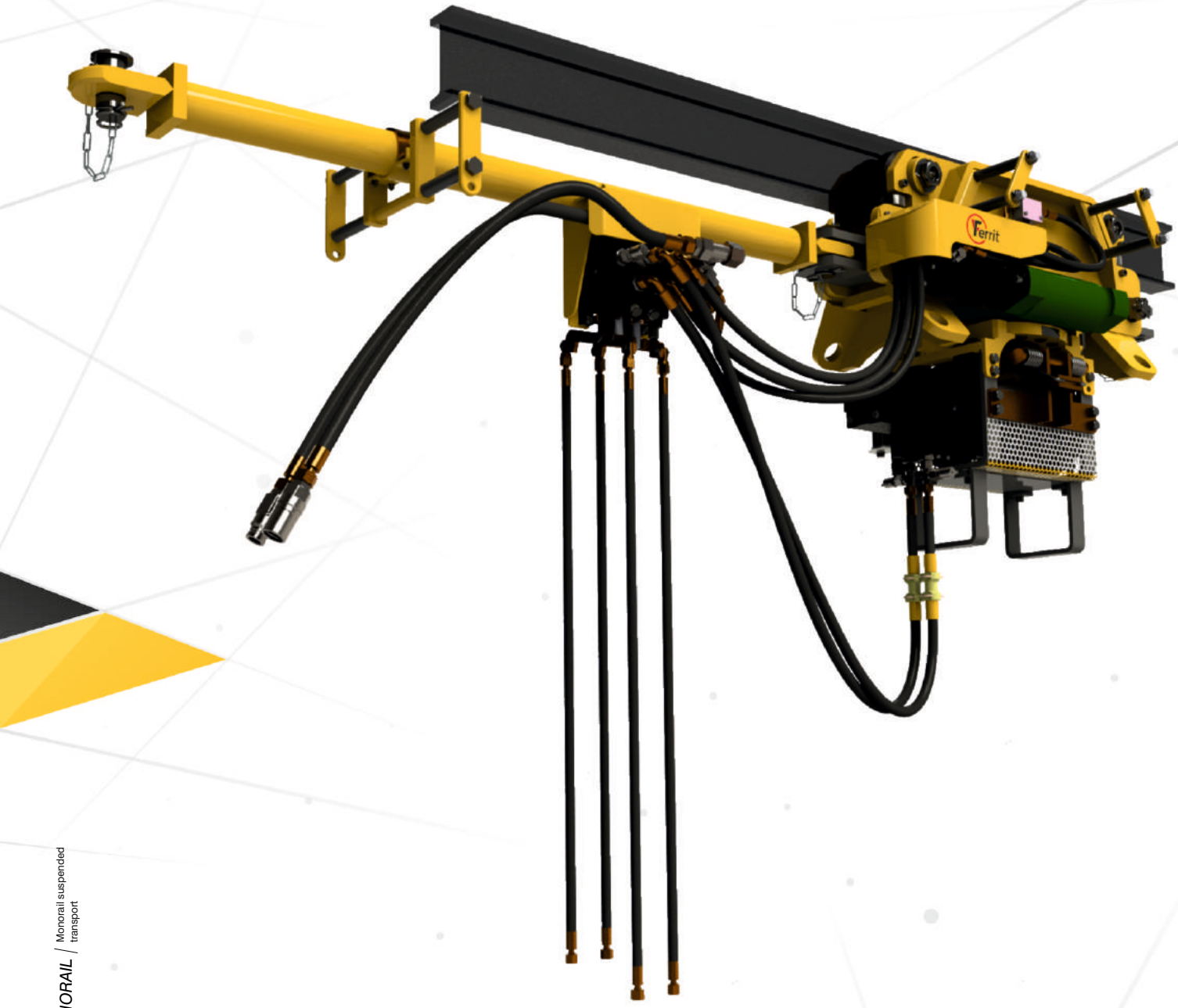
Accessories

ZHN2000F

Suspended hydraulic winch type ZHN2000F is a device used for manipulation with loads, and their pulling under the monorail so that they could be lifted and subsequently transported by lifting equipment. The hydraulic winch is usually connected to hydraulic lifting devices attached to the traction device.

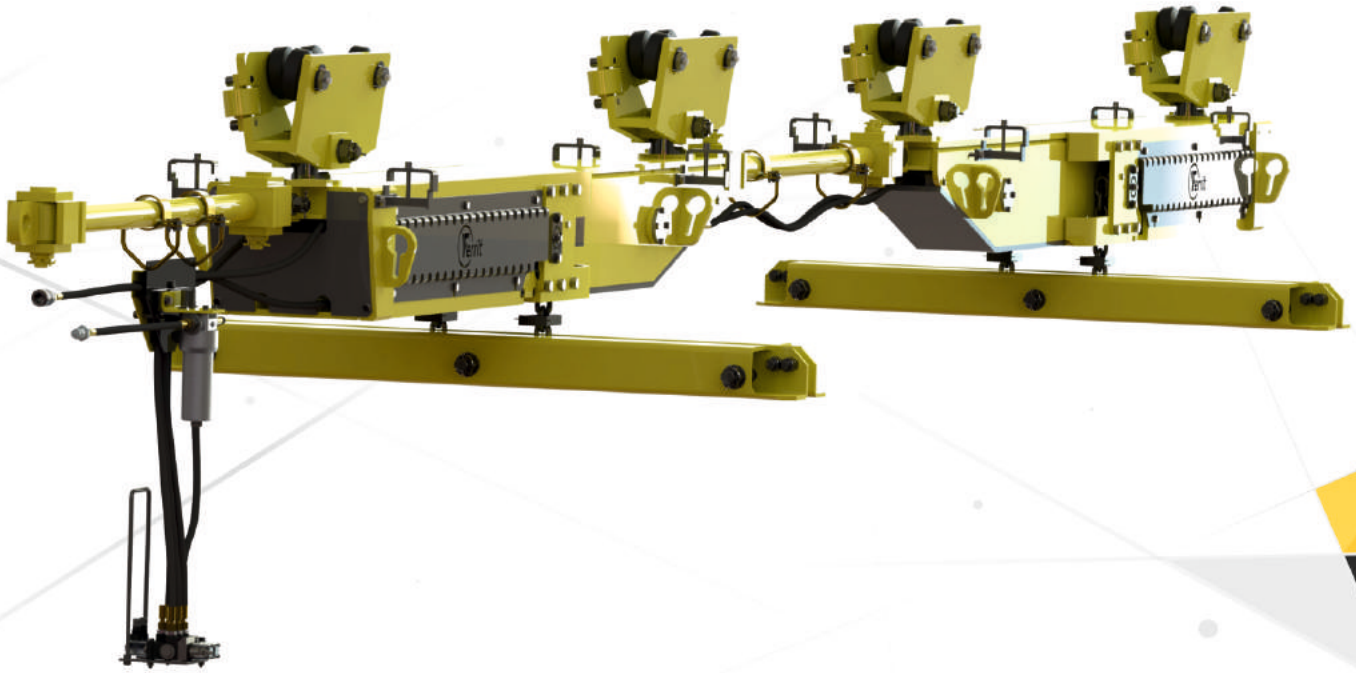
Specification:

Pull force:	**20 kN**
Rotation:	**hydraulic**
Control lock:	**mechanic**
Max. inclination:	**30 °**
Winding speed:	**9,8 - 15,5 m/min**



LIFTING TRANSPORT EQUIPMENT

Hydraulic lifting transport equipment is used for lifting and transport of material (or cabins) on the monorail suspended track. The lifting equipment is connected to locomotives or manipulators and pressure supplied from their auxiliary hydraulic circuits. There are many types of lifting transport devices differing from each other structurally or by their load capacities of up to 40 tons. They can be further modified to transport specific loads, or arranged into sets and thus achieve the required transport capacity.

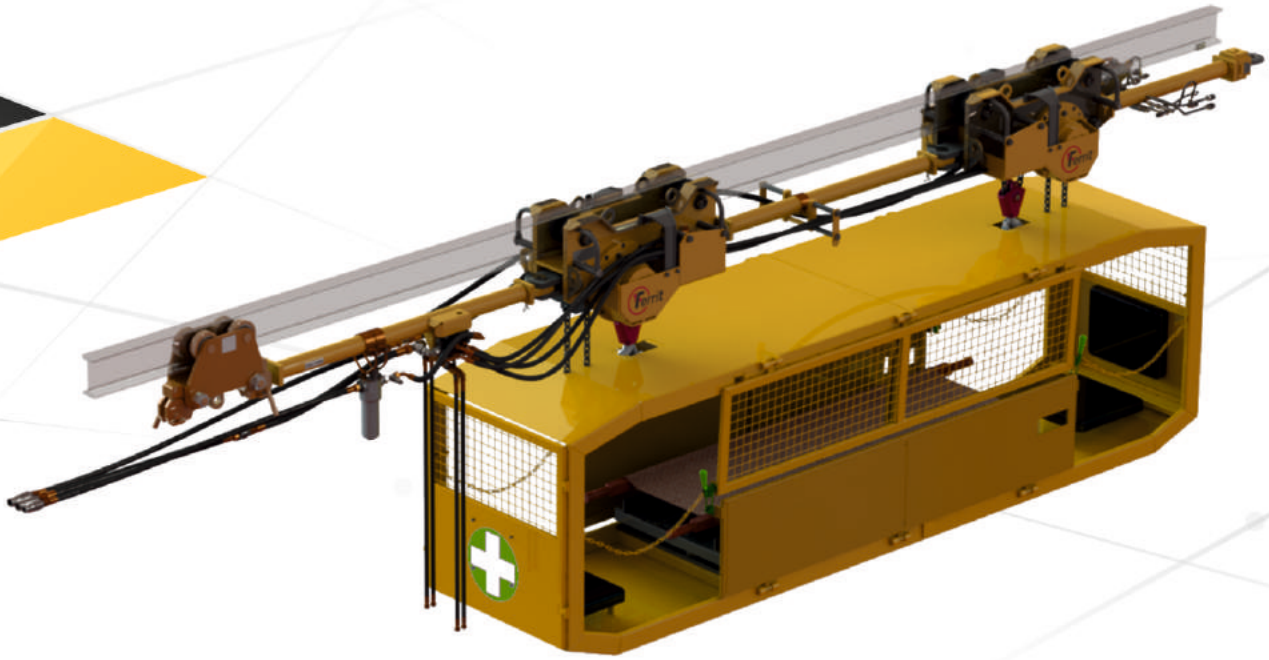


BRAKING TROLLEYS

The braking trolley is a safety device designed to stop transport sets and their parts (carrying trolleys, lifting equipment etc.) in emergencies in case of spontaneous travel on the monorail track. When pre-set transport speed is exceeded, the braking trolley brakes by clamping the track profile by the brake shoes. The braking trolleys are connected to transport sets by connecting rods and are placed in front of the transport set in downhill direction. Number of mechanically and hydraulically interconnected braking trolleys is determined by the operator in dependence on transport set weight and track inclination. The braking trolleys are usually delivered interconnected as single, duo or trio.

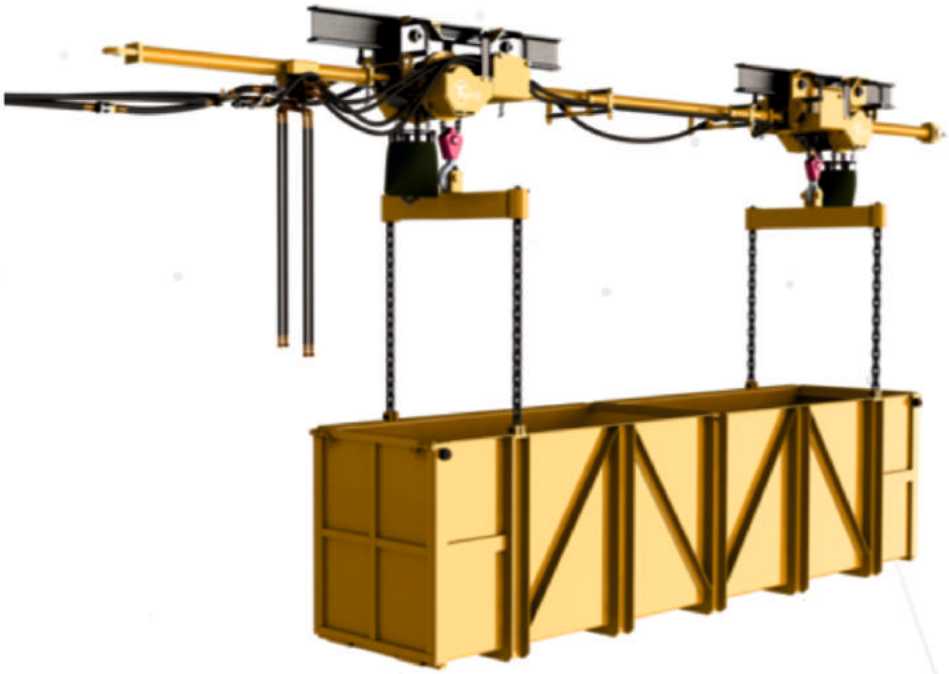
CABINS

Cabins for passenger transport are designed and manufactured with regard to the purpose of their use. Most often it is a cabin for transport of crew (various sizes and numbers of seats) rescue teams, injured personnel or last not least a special cabin for high speed transport (up to 25 km / h). Cabins are suspended on a monorail track on carrying trolleys, or a hydraulic lifting device, which after completion of transport of persons could be further used to transport a material. Cabins can be individually customized or combined to achieve variable capacity and dimensions.



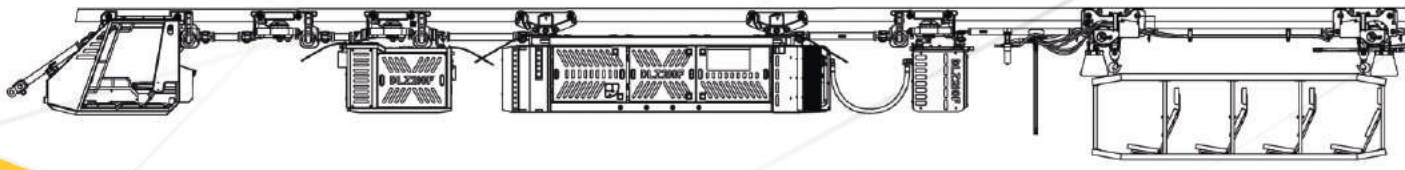
CONTAINERS

Containers of different types are used for transport of any kind of material in underground mines, or on the surface. Standardized versions of containers may be used for transport of technological materials such as components of mining arch supports, as well as bulky materials, explosives or fuels and the like. The derived or purpose-built variants of these containers may be delivered on customer's request.

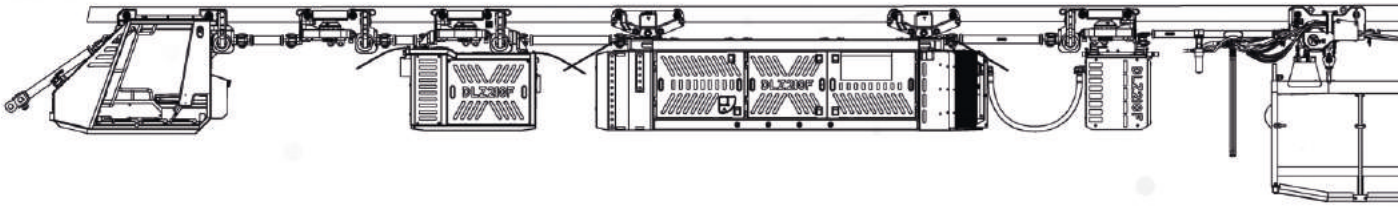


NOTES

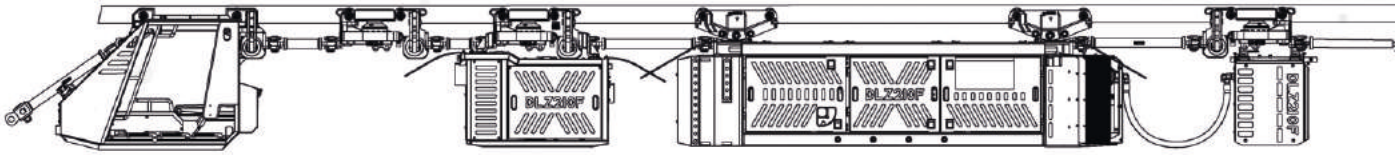
DLZ210F with cabin KVS4 for personal transport



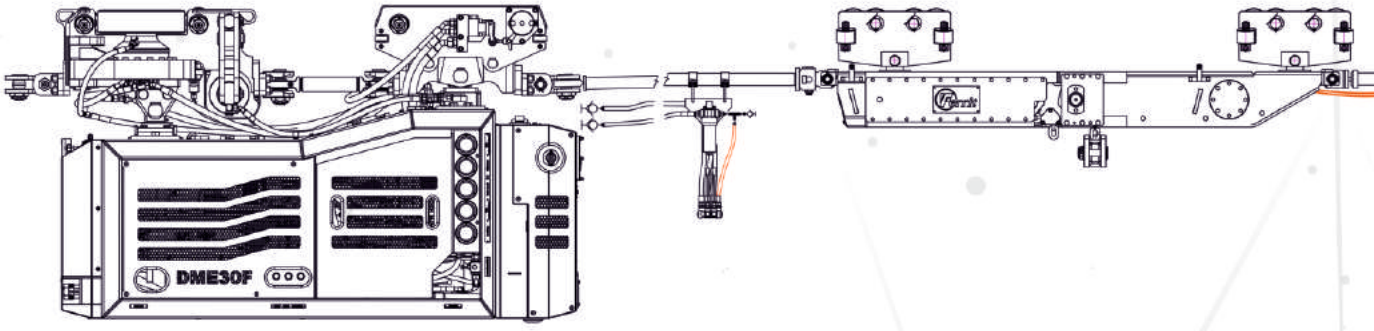
DLZ210F with lifting transport equipment NZH2/4 + containers

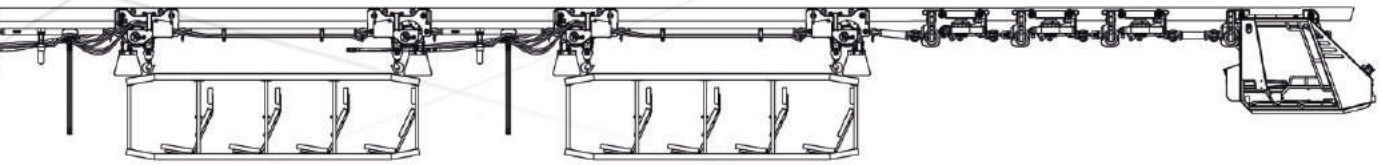


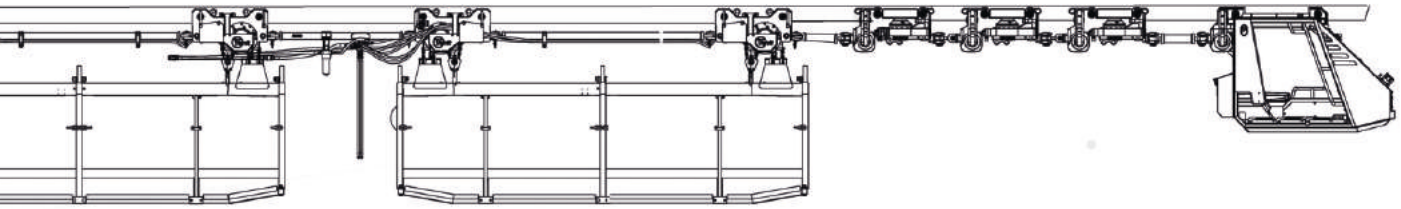
DLZ210F with lifting transport equipment TZH8/16

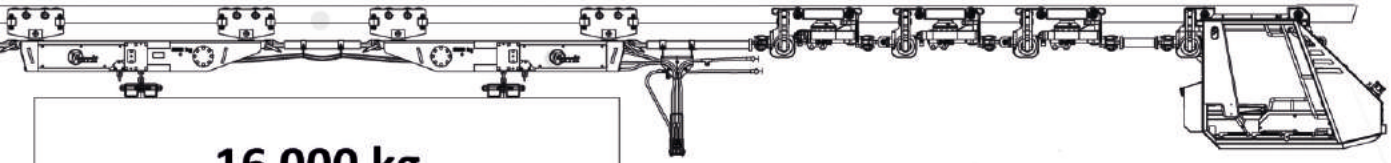


DME 30F + TZH 8/16

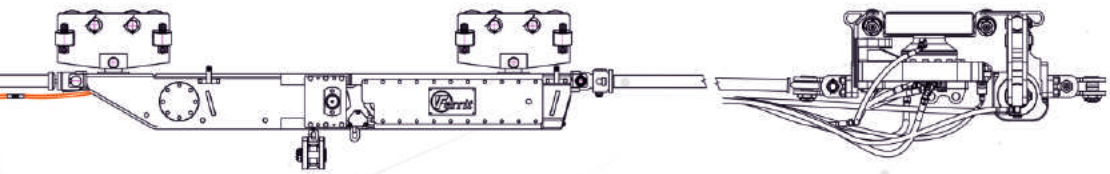








16 000 kg



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