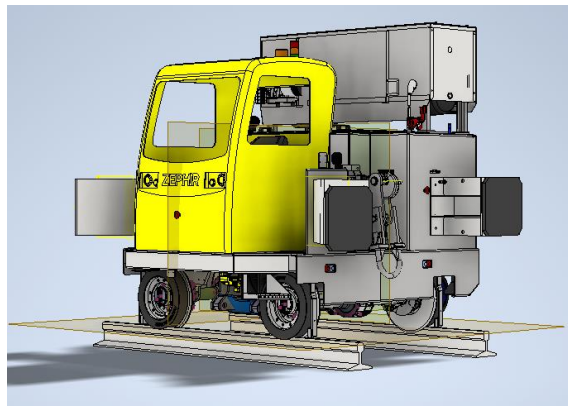


THE CRAB



The Zephir CRAB is a road/rail shunter designed to be used in the confined spaces found in rail vehicle maintenance depots. Its compact dimensions and tight turning circle make it easy to manoeuvre within the depot and it is able to enter and leave the tracks at 90 degrees within a space of 2,1 metres between rail vehicles. The wide range of optional equipment, such as different coupler types, radio remote control and pneumatic braking system air supply, make the CRAB the safest and most effective shunter on the market.

CRAB EZ3

DRAW BAR PULL⁽¹⁾: 36 kN

MAX TOWING/PULLING CAPACITY⁽¹⁾: 730 t*

ELECTRIC MOTOR: 20 kW, 80V

BATTERY: ~700 Ah, 80 V

MAX SPEED: 7 km/h

WEIGHT²: 6.6 t

DIMENSIONS (LxWxH): 2500 x 2050 x 2435 mm

GAUGE: 1435 mm

(*) max performance on dry, flat and straight rail

ELECTRICAL MOTOR:

¹ ±2%

² ±3%

AC 20 kW, 80 V AC Electric motor 250 A at 2400 r.p.m., self-ventilated, isolation class H CEI 2-3F355. Motor performance may vary depending on altitude and temperature.

ELECTRONIC CONTROL:

80 V, 600 A, 8 kHz. Flash Memory (256 Kbyte on-Chip Program memory): it can be programmable from the console, internal tester unit, thermal protection and unloaded battery protection; diagnosis by led, console and faults memory. External temperature range: -30°C to +40°C.

VEHICLE LOGIC CONTROL:

Programmable micro-PLC.
Decentralized control with CAN BUS communication.
Voltage from 10 V to 32 V.
Operating temperature from -40°C to +80°C.
IP67 protection.

ONBOARD TRIFASE BATTERY CHARGER 80V:

Voltage entry 400 +/- 15% VAC Trifase.
Frequency entry 50-60 Hz.
Efficiency over 87%.
Operating temperature from -20°C to 50°C.
Protection against short-circuit in exit and against reversal polarity.
Programmable charging curve.
Voltage precision in exit +/- 0.5 %.
Warning signal (Buzzer).
Charger lightning.
Auxiliary contacts to signal availability of current and end loading.
Forced ventilation.
8 m cable and plug for connection to external net.
Safety system preventing motion of the machine while charging.
Supply connection through IEC309 industrial socket (3 poles + ground / max 32 A).

BATTERY:

80 V ~700 Ah battery, 40 high capacity elements, positive tube plates (DIN standard dimensions) and welded connections.
Each element is fitted with dedicated floater level indicator.
Heavy duty metallic protective casing with 4 lifting eyes.
Centralized water filling and levelling system delivered with plastic tank, quick plug-in system and flow indicator.

FRAME:

Heavy duty mono block composition of strong thickness steel plates S275 J0 quality EN10025.

AXLES:

Double reduction with epicyclical final drive on the wheels.

BRAKING SYSTEM:

CRAB EZ3 Standard Description

Fully proportional hydraulic powerbrake system with 2 independent circuits, one per each axle.

1,5 kW motor-driven pump equipped with 3 safety Nitrogen accumulators granting full powered brake capacity even in case of failed pump.

4 disc and calliper brakes, disc diameter 323 mm.

Emergency parking brake with antagonist spring on the axle.

WHEELS:

Zephir patented steel rail wheels, diameter 520 mm, rail profile and replaceable rolling rubber tread.

CABIN AND DRIVER SEAT:

Completely close, heavy duty metallic cabin, insulated, with 2 lockable doors.

Internal courtesy light.

Designed according to ergonomic standards.

Frontal windscreen equipped with windscreen wiper, water sprinkler, and rear security window. Frontal windscreen and side windows are according ECE R43.

Panoramic 360° complete visibility from the driver seat.

Completely stuffed and adjustable driver seat, equipped with safety belt.

2 Transparent bottom windows positioned on the pavement, with dedicated lights for easy positioning of the machine on the railtracks directly from the driving position.

Cup holder and internal clothes hanger.



INSTRUMENT PANEL: User friendly ergonomically designed. All controls are easy to use and the indications are intuitive and well displayed. Safety controls are covered with dedicated protections which require voluntary actions to be removed.

RAIL LIGHTING:

Every time the vehicle changes direction a red light and a white light are switched on automatically and alternately.

An automatic flashing beacon light every time the vehicle moves on.

ROAD PERFORMANCES

POWER: 7.5 kW , 80 V

MAX SPEED: 6 km/h

TURNING RADIUS: 2.55 m

TRACTION DRIVE: ON THE FRONT WHEEL

DRIVING:

DANFOSS, powersteering, hydraulic type on the front wheel, turning straight angle ($\pm 90^\circ$), motordriven pump .

REAR AXLE:

Steel body, hubs assembled on double conical bearings in permanent lubrication.

ROAD SUSPENSIONS:

Hydraulic type with Nitrogen accumulators.

BRAKES:

Drum type with 2 independent circuits, mechanical parking brake acting on rear wheel.

WHEELS:

Solid tires, diameter 500 x 140 mm on the front wheel, diameter 405 x 130 mm on the rear wheels.

PAINTING

CHASSIS:

- Sandblasting SA 2.5;
- PRIMER EPOXIC painting, thickness 80 microns, polyurethane RAL variable enamel 40 microns, **dry thickness 100/120 microns.**

CABIN:

Cycle "A" – Thermosetting paint application:

1. Degreasing;
2. Phosphating;
3. Cathaphoresis sanding with abrasive paper, grain 150;
4. Clean water rinse;
5. Drying passage at 120°C temperature;
6. Thermosetting paint application by sprayer;
7. Furnace passage at 200°C temperature for 20 minutes in order to obtain the polymerisation painting.

Goods package effected with specific material in order to prevent the surface rubbing.

Total external thickness 90/100 microns.

OPTIONS

Operator remote control Zephir K 2.3 (Rail only) with dedicated receiver / battery charger and spare battery

Ground operator safety remote control with dedicated receiver / battery charger and spare battery

Sil3 remote control certified

Cable controls (functions: Fw/Rev/Brake/Emergency brake/Horn)

Interlock safety remote control system (4 channels) including transmitter (installed on UWL) and receiver (on board the machine)

Interlock safety remote control system (9 channels) (bi-directional for UWL) including transreceiver (installed on UWL) and transreceiver (on board the machine)

Photocell safety barrier: 2 photocells and 10 pads, automatically stops the machine in a certain set distance

Different rail gauge measures

In-railing video camera system (1 monitor and 2 video cameras)

Pin type connector single stage (plate and pin)

Pin type connector four stage (plate and pin)

Pre-arrangement for coupler supplied by the customer

Electric winch

ZEPHIR automatic coupler

Hydraulic slide

UIC hook

AAR coupler (short version)

Tow bar

Semi permanent bar

Rubber buffers

Mechanical locking transmission for rail mode (locked differentials granting 4WD capacity)

Pneumatic braking system with 280 liters/minute air compressor

Rail track short-circuiting signalling system (permitting the visibility of the vehicle for the control/safety systems)

Heating system inside cabin

Air conditioning system inside cabin

Led working lights

Arctic Pack: electronic comps., hyd. oil tank, oil filters, battery are heated with dedicated heating resistors in order to keep the temperature over the allowed limit of - 20°C. Also operator cabin and operator seat is heated.

Customized painting

Special machine Rail Version ONLY (price reduction)

Other accessories available on demand³

³ Subject to feasibility check

STANDARD SAFETIES

HAND BRAKE INSERTION

In case of low oil pressure in the braking system, the emergency brake is automatically inserted.

FLASHLIGHT

Activated every time the CRAB is in motion.

BUZZER

In rail mode the buzzer is activated when unit is used both by control panel (in this case only for 5 seconds) and by the remote control.

EMERGENCY BUTTONS

On the CRAB perimeter there are 4 buttons which can activate the following functions:

- Emergency braking;
- Hand brake locking;
- Engine stop.

DRIVER PRESENCE BUTTON/SWITCH

Driver presence is monitored through a button switch.

VEHICLE STOPPING

If road wheels lower from their position during rail mode, the CRAB is automatically stopped.

BRAKING SYSTEM

The braking system allows to effect 6 full powered brakes even if the braking pump is out of order.

ANTI-INVERSION SYSTEM

The system prevents the insertion of a reverse gear when the machine is still in movement. The gear is enabled only once the machine is stopped.

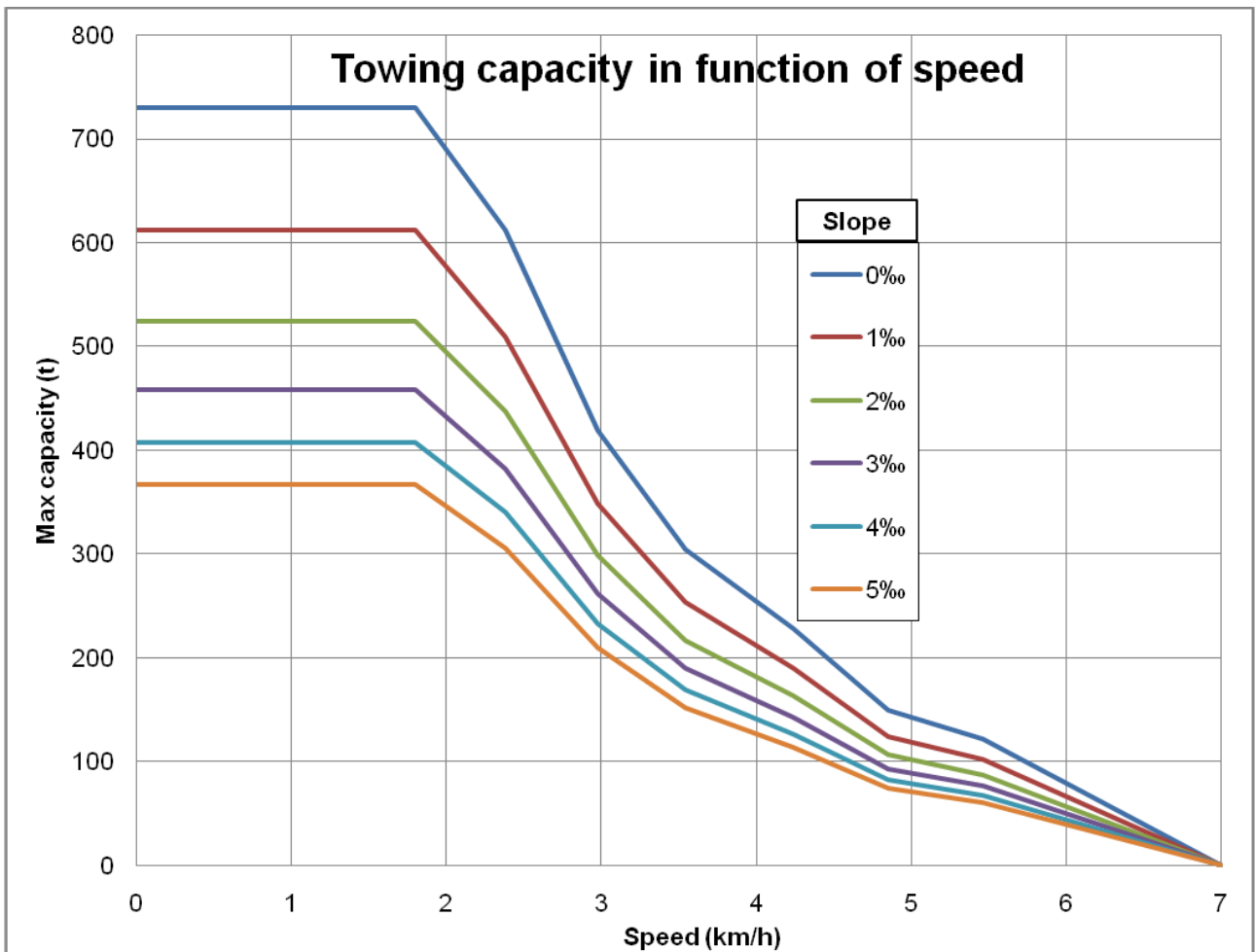
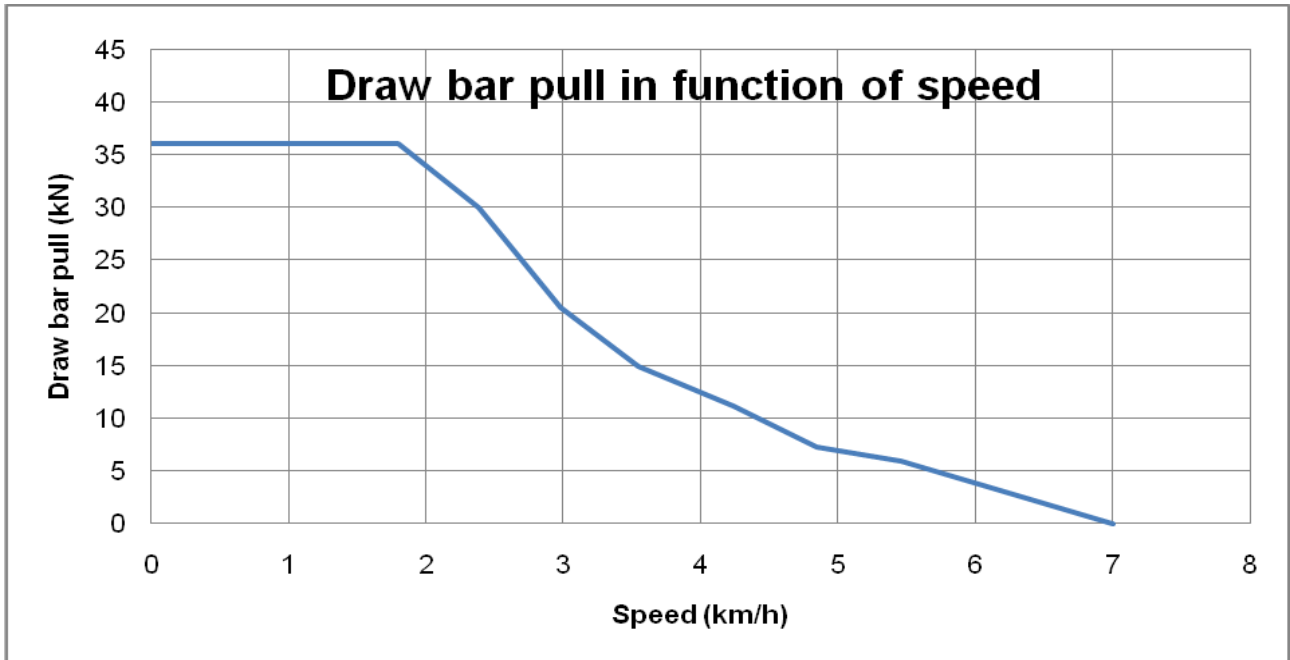
SAFETY AGAINST MOVEMENT WHEN THE CRAB IS ON CHARGE

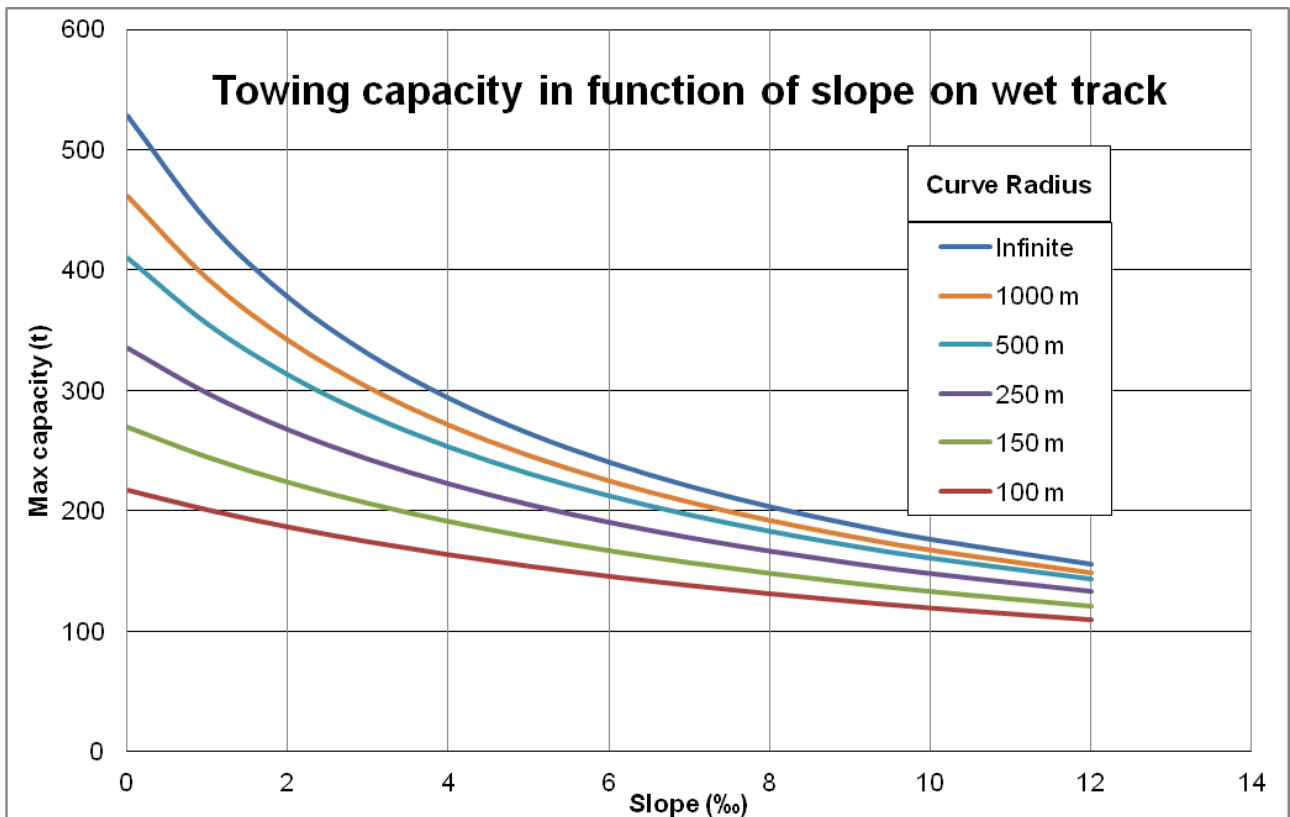
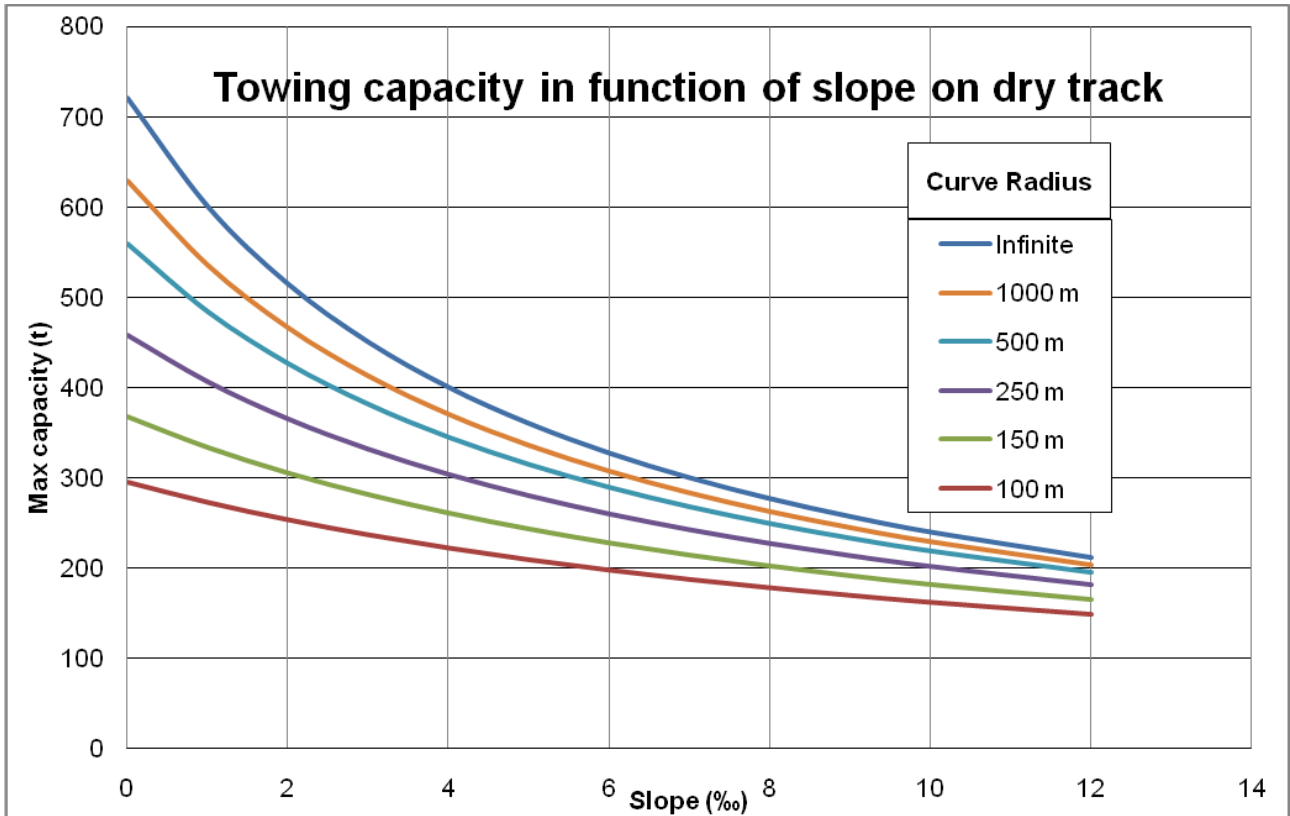
A dedicated safety switch prevents the machine to be moved during the charging.

RECOVERING THE MACHINE

In case of failure, the parking brake can be released to recover the machine by hand pump.

CRAB EZ3 Standard Description





REFERENCE PARAMETERS USED FOR THE DIAGRAMS

Rolling Resistance

5 [kg/t]

Slope Resistance

1 [kg/t] per 1 ‰

Curve Resistance

750/radius [m] [kg/t]

Dry Track Rail Wheels Friction

72%

Wet Track Rail Wheels Friction

40%