

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 in reduced spaces 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 5000E

DRAW BAR PULL: 52 kN

MAX TOWING/PULLING CAPACITY: 1040 t*

ELECTRIC MOTOR: 32 kW, 80V

BATTERY: 1000 Ah, 80 V

MAX SPEED: 7,5 km/h

WEIGHT: 9 t

DIMENSIONS (LxWxH): 3850x2200x2650 mm

GAUGE: 1435 mm

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

ELECTRIC MOTOR:

32 kW S2 30' (50 kW @ S2 5'), 80 V, A/C, 430 A at 2000 r.p.m., isolation class H CEI 2-3 F355, IP 54. Motor performance may vary depending on altitude and temperature.

ELECTRONIC CONTROL:

80 V, 1000 A, 8 kHz. Logic microprocessor FAULTS MEMORY (256 Kbytes On-Chip Program Memory) which can be programmed from the console, internal tester unit, thermal protection and unloaded battery protection; diagnosis by led, console and faults memory. Operating temperature from -30°C to +40°C.

VEHICLE LOGIC CONTROL:

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

ONBOARD TRIFASE BATTERY CHARGER 80 V:

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;
IP 20 protection.
Supply connection through IEC309 industrial socket (3 poles + ground / max 32 A).

BATTERY:

80 V 1000 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 S275J0 quality EN10025.

AXLES:

Double reduction with epicyclical final drive on the wheels.

BRAKING SYSTEM:

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 polyurethane tread.

CABIN AND DRIVER SEAT:

Completely close, heavy duty metallic cabin with side lockable door;

Internal courtesy light;

Designed according 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;

Full colour LCD 7" display;

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.

CAMERAS:

2 cameras (one for each rail axle) allows clear visibility of the rail wheels while performing the passage from road mode to rail mode. The view of the cameras is clearly displayed on a full colour LCD 7" monitor in the driver cabin.

ROAD PERFORMANCES

POWER: 7,5 kW, 80 V

MAX SPEED: 10 km/h

DRAW BAR PULL: 10 kN

TURNING RADIUS: 6,2 m

TRACTION DRIVE: ON THE REAR WHEELS

DRIVING:

DANFOSS, power steering, hydraulic type on the front wheels, motor driven pump.

REAR AXLE:

Steel body, hubs assembled on double conical bearings and central reduction gear.

ROAD SUSPENSIONS: Hydraulic type activated through the main pump which is able to pick up the vehicle while the elastic element is composed by 2 Nitrogen accumulators.

BRAKES:

High-pressure hydraulic braking system on the rear axle by two drum brakes.

WHEELS:

Superelastic tyres 23 x 10 x 12.

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. Cataphoresis 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 system including transmitter (installed on UWL) and receiver (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

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)

Road mode 4 wheels steering system (weight 7,5t, draw bar pull 45kN)

Pneumatic braking system with 280 liters/minute air compressor

Pneumatic braking system with 750 liters/minute air compressor

Pneumatic braking system with 1540 liters/minute air compressor

Vacuum braking system

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

Std cabin with double dashboard and swivel operator seat for reverse rail driving

Swivel operator seat (already available with reverse rail driving)

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.

Hybrid Pack: diesel generator mounted (auxiliary battery charging system in case of low battery)

Customized painting

Other accessories available on demand

STANDARD SAFETIES

HAND BRAKE INSERTION

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

FLASH LIGHT

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 no. 6 full powered brakes even if the braking pump is out of order.

ANTI-INVERSION SYSTEM

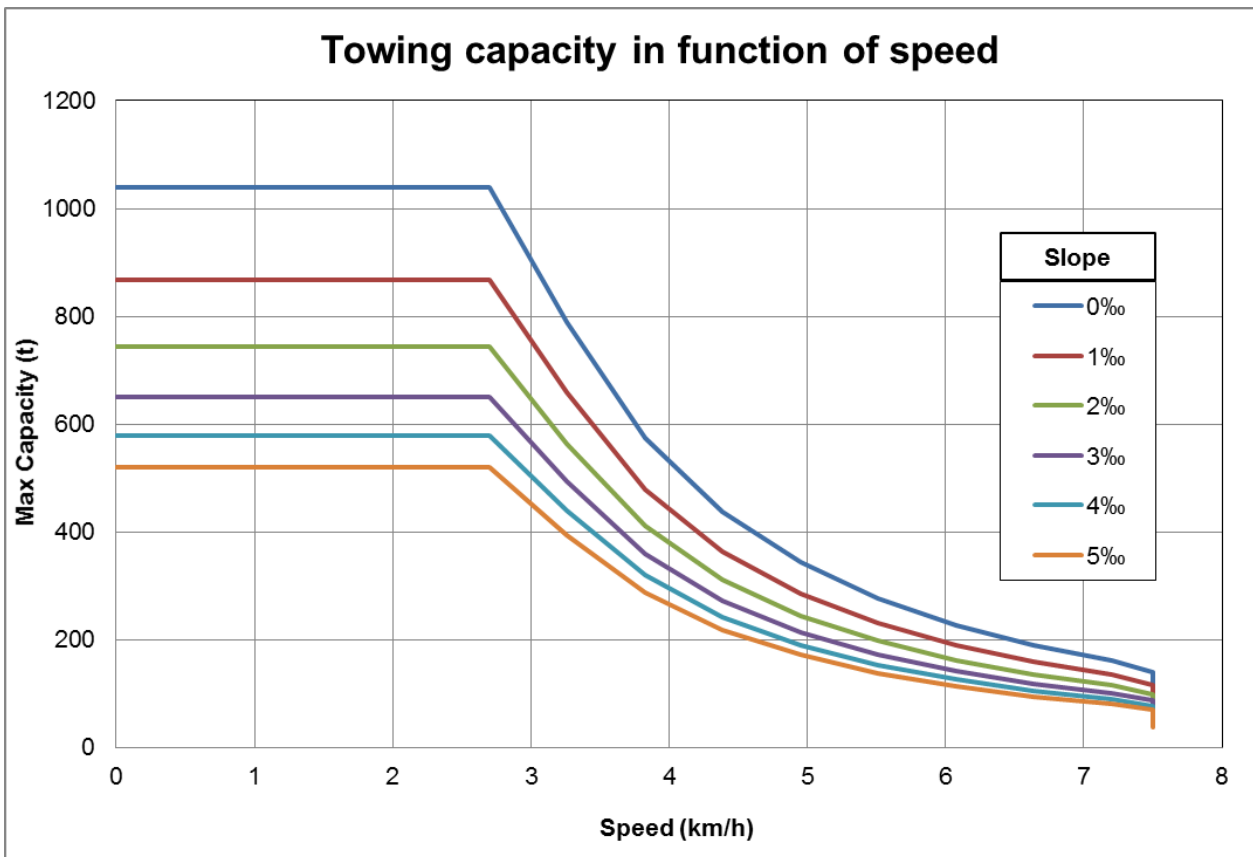
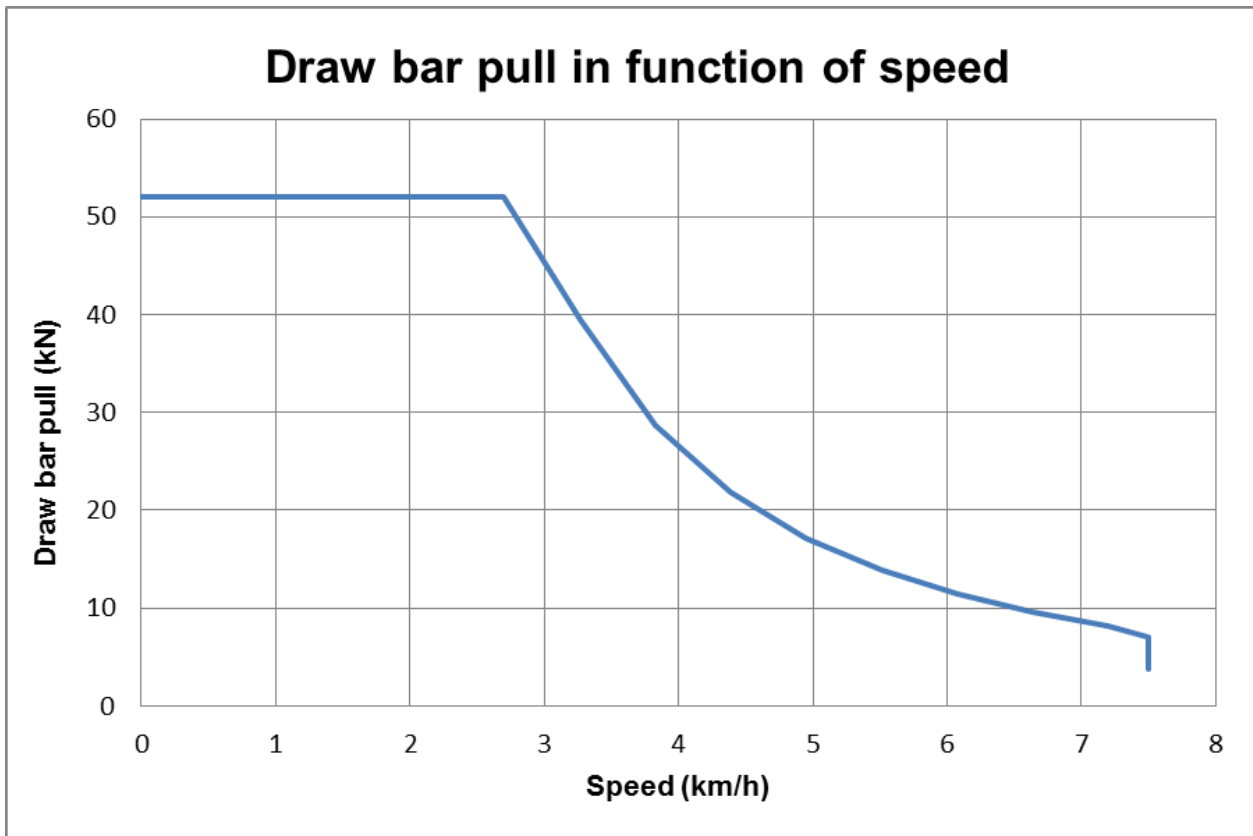
The system prevents the insertion of a reverse gear when the machine is still in movement. The gear is enabled only once the machine is stopped.

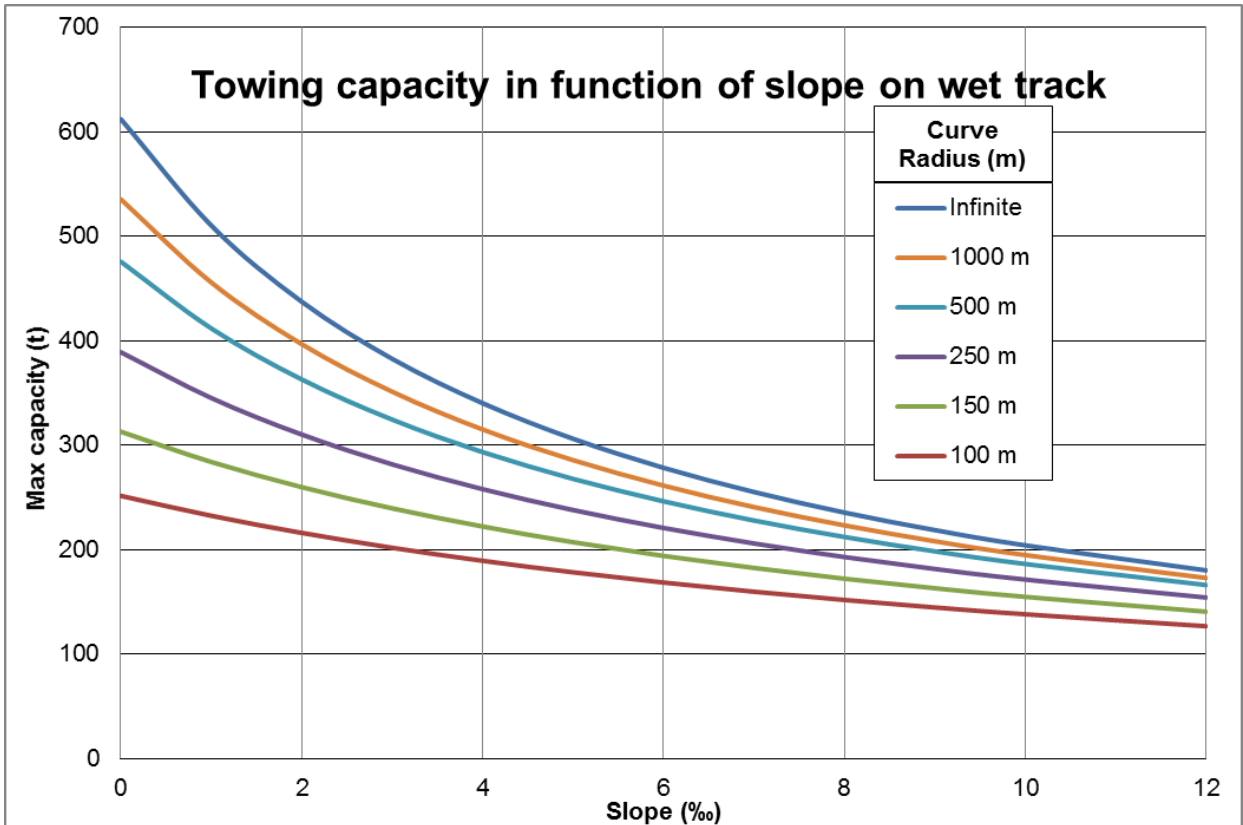
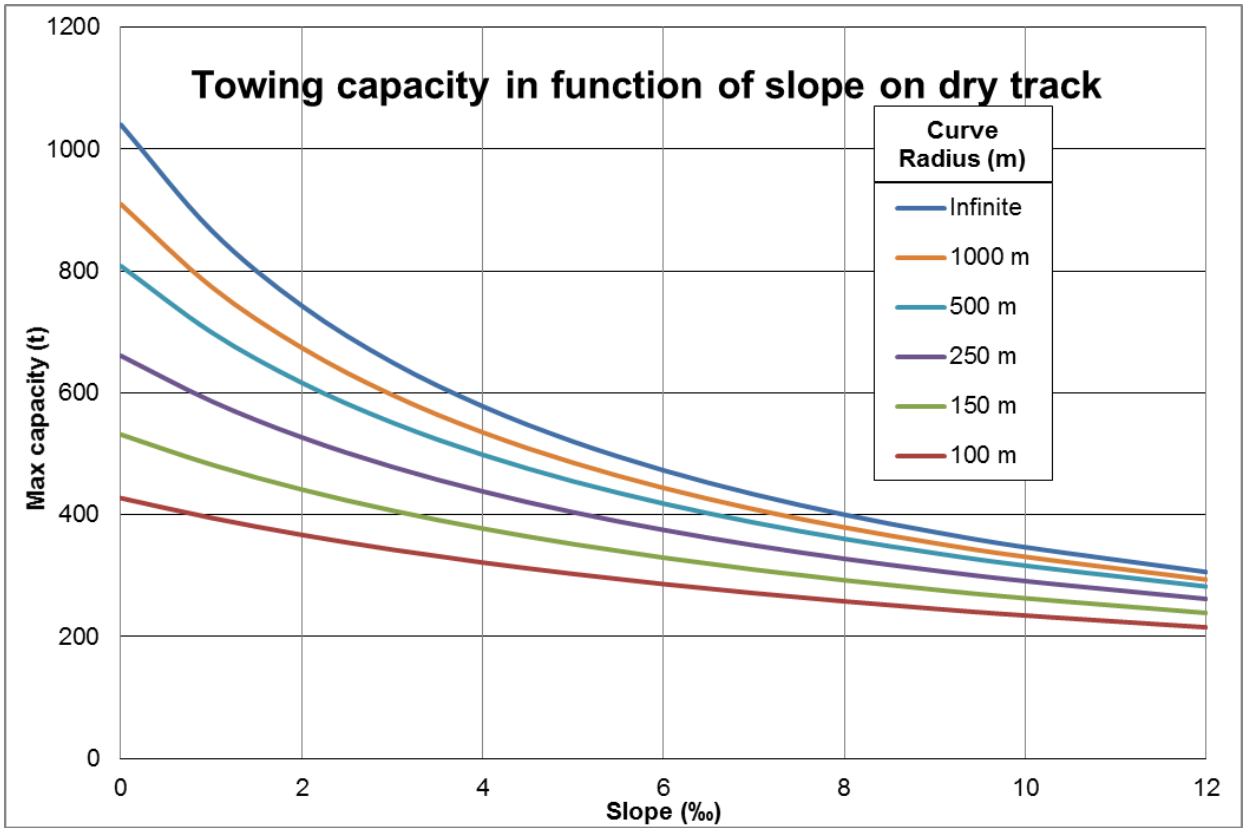
SAFETY AGAINST MOVEMENT WHEN THE CRAB IS ON CHARGE

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.





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

70%

Wet Track Rail Wheels Friction

34%