A 924 Rail Litronic

LIEBHERR

Railroad excavator

Generation
6

Operating weight
21,800 – 25,000 kg

Engine
120 kW / 163 HP
Stage V
Tier 4 Final

Technical data

Diesel engine

Rating per ISO 9249	120 kW (163 HP) at 1,900 RPM
Model	D924 – FPT motor designed for Liebherr
Type	4 cylinder in-line
Bore / Stroke	104 / 132 mm
Displacement	4.5 l
Engine operation	4-stroke diesel Common-Rail Turbo-charged and after-cooled Reduced emissions
Air cleaner	Dry-type air cleaner with pre-cleaner, primary and safety elements
Engine idling	Sensor controlled
Electrical system	
Voltage	24 V
Batteries	2 x 135 Ah / 12 V
Alternator	Three-phase current 28 V / 140 A
Stage V	
Harmful emissions values	According to regulation (EU) 2016/1628
Emission control	Liebherr-SCRT technology
Fuel tank	250 l
Urea tank	46 l
Tier 4 Final	
Harmful emissions values	In accordance with 40CFR1039 (EPA) / 13CCR (CARB)
Emission control	Liebherr-SCR technology
Fuel tank	250 l
Urea tank	46 l

Cooling system

Diesel engine	Water-cooled Compact cooling system consisting cooling unit for water, hydraulic oil and charge air with stepless thermostatically controlled fan, fans for radiator cleaning can be completely folded away

Hydraulic controls

Power distribution	Via control valves with integrated safety valves, simultaneous and independent actuation of chassis, swing drive and equipment
Servo circuit	
Equipment and swing	With electro-proportional joystick levers
Chassis	Electro-proportional via foot pedal, dedicated control and display unit for rail undercarriage operation
Additional functions	Via switch or electro-proportional foot pedals
Proportional control	Proportionally acting transmitters on the joysticks for additional hydraulic functions

Hydraulic system

Hydraulic pump	
For equipment and travel drive	2 Liebherr axial piston variable displacement pumps (double construction)
Max. flow	2 x 220 l/min.
Max. pressure	350 bar / PowerLift 375 bar
Hydraulic pump regulation and control	Liebherr-Synchron-Comfort-system (LSC) with electronic engine speed sensing regulation, pressure and flow compensation, torque controlled swing drive priority
Hydraulic tank	130 l
Hydraulic system	max. 340 l
Hydraulic oil filter	1 main return filter with integrated partial micro filtration (5 µm)
MODE selection	Adjustment of engine and hydraulic performance via a mode pre-selector to match application, e.g. for especially economical and environmentally friendly operation or for maximum digging performance and heavy-duty jobs
S (Sensitive)	Mode for precision work and lifting through very sensitive movements
E (Eco)	Mode for especially economical and environmentally friendly operation
P (Power)	Mode for high performance with low fuel consumption
P+ (Power-Plus)	Mode for highest performance and for very heavy duty applications, suitable for continuous operation
Engine speed and performance setting	Stepless alignment of engine output and hydraulic power via engine speed
	Tool Control: 20 pre-adjustable pump flows and pressures for add-on attachments

Swing drive

Drive	Liebherr axial piston motor with integrated brake valve and torque control, Liebherr planetary reduction gear
Swing ring	Liebherr, sealed race ball bearing swing ring, internal teeth
Swing speed	0 – 9.0 RPM stepless
Swing torque	54 kNm
Holding brake	Wet multi-disc (spring applied, pressure released)
	Pedal controlled positioning swing brake

Cab

Double cabin	ROPS safety cab structure (roll-over protection system for complete operator's cab), shock-absorbing suspension, sound damping insulating, electrically unlockable door, two-piece retractable front windscreen, tinted laminated safety glass, separate window shades for the sunroof window and windscreen, roof window and front windscreen wipers, work headlights integrated in the ceiling, ambient lighting for night operations in addition to interior lighting, access lighting outside, operator's door with a sliding window (can be opened on both sides), large stowing and depositing possibilities, 12 V / 24 V electrical connections
Operator's seat Standard	Air cushioned operator's seat with 3D-adjustable armrests, headrest, lap belt, seat heater, manual weight adjustment, adjustable seat cushion inclination and length and mechanical lumbar vertebrae support
Operator's seat Comfort (Option)	In addition to operator's seat standard: lockable horizontal suspension, automatic weight adjustment, adjustable suspension stiffness, pneumatic lumbar vertebrae support and passive seat climatisation with active coal
Operator's seat Premium (Option)	In addition to operator's seat comfort: active electronic weight adjustment (automatic readjustment), pneumatic low frequency suspension and active seat climatisation with active coal and ventilator
Two-man operation	Ergonomical co-operator's seat with lap belt as well as signal horn and emergency stop
Arm consoles	Joysticks with control consoles and swivel seat, folding left control console
Operation and displays	Large high-resolution operating unit with touchscreen control, self-explanatory, numerous settings, control and monitoring options, e.g. air conditioning control, fuel consumption, machine and attachment parameters as well as safety functions such as load display, load torque limitation, lift and swivel limitation or virtual wall, separate display for rear view and side view monitoring, dedicated control and display unit for rail undercarriage operation with emergency stop function
Air-conditioning	Complete air-conditioning for operator and co-operator, automatic air-conditioning, recirculated air function, fast de-icing and demisting at the press of a button, air vents can be operated via a menu; recirculated air and fresh air filters can be easily replaced and are accessible from the outside; heating-cooling unit, designed for extreme outside temperatures, sensors for solar radiation, inside and outside temperatures
Refrigerant	R134a
Global warming potential	1,430
Quantity at 25 °C	1,300 g
CO_2 equivalent	1.859 t
Vibration emission*	
Hand / arm vibrations	< 2.5 m/s²
Whole-body vibrations	< 0.5 m/s²
Measuring inaccuracy	According with standard EN 12096:1997

Undercarriage

Drive	Oversized two speed power shift transmission with additional creeper speed, Liebherr axial piston motor with functional brake valve on both sides
Pulling force	117 kN
Travel speed	0 – 3.5 km/h stepless (creeper speed off-road) 0 – 7.0 km/h stepless (off-road) 0 – 13.0 km/h stepless (creeper speed on-road) 0 – 20.0 km/h stepless (road travel) 0 – max. 25.0 or 30.0 km/h Speeder (option)
Driving operation	Automotive driving using accelerator pedal, cruise control function: storage of variable accelerator pedal positions, both off-road, on-road and on-rail (country-dependent)
Axles	Manual or automatic hydraulically controlled front axle oscillation lock (country-dependent)
Service brake	Two circuit travel brake system with accumulator; road axle wet and backlash-free disc brake; rail wheels with disc brake (spring applied, pressure released)
Holding brake	Wet multi-disc (spring applied, pressure released)
Wagon braking system	1 circuit compressed air brake for railway wagon
Option	2 circuit compressed air brake for trailer 2 circuit hydraulic brake for trailer
Rail undercarriage	Standard gauge 1,435 mm
Stabilization	Without outriggers

Equipment

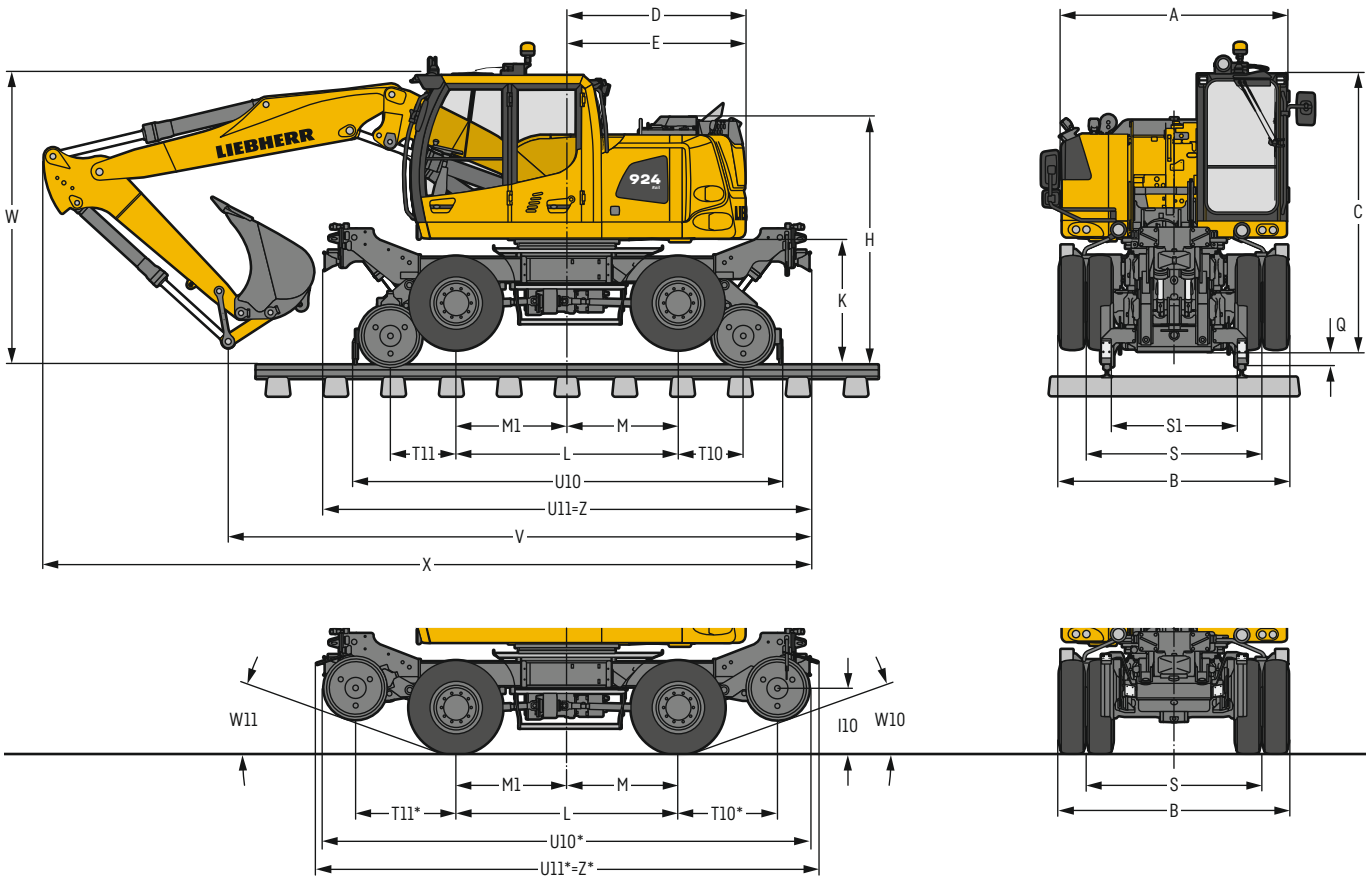
Type	High-strength steel plates at highly-stressed points for the toughest requirements. Complex and stable mountings of equipment and cylinders
Hydraulic cylinders	Liebherr cylinders with special sealing and guide system and, depending on cylinder type, shock absorption
Bearings	Sealed, low maintenance

Complete machine

Lubrication	Liebherr central lubrication system for uppercarriage and equipment, automatically
Noise emission	
ISO 6396	70 dB(A) = L_{pA} (inside cab)
2000/14/EC	101 dB(A) = L_{WA} (surround noise)

* for risk assessment according to 2002/44/EC see ISO/TR 25398:2006

Dimensions

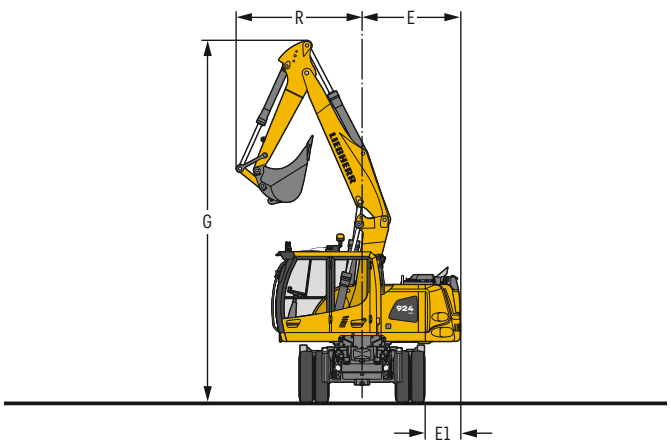

D
E
W
H
K
M1
M
T11
L
T10
U10
U11=Z
V
X
A
C
Q
S1
S
B
W11
I10
W10
T11*
T10*
U10*
U11*=Z*

	on tyres	mm	on rail	mm
A		2,525		2,525
B		2,565		2,565
C		3,070		3,260
D		2,000 / 2,110*		2,000 / 2,110*
E		2,000 / 2,110*		2,000 / 2,110*
H		2,600		2,790
K		1,235		1,425
L		2,500		2,500
M		1,250		1,250
M1		1,250		1,250
I10		725		–
Q		345		145
S		1,973		1,973
S1		–		1,435
T10		–		730
T10*		1,125		–
T11		–		730
T11*		1,125		–
U10		–		4,680
U10*		5,470		–
U11		–		5,475
U11*		5,650		–
W10		20°		–
W11		20°		–
Z		–		5,475
Z*		5,650		–

* Execution required for acceptance Network Rail
E = Tail radius
Tyres 10.00-20

	Stick	Two-piece boom 5.05 m
	m	mm
V	1.85	6,900
	2.05	6,650
	2.25	6,500
W	1.85	3,000
	2.05	3,050
	2.25	3,100
X	1.85	8,900
	2.05	8,750
	2.25	8,750

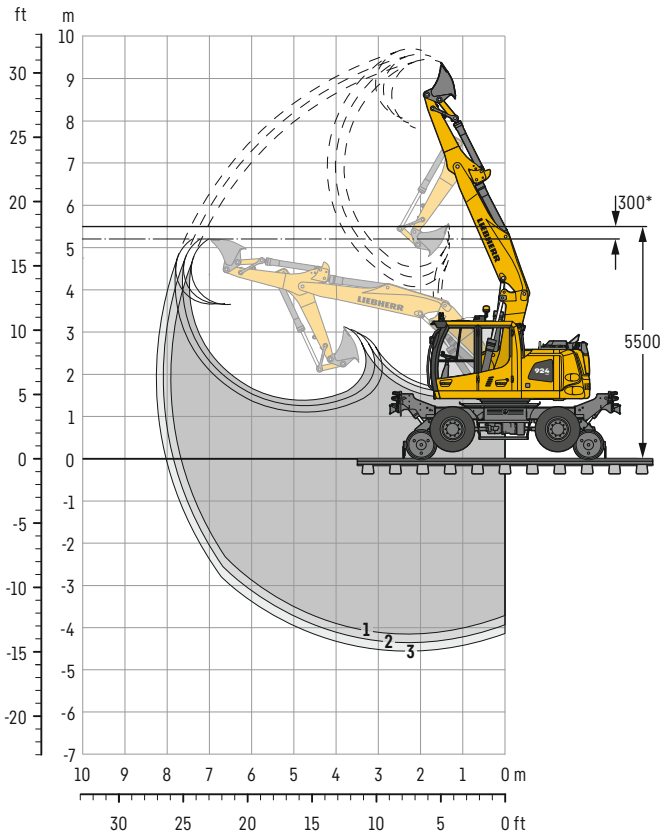
Dimensions are with attachment over steering axle
W = Max. ground clearance including approx. 150 mm piping



Boom	Stick	G	R	E	E1
	m	mm	mm	mm	mm
Two-piece boom 5.05 m	1.85	7,380	2,560	2,000 / 2,110	718 / 828
Two-piece boom 5.05 m	2.05	7,380	2,560	2,000 / 2,110	718 / 828
Two-piece boom 5.05 m	2.25	7,380	2,570	2,000 / 2,110	718 / 828

Ditch cleaning bucket

with two-piece boom 5.05 m



* Safety distance to overhead wires

Digging envelope

		1	2	3
Stick length	m	1.85	2.05	2.25
Max. digging depth	m	4.15	4.35	4.55
Max. reach at ground level	m	7.65	7.85	8.00
Max. dumping height	m	7.85	7.95	8.05
Max. dumping height under overhead wires	m	3.65	3.67	3.67
Max. teeth height	m	9.45	9.60	9.70
Min. equipment radius	m	2.56	2.56	2.57

Digging forces

		1	2	3
Max. digging force (ISO 6015)	kN	110.6	102.2	95.2
	t	11.3	10.4	9.7
Max. breakout force (ISO 6015)	kN	101.3	101.3	101.3
	t	10.3	10.3	10.3

Max. breakout force with ripper bucket 134.6 kN (13.7 t)

Operating weight

The operating weight includes the basic machine with 8 tyres, two-piece boom 5.05 m, stick 2.25 m and ditch cleaning bucket 2,000 mm / 0.65 m³.

Tail radius	Weight (kg)
A 924 Rail Litronic Friction drive with tail radius 2,000 mm	22,200
A 924 Rail Litronic Friction drive with tail radius 2,000 mm (heavy counterweight)	22,800
A 924 Rail Litronic Friction drive with tail radius 2,110 mm	24,500

Ditch cleaning buckets Machine stability per ISO 10567* (75% of tipping capacity)

Cutting width	Capacity ISO 7451[1]	Weight	Tail radius 2,000 mm						Tail radius 2,000 mm (heavy counterweight)						Tail radius 2,110 mm					
			on rail			on tyres			on rail			on tyres			on rail			on tyres		
			Stick length (m)			Stick length (m)			Stick length (m)			Stick length (m)			Stick length (m)			Stick length (m)		
mm	m³	kg	1.85	2.05	2.25	1.85	2.05	2.25	1.85	2.05	2.25	1.85	2.05	2.25	1.85	2.05	2.25	1.85	2.05	2.25
1,600[1]	0.50	330	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
1,800[1]	0.57	360	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
2,000[1]	0.65	390	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
1,600[2]	0.80	766	■	△	△	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
2,000[2]	0.70	811	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

* Indicated loads are based on ISO 10567 and do not exceed 75% of tipping or 87% of hydraulic capacity, max. stick length without quick coupler, lifted 360° on firm with blocked oscillating axle

[1] comparable with SAE (heaped)

[2] with 2 x 50° rotator

Max. material weight ■ = ≤ 1.8 t/m³, ■ = ≤ 1.5 t/m³, △ = ≤ 1.2 t/m³, – = not authorised

Lift capacities

with two-piece boom 5.05 m, tail radius 2,000 mm

Stick 1.85 m

m	Undercarriage	3.0 m		4.5 m		6.0 m				m
7.5	on rail	7.4	8.3*					4.2	5.6*	4.3
	on tyres	8.5*	8.5*					5.9*	5.9*	
6.0	on rail	7.4	7.6*	4.1	6.9*			2.6	4.4*	5.8
	on tyres	7.6*	7.6*	5.6	6.9*			3.8	4.5*	
4.5	on rail	7.1	10.1*	4.1	7.5*	2.5	6.2*	2.1	4.0*	6.6
	on tyres	10.0	10.3*	5.6	7.0	3.5	4.5	3.0	3.9	
3.0	on rail	6.9	10.4*	4.1	8.5*	2.5	6.4*	1.8	3.8*	7.0
	on tyres	9.7*	10.2*	5.5	6.8	3.5	4.5	2.7	3.4	
1.5	on rail	6.8	12.6*	3.9	8.9*	2.4	6.6*	1.8	3.9*	7.1
	on tyres	9.6	12.4*	5.5	6.8	3.4	4.4	2.6	3.3	
0	on rail	6.3	14.1*	3.7	9.0*	2.3	6.6*	1.9	4.3*	6.8
	on tyres	9.4	12.6	5.3	6.8	3.3	4.2	2.7	3.4	
-1.5	on rail	6.2	14.5*	3.5	9.1*	2.2	4.8*	2.1	4.2*	6.2
	on tyres	9.2	12.6	5.0	6.5	3.2	4.2	3.0	3.9	
-3.0	on rail	6.0	10.8*					3.9	6.4*	4.0
	on tyres	9.0	11.9*	4.9	5.7*			4.8	5.6*	

Stick 2.05 m

m	Undercarriage	3.0 m		4.5 m		6.0 m				m
7.5	on rail			3.9	5.2*			3.9	4.6*	4.5
	on tyres							4.8*	4.8*	
6.0	on rail	6.9*	6.9*	4.2	6.7*			2.5	3.8*	6.0
	on tyres			5.7	6.7*			3.7	3.9*	
4.5	on rail	7.2	10.3*	4.1	7.4*	2.6	6.1*	2.0	3.5*	6.8
	on tyres	9.9*	9.9*	5.6	7.0	3.6	4.5	2.9	3.5*	
3.0	on rail	6.9	10.9*	4.1	8.4*	2.5	6.4*	1.8	3.4*	7.2
	on tyres	9.7	10.6*	5.5	6.9	3.6	4.5	2.6	3.3	
1.5	on rail	6.9	12.6*	3.9	8.9*	2.5	6.6*	1.7	3.5*	7.2
	on tyres	9.6	12.4*	5.5	6.8	3.5	4.4	2.5	3.2	
0	on rail	6.4	14.1*	3.7	9.0*	2.3	6.6*	1.8	3.9*	7.0
	on tyres	9.5	12.6	5.3	6.8	3.3	4.3	2.6	3.3	
-1.5	on rail	6.2	14.4*	3.5	9.2*	2.2	5.4*	2.0	4.3*	6.4
	on tyres	9.2	12.6	5.0	6.5	3.2	4.2	2.9	3.7	
-3.0	on rail	6.0	11.9*	3.4	5.8*			3.3	5.5*	4.6
	on tyres	9.0	12.4	4.9	6.4			4.2	5.0*	

Stick 2.25 m

m	Undercarriage	3.0 m		4.5 m		6.0 m				m
7.5	on rail			4.0	5.7*			3.5	4.0*	4.8
	on tyres			4.8*	4.8*			4.1*	4.1*	
6.0	on rail			4.2	6.5*	2.5	4.8*	2.4	3.3*	6.2
	on tyres			5.7	6.4*	3.5	3.9*	3.4*	3.4*	
4.5	on rail	7.2	9.9*	4.1	7.2*	2.6	5.9*	1.9	3.1*	7.0
	on tyres	8.6*	8.6*	5.6	7.0	3.6	4.5	2.8	3.1*	
3.0	on rail	6.9	11.1*	4.0	8.2*	2.6	6.3*	1.7	3.1*	7.4
	on tyres	9.7	10.9*	5.5	6.8	3.6	4.5	2.5	3.1*	
1.5	on rail	6.8	12.6*	4.0	8.9*	2.5	6.5*	1.6	3.2*	7.4
	on tyres	9.6	12.4	5.5	6.8	3.5	4.4	2.4	3.1	
0	on rail	6.4	14.0*	3.7	8.9*	2.3	6.6*	1.7	3.5*	7.2
	on tyres	9.5	12.5	5.3	6.8	3.4	4.3	2.5	3.2	
-1.5	on rail	6.2	14.3*	3.5	9.2*	2.2	5.9*	1.9	4.2*	6.6
	on tyres	9.2	12.6	5.1	6.5	3.2	4.2	2.8	3.6	
-3.0	on rail	6.0	12.8*	3.3	6.7*			2.9	4.9*	5.0
	on tyres	9.0	12.4	4.9	6.3			3.8	4.5*	

Height **Can be slewed through 360°** **In longitudinal position of undercarriage** **Max. reach** *** Limited by hydr. capacity**

The lift capacities are stated in metric tonnes (t) at the stick end and can be lifted 360° on firm, level supporting surface with locked steering axle. These capacities can be slewed through 360° with the undercarriage in the transverse position. Capacities in the longitudinal position of the undercarriage (+/- 15°) are specified over the steering axle. The values apply when the adjusting cylinder is in the optimal position. Indicated loads based on the ISO 10567 standard and do not exceed 75 % of tipping or 87 % of hydraulic capacity, or are limited by the permissible load of the load lift hook.
In accordance with the harmonised European Standard EN 474-5, hydraulic excavators used for lifting operations must be equipped with pipe fracture safety valves, an overload warning device, a load lift hook and a lift capacity chart.
Please note that the stability will be reduced by approx. 20 % in case of a 100 mm cant and 40 % in case of a 180 mm cant.

Lift capacities

with two-piece boom 5.05 m, tail radius 2,000 mm (heavy counterweight)

Stick 1.85 m

m	Undercarriage	3.0 m		4.5 m		6.0 m				m
7.5	on rail	7.9	8.3*					4.5	5.6*	4.3
	on tyres	8.5*	8.5*					5.9*	5.9*	
6.0	on rail	7.6*	7.6*	4.4	6.9*			2.8	4.4*	5.8
	on tyres	7.6*	7.6*	6.0	6.9*			4.1	4.5*	
4.5	on rail	7.6	10.1*	4.4	7.5*	2.7	6.2*	2.3	4.0*	6.6
	on tyres	10.3*	10.3*	5.9	7.3	3.7	4.7	3.2	4.0*	
3.0	on rail	7.3	10.4*	4.3	8.5*	2.7	6.4*	2.0	3.8*	7.0
	on tyres	10.1	10.2*	5.8	7.2	3.7	4.7	2.9	3.6	
1.5	on rail	7.3	12.6*	4.2	8.9*	2.6	6.6*	1.9	3.9*	7.1
	on tyres	10.1	12.4*	5.8	7.2	3.7	4.6	2.8	3.5	
0	on rail	6.8	14.1*	4.0	9.0*	2.5	6.6*	2.0	4.3*	6.8
	on tyres	10.0	13.2	5.6	7.2	3.5	4.5	2.9	3.6	
-1.5	on rail	6.6	14.5*	3.7	9.1*	2.4	4.8*	2.3	4.2*	6.2
	on tyres	9.7	13.3	5.3	6.9	3.5	4.4	3.2	4.1	
-3.0	on rail	6.5	10.8*					4.2	6.4*	4.0
	on tyres	9.6	11.9*	5.2	5.7*			5.2	5.6*	

Stick 2.05 m

m	Undercarriage	3.0 m		4.5 m		6.0 m				m
7.5	on rail			4.2	5.2*			4.1	4.6*	4.5
	on tyres							4.8*	4.8*	
6.0	on rail	6.9*	6.9*	4.4	6.7*			2.7	3.8*	6.0
	on tyres			6.0	6.7*			3.9*	3.9*	
4.5	on rail	7.6	10.3*	4.4	7.4*	2.8	6.1*	2.2	3.5*	6.8
	on tyres	9.9*	9.9*	5.9	7.3*	3.8	4.8	3.1	3.5*	
3.0	on rail	7.4	10.9*	4.3	8.4*	2.7	6.4*	1.9	3.4*	7.2
	on tyres	10.2	10.6*	5.8	7.2	3.8	4.8	2.8	3.4*	
1.5	on rail	7.3	12.6*	4.2	8.9*	2.6	6.6*	1.9	3.5*	7.2
	on tyres	10.1	12.4*	5.8	7.1	3.7	4.7	2.7	3.4	
0	on rail	6.8	14.1*	4.0	9.0*	2.5	6.6*	2.0	3.9*	7.0
	on tyres	10.0	13.1	5.6	7.2	3.6	4.5	2.8	3.5	
-1.5	on rail	6.6	14.4*	3.8	9.2*	2.4	5.4*	2.2	4.3*	6.4
	on tyres	9.8	13.3	5.4	6.9	3.5	4.4	3.1	4.0	
-3.0	on rail	6.5	11.9*	3.6	5.8*			3.5	5.5*	4.6
	on tyres	9.6	12.8*	5.2	6.6*			4.5	5.0*	

Stick 2.25 m

m	Undercarriage	3.0 m		4.5 m		6.0 m				m
7.5	on rail			4.3	5.7*			3.8	4.0*	4.8
	on tyres			4.8*	4.8*			4.1*	4.1*	
6.0	on rail			4.4	6.5*	2.7	4.8*	2.6	3.3*	6.2
	on tyres			6.0	6.4*	3.8	3.9*	3.4*	3.4*	
4.5	on rail	7.6	9.9*	4.4	7.2*	2.8	5.9*	2.1	3.1*	7.0
	on tyres	8.6*	8.6*	5.9	7.0*	3.8	4.8	3.0	3.1*	
3.0	on rail	7.4	11.1*	4.3	8.2*	2.8	6.3*	1.9	3.1*	7.4
	on tyres	10.2	10.9*	5.8	7.2	3.8	4.8	2.7	3.1*	
1.5	on rail	7.3	12.6*	4.2	8.9*	2.7	6.5*	1.8	3.2*	7.4
	on tyres	10.1	12.4*	5.8	7.1	3.7	4.7	2.6	3.2*	
0	on rail	6.9	14.0*	4.0	8.9*	2.5	6.6*	1.9	3.5*	7.2
	on tyres	10.1	13.1	5.6	7.2	3.6	4.5	2.7	3.4	
-1.5	on rail	6.6	14.3*	3.8	9.2*	2.4	5.9*	2.1	4.2*	6.6
	on tyres	9.8	13.3	5.4	6.9	3.5	4.4	3.0	3.8	
-3.0	on rail	6.5	12.8*	3.6	6.7*			3.1	4.9*	5.0
	on tyres	9.6	13.1	5.2	6.7			4.0	4.5*	

Height **Can be slewed through 360°** **In longitudinal position of undercarriage** **Max. reach** *** Limited by hydr. capacity**

The lift capacities are stated in metric tonnes (t) at the stick end and can be lifted 360° on firm, level supporting surface with locked steering axle. These capacities can be slewed through 360° with the undercarriage in the transverse position. Capacities in the longitudinal position of the undercarriage (+/- 15°) are specified over the steering axle. The values apply when the adjusting cylinder is in the optimal position. Indicated loads based on the ISO 10567 standard and do not exceed 75 % of tipping or 87 % of hydraulic capacity, or are limited by the permissible load of the load lift hook.
In accordance with the harmonised European Standard EN 474-5, hydraulic excavators used for lifting operations must be equipped with pipe fracture safety valves, an overload warning device, a load lift hook and a lift capacity chart.
Please note that the stability will be reduced by approx. 20 % in case of a 100 mm cant and 40 % in case of a 180 mm cant.

Lift capacities

with two-piece boom 5.05 m, tail radius 2,110 mm

Stick 1.85 m

m	Undercarriage	3.0 m		4.5 m		6.0 m				m
7.5	on rail	8.3*	8.3*					5.5	5.6*	4.3
	on tyres	8.5*	8.5*					5.9*	5.9*	
6.0	on rail	7.6*	7.6*	5.3	6.9*			3.5	4.4*	5.8
	on tyres	7.6*	7.6*	6.9*	6.9*			4.5*	4.5*	
4.5	on rail	9.0	10.1*	5.3	7.5*	3.4	6.2*	2.9	4.0*	6.6
	on tyres	10.3*	10.3*	6.9	7.4*	4.5	5.6	3.9	4.0*	
3.0	on rail	8.7	10.4*	5.2	8.5*	3.4	6.4*	2.6	3.8*	7.0
	on tyres	10.2*	10.2*	6.8	8.2	4.5	5.6	3.5	3.8*	
1.5	on rail	8.7	12.6*	5.1	8.9*	3.3	6.6*	2.5	3.9*	7.1
	on tyres	11.7	12.4*	6.8	8.2	4.4	5.5	3.4	3.9*	
0	on rail	8.3	14.1*	4.9	9.0*	3.2	6.6*	2.6	4.3*	6.8
	on tyres	11.9	14.0*	6.7	8.4	4.3	5.4	3.5	4.2*	
-1.5	on rail	8.2	14.5*	4.7	9.1*	3.1	4.8*	3.0	4.2*	6.2
	on tyres	11.7	14.4*	6.4	8.2	4.2	5.2*	4.0	4.3*	
-3.0	on rail	8.0	10.8*					5.3	6.4*	4.0
	on tyres	11.5	11.9*	5.7*	5.7*			5.6*	5.6*	

Stick 2.05 m

m	Undercarriage	3.0 m		4.5 m		6.0 m				m
7.5	on rail			5.1	5.2*			4.6*	4.6*	4.5
	on tyres							4.8*	4.8*	
6.0	on rail	6.9*	6.9*	5.3	6.7*			3.4	3.8*	6.0
	on tyres			6.7*	6.7*			3.9*	3.9*	
4.5	on rail	9.0	10.3*	5.3	7.4*	3.4	6.1*	2.8	3.5*	6.8
	on tyres	9.9*	9.9*	6.9	7.3*	4.6	5.7	3.5*	3.5*	
3.0	on rail	8.8	10.9*	5.2	8.4*	3.4	6.4*	2.5	3.4*	7.2
	on tyres	10.6*	10.6*	6.8	8.3	4.6	5.6	3.4	3.4*	
1.5	on rail	8.7	12.6*	5.2	8.9*	3.3	6.6*	2.4	3.5*	7.2
	on tyres	11.7	12.4*	6.8	8.2	4.5	5.6	3.3	3.5*	
0	on rail	8.4	14.1*	4.9	9.0*	3.2	6.6*	2.5	3.9*	7.0
	on tyres	11.9	14.0*	6.7	8.3	4.4	5.4	3.4	3.8*	
-1.5	on rail	8.2	14.4*	4.7	9.2*	3.1	5.4*	2.9	4.3*	6.4
	on tyres	11.7	14.3*	6.5	8.2	4.2	5.3	3.8	4.4*	
-3.0	on rail	8.0	11.9*	4.6	5.8*			4.5	5.5*	4.6
	on tyres	11.5	12.8*	6.3	6.6*			5.0*	5.0*	

Stick 2.25 m

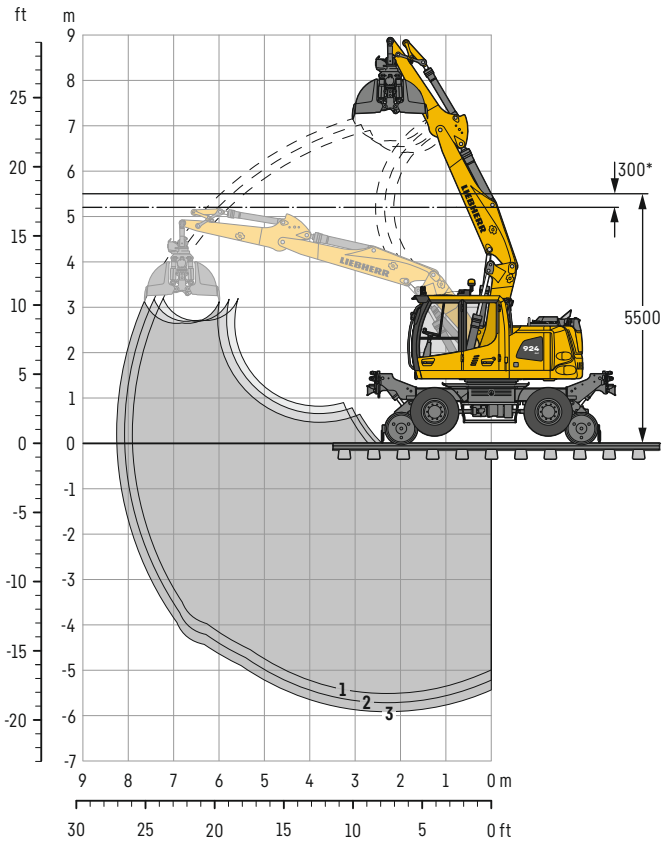
m	Undercarriage	3.0 m		4.5 m		6.0 m				m
7.5	on rail			5.2	5.7*			4.0*	4.0*	4.8
	on tyres			4.8*	4.8*			4.1*	4.1*	
6.0	on rail			5.4	6.5*	3.4	4.8*	3.2	3.3*	6.2
	on tyres			6.4*	6.4*	3.9*	3.9*	3.4*	3.4*	
4.5	on rail	9.0	9.9*	5.3	7.2*	3.5	5.9*	2.7	3.1*	7.0
	on tyres	8.6*	8.6*	6.9	7.0*	4.6	5.7	3.1*	3.1*	
3.0	on rail	8.7	11.1*	5.2	8.2*	3.4	6.3*	2.4	3.1*	7.4
	on tyres	10.9*	10.9*	6.8	8.1*	4.6	5.6	3.1*	3.1*	
1.5	on rail	8.7	12.6*	5.2	8.9*	3.3	6.5*	2.3	3.2*	7.4
	on tyres	11.7	12.4*	6.7	8.2	4.5	5.6	3.2*	3.2*	
0	on rail	8.4	14.0*	4.9	8.9*	3.2	6.6*	2.4	3.5*	7.2
	on tyres	11.8	13.8*	6.7	8.2	4.4	5.4	3.3	3.5*	
-1.5	on rail	8.2	14.3*	4.7	9.2*	3.1	5.9*	2.7	4.2*	6.6
	on tyres	11.7	14.2*	6.5	8.2	4.2	5.3	3.7	4.1*	
-3.0	on rail	8.0	12.8*	4.5	6.7*			3.9	4.9*	5.0
	on tyres	11.5	13.5*	6.3	7.4*			4.5*	4.5*	

Height **Can be slewed through 360°** **In longitudinal position of undercarriage** **Max. reach** *** Limited by hydr. capacity**

The lift capacities are stated in metric tonnes (t) at the stick end and can be lifted 360° on firm, level supporting surface with locked steering axle. These capacities can be slewed through 360° with the undercarriage in the transverse position. Capacities in the longitudinal position of the undercarriage (+/– 15°) are specified over the steering axle. The values apply when the adjusting cylinder is in the optimal position. Indicated loads based on the ISO 10567 standard and do not exceed 75 % of tipping or 87 % of hydraulic capacity, or are limited by the permissible load of the load lift hook.
In accordance with the harmonised European Standard EN 474-5, hydraulic excavators used for lifting operations must be equipped with pipe fracture safety valves, an overload warning device, a load lift hook and a lift capacity chart.
Please note that the stability will be reduced by approx. 20 % in case of a 100 mm cant and 40 % in case of a 180 mm cant.

Clamshell grab

with two-piece boom 5.05 m



* Safety distance to overhead wires

Digging envelope

		1	2	3
Stick length	**m**	1.85	2.05	2.25
Max. digging depth	**m**	5.30	5.50	5.70
Max. reach at ground level	**m**	7.75	7.95	8.10
Max. dumping height	**m**	6.60	6.75	6.85
Max. dumping height under overhead wires	**m**	2.90	2.90	2.85

Operating weight

The operating weight includes the basic machine with 8 tyres, two-piece boom 5.05 m, stick 2.25 m and clamshell grab GMZ 22 / 0.30 m³.

Tail radius	Weight (kg)
A 924 Rail Litronic Friction drive with tail radius 2,000 mm	22,700
A 924 Rail Litronic Friction drive with tail radius 2,000 mm (heavy counterweight)	23,300
A 924 Rail Litronic Friction drive with tail radius 2,110 mm	25,000

Clamshell grabs GMZ 22 Machine stability per ISO 10567* (75 % of tipping capacity)

Width of clamshells	Capacity	Weight	Tail radius 2,000 mm						Tail radius 2,000 mm (heavy counterweight)						Tail radius 2,110 mm					
			on rail			on tyres			on rail			on tyres			on rail			on tyres		
			Stick length (m)			Stick length (m)			Stick length (m)			Stick length (m)			Stick length (m)			Stick length (m)		
mm	m³	kg	1.85	2.05	2.25	1.85	2.05	2.25	1.85	2.05	2.25	1.85	2.05	2.25	1.85	2.05	2.25	1.85	2.05	2.25
300[1]	0.08	675	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
500[2]	0.16	740	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
600[2]	0.20	770	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
700[2]	0.24	810	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
800[2]	0.28	840	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
1,000[2]	0.34	905	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
600[3]	0.30	850	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
800[3]	0.42	925	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
1,000[3]	0.54	1,005	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

* Indicated loads are based on ISO 10567 and do not exceed 75 % of tipping or 87 % of hydraulic capacity, max. stick length without quick coupler, lifted 360° on firm with blocked oscillating axle

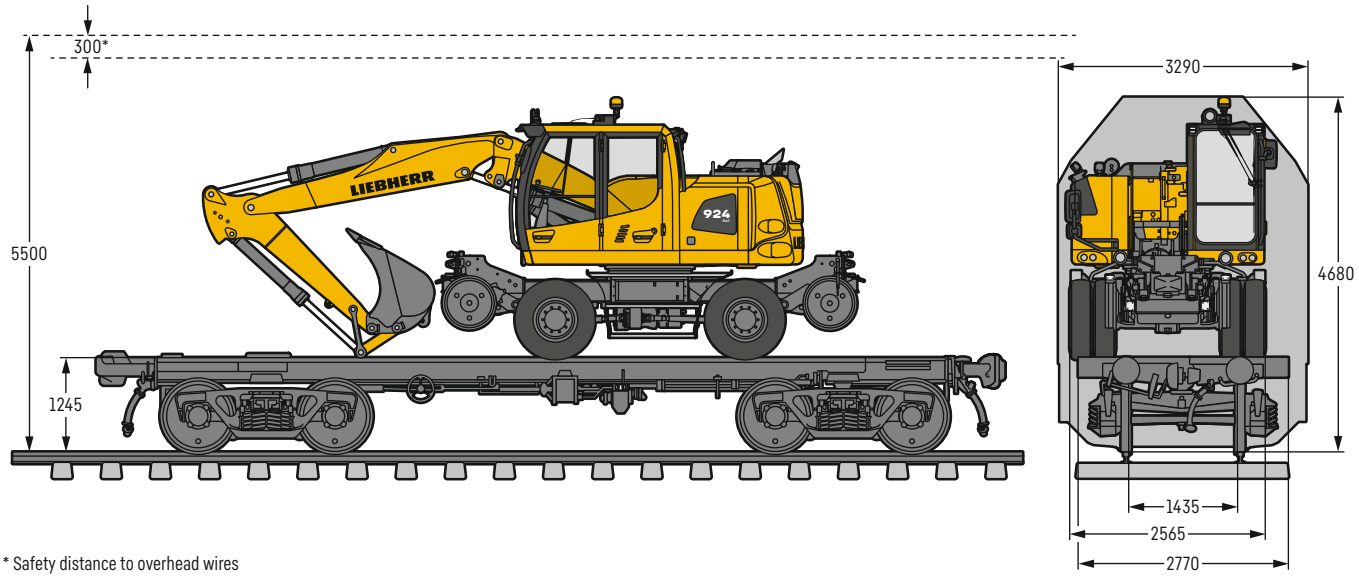
[1] Track construction bucket

[2] Combination bucket

[3] Clamshell bucket

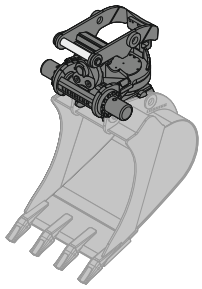
Max. material weight ■ = ≤ 1.8 t/m³, ■ = ≤ 1.5 t/m³, △ = ≤ 1.2 t/m³, – = not authorised

Dimensions for transport



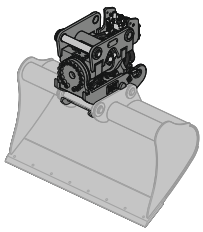
* Safety distance to overhead wires

Attachments



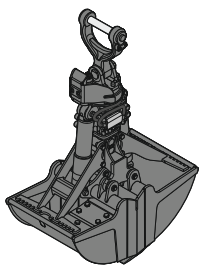
Tilt rotator

Mounting machine side		SW stick mechanical, SWA 33 mechanical, SWA 33 hydraulic, SWA 33 LIKUFIX, SWA 48 mechanical, SWA 48 LIKUFIX
TR 20		
Mountings attachment side		SW stick mechanical, SWA 33 mechanical, SWA 33 hydraulic, SWA 48 mechanical
Weight[1) 3)]	kg	505 – 575
Rotation		360°
Tilt		2 x 50°
TR 25		
Mountings attachment side		SW stick mechanical, SWA 33 mechanical, SWA 33 hydraulic, SWA 48 mechanical, SWA 48 hydraulic
Weight[1) 3)]	kg	640 – 705
Rotation		360°
Tilt		2 x 50°



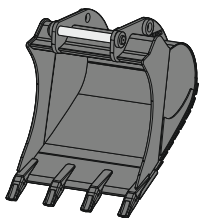
Tilt unit

LiTiU 33		
Mounting machine side		SWA 33 LIKUFIX
Mountings attachment side		SWA 33 hydraulic, SWA 33 LIKUFIX
Weight[1) 3)]	kg	380 – 410
Tilt		2 x 50°
LiTiU 48		
Mounting machine side		SWA 48 LIKUFIX
Mountings attachment side		SWA 48 hydraulic, SWA 48 LIKUFIX
Weight[2) 3)]	kg	700 – 740
Tilt		2 x 45°



Clamshell grab GMZ 22 / GMZ 22 HD[4)]

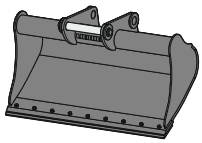
Mountings		direct mounting, SW stick mechanical, SWA 33 mechanical, SWA 33 hydraulic, SWA 33 LIKUFIX, SWA 48 mechanical, SWA 48 hydraulic, SWA 48 LIKUFIX					
Clamshell buckets							
Shell width	mm	300	400	600	800	1,000	
Opening width	mm	1,502	1,502	1,502	1,502	1,502	
Capacity	m³	0.14	0.20	0.30	0.42	0.54	
Weight[1)]	kg	895	925	1,025	1,105	1,180	
Track construction buckets							
Shell width	mm	300					
Opening width	mm	1,141					
Capacity	m³	0.08					
Weight[1)]	kg	815					
Combination buckets							
Shell width	mm	400	500	600	700	800	1,000
Opening width	mm	1,227	1,227	1,227	1,227	1,227	1,227
Capacity	m³	0.12	0.16	0.20	0.24	0.28	0.34
Weight[1)]	kg	835	895	945	985	1,015	1,080



Backhoe bucket 03

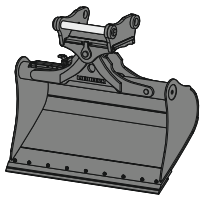
Mountings		direct mounting, SW stick mechanical, SWA 33 mechanical, SWA 33 hydraulic, SWA 33 LIKUFIX, SWA 48 mechanical, SWA 48 hydraulic, SWA 48 LIKUFIX						
Cutting width	mm	300	400	500	650	850	1,050	1,250
Capacity	m³	0.17	0.24	0.32	0.42	0.60	0.80	0.95
Weight[1)]	kg	235	260	305	360	415	495	540

[1)] weights based on an attachment in a standard design with the machine SWA 33 LIKUFIX mounting
[2)] weights based on an attachment in a standard design with the machine SWA 48 LIKUFIX mounting
[3)] depending on the mounting on the attachment
[4)] 20 kg additional weight for HD version



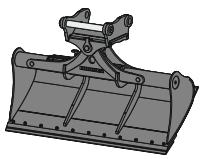
Universal bucket 03

Mountings		SWA 33 mechanical, SWA 33 hydraulic, SWA 33 LIKUFIX, SWA 48 mechanical, SWA 48 hydraulic, SWA 48 LIKUFIX
Cutting width	mm	1,500
Capacity	m³	0.60
Weight[1]	kg	385



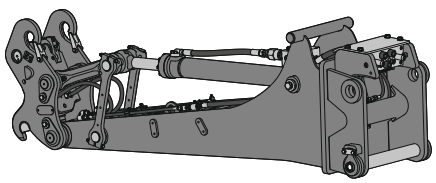
Tilt bucket 90

Mountings		direct mounting, SW stick mechanical, SWA 33 mechanical, SWA 33 hydraulic, SWA 33 LIKUFIX, SWA 48 mechanical, SWA 48 hydraulic, SWA 48 LIKUFIX		
Cutting width	mm	1,500	1,600	1,600
Capacity	m³	0.60	0.80	1.00
Weight[1]	kg	700	785	825
Tilt angle		2 x 50°	2 x 50°	2 x 50°



Ditch cleaning bucket

Mountings		direct mounting, SW stick mechanical, SWA 33 mechanical, SWA 33 hydraulic, SWA 33 LIKUFIX, SWA 48 mechanical, SWA 48 hydraulic, SWA 48 LIKUFIX						
GRL 90								
Cutting width	mm	1,600	1,600	2,000	2,200			
Capacity	m³	0.55	0.80	0.50	0.80			
Weight[1]	kg	685	815	705	840			
Tilt angle		2 x 50°	2 x 50°	2 x 50°	2 x 50°			
GRL 90 Rail								
Cutting width	mm	2,000	2,000					
Capacity	m³	0.70	1.00					
Weight[1]	kg	820	870					
Tilt angle		2 x 50°	2 x 50°					
GRL rigid 2B								
Cutting width	mm	600	800	1,000	1,200	1,400	1,600	1,800	2,000
Capacity	m³	0.17	0.25	0.30	0.38	0.45	0.50	0.57	0.65
Weight[1]	kg	185	215	245	275	310	350	380	410
GRL rigid Rail								
Cutting width	mm	1,600	2,000					
Capacity	m³	0.80	0.48					
Weight[1]	kg	470	370					

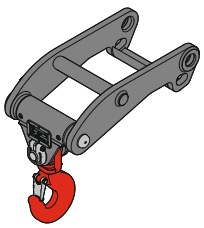


Stick extension LS 12

Mounting machine side		SWA 33 LIKUFIX, SWA 48 LIKUFIX
Mountings attachment side		SWA 33 mechanical, SWA 33 mechanical LIKUFIX[2], SWA 33 hydraulic[4], SWA 33 LIKUFIX[3] [4] [5]
Length	m	2.25
Weight[1]	kg	approx. 580 – 630

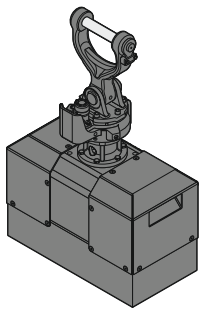
[1] weights based on an attachment in a standard design with the machine SWA 33 LIKUFIX mounting
[2] attachment with high pressure circuit only possible with the manual switchover tipping cylinder or an extended hydraulic circuit on the carrier machine
[3] attachment with high pressure circuit only possible with the electric switchover tipping cylinder or an extended hydraulic circuit on the carrier machine
[4] 14-pole signal contact strip is required, for example to control and monitor the hydraulic quick coupling system on the stick extension on the attachment side or to transfer electrical signals for the switchover
[5] a socket on the stick above the signal contact strip for the carrier machine is also required for switching between different hydraulic circuits

Attachments



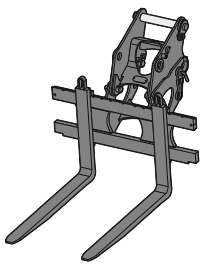
Load lift hook

Mountings		direct mounting, SW stick mechanical, SWA 33 mechanical, SWA 33 hydraulic, SWA 48 mechanical, SWA 48 hydraulic
Max. load	t	8
Rotatable		360°, mechanical
Height to bolting point	mm	508
Weight[1)]	kg	120



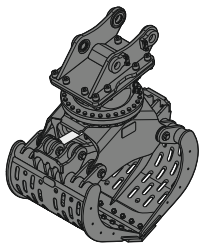
Hydro magnet

Mountings		direct mounting, SW stick mechanical, SWA 33 mechanical, SWA 33 hydraulic, SWA 33 LIKUFIX, SWA 48 mechanical, SWA 48 hydraulic, SWA 48 LIKUFIX
Power	kW	5
Lifting capacity	t	5
Swivel circuit		330°
Overall height to bearing fork	mm	1,182
Weight[1)]	kg	1,485



Pallet fork

Mountings		direct mounting, SW stick mechanical, SWA 33 mechanical, SWA 33 hydraulic, SWA 33 LIKUFIX, SWA 48 mechanical, SWA 48 hydraulic, SWA 48 LIKUFIX
Max. width pallet fork	mm	1,245
Pallet forks length	mm	1,200
Lifting capacity (ISO 2328)	t	2.5
Weight[1)]	kg	330



Sorting grab

		perforated	ribbed	closed	perforated	ribbed	closed	perforated	closed	perforated	closed
Mountings		direct mounting, SW stick mechanical, SWA 33 mechanical, SWA 33 hydraulic, SWA 33 LIKUFIX, SWA 48 mechanical, SWA 48 hydraulic, SWA 48 LIKUFIX									
SG 20B											
Shell width	mm	800		800	1,000		1,000	1,200	1,200	1,400	1,400
Capacity	m³	0.40		0.40	0.50		0.50	0.60	0.60	0.70	0.70
Max. closing force	kN	40		40	40		40	40	40	40	40
Weight[1)]	kg	915		925	955		970	1,000	1,015	1,040	1,060
SG 25B											
Shell width	mm	800	800	800	1,000	1,000	1,000	1,200	1,200	1,400	1,400
Capacity	m³	0.55	0.50	0.55	0.75	0.65	0.75	0.90	0.90	1.10	1.10
Max. closing force	kN	60	60	60	60	60	60	60	60	60	60
Weight[1)]	kg	1,170	1,220	1,190	1,235	1,300	1,260	1,300	1,325	1,380	1,415

[1)] weights based on an attachment in a standard design with the machine SWA 33 LIKUFIX mounting

Equipment

Undercarriage

Dual-circuit braking system with rail wheel brake, hydraulically	●
Trailer coupling on rolling stock axle	●
Trailer coupling Rockinger, semi-automatic	●
Drive via friction wheel (9B) or rail (9C)	+
Additional ascent laterally, left	+
Additional ascent laterally, right	+
Counterweight at undercarriage	●
Lighting system white / red incl. power socket*	X*
Earthing cable with ball-headed pin	X
Rotating assembly position symmetric	●
Fire extinguisher 6 kg	X
Hydraulic connection for tipping the trailer	+
Parking brake, maintenance-free	●
Tyre inflation hose with pressure gauge at wagon braking system	+
Rolling stock chassis cylinder pipe fracture safety device	●
Rail undercarriage oscillating steering axle, hydraulically locking, rear rigid	●
Rail undercarriage friction wheel, gauge 1,435 mm	●
Rail sweeper	●
Protection for oscillating axle cylinders	+
Proportional servo-steering with emergency function	●
Speeder*	+
Two storage compartments	●
Storage compartment with drawer	+
Lashing eyelets for transport	●
Wagon braking system (hydraulic, 2 circuits)	+
Wagon braking system (pneumatic, 1 circuit)	●
Wagon braking system (pneumatic, 2 circuits)	+
Tool equipment, extended	+
Pull rod	X/X*

Uppercarriage

Uppercarriage rear light, 2 pieces, LED	+
Uppercarriage right side light, 1 piece, LED	●
Counterweight (tail swing radius 2,000 mm)	●
Counterweight (tail swing radius 2,000 mm), heavy	+
Counterweight (tail swing radius 2,110 mm)	+
Refuelling system with filling pump	+
External starting aid (battery connectors)	+
Handrails, non slip surfaces	●
Main battery switch for electrical system	●
Engine hood with gas spring	●
Uppercarriage doors, lockable	●
Amber beacon, at uppercarriage, LED double flash	+
Signal light DB, halogen	X
Signal light DB, LED	+

Hydraulic system

Shut-off valve between hydraulic tank and pump(s)	●
Pressure test fittings	●
Electronic pump regulation	●
Hydraulic oil filter with integrated microfilter	●
Liebherr hydraulic oil from – 20 °C to + 40 °C	●
Liebherr hydraulic oil, biologically degradable	+
Liebherr hydraulic oil, specially for warm or cold regions	+
Bypass filter	+
Emergency actuation, electric	X/X*
Switchover clamshell operation and tipping cylinder (not available in combination with LIKUFIX)	●
Switchover high pressure circuit and tipping cylinder	+
Switchover high pressure circuit and two-piece boom	+
Preparation Liebherr hydro-magnet	+

Diesel engine

Fuel anti-theft device	+
Sensor controlled engine idling	●
Liebherr particle filter*	●
Air pre-filter with dust discharge	+
Preheating hydraulic oil	+
Preheating fuel	+
Preheating engine oil	+

Work space limitation

Electronic lift limitation	X/X*
Load torque limitation (RCL)	X/X*
Load torque warning (RCI)	+
Swivel limitation	X
Virtual wall	X*

Equipment

Cab

Storage compartment	●
Cab lights rear, 2 pieces, LED	●
Cab lights front, 2 pieces, LED (under rain cover)	●
Exterior mirror, electrical adjustable, with heating	+
Control elements for signal-horn and emergency brake at co-driver's seat	●
Lighting for cab access	x
Mechanical hour meters, readable from outside the cab	●
Roof window made from impact-resistant laminated safety glass	●
Data logger	●
Two seater cab	●
Circular bubble level	+
Pressure indication of rail axles on the display	●
Driver identification code	+
Driver profile, personalised	●
Operator's seat Standard	●
Operator's seat Comfort	+
Operator's seat Premium	+
Driving alarm (acoustic signal is emitted during travel, can be switched ON / OFF)	+
Fire extinguisher 2 kg	x*
Windscreen retractable (including upper part)	●
Intermittent windscreen wiper with wiper washer	●
Footrest	+
Speed indication on the rail-display	●
Cruise control*	●
Rubber floor mat, removable	●
High pressure circuit, permanent drive	●
Dome light	●
Licence plate holder with light*	+
Coat hook	●
Automatic air conditioning	●
Fuel consumption indicator	●
Electric cooler	+
Steering wheel lock	●
Steering column adjustable	●
LiDAT, vehicle fleet management* / **	●
Emergency exit rear window	●
Positioning swing brake	+
Proportional control	●
Radio Comfort, control via display with handsfree set	+
Preparation for radio installation	●
Rain cover over front window opening	●
ROPS cab	●
Back-up alarm (acoustic signal is emitted traveling backward, can not be switched off)	+
Amber beacon, on cab, LED double flash	+
Windshield wiper with interval switching and washer, roof window	●
Windshield wiper with interval switching and washer, rear window	●
Driver door with sliding window	●
Slipcover for operator seat	+
Right side window and windshield made from laminated safety glass	●
Safety components DB (safety flag, signal horn, warning triangle, warning light)	x
Safety components GB (safety flag)	x*
Sun blind	●
Auxiliary heating, adjustable (week time switch)	+
Power socket 12 V	●
Left control console, folding	●
Electronic immobilizer	+
Cigarette lighter / power socket 24 V	●

Equipment

Alternative connection medium pressure circuit on right side of stick	+
Boom lights, 2 pieces, LED	●
Stick lights, 2 pieces, LED	+
Grab lines for stick with tipping kinematic	+
High pressure circuit 1 incl. unpressurised return line and Tool Control	●
High pressure circuit 2 incl. lines	●
Load holding valve tipping cylinder, both sides	+
Load holding valve tipping cylinder, single-sided	+
Load lug on boom	+
Load lug on stick	+
Leak oil line, additional for attachments	+
Stick prepared for quick coupler stick	●
Medium pressure circuit incl. lines	●
PowerLift	●
Pipe fracture safety valves hoist cylinders	●
Pipe fracture safety valve stick cylinder	●
Hose quick coupling at grab lines	●
Hose protection for LIKUFIX	+
Quick coupling system LIKUFIX-9 SWA 33	+
Quick coupling system LIKUFIX SWA 33	+
Quick coupling system LIKUFIX SWA 48	+
Signal contacts for LIKUFIX, 14-pin	+
Signal contacts for LIKUFIX, 14-pin, with control unit for second SWA	+
Special buckets and other attachments	+
Power socket on stick, commutable (2 circuits)	+
Tool Control, 20 attachment adjustments selectable over the display	●
Tool Management, automatic attachment recognition (in combination with LIKUFIX)	+
Latching for connecting link in grab operation	+
Two-piece boom	●
Offset two-piece boom	+

Complete machine

Machine guidance system	
Preparation	+
Lubrication	
Lubrication undercarriage, manually – decentralised (grease points)	+
Lubrication undercarriage steering axle, manually – centralised (one grease point)	●
Central lubrication system for uppercarriage and equipment, automatically (without quick coupler and connecting link)	●
Centralised lubrication extended for quick coupler	+
Centralised lubrication extended for connecting link	+
Special coating	
DB-coating	x
Special coating undercarriage, uppercarriage, equipment	+
Monitoring	
Rear view monitoring with camera	●
Side view monitoring with camera	●

● = Standard, + = Option, x = Required for acceptance by the German RR (DB), x* = Required for acceptance by the British RR – necessary for compliance RIS 1530
* = country-dependent, ** = optionally extendable after one year

Availability of equipment may differ by country.
Options and / or special equipment, supplied by vendors other than Liebherr, are only to be installed with the knowledge and approval of Liebherr in order to retain warranty.

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