

Up to 2 shifts without
battery exchange

RFID technology

Redundant height and
weight checks

Logistics Interface

Expandable to automatic
operation – ideal for
3-shift operation

Modular design and special
build solutions ex-works



ETX 513/515

Electric sideways-seated / tri-lateral stacker with swivelling or telescopic forks (1,200/1,250/1,500 kg)

The ETX 513/515 high rack stackers offer maximum performance in the 'high end area' of a narrow aisle warehouse. They set new benchmarks when it comes to flexibility, efficiency and ergonomics.

Flexibility through modular construction: The Jungheinrich modular system has more than 5 million possible configurations providing flexibility from the outset. The advantage: Optimum adaptation to any warehouse and logistics strategy. An intelligent truck management system with TÜV certified control and CAN-Bus system, means the performance range is adaptable to any requirements and offers a range of additional safety features.

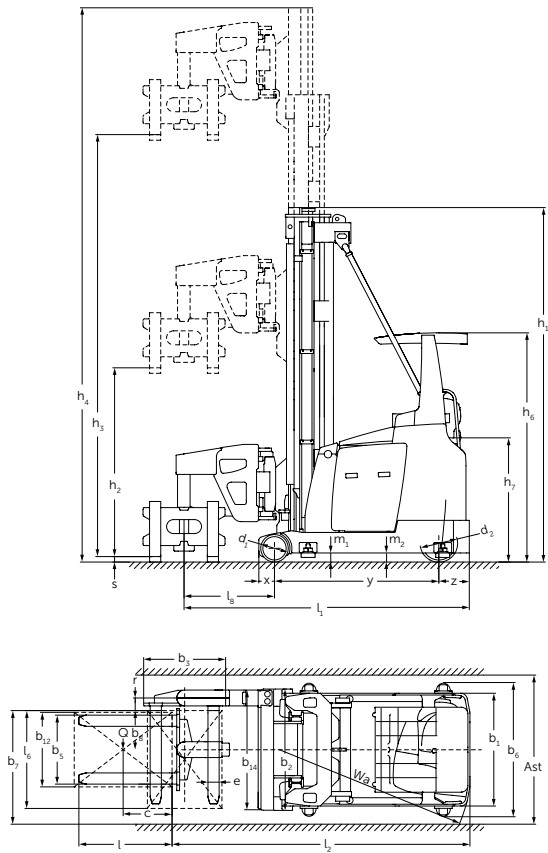
Excellent performance and energy efficiency lead to fast

throughput and high cost-effectiveness. This is precisely what is offered by our 3-phase AC technology with higher performance data and greater dynamics, matched by improved energy utilisation. The advantage: Fully usable throughout two shifts in normal operation without battery change. Accessing all these applications is child's play for the ETX operator:

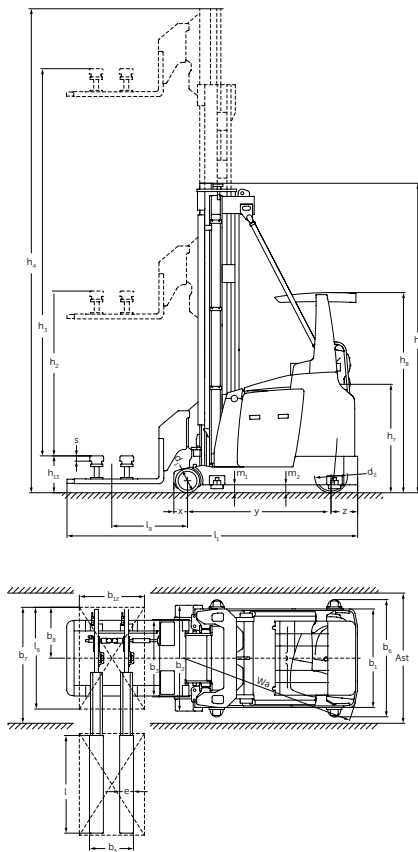
- Informative colour display. Important operating data is easily and legibly laid out.
- All parameters and programs can be set individually.
- Softkeys to control functions and menus.
- Camera/monitor system for effective stacking and retrieval of pallets at great lift heights.
- Hydraulic control by thumb movement.
- Automotive style pedal arrangement for control and braking.
- Side-seated position for fatigue-free operation.

**JUNGHEINRICH**

ETX 513/515



ETX 513/ 515
Swivelling sideshift fork



ETX 513/ 515
telescopic fork

Technical data in line with VDI 2198

		Jungheinrich						
				ETX 513	ETX 515	ETX 513	ETX 515	
Identification	1.1	Manufacturer (abbreviation)						
	1.2	Model						
	1.3	Drive		Electric				
	1.4	Manual, pedestrian, stand-on, seated, order picker operation		tri-lateral stacker	tri-lateral stacker	Bi-lateral stacker	Bi-lateral stacker	
	1.5	Load capacity/rated load	Q t	1.25	1.5	1.2 ¹⁾	1.2 ¹⁾	
	1.6	Load centre distance	c mm	600				
	1.8	Load distance	x mm	168	193	168	193	
	1.9	Wheelbase	y mm	1,764	2,094	1,764	2,094	
	Weights	2.1	Net weight		kg	6,540	7,530	6,540
2.2		Axle loading, laden front/rear		kg	5,736 / 2,058	6,540 / 2,490	5,736 / 2,058	6,540 / 2,490
2.3		Axle loading, unladen front/rear		kg	3,810 / 2,730	4,350 / 3,180	3,810 / 2,730	4,350 / 3,180
Wheels / frame	3.1	Tyres		Vulkollan				
	3.2	Tyre size, front	mm	Ø 295 x 144	Ø 380 x 192	Ø 295 x 144	Ø 380 x 192	
	3.3	Tyre size, rear	mm	Ø 400 x 160				
	3.5	Wheels, number front/rear (x = driven wheels)		2 / 1x				
Basic dimensions	4.2	Mast height (closed)	h ₁ mm	3,820	3,920	3,820	3,920	
	4.4	Lift	h ₃ mm	5,500				
	4.5	Extended mast height	h ₄ mm	6,650	6,750	6,650	6,750	
	4.7	Height of overhead guard	h ₆ mm	2,461				
	4.8	Seat height/standing height	h ₇ mm	1,360				
	4.19.2	Total length (without load)	mm	3,492	3,780	3,425	3,711	
	4.20	Length to face of forks	l ₂ mm	3,176	3,475			
	4.21	Overall width	b ₁ /b ₂ mm	1,210 / 1,450	1,210 / 1,450	1,210 / 1,210	1,210 / 1,250	
	4.22	Fork dimensions	s/e/l mm	40 / 120 / 1,200	50 / 120 / 1,200	60 / 180 / 1,200	60 / 180 / 1,200	
	4.23	Fork carriage ISO 2328, class/type A, B		2A	2A			
	4.24	Fork carriage width	b ₃ mm	880	880	0	0	
	4.25	Width across forks	b ₅ mm	845	845	540	540	
	4.29	Reach, sideways	mm	1,290	1,290	1,300	1,300	
	4.31	Floor clearance with load under mast	m ₁ mm	80				
	4.32	Ground clearance, centre of wheelbase	m ₂ mm	85				
	4.33.16	Working aisle width for 1200 x 800 pallet	Ast mm	1,600	1,600	1,400	1,450	
	4.35	Turning radius	W _a mm	2,135	2,460	2,135	2,460	
4.38.4	Pallet width	mm	800					
4.38.5	Pallet length	mm	1,200					
4.38.7	Inner clearance height of operator compartment	mm	1,518					
Performance data	5.1	Travel speed, laden/unladen		km/h 10.5 / 10.5				
	5.2	Lift speed, laden/unladen		m/s 0.45 / 0.46	0.45 / 0.46 ²⁾	0.45 / 0.46	0.45 / 0.46 ²⁾	
	5.3	Lowering speed, laden/unladen		m/s 0.48 / 0.48				
	5.4	Reaching speed, laden/unladen		m/s 0.3 / 0.3 ³⁾				
	5.10	Service brake		regenerative				
	5.11	Parking brake		electric spring-loaded				
Electrics	6.1	Drive motor, output S2 60 min.		kW 7.6				
	6.2	Lift motor, output at S3 25%		kW 21.0				
	6.3	Battery as per DIN 43531/35/36 A, B, C, no		3 PzS 465	5 PzS 775	3 PzS 465	5 PzS 775	
	6.4	Battery voltage/nominal capacity K5		V/Ah 80 / 465	80 / 775	80 / 465	80 / 775	
	6.5	Battery weight		kg 1,238	1,863	1,238	1,863	
Misc.	8.1	Type of drive control		AC Control				
	8.4	Sound pressure level at operator's ear as per EN 12053		dB (A) 65				
	8.6	Steering		electric				

¹⁾ For F (low profile telescopic forks) 1000 kg

²⁾ In connection with performance package to 0.52 m/s

³⁾ possible in connection with performance package to 0.4 m/s

ETX 513/515

Standard values for aisle widths (mm)					
with rail guidance					
Pallet size [mm]	Stacking depth	Ast	Ast/ theoretical VDI		Ast Practical
Sideshift version			ETX 513	ETX 515	
1200 x 800	1200	1600	3538	3820	+500
1200 x 1200	1200	1600	3689	3971	+500
800 x 1200	800	1300	3891	4173	+500
Version with telescopic forks			ETX 513 T/F	ETX 515 T/F	
1200 x 800	1200	1400	3698	3986	+500
with wire guidance					
Pallet size [mm]	Stacking depth	Ast	Ast/ theoretical VDI		Ast Practical
Sideshift version			ETX 513	ETX 515	
1200 x 800	1200	1705	3538	3820	+1000
1200 x 1200	1200	1705	3689	3971	+1000
800 x 1200	800	1370	3891	4173	+1000
Version with telescopic forks			ETX 513 T/F	ETX 515 T/F	
1200 x 800	1200	1450	3698	3986	+1000

ETX 513/515

Standard mast designs ETX 513/515							
	Lift h_3 (mm)	Lowered mast height h_1 (mm)		Free lift h_2 (mm)		Extended mast height h_4 (mm)	
		ETX 513	ETX 515	ETX 513	ETX 515	ETX 513	ETX 515
ZT	3000	2570	2670	-	-	4150	4250
	3500	2820	2920	-	-	4650	4750
	4000	3070	3170	-	-	5150	5250
	4500	3320	3420	-	-	5650	5750
	5000	3570	3670	-	-	6150	6250
	5500	3820	3920	-	-	6650	6750
	6000	4070	4170	-	-	7150	7250
	6500	4320	4420	-	-	7650	7750
	7000	4570	4720	-	-	8150	8250
	7500	4820	4970	-	-	8650	8750
	8000	5070	5220	-	-	9150	9250
	8500	-	5470	-	-	-	9750
9000	-	5720	-	-	-	10250	
DZ	5500	2900	-	1750	-	6650	-
	6000	3100	3200	1950	1950	7150	7250
	6500	3300	3400	2150	2150	7650	7750
	7000	3500	3600	2350	2350	8150	8250
	7500	3700	3800	2550	2550	8650	8750
	8000	3900	4000	2750	2750	9150	9250
	8500	4100	4200	2950	2950	9650	9750
	9000	4300	4400	3150	3150	10150	10250
	9500	4500	4600	3350	3350	10650	10750
	10000	4700	4750	3550	3500	11150	11250
	10500	-	4950	-	3700	-	11750
	11000	-	5100	-	3850	-	12250
	11500	-	5300	-	4050	-	12750
	12000	-	5450	-	4200	-	13250
	12500	-	5650	-	4400	-	13750
13000	-	5800	-	4550	-	14250	

ETX 513/515



ETX standard equipment

- Sprung, adaptable and weight-adjustable operator seat with armrests.
- Pivoting operating module with overhead guard.
- Operating console adjustable in height and distance to the operator.
- Graphics-compatible display with function keys for status and service displays.
- Effortless, precise manoeuvring with electronic power-assisted steering.
- Camera/colour monitor system (5.6") for reliable stacking and retrieval.
- Integrated rack height select without 'No load' sensor.
- Diagonal travel with optimum speed profile (dependent on travel direction).
- Gentle movement at best efficiency due to stepless speed control of all drives.
- Electromagnetic spring-loaded brake acts on load and drive wheel.
- End position and transfer cushioning of all hydraulic functions.
- Manually overlaid swivelling/sideshift.
- Integrated diagnostic system with display and service interface.
- Energy recovery while braking and lowering.
- CAN-Bus networked controllers.
- 2 RFID readers for load and drive direction.

Optional equipment for the ETX

- Performance module for lifting and swivelling.
- Modular telescopic forks in various designs (standard or flat design).
- Symmetrical fork positioner for lifting loads of different sizes.
- Asymmetrical fork positioner, adjustable to load size and sideshift.
- Mechanical rail guidance in different designs.
- Wire guidance for precise control in the aisle with no mechanical loading of components.
- Enclosed cab (glass version).
- Synchronised swivelling in or outside the aisle (automatic process).
- Heating in foot-well.
- Radio with CD player and MP3 interface.
- Modular system of lift, travel and lowering cutouts.
- End of aisle control with speed reductions.
- Integrated Jungheinrich personal protection system (PPS, optional), factory-fitted integration into the safety computer.
- Impact protection (mixed operation of 2 trucks in the aisle).
- warehouseNAVIGATION for semi-automatic approach within the aisle.
- LED working lights and LED interior lighting.

- Different designs of converter (e.g. power supply for terminals, printers etc.).
- DIN A4 writing pad.
- Document holder.
- Rack height select plus automatic stacking with active reach control.
- Optional no load sensor in the fork tips or on load handler.
- Jungheinrich radio data terminals with mechanical and electrical interface for material flow management systems.
- Laser scanner including bracket.
- Jungheinrich Information System for Truck Management (ISM).

Built-in charger and busbar

Wherever high throughputs are required in two or three-shift operations, busbar systems have really proven themselves:

- Power supply of the truck and battery charging in narrow aisles.
- Built-in charger.
- Three-shift operation without having to change the battery.
- No replacement batteries, no charging station, no time lost replacing batteries.
- Closed busbar for optimum protection and low contamination.
- Low installation height due to open busbar.

ETX 513/515



High level of efficiency from 'manual' to 'automatic'

The ETX can be adapted for use in any warehouse or for any application thanks to its modularity and innovative control technology. Irrespective of whether your warehouse is manual, semi-automatic or fully automatic, the ETX has the appropriate technology on board:

- RFID technology for truck positioning in narrow aisles.
- Inductive guidance with multi-frequency control.
- In-aisle travel distance and height measuring.
- Active reach control and correction of the backward mast tilt.
- warehouseNAVIGATION with precise approach and automatic stacking.
- Load handling alternatively by swiveling sideshift or telescopic forks.

Modules for automation

- Automation computer with radio module for data transfer.

- System interface for communication with warehouse management computer.
- Apron navigation by means of inductive guidance and cornering by RFID control.
- Redundant safety cutouts via activation frequency or warehouse management computer.
- Precise positioning for safe lifting of loads.
- Optional with centering frame, perimeter monitoring and gap check (telescopic forks).
- No-load sensor
- Built-in charger with busbar operation, for three-shift operation without battery exchange
- Personal protection system (PPS)

Prerequisites for automation

When justifying automation and the requirements which are necessary, our system consultants should be approached in advance of a project. Here are a few examples of what is to be considered:

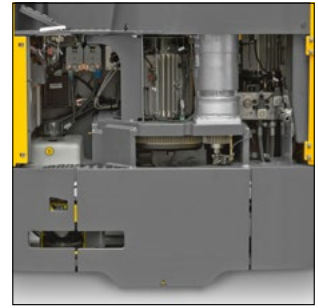
- Warehouse control and processes must be configurable for an automated system (warehouse management computer, warehouse management system).
- Configure warehouse environment accordingly (materials handling equipment, defined transfer positions).
- Uniform loads if possible (max. 2 loads; observe the quality of the load carrier).
- Observe tolerances for floors and racking systems.
- Area security and access monitoring.
- Maximum lift heights on request.

Design, commissioning and service from a single source

We offer you:

- Design, planning and development.
- Material flow, capacity planning and calculation of economic efficiency.
- Fork lift trucks and racking.
- Hardware and software for warehouse management and control.
- Design and commissioning.
- Service and support for all system components.

Benefit from the advantages



Pioneer of 3-phase AC technology

Over 150,000 Jungheinrich 3-phase AC trucks are in use all over the world. This depth of knowledge is reflected in today's drive and control technology:

- Excellent productivity.
- Low energy consumption.
- Effective thermal economy.
- Reduced maintenance and wear.

High throughput levels

- 3-phase AC motors with high torque.
- Excellent acceleration, rapid lift, dynamic ancillary movements.
- Quiet swivelling reach system with high reaching speed.
- Travel direction and height-dependent diagonal travel speed profiles.
- Fast working cycles with synchronised swivel (optional).

Cost-effective energy management

- Doubled energy recovery through regenerative braking and lowering.
- Longer operating times with one battery charge (up to 2 shifts).
- Shorter charging times.
- Active energy / battery management.
- Longer battery life.

- Battery rollers for rapid battery replacement.

RFID ground control (standard)

- Truck control with transponder technology.
- Permanent route measuring for precise identification of all warehouse areas.
- High flexibility regarding switching and safety functions (end of aisle control, lift/travel cutouts, speed reductions).
- Travel speeds optimised according to the floor topology.

Control and CAN-Bus system

- All functions are adjustable.
- Electronically controlled drive wheel brake and wear-free electromagnetic multi-plate brake on the load wheels (ETX 515).

Commissioning and maintenance

- Quick and reliable commissioning through teach-in process.
- 1000 operating hours service interval.
- Electronics with non-wearing sensor system.

- Gear oil in maintenance-free swing bearing does not require replacement during life of the part.

Reliable operation – high availability

- Robust and maintenance-free 3-phase AC drives with wear-free parts.
- 70% fewer cables and plugs due to CAN-Bus.
- Extremely torsion-resistant mast for high residual capacities and low mast sway.

warehouseNAVIGATION (optional)

- Linking the ETX to a warehouse management system (WMS) via radio data terminal or scanner.
- Direct acceptance of the destination in the narrow aisle by the truck computer.
- Automatic vertical positioning.
- Automatic horizontal position control system.
- Automatic stacking operation.
- Effective twin cycles.
- RFID location detection prevents trucks travelling to incorrect destinations.
- Maximum flexibility in the warehouse, as the existing WMS can be modified to cater for warehouse extensions.

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The German production facilities in Norderstedt, Moosburg and Landsberg are certified. **ISO 9001**
ISO 14001

Jungheinrich fork lift trucks meet European safety requirements.



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