

Ergonomics: new operating concept for greater adjustability of the operator console.

Intelligence: RFID technology as standard for easy system integration and future-proof assurance.

Efficiency: New AC motors ensure optimum performance with low energy consumption.

Flexibility: A choice of performance packages and assistance systems for optimised performance.

Technology leader: System for vibration damping for improved safety and performance on uneven floors (optional for Series 5 EKK).



## **EKK 410/412/514/516k/516**

**Electric order picker/tri-lateral stacker (1,000/1,200/1,400/1,600 kg)**

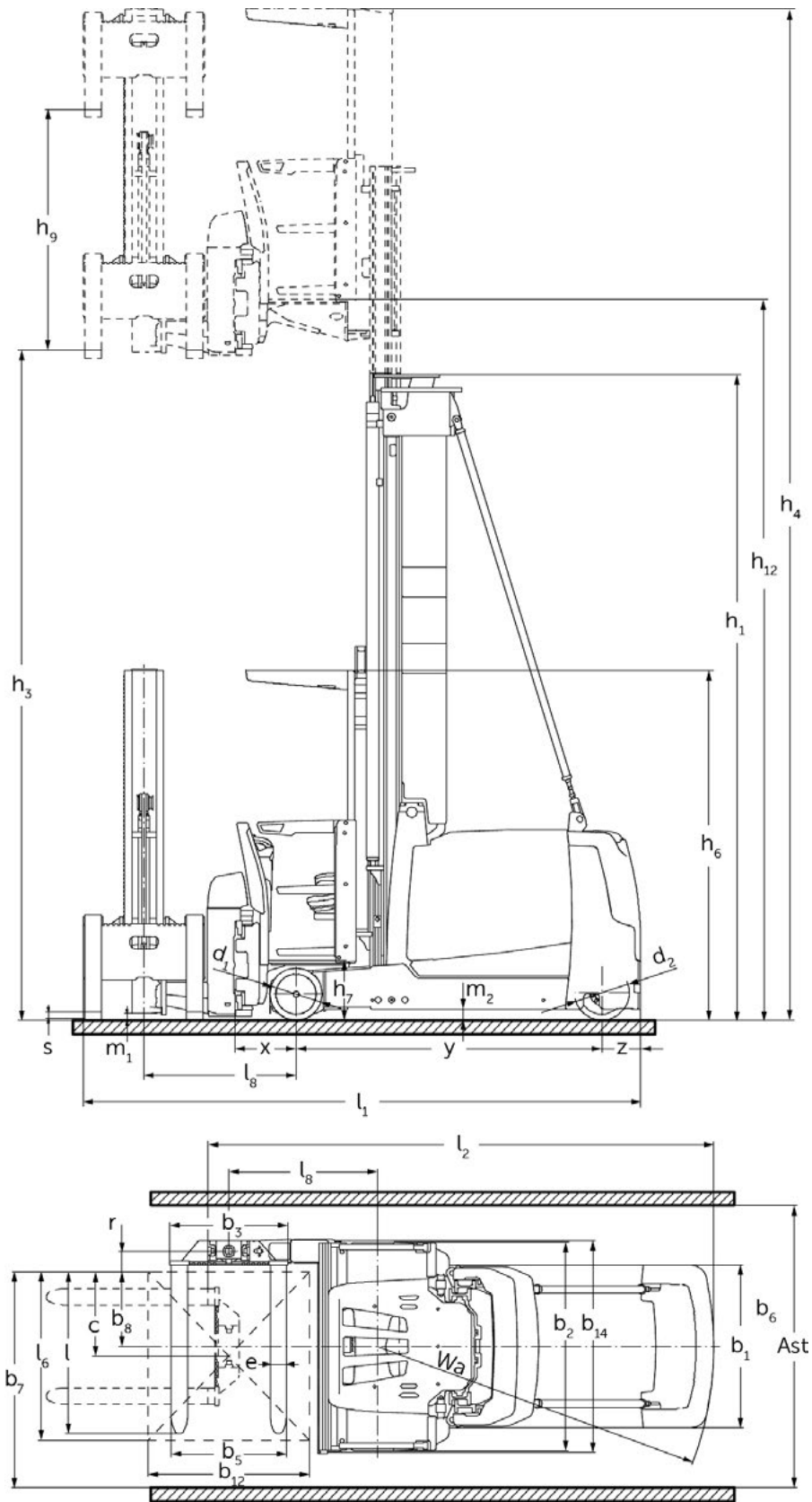
Our EKK has been the industry benchmark for years. The Series 4 with a 48-volt synchronous drive is ideal for maximum efficiency in the medium lift segment, while the Series 5 – equipped with an 80-volt synchronous drive – guarantees maximum performance with lift heights up to 17.5 metres. The new maintenance-free synchronous reluctance motors offer you completely new performance dimensions and reduce the energy loss by up to a further 10 percent. With top performance data at minimal consumption, the EKK can operate for two shifts without a battery change, even in demanding applications. For more pallets per hour and even longer operating times. The EKK 5 is also fitted with the innovative new vibration damping system, which provides you with more safety and performance, even on uneven floors. Advanced RFID tracking increases flexibility and adapts travel speeds optimally to your warehouse topology. This makes the EKK your reliable partner for manual, semi-automated or

fully automated applications. Our Warehouse Navigation also prevents stacking errors and increases throughput by up to 25 percent. Whatever challenges you face in the future, the system will remain flexible and prepared for everything. With our new modular performance and assistance packages you can adapt the truck characteristics optimally to a wide variety of applications at any time.

The new sideshiftPLUS system also gives you more options for handling different pallet sizes. The up to 200 kg increase in basic rated capacity enables more capacity at higher lift heights than its predecessor, meaning different pallet sizes no longer represent an issue.

The Series 5 EKK is also available as a fully automated truck.

# EKX 410/412/514/516k/516



# Technical data in line with VDI 2198

		Jungheinrich								
		EKX 410	EKX 412	EKX 514	EKX 516k	EKX 516				
<b>Identification</b>	1.1	Manufacturer (abbreviation)								
	1.2	Model								
			<b>Rail-guided</b>							
	1.3	Drive	Electric							
	1.4	Manual, pedestrian, stand-on, seated, order picker operation	order picker tri-lateral stacker							
	1.5	Load capacity/rated load	Q	t	1	1.2	1.4	1.6	1.6	
	1.6	Load centre distance	c	mm	600					
	1.8	Load distance	x	mm	450	450	445	445	445	
	1.9	Wheelbase	y	mm	1,807	1,807	1,840	1,950	2,220	
	1.10	Centre of drive wheel/counterweight	z	mm	320	320	282	282	282	
<b>Weights</b>	2.1.1	Net weight incl. battery (see row 6.5)			kg	5,895	5,895	6,350	6,750	7,900
	2.2	Axle load with load front/rear			kg	5,400 / 1,705	5,400 / 1,705	5,720 / 1,880	6,190 / 2,060	6,590 / 2,810
	2.3	Axle load without load front/rear			kg	3,450 / 2,445	3,450 / 2,445	3,850 / 2,500	3,980 / 2,770	4,480 / 3,420
<b>Wheels / frame</b>	3.1	Tyres	Bestthane							
	3.2	Tyre size, front			mm	Ø 295 x 144	Ø 295 x 144	Ø 380 x 192	Ø 380 x 192	Ø 380 x 192
	3.3	Tyre size, rear			mm	Ø 343 x 110	Ø 343 x 110	Ø 400 x 160	Ø 400 x 160	Ø 400 x 160
	3.5	Wheels, number front/rear (x = driven wheels)				2 / 1 x	2 / 1 x	2 / 1x	2 / 1x	2 / 1x
	3.6	Tread width, front	b <sub>10</sub>	mm	1,106	1,106	1,258	1,258	1,258	
	<b>Basic dimensions</b>	4.2	Mast height (lowered)	h <sub>1</sub>	mm	2,850	2,850	2,955	2,955	2,955
4.4		Lift	h <sub>3</sub>	mm	3,500					
4.5		Extended mast height	h <sub>4</sub>	mm	6,050					
4.7		Height of overhead guard	h <sub>6</sub>	mm	2,550					
4.8.1		Standing height	h <sub>7</sub>	mm	430					
4.11		Auxiliary lift	h <sub>9</sub>	mm	1,780					
4.14		Standing height raised	h <sub>12</sub>	mm	3,930					
4.19		Overall length	l <sub>1</sub>	mm	3,665	3,665	0	0	0	
4.19.2		Total length (without load)			mm	0	0	3,665	3,775	4,045
4.20		Length to face of forks	l <sub>2</sub>	mm	3,369	3,369	3,379	3,489	3,759	
4.21		Overall width	b <sub>1</sub> /b <sub>2</sub>	mm	1,210 / 1,450					
4.22		Fork dimensions	s/e/l	mm	40 / 120 / 1,200	40 / 120 / 1,200	50 / 120 / 1,200	50 / 120 / 1,200	50 / 120 / 1,200	
4.23		Fork carriage ISO 2328, class/type A, B	2B							
4.24		Fork carriage width	b <sub>3</sub>	mm	880					
4.25		Width across forks	b <sub>5</sub>	mm	856					
4.29		Reach, sideways			mm	1,300				
4.30		Reach, sideways from centre of truck			mm	480				
4.31		Floor clearance with load under mast	m <sub>1</sub>	mm	80					
4.32		Ground clearance, centre of wheelbase	m <sub>2</sub>	mm	80					
4.33.6		Aisle width for pallets 1200 x 1200	Ast	mm	1,640					
4.35		Turning radius	W <sub>a</sub>	mm	2,122	2,122	2,122	2,232	2,502	
4.38	Distance swivelling fork pivot point			mm	1,103					
4.38.1	Total lift			mm	5,280					
4.38.2	Order picking height			mm	5,530					
4.38.3	distance swivelling forks pivot-point to steering rack			mm	653	653	658	658	658	
4.38.4	Pallet width			mm	1,200					
4.38.5	Pallet length			mm	1,200					
4.38.6	Clear width of operator entrance			mm	490					
4.38.7	Inner clear height of operator compartment			mm	2,100					
4.38.8	Outer width of operator compartment			mm	1,440					
4.38.9	Width of swivel reach frame			mm	1,440					
4.38.10	Wide jib			mm	172					
4.38.11	Distance swivelling forks pivot-point to back of forks			mm	144	144	154	154	154	
<b>Performance data</b>	5.1	Travel speed, laden/unladen			km/h	10.5 / 10.5 <sup>1)</sup>	10.5 / 10.5 <sup>1)</sup>	10.5 / 10.5	12 / 12 <sup>4)</sup>	12 / 12 <sup>4)</sup>
	5.2	Lift speed, laden/unladen			m/s	0.4 / 0.4	0.4 / 0.4	0.45 / 0.45	0.6 / 0.6 <sup>3)</sup>	0.6 / 0.6 <sup>3)</sup>
	5.3	Lowering speed, laden/unladen			m/s	0.4 / 0.4	0.4 / 0.4	0.5 / 0.5	0.5 / 0.5	0.5 / 0.5
	5.4	Traverse speed w. / w.o. load			m/s	0.4 / 0.4	0.4 / 0.4	0.4 / 0.5 <sup>2)</sup>	0.4 / 0.5 <sup>2)</sup>	0.4 / 0.5 <sup>2)</sup>
	5.10	Service brake			regenerative					
	5.11	Parking brake			electric spring-loaded					
<b>Electrics</b>	6.1	Drive motor, output S2 60 min.			kW	6.9	6.9	9.0	9.0	9.0
	6.2	Lift motor, output at S3 15%			kW	10.0	10.0	25.0	25.0	25.0
	6.3	Battery as per DIN 43531 /35/36 A, B, C, no				6 PzS 750	6 PzS 930	3 PzS 465	4 PzS 620	6 PzS 930
	6.4	Battery voltage/nominal capacity K5			V/Ah	48 / 750	48 / 930	80 / 465	80 / 620	80 / 930
	6.5	Battery weight			kg	1,011	1,388	1,238	1,558	2,178
<b>Misc.</b>	8.1	Type of drive control			AC Synchron-Reluktanz					
	8.4	Sound pressure level at operator's ear as per EN 12053			dB (A)	64				
	8.6	Steering			electric					

<sup>1)</sup> possible in connection with performance package to 10.5 km/h

<sup>2)</sup> With performance package (standard 0.4 / 0.4)

<sup>3)</sup> With performance package (standard 0.5 / 0.5)

<sup>4)</sup> With performance package (standard 10.5 / 10.5)

# EKX 410/412/514/516k/516

EKX 410 / EKX 412				
Standard values for working aisle widths (mm)				
with rail guidance				
Pallet size [mm]	Stacking depth	Ast	Ast3 / VDI theoretical	Ast* practical
1200 x 800	1200	1640	3624	+ 500
1200 x 1200	1200	1640	3983	+ 500
800 x 1200	800	1440	3987	+ 500

\* The practical intersecting aisle width is a guide value.

with wire guidance				
Pallet size [mm]	Stacking depth	Ast	Ast3 / VDI theoretical	Ast* practical
1200 x 800	1200	1720	3850	+ 1000
1200 x 1200	1200	1720	4237	+ 1000
800 x 1200	800	1490	4050	+ 1000

\* The practical intersecting aisle width is a guide value.

Standard values for working aisle widths (mm)						
with rail guidance						
Pallet size [mm]	Stacking depth	Ast	Ast3 / VDI theoretical			Ast* practical
			EKX 514	EKX 516k	EKX 516	
1200 x 800	1200	1640	3624	3734	4002	+500
1200 x 1200	1200	1640	3983	4093	4361	+500
800 x 1200	800	1440	3987	4097	4365	+500

\* The practical intersecting aisle width is a guide value.

with wire guidance						
Pallet size [mm]	Stacking depth	Ast	Ast3 / VDI theoretical			Ast* practical
			EKX 514	EKX 516k	EKX 516	
1200 x 800	1200	1720	3850	3960	4228	+1000
1200 x 1200	1200	1720	4237	4347	4615	+1000
800 x 1200	800	1490	4050	4160	4428	+1000

\* The practical intersecting aisle width is a guide value.

# EKX 410/412/514/516k/516

Standard mast designs EKX 410/412/514/516k/516											
	Lift h <sub>3</sub> (mm)	Lowered mast height h <sub>1</sub> (mm)		Free lift h <sub>2</sub> (mm)		Extended mast height h <sub>4</sub> (mm)		Overall height h <sub>3</sub> + h <sub>9</sub> (mm)		Order picking height h <sub>15</sub> (mm)	
		EKX 410	EKX 412	EKX 410	EKX 412	EKX 410	EKX 412	EKX 410	EKX 412	EKX 410	EKX 412
Duplex ZT	3000	2600	2600	-	-	5550	5550	4780	4780	5030	5030
	4000	3100	3100	-	-	6550	6550	5780	5780	6030	6030
	5000	3600	3600	-	-	7550	7550	6780	6780	7030	7030
	6000	4100	4100	-	-	8550	8550	7780	7780	8030	8030
	6500	4375	4375	-	-	9050	9050	8280	8280	8530	8530
	7000	4650	4650	-	-	9550	9550	8780	8780	9030	9030
	7500	4925	4925	-	-	10050	10050	9280	9280	9530	9530
	8000	-	5200	-	-	-	10550	-	9780	-	10030
8500	-	5475	-	-	-	11050	-	10280	-	10530	
Triplex DZ	4500	2625	2625	75	75	7050	7050	6280	6280	6530	6530
	5000	2800	2800	250	250	7550	7550	6780	6780	7030	7030
	5500	2975	2975	425	425	8050	8050	7280	7280	7530	7530
	6000	3150	3150	600	600	8550	8550	7780	7780	8030	8030
	6500	3325	3325	775	775	9050	9050	8280	8280	8530	8530
	7000	3500	3500	950	950	9550	9550	8780	8780	9030	9030
	7500	3675	3675	1125	1125	10050	10050	9280	9280	9530	9530
	8000	-	3850	-	1300	-	10550	-	9780	-	10030
8500	-	4025	-	1475	-	11050	-	10280	-	10530	

Standard mast designs EKX 514/516k/516																
	Lift h <sub>3</sub> (mm)	Lowered mast height h <sub>1</sub> (mm)			Free lift h <sub>2</sub> (mm)			Extended mast height h <sub>4</sub> (mm)			Overall height h <sub>3</sub> + h <sub>9</sub> (mm)			Order picking height h <sub>15</sub> (mm)		
		EKX 514	EKX 516k	EKX 516	EKX 514	EKX 516k	EKX 516	EKX 514	EKX 516k	EKX 516	EKX 514	EKX 516k	EKX 516	EKX 514	EKX 516k	EKX 516
Duplex ZT	3000	2705	2705	2705	-	-	-	5550	5550	5550	4780	4780	4780	5030	5030	5030
	4000	3205	3205	3205	-	-	-	6550	6550	6550	5780	5780	5780	6030	6030	6030
	5000	3705	3705	3705	-	-	-	7550	7550	7550	6780	6780	6780	7030	7030	7030
	6000	4205	4205	4205	-	-	-	8550	8550	8550	7780	7780	7780	8030	8030	8030
	7000	4805	4805	4805	-	-	-	9550	9550	9550	8780	8780	8780	9030	9030	9030
	7500	5055	5055	5055	-	-	-	10050	10050	10050	9280	9280	9280	9530	9530	9530
	8000	5305	5305	5305	-	-	-	10550	10550	10550	9780	9780	9780	10030	10030	10030
	8500	5655	5655	5655	-	-	-	11050	11050	11050	10280	10280	10280	10530	10530	10530
	9000	5905	5905	5905	-	-	-	11550	11550	11550	10780	10780	10780	11030	11030	11030
	9500	6155	6155	6155	-	-	-	12050	12050	12050	11280	11280	11280	11530	11530	11530
	10000	-	6405	6405	-	-	-	-	12550	12550	-	11780	11780	-	12030	12030
10500	-	6655	6655	-	-	-	-	13050	13050	-	12280	12280	-	12530	12530	
Triplex DZ	4000	2550	2550	2550	-	-	-	6550	6550	6550	5780	5780	5780	6030	6030	6030
	4500	2710	2710	2710	160	160	160	7050	7050	7050	6280	6280	6280	6530	6530	6530
	5000	2895	2895	2895	345	345	345	7550	7550	7550	6780	6780	6780	7030	7030	7030
	6000	3295	3295	3295	745	745	745	8550	8550	8550	7780	7780	7780	8030	8030	8030
	7000	3695	3695	3695	1145	1145	1145	9550	9550	9550	8780	8780	8780	9030	9030	9030
	7500	3895	3895	3895	1345	1345	1345	10050	10050	10050	9280	9280	9280	9530	9530	9530
	8000	4095	4095	4095	1545	1545	1545	10550	10550	10550	9780	9780	9780	10030	10030	10030
	8500	4295	4295	4295	1745	1745	1745	11050	11050	11050	10280	10280	10280	10530	10530	10530
	9000	4495	4495	4495	1945	1945	1945	11550	11550	11550	10780	10780	10780	11030	11030	11030
	9500	4695	4695	4695	2145	2145	2145	12050	12050	12050	11280	11280	11280	11530	11530	11530
	10000	-	4875	4875	-	2325	2325	-	12550	12550	-	11780	11780	-	12030	12030
	10500	-	5045	5045	-	2495	2495	-	13050	13050	-	12280	12280	-	12530	12530
	11000	-	-	5215	-	-	2665	-	-	13550	-	-	12780	-	-	13030
	11500	-	-	5395	-	-	2845	-	-	14050	-	-	13280	-	-	13530
	12000	-	-	5565	-	-	3015	-	-	14550	-	-	13780	-	-	14030
12500	-	-	5750	-	-	3200	-	-	15050	-	-	14280	-	-	14530	
13000	-	-	5950	-	-	3400	-	-	15550	-	-	14780	-	-	15030	
13500	-	-	6250	-	-	3700	-	-	16050	-	-	15280	-	-	15530	
14000	-	-	6550	-	-	4000	-	-	16550	-	-	15780	-	-	16030	
14500	-	-	6850	-	-	4300	-	-	17050	-	-	16280	-	-	16530	

# EKX 410/412/514/516k/516



## EKX standard equipment

- Cushioned comfort seat can be folded for standing or seated operation.
- Spacious, ergonomic cab with low entry/exit step.
- Control panel with electrically adjustable height/tilt and capacitive two-handed recognition.
- Graphics-compatible colour display for truck status and service information, such as the digital capacity chart. High level of flexibility thanks to soft key controls.
- Panoramic window made of safety glass for protection against draughts with a clear view of the forks.
- Upholstered knee supports with integrated storage space.
- Comfort package with efficient LED lighting for the cab and good ventilation.
- Electronic power-assisted steering for effortless, precise manoeuvring.
- Combined lifting and lowering of main and additional lift on Series 5 and combined lowering on Series 4 saves time through simultaneous movements.
- Sideshift with additional lift of 1780 mm.
- Patented regenerative lowering and braking for maximum energy recovery during operation.
- Electro-magnetic spring-loaded brake on load and drive wheel for Series 5.
- Active energy and battery management.
- Battery rollers for quick battery change.
- Non-contact two-hand control for reliable operation in narrow aisles.
- Two-channel, redundant computer system (master and safe).
- Diagonal travel with speed profiles dependent on travel direction.
- RFID-controlled system for safety switches.
- Jungheinrich curveCONTROL for reliable speed reduction when cornering.
- TÜV-certified CAN bus system for reliable data transfer and high flexibility.
- Two RFID readers for zone detection and positioning in narrow aisles.
- Integrated on-board diagnostics system for targeted service.

**Illustrations show some options.**

# EKX 410/412/514/516k/516



## Optional equipment for EKX

- 'Comfort Plus' operator seat with lumbar support and heating.
- 'Stack by light' stacking spotlights.
- 'Pick by light' picking spotlights with display of the picking direction.
- Synchronised swivelling in or outside the aisle (automatic process).
- Modular storage system with integrated drink holder.
- Rail guidance as a guidance system for high travel speeds in aisles.
- Inductive guidance system with automatic guide wire search for convenient alignment.
- Sideshift with additional lift from 2000 to 3500 mm.
- Symmetrical fork positioner for lifting loads of different sizes.
- Asymmetrical fork positioner for adjusting to load size and sideshift for comfortable picking.
- Modular telescopic forks in various designs such as standard or flat design.
- Jungheinrich logistics interface – the easy middleware for connecting to your Warehouse Management System.
- Jungheinrich radio data terminals with electrical interfaces for the Warehouse Management System.

- Jungheinrich barcode scanner including holder on the railing or overhead guard.
- Jungheinrich Information System for Truck Management (ISM Online).
- EasyAccess system for easy access via softkey, PIN code or transponder.
- drivePLUS performance package for increased travel speed.
- capacityPLUS performance package to increase the residual carrying capacity.
- positionCONTROL assistance system for semi-automated approach to the lift height.
- warehouseNAVIGATION assistance system for semi-automated approach to destination.
- autoID assistance system for automated load identification.
- operationCONTROL assistance system with display of the load weight on the screen.
- 'PPS Standard' and 'PPS plus' assistance systems with integrated personal protection systems.
- "PPS Anti Collision" assistance system with integrated personal protection and collision avoidance system for the use of multiple vehicles at the same time.

- floorSPOT assistance system as a visual warning signal for pedestrians.

## Optional equipment for Series 5 EKX

- Cushioned operator seat with optimum damping properties.
- Heating in cab.
- Enclosed cab in the glass version (as comfort solution for chill store).
- Overhead guard height up to 2,200 mm for more headroom.
- speedprofilePLUS performance package for weight-based optimisation of the speed profiles.
- liftPLUS performance package for increased lift speed.
- floorPRO performance package – the system for vibration damping.
- sideshiftPLUS performance package with an additional reach distance of +100 mm.

## Optional equipment for Series 4 EKX

- Comfort seat with adjustable armrests

Illustrations show some options.

# Benefit from the advantages

## Ergonomics

- Comfortable and fast entering and exiting through the lowest entry step in its class.
- Generous space for ample freedom of movement. Increase in cabin depth and height (optional).
- Large panoramic window with optimum view of fork tips for reliable lifting of loads.
- Control panel with electrically adjustable tilt for optimum operating position.
- Upholstered knee supports with integrated storage space for comfortable picking.
- Relaxed sitting and comfortable standing with sprung, adjustable and foldable comfort seat.
- Large colour display with all the important information available at a glance.
- Modular storage and holder system (optional).

## Intelligent stacking

- 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 mast backward tilt.
- warehouseNAVIGATION with precise approach and automatic stacking.
- Load handling by sideshift or telescopic forks.

## Maximum efficiency

- New motor technology: AC drives cut energy loss in half, allowing for even longer operating times.

- Double energy recovery during braking and lowering with maximum effectiveness due to patented hydraulic valve technology.
- Compact hydraulics with short distances and lower resistance for less energy consumption.
- Compactly electronics means fewer cables and plugs and all components (motors, controllers and software) optimally matched.
- Active battery and energy management reduces peak currents and reduces the load on the battery and components.
- High-performance capability lasting two shifts without battery change

## Flexibility

- With our optional modular performance packages you can be equipped for every application.
- Modular performance packages offer the optimum adaptation to your operating requirements.
- Various assistance systems increase process reliability and safe time in pallet handling.

## Optional performance package: Floor Pro for Series 5

- Innovative system for vibration damping.
- Reduces swaying of the truck from side to side.
- Smoother and faster driving on uneven surfaces.

## Optional performance package: sideshiftPLUS for Series 5

- The active sideshiftPLUS (optional) extends the reach distance by 100 mm and makes it possible to handle different load sizes.

## Optional assistance system: warehouseNAVIGATION

- Up to 25% greater throughput in narrow aisles.
- Easy to set up a connection from the EKX to your Warehouse Management System with the Jungheinrich logistics interface.
- Target position is transferred direct to the truck control system.
- Automatic vertical positioning.
- Automatic horizontal position control system.
- Automatic stacking operation.
- Effective twin cycles.
- Automatic confirmation to the Warehouse Management System increases process reliability and saves time. The security scan is eliminated.
- Maximum flexibility in the warehouse, as the existing Warehouse Management Systems can be modified to cater for warehouse extensions.

## Commissioning and maintenance

- Quick and reliable commissioning through teach-in process.
- The integrated diagnostic system allows for fast and accurate fault diagnosis.
- 1000 operating hours maintenance interval for high truck availability.
- Maintenance-free AC motors and wear-free sensor systems ensure a high level of operational safety and reliability.

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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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