

**48 V 3-phase AC technology
for high performance
and productivity**

**Excellent economic
efficiency through
energy reclamation**

**Excellent reliability
through AC drive control
and CAN-Bus**

**Optimised operator
control through modular
workplace concept**

**Broad application spectrum
through walk-on load section
or additional lift**



EKS 310

Vertical order picker (1000 kg)

The order picker of the range EKS 310 with 48V 3-phase AC technology, 1000 kg capacity and order picking heights up to 10,390 mm present top performance in the high-rack warehouse. The EKS 310 is designed for picking single articles from the racking. The facility to ergonomically optimise order picking from a walk-on load section or via an additional lift increases both flexibility and economic efficiency. The EKS 310k is specifically designed for the medium performance segment. Its compactness provides maximum manoeuvrability. This high efficiency is available to the operator for effortless operation: The

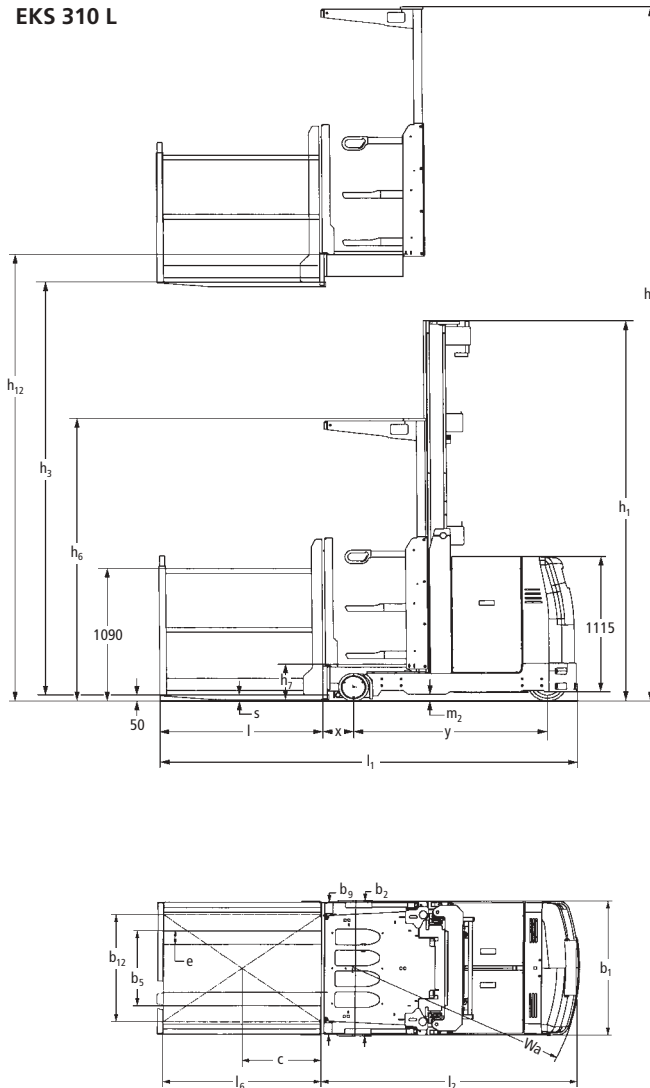
clearly arranged cab provides a generously dimensioned workplace. Large depositing areas, clear contours and the choice of various operating directions make work significantly more pleasant and consequently faster. At the centre of the effective operating concept is the two-piece operating console and the large display. With a number of innovative performance characteristics, they define technologically advanced system ergonomics:

- Operating arrangement in the drive direction, the load direction, both or diagonal.

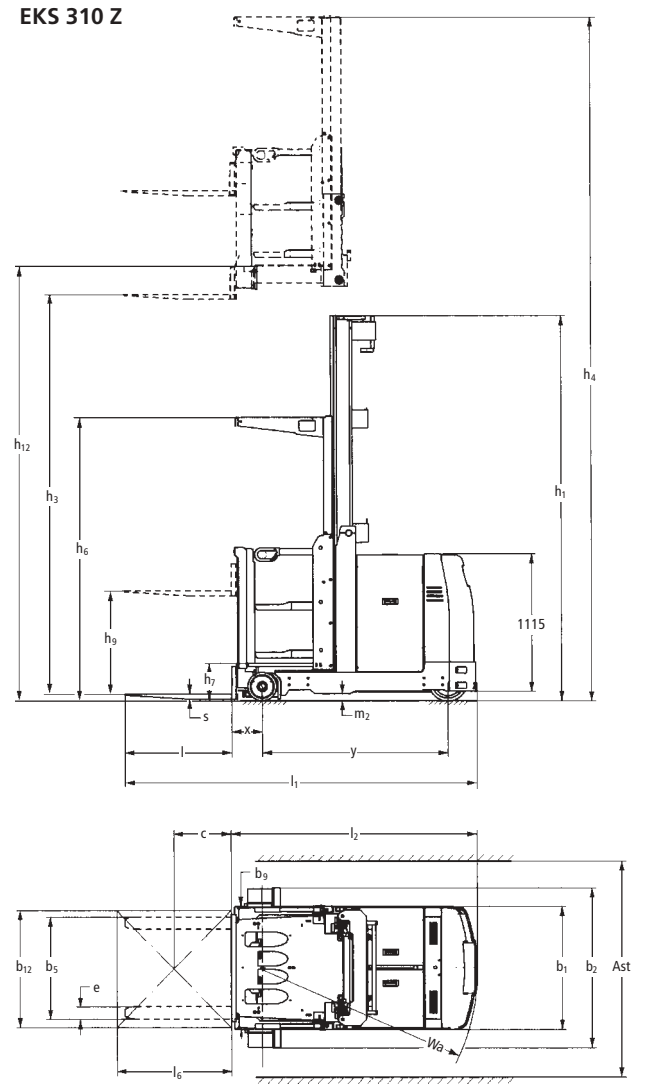
- Information transmission via graphic display. Important operating data is quickly and legibly displayed in pictograms.
- Individually adjustable steering characteristics and degree of steering lock.
- Travel control via thumb movement on multi-function lever for safe hold during acceleration and braking.
- Two-handed operating concept for first class safety and operating comfort. Switch-free sensors register the operator's touch and pass this information to the onboard computer where all safety-relevant checks are carried out.

EKS 310

EKS 310 L



EKS 310 Z



Standard values for working aisle widths (mm)					
with rail guidance					
pallet size	pallet width	Ast	Ast ₃ /VDI theoretical	Ast ₃ /VDI theoretical	Ast ₃ * practical
L design		EKS 310 L		EKS 310k L	
800 x 1200	1200	1600	2963	2863	+ 500
1200 x 1200	1200	1600	3372	3271	+ 500
1200 x 800	800	1200	3380	3279	+ 500
Z design		EKS 310 Z		EKS 310k Z	
800 x 1200	1200	1400	2926	2826	+ 500
1200 x 1200	1200	1400	3335	3234	+ 500
1200 x 800	800	1200	3340	3238	+ 500
with inductive guidance					
pallet size	pallet width	Ast	Ast ₃ /VDI theoretical	Ast ₃ /VDI theoretical	Ast ₃ * practical
L design		EKS 310 L		EKS 310k L	
800 x 1200	1200	1650	2963	2863	+ 1000
1200 x 1200	1200	1650	3372	3271	+ 1000
1200 x 800	800	1250	3380	3279	+ 1000
Z design		EKS 310 Z		EKS 310k Z	
800 x 1200	1200	1450	2926	2826	+ 1000
1200 x 1200	1200	1450	3335	3234	+ 1000
1200 x 800	800	1250	3340	3238	+ 1000

* the practical transfer aisle width is a reference value.

Technical Data according to VDI 2198

Identification	1.1	Manufacturer (abbreviation)	Jungheinrich	Jungheinrich	Jungheinrich	Jungheinrich	1.1	
	1.2	Manufacturer's type designation	EKS 310k L	EKS 310 L	EKS 310k Z	EKS 310 Z	1.2	
	1.3	Drive (electric – battery or mains, diesel, petrol, fuel gas, manual)	electric	electric	electric	electric	1.3	
	1.4	Type of operation (hand, pedestrian, standing, seated, order picker)	order picker	order picker	order picker	order picker	1.4	
	1.5	Load capacity/rated load	Q (t)	1.0	1.0	1.0	1.0	1.5
	1.6	Load centre distance	c (mm)	400	600	400	600	1.6
	1.8	Load distance, centre of drive axle to fork	x (mm)	327	237	337	247	1.8
	1.9	Wheelbase	y (mm)	1297	1490	1297	1490	1.9
	Weights	2.1	Service weight	kg	2800	3500	2880	3350
2.2		Axle loading, laden front/rear	kg	2900/820	3180/1170	2900/820	3180/1170	2.2
2.3		Axle loading, unladen front/rear	kg	1330/1390	1550/1720	1330/1390	1550/1720	2.3
Wheels, Chassis	3.1	Tyres (solid rubber, superelastic, pneumatic, polyurethane)	Vulkollan	Vulkollan	Vulkollan	Vulkollan	3.1	
	3.2	Tyre size, front	230x115	230x115	230x115	230x115	3.2	
	3.3	Tyre size, rear	254x100	310x100	254x100	310x100	3.3	
	3.5	Wheels, number front/rear (x = driven wheels)	2/1x	2/1x	2/1x	2/1x	3.5	
	3.6	Track width, front	b ₁₀ (mm)	1285	985	1085	985	3.6
	Basic Dimensions	4.2	Lowered mast height	h ₁ (mm)	2380	3380	2380	3380
4.4		Lift height	h ₃ (mm)	3000	5000	3000	5000	4.4
4.5		Extended mast height	h ₄ (mm)	5300	7300	5300	7300	4.5
4.7		Overhead load guard (cab) height	h ₆ (mm)	2300	2300	2300	2300	4.7
4.8		Seat height/standing height	h ₇ (mm)	290	290	290	290	4.8
4.11		Additional lift	h ₉ (mm)			840	840	4.11
4.14		Standing height, elevated	h ₁₂ (mm)	3290	5290	3290	5290	4.14
4.19		Overall length	l ₁ (mm)	2707	3210	2667	3170	4.19
4.20		Length to face of forks	l ₂ (mm)	1857	1960	1867	1970	4.20
4.21		Overall width	b ₁ /b ₂ (mm)	1000/1400	1000/1100	1000/1200	1000/1100	4.21
4.22		Fork dimensions	s/e/l (mm)	40/100/800	40/100/1200	40/100/800	40/100/1200	4.22
4.24		Fork carriage width	b ₃ (mm)			870	600	4.24
4.25		Width over forks	b ₅ (mm)	830	560	830	560	4.25
4.27		Width across guide roller	b ₆ (mm)	1500	1200	1400	1200	4.27
4.31		Ground clearance, laden, under mast	m ₁ (mm)	75	70	75	70	4.31
4.32		Ground clearance, centre of wheelbase	m ₂ (mm)	67	67	67	67	4.32
4.34		Aisle width for pallets 800 x 1200	Ast (mm)	1600		1400		4.34
		Aisle width for pallets 1200 x 800	Ast (mm)		1200		1200	
4.35		Turning radius	Wa (mm)	1530	1723	1530	1723	4.35
4.39		Total lift	h ₃ + h ₉ (mm)			3840	5840	4.39
4.40		Order picking height	h ₁₂ + 1600 (mm)	4890	6890	4890	6890	4.40
4.42	Pallet width	b ₁₂ (mm)	1200	800	1200	800	4.42	
4.43	Pallet length	l ₆ (mm)	800	1200	800	1200	4.43	
4.44	Clear width driver compartment entrance	(mm)	530	530	530	530	4.44	
4.45	Clear driver compartment height inside	(mm)	2000	2000	2000	2000	4.45	
4.46	Driver compartment width outside	b ₉ (mm)	1400	1000	1200	1000	4.46	
	Platform length/height protection device/platform width	(mm)	850/1090/1400	1250/1090/1000				
Performance Data	5.1	Travel speed, laden/unladen (SF)	km/h	8.8/9.0	10.0/10.5	8.8/9.0	10.0/10.5	5.1
	5.2	Lift speed, laden/unladen	m/s	0.18/0.22	0.32/0.37	0.18/0.22	0.32/0.37	5.2
	5.3	Lowering speed, laden/unladen	m/s	0.31/0.28	0.34/0.33	0.31/0.28	0.34/0.33	5.3
	5.10	Service brake		reverse current/ regenerative	reverse current/ regenerative	reverse current/ regenerative	reverse current/ regenerative	5.10
	5.11	Parking brake		electric spring loaded	electric spring loaded	electric spring loaded	electric spring loaded	5.11
	E-Motor	6.1	Drive motor rating S ₂ 60 min.	kW	2	4	2	4
6.2		Lift motor rating at S ₃ 25 %	kW	3.5	9.5	3.5	9.5	6.2
6.3		Battery acc. to DIN 43531/35/36 A, B, C, no		3 EPzS 420	4 EPzS 560	3 EPzS 420	4 EPzS 560	6.3
6.4		Battery voltage, nominal capacity K _s	V/Ah	48/420	48/560	48/420	48/560	6.4
6.5		Battery weight	kg	739	933	739	933	6.5
Others	8.1	Type of drive control		AC drive control	AC drive control	AC drive control	AC drive control	8.1
	8.4	Sound level at driver's ear acc. to EN 12 053	dB(A)	65	65	65	65	8.4
	8.6	Steering		electric	electric	electric	electric	8.6

This specification sheet according to VDI regulation 2198 only provides technical values for the standard truck. Non-standard tyres, different masts, additional equipment, etc. could produce other values. Right reserved for technical changes and improvements.

Standard mast designs (mm) Two-stage mast ZT					EKS 310k	EKS 310
h_3	h_{12}	Order picking height	h_1	h_4		
2500	2790	4390	2300	4800	•	
2750	3040	4640	2300	5050	•	
3000	3290	4890	2380	5300	•	•
3250	3540	5140	2505	5550	•	•
3500	3790	5390	2630	5800	•	•
3750	4040	5640	2755	6050	•	•
4000	4290	5890	2880	6300	•	•
4250	4540	6140	3005	6550	•	•
4500	4790	6390	3130	6800		•
4750	5040	6640	3255	7050		•
5000	5290	6890	3380	7300		•
5250	5540	7140	3605	7550		•
5500	5790	7390	3830	7800		•
5750	6040	7640	3955	8050		•
6000	6290	7890	4080	8300		•
6250	6540	8140	4205	8550		•
6500	6790	8390	4330	8800		•
6750	7040	8640	4455	9050		•
7000	7290	8890	4580	9300		•
7250	7540	9140	4705	9550		•
7500	7790	9390	4830	9800		•
7750	8040	9640	4955	10050		•
8000	8290	9890	5080	10300		•
8250	8540	10140	5305	10550		•
8500	8790	10390	5530	10800		•

Standard mast designs (mm) Three-stage mast DZ					EKS 310k	EKS 310
h_3	h_{12}	Order picking height	h_1	h_4		
3500	3790	5390	2320	5820		•
4000	4290	5890	2320	6320		•
4500	4790	6390	2320	6820		•
5000	5290	6890	2483	7320		•
5500	5790	7390	2650	7820		•
6000	6290	7890	2816	8320		•
6500	6790	8390	3104	8820		•
7000	7290	8890	3354	9320		•
7500	7790	9390	3604	9820		•
8000	8290	9890	3854	10320		•
8500	8790	10390	4104	10820		•



Make use of the advantages

48 V 3-phase AC technology

Constant application of 3-phase AC technology for travel, hydraulics and steering drive is characteristic for the EKS 310. The advantages are obvious:

- Optimum energy consumption through favourable efficiency factor.
- High efficiency factor of hydraulic system through rpm control of hydraulic motor.
- Optimised thermal economy allows the use of corrosion-free, heat-resistant plastic containers for hydraulic oil.
- Excellent efficiency factor of motors.
- Dynamic movement sequences, particularly for fast order picking.
- Gentle lifting and lowering of stand-on platform provides noticeable relief for the operator.
- Reduced maintenance through omission of wear-susceptible components.

Economic efficiency

During lowering, energy is fed back into the battery – “regenerative lowering”. The energy is also fed back into the battery during braking – “regenerative braking”. The energy reclaimed in this way is available for subsequent energy consumption. The advantages:



Operating module: steering

- Longer operating times with the same battery capacity.
- Improved order picking efficiency.
- Shorter battery charging times with longer battery life at the same time.
- Lower investments for smaller batteries and lower energy costs.

Reliability

AC drive control and CAN-Bus enable EKS 310 applications to be as requirement-oriented, economical and reliable as never before. The advantages:

- Individual adjustment to every application.
- Active safety through steplessly adjustable speed profiles in narrow aisles and on aprons.
- Care of components.
- Service-friendly through repairable control boards and exchangeable interface.

Standard equipment

- Ergonomic operator cab with overhead load guard.
- Cab floor covered with snug rubber mat for comfortable standing.
- Two-piece operating console with display that has graphics capability, battery discharge monitor, operating hour meter, key switch, emergency stop switch, clock, display of lift height and steering position.
- Electric power-assisted steering.
- Travel direction dependent diagonal travel speed profiles.
- AC drive control with CAN-Bus connection.
- Wear-free regenerative braking with energy reclamation.
- Spring-loaded brake on drive wheel.
- Stepless rpm control of hydraulics aggregate.
- End position and transfer cushioning of all hydraulic functions.
- Integrated diagnostic system with display and service interface.



Operating module: travel and hydraulics

- Removable rear cover for excellent accessibility of drive unit.
- Foldable and removable battery cover for excellent accessibility to integrated battery.
- Battery rollers for sideways battery change.
- Warning flashing light during lowering and travel operation.
- Deadman switch.
- Emergency lowering of main lift under rear cover.
- Slack chain guard.

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