

Unique truck design with forward-facing seat and side-mounted mast

Exceptional visibility for a clear view of the load, racking and travel direction

Jungheinrich proprietary 3-phase AC technology in drive, lift and steering motors

Energy regeneration during braking

Energy reclamation during lowering



EFX 410–413

Turret truck (Man-down) (2200-2750 lbs.)

The EFX 410 and EFX 413 turret trucks, with 48 Volt 3-phase AC technology, 2200-2750 lbs. capacity and lift heights up to 23 feet, provide excellent performance and flexibility in very narrow-aisle warehouses. The EFX can be utilized with wire or rail guidance as well, increasing productivity and combining applications in very narrow-aisles, wide aisles and staging areas.

The EFX operator is more productive due to the spacious and ergonomic compartment, which includes a comfortable footwell for easy entry and exit, a cushioned seat with height and weight adjustments and an automotive-style pedal layout. Large storage

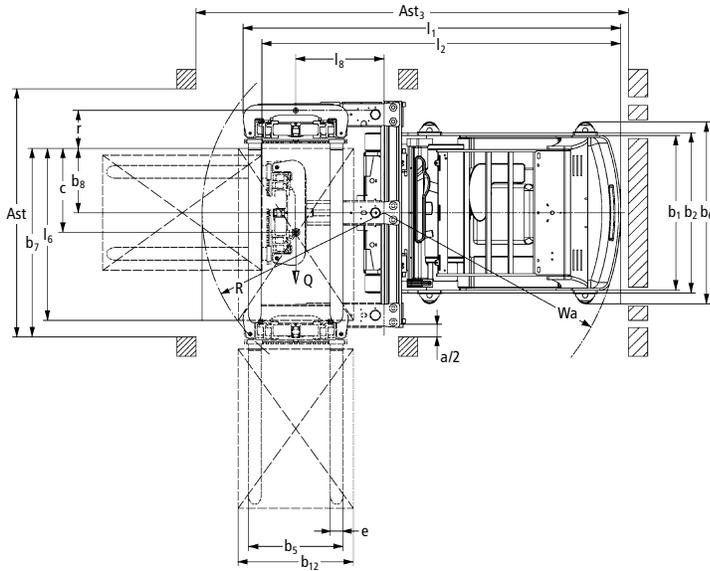
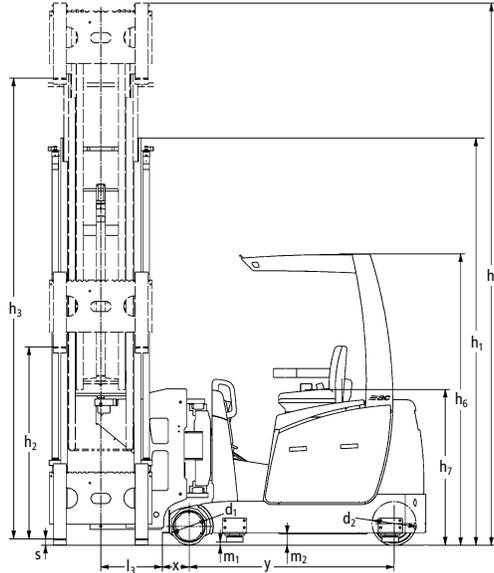
areas and a functional ergonomic design, including centrally-positioned controls, help the operator work faster and more confidently with less physical demand.

The forward-facing seat and side-mounted mast allow for unobstructed visibility of the load, travel direction, and the racking. The operating console, which has an adjustable height and angle and a large display, is at the center of effective operations. With several innovative features, the EFX defines state-of-the-art VNA technology:

- Travel and hydraulic functions are controlled via an easy thumb movement.

- Electric power steering enables precise positioning.
- Important operating data is displayed in pictograms on the large, graphic display.
- A wide range of available options ensure the truck can be configured to precisely suit the application.

EFX 410-413



Standard mast types (inches)			
Two-stage mast ZT			
Lift Height (h ₃)	Extended Mast Height (h ₄)	Collapsed Mast Height (h ₁)	Free Lift (h ₂)
118	150	91*	2.6
128	159	96	2.6
137	169	101	2.6
147	179	106	2.6
157	189	111	2.6
167	199	116	2.6
177	209	121	2.6
187	221	129	2.6
196	231	133	2.6
206	241	138	2.6
216	251	143	2.6
226	261	148	2.6
236	270	153	2.6

Standard mast types (inches)			
Three-stage mast DZ (Full free-lift)			
Lift Height (h ₃)	Extended Mast Height (h ₄)	Collapsed Mast Height (h ₁)	Free Lift (h ₂)
157	185	83*	55.5
167	195	87*	59.1
177	205	90*	62.6
187	215	94	66.1
196	225	97	69.7
206	234	101	73.2
216	244	104	76.8
226	254	108	80.3
236	264	111	83.9
246	274	115	87.4
255	284	119	90.9
265	293	122	94.5
275	303	126	98.0

* Note: overhead guard height 89.6 inches or 93.3 inches with warning light on overhead guard

Standard values for working aisle widths (inches)				
with rail guidance				
Pallet size	Stacking-in depth	Clear Aisle Width (AST)	Transfer Aisle (AST ₃) - Theoretical	Transfer Aisle (AST3) - Practical
48 x 48	48.0	69.3	146.8	+ 20.0
48 x 40	40.0	64.0**	146.8	+ 20.0
with wire guidance				
Pallet size	Stacking-in depth	Clear Aisle Width (AST)	Transfer Aisle (AST ₃) - Theoretical	Transfer Aisle (AST3) - Practical
48 x 48	48.0	72.0	148.4	+ 40.0
48 x 40	40.0	65.4	148.4	+ 40.0

* up to h₃ = 157.5 inches; +0.8 inches for h₃ > 157.5–236.2 inches; +2.8 inches for h₃ > 236.2 inches
 ** Lower values possible if lower rail guide rollers are used.
 *** The practical transfer aisle width is a reference value.

Technical Data

as of: 01/2010

Characteristics	1.1	Manufacturer (abbreviation)	Jungheinrich	Jungheinrich	1.1	
	1.2	Manufacturer's type designation	EFX 410	EFX 413	1.2	
	1.3	Drive	electric	electric	1.3	
	1.4	Type of operation	turret truck	turret truck	1.4	
	1.5	Load capacity / rated load	Q (lbs)	2200	2750	1.5
	1.6	Load center distance	c (inches)	24.0	24.0	1.6
	1.8	Load distance, center of load axle to fork face	x (inches)	8.3	8.3	1.8
	1.9	Wheelbase	y (inches)	62.8	62.8	1.9
	Weights	2.1	Service weight incl. battery (see line 6.5)	lbs	11023	11640
2.2		Axle loading, loaded front/rear	lbs	10640 / 2765	11753 / 2820	2.2
2.3		Axle loading, unloaded front/rear	lbs	7022 / 4001	7275 / 4365	2.3
Wheels/Chassis	3.1	Tires	Vulkollan	Vulkollan	3.1	
	3.2	Tire size, front	inches	11.6 x 5.7	11.6 x 5.7	3.2
	3.3	Tire size, rear	inches	13.5 x 5.5	13.5 x 5.5	3.3
	3.5	Wheels, number front/rear (x = driven wheels)		2 / 1 x	2 / 1 x	3.5
	3.6	Track width, front	b ₁₀ (inches)	55.4	55.4	3.6
	Dimensions	4.2	Collapsed mast height	h ₁ (inches)	110.4 ¹⁾	110.4 ²⁾
4.3		Free-lift	h ₂ (inches)	2.6	2.6	4.3
4.4		Lift height	h ₃ (inches)	157.5 ¹⁾	157.5 ²⁾	4.4
4.5		Extended mast height	h ₄ (inches)	188.5	188.5	4.5
4.7		Overhead guard height	h ₆ (inches)	89.6	89.6	4.7
4.8		Seat height / platform height	h ₇ (inches)	46.9	46.9	4.8
4.19		Overall length (without load)	l ₁ (inches)	125.4	125.4	4.19
4.20		Length to fork face (headlength)	l ₂ (inches)	118.4	118.4	4.20
4.21		Overall width	b ₁ / b ₂ (inches)	47.6 / 61.0	47.6 / 61.0	4.21
4.22		Fork dimensions	s / e / l (inches)	1.6 / 3.9 / 47.2	1.6 / 3.9 / 47.2	4.22
4.23		Fork carriage ISO 2328, class/type A, B		2 / B	2 / B	4.23
4.24		Fork carriage width	b ₃ (inches)	35.0	35.0	4.24
4.25		Overall fork width	b ₅ (inches)	33.5	33.5	4.25
4.30		Insert dimension from vehicle centerline	b ₈ (inches)	16.7	16.7	4.30
4.32		Ground clearance, center of wheelbase	m ₂ (inches)	3.3	3.3	4.32
4.33		Aisle width for pallets 48 x 40 (L x W)	Ast (inches)	70	70	4.33
4.35		Turning radius	Wa (inches)	72.8	72.8	4.35
4.38		Distance to swivel-forks' pivot point	l ₈ (inches)	35.2	35.2	4.38
4.42		Pallet width	b ₁₂ (inches)	40.0	40.0	4.42
4.43	Pallet length	l ₆ (inches)	48.0	48.0	4.43	
4.49	Distance: swivel-forks' pivot point to fork face	r (inches)	10.4	10.4	4.49	
Performance	5.1	Travel speed, loaded / unloaded	mph	5.6 / 5.6	5.6 / 5.6	5.1
	5.2	Lift speed, loaded / unloaded	ft/min	78.7 / 80.7	78.7 / 80.7	5.2
	5.3	Lowering speed, loaded / unloaded	ft/min	88.6 / 86.6	88.6 / 86.6	5.3
	5.4	Reaching speed, loaded/unloaded	ft/min	39.4 / 39.4	39.4 / 39.4	5.4
	5.10	Service brake		regenerative / hydraulic	regenerative / hydraulic	5.10
	5.11	Parking brake		electric spring-loaded	electric spring-loaded	5.11
Motors	6.1	Drive motor rating S2 60 min	kW/HP	4.4/5.9	4.4/5.9	6.1
	6.2	Lift motor rating at S3 15%	kW/HP	9.5/12.7	9.5/12.7	6.2
	6.4	Battery voltage, nominal capacity (at 6 hour rate)	V/Ah	48/575	48/690	6.4
	6.5	Battery weight	lbs	1887 (+/- 5%)	2228 (+/- 5%)	6.5
	Other Details	8.1	Type of drive control		3-phase AC drive control	3-phase AC drive control
8.4		Sound level at the driver's ear	dB (A)	69	69	8.4
8.6		Steering		electric	electric	8.6

1) EFX 410 with two-stage mast, 157.5" lift height and 110.4" collapsed mast height

2) EFX 413 with two-stage mast, 157.5" lift height and 110.4" collapsed mast height

The Jungheinrich Advantage



Operating console

48 Volt 3-phase AC technology

The EFX 410-413 uses constant application of 3-phase AC technology for drive, lift and steering. The advantages:

- Lower energy consumption due to excellent efficiency in all motors.
- Stepless speed control of hydraulic motor.
- Optimal heat management allows for cooler operating temperatures.
- High torque for dynamic movement.
- Reduced maintenance resulting from the omission of wear-susceptible components (carbon brushes, commutator, contacts, etc.).

Energy efficiency

During lowering of the forks or load, energy is fed back into the battery (reclamation lowering). Energy is also fed back into the system during braking (regenerative braking). This reclaimed energy significantly lowers energy consumption.

The advantages:

- Longer operating times with the same battery capacity.
- Shorter battery charging times resulting in a prolonged life.
- Reduced energy costs through the use of smaller batteries.

Reliability

AC drive control and CAN-Bus make the EFX user-friendly, application-oriented, economical and reliable. The advantages:

- Individual adjustment to suit the application.
- Adjustable speed controls for very narrow-aisles.
- Fewer maintenance components.

Standard equipment

- Ergonomic operator compartment with overhead load guard.
- Weight-adjustable seat with armrests.
- Adjustable operating console.
- Graphic display with keys for operating and service functions.
- Ergonomic, single-handed operating lever controls hydraulic functions.
- Electric power steering for precise maneuvering.
- Simultaneous travel and lift/lower with optimum speed profile based on travel direction.
- AC drive control with CAN-Bus connection.
- Mirror on overhead load guard.
- Wear-free regenerative braking.
- Spring-loaded parking brake on drive wheel.
- Hydraulic load wheel brake (wire guided only).



Hinged battery cover

- Stepless speed control of all 3-phase AC motors for smooth and efficient travel.
- Smooth operation of all hydraulic functions with cushioning at all end stops.
- Integrated diagnostic system.
- Removable rear cover for easy access to drive and lift components.
- Removable battery side panels and hinged battery cover for easy access to battery.
- Battery can be removed from either side of the truck.



Mixed Sources
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