Standard equipment/Optional equipment

Standard equipment

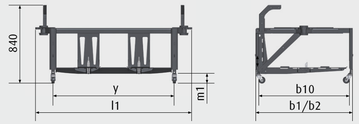
Standardized modules (Front module, main module, end module) with electrically powered lifting-spindles and shock absorbing chassis.
Different types of customized, interchangeable load carriers
Capacity of 800 kg / 1000 kg / 1600 kg /2000 kg (including load carriers)
Load-carriers equipped with castor-wheels and the possibility to lift different sizes of loads on trolleys from 400 x 600 up to 1200 x 2000 mm
Control console on truck and additional lift-operation at the module
CAN bus communication between tractor and modules
Automatic tractor drive-lock when load-carriers are lowered
Articulated steering with steering-angle extension up to 120° between 2 load-carriers and active steering against drifting in curves
Lifting unit suspension: 30mm travel at FT08/FT10, 40 mm at FT16/FT20
Adjustable lifting height: 0 – 150 mm FT08/FT10; 0 - 200 mm at FT16/20
Lifting speed max. 20 mm/s
Economical energy consumption
Tires: 3.00-4 SE at FT08/FT10; 4.00-4 SE at FT16/FT20
Power connector to tractor
Linde red/anthracite paintwork

Requires adaptation of the tractor (electrical connector, control console)

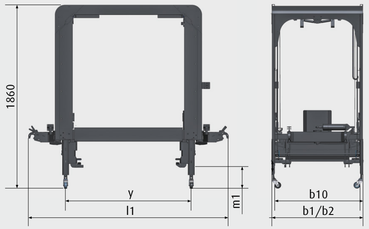
Optional equipment

Customised load carriers adapt to existing trolleys
Glide- and wear strips at trolley contact-surfaces
Other load/trolley dimensions
Alternative paintwork
Crab motion for obliquely side positioning of the train
Further options on request

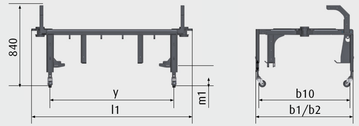
C-frame

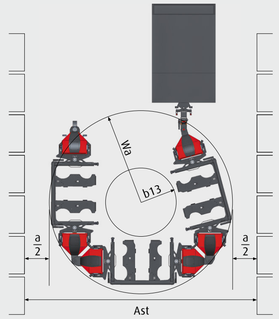


Bridge-frame



E-frame





Linde Factory Train FT08 – FT20
Capacity: 800 – 2.000 kg

BR 8960

Safety

The innovative Factory Train (FT) brings a new dimension to efficient and safe material flows for production plants. The double-swivel-axle principle ensures that all wheels remain in constant contact to the ground also on uneven surface applications. Raising goods on trolleys with the load carriers above the floor creates a load-protecting, low-noise, low-wear and safe load handling process. An integral drive-lock prevents the tractor moving with lowered load carriers.

Performance

The modular train principle with its interchangeable load carriers is an efficient and cost-effective solution for a rapid external and internal load transfer. It allows for simultaneous transport of various goods on trolleys. The articulated steering gives a best in class directional driving stability and the shock absorbing elements combined with the weather protection secure the goods from environmental impact. In case of route/requirement changes, load carriers can be swapped conveniently or combined differently to enhance the handling capacity and to keep the performance level high.

Comfort

The train with its SE- tires delivers a comfortable and smooth driving on uneven surfaces. The quiet operating electrical spindle-lifting can be pre-lowered from the tractor or operated directly from the module. Load carriers for two or three trolleys keep the train and the walking distances short and allow for a comfortable follow up on internal deliveries. This, combined with the upright standing position for opening and closing the comfort-class weather protection, offers the best possible ergonomics for the operator.

Linde Material Handling

Reliability

The FT modules and load carriers are designed for consistent reliability in demanding outdoor and indoor applications. The rugged construction of the low-maintenance modules, the backlash-free connections and the sturdy construction of the load carriers guarantee safe and stable transports for years.

Serviceability

Economy and durability of the FT modules and load carriers result in easy diagnosis and preventive maintenance. The CAN bus system enables all unit data to be read out for inspection when service is due or for the change of parameters. Easy accessibility of all components employed play an additional part in keeping train uptime up.

Product information

Directionally stable train
- Articulated steering modules for best manoeuvrability
- Choice of standard or wider wheelbase for wider trolleys/loads
- Optimized driving-behaviour: electrical steering with active curve correction
- Train designed for a superbly controlled narrow cornering

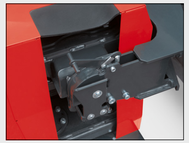
Silent
- Silent lifting and lowering due to spindle drive
- Backlash-free module connections
- SE-tires, suspension, double-swivel-axle and tight fits avoid noise generation

Serviceability
- Easily maintained basic construction
- CAN bus controller with data memory
- Wheels and rollers are easily accessible for exchange
- Suspension elements and bearings are service-friendly accessible and exchangeable

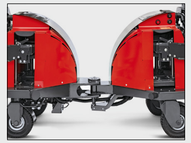
Energy management
- Energy-optimized lifting system
- Reduced rolling resistance by optimized bearings

Safety
- Drive lock function: The tractor cannot be started before the load is lifted
- Crab-motion allows a safely side positioning of the whole train
- Slow speed in curves until the last axle of the train is back in straight direction.

Operation
- Time-saving pre-lifting and pre–lowering of the load carriers operated from the control console at the tow tractor
- For on-site-control the lift can be operated directly at the module
- Console provides visual feedback of lift-units positions
- CAN bus control system avoids driving with lowered load carriers



Lifting device
- Infinitely adjustable load carrier lifting height 0 – 150 mm and up to 200 mm at FT16/FT20
- Form-fitted trolley locking
- Quiet, electrically powered recirculating ball screw spindles for lifting
- lifting units with integrated shock absorption



Module / load carrier coupling
- Unique train without drawbars but articulated steering system
- No fit tolerances between module - load-carrier connections
- Silent operating train

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Linde Material Handling

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Key characteristics (according VDI 2198)

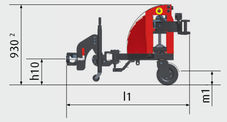
Characteristics	1.1	Manufacturer			NEUMAIER	NEUMAIER	NEUMAIER	NEUMAIER	NEUMAIER	NEUMAIER	NEUMAIER
	1.2	Model designation			Front module	Main module	Rear module	C-frame	E-frame	QS-frame/platform-frame	Bridge-frame
	1.2a	Series			8960	8960	8960	8960	8960	8960	8960
	1.5	Load capacity	FT08 / FT10 / FT16 / FT20	Q(t)	0,4 / 0,5 / 0,8/1,0	08/1,0/ 1,6/ 2,0	0,4 / 0,5 / 0,8/1,0	0,8 / 1,0 / 1,6 / 2,0	0,8 / 1,0 / 1,6 / 2,0	0,8 / 1,0 / 1,6 / 2,0	0,8 / 1,0 / 1,6 / 2,0
	1.6	Load centre		c(mm)	-	-	-	-	-	-	-
	1.8	Axle centre to fork		x(mm)	-	-	-	-	-	-	-
	1.9	Wheelbase		y(mm)	-	1175 / 1175 / 1450 / 1450	588 / 588 / 688 / 688	-	-	-	-
Weights	2.1	Service Weight	FT08 / FT10 / FT16 / FT20	(kg)	210 / 225 / 260 / 275	270 / 330 / 465 / 275	150 / 170 / 290 / 315	340 / 340 / 700 / 700	450 / 450 / 800 / 800	600 / 600 / 800 / 800	535 / 535 / 735 / 735
Wheels/Tyres	3.1	Tyres	FT08 / FT10 / FT16 / FT20		Continental SE	Continental SE	Continental SE	Polyamid support wheels	Polyamid support wheels	Polyamid support wheels	Polyamid support wheels
	3.2	Tyres size, front	FT08 / FT10 / FT16 / FT20		3.00-4 / 3,00- 4 / 4.00-4 / 4,00- 4	3.00-4 / 3,00- 4 / 4.00-4 / 4,00- 4	3.00-4 / 3,00- 4 / 4.00-4 / 4,00- 4	Ø 50	Ø 50	Ø 50	Ø 50
	3.3	Tyres size, rear	FT08 / FT10 / FT16 / FT20		3.00-4 / 3,00- 4 / 4.00-4 / 4,00- 4	3.00-4 / 3,00- 4 / 4.00-4 / 4,00- 4	3.00-4 / 3,00- 4 / 4.00-4 / 4,00- 4	Ø 50	Ø 50	Ø 50	Ø 50
	3.5	Wheels, number1	FT08 / FT10 / FT16 / FT20		2 / 4 / 2 / 4	4/ 8 / 4/ 8	3/ 5/ 3 / 5	4	4	4	4
	3.6	Track width, front		b10(mm)	620 /620/980 / 980	620 /620/980 / 980	620 /620/980 / 980				
Dimensions	4.1	Mast/fork carriage tilt, forward/backward		a/b(°)	-	-	-	-	-	-	-
	4.2	Height of mast, lowerered		h1(mm)	-	-	-	-	-	-	-
	4.4	Lift	FT08 / FT10 / FT16 / FT20	h3(mm)	150 / 150 / 200 / 200	150 / 150 / 200 / 200	150 / 150 / 200 / 200	-	-	-	-
	4.4d	Lift funktion			electrical spindle	electrical spindle	electrical spindle	-	-	-	-
	4.5	Height of mast, extended		h4(mm)	-	-	-	-	-	-	-
	4.12	Towing coupling height		h10(mm)	front side: tractor	-	-	-	-	-	-
	4.15	fork height, lowered		h(13)	-	-	-	-	-	-	-
	4.19	Overall length		l1(mm)	1377 / 1377 / 1760 / 1760	1620 / 1620 / 1850 / 1850	930 / 930 / 1075 / 1075	1615 / 1615 / 2015 / 2015	1655 / 1655 / 2055 / 2055	1830 / 1830 / 2230 / 2230	1650 / 1650 / 2300 / 2300
	4.21	Overall width	FT08 / FT10 / FT16 / FT20	b1(mm)	780 / 780/ 1200/ 1200	780 / 780/ 1200/ 1200	780 / 780/ 1200/ 1200	1105	1160	1290	1200
	4.21.6	Load Lenght	FT08 / FT10 / FT16 / FT20	l6(mm)	-	-	-	1240 / 1240 / 1680 / 1680	1240 / 1240 / 1680 / 1680	1240 / 1240 / 1680 / 1680	1240 / 1240 / 1890 / 1890
	4.21.7	Load width	FT08 / FT10 / FT16 / FT20	b12(mm)	-	-	-	850	850	850	850
	4.22	Fork dimention		s/e/l(mm)	-	-	-	-	-	-	-
	4.25	Fork spread, min/max		b5(mm)	-	-	-	-	-	-	-
	4.31	Ground clearance	FT08 / FT10 / FT16 / FT20	m1(mm)	100 / 100 / 150 / 150	100 / 100 / 150 / 150	100 / 100 / 150 / 150	125 / 125 / 175 / 175	125 / 125 / 175 / 175	150 / 150 / 200 / 200	125 / 125 / 175 / 175
	4.35	Turning radius of the train	FT08 / FT10 / FT16 / FT20	Wa(mm)	2500 / 2700	2500 / 2700	2500 / 2700				
	4.36	Minimum pivoting point distance		b13(mm)	-	-	-	-	-	-	-
Performance	5.2	Lifting speed, with/without load		(m/s)	0,02	0,02	0,02	-	-	-	-
	5.3	Lowering speed, with/without load		(m/s)	0,02	0,02	0,02	-	-	-	-
	5.7	Climbing abilitiy, with/without load		(%)	see tractor diagramm	see tractor diagramm	see tractor diagramm	-	-	-	-
	5.10	Service brake			-	-	-	-	-	-	-
	6.2	Lift motor rating at SE 15%		(kW)	-	-	-	-	-	-	-
	8.5	Towing coupling: design/type		(mm)	front: Linde, train: system Neumaier	System Neumaier	System Neumaier	System Neumaier	System Neumaier	System Neumaier	System Neumaier

[1] the load wheels of FT10 and FT 20 are fitted with twin tyres
[2] FT08/10 = 930 mm, FT 16/20 = 1067 mm

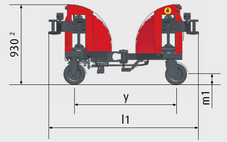
Additional details

		NEUMAIER	NEUMAIER	NEUMAIER	NEUMAIER
		FT08	FT10	FT16	FT20
Series		8960	8960	8960	8960
Application		Indoor/Outdoor	Indoor/Outdoor	Indoor/Outdoor	Indoor/Outdoor
Tractor adaptation		Power socket 48V / 80V operation panel	Power socket 48V / 80V operation panel	Power socket 48V / 80V operation panel	Power socket 48V / 80V operation panel
Chassis		swing axle / double swing axle	swing axle / double swing axle	swing axle / double swing axle	swing axle / double swing
Steering system		Articulated steering with active curve correction	Articulated steering with active curve correction	Articulated steering with active curve correction	Articulated steering with active curve correction
Suspension		standard feature, module-integrated	standard feature, module-integrated	standard feature, module-integrated	standard feature, module-integrated
Lifting speed	(mm/s)	20	20	20	20
Opening for loading/unloading					
C-frame		one side (changeable)	one side (changeable)	one side (changeable)	one side (changeable)
E-frame		one side (changeable)	one side (changeable)	one side (changeable)	one side (changeable)
Bridge type load carrier		open to both sides	open to both sides	open to both sides	open to both sides
QS-frame		open to both sides	open to both sides	open to both sides	open to both sides
Lenght of train (without tractor)	(m)			-	-
with 2 load carriers		7,20	7,20	8,75	8,75
with 3 load carriers		10,40	10,40	12,60	12,60
with 4load carriers		13,65	13,65	16,50	16,50
with 5 load carriers		16,90	16,90	20,30	20,30
Weight of train without tractor	(kg)				
with 2 load carriers		1310	1390	2415	2500
with 3 load carriers		1920	2040	3580	3710
with 4load carriers		2530	2690	4745	4920
with 5 load carriers		3140	3340	5910	6130
Load-time diagram		 Load-time diagram - Factory Train FTD-800	 Load-time diagram - Factory Train FTD-1000	 Load-time diagram - Factory Train FTD-1600	 Load-time diagram - Factory Train FTD-2000
Options					
Weather protection		√	√	√	√
weighing system		√	√	√	√
Graphical display, digital		√	√	√	√
Lighting in accordance with regulations		√	√	√	√

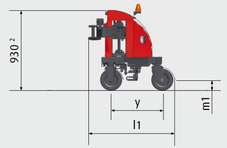
Front module

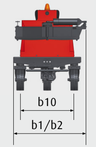


Main module



Rear module





QS-frame/platform-frame