



Linde Factory Train FT 08 – FT 20 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 in-



for opening and closing the comfort-class weather protection, offers the best possible ergonomics for the operator.

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.

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

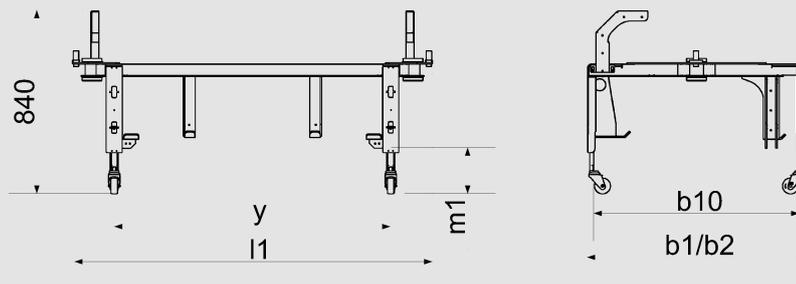
Other load/trolley dimensions

Alternative paintwork

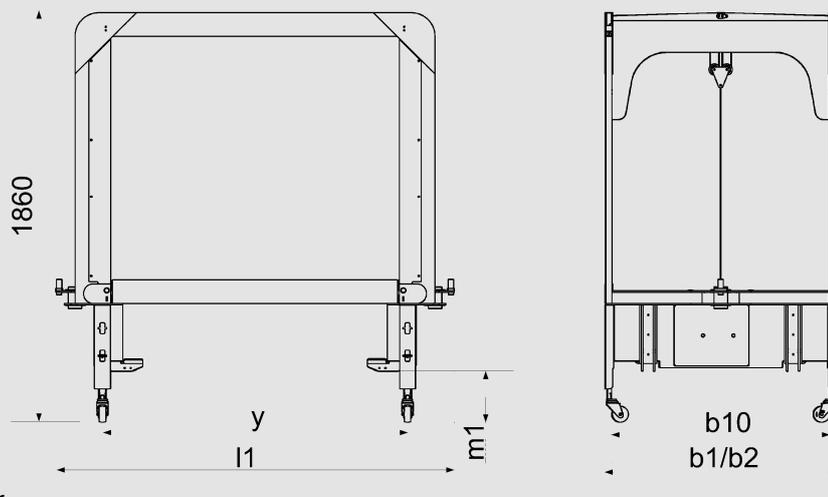
Crab motion for obliquely side positioning of the train

Further options on request

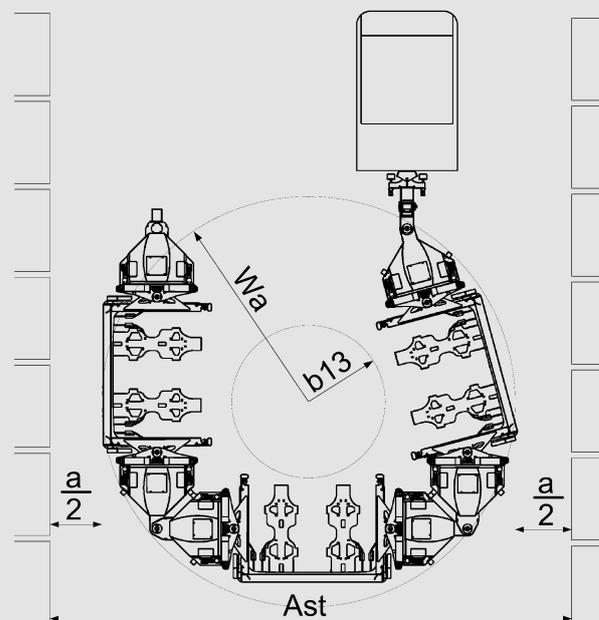
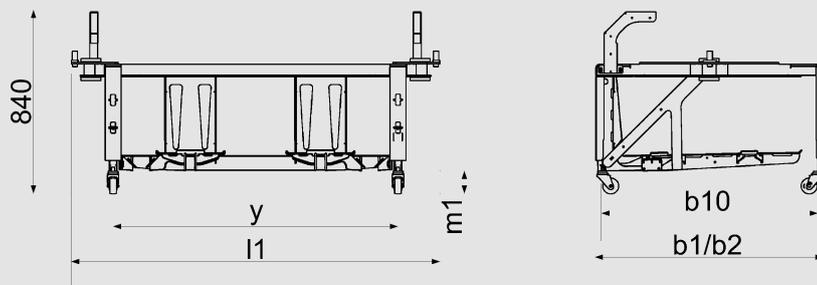
C-frame



Bridge-frame



E-frame



Key characteristics (according VDI 2198)

Characteristics	1.1	Manufacturer		NEUMAIER	NEUMAIER	
	1.2	Model designation		Front module	Main module	
	1.2a	Series		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
	1.6	Load centre		c(mm)	-	-
	1.8	Axle centre to fork		x(mm)	-	-
	1.9	Wheelbase		y(mm)	-	1035
Weights	2.1	Service Weight	FT08 / FT10 / FT16 / FT20	(kg)	180 / 200 / 210 / 230	310 / 350 / 480 / 520
Wheels/Tyres	3.1	Tyres	FT08 / FT10 / FT16 / FT20		Continental SE	Continental SE
	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
	3.3	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
	3.5	Wheels, number ¹⁾	FT08 / FT10 / FT16 / FT20		2 / 4 / 2 / 4	4/ 8 / 4/ 8
	3.6	Track width, front		b10(mm)	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
	4.4d	Lift funktion			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)	1285	1580
	4.21	Overall width	FT08 / FT10 / FT16 / FT20	b1(mm)	780 / 780/ 1200/ 1200	780 / 780/ 1200/ 1200
	4.21.6	Load Lenght	FT08 / FT10 / FT16 / FT20	l6(mm)	-	-
	4.21.7	Load width	FT08 / FT10 / FT16 / FT20	b12(mm)	-	-
	4.22	Fork dimation		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
	4.35	Turning radius of the train	FT08 / FT10 / FT16 / FT20	Wa(mm)	ca.4000 /4000 /5000 /5000	ca.4000 /4000 /5000 /5000
4.36	Minimum pivoting point distance		b13(mm)	-	-	
Performance	5.2	Lifting speed, with/without load		(m/s)	0,02	0,02
	5.3	Lowering speed, with/without load		(m/s)	0,02	0,02
	5.7	Climbing abilitiy, with/without load		(%)	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	

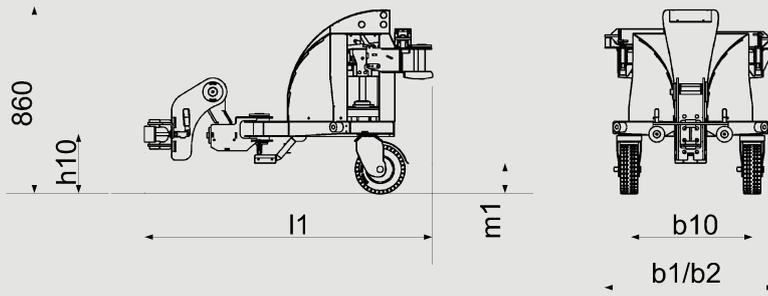
¹⁾ the load wheels of FT10 and FT 20 are fitted with twin tyres

NEUMAIER	NEUMAIER	NEUMAIER	NEUMAIER	NEUMAIER
Rear module	C-frame	E-frame	QS-frame	Bridge-frame
8960	8960	8960	8960	8960
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
-	-	-	-	-
-	-	-	-	-
495	1250	-	-	-
190 / 210 / 250 / 270	ca. 200 / 200 / 400 / 400	ca. 200 / 200 / 400 / 400	ca. 200 / 200 / 400 / 400	ca. 200 / 200 / 400 / 400
Continental SE	Polyamid support wheels	Polyamid support wheels	Polyamid support wheels	Polyamid support wheels
3.00-4 / 3,00- 4 / 4.00-4 / 4,00- 4	Ø 50	Ø 50	Ø 50	Ø 50
3.00-4 / 3,00- 4 / 4.00-4 / 4,00- 4	Ø 50	Ø 50	Ø 50	Ø 50
3/ 5/ 3 / 5	4	4	4	4
620 / 620/980 / 980				
-	-	-	-	-
-	-	-	-	-
150 / 150 / 200 / 200	-	-	-	-
electrical spindle	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
890	1620	1670	120	1720
780 / 780/ 1200/ 1200	990	1035	1150	1050
-	1220	1220	1220	1220
-	850	850	850	850
-	-	-	-	-
-	-	-	-	-
100 / 100 / 150 / 150	100	230	100	230
ca.4000 / 4000 / 5000 / 5000				
-	-	-	-	-
0,02	-	-	-	-
0,02	-	-	-	-
siehe Schlepper Diagramm	-	-	-	-
-	-	-	-	-
-	-	-	-	-
System Neumaier	System Neumaier	System Neumaier	System Neumaier	System Neumaier

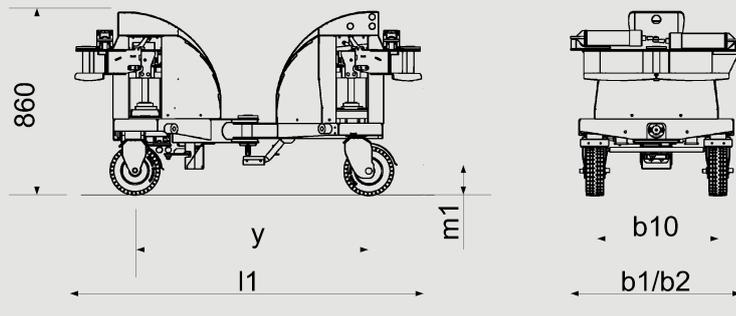
Additional details

		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			
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			
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			
QS-frame		open to both sides			
Length of train (without tractor)	(m)			-	-
with 2 load carriers		6,60	6,60	7,50	7,50
with 3 load carriers		9,80	9,80	11,00	11,00
with 4load carriers		13,00	13,00	14,50	14,50
with 5 load carriers		16,20	16,20	18,00	18,00
Weight of train without tractor	(kg)				
with 2 load carriers		770	855	1350	1425
with 3 load carriers		1120	1245	2220	2320
with 4load carriers		1470	1620	3100	3225
with 5 load carriers		1820	1970	3980	4230
Load-time diagram					
Options					
Weather protection		√	√	√	√
weighing system		√	√	√	√
Graphical display, digital		√	√	√	√
Lighting in accordance with regulations		√	√	√	√

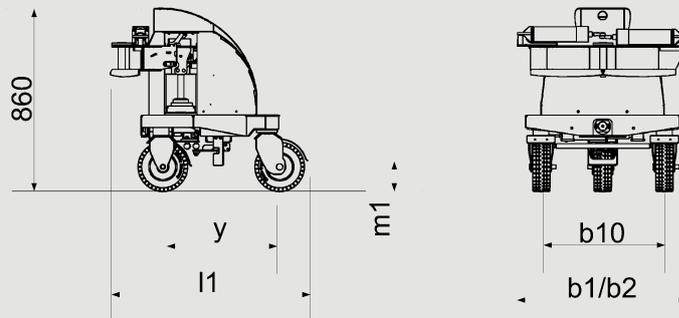
Front module



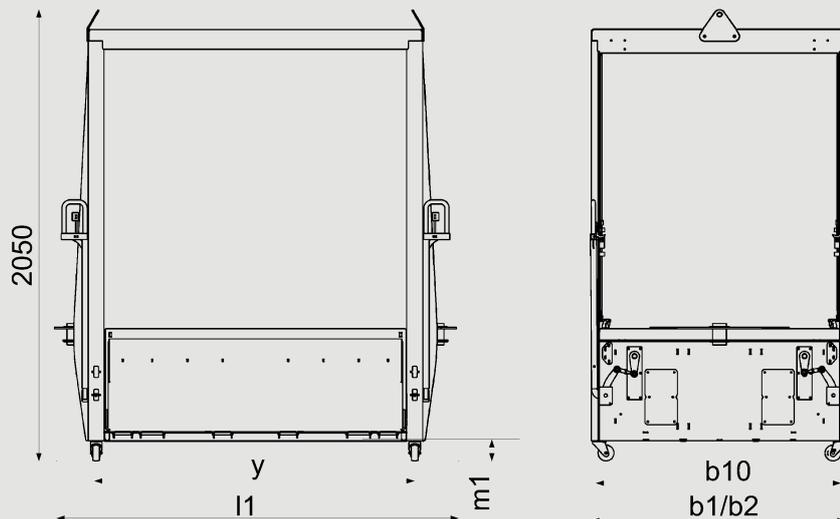
Main module



Rear module



QS-frame



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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