



## Electric Mobile Mast Reach Trucks

Capacity 3,000 to 4,500 lbs.  
R14, R16, and R20

Series 115-02 AC

Linde Material Handling

The Linde logo, featuring the word 'Linde' in a white, cursive script font, set against a red background.

### Design

The three wheel electric mobile mast reach truck models R14, R16 and R20, have been developed to meet the most arduous application requirements. Designed to achieve maximum productivity, the truck's unique features result from a thorough analysis of today's warehouse logistics. The overall design concept ensures premium operator comfort and contributes significantly to high work throughput with minimum fatigue.

The chassis has been designed to yield exceptional strength and rigidity. The rear section is constructed of a steel casting which helps to lower the center of gravity for greater stability and higher residual capacities at high lift. The operator's compartment, motors, and electronics are protected within this rugged structure; all with easy accessibility for maintenance.

### Comfort

The wide operator compartment provides excellent protection and superior ergonomics. Every aspect of form and function has been evaluated to optimize the combined efficiency of man and machine for maximum productivity. The advanced ergonomic layout of all operating controls ensures optimum comfort and efficiency. The Linde twin directional control pedals, combined with electronic traction control, enable smooth load handling and maneuverability even in confined areas. The specially designed full suspension seat supports every operational body movement, with full lateral lumbar and weight adjustments to suit every operator. The Linde Load Control (LLC) system features dual axis joystick controls for minimum operator effort and efficient, fatigue-free load handling. The comprehensive integrated display includes steering angle indicator, hour meter, battery discharge indicator with lift slowdown interlock, motor temperature, brush wear and brake fluid level indicators for cost effective planning of maintenance intervals and battery charging schedules.

Steering is controlled electronically through "steer-by-wire" technology providing extremely low steering efforts. Parameter adjustments allow the steering to be tailored to suit specific applications.

### Performance

A powerful 8.0hp AC drive motor is positioned in a fixed mounting above a turntable gear box assembly. Power is transmitted to the drive wheel via helical and bevel gear reduction. Electronically governed power reduction

when the handbrake is applied enables safe starting on grades without overloading the transmission or parking brake.

### Reliability

Linde R-Series trucks are fitted with the advanced, high frequency, Linde Digital Control (LDC) system for traction and load handling. The system reacts progressively to operator demand and provides extremely smooth movements. It also incorporates wear-free dynamic braking upon the release of either directional control pedal. Integrated diagnostics via a CAN bus connection ensures rapid servicing and maximum uptime.

### Productivity

The low-deflection clearview triple mast with tilting carriage and integral sideshifter provides a clear view at all lift heights for faster and safer load handling. The patented design uses only two hydraulic cylinders mounted behind the mast uprights. The integral outer mast and reach frame allows for superior forward visibility of the forks and load at low lift heights. The tilting carriage with an integral sideshifter fitted as standard equipment minimizes forward load movement providing high residual capacities. Internal reeving for up to four hydraulic functions eliminates the need for hose reels. Permanently sealed canted mast rollers provide precise alignment of the moving mast sections with minimal friction to ensure smooth, rapid lift/lower movements. A powerful digital controlled pump motor delivers fast lift speeds, and automatic slowdown at both ends of the reach stroke ensures smooth, safe and accurate load placement. Lift speed automatically slows down as maximum lift is reached.

# Standard and optional equipment

## Standard Equipment

AC Drive & Hydraulics

All items shown under safety

Steering indicator

Electronic controls with integrated microprocessor for infinitely variable, highly economical control of travel speeds and working hydraulics (LDC system)

Combination battery discharge indicator; when battery discharge has reached 80%, the electric power supplied to the hydraulic motor is automatically reduced

Motor temperature, brush wear and brake fluid level indicators

Two lever Linde load control - 1 lift and reach - 2 tilt and sideshift

Suspension type driver seat with fore-aft, backrest angle and operator weight adjustments

Linde twin directional control pedals

Polyurethane drive and load wheels

Load backrest extension

## Optional Equipment

R20W overall width 63 in.(1600mm)

Seat interlock alarm

CCTV

Height pre-selector (LPS)

Height indicator (LHI)

Non-standard fork lengths

Rotating beacon

Back-up alarm

Working lights

Flashing lights

Separate levers for lift, tilt, sideshift and reach functions

Single accelerator pedal and direction switch with interlock actuated by left foot

PVC seat (with/without heater)

Seat with adjustable lumbar support

Seat with backrest extension

Cold storage protection to -300F

Cold storage/comfort cabin

Drive-in-rack overhead guard

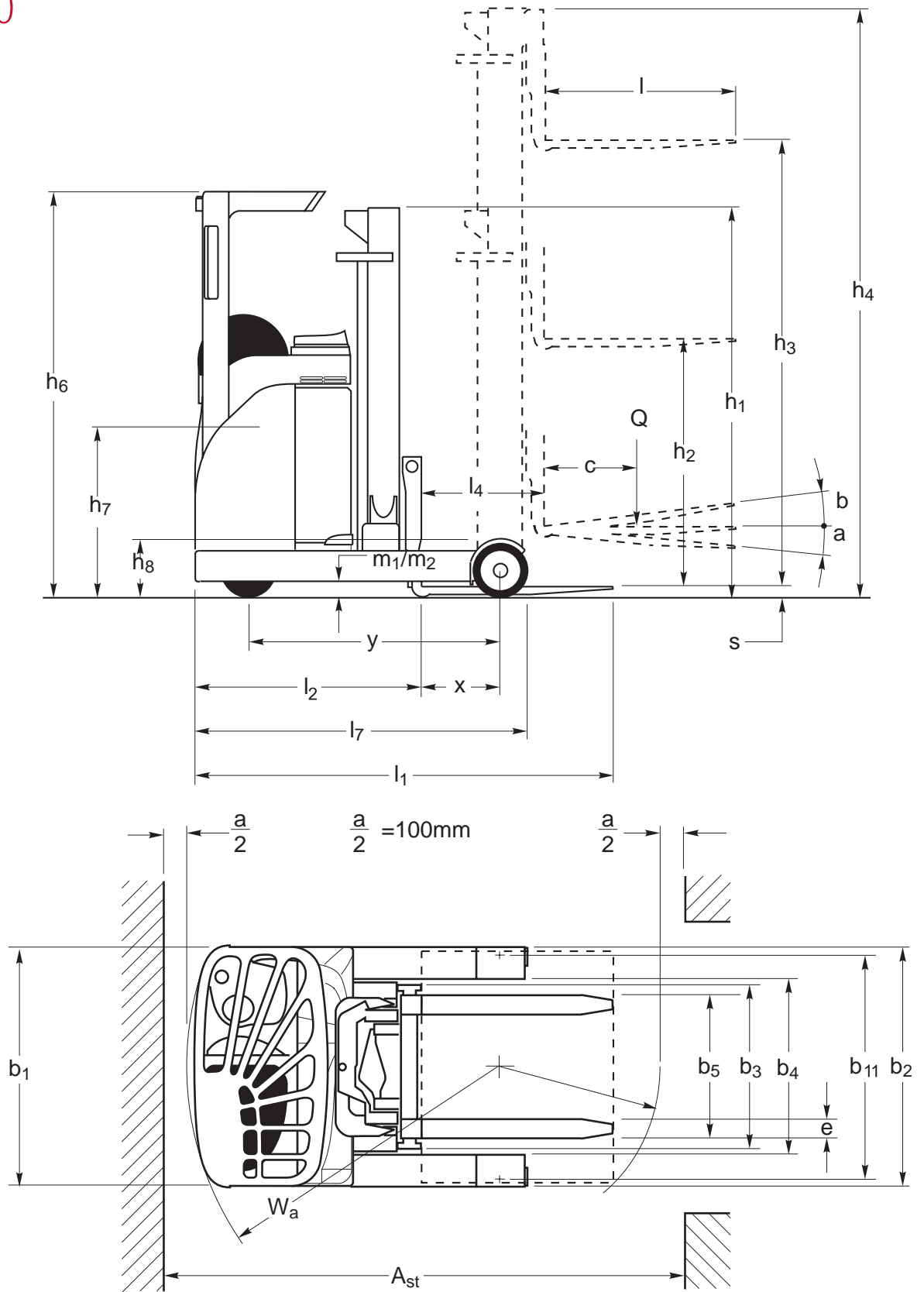
Side guidance for drive-in-racking

Battery compartment rollers

Alternative colors

Other options available on request

R14  
R16  
R20



# Technical data

November 2006 SERIES 115-02

Characteristics	1.1	Manufacturer		Linde	Linde	
	1.2	Model designation		R14R	16R	
	1.3	Power unit: Battery, Diesel, Gasoline, LP Gas		Battery	Battery	
	1.4	Operation		Rider/Sit down	Rider/Sit down	
	1.5	Load capacity <sup>1)</sup>	Q lb (kg)	3000 (1400)	3500 (1600)	
	1.6	Load center	c in (mm)	24 (600)	24 (600)	
	1.8	Axle center to fork face	x in (mm)	12.1 (311)	16.2 (416)	
	1.9	Wheelbase	y in (mm)	50.2 (1275)	54.5 (1385)	
	Weight	2.1	Service weight (with minimum battery)	lbs (kg)	6292 (2854)	6403 (2904)
2.3		Axle load without load, front/rear	lbs (kg)	3919/2373 (1778/1077)	4138/2265 (1877/1027)	
2.4		Axle load, forks extended with load, front/rear	lbs (kg)	1064/8229 (516/3739)	1164/8739 (526/3979)	
2.5		Axle load, forks retracted with load, front/rear	lbs (kg)	3174/6119 (1473/2782)	3701/6202 (1677/2828)	
Wheels/Tires		3.1	Tires		Polyurethane	Polyurethane
	3.2	Tire size, front	in (mm)	13 x 5.3 (330 x 135)	13 x 5.3 (330 x 135)	
	3.3	Tire size, rear	in (mm)	11.2 x 3.9 (285 x 100)	11.2 x 3.9 (285 x 100)	
	3.5	Wheels, number front/rear (x = driven)		1x/2	1x/2	
	3.7	Track width, rear	b11 in (mm)	45.3 (1150)	45.3 (1150)	
	Dimensions	4.1	Mast/fork carriage tilt, forward/back	degrees	2/4	2/4
		4.2	Height of mast lowered	h1 in (mm)	83 (2110)	83 (2110)
4.3		Free lift	h2 in (mm)	49 (1261)	49 (1261)	
4.4		Lift <sup>2)</sup>	h3 in (mm)	185 (4695)	185 (4695)	
4.5		Height of mast extended	h4 in (mm)	212 (5395)	212 (5395)	
4.7		Height of overhead guard (cabin)	h6 in (mm)	83.1 (2110)	83.1 (2110)	
4.8		Height of seat, minimum/maximum	h7 in (mm)	37/40.6 (940/1030)	37/40.6 (940/1030)	
4.10		Height of reach legs	h8 in (mm)	12.2 (310)	12.2 (310)	
4.19		Overall length	l1 in (mm)	93.86 (2384)	94.06 (2389)	
4.20		Length to fork face	l2 in (mm)	46.61 (1184)	46.81 (1189)	
4.21		Overall width	b1/b2 in (mm)	48.6/49.2 (1234/1250)	48.6/49.2 (1234/1250)	
4.22		Fork dimensions	s/e/l in (mm)	1.5x4x48 (40x100x1200)	1.75x4x48 (45x100x1200)	
4.23		Fork carriage class		2A	2A	
4.24		Width of fork carriage	b3 in (mm)	32.7 (830)	32.7 (830)	
4.25		Fork spread, minimum/maximum	b5 in (mm)	11.7/27.2 (296/690)	12.4/28.0 (316/710)	
4.26		Width between reach legs	b4 in (mm)	36.3 (922)	36.3 (922)	
4.28		Reach travel	l4 in (mm)	19.5 (496)	23.9 (606)	
4.31		Ground clearance, mast	m1 in (mm)	3 (75)	3 (75)	
4.32		Ground clearance, center of wheelbase	m2 in (mm)	3 (75)	3 (75)	
4.34		Aisle width w/pallet 40" x 48" (1000 x 1200) along forks	Ast in (mm)	103.5 (2630)	103.3 (2625)	
4.35	Turning radius	Wa in (mm)	60.6 (1540)	64.6 (1640)		
4.37	Length of chassis	l7 in (mm)	64.5 (1638)	68.8 (1748)		
Performance	5.1	Travel speed, w/wo load <sup>4)</sup> (AC & DC)	mph (km/h)	7.5/7.8 (12/12.5)	7.5/7.8 (12/12.5)	
	5.2a	Lifting speed, w/wo load <sup>4)</sup> (DC)	fpm (m/s)	66.9/118 (0.34/0.6)	66.9/118 (0.34/0.6)	
	5.2b	Lifting speed, w/wo load <sup>4)</sup> (AC)	fpm (m/s)	82.6/129.8 (0.42/0.66)	78.7/129.8 (0.40/0.66)	
	5.3	Lowering speed, w/wo load <sup>4)</sup> (AC & DC)	fpm (m/s)	108.3/88.6 (0.55/0.45)	108.3/88.6 (0.55/0.45)	
	5.4	Reach speed, w/wo load <sup>4)</sup> (AC & DC)	fpm (m/s)	29.5/29.5 (0.15/0.15)	29.5/29.5 (0.15/0.15)	
	5.7	Climbing ability, w/wo load, 30 minute rating, (AC & DC)	%	4.5/8.2	4.7/8.2	
	5.8	Maximum climbability, w/wo load, 30 minute rating, (AC & DC)	%	10/10	10/10	
	5.9	Acceleration time, w/wo load, (AC & DC)	sec	5.5/4.8	5.5/4.8	
	5.10	Service brake		Hydraulic/Electric	Hydraulic/Electric	
	Drive	6.1a	DC Drive motor, 60 min. rating	hp (kW)	7.24 (5.4)	7.24 (5.4)
6.1b		AC Drive Motor, 60 min. rating	hp (kW)	8.05 (6)	8.05 (6)	
6.2		Lift motor, 15% rating	hp (kW)	16.1 (12)	16.1 (12)	
6.4		Battery voltage/rated capacity (6h)	V/Ah	48/450	48/450	
6.5		Battery weight (minimum) <sup>3)</sup>	lbs (kg)	1575 (714)	1575 (714)	
Other	8.1	Type of drive/hydraulic-steering control		Electronic/Stepless	Electronic/Stepless	
	8.2	Working pressure for attachments	psi (bar)	2900 (200)	2,900 (200)	
	8.3	Oil flow for attachments	gpm (l/min)	1.7 (6.5)	1.7 (6.5)	
	8.4	Noise level at operator's ear <sup>5)</sup>	dB	63	63	

1) Capacity may be reduced for high lifts - see capacity diagrams.

2) Alternative width of 63 in. (1600mm) available for R20W.

3) Battery must be manufactured to IEC 254-2 Standards and Specifications.

4) Lift heights of 251 in. (6,400 mm) and above increase length to fork face and 900 stacking aisle widths by 1 in. (27mm) on R20, R20N and R20W.

5) Noise level increases to 66 dB when cab is installed.

Linde 16HD Battery Rider/Sit down	Linde R16N Battery Rider /Sit down	Linde R20 Battery Rider/Sit down	Linde R20N Battery Rider/Sit down	Linde R20W Battery Rider/Sit down
3,500 (1,600)	3,500 (1,600)	4,500 (2,000)	4,500 (2,000)	4,500 (2,000)
24 (600)	24 (600)	24 (600)	24 (600)	24 (600)
14.8 (380)	13.4 (346)	18.5 (475)	15.0 (385)	18.5 (475)
54.5 (1,385)	54.5 (1,385)	59.8 (1,520)	59.8 (1,520)	59.8 (1,520)
7,085 (3,214)	6,137 (2,784)	7,087 (3,215)	6,734 (3,054)	8,117 (3,682)
4,604/2,481 (2,088/1,125)	3,830/2,307 (1,737/1,046)	4,609/2,478 (2,090/1,124)	3,997/2,737 (1,813/1,241)	5,278/2,838 (2,394/1,287)
958/9,627 (433/4,381)	1,020/8,618 (461/3,923)	1,517/10,070 (625/4,590)	1,456/9,778 (595/4,460)	1,640/10,977 (681/5,001)
3,958/6,627 (1,793/3,020)	3,195/6,442 (1,448/2,936)	4,424/7,163 (1,943/3,272)	3,543/7,691 (1,541/3,513)	4,807/7,810 (2,117/3,565)
Polyurethane 13 x 5.3 (330 x 135) 11.2 x 3.9 (285 x 100) 1x/2	Polyurethane 13 x 5.3 (330 x 135) 11.2 x 3.9 (285 x 100) 1x/2	Polyurethane 13 x 5.3 (330 x 135) 13.8 x 3.9 (350 x 100) 1x/2	Polyurethane 13 x 5.3 (330 x 135) 13.8 x 3.9 (350 x 100) 1x/2	Polyurethane 13 x 5.3 (330 x 135) 13.8 x 3.9 (350 x 100) 1x/2
45.3 (1,150)	38.6 (980)	45.3 (1,150)	38.6 (980)	51.2 (1300)
2/4	2/4	2/4	2/4	2/4
116 (2,930)	83.1 (2,110)	97.5 (2,476)	97.5 (2,476)	97.5 (2,476)
82 (2,081)	49.7 (1,261)	64.1 (1,627)	64.1 (1,627)	64.1 (1,627)
251 (6,400)	183.3 (4,655)	183.3 (4,655)	183.3 (4,655)	183.3 (4,655)
281 (7,139)	212.4 (5,395)	212.4 (5,395)	212.4 (5,395)	212.4 (5,395)
83.1 (2,110)	83.1 (2,110)	83.1 (2,110)	83.1 (2,110)	83.1 (2,110)
37/40.6 (940/1030)	37/40.6 (940/1030)	37/40.6 (940/1030)	37/40.6 (940/1030)	37/40.6 (940/1030)
12.2 (310)	12.2 (310)	14.7 (373)	14.7 (373)	14.7 (373)
95.47 (2,425)	97.05 (2,465)	96.89 (2,461)	100.83 (2561)	96.89 (2,461)
48.23 (1,225)	49.80 (1,265)	49.65 (1,261) <sup>5</sup>	53.58 (1,361) <sup>5</sup>	49.65 (1,261) <sup>5</sup>
48.6/49.2 (1,234/1,250)	41.5/42.5 (1,054/1,080)	48.6/49.2 (1,234/1,250)	41.5/42.5 (1,054/1,080)	48.6/55.1 1,234/1,400 <sup>2</sup>
1.75x4x48 (45x100x1,200)	1.75x4x48 (45x100x1,200)	1.75x4x48 (45x100x1,200)	1.75x4x48 (45x100x1,200)	1.75x4x48 (45x100x1,200)
2A	2A	2A	2A	2A
32.7 (830)	32.7 (830)	32.7 (830)	32.7 (830)	32.7 (830)
12.4/28.0 (316/710)	12.4/20.5 (316/520)	12.4/28.0 (316/710)	12.4/20.5 (316/520)	12.4/28.0 (316/710)
36.3 (922)	29.6 (752)	36.3 (922)	29.6 (752)	42.2 (1,072)
22.44 (570)	21.1 (536)	27.4 (695)	23.9 (608)	27.4 (695)
3 (75)	3 (75)	3 (75)	3 (75)	3 (75)
3 (75)	3 (75)	3 (75)	3 (75)	3 (75)
104.7 (2,660)	105.3 (2,675)	106.3 (2,700)	108.9 (2,765)	106.3 (2,700)
64.6 (1,640)	63.8 (1,620)	69.9 (1,775)	68.9 (1,750)	69.9 (1,775)
68.8 (1,748)	69.1 (1,754)	75.2 (1,911)	75.6 (1,921)	75.2 (1,911)
7.5/7.8 (12/12.5)	7.5/7.8 (12/12.5)	7.5/7.8 (12/12.5)	7.5/7.8 (12/12.5)	7.5/7.8 (12/12.5)
59/94.4 (0.3/0.48)	66.9/118 (0.34/0.6)	59/94.4 (0.3/0.48)	59/94.4 (0.3/0.48)	59/94.4 (0.3/0.48)
68.8/100.3 (0.35/0.51)	78.7/129.8 (0.40/0.66)	63.0/100.3 (0.32/0.51)	62.9/100.3 (0.32/0.51)	64.9/100.3 (0.33/0.51)
108.3/78.7 (0.55/0.4)	108.3/88.6 (0.55/0.45)	108.3/78.7 (0.55/0.4)	108.3/78.7 (0.55/0.4)	108.3/78.7 (0.55/0.4)
29.5/29.5 (0.15/0.15)	29.5/29.5 (0.15/0.15)	29.5/29.5 (0.15/0.15)	29.5/29.5 (0.15/0.15)	29.5/29.5 (0.15/0.15)
3.9/7.1	4.3/8	3.9/7.1	3.9/7.2	3.9/7.1
10/10	10/10	10/10	10/10	10/10
5.8/5	5.5/4.8	5.8/5	5.8/5	5.8/5
Hydraulic/Electric	Hydraulic/Electric	Hydraulic/Electric	Hydraulic/Electric	Hydraulic/Electric
7.24 (5.4)	7.24 (5.4)	7.24 (5.4)	7.24 (5.4)	7.24 (5.4)
8.05 (6)	8.05 (6)	8.05 (6)	8.05 (6)	8.05 (6)
16.1 (12)	16.1 (12)	16.1 (12)	16.1 (12)	16.1 (12)
48/600	48/450	48/600	48/600	48/600
1,970 (894)	1,565 (710)	1970 (894)	1965 (891)	3000 (1361)
Electronic/Stepless	Electronic/Stepless	Electronic/Stepless	Electronic/Stepless	Electronic/Stepless
2,900 (200)	2,900 (200)	2,900 (200)	2,900 (200)	2,900 (200)
(6.5) 1.7	(6.5) 1.7	(6.5) 1.7	(6.5)	1.7 (6.5)
63 <sup>5</sup>	63 <sup>5</sup>	64 <sup>5</sup>	64 <sup>5</sup>	64 <sup>5</sup>

6) Traction, lift, lower, reach speeds and weights may vary with alternative lift heights.

7) For all other heights, see tables.

8) Minimum battery weight varies with alternative masts.



# Battery Sizes\*

\*Required battery determined by lift height.

Battery Sizes	Battery Case Dimensions (in)	Minimum Battery Weight (lb)
Size A	11.1 x 48.2 x 30.8	1575
Size B	14 x 48.2 x 30.8	1970
Size C	16.8 x 48.2 x 30.8	2345
Size AN	13.9 x 40.75 x 30.8	1565
Size BN	17.4 x 40.75 x 30.8	1965
Size CN	21 x 40.75 x 30.8	2345

## Mast Table and Optional Battery Sizes for Models Listed

Triple clearview fixed masts with tilting carriage (2° forward, 4° back) and integrated sideshift, 3.2 in. (80 mm) each side.

Battery Size Requirement/Mast Table						
			lift height h3 + s	collapsed height h1	free lift h2	maximum ext. height h4
R16N	R14	R16	in / mm	in / mm	in / mm	in / mm
AN and BN	A and B	A and B and C	185 / 4695	98 / 2110	49 / 1261	212 / 5395
			204 / 5200	98 / 2476	64 / 1627	232 / 5895
			228 / 5800	98 / 2476	64 / 1627	256 / 6495
			248 / 6295	115 / 2910	81 / 2061	275 / 6995
			264 / 6700	115 / 2910	81 / 2061	291 / 7395
BN	B	B and C	275 / 7000	115 / 2910	81 / 2061	303 / 7695
			287 / 7295	133 / 3376	99 / 2527	315 / 7995
			299 / 7595	133 / 3376	99 / 2527	327 / 8295
			315 / 7995	133 / 3376	99 / 2527	343 / 8695
			326 / 8295	133 / 3376	99 / 2527	354 / 8995
		C	338 / 8595	154 / 3910	120 / 3061	366 / 9295
			354 / 9000	154 / 3910	120 / 3061	382 / 9695
			360 / 9200	154 / 3910	120 / 3061	390 / 9895
			373 / 9500	154 / 3910	120 / 3061	401 / 10195

# Mast Table and Optional Battery Sizes for Models Listed

Triple clearview fixed masts with tilting carriage (2° forward, 4° back) and integrated sideshift, 3.2 in. (80 mm) each side.

Battery Size Requirement/Mast Table								
R16HD	R20 and R20W	R20N	lift height h3 + s in / mm	collapsed height h1 in / mm	free lift h2 in / mm	maximum ext. height h4 in / mm		
<del>X</del>			172 / 4400	83 / 2110	49 / 1261	201 / 5095		
			185 / 4700	98 / 2476	64 / 1627	212 / 5395		
B and C	B and C	BN and CN	204 / 5200	98 / 2476	64 / 1627	232 / 5895		
			228 / 5800	115 / 2910	81 / 2061	256 / 6495		
			251 / 6400	116 / 2930	82 / 2081	281 / 7139		
			263 / 6700	116 / 2930	82 / 2081	293 / 7439		
			275 / 7000	136 / 3430	101 / 2581	305 / 7739		
			287 / 7300	136 / 3430	101 / 2581	317 / 8039		
			298 / 7600	136 / 3430	101 / 2581	328 / 8339		
			314 / 8000	136 / 3430	101 / 2581	344 / 8739		
			326 / 8300	136 / 3430	101 / 2581	356 / 9039		
			C	C	CN	338 / 8600	155 / 3930	121 / 3081
354 / 9000	155 / 3930	121 / 3081				384 / 9739		
361 / 9200	155 / 3930	121 / 3081				391 / 9939		
373 / 9500	155 / 3930	121 / 3081				403 / 10239		
<del>X</del>	<del>X</del>	<del>X</del>			381 / 9700	155 / 3930	121 / 3081	411 / 10439
					393 / 10000	175 / 4430	140 / 3581	423 / 10739
					401 / 10200	175 / 4430	140 / 3581	431 / 10939
					413 / 10500	175 / 4430	140 / 3581	443 / 11239
					420 / 10700	175 / 4430	140 / 3581	450 / 11439
					432 / 11000	195 / 4930	160 / 4081	462 / 11739
					440 / 11200	195 / 4930	160 / 4081	470 / 11939
					452 / 11500	195 / 4930	160 / 4081	482 / 12239



# Features

## Three independent braking systems

- Footbrake hydraulically actuated on drive and load wheels.
- Electric parking brake operating on the drive motor armature shaft. Parking brake will automatically apply when the operator leaves the seat — deadman brake.
- Electric regenerative braking on accelerator pedal release. Electrical energy is returned to the battery and wear on the service brakes is greatly reduced.

## Electric power steering

- Electric power steering with variable torque feedback provides excellent maneuverability with very low, fatigue free steering effort.

## Linde clearview mast design

- The clearview triple mast with tilting carriage and integrated sideshift yields exceptional visibility at all lift heights.



## Safety

- Three independent braking systems
- All wheel braking
- Deadman brake
- Emergency power cut-off (also applies parking brake)
- Keyswitch
- Electric horn
- Electronic and hydraulic overload protection
- Traction isolated by seatswitch
- Parking brake interlock actuates power reduction to allow gradient start without roll back
- Automatic slow down at maximum/minimum lift and reach
- Polycarbon screen between operator and mast
- Overhead guard
- Dual channel fail-safe circuitry
- Automatic speed reduction above 335 in. lift (8,500 mm).



## Linde operator's compartment

- The advanced design full suspension comfort seat is completely adjustable to operator's size and weight.



## Linde Load Control (LLC)

- The unique Linde Load Control (LLC) system enables accurate, fatigue free, fingertip control of all load movements



## Linde energy management

- Energy saving Linde Digital Control (LDC) provides for smooth, efficient control of traction and load handling together with parameter adjustments and diagnostic capability. Efficient conversion of energy to motion.

ANSI: Standard truck meets all applicable mandatory requirements of ANSI/ITSDF B56.1 standards for powered industrial trucks.  
 NOTE: Performance data may vary due to motor and system efficiency tolerances. The performance depicted represents nominal values obtained under typical operating conditions. Metric dimensions are in millimeters unless otherwise specified. All metric dimensions are not direct equivalents due to rounding data. The descriptions and specifications included on this data sheet were in effect at the time of printing. Linde Material Handling North America Corporation reserves the right to make improvements and changes in specification or design without notice and without incurring obligation. Please check with your authorized Linde dealer for information on possible updates or revisions.

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