



Equipment



SAFETY

The equipment of this model range corresponds to all current safety standards. Of particular interest are the following standard features:

- Three independent braking systems
- All wheel braking
- 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).

STANDARD EQUIPMENT

- All items shown under safety
- 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
- CCTV
- Height pre-selector (LPS)
- Height indicator (LHI)
- Data logger
- Steering indicator
- 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 -30°F
- Cold storage/comfort cabin
- Drive-in-rack overhead guard
- Side guidance for drive-in-racking
- Battery compartment rollers
- Alternative colors

OPTIONAL EQUIPMENT

- AC Drive & Hydraulics
- R20W overall width 63 in.(1600mm)
- Seat interlock alarm

Contact dealer/manufacturer for additional equipment availability.



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ANSI CLASSIFICATION:
Standard truck meets all applicable mandatory requirements of ANSI/ASME 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 Lift Truck 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.

903/250

DC/AC Electric Mobile Mast Reach Trucks 3000 lb. to 4500 lb. Capacity Range



Introduction

The three wheel electric mobile mast reach truck models R 14, R 16 and R 20, 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.

Features:

- The unique Linde Load Control (LLC) system enables accurate, fatigue free, fingertip control of all load movements.
- The clearview triple mast with tilting carriage and integrated sideshift yields exceptional visibility at all lift heights.
- The advanced design full suspension comfort seat is completely adjustable to operator's size and weight.
- Energy saving Linde Digital Control (LDC) provides for smooth, efficient control of traction and load handling together with parameter adjustments and diagnostic capability.
- All-wheel braking for safe operation under all work conditions.
- Electric power steering with variable torque feedback provides excellent maneuverability with very low, fatigue free steering effort.

Operator Compartment and Controls

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.

Chassis

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.

Drive and Transmission

A powerful 7.2hp/8.0hp DC or 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.

Digital control & diagnostics

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.

Steering

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.

Mast, Hydraulics and Reach Unit

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 unique 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.

Brakes

The trucks have three independent braking systems:

1. Footbrake hydraulically actuated on drive and load wheels.
2. Electric parking brake operating on drive motor armature shaft.
3. Electric regenerative braking on accelerator pedal release. Electrical energy is returned to the battery and wear on the service brakes is greatly reduced.

Manufacturer's Data and Design Characteristics
September 2003

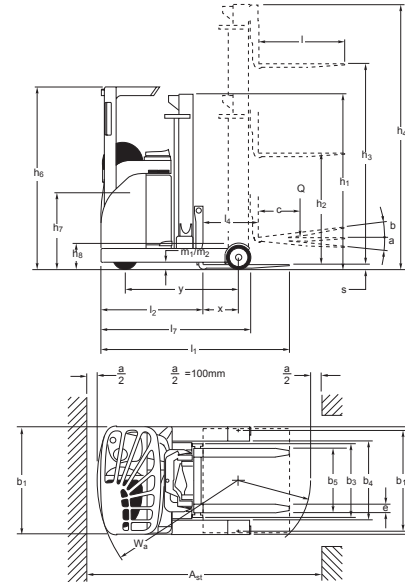


Characteristics	Linde		Linde		Linde		Linde		Linde	
	R14	R16	R16HD	R16N	R20	R20N	R20W	R20N	R20W	
1.1 Manufacturer	Linde									
1.2 Model designation	R14									
1.3 Power unit: Battery, Diesel, Gasoline, LP Gas	Battery									
1.4 Operation	Rider Seated									
1.5 Load capacity ¹	Q lbs (kg)	3,000 (1,400)	3,500 (1,600)	3,500 (1,600)	3,500 (1,600)	4,500 (2,000)	4,500 (2,000)	4,500 (2,000)	4,500 (2,000)	
1.6 Load center	c in (mm)	24 (600)	24 (600)	24 (600)	24 (600)	24 (600)	24 (600)	24 (600)	24 (600)	
1.8 Axle center to fork face	x in (mm)	12.1 (311)	16.2 (416)	14.8 (380)	13.4 (346)	18.5 (475)	15.0 (385)	18.5 (475)	18.5 (475)	
1.9 Wheelbase	y in (mm)	50.2 (1275)	54.5 (1,385)	54.5 (1,385)	54.5 (1,385)	59.8 (1,520)	59.8 (1,520)	59.8 (1,520)	59.8 (1,520)	
2.1 Service weight (with minimum battery)	lbs (kg)	6,292 (2,854)	6,403 (2,904)	7,085 (3,214)	6,137 (2,784)	7,087 (3,215)	6,734 (3,054)	8,117 (3,682)	8,117 (3,682)	
2.2 Axle load without load, front/rear	lbs (kg)	3,919/2,373 (1,778/1,077)	4,138/2,265 (1,877/1,027)	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)	5,278/2,838 (2,394/1,287)	
2.4 Axle load, forks extended with load, front/rear	lbs (kg)	1,064/8,229 (516/3,739)	1,164/8,739 (526/3,979)	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)	1,640/10,977 (681/5,001)	
2.5 Axle load, forks retracted with load, front/rear	lbs (kg)	3,174/6,119 (1,473/2,782)	3,701/6,202 (1,677/2,828)	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)	4,807/7,810 (2,117/3,565)	
3.1 Tires	Polyurethane									
3.2 Tire size, front	in (mm)	13 x 5.3 (330 x 135)	13 x 5.3 (330 x 5.3)	13 x 5.3 (330 x 5.3)	13 x 5.3 (330 x 5.3)	13 x 5.3 (330 x 5.3)	13 x 5.3 (330 x 5.3)	13 x 5.3 (330 x 5.3)	13 x 5.3 (330 x 5.3)	
3.3 Tire size, rear	in (mm)	11.2 x 3.9 (285 x 100)	11.2 x 3.9 (285 x 100)	11.2 x 3.9 (285 x 100)	11.2 x 3.9 (285 x 100)	13.8 x 3.9 (350 x 100)	13.8 x 3.9 (350 x 100)	13.8 x 3.9 (350 x 100)	13.8 x 3.9 (350 x 100)	
3.5 Wheels, number front/rear (x = driven)	1x/2									
3.7 Track width, rear	b11 in (mm)	45.3 (1,150)	45.3 (1,150)	45.3 (1,150)	38.6 (980)	45.3 (1,150)	38.6 (980)	51.2 (1,300)	51.2 (1,300)	
4.1 Mast/fork carriage tilt, forward/back	degrees	2/4		2/4		2/4		2/4		
4.2 Height of mast lowered	h1 in (mm)	83 (2,110)	83 (2,110)	116 (2,930)	83.1 (2,110)	97.5 (2,476)	97.5 (2,476)	97.5 (2,476)	97.5 (2,476)	
4.3 Free lift	h2 in (mm)	49 (1,261)	49 (1,261)	82 (2,081)	49.7 (1,261)	64.1 (1,627)	64.1 (1,627)	64.1 (1,627)	64.1 (1,627)	
4.4 Lift ⁷	h3 in (mm)	185 (4,695)	185 (4,695)	251 (6,400)	183.3 (4,655)	183.3 (4,655)	183.3 (4,655)	183.3 (4,655)	183.3 (4,655)	
4.5 Height of mast extended	h4 in (mm)	212 (5,395)	212 (5,395)	281 (7,139)	212.4 (5,395)	212.4 (5,395)	212.4 (5,395)	212.4 (5,395)	212.4 (5,395)	
4.7 Height of overhead guard (cabin)	h6 in (mm)	83.1 (2,110)	83.1 (2,110)	83.1 (2,110)	83.1 (2,110)	83.1 (2,110)	83.1 (2,110)	83.1 (2,110)	83.1 (2,110)	
4.8 Height of seat, minimum/maximum	h7 in (mm)	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)	37/40.6 (940/1030)	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)	12.2 (310)	12.2 (310)	14.7 (373)	14.7 (373)	14.7 (373)	14.7 (373)	
4.19 Overall length	l1 in (mm)	93.86 (2,384)	94.06 (2,389)	95.47 (2,425)	97.05 (2,465)	96.89 (2,461)	100.83 (2,561)	96.89 (2,461)	96.89 (2,461)	
4.20 Length to fork face	l2 in (mm)	46.61 (1,184)	46.81 (1,189)	48.23 (1,225)	49.80 (1,265)	49.65 (1,261) ⁵	53.58 (1,361) ⁵	49.65 (1,261) ⁵	49.65 (1,261) ⁵	
4.21 Overall width	b1/b2 in (mm)	48.6/49.2 (1,234/1,250)	48.6/49.2 (1,234/1,250)	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) ²	48.6/55.1 (1,234/1,400) ²	
4.22 Fork dimensions	s/e/l in (mm)	1.5x4x48 (40x100x1,200)	1.75x4x48 (45x100x48)	1.75x4x48 (45x100x48)	1.75x4x48 (45x100x48)	1.75x4x48 (45x100x48)	1.75x4x48 (45x100x48)	1.75x4x48 (45x100x48)	1.75x4x48 (45x100x48)	
4.23 Fork carriage class	2A									
4.24 Width of fork carriage	b3 in (mm)	32.7 (830)	32.7 (830)	32.7 (830)	32.7 (830)	32.7 (830)	32.7 (830)	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)	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)	12.4/28.0 (316/710)	
4.26 Width between reach legs	b4 in (mm)	36.3 (922)	36.3 (922)	36.3 (922)	29.6 (752)	36.3 (922)	29.6 (752)	42.2 (1,072)	42.2 (1,072)	
4.28 Reach travel	l4 in (mm)	19.5 (496)	23.9 (606)	22.44 (570)	21.1 (536)	27.4 (695)	23.9 (608)	27.4 (695)	27.4 (695)	
4.31 Ground clearance, mast	m1 in (mm)	3 (75)	3 (75)	3 (75)	3 (75)	3 (75)	3 (75)	3 (75)	3 (75)	
4.32 Ground clearance, center of wheelbase	m2 in (mm)	3 (75)	3 (75)	3 (75)	3 (75)	3 (75)	3 (75)	3 (75)	3 (75)	
4.34 Aisle width with pallet 40" x 48" (1000 x 1200) along forks	Ast in (mm)	103.5 (2,630)	103.3 (2,625)	104.7 (2,660)	105.3 (2,675)	106.3 (2,700)	108.9 (2,765)	106.3 (2,700)	106.3 (2,700)	
4.35 Turning radius	Wa in (mm)	60.6 (1,540)	64.6 (1,640)	64.6 (1,640)	63.8 (1,620)	69.9 (1,775)	68.9 (1,750)	69.9 (1,775)	69.9 (1,775)	
4.37 Length of chassis	l7 in (mm)	64.5 (1,638)	68.8 (1,748)	68.8 (1,748)	69.1 (1,754)	75.2 (1,911)	75.6 (1,921)	75.2 (1,911)	75.2 (1,911)	
5.1 Travel speed, with/without load ⁶ , (AC & DC)	mph (km/h)	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)	7.5/7.8 (12/12.5)	7.5/7.8 (12/12.5)	7.5/7.8 (12/12.5)	
5.2a Lifting speed, with/without load ⁶ , (DC)	fpm (m/s)	66.9/118 (0.34/0.6)	66.9/118 (0.34/0.6)	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)	59/94.4 (0.3/0.48)	
5.2b Lifting speed, with/without load ⁶ , (AC)	fpm (m/s)	82.6/129.8 (0.42/0.66)	78.7/129.8 (0.40/0.66)	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)	64.9/100.3 (0.33/0.51)	
5.3 Lowering speed, with/without load ⁶ , (AC & DC)	fpm (m/s)	108.3/88.6 (0.55/0.45)	108.3/88.6 (0.55/0.45)	108.3/88.6 (0.55/0.45)	108.3/88.6 (0.55/0.45)	108.3/88.6 (0.55/0.45)	108.3/88.6 (0.55/0.45)	108.3/88.6 (0.55/0.45)	108.3/88.6 (0.55/0.45)	
5.4 Reach speed, with/without load ⁶ , (AC & DC)	fpm (m/s)	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)	29.5/29.5 (0.15/0.15)	29.5/29.5 (0.15/0.15)	29.5/29.5 (0.15/0.15)	
5.7 Climbing ability, with/without load, 30 minute rating, (AC & DC)	%	4.5/8.2	4.7/8.2	3.9/7.1	4.3/8	3.9/7.1	3.9/7.2	3.9/7.1	3.9/7.1	
5.8 Maximum climbing ability, with/without load, 30 minute rating, (AC & DC)	%	10/10	10/10	10/10	10/10	10/10	10/10	10/10	10/10	
5.9 Acceleration time, with/without load, (AC & DC)	sec	5.5/4.8	5.5/4.8	5.8/5	5.5/4.8	5.8/5	5.8/5	5.8/5	5.8/5	
5.10 Service brake	Hydraulic/Electric									
6.1a DC Drive motor, 60 min. rating	hp (kW)	7.24 (5.4)	7.24 (5.4)	7.24 (5.4)	7.24 (5.4)	7.24 (5.4)	7.24 (5.4)	7.24 (5.4)	7.24 (5.4)	
6.1b AC Drive Motor, 60 min. rating	hp (kW)	8.05 (6)	8.05 (6)	8.05 (6)	8.05 (6)	8.05 (6)	8.05 (6)	8.05 (6)	8.05 (6)	
6.2 Lift motor, 15% rating	hp (kW)	16.1 (12)	16.1 (12)	16.1 (12)	16.1 (12)	16.1 (12)	16.1 (12)	16.1 (12)	16.1 (12)	
6.4 Battery voltage/rated capacity (6h)	V/Ah	48/450	48/450	48/600	48/450	48/600	48/600	48/600	48/600	
6.5 Battery weight (minimum) ⁸	lbs (kg)	1,575 (714)	1,575 (714)	1,970 (894)	1,565 (710)	1,970 (894)	1,965 (891)	3,000 (1,361)	3,000 (1,361)	
8.1 Type of drive/hydraulic-steering control	Electronic/Stepless									
8.2 Working pressure for attachments	psi (bar)	2,900 (200)	2,900 (200)	2,900 (200)	2,900 (200)	2,900 (200)	2,900 (200)	2,900 (200)	2,900 (200)	
8.3 Oil flow for attachments	gpm (l/min)	1.7 (6.5)	1.7 (6.5)	1.7 (6.5)	1.7 (6.5)	1.7 (6.5)	1.7 (6.5)	1.7 (6.5)	1.7 (6.5)	
8.4 Noise level at operator's ear	dB	63 ⁹		63 ⁹		64 ⁹		64 ⁹		

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 90° stacking aisle widths by 1 in. (27mm) on R20, R20N and R20W.
5) Noise level increases to 66 dB when cab is installed.

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



Battery Sizes*

	Battery Case Dimensions (in)	Min. Batt. Weight (lb.)
Size A	11.1 x 48.2 x 30.8	1,575
Size B	14 x 48.2 x 30.8	1,970
Size C	16.8 x 48.2 x 30.8	2,345
Size D	19.5 x 48.2 x 30.8	3,000
Size AN	13.9 x 40.75 x 30.8	1,565
Size BN	17.4 x 40.75 x 30.8	1,965
Size CN	21 x 40.75 x 30.8	2,345

* Required battery determined by lift height

Mast Height Information 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.

Model	Lift Height h3 + s in (mm)	Collapsed Height h1 in (mm)	Free Lift h2 in (mm)	Maximum Extended Height h4 in (mm)
B, C, D	172 (4,400)	83 (2,110)	49 (1,261)	201 (5,095)
	185 (4,700)	98 (2,476)	64 (1,627)	212 (5,395)
	204 (5,200)	98 (2,476)	64 (1,627)	232 (5,895)
	228 (5,800)	115 (2,910)	81 (2,061)	256 (6,495)
	251 (6,400)	116 (2,930)	82 (2,081)	281 (7,139)
	263 (6,700)	116 (2,930)	82 (2,081)	293 (7,439)
	275 (7,000)	136 (3,430)	101 (2,581)	305 (7,739)
	287 (7,300)	136 (3,430)	101 (2,581)	317 (8,039)
	298 (7,600)	136 (3,430)	101 (2,581)	328 (8,339)
	314 (8,000)	136 (3,430)	101 (2,581)	344 (8,739)
C, D	326 (8,300)	136 (3,430)	101 (2,581)	356 (9,039)
	338 (8,600)	155 (3,930)	121 (3,081)	368 (9,339)
	354 (9,000)	155 (3,930)	121 (3,081)	384 (9,739)
	361 (9,200)	155 (3,930)	121 (3,081)	391 (9,939)
	373 (9,500)	155 (3,930)	121 (3,081)	403 (10,239)
	381 (9,700)	155 (3,930)	121 (3,081)	411 (10,439)
	393 (10,000)	175 (4,430)	140 (3,581)	423 (10,739)
	401 (10,200)	175 (4,430)	140 (3,581)	431 (10,939)
	413 (10,500)	175 (4,430)	140 (3,581)	443 (11,239)
	420 (10,700)	175 (4,430)	140 (3,581)	450 (11,439)
C, D	432 (11,000)	195 (4,930)	160 (4,081)	462 (11,739)
	440 (11,200)	195 (4,930)	160 (4,081)	470 (11,939)
	452 (11,500)	195 (4,930)	160 (4,081)	482 (12,239)

Model	Lift Height h3 + s in (mm)	Collapsed Height h1 in (mm)	Free Lift h2 in (mm)	Maximum Extended Height h4 in (mm)
AN, BN	185 (4,695)	83 (2,110)	49 (1,261)	212 (5,395)
	204 (5,200)	98 (2,476)	64 (1,627)	232 (5,895)
	228 (5,800)	98 (2,476)	64 (1,627)	256 (6,495)
	248 (6,295)	115 (2,910)	81 (2,061)	275 (6,995)
	264 (6,700)	115 (2,910)	81 (2,061)	291 (7,395)
	275 (7,000)	115 (2,910)	81 (2,061)	303 (7,695)
	287 (7,295)	133 (3,376)	99 (2,527)	315 (7,995)
	299 (7,595)	133 (3,376)	99 (2,527)	327 (8,295)
	315 (7,995)	133 (3,376)	99 (2,527)	343 (8,695)