R 20

Technical Data.

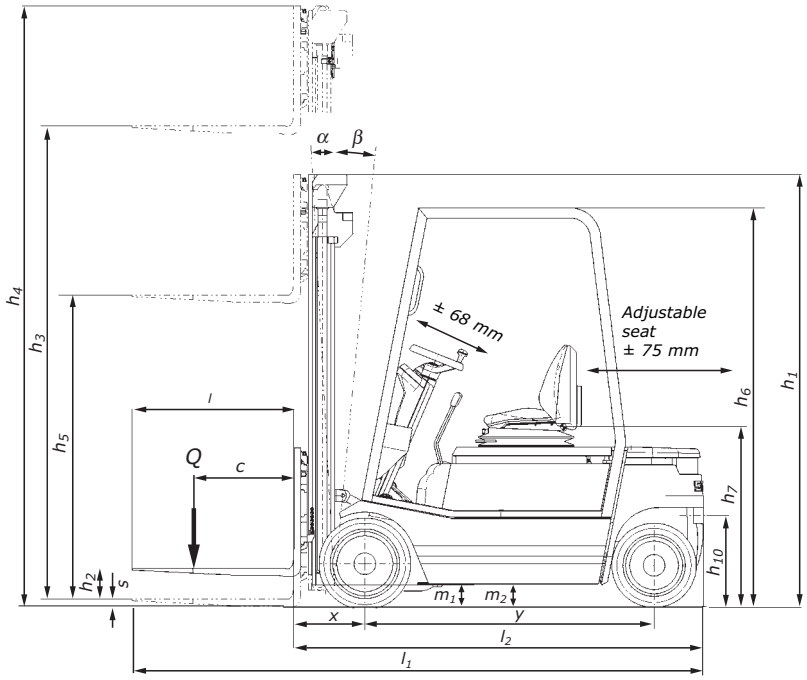
Electric Forklift Trucks
Models R 20-16 P / R 20-20 P.

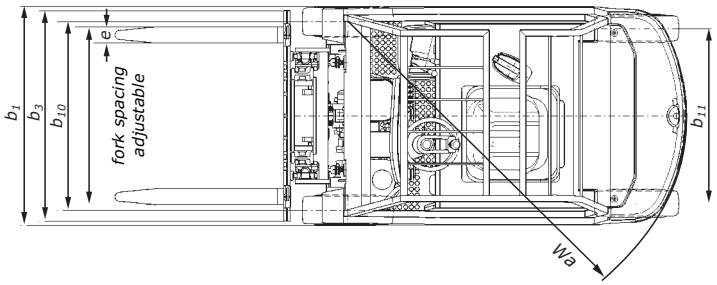
STILL
Making the right moves.

R 20 Electric Forklift Trucks.

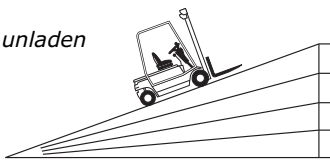
In accordance with VDI guidelines 2198, this specification applies to the standard model only.
Alternative tyres, mast types, ancillary equipment, etc. could result in different values.

Characteristics	1.1	Manufacturer		STILL	STILL
	1.2	Manufacturer's model designation		R 20-16 P	R 20-20 P
	1.3	Power supply – electric, diesel, petrol, gas, mains electric		electric	electric
	1.4	Type of control – hand, pedestrian, stand-on, rider seated		rider seated	rider seated
	1.5	Carrying capacity/load	Q (kg)	1600	2000
	1.6	Load centre	c (mm)	500	500
	1.8	Load distance	x (mm)	355	365
	1.9	Wheelbase	y (mm)	1425	1530
Weight	2.1	Weight	kg	2905	3120
	2.2	Axle loadings laden front	kg	3970	4580
	2.2.1	Axle loadings laden rear	kg	535	490
	2.3	Axle loadings unladen front	kg	1380	1540
	2.3.1	Axle loadings unladen rear	kg	1525	1580
Wheels, tyres	3.1	Tyres – rubber (V), superelastic (SE), pneumatic (L), polyurethane (PE)		SE/L	SE
	3.2	Tyre size – front		18 x 7-8 (16 PR)	200/50-10
	3.3	Tyre size – rear		16 x 6-8 (14 PR)	16 x 6-8
	3.5	Wheels – number front (x = drive wheel)		2x	2x
	3.5.1	Wheels – number rear (x = drive wheel)		2	2
	3.6	Track width – front	b_{10} (mm)	932	942
	3.7	Track width – rear	b_{11} (mm)	865	865
Dimensions	4.1	Tilt angle, mast/fork carriage forwards	degrees	3	3
	4.1.1	Tilt angle, mast/fork carriage backwards	degrees	7	7
	4.2	Closed height	h_1 (mm)	2260	2260
	4.3	Free lift	h_2 (mm)	150	150
	4.4	Lift height	h_3 (mm)	3430	3350
	4.5	Height, mast raised	h_4 (mm)	4080	4000
	4.7	Height to top of overhead guard (cabin)	h_6 (mm)	1960	1960
	4.8	Seat height	h_7 (mm)	892	892
	4.12	Coupling height	h_{10} (mm)	460	460
	4.19	Overall length	l_1 (mm)	2825	2940
	4.20	Length to front face of forks	l_2 (mm)	2025	2140
	4.21	Overall width	b_1 (mm)	1080/1115	1148
	4.22	Fork thickness	s (mm)	40	40
	4.22.1	Fork width	e (mm)	80	80
	4.22.2	Fork length	l (mm)	800	800
	4.23	Fork carriage to DIN 15173 – class / form A or B		ISO II B	ISO II B
	4.24	Fork carriage width	b_3 (mm)	980	1040
	4.31	Ground clearance beneath mast, laden	m_1 (mm)	91	100
	4.32	Ground clearance at centre of wheelbase	m_2 (mm)	110	110
	4.33	Aisle width for pallets 1000 x 1200 wide	A_{st} (mm)	3400	3507
	4.34	Aisle width for pallets 800 x 1200 long	A_{st} (mm)	3595	3702
	4.35	Outer turning radius	W_a (mm)	1839	1936
	4.36	Inner turning radius	b_{13} (mm)	–	–
Performance	5.1	Speed laden	km/h	14	14
	5.1.1	Speed unladen	km/h	16	16
	5.2	Lift speed laden	m/s	0.42	0.38
	5.2.1	Lift speed unladen	m/s	0.6	0.6
	5.3	Lowering speed laden	m/s	0.6	0.6
	5.3.1	Lowering speed unladen	m/s	0.47	0.47
	5.5	Rated drawbar pull laden	N	2700	1870
	5.5.1	Rated drawbar pull unladen	N	2700	2120
	5.6	Max. drawbar pull laden	N	7550	7480
	5.6.1	Max. drawbar pull unladen	N	7700	7630
	5.7	Gradeability laden	%	6	3.6
	5.7.1	Gradeability unladen	%	10	7.1
	5.8	Max. gradeability laden	%	17	14.3
	5.8.1	Max. gradeability unladen	%	28	24.5
	5.9	Acceleration time laden	s	4.8	5
	5.9.1	Acceleration time unladen	s	4.1	4.3
	5.10	Brakes		mech.	mech.
Motors	6.1	Drive motor hourly capacity	kW	2 x 4	2 x 4
	6.2	Hoist motor capacity at 15% duty factor	kW	9	9
	6.3	Battery equipment to DIN 43531/35/36 A, B, C, no		DIN 43531 A	DIN 43531 A
	6.4	Battery voltage	U (V)	48	48
	6.4.1	Battery capacity	K 5 (Ah)	575 (500–625)	690 (600–750)
	6.5	Battery weight	kg	856	1013
	6.6	Energy consumption according to VDI cycle	kWh/h		
Other	8.1	Drive control		Stilltronic-Impuls	Stilltronic-Impuls
	8.2	Operating pressure for attachments	bar	170	170
	8.3	Oil flow for attachments	l/min.		
	8.4	Average noise peak at operator's ears	dB (A)		
	8.5	Trailer coupling, type/DIN		pin	pin



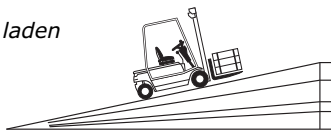


Gradient performance (dry, concrete surface = coefficient of friction 0.8, battery 600 A/h)



		R 20-16 P	R 20-20 P
unladen	20% –	*800 m*	*730 m*
	15% – *once*	*1660 m*	*1400 m*
	10% – *per hour*	*4600 m*	*3300 m*
	5% –	*16075 m*	*13000 m*

Example (with 2000 kg load): 9% gradient, 10 m distance. This gradient is negotiable 128 times per hour.



		R 20-16 P	R 20-20 P
laden	12% – *once*	*680 m*	*680 m*
	9% – *per*	*1450 m*	*1280 m*
	5% – *hour*	*5550 m*	*4050 m*
	3% –	*13285 m*	*9450 m*

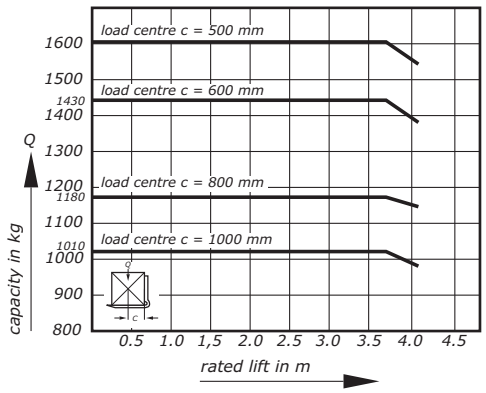
Mast types.

			Telescopic				Full free lift				Triple	
			from	to	from	to	from	to	from	to	from	to
R 20-16 P	Lift height	h_3 mm	2630 - 3530		3630 - 5430		2775 - 3575		3675 - 4075		4020 - 8020	
	Closed mast height	h_1 mm	1860 - 2310		2360 - 3260		1860 - 2260		2310 - 2510		1860 - 3260	
	Raised mast height	h_4 mm	3280 - 4180		4280 - 6080		3425 - 4225		4325 - 4725		4670 - 8670	
	Free lift	h_2/h_5 mm	150				1230 - 1630		1680 - 1880		1230 - 2630	
	Angle of tilt	α | β ∢ °	3	7	3	9	3	7	3	9	3	5
	Length	l_2 mm	2025				2025				2045	
	Lost load centre	x mm	355				355				375	
	Working aisle width Pallets 1000 x 1200 wide | 800 x 1200 long	A_{st} mm	3400		3595		3400		3595		3420	3615
R 20-20 P	Lift height	h_3 mm	2550 - 3350		3450 - 5350		2670 - 3570		3670 - 4370		3865 - 8065	
	Closed mast height	h_1 mm	1860 - 2260		2310 - 3260		1860 - 2310		2360 - 2710		1860 - 3260	
	Raised mast height	h_4 mm	3200 - 4000		4100 - 6000		3320 - 4220		4320 - 5020		4530 - 8730	
	Free lift	h_2/h_5 mm	150				1230 - 1680		1730 - 2080		1230 - 2630	
	Angle of tilt	α | β ∢ °	3	7	3	9	3	7	3	9	3	5
	Length	l_2 mm	2140				2140				2162	
	Lost load centre	x mm	365				365				387	
	Working aisle width Pallets 1000 x 1200 wide | 800 x 1200 long	A_{st} mm	3507		3702		3507		3702		3528	3724

The models depicted in this brochure may contain special parts or attachments which are not supplied as standard.

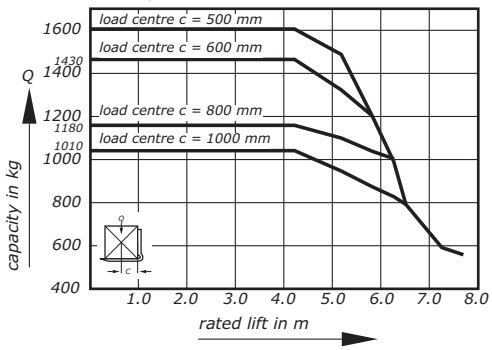
Capacity Chart R 20-16 P

Tele HiLo mast



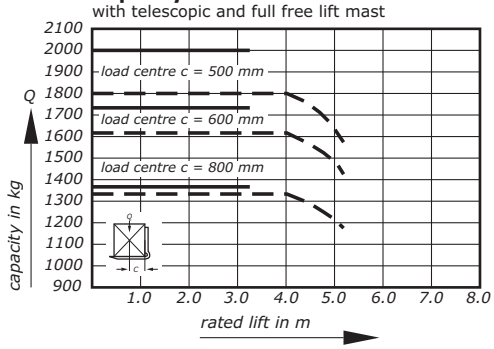
Capacity Chart R 20-16 P

with triple mast



Capacity Chart R 20-20 P

with telescopic and full free lift mast

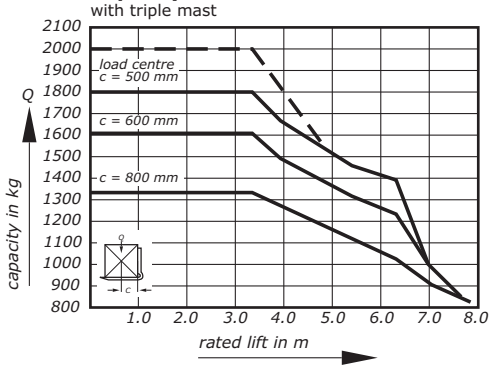


Tele up to 2240 mm

Tele/full free lift from 2290 mm

Capacity Chart R 20-20 P

with triple mast



up to closed height of 2190 mm

over closed height of 2240 mm

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Dual motor front wheel drive.

With a 48 volt battery and dual motor front wheel drive, the R 20 is a high performance machine.

Two heavy duty drive motors provide powerful traction, particularly on steep slopes.

The tractive power of the drive motors is precisely matched to the movement of the steering i.e. at full steering lock both drive motors turn the truck actively into the corner. This makes for sensitive operation in narrow aisles and gives better manoeuvrability.

- Speed and torque can be regulated independently of each other, allowing sensitive driving, powerful acceleration and wear free electrical braking using only the drive pedal.

- High efficiency regenerative braking (energy recovery of up to 10 % is possible). When plugging or braking, or if the drive pedal is released, energy flows back into the battery to give the R 20 a greater working range from one battery charge. It is often possible to use a smaller battery.

Electrics.

The digital electrical system allows simple adaptation to altered operating conditions. The exchange of information between electrical assemblies, e.g. between the drive controller and the cockpit, is achieved using the CAN bus system (Controller Area Network) already used successfully in other types of vehicle. The number of cables and plug connectors is reduced in comparison to the previous system and thus reliability is increased. In addition, it is easy to implement variants to the electrical equipment.

Mast.

STILL clear view masts in telescopic, HiLo and triplex designs for every application:

- Telescopic:
the mast suitable for most applications. Economical mast design.

- HiLo:
for high stacking under low ceilings. Utilises the space right up to the roof.

- Triplex:
for applications with low doorways and greater stacking heights. Utilises the space right up to the roof.

- Fork carriage
The fork carriage, completely redesigned for this truck, gives a clear view onto the load being picked up thanks to its optimised profiles. Hydraulic hoses for attachments are run in the dead visibility area of the mast sections – with no hose reels – for wear-free operation.

Steering.

- The steering operates on the hydrostatic principle with a priority valve.

- The pump operates "on demand" – i.e. only when the steering wheel is moved – for optimal energy economy.

- With its articulating steer axle, the R 20 is suitable for use on uneven roads. As a genuine 4 wheel truck it absorbs road shocks particularly well.

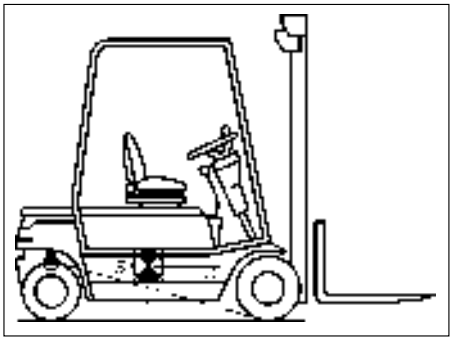
Hydraulics.

- Pump motor speed precisely follows valve lever position to match demand exactly, thereby conserving energy to give longer operation from a battery charge. Working safety is increased due to precision hoisting.

- The oil is filtered through a suction filter before going to the hydraulic units, reducing wear to a minimum.

Stability.

High levels of stability mean that the R 20 can traverse corners at relatively high speeds in safety. This contributes to greater throughput.



Stability is achieved by virtue of the high position of the steer axle articulation point. This means that the centrifugal force has less effect because of the short length of its lever arm from the tipping line.

Driver's compartment.

- The cockpit has an LCD display and a facility for the driver to select from a range of pre-set drive performance levels. He can select the most suitable acceleration or braking and travel speeds from 5 pre-set options. Further adjustments of the drive parameters to suit the application conditions can be made by simply altering the software.

- The drive pedal* sets the travel speed required by the driver, which is unaffected by either load or road surface.

- The up-to-date driving characteristics of the R 20 allow the truck to be held on a gradient or on uneven roadways without the use of hand or foot brakes.

- Roomy footwell with inclined floor plate and non-slip rubber matting.

- Automotive style hand brake to the right of the driver's seat.

- Low step gives convenient entry and exit to the spacious footwell. Inclined floor plate helps reduce leg fatigue.

- Comfortable, hydraulically damped seat adjusts to the driver's weight. Generous squab length gives added support to the thighs and reduces fatigue.

- Adjustable steering column plus reach and rake adjustment for the seat provide an extremely comfortable working position for any physique.

Service.

The servicing interval is doubled – from the previous 500 operating hours up to 1000. This has been made possible by improvements in quality and by reducing the number of components which require maintenance.

* Available with dual pedal control on request.

R 20-16P/20P – e 4 3/03 td Subject to technical modifications.

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