

# MO series

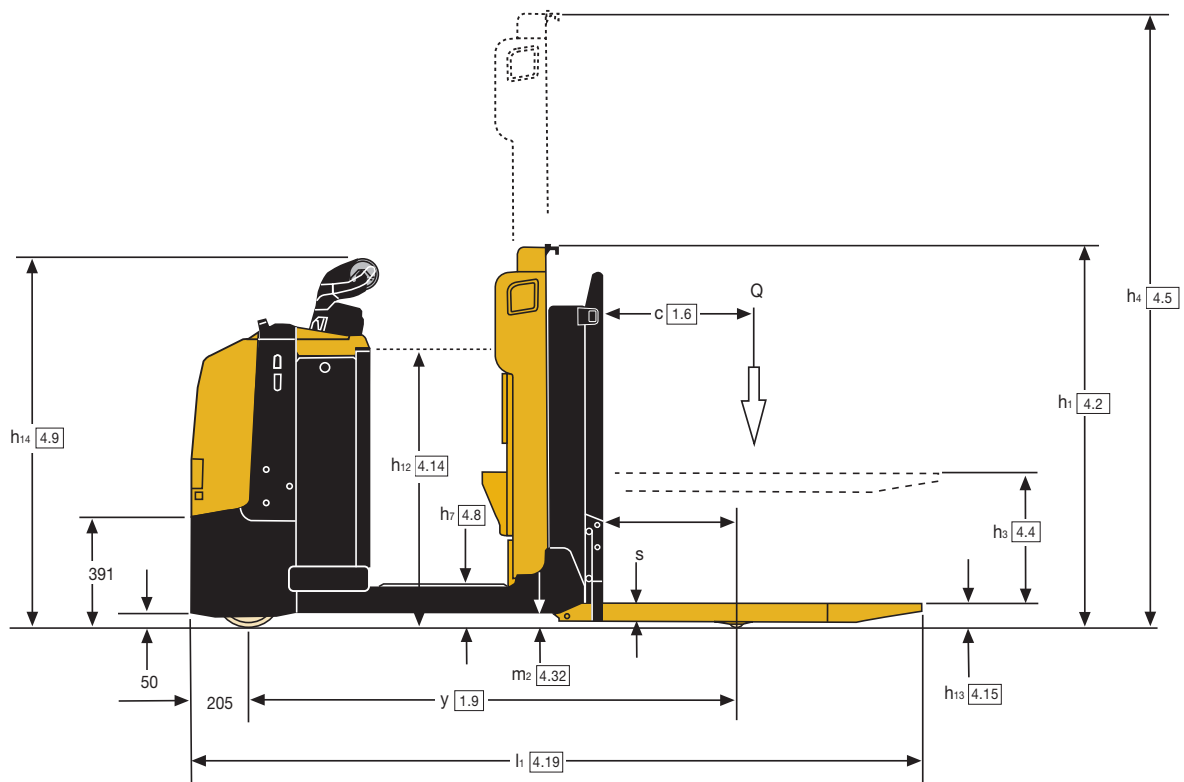
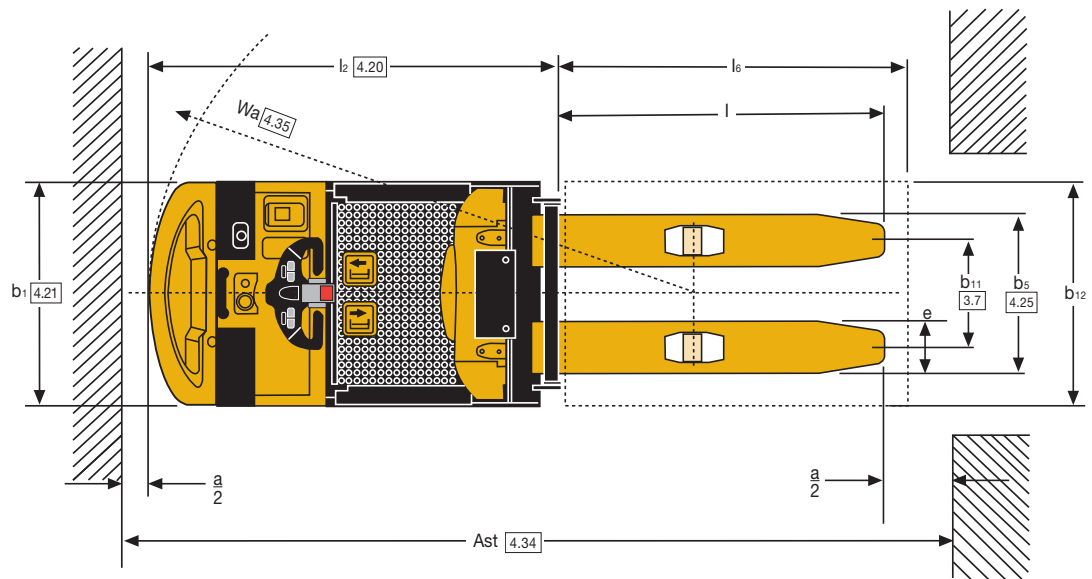
## Low Level Order Picker

**1,000kg / 2,000kg / 2,500kg**

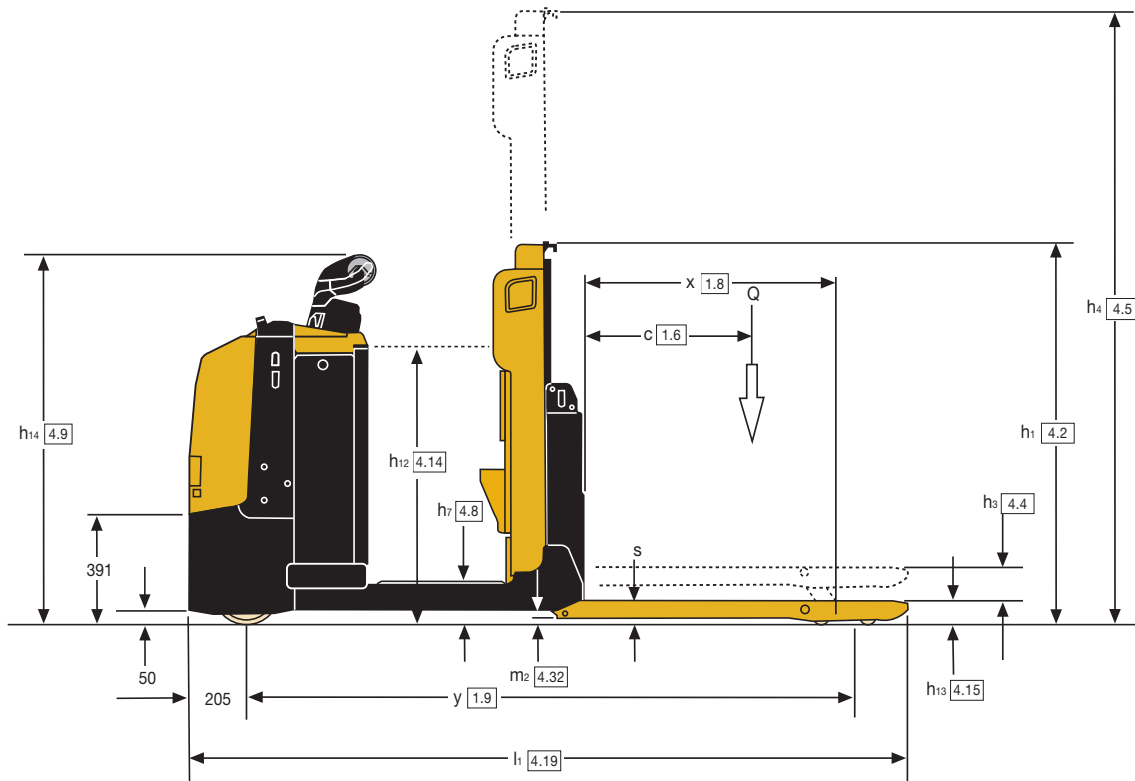
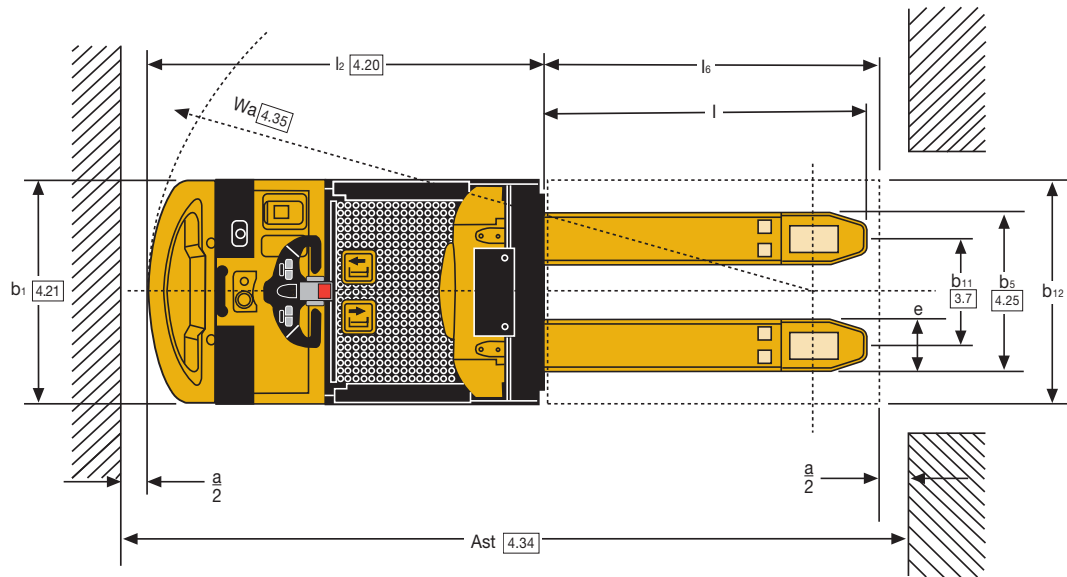
- Scooter control steering device enhances ergonomics and productivity
- Extended model range and option offering for tailored solution
- CANbus technology and high IP protection for main components
- Efficient energy management



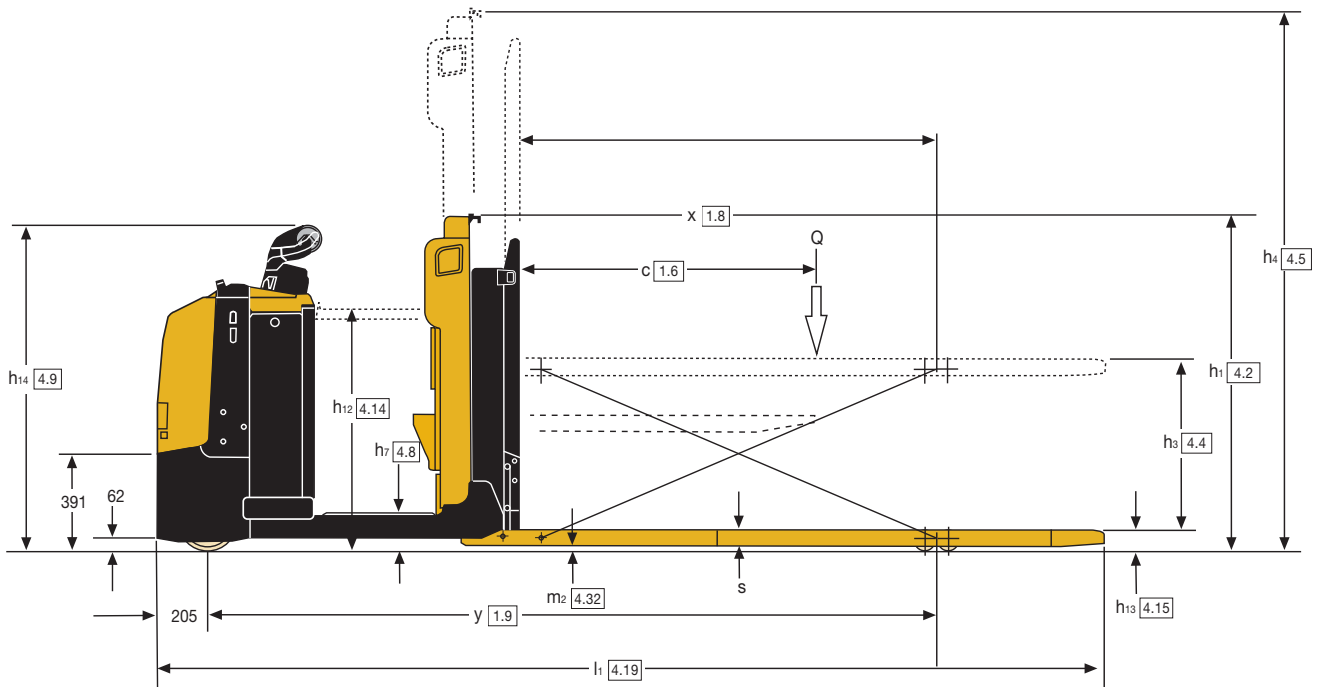
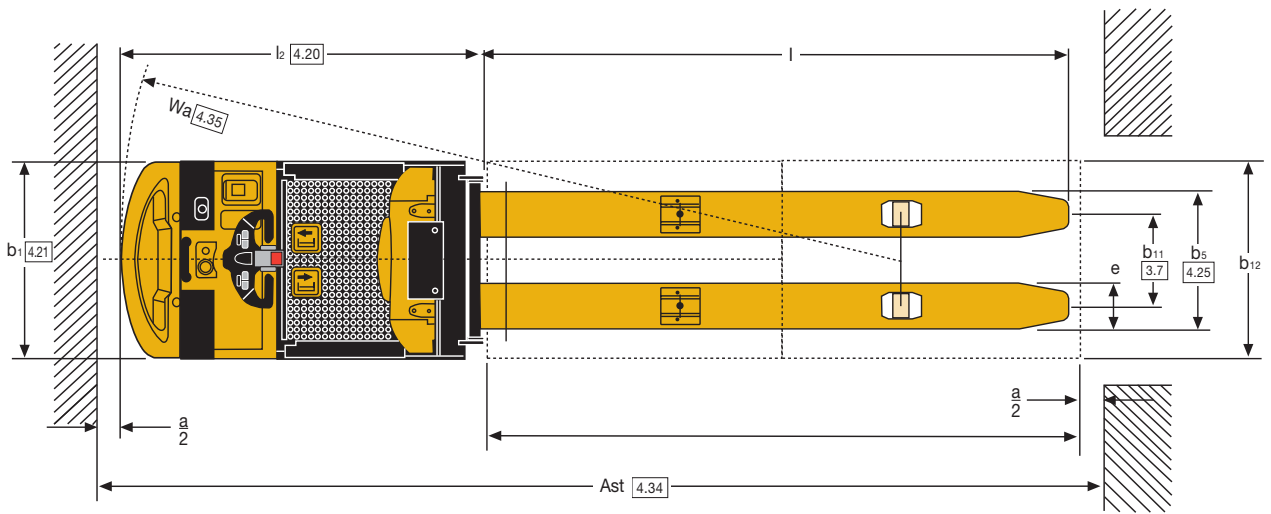
# Truck Dimensions - MO10L



# Truck Dimensions - MO20, MO25



# Truck Dimensions - MO20P



**Table “A” battery dimensions**

	For all batteries				
	b5 = 480mm - 530mm - 560mm - 670mm.		b11 = 300mm - 350mm - 380mm - 490mm		
	C (mm)	I (mm)	x (mm)	I - x (mm)	I6 (mm)
	500	1006	815	191	1000
	600	1156	965	191	1200
	700	1406	965	441	1400
	800	1606	965	641	1600
	1000	1956	1405	551	2000
<b>UK</b>	1000	1956	1356	600	2000
	1100	2156	1405	751	2200
<b>UK</b>	1100	2156	1356	800	2200
<b>UK</b>	1200	2356	1650	706	2400
<b>Short</b>	1200	2356	1405	951	2400
<b>Long</b>	1200	2356	1860	496	2400
	1500	2856	1860	996	3000

**Note:** all values of y, x, Wa are intended with lowered forks; with forks lifted 120mm all values of y, x, Wa are 70mm less

**Table “A” battery dimensions**

	Battery 24V 465Ah				
	b5 = 480mm - 530mm - 560mm - 670mm.		b11 = 300mm - 350mm - 380mm - 490mm		
	y (mm)	l2 (mm)	l1 (mm)	Wa (mm)	Ast (mm)
	500	500	1006	1006	815
	600	600	1156	1156	965
	700	700	1406	1406	965
	800	800	1606	1606	965
	1000	1000	1956	1956	1405
<b>UK</b>	1000	1000	1956	1956	1356
	1100	1100	2156	2156	1405
<b>UK</b>	1100	1100	2156	2156	1356
<b>UK</b>	1200	1200	2356	2356	1650
<b>Short</b>	1200	1200	2356	2356	1405
<b>Long</b>	1200	1200	2356	2356	1860
	1500	1500	2856	2856	1860

**Note:** all values of y, x, Wa are intended with lowered forks; with forks lifted 120mm all values of y, x, Wa are 70mm less

**Table “A” battery dimensions**

	Battery 24V 500Ah / 620Ah				
	b5 = 480mm - 530mm - 560mm - 670mm.		b11 = 300mm - 350mm - 380mm - 490mm		
	y (mm)	l2 (mm)	l1 (mm)	Wa (mm)	Ast (mm)
	815	191	191	1000	1000
	965	191	191	1200	1200
	965	441	441	1400	1400
	965	641	641	1600	1600
	1405	551	551	2000	2000
<b>UK</b>	1356	600	600	2000	2000
	1405	751	751	2200	2200
<b>UK</b>	1356	800	800	2200	2200
<b>UK</b>	1650	706	706	2400	2400
<b>Short</b>	1405	951	951	2400	2400
<b>Long</b>	1860	496	496	2400	2400
	1860	996	996	3000	3000

**Note:** all values of y, x, Wa are intended with lowered forks; with forks lifted 120mm all values of y, x, Wa are 70mm less

## VDI 2198 - General Specifications

Distinguishing mark	1.1	Manufacturer (abbreviation)		Yale	Yale	Yale
	1.2	Manufacturer's type designation		<b>MO20</b>	<b>MO20</b>	<b>MO20</b>
	1.3	Drive: electric (battery or mains), diesel, petrol, fuel gas		Electric (battery)	Electric (battery)	Electric (battery)
	1.4	Operator type: hand, pedestrian, standing, seated, order-picker		Order-picker	Order-picker	Order-picker
	1.5	Rated capacity/rated load	Q (kg)	2000	2000	2000
	1.6	Load centre distance	c (mm)	1200 <sup>(2)</sup>	1200 <sup>(2)</sup>	1200 <sup>(2)</sup>
	1.8	Load distance, centre of drive axle to fork <sup>(6)</sup>	x (mm)	1405	1405	1405
	1.9	Wheelbase <sup>(6)</sup>	y (mm)	2608	2608	2608
	Weights	2.1	Service weight	kg	1050 <sup>(2)</sup>	1195 <sup>(2)</sup>
2.2		Axle loading, laden front/rear	kg	883 / 2167	955 / 2240	975 / 2250
2.3		Axle loading, unladen front/rear	kg	793 / 257	865 / 330	885 / 340
Tyres/chassis	3.1	Tyres: polyurethane, tophane, Vulkollan <sup>(7)</sup> , front/rear		Vulkollan / Vulkollan	Vulkollan / Vulkollan	Vulkollan / Vulkollan
	3.2	Tyre size, front	ø (mm x mm)	254 x 90	254 x 90	254 x 90
	3.3	Tyre size, rear	ø (mm x mm)	85 x 90	85 x 90	85 x 90
	3.4	Additional wheels (dimensions)	ø (mm x mm)	150 x 79	150 x 79	150 x 79
	3.5	Wheels, number front/rear (x = driven wheels)		1x + 1/4	1x + 1/4	1x + 1/4
	3.6	Tread, front	b10 (mm)	437	437	437
	3.7	Tread, rear	b11 (mm)	380	380	380
Dimensions	4.2	Height of mast, lowered	h1 (mm)	1360	1360	1878
	4.4	Lift	h3 (mm)	120	120	120
	4.5	Height, mast extended	h4 (mm)	-	2340	3228
	4.8	Seat height relating to SIP/stand height	h7 (mm)	152	152	152
	4.9	Height drawbar in driving position min./max.	h14 (mm)	1317	1317	1317
	4.12	Coupling height	h10 (mm)	-	-	-
	4.14	Stand height, elevated	h12 (mm)	-	980	1500
	4.15	Height, lowered	h13 (mm)	85	85	85
	4.17	Overhang	l5 (mm)	-	-	-
	4.19	Overall length <sup>(6)</sup>	l1 (mm)	3764	3764	3764
	4.20	Length to face of forks <sup>(6)</sup>	l2 (mm)	1410	1410	1410
	4.21	Overall width	b1/b2 (mm)	796	796	796
	4.22	Fork dimensions ISO 2331 <sup>(6)</sup>	s/e/l (mm)	60 / 184 / 2356	60 / 184 / 2356	60 / 184 / 2356
	4.25	Distance between fork-arms	b5 (mm)	560	560	560
	4.32	Ground clearance, centre of wheelbase	m2 (mm)	25	25	25
	4.33	Load dimensions b12 x l6 crossways	b12 x l6 (mm)	800 x 1200 <sup>(2)</sup>	800 x 1200 <sup>(2)</sup>	800 x 1200 <sup>(2)</sup>
	4.34.1	Aisle width for pallets 1000 x 1200 crossways <sup>(6)</sup>	Ast (mm)	3737 <sup>(2)</sup>	3737 <sup>(2)</sup>	3737 <sup>(2)</sup>
4.34.2	Aisle width for pallets 800 x 1200 lengthways <sup>(6)</sup>	Ast (mm)	3462 <sup>(2)</sup>	3462 <sup>(2)</sup>	3462 <sup>(2)</sup>	
4.35	Turning radius	Wa (mm)	2813 <sup>(2)</sup>	2813 <sup>(2)</sup>	2813 <sup>(2)</sup>	
Performance data	5.1	Travel speed, laden/unladen	km/h	8.5 / 10.5 <sup>(4)</sup>	8.5 / 10.5 <sup>(4)</sup>	8.5 / 10.5 <sup>(4)</sup>
	5.1.1	Travel speed, laden/unladen, backwards	km/h	8 / 8	8 / 8	8 / 8
	5.2.1	Lift speed, laden/unladen (Forks)	m/s	0.027 / 0.039	0.027 / 0.039	0.027 / 0.039
	5.2.2	Lift speed, laden/unladen (Cab)	m/s	-	0.189 / 0.189	0.189 / 0.189
	5.3.1	Lowering speed, laden/unladen (Forks)	m/s	0.038 / 0.018	0.038 / 0.018	0.038 / 0.018
	5.3.2	Lowering speed, laden/unladen (Cab)	m/s	-	0.162 / 0.162	0.162 / 0.162
	5.5	Drawbar pull, laden/unladen	N	-	-	-
	5.6	Max. drawbar pull, laden/unladen	N	-	-	-
	5.7	Gradeability, laden/unladen	%	6 / 20	6 / 20	6 / 20
	5.8	Max. gradeability, laden/unladen	%	10 / 20	10 / 20	10 / 20
5.9	Acceleration time, laden/unladen	s	7,6 / 5,3	7,6 / 5,3	7,6 / 5,3	
5.10	Service brake		Electromagnetic	Electromagnetic	Electromagnetic	
Electric-engine	6.1	Drive motor rating S2 60 min	kW	2.6	2.6	2.6
	6.2	Lift motor rating at S3 15%	kW	1,2	2	2
	6.3	Battery according to DIN 43531/35/36 A, B, C, no		no	no	no
	6.4	Battery voltage/nominal capacity K5	(V) / (Ah)	24 / 465 <sup>(2)</sup>	24 / 465 <sup>(2)</sup>	24 / 465 <sup>(2)</sup>
	6.5	Battery weight	kg	366	366	366
	6.6	Energy consumption according to VDI cycle <sup>(7)</sup>	kWh/h @ no. of cycles	1,13	1,13	1,13
Drive/lift mechanism	8.1	Type of drive unit		AC-Controller	AC-Controller	AC-Controller
Additional data	10.7	Average noise level at the operator's ear according to EN 12053	dB (A)	< 67.5	< 67.5	< 67.5

(2) Available battery 500Ah; see Table "A". With battery 500Ah service weight 1069 (MO20 fixed cab), 1214 (MO20 lift cab 980 mm), 1244 (MO20 lift cab 1500 mm)

(3) Applies to 2 pallets=2400 mm

(4) Optional 10/13 km/h (MO20-MO20P) and 9/13 km/h (MO25)

(8) +/- 5%

(5) Optional 12/13 km/h (MO10L)

(6) For models MO20, MO25, see Table "A"

(7) values obtained with 40 cycles

Yale	Yale	Yale	Yale	Yale	Yale	Yale	1.1	
<b>MO25</b>	<b>MO25</b>	<b>MO25</b>	<b>MO10L</b>	<b>MO10L</b>	<b>MO20P</b>	<b>MO20P</b>	1.2	Distinguishing mark
Electric (battery)	Electric (battery)	Electric (battery)	Electric (battery)	Electric (battery)	Electric (battery)	Electric (battery)	1.3	
Order-picker	Order-picker	Order-picker	Order-picker	Order-picker	Order-picker	Order-picker	1.4	
2500	2500	2500	1000	1000	2000	2000	1.5	
1200 <sup>(3)</sup>	1200 <sup>(3)</sup>	1200 <sup>(3)</sup>	600	600	1200 <sup>(3)</sup>	1200 <sup>(3)</sup>	1.6	
1860	1860	1860	486	486	1682	1682	1.8	
3208	3208	3208	1740	1740	2936	2936	1.9	
1165	1310	1340	1045	1190	1220	1365	2.1	
1370 / 2295	1442 / 2368	1462 / 2378	622 / 1413	695 / 1485	1089 / 2131	1161 / 2204	2.2	
905 / 260	977 / 333	977 / 343	722 / 323	795 / 395	834 / 386	906 / 459	2.3	
Vulkollan / Vulkollan	Vulkollan / Vulkollan	Vulkollan / Vulkollan	Vulkollan / Vulkollan	Vulkollan / Vulkollan	Vulkollan / Vulkollan	Vulkollan / Vulkollan	3.1	Weights
254 x 90	254 x 90	254 x 90	254 x 90	254 x 90	254 x 90	254 x 90	3.2	
85 x 90	85 x 90	85 x 90	85 x 100	85 x 100	85 x 70	85 x 70	3.3	
150 x 79	150 x 79	150 x 79	150 x 79	150 x 79	150 x 79	150 x 79	3.4	
1x + 1/4	1x + 1/4	1x + 1/4	1x + 1/2	1x + 1/2	1x + 1/4	1x + 1/4	3.5	
437	437	437	437	437	437	437	3.6	
376	380	380	390	390	372	372	3.7	
1360	1360	1878	1360	1360	1360	1360	4.2	
120	120	120	690	690	690	690	4.4	
-	2340	3228	-	2340	-	2340	4.5	
152	152	152	152	152	152	152	4.8	
1317	1317	1317	1317	1317	1317	1317	4.9	
-	-	-	-	-	-	-	4.12	
-	980	1500	-	980	-	980	4.14	
85	85	85	90	90	85	85	4.15	
-	-	-	-	-	-	-	4.17	
3909	3909	3909	2619	2619	3816	3816	4.19	
1555	1555	1555	1459	1459	1460	1460	4.20	
796	796	796	796	796	796	796	4.21	
60 / 184 / 2356	60 / 184 / 2356	60 / 184 / 2356	60 / 180 / 1160	60 / 180 / 1160	68 / 192 / 2356	68 / 192 / 2356	4.22	
560	560	560	570	570	564	564	4.25	
25	25	25	48	48	20	20	4.32	
800 x 1200 <sup>(3)</sup>	800 x 1200 <sup>(3)</sup>	800 x 1200 <sup>(3)</sup>	800 x 1200	800 x 1200	800 x 1200 <sup>(3)</sup>	800 x 1200 <sup>(3)</sup>	4.33	
4662 <sup>(3)</sup>	4662 <sup>(3)</sup>	4662 <sup>(3)</sup>	1739	1739	4250 <sup>(3)</sup>	4250 <sup>(3)</sup>	4.34.1	
4385 <sup>(3)</sup>	4385 <sup>(3)</sup>	4385 <sup>(3)</sup>	1767	1767	3968 <sup>(3)</sup>	3968 <sup>(3)</sup>	4.34.2	
3413 <sup>(3)</sup>	3413 <sup>(3)</sup>	3413 <sup>(3)</sup>	1945	1945	3142 <sup>(3)</sup>	3142 <sup>(3)</sup>	4.35	
8.5 / 10.5 <sup>(4)</sup>	8.5 / 10.5 <sup>(4)</sup>	8.5 / 10.5 <sup>(4)</sup>	10.5 / 10.5 <sup>(5)</sup>	10.5 / 10.5 <sup>(5)</sup>	8.5 / 10.5 <sup>(4)</sup>	8.5 / 10.5 <sup>(4)</sup>	5.1	
8 / 8	8 / 8	8 / 8	8 / 8	8 / 8	8 / 8	8 / 8	5.1.1	
0.023 / 0.039	0.023 / 0.039	0.027 / 0.039	0.087 / 0.233	0.087 / 0.233	0.060 / 0.150	0.060 / 0.150	5.2.1	
-	0.189 / 0.189	0.189 / 0.189	-	0.189 / 0.189	-	0.189 / 0.189	5.2.2	
0.038 / 0.018	0.038 / 0.018	0.038 / 0.018	0.173 / 0.154	0.173 / 0.154	0.147 / 0.126	0.147 / 0.126	5.3.1	
-	0.162 / 0.162	0.162 / 0.162	-	0.162 / 0.162	-	0.162 / 0.162	5.3.2	
-	-	-	-	-	-	-	5.5	
-	-	-	-	-	-	-	5.6	
6 / 20	6 / 20	6 / 20	6 / 20	6 / 20	6 / 20	6 / 20	5.7	
10 / 20	10 / 20	10 / 20	10 / 20	10 / 20	10 / 20	10 / 20	5.8	
8,9 / 5,5	8,9 / 5,5	8,9 / 5,5	7,0 / 5,2	7,0 / 5,2	7,6 / 5,3	7,6 / 5,3	5.9	
Electromagnetic	Electromagnetic	Electromagnetic	Electromagnetic	Electromagnetic	Electromagnetic	Electromagnetic	5.10	
2.6	2.6	2.6	2.6	2.6	2.6	2.6	6.1	
1,2	2	2	2	2	2	2	6.2	
no	no	no	no	no	no	no	6.3	
24 / 620	24 / 620	24 / 620	24 / 465	24 / 465	24 / 465	24 / 465	6.4	
480	480	480	366	366	366	366	6.5	
1,13	1,13	1,13	1,13	1,13	1,13	1,13	6.6	
AC-Controller	AC-Controller	AC-Controller	AC-Controller	AC-Controller	AC-Controller	AC-Controller	8.1	Drive/lift mechanism
< 67.5	< 67.5	< 67.5	< 68.5	< 68.5	< 68.5	< 68.5	10.7	

All values are nominal values and they are subject to tolerances. For further information, please contact the manufacturer.

Yale products might be subject to change without notice. Lift trucks illustrated may feature optional equipment. Values may vary with alternative configurations.

# MO series

Models: MO10L, MO20, MO20P, MO25



**MO20 and MO25** with fixed or raising platform for ground up to second level picking.

**MO20P** allows the handling of double pallets (Europallets) where heavy and/or bulky case picks are the items handled. Here the scissor lift height serves to eliminate constant bending and stretching.

**MO10L** with mast lift allows the pallet to be maintained at a constant comfortable working height.

## Productivity

- The powerful high thermal capacity 2,6kW AC drive motor delivers high performance acceleration, braking and travel speed, making these models ideal for stop and go operations
- Acceleration, travel and braking speeds can be adjusted by a service engineer to the particular needs of the application through the operator console
- Effortless electrical steering and automatic speed reduction on cornering ensure excellent control and high productivity
- The anti-roll back on ramps device ensures efficient operation
- LLOP models provide a nominal capacity of up to 2500kg, with 48 different fork length options. This enables the truck to be configured to suit the varying operational requirements of a vast range of applications
- A maximum travel speed of 13km/h reduces travel time on long runs between docking and picking areas
- Vertical or lateral battery extraction is available

## Ergonomics

- Scooter control with electric steering reduces the arm movement required to change direction. This allows the operator to remain within the truck footprint at all times for protection as well as reducing operator fatigue and increasing productivity
- A personnel sensor, which covers the entire platform floor area detects when the operator is on board. This, together with the high, soft touch, back rest, allows the operator to locate the most comfortable operating position
- The large platform area increases operator comfort and allows easier pass through to optimize picking from both sides

- Slow-speed forward and reverse direction buttons (coasting function) are located on the backrest. This allows the operator to walk alongside the truck to the next pick location
- LLOP - Foot controlled lifting platform option facilitates up to second level picking and limits the amount of reaching the operator has to do from rack to pallet, reducing operator fatigue
- On MO20 and MO25 optional slow-speed forward direction buttons (coasting function) are located on the backrest and allow the operator to move the truck whilst walking alongside, to the next pick location without having to board
- On MO10L and MO20P optional coasting function provides also lifting/lowering forks controls to allow the operator to maintain the pallet at a constant comfortable working height

## Cost of Ownership

- Integrated system controls, AC traction and DC pump motors increase energy efficiency
- Adjustable performance settings allow the truck to be tailored to the needs of the application, reducing energy consumption
- Regenerative braking reduces the use of the service brake and dissipates heat from the traction motor increasing the life of key components
- Motors and controllers are protected against damage and debris, reducing servicing and repair costs

## Dependability

- The solid frame construction and industrial grade components ensure long-term reliability and durability
- A sturdy wrap around bumper plate protects the truck against impacts and damage and minimises repair costs
- On LLOP models, the robust pull rod design of the load wheel axle ensures long term reliability
- The truck's electronics - including the enclosed AC traction motor, sealed combi-controller (with IP65 rating), sealed electrical connectors and hall effect sensors and switches - are all protected from damage to ensure excellent reliability, maximum productivity and reduced servicing costs
- Reduced wiring complexity is a result of

the CANbus communication system, which also provides easy access to components and delivers world-class reliability

## Serviceability

- The CANbus system and diagnostics can be controlled and monitored via the console or through the single plug-point. Fault codes can be displayed on the console for easy service identification
- A one-piece hood provides easy access to key components
- Full access to all the trucks main components, including the motor is, by the removal of the motor cover, which is retained by two easily removed screws
- The low maintenance AC traction motor with built in thermal protection is fully enclosed for protection against damage and debris, minimising service downtime

## Available Options include:

### MO20, MO25

- 48 different fork dimensions
- 2nd level foldable step (only for MO20 and MO25 models with fixed operator platform)
- Removable trash bin in operator back rest (for models with fixed operator platform)
- Coasting function with slow-speed forward buttons

### MO10L, MO20P

- Coasting function with slow-speed forward, lifting and lowering forks buttons

### Miscellaneous

- Key pad
- Cold store version
- Side battery extraction
- Floor-level bumper (rubber bumper)
- Mid mounted bumper (bull bar)
- Universal support bar on motor compartment
- Various drive wheels
- Various platform lift heights
- Various storage compartments
- Object tray on operator back rest.
- Scooter control raising with platform
- Standard and extended warranty options

**NACCO Materials Handling Limited**  
trading as **Yale Europe Materials Handling**  
Centennial House, Frimley Business Park,  
Frimley, Surrey GU16 7SG, United Kingdom.  
Tel: +44 (0) 1276 538500 Fax: +44 (0) 1276 538559


[www.yale-forklifts.eu](http://www.yale-forklifts.eu)

Country of Registration: England. Company Registration Number: 02636775



**Safety.** This truck conforms to the current EU requirements. Specification is subject to change without notice.

Yale, VERACITOR and  are registered trademarks. "PEOPLE, PRODUCTS, PRODUCTIVITY", PREMIER, Hi-Vis, and CSS are trademarks in the United States and certain other jurisdictions. MATERIALS HANDLING CENTRAL and MATERIAL HANDLING CENTRAL are Service Marks in the United States and certain other jurisdictions.

 is a Registered Copyright. © Yale Europe Materials Handling 2014. All rights reserved.  
Truck shown with optional equipment  
Printed in The United Kingdom (0114HG) EN  
Publication part no. 258983337 Rev.02