

## MO Series

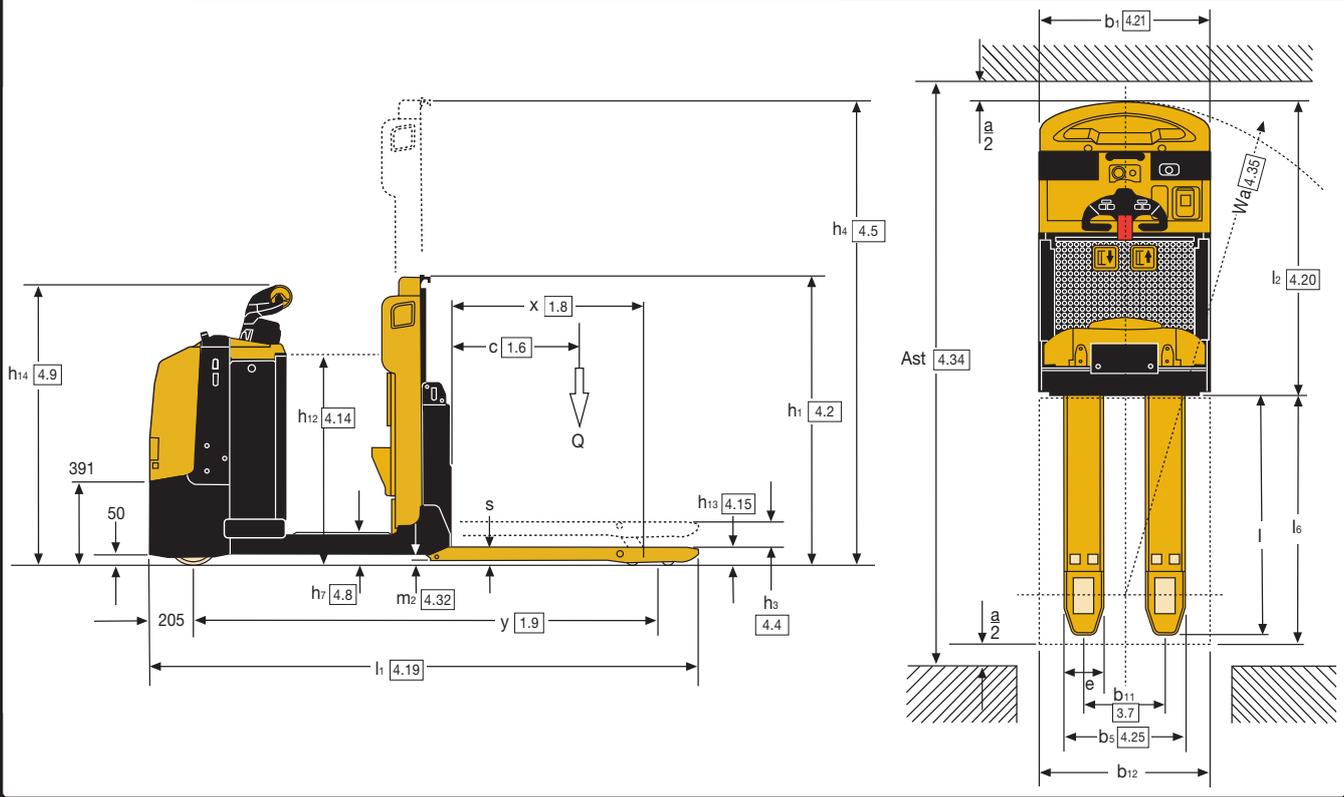
### Low Level Order Picker and Tow Tractor

2,000kg, 2,500kg and 5,000kg

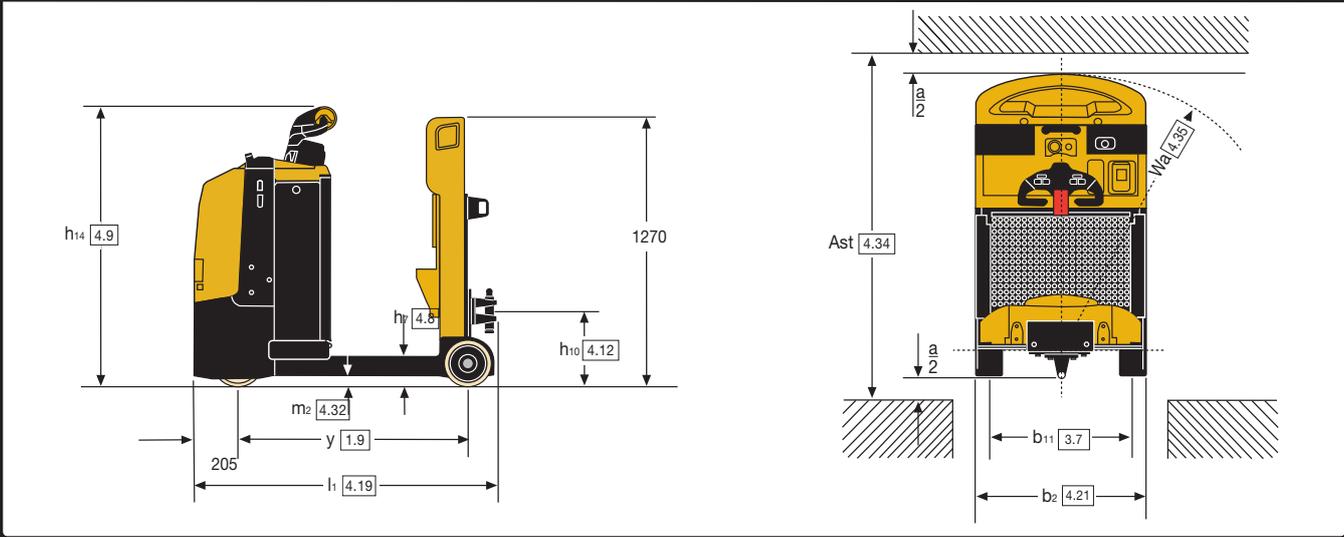


- Scooter control steering device enhances ergonomics and productivity
- Extended model range and option offering for tailored solution
- CANbus technology and high IP protection for main components
- Efficient energy management

## Truck Dimensions - MO20, MO25



## Truck Dimensions - MO50T



## Dimensions

Note	b5 = 520mm - 560mm - 670mm. b11 = 340mm - 380mm - 490mm					with 465 Ah battery *			
	C	l	x**	z	l6	y**	l1	Wa**	Ast
	(fork overhang) mm					(fork overhang) mm			
	500	1006	745	191	1000	2018	2414	2223	2608
	600	1156	895	191	1200	2168	2564	2373	2808
	700	1406	895	441	1400	2168	2814	2373	3008
	800	1606	895	641	1600	2168	3014	2373	3208
	1000	1956	1335	551	2000	2608	3364	2813	3608
<b>UK</b>	1000	1956	1286	600	2000	2559	3364	2764	3608
	1100	2156	1335	751	2200	2608	3564	2813	3808
<b>UK</b>	1100	2156	1286	800	2200	2559	3564	2764	3808
<b>UK</b>	1200	2356	1580	706	2400	2853	3764	3058	4008
<b>short</b>	1200	2356	1335	951	2400	2608	3764	2813	4008
<b>long</b>	1200	2356	1790	496	2400	3063	3764	3268	4008
	1450	2856	1790	996	3000	3063	4264	3268	4608

\*Add 145mm to this value and l2 dimension with 620Ah. \*\*All values for y and Wa are with lowered forks. With forks raised 120mm, these dimensions will be reduced by 70mm. \*\*\*All values for x are intended with forks raised 120mm. With forks lowered these dimensions will be increased by 70mm. Ast = Wa-x+a, where a = minimum operating clearance of 200mm. Ast is calculated for 465Ah battery and Wa reduced by 70mm (forks raised)

## VDI 2198 - General Specifications

Characteristics	1.1	Manufacturer		Yale	Yale	Yale	Yale	Yale
	1.2	Model designation		<b>MO20</b>	<b>MO20</b>	<b>MO25</b>	<b>MO25</b>	<b>MO50T</b>
	1.3	Power: battery, diesel, LPG, electric mains		Battery	Battery	Battery	Battery	Battery
	1.4	Operation; manual, pedestrian, stand, seat, orderpicker		Orderpicker	Orderpicker	Orderpicker	Orderpicker	Stand
	1.5	Load capacity	Q (kg)	2000	2000	2500	2500	5000
	1.6	Load centre	c (mm)	1200	1200	1200	1200	-
	1.7	Rated drawbar pull	F(N)	-	-	-	-	1000
	1.8	Load distance, centre of drive axle to fork	x (mm)	1335	1335	1790	1790	-
	1.9	Wheelbase	y (mm)	2608	2608	3208	3208	1084 <sup>(1)</sup>
Weights	2.1	Service weight	kg	1050	1195	1165	1310	1018 <sup>(1)</sup>
	2.2	Axle loading with load, front/rear	kg	883 / 2167	955 / 2240	1370 / 2295	1442 / 2368	-
	2.3	Axle loading without load, front/rear	kg	793 / 257	865 / 330	905 / 260	977 / 333	584 / 434
Wheels and Tyres	3.1	Tyres: polyurethane, tophane, vulkollan, front/rear		Vulkollan / Polyurethane	Vulkollan / Polyurethane	Vulkollan / Polyurethane	Vulkollan / Polyurethane	Tophane / Polyurethane
	3.2	Tyre size, front	ø (mm x mm)	254 x 90	254 x 90	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	85 x 90	200 x 100
	3.4	Additional wheels (dimensions)	ø (mm x mm)	150 x 79	150 x 79	150 x 79	150 x 79	-
	3.5	Number of wheels front/rear (x = driven)		1x+1/4	1x+1/4	1x+1/4	1x+1/4	1x/2
	3.6	Track width, front	b <sub>10</sub> (mm)	437	437	437	437	-
	3.7	Track width, rear	b <sub>11</sub> (mm)	376	376	376	376	686
Dimensions	4.2	Height, mast lowered	h <sub>1</sub> (mm)	1360	1360	1360	1360	-
	4.4	Lift height	h <sub>3</sub> (mm)	120	120	120	120	-
	4.5	Height, mast extended	h <sub>4</sub> (mm)	-	2340	-	2340	-
	4.8	Seat height/stand height	h <sub>7</sub> (mm)	152	152	152	152	152
	4.9	Height of tiller in drive position min./max	h <sub>14</sub> (mm)	1317	1317	1317	1317	1317
	4.12	Coupling height	h <sub>10</sub> (mm)	-	-	-	-	365
	4.14	Stand height, elevated	h <sub>12</sub> (mm)	-	980	-	980	-
	4.15	Height, lowered	h <sub>13</sub> (mm)	85	85	85	85	-
	4.17	Overhang	l <sub>5</sub> (mm)	-	-	-	-	150
	4.19	Overall length	l <sub>1</sub> (mm)	3764	3764	3909	3909	1429 <sup>(1)</sup>
	4.20	Length to face of forks	l <sub>2</sub> (mm)	1410	1410	1555	1555	-
	4.21	Overall width	b <sub>1</sub> /b <sub>2</sub> (mm)	796	796	796	796	796
	4.22	Fork dimensions	s/e/l (mm)	60 / 184 / 2356	60 / 184 / 2356	60 / 184 / 2356	60 / 184 / 2356	-
	4.25	Distance between fork-arms	b <sub>5</sub> (mm)	560	560	560	560	-
	4.32	Ground clearance, center of wheelbase	m <sub>2</sub> (mm)	25	25	25	25	50
4.34	Aisle width for pallets 800mm x 1200mm long	A <sub>st</sub> (mm)	4008 <sup>(2)</sup>	4008 <sup>(2)</sup>	4153 <sup>(2)</sup>	4153 <sup>(2)</sup>	-	
4.35	Turning radius	W <sub>a</sub> (mm)	2813	2813	3413	3413	1289 <sup>(1)</sup>	
Performance	5.1	Travel speed, with/without load	km/h	8,5 / 10,5 <sup>(3)</sup>	8,5 / 10,5 <sup>(3)</sup>	8,5 / 10,5 <sup>(3)</sup>	8,5 / 10,5 (3)	7 / 12,5
	5.2.1	Lift speed, with/without load (Forks)	m/s	0.027 / 0.039	0.027 / 0.039	0.023 / 0.039	0.023 / 0.039	-
	5.2.2	Lift speed, with/without load (Cab)	m/s	-	0.189 / 0.189	-	0.189 / 0.189	-
	5.3.1	Lowering speed, with/without load (Forks)	m/s	0.038 / 0.018	0.038 / 0.018	0.038 / 0.018	0.038 / 0.018	-
	5.3.2	Lowering speed, with/without load (Cab)	m/s	-	0.162 / 0.162	-	0.162 / 0.162	-
	5.5	Drawbar pull, with/without load	N	-	-	-	-	1000
	5.6	Max drawbar pull, with/without load	N	-	-	-	-	3200
	5.7	Gradeability, with/without load	%	5 / 5	5 / 5	5 / 5	5 / 5	- / 8,9
	5.8	Max. gradeability, with/without load	%	TBD	TBD	TBD	TBD	TBD
	5.10	Service brake		Electromagnetic	Electromagnetic	Electromagnetic	Electromagnetic	Electromagnetic
Motors	6.1	Drive motor, S2 60 min rating	kW	2.6	2.6	2.6	2.6	2.6
	6.2	Lift motor S3 15% rating	kW	1.2	2	1.2	2	-
	6.3	Battery according to DIN 43531/35/36 A,B,C, no		no	no	no	no	no
	6.4	Battery voltage / capacity at 5 hours rate	V/Ah	24/465	24/465	24/620	24/620	24/465 <sup>(1)</sup>
	6.5	Battery weight (+/- 5%)	kg	366	366	480	480	366
	6.6	Energy consumption acc. to VDI cycle	kWh/h	1,16	1,16	1,16	1,16	TBD
Other	8.1	Drive control		AC ~ Mosfet	AC ~ Mosfet	AC ~ Mosfet	AC ~ Mosfet	AC ~ Mosfet
	8.4	Average noise level at the operator's ear according to EN 12053	dB (A)	< 68,5	< 68,5	< 68,5	< 68,5	TBD

<sup>(1)</sup> With standard battery. With Optional 620Ah battery, add 145mm. Service weight is increased by 114kg

<sup>(2)</sup> Applies to 2 pallets = 2400mm

<sup>(3)</sup> Optional 10/13 km/h (MO20) and 9/13 km/h (MO25)

## MO Series

Models: MO20, MO25, MO50T

### MO20-25 Low Level Order Picker (LLOP)

Available with fixed or lifting platform, with independent fork lift to facilitate ground, first and second level picking

### MO50T Tow Tractor

Designed for use in a wide range of manufacturing applications, particularly for line-feed operations

#### 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
- The large battery capacity makes these models perfect for dual shift operation whilst reducing the frequency of battery charging. 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 suspended 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
- On LLOP models, the foot controlled lifting platform option facilitates second level picking. This option reduces the distance the operator has to reach when picking from rack to pallet, reducing fatigue.

#### Cost of Ownership

- Integrated system controls, including the dual technology MOSFET combi-controller, 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:

- Side battery extraction
- 48 different fork dimensions
- Floor-level bumper (rubber bumper)
- Mid mounted bumper (bull bar)
- Universal support bar on motor compartment
- Several hook types (MO50T)
- Various drive wheel compounds, platform lift heights and storage compartments



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

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Truck shown with optional equipment