

MO E/S series

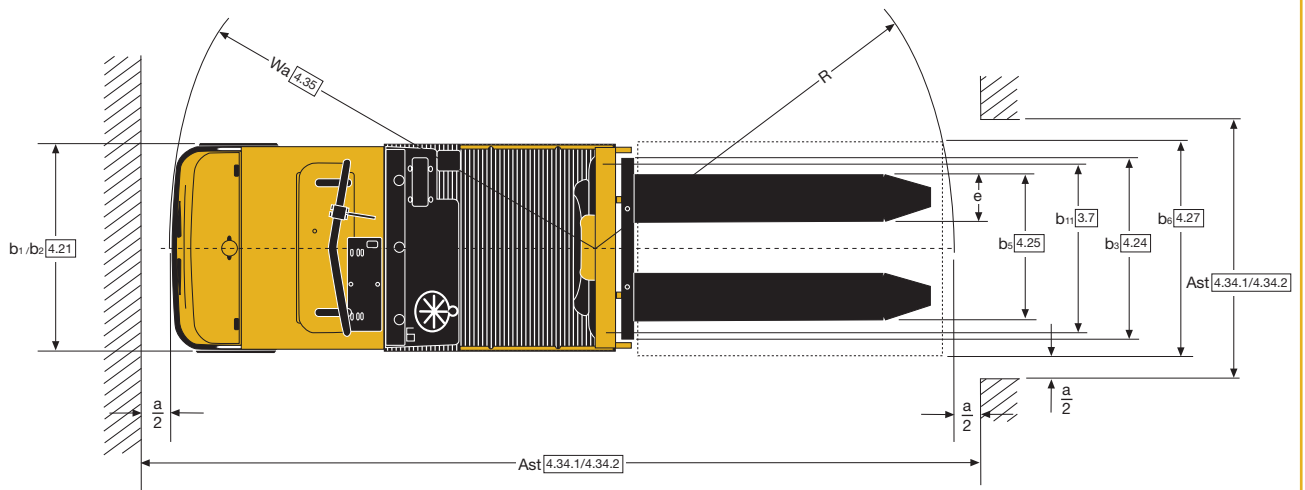
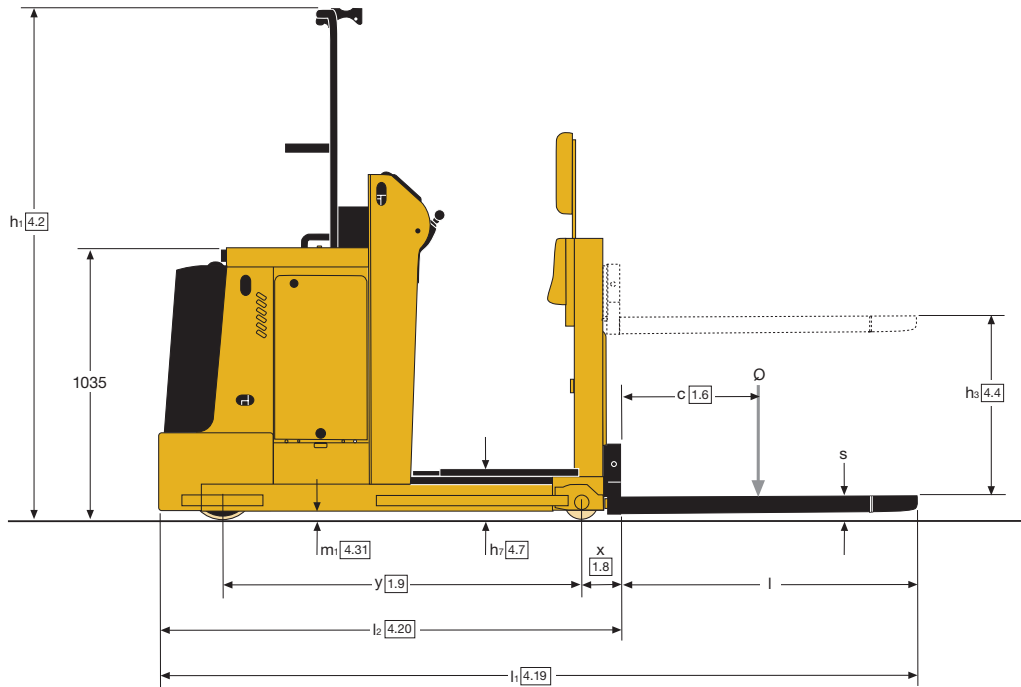
Medium & high level order picker

1,000 kg

- Yale AC technology
- AC motors
- CANbus
- Fly-by-wire steering
- Enhanced comfort and performance
- Low maintenance features



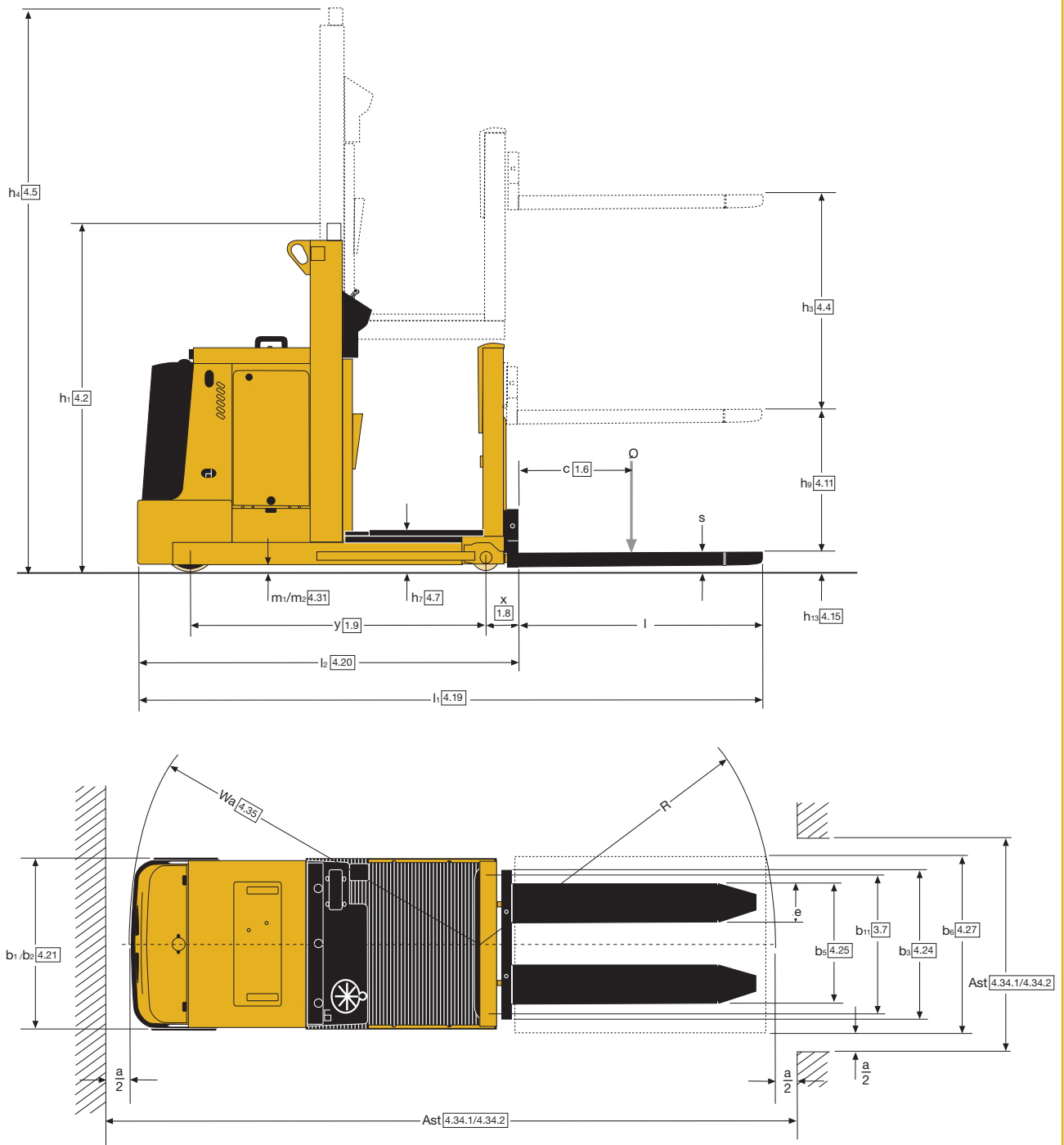
Truck Dimensions - MO10E AC 7 FC



MO10E Mast details - 2 stage SL

Lift height h_3 (mm)	Fork lift H (mm)	Height, mast lowered h_1 (mm)	Height, mast extended h_4 (mm)	Stand height, elevated h_{12} (mm)
1010	1750	1654	2664	1190
1530	2270	2270	3800	1710
1690	2430	2270	3960	1870

Truck Dimensions - MO10E AC 14 FC



MO10E Mast details - 2 stage WP

Lift height h_3 (mm)	Fork lift H (mm)	Height, mast lowered h_1 (mm)	Height, mast extended h_4 (mm)	Stand height, elevated h_{12} (mm)
3028	3798	2275	5298	3208
3428	4198	2475	5698	3608
3828	4598	2675	6098	4008
4228	4998	2875	6498	4408
4628	5398	3075	6898	4808

VDI 2198 - General Specifications

Distinguishing mark	1.1	Manufacturer (abbreviation)		Yale	Yale	Yale
	1.2	Manufacturer's type designation		MO10E AC 7 FC	MO10E AC 14 FC	MO10E AC 12
	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 (t)	1.0	1.0	1.0
	1.6	Load centre distance	c (mm)	600	600	600
	1.8	Load distance, centre of drive axle to fork ⁽¹⁾	x (mm)	144	144	96
	1.9	Wheelbase	y (mm)	1390	1390	1390
	Weights	2.1	Service weight ⁽⁹⁾ ⁽¹⁰⁾	kg	1550	1750
2.2		Axle loading, laden front/rear	kg	350 / 2200	350 / 2400	350 / 2250
2.3		Axle loading, unladen front/rear	kg	900 / 650	950 / 800	900 / 700
Tyres/chassis	3.1	Tyres: polyurethane, tophane, vulkollan, front/rear		Vulkollan / Vulkollan	Vulkollan / Vulkollan	Vulkollan / Vulkollan
	3.2	Tyre size, front	ø (mm x mm)	254 x 125	254 x 125	254 x 125
	3.3	Tyre size, rear	ø (mm x mm)	125 x 94	125 x 94	125 x 94
	3.5	Wheels, number front/rear (x = driven wheels)		1x / 2	1x / 2	1x / 2
	3.7	Tread, rear	b ₁₁ (mm)	660	660	660
	4.2	Height, mast lowered	h ₁ (mm)	1074	1794	1654
	4.4	Lift	h ₃ (mm)	690	1410	1010
Dimensions	4.5	Height, mast extended ⁽²⁾	h ₄ (mm)	-	-	2664
	4.7	Height of overhead guard (cabin) ⁽²⁾	h ₆ (mm)	1957 ⁽¹¹⁾	1957 ⁽¹¹⁾	-
	4.8	Seat height relating to SIP/stand height	h ₇ (mm)	180	180	180
	4.11	Additional lift	h ₉ (mm)	-	-	-
	4.14	Stand height, elevated	h ₁₂ (mm)	-	-	1190
	4.15	Height, lowered	h ₁₃ (mm)	80 ⁽³⁾	80 ⁽³⁾	80
	4.19	Overall length ⁽¹⁾ ⁽⁸⁾	l ₁ (mm)	2907	2907	2874
	4.20	Length to face of forks ⁽¹⁾ ⁽⁸⁾	l ₂ (mm)	1767	1767	1719
	4.21	Overall width ⁽⁴⁾	b ₁ /b ₂ (mm)	796	796	780
	4.22	Fork dimensions DIN ISO 2331 ⁽⁵⁾	s/e/l (mm)	60 / 180 / 1140	60 / 180 / 1140	60 / 180 / 1155
	4.23	Fork carriage ISO 2328, class/type A, B		No	No	No
	4.24	Fork-carriage width ⁽⁶⁾	b ₃ (mm)	700	700	-
	4.25	Distance between fork-arms ⁽⁷⁾	b ₅ (mm)	560	560	526
	4.31	Ground clearance, laden, below mast	m ₁ (mm)	135	135	135
	4.32	Ground clearance, center of wheelbase	m ₂ (mm)	30	30	30
4.33	Load dimension b ₁₂ x l ₆ lengthwise	b ₁₂ x l ₆ (mm)	800 x 1200	800 x 1200	800 x 1200	
4.34.1	Aisle width for pallets 1000mm x 1200mm crossways ⁽¹⁷⁾	A _{st} (mm)	3256	3256	3277	
4.34.2	Aisle width for pallets 800mm x 1200mm lengthwise ⁽¹⁷⁾	A _{st} (mm)	3224	3224	3245	
4.35	Turning radius	W _a (mm)	1622	1622	1622	
Performance data	5.1	Travel speed, laden/unladen	km/h	10.1 / 10.4	10.1 / 10.4	10.1 / 10.5
	5.2	Lift speed, laden/unladen (Cab)	m/s	-	-	0.17 / 0.25
	5.2	Lift speed, laden/unladen (SL)	m/s	0.09 / 0.18	0.09 / 0.18	-
	5.3	Lowering speed, laden/unladen (Cab)	m/s	-	-	0.29 / 0.25
	5.3	Lowering speed, laden/unladen (SL)	m/s	0.20 / 0.07	0.20 / 0.07	-
	5.7	Gradeability, laden/unladen	%	5 / 8	5 / 8	5 / 8
	5.8	Max. gradeability, laden/unladen	%	5 / 8	5 / 8	5 / 8
	5.9	Acceleration time, laden/unladen	s	5.5 / 7.5	5.5 / 7.5	5.5 / 7.5
	5.10	Service brake		Electromagnetic	Electromagnetic	Electromagnetic
	Electric-engine	6.1	Drive motor S2 60 minute rating	km/h	4	4
6.2		Lift motor, S3 15% rating	km/h	2	3	3
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 / 500	24 / 500	24 / 620 ⁽¹⁰⁾
6.5		Battery weight ⁽⁹⁾	kg	370	370	485
6.6		Energy consumption according to VDI cycle	kWh/h at no. of cycles	2.28	2.35	2.30
8.1	Type of drive unit		AC-Controller	AC-Controller	AC-Controller	
10.7	Sound pressure level at the driver's seat	dB (A)	< 70	< 70	< 70	

⁽¹⁾ Note for SL model: With FEM carriage and forks 80 x 30mm + 20mm. With FEM carriage and forks 100 x 35mm + 25mm

⁽²⁾ Note for models with over head guard: With Lift Interrupt mounted on OHG h₆ + 80mm

⁽³⁾ Note for SL model: With FEM carriage and forks 80 x 30mm and 100 x 35mm h₁₃ = 40mm

⁽⁴⁾ Note for SL model: With FEM carriage b₂ = 800mm

⁽⁵⁾ Note for SL model: Available also FEM carriage and fork size 80 x 30mm (600Kg @ 600mm, 800Kg @ 500mm, 1000Kg @ 400mm) and 100 x 35mm with 1000Kg @ 600mm

⁽⁶⁾ Note for SL model: With FEM carriage b₃ = 800mm

⁽⁷⁾ Note for SL model: With FEM carriage and forks 80 x 30mm b₅ = 753mm. With FEM carriage and forks 100 x 35mm b₅ = 773mm

⁽⁸⁾ With wire guidance l₁ and l₂ + 40mm

⁽⁹⁾ These values may vary of +/- 5%

⁽¹⁰⁾ Available battery 560Ah. With battery 560Ah service weight -9kg

⁽¹¹⁾ Model without cabin; the value is referred to the overall height, without load backrest

⁽¹²⁾ Models name referred to h₁₂

⁽¹³⁾ Available models K1.0L AC 1.9 SL / MO10E AC 19 SL

Yale	Yale	Yale	Yale	Yale	1.1	Distinguishing mark
MO10E AC 12 SL	MO10E AC 17 SL ⁽¹³⁾	MO10E AC 17 WP ⁽¹⁴⁾	MO10E AC 48 SL ⁽¹⁵⁾	MO10E AC 48 WP ⁽¹⁶⁾	1.2	
Electric (battery)	Electric (battery)	Electric (battery)	Electric (battery)	Electric (battery)	1.3	
Order-picker	Order-picker	Order-picker	Order-picker	Order-picker	1.4	
1.0	1.0	1.0	1.0	1.0	1.5	
600	600	600	600	600	1.6	
166	166	166	157	166	1.8	
1390	1390	1390	1510	1510	1.9	
1700	1800	2000	2736	2875	2.1	
350 / 2350	350 / 2450	350 / 2650	1034 / 2702	1223 / 2652	2.2	
950 / 750	950 / 850	950 / 1050	1523 / 1213	1755 / 1120	2.3	
Vulkollan / Vulkollan	Vulkollan / Vulkollan	Vulkollan / Vulkollan	Vulkollan / Vulkollan	Vulkollan / Vulkollan	3.1	Weights
254 x 125	254 x 125	254 x 125	254 x 125	254 x 125	3.2	
125 x 94	125 x 94	125 x 94	125 x 94	125 x 94	3.3	
1x / 2	1x / 2	1x / 2	1x / 2	1x / 2	3.5	
660	660	660	830	830	3.7	
1654	2270	2270	3075	3075	4.2	Tyres/chassis
1010	1510	1510	4628	4628	4.4	
2664	3800	3800	6898	6898	4.5	
-	2270	2270	2270	2270	4.7	
180	180	180	180	180	4.8	
690	690	-	690	-	4.11	
1190	1710 ⁽¹²⁾	1710 ⁽¹²⁾	4808 ⁽¹²⁾	4808 ⁽¹²⁾	4.14	
80 ⁽³⁾	80 ⁽³⁾	80	80	80	4.15	
2929	2929	3099	3040	3220	4.19	
1789	1789	1789	1900	1910	4.20	
780	780	780 / 996	950	950 / 996	4.21	
60 / 180 / 1140	60 / 180 / 1140	60 / 180 / 1140	60 / 180 / 1140	60 / 180 / 1140	4.22	
No	No	No	No	No	4.23	
700	700	880	700	880	4.24	
560	560	560	560	560	4.25	
135	135	135	135	135	4.31	
30	30	30	30	30	4.32	
800 x 1200	800 x 1200	800 x 1200	800 x 1200	800 x 1200	4.33	
3277	3277	-	3397	-	4.34.1	
3245	3245	3377	3365	3497	4.34.2	
1622	1622	1622	1742	1742	4.35	
10.1 / 10.5	10.1 / 10.5	10.1 / 10.5	8.6 / 9.5	8.6 / 9.5	5.1	Dimensions
0.11 / 0.21	0.11 / 0.21	0.15 / 0.20	0.15 / 0.20	0.15 / 0.20	5.2	
0.09 / 0.18	0.09 / 0.18	-	0.09 / 0.18	-	5.2	
0.26 / 0.14	0.26 / 0.14	0.28 / 0.24	0.27 / 0.23	0.28 / 0.24	5.3	
0.20 / 0.07	0.20 / 0.07	-	0.20 / 0.,07	-	5.3	
5 / 8	5 / 8	5 / 8	5 / 8	5 / 8	5.7	
5 / 8	5 / 8	5 / 8	5 / 8	5 / 8	5.8	
5.5 / 7.5	5.5 / 7.5	5.5 / 7.5	5.5 / 7.5	5.5 / 7.5	5.9	
Electromagnetic	Electromagnetic	Electromagnetic	Electromagnetic	Electromagnetic	5.10	
4	4	4	4	4	6.1	
3	3	3	3	3	6.2	
no	no	no	no	no	6.3	
24 / 620 ⁽¹⁰⁾	24 / 620 ⁽¹⁰⁾	24 / 620 ⁽¹⁰⁾	24 / 620 ⁽¹⁰⁾	24 / 620 ⁽¹⁰⁾	6.4	
485	485	485	485	485	6.5	
2.38	2.40	2.40	2.86	2.90	6.6	
AC-Controller	AC-Controller	AC-Controller	AC-Controller	AC-Controller	8.1	
< 70	< 70	< 70	< 70	< 70	10.7	

⁽¹⁴⁾ Available models K1.0L AC 1.9 WP / MO10E AC 19 WP recommends the addition of 100 mm to the total clearance (dimension a) for extra operating margin at the rear of the truck. Values may vary with alternative configurations.

⁽¹⁵⁾ Available models K1.0L AC 3.2-3.6-4.0-4.4 SL / MO10E AC 32-36-40-44 SL

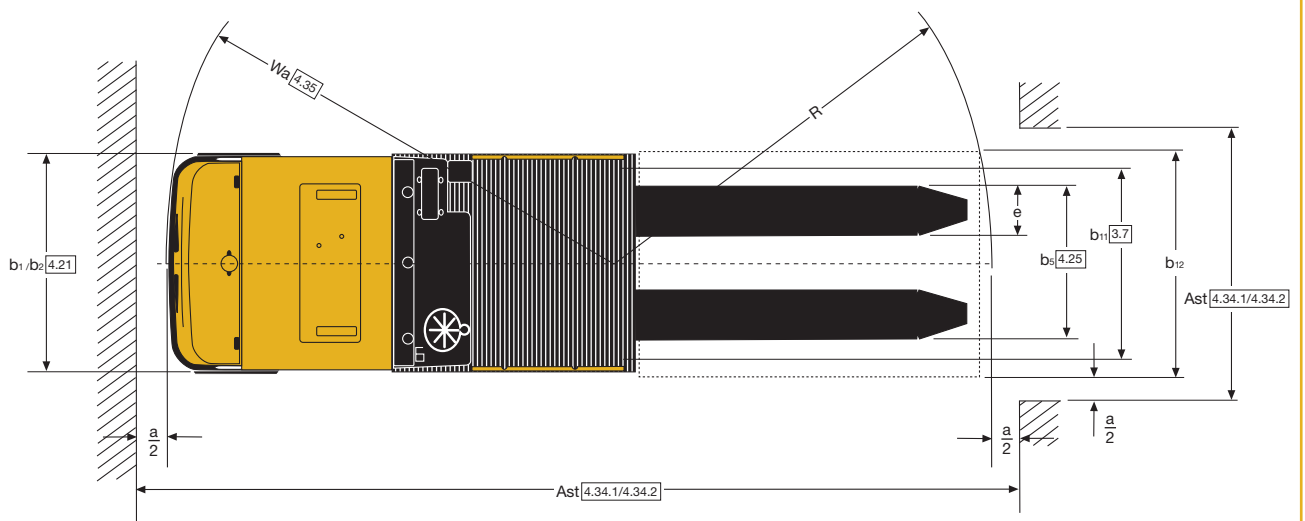
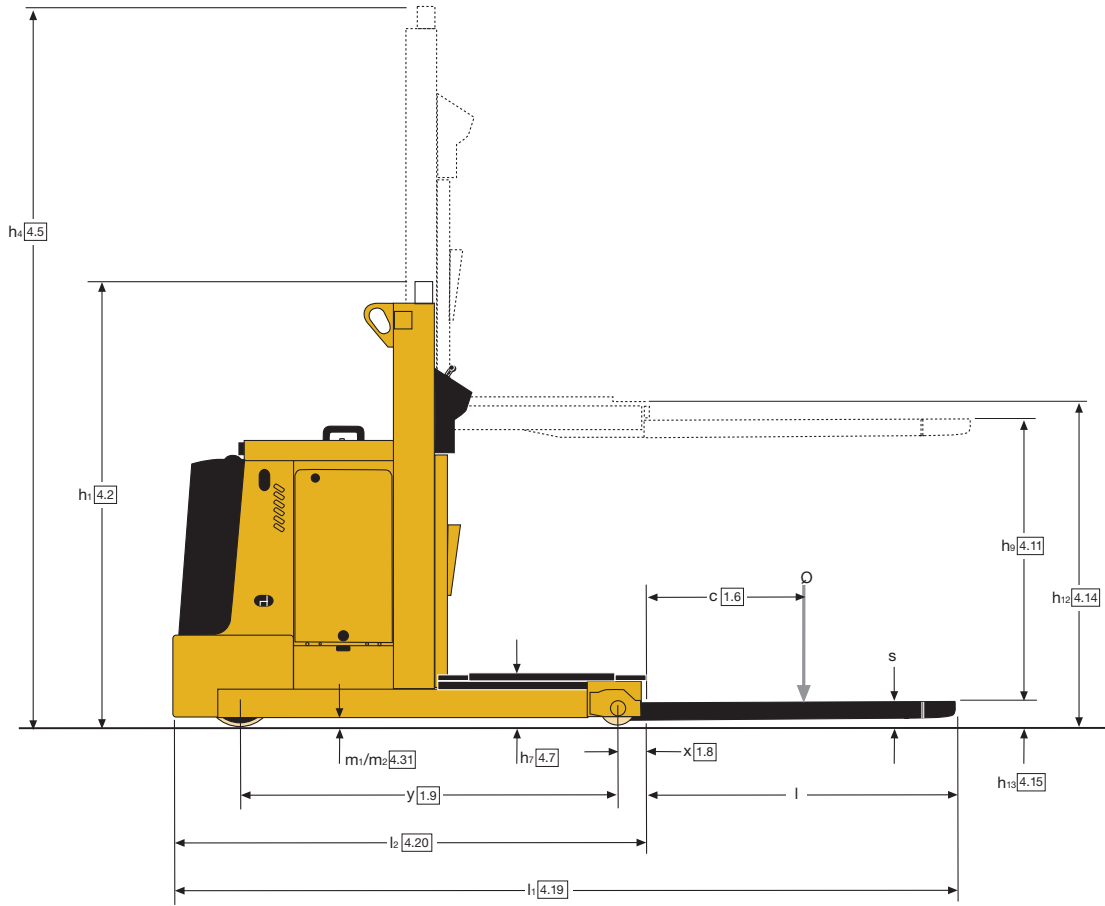
⁽¹⁶⁾ Available models K1.0L AC 3.2-3.6-4.0-4.4 WP / MO10E AC 32-36-40-44 WP

⁽¹⁷⁾ Transfer aisle widths (lines 4.34.1 & 4.34.2) are based on the VDI standard calculation as shown on illustration. The British Industrial Truck Association

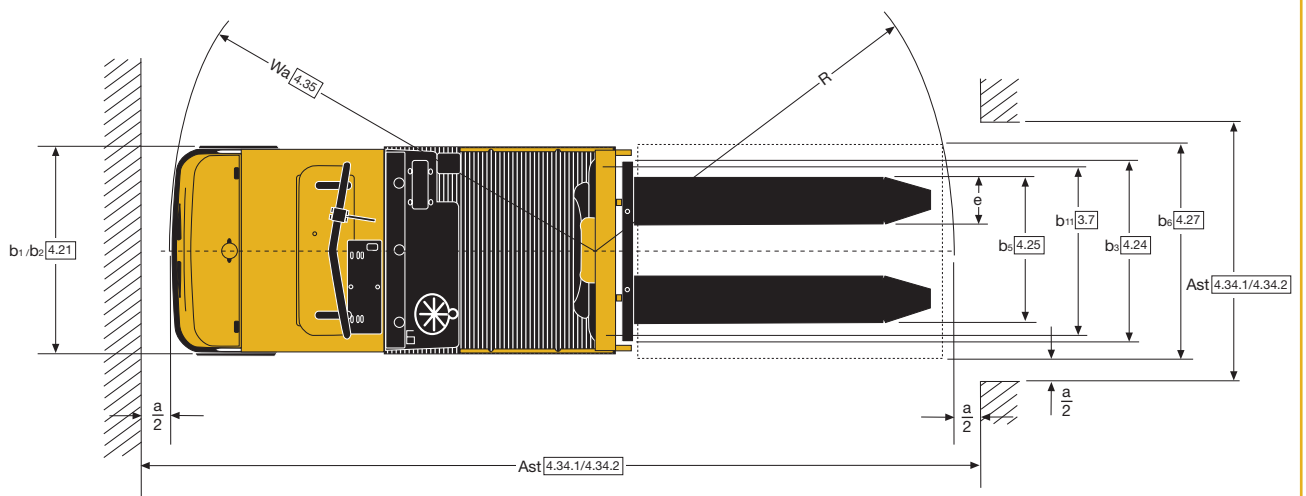
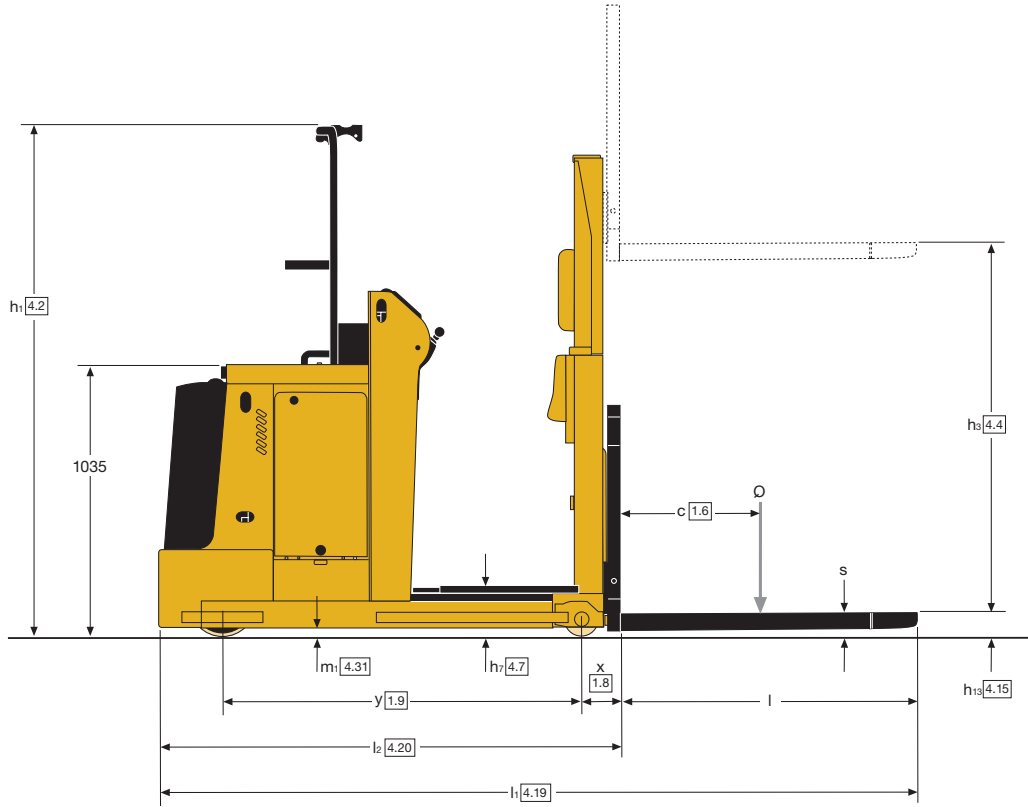
All values are nominal values and they are subject to tolerances. For further information, please contact the manufacturer.

Yale products might be subject to change without notice. Lift trucks illustrated may feature optional equipment.

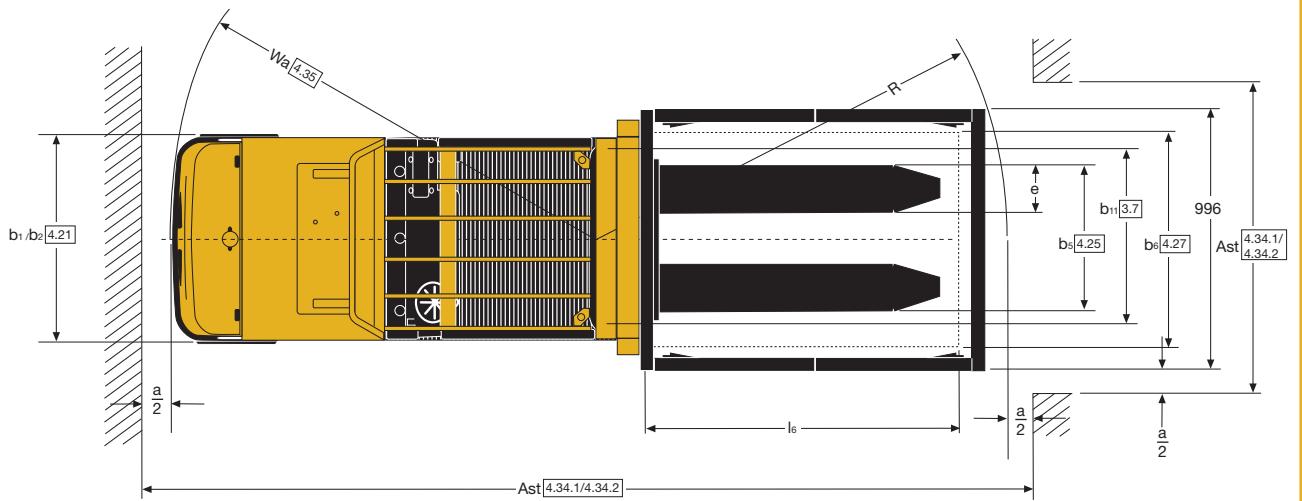
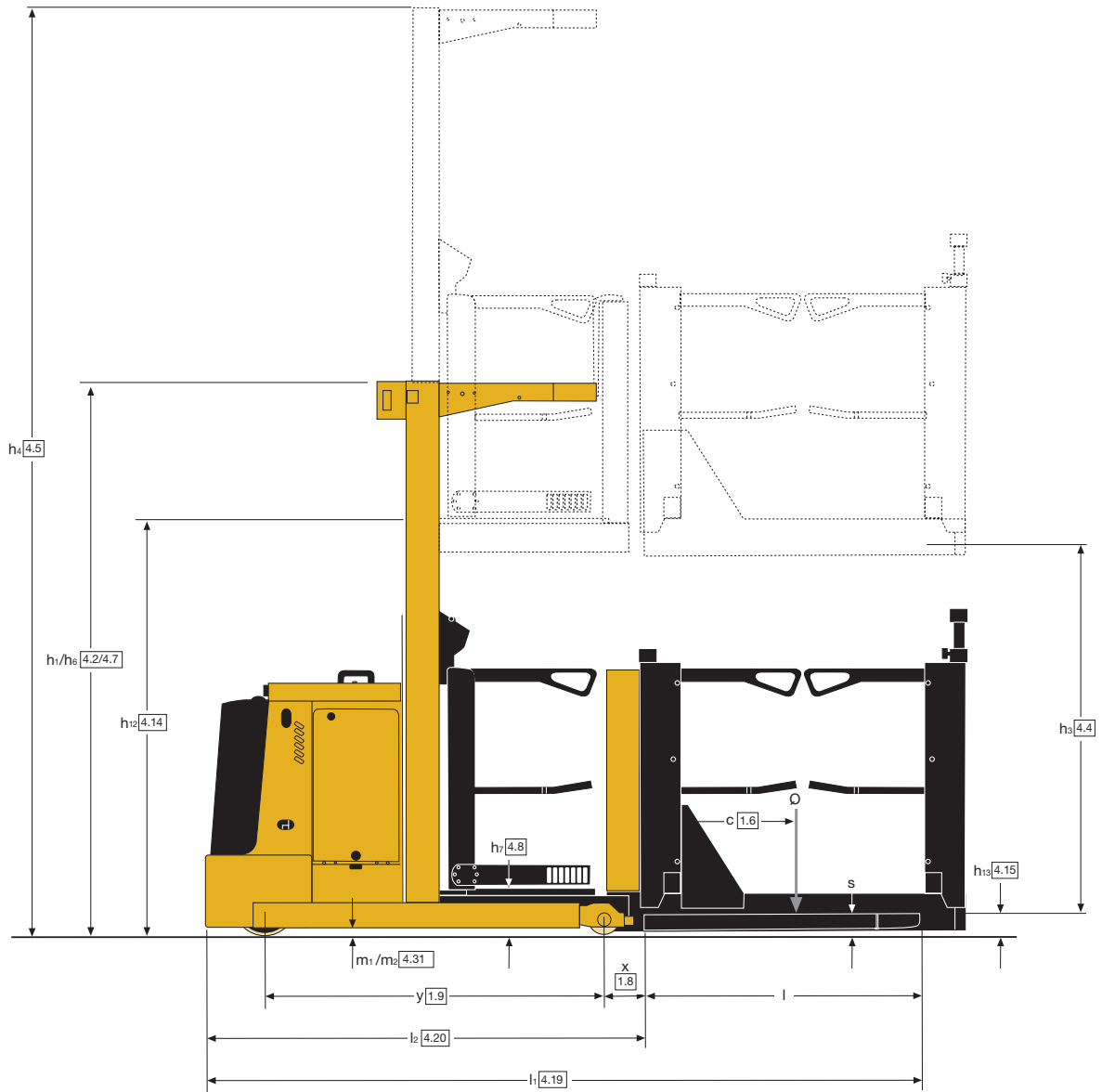
Truck Dimensions - MO10E AC 12



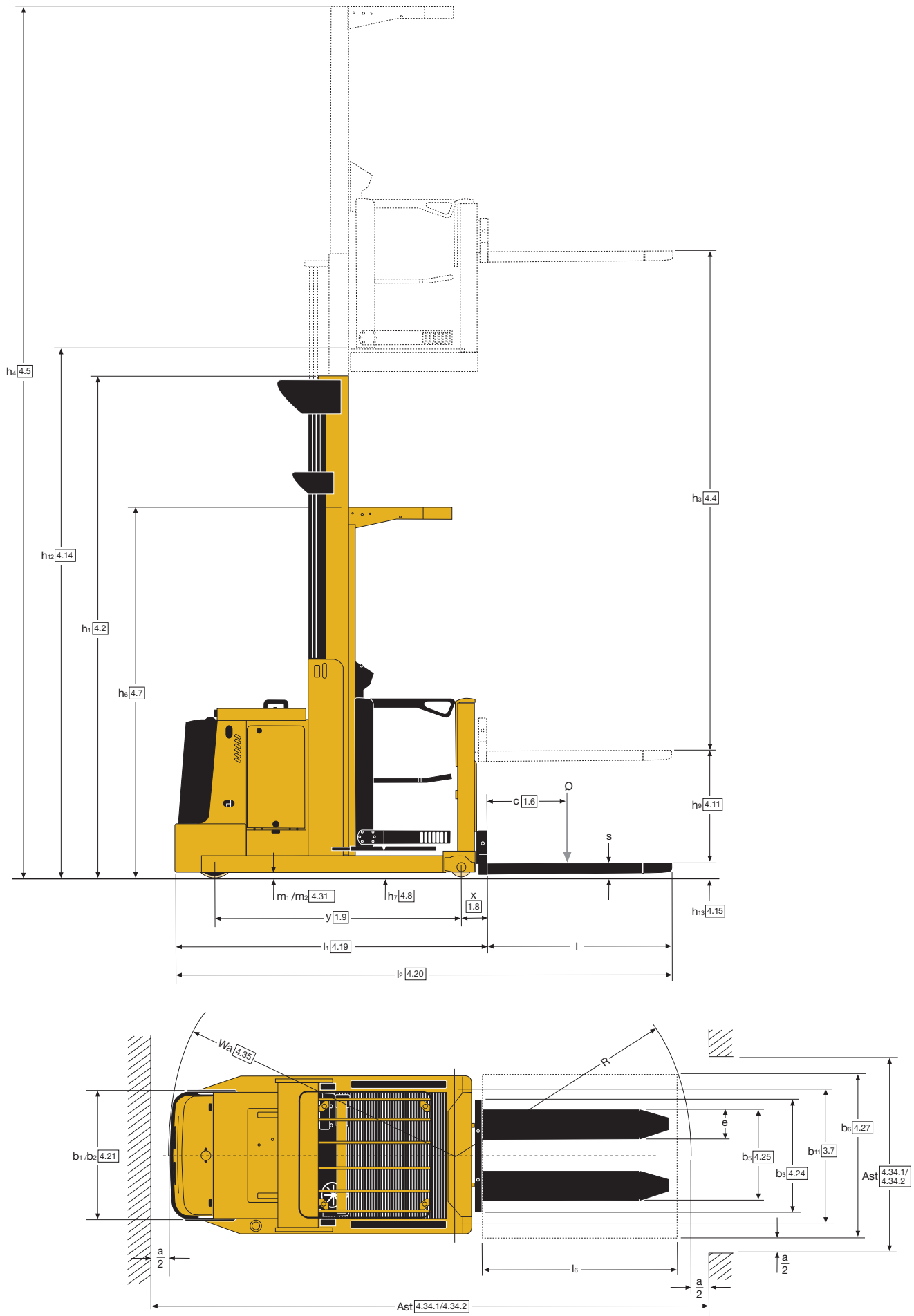
Truck Dimensions - MO10E AC 12 SL



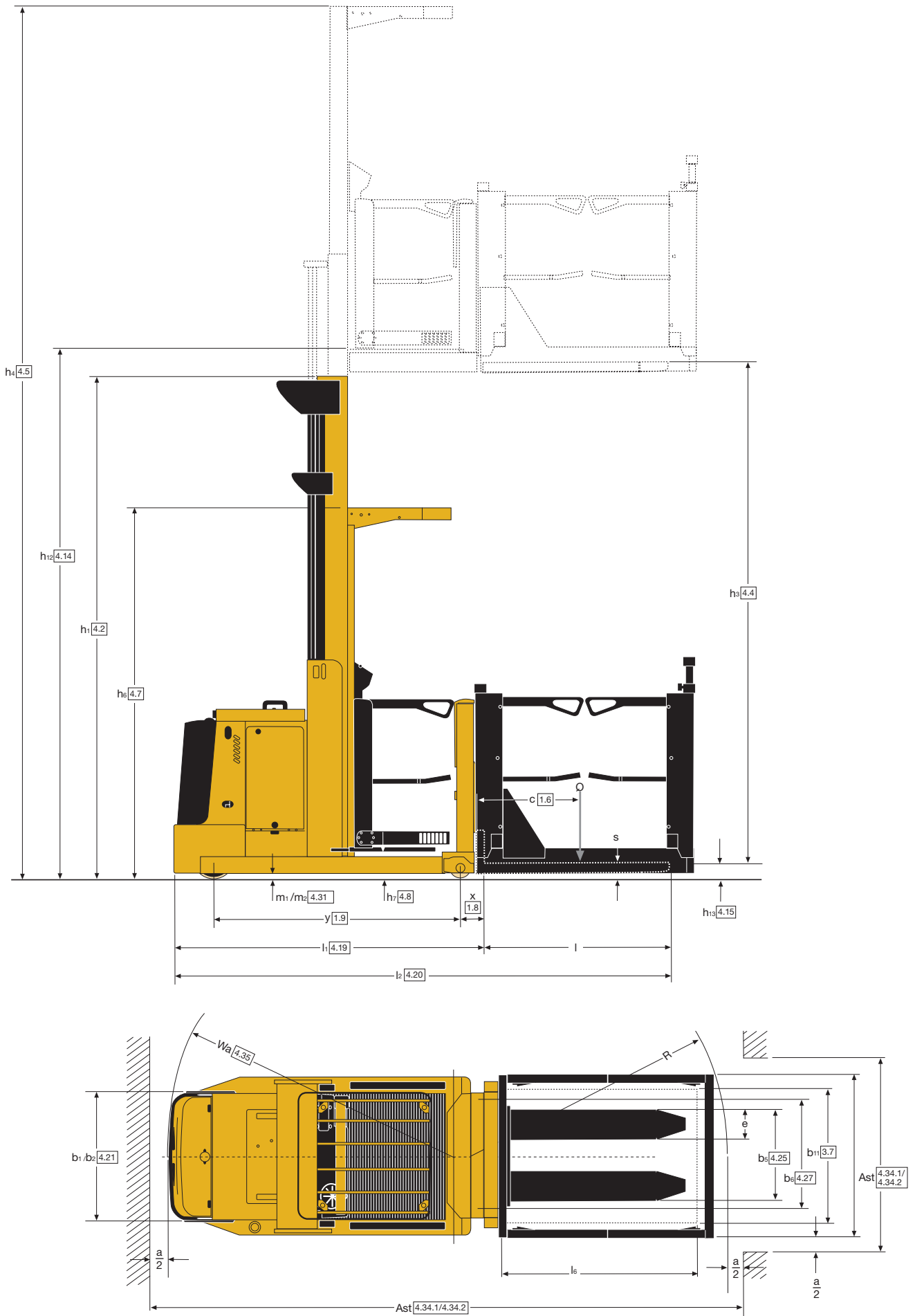
Truck Dimensions - MO10E AC 19 WP



Truck Dimensions - MO10E AC 48 SL



Truck Dimensions - MO10E AC 48 WP



MO10, MO10S VDI 2198 – General Specifications

Distinguishing mark	1.1	Manufacturer (abbreviation)		Yale	Yale	Yale
	1.2	Manufacturer's type designation		MO10 AC	MO10S AC	MO10S AC
	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 (t)	1.0	1.0	1.0
	1.6	Load centre distance	c (mm)	600	600	600
	1.8	Load distance, centre of drive axle to fork ⁽¹⁾	x (mm)	190	150 ⁽²⁾	150 ⁽³⁾
	1.9	Wheelbase	y (mm)	1534.5	1574.5	1674.5
	Weights	2.1	Service weight ⁽¹⁸⁾	kg	2890	3259
2.2		Axle loading, laden front/rear	kg	1060 / 2830	1509 / 2750	1763 / 3310
2.3		Axle loading, unladen front/rear	kg	1650 / 1240	1942 / 1317	2204 / 1869
Tyres/chassis	3.1	Tyres: polyurethane, tophane, vulkollan, front/rear		Vulkollan / Vulkollan	Vulkollan / Vulkollan	Vulkollan / Vulkollan
	3.2	Tyre size, front	ø (mm x mm)	343 x 140	343 x 140	343 x 140
	3.3	Tyre size, rear	ø (mm x mm)	200 x 80	200 x 80	200 x 100
	3.5	Wheels, number front/rear (x = driven wheels)		1 x / 2	1 x / 2	1 x / 2
	3.7	Tread, rear	b ₁₁ (mm)	877	977	1057
Dimensions	4.2	Height, mast lowered	h ₁ (mm)	3070	3320	3720
	4.4	Lift	h ₃ (mm)	4670	5170	8895
	4.5	Height, mast extended ^{(4) (5)}	h ₄ (mm)	7040	7540	11265
	4.7	Height of overhead guard (cabin) ^{(4) (5)}	h ₆ (mm)	2370	2370	2370
	4.8	Seat height relating to SIP/stand height	h ₇ (mm)	250	250	250
	4.11	Additional Lift	h ₉ (mm)	770	770	770
	4.14	Stand height, elevated	h ₁₂ (mm)	4920	5420	9145
	4.15	Height, lowered ⁽⁶⁾	h ₁₃ (mm)	80	80	80
	4.19	Overall length ⁽¹⁾	l ₁ (mm)	3087	3087	3242
	4.20	Length to face of forks ⁽¹⁾	l ₂ (mm)	1947	1947	1947
	4.21	Overall width	b ₁ /b ₂ (mm)	1000 / 1000	1000 / 1100	1100 / 1200
	4.22	Fork dimensions ⁽⁷⁾	s/e/l (mm)	60 / 180 / 1140	60 / 180 / 1140	60 / 180 / 1140
	4.23	Fork carriage ISO 2328, class/type A, B		No	No	No
	4.24	Fork-carriage width ⁽⁸⁾	b ₃ (mm)	780 ⁽¹⁴⁾	780 ⁽¹⁴⁾	780 ⁽¹⁴⁾
	4.25	Distance between fork-arms ⁽⁹⁾	b ₅ (mm)	560 ⁽¹⁵⁾	560 ⁽¹⁵⁾	560 ⁽¹⁵⁾
	4.27	Width across guide rollers	b ₆ (mm)	1130 ⁽¹⁶⁾	1230 ⁽¹⁶⁾	1430 ⁽¹⁶⁾
	4.31	Ground clearance, laden, below mast	m ₁ (mm)	80	80	80
4.32	Ground clearance, centre of wheelbase ⁽¹⁰⁾	m ₂ (mm)	60	60	60	
4.33	Load dimension b ₁₂ x l ₆ lengthwise	b ₁₂ x l ₆ (mm)	800 x 1200	800 x 1200	800 x 1200	
4.34.1	Transfer aisle width for pallets 1000mm x 1200mm lengthwise ⁽¹⁹⁾	A _{st} (mm)	4737	4816	5015	
4.34.2	Transfer aisle width for pallets 800mm x 1200mm lengthwise ⁽¹⁹⁾	A _{st} (mm)	4721	4800	4999	
4.35	Turning radius	W _a (mm)	1757	1797	1897	
Performance data	5.1	Travel speed, laden/unladen	km/h	8.8 / 9	8.8 / 9	8.8 / 9
	5.2	Lift speed, laden/unladen (Cab)	m/s	0.35 / 0.42	0.31 / 0.42	0.31 / 0.42
	5.2	Lift speed, laden/unladen (SL)	m/s	0.22 / 0.24	0.2 / 0.24	0.2 / 0.24
	5.3	Lowering speed, laden/unladen (Cab)	m/s	0.37 / 0.37	0.38 / 0.38	0.38 / 0.38
	5.3	Lowering speed, laden/unladen (SL)	m/s	0.14 / 0.12	0.14 / 0.12	0.14 / 0.12
	5.7	Gradeability, laden/unladen	%	6.3	6.2	5.8
	5.10	Service brake		Electromagnetic	Electromagnetic	Electromagnetic
Electric engine	6.1	Drive motor S2 60 minute rating	kW	6.4	6.4	6.4
	6.2	Lift motor, S3 15% rating	kW	12	12	12
	6.3	Battery according to DIN 43531/35/36 A,B,C, no		no	DIN 43531 B	DIN 43531 B
	6.4	Battery voltage/nominal capacity K5	(V)/(Ah)	48 / 310 ⁽¹¹⁾	48 / 465 ⁽¹²⁾	48 / 620 ⁽¹³⁾
	6.5	Battery weight ⁽¹⁸⁾	kg	541	750	945
	6.6	Energy consumption according to VDI cycle	kWh/h @ no. of cycles	3.27kW	3.27kW	3.27kW
8.1	Type of drive unit		AC-Controller	AC	AC	
10.7	Sound pressure level at the driver's seat	dB (A)	59	59	59	

⁽¹⁾ With FEM carriage and Forks 100 x 35 add + 25mm

⁽²⁾ With TX mast add 55mm

⁽³⁾ With DX mast reduce 55mm

⁽⁴⁾ With Lift Interrupt mounted on OHG: h₆ and h₄ are increased by 105mm

⁽⁵⁾ With flashing light fitted on Over Head Guard: h₆ and h₄ are increased by 120 mm

⁽⁶⁾ With Fem like carriage and Forks 80 x 30 and 100 x 35 h₁₃ = 40mm

⁽⁷⁾ Available also FEM carriage and fork size 100 x 35 with 1000Kg @ 600mm

⁽⁸⁾ With FEM carriage b₃ = 800mm

⁽⁹⁾ With FEM carriage and Forks 100 x 35 b₅ max = 773mm

⁽¹⁰⁾ Sensor height 30mm from the ground

⁽¹¹⁾ Additional battery available: 48/280 (541kg)

⁽¹²⁾ Additional battery available: 48/420 (746kg)

⁽¹³⁾ Additional battery available: 48/560 (937kg)

⁽¹⁴⁾ Available 700mm and 860mm

⁽¹⁵⁾ Available 520mm, 680mm, 830mm

⁽¹⁶⁾ Available 1075mm and 1330mm

⁽¹⁷⁾ Available 1175mm and 1430mm

⁽¹⁸⁾ These values may vary of +/- 5%

⁽¹⁹⁾ Transfer aisle widths (lines 4.34.1 & 4.34.2) are based on the VDI standard calculation as shown on illustration. The British Industrial Truck Association recommends the addition of 100mm to the total clearance (dimension a) for extra operating margin at the rear of the truck.

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MO10, MO10S Mast details - 2 stage SL

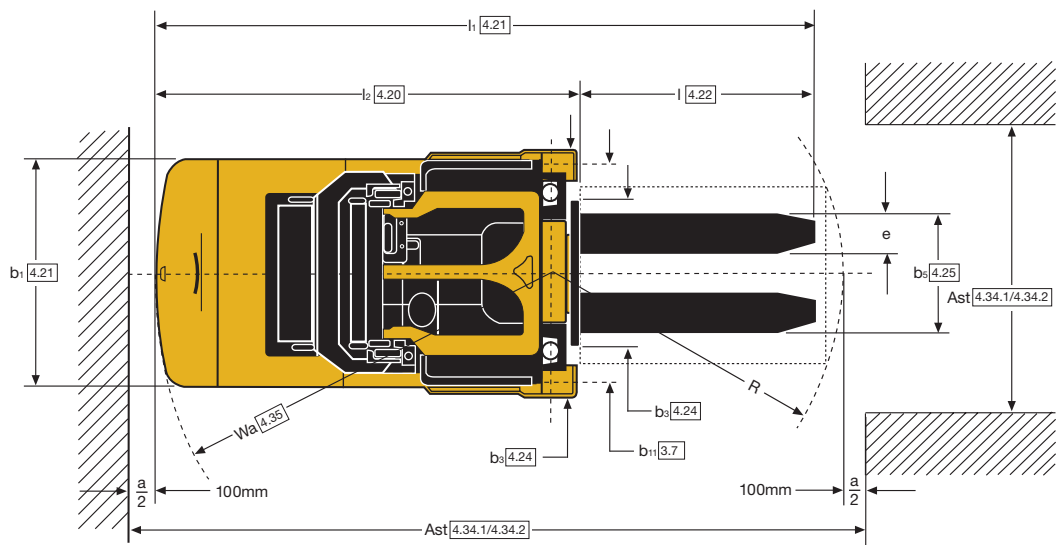
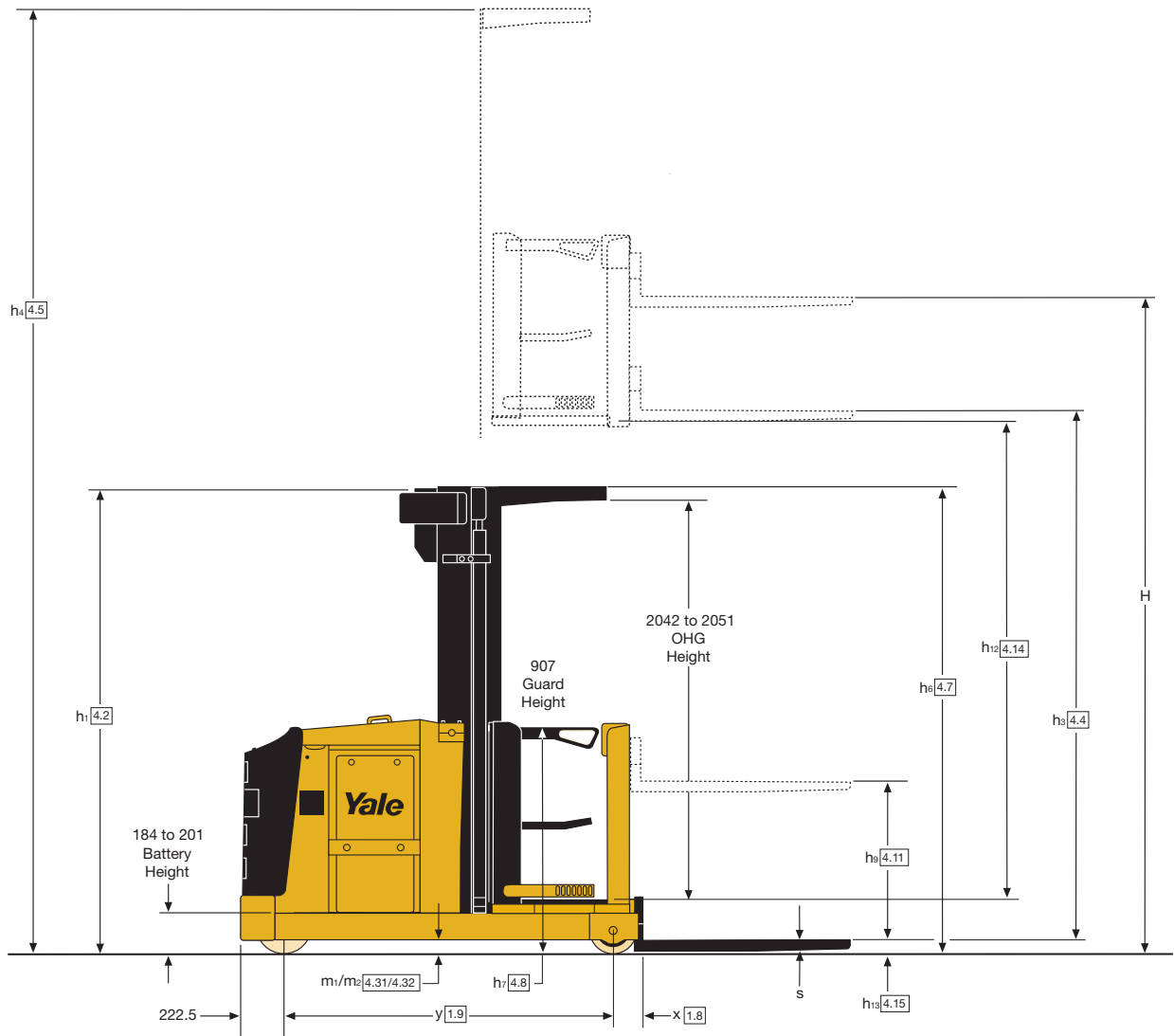
Lift height h ₃ (mm)	Fork lift H (mm)	Height, mast lowered h ₁ (mm)	Height, mast extended h ₄ (mm)	Stand height, elevated h ₁₂ (mm)
3270	4130	2370	5640	3520
3370	4230	2420	5740	3620
3470	4330	2470	5840	3720
3570	4430	2520	5940	3820
3670	4530	2570	6040	3920
3770	4630	2620	6140	4020
3870	4730	2670	6240	4120
3970	4830	2720	6340	4220
4070	4930	2770	6440	4320
4170	5030	2820	6540	4420
4270	5130	2870	6640	4520
4370	5230	2920	6740	4620
4470	5330	2970	6840	4720
4570	5430	3020	6940	4820
4670	5530	3070	7040	4920
4770	5630	3120	7140	5020
4870	5730	3170	7240	5120
4970	5830	3220	7340	5220
5070	5930	3270	7440	5320
5170	6030	3320	7540	5420
5270	6130	3370	7640	5520
5370	6230	3420	7740	5620
5470	6330	3470	7840	5720
5570	6430	3520	7940	5820
5670	6530	3570	8040	5920
5770	6630	3620	8140	6020
5870	6730	3670	8240	6120
5970	6830	3720	8340	6220
6070	6930	3770	8440	6320
6170	7030	3820	8540	6420
6270	7130	3870	8640	6520
6370	7230	3920	8740	6620
6470	7330	3970	8840	6720
6570	7430	4020	8940	6820
6670	7530	4070	9040	6920

MO10, MO10S Mast details - 3 stage SL

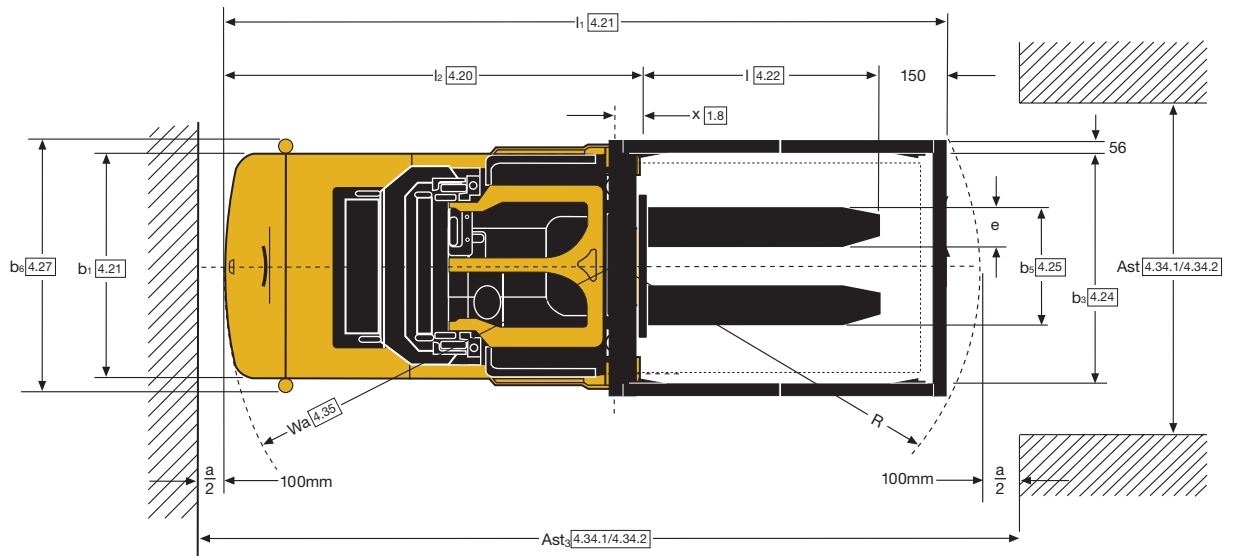
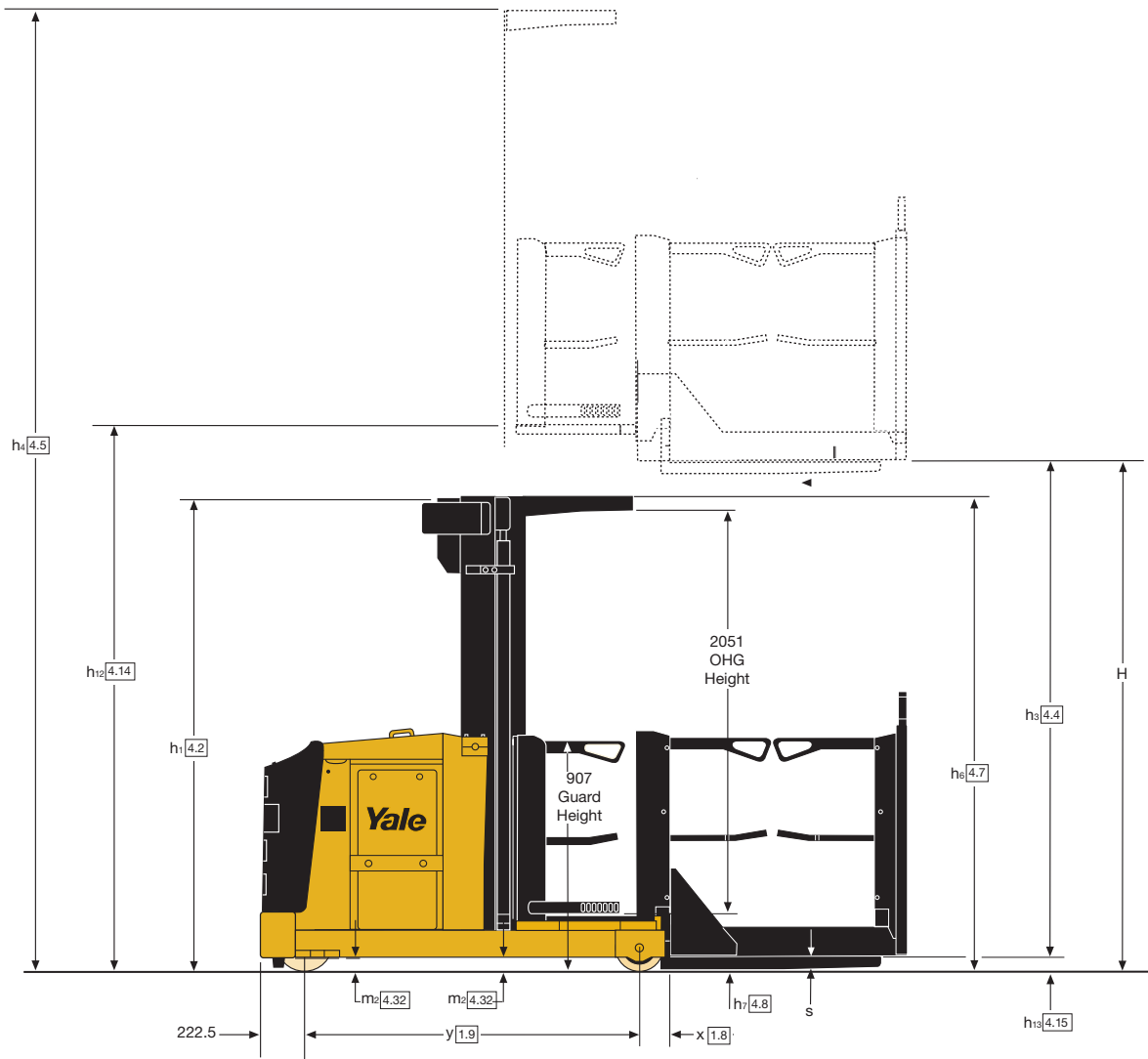
Lift height h ₃ (mm)	Fork lift H (mm)	Height, mast lowered h ₁ (mm)	Height, mast extended h ₄ (mm)	Stand height, elevated h ₁₂ (mm)
4845	5705 ⁽¹⁾	2370	7215	5095
4995	5855	2420	7365	5245
5145	6005 ⁽¹⁾	2470	7515	5395
5295	6155	2520	7665	5545
5445	6305	2570	7815	5695
5595	6455	2620	7965	5845
5745	6605 ⁽¹⁾	2670	8115	5995
5895	6755	2720	8265	6145
6045	6905	2770	8415	6295
6195	7055	2820	8565	6445
6345	7205 ⁽¹⁾	2870	8715	6595
6495	7355	2920	8865	6745
6645	7505	2970	9015	6895
6795	7655	3020	9165	7045
6945	7805 ⁽¹⁾	3070	9315	7195
7095	7955	3120	9465	7345
7245	8105	3170	9615	7495
7395	8255	3220	9765	7645
7545	8405 ⁽¹⁾	3270	9915	7795
7695	8555	3320	10065	7945
7845	8705	3370	10215	8095
7995	8855	3420	10365	8245
8145	9005 ⁽¹⁾	3470	10515	8395
8295	9155	3520	10665	8545
8445	9305	3570	10815	8695
8595	9455	3620	10965	8845
8745	9605 ⁽¹⁾	3670	11115	8995
8895	9755	3720	11265	9145

⁽¹⁾ For models WP -780mm

Truck Dimensions - MO10 AC, MO10S AC



Truck Dimensions - MO10S AC WP



MO10S WP VDI 2198 – General Specifications

Distinguishing mark	1.1	Manufacturer (abbreviation)		Yale	Yale	
	1.2	Manufacturer's type designation		MO10S AC WP	MO10S AC WP	
	1.3	Drive: electric (battery or mains), diesel, petrol, fuel gas		Electric (battery)	Electric (battery)	
	1.4	Operator type: hand, pedestrian, standing, seated, order-picker		Order-picker	Order-picker	
	1.5	Rated capacity/Rated load	Q (t)	1.0	1.0	
	1.6	Load centre distance	c (mm)	600	600	
	1.8	Load distance, centre of drive axle to fork	x (mm)	162.5	162.5	
	1.9	Wheelbase	y (mm)	1574.5	1674.5	
	Weights	2.1	Service weight ⁽⁵⁾	kg	3343	4161
2.2		Axle loading, laden front/rear	kg	1539 / 2804	1573 / 3588	
2.3		Axle loading, unladen front/rear	kg	19920 / 1351	2154 / 2007	
Tyres/chassis	3.1	Tyres: polyurethane, tophane, vulkollan, front/rear		Vulkollan / Vulkollan	Vulkollan / Vulkollan	
	3.2	Tyre size, front	ø (mm x mm)	343 x 140	343 x 140	
	3.3	Tyre size, rear	ø (mm x mm)	200 x 80	200 x 100	
	3.5	Wheels, number front/rear (x = driven wheels)		1 x / 2	1 x / 2	
	3.7	Track width, rear	b ₁₁ (mm)	977	1057	
	Dimensions	4.2	Height, mast lowered	h ₁ (mm)	3320	3470
		4.4	Lift	h ₃ (mm)	5170	8145
4.5		Height, mast extended ^{(1) (2)}	h ₄ (mm)	7540	10515	
4.7		Height of overhead guard (cabin) ^{(1) (2)}	h ₆ (mm)	2370	2370	
4.8		Seat height relating to SIP/stand height	h ₇ (mm)	250	250	
4.14		Stand height, elevated	h ₁₂ (mm)	5420	8395	
4.15		Height, lowered	h ₁₃ (mm)	80	80	
4.19		Overall length	l ₁ (mm)	3260	3360	
4.20		Length to face of forks	l ₂ (mm)	1960	2060	
4.21		Overall width	b ₁ /b ₂ (mm)	1100 / 1100	1100 / 1200	
4.22		Fork dimensions	s/e/l (mm)	60 / 180 / 1150	60 / 180 / 1150	
4.23		Fork carriage ISO 2328, class/type A, B		No	No	
4.24		Fork-carriage width	b ₃ (mm)	1080	1280	
4.25		Distance between fork-arms	b ₅ (mm)	560	560	
4.27		Width across guide rollers	b ₆ (mm)	1230 ⁽⁶⁾	1430	
4.31		Ground clearance, laden, below mast	m ₁ (mm)	80	80	
4.32		Ground clearance, centre of wheelbase	m ₂ (mm)	60	60	
4.33	Load dimension b ₁₂ x l ₆ lengthwise	b ₁₂ x l ₆ (mm)	1000 x 1200	1200 x 1200		
4.34	Transfer aisle width ⁽⁷⁾	A _{st} (mm)	3575	3715		
4.35	Turning radius	W _a (mm)	1798	1898		
Performance data	5.1	Travel speed, laden/unladen	km/h	8.8 / 9	8.8 / 9	
	5.2	Lift speed, laden/unladen (Cab)	m/s	0.37 / 0.43	0.37 / 0.43	
	5.3	Lowering speed, laden/unladen (Cab)	m/s	0.38 / 0.38	0.38 / 0.38	
	5.7	Gradeability, laden/unladen	%	-	-	
	5.10	Service brake		Electromagnetic	Electromagnetic	
Electric engine	6.1	Drive motor, S2 60 minute rating	kW	6.4	6.4	
	6.2	Lift motor S3 15% rating	kW	12	12	
	6.3	Battery according to DIN 43531/35/36 A,B,C, no		DIN 43531 B	DIN 43531 B	
	6.4	Battery voltage/nominal capacity K5	V/Ah	48 / 465 ⁽³⁾	48 / 620 ⁽⁴⁾	
	6.5	Battery weight ⁽⁵⁾	kg	750	945	
	6.6	Energy consumption according to VDI cycle	kWh/h	3.27kW	3.27kW	
8.1	Type of drive unit		AC-Controller	AC-Controller		
10.7	Sound pressure level at the driver's seat	dB (A)	< 70	< 70		

- (1) With Lift Interrupt mounted on Over Head Guard h₆ and h₄ are increased by 105mm
- (2) With flashing light fitted on Over Head Guard h₆ and h₄ are increased by 120mm
- (3) Additional battery available: 48/420 (746kg)
- (4) Additional batterie available: 48/560 (937kg)
- (5) These values may vary of +/- 5%
- (6) Available 1175mm and 1430mm
- (7) Transfer aisle widths (lines 4.34.1 & 4.34.2) are based on the VDI standard calculation as shown on illustration. The British Industrial Truck Association recommends the addition of 100 mm to the total clearance (dimension a) for extra operating margin at the rear of the truck.

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.

Standard Options and Optional Equipment

Feature	MO10E -7/14 FC	MO10E 12 SL/WP	MO10E 19-48 SL/WP	MO10	MO10E -7/14 FC
Operator's compartment					
Drive side facing controls	x	x	x	x	x
Dual drive and load side facing controls	-	-	-	o	o
Electric power steering	x	x	x	x	x
Floor integrated operator presence sensing	x	x	x	x	x
Height indicator	x	x	x	x	x
Storage compartments	x	x	x	x	x
Open operator's compartment - raised floor height (h12) < 1200 mm	-	x	-	-	-
Enclosed operator's compartment - front and sides	-	-	x	x	x
Fold-up bottom toe plate on side gates (enclosed compartment only)	-	-	x	x	x
Lift and traction					
Proportional lift/lower control	-	-	x	x	x
Soft stop on lowering	-	-	-	x	x
Emergency lowering from the ground	-	-	x	x	x
Driver select performance settings on traction and lift	x	x	x	x	x
Walk along slow speed advance control from side of truck	x	x	x	x	x
Off board lift / lower control of forks	x	x	x	x	x
Load handling					
Walk-on forks - open	-	x (WP)	-	-	-
Walk-on forks - pallet cage with fold-up side-gates / pallet sensing	-	-	x (WP)	-	o
Welded fixed forks - walk-on pallet option	-	x (WP)	x (WP)	-	o
Supplementary lift - fixed fork width	o (7 FC)	o (SL)	o (SL)	o	o
Supplementary lift - adjustable fork width	o (7 FC)	o (SL)	o (SL)	o	o
Masted lift - adjustable width forks	o (14 FC)	-	-	-	-
Load backrest	o	-	-	-	-
Travel					
Free ranging	x	x	x	x	x
Speed reduction on cornering	x	x	x	x	x
Height / load sensing speed control	-	-	-	x	x
Guide rollers for rail guidance (rail not included)	-	-	o ⁽¹⁾	o	o
Wire guidance (5.2 / 6.25 / 7.0 / 10 kHz)	-	-	o ⁽¹⁾	o	o
End of aisle control options (slow down / stop) via floor magnets	-	-	o ⁽¹⁾	o	o
Options					
Flashing beacon	o	o	o ⁽²⁾	x	x
Dome light	-	-	o	o	o ⁽³⁾
Fan	-	-	o	-	-
Dome light and fan	-	-	-	o	o
Work lights - facing racks	-	-	o	o	o
Work light - over load	-	-	o	o	o
Lexan overhead guard	-	-	o	o	o
Wire mesh overhead guard	-	-	o	o	o
Lift Interrupt with override	-	o	o	o	o
Lift Interrupt on overhead guard	-	-	o	o	o
Autostop on lowering	-	-	-	o	o
Reverse alarm	o	o	o	o	o
Cold store protection	o	o	o	o	o
Clipboard	o	-	o	o	o
RFDT hang -on support	o	o	o	o	o
DC/DC converter 12V	o	o	o	o	o
DC/DC converter 24V	-	-	-	o	o
Antistatic drive tyre	-	-	-	o	o
Configuration					
Cabin width (mm)	796	780	940	950	1050 - 1150 - 1240 ⁽⁴⁾
Chassis width b (mm)	796	780	950	1000	1100 - 1200 ⁽⁵⁾
Fixed cab / supplementary lift - 690 mm	MO10E 7	o	o	-	-
Fixed cab / masted fork lift - 1410 mm	MO10E 14	-	-	-	-
Rising cab 1 stage mast - raised platform height (h12) = 1190 mm	-	x	-	-	-
Rising cab 1 stage mast - raised platform height (h12) = 1690 - 1850mm	-	-	o	-	-
Rising cab 2 stage mast - raised platform height (h12) = 3207 - 4807mm	-	-	o	-	-
Rising cab 2 stage mast - raised platform height (h12) = 3620 - 4920mm	-	-	-	o	-
Rising cab 2 stage mast - raised platform height (h12) = 3620 - 6920mm	-	-	-	-	o
Rising cab 3 stage mast - raised platform height (h12) = 5095 - 9145mm	-	-	-	-	o ⁽⁶⁾
Power					
AC traction	x	x	x	x	x
AC steering	x	x	x	x	x
AC pump motor	-	-	-	x	x
Voltage	24	24	24	48	48
Battery size (Ah)	500	560-620	560-620	280-310	420-620
Regen on lowering	-	-	-	x	x
Battery rollers	x	x	x	x	x
Side battery change table- single bed	o	o	o	o	o
Side battery change table - twin bed	o	o	o ⁽⁶⁾	-	-

⁽¹⁾ with 2 stage mast only (Raised platform height (h12) = 3200-4800 mm)

⁽²⁾ required option (Raised platform height (h12) > 1200 mm)

⁽³⁾ with 2 stage mast only

⁽⁴⁾ with walk-on pallet cage - 1140 / 1340 mm

⁽⁵⁾ from raised platform height (h12) = 8450 mm, 1200 mm chassis required

⁽⁶⁾ not with rail guidance

x = Standard

o = Optional

- = Not available

MO E/S series

Models: MO10E AC 7, 14FC, 12, 12SL, 19SL, 19WP, 48SL, 48WP, MO10 AC, MO10S AC SL, WP

Operator Compartment

The operator cab allows the operator to find the most comfortable driving position. The platform is cushioned to absorb vibrations and incorporates an operator presence switch over the entire floor surface area. The cabin bulkhead is angled and padded to facilitate access to the load support. The low step height is a further aid to driver comfort and productivity.

MO10E Fixed Cab models feature a non-raising cab and forks that can be lifted up to a height of 1500mm. The standard platform is open on two sides for direct access/pass through.

MO10E AC 12 models have a maximum cabin platform lifting height of 1200mm. The standard platform is open on three sides for direct access to the pallet/load. The forks are welded directly to the cabin floor structure.

MO10E Supplementary Lift (SL) models have a maximum cabin platform lifting height of 4800mm and feature pallet/load auxiliary lift.

MO10E Walk on Pallet (WP) models have fixed forks, welded directly to the cabin floor structure, with platform lifting heights of 4800mm. The compartment is fitted with closing side gates forming an enclosed cage around the pallet, and the cabin has its own gates for operator entry and exit. The side gates are spring assisted and the integral toe board lifts up with the side arms to maintain a low step height for on/off access. An abseil device is provided with the truck. Storage facilities are located under the control console.

Chassis

Chassis are available in different widths and are manufactured using a heavy duty welded construction, including a thick bumper plate to protect components from the effect of any impact. The short chassis head L2 enhances manoeuvring, and the narrow width facilitates two-way traffic in the aisle. An overhead guard will be supplied for h12 higher than 1200mm.

MO10 model has a maximum cabin platform lifting height of 4920mm and features pallet/load auxiliary lift.

MO10S models have a maximum cabin platform lifting height of 9145mm

when featuring pallet/load auxiliary lift and 6920mm when featuring fixed forks welded directly to the cab (Walk on Pallet).

Controls

The controls are located to maximise the walk-through area of the platform for easy pick-face access either side of the aisle. The control console is mounted on the drive side of the truck. The butterfly switch controls travel speed and forward /reverse direction. Whilst the left mini-lever controls the main lift/lower function for efficiency, the right mini-lever acts as an emergency stop actuator.

Extensive use of CANbus enhances the performance of the truck providing a quick response to any controls activated. Wiring complexity is reduced simplifying service maintenance. Hall effect sensors have replaced mechanical micro-switches increasing reliability.

Graphic Display

The graphic display is readable under all light conditions and contains a wealth of truck status information including; steer wheel position, cabin platform height, traction and/or lifting-lowering speed, fault code display, battery discharge status and preset performance levels which the operator can easily set dependent on the application. Additional information on technical services for example sensor tests and functions is accessible via a password. Password protection for up to 20 operators is also available as a standard option, as are selectable picking intermediate stops lift levels and adjustable height pre-selection.

Steering

The electric steering system is “fly-by-wire” technology and incorporates a high efficiency AC motor. An ergonomically designed steering wheel is adjustable for enhanced steering feedback. The self-centring steering mechanism works automatically when the truck is turned on, via a push button on the control panel or when the creep speed advance mode is activated. On entering a guided aisle the steer wheel is automatically centred and steering is disengaged.

Creep Speed Advance

The “pedestrian mode” creep speed function allows the operator to advance the truck, and lift or lower the platform (and forks on the SL model) while on the ground next to the truck.

Supplementary lift

The supplementary carriage/forks are mounted on a bulkhead fitted to the operator’s compartment and provide auxiliary lift. The materials handling interface and/or load can be raised or lowered to maintain a constant comfortable working height throughout the pick routine, reducing bending and stretching for the operator. The auxiliary lift/lower control requires two-handed operation. Pallet or FEM forks are available.

Walk on Pallet cage (WP)

The walk on pallet cage model allows direct access to the pallet at heights over 1200mm. Access to the operator’s compartment and the pallet is provided via spring assisted swing-up gates. The cage is a strong metal structure which surrounds the pallet and features 2 swing-up gates on each side allowing full pick access from floor level. An additional retention rail is fitted at the load end of the cage. A fork-mounted pallet sensor prevents traction/lifting above 1200mm raised platform height with empty forks. The side and cabin gates are interlocked and must be deployed above this height for traction.

Mast

The mast section design provides torsional rigidity and minimises deflection.

The panorama design provides excellent visibility of the working environment. Slack chain detection devices mounted on the mast prevent further lowering if an obstacle is encountered. Lowering speed is automatically reduced as the cab nears the floor. The MO10/MO10S feature two stage mast options, with a three stage mast option available on the MO10S with a maximum cabin lifting height of up to 9145mm (depending on model - see VDI & mast tables). A strobe light is mounted on the chassis behind the mast.

The MO10E offers one stage mast with a lifting height (h12) up to 1860mm and

two stage masts up to 4800mm with a proven mast profile.

Traction – Steering Unit

A powerful AC traction motor, with instant response to forward and reverse traction inputs, provides considerable torque, delivers fast acceleration and travel speeds matched to the model specification, with almost no difference in unladen and laden performance. The fixed motor and vertically mounted drive unit eliminate flexing stresses to the power cables to ensure maximum uptime.

The electronic AC+DC combi MOSFET (MO10E) & AC (MO10-10S) controllers manage traction and hoist, offering excellent management of power and consumption, acceleration and regenerative braking.

The performance parameters can be adjusted using an external handset. Self diagnostics and thermal protection are features of the controller. The maintenance free motor (inspection intervals every 1000 operating hours) provides low cost long operational life.

Hydraulic system

The DC (MO10E) or AC (MO10-10S) pump motor guarantees consistent performance matched to the model specification. The MOSFET control provides proportional handling for lifting through control of the motor as well as proportional control on lowering movements of the cab and supplementary lift. The pump motor regenerative action (MO10-10S) provides efficient energy management, smooth starting and stopping.

Hose break valves prevent lowering in the event of a line break and a manual lowering valve allows emergency cab lowering to the ground. The integral and transparent plastic hydraulic tank allows easy checking of the oil level.

Brakes

The drive motor brakes automatically when the butterfly control is released. An electromagnetic parking brake is activated by a platform sensor. Emergency braking is carried out with a fingertip control and activates powerful reverse direction braking and the electromagnetic brake. If the operator leaves the platform, the emergency brake activates immediately.

Batteries

MO10E – 24V; 500 to 620 Ah

MO10 – 48V; 280 to 310Ah

MO10S – 48V; 420 to 620Ah

A flip up cover provides easy access for battery servicing and checking. The battery is mounted on rollers to facilitate left side extraction with a roller bed trolley available as an option to facilitate double shift operation.

Guidance Options

MO10 range trucks may be free ranging or fitted with guidance options. Guided trucks can increase productivity as maximum speed can be maintained to higher heights inside the working aisle as the driver can simultaneously travel and lift or lower without having to focus on steering. Guidance options include wire-guidance package or rollers for rail guidance. The on-board wire guidance package includes sensors mounted fore and aft as well as a truck logic module linked to the steering system. The standard operating frequency is 6.25 kHz.

Optional Extras

A wide range of options is available. Further information on these is available from your local Yale dealer.

MO E/S series

Models: MO10E AC 7, 14FC, 12, 12SL, 19SL,
19WP, 48SL, 48WP, MO10 AC, MO10S AC SL , WP



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
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Publication part no. 220990233 Rev.06 Printed in The Netherlands (0916HG) EN.

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