

Models:

MS10, MS12, MS14, MS14 IL, MS16, MS16 IL

Tiller head and controls

The tiller head features an ergonomic shaped handle with integral hand guard. Large dimensioned, low effort butterfly buttons control direction of travel and speed as well as the electromagnetic brake. Lift and lower buttons are conveniently located on the tiller head and can be readily accessed for left/right hand use. The travel direction inverter button is designed for maximum angle of contact with the operator's body. When activated the direction of travel is automatically reversed and the truck comes to a stop. The horn is located on top of the tiller head and conveniently actuated by thumb or forefinger. An optional creep speed control allows the truck to be operated with the tiller arm in the vertical position at reduced speed for manoeuvring in tight confines.

Tiller arm

The tiller arm is mounted onto the drive unit. The offset position facilitates visibility around the mast. The low anchor point requires minimum steering effort and the long tiller arm enhances the operating clearance when walking inside the truck envelope. The tiller arm is spring assisted and returns automatically to the vertical position when released.

Chassis

The all welded chassis provides fully enclosed protection for the drive train and main components. The compact chassis width of 800mm is standard across the range.

Mast and forks

2 stage clearview masts are featured on all models. For durability the mast guard is made from wire mesh. A transparent guard is available as an option. A variety of mast types depending on the model and including single stage, 2 stage and 3 stage with full free lift are offered. Rollers are permanently lubricated and sealed for maximum service life. Masts are bolt-on type. The standard fork section is 65mm thick. A slim line fork profile

(55mm) option is available for handling cage pallets lengthwise in block stacking operations.

Traction and pump control

A new generation MOSFET high frequency Combi controller is used to regulate both traction and pump operation. Energy efficient, smooth progressive control is available at all times. The controller features automatic braking (reverse current braking) and regenerative braking on release of the butterfly buttons as well as antirollback start-up on an incline. Using a plug-in console the controller can be adjusted for forward and reverse travel speeds, reverse current braking, release braking, acceleration, lift and lowering speeds, ramp and deceleration on lifting and lowering.

Drive unit

Separately excited (SEM) drive motors are used across the range. They deliver fast travel speeds in the laden/ unladen condition, high start-up torque and acceleration as well as efficient running. The use of SEM motor technology eliminates forward and reverse contactors.

The motors are mounted vertically for easy brush access, improved ventilation and minimum contamination from floor conditions. Motors are flanged directly on to a helicoidal gear transmission running in an oil bath. Drive wheel is mounted automobile style to the wheel hub for easy change.

Hydraulics

A heavy duty compound wound motor drives the pump. Inputs to the motor and proportional valve are received from the controller to control lifting and lowering performance. Lift/lower functions are actuated directly from tiller head controls via the Combi controller. The MS10 and MS12 feature on/off buttons with soft stop control. The MS14 and MS16 feature proportional control for the right side control buttons and on/off buttons with soft stop on the left side. A flow control valve regulates lowering speeds and a

protection valve prevents further lowering in the event of a line break. A transparent oil reservoir facilitates checking of the oil level.

Braking

The electromagnetic brake is electrically released and spring applied. The brake is opened and closed by activation of the butterfly buttons with the tiller arm in the working position. The brake is closed by bringing the tiller arm to the vertical or horizontal position. Reverse current braking is applied by inverting the direction of travel. Releasing the butterfly buttons induces both reverse current braking (adjustable) and regenerative braking.

Dashboard

A combined hourmeter/battery discharge indicator with lift interrupt is featured on the dashboard. The indicator also displays alarm conditions should they occur. A quick disconnect traction cut-out button is mounted on the dashboard.

Options

A comprehensive range of options including tandem load wheels (MS10/12), load backrest, tyres, cold store protection and creep speed control are available.



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

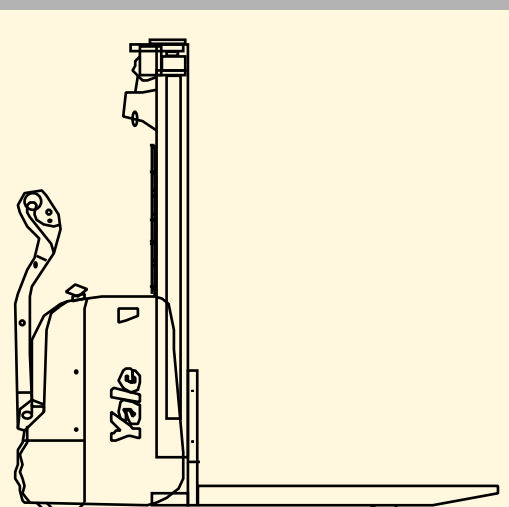
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Truck shown with optional equipment

Pedestrian Stacker

1,000kg, 1,200kg, 1,400kg and 1,600kg



- Combi MOSFET traction and pump control
- SEM drive motor
- Dual lift/lower controls on tiller head
- Panorama mast
- Low mounted tiller arm
- Initial Lift feature

VDI 2198 - General Specifications

		Yale	Yale	Yale	Yale	Yale	Yale	Yale	Yale
Characteristics	1.1 Manufacturer		Yale	Yale	Yale	Yale	Yale	Yale	Yale
	1.2 Model designation		MS10	MS12	MS14	MS14	MS14 IL	MS16	MS16 IL
	1.3 Power: Battery, Diesel, LPG, Electric mains		Battery	Battery	Battery	Battery	Battery	Battery	Battery
	1.4 Operation: Manual, pedestrian, stand-on, seated, orderpicker		Pedestrian	Pedestrian	Pedestrian	Pedestrian	Pedestrian	Pedestrian	Pedestrian
	1.5 Load capacity	Q (t)	1000	1200	1400	1400	1400	1600	1600
	1.6 Load centre	c (mm)	600	600	600	600	600	600	600
	1.8 Load distance	x (mm)	714	744 ¹⁾	712 ²⁾	712 ²⁾	818 ²⁾	712 ²⁾	818 ²⁾
	1.9 Wheelbase	y (mm)	1225	1315	1315	1385	1529	1385	1529
	Weights	2.1 Unladen weight	kg	880	960 ³⁾	1000 ⁴⁾	1120 ⁴⁾	1200 ⁴⁾	1120 ⁴⁾
2.2 Axle loading laden, front/rear		kg	660 / 1220	740 / 1420	570 / 1830	810 / 1710	900 / 1700	875 / 1845	950 / 1850
2.3 Axle loading unladen, front/rear		kg	610 / 270	670 / 290	695 / 305	760 / 360	800 / 400	760 / 360	800 / 400
Wheels and Tyres	3.1 Tyres - rubber, polyurethane, front/rear		Poly / Poly	Poly / Poly	Poly / Poly	Poly / Poly	Poly / Poly	Poly / Poly	Poly / Poly
	3.2 Tyre size - front		Ø 230 x 75	Ø 230 x 75	Ø 230 x 75	Ø 230 x 75	Ø 230 x 75	Ø 230 x 75	Ø 230 x 75
	3.3 Tyre size - rear		Ø 85 x 100	Ø 85 x 100	Ø 85 x 70	Ø 85 x 70	Ø 85 x 70	Ø 85 x 70	Ø 85 x 70
	3.4 Additional wheels (dimensions)		Ø 150 x 50	Ø 150 x 50	Ø 150 x 50	Ø 150 x 50	Ø 150 x 50	Ø 150 x 50	Ø 150 x 50
	3.5 Wheels - number front/rear (x = driven)		1 x + 1/2	1 x + 1/2	1 x + 1/4	1 x + 1/4	1 x + 1/4	1 x + 1/4	1 x + 1/4
	3.6 Track width - front	b10 (mm)	515	515	515	515	515	515	515
	3.7 Track width - rear	b11 (mm)	400	400	400	400	375	400	375
Dimensions	4.2 Height of mast, lowered	h1 (mm)	1870 ⁵⁾	1870 ⁵⁾	1970 ⁵⁾	1970 ⁵⁾	1970 ⁵⁾	1970 ⁵⁾	1970 ⁵⁾
	4.3 Free lift	h2 (mm)	100	100	100	100	100	100	100
	4.4 Lift height	h3 (mm)	2830	2830	2965	2965	2965	2965	2965
	4.5 Height of mast extended	h4 (mm)	3385	3385	3535	3535	3535	3535	3535
	4.6 Initial lift	h5 (mm)	-	-	-	-	130	-	130
	4.9 Height of tiller arm in working position, min./max.	h14 (mm)	695 / 1196	695 / 1196	695 / 1196	695 / 1196	695 / 1196	695 / 1196	695 / 1196
	4.15 Lowered height	h13 (mm)	90	90	90	90	90	90	90
	4.19 Overall length	l1 (mm)	1852	1912 ⁶⁾	1944 ⁷⁾	2013 ⁷⁾	2052 ⁷⁾	2013 ⁷⁾	2052 ⁷⁾
	4.20 Length to front face of forks	l2 (mm)	692	752 ⁶⁾	784 ⁷⁾	853 ⁷⁾	892 ⁷⁾	853 ⁷⁾	892 ⁷⁾
	4.21 Overall width	b1/b2 (mm)	800	800	800	800	860	800	860
	4.22 Fork dimensions	s/e/l (mm)	65 / 180 / 1160	65 / 180 / 1160	65 / 180 / 1160	65 / 180 / 1160	65 / 195 / 1160	65 / 180 / 1160	65 / 195 / 1160
	4.24 Fork carriage width	b3 (mm)	675	675	675	675	675	675	675
	4.25 Outside fork width	b5 (mm)	570	570	570	570	570	570	570
	4.31 Ground clearance beneath mast, laden	m1 (mm)	22	22	22	22	30+130	22	30+130
	4.32 Ground clearance, centre of wheelbase	m2 (mm)	30	30	30	30	30+130	30	30+130
4.33 Aisle width for pallets 1000 x 1200 wide	Ast (mm)	2405	2478 ⁸⁾	2492 ¹⁰⁾	2558 ¹⁰⁾	2587 ¹⁰⁾	2558 ¹⁰⁾	2587 ¹⁰⁾	
4.34 Aisle width for pallets 800 x 1200 long	Ast (mm)	2369	2433 ⁹⁾	2457 ¹¹⁾	2523 ¹¹⁾	2513 ¹¹⁾	2523 ¹¹⁾	2513 ¹¹⁾	
4.35 Turning radius	Wa (mm)	1540	1626	1626	1692	1760	1692	1760	
Performance	5.1 Travel speed, laden/unladen	Kmh	5.6 / 6.0	5.6 / 6.0	5.8 / 6.0	5.8 / 6.0	5.0 / 5.0	5.8 / 6.0	5.0 / 5.0
	5.2 Lift speed, laden/unladen	m/s	0.13 / 0.18	0.12 / 0.18 ¹²⁾	0.15 / 0.22	0.15 / 0.22	0.16 / 0.22	0.15 / 0.22	0.16 / 0.22
	5.3 Lowering speed, laden/unladen	m/s	0.3 / 0.25	0.3 / 0.25	0.3 / 0.25	0.3 / 0.25	0.28 / 0.26	0.3 / 0.25	0.28 / 0.26
	5.8 Max. gradeability, laden/unladen	%	8 / 10	8 / 10 ¹³⁾	8 / 10 ¹³⁾	8 / 10 ¹³⁾	8 / 10 ¹³⁾	8 / 10 ¹³⁾	8 / 10 ¹³⁾
	5.10 Service brake		Electromagnetic	Electromagnetic	Electromagnetic	Electromagnetic	Electromagnetic	Electromagnetic	Electromagnetic
Motors	6.1 Drive motor rating (S2 60 min)	kW	1	1	2	2	2	2	2
	6.2 Lift motor rating (S3 15%)	kW	2	2	3	3	3	3	3
	6.3 Battery to DIN 43531/35/36 A, B, C, no		no	43535 B	43535 B	43535 B	no	43535 B	no
	6.4 Battery voltage/capacity (5 hour rate)	V/Ah	24 / 200	24 / 250	24 / 250	24 / 375	24 / 345	24 / 375	24 / 345
	6.5 Battery weight	kg	225	240	240	300	300	300	300
Other	8.1 Drive control		MOSFET	MOSFET	MOSFET	MOSFET	MOSFET	MOSFET	MOSFET
	8.4 Average noise level at operator's ear	dB (A)	65	65	65	65	<70	65	<70

¹⁾ With three stage mast : - 50mm

²⁾ With three stage mast : - 18mm

³⁾ With three stage mast : + 175kg

⁴⁾ With three stage mast : + 115kg

⁵⁾ With free lift : 100mm

⁶⁾ With three stage mast : + 50mm

⁷⁾ With three stage mast : + 18mm

⁸⁾ With three stage mast : + 22mm

⁹⁾ With three stage mast : + 38mm

¹⁰⁾ With three stage mast : + 8mm

¹¹⁾ With three stage mast : + 14mm

¹²⁾ With three stage mast : 0.10/0, 18m/s

¹³⁾ With three stage mast : 7/10%

Notes: Equipment Weight

Weights are based on following mast specifications:

MS10: 2830mm

MS12: 2830mm

MS14: 2965mm

MS16: 2965mm