

MSIL series

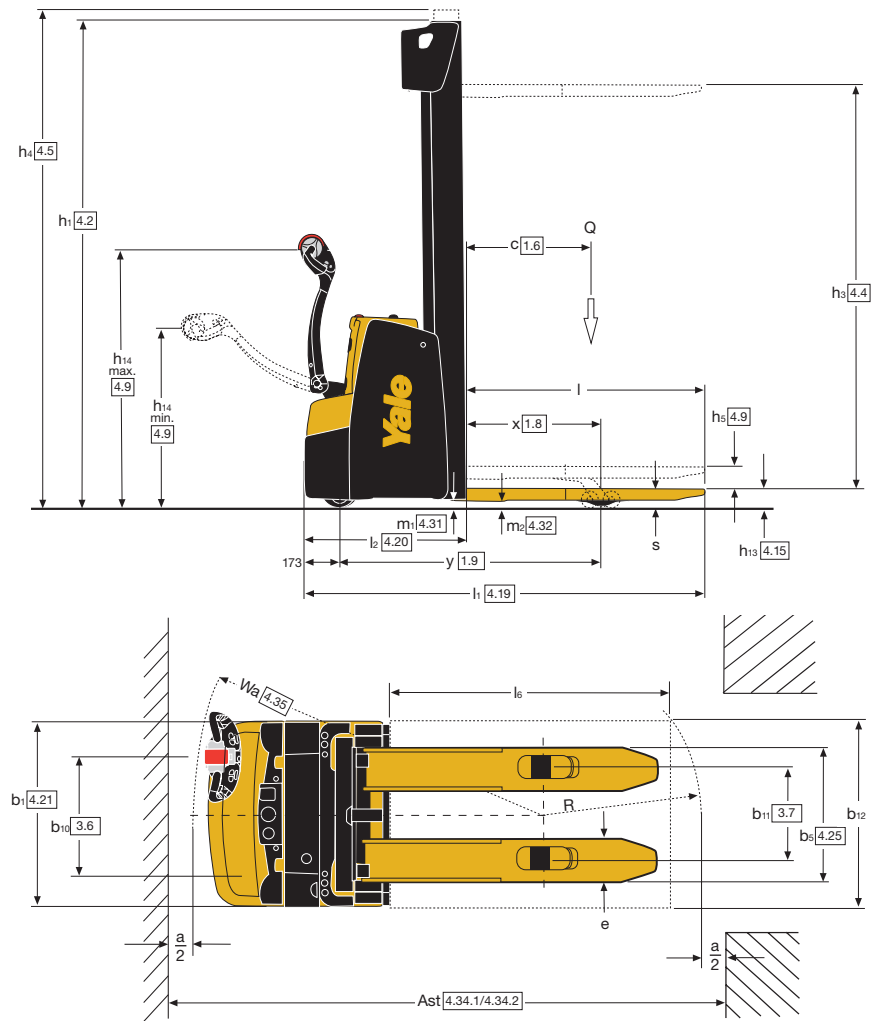
Pedestrian high lift stacker

1,200kg / 1,400kg / 1,600kg

- Initial lift model
- Vertically mid-mounted, horizontally off-set tiller arm
- Dual lift/lower controls on tiller head
- Excellent through-mast visibility
- Robust chassis design



Truck Dimensions



Mast details MS12IL, MS14IL, MS16IL

Mast type	Model			h_3 (mm)	h_2 (mm)	h_1 ⁽¹⁾ (mm)	h_4 ^{(2) (5)} (mm)	Weight ^{(3) (2)} (kg)
2 stage NFL	MS12 MS14 MS16			2800	100	1900 ⁽⁴⁾	3328	329
				3000	100	2000 ⁽⁴⁾	3528	343
				3200	100	2100	3728	356
				3400	100	2200	3928	369
				3600	100	2300	4128	382
				3800	100	2400	4328	395
				4000	100	2500	4528	409
				4200	100	2600	4728	422
2 stage FFL	MS12 MS14 MS16			2740	1418	1850 ⁽³⁾	3268	341
				2940	1518	1950 ⁽³⁾	3468	354
				3140	1618	2050	3668	367
				3340	1718	2150	3868	380
				3540	1818	2250	4068	393
				3740	1918	2350	4268	406
				3940	2018	2450	4468	419
				4140	2118	2550	4668	432
3 stage FFL	MS16	MS14	MS12	4040	1318	1850 ⁽³⁾	4606	462
				4340	1418	1950 ⁽³⁾	4906	481
				4620	1518	2050	5186	499
				4900	1618	2150	5466	518
				5180	1718	2250	5746	537
				5460	1818	2350	6026	556
				5740	1918	2450	6306	575
				6020	2018	2550	6586	594

⁽¹⁾ With free lift of 100 mm.

⁽²⁾ With load backrest ($h=1000$) for carriage $h_4 + 562$ mm.

⁽³⁾ All weights are: mast structures (weldment, cylinders, chain, pulley) + oil.

EXCLUDED: forks, accessories

⁽⁴⁾ Not available with vertical extraction of battery BS200Ah.

⁽⁵⁾ With load backrest ($h=1000$) for carriage $h_4 + 524$ mm.

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.

VDI 2198 – General Specifications

Distinguishing mark	1.1	Manufacturer (abbreviation)		Yale	Yale	Yale
	1.2	Manufacturer's type designation		MS12IL	MS14IL	MS16IL
	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		Pedestrian	Pedestrian	Pedestrian
	1.5	Rated capacity/Rated load	Q (t)	1.2	1.4	1.6
	1.6	Load centre distance	c (mm)	600	600	600
	1.8	Load distance, centre of drive axle to fork ⁽¹⁾	x (mm)	644	644	644
	1.9	Wheelbase	y (mm)	1350	1350	1422
Weights	2.1	Service weight ⁽⁸⁾	kg	1111	1111	1187
	2.2	Axle loading, laden front/rear	kg	832 / 1479	760 / 1751	920 / 1867
	2.3	Axle loading, unladen front/rear	kg	735 / 376	715 / 396	790 / 397
Tyres/chassis	3.1	Tyres: polyurethane, tophane, vulkollan, front/rear		Tophane / Polyurethane	Tophane/Polyurethane	Tophane/Polyurethane
	3.2	Tyre size, front	ø mm x mm	230 x 70	230 x 70	230 x 70
	3.3	Tyre size, rear	ø mm x mm	85 x 95	85 x 75	85 x 75
	3.4	Additional wheels (dimensions)	ø mm x mm	150 x 54	150 x 54	150 x 54
	3.5	Wheels, number front/rear (x = driven wheels)		1 x + 1/2	1 x +1/4	1 x +1/4
	3.6	Tread, front	b10 (mm)	510	510	510
	3.7	Tread, rear	b11 (mm)	385	385	385
Dimensions	4.2	Height, mast lowered	h1 (mm)	1900	1900	1900
	4.3	Free lift	h2 (mm)	100	100	100
	4.4	Lift	h3 (mm)	2800	2800	2800
	4.5	Height, mast extended	h4 (mm)	3328	3328	3328
	4.6	Initial lift	h5 (mm)	120	120	120
	4.9	Height drawbar in driving position min./max.	h14 (mm)	867 / 1223	867 / 1223	867 / 1223
	4.10	Height of wheel arms	h8 (mm)	85	85	85
	4.15	Height, lowered	h13 (mm)	90	90	90
	4.19.1	Overall length (pedestrian) ⁽²⁾	l1 (mm)	2028	2028	2100
	4.20.1	Length to face of forks (pedestrian) ⁽²⁾	l2 (mm)	878	878	950
	4.21	Overall width	b1/b2 (mm)	790	790	790
	4.22	Fork dimensions	s/e/l (mm)	55 / 185 / 1150	55 / 185 / 1150	55 / 185 / 1150
	4.25	Distance between fork-arms ⁽⁹⁾	b5 (mm)	570	570	570
	4.31	Ground clearance, laden, below mast	m1 (mm)	44	44	44
	4.32	Ground clearance, center of wheelbase	m2 (mm)	20	20	20
	4.33	Load dimension b12 x l6 crossways	b12 x l6 (mm)	1000 x 1200	1000 x 1200	1000 x 1200
	4.34.1	Aisle width for pallets 1200mm x 1000mm crossways (pedestrian)	Ast (mm)	2449	2449	2518
	4.34.2	Aisle width for pallets 800mm x 1200mm lengthwise (pedestrian)	Ast (mm)	2436	2436	2505
	4.35.2	Turning radius (pedestrian)	Wa (mm)	1551	1551	1620
Performance data	5.1	Travel speed, with/without load (pedestrian)	km/h	6 / 6	6 / 6	6 / 6
	5.2	Lift speed, laden/unladen	m/s	0.16 / 0.27	0.15 / 0.27	0.15 / 0.27
	5.3	Lowering speed, laden/unladen	m/s	0.40 / 0.25	0.40 / 0.25	0.40 / 0.25
	5.7	Gradeability, laden/unladen	%	4.1 / 10.6	3.6 / 10.6	3.0 / 9.8
	5.8	Max. gradeability, laden/unladen	%	11.0 / 22.5	9.9 / 22.5	8.8 / 23.3
	5.10	Service brake		Electromagnetic	Electromagnetic	Electromagnetic
Electric engine	6.1	Drive motor S2 60 minute rating	kW	1.2	1.2	1.2
	6.2	Lift motor S3 15% rating	kW	3kW (S3 12%)	3kW (S3 12%)	3kW (S3 12%)
	6.3	Battery according to DIN 43531/35/36 A,B,C, no		B	B	B
	6.4	Battery voltage/nominal capacity K5	(V)/(Ah)	24V / 250Ah ⁽⁵⁾	24V / 250Ah ⁽⁶⁾	24V / 375Ah ⁽⁷⁾
	6.5	Battery weight ⁽³⁾	kg	212	212	288
	6.6	Energy consumption according to VDI cycle	kWh/h at no. of cycles	0.78	0.89	0.99
	8.1	Type of drive unit		AC-Controller	AC-Controller	AC-Controller
	10.7	Sound pressure level at the driver's position	dB(A)	67.6	67.6	67.6

⁽¹⁾ With 3 stage mast -43mm

⁽²⁾ With 3 stage mast +43mm

⁽³⁾ These values may vary of +/-5%

⁽⁴⁾ Available batteries 24V / 200Ah (160kg) ; 24V / 150Ah (144kg / 125kg)

⁽⁵⁾ Available battery 24V / 210Ah

⁽⁶⁾ Available battery 24V / 210Ah ; 24V / 315Ah (288kg) ; 24V / 375Ah (288kg)

⁽⁷⁾ Available battery 24V / 315Ah

⁽⁸⁾ With forks 1400 / 1600mm +14kg

⁽⁹⁾ Available b5 680mm: with bs 680mm, x -43mm, l1 and l2 +43mm.

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MSIL series

Models: MS12IL, MS14IL, MS16IL



Initial Lift

The initial lift increases the distance from the ground, allowing transfer on irregular surfaces, loading levels and ramps. The lift/lower control of base arms is provided by two push buttons located to the left of the tiller. The loading rollers are tandem HD (Heavy Duty) with lubrication points and sealed bearings. Speed is automatically reduced with forks raised > 2m (2m dimension may be different depending on truck configuration).

Tiller head and controls

The tiller head features an ergonomic shaped handle with angled grips and integral hand guard. Large, low-effort, buttons control the direction of travel, speed and the electromagnetic brake, all accessible with the operator's hand on the handle.

The left hand buttons offer slow speeds for fine positioning (on IL models the left hand buttons control the base arm movement), the right hand ones proportional lifting and lowering.

Additional hydraulic on/off valve on the lifting line reduces inertia of the forks at the end of the lifting movement.

The travel direction inverter button (emergency stop), when activated, automatically reverses the direction of travel and the truck comes to a stop.

The horn is located on top of the tiller head. The creep speed control allows all functions of the truck to be operated with the tiller arm in the vertical position when operated at reduced speed for manoeuvring in tight confines.

Tiller arm

The mid-mounted tiller arm is offset to enhance visibility around the mast and is spring assisted to return automatically to the vertical position when released.

The long tiller arm requires minimum steering effort and increases the operating clearance when working inside the truck's envelope.

Dashboard instrumentation

The truck's dashboard features a Multifunctional Display Indicator (MDI) displaying operating hours, battery discharge indicator and error code display.

Key control activates the truck.

Chassis

The drive gear and main components are fully enclosed for maximum protection by the welded chassis.

The compact chassis width of 790mm is standard allowing the handling of loads in

tight spaces, containers or in aisle stacking applications.

Load arms are integrated into the base frame - 130 x 45mm thickness for 1.2t and 130 x 55mm for 1.4t/ 1.6t capacity models. Strengthened frame and heavy duty covers reduce service and repair costs over the life of the machine.

Mast and forks

The new mast incorporates unique designed profiles to reduce the total mast channel width, allowing quick and easy disassembly/assembly for servicing and replacement.

The lift cylinders are positioned to aid high operator-visibility, cross members are not in direct line of visibility for critical heights. The mast guard is made from wire mesh.

A variety of bolt-on mast types are offered including two and three stage with full free lift. Rollers are permanently lubricated and sealed for maximum service life. The standard fork section is 55mm.

Battery

A selection of batteries is available from 24V-210 Ah to 24V-375 Ah and also a range of battery change options:

- Closed - vertical battery extraction.
- Open on left hand side - lateral battery extraction with a roller bed.

The connector handle allows quick and easy battery connection and disconnection when charging or changing of battery.

Wheels

Four wheel layout for control and traction.

Drive, castor and high-traction wheels:

Castor wheel: 150x54mm

Drive wheel: 230x70mm.

- Standard drive and castor wheels are made from Tophane 92Sh - applicable for high loads, high tear resistant and high elastic impact.

Other wheel materials are available for specific uses.

Load wheels:

Two sizes of load wheels are offered.

- 85mm x 98mm - single load wheel
 - 85mm x 66mm - tandem load wheels
- Standard load wheel has a polyurethane wheels - Vulkollan 92 - applicable for high loads, high tear resistant and high elastic impact

Electric motors

The MS features a 1.2kW AC drive motor, delivering instant response for forward and reverse with considerable torque.

The maintenance free motor also has long inspection intervals providing a long, low-cost operational life.

The 2-3kW DC (3kW only on IL models) lift motor provides the power output to match the truck's operational requirements.

Traction - steering unit

The drive motor is connected directly to the helicoidal gear transmission running in an oil bath, mounted vertically for efficient ventilation.

Hydraulic unit

A heavy duty compound wound motor drives the pump. Inputs to the motor and valve are received from the controller to control lifting and lowering performance. Lift/lower functions are actuated directly from the tiller head controls via the Combi MOSFET controller.

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 allows the oil level to be easily checked.

Electronic controls

A Combi MOSFET controller is used to regulate both traction and pump operation. Smooth progressive control is available at all times. The controller features automatic braking (reverse current braking), regenerative braking and anti-roll-back/start-up on gradients.

Using a plug-in console, the controller can be adjusted for all performance parameters ensuring the operator and application performance requirements can be easily matched to ensure maximum productivity.

Options

A comprehensive range of options including:

- Special truck design for the use in a cold store environment:
 - Cold store temperature stability: min.-30°C
 - Low temperature hydraulic oil and lubrication grease
- Acoustic alarm while travelling, three configurations possible:
 - Audible alarm while travelling forks leading, travelling forks trailing or travelling forks leading and forks trailing
- Stretch-wrap roll holder
- Bottle holder
- Universal support bracket
- Load backrest
- A4 document holder
- Lexan transparent mast guard

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Publication part no. 220990508 Rev.00 Printed in The Netherlands (1116HG) EN.

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

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