



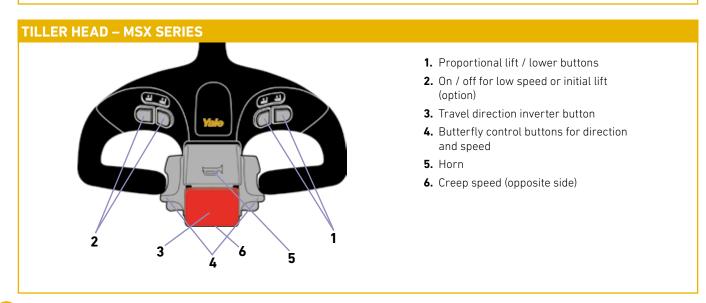
MS12-20X

1,200 - 2,000 kg

MSX Series

Pedestrian High Lift Stacker With Operator Platform

TRUCK DIMENSIONS – MSX SERIES Ast = Wa + R + a $R = \sqrt{(l_6 + x)^2 + (\underline{b_{12}})^2}$ a = 200mm l₆ = Load length h4 4.5 h₃ 4.4 h₁4.2 h₂ 4.3 h₁₄ | 4.9 1052 h₂* m₁ 4.31 y 1.9 h₁₃ -l₂ 4.20 - L₁ 4.19 b₁ 4.21 b5 b3 b12 4.25 4.24 4.14



MAST DIMENSIONS – MS12X, MS14X, MS16X							
h₃ (mm)	h ₂ (mm)	h₃ ⁽¹⁾ (mm)	h ₄ ⁽²⁾ (mm)	Weight ⁽³⁾ (kg)			
		2-Stage No Free-Lift (NFL) Mast					
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			

- (1) With free lift of 100mm for NFL mast
- (2) With load backrest (h=1000) for carriage h_4 + 562mm (2 stage mast), + 524mm (3 stage mast), + 518mm (2 ton. mast)
- (3) All weights are: mast structures (weldment, cylinders, chain, pulley) + oil. EXCLUDED: forks, accessories
- (4) Not available with vertical extraction

MAST DIMENSIONS – MS12X, MS14X, MS16X							
h₃ (mm)	h² (mm)	h₃ ⁽¹⁾ (mm)	h4 ⁽²⁾ (mm)	Weight ⁽³⁾ (kg)			
		2-Stage No Free-Lift (NFL) Mast					
2740	1418	1850 ⁽⁴⁾	3268	341			
2940	1518	1950 (4)	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			

- (1) With free lift of 100mm for NFL mast
- (2) With load backrest (h=1000) for carriage h₄ + 562mm (2 stage mast), + 524mm (3 stage mast), + 518mm (2 ton. mast)
- (3) All weights are: mast structures (weldment, cylinders, chain, pulley) + oil. EXCLUDED: forks, accessories
- (4) Not available with vertical extraction

MODEL			h₃ (mm)	h ₂ (mm)	h₃ ⁽¹⁾ (mm)	h ₄ ⁽²⁾ (mm)	Weight ⁽³⁾ (kg)
				3-Stage Fu	ull Free-Lift (FFL) Mast		
			4040	1318	1850 (4)	4606	462
MS16X		MS12X	4340	1418	1950 ⁽⁴⁾	4906	481
	MS14X		4620	1518	2050	5186	499
			4900	1618	2150	5466	518
Σ			5180	1718	2250	5746	537
				5460	1818	2350	6026
			5740	1918	2450	6306	575
			6020	2018	2550	6586	594

- (1) With free lift of 100mm for NFL mast
- (2) With load backrest (h=1000) for carriage h_4 + 562mm (2 stage mast), + 524mm (3 stage mast), + 518mm (2 ton. mast)
- (3) All weights are: mast structures (weldment, cylinders, chain, pulley) + oil. EXCLUDED: forks, accessories
- (4) Not available with vertical extraction

MAST DIMENSIONS – MS20X								
h₃ (mm)	h² (mm)	h₃ ⁽¹⁾ (mm)	h₄ ⁽²⁾ (mm)	Weight ⁽³⁾ (kg)				
		2-Stage No Free-Lift (NFL) Mast						
2600	100	1900 (4)	3172	327				
2800	100	2000 (4)	3372	340				
3000	100	2100	3572	353				
3200	100	2200	3772	366				
3400	100	2300	3972	379				
3600	100	2400	4172	393				
3800	100	2500	4372	406				
4000	100	2600	4572	419				

- (1) With free lift of 100mm for NFL mast
- (2) With load backrest (h=1000) for carriage h_4 + 562mm (2 stage mast), + 524mm (3 stage mast), + 518mm (2 ton. mast)
- (3) All weights are: mast structures (weldment, cylinders, chain, pulley) + oil. EXCLUDED: forks, accessories
- (4) Not available with vertical extraction

All values are nominal values and they are subject to tolerances.

, ,	217	8 – GENERAL SPECIFICATIONS – MSX :	PERIES				
	1.1	Manufacturer				ale	
	1.2	Model designation		MS12X	MS14X	MS16X	MS20X
ب	1.3	Drive			Electric	(battery)	
Σ	1.4	Operator type			Pedestria	n/Standing	
GENERAL	1.5	Rated capacity/Rated load	Q (t)	1.2	1.4	1.6	2.0
9	1.6	Load centre distance	c (mm)		6	00	
	1.8	Load distance, centre of drive axle to fork (1)	x (mm)		7	09	
	1.9	Wheelbase	y (mm)		13	319	
Ė	2.1	Service weight	kg	1100	1130	1240	1243
WEIGHT	2.2	Axle loading with load, front/rear (17)	kg	797 / 1503	830 / 1700	897 / 1943	938 / 2305
×	2.3	Axle loading without load, front/rear (17)	kg	749/ 351	774 / 356	837 / 403	836 / 407
	3.1	Tyres front/rear	· · · ·			Thane	3337.131
	3.2	Tyre size, front (17)				x 80	
	3.3	Tyre size, rear (17)		85 x 100		85 x 70	
TYRES	3.4	Additional wheels (dimensions)		03 X 100	150	x 54	
Ξ	3.5	Wheels, number front/rear (x = driven wheels) (17)		1x + 1 / 2	130	1x + 1 / 4	
	3.6	Tread, front (17)	b10 (mm)	1X + 1 / Z		10 10	
	3.7	Tread, rear (17)	b ₁₁ (mm)			96	
	4.2	Height, mast lowered	h ₁ (mm)			00	
	4.3	Free lift	h ₂ (mm)			00	
	4.4	Lift	h ₃ (mm)		3200		3000
	4.5	Height, mast extended	h4 (mm)		3728		3572
	4.6	Initial lift	hs (mm)			-	
	4.8	Seat height/stand height	h ₁₄ (mm)			85	
	4.9	Height drawbar in driving position min./max.	hs (mm)			/ 1382	
	4.15	Height, lowered	h ₁₃ (mm)		9	0	
	4.19.1	Overall length (pedestrian) (3)	lı (mm)	20	09	2081	
	4.19.2	Overall length (standing) (3)	lı (mm)	24	45	2517	
	4.20.1	Length to face of forks (pedestrian) (3)	l2 (mm)	85	59	931	
	4.20.2	Length to face of forks (standing) (3)	l ₂ (mm)	12	95	1367	
DIMENSIONS	4.21	Overall width	b ₁ /b ₂ (mm)	790			
Ä	4.22	Fork dimensions	s/e/l (mm)		55 / 185 / 1150		65 / 185 / 1150
፷	4.24	Fork-carriage width	b3 (mm)			-	
_	4.25	Distance between fork-arms	b₅ (mm)		57	O (18)	
	4.26	Width between load arms	b4 (mm) m1			-	
	4.31	Ground clearance, laden, below mast	(mm)		/	-2	
	4.32	Ground clearance, center of wheelbase	m ₂ (mm)			32	
	4.33	Load dimension b12 × l6 crossways	b ₁₂ x l ₆ (mm)			x 1200	
	4.34	Aisle width for pallets 1000mm x 1200mm crossways (pedestrian)	Ast ₂ (mm)	24			534
	4.34.1	Aisle width for pallets 1000mm x 1200mm crossways (standing)	Astı (mm)		70		942
		Aisle width for pallets 800mm x 1200mm lengthwise (pedestrian)		24			500
	4.34.2		Astz (mm)				
	4.34.3	Aisle width for pallets 800mm x 1200mm lengthwise (standing)	Astı (mm)	2836		2908	
	4.35	Turning radius (pedestrian) (2)	Wa ₂ (mm)	15			567
		Turning radius (standing) (2)	Wa ₁ (mm)	20			075
	5.1	Travel speed, laden/unladen (pedestrian)	km/h			6	
	5.1.1	Travel speed, laden/unladen (standing) (19) (20)	km/h	7.5	(10)	8.5	7
빌	5.1.2	Travel speed, laden/unladen, backwards (pedestrian)	km/h			6	
PERFORMANCE	5.1.3	Travel speed, laden/unladen, backwards (standing) (19) (20)	km/h		(10)	8.5	7
Š	5.2	Lift speed, laden/unladen	m/s	0.15 /	0.26	0.13 / 0.26	0.10 / 0.19
Ě	5.3	Lowering speed, laden/unladen	m/s		0.4 / 0.3		0.24 / 0.17
4	5.7	Gradeability, laden/unladen	%	_ (16)	_ (17)	1.1 / 5.0	0.7 / 5.0
	5.8	Max. gradeability, laden/unladen	%	7.0 / 16.8 (12)	6.2 / 16.3 (13)	8.1 / 20.0	6.8 / 20
	5.10	Service brake			Electror	nagnetic	
	6.1	Drive motor, S2 60 min rating	kW	1.8	(11)	2	2.5
	6.2	Lift motor S3 15% rating	kW			(16)	
₹	6.3	Battery according to DIN 43531 / 35 / 36 A,B,C, no				В	
ົວ	6.4	Battery voltage/nominal capacity K5	V/Ah	24V / 250Ah (5)	24V / 250Ah (6)	24V / 375Ah ⁽⁷⁾	24V / 375Ah (
щ	1 ***						
	6.5	Rattery weight (4)	kn	2.	12)	88
3	6.5	Battery weight (4) Energy consumption acc. to VDI cycle	kg kWh/h	2			88
ELECTRIC	6.5 6.6 8.1	Battery weight (4) Energy consumption acc. to VDI cycle Type of drive unit	kWh/h	1	1.1	1.25	1.3

- (1) With 3 stage mast 43mm
- (2) IL: load section lowered +72mm
- (3) With 3 stage mast +43mm, with 3 stage mast with load backrest +43mm, with 2 stage mast with load backrest +27mm
- (4) These values may vary of +/-5%
- (5) Available battery 24V / 210Ah (212 kg); 24V / 250Ah Polypropylene case version (180 kg + ballast 32kg); 24V / 200Ah Li-lon (211kg)
- (6) Available battery 24V / 210Ah (212kg) ; 24V / 315Ah (288kg) ; 24V / 375Ah (288kg) ; 24V / 250Ah Polypropylene case version (180kg + ballast 32kg) ; 24V / 200Ah Li-Ion (211 kg) ; 24V / 300Ah Li-Ion (277kg) ; with 315 / 375Ah the wheelbase is increased y = +72mm
- $(7) \quad \text{Available battery 24V / 315Ah (288kg) ; 24V / 300Ah Li-lon (277kg)} \\$
- (8) Available battery 24V / 210Ah (212kg) ; 24V / 200Ah Li-lon (211kg)
- (9) Available battery 24V / 210Ah (212kg); 24V / 315Ah (288kg); 24V / 375Ah (288kg); 24V / 200Ah Li-lon (211kg); 24V / 300Ah Li-lon (277kg); with 315 / 375Ah the wheelbase is increased y = +72mm
- (10) Available 8.5km/h with 2.5kW S2 = 60min motor

		8 – GENERAL SPECIFICATIONS – MSX S	EKIES				
	1.1	Manufacturer				ale	
	1.2	Model designation		MS12X IL	MS14X IL	MS16X IL	MS16X SL
7	1.3	Drive		Electric (battery)			
GENERAL	1.4	Operator type			1	n/Standing	
Ä	1.5	Rated capacity/Rated load	Q (t)	1.2	1.4	1.6	1.6
9	1.6	Load centre distance	c (mm)		6	000	
	1.8	Load distance, centre of drive axle to fork (1)	x (mm)		644		646
	1.9	Wheelbase	y (mm)	1:	350	1422	1408
높	2.1	Service weight	kg	1	191	1267	1523
WEIGHT	2.2	Axle loading with load, front/rear (17)	kg	912 / 1479	840 / 1751	1000 / 1867	1042 / 2081
≥	2.3	Axle loading without load, front/rear (17)	kg	815 / 376	795 / 396	870 / 397	985 / 538
	3.1	Tyres front/rear			NDII	Thane	
	3.2	Tyre size, front (17)			230	0 x 80	
S	3.3	Tyre size, rear (17)		85 x 95	85	x 75	85 x 70
TYRES	3.4	Additional wheels (dimensions)			150 x 54		125 x 60
F	3.5	Wheels, number front/rear (x = driven wheels) (17)		1x + 1 / 2		1x + 1 / 4	
	3.6	Tread, front (17)	b10 (mm)		510		522
	3.7	Tread, rear (17)	b ₁₁ (mm)		385		968 - 1168 - 136
	4.2	Height, mast lowered	h1 (mm)		1900		2100
	4.3	Free lift	h ₂ (mm)		1	00	
	4.4	Lift	h ₃ (mm)		2800		3200
	4.5	Height, mast extended	h4 (mm)		3328		3728
	4.6	Initial lift	hs (mm)		120		-
	4.8	Seat height/stand height	h ₁₄ (mm)			85	1
	4.9	Height drawbar in driving position min./max.	hs (mm)	1147 / 1382			
	4.15	Height, lowered	h ₁₃ (mm)		90	7 1002	55
	4.19.1	Overall length (pedestrian) (3)	lı (mm)	2	105	2177	2161
S	4.19.2	Overall length (standing) (3)	lı (mm)		540	2612	2597
	4.20.1	Length to face of forks (pedestrian) (3)	l ₂ (mm)	955		1027	1011
	4.20.2	Length to face of forks (standing) (3)	l ₂ (mm)			1462	1447
	4.20.2	Length to face of forks (standing).	12 (11111)	1390 1462		794 /	
DIMENSIONS	4.21	Overall width	b ₁ /b ₂ (mm)	790			1095 -1295 -149
Ξ	4.22	Fork dimensions	s/e/l (mm)		55 / 185 / 1150		35 / 120 / 1150
0	4.24	Fork-carriage width	b ₃ (mm)	-			800 / 1000 / 120
	4.25	Distance between fork-arms	b₅ (mm)		570 (18)		max 716 / 944 / 1096 ⁽²¹⁾
	4.26	Width between load arms	b4 (mm) m1		-		841-1041-1241
	4.31	Ground clearance, laden, below mast	(mm)		44		42
	4.32	Ground clearance, center of wheelbase	m ₂ (mm)		20		26
	4.33	Load dimension b12 × l6 crossways	b12 x l6 (mm)		1000	x 1200	
	4.34.1	Aisle width for pallets 1000mm x 1200mm crossways (pedestrian)	Ast ₂ (mm)	2	524	2595	2619
	4.34.1	Aisle width for pallets 1000mm x 1200mm crossways (standing)	Astı (mm)	2'	732	3002	3034
	4.34.2	Aisle width for pallets 800mm x 1200mm lengthwise (pedestrian)	Ast ₂ (mm)	2	511	2582	2605
	4.34.2	Aisle width for pallets 800mm x 1200mm lengthwise (standing)	Astı (mm)	2	919	2990	3020
	4.35.1	Turning radius (pedestrian) (2)	Wa ₂ (mm)	10	526	1697	1722
	4.35.1	Turning radius (standing) (2)	Wa ₁ (mm)	21	34	2105	2137
	5.1	Travel speed, laden/unladen (pedestrian)	km/h			6	
	5.1	Travel speed, laden/unladen (standing) (19) (20)	km/h	7.	5 (10)	8.5	7
병	5.1.1	Travel speed, laden/unladen, backwards (pedestrian)	km/h			6	•
Ž	5.1.1	Travel speed, laden/unladen, backwards (standing) (19) (20)	km/h	7.	5 (10)	8.5	7
Σ	5.2	Lift speed, laden/unladen	m/s		0.15	/ 0.26	1
PERFORMANCE	5.3	Lowering speed, laden/unladen	m/s	0.4 / 0.3			
Ē	5.7	Gradeability, laden/unladen	%	_ (18)	_ (19)	1.0 / 4.8	0.8 / 3.7
	5.8	Max. gradeability, laden/unladen	%	6.6/ 15.3 (14)	6.0 / 15.3 (15)	8.0 / 20.0	7.2 / 16.8
	5.10	Service brake				magnetic	
	6.1	Drive motor, S2 60 min rating	kW	1	8 (11)		2.5
	6.2	Lift motor S3 15% rating	kW			(16)	
2	6.3	Battery according to DIN 43531 / 35 / 36 A,B,C, no	KTY			В	
ELECTRIC	6.4	Battery voltage/nominal capacity K5	V/Ah	24V / 250Ah (8)	24V / 250Ah (9)	24V / 375Ah (7)	24V / 375Ah ⁽⁷
H	6.5	Battery weight (4)			12 24V / 25UAN W		
			kg	1	1		288
	6.6	Energy consumption acc. to VDI cycle	kWh/h	1	1.1	1.25	1.3
	8.1	Type of drive unit			AU-UC	ntroller	

- (11) Available 2.5kW S2=60min motor
- (12) Available 10.4 / 20.0 with 2.5kW S2 = 60min motor
- (13) Available 9.3 / 20.0 with 2.5kW S2 = 60min motor
- (14) Available 10.0 / 20.0 with 2.5kW S2 = 60min motor
- (15) Available 9.0 / 20.0 with 2.5kW S2 = 60min motor
- (16) Value referred to S3 12%

All values are nominal values and they are subject to tolerances.

- (17) Pedestrian version. For Standing version, front / rear are inverted
- (18) Available bs 680mm: with bs 680mm and 2 stage mast, x -43 mm, l1 and l2 +43mm
- (19) With lateral protections not in guarding position: 6km/h
- (20) Without lateral protections (optional): 6 km/h MS16 X SL
- (21) With forks 35 / 120 / 1150, effective dimension may change depending on forks position and on forks dimensions

RE/	AR TYRE SIZE – MSX SERIES			
			b4 1050mm	b4 1250mm
3.7	Tread, rear (tyre size, rear = ø 85 x 70mm) (1)	b ₁₁ (mm)	1178	1378
3.7	Tread, rear (tyre size, rear = \emptyset 125 x 50mm) (1)	b ₁₁ (mm)	1132	1332
4.21	Overall width (tyre size, rear = ø 85 x 70mm)	b ₁ /b ₂ (mm)	860 / 1305	860 / 1505
4.21	Overall width (tyre size, rear = ø 125 x 50mm)	b ₁ /b ₂ (mm)	860 / 1214	860 / 1414
4.26	Distance between wheel arms / loading surfaces	b4 (mm)	1050	1250
4.34	Aisle width for pallets 1000mm x 1200mm crossways (standing) (tyre size, rear = ø 85 x 70mm)	Astı (mm)	2989 (2)	3040 ⁽²⁾
4.34.1	Aisle width for pallets 1000mm x 1200mm crossways (pedestrian) (tyre size, rear = ø 85 x 70mm)	Ast ₂ (mm)	2540 (2)	2591 ⁽²⁾
4.34.2	Aisle width for pallets 1000mm x 1200mm crossways (standing) (tyre size, rear = ø 125 x 50mm)	Astı (mm)	3003 (2)	3031 ⁽²⁾
4.34.3	Aisle width for pallets 1000mm x 1200mm crossways (pedestrian) (tyre size, rear = ø 125 x 50mm)	Ast ₂ (mm)	2554 (2)	2582 ⁽²⁾
4.34.4	Aisle width for pallets 800mm x 1200mm lengthwise (standing) (tyre size, rear = ø 85 x 70mm)	Astı (mm)	2978 (2)	3042 (2)
4.34.5	Aisle width for pallets 800mm x 1200mm lengthwise (pedestrian) (tyre size, rear = ø 85 x 70mm)	Ast ₂ (mm)	2529 (2)	2593 ⁽²⁾
4.34.6	Aisle width for pallets 800mm x 1200mm lengthwise (standing) (tyre size, rear = ø 125 x 50mm)	Astı (mm)	2984 (2)	3032 (2)
4.34.7	Aisle width for pallets 800mm x 1200mm lengthwise (pedestrian) (tyre size, rear = ø 125 x 50 mm)	Ast ₂ (mm)	2535 ⁽²⁾	2583 ⁽²⁾

⁽¹⁾ Pedestrian version. For Stand-on version, front/rear are inverted

All values are nominal values and they are subject to tolerances.

⁽²⁾ With 3 stage mast +12mm





About Yale®

Yale Lift Truck Technologies leverages over a century of material handling experience and substantial investment in innovation to bring the most advanced technology-driven lift truck solutions to market. The company offers a full line of award-winning lift trucks, including reach trucks, order pickers, turret trucks, pallet jacks and trucks, pallet stackers, tow tractors and counterbalanced forklifts, as well as powerful operator assist solutions, proven robotics and a wide range of power sources to help customers adapt to today's demanding supply chain. Yale and its independent dealer network support these solutions with comprehensive after-sales service, parts, financing and training.

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Government

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