



MS10-20

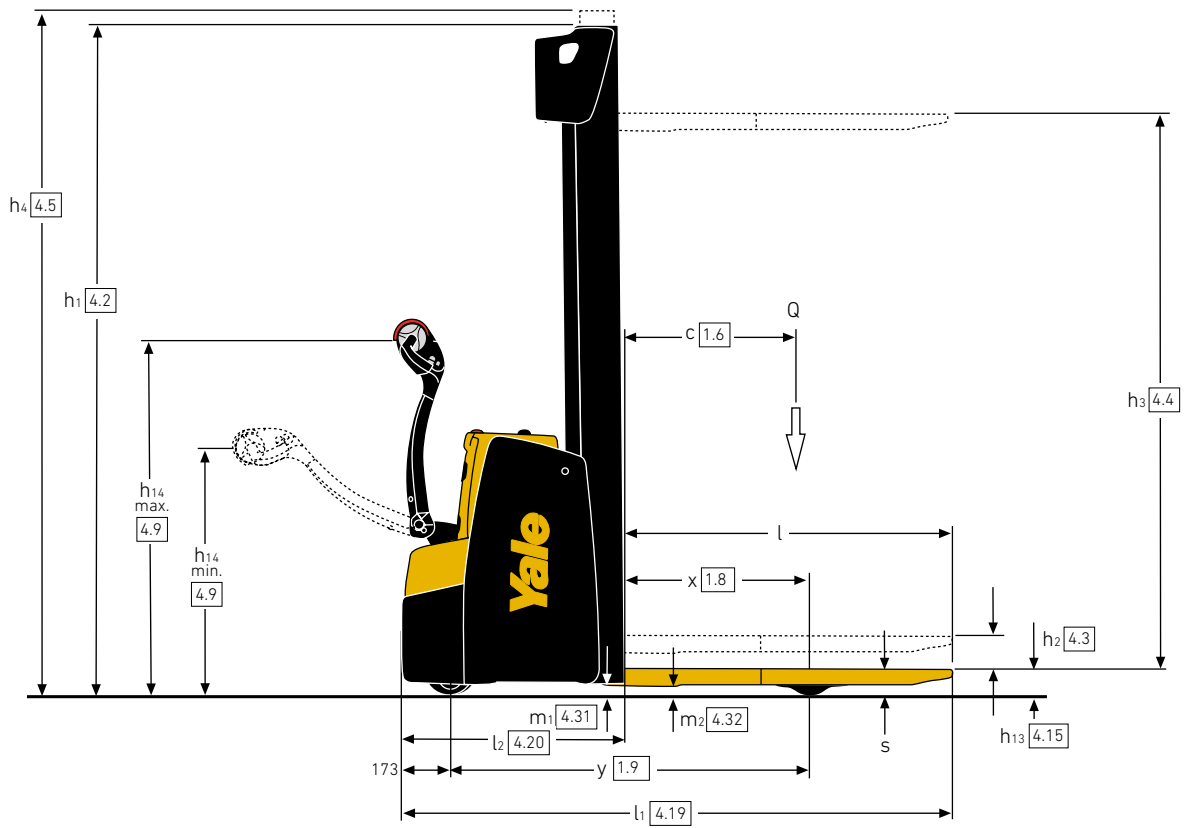
SPEC SHEET

1,000 - 2,000 kg

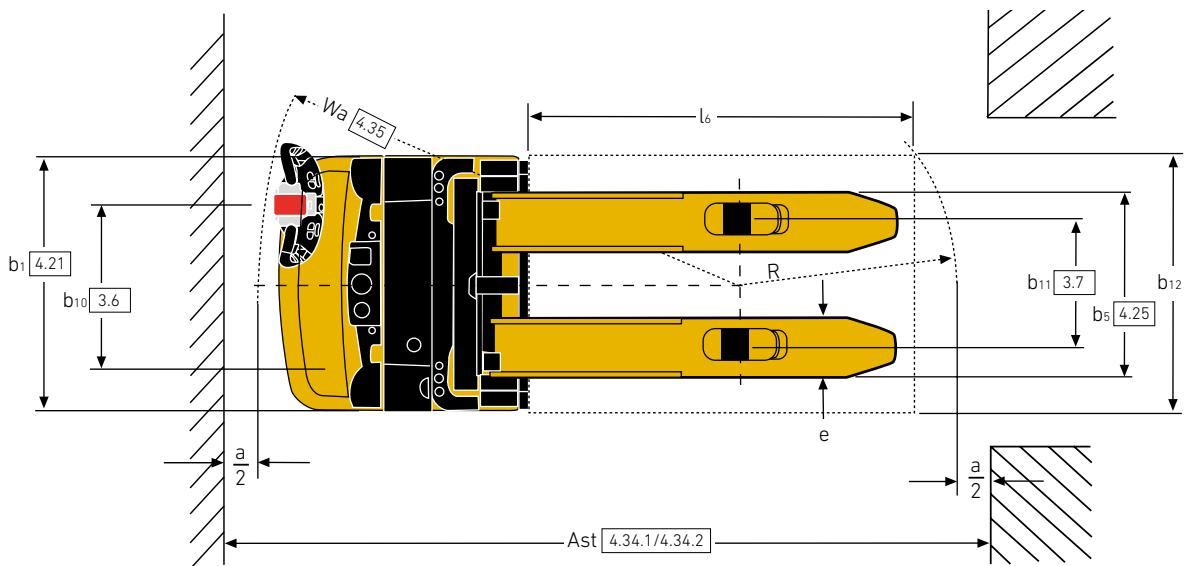
MS Series

Pedestrian High
Lift Stacker

TRUCK DIMENSIONS – MS SERIES



TRUCK DIMENSIONS – MS SERIES



VDI 2198 – GENERAL SPECIFICATIONS – MS SERIES

| | | | Yale | | | |
|--------------------|---|--|-------------------------------------|---------------------------------|----------------------------|----------------------------|
| | | | MS10 | MS12 | MS14 | |
| GENERAL | 1.1 | Manufacturer | | Yale | | |
| | 1.2 | Model designation | | MS10 | MS12 | MS14 |
| | 1.3 | Drive | | Electric (battery) | | |
| | 1.4 | Operator type | | Pedestrian | | |
| | 1.5 | Rated capacity/Rated load | Q (t) | 1.0 | 1.2 | 1.4 |
| | 1.6 | Load centre distance | c (mm) | 600 | | |
| | 1.8 | Load distance, centre of drive axle to fork ⁽¹⁾ | x (mm) | 648 | 649 | |
| | 1.9 | Wheelbase | y (mm) | 1204 | 1259 | |
| | WEIGHT | 2.1 | Service weight ⁽⁸⁾ | kg | 956 | 1005 |
| 2.2 | | Axle loading, laden front/rear | kg | 676 / 1280 | 708 / 1497 | 741 / 1697 |
| 2.3 | | Axle loading, unladen front/rear | kg | 642 / 314 | 663 / 342 | 688 / 350 |
| TYRES | 3.1 | Tyres front/rear | | Topthane/Polyurethane | | |
| | 3.2 | Tyre size, front | | 230 x 70 | | |
| | 3.3 | Tyre size, rear | ø mm x mm | 85 x 100 | | 85 x 70 |
| | 3.4 | Additional wheels (dimensions) | ø mm x mm | 150 x 54 | | |
| | 3.5 | Wheels, number front/rear (x = driven wheels) | ø mm x mm | 1x + 1/ 2 | | 1x + 1/4 |
| | 3.6 | Tread, front | b ₁₀ (mm) | 510 | | |
| | 3.7 | Tread, rear | b ₁₁ (mm) | 400 | | |
| DIMENSIONS | 4.2 | Height, mast lowered | h ₁ (mm) | 2100 | | |
| | 4.3 | Free lift | h ₂ (mm) | 100 | | |
| | 4.4 | Lift | h ₃ (mm) | 3200 | | |
| | 4.5 | Height, mast extended | h ₄ (mm) | 3728 | | |
| | 4.9 | Height drawbar in driving position min./max. | h ₁₄ (mm) | 867 / 1223 | | |
| | 4.15 | Height, lowered | h ₁₃ (mm) | 90 | | |
| | 4.19 | Overall length ⁽²⁾ | l ₁ (mm) | 1878 | 1933 | |
| | 4.20 | Length to face of forks ⁽²⁾ | l ₂ (mm) | 728 | 783 | |
| | 4.21 | Overall width | b ₁ /b ₂ (mm) | 790 | | |
| | 4.22 | Fork dimensions ⁽¹³⁾ | s/e/l (mm) | 55 / 185 / 1150 ⁽¹³⁾ | | |
| | 4.24 | Fork carriage width | b ₃ (mm) | - | | |
| | 4.25 | Distance between fork-arms ⁽⁸⁾ | b ₅ (mm) | 570 ⁽⁹⁾ | | |
| | 4.26 | Distance between wheel arms/loading surfaces | b ₄ (mm) | - | | |
| | 4.31 | Ground clearance, laden, below mast | m ₁ (mm) | 42 | | |
| | 4.32 | Ground clearance, center of wheelbase | m ₂ (mm) | 32 | | |
| 4.33 | Load dimension b ₁₂ × l ₆ crossways | b ₁₂ × l ₆ (mm) | 1000 x 1200 | | | |
| 4.34.1 | Aisle width for pallets 1200mm x 1000mm crossways | Ast (mm) | 2307 | 2359 | | |
| 4.34.2 | Aisle width for pallets 800mm x 1200mm lengthwise | Ast (mm) | 2293 | 2345 | | |
| 4.35 | Turning radius | Wa (mm) | 1411 | 1464 | | |
| PERFORMANCE | 5.1 | Travel speed, with/without load | km/h | 6 / 6 | | |
| | 5.1.1 | Travel speed, laden/unladen, backwards | km/h | 6 / 6 | | |
| | 5.2 | Lift speed, laden/unladen | m/s | 0.15 / 0.23 | 0.17 / 0.28 | 0.16 / 0.28 |
| | 5.3 | Lowering speed, laden/unladen | m/s | 0.37 / 0.35 | 0.4 / 0.35 | |
| | 5.7 | Gradeability, laden/unladen | % | 5.1 / 12.4 | 4.3 / 11.7 | 3.7 / 11.3 |
| | 5.8 | Max. gradeability, laden/unladen | % | 13.2 / 24.6 | 11.5 / 24.0 | 10.2 / 24.7 |
| 5.10 | Service brake | | Electromagnetic | | | |
| ELECTRIC | 6.1 | Drive motor S2 60 minute rating | kW | 1.2 | | |
| | 6.2 | Lift motor S3 15% rating | kW | 2.2 ⁽¹¹⁾ | 3 ⁽¹²⁾ | |
| | 6.3 | Battery according to DIN 43531/35 /36 A,B,C, no | | No | B | |
| | 6.4 | Battery voltage/nominal capacity K5 | (V)/(Ah) | 24V / 200Ah ⁽⁴⁾ | 24V / 250Ah ⁽⁵⁾ | 24V / 250Ah ⁽⁶⁾ |
| | 6.5 | Battery weight ⁽³⁾ | kg | 185 | 212 | |
| | 6.6 | Energy consumption according to VDI cycle | kWh/h @ no. of cycles | 0.68 / 0.85 | 0.78 / 1.0 | 0.89 / 1.13 |
| 8.1 | Type of drive unit | | AC-Controller | | | |
| 10.7 | Sound pressure level at the driver's position | dB(A) | 67.6 / 64 | | | |

(1) With 3 stage mast -43mm

(2) With 3 stage mast +43mm, with 3 stage mast with load backrest +43mm, with 2 stage mast with load backrest +27mm

(3) These values may vary of +/-5%.

(4) Available batteries 24V / 150Ah (144kg); 24V / 150Ah Polypropylene case version (125kg); 24V / 200Ah Polypropylene case version (160kg); 24V / 100Ah Li-Ion (144kg); 24V / 200Ah Li-Ion (154kg)

(5) Available battery 24V / 210Ah (212kg); 24V / 250Ah Polypropylene case version (180kg + ballast 32kg); 24V / 200Ah Li-Ion (211kg)

(6) Available battery 24V / 210Ah (212kg); 24V / 315Ah (288 kg); 24V / 375Ah (288kg); 24V / 250Ah Polypropylene case version (180kg + ballast 32kg); 24V / 200Ah Li-Ion (211kg); 24V / 300Ah Li-Ion (277kg); with 315/375Ah the wheelbase is increased y=+72mm

(7) Available battery 24V / 315Ah (288 kg); 24V / 300Ah Li-Ion (277kg)

VDI 2198 – GENERAL SPECIFICATIONS – MS SERIES

| | | Yale | | | |
|--------------------|---|--|---|-----------------------------|---------------------------------|
| | | MS16 | MS16SL | MS20 | |
| GENERAL | 1.1 | Manufacturer | | | |
| | 1.2 | Model designation | | | |
| | 1.3 | Drive | Electric (battery) | | |
| | 1.4 | Operator type | Pedestrian | | |
| | 1.5 | Rated capacity/Rated load | 1.6 | | 2.0 |
| | 1.6 | Load centre distance | c (mm) 600 | | |
| | 1.8 | Load distance, centre of drive axle to fork ⁽¹⁾ | x (mm) 649 | 646 | 649 |
| | 1.9 | Wheelbase | y (mm) 1331 | 1408 | 1331 |
| | WEIGHT | 2.1 | Service weight ⁽⁸⁾ | 1145 | 1431 |
| 2.2 | | Axle loading, laden front/rear | kg 805 / 1940 | 950 / 2081 | 846 / 2305 |
| 2.3 | | Axle loading, unladen front/rear | kg 748 / 397 | 893/538 | 771 / 380 |
| TYRES | 3.1 | Tyres front/rear | Tophane/Polyurethane | | |
| | 3.2 | Tyre size, front | 230 x 70 | | |
| | 3.3 | Tyre size, rear | ø mm x mm 85 x 70 | | |
| | 3.4 | Additional wheels (dimensions) | ø mm x mm 150 x 54 | 125 x 60 | 150 x 54 |
| | 3.5 | Wheels, number front/rear (x = driven wheels) | ø mm x mm 1x + 1/4 | 1x+1/4 | 1x + 1/4 |
| | 3.6 | Tread, front | b ₁₀ (mm) 510 | 522 | 510 |
| | 3.7 | Tread, rear | b ₁₁ (mm) 400 | 968 / 1168 / 1368 | 400 |
| DIMENSIONS | 4.2 | Height, mast lowered | h ₁ (mm) 2100 | | |
| | 4.3 | Free lift | h ₂ (mm) 100 | | |
| | 4.4 | Lift | h ₃ (mm) 3200 | | |
| | 4.5 | Height, mast extended | h ₄ (mm) 3728 | 3728 | 3572 |
| | 4.9 | Height drawbar in driving position min./max. | h ₁₄ (mm) 867 / 1223 | 867/1223 | 867 / 1223 |
| | 4.15 | Height, lowered | h ₁₃ (mm) 90 | 55 | 90 |
| | 4.19 | Overall length ⁽²⁾ | l ₁ (mm) 2005 | | |
| | 4.20 | Length to face of forks ⁽²⁾ | l ₂ (mm) 855 | | |
| | 4.21 | Overall width | b ₁ /b ₂ (mm) 790 | 794 / 1095-1295-1495 | |
| | 4.22 | Fork dimensions ⁽¹³⁾ | s/e/l (mm) 55 / 185 / 1150 ⁽¹³⁾ | 35 / 120 / 1150 | 65 / 185 / 1150 ⁽¹³⁾ |
| | 4.24 | Fork carriage width | b ₃ (mm) - | 800 / 1000 / 1200 | |
| | 4.25 | Distance between fork-arms ⁽⁸⁾ | b ₅ (mm) 570 ⁽⁹⁾ | - | |
| | 4.26 | Distance between wheel arms/loading surfaces | b ₄ (mm) - | 841-1041-1241 | |
| | 4.31 | Ground clearance, laden, below mast | m ₁ (mm) 42 | | |
| | 4.32 | Ground clearance, center of wheelbase | m ₂ (mm) 32 | 26 | 32 |
| | 4.33 | Load dimension b ₁₂ × l ₆ crossways | b ₁₂ × l ₆ (mm) 1000 x 1200 | | |
| | 4.34.1 | Aisle width for pallets 1200mm x 1000mm crossways | A _{st} (mm) 2428 | 2504 | 2428 |
| 4.34.2 | Aisle width for pallets 800mm x 1200mm lengthwise | A _{st} (mm) 2414 | 2490 | 2414 | |
| 4.35 | Turning radius | W _a (mm) 1533 | 1607 | 1533 | |
| PERFORMANCE | 5.1 | Travel speed, with/without load | km/h 6 / 6 | | |
| | 5.1.1 | Travel speed, laden/unladen, backwards | km/h 6 / 6 | | |
| | 5.2 | Lift speed, laden/unladen | m/s 0.14 / 0.28 | | 0.10 / 0.19 |
| | 5.3 | Lowering speed, laden/unladen | m/s 0.4 / 0.35 | | 0.24 / 0.17 |
| | 5.7 | Gradeability, laden/unladen | % 3.1 / 10.1 | 3.1 / 8.9 | 2.5 / 10.3 |
| | 5.8 | Max. gradeability, laden/unladen | % 8.9 / 23.8 | 7.4 / 17.8 | 7.5 / 24.3 |
| 5.10 | Service brake | Electromagnetic | | | |
| ELECTRIC | 6.1 | Drive motor S2 60 minute rating | kW 1.2 | | |
| | 6.2 | Lift motor S3 15% rating | kW 3 (12) | | |
| | 6.3 | Battery according to DIN 43531/35 /36 A,B,C, no | B | | |
| | 6.4 | Battery voltage/nominal capacity K5 | (V)/(Ah) 24V / 375Ah ⁽⁷⁾ | 24V / 375Ah ⁽¹⁵⁾ | 24V / 375Ah ⁽⁷⁾ |
| | 6.5 | Battery weight ⁽³⁾ | kg 288 | | |
| | 6.6 | Energy consumption according to VDI cycle | kWh/h @ no. of cycles 0.99 / 1.13 | | |
| 8.1 | Type of drive unit | AC-Controller | | | |
| 10.7 | Sound pressure level at the driver's position | dB(A) 67.6 / 64 | | | |

(8) With forks 1400/1600mm +14kg

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

(10) Available battery 24V / 210Ah (212 kg); 24V / 315Ah (288 kg); 24V / 375Ah (288 kg); 24V / 200Ah Li-Ion (211 kg); 24V / 300Ah Li-Ion (277kg); with 315 / 375Ah the wheelbase is increased y=+72mm

(11) Value referred to S3 6%

(12) Value referred to S3 12%

(13) With 2 stage mast and b₅ = 570mm the s dimension increases 5mm for first 250mm at toe

(14) lL: load section lowered +72mm

(15) Available battery 24V / 315Ah (288kg)

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

MAST DIMENSIONS – MS10, MS12, MS14, MS16, MS16SL

| Model | | h ₃ (mm) | h ₂ (mm) | h ₁ ⁽¹⁾ (mm) | h ₄ ⁽²⁾ (mm) | Weight ⁽³⁾ (kg) | |
|-----------------------------------|--------------|------------------------|------------------------|---------------------------------------|---------------------------------------|-------------------------------|------|
| 2-Stage No Free-Lift (NFL) Mast | | | | | | | |
| MS12, MS14, MS16 | MS10 | 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 Full Free-Lift (FFL) Mast | | | | | | | |
| MS12, MS14, MS16 | MS10 | 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 |
| 3-Stage Full Free-Lift (FFL) Mast | | | | | | | |
| MS16 | MS14, MS16SL | MS12 | 4040 | 1318 | 1850 ⁽⁴⁾ | 4606 | 462 |
| | | | 4340 | 1418 | 1950 ⁽⁴⁾ | 4906 | 481 |
| | | | 4620 | 1518 | 2050 | 5186 | 499 |
| | | 4900 | 1618 | 2150 | 5466 | 518 | |
| | | | | 5180 | 1718 | 2250 | 5746 |
| | | | 5460 | 1818 | 2350 | 6026 | 556 |
| | | | 5740 | 1918 | 2450 | 6306 | 575 |
| | | | 6020 | 2018 | 2550 | 6586 | 594 |

(1) With free lift of 100 mm 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 of battery BS200Ah

MAST DIMENSIONS – MS20

| h ₃ (mm) | h ₂ (mm) | h ₁ ⁽¹⁾ (mm) | h ₄ ⁽²⁾ (mm) | Weight ⁽³⁾ (kg) |
|-----------------------------------|------------------------|---------------------------------------|---------------------------------------|-------------------------------|
| 2-Stage Full Free-Lift (FFL) Mast | | | | |
| 2600 | 100 | 1900 | 3172 | 327 |
| 2800 | 100 | 2000 | 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 100 mm 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

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





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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