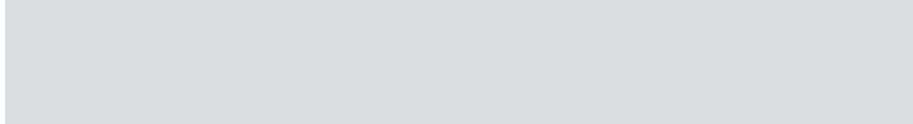


FORKLIFT TRUCKS 5–9 TONNES

TECHNICAL INFORMATION, KALMAR DCE 50-90HM

HYDROSTATIC OPERATION - MECHANICALLY CONTROLLED





A new range of trucks

The Kalmar DCE 50-90HM is an entirely new range of diesel trucks with mechanically controlled hydrostatic operation and a capacity of 5-9 tonnes. The trucks are constructed in every respect for reliability and efficiency in demanding industrial applications.

The brand new engines all have smooth drive with low noise levels and emissions that meet the latest environmental requirements. Low fuel consumption, good access with a low service requirement and excellent quality all result in good operational economy.

Our already world-beating operator's environment has been developed and widened, with two versions available for the DCE 50-90HM. The electronic systems represent an entirely new generation, which can also be expanded by the addition of a whole range of intelligent handling options.

The Kalmar DCE 50-90HM is in every respect a real Kalmar truck built for tough handling.



DCE 80-6HM - FlexCab



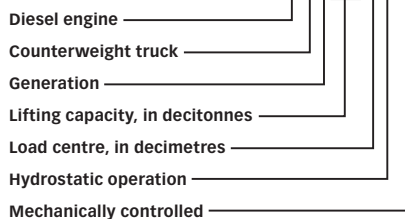
Spirit Delta



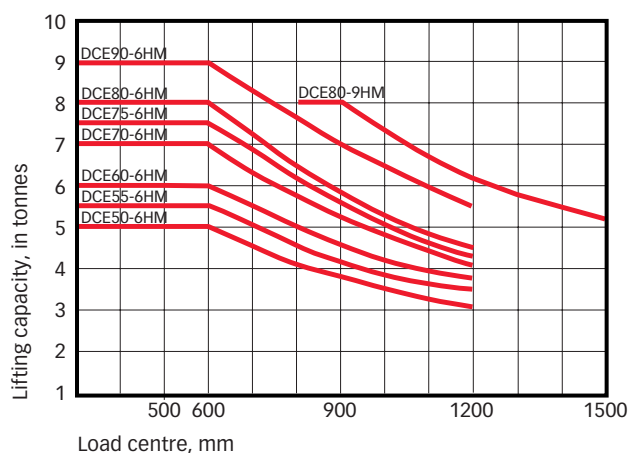
FlexGuard

Model designation

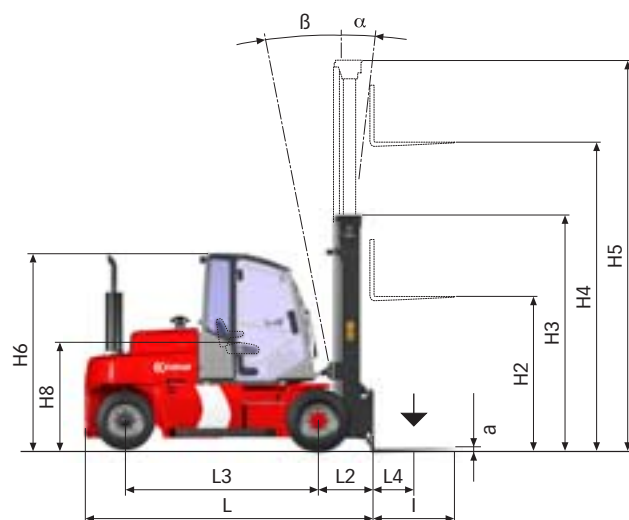
eg. DCE50-6HM



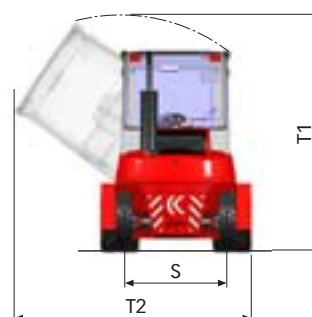
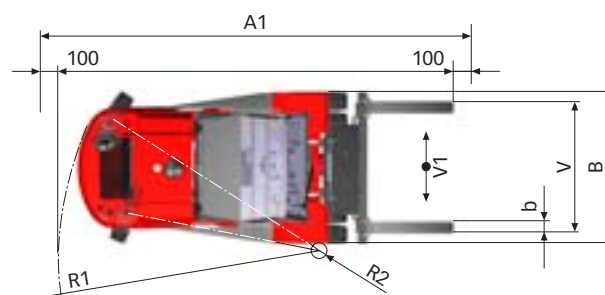
| Dimensions | | | | 50-6HM | 55-6HM |
|--------------------------|--------------------------|--|-----------|---|-------------|
| Lifting | Lift capacity | Rated | kg | 5000 | 5500 |
| | | Load centre | L4 mm | 600 | 600 |
| Dimensions | Truck | Truck length without forks | L mm | 3285 | 3285 |
| | | Truck width | B mm | 1550 | 1550 |
| | | Height, basic machine, Spirit Delta | H6 mm | 2570 | 2570 |
| | | Height, basic machine, FlexCab | H6 mm | 2670 | 2670 |
| | | Seat height SD/FC | H8 mm | 1440 | 1440 |
| | | Distance between centre of front axle - front face of fork arm | L2 mm | 645 | 645 |
| | | Wheelbase | L3 mm | 2100 | 2100 |
| | | Track (c-c) front - rear | S mm | 1240 - 1195 | 1240 - 1195 |
| | | Turning radius, outer | R1 mm | 2850 | 2850 |
| | | Turning radius, inner | R2 mm | 120 | 120 |
| | | Ground clearance, min | mm | 160 | 160 |
| | | Height when tilting cab, max Spirit Delta | T1 mm | 3050 | 3050 |
| | | Width when tilting cab, max Spirit Delta | T2 mm | 2900 | 2900 |
| | | Height when tilting cab, max FlexCab | T1 mm | 3150 | 3150 |
| | | Width when tilting cab, max FlexCab | T2 mm | 2950 | 2950 |
| | Min, aisle width for 90° | stacking with forks | A1 mm | 4925 | 4925 |
| | | Lifting height | H4 mm | 3500 | 3500 |
| | | Mast height, min. | H3 mm | 2625 | 2625 |
| | | Mast height, max. | H5 mm | 4500 | 4500 |
| | Standard duplex mast | Mast tilting, forwards - backwards | α - β ° | 5 - 10 | 5 - 10 |
| | | Ground clearance, min. | mm | 170 | 170 |
| | | Width | b mm | 150 | 150 |
| | | Thickness | a mm | 60 | 60 |
| | Forks | Length of fork arm | l mm | 120 | 1200 |
| | | Width across fork arms, max. | V mm | 1400 | 1400 |
| | | Width across fork arms, min | V mm | 420 | 420 |
| | | Sideshift ± at width across fork arms | V1 - V mm | 250 - 910 | 250 - 910 |
| | | | | | |
| Weight | Service weight | | kg | 8400 | 8800 |
| | Axle load front | Unloaded | kg | 4400 | 4400 |
| | | At rated load | kg | 12600 | 13400 |
| | Axle load back | Unloaded | kg | 4000 | 4400 |
| | | At rated load | kg | 850 | 900 |
| Wheels, brakes, steering | Wheels/tyres | Type, front-rear | | Pneumatic - Pneumatic | |
| | | Dimensions, front-rear | inch | 315/70-15 - 28x9-15 | |
| | | Number of wheels, front-rear (*driven) | | 2* - 2 | |
| | Steering system | Pressure | MPa | 1,0 - 0,9 | |
| | | Type - manoeuvring | | Hydraulic servo - Steering wheel | |
| Misc. | Service brake system | Type - affected wheels | | Oil cooled disc brakes (Wet disc brakes - drive wheels) | |
| | Parking brake system | Type - affected wheels | | Dry, spring activated disc brake - drive wheels | |
| | Hydraulic pressure | Max. | MPa | 17,0 | 17,0 |
| | Hydraulic fluid volume | | l | 125 | 125 |
| | Fuel volume | | l | 90 | 90 |
| Starting battery | Voltage - capacity | | V-Ah | 24 - 75 | 24 - 75 |
| | | | | | |

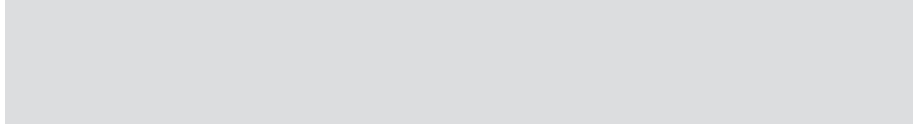


1. Full lifting capacity up to 4 m lifting height with duplex/duplex free lift/ triplex mast and fork carriage with side shift/fork positioning. Applies to DCE50-6HM to DCE90-6HM, except for DCE80-9HM.
2. Full lifting capacity up to 4 m lifting height with duplex mast and FEM fork carriage. Only applies to DCE80-9HM.



| | 60-6HM | 70-6HM | 75-6HM | 80-6HM | 80-9HM | 90-6HM |
|---|-------------|-------------|-------------|-------------|-------------|-------------|
| | 6000 | 7000 | 7500 | 8000 | 8000 | 9000 |
| | 600 | 600 | 600 | 600 | 900 | 600 |
| | 3700 | 3700 | 3915 | 3915 | 4075 | 4120 |
| | 2000 | 2000 | 2000 | 2000 | 2000 | 2000 |
| | 2570 | 2570 | 2570 | 2570 | 2570 | 2570 |
| | 2670 | 2670 | 2670 | 2670 | 2670 | 2670 |
| | 1440 | 1440 | 1440 | 1440 | 1440 | 1440 |
| | 710 | 710 | 770 | 770 | 730 | 775 |
| | 2450 | 2450 | 2600 | 2600 | 2800 | 2800 |
| | 1500 - 1360 | 1500 - 1360 | 1500 - 1360 | 1500 - 1360 | 1500 - 1360 | 1500 - 1360 |
| | 3300 | 3300 | 3500 | 3500 | 3700 | 3700 |
| | 150 | 150 | 250 | 250 | 250 | 250 |
| | 160 | 160 | 160 | 160 | 160 | 160 |
| | 3050 | 3050 | 3050 | 3050 | 3050 | 3050 |
| | 3100 | 3100 | 3100 | 3100 | 3100 | 3100 |
| | 3150 | 3150 | 3150 | 3150 | 3150 | 3150 |
| | 3150 | 3150 | 3150 | 3150 | 3150 | 3150 |
| | 5410 | 5410 | 5675 | 5675 | 6435 | 5880 |
| | 3500 | 3500 | 3500 | 3500 | 3500 | 3500 |
| | 2625 | 2625 | 2935 | 2935 | 2935 | 2935 |
| | 4500 | 4500 | 4660 | 4660 | 4660 | 4660 |
| | 5 - 10 | 5 - 10 | 5 - 10 | 5 - 10 | 5 - 10 | 5 - 10 |
| | 170 | 170 | 170 | 170 | 170 | 170 |
| | 150 | 150 | 150 | 150 | 200 | 200 |
| | 60 | 60 | 60 | 60 | 60 | 60 |
| | 1200 | 1200 | 1200 | 1200 | 1800 | 1200 |
| | 1900 | 1900 | 1900 | 1900 | - | 1900 |
| | 420 | 420 | 420 | 420 | - | 520 |
| | 375 - 1160 | 375 - 1160 | 375 - 1160 | 375 - 1160 | - | 375 - 1210 |
| | 9000 | 9700 | 10500 | 10800 | 11700 | 11300 |
| | 4600 | 4600 | 5200 | 5200 | 5500 | 5300 |
| | 14100 | 15700 | 16900 | 17700 | 18400 | 19000 |
| | 4400 | 5100 | 5300 | 5600 | 6200 | 6000 |
| | 900 | 1000 | 1000 | 1100 | 1300 | 1200 |
| Pneumatic - Pneumatic | | | | | | |
| 8,25-15 - 8,25-15 | | | | | | |
| 4* - 2 | | | | | | |
| 0,85 - 0,85 | | | | 1,0 - 0,85 | | |
| Hydraulic servo - Steering wheel | | | | | | |
| Oil cooled disc brakes (Wet disc brakes - drive wheels) | | | | | | |
| Dry, spring activated disc brake - drive wheels | | | | | | |
| 19,5 | 19,5 | 19,5 | 19,5 | 19,5 | 19,5 | 19,5 |
| 150 | 150 | 150 | 150 | 150 | 150 | 150 |
| 155 | 155 | 155 | 155 | 155 | 155 | 155 |
| 24 - 75 | 24 - 75 | 24 - 75 | 24 - 75 | 24 - 75 | 24 - 75 | 24 - 75 |





Two operator's environment versions

Kalmar is the world leader in terms of ergonomics and efficient operator's environments. There are two operator's environment versions available for the new Kalmar DCE 50-55HM: the Spirit Delta,

which has now been improved even more, and the new robust FlexCab/FlexGuard. All DCE 60-90HM models come fitted with a FlexCab cab or a FlexGuard safety cage.

Spirit Delta

Our highly regarded Spirit Delta is the best thought-out and most functional operator's environment in the entire industry. Based on extensive research, it provides superior ergonomics and total control of all the truck's various functions.

We are now introducing a more spacious version of the Spirit Delta, which provides more room for installing your own equipment, for example a computer and communications equipment. The overall design and all the various adjustment options mean that the Spirit Delta is suitable for all kinds of operators. The instrument and control layout provides an entirely clear view and



control of all the machine's functions. There is an optimal field of vision in every direction and a wide range of options means that it is easy to customise the operator's environment.

All the options and accessories for ergonomics and smart handling are available for the Spirit Delta.

FlexCab/FlexGuard

The new FlexCab/FlexGuard is a robust alternative for activities that do not require the Spirit Delta's total concept or the most advanced options. FlexCab is a complete cab that can be converted into an open safety cage, FlexGuard, with or without panes, door and heating system depending on climate and environment.

FlexCab and FlexGuard allow for good ergonomics with an excellent field of vision in all directions. The construction of the body is robust with profiled beams for optimal vision. The interior is airy and robust with very good close-up vision and generously increased headroom.



FlexCab



FlexGuard

KCS - Kalmar Control System

KCS is Kalmar's own in-house developed electronic control system that allows for increased safety and efficiency. KCS is based around fast processors and modern CAN-bus technology, resulting in a high level of performance and considerable operating safety.

Information is presented on a clear display on the steering wheel panel by means of a simple, non-language-based interface.

Function buttons simplify navigation around the menus and provide fast access to information on operation, diagnostics and alarms where appropriate.

There are many options available in KCS with considerable opportunities for customising the truck's functions – everything from functions for improving productivity, such as pre-selected lifting height and automatic gearing, to ergonomics functions, such as

joystick control and mini-steering wheel as well as further functions for improving safety, for example chain slack prevention.

The KCS options are only available for the DCE 50-55HM in combination with the Spirit Delta.

DCE 50-55HM drive train

Engine

The Kalmar DCE 50-90L range has a modern drive train for efficient running with minimal emissions and good fuel economy. The engine and transmission are constructed and combined to form the highest performance and a long lifetime.

The diesel engine is a new turbo-charged four-cylinder Perkins with low noise levels and exhaust emissions that meet the latest environmental requirements. The torque is powerful and direct from low revolutions, giving a smooth drive and good acceleration. A new powerful cooler for more efficient cooling of the engine and the hydraulic system.

Transmission

The transmission is hydrostatic with a hydraulic pump mounted directly on the engine and hydraulically driven wheel motors. This gives a smooth acceleration with a

very comfortable drive and a high degree of precision. There is a high level of reliability with a low service requirement and a long lifetime.

| Drive train | | | | 4-cyl. diesel | 4 cyl. LPG |
|-------------|--------------|------------------------------------|-----------|--|------------------|
| Drive train | Engine | Manufacturer - type designation | | Perkins 1104C-44T | Perkins 1004-40S |
| | | Fuel - type of engine | | Diesel - 4-stroke | LPG - 4-stroke |
| | | Rating ISO 3046 - at revs | kW/hp-rpm | 74,5 - 2200 | 60 - 2600 |
| | | Peak torque ISO 3046 - at revs | Nm-rpm | 412 - 1400 | 260 - 1400 |
| | | Number of cylinders - displacement | | 4 - 4400 | 4 - 4000 |
| | Transmission | Type | | Hydrostatic with wheel motors - mechanical control | |
| | | Hydraulic pump | cm³ | 125 | 125 |
| | | Hydraulic engine | cm³ | 940 | 940 |
| | Alternator | Type - power | W | 1540 | 1540 |

| Performance | | | | 4-cyl. diesel | | 4 cyl. LPG | |
|-------------|-------------------------------------|-----------------------------|---------------|---------------|------------|------------|------------|
| | | | | DCE 50-6HM | DCE 55-6HM | DCE 50-6HM | DCE 55-6HM |
| Performance | Lifting speed | Unloaded | m/s | 0,50 | 0,50 | 0,50 | 0,50 |
| | | At rated load | m/s | 0,40 | 0,40 | 0,40 | 0,40 |
| | Lowering speed | Unloaded | m/s | 0,40 | 0,40 | 0,40 | 0,40 |
| | | At rated load | m/s | 0,50 | 0,50 | 0,50 | 0,50 |
| | Travelling speed, f/r | Unloaded | km/h | 24 | 24 | 24 | 24 |
| | | At rated load | km/h | 22 | 22 | 22 | 22 |
| | Gradeability | Max | unloaded | % | 35 | 32 | 35 |
| | | | at rated load | % | 19 | 17 | 19 |
| | | At 2 km/h | unloaded | % | - | - | - |
| | | | at rated load | % | - | - | - |
| Noise | Drawbar pull | Max | kN | 27 | 27 | 27 | 27 |
| | | | | | | | |
| | Noise level according to EN12053 | LpAZ (inside) Spirit Delta | dB(A) | 72 | 72 | 72 | 72 |
| | | LpAZ (inside) OHG FlexGuard | dB(A) | 85 | 85 | 80 | 80 |
| | | LpAZ (inside) OHG FlexCab | dB(A) | 76 | 76 | 76 | 76 |
| | Noise level according to 2000/14/EC | LwAZ (outside) | dB(A) | 105 | 105 | 103 | 103 |





DCE 60-90HM drive train

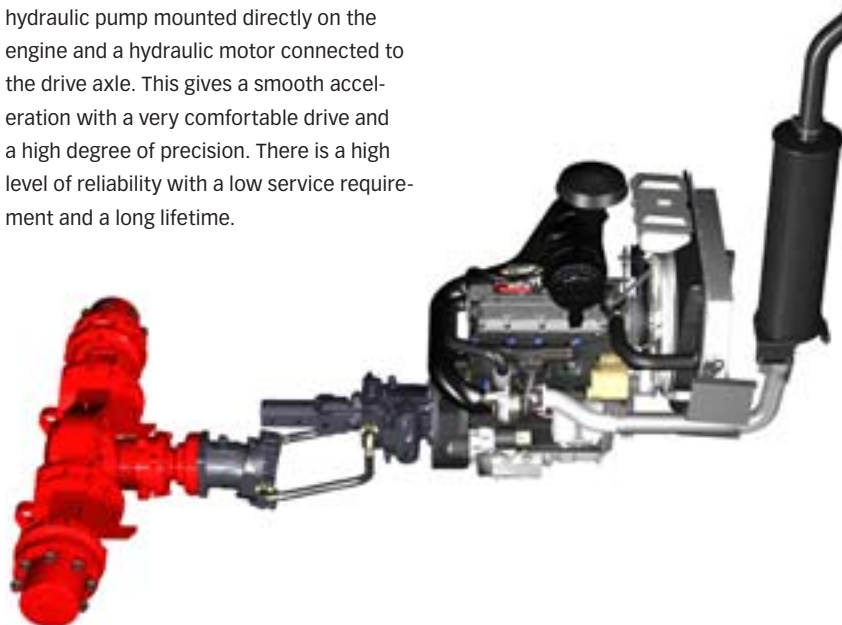
Engine

The Kalmar DCE 60-90HM range has a modern drive train for efficient running with minimal emissions and good fuel economy. The engine and transmission are constructed and combined to form a whole with the highest performance and a long lifetime.

The diesel engine is a new turbo-charged four-cylinder Perkins with low noise levels and exhaust emissions that meet the latest environmental requirements. The torque is powerful and direct from low revolutions, giving a smooth drive and good acceleration. A new powerful cooler for more efficient cooling of the engine and the hydraulic system.

Transmission

The transmission is hydrostatic with a hydraulic pump mounted directly on the engine and a hydraulic motor connected to the drive axle. This gives a smooth acceleration with a very comfortable drive and a high degree of precision. There is a high level of reliability with a low service requirement and a long lifetime.



| Drive train | | | | 4-cyl. diesel | |
|-------------|--------------|------------------------------------|--------------------------------|---|------|
| Drive train | Engine | Manufacturer - type designation | | Perkins 1104C-44T | |
| | | Fuel - type of engine | | Diesel - 4-stroke | |
| | | Rating ISO 3046 - at revs | kW/hp-rpm | 74,5 - 2200 | |
| | | Peak torque ISO 3046 - at revs | Nm-rpm | 412 - 1400 | |
| | | Number of cylinders - displacement | cm³ | 4 - 4400 | |
| | Transmission | Type | | Hydrostatic with drive axle - mechanical control | |
| | | Hydraulic pump | | cm³ | 90 |
| | | Hydraulic engine | | cm³ | 160 |
| | Alternator | Type - power | | W | 1540 |
| Drive axle | Type | | Differential and hub reduction | | |

| Performance, Perkins 4-cyl | | | | DCE 60-6HM | DCE 70-6HM | DCE 75-6HM | DCE 80-6HM | DCE 80-9HM | DCE 90-6HM |
|----------------------------|-------------------------------------|-------------------------------------|-----------------------------|------------|------------|------------|------------|------------|------------|
| Performance | Lifting speed | Unloaded | m/s | 0,40 | 0,40 | 0,40 | 0,40 | 0,40 | 0,40 |
| | | At rated load | m/s | 0,30 | 0,30 | 0,30 | 0,30 | 0,30 | 0,30 |
| | Lowering speed | Unloaded | m/s | 0,40 | 0,40 | 0,40 | 0,40 | 0,40 | 0,40 |
| | | At rated load | m/s | 0,50 | 0,50 | 0,50 | 0,50 | 0,50 | 0,50 |
| | Travelling speed, f/r | Unloaded | km/h | 24 | 23 | 23 | 23 | 23 | 23 |
| | | At rated load | km/h | 22 | 21 | 21 | 21 | 21 | 21 |
| | Gradeability | Max | unloaded % | 44 | 42 | 42 | 42 | 38 | 40 |
| | | | at rated load % | 25 | 24 | 24 | 24 | 21 | 20 |
| Noise | Noise level according to EN12053 | At 2 km/h | unloaded % | - | - | - | - | - | - |
| | | | at rated load % | - | - | - | - | - | - |
| | | Drawbar pull | Max | 45 | 45 | 45 | 45 | 45 | 45 |
| | | Noise level according to 2000/14/EC | LpAZ (inside) Spirit Delta | 72 | 72 | 72 | 72 | 72 | 72 |
| | Noise level according to 2000/14/EC | | LpAZ (inside) OHG FlexGuard | 85 | 85 | 85 | 85 | 85 | 85 |
| | | | LpAZ (inside) OHG FlexCab | 76 | 76 | 76 | 76 | 76 | 76 |
| | | | LwAZ (outside) | 105 | 105 | 105 | 105 | 105 | 105 |
| | | | | | | | | | |



Lifting equipment

The lifting equipment on Kalmar's machines is characterised by robust and high-quality construction and numerous options combined with a good field of vision. We can offer many different types of mast and trucks - all in the free field of vision design. In combination with forks and/or aggregate, we can provide the handling solution to meet your needs.

Masts



Duplex standard, clear view



Duplex full free lift, clear view



Triplex full free lift, clear view

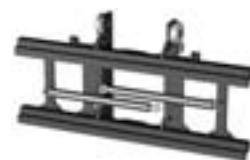
Carriages



Fork carriage for manually adjustable forks



Sideshift carriage



Sideshift and fork positioning carriage

Forks



Standard forks for manual operation



Forks with roller brackets for hydraulic operation



Fork shaft system with separate carriers for each fork



Fork with hydraulic levelling

| Mast | | | | | | | | |
|------------------------------------|-------------|-------------|---------|-----------|-------------|-------------|---------|-----------|
| | Lift height | Mast height | | Free lift | Lift height | Mast height | | Free lift |
| | | H3 min. | H5 max. | H2 | | H3 min. | H5 max. | H2 |
| Duplex standard, clear view | DCE 50-70HM | | | | DCE 75-90HM | | | |
| | 2650 | 2200 | 3650 | - | 2030 | 2200 | 3200 | - |
| | 2950 | 2350 | 3950 | - | 2330 | 2350 | 3500 | - |
| | 3500 | 2620 | 4500 | - | 3500 | 2935 | 4660 | - |
| | 3750 | 2750 | 4750 | - | 3750 | 3060 | 4910 | - |
| | 4000 | 2870 | 5000 | - | 4000 | 3185 | 5160 | - |
| | 4250 | 3000 | 5250 | - | 4250 | 3310 | 5410 | - |
| | 4500 | 3120 | 5500 | - | 4500 | 3435 | 5660 | - |
| | 4750 | 3250 | 5750 | - | 4750 | 3560 | 5910 | - |
| | 5000 | 3370 | 6000 | - | 5000 | 3685 | 6160 | - |
| | 5250 | 3500 | 6250 | - | 5250 | 3810 | 6410 | - |
| | 5500 | 3620 | 6500 | - | 5500 | 3935 | 6660 | - |
| | 5750 | 3750 | 6750 | - | 5750 | 4060 | 6910 | - |
| | 6000 | 3870 | 7000 | - | 6000 | 4185 | 7160 | - |
| Duplex full free lift, clear view | 2400 | 2200 | 3500 | 1105 | 2030 | 2200 | 3190 | 1065 |
| | 2700 | 2350 | 3800 | 1255 | 2330 | 2350 | 3490 | 1215 |
| | 3250 | 2620 | 4350 | 1530 | 3250 | 2810 | 4410 | 1675 |
| | 3500 | 2750 | 4600 | 1655 | 3500 | 2935 | 4660 | 1800 |
| | 3750 | 2870 | 4850 | 1780 | 3750 | 3060 | 4910 | 1925 |
| | 4000 | 3000 | 5100 | 1905 | 4000 | 3185 | 5160 | 2025 |
| | 4250 | 3120 | 5350 | 2030 | 4250 | 3310 | 5410 | 2175 |
| | 4500 | 3250 | 5600 | 2155 | 4500 | 3435 | 5660 | 2300 |
| | 4750 | 3370 | 5850 | 2280 | 4750 | 3560 | 5910 | 2425 |
| | 5000 | 3500 | 6100 | 2405 | 5000 | 3685 | 6160 | 2550 |
| | 5250 | 3620 | 6350 | 2530 | 5250 | 3810 | 6410 | 2675 |
| | 5500 | 3750 | 6600 | 2655 | 5500 | 3935 | 6660 | 2800 |
| | 5750 | 3870 | 6850 | 2780 | 5750 | 4060 | 6910 | 2925 |
| | 6000 | 4000 | 7100 | 2905 | 6000 | 4185 | 7160 | 3050 |
| Triplex full free lift, clear view | 3840 | 2200 | 4900 | 1160 | 3060 | 2200 | 4190 | 1090 |
| | 4290 | 2350 | 5350 | 1310 | 3510 | 2350 | 4640 | 1240 |
| | 4950 | 2570 | 6010 | 1530 | 4200 | 2580 | 5330 | 1470 |
| | 5450 | 2740 | 6515 | 1690 | 4700 | 2750 | 5825 | 1640 |
| | 5950 | 2910 | 7015 | 1860 | 5200 | 2920 | 6330 | 1800 |
| | 6450 | 3070 | 7510 | 2030 | 5700 | 3080 | 6825 | 1970 |
| | - | - | - | - | 6200 | 3250 | 7330 | 2140 |

Quality and service

The Kalmar DCE 50-90HM has been developed from the very beginning to give safe operation and a long lifetime with minimum downtime. In part this due to technical solutions and components, but also the fact that the truck is not exposed to any in-built loads that produce unnecessary wear and tear and higher costs.

Optimised chassis modules, fittings, mast, dynamic stability, electronically controlled driving, wet disc brakes, double seals in all hydraulic cylinders, ORFS hydraulic couplings, reinforced drive axle bracket, a new KCS system, welded cab mounting, etc. all result in a very high quality machine with low running costs.

Simple inspection and service

Daily inspection is simple and fast. The cab tips, providing ease of access to the entire drive train.

Safety and the environment

The Kalmar DCE 50-90HM is CE marked and its construction complies with the following standards:

- The Machinery Directive 98/37/EG
- The EMC Directive 89/336
- The Noise Emission Directive 2000/14/EC
- The Exhaust Gas Directive 97-68-GG

