



MOVING YOU FURTHER

# 13BOP-9



Some of the photos may include optional equipment.



A worker in a blue uniform and hard hat is operating a Hyundai BOP-9 order picker in a warehouse. The worker is positioned on the platform of the order picker, which is elevated. The warehouse has a high ceiling with a grid of metal beams and several large, industrial-style pendant lights. The background shows rows of blue and yellow shelving units.

# Hyundai Technology, Hyundai Innovation

## Hyundai BOP-9 order picker

The BOP series has enhanced ergonomics providing improved reliability, performance and comfort with new safety features and lift performance.



#### **Ergonomic design**

- Multi-function handle (Lift, Travel, and Horn button)
- Height-adjustable operator control panel (3")
- Safety bar on top of the dashboard (Provides operator stability during wire guidance travel)
- Platform stability and operator comfort increased with spring applied assistance.

#### **Optimal Performance**

- Electric Power Steering (EPS) & Auto centering
- Wire guidance (OPT)
- Fork height indicator (OPT)
- Dual micom type ZAPI controller

#### **Advanced Safety**

- Travel speed proportional to lift height.
- Limited vehicle operation: Password settings
- Lift chain slack detection
- Lifting deceleration system

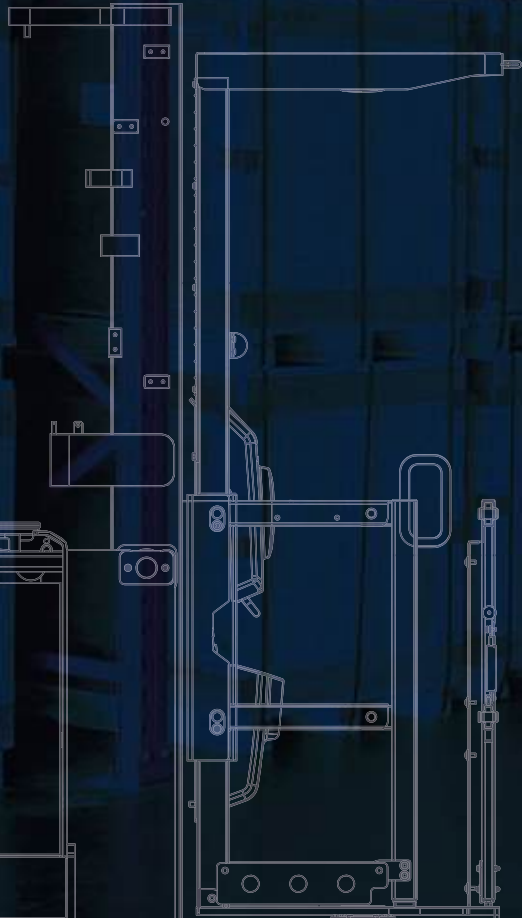




Power & Performance

# Superior Power & Optimal Performance

Efficient, smooth running and powerful performance make your work more productive.



HIGH PERFORMANCE

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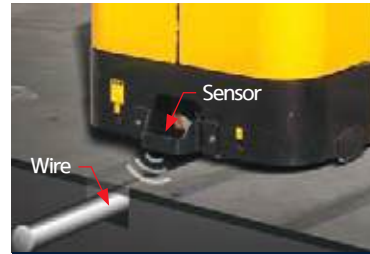
# Drive motor & Pump motor, Brake system

Efficient AC motor guarantees reliability and an optimized motor design provides for low noise levels. Temperature sensor ensures long motor life. Electro-magnetic brake applied for parking - On travel, brake unlocks automatically. (Negative type braking system by spring return force)



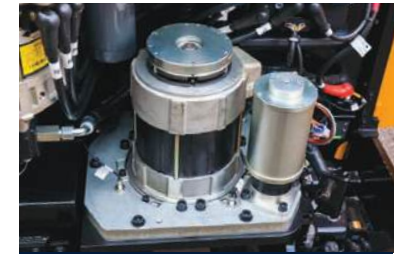
**Electric brake**

The electric brake for parking and service on top of the driving motor automatically reduces the speed proportionally to stop the vehicle when the drive motor loses the electric signal (key off, driving lever to neutral).



**Wire guidance (OPT)**

The steer tracking is automatically controlled by an electric signal from wiring in the floor providing forklift stability in narrow aisle applications for operator and site safety.



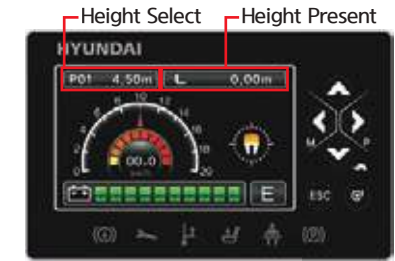
**EPS & Autocentering**

The electric power steering system performs smoothly with the operation of the steering wheel reducing operator fatigue and enhances energy efficiency. Also, the steer wheel auto-centers when the key is turned on.



**Height indicator (OPT)**

Once pre-programmed, when the lift/lowering lever is engaged the platform automatically raises or lowers and stops at the designated height.



**Mast cover : Platform control system protection**

An outer mast cover has been added to enhance the durability of the outer mast and to protect the sensor and harnesses exposed on the side. This structure reduces the vibration of the mast for safe operation on high levels.



**Additional Lift (Option)**

The additional lift option enables the operator to lift the forks up to waist level so the operator can pick orders without having to bend down.



**Dual micom controller**

With a dual micom system on the inside, ZAPI's new AC controller safely controls the forklift by processing signals and faults via a two-way method, and is rated at IP65 from moisture and other pollutants.



**Guide roller (Option)**

When the truck enters the racking system, the drive wheel position is centered and the operator can focus on picking and driving safely.

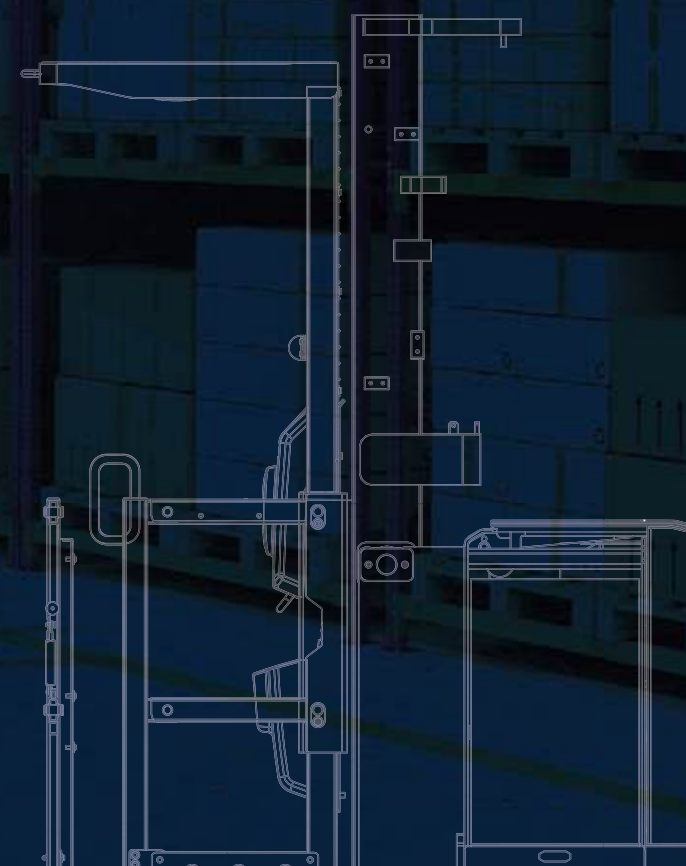




Ease & Comfort

# Optimized Ergonomics & Excellent Visibility

The ergonomically designed operator compartment and open visibility ensure the operator's safety and comfort during operation.



Some of the photos may include optional equipment.

## Operator Panel & Visibility

The ergonomically designed operating space comes with a 3" (75mm) height-adjustable operator panel, safety bar, slim steering handle and multi-functional control lever to ensure minimal blind spots providing both safety and improved visibility.



### Multifunctional handle

The multifunctional handle controls the travel direction and speed, variable speed lift and horn operation.



### Operating panel top handle : Safety bar

There is a handle on top of the operating panel for the operator to maintain balance while driving. This handle can also be used to hold a barcode reader.



### Stable platform

Vibration of platform dramatically reduced during vertical travel with introduction of springs on chain anchors.

## 4.3 inch LCD color monitor

The LCD color display allows the operator to easily and efficiently monitor and control the machine. Information provided includes speed & accelerator level, steer angle & travel direction, battery discharge indicator, hour meter & working mode. The monitor also displays information about operation error, system fault codes, battery level, hour meter and various other functions.



### Main functions

- |  |                              |                                     |
|--|------------------------------|-------------------------------------|
| ① Speed (Digital)                              | ⑥ Performance / Scroll right | ⑫ Dead man switch                   |
| ② Steering wheel position and travel direction | ⑦ Turtle / Scroll down       | ⑬ Parking brake                     |
| ③ Battery discharge indicator                  | ⑧ ESC / Back                 | ⑭ Time / Height select (OPT)        |
| ④ Scroll up / Height indicator (OPT)           | ⑨ Enter                      | ⑮ Hour meter / Height present (OPT) |
| ⑤ Menu / Scroll Left                           | ⑩ Error warning lamp         |                                     |
|  | ⑪ High temp warning lamp     |                                     |



### New floor mat & Dead man switch

To improve durability and comfort, the floor mat material is now constructed with EVA sponge material. Also, the surface of the mat is raised in areas to identify debris for easy removal. A dead man switch has been added to the center of the platform for additional safety.



### Head guard view & Working lamp

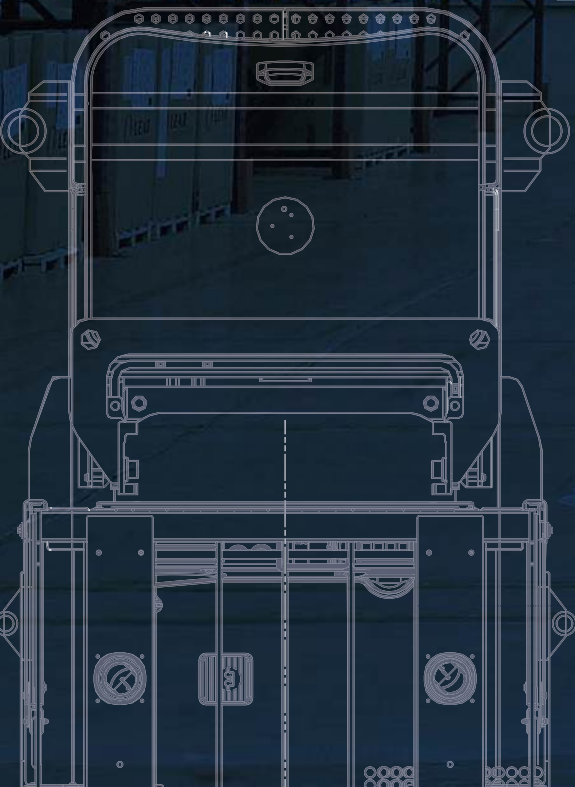
OHG allows the operator an open view of the warehouse while providing protection from falling objects. Standard features include LED front work lights, operator compartment lights and operator cooling fans.



Safe & Secure

# Advanced Safety & Easy Maintenance

Interior space and ergonomics have been redesigned with safety as the top priority, thus enabling the operator to focus on their work safely and conveniently.

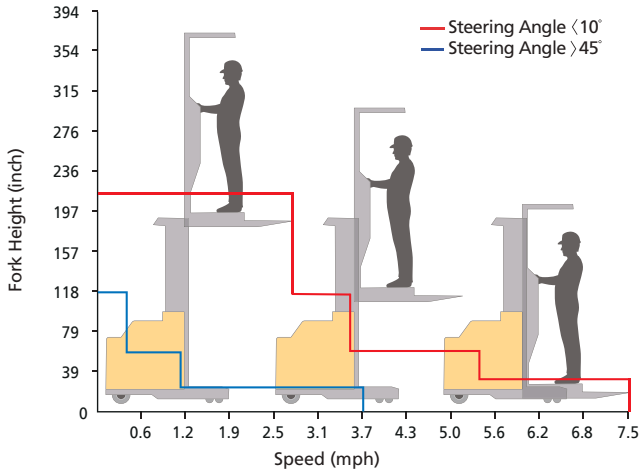


ADVANCED SAFETY

Some of the photos may include optional equipment.

# Operating speed controlled by the height of the platform

For the safety of operators working at high levels, the driving and platform lifting speeds gradually decrease according to the height of the platform. Also, the driving speed is linearly limited according to the angle of the steering wheel. The vehicle cannot drive when the platform reaches 217" or higher and the driving speed decreases significantly when the angle of the steering wheel exceeds 45°.



Steering angle	Travel speed by platform height (mph)				
	24	59	118	216	362
Angle < 10°	7.5	5.5	3.5	2.7	0
10° < Angle < 45°	7.5-3.7	5.5-1.2	3.5-0.4	2.7-0	0
Angle > 45°	3.7	1.2	0.4	0	0

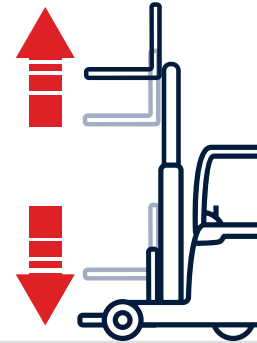
# Safety features

The adoption of a high-sensitivity sensor and advanced safety system can help to prevent accidents.



## Curve control

Curve control limits travel speed based on turning radius for a smooth, precise turning operation for the driver.



## Lift end stroke decelerating system

To reduce the impact from the lift cylinder end stroke when the platform moves up or down, the platform's speed decreases before reaching the fork height and approaching the ground.



## Loose lift chain detection

If the front of the fork is caught and the chain is loosened, the platform moves rapidly. To protect the operator and the cargo from any sudden vertical movement, the mast stops lowering if the chain slackens to more than 0.1".



## Pallet clamp

The new pantograph-type pallet clamp has enhanced clamping and can help to prevent accidents caused when the pallet is shifted from the fork while operating.



## Password settings

The operator's password setting can be set on the cluster to prevent use by an unauthorized operator.



## Easy maintenance

Open access to the service compartment with easy to open service doors and top cover. All major service components including drive and lift motors, motor controllers, EPS system and hydraulic system are exposed for ease of maintenance.



## Toe board

A toe board has been added to the bottom of the safety bar at the driver's side to prevent any accidents that can be caused when the driver's feet are not kept inside while operating the vehicle.



## Rear safety gate (Option)

A rear safety gate can be added between the platform and the fork to prevent any accidents that can be caused when the driver leans the body beyond the platform while operating the vehicle.



# New 9 Series Mast Specification

**10/13BOP-9**

## 13BOP-9



Mast Type	Maximum Fork Height		Overall Height (Lowered)		Overall Height (Extended)		Free lift height		Load capacity w/o side shift		Truck weight (unloaded)		
	in	mm	in	mm	With OHG		With OHG		24 in LC	600mm LC	lb	kg	
					in	mm	in	mm					
2-STAGE LIMITED FREE LIFT	V325	128.9	3275	87.4	2220	215.4	5470	0.0	0	3000	1361	6469	2934
	V355	140.7	3575	93.5	2375	227.2	5770	0.0	0	3000	1361	6526	2960
	V415	164.4	4175	105.5	2680	250.8	6370	0.0	0	3000	1361	6636	3010
	V475	188.0	4775	117.5	2985	274.4	6970	0.0	0	3000	1361	6747	3061
	V535	211.6	5375	129.3	3285	298.0	7570	0.0	0	3000	1361	6966	3160
3-STAGE FULL FREE LIFT	TF500	198.1	5031	87.4	2220	286.1	7266	1.0	25	3000	1361	6989	3170
	TF530	210.8	5355	93.5	2375	297.2	7550	7.1	180	3000	1361	7082	3212
	TF610	240.7	6115	105.5	2680	327.2	8310	19.1	485	2668	1210	7264	3295
	TF685	270.8	6879	117.5	2985	357.2	9074	31.1	790	2447	1110	7472	3389
	TF760	300.8	7641	129.3	3285	387.2	9836	42.9	1090	2205	1000	7773	3526
	TF815	321.9	8175	138.4	3515	408.3	10370	52.0	1320	2050	930	7911	3589
	TF865	341.8	8681	147.4	3745	428.2	10876	61.0	1550	1896	860	8056	3654
TF930	367.0	9321	158.5	4025	453.4	11516	72.0	1830	1742	790	8337	3782	

## 13BOP-9 With Additional Mast



Mast Type	Maximum Fork Height (Additional lift Extended)		Overall Height (Lowered)		Overall Height (Extended)		Free lift height		Additional lift	Load capacity		Truck weight (unloaded)			
	in	mm	in	mm	With OHG		With OHG			24 in LC	600mm LC	lb	kg		
					in	mm	in	mm							
2-STAGE LIMITED FREE LIFT	V325	158.9	4035	87.4	2220	215.4	5470	0.0	0	29.9	760	2205	1000	6786	3078
	V355	170.7	4335	93.5	2375	227.2	5770	0.0	0	29.9	760	2205	1000	6841	3103
	V415	194.3	4935	105.5	2680	250.8	6370	0.0	0	29.9	760	2205	1000	6952	3154
	V475	217.9	5535	117.5	2985	274.4	6970	0.0	0	29.9	760	2205	1000	7063	3204
	V535	241.5	6135	129.3	3285	298.0	7570	0.0	0	29.9	760	2205	1000	7282	3303
3-STAGE FULL FREE LIFT	TF500	229.6	5831	87.4	2220	286.1	7266	1.0	25	29.9	760	2205	1000	7317	3319
	TF530	240.7	6115	93.5	2375	297.2	7550	7.1	180	29.9	760	2205	1000	7410	3361
	TF610	270.7	6875	105.5	2680	327.2	8310	19.1	485	29.9	760	1819	825	7592	3444
	TF685	300.7	7639	117.5	2985	357.2	9074	31.1	790	29.9	760	1433	650	7800	3538
	TF760	330.7	8401	129.3	3285	387.2	9836	42.9	1090	29.9	760	1213	550	8101	3675
	TF815	351.8	8935	138.4	3515	408.3	10370	52.0	1320	29.9	760	1102	500	8239	3737
	TF865	371.7	9441	147.4	3745	428.2	10876	61.0	1550	29.9	760	992	450	8384	3803
TF930	396.9	10081	158.5	4025	453.4	11516	72.0	1830	29.9	760	772	350	8665	3930	

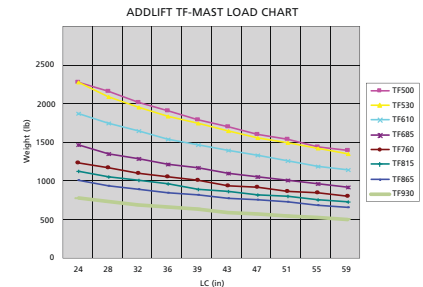
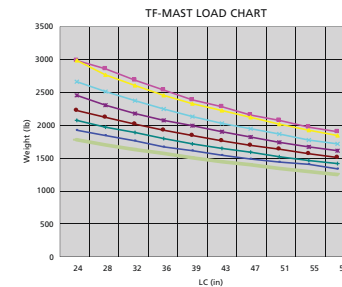
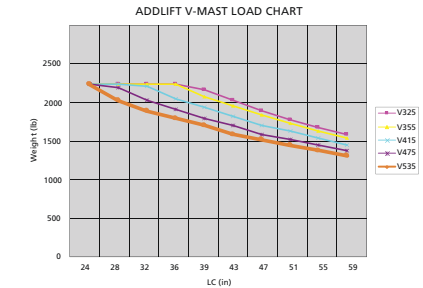
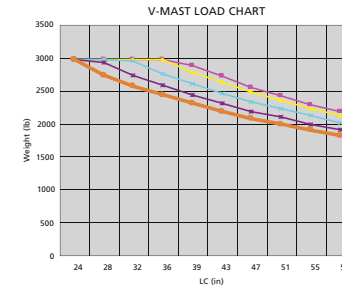
※ TF-Mast: A mast with 1 free lift cylinder in the center  
 ※ When TF Mast is applied, the overall width increases.

## Load Capacity



### 13BOP-9

### 13BOP-9 w/ Addl. Mast



## Optional Items



- Fork (inch) : 35.4 / 47.2 / 53.1 / 59.0 / 63.0 / 74.8
- Guide roller (Wide frame)  
48.3" / 49.4" (57.3") / 50.4" (58.3") / 51.3 (59.2)
- Beacon lamp (Blue, Red)
- Tire : VULKOLLAN
- Wire guidance
- Height indicator



## Specification 13BOP-9

Characteristics					
1.1	Manufacturer		Hyundai	Hyundai	
1.2	Manufacturer's type designation		13BOP-9	13BOP-9 w/ addl lift	
1.3	Drive: Electric (Battery Or Mains), Diesel, Petrol, Fuel Gas		electric	electric	
1.4	Type of operation: Hand, Pedestrian, Standing, Seated, Order-Picker		stockpicker	stockpicker	
1.5	Load capacity / Rated load	Q	lb / kg	3,000 / 1,360	2,200 / 1,000
1.6	Load center distance	c	in / mm	24 / 600	24 / 600
1.8	Load distance, Center of load wheels to fork	x	in / mm	9.3 / 235	9.3 / 385
1.9	Wheelbase	y	in / mm	58.3 / 1,480	58.3 / 1,480

Weights					
2.1	Service weight, inc. battery	kg	lb / kg	6,470 / 2,935	6,786 / 3,078
2.2	Axle loading, Loaded front / rear	kg	lb / kg	1,634 - 7,701 / 741 - 3,493	1,970 - 7,081 / 865 - 3,212
2.3	Axle loading, Unloaded front / rear	kg	lb / kg	3,448 - 3,020 / 1,564 - 1,370	3,393 - 3,393 / 1,539 - 1,539

Wheels, tyres				
3.1	Tires : Solid rubber, Superelastic, Pneumatic, Polyurethane			polyurethane
3.2	Tire size, Front		in / mm	12 x 5.5 / 305 x 140
3.3	Tire size, Rear		in / mm	5.9 x 3.9 / 152 x 100
3.5	Wheels, number front / rear (X = Driven wheels)			1x / 4
3.7	Tread, Rear			35.8 / 909
	Tread, Rear, Wide frame	b11	in/mm	43.7 / 1,109

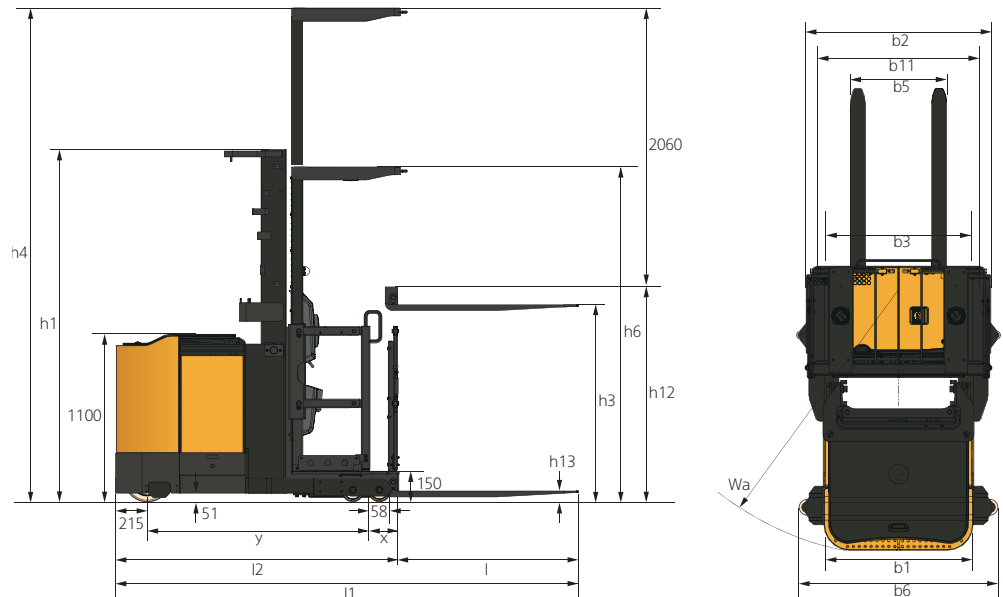
Dimensions					
4.2	Height, Mast lowered	h1	in / mm	87.4 / 2,220	87.4 / 2,220
4.4	Lift height	h3	in / mm	128.9 / 3,275	128.9 / 3,275
4.5	Height, Mast extended	h4	in / mm	215.4 / 5,470	215.4 / 5,470
4.7	Height of overhead guard	h6	in / mm	89.0 / 2,260	89.0 / 2,260
4.8	Platform height (h13+135mm)	h7	in / mm	7.9 / 200	7.9 / 200
4.11	Additional Lift	h9	in / mm	n/a	760
4.14	Height, Platform raised (h3 + 135mm)	h12	in / mm	134.4 / 3,410	134.4 / 3,410
4.14-1	Picking height (h12+ 1600mm)	h28	in / mm	197.2 / 5,010	197.2 / 5,010
4.15	Height lowered (Fork height)	h13	in / mm	2.6 / 65	2.6 / 65
4.19	Overall length	l1	in / mm	117.3 / 2,980	123.2 / 3,130
4.20	Length to face of forks	l2	in / mm	76.0 / 1,930	81.9 / 2,080
4.21	Overall width	b1/b2	in / mm	40.2-41.3 / 1,020-1,050	40.2-41.3 / 1,020-1,050
	Overall width, Wide frame		in / mm	40.2-49.2 / 1,020-1,250	40.2-49.2 / 1,020-1,250
4.22	Fork dimensions	s/e/l	in / mm	1.6 x 3.9 x 41.3 / 40 x 100 x 1,050	
4.25	Overall fork width	b5	in / mm	25.6 / 650	33.1 / 840
4.26	Platform width		in / mm	40.2 / 1,020	40.2 / 1,020
	Platform width, Wide frame	b3	in / mm	49.2 / 1,250	49.2 / 1,250
4.27	Guide roller width	b6	in / mm	See chart	See chart
4.32	Ground clearance, Center of wheelbase	m2	in / mm	2.0 / 51	2.0 / 51
4.33	Working aisle width, with 800 x 1200 crosswise	Ast	in / mm	126.5 / 3,214	131.7 / 3,346
4.34	Working aisle width, with 1200 x 800 lengthwise	Ast	in / mm	138.1 / 3,508	143.8 / 3,653
4.35	Turning radius	Wa	in / mm	71.6 / 1,818	71.6 / 1,818

Performance			
5.1	Travel speed, Loaded / Unloaded	mph / km/h	7.5 - 7.5 / 12.0 - 12.0
		in / s	9.4 / 14.6
5.2	Lift speed, Loaded / Unloaded	mm / s	240 / 370
		in / s	16.9 / 15.7
5.3	Lowering speed, Loaded / Unloaded	mm / s	430 / 400
		s	6.4
5.9	Acceleration time (over 10 m)		6.4
5.10	Service brake		electric release

Electric Motor			
6.1	Drive motor rating S2 60 min	HP / kW	5.8 / 4.3
6.2	Lift motor rating at S3 20% (S2 10min)	HP / kW	12.2 / 9
6.3	Battery voltage, Nominal capacity K5	V/Ah	24 / 825
6.4	Battery weight	lb/kg	1,609 / 730
6.5	Battery compartment dimensions L x W x H	in/mm	38.3x16.5x32.5 / 973x420x825
	Maximum battery dimensions L x W x H	in/mm	38.26x16.33x31.10 / 972/415/790
	Connector location - length	in/mm	A - 7.9 / 200
	Standard connector		SBE320 Black

Other Details			
8.1	Type of drive control		AC

## Dimension 13BOP-9



\* All specifications in this catalog are subject to change according to the optional items.



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