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ISO14001
ISO14001:2015



ISO9001
ISO9001:2015



HANGCHA trucks conform
to the European Safety
Requirements.

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EPS
ELECTRIC POWER
STEERING

A Series 3-W Electric Forklift Truck with EPS System

with capacities of 1,300 to 2,000kg

The World of Hangcha



Characteristics and Advantages

- / Compact design offering all components required for the steering.
- / 13% energy saving in VDI cycle thanks to power-on-demand technology.
- / Transmission with automotive gearing guarantees an extremely low noise level.
- / Omission of all hydraulic components, therefore no assembly costs incur for the currently used hydraulic steering (valves, tubes, hoses).
- / Maintenance free.
- / Ease service due to self test routine.
- / Harmonized system components (transmission, steering motor and-controller, steering angle sensor).
- / Easy-to-assemble design.



EPS3

- ▶ Excellent driving ergonomics (e.g. steering ratio adjusted to actual driving situation).
- ▶ Steering parameters matched to customer specifications.
- ▶ New features via software modification (e.g. signaling straight-line driving by modifying the steering resistance).
- ▶ ZF-tested interaction of all system modules.
- ▶ 100% EOL tested.
- ▶ ZF's system responsibility.
- ▶ Certified according to UL583E.
- ▶ Functional system safety approved by the Technical Control Board (TÜV Süd) according to DIN EN 13849, PL d conformity.



Standard Specification

- / High efficiency AC driving motor AC pump motor
- / Multi-functions instrument
- / Front dual driving motors GP21(ZF)
- / Rubber floor mat
- / Solid tyre
- / Emergency disconnect switch
- / 2-valve inside chassis
- / LED headlight
- / Rear combination LED light
- / Panoramic rearview mirror (in the middle position of the overhead guard)
- / 3 meters duplex wide view mast
- / Adjustable steering column
- / Full electronic controlled travelling, lifting and steering
- / Horn and reversing buzzer
- / ZAPI controller
- / CAN-BUS system
- / Low noise gear pump (Brand: Shimadzu, Made in Japan)
- / EPS3 (ZF) steering system
- / Soft landing system
- / Non suspension seat: Grammer GS12 with switch
- / ZF reducer and SCHABMULLER traveling motor



ZF GP21 dual traction motor



EPS3 steering system

Technical Data EPS3:

Technical data	EPS 3
Max. static wheel load	1900kg
Transmission type	3-stage helical gear transmission with grease filling
Steering ratio	1:1.76
Max. steering torque	700Nm
Wheel dimension	Solid Tire 15x4.5-8
Steering angle	max. +/-135°
Supply voltage	48V
Motor power (53-70%)	400W
Ambient temperature range	-30...+40°C
Protection class	IP65

Energy Savings Result of Customer Measurements

EPS 3 - basis of comparison: VDI 2198 cycle (determination of consumption data)

Example	Hydrost. Steering	Electric Power Steering
Average lap time (sec)	60	60
Total energy used (kWh)	5.96	5.19
Energy used per lap (kWh)	0.099	0.0865
E-steer energy savings	0.77kWh	
E-steering energy percent difference saved	12.9%	

E-Steering vs. Hydrostatic Steering Motivation for Development

	Hydrostatic Steering	Electric Power Steering	
Energy Consumption	Hydraulic circle always active	Only active during steering maneuver	Energy Consumption
Environment	Oil circuit Necessaire	No oil circuit for steering	Environment
	Risk of oil leakage		
Comfort	Hydro motor loud and constantly active	Quiet transmission with automotive gears in short-term operation (Power on demand)	Comfort
	Fix steering regime	Programmable driver profile	
	Functionality fixed	New features per software modification	
	Complex, decentral system	Compact, ready-to-go, EOL tested	

Options

- / 3rd or 4th hydraulic function
- / 2.5-4.5 meters duplex mast
- / 4.3-6.5 meters triplex mast
- / Rear working LED light
- / Reversing assist grip with horn button
- / Integrated sidsifter
- / Other attachments
- / Other dimension forks
- / Special carriage and backrest
- / Big capacity battery
- / Non-marking tyre
- / Battery charger
- / Battery side roll-out (Using pallet truck or trolley)
- / Fingertip control on the adjustable armrest
- / Cold store protection
- / Suspension seat
- / Full closed cabin
- / Socket for other equipment
- / Blue spot light
- / OPS system



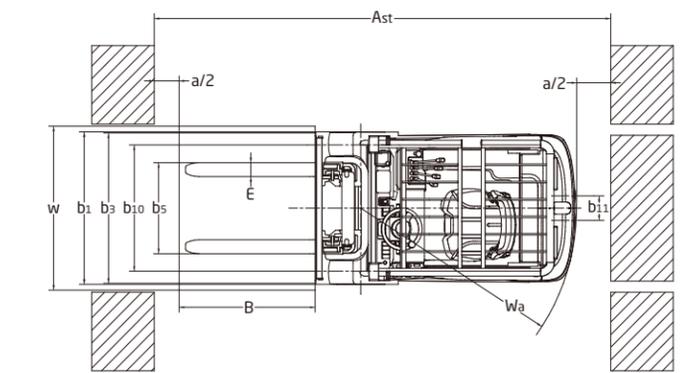
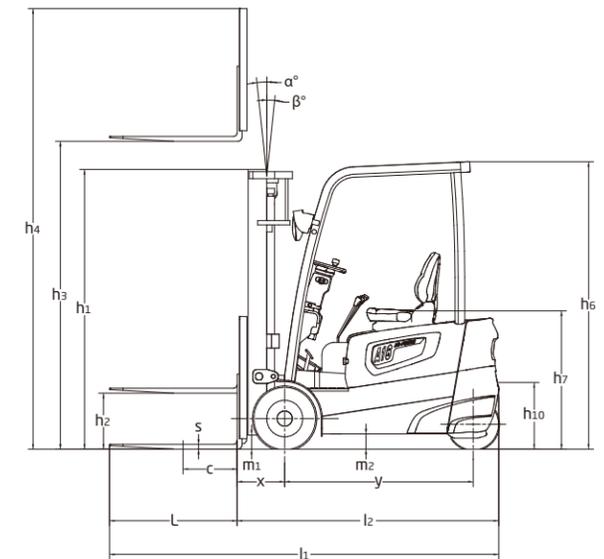
Steering angle display can help improving safety during driving



The small turning radius is suitable for narrow channel

A Series 3-W Electric Forklift Truck with EPS System

		HANGCHA GROUP CO., LTD.						
		CPD513-AZ6-ES	CPD516-AZ6-ES	CPD518-AZ6-ES	CPD520-AZ6-ES	CPD520-AZ6-ES		
Distinguishing mark	1.1	Manufacturer						
	1.2	Manufacturers type designation						
	1.3	Drive: electric (battery or mains), diesel, petrol, fuel gas						
Weight	1.4	Operator type: hand, pedestrian, standing, seated, order-picker						
	1.5	Load capacity/rated load						
	1.6	Load centre distance						
Tyres: chassis	1.7	Load distance, centre of drive axle to fork						
	1.8	Wheelbase						
	2.1	Service Weight						
	2.2	Axle loading, laden front/rear						
	2.3	Axle loading, unladen front/rear						
	3.1	Tyres: solid rubber, superelastic, pneumatic, polyurethane						
	3.2	Tyre size, front						
	3.3	Tyre size, rear						
	3.4	Wheels, number front rear (x = driven wheels)						
	3.5	Tread, front						
Dimensions	3.6	Tread, rear						
	4.1	Tilt of mast/fork carriage forward/backward						
	4.2	Height, mast lowered						
	4.3	Free lift						
	4.4	Lift						
	4.5	Height, mast extended						
	4.6	Height of overhead guard STD.						
	4.7	Seat height/stand height						
	4.8	Coupling height						
	4.9	Overall length						
	4.10	Length to face of forks						
	4.11	Overall width						
	4.12	Fork dimensions						
	4.13	Fork carriage DIN 15 173 --- ISO 2328, class/type A,B						
	4.14	Fork-carriage width						
	4.15	Distance between fork-arms						
	4.16	Ground clearance, laden, below mast						
	4.17	Ground clearance, centre of wheelbase						
	4.18	Aisle width for pallets 1000 x 1200 crossways						
	4.19	Aisle width for pallets 800 x 1200 lengthways						
	4.20	Turning radius						
	4.21	Internal turning radius						
	Performance Data	5.1	Travel speed, laden/unladen					
		5.2	Lift speed, laden/unladen					
		5.3	Lowering speed, laden/unladen					
5.4		Drawbar pull, laden/unladen						
5.5		Max. Drawbar pull, laden/unladen						
5.6		Gradeability, laden/unladen						
5.7		Max. gradeability, laden/unladen						
5.8		Acceleration time, laden/unladen (0-10m)						
5.9		Service brake						
5.10		Parking brake						
Electric engine	6.1	Drive motor rating S2 60 min						
	6.2	Lift motor rating at S3 15%						
	6.3	Steering motor						
	6.4	Battery acc. to DIN 43 531/35/36 A,B,C, no						
	6.5	Battery voltage, nominal capacity K5						
	6.6	Battery weight						
	6.7	Battery dimensions						
Addition data	8.1	Type of drive control						
	9.1	Manufacturer						
	10.1	Operating pressure for attachments						
10.2	Oil volume for attachments							
10.3	Hydraulic Tank - capacity (drain & refill)							
10.4	Sound level at the driver's ear according to EN / DIN 12 053							
10.5	Towing coupling, type DIN							



a=200mm safety clearance
 $Ast = a + Wa + \sqrt{(X+B)^2 + (W/2)^2}$
 X: Load distance
 B: Length of load or forks which is longer

1.3-2.0t Mast Specification:

NO.	Type	Model	Lifting height	Lowered overall height	Overall height		Free lifting height		Tilting range		Capacity				
					With backrest	Without backrest	With backrest	Without backrest	Forward	Backward	Load center@500mm				
					mm	mm	mm	mm	(°)	(°)	1.3t	1.5t	1.6t	1.8t	2.0t
1	Duplex wide view mast	M250	2500	1745	3445	3065	145	145	5.5	6	1300	1500	1600	1800	2000
2		M270	2700	1845	3645	3265	145	145	5.5	6	1300	1500	1600	1800	2000
3		M300	3000	1995	3945	3565	145	145	5.5	6	1300	1500	1600	1800	2000
4		M330	3300	2145	4245	3865	145	145	5.5	6	1300	1500	1600	1800	2000
5		M350	3500	2245	4445	4065	145	145	5.5	6	1300	1500	1600	1800	2000
6		M360	3600	2295	4545	4165	145	145	5.5	6	1300	1500	1600	1800	2000
7		M400	4000	2545	4945	4565	145	145	3.5	5	1300	1500	1600	1800	2000
8		M430	4300	2710	5245	4865	145	145	3.5	5	1200	1450	1600	1700	1950
9		M450	4500	2820	5445	5065	145	145	3.5	5	1100	1400	1500	1700	1900
1		Duplex full-free lifting mast	U250	2500	1745	3455	3095	800	1160	5.5	6	1300	1500	1600	1800
2	U270		2700	1845	3655	3295	900	1260	5.5	6	1300	1500	1600	1800	2000
3	U300		3000	1995	3955	3595	1050	1410	5.5	6	1300	1500	1600	1800	2000
4	U330		3300	2145	4255	3895	1200	1560	5.5	6	1300	1500	1600	1800	2000
5	U350		3500	2245	4455	4095	1300	1660	5.5	6	1300	1500	1600	1800	2000
6	U360		3600	2295	4555	4195	1350	1710	5.5	6	1300	1500	1600	1800	2000
7	U400		4000	2545	4955	4595	1600	1960	3.5	5	1300	1500	1600	1800	2000
8	N400		4000	1910	4955	4595	965	1325	3.5	5	1300	1500	1600	1800	2000
9	N430		4300	2010	5255	4895	1065	1425	3.5	5	1200	1400	1500	1700	1900
10	N450		4500	2075	5455	5095	1130	1490	3.5	5	1100	1350	1500	1600	1800
1	Triplex full-free lifting mast	N480	4800	2175	5755	5395	1230	1590	3.5	5	1000	1300	1450	1600	1700
2		N500	5000	2240	5955	5595	1295	1655	3.5	5	900	1200	1400	1500	1600
3		N550	5500	2410	6455	6095	1465	1825	3.5	5	800	1150	1250	1300	1500
4		N600	6000	2625	6955	6625	1680	2010	3.5	5	700	1000	1100	1200	1300
5		N650	6500	2840	7455	7170	1895	2180	3.5	5	530	800	900	1000	1100

