

**ZOOMLION**

**ZOOMLION ZCC500V (50t) CRAWLER CRANE**

# **TECHNICAL SPECIFICATIONS**

**GQ0660342700000EN**

**Zoomlion Heavy Industry Science & Technology Co., Ltd**

# Zoomlion ZCC500V (50t) Crawler Crane

## Technical Specifications

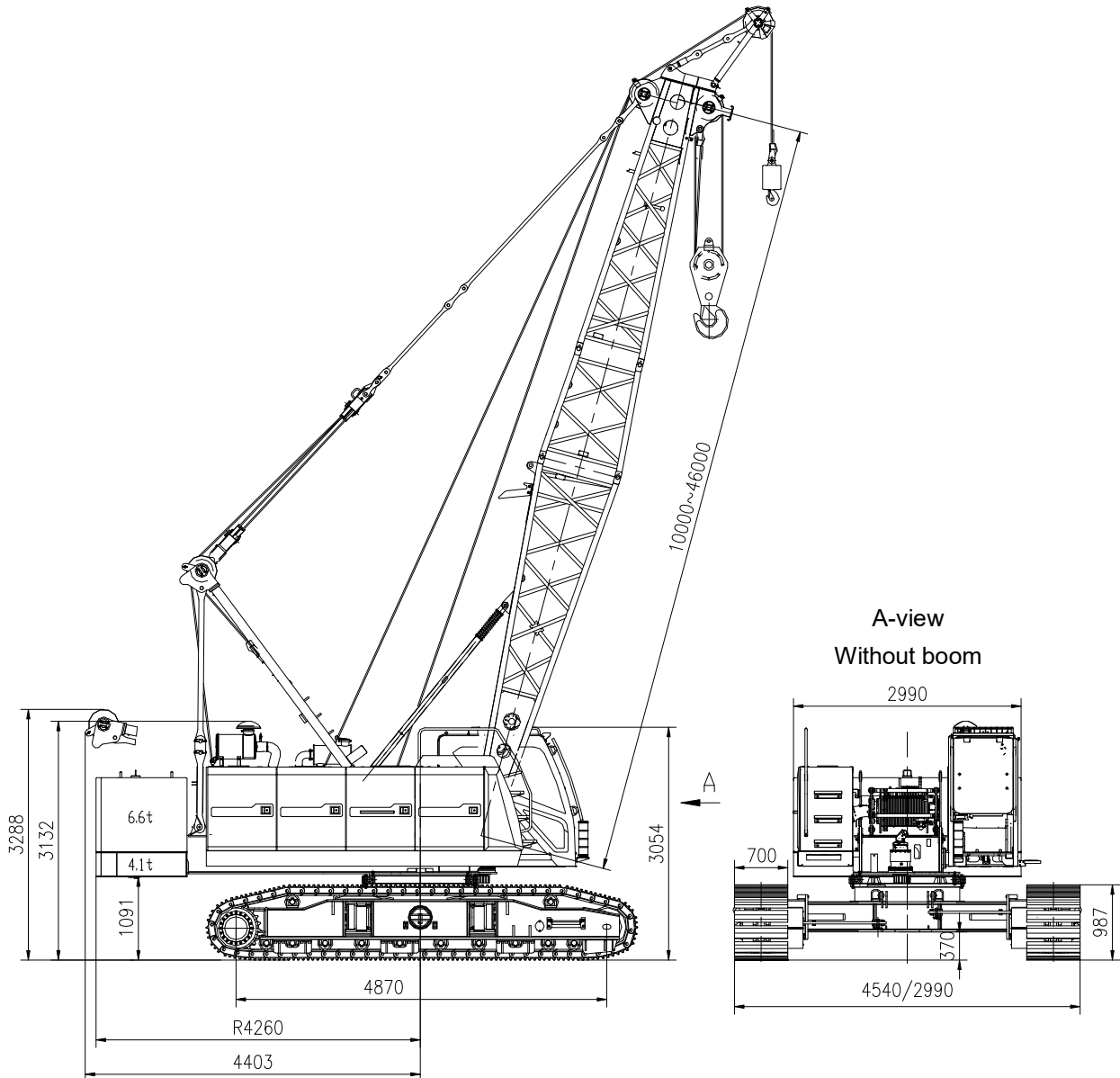
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# 1. Overall dimensions and major technical parameters

## 1.1. Overall dimensions



## 1.2. Major technical parameters

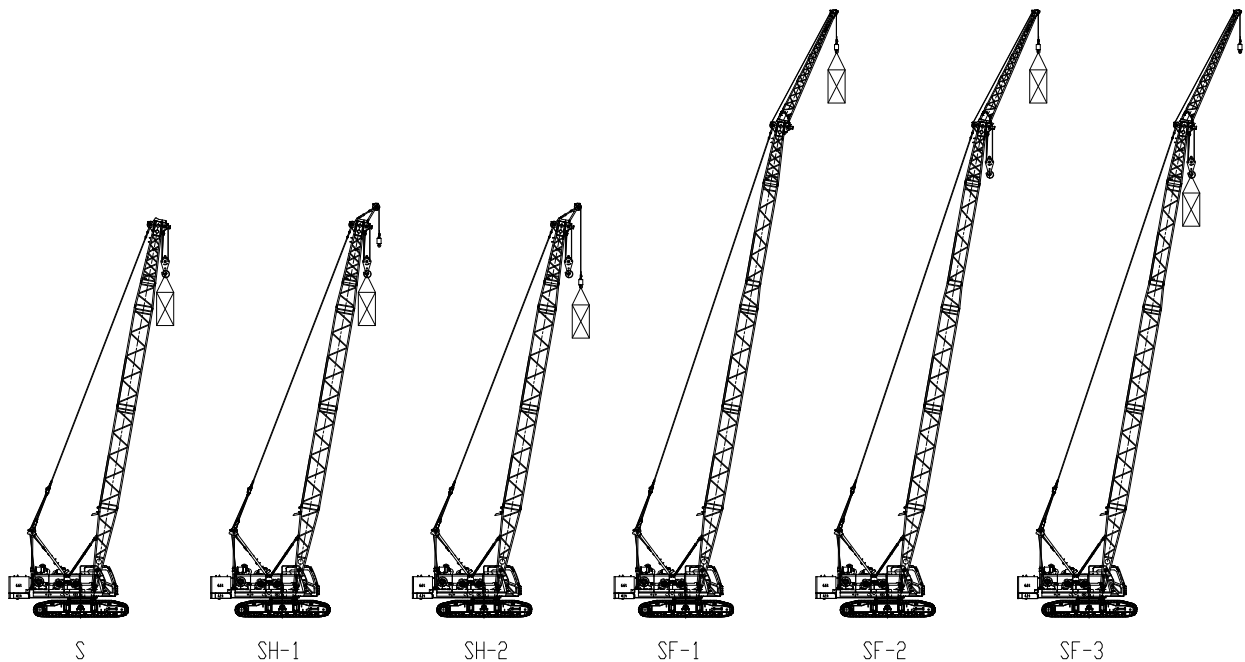
Table of major technical parameters

Items	Units	Values	Notes
Max. lifting moment	t·m	169.6 (42.4t×4m)	
Max. lifting capacity	t	50	
Max. lifting capacity of jib	t	5	
Main boom length	m	10~46	
Fixed jib length	m	7	
Max. length of main boom + fixed jib	m	46+7	
Main boom angle	°	30~80	
Fixed jib angle	°	15,30	
Single rope speed of main hoisting winch	m/min	0~129	
Single rope speed of derricking winch	m/min	0~85	
Slewing speed	rpm	0~2.6	
Crawling speed	km/h	0~2.9	
Gradeability	%	40	
Ground pressure	MPa	0.05	
Dead weight of the crane	t	34	Basic boom with main hook
Counterweight	t	10.7	
Overall dimensions L×W×H	mm	10240×4540(2990)×3290	With A-frame and pivot section
Engine	Model		WP4.1NG175E300
	Rated power/speed	kW/rpm	129/2300
	Max. output torque/speed	N·m/rpm	680/(1400~1600)
	Emission standard	/	China III for Non-road Mobile Machinery
Track gauge × track contact length × track pad width	mm	2290×4870×700	Track carrier retracted
	mm	3840×4870×700	Track carrier extended

### Attention:

1. Single rope speed of winch, slewing speed and crawling speed vary with the load.
2. The value of ground pressure is a mean value. The actual maximum ground pressure is determined according to the actual operating mode.

### 1.3. Illustrations of operating modes



Code	Operating mode	Boom combination
S	Main boom	10m~46m
SH-1	Main boom + tip boom (main hook)	10m~46m
SH-2	Main boom + tip boom (auxiliary hook)	10m~46m
SF-1	Main boom + fixed jib (auxiliary hook, without main hook)	(28m~46m) + 7m
SF-2	Main boom + fixed jib (auxiliary hook, with main hook)	(28m~46m) + 7m
SF-3	Main boom + fixed jib (main hook)	(28m~46m) + 7m

### 1.4. Major technical features

#### ✦ High working efficiency

All operations can be performed synchronously with another one without speed variation for the switching between operations.

Single rope speed of hoisting winches reaches 129m/min.

The optional free-fall winch helps improve the efficiency of hoisting.

#### ✦ Optimized transport and dismantling

A-frame can be erected automatically without the erecting cylinder for fast assembly.

Tracks can be extended or retracted. The maximum width for transport is less than 3m.

Weight of a single counterweight slab  $\leq 7t$ . Counterweight can be assembled simply by a small-sized auxiliary hoisting equipment.

## **2. Technical instructions**

### **2.1. Power unit**

Engine:

Model: WeiChai WP4.1NG175E300

Type: in-line four-cylinder, intercooling supercharged diesel engine

Displacement: 4.1L

Rated power: 129kW/2300r/min

Maximum torque: 680N·m/(1400~1600)r/min

Emission standard: China III for Non-road Mobile Machinery

Volume of fuel oil tank: 400L

### **2.2. Hydraulic system**

Hydraulic pump: The main pump, a plunger pump, drives winches and the crawling mechanism. The dual gear pump is used for slewing and heat dissipation.

Control system: pilot proportional control hydraulic system. The motor of hoisting winch is a variable plunger pump. Two cross hydraulic-control joysticks and a dual control valve of crawling pedal are used for controlling different executive components.

Volume of hydraulic oil tank: 310L

### **2.3. Electrical system**

DC of 24V, negative ground, two storage batteries of 180AH

Components of electrical system: power supply, engine system, load moment limiter, illumination system, safety control system, etc. Data communication between controllers and electrical components are conducted through CAN bus.

The crane is equipped with a global position system (GPS/GPRS).

### **2.4. Hoisting mechanism**

Both the main hoisting winch and the auxiliary hoisting winch are driven by an axial hydraulic variable-displacement piston motor through a built-in planetary reducer. Spring braking of winch motor is controlled by a balance valve. The drum with double-rope grooves ensures that multiple layers of rope never intertwine together.

	H1	H2
Rated single line pull	5t	5t
Rope diameter	17mm	17mm
Rope length	180m	110m
Single rope speed	129m/min	120m/min

Free-fall hook is optional for both hoisting winches.

## 2.5. Derricking mechanism

The derricking winch is driven by an axial piston motor through a built-in planetary reducer and braked through the spring on the motor end.

Cable drum lock: The winch is locked by ratchet wheel and ratchet pawl.

	Derricking mechanism
Rated single line pull	5t
Rope diameter	17mm
Rope length	100m
Single rope speed	85m/min

## 2.6. Slewing mechanism

The slewing gear is driven by an axial constant-displacement piston hydraulic motor through a planetary gear reducer. Small gear of the output shaft rotates around the slewing ring fixed on the chassis so that the slewing platform makes a full-range slewing of 360°. Lateral pulling force on boom can be effectively reduced through the function of free slewing.

### ✦ Slewing ring

Single-row-roller and four-point-contact slewing ring; external gearing

### ✦ Slewing speed

The maximum slewing speed is 2.6 rpm.

## 2.7. Counterweight

Counterweight slabs are piled one by one on a pallet.

Rear counterweight is composed of a counterweight base and a counterweight slab, weighing 10.7t in total.

## 2.8. Operator's cab

The classic operator's cab is decorated with fine interiors and equipped with rearview mirrors that provide a broad vision.

The cab is also equipped with a warm/cold air-conditioner and a color display of 7.0 inches.

Joysticks and switches are designed in line with the ergonomics, ensuring more comfort operations.

#### ✧ Armrest boxes

Both armrest boxes are designed with various kinds of electrical switches and can be adjusted with the seat.

#### ✧ Joysticks and control levers

The two cross pilot hydraulic-control joysticks control the main and the secondary hoisting winches, the slewing mechanism and the derricking mechanism.

Crawling control levers (with pedals) control crawling and steering of the crane.

#### ✧ Air-conditioner

A warm/cold air-conditioner with optimized air flue and air vent is configured as standard.

### **2.9. Crawling mechanism**

#### ✧ Undercarriage

The two independent hydraulic driving systems on both sides are installed in track carriers. Each hydraulic driving system is equipped with a hydraulic motor that drives the driving sprocket through the planetary reducer.

#### ✧ Retracting and extension of track carriers

Retracting and extension of track carriers are controlled by hydraulic cylinders. Tracks must be fully extended during operation.

#### ✧ Tensioning of tracks

The tension of tracks is adjusted by the auxiliary cylinder of the tensioning device through filling grease.

#### ✧ Track roller

Maintenance-free enclosed structure.

#### ✧ Track pad

The high-strength alloy-cast steel track-mounted track pads provide strong road holding and are more suitable for bad road conditions.

### **2.10. Safety devices**

The crane is equipped with different types of mechanical, electronic and hydraulic safety devices and alarm devices, which guarantee the safe operation of the crane.

#### ✧ Load moment limiter

Main boom angle and load capacity can be automatically detected by load moment limiter, which gives a feedback according to the actual lifting condition. It sends out an alarm and limits the current operation if the normal working range of the crane is exceeded.

Information such as load moment percentage, main boom angle, main boom length, working radius, actual load capacity on the hook and rated load capacity can be displayed on the screen as required.

#### ✧ Hoisting height limiter

Limit switch and limit weight fixed on boom end are used to prevent excessive hoisting of the hook. Limit switch sends out a signal if the hook is hoisted to a certain height so as to avoid excessive hoisting.

#### ✧ Main boom angle limiter

The limit switch on the main boom pivot section is triggered if the main boom angle reaches 80°. The upward derricking will be cut off and a sound-light alarm signal will be sent out from the cab.

#### ✧ Protective device for over-lowering

The protective device sends out a signal and cuts off lowering of hook when there are only three windings of rope left on the drum. A sound-light signal is also sent out from the operator's cab.

#### ✧ Tilting-back support for boom

A tilting-back support, composed of nested steel pipes and a spring, is used to avoid backward tilting of the boom.

#### ✧ Locking device for slewing

It is used to secure the superstructure and the undercarriage during transport, which must be unlocked during operation.

#### ✧ Mousing on hook

It closes off a hook to prevent the load from slipping off.

#### ✧ Anemometer

An electronic wind speed sensor fixed on boom head to detect real-time wind speed, which is then displayed on the screen.

#### ✧ Electronic gradienter

The levelness of the crane is displayed on the screen.

#### ✧ Aviation warning light

It is fixed at the top of the boom for warning in the upper air.

#### ✧ Main boom angle indicator

The angle indicator is fitted at the rear bottom of the main boom pivot section. The operator is able to see the elevation angle of the boom clearly from the operator's cab.

#### ✧ Rear-view mirrors

At the front left side of the cab and on the handrail of the right hood.

#### ✧ Automatic locking mechanism of ratchet wheel on the derricking winch

It is used to lock the derricking winch when the crane is stopped.

#### ✧ Emergency stop button

Press this button to shut down the engine and cut off all operations in an emergency.

#### ✧ Tri-color warning light

The warning light illuminates in three colors, red, yellow, and green. The load condition of the crane can be displayed simultaneously. Green light indicates that the load rate is below 90%; yellow light indicates that the load rate ranges between 90% and 100%; red light means that the load rate is beyond 100% and the crane is overloaded.

#### ✧ Slewing and crawling alarm

It sends out a sound-light alarm during slewing and/or crawling.

#### ✧ Monitoring system

Camera and video displayer are optional, through which real-time working condition of hoisting winches can be monitored.

### **2.11. Boom**

#### ✧ Main boom

Main boom length ranges between 10m~46m. Components of a main boom include: a pivot section of 5m, a reducing section of 1.5m, a boom head of 3.5m, intermediate sections of 3m and 6m, and a small-section intermediate section of 6m. Tip boom is available for the main boom.

#### ✧ Fixed jib

The length of the fixed jib is 7m. It is equipped with two sets of anchoring rods for angle adjusting. The length of the main boom with a fixed jib ranges between 28m~46m.

## 2.12. Hooks

Three types of hooks are available:

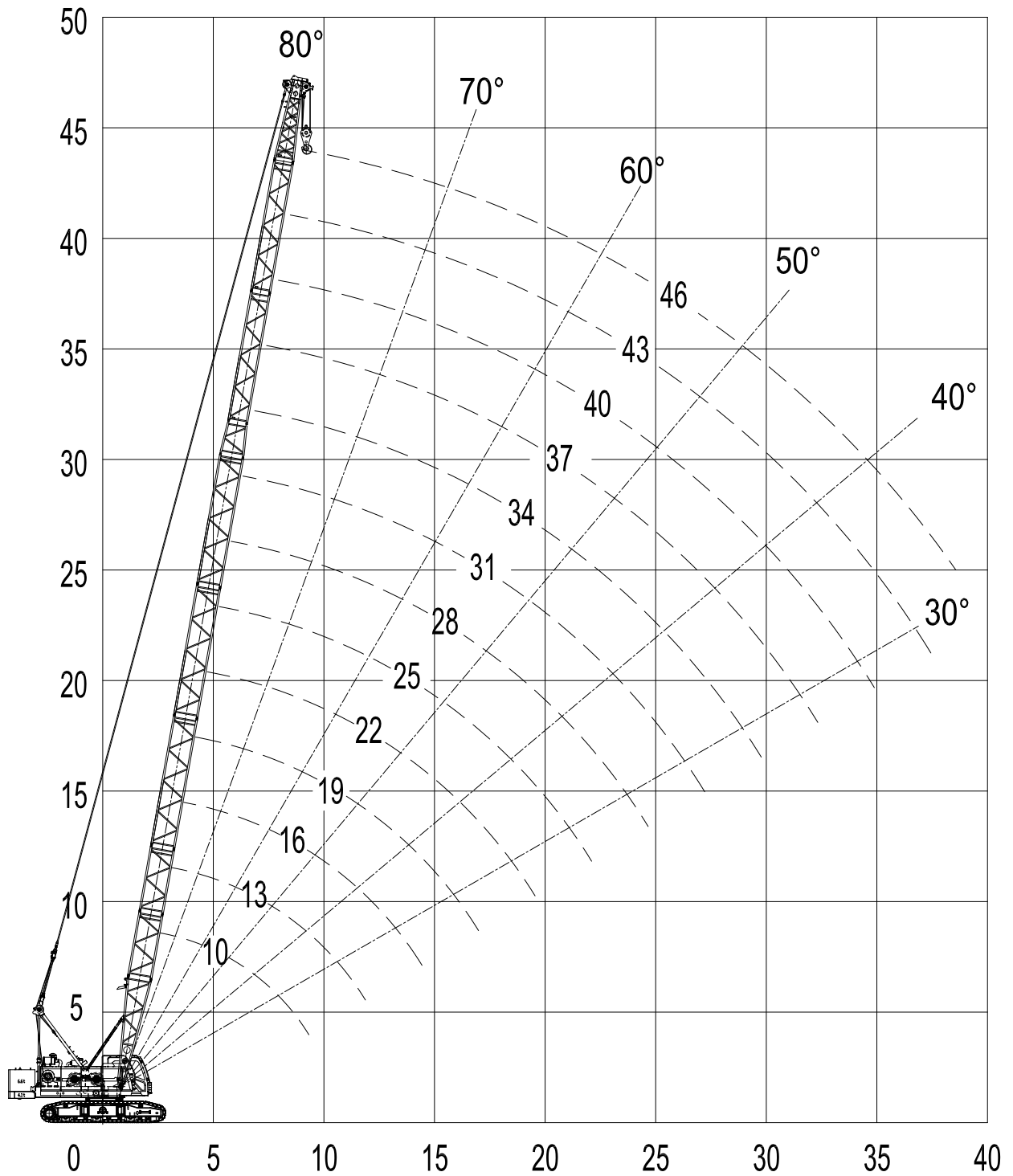
Specification of hook	Weight (kg)	Number of pulleys
55 t	510	6
30 t	285	4
5t	90	0

### 3. Working radius and lifting capacity charts

#### 3.1. Operating mode S

Hoisting height curves (S)

Unit: m



**Lifting capacity chart (S)**

Counterweight: 10.7t Unit: t

Radius (m)	Main boom length (m)												
	10	13	16	19	22	25	28	31	34	37	40	43	46
3	50												
4	42.4	42.4	40.6										
5	28.1	28.1	28.1	28.1	27.9								
6	21	20.9	20.9	20.9	20.8	20.8	20.6						
7	16.7	16.6	16.6	16.5	16.5	16.5	16.4	16.4	15.3				
8	13.8	13.8	13.7	13.6	13.6	13.6	13.5	13.5	13.4	12.8	11.4		
9	11.8	11.7	11.6	11.6	11.5	11.5	11.4	11.4	11.3	11.3	11	9.7	8.3
10		10.2	10.1	10	10	9.9	9.9	9.8	9.8	9.7	9.6	9.4	8
11		9	8.9	8.8	8.8	8.7	8.7	8.6	8.6	8.5	8.4	8.3	7.8
12		8	7.9	7.9	7.8	7.8	7.7	7.6	7.6	7.5	7.4	7.4	7.2
14			6.5	6.4	6.3	6.3	6.2	6.2	6.1	6	6	5.9	5.8
16				5.4	5.3	5.3	5.2	5.1	5.1	5	4.9	4.8	4.8
18					4.5	4.5	4.4	4.3	4.3	4.2	4.1	4.1	4
20					3.9	3.9	3.8	3.7	3.7	3.6	3.6	3.4	3.4
22						3.4	3.3	3.2	3.2	3.1	3.1	2.9	2.9
24							2.9	2.9	2.8	2.8	2.7	2.5	2.5
26								2.5	2.5	2.4	2.4	2.2	2.1
28									2.2	2.1	2.1	1.9	1.8
30									2	1.9	1.8	1.7	1.6
32										1.7	1.6	1.5	1.4
34											1.4	1.3	1.2
36												1.1	1
<b>Reeving</b>	<b>12</b>	<b>10</b>	<b>9</b>	<b>8</b>	<b>7</b>	<b>6</b>	<b>5</b>	<b>4</b>	<b>4</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>
<b>Hook</b>	<b>55t</b>			<b>30t</b>									

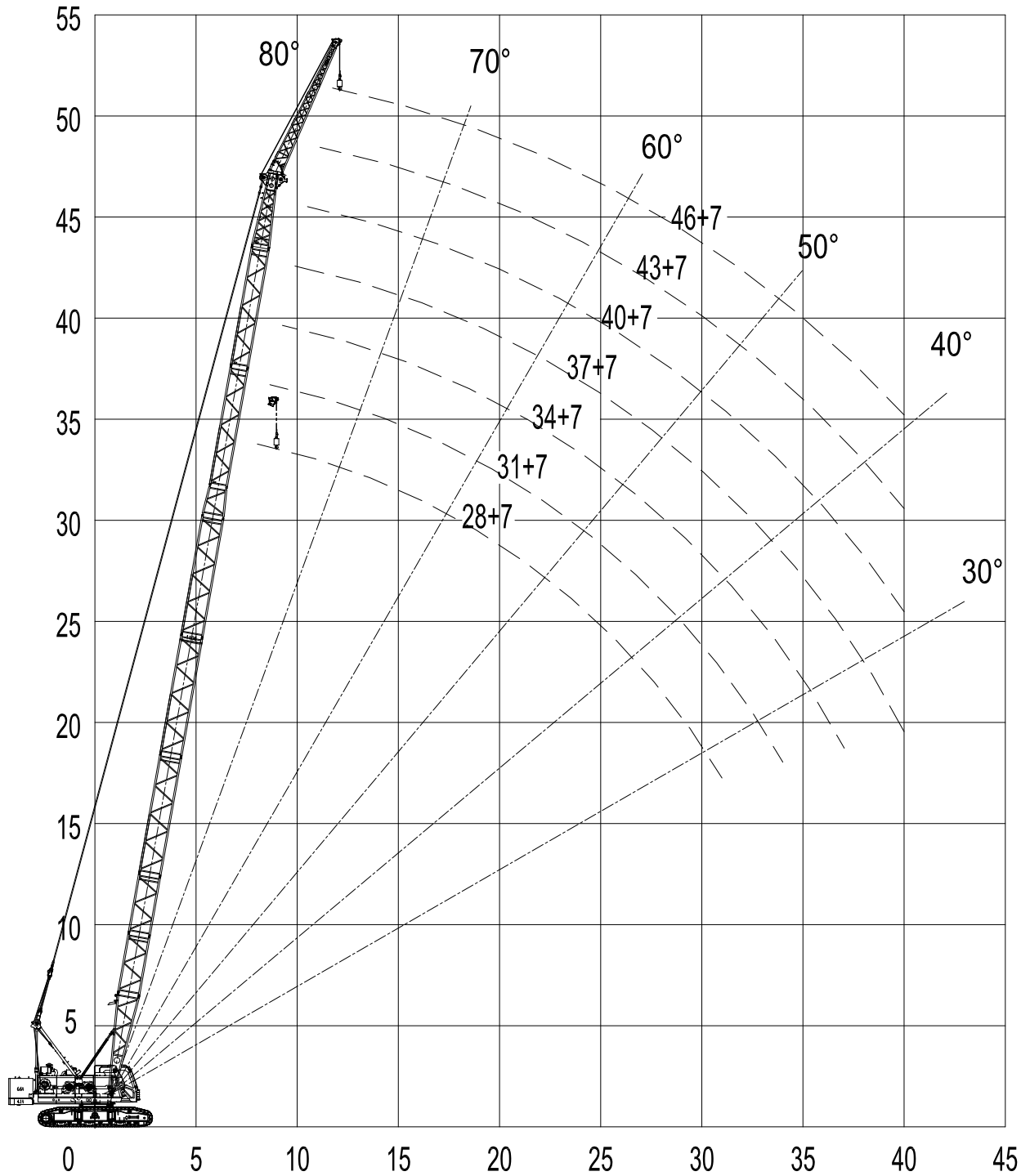
**Attention:**

- (1) Weight of slings and ropes are included. The net weight of the actual load should be smaller than the values provided in the table.
- (2) Data in the above table are provided based on the fact that the ground is solid and flat and the load is freely suspended.

### 3.2. Operating mode SF

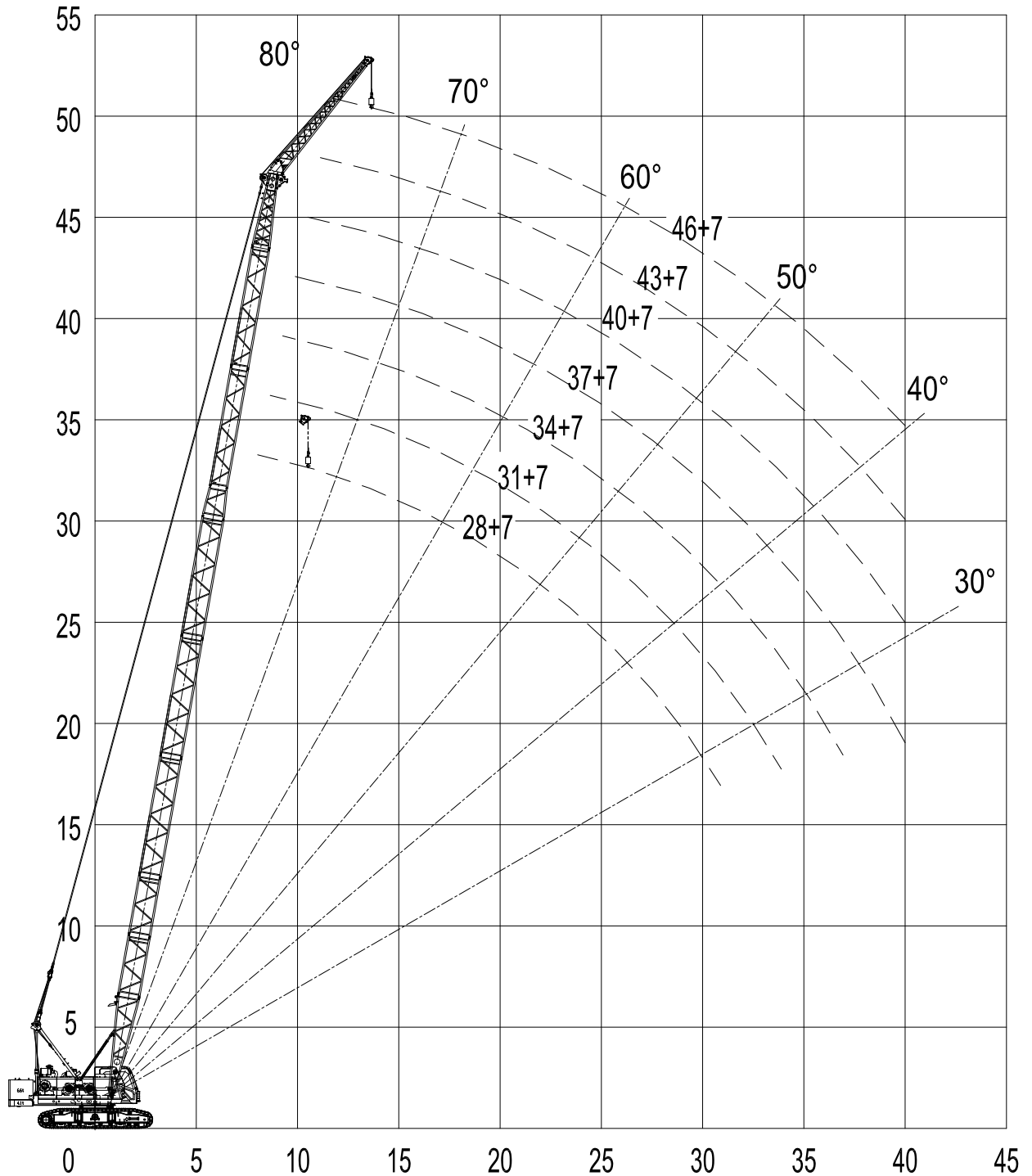
#### Hoisting height curves (SF-1, 15°)

Unit: m



## Hoisting height curves (SF-1, 30°)

Unit: m



## Lifting capacity chart (SF-1)

Counterweight: 10.7t Unit: t

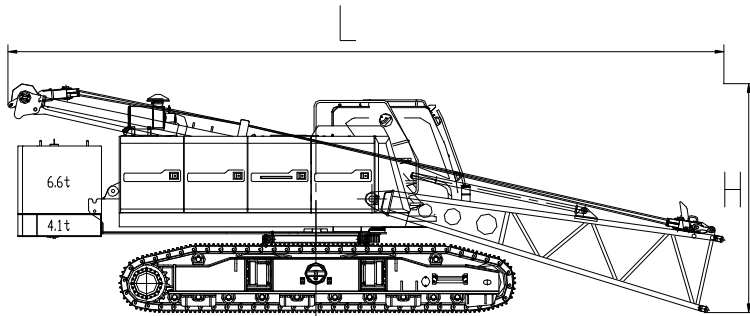
Main boom	28		31		34		37		40		43		46	
Jib	7													
Angle	15°	30°	15°	30°	15°	30°	15°	30°	15°	30°	15°	30°	15°	30°
9	5													
10	5		5		5									
11	5	5	5	5	5		5		5					
12	5	5	5	5	5	5	5	5	5		5		4.6	
14	5	5	5	5	5	5	5	5	4.8	4.8	4.5	4.5	4.2	4.2
16	5	5	5	5	5	5	4.7	4.7	4.4	4.4	4.1	4.1	3.8	3.8
18	4.7	4.8	4.6	4.7	4.6	4.7	4.3	4.3	4	4	3.7	3.8	3.4	3.5
20	4.1	4.1	4	4.1	3.9	4	3.9	3.9	3.7	3.7	3.4	3.5	3.2	3.2
22	3.6	3.6	3.5	3.6	3.4	3.5	3.4	3.4	3.3	3.4	3.2	3.2	2.9	2.9
24	3.2	3.2	3.1	3.1	3	3.1	2.9	3	2.9	2.9	2.8	2.9	2.7	2.7
26	2.8	2.9	2.7	2.8	2.7	2.7	2.6	2.7	2.5	2.6	2.5	2.5	2.4	2.5
28	2.5	2.6	2.5	2.5	2.4	2.4	2.3	2.4	2.2	2.3	2.2	2.2	2.1	2.1
30	2.3	2.3	2.2	2.2	2.1	2.2	2.1	2.1	2	2	1.9	2	1.8	1.9
32	2.1	2.1	2	2	1.9	2	1.8	1.9	1.8	1.8	1.7	1.7	1.6	1.7
34			1.8	1.8	1.7	1.8	1.7	1.7	1.6	1.6	1.5	1.5	1.4	1.5
36					1.6	1.6	1.5	1.5	1.4	1.4	1.3	1.4	1.2	1.3
38							1.3	1.3	1.3	1.3	1.2	1.2	1.1	1.1
40							1.2	1.2	1.1	1.1	1	1.1	1	1
Reeving	1													
Hook	5t													

**Attention:**

- (1) Weight of slings and ropes are included. The net weight of the actual load should be smaller than the values provided in the table.
- (2) Data in the above table are provided based on the fact that the ground is solid and flat and the load is freely suspended.

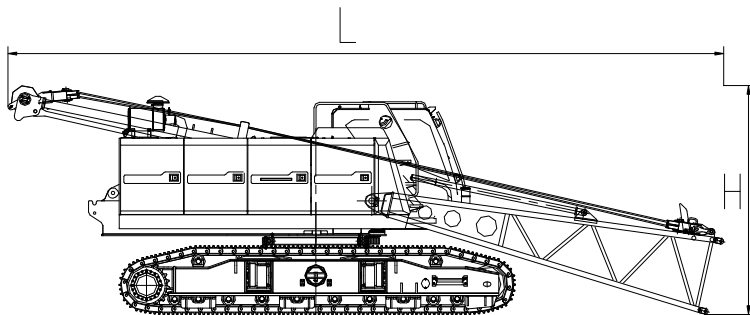
## 4. Dimensions of components in transport

Basic machine 1 (with counterweight)



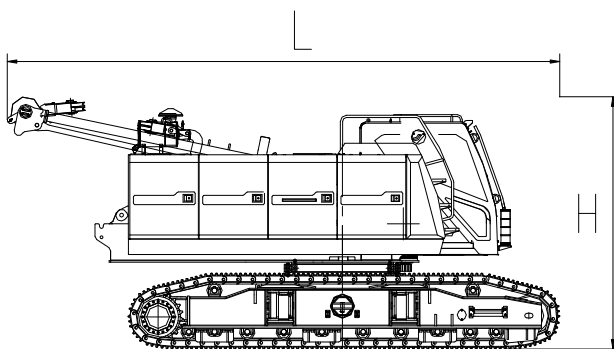
	1 piece *
Length (L)	10240 mm
Width (W)	2990 mm
Height (H)	3290 mm
Weight	33000 kg

Basic machine 2 (with pivot section and tracks)



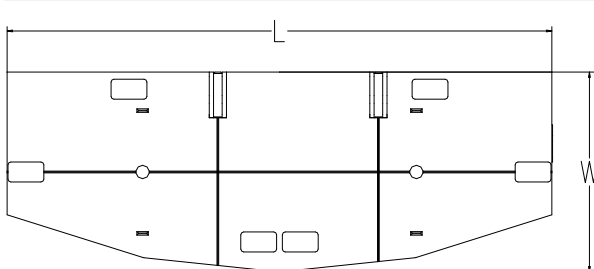
	1 piece*
Length (L)	10240 mm
Width (W)	2990 mm
Height (H)	3290 mm
Weight	22300 kg

Basic machine 3 (without pivot section)

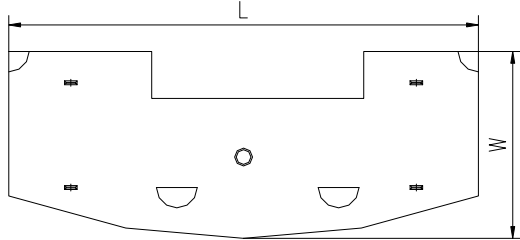


	1 piece*
Length (L)	7260 mm
Width (W)	2990 mm
Height (H)	3290 mm
Weight	21730kg

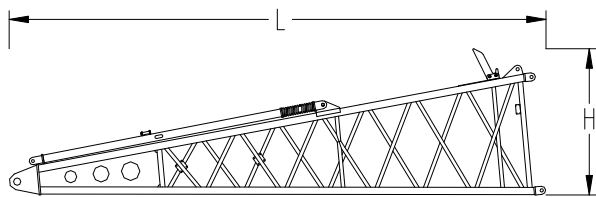
Counterweight base



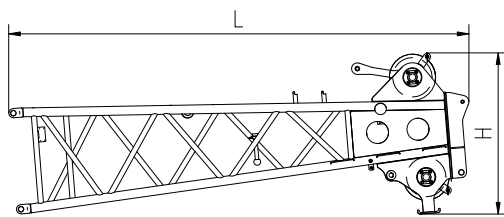
	1 piece
Length (L)	2990 mm
Width (W)	1195 mm
Height (H)	575 mm
Weight	4100 kg

**Counterweight slab**

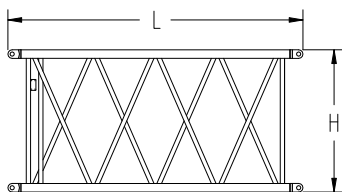
	1 piece
Length (L)	2990 mm
Width (W)	1195 mm
Height (H)	1130mm
Weight	6600 kg

**Main boom pivot section + tilting-back support**

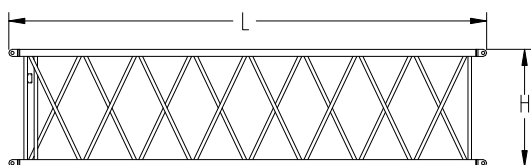
	1 piece*
Length (L)	5165 mm
Width (W)	1150 mm
Height (H)	1420 mm
Weight	570 kg

**Main boom head section**

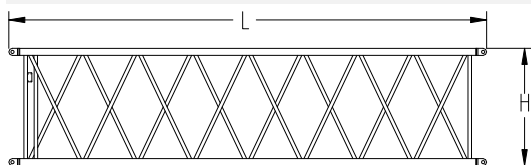
	1 piece
Length (L)	3970 mm
Width (W)	930mm
Height (H)	1390 mm
Weight	430 kg

**Main boom intermediate section (3m)**

	2 pieces*
Length (L)	3090 mm
Width (W)	1130 mm
Height (H)	1110mm
Weight	190 kg

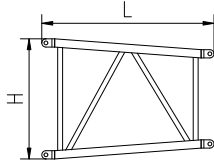
**Main boom intermediate section (6m)**

	3 pieces*
Length (L)	6090 mm
Width (W)	1130 mm
Height (H)	1110 mm
Weight	322 kg

**Main boom intermediate section A (6m)**

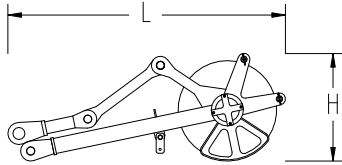
	2 pieces*
Length (L)	6090 mm
Width (W)	930 mm
Height (H)	910 mm
Weight	300 kg

## Main boom reducing section



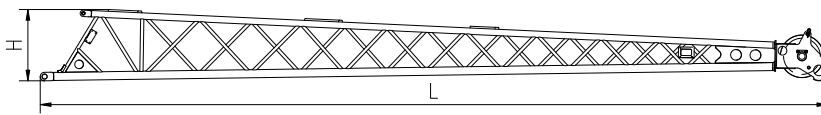
	1 piece
Length (L)	1580 mm
Width (W)	1130 mm
Height (H)	1110 mm
Weight	110kg

## Tip boom



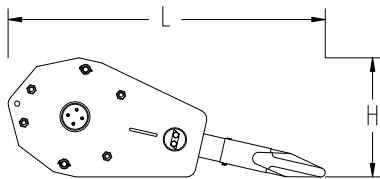
	1 piece
Length (L)	1270 mm
Width (W)	590 mm
Height (H)	470 mm
Weight	100 kg

## Fixed jib



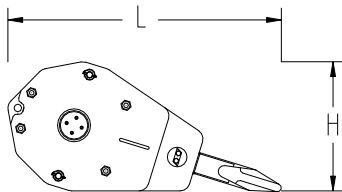
	1 piece*
Length (L)	7285 mm
Width (W)	580 mm
Height (H)	670mm
Weight	165 kg

## Hook for 55t



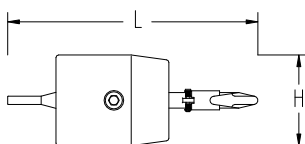
	1 piece*
Length (L)	1430 mm
Width (W)	470 mm
Height (H)	520 mm
Weight	510 kg

## Hook for 30t



	1 piece*
Length (L)	1250 mm
Width (W)	380 mm
Height (H)	480 mm
Weight	285 kg

## Hook for 8t



	1 piece*
Length (L)	910mm
Width (W)	240mm
Height (H)	240mm
Weight	90kg

**Attention:**

- Figures in the above table are schematic diagrams that are not drawn in fixed proportions. Dimensions shown are general boundary dimensions.

2. Packaging weight is not included. Weights might be different from what are listed in the above table due to manufacturing error.
3. Dimensions of actual products shall prevail if dimensions and weights differ from what are listed above due to parts improvement.
4. Numbers of components marked \* are determined by the actual need.