and lanes on the stack-yard should be designated with lines. The electrical safety protection devices on the Crane should be adjusted properly.

For safety and protection the Crane has overload protection, diesel engine overspeed protection, high water temperature and low oil (lubrication) pressure signaling, anemometer, anti-collision devices for gantry traveling located on four corners, emergency stop buttons, spreader load indicator, limit switches for every movement and signal indicators, etc.

The Crane has lighting and signaling equipment for operation at night. The gantry traveling is provided with alarms. For intercommunication between the operator and the dock, the Crane has telephones, a public address system and a radio speakerphone.

2. Principal Technical Parameters

Item			Value	Unit	Remarks
Rated lifting capacity			50	*t*	Under spreader
Exceptional lifting capacity			61	*t*	Under spreader
Lifting height			18.25	*m*	
Working Speed	Hoisting speed	exceptional load	19	*m /min*	
		Rated load	22	*m /min*	
		Without load	50	*m /min*	
	Gantry travel speed	exceptional load	30	*m /min*	
		Spin turning	30	*m /min*	
		Without load	135	*m /min*	
	Trolley travel speed	exceptional load	35	*m /min*	
		Rated load	70	*m /min*	
Span			26.5	*m*	
Wheel Base			7.9	*m*	
Total No. of wheels / No. of driven wheels			8/4	*ps*	
Spreader	Skewing		±5°		
	micromovement		±200mm		
Diesel Engine	Model		KTA19-G4		CUMMINS
	Power		600	*BHP*	
	Revolutions		1500	*rpm*	
Alternator	Model		HCI 634J2		STAMFORD
	Power		820	*KVA*	400V, 50HZ, 3-phase
	Revolutions		1500	*rpm*	
Auxiliary diesel –generator set			C38D5	28kw	CUMMINS
Row of containers stacked by the Crane			5	*Container*	
Number of containers the Crane passes over			7	*Container*	With one container

2.1. Table of Main Hoist Particulars

Description			Value	Unite	Remarks
Number of wire ropes coming from the drum			8	*ps*	
Multiple of rope reeving of sheave block			1		
Rated lifting capacity (under spreader)			50	*t*	
Exceptional lifting capacity			61	*t*	
Hoisting Speed		exceptional load	19	*m /min*	
		Rated load	22	*m /min*	
		Without load	50	*m /min*	
Linear velocity of Wire rope		exceptional load	19	*m /min*	
		Rated load	22	*m /min*	
		Without load	50	*m /min*	
The drum	Nominal diameter		∅1200	*mm*	
	Number of groups of grooves on the wire rope drum		8	*groups*	
	Number of wraps of rope for fixing		2	*wraps*	
	Capacity of the drum (TOTAL)		~380	*m*	
Motor	Model		1PQ8-355		Siemens
	Power		220	*kW*	
	Revolution		735/1670	*rpm*	
	Voltage		400	*V*	
	Quantity		1	*set*	
Reducer	Model		FH1650.125.		ZPMC
	Reduction ratio		125.315		
	Quantity		1	*set*	
Working Brake	Model		YP31A-630x30		ZPMC
	Model of thruster		ED2000-50		
	Braking torque		6600	*Nm*	
	Quantity		1	*set*	
Emergency Brake	Model		ZPMC-SBB425-2000x36		ZPMC
	Braking torque		425000	*Nm*	
	Quantity		3	*set*	
Wire rope	Model		6XFi(29)-IWRC-B-Z lay		KOREA /JAPAN
	Diameter		Ø30	*mm*	
	Length		2x49	*m*	Outside
			2x49	*m*	
			2x46	*m*	Inside
			2x46	*m*	

2.2. Table of Trolley Traversing Particulars

Description		Value	Unite	Remarks
Traversing Speed	exceptional load	35	*m /min*	
	Rated load	70	*m /min*	
A.C motor	Model	M3BP-180L		Siemens
	Power	17.5	*kW*	
	Revolutions	1430	*rpm*	
	Voltage	400	*V*	
	Qnt'y	2	*set*	
Reducer	Model	FH495.40		ZPMC
	Reduction ratio	40.4		
	Input Power	20	*kW*	
	Qnt'y	2	*set*	
Brake	Model	YP11 315x20		ZPMC
	Model of thruster	Ed220-50		
	Braking torque	260	*Nm*	
	Qnt'y	2	*set*	
Wheels	Diameter	∅630	*mm*	
	Qnt'y	4	*pcs*	
Rail track		80x80	*mm*	Square steel

2.3. Table of Gantry Traveling Particulars

Description		Value	Unite	Remarks
Gantry travel speed	exceptional load	30	*m /min*	
	Spin turning	30	*m /min*	
	Without load	135	*m /min*	
A.C. motor	Model	1LP4209		Siemens
	Power	40	*kW*	
	Revolutions	1730	*rpm*	
	Voltage	400	*V*	
	Qnt'y	4	*sets*	
Reducer	Model	FB395.26		ZPMC
	Reduction ratio	26.157		
	Input power	40	*kW*	
	Qnt'y	4	*sets*	
Brake	Model	KFB40		PINTSCH-BAMAG
	Braking torque	400		*Nm*
	Qnt'y	4	*set*	

Chain transmission	Model of chain	160SW-2X120		ANSI 160-2
	Pitch	50.80	*mm*	
	Reduction ratio	2.994(53/18)		
Rubber tyres	Model	21.00-35, 40Ply		
	Effective diameter	2050	*mm*	
	Inflation pressure	10.0	kg/cm^2	145PSI
	Qnt'y(driven/total)	4/8	*pcs*	

3. Points for Attention for Safety

3.1. Preparation before Crane starting.

3.1.1. Check for obstructions in the Crane's path.
3.1.2. Check that lubrication for every mechanical part is sufficient.
3.1.3. Check that every operation joystick and operation switch is in normal position.
3.1.4. Check that power supply voltage is normal.
3.1.5. A trial run without load should be done first and the running with load can be started only after it is confirmed that various safety devices and limit switches are activated normally.

Attention: Only authorized person is allowed to access the crane.

3.2. Points for Attention after Operation

3.3. Park the Crane at the assigned location.

3.3.1. Park the trolley at the stowed location, i.e., anchoring location.
3.3.2. Return all the operation joysticks and switches in the cab to neutral position and specified position.
3.3.3. Check the rubber-tyred wheels.
3.3.4. If the Crane is not expected to be in use for a long period or a storm is forecast, the crane tyres should be turned to the right position, and secured with chock racks.
3.3.5. Repair defects found during operation and confirm that all lubricants are correct for the next operation.
3.3.6. Lock the doors of the operator's cab and electrical room to prevent unauthorized entry.

4. Operator's cab

The operator's cab is attached to the extended support beam of the trolley frame with bolts and cushioning pads. The left side of the cab is connected with the towing support of the Energy chain system. When the trolley traverses, it drags the chain and cable and allows the operator a clear view of the container handling.

The operator's cab is 2.5m long and 2.2m wide and has window glass in front and rear, and both sides as well as the front lower part of the cab. The glass is electrical heating and laminated safety glass. The cab provides an excellent view and has good natural light. The cab is spacious enough for easy cleaning. The