

LAMPIRAN

1. Spesifikasi Hoist

Description		Value	Unite	Remarks
Number of wire ropes coming from the drum		8	<i>ps</i>	
Multiple of rope reeving of sheave block		1		
Rated lifting capacity (under spreader)		50	<i>t</i>	
Exceptional lifting capacity		61	<i>t</i>	
Hoisting Speed	exceptional load	11	<i>m /min</i>	
	Rated load	22	<i>m /min</i>	
	Without load	50	<i>m /min</i>	
Linear velocity of Wire rope	exceptional load	11	<i>m /min</i>	
	Rated load	22	<i>m /min</i>	
	Without load	50	<i>m /min</i>	
The drum	Nominal diameter	∅1200	<i>mm</i>	
	Number of groups of grooves on the wire rope drum	8	<i>groups</i>	
	Number of wraps of rope for fixing	2	<i>wraps</i>	
	Capacity of the drum (TOTAL)	~386	<i>m</i>	
Motor	Model	YTSP355L-6		Nanyang
	Power	220	<i>kW</i>	
	Revolution	842/1913	<i>rpm</i>	
	Voltage	415	<i>V</i>	
	Quantity	1	<i>set</i>	
Reducer	Model	FH1660.144.C1A-00		ZPMC
	Reduction ratio	144.244		
	Quantity	1	<i>set</i>	
Working Brake	Model	YP31A-630x30-ED2000-60		ZPMC
	Model of thruster	ED2000-60		
	Braking torque	6600	<i>Nm</i>	
	Quantity	2	<i>set</i>	
Emergency Brake	Model	SB315		ZPMC
	Braking torque	210,000	<i>Nm</i>	
	Quantity	4	<i>set</i>	
Wire rope	Model	6xFi(29)-∅30mm		DSR
	Diameter	∅30	<i>mm</i>	
		4x47	<i>m</i>	Outside
		2x48	<i>m</i>	
2x50	<i>m</i>			

2. Spesifikasi Trolley



Oman 23 RTGs

APM SLV03 PROJECT

2.2. Table of Trolley Traversing Particulars

Description		Value	Unite	Remarks
Traversing Speed	exceptional load	35	<i>m /min</i>	
	Rated load	70	<i>m /min</i>	
A.C motor	Model	YTSP180L-4		Nanyang
	Power	20	<i>kW</i>	
	Revolutions	1405	<i>rpm</i>	
	Voltage	415	<i>V</i>	
	Qnt'y	2	<i>sets</i>	
Reducer	Model	FH495.40.A1A-00		ZPMC
	Reduction ratio	40.4		
	Input Power	20	<i>kW</i>	
	Qnt'y	2	<i>sets</i>	
Brake	Model	YP11 315x20/Ed220-50		ZPMC
	Model of thruster	Ed220-50		
	Braking torque	260	<i>Nm</i>	
	Qnt'y	2	<i>set</i>	
Wheels	Diameter	Ø630	<i>mm</i>	
	Qnt'y	4	<i>pcs</i>	
Rail track	80x80	<i>mm</i>	Square steel	

3. Spesifikasi Gantry

2.3. Table of Gantry Traveling Particulars

Description		Value	Unite	Remarks
Gantry travel speed	exceptional load	30	<i>m /min</i>	
	Spin turning	30	<i>m /min</i>	
	Without load	135	<i>m /min</i>	
A.C. motor	Model	YTSP2255-4		Nanyang
	Power	37.5	<i>kW</i>	
	Revolutions	1821	<i>rpm</i>	
	Voltage	415	<i>V</i>	
	Qnt'y	4	<i>sets</i>	
Reducer	Model	FVS445.30.D1A		ZPMC
	Reduction ratio	29.781		
	Input power	45	<i>kW</i>	
	Qnt'y	4	<i>sets</i>	
Brake	Model	BFK458-25N		
	Braking torque	400		<i>Nm</i>
	Qnt'y	4	<i>set</i>	
Rubber tyres	Model	21.00-35, 40Ply		
	Effective diameter	1860	<i>mm</i>	
	Inflation pressure	10.0	<i>kg/cm²</i>	145PSI
	Qnt'y(driving/total)	4/8	<i>pcs</i>	

2. Dokumentasi Pemotongan Besi Hollow



3. Dokumentasi Pengelasan



4. Dokumentasi Proses Pewarnaan Rangka



5. Jenis Cat Semprot



6. Bearing

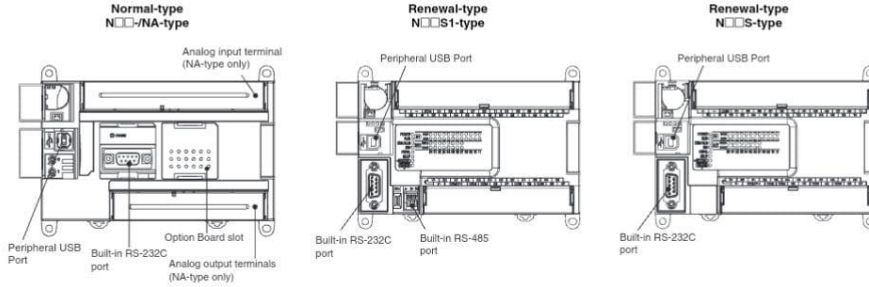


7. Trolley Tampak Bawah



8. Data Sheet PLC

Application Model N/NA□□(S)-type CPU Units



Difference in Characteristics and Functions

Function	N/NA□□-type (Normal)	N□□S(1)-type (Renewal)
Analog adjusters	2 adjusters (Setting range: 0 to 255)	None The analog adjuster PV in A642/A643 is fixed on 0000.
Built-in RS-232C port	6 signals are supported: SD, RD, RS, CS, DR and ER.	4 signals are supported: SD, RD, RS and CS. DR (pin 7) and ER (pin 8) are not supported.
Option board	1 port (N30/40/60, NA20 CPU Unit only)	Cannot be mounted There is no slot for an option board.
Built-in RS-485 port	None	1 port (N30/40/60S1 CPU Unit only) With 2-wire connections, it can only communicate in half duplex. Terminating resistance ON/OFF can be set by DIP switch.
Terminal Arrangements (Transistor outputs only)	COM allocation CIO 100.00 and CIO 100.01 are different COM.	 CIO 100.00 and CIO 100.01 are the same COM.
	Power supply for transistor outputs Not needed Do not connect an external power supply.	Needed It is necessary to connect a DC24V external power supply when using terminals 00 and 01 on terminal block CIO 100. Do not connect the external power supply to the terminals except 00 and 01 on terminal block CIO 100.

Product Lineup

	Normal-type				Renewal-type							
	N□□ CPU Unit RS-232C+1 option slot (*)				N□□S CPU Unit Built-in RS-232C				N□□S1 CPU Unit Built-in RS-232C+RS-485			
	Relay outputs		Transistor outputs (sinking/sourcing)		Relay outputs		Transistor outputs (sinking/sourcing)		Relay outputs		Transistor outputs (sinking/sourcing)	
Power supply	AC	DC	AC	DC	AC	DC	AC	DC	AC	DC	AC	DC
10 I/O points	--	--	--	--	--	--	--	--	--	--	--	--
14 I/O points	○	○	○	○	--	--	--	--	--	--	--	--
20 I/O points	○	○	○	○	--	--	--	--	--	--	--	--
30 I/O points	○	○	○	○	○	--	--	○	○	--	--	○
40 I/O points	○	○	○	○	○	--	--	○	○	--	--	○
60 I/O points	○	○	○	○	○	--	--	○	○	--	--	○
20 I/O points (Built-in analog)	○	--	--	○	--	--	--	--	--	--	--	--

*30, 40 and 60 I/O points only.

9. Program Arduino

```
2.2.    #include <LiquidCrystal_I2C.h>
2.3.    #include <Wire.h>
2.4.    #define RELAY1_PIN 10
2.5.    #define RELAY2_PIN 11
2.6.    #define RELAY3_PIN 12
2.7.    #define RELAY4_PIN 13
2.8.    LiquidCrystal_I2C lcd(0x27, 20,4);
2.9.    const int trigPin = 2;
2.10.   const int echoPin = 3;
2.11.   const int trigPin1 = 4;
2.12.   const int echoPin1 = 5;
2.13.   long duration;
2.14.   int jarak;
2.15.   long duration1;
2.16.   int jarak1;
2.17.   void setup() {
2.18.       // Relay 4 Channel
2.19.       pinMode(RELAY1_PIN, OUTPUT);
2.20.       pinMode(RELAY2_PIN, OUTPUT);
2.21.       pinMode(RELAY3_PIN, OUTPUT);
2.22.       pinMode(RELAY4_PIN, OUTPUT);
2.23.       digitalWrite(RELAY1_PIN, LOW);
2.24.       digitalWrite(RELAY2_PIN, LOW);
2.25.       digitalWrite(RELAY3_PIN, LOW);
2.26.       digitalWrite(RELAY4_PIN, LOW);
2.27.       // Sensor HC-SR04
```

```

2.28.     lcd.backlight();
2.29.     lcd.begin(20, 4);
2.30.     pinMode(trigPin, OUTPUT);
2.31.     pinMode(echoPin, INPUT);
2.32.     pinMode(trigPin1, OUTPUT);
2.33.     pinMode(echoPin1, INPUT);
2.34.
2.35.     }
2.36. void loop() {
2.37.     digitalWrite(trigPin, LOW);
2.38.     delayMicroseconds(2);
2.39.     digitalWrite(trigPin, HIGH);
2.40.     delayMicroseconds(10);
2.41.     digitalWrite(trigPin, LOW);
2.42.     duration = pulseIn(echoPin, HIGH);
2.43.     jarak = duration * 0.034 / 2;
2.44.     digitalWrite(trigPin1, LOW);
2.45.     delayMicroseconds(2);
2.46.     digitalWrite(trigPin1, HIGH);
2.47.     delayMicroseconds(10);
2.48.     digitalWrite(trigPin1, LOW);
2.49.     duration1 = pulseIn(echoPin1, HIGH);
2.50.     jarak1 = duration1 * 0.034 / 2;
2.51.     lcd.setCursor(0, 0);
2.52.     lcd.print("HCSR 1: ");
2.53.     lcd.print(jarak);
2.54.     lcd.print("cm");
2.55.     lcd.setCursor(0, 2);
2.56.     lcd.print("HCSR 2: ");

```

```

2.57.     lcd.print(jarak1);
2.58.     lcd.print("cm");
2.59.     delay(100);
2.60.     if (jarak >= 6 && jarak <=8){
2.61.         lcd.setCursor(0, 0);
2.62.         lcd.print("HCSR 1: ");
2.63.         lcd.print(jarak);
2.64.         lcd.print("cm");
2.65.         lcd.setCursor(0, 1);
2.66.         lcd.print("Aman  ");
2.67.         delay(100);
2.68.         digitalWrite(RELAY1_PIN, HIGH);
2.69.         digitalWrite(RELAY2_PIN, HIGH);
2.70.         digitalWrite(RELAY3_PIN, HIGH);
2.71.         digitalWrite(RELAY4_PIN, HIGH);
2.72.     }
2.73.     else if (jarak >= 4 && jarak <= 5){
2.74.         lcd.setCursor(0, 0);
2.75.         lcd.print("HCSR 1: ");
2.76.         lcd.print(jarak);
2.77.         lcd.print("cm");
2.78.         lcd.setCursor(0, 1);
2.79.         lcd.print("Waspada");
2.80.         delay(100);
2.81.         digitalWrite(RELAY1_PIN, HIGH);
2.82.         digitalWrite(RELAY2_PIN, HIGH);
2.83.         digitalWrite(RELAY3_PIN, HIGH);
2.84.         digitalWrite(RELAY4_PIN, HIGH);
2.85.     }

```

```

2.86.     else if (jarak >= 0 && jarak <= 3){
2.87.     lcd.setCursor(0, 0);
2.88.     lcd.print("HCSR 1: ");
2.89.     lcd.print(jarak);
2.90.     lcd.print("cm");
2.91.     lcd.setCursor(0, 1);
2.92.     lcd.print("Miring ");
2.93.     delay(100);
2.94.     digitalWrite(RELAY1_PIN, LOW);
2.95.     digitalWrite(RELAY2_PIN, HIGH);
2.96.     digitalWrite(RELAY3_PIN, HIGH);
2.97.     digitalWrite(RELAY4_PIN, HIGH);
2.98.     }
2.99.     else if (jarak <= 9 && jarak >= 12){
2.100.    lcd.setCursor(0, 0);
2.101.    lcd.print("HCSR 2: ");
2.102.    lcd.print(jarak);
2.103.    lcd.print("cm");
2.104.    lcd.setCursor(0, 1);
2.105.    lcd.print("      ");
2.106.    delay(100);
2.107.    digitalWrite(RELAY1_PIN, HIGH);
2.108.    digitalWrite(RELAY2_PIN, HIGH);
2.109.    digitalWrite(RELAY3_PIN, HIGH);
2.110.    digitalWrite(RELAY4_PIN, HIGH);
2.111.    }
2.112.    if (jarak1 >= 6 && jarak1 <=8){
2.113.    lcd.setCursor(0, 2);
2.114.    lcd.print("HCSR 2: ");

```

```

2.115.     lcd.print(jarak1);
2.116.     lcd.print("cm");
2.117.     lcd.setCursor(0, 3);
2.118.     lcd.print("Aman  ");
2.119.     delay(100);
2.120.     digitalWrite(RELAY1_PIN, HIGH);
2.121.     digitalWrite(RELAY2_PIN, HIGH);
2.122.     digitalWrite(RELAY3_PIN, HIGH);
2.123.     digitalWrite(RELAY4_PIN, HIGH);
2.124.     }
2.125.     else if (jarak1 >= 4 && jarak1 <= 5){
2.126.         lcd.setCursor(0, 2);
2.127.         lcd.print("HCSR 2: ");
2.128.         lcd.print(jarak1);
2.129.         lcd.print("cm");
2.130.         lcd.setCursor(0, 3);
2.131.         lcd.print("Waspada");
2.132.         delay(100);
2.133.         digitalWrite(RELAY1_PIN, HIGH);
2.134.         digitalWrite(RELAY2_PIN, HIGH);
2.135.         digitalWrite(RELAY3_PIN, HIGH);
2.136.         digitalWrite(RELAY4_PIN, HIGH);
2.137.         }
2.138.     else if (jarak1 >= 0 && jarak1 <= 3){
2.139.         lcd.setCursor(0, 2);
2.140.         lcd.print("HCSR 2: ");
2.141.         lcd.print(jarak1);
2.142.         lcd.print("cm");
2.143.         lcd.setCursor(0, 3);

```

```

2.144.     lcd.print("Miring ");
2.145.     delay(100);
2.146.     digitalWrite(RELAY1_PIN, HIGH);
2.147.     digitalWrite(RELAY2_PIN, LOW);
2.148.     digitalWrite(RELAY3_PIN, HIGH);
2.149.     digitalWrite(RELAY4_PIN, HIGH);
2.150.     }
2.151.     else if (jarak1 <= 9 && jarak1 >= 12){
2.152.     lcd.setCursor(0, 2);
2.153.     lcd.print("HCSR 2: ");
2.154.     lcd.print(jarak1);
2.155.     lcd.print("cm");
2.156.     lcd.setCursor(0, 3);
2.157.     lcd.print("      ");
2.158.     delay(100);
2.159.     digitalWrite(RELAY1_PIN, HIGH);
2.160.     digitalWrite(RELAY2_PIN, HIGH);
2.161.     digitalWrite(RELAY3_PIN, HIGH);
2.162.     digitalWrite(RELAY4_PIN, HIGH);
2.163.     }
2.164. }

```