Installation Operation Manual
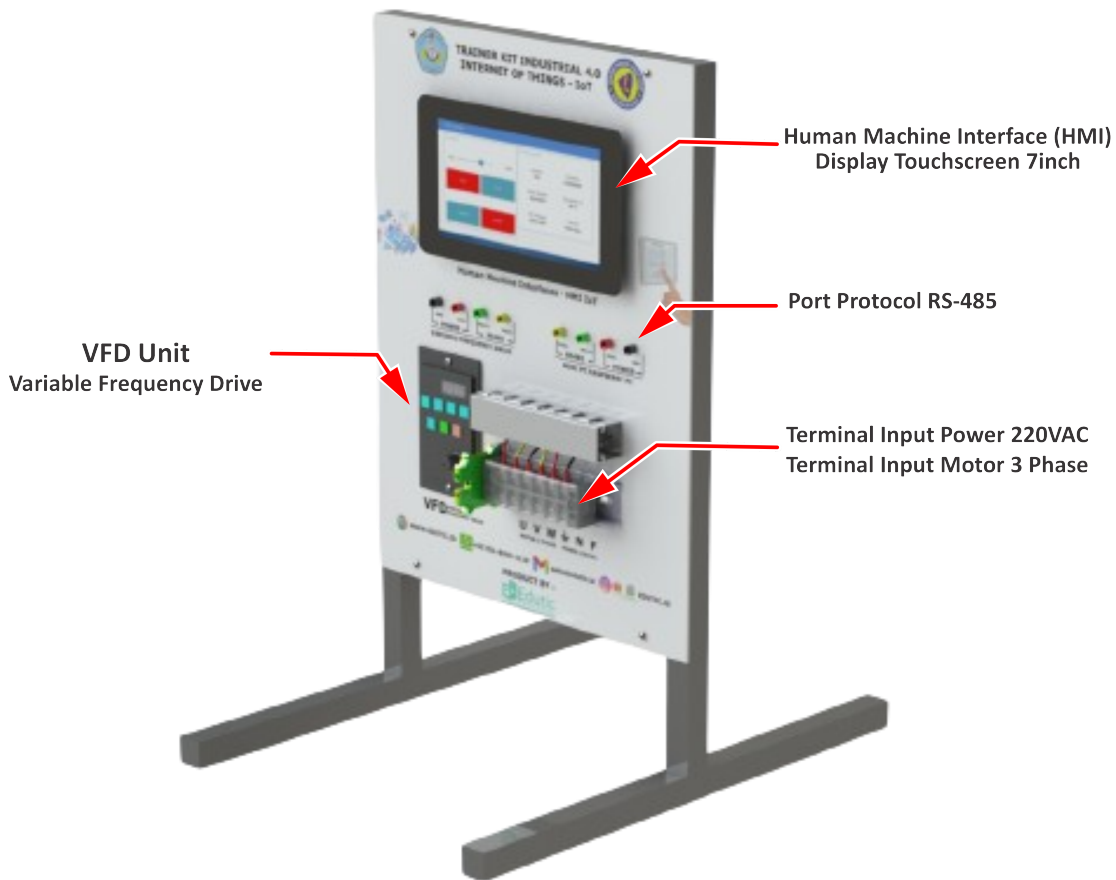# Training Kit
Variable Frequency Drive VFD
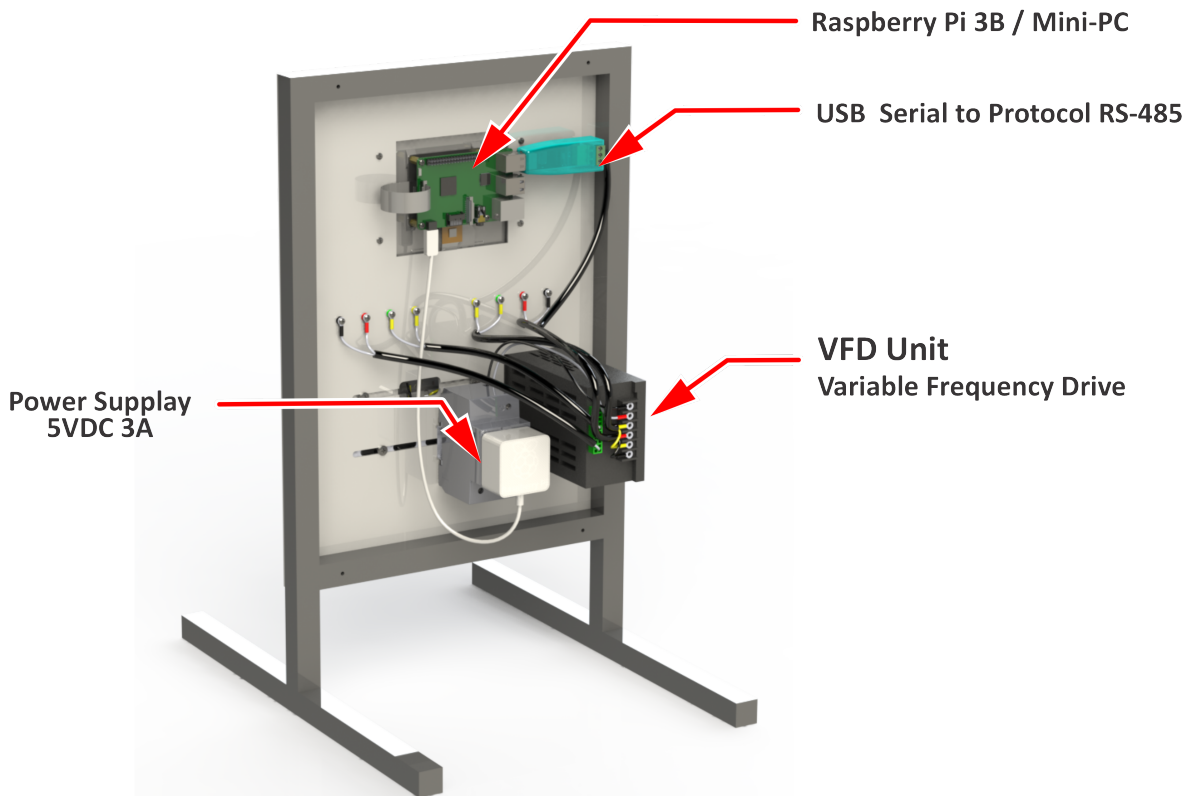

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1. Bagian Kit Trainer
✓ Bagian Depan

Human Machine Interface (HMI)
Display Touchscreen 7inch

Port Protocol RS-485

VFD Unit
Variable Frequency Drive

Terminal Input Power 220VAC
Terminal Input Motor 3 Phase

✓ Bagian Belakang

Raspberry Pi 3B / Mini-PC

USB Serial to Protocol RS-485

VFD Unit
Variable Frequency Drive

Power Supplay
5VDC 3A

2. Unit Inverter/VFD Bagian Depan

L1 lock indication	**L4** power indication
L2 forward rotation indication	**L5** Rs485 indication
L3 reverse rotation indication	**K4** reverse/forward rotation
K1 view / shift	**K3** save / lock
K2 menu / exit	**K7** Diminishing
K5 increasing	**VR** speed regulating potentiometer
K6 start / stop	

3. Unit Inverter/VFD Bagian Belakang

Port Kontroler

Input Power 1 phase 220V

Ground

Output Motor 3 Phase Max. 0.75 Kw

Catatan :
Dikarenakan VFD bersumber dari listrik 1 Fase 220V, Pastikan Motor 3 Phase terhubung pada koneksi **DELTA.**
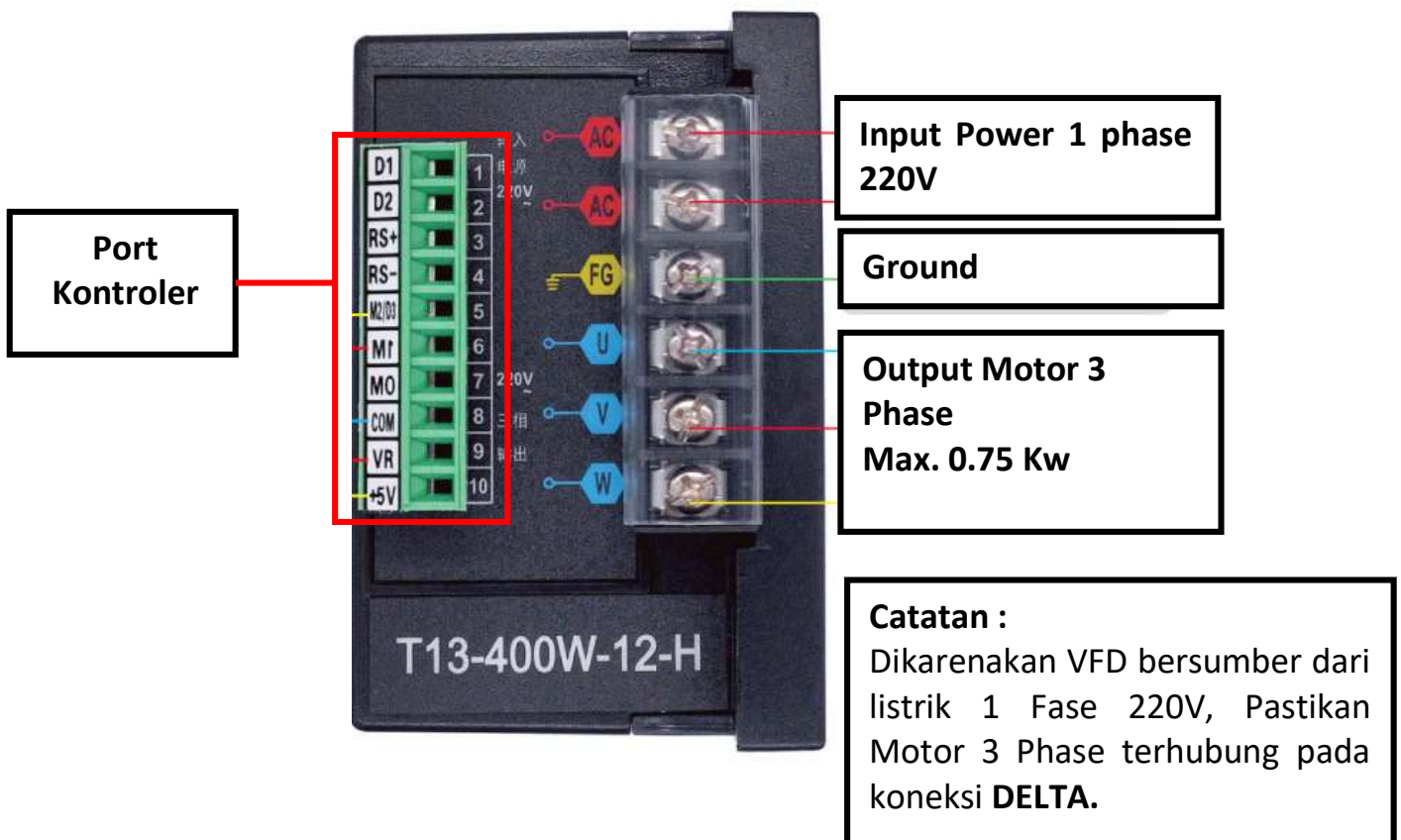
4. Diagram Port Kontroler

Human Machine Interface (HMI)

Kontrol D1 & D2

Kontrol FWD / REV

Lampu Indikator

Resistor 220 Ω

Potensio Kontrol
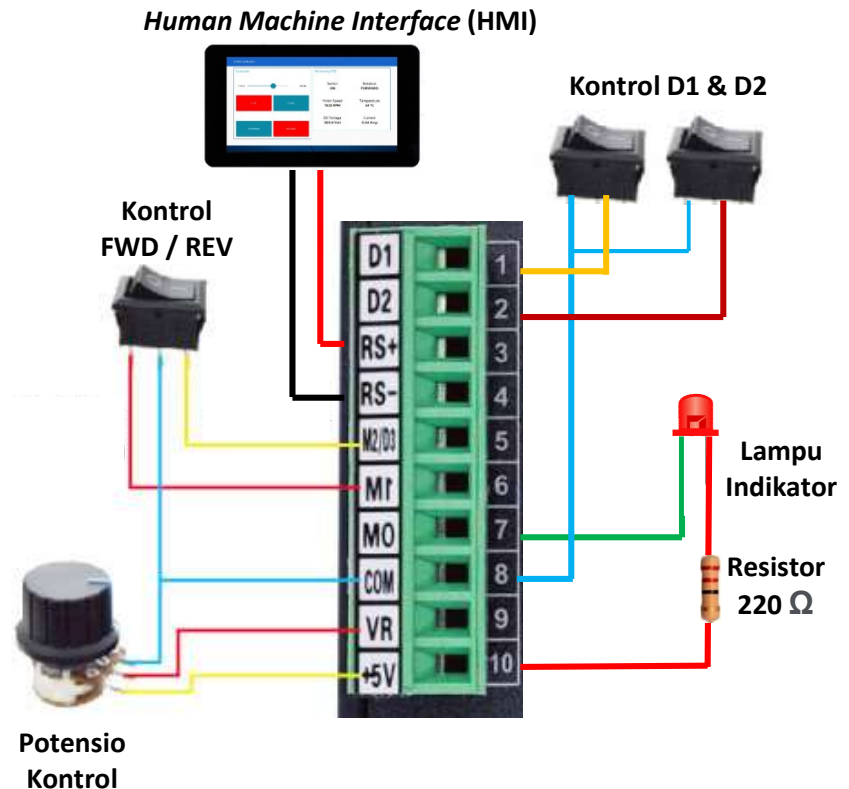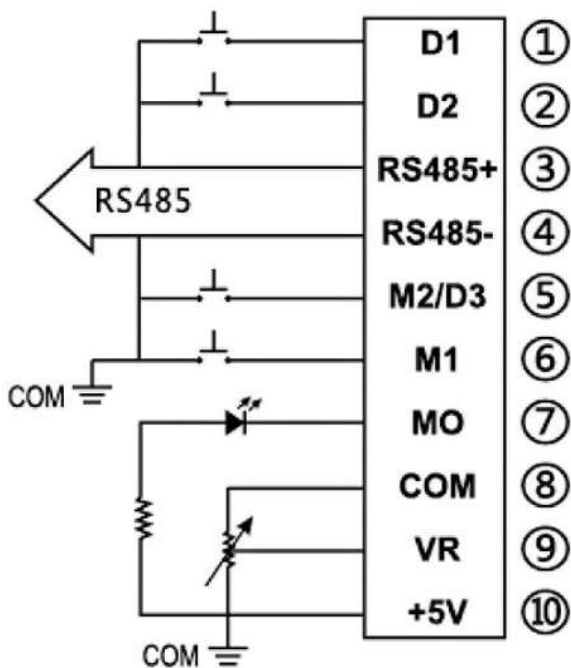
5. Indikator pada Layar VFD

L1 (LOCK) : Indikator bahwa tombol terkunci
L2 (FWD) : Indikator motor dalam putaran Forward
L3 (REV) : Indikator motor dalam putaran Reverse
L4 (POWER) : Indikator Power
L5 (RS-485): Indikator Komunikasi data RS-485

6. Fungsi tombol pada VFD

1. Tombol **K1 (view/shift)** untuk merubah nilai tampilan pada layar, nilai yang ditampilkan sebagai berikut :
    (1) Fxx.x: Menampilkan nilai frekuensi driver.
    (2) t-xx: Menampilkan nilai Suhu driver VFD.
    (3) Cx.xx:Menampilkan nilai Arus listrik.
    (4) xxx.x: Menampilkan nilai Tegangan DC internal.
    (5) xxxx: menampilkan nilai RPM motor.
2. Tombol **K2 (menu/exit)** untuk masuk ke menu setting, ataupun keluar dari menu setting.
3. Tombol **K3 (Save/Lock)** untuk menyimpan setting atau mengunci semua tombol.
    Jika tidak ada interaksi pada tombol selama lebih dari 3 menit, maka tombol akan terkunci secara otomatis. Untuk membukanya tekan tombol **K3 (Save/Lock)** selama 5 detik**.**
4. Tombol **K4 (FWD/REV)** untuk merubah arah putaran motor.
5. Tombol **K5 (arah atas)** untuk navigasi menu setting/ menambah nilai control.
6. Tombol **K6 (On/Off)** untuk menyalakan/mematikan motor dan select pada menu setting.
7. Tombol **K7 (arah bawah)** untuk navigasi menu setting/ mengurangi nilai control.
8. Tombol **VR (potensio knob)** untuk mengantur nilai frekuensi VFD.

7. Cara Merubah Setting VFD

1. Tekan Tombol **K2 (menu/exit).**
2. Akan tertampil angka, angka tersebut merupakan nomor **parrent code** setiap parameter setting
3. Tekan tombol **K5 (arah atas)** atau **K7 (arah bawah)** untuk menggeser nomor
4. Jika sudah tertuju pada nomor parent code yang diinginkan **,** tekan tombol **K6 (On/Off)**
5. Akan muncul angka yang berisi nilai dari parrent code (subitem code), silakan rubah sesuai tujuan Menggunakan tombol **K5** atau **K7 (lihat tabel reverensi).**
6. Jika sudah, tekan Tombol **K6 (On/Off)** untuk memilih dan kembali ke menu **parrent code.**
7. Untuk menyimpan setting, silahkan tekan tombol **K3 (Save/Lock),** pada layar akan muncul tulisan **SAVE,** silahkan tekan kembali tombol **K3 (Save/Lock)** untuk menyimpan setting**.**

8. Tabel Code Parameter Setting VFD

No.	Parent code	Content	Subitem code	Factory value
1	-0.1-	Set start time	Setting range: 1-15 (corresponding time 5s-0.1s)	7
2	-0.2-	Set stop time	Setting range: 1-15 (corresponding time 5s-0.1s)	7
3	-0.3-	Minimum frequency compensation	Setting range: 5-15	8
4	-0.4-	Set compensation maximum frequency	Setting range: 5.0-30.0Hz	20
5	-0.5-	Set the highest frequency voltage ratio of compensation	Setting range: 25-85	55
6	-0.6-	Maximum frequency limiting voltage ratio	Setting range: 80-128	128
7	-0.7-	Rs485 baud rate	0:48(4800) 2:192(19200) 1:96(9600) 3:384(38400)	96
8	-0.8-	Rs485 format, ASCII	1:8N1 3:8E1 2:8N2 4:801	8N1
9	-0.9-	Machine number	1~255	1
10	-1.0-	Source of working frequency	0: Panel keyboard control 1: Panel potentiometer control 2: External analog signal input (output voltage is 0-5V) or external potentiometer 3: RS485 (RS485) 4: Segment speed input	1
11	-1.1-	Start/stop source of control	0: Panel keyboard control 1: RS485 (RS485) 2: Turn forward when power on 3: Turn reverse when power on 4: External port	0
12	-1.2-	Parking method	0: Inertia stop 1: Deceleration stop 2: Brake stop	1
13	-1.3-	M * function selection	0: M1 forward rotation / stop, M2 reverse rotation / stop 1: M1 operation / stop, M2 reverse rotation / forward rotation 2: M1 operation / stop, M2 section speed	0
14	-1.4-	M0 function selection	0: Indication in operation 1: Set arrival indication 2: Fault indication 3: Undefined (customizable)	0
15	-1.5-	Overload protection selection	Undefined	
16	-1.6-	Over temperature protection selection	40℃~100℃	90℃
17	-1.7-	Maximum frequency setting	1.0~99.0Hz	50
18	-1.8-	Minimum operating frequency	1.0~30.0Hz	1
19	-1.9-	Working frequency	1.0~99.0Hz	50
20	-2.0-	Corresponding frequency of the highest output voltage	35.0~99.0Hz	50
21	-2.1-	Segment speed 1 setting	1.0~99.0Hz	5
22	-2.2-	Segment speed 2 setting	1.0~99.0Hz	10
23	-2.3-	Segment speed 3 setting	1.0~99.0Hz	20
24	-2.4-	Segment speed 4 setting	1.0~99.0Hz	25
25	-2.5-	Segment speed 5 setting	1.0~99.0Hz	35
26	-2.6-	Segment speed 6 setting	1.0~99.0Hz	40

27	-2.7-	Segment speed 7 setting	1.0~99.0Hz	45
28	-2.8-	Operating arrival frequency	1.0~99.0Hz	45
29	-2.9-	Undefined (customizable)	...	...
30	-3.0-	Current display selection	1: percentage	1
31	-3.1-	Undefined (customizable)	...	...
32	-3.2-	Braking frequency at stop	0.0-50.0Hz	0
33	-3.3-	Braking time	0.0-5.0S	0
34	-3.4-	Braking coefficient	0-30%	0
35	-3.5-	Polar logarithm	1~6	2
36	-3.6-	Motor slip	0.01~1.00	1
37	-3.7-	Rated speed of motor	1~9999	1500
38	-3.8-	Segment speed 0 setting	1.0~99.0Hz	1
39	-9.1-	Restore default value	Display flashing CLE, press start / stop key to restore	
40	-9.5-	Reset MCU	Display flashing - 8.88, press start / stop key to restore	-8.88

8. Koneksi Terminal Power

Motor 3 Phase
Delta (Δ) Connection
Max. 0.75 kW

Sumber Listrik
1 Phase 220V
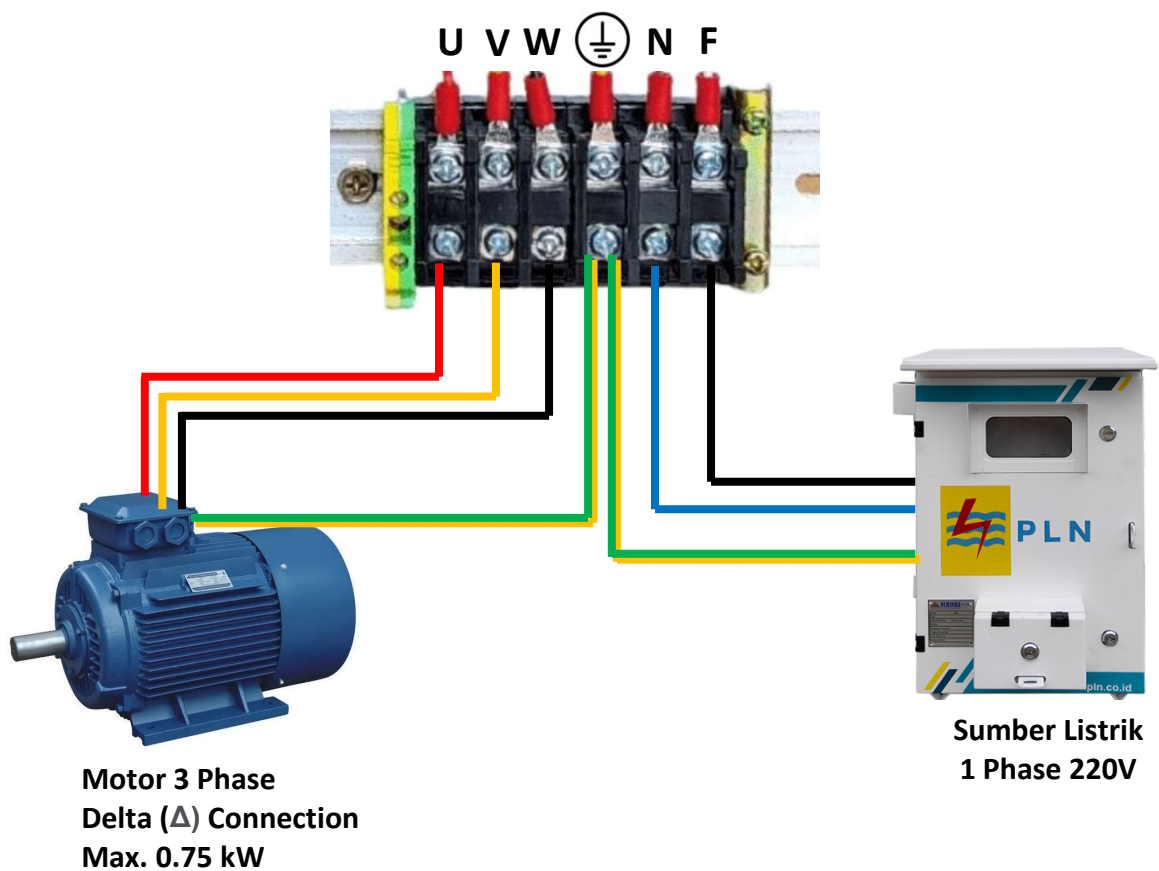
Simbol	Keterangan
U	**Motor Terminal U**
V	**Motor Terminal V**
W	**Motor Terminal W**
⏚	**Grounding**
F	**Fasa - Input Power 220VAC**
N	**Netral - Input Power Netral**

9. Koneksi Port RS-485
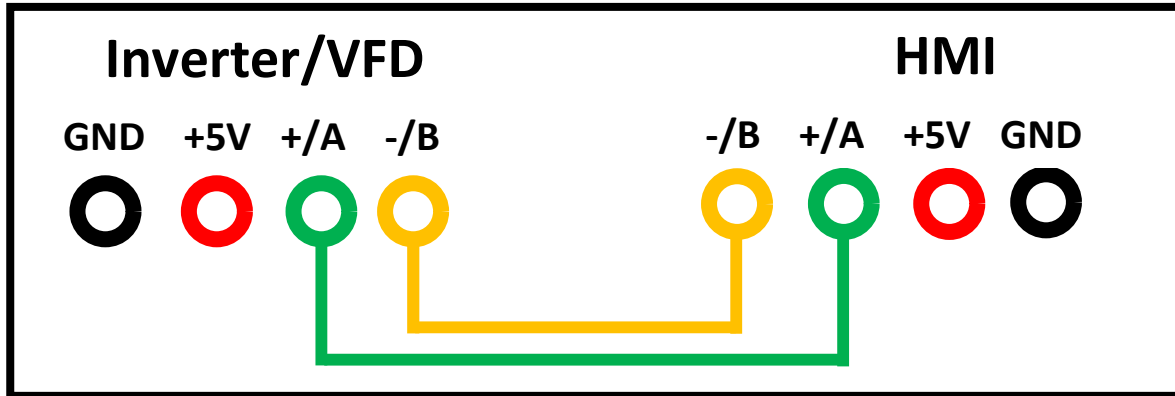
9. Alamat Modbus Inverter/VFD

MODBUS-RTU Protocol Specification V1.3

The data in the protocol include: hexadecimal number, integer, BCD code, floating point number

Register address the attributes in the following table refer to the read-write attributes of data:

R-read   **W-write**   **R / W-read and write**

attribute	address(hex/word)	Register length(word)	data type	describe	explain	Remarks (for example)
				Collect data information		
R	0	2	UINT	--	Display panel firmware version number	--
R	1	2	UINT	--	Power driver board firmware version number	--
R/W	2	2	UINT	Hz	Inverter speed setting and speed feedback	500/10=50.0Hz
R/W	3	2	UINT	--	Inverter start stop and running state feedback	1: forward 2: stop 5: reverse
R	4	2	--	--	--	spare
R	5	2	--	--	--	spare
R	6	2	--	--	--	spare
R	7	2	--	--	--	--
R	8	2	UINT	V	Bus voltage value	3100/10=310.0 V
R	9	2	UINT	A	Bus current value	132/100=1.32A
R	10	2	UINT	℃	Radiator temperature	43=43℃

10. Detail Dimensi Kit Trainer