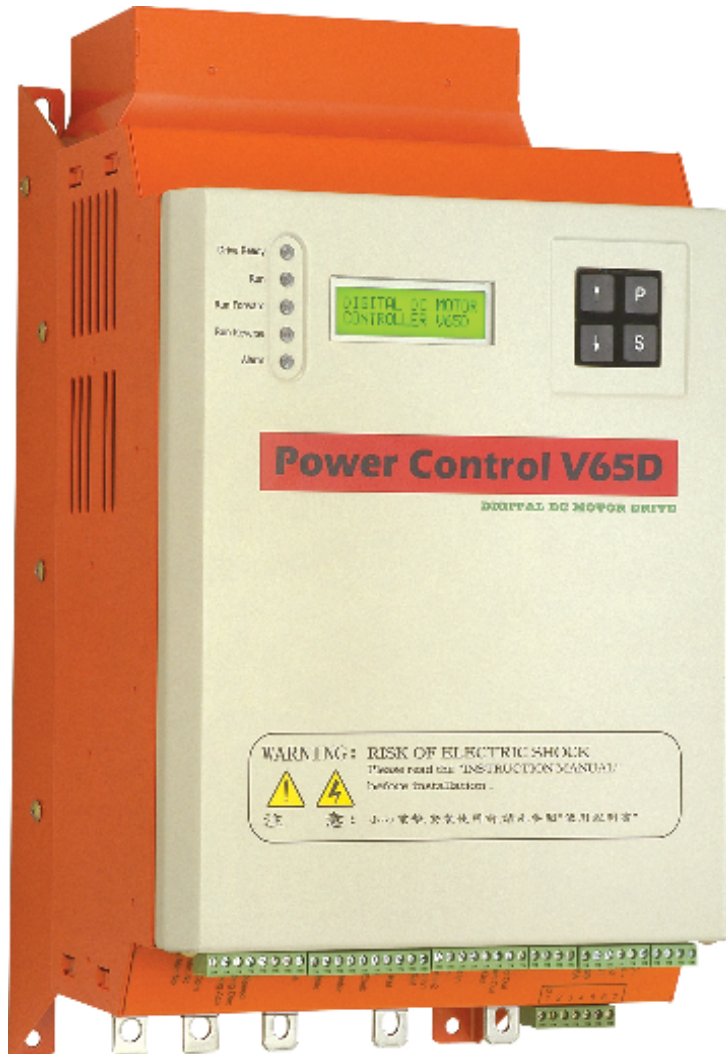


DC MOTOR DRIVE V65D

INSTRUCTION MANUAL



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1. Specifications

Item		Specifications									
Type Code		V65D-DCD4									
Type		0035	0070	0110	0150	0180	0270	0380	0500	0720	
Maximum Applicable DC Motor (KW)	220Vdc	7.5	15	22	30	37.5	55	75	90	150	
	440Vdc	15	30	45	60	75	110	150	185	300	
Input Power (VAC)	Main Circuit (□1)	3□ 200 ~ 440 VAC ±10□ 50/60Hz									
	Control Circuit	1□ 200/220 VAC ±10□ 50/60Hz									
Rating Output	Armature Current	35	70	110	150	180	270	380	500	720	
	Field Current (A)	10	10	10	10	10	10	20	20	20	
Operating Environment	Location	Indoor (avoid with corrosive gas and dust)									
	Ambient Temperature (□2)	0 ~ + 45□			0 ~ +35□						
	Humidity	Relative humidity below 85□ (non-condensing)									
	Altitude (□3)	Below altitude 1000M(sea level)									
Structure	Cooling	Self-cooling		Forced cooling fan							
	Structure	Wall Mounted, Steel Housing, Protection IP20									
	Color	Orange									
Characteristic	Accuracy	2% armature voltage feedback (standard function)									
		0.1% DC TC feedback (standard function)									
		0.01% Encoder feedback (standard function)									
	Speed Range	100: 1(DC TG feedback)									
	Overload Ability	110% continuous; 150%, 30sec; 200%, 10 sec									
	Control Characteristic	Fully Digital Speed Loop: Adjustable P.I Gain Current Loop: Adjustable P.I Gain									
	Display Function	Digital LCD parameters display and Diagnostic Display 5 LED Status indication (run, stop, ...)									
<p>□1 Armature Voltage: $1.2 \times$ AC power Voltage(2Q and 4Q).</p> <p>□2 When the ambient temperature exceeds permissive temperature, Every 1 degree C ,Derating 1% Capacity. The maximum temperature can't exceed +55□.</p> <p>□3 If altitude exceeds 1000M(sea level), Every 200M ,Derating 1% Capacity. The highest altitude can't exceed 5000M.</p>											

Item		Standard	
Main Structure	System Constiution	Provide auxiliary DC +10V/10mA, -10V/10mA, and +12V/250 mA	
		16bit microprocessor	
		System :speed loop, current loop, diital inputs,digital outputs, analoge inputs,analoge outputs.....etc	
		Programing: Keypad or Serial Link	
		Speed Setting: -10V~+10V, Keypad and Serial link	
		Accel/Decel Time: 0 ~ 600 seconds	
		Current Limit: Bi-direction , Limit or Control	
Main Structure	Main Circuit	3□ Full rectified, 2Q (Thiristor× 6) 3□ Full rectified, 4Q(Thiristor × 12)	
	Field Circuit	1φ full-wave rectification	
Protection	Control Board	Self-diagnosis	
	Output Current	Instantaneous Over-cuurent: 200%, 10 sec	
Overload: 150%, 30 sec			
Function	Field Loss	Trip	
	Over-temperature	Motor over-temperature (thermistor/thermostate)	
		Thiristor over-temperature (Forced cooling fan air cooled and thermostate)	
	Feedback Protection	Feedback Error, Feedback Loss	
Others	Motor Lock	Power Phase Loss	
	SCR Trigger Failure	Phase Mistake	
	Zero Speed Dectect	Communication Failure	
	Over-voltage	Over-current	

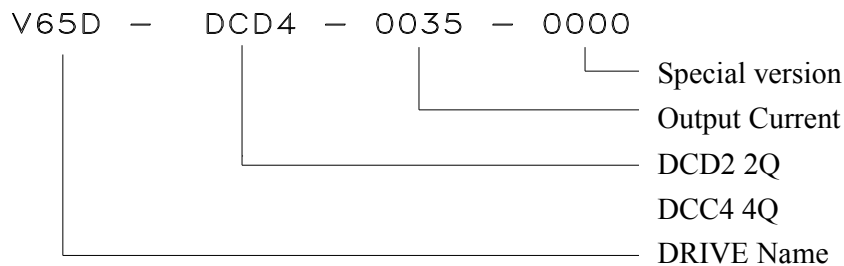
2. Check Items After Receipt

Each V65D DC Motor Drive is tested and adjusted before the delivery. After customer opening the package, please check the followings.

- Check if the type of drive is right (please refer to the data on name-plate).
- Check if the drive is damaged during the transportation.

SPEC.	3□	← Specification
TYPE	V65D-DCD4-0035	← Drive Type
AUX. SUPPLY	50/60HZ 200/200V	← Control Power
SERIAL NO.		← Serial Number
www.hpb-industry.com		

2. 1 Type of Motor Drive:



2. 2 Notices:

- (1) When the drive connect to the power, The user can not do the wire connection job or remove any connector, terminal, component of the drive.
- (2) A ground terminal E of the drive must be grounded. (EARTH)
- (3) Do not make the high voltage test to the components of drive

3. Installation

The installing environment of drive will directly influence its performance and lifetime. Therefore, the installing environment must be considered when installing V65D DC Drive.

. Ambient Temperature: 0 ~ +45°C (35A and 70A)

0 ~ +35°C (rating > 70A)

. Avoid rain, moisture or direct sun exposure.

. Avoid locations with vibration or electromagnetic interference.

. In order to ensure heat dissipation of the drive, the space of devices must be considered when installing.

(1) Cool air should be allowed to vertically flow drive's control board, power board and heat sink.

(2) A space of 150mm or more of the drive (up-side and bottom) should be reserved for airflow at least. If several drives are installed in the same panel, please install a fan to cool down the ambient temperature (refer to the list in the specifications table).

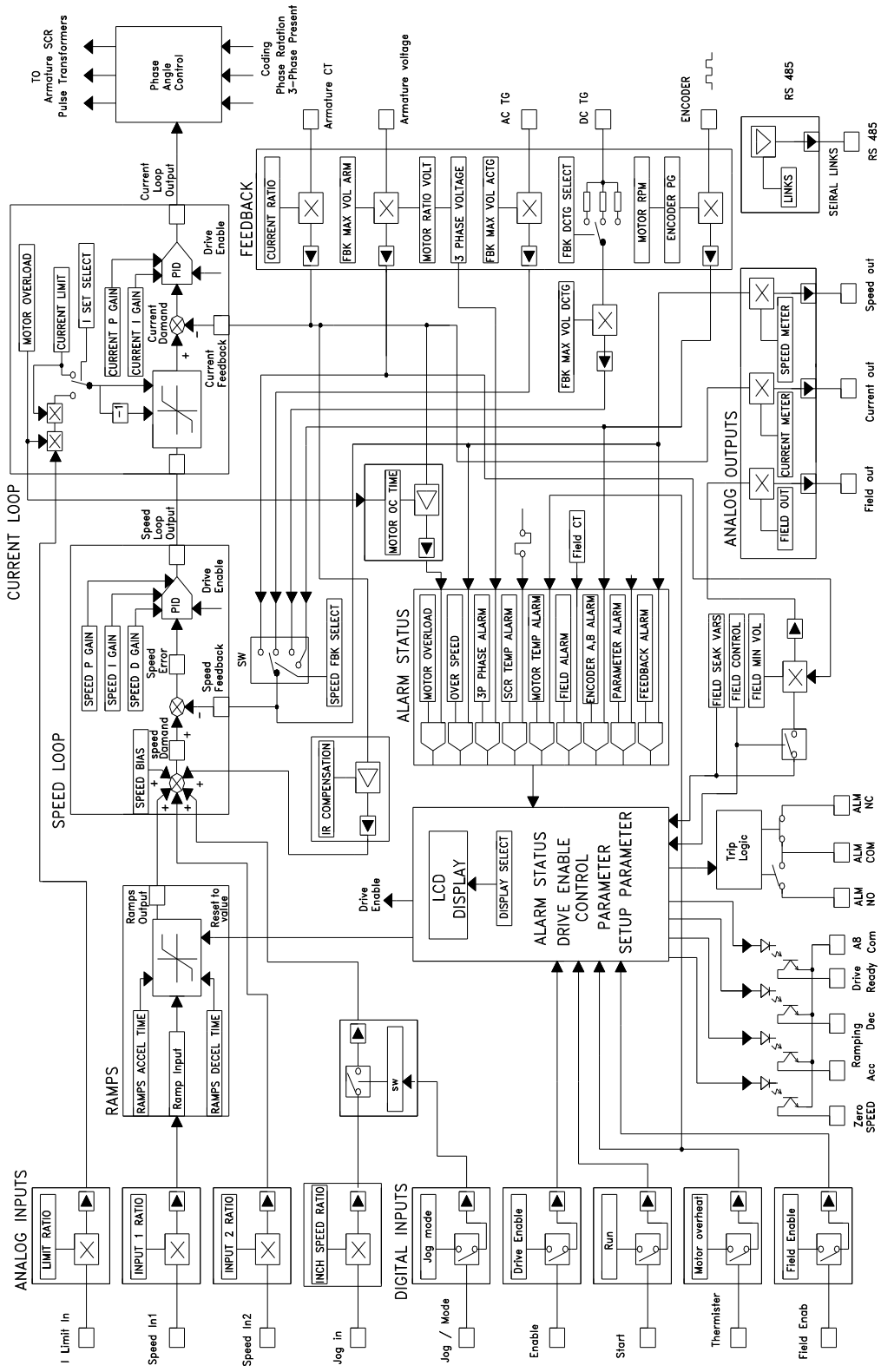
4. System Block Diagram

4.1 Hardware: Including Control Board and Power Board

(1) Control Board:

. Structure: Single board.

Block Diagram:



5. Electric Connections

5.1 Important Notices:

(1) Control Circuit

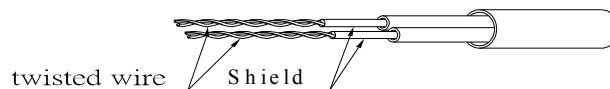
- a. Connection of control circuit cables (terminal A, B, C, E, and F) must be separated with main circuit (R, S, T, A, and H) and other power connection (terminal RF, TF, J, and K), and can't cabling in parallel to avoid noise interference.
- b. In order to avoid noise interference, control cable must use shield cable. The shield must be connected to terminal "OV "(oner side connect to 0V, one side keep free)

(2) Main circuit connection:

Do not care the phase order of input power source.

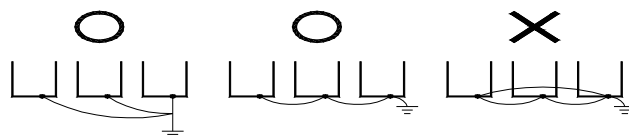
(3) Series Link connection:

cable for a pin E5 and E6 of series link is shown as follows. Two sets of twisted,paired wire are used, each with independently shield.



(4) Grounding cable:

- a. A terminal GND is grounded by the third method (Ground resistance is below 100Ω.).
- b. A ground wire of drive should not be mutually grounded with an electric welding machine and large power motor, which must be separately grounded.
- c. The diameter of ground wire is as big as good and as short as possible.
- d. Please refer to the following diagram when mutually grounding with several drives.



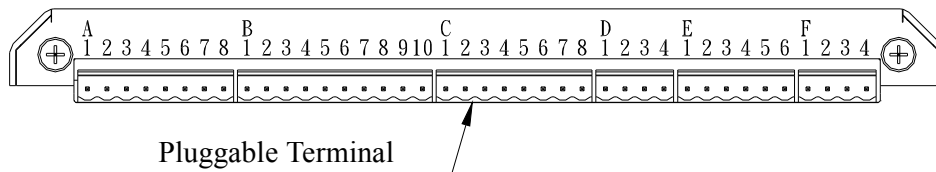
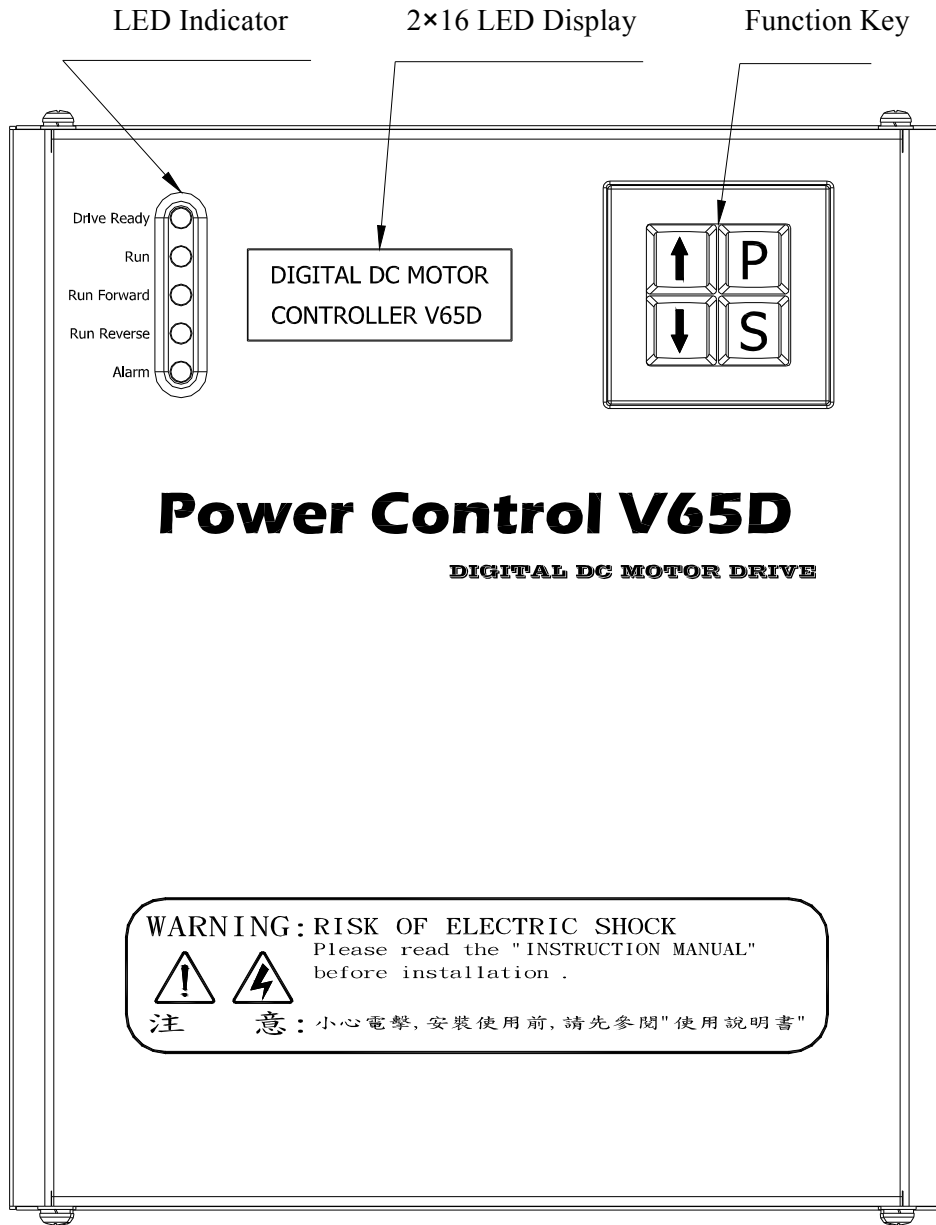
(5) Appliances for main circuit Wiring:

AC power for V65D, input R, S and T should install Circuit breaker (MCCB), AC Line choke (ACL) and high-speed fuse (F).

The rating values recommended for each appliance are shown as the following table:

Rating Output for Drive	Circuit Breaker (MCCB)	AC Line choke	Hiugh-speed Fuse
35A	50A	40A	40A/1000I ² T
70 A	75A	63A	80A/5000 I ² T
110 A	125A	100A	125A/10000 I ² T
150 A	175A	160A	175A/20000 I ² T
180 A	200A	250A	200A/20000 I ² T
270 A	300A	250A	300A/60000 I ² T
380 A	400A	400A	400A/110000 I ² T
500 A	500A	630A	500A/1750000I ² T
720 A	800A	1000A	800A/450000 I ² T

(6) Panel Indication



5.2 Terminals Description:

(1) Terminals Function:

A Main circuit is connected with copper bar R, S, T, A and H. from a power board, RF, TF, R220V and TOV are connected cables from internal drive. A control board is with terminal blocks A,B,C,D,E,F for external connection.

(2) Main circuit:

Copper bar R, S, and T: Connect with input power source.

Copper bar A: Connect with motor armature.

Copper bar H: Connect with motor armature.

(3) Power Board:

Symbol	Function Description	Voltage Range	Remark
Rf Tf	External AC power input of motor field, a field DC power is not supplied by main power, and required to connect external AC power	220Vac recommended	AC voltage=1.11 * DC Field voltage
K J	Output DC voltage of motor field.	According to motor specifications	
R220V Tov	Input of AC power(control voltage) 110Vac ~ 220 Vac can be used.	200/220 Vac recommended	Special voltage available by required

(4) External Power Input of motor Field:

For the power of motor field, please input(connect) the external power (The DC field voltage isn't supplied by the Main power.).

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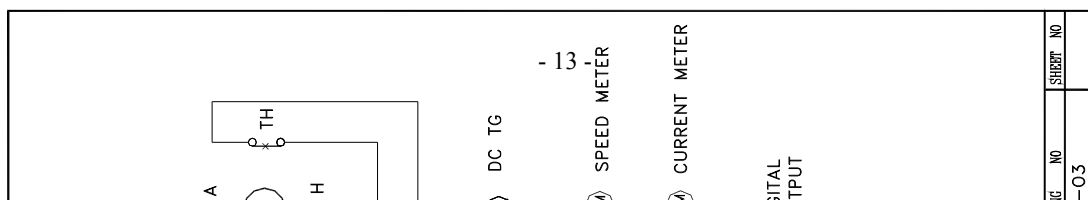
(5) Control Terminals:

Symbol	Name	Function Description	Voltage Range	Remark
A1	Alm NO	Alarm contact output (Dry contact)	250VAC 1 A	
A2	Alm NC	Alarm contact output (Dry close contact)	250VAC 1 A	
A3	Alm COM	Alarm contact output (common point Dry contact)	250VAC 1 A	
A4	Ready	Digital output for a drive ready (open collector)	30VDC 30ma max	
A5	Ramp-ing Acc	Digital output in accelerating (open collector)	30VDC 30ma max	
A6	Ramp-ing Dec	Digital output in decelerating (open collector)	30VDC 30ma max	
A7	Zero Speed	Digital output at zero speed (open collector)	30VDC 30ma max	
A8	Com	Common point for Digital open collector output (OV)		
B1	Start	RUN Digital input		Regularly at +24v
B2	Com	Common point (OV) for Digital inputs		
B3	Enable	Enable Digital input		Regularly at +24v
B4	Com	Common point for Digital open collector output (OV)		
B5	Jog/Mode	Jog digital input		
B6	Com	Common point (OV) for Digital inputs		
B7	Thermistor	Thermistor input (If Thermistor is not used, it must be short-circuited with COM.)		

B8	Com	Common point for Digital open collector output (OV)		
B9	Field Enable	IF An external Auxiliary field power supply is used. The field supply should give a digital signal to drive (B9) to inform DRIVE that the field voltage is set up already. Then the drive is allowable to enable.		
B10	Com	Common point for Digital open collector output (OV)		
C1	+10V Ref	+10VDC, reference voltage	Max 20 ma	
C2	OV	Analog voltage zero point (0V)		
C3	-10V Ref	-10VDC, reference voltage	Max 20 ma	
C4	Speed In1	Speed reference input #1(with ramp)	0 ~ ±10VDC	
C5	Speed In2	Speed reference input#2 (without ramp)	0 ~ ±10VDC	
C6	Jog In	Jog speed reference input	0 ~ ±10VDC	
C7	I Limit In	Current limit reference input	0 ~ ±10VDC	
C8	OV	Zero voltage for Analog signals		
D1	Field Out	Analog output → To control external Auxiliary field supply	0 ~ □10VDC	Max 5 ma
D2	Current Out	Analog output → motor current	0 ~ ±10VDC	Max 5 ma
D3	Speed Out	Analog output →motor speed	0 ~ ±10VDC	Max 5 ma
D4	OV	Zero voltage for Analog signals		
E1	+12V	+12VDC, reference voltage (encoder power)	Max 50ma	
E2	PG B	Phase B of speed feedback encoder	Max 36KHZ	Input impedance 5KΩ
E3	PG A	Phase A of speed feedback encoder	Max 36KHZ	Input impedance 5KΩ
E4	OV	Zero voltage of speed feedback		

		encoder (OV)		
E5	RS 485 A	RS485 terminal A for series link		
E6	RS 485 B	RS485 terminal B for series link		
F1	ACTG1	AC TG terminal	52VAC/2600rpm	
F2	ACTG2	AC TG terminal	72VAC/3600rpm	
F3	DCTG +	DC TG + terminal		
F4	DCTG -	DC TG - terminal		

5.3 Electric connection Diagram:



6. KEYPAD

The user can use KEYPAD, which allows the user to adjust ,control, diagnosis, and monitor the drive system.

Display:

2×16 LCD displays. the upper line indicate the parameter. down line indicate the value of this parameter.

Function Key:

There are four function keys on the right side of KEYPAD, which enables to read and modify parameters. The user can easily find relevant messages and modify parameters to achieve the system requirements.

P Key: Go the next paramrter .This key will not change or save parameters.

S Key: Set parameters values, and save new value.

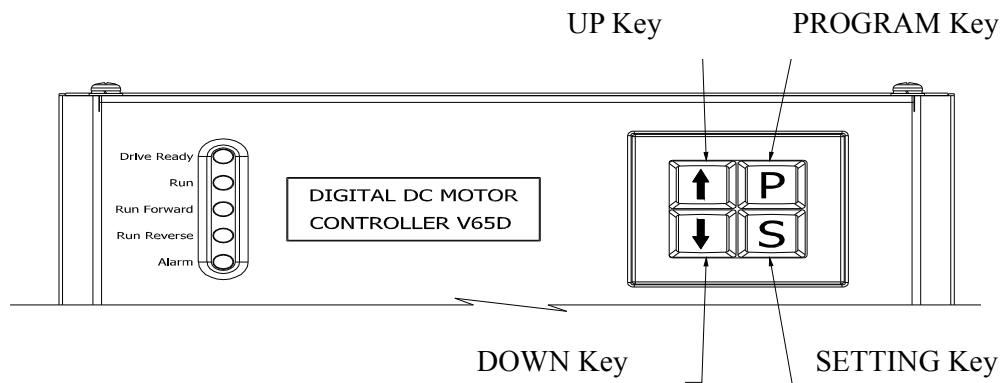
↑ (UP Key): a. Item/Parameter, to move the parameter to next one.

b. When drive is in the parameter setting mode, the UP KEY can increase the value of parameter.

↓ (DOWN Key): a. Item/Parameter, to move the parameter to previous one.

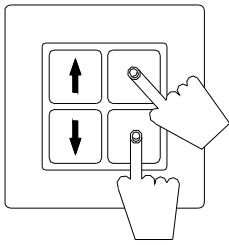
b. When the drive is in parameter setting mode, use the DOWN key to decrease the value of parameter.

Figure:



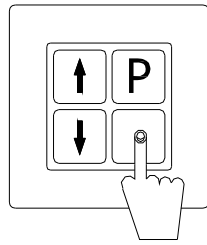
7. Parameter Setting

DIGITAL DC MOTOR
CONTROLLER V65D



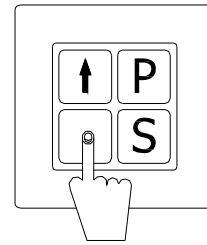
Press P&S key in 5 Seconds
to enter into Paramete
Setting Mode.

DISPLAY SELECT
INPUT VOL



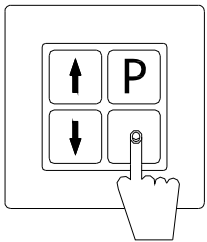
Press the S key to flash
Parameter Value

DISPLAY SELECT
SPEED ERROR



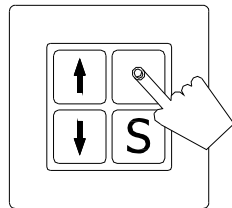
Press the ↑ key or ↓ key
to change parameter Value

RAMPS ACCEL TIME
10.0 SEC



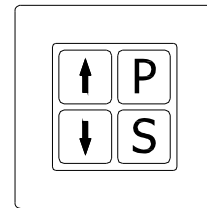
Press the S key after Parameter
Value changed, then to jump the
next parameter.

RAMPS DECEL TIME
10.0 SEC



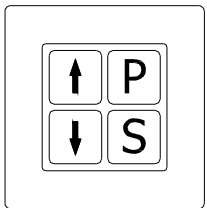
Press the P key to jump to the
next parameter if no
parameter Value change.

RAMPS DECEL TIME
10.0 SEC



If it is in PARAMETER
Setting mode (no flash) the
display will automatioally be
back to normal display mode
in 15 seconds

0.0 A
2.00 V



Finish → Go back to normal display mode

8. Parameters Table

Item	Symbol	Name	Default Setting	Setting Range	Description
1	DISPLAY SELECT	Display selection (Upper line) <input type="checkbox"/> The low line displays speed reference voltage.	feedback voltage	(1): AC phase voltage (2): feedback voltage (3): current (4): current setting (5): armature voltage (6): speed error (7): speed reference	(1) Main power voltage (2) Feedback voltage (3) Motor current (4) Current setting (5) Armature voltage (6) Speed error (7) reference voltage
2	RAMPS ACCEL TIME	Acceleration time	10S	0 ~ 600.0S	0 ~ 600.0s
3	RAMPS DECEL TIME	Deceleration time	10S	0 ~ 600.0S	0 ~ 600.0s
4	INPUT1 RATIO	Ratio of speed input 1	100%	0 ~ 999.9%	
5	INPUT2 RATIO	Ratio of speed input 2	100%	0 ~ 999.9%	
6	INCH SPEED RATIO	Ratio of Jog speed reference input	100 <input type="checkbox"/>	0 ~ 999.9 <input type="checkbox"/>	When the JOG mode enables, The JOG reference input will take effect.
7	SPEED BIAS	Speed input reference bias	0V	-5.00V ~ +5.00V	
8	SPEED P GAIN	Speed loop P gain	200%	0 ~ 999.9%	
9	SPEED I GAIN	Speed loop I gain	15 SEC	0 ~ 999.9S	
10	SPEED D GAIN	Speed loop D gain	0.0%	0 ~ 30.0%	

11	CURRENT P GAIN	Current loop P gain	300%	0 ~ 999.9%	
12	CURRENT I GAIN	Current loop I gain	20SEC	0 ~ 999.9S	
13	IR COMPEN- SATION	Current x Resistor compensation	0%	0 ~ 30.0%	This is for armature voltage feedback mode
14	I SET SELECT	Current reference source selection	CURRENT INSIDE	CURRENT INSIDE CURRENT TB	
15	CURRENT LIMIT	Maximum current limit	According to drive's specifica- tions	25 ~ CURRENT DEMAND	
16	MOTOR OVER LOAD	Motor overload	According to motor's specifica- tions	0 ~ CURRENT LIMIT	
17	MOTOR OC TIME	Over-current Trip time	15S	0 ~ 60.0s	
18	CURRENT METER	Analoge Output signal gain for current meter (analoge output)	100%	0 ~ 200.0%	
19	SPEED METER	Analoge Output signal gain for a speed meter (analoge output)	100%	0 ~ 200.0%	
20	3 PHASE VOLTAGE	3-phase main input voltage	220V	220V, 380V, 440V	Main power voltage

21	MOTOR MAX VOLT	Maximum armature voltage	220V	AC220V: 110 ~ 260V AC380V: 300 ~ 450V AC440V: 370 ~ 520V	The range of armature voltage can be set according to 3-phase input voltage.(This value is the level of over-speed detecting)
22	SPEED FBK SELECT	Selection of speed feedback	VFB	VFB ACTG DCTG ENCODER	VFB: Armature voltage feedback ACTG: AC TG feedback DCTG: DC TG feedback ENCODER: Encoder feedback
23	FBK MAX VOL ARM	Maximum output voltage (armature voltage feedback)	220V	AC220V: 110 ~ 260V AC380V: 300 ~ 450V AC440V: 370 ~ 520V	<u>When the speed reference is</u> <u>10VDC, the output voltage of</u> <u>this drive will be equivalent</u> <u>this value (Only for armature</u> <u>voltage feedback)</u>
24	FBK MAX VOL AC TG	Maximum voltage of AC generator	36VAC (AC TG is 20VAC/ 1000RPM	Speed below 2600rpm (0~52VAC) . 2600rpm~3600rpm (Max= 72VAC)	<u>When speed command is</u> <u>10VDC, output voltage of this</u> <u>drive will be proportional to</u> <u>this voltage(Only for AC TG</u> <u>feedback).</u>
25	FBK DCTG SELECT	Selection of DC TG specification	30VDC/ 1000RPM	DC TG 30VDC/1000RPM DC TG 60VDC/1000RPM DC TG 100VDC/1000RPM	Select according to DC TG specifications.

26	FBK MAX VOL DCTG	Maximum voltage of DC TG	54VDC (30VDC/ 1000RPM)	30VDC/1000RPM: 20 ~ 78V 60VDC/1000RPM: 60 ~ 156V 100VDC/1000RPM: 100 ~ 260V	Take a example: When a motor speed is 2600rpm ~ 3600rpm, the value are as follows: 30VDC: MAX 108V 60VDC: MAX 216V 100VDC: Not applicable
27	MOTOR RPM	Maximum SPEED of motor when the feedback is encoder	1800rpm	0 ~ 3600rpm	When speed reference is 10VDC, The motor will run this speed.
28	ENCODER PG	Pulses per rotation	600P/R	0 ~ 1024P/R	
29	FIELD CONTROL	Select the external auxiliary field supply or drive internal field supply	DISABIE	ENABLE: external auxiliary field supply DISABLE: drive internal field supply	When external auxiliary field supply is used.A contact signal must be sent to drive when the field voltage is set up
30	FIELD WEAK VARS	Armature voltage for field weakening	220VDC	0 ~ 600.0VDC	Normally set the value as rating voltage of motor armature
31	FIELD MAX AMP	Set the max field current of external auxiliary field Controller	20A	1A~20A (Field current reference is 0.5V~10Vdc)	

32	FIELD MIN AMP	T0 set the minimum field current of auxiliary field controller	1A		
33	YUNNTAY Mode#2	Internal calibration Parameter group	0000		Set password to enter calibration parameter group.
34	DIGITAL COM- MAND SELECT	Digital input selection	OUTSIDE TB	(1) OUTSIDE TB (2) SERIAL	(1) DRIVE is controlled by terminals (2) DRIVE is controlled by RS485
35	ANALOG SIGNLE SELECT	Analog input selection	OUTSIDE TB	(1) OUTSIDE TB (3) SERIAL	(1) DRIVE is controlled by terminals (2) DRIVE is controlled by RS485
36	SERIAL ADDRESS	Communication address (STATION.....)	0	0 , 1 ~ 2~99	<input type="checkbox"/> When SERIAL communication is used, the following parameters will display. 0 <input type="checkbox"/> NO send back, all reception 1 ~ 99 stationl address.
37	BAUD RATE	Baud rate	9600	4800 9600 19200	
38	PARITY SET	Parity set	NO PARITY	NO PARITY EVEN PARITY ODD PARITY	NO: No parity bit EVEN: Even bit ODD: Odd bit
39	SERIAL TIME	Detection time for communication error	0.0SEC	0 ~ 25SEC	0.0S <input type="checkbox"/> No detection 0.1 ~ 25SEC

9. Parameters Setting and Description:

9.1 DISPLAY SELECTION

Parameter: DISPLAY SELECT

Select the items displayed on LCD.

1. AC PHASE VOL AC phase voltage
2. FEEDBACK VOL Feedback voltage
3. CURRENT Motor current
4. CURRENT SET Current reference voltage
5. ARM VOLTAGE Armature voltage
6. SPEED ERROR Speed error
7. INPUT VOL Speed reference voltage

9.2 ACCEL TIME

Parameter: RAMPS ACCEL TIME

The time required for motor accelerating from zero speed to the maximum speed.

9.3 DECEL TIME

Parameter: RAMPS DECEL TIME

The time required for motor decelerating from the maximum speed to zero speed.

9.4 REFERENCE INPUT1 RATIO

Parameter: INPUT1 RATIO

Input reference voltage of INPUT1 multiplied by the ratio equals to the actual speed reference voltage

9.5 REFERENCE INPUT2 RATIO

Parameter: INPUT2 RATIO

Input reference voltage of INPUT2 multiplied by the ratio equals to the actual speed reference voltage

9.6 INCH SPEED REFERENCE RATIO

Parameter: INCH SPEED RATIO

Input reference voltage of Jog In multiplied by the ratio equals to the actual JOG speed reference voltage .

SPEED BIAS

Parameter: SPEED BIAS

Bias for reference voltage

9.8 SPEED LOOP P GAIN

Parameter: SPEED P GAIN

The proportional gain of speed loop.

9.9 SPEED LOOP I GAIN

Parameter: SPEED I GAIN

The integral gain of speed loop.

9.10 SPEED LOOP D GAIN

Parameter: SPEED D GAIN

The D gain of speed loop.

9.11 CURRENT LOOP P GAIN

Parameter: CURRENT P GAIN

The proportional gain of current loop.

9.12 CURRENT LOOP I GAIN

Parameter: CURRENT I GAIN

The integral gain of current loop.

9.13 IR COMPENSATION

Parameter: IR COMPENSTION 0 ~ 30%

The speed of motor easily decrease when the current of motor is increasing at armature feedback mode .Using IR compensation function to improve this situation.

9.14 CURRENT SET SELECTION

Parameter: I SET SELECT

Current reference Selection: If select “CURRENT INSIDE” the current limit will be the maximum. If select “CURRENT TB” The current is controlled by +/- 10V from the terminal.

9.15 CURRENT LIMIT

Parameter: CURRENT LIMIT

Set the output current limit of the drive

9.16 MOTOR OVER LOAD

Parameter: MOTOR OVER LOAD

To set the overload level of the motor, please refer the rating current of the motor.

9.17 OVER-CURRENT TRIP TIME

Parameter: MOTOR OC TIME

When motor current exceeds motor overload value, the drive will trip within this time.

Example: Rating current 20A and trip time 10S. When a load operates at 20A, a motor will trip in 10 seconds. Trip constant $\rightarrow 20A \times 10S = 200 AS$. When a load operates at 30A, the trip time will be $200AS/30A = 6.66S$.

9.18 CURRENT METER

Parameter: CURRENT METER

Factory Value: 100%

It is for calibration of external current meter that connect to analog output.

9.19 SPEED METER

Parameter: SPEED METER

Factory Value: 100.0□

It is for calibration of external speed meter that connect to analog output.

9.20 3 PHASE VOLTAGE

Parameter: 3 PHASE VOLTAGE

Default setting: 220V

Set according to 3-phase main power voltage.

9.21 MOTOR MAX VOLTAGE.

Parameter: MOTOR MAX VOLT

Set according to rating voltage of motor armature. The range of armature voltage can be set according to 3-phase voltage.

Main power Input Voltage	Range
AC220V	110 ~ 260VDC
AC380V	360 ~ 450VDC
AC440V	370 ~ 520VDC

9.22 SPEED FEEDBACK SELECTION

Parameter: SPEED FBK SELECT

Default setting: VFB

VFB: Armature voltage feedback

ACTG: AC tacho-generator feedback (ACTG1, ACTG2)

DCTG: DC tacho-generator feedback (DCTG+, DCTG-)

ENCODER: encoder feedback (PG must be with phase A, B)

9.23 FEEDBACK MAX ARMATURE VOLTAGE

Parameter: FBK MAX VOL ARM

Default setting: 220VDC

Setting the value of this parameter is equal to armature voltage at 10VDC speed reference.

9.24 FEEDBACK MAX AC-TG VOLTAGE

Parameter: FBK MAX VOL ACTG

Default setting: 36VAC

Setting the value of this parameter is equal to the voltage of the AC TG while the speed reference voltage is 10VDC.

Example: AC generator is 20VAC/1000RPM. When The motor rotates 1800rpm, the setting will be as follows $\rightarrow 20\text{VAC}/1000\text{rpm} \times 1800\text{rpm} \square 36 \text{ VAC}$. When a speed command is 10VDC, maximum voltage of generator feedback will be 36VAC.

- When a motor rotates over 2600RPM, SW1 for 4P must be fully switched to a position of 3600rpm. (SW1 is located on the bottom right side of PCB YT-214C). Turn off the power when change the position of SW1.

9.25 FEEDBACK DC TG SPECIFICATION SELECTION

Parameter: FBK DC TG SELECT

Default setting: 30VDC/1000RPM

Please set the value according to DC tacho-generator specifications.

9.26 FEEDBACK MAX DC TG VOLTAGE

Parameter: **FBK MAX VOL DCTG**

Default setting: 54VDC

Setting the value of this parameter is equal to speed reference voltage is 10VDC.

Example: DC tacho-generator is 30VDC/1000RPM. When a motor needs to rotate 1800rpm, the setting will be as follows: $30\text{VDC}/1000\text{rpm} \times 1800 \text{ rpm} = 54\text{VDC}$. When a speed command is 10VDC, maximum voltage of DC tacho-generator feedback will be 54VDC.

- When a motor rotates over 2600rpm, SW1 for 4P must be fully switched to a position of 3600rpm. (SW1 is located on the bottom right side of PCB YT-214C). Turn off the power when change the position of SW1.

9.27 MOTOR SPEED IN ENCODER FEEDBACK MODE

Parameter: MOTOR RPM

Default setting: 1800RPM

When the speed command is 10VDC, The speed of motor will be same as the setting

value.

9.28 ENCODER PG

Parameter: ENCODER RESOLUTION

Default setting: 600P/R

Pulses per revolution of encoder

9.29 FIELD CONTROLLER SELECTION

Parameter: FIELD CONTROL

Default setting: DISABLE (field power is supplied by DC DRIVE)

When this parameter is selected as DISABLE, the field power is supplied from this drive.

Field Voltage is determined by AC voltage supplied to RF and TF terminals. The calculations are as follows: AC voltage of RF and TF \times 0.9 \square DC field voltage.

Example: When voltage between RF and TF is AC220V, DC Field voltage (terminal J and K) will be: $220\text{VAC} \times 0.9 \square 198\text{VDC}$. Maximum output current will be set according to drive's specifications, which can be classified as 10A and 20A. If output current exceeds this current, a auxiliary field controller should be ordered.

If parameter is set to ENABLE, the auxiliary external field controller.

will supply exciting current to a motor field, and "FIELD OUT" analogue

output will deliver signal (0~10VDC) to the field controller. After the field voltage and current are completely established, the field controller have to send a contact signal to the dc drive(B9)

9.30 FIELD WEAK ARMATURE VOLTAGE (When the external auxiliary field controller is ENABLE, this parameter will display.)

Parameter: FIELD WEAK VARS

Set this value is the point that starting the field weakening (constant power zone)

It is usually set according to rating voltage of motor armature.

If the field weakening required, a auxiliary field controller should be ordered.

9.31 MAX FIELD CURRENT OF EXTERNAL AUXILIARY FIELD

SUPPLY.(When the external field CURRENT is SET UP, this parameter will display.)

Parameter: FIELD MAX AMP

Default setting: 20A

When the auxiliary field controller is used, this parameter will decide the current of the field.

9.32 MINMUM FIELD CURRENT OF EXTERNAL AUXILIARY FIELD SUPPLY.(When the external field CURRENT is SET UP, this parameter will display.)

Parameter: FIELD MIN AMP

Default value: 1A (Field Out=0.5v)

When the user use the auxiliary field controller.this will decide the minimum field current when field weakebing.

9.33 ENGINEER CALIBRATION PARAMETERS

Parameter: YUNNTAY MODE#2

Default setting: 0000

After setting the password .The user can enter YUNNTAY MODE for setting and calibration the calibration parameters group.

9.34 For communication setting and usage, please refer to Chapter 13.

10. Start Setting and Adjustment

When V65D leaves the factory, basic functions have been set. Before The drive starts to run, all wiring and setting for the installation and connection must be confirmed. The procedures

below should be followed to set and adjust:

- (1) Check motor
- (2) Check power
- (3) Trial run
- (4) Check motor rotation direction
- (5) Adjust the speed feedback.
- (6) Adjust the field weakening
- (7) Adjustment of speed loop gain
- (8) Starting run

10.1 Check Motors:

Before supplying the power, you should make the following checks:

- (1) Check the data on the motor name plate.
- (2) Confirm if the specifications of this drive is suitable for this motor.
- (3) Check 3-phase power voltage .Make sure the voltage is match to the drive.

10.2 Check Power and Start Setting:

10.2.1 Power Setting and Start Setting

□ The items of main setting include:

- (1) Main power Voltage setting: Voltage is set by actual main input power voltage from 3 PHASE power source(AC200V or AC380V or AC440V).
- (2) Setting the maximum armature voltage: Maximum voltage of a motor can be set from MOTOR MAX VOLT. It is usually set according to rating voltage on a motor name plate .multiplied by 1.2 times as the trip value.
- (3) Setting of overload current: Overload current of motor armature can be set from MOTOR OVER LOAD. It is recommended to set according to rating current of a motor.
- (4) Setting of trip time for armature overload: The trip time of motor overload can be set from MOTOR OC TIME.
- (5) Maxmium drive current: The maximum output current of drive can be set from CURRENT LIMIT. It is usually set as the rating current of motor $\times 1.25$ times.
- (6) Feedback selection: The speed feedback mode can be selected from parameter SPEED FBK SELECT.

VFB: Armature voltage feedback
 ACTG: Feedback by AC tacho-generator
 DCTG: Feedback by DC tacho-generator
 ENCODER: Feedback by encoder

(7) Voltage of feedback devices: Setting the parameter by the specification of feedback device.

10.2.2 VFB:

Feedback of armature voltage (It is recommended to set by a motor name plate.) The maximum voltage of this motor is set from FBK MAX VOL ARM (the max speed of the motor for SPEEDIN =10VDC). Before setting this parameter, main power voltage must be set in advance. Otherwise, the drive may not reach the required motor armature voltage.

Table 10-1

Main Input Voltage	Minimum Armature Voltage Setting	Maximum Armature Voltage Setting
3□AC 220V	DC110V ~ DC260V	
3□AC 380V	DC300V ~ DC450V	
3□AC 440V	DC370V ~ DC520V	

10.2.3 ACTG:

AC tacho-generator feedback (20VAC/1000rpm generator) is set from FBK MAX VOL ACTG. Voltage of AC TG is also set when this motor reaches the maximum speed (the max speed of the motor for SPEED IN=10Vdc).

Example: If the AC TG specification is 20VAC/1000RPM. The required speed of a motor is 1800rpm. The voltage calculation for this parameter is: $20VAC \div 1000rpm \times (\text{required speed } 1800rpm) = 36 VAC$.

10.2.4 FBK DCTG:

DC tacho-generator specification is selected by FBK DCTG SELECT.

- (1) DCTG 1000rpm/30VDC
- (2) DCTG 1000rpm/60VDC

(3) DCTG 1000rpm/100VDC

10.2.5 DC TACHO-Generator Voltage:

The voltage is set by FBK MAX VOL DCTG .when the motor is reaching to the maximum speed (the max speed of this motor for SPEEDIN = 10Vdc).

Example: If the DC TG specification is 30VDC/1000RPM The speed required of motor is 1800rpm. The voltage calculation of this parameter will be $30\text{VDC} \div 1000 \text{ rpm} \times (\text{required speed } 1800\text{rpm}) = 54\text{vdc}$.

DC Generator	Minimum Value of Setting Voltage	Maximum Value of Setting Voltage
30VDC/1000RPM	20 VDC (667rpm)	78VDC(2600rpm)
60VDC/1000RPM	60 VDC (1000rpm)	156VDC(2600 rpm)
100VDC/1000RPM	100 VDC (1000rpm)	260VDC(2600 rpm)

10.2.6 Field Setting:

This drive contains one set of single phase full-wave rectified power supply for motor field, AC power supplies from terminal RF and TF, and DC outputs from terminal J and K. If internal field supply of this drive is used, “FIELD CONTROL” must be set to DISABLE.

The maximum output current by this field supply is 10A or 20A(depend on by the drive’s size). DC Output voltage is got by AC voltage between terminal RF and TF. DC Output voltage is calculated as follows:

Voltage between terminal RF and TF $\times 0.9 =$ DC voltage between terminal J and K

If field power is supplied by an external auxiliary field controller, “FIELD CONTROL” must be set to ENABLE. Moreover, The drive will send one analog signal with 0 ~ +10V from FIELD CONTROL terminal to the field controller.. After the field voltage and current is completely established, the field controller has to send a contact signal to the drive.

10.3 Trial Run:

10.3.1 Check Field voltage and current

Please confirm that there are not any mechanical connection between a motor and load during start.

Speed command =1V

Current limit increased
=20□

Feedback error

Check TG feedback

Check PG feedback

Wrong direction

Check TG polarity

Check PG polarity

Motor can not run

Check current

Check armature wiring

Refer to "Error Display
and Troubleshooting"

Speed O.K

Current limit=0

(1) Check AC voltage, The variation is within $\pm 10\%$, and confirm power voltage set to the parameters.

(2) Adjust the speed reference(command) is 0V.

(3) CURRENT LIMIT: According to name plate of motor and multiplied by 1.25 times.

(4) Check the field

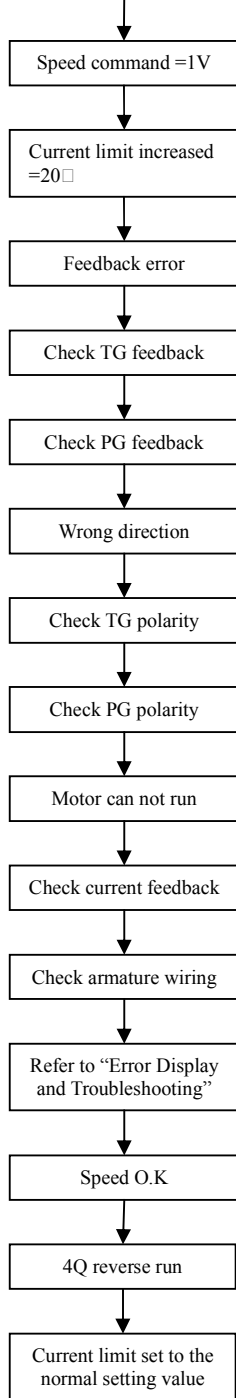
- Confirm the field connection is right.
- Connect a current meter in series to measure the field current.
- Setting this parameter as FIELD DISABLE (Use the internal field power supply of the drive). If a external auxiliary field controller is supplied, Refer to 10.2.6 field setting
- Measure AC voltage between terminal RF and TF
- Measure voltage between terminal J and K(field voltage) and check the current by current meter .



10.4 Check Motor Rotation Direction:

This process is to check if the connection of a motor and feedback device is appropriate.

(1) The current limit is set as 0 .



(2) A speed command is adjusted to 1V; start the drive, and slowly increases the current limit to 20%.

If the speed is correct, the speed of motor will reach 10% of rating speed. If speed feedback is wrong, the speed of a motor will accelerate to the maximum speed and the drive will trip. Error messages will show “SPEED FEEDBACK”. At this situation, the drive should be stopped and 3-phase power will be disconnected.

A. Check followings if the system is TG feedback mode:

1. If motor rotation direction is right? connection of TG is right?
2. Check the field connection.

B. Check the followings if the system is Encoder Feedback mode

1. If motor rotation direction is right? connection of ENCODER is right?
Phase A Lead B or Phase B Lead A
2. Check the field connection.

C. Check the followings if the rotation direction is wrong , but the speed is right.

1. Check the field and TG or ENCODER connections
.When the current limit is increased to 50% or more but the motor doesn't run, you should check the current displayed by keypad.

2. If it displays 0A, please check the connection of motor armature.

If it displays some current, the motor may be overloaded. Or please refer to Troubleshooting for more details.

(3) When the drive is 4Q type, a negative speed command will be required to provide for motor reverse rotation.

(4) The current limit set to the normal value.

10.5 Adjust the speed feedback:

Slowly increase a speed command to 50%, and check Armature voltage , which should be 50% of motor rated voltage .If the voltage is not correct,adjust the speed feedback parameters.

10.6 Field Weakening Setting:

(1) Check if “FIELD OUT” terminal is connected with a external auxiliary field controller

(2) Parameter Setting:

Setting “FIELD CONTROL” parameter to ENABLE

Setting “FIELD WEAK VARS” PARAMETER TO THE “START FIELD WEAKENING ARMATURE VOLTAGE”, which is usually set as rating voltage of armature.

Setting FIELD MIN AMP as MINIMUM EXCITING FIELD CURRENT, which is set according to the motor specifications.

(3) Calibrate the field current is 10A when the field current reference is 10V(OR 20A=10V, Depend the size of motor and drive)

(4) At this ccontrol mode the scale of internal speed (SW1) must be changed if the speed will be between 2600rpm and 3600rpm.

Please disconnect the power before replacing SW1. After ensuring the power light turns off, the upper cover on the low right of control panel will be removed: please turn a switch to a position of 3600rpm.

10.7 Adjustment of Speed Loop Gain:

The adjustments is for response and stability of the drive.the user can check the performance by oscilloscope.

10.8 Starting Run

Before operating, please reconfirm if all relevant parameters are appropriately adjusted.

Then test the motor with load . For the rest of relevant parameters, please refer to chapter 9. Parameter Setting and Description.

11. Error Display and Troubleshooting

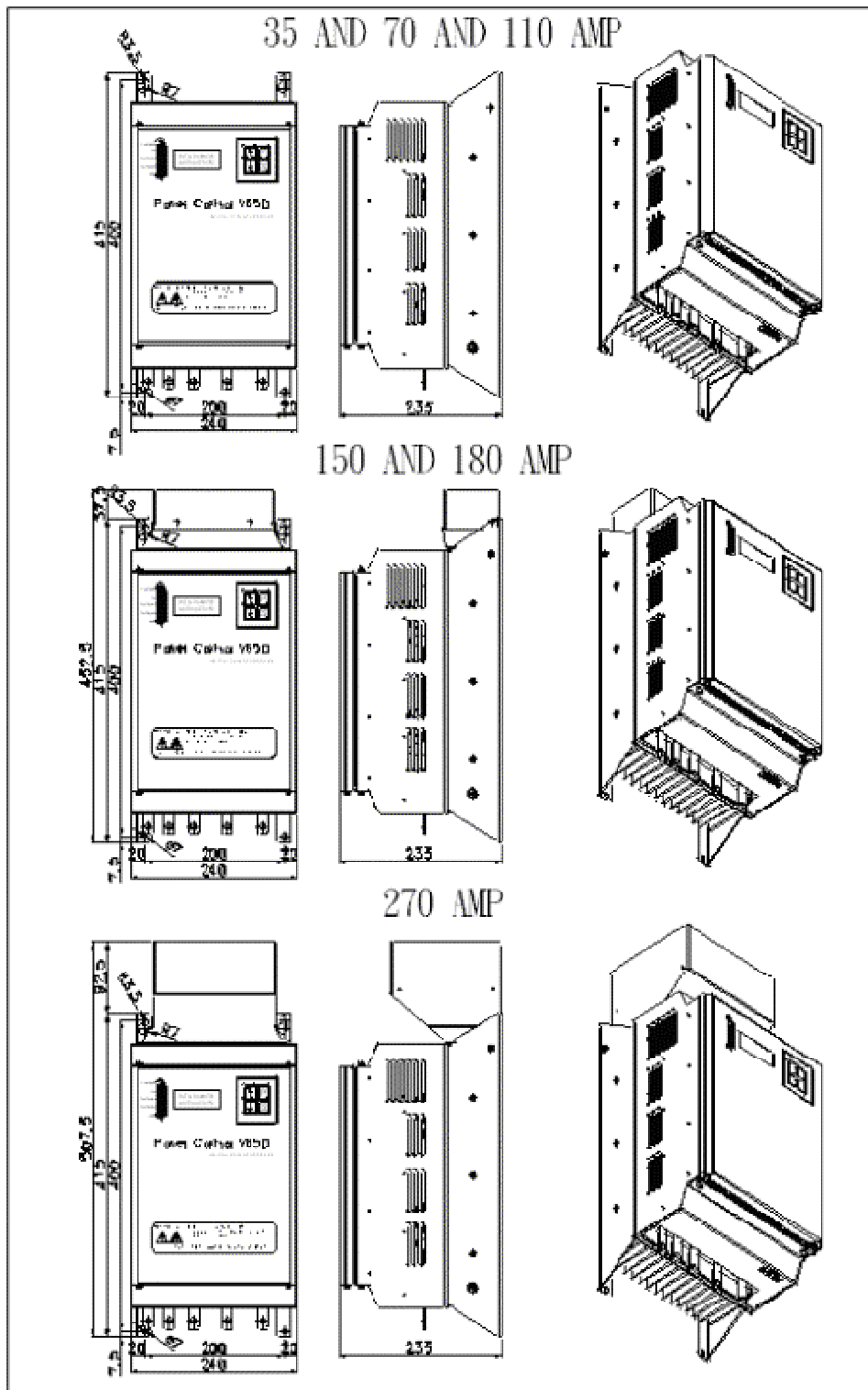
Message Display	Description	Error Cause	Troubleshooting
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RST PHASE ALARM	<ul style="list-style-type: none"> ● phase loss ● Power Voltage below 180VAC 	<ul style="list-style-type: none"> ● PHASE LOSS 	<ul style="list-style-type: none"> ● Check 3-phase voltage
		<ul style="list-style-type: none"> ● Fuse BURN OUT 	<ul style="list-style-type: none"> ● Check fuse
		Poor 3-phase wiring	Check the wiring and tighten up
		Power board error	Replace power board
OVER SPEED ALARM	Overspeed alarm	Armature voltage higher than parameter setting	<ul style="list-style-type: none"> ● Check if armature voltage is incorrectly set ● No speed feedback ● Wrong feedback selection
MOTOR OVERLOAD	Motor overload	<ul style="list-style-type: none"> ● Wrong current setting ● Motor shaft locked ● Wrong field current 	<ul style="list-style-type: none"> ● Check if parameter setting is correct ● Check the machnical side ● Check the field current
SCR TEMP ALARM	SCR temperature alarm	<ul style="list-style-type: none"> ● Drive's fan error ● Fan socket not plugged ● Bad ventilation in a control panel ● High ambient temperature 	<ul style="list-style-type: none"> ● Check cooling fan ● Check fan socket ● Check the position of cooling fan and drive ● Measure the temperature in the control panel. A cooling fan or air-conditioner must be installed if the temperature exceeds the specification

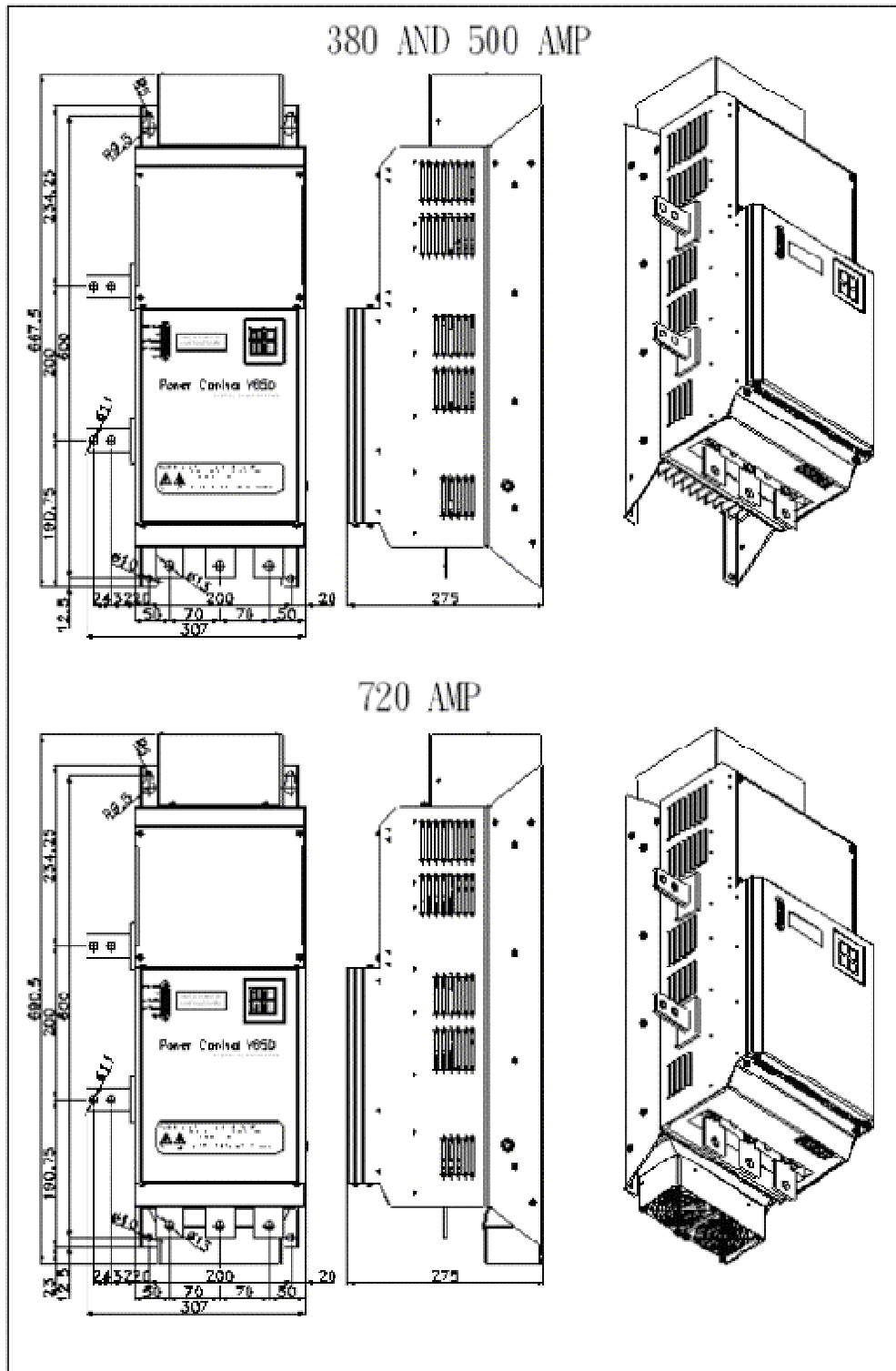
MOTOR TEMP ALARM	Motor temperature alarm	<ul style="list-style-type: none"> ● Over-temperature Protective devices of motor not connected to drive or thermal switch open-circuited ● Fan of motor failure ● Fan filter blocked ● Wrong controller setting 	<p>Check wiring of thermistors and COM.</p> <p>If thermal protectors are not installed, thermistors will be short-circuited with COM.</p> <ul style="list-style-type: none"> ● Check the cooling fan ● Clean or replace a filter of fan unit ● Check current settings
FIELD ALARM	Field alarm	<ul style="list-style-type: none"> ● Field open-circuited or short-circuited ● Permanent magnetic motor used ● Wrong field current ● Field power supply failure 	<ul style="list-style-type: none"> ● Check wiring and isolation. ● Check if FIELD ENAD is short-circuited with COM. ● Check drive's internal field power supply Check field current
ENCODER A. B ALARM	Encoder alarm	<ul style="list-style-type: none"> ● No feedback signal ● No power for encoder ● encoder failure 	<ul style="list-style-type: none"> ● Check the connection of encoder ● Check the power of encoder ● Replace encoder
PARAMETER ALARM	Parameter setting alarm	<ul style="list-style-type: none"> ● Parameter setting out of range 	<ul style="list-style-type: none"> ● Check parameters setting

FEEDBACK ALARM	Feedback alarm	<ul style="list-style-type: none">● Wrong feedback selection● No feedback signal	<ul style="list-style-type: none">● Select the right feedback source● Check feedback wiring
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12.1 Dimension



12.2 Dimension Drawings



13. Communication

V65D MOTOR DRIVE

MODBUS COMMUNICATION

1. Introduction: V65D DRIVE uses RS-485 serial port and Modbus RTU protocol. Several V65D DRIVES connect with PLC or PC in series to achieve the purpose of control and monitoring.

2. Communication standard:

- (1) RS-485 serial port
- (2) Modbus RTU
- (3) Parameter group

3. 1 Setting if the run command is from RS-485:

COMMAND SELECT 0----- run command from terminal block.

COMMAND SELECT 1----- run command from RS-485

3.2 Setting if the analog signal is from RS-485:

SIGNAL SELECT 0 analog signal from terminal block.

SIGNAL SELECT 1 analog signal from RS-485

3.3 SERIAL ADDRESS 0 ~ 99-----communication address (default 0)

In communication format, each unit must have an and unique communication address.

3.4 BAUD RATE 0 ~ 2----- baud rate (default value 0)

BAUD RATE 0-----9600 Bps(bit/s)

BAUD RATE 1-----19200 Bps(bit/s)

BAUD RATE 2-----38400 Bps(bit/s)

3.5 PARITY SELECT 0 ~ 2-----parity setting (default value 0)

PARITY SELECT 0-----no parity

PARITY SELECT 1-----even parity

PARITY SELECT 2-----odd parity

3.6 Time that an error lasts to send communication alarm:

SERIAL TIME□00.0 ~ 999.9S----- error detection time (default value□0.0s)

When SERIAL TIME□00.0S, no communication error will be detected.

When the alarm time exceeds the setting value, the keypad will display error messages.

3.7 RS-485 serial port provides two contacts of RXD and TXD, which enable half-duplex link.

When several RS-485 serial ports are connected in series, only all of RXDs and TXDs must be linked.

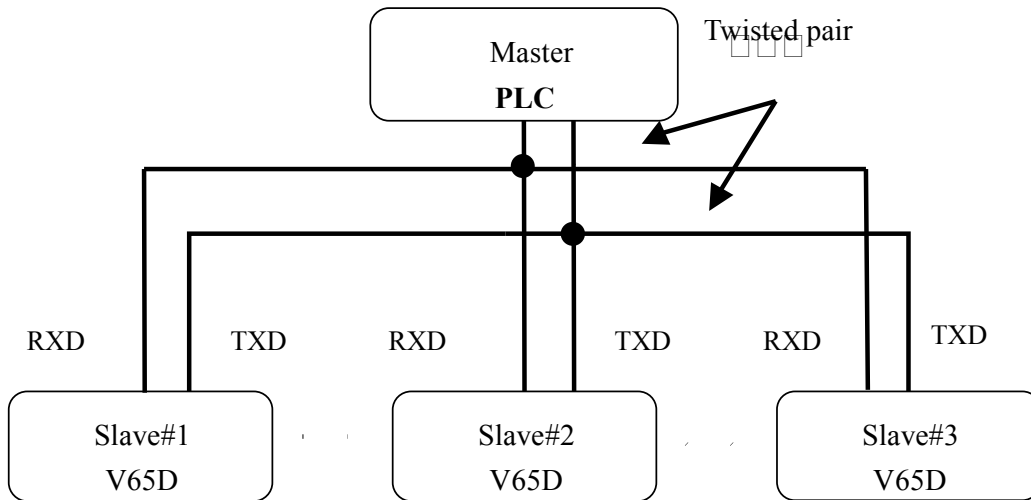


Figure 1: RS-485 wiring

4. Communication Procedures:

- (1) Supply power to a drive, set parameters related to RS-485, connect RS-485 cable, and then a controller(PC or PLC can start communication.
- (2) If the drive is in stop situation (when a run or a speed command of drive is from RS-485) that exceeds the time set by parameters,the doesn't receive any data, The keypad will display "serial alarm" to indicate standby of communication. After the drive receives the data, this message will not be displayed. If the drive is in running situation, that exceeds the time set by parameters doesn't receive any data, The keypad will display "serial alarm".

5. Modbus RTU:

(1) Character:

In Modbus RTU, each character or byte consists of 11 bits: 1 start bit, 8 data bits, 1 parity bit and 1 stop bit. If Parameter=0 no parity, parity must be set as “1”; the transmission is sent from start bit in order, which character formats are shown as follows.

Parity check:

LSB										MSB	
1	2	3	4	5	6	7	8	9	10	11	
Start Bit	Data Bit	Data Bit	Data Bit	Data Bit	Data Bit	Data Bit	Data Bit	Data Bit	Data Bit	Parity Bit	Stop Bit
	0	1	2	3	4	5	6	7			

No-parity check:

MSB										LSB	
1	2	3	4	5	6	7	8	9	10	11	
Start Bit	Data Bit	Data Bit	Data Bit	Data Bit	Data Bit	Data Bit	Data Bit	Data Bit	Data Bit	Stop Bit	Stop Bit
	0	1	2	3	4	5	6	7			

(2) Message:

In Modbus RTU, each message consists of 4 parts, ordering from Slave Address, Function Code Data and CRC-16. Start and end of each message will be 3.5-character time longer for a message and message interval. Message formats are as follows:

3.5-char acter Time Longer	Slave Address	Function Code	Data	CRC-16		3.5-char acter Time Longer
	1 character	1 character	N characters	CRC_L	CRC_L	

(3) Message:

(i) Slave Address

In message format, 1-character will be used to indicate slave address of a drive in RTU, which can be set by parameters with the range from 1 ~ 99

All linked Slaves can receive messages sent from a Master. A Slave that has setting address and is the same with Slave Address not only will be granted to execute this message, but also respond messages to a Master. When sent message address is set as 0, all linked slaves will receive this message at this time, and execute it. A slave will only receive sent messages, and will not respond any messages to a Master.

(ii) Function Code

In message format, 1-character will be used to indicate the function codes of RTU and execute Slave functions in accordance with a command. The function codes of this drive are provided as the following table, which each function is shown in “Message Mode” for further discussion.

Function Code	Function
03H	Read data in register (Holding Register)
06H	Write single datum to register (Holding Register)
08H	Loop test
10H	Write data to register (Holding Register)

(iii) Data

In message format, the data required by each function will be different. Therefore, it isn't fixed for the length of data character, shown in “Message Mode” for further discussion.

(iv) Cyclic Redundancy Check (CRC-16)

In message format, CRC-16 with 2-character length is used to check if the sent data are correct. CRC-16 is a 16-bit binary value. When sending CRC-16, low-byte CRC will be sent first and then followed by byte CRC. The procedures to calculate CRC-16 are as follows:

- i. Setting CRC_16 as FFFFH.

- ii. Making a XOR operation between low byte in CRC-16 and first byte in messages, and low byte are sent back.
- iii. If LSB of CRC_16 is 0, CRC_16 will right shift one bit and upper bit will fill in 0. If LSB of CRC_16 is 1, CRC_16 will right shift one bit and upper bit will fill in 0, and make a XOR operation with A001H.
- iv. Repeat procedure iii until it has right shifted 8 bits.
- v. Repeat (ii)~(iv) for next byte of a message until all byte in it are handled. At this time, the value of CRC-16 is cyclic redundancy check.

Using BASIC to calculate CRC-16:

Function CRC_16(message\$) as long

Crc16&=65535

FOR CHAR%=1 TO LEN(message\$)

Crc16&=crc16& XOR ASC (MID\$(message\$, C% ,1))

FOR BIT%=1 TO 8

IF crc16& MOD 2 THEN

Crc16&=(crc16&\2) XDR 40961

ELSE

Crc16&=crc16&\2

END IF

NEXT BIT%

NEXT CHAR%

Crc_hi%=crc16&\256

Crc_lo%=crc16& MOD 256

Message\$ =message\$ +CHR\$(crc_lo%) + CHR\$(crc_hi%)

Crc_16=crc16&

END FUNCTION CRC_16

(4) Message Mode:

A message can be classified as Command Message and Response Message according to

the source, where a message sent from a Master to a Slave is called Command Message and that sent from a Slave to a Master is called Response Message. In general situation, a Slave with designated address will respond all received Command Messages in 5ms. In the following situations, a Slave will not respond any message:

1. Slave Address in Command Message is different from all of online address.
2. When a Slave receives messages, an error will be detected (Parity, Framing, Overrun or CRC_16).

6. Message Format:

This drive only receives three kinds of command message: Read (03H), Loop Test (08H) and Write (06H and 10H) listed as follows:

Command	Function Code	Function	Command Message		Response Message	
			Byte (Min.)	Byte (Max.)	Byte (Min.)	Byte (Max.)
Read	03H	Read register (holding register) data	8	8	7	37
Write	06H	Write data to single register	8	8	8	8
Loop Test	08H	Loop test	8	8	8	8
Write	10H	Write data to register	11	41	8	8

The format of Command Message and Response Message that can be accepted by a drive is as follows:

(1) Read Command (03H):

Once read the data in 16 registers (Holding Register) at most.

Master Command Message

Slave Address		01H
Function Code		03H
First Register Address	Upper byte	00H
	Low byte	20H
Register Number	Upper byte	00H
	Low byte	01H
CRC-16	Upper byte	00H

Example: A Master reads Slave Address □ 01H, which starts from register address □ 0020H with a length of 1-world data.

Slave Response Message (error)

Slave Address		01H
80H+ Function Code		83H
Error Code		02H
CRC-16	Low byte	01H
	Upper byte	31H

Slave Response Message (ok)

Slave Address		01H
Function Code		03H
Data Byte		02H
First Register Data	Upper byte	08H
	Low byte	02H
CRC-16	Low byte	85H
	Upper byte	10H

(2) Write Command (06H):

Write the data to single register (Holding Register). When inputting a command to set Slave Address as 0, all of online Slaves will simultaneously receive this message and execute it. However, this function is only used to set register address 0000H and 0100H. At this time, all of Slaves will not make any responses. During shutdown, parameters will not be saved in EEPROM. If you input a command to modify parameters, you must write address 0600H to save in EEPROM.

Master Command Message

Slave Address	01H
---------------	-----

Example: A Master writes 0020H to a register 0001H in Slave Address □ 01H.

Function Code		06H
Register Address	Upper byte	00H
	Low byte	01H
Data Characters	Upper byte	00H
	Low byte	20H
CRC-16	Low byte	D9H
	Upper byte	D2H

Slave Response Message (error)

Slave Address		01H
80H+ Function Code		86H
Error Code		03H
CRC-16	Low byte	02H
	Upper byte	61H

Slave Response Message (ok)

Slave Address		01H
Function Code		06H
Register Address	Upper byte	00H
	Low byte	01H
Data Characters	Upper byte	00H
	Low byte	20H
CRC-16	Low byte	D9H
	Upper byte	D2H

(3) Loop Test Command (08H):

Test if a loop is ok

Master Command Message

Slave Address		01H
Function Code		08H
Test Function Code	Upper byte	00H
	Low byte	00H
Test Data	Upper byte	12H
	Low byte	34H
CRC-16	Low byte	EDH
	Upper byte	7CH

Example:

A Master tests if a loop of Slave Address 01H is ok? Send 1234H to a Slave.

Slave Response Message (ok)

Slave Address		01H
Function Code		08H
Test Function Code	Upper byte	00H
	Low byte	00H

Slave Response Message (error)

Slave Address		01H
80H+ Function Code		88H
Error Code		03H
CRC-16	Low byte	06H
	Upper byte	01H

(4) Write Command (10H):

Write several sums of register (Holding Register). Once write the data in 16 registers. When writing a command to set address as 0, all of online Slaves will simultaneously receive this message and execute it. However, this function is only used to set register address 0000H and 0001H. At this time, all of Slaves will not make any responses. During shutdown, parameters will not be saved in EEPROM. If you input a command to modify parameters, you must write address 0600H to save in EEPROM.

Master Command Message

Slave Address		01H
Function Code		10H
First Register Address	Upper byte	00H
	Low byte	01H
Register Number	Upper byte	00H
	Low byte	01H
Date Byte□		02H
First Data Characters	Upper byte	00H
	Low byte	30H
CRC-16	Low byte	
	Upper byte	

Example: A Master writes 2-byte data (0003H) to Slave Address□01H. The start position of a register is in 00001H.

Slave Response Message (error)

Slave Address		01H
Function Code		10H
First Register	Upper byte	00H
	Lower byte	

Slave Response Message (ok)

Slave Address		01H
80H+ Function Code		90H
Error code		03H
CRC-16	Low byte	0CH
	Upper byte	01H

- Data byte are 2 times register number

7. Register (Holding Register):

Registers can be classified as Control, Monitor and Drive Parameter:

Register Type	Register Property	Register Address
Control data	Read/write	0270H ~ 027FH
Monitor data	Read only	0280H ~ 028FH
Drive parameter	Read/write	0200H ~ 025FH

7. 1 Control Data Registers (read and write): Used to control motor drive's motion.

Control Data Registers (0270H ~ 027FH)

1. 0270H

BIT0:

BIT1: Drive Run

BIT2: Jog Enable

BIT3:

BIT4: Field Enable

BIT5:

BIT6:

BIT7:

2. 0271H (SPARE)

BIT0:

BIT1:

BIT2:

BIT3:

BIT4:

BIT5:

BIT6:

BIT7:

3. 0272H: 0 ~ 10v single

0 ~ 4095 count

IN 1 Sfs

0273H.15=0 (+)

4. 0274H: 0 ~ 10v single

0 ~ 4095 count

IN 2

0275H.15=0 (+)

5. 0276H: 0 ~ 10v single

0 ~ 4095 count

Jog

0277H.15=0 (+)

6. 0278H: 0 ~ 10v single

0 ~ 4095 count

Iset

0279H.15=0 (+)

7. 2 Parameter Data Registers (read/write): Used to control motor drive's motion.

Register (0200H ~ 024FH)

1. 0200H: Resverd
2. 0202H: Display Select
3. 0204H: Ramps Accel Time
4. 0206H: Ramps Decal Time
5. 0208H: Input 1 Ratio
6. 020AH: Input 2 Ratio
7. 020CH: Inch Speed Ratio
8. 020EH: Speed Bias
9. 0210H: Current P Gain
10. 0212H: Current I Gain
11. 0214H: Current D Gain
12. 0216H: Current P Gain
13. 0218H: Current I Gain
14. 021AH: IR ompensation
15. 021CH: I Set Select
16. 021EH: Current limit
17. 0220H: Motor Over Load
18. 0222H: Motor Oc Time
19. 0224H: Current Meter %
20. 0226H: Speed Meter %
21. 0228H: 3 Phase Voltage
22. 022AH: Motor Max Volt
23. 022CH: Speed Fbk Select
24. 022EH: FBK Max Vol Arm
25. 0230H: FBK Max Vol Dctg
26. 0232H: FBK DC TG Select
27. 0234H: FBK Max Vol DC TG
28. 0236H: Motor rpm
29. 0238H: Eneoder PG
30. 023AH: Field Control
31. 023CH: Field Seak Vars

- 32. 023EH: Field Max Amp
- 33. 0240H: Field Min Amp
- 34. 0242H: Command Select
- 35. 0244H: Single Select
- 36. 0246H: Serial Address
- 37. 0248H: Baud Rate
- 38. 024AH: Party Set
- 39. 024CH: Serial Time
- 40. 024EH: Yunntay Mode #2

7. 3 Monitoring Data Registers (read only) used to read motor drive's run.

1. 0280H

BIT0: Drive Enable	0: Stop	1: Enable
BIT1: Drive Run	0: Stop	1: Run
BIT2: Input	0: For	1: Rev
BIT3: Acc Speed	0:	1: Accelerating
BIT4: Dec Speed	0:	1: Declerating
BIT5:	0:	1: Zero speed
BIT6: Zero current	0:Zero current	1: with current
BIT7: Relay	0: No Alarm	1: Alarm

2. 0281H

BIT0:		
BIT1:		
BIT2:		
BIT3:		
BIT4:		
BIT5: VFB	0: For	1: Rev
BIT6:		
BIT7: Dctg	0: For	1: Rev

3. 282H

BIT0: Primary Power Error

- BIT1: Over Speed Error
- BIT2: Over Load Error
- BIT3: Feed Back Error
- BIT4: Motor Over Temperature Error
- BIT5: SCR Over Temperature Error
- BIT6: EEPROM Error
- BIT7: Parameter Set Error

4. 0283H

- BIT0: Internal Field Error
- BIT1: Encode A.B Error
- BIT2: External Field Error
- BIT3:
- BIT4:
- BIT5: Serial link Error
- BIT6: Serial Read/Write Address Error
- BIT7: Crc16 Code Error

- | | | | | | |
|-----|----------------|--------|--------------------------|-----------------|-----------------|
| 5. | 0284H: 0 ~ 10v | Single | | | |
| | 0 ~ 4095 | Count | <input type="checkbox"/> | Input | 0285H.15=0 (+) |
| 6. | 0286H: 0 ~ 10v | Single | | | |
| | 0 ~ 4095 | Count | <input type="checkbox"/> | Feed Back VFB | 0287H.15=0 (+) |
| 7. | 0288H: 0 ~ 10v | Single | | | |
| | 0 ~ 4095 | Count | <input type="checkbox"/> | Feed Back AC TG | 0289H.15=0 (+) |
| 8. | 028AH: 0 ~ 10v | Single | | | |
| | 0 ~ 4095 | Count | <input type="checkbox"/> | Feed Back DC TG | 028BH.15=0 (+) |
| 9. | 028CH: 0 ~ 10v | Single | | | |
| | 0 ~ 4095 | Count | <input type="checkbox"/> | Feed Back RPM | 0285DH.15=0 (+) |
| 10. | 028EH: 0 ~ 10v | Single | | | |
| | 0 ~ 409 | | <input type="checkbox"/> | Feed Back IFB | 0285FH.15=0 (+) |