ann丹那赫

QDS1-O Series Online Soft Starter

User's Manual Ⅱ V2020W

QDS1-O Series Online Soft Starter

User's Manual

Jiaxing Dannahe Elecctronic Science&Technology Co.,Ltd

Preface

Thank you for choose Jiaxing Dannahe Electronic science&Technology Co., LTD., QDS1-0 column is a intelligent ac motor soft starter.

In order to give full play to the function of this product, please read this manual in detail before use. Please according to the rules of the correct operation and use, and ensure the safety of the operator, when you found problems in the use and this manual cannot provide answers, Please contact Jiaxing Dannahe Electronic science&Technology Co., LTD., or around the agents, distributors, we will serve you whole heartedly.

Safety considideration

1. Directed by should be professional and technical personnel to install or install the soft starter;

2. The amount should be made to the motor power, specification matching with the soft starter;

3. It is strictly prohibited in the output of the soft starter (U.V.W) the capacitor;

4. Use insulating tape to wrap the input and output wires with soft starter;

5. Soft starter housing must be reliably grounded;

6. When the equipment is repaired, the input power must be cut off first;

7. Internal circuit board with high voltage, non-professional personnel do not repair.

Catalog

1. Function and Characteristics of QDS1-O Series Soft Starters

QDS1-O Series Intelligent AC Motor Soft Starter is a new type of motor starting equipment designed and manufactured by using power electronics technology, microprocessor technology and modern control theory. This product can effectively limit the starting current of asynchronous motor when starting. It can be widely used in heavy load equipment such as fans, pumps, conveyors and compressors. It is an ideal replacement product for traditional starter/triangle converter, auto-decoupling and magnetron step-down starter.

Function

◆ Reduce the starting current of the motor, reduce the distribution capacity and avoid the investment of capacity increase.
◆ Reducing starting stress and prolonging service life of motor and related equipment;
◆ Smooth start and soft stop avoid surge and water hammer effect of traditional starting equipment.
◆ Various starting modes and wide range of current and voltage settings can be adapted to various load situations and improve the process.
◆ Erfect reliable protection function, more effective protection of motor and related equipment safety;
◆ It can be used in occasions of frequent starting and stopping.

Specialty

◆ The QDS1-O series soft starter adopts high performance microprocessor technology, which has higher performance and wider voltage adaptability.
◆ Therr starting modes can be selected to maximize the motor starting effect and achieve soft parking.
◆ Multiple protection monitoring functions, thermal overload protection can be selected according to the load requirements of 6 levels. The last three fault records can be inquired to provide the basis for fault analysis.
◆ This product can provide 4-20 m A analog output, RS485 communication interface (using MODBUS-RTU communication protocol), through the upper computer access parameter setting, operation and monitoring, to achieve high intelligent control.
◆ Real power setting: When the power of soft starter is larger than the actual load power, the rated current of soft starter can be set according to the actual load, so that the actual power of soft starter matches the load, so as to ensure the accuracy of starting, operation, protection and other parameters.
◆ Programmable Output Relay: Interlocking Control with Other Equipment.

2. Product Type and Inspection

◆ Each QDS1-O series soft starter has been tested for all functions and operation before leaving the factory. After receiving the equipment, the user should check it according to the following steps. If you find any problems, please contact the supplier immediately.

◆ Check the product nameplate: Make sure that the goods you receive are in conformity with the products you ordered.

Meet the standards: GB/T14048.6-2016

Soft Starter			
Model	DDS-T3-18	**Rated Current Le**	37A
Input Voltage Us	380V	**Electric Motor Power Pe**	18.5kW
Applicable Standard:	GB/14048.6-2016	**Use Classes:**	AC-53b
Identification NO.			

CE ⌧ ⚠

Jiaxing Dannahe Electronic
Science&Technology Co.,Ltd

TEL: 0086-0573-88628290
ADD: NO.1156 Gaoqiao avenue,
Tongxiang city,Zhejiang

DST - T3 - XXX

Adapted motor power: for example 75 means 75KW

Product voltage rating: 3-380V

Product design serial number: DDS means type DDS
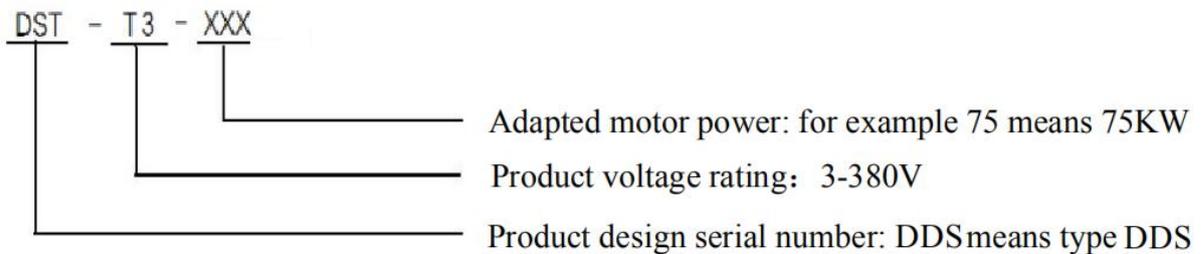
◆ Check whether the product is damaged during transportation, such as internal parts falling off, shell depression, deformation and connection falling off.

◆ Product Certificate, Warranty Card and Instructions: One copy is attached to each soft starter.

3. Use Conditions and Installation

3.1 Use conditions

The operating conditions have some influence on the normal use and life of the soft starter, so please install the soft starter in the places that meet the following operating conditions.Conditions of use of the product:

◆ Power supply: municipal power, self-provided power station, diesel generator set;

◆ Input Voltage: AC380V (-10%~+15%), 50 H z; (Please specify when ordering 60 H z);

◆ Applicable motors: general squirrel cage asynchronous motors (please specify when ordering winding motors);

◆ Start frequency: Standard products recommend starting and stopping no more than 12 times per hour.

◆ Cooling mode: natural air cooling;

◆ Installation method: wall hanging type;

◆ Installation requirements: QDS1-0 series soft starter should be equipped with bypass AC contactor when used; Z series does not need bypass AC contactor

◆ Protection level: IP20-IP30, depending on power level;

◆ Environmental Conditions: Above 1000 meters above sea level, reduce capacity use accordingly;

◆ The ambient temperature ranges from - 25℃ to + 45℃.

◆ Relative humidity does not exceed 95% (20℃±5℃);

◆ No condensation, no flammable, explosive, corrosive gas, no conductive dust. Indoor installation,

◆ Good ventilation. The vibration is less than 0.5 G.

3.2 Installation requirements in cabinet

◆ Soft starter should be installed vertically, not upside down, obliquely, and bolt should be used to install solid structure.

◆ Soft starter will generate heat when it is running. In order to ensure air dredging, it should be shown in Figure 3-1 below, leaving some space for design.

◆ Produce heat to emit upward, so do not install it under non-heat-resistant equipment.

3-1
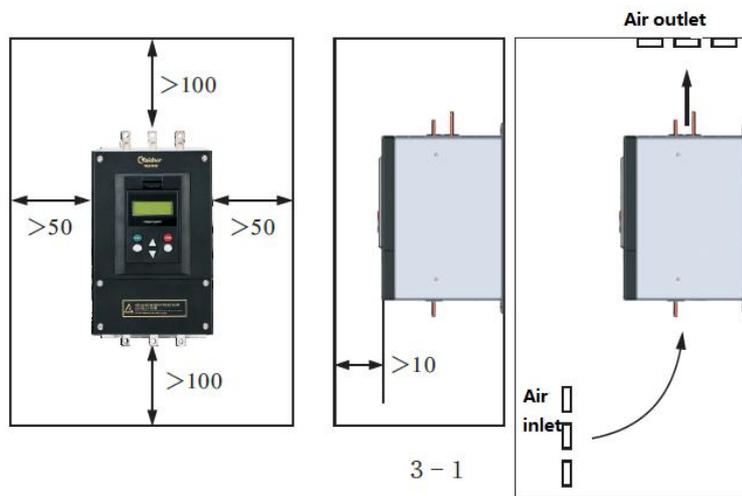
4. Working principle

◆ The QDS1-0 series motor soft starter adopts three pairs of anti-parallel thyristors connected in series to the stator circuit of AC motor. With the function of electronic switch of thyristor, the trigger angle of thyristor is controlled by microprocessor to change the opening degree of thyristor, thereby changing the input voltage of motor, so as to control the soft starting of motor. When the starting is completed, the soft starter output reaches the rated voltage. At this time, the three-phase bypass AC

contactor (KM) will be automatically controlled by bypass control signal (QDS1-0 series), and the motor will be put into power grid operation, as shown in Figure 4-1.
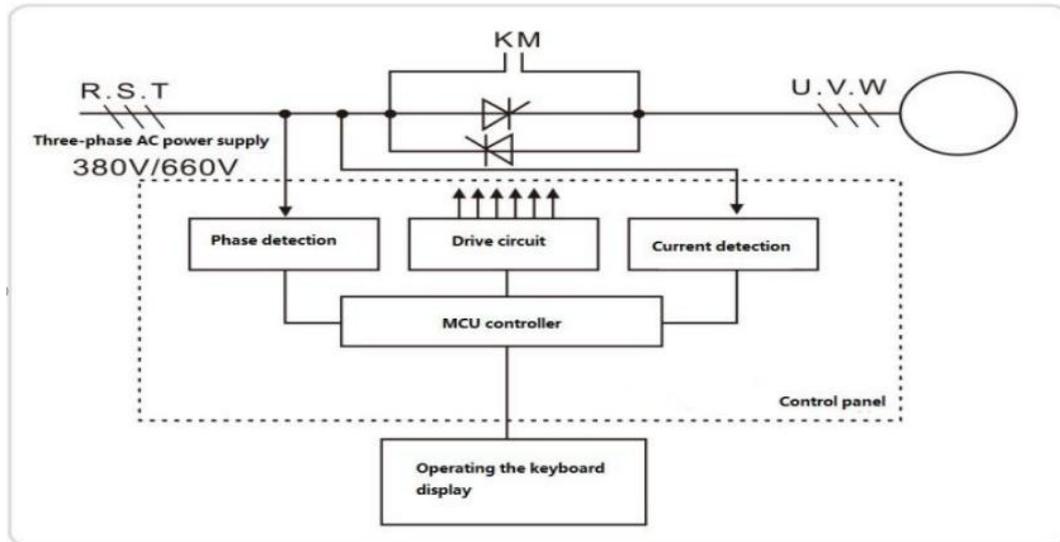
5. Basic wiring and external terminals

Fig. 5-1 and Fig. 5-2 are all external terminals of QDS1-0 series soft starters for users. Detailed functions are shown in Table 5-1 "Basic wiring diagram description".

5.1 Basic wiring diagram
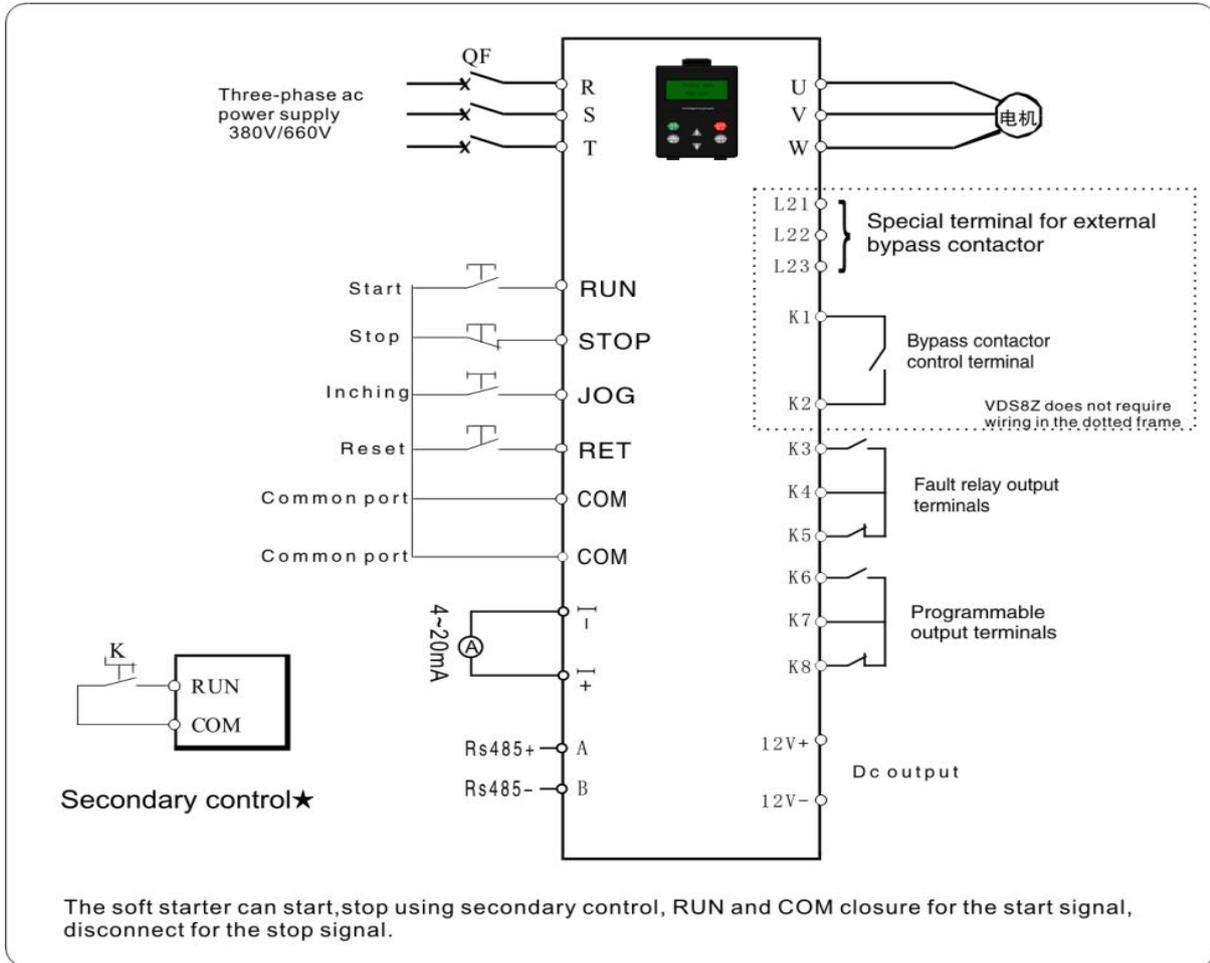
图5-1

5.2 Sorting Diagram of External Terminals of QDS1-O Series Soft Starters
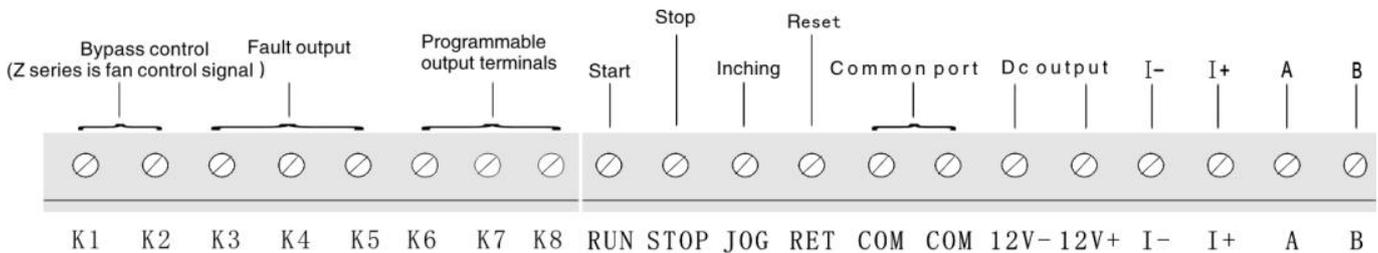
图5-2

5.3 Description of External Terminal of QDS1-O Series Soft Starter

Terminal description		Terminal name	Description
Main circuit		R.S.T	AC power input terminal	Connect three-phase AC power supply through the circuit breaker (QF)
		U.V.W	Soft starter output terminal	Connected three-phase asynchronous motor
		L21.L22. L23	External bypass contactor special terminal	Please refer to the wiring method (Figure 11-1)
Control circuit	Contact input	RUN	External control start terminal	RUN and COM can be shorted to start external control
		STOP	External control stop terminal	STOP and COM can be shorted to stop external control
		JOG	External control jog terminal	Jog and COM can be shorted to achieve jog

	RET	External control reset terminal		Fault reset by shorting RET and COM
Contact output	COM	Control signal common terminal		Internal power reference point
	12V-、12V+	DC output		Output power:DC 12V,100mA
	A、B	Rs485 communication terminal (for QDS1-OC)		A-Rs485+ B-Rs485-
Analog output	I- I+	4~20mA output Load input impedance ≦400Ω		Im=Ie（Io - 4）/8
	COM	Control signal common terminal		
Relay output	K1 K2	Normally open	External bypass contactor control terminal	After startup:J01-J02 Contact rating:AC220V 16A Z series is fan control signal
	K3-K4 K4-K5	Normally open/ Normally close	Fault output terminal	When fault:K3-K4 closure K4-K5 open Contact rating:AC220V 5A
Program mable relay function	K6-K7 K7-K8	Normally open normally closed	Programmable relay output terminal	1: Effective downtime 2: Fault present 3:edit effective 4: Start effective 5: Effective completion of the activation 6: Soft stop effective 7: Start to stop effective 8:Power-efficient When effective:J05-J06 closure Contact rating:AC220V 5A

★ ①There are two connection modes for external control start-stop signal. When using two-wire control, the STOP terminal is not connected; see basic wiring figure 5-1 for details.

②The setting of programmable output can be seen in detail: the relay function in the above table.

6. QDS1-O Series Soft Starter Control Mode

6.1 Start mode

QDS1-O series soft starter has the following six starting modes, users can choose according to their own load conditions.

◆1: Ramp voltage starting
◆2: Current Limited Start
◆3: point start

6.1.1 Ramp voltage start

After starting, the output voltage of the soft starter rises rapidly to the "initial slope starting voltage" U 1, and then gradually increases the output voltage according to the "voltage ramp starting time" until the start is completed, as shown in Figure 6 - 1.

Voltage ramp starting mode is suitable for large inertia load, or not strict for starting current, but high for starting smoothness.

Occasions. This starting mode can greatly reduce the starting impact and mechanical stress. The bigger the initial voltage U 1 is, the bigger the initial starting torque is, but the bigger the impact is at the moment of starting. The length of starting process is related to the setting value of starting time and the weight of load, and has nothing to do with the current limiting factor.

Parameters related to "voltage ramp start":

Voltage ramp voltage (U 1): 0%-80%

Voltage ramp time (t): 1-120 s
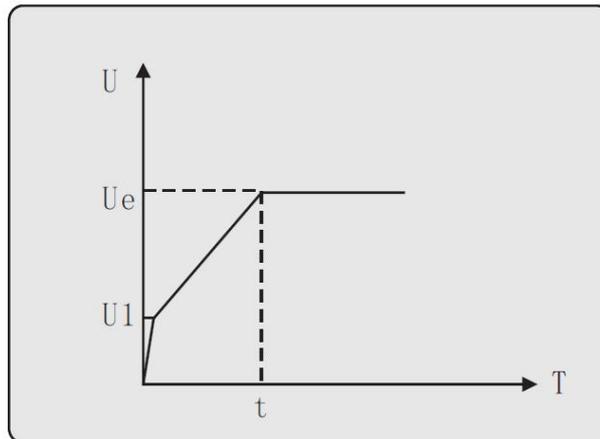
6.1.2 Current Limited Start

After starting, the motor current rapidly rises to the set current limiting value I m, and maintains the output current not greater than this value, so that the motor gradually accelerates and the voltage gradually rises. When the motor approaches the rated speed, the motor current rapidly drops to the rated current I e to complete the starting process, as shown in Figure 6 - 2.

Current-limiting starting mode is generally used in situations where there are strict requirements for starting current, especially when the capacity of power grid is too small to be limited.

When dynamic capacity is used, current limiting multiples can be set according to requirements, usually between 2.5 and 3 times. If the setting is too small, normal starting will be impossible. When starting with current limiting, the starting time is related to the magnitude of current limiting multiples. The larger the current limiting multiples, the shorter the starting time, the smaller the current limiting multiples and the longer the starting time.

Parameters related to "current limiting starting":

Current Limiting Start Multiple (I m): 50%~500%
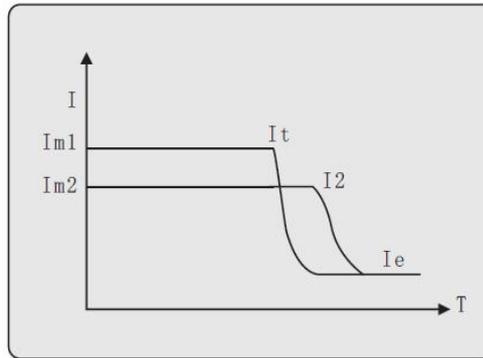
6.1.3 Point start

When point starting, the output voltage of the soft starter increases rapidly to the point voltage U 1 and remains unchanged. Changing the setting value of U 1 can change the output torque of the motor when starting. This function is very convenient for the test run or the positioning of some loads, as shown in Figure 6 - 3.

Parameters related to "point motion":

Point voltage: 0%-80%
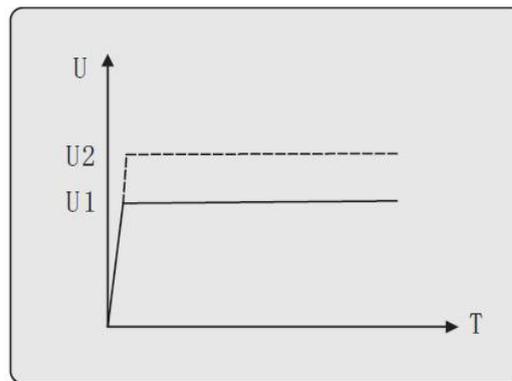
6.2 Stopping mode

6.2.1 Free stop

After receiving the stop instruction, the soft starter will control the bypass contactor to disconnect, and at the same time, the output voltage of the main circuit thyristor and the motor will stop gradually according to the inertia

6.2.2 Soft-stop

In this shutdown mode, the motor power supply is switched from the bypass contactor to the main circuit thyristor, and the control output voltage is gradually reduced until the motor stops smoothly.

Soft downtime: 0 s ~ 6 0s

7. Control keyboard function and operation method

7.1 Operation keyboard interface

QDS1-0 series soft starter adopts LED digital tube and silica gel keys to form operation display keyboard, digital display mode, six silica gel touch keys, which can realize soft starter start and stop operation, parameter setting, modification, fault inquiry, fault reset and other operations. See Figure 7 - 1 for details.

7.2 Operating Key Function

7.2.1 Single key operation

RUN: Start button, click this button to make the motor starter.

STOP: Stop button, press this button to run the motor to stop running.

PRG: Programming button, under the outage or failure state, click this button to enter programming mode. (main function or subroutine menu).

EXIT: ①Programming, press this button to exit the program state, also can realize other functions.
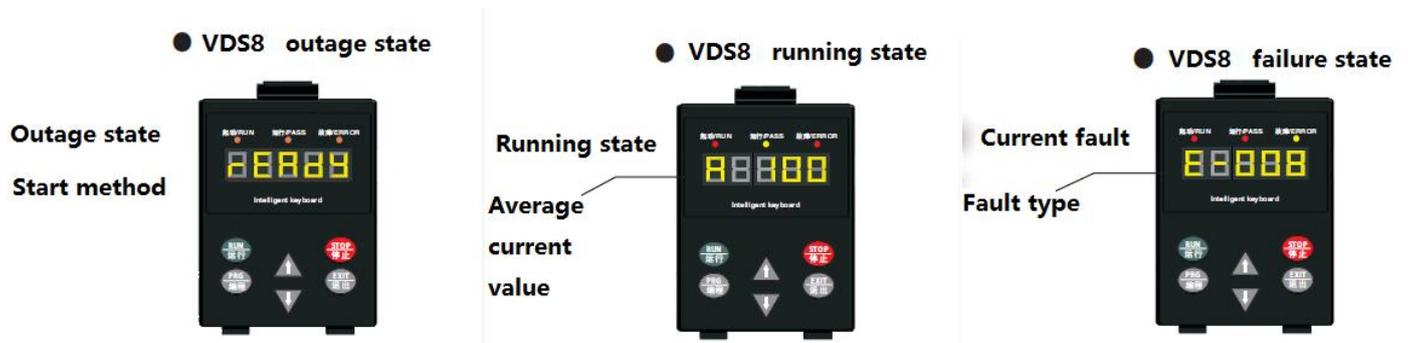
②Fault reset, in fault state, press this button, can exit the fault state, back to the stop condition.

③EXIT and other key compound use, also can realize other functions.

▲ ▼ : ① In edit mode, can scroll through the menu function.

②In the condition of function parameters, bring about▲、▼button, can modify the current function parameters.

▲: Make parameter increases▼ : Reduce parameters.

③In fault state, bring abou▲、▼ button to turn the first and the first two fault condition.

7.2.2 Compound key operation(Press two keys at the same time during operation)

● In the condition of downtime

STOP + EXIT : At the same time the searchable fault record.

●In the running state

RUN +▲ : Running current calibration, according to current increase.

RUN +▼ : Running current calibration, reduce according to current.

●Under the communication interrupt status (display "communication failure")

STOP + EXIT : Reconnect for communication.

7.2.3 Control keyboard hot swap function

QDS1-0 series soft starter can start or stop by external control mode without connecting the control keyboard after setting the parameters. It can also be plugged or dialed in operation without affecting the normal use of soft starter.

8. Display interface and parameter setting

The display interface of QDS1-0 series soft starter is digital display mode. After power-on, the following three kinds of pictures can be displayed in turn (Figure 8 - 1), each picture interval of 2 seconds, and finally stabilized in the downtime state.

VDS8 power on display mode

udnor

rEAdy
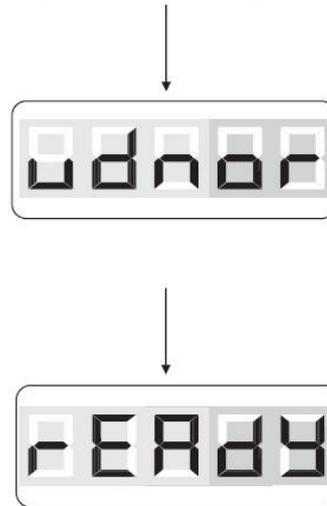
8.1 Set the parameters of the storage

When entering the menu to consult or modify the parameters, once the data is selected, press EXIT key to exit, the data will be automatically stored.
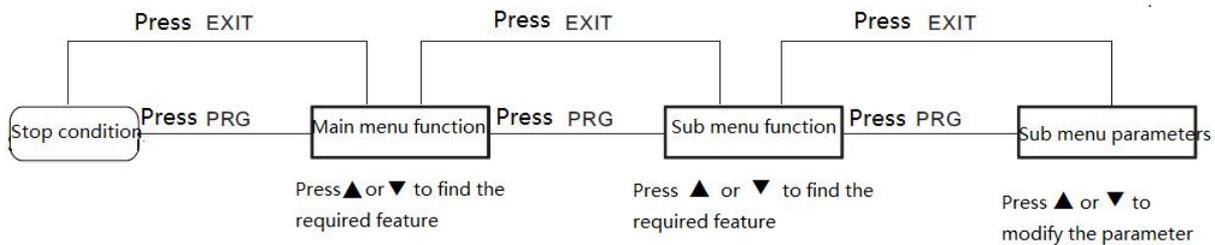
8-2

Operation method:

Press PRG key to enter main menu or submenu functions and parameters.

Press ▲ or ▼ key to scroll to find menu functions or modify parameter values.

Press EXIT key to exit the main menu or submenu.

Note: Once the data is modified, it will be automatically saved and will not be lost until the next modification.

★Keyboard display current calibration methods: (according to the following two methods)

In downtime, PRG enters the item of "current calibration value". Pressing ▲ or ▼ key can change the display current value in operation by changing the current correction constant. Pressing ▲ key can increase the display current in operation, and pressing ▼ key can decrease the display current in operation; Pressing RUN +▲ can increase the display current in operation; Pressing RUN +▼ can decrease the display current in operation.(After calibration of current must be after downtime, heavy into "current calibration value" store, otherwise, when the power is the calibration values will be lost).

8.2 Functional parameter table

QDS1-O series of functional parameters query and settings are divided into a main menu, including all settable and queriable parameters, its full menu function expansion process as shown in Figure 8-2.

8.2.1 QDS1-O functional parameter table

Function code	Function name	Setting range	Factory default	Description
10 150	Soft starter current	Soft starter rated current nominal value	Rated current nominal value	Read only, not modifiable
2-150	Motor current	Soft starter rated current(50%-100%)	Rated current nominal value	Can modify the rated motor current

3-002	Starting method	1-3 1：Ramp voltage start 2：Current Limited Start 3：Inching start	2	Three starting methods can be selected according to site requirements
4-001	Stopping methods	1-2 1:free stop 2:soft stop	1	Two ways of stopping can be selected according to site requirements
5-003	Control methods	1-3 1:key board 2: External control 3:key board and External control	3	Three ways to stop can be selected according to site requirements
6-030	Voltage ramp voltage	0-80	30%	0%-80% of the supply voltage

`7-030`	Voltage ramp time	1-120	30s	Starting time 1s-120s
`8-320`	Current limiting multiple	50-500	320%	0.5-5 times the rated current of the soft starter
`9-030`	Inching voltage	0-80	30s	0%-80% of the supply voltage
`A-000`	soft stop time	0-60	0s	0s-60s can be set according to site downtime requirements
`b-450`	Start over current value	400-600	450%	4-6 times the rated current of the soft starter
`C-200`	Running over current	20-400	200%	Soft starter rated current 20%- 400%
`d-005`	Starting overload value	1-6	5	The starting overload value is divided into 6 levels (see Table 9-2 for details).
`E-002`	running overload value	1-6	2	The running overload value is divided into 6 levels (see Table 9-2 for details)
`F-040`	Current imbalance	5-150	40%	Ratio of the difference between any phase current and three-phase average current and the average current
`H-002`	Operation mode	1:trigger 2: nontriggering	2	1: Trigger pulse after bypass operation 2: Turn off the trigger pulse after bypass operation
`J-007`	Relay function	1: Effective downtime 2: Fault present 3:edit effective 4: Start effective 5: Effective completion of the activation 6: Soft stop effective 7: Start to stop effective 8:Power-efficient	7	Relay function is selected according to user requirements

`L-100`	Current calibration value	5-500	%	Read only, not modifiable
`U-070`	Start timeout	5-200	70s	Protected when the starting time exceeds the set value
`5-000`	Start delay time	0-999	0s	After starting, set the time to start the soft starter

9. Fault Protection Function and Solution

9.1 Fault Display and Solution

NO.	QDS1-O fault	QDS1-O	Cause of the	Solution

	display	fault	malfunction	
1	E-001	Power failure	The incoming power supply is out of phase	This fault cannot be reset. Check the three-phase power supply and isolate the circuit breaker after power failure.
2	E-002	Running out phase	Is the power supply phase missing during operation? Thyristor open?	Check if the incoming power is out of phase. Check the thyristor or trigger circuit.
3	E-003	Start over current	Current limiting mode: Is the current limiting multiple suitable? Ramp mode: Is the starting time appropriate?	Adjust the parameters as appropriate. The initial voltage is too high.
4	E-004	Running over current	Suddenly increased load? Or too much fluctuation? The network pressure caused by the load increase is reduced?	Adjust the load to check the grid voltage. Adjust the current protection value appropriately.
5	E-005	Starting overload	Is the load too heavy during starting?	Check if the load can be reduced appropriately. Check the overload level or adjust it appropriately.
6	E-006	Running overload	Is the motor overloaded? Inaccurate feedback (display current is larger than actual)	Adjust the load within the rating The calibration keyboard current value should be consistent with the actual value. Check if the overload curve is suitable

7	E-007	Current imbalance	Motor three-phase current imbalance? Bad contact of the thyristor trigger socket? Thyristor open?	Handling power imbalances Check the trigger signal or thyristor
8	E-008	Overheating protection	Is the start too frequent or the start time is too long?	Reduce the starting frequency or adjust related parameters
9		Communication interruption	Communication transmission failure (does not affect operation)	Check the communication transmission system
10	E-009	Start timeout	Start time exceeds the	The starting parameter setting is not suitable

				set value	or the load is too heavy, the power supply capacity is insufficient, etc.

9.2 Overload Protection Level Selection

●Motor overload protection by electronic overload protection level parameters to set.

● Electronic overload protection level is divided into 1 - 6 levels, the higher the level, the stricter the protection, the lower the level, the more sensitive the protection. Users can set different protection levels according to the weight of the load. The higher the level, the heavier the applicable load. Under the same protection level, the overload tripping time of soft starter is different from that of motor after starting and finishing. In the process of starting, running and soft shutdown, the specific standard overload protection level and action tripping time of soft starter are given. See table 9-2.

●Overload Class Output Value of Start-up Process: Level 5

●Operating overload level factory value: Level 2

●Overload Protection Characteristic Level of Motor (Hot-state Recovery to Cold-state Time is 180 seconds)

Overload level \ Overload index	6Ie	5Ie	4Ie	3Ie	2Ie	1.5Ie	1.2Ie	1.05Ie
1	1s	3s	6s	8s	10s	15s	150s	3600s
2	3s	8s	12s	16s	20s	30s	300s	3600s
3	6s	15s	22s	30s	40s	60s	350s	3600s
4	10s	22s	35s	48s	60s	90s	400s	3600s
5	15s	35s	55s	75s	90s	120s	450s	3600s
6	20s	45s	70s	95s	120s	150s	500s	3600s

Motor overload protection characteristic curve
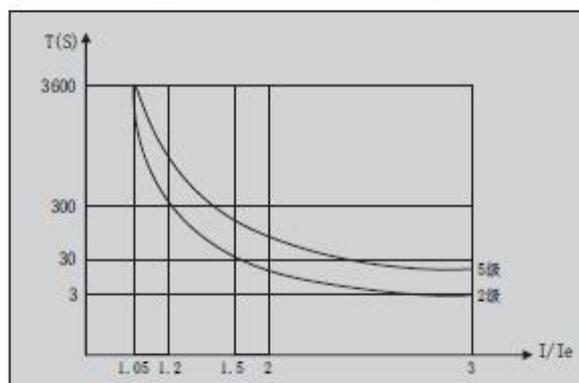
9.3 The last three fault query methods

QDS1-O series soft starter has the function of automatic storage of the last three failures and can be consulted at any time so as to analyze the causes of the failures and find out the solutions. Specific access methods are as follows:

●In case of failure to query
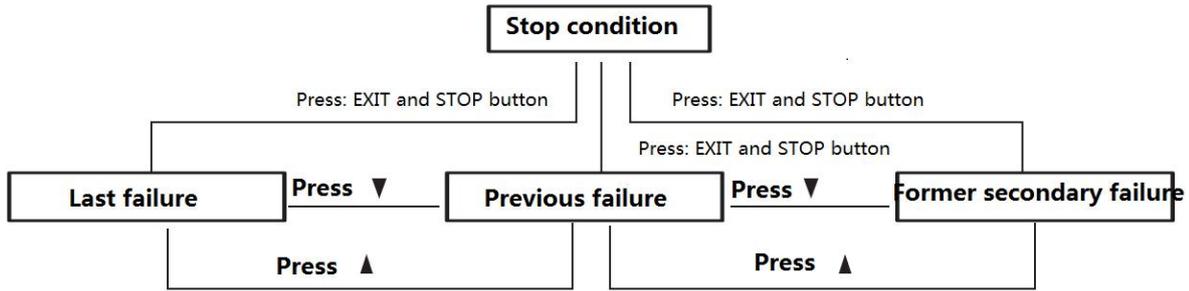
9-2

Note: In the state of failure, the parameters can also be modified by directly entering the function menu. The specific operation is shown in the following figure.

9-3
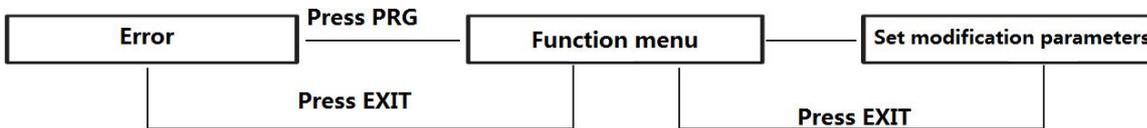
10. QDS1-O Series Secondary Connection Diagram
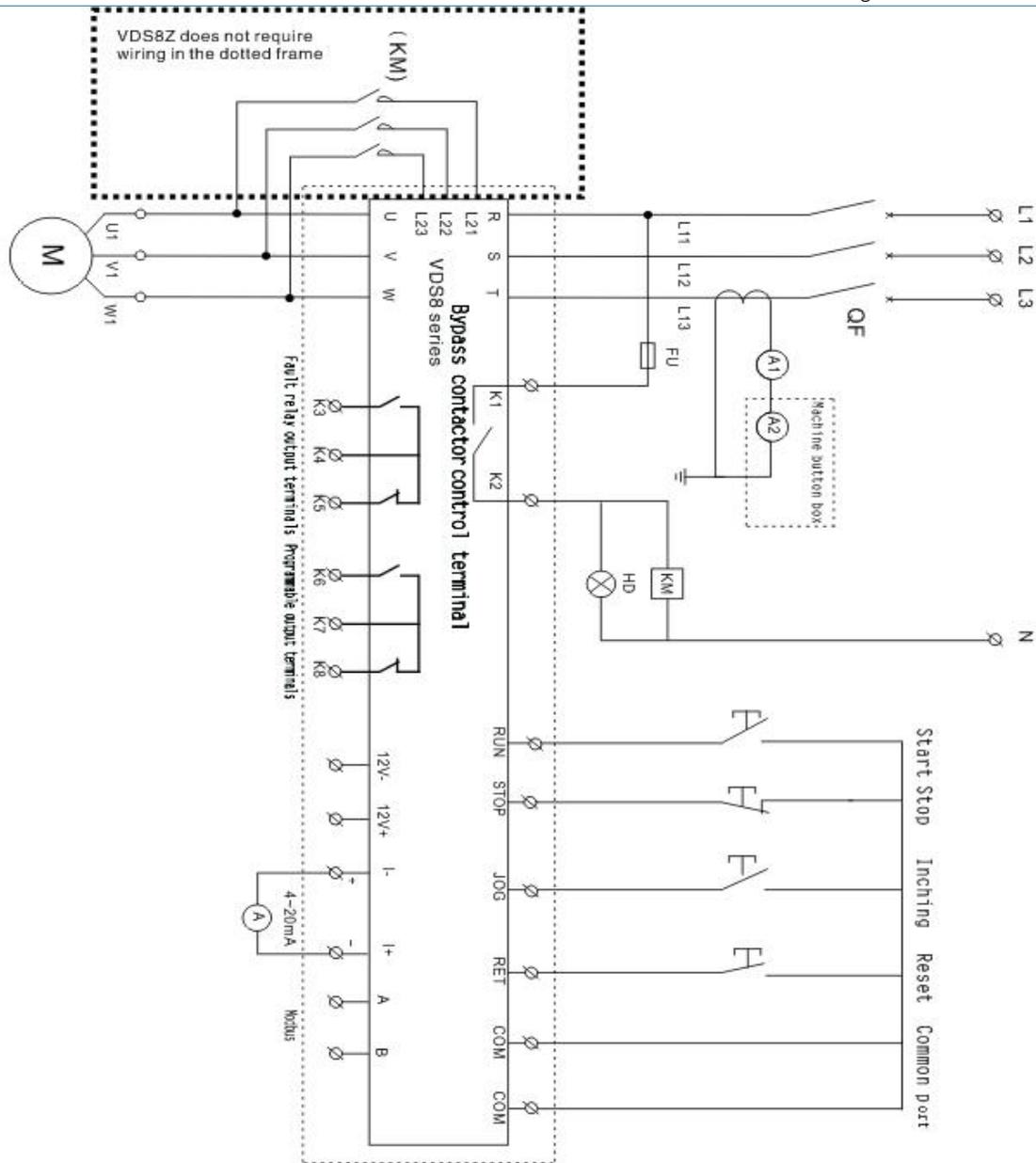
11. Attentions for trial operation and daily maintenance of QDS1-0 series

11.1 Trial operation inspection and matters needing attention

In order to operate safely, the following items should be checked before power is turned on.

●Whether the soft starting power is consistent with the motor power or not: It can enter the "rated current" item of "operation parameter setting" and set it according to the motor nameplate current value.

●Does the motor insulation meet the requirements?

●Is the input and output wiring of the main circuit correct?

●Are all wiring nuts tightened?

●Check whether there is short circuit in three-phase power supply (R. S. T) with multimeter?

●After power-on, it shows that the "stop state" means that the motor is in the normal ready starting state, and can check whether the motor steering is correct by "point-moving" mode. If not, any two phases at the motor end can be changed.

●During the trial operation, if the starting state of the motor is not ideal, the starting and stopping parameters can be set according to 17 pages of function parameter table, and the starting mode, current, voltage, time and other parameters can be modified accordingly.

●If there is fault protection in the whole process of power-on and operation, the fault status will be displayed. Please press 19 pages of fault display and treatment methods, and prompt for treatment accordingly.

●After the soft starter is electrified, do not open the cover to avoid electric shock.

●During the trial operation, if abnormal phenomena, such as abnormal sound, smoke or odor, should be stopped quickly, power supply should be cut off and cause checked.

●When the soft starter output is not connected to the motor, the U. V. W three-phase induction voltage is normal and connected to the power.

11.2 Daily maintenance precautions

●Induction Voltage: When QDS1-0 soft starter is connected to the power supply at the input end, when the load is open, even in the stop state, the output end of the soft starter will have induction voltage, which is caused by leakage current of thyristor and belongs to normal phenomenon; after connecting the motor, the induction voltage will disappear, so the danger of electric shock should be paid attention to when using.

●Reactive power compensation: If the reactive power compensation circuit with higher power factor needs to be installed in the distribution circuit, the reactive power compensation capacitor should be connected to the input end of the soft starter and not to the output end, otherwise the power device of the soft starter will be damaged.

●Insulation test: It is strictly forbidden to use megaohmmeter to measure the insulation resistance between input and output of QDS1-0 soft starter, otherwise the power device and control board of the soft starter may be damaged due to overvoltage.

●Circuit wiring: The input and output of QDS1-0 soft starter should not be reversed, otherwise the soft starter or motor may be damaged.

●Bypass AC contactor wiring: When QDS1-0 soft starter is equipped with Bypass AC contactor, the phases of U, V, W and L21, L22, L23 of soft starter output must be the same. Z series does not have this requirement.

●External control terminals: the external control terminals RUN, STOP, JOG, RET and COM of QDS1-0 soft starter shall not be introduced into the external power supply, otherwise the control board of the soft starter may be damaged.

●In the case of more dust, dust cleaning should be carried out regularly. Otherwise, the insulation grade and heat dissipation effect of soft starter will be reduced, resulting in failure or damage.

●In humid environment, if soft starter is not used for a long time, dehumidification treatment (such as drying with hairdryer or electric furnace) must be carried out before use. Otherwise, due to humidity or condensation, the insulation grade of soft starter will be reduced, resulting in creeping, short circuit and damage to soft starter.

12. Specifications and models

Motor power	Voltage 380v	
(kw)	Rated current	QDS1-O series
5.5-11	11-22	QDS1-T3-11-0
15	30	QDS1-T3-15-0
18.5	37	QDS1-T3-18-0
22	45	QDS1-T3-22-0
30	60	QDS1-T3-30-0
37	75	QDS1-T3-37-0
45	90	QDS1-T3-45-0
55	110	QDS1-T3-55-0
75	150	QDS1-T3-75-0
90	180	QDS1-T3-90-0
110	220	QDS1-T3-110-0
132	260	QDS1-T3-132-0
160	320	QDS1-T3-160-0
185	370	QDS1-T3-185-0
200	400	QDS1-T3-200-0
250	480	QDS1-T3-250-0
280	550	QDS1-T3-280-0
320	620	QDS1-T3-320-0

13. Instructions for ordering

●When ordering, the user should inform the supplier of the product type, specification, load and use condition so as to select the product correctly.

●QDS1-O series products should be equipped with bypass AC contactors while Z series products need not be equipped with bypass AC contactors.

●Customers who have special conditions or requirements for the use of this product, please explain to the supplier when ordering, and we will provide perfect service.

●If the load is winding motor, it should be specified when ordering.

14. QDS1-O Series Outlook and Installation Dimensions

●The appearance and installation dimensions of QDS1-O 5.5kW-320kW soft starter are shown in Table 14-1, and its factory standard configuration is three in and three out.
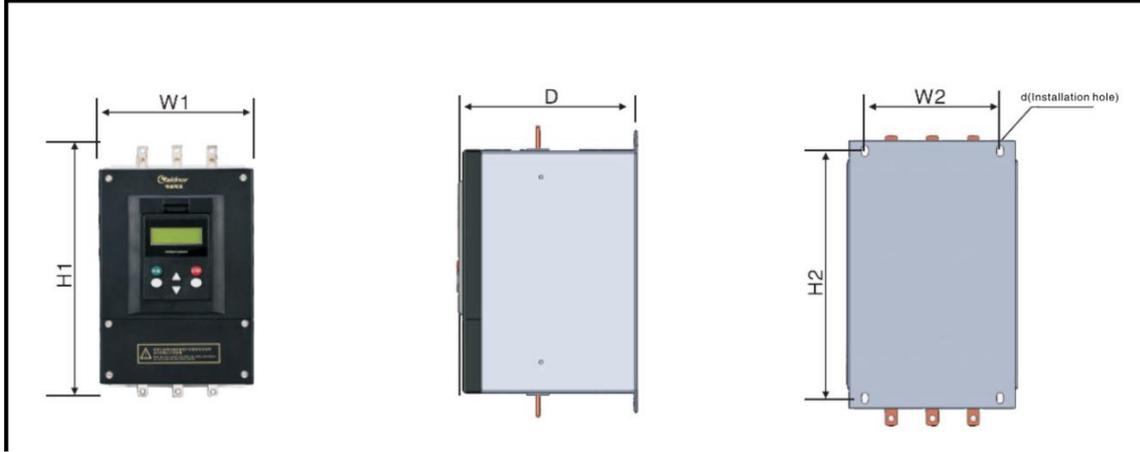
Rated power(kw)	Dimensions(mm)			Installation size (mm)			Net weight (kg)
5.5-55	166	288	199	132	250	M6	6.6
75	222	363	247	132	320	M6	12.8
90	222	363	247	132	320	M6	12.8
110	386	574	243	230	495	M8	30.0
132	386	574	243	230	495	M8	30.0
160	386	574	243	230	495	M8	30.0
185	477	597	265	400	532	M8	43.0
200	477	597	265	400	532	M8	43.0
250	477	597	265	400	532	M8	43.0
280	477	597	265	400	532	M8	43.0
320	477	597	265	400	532	M8	43.0

●Rated power and rated current refer to the maximum rated value of soft starter. Generally, the corresponding parameters of the adapter motor should not be greater than this value.

15. Modbus protocol

The communication data format of soft starter MODBUS protocol is RTU (remote terminal unit) mode. The data format is 8-N-1. In RTU mode, each byte is 8-bit binary code, which can be represented by two hexadecimal characters. Hexadecimal characters are: 0-9, A, B, C, D, E, F.

RTU frame of standard structure:

The frame header START	T1-T2-T3-T4(3.5 bytes transmission time)
Slave address ADDR	Address: 1~63 (decimal), 0 for the broadcast address
Function code CMD	03H: Read slave parameters; 06H: Write slave parameters
Data DATA	2 * N bytes of data
CRC Check low	CRC check values
CRC Check high	
End of frame END	T1-T2-T3-T4(.5 bytes transmission time)

15.1 Command Code and Communication Data Description

(1) command word 3 h (0000, 0011 b) : read the N word (2 N bytes)

The RTU host command information;

START , 3.5 bytes transmission time	T1-T2-T3-T4
Slave addressADDR	Slave address number
Function codeCMD	03H
DATA AREA	Starting address
	Data count
CRC	CRC check
END, 3.5 bytes transmission time	T1-T2-T3-T4

--From the machine address: the host must be selected from the station to identify and address does not match from the stand will only receive messages, but no response to the host. Byte: 1.

--Can read command code: the function of the code for 03H. Byte: 1.

--Data area:

--The starting address: want to read data starting address the soft starter of internal storage. Byte: 2.

--The number of data in the data number: the need to read. Byte: 2.

--CRC check: byte: 2.

In receiving the correct response from the machine frame format:

START, 3.5 bytes transmission time	T1-T2-T3-T4
Slave address ADDR	Slave address number
Function code CMD	03H
DATA AREA	bytes
	Data value
CRC	CRCcheck
END, 3.5 bytes transmission time	T1-T2-T3-T4

--Slave address: the slave address of the response is the same as the slave address of the host request. Byte: 1.

--Function code: the function code of reading command is 03H. Byte: 1.

--Data area:

--Bytes: read command returns the number of bytes in the data. Byte: 1.

--Data values: read command returns the data values.

--CRC check: byte: 2.

From the machine in receiving the response frame format of the error:

START, 3.5 bytes transmission time	T1-T2-T3-T4
Slave address ADDR	Slave address number
Error code	83H
Abnormal code	
CRC	CRC Check
END, 3.5 bytes transmission time	T1-T2-T3-T4

--From the machine address: the response from the machine address and host requests from the machine. Byte: 1.

--error code: 83H, indicating that the slave machine receives error messages. Byte: 1.

--Abnormal code: said error message. Byte: 1.

    01H:Illegal function code;

    02H:Illegal starting address or does not support the "starting address and the number of data";

    03H:Number of unsupported data;

--CRC Check: byte: 2.   Command word 10H (0001 0000b) : write N words (2N bytes)

(2) RTU host command information

START, 3.5 bytes transmission time	T1-T2-T3-T4
Slave address ADDR	Slave address number
Function code CMD	10H
DATA AREA	Start address
	Data quantity
	Bytes
	Data value
CRC	CRC check
END，3.5 bytes transmission time	T1-T2-T3-T4

-- Slave address: the host must recognize the selected slave station, and if the address does not match, the slave station will only receive messages but not respond to the host. Bytes: 1.

-- Function code: the function code for writing commands is 10H. Bytes: 1.

--Data area:

    -- Starting address: the starting address of the data to be written in the internal memory of the soft starter. Bytes: 2.

    -- Data quantity: the number of data to be written. Bytes: 2.

--Number of bytes: the number of bytes of data to be written. Bytes: 1.

-- Data value: the data value to be written. Bytes: 2.

-- CRC check: byte: 2.

In receiving the correct response from the machine frame format:

Start, 3.5 bytes transmission time	T1-T2-T3-T4
Slave address ADDR	Slave address number
Function code CMD	10H
Data area	Start address
	Data quantity
CRC	CRC check
End, 3.5 bytes transmission time	T1-T2-T3-T4

-- Slave address: the slave address of the response is the same as the slave address of the host request. Bytes: 1.

-- Function code: returns the function code for writing the command 10H. Bytes: 1.

--Data area:

    -- Start address: returns the start address of written data. Bytes: 2.

    -- Number of data: the number of data to return written data.

-- CRC check: byte: 2.

Response frame format when the slave receives an error:

Start , 3.5 bytes transmission time	T1-T2-T3-T4
Slave address ADDR	Slave address number
Error code	90H
Abnormal code	
CRC	CRC check
End , 3.5 bytes transmission tim	T1-T2-T3-T4

-- Slave address: the slave address of the response is the same as the slave address of the host request. Bytes: 1.

-- Error code: 90H, indicating that the slave machine receives an error message. Bytes: 1.

-- Abnormal code: said error message. Bytes: 1.

01H: Illegal function code;

02H: Illegal starting address or unsupported "starting address + number of data";

03H: Number of unsupported data;

-- CRC check: byte: 2.

15.2 Communication Data Address Definition

address	Name	Read/Write
1000	Control mode	R/W
1001	Starting mode	R/W
1002	Stop mode	R/W
1003	Soft starter power	R
1004	The motor rated power	R/W
1008	Dynamic voltage point	R/W
1005	Current limiting starting multiple	R/W
1006	Ramp voltage	R/W
1007	Voltage ramp time	R/W
1009	Pulse conflict jump voltage	R/W
100a	Pulse conflict time	R/W
100b	Current ramp multiple	R/W
100c	Current ramp time	R/W
100d	Soft downtime	R/W
100e	Operation mode	R/W
1019	Relay function	R/W
100f	Current calibration value	R/W
1010	Voltage calibration value	R/W
1011	Starting overcurrent value	R/W
1012	Run overcurrent values	R/W
1013	Starting overload value	R/W
1014	Operating overload value	R/W
1015	Degree of current imbalance	R/W
1017	overvoltage	R/W
1018	undervoltage	R/W

101a	Slave address	R/W
101b	Baud rate	R/W
1027	Control command	W
1029	Soft starter status	R
102a	Three-phase average current	R
102e	Voltage value	R
1033	First failure	R
1034	Secondary failure	R
1035	Third failure	R

Note:

0x1028: control command, bit7: parking position. Bit6: starting position. Bit5: fault reset. Other bits undefined.

'1' means valid; '0' means invalid.

0x102a: soft starter state. 0-stop state; 1- starting state; 2- operating status; 3- soft stop state; 4 - editing; 5 - failure.

Jiaixing Dannahe Electronic Science&Technology Co.,Ltd

Add   1): NO.992 Gaoxin west 1 road, Tongxiang City,

Zhejiang Province,P.R.China

2): NO.339 Songchun load,Qingpu District, Shanghai,
P.R.China

Email：admin@dnh-drive.com