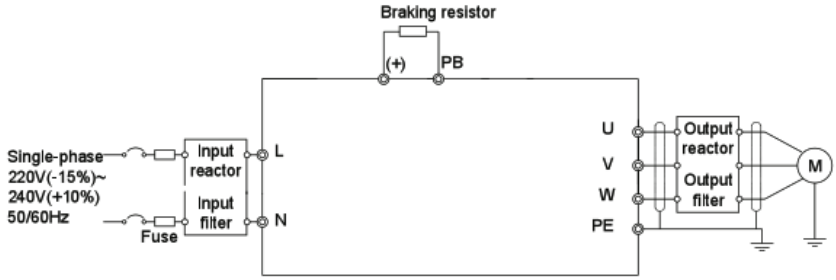
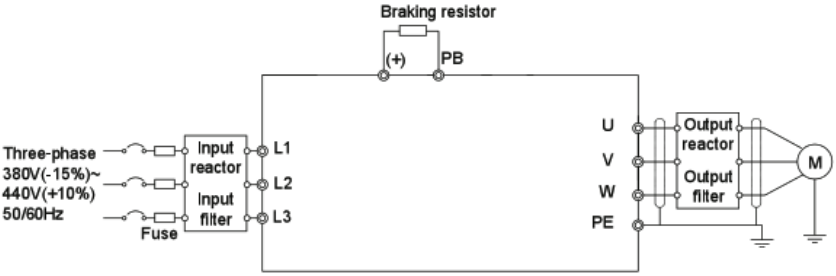
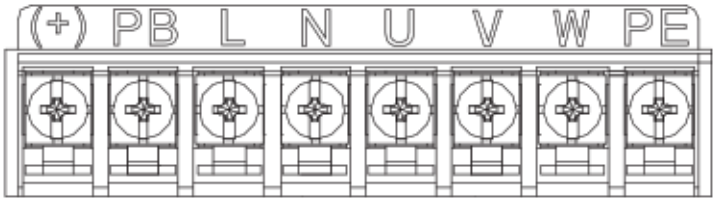
MANUAL MA410 QUICK

TETA ELECTRIC CO.,

Standard wiring



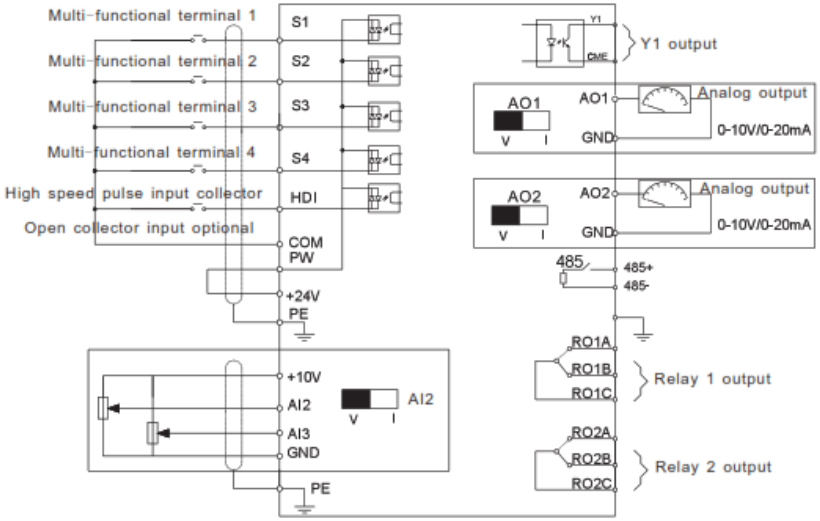




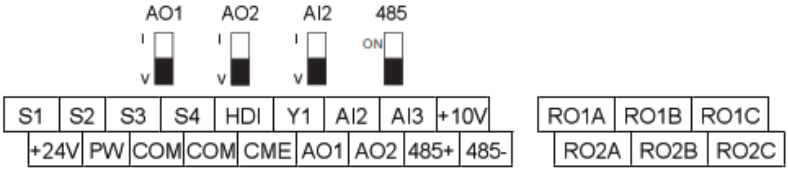
1PH terminals of main circuit

Terminal	Function
L , N	1-phase AC input terminals which are generally connected with the power supply.
U , V , W	3-phase AC output terminals which are generally connected with the motor.
PB , (+)	External dynamic braking resistor terminal
(+) , (-)	Input terminal of the DBU or DC bus
PE	Protective grounding terminals

Wiring diagram of control circuit

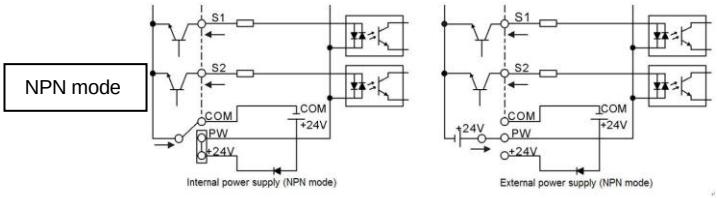


Terminals of control circuit

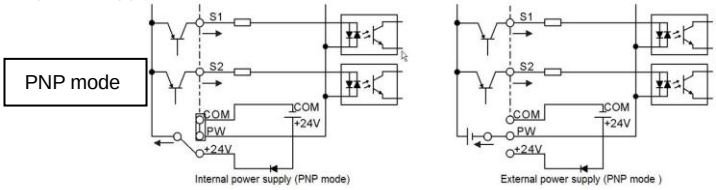


Input /Output signal connection figure

If the signal is from NPN transistor, please set the U-shaped contact tag between +24V and PW as below according to the used power supply.



If the signal is from PNP transistor, please set the U-shaped contact tag as below according to the used power supply.



Terminal name	Description	
+10V	Local power supply +10V	
AI2 AI3	1. Input range: AI2 voltage and current can be chose: 0~10V/0~20mA; AI3:-10V~+10V 2. Input impedance: voltage input: 20kΩ; current input: 500Ω 3. Resolution: the minimum AI2/AI3 is 10Mv/20mv when 10V corresponds to 50Hz 4. Deviation ±1%, 25℃	
GND	Analog reference ground	
AO1 AO2	1. Output range:0~10V or 0~20mA; 2. Deviation±1%,25℃	
RO1A RO1B RO1C	RO1 relay output, RO1A NO, RO1B NC, RO1C common terminal Contactor capability: 3A/AC250V,1A/DC30V	
RO2A RO2B RO2C	RO2 relay output, RO2A NO, RO2B NC, RO2C common terminal Contactor capability: 3A/AC250V,1A/DC30V	
PW	Provide the input switch working power supply from external to internal. Voltage range: 12~30V	
24V	The inverter provides the power supply for users with a maximum output current of 200mA	
COM	common digital terminal	
S1	Switch	1. Internal impedance:3.3kΩ 2. 12~30V voltage input is available 3. The terminal is the dual-direction input terminal supporting both NPN and PNP 4. Max input frequency:1kHz.
S2	Switch	
S3	Switch	
S4	Switch input 4	
HDI	Except for S1~S4, this terminal can be used as high frequency input channel. Max. input frequency:50kHz Duty cycle : 30%-70%	
COM	common terminal of open collector output	
Y1	1.Swtich capability:200mA/30V 2.Output frequency range:0~1kHz	
485+ 485-	485 communication interface and 485 differential signal interface If it is the standard 485 communication interface, please use twisted pairs or shield cable.	

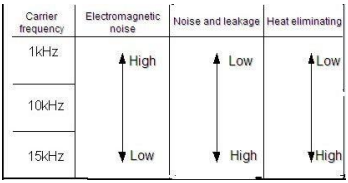
Functions

Function code	Name	Detailed instruction of parameters	Default value	Modify
P00 Group Basic function group				
P00.00	Speed control mode	0: SVC 0 No need to install encoders. Suitable in applications which need low frequency, big torque for ugh accuracy of rotating speed and torque control. Relative to mode 1, it is more suitable for the applications which need small power 1: SVC 1 Is suitable In high performance cases with the advantage of high accuracy of rotating speed and torque. It does not need to Install pulse encoder 2:SVPWM control 2 Is suitable In applications which do not need high control accuracy, such as the load of fan and pump. One inverter can drive multiple motors. **Note**: Carry out motor parameter autotuning before adopting vector mode.	2	◎
P00.01	Run command channel	Select the run command channel of the inverter. The control command of the inverter includes: start-up, stop, forward, reverse, jogging and fault reset. 0:Keypad running command channel(“LOCAL/REMOT” light off) Carry out the command control by RUN, STOP/RST on the keypad. Set the multi-function key QUICK/JOG as FWD/REV shifting function (P07.02=3) to change the running direction; press RUN and STOP/RST simultaneously in running state to make the inverter coast to stop. 1:Terminal running command channel (“LOCAL/REMOT” flickering) Carry out the running command control by the forward rotation, reverse rotation and forward jogging and reverse jogging of the multi-function terminals 2:Communication running command channel (“LOCAL/REMOT” on); The running command is controlled by the upper monitor via communication.	0	○

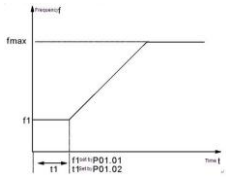
P00.03	Max. output frequency	This parameter is used to set the Maximum output frequency of the inverter. Users should pay attention to this parameter because it is the foundation of the frequency setting and the speed of acceleration and deceleration. Setting range: P00.04~400.00Hz	50.00 Hz	◎
P00.06	A frequency	0:Keypad data setting Modify the value of P00.10 (set the frequency by keypad) to modify the frequency by the keypad.	0	○
P00.07	B frequency command	2:Analog AI1 setting(potentiometer on keypad) 2:Analog AI2 setting 3:Analog AI3 setting Set the frequency by analog input terminals. TETA MA610 series inverters provide 3 channels analog input terminals as the standard configuration, of which AI2 is the voltage/current option (0~10V/0~20mA) which can be shifted by jumpers; while AI3 is voltage input (-10V~+10V). Note: when analog AI2 select 0~20mA input, the corresponding voltage of 20mA is 10V. 100.0% of the analog input setting corresponds to the maximum frequency (function code P00.03) in forward direction and -100.0% corresponds to the maximum frequency in reverse direction (function code P00.03) 4:High-speed pulse HDI setting The frequency is set by high-speed pulse terminals. TETA MA610 series inverters provide 1 channel high speed pulse input as the standard configuration. The pulse frequency range is 0.00~50.00kHz. 100.0% of the high speed pulse input setting corresponds to the maximum frequency in forward direction (P00.03) and -100.0% corresponds to the maximum frequency in reverse direction (P00.03). **Note:** The pulse setting can only be input by multi-function terminals HDI. Set P05.00 (HDI input selection) to high speed pulse input, and set P05.49 (HDI high speed pulse input function selection) to frequency setting input. 5:Simple PLC program setting The inverter runs at simple PLC program mode when P00.06=5 or P00.07=5. Set P10 (simple PLC and multi-step speed control) to select the running frequency, running direction, ACC/DEC time and the keeping time of corresponding step. See the function description of P10 for detailed information.	2	○

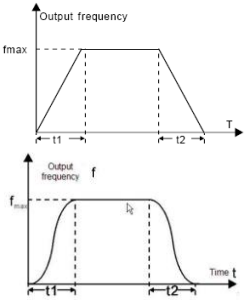
		6: Multi-step speed running setting The inverter runs at multi-step speed mode when P00.06=6 or P00.07=6. Set P05 to select the current running step, and set P10 to select the current running frequency. The multi-step speed has the priority when P00.06 or P00.07 does not equal to 6, but the setting step can only be the 1~15 step. The setting step is 0~15 if P00.06 or P00.07 equals to 6 7: PID control setting The running mode of the inverter is process PID 8:MODBUS communication setting The frequency is set by MODBUS		
P00.09	Combination of the setting source	0: A, the current frequency setting is A frequency command 1: B, the current frequency setting is B frequency command 2: A+B, the current frequency setting is A frequency command + B frequency command 3: A-B, the current frequency setting is A frequency command - B frequency command 4: Max (A, B): the bigger one between A frequency command and B frequency is the set frequency. 5: Min (A, B): The lower one between A frequency command and B frequency is the set frequency. **Note:**The combination manner can be shifted by P05(terminal function)	0	○
P00.10	Keypad set frequency	When A and B frequency commands are selected as “keypad setting”, this parameter will be the initial value of inverter reference frequency Setting range:0.00 Hz~P00.03(the Max. frequency)	50.0Hz	○
P00.11	ACC time1	ACC time means the time needed if the inverter speeds up from 0Hz to the Max. One (P00.03). DEC time means the time needed if the inverter speeds down from the Max. Output frequency to 0Hz	Depend on model	○

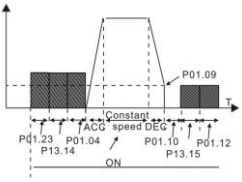
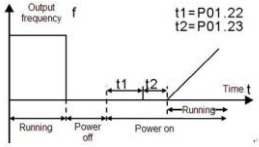
P00.12	DEC time1	(P00.03). TETA MA610 series inverters define four groups of ACC/DEC time which can be selected by P05. The factory default ACC/DEC time of the inverter is the first group. Setting range of P00.11 and P00.12:0.0~3600.0s	Depend on model	○

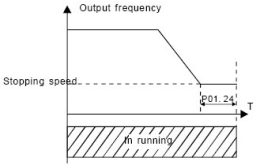
<table>
<tr>
<td>P00.14</td>
<td>Carrier frequency setting</td>
<td>


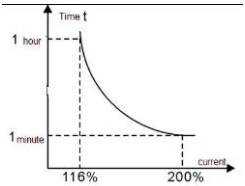
The relationship table of the motor type and carrier frequency:
<table>
<tr><th>Motor type</th><th>Factory setting</th></tr>
<tr><td>0.4-11kw</td><td>8 kHz</td></tr>
<tr><td>15-55kw</td><td>4kHz</td></tr>
<tr><td>75-110kw</td><td>2kHz</td></tr>
</table>
The advantage of high carrier frequency: ideal current waveform, little current harmonic wave and motor noise.
The disadvantage of high carrier frequency: increasing the switch loss, increasing inverter temperature and the impact to the output capacity. The inverter needs to derate on high carrier frequency. At the same time, the leakage
and electrical magnetic interference will increase.
Applying low carrier frequency is contrary to the above, too low carrier frequency will cause unstable running, torque decreasing and surge. The manufacturer has set a reasonable carrier frequency when the inverter is in factory. In general, users do not need to change the parameter.
When the frequency used exceeds the default carrier frequency, the inverter needs to derate
20% for each additional 1k carrier frequency. Setting range:1.0~15.0kHz
</td>
<td>Depend on model</td>
<td>○</td>
</tr>
<tr>
<td>P00.15</td>
<td>Motor parameter autotuning</td>
<td>0:No operation
1:Rotation autotuning
Comprehensive motor parameter autotune
It is recommended to use rotation autotuning when high control accuracy is needed.
2:Static autotuning 1
It is suitable in the cases when the motor can not de-couple from the load.
3:Static autotuning 2
It is suitable in the cases when the motor can not de-couple form the load. But only for parts of parameters.</td>
<td>0</td>
<td>◎</td>
</tr>
</table>

P00.18	Function restore parameter	0:No operation 1:Restore the default value 2:Clear fault records **Note:** The function code will restore to 0 after finishing the operation of the selected function code. Restoring to the default value will cancel the user password, please use this function with caution.	0	◎
P01 Group Start-up and stop control				
P01.00	Start mode	0:Start-up directly:start from the starting frequency P01.01 1:Start-up after DC braking: start the motor from the starting frequency after DC braking (set the parameter P01.03 and P01.04). It is suitable in the cases where reverse rotation may occur to the low inertia load during starting. 2: Start-up after speed tracking: start the rotating motor smoothly after tracking the rotation speed and direction automatically. It is suitable in the cases where reverse rotation may occur to the big inertia load during starting. **Note:** This function is available for the inverters of 4kW and above.	0	◎
P01.01	Starting frequency of direct start	Starting frequency of direct start-up means the original frequency during the inverter starting. See P01.02 for detailed information. Setting range: 0.00~50.00Hz	0.50Hz	◎
P01.02	Retention time of the starting frequency	Set a proper starting frequency to increase the torque of the inverter during starting. During the retention time of the starting frequency, the output frequency of the inverter is the starting frequency. And then, the inverter will run from the starting frequency to the set frequency. If the set frequency is lower than the starting frequency, the inverter will stop running and keep in the stand-by state. The starting frequency is not limited in the lower limit frequency.  Setting range: 0.0~50.0s	0.0s	◎

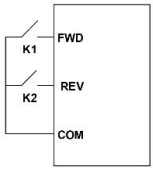
P01.03	The braking current before starting	The inverter will carry out DC braking at the braking current set before starting and it will speed up after the DC braking time. If the DC braking time is set to 0, the DC braking is invalid. The stronger the braking current, the bigger the braking power. The DC braking current before starting means the percentage of the rated current of the inverter. The setting range of P01.03: 0.0~100.0% The setting range of P01.04: 0.00~50.00s	0.0%	◎
P01.04	The braking time before starting		0.00s	◎
P01.05	ACC/DEC selection	The changing mode of the frequency during start-up and running. 0:Linear type The output frequency increases or decreases linearly.  1: S curve	0	◎
P01.08	Stop mode	0: Decelerate to stop: after the stop command becomes valid, the inverter decelerates to reduce the output frequency during the set time. When the frequency decreases to 0Hz, the inverter stops. 1: Coast to stop: after the stop command becomes valid, the inverter ceases the output immediately. And the load coasts to stop at the mechanical inertia.	0	○
P01.09	Starting frequency of DC braking	Starting frequency of DC braking: start the DC braking when running frequency reaches starting frequency determined by P1.09. Waiting time before DC braking: Inverters block the output before starting the DC braking. After this waiting time, the DC braking will be started so as to prevent over-current fault caused by DC braking at high speed. DC braking current: The value of P01.11 is the	0.00Hz	○

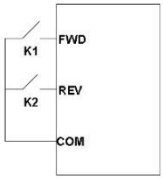
P01.10	Waiting time before DC braking	percentage of rated current of inverter. The bigger the DC braking current is, the greater the braking torque is. DC braking time: The retention time of DC brake. If the time is 0, the DC brake is invalid. The inverter will stop at the set deceleration time.  Setting range of P01.09: 0.00Hz~P00.03 (the Max. frequency) Setting range of P01.10: 0.00~50.00s Setting range of P01.11: 0.0~100.0% Setting range of P01.12: 0.00~50.00s	0.00s	○
P01.11	DC braking current		0.0%	○
P01.12	DC braking time		0.00s	○
P01.21	Restart after power off	This function can enable the inverter start or not after the power off and then power on. 0: Disable 1: Enable, if the starting need is met, the inverter will run automatically after waiting for the time defined by P01.22.	0	○
P01.22	The waiting time of restart after power off	The function determines the waiting time before the automatic running of the inverter when powering off and then powering on.  Setting range: 0.0~3600.0s (valid when P01.21=1)	1.0s	○
P01.23	Start delay time	The function determines the brake release after the running command is reference, and the inverter is in a stand-by state and wait for the delay time set by P01.23 Setting range: 0.0~60.0s	0.0s	○

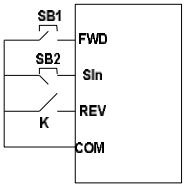
P01.24	Delay time of the stop speed	 Setting range: 0.0~100.0 s	0.0s	●
P02 Group Motor 1				
P02.01	Rated power of AM 1	0.1~3000.0kW	Depend on model	◎
P02.02	Rated frequency of AM 1	0.01Hz~P00.03(the Max. frequency)	50.00 Hz	◎
P02.03	Rated speed of AM 1	1~36000rpm	Depend on model	◎
P02.04	Rated voltage of AM 1	0~1200V	Depend on model	◎
P02.05	Rated current of AM 1	0.8~6000.0A	Depend on model	◎
P02.06	Stator resistor of AM 1	0.001~65.535Ω	Depend on model	○
P02.07	Rotor resistor of AM 1	0.001~65.535Ω	Depend on model	○
P02.08	Leakage inductance of AM 1	0.1~6553.5mH	Depend on model	○
P02.09	Mutual inductance of AM 1	0.1~6553.5mH	Depend on model	○
P02.10	Non-load current of AM 1	0.1~6553.5A	Depend on model	○

P02.26	Motor 1 overload protection	0: No protection 1: Common motor (with low speed compensation). Because the heat-releasing effect of the common motors will be weakened, the corresponding electric heat protection will be adjusted properly. The low speed compensation characteristic mentioned here means reducing the threshold of the overload protection of the motor whose running frequency is below 30Hz. 2: Variable frequency motor (without low speed compensation) Because the heat-releasing effect of the specific motors won't be impacted by the rotation speed, it is not necessary to adjust the protection value during low-speed running.	2	◎
P02.27	Motor 1 over load protection coefficient	Times of motor overload M = Iout/(In*K) In is the rated current of the motor, Iout is the output current of the inverter and K is the motor protection coefficient. So, the bigger the value of K is, the smaller the value of M is. When M =116%, the fault will be reported after 1 hour, when M =200%, the fault will be reported after 1 minute, when M>=400%, the fault will be reported instantly.  Setting range: 20.0%~120.0%	100.0%	○
P03 Group Vector control				
P04 Group SVPWM control				
P05 Group Input terminals				
P05.00	HDI input	0: HDI is high pulse input. See P05.49~P05.54 1: HDI is switch input	0	◎
P05.01	S1 terminal function selection	0: No function 1: Forward rotation 2: Reverse rotation 3: 3-wire control	1	◎
	S2 terminal			

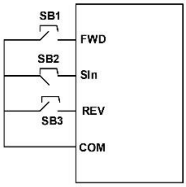
P05.02	function selection	4: Forward jogging 5: Reverse jogging 7: Fault reset 10:Increasing frequency setting(UP) 11:Decreasing frequency setting(DOWN) 16:Multi-step speed terminal 1 17:Multi-step speed terminal 2 18:Multi-step speed terminal 3 19:Multi- step speed terminal 4 20:Multi- step speed pause 21:ACC/DEC time option 1 22:ACC/DEC time option 2 23:Simple PLC stop reset 24:Simple PLC pause	4	◎
P05.03	S3 terminal function selection		7	◎
P05.04	S4 terminal function selection		0	◎
P05.09	HDI terminal function selection		0	◎

<table>
<tr>
<td>P05.13</td>
<td>Terminals control running mode</td>
<td>during operation:
Set the operation mode of the terminals control
0:2-wire control 1, comply the enable with the direction. This mode is widely used. It determines the rotation direction by the defined FWD and REV terminals command.
 

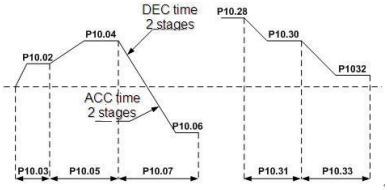
<table>
<tr><td>FWD</td><td>REV</td><td>运行命令</td></tr>
<tr><td>OFF</td><td>OFF</td><td>停止</td></tr>
<tr><td>ON</td><td>OFF</td><td>正转运行</td></tr>
<tr><td>OFF</td><td>ON</td><td>反转运行</td></tr>
<tr><td>ON</td><td>ON</td><td>保持</td></tr>
</table>
1:2-wire control 2; Separate the enable from the direction. FW D defined by this mode is the enabling ones. The direction depends on the state of the defined REV.
 

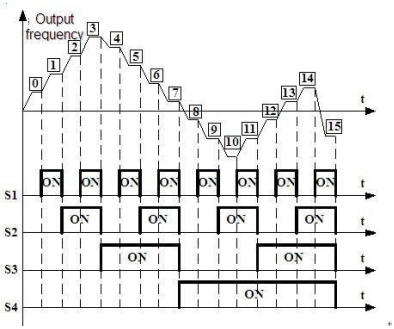
<table>
<tr><td>FWD</td><td>REV</td><td>运行命令</td></tr>
<tr><td>OFF</td><td>OFF</td><td>停止</td></tr>
<tr><td>ON</td><td>OFF</td><td>正转运行</td></tr>
<tr><td>OFF</td><td>ON</td><td>停止</td></tr>
<tr><td>ON</td><td>ON</td><td>反转运行</td></tr>
</table>
2:3-wire control 1; Sin is the enabling terminal on this mode, and the running command is caused by FWD and the direction is controlled by REV. Sin is natural closed
 

The direction control is as below</td>
<td>0</td>
<td>◎</td>
</tr>
</table>

		<table><tr><th>Sin</th><th>REV</th><th>Previous direction</th><th>Current direction</th></tr><tr><td rowspan="2">ON</td><td rowspan="2">OFF→ON</td><td>Forward</td><td>Reverse</td></tr><tr><td>Reverse</td><td>Forward</td></tr><tr><td rowspan="2">ON</td><td rowspan="2">ON→OFF</td><td>Reverse</td><td>Forward</td></tr><tr><td>Forward</td><td>Reverse</td></tr><tr><td>ON→ OFF</td><td>ON OFF</td><td colspan="2">Decelerate to stop</td></tr></table> 3:3-wire control 2; Sin is the enabling terminal on this mode, and the running command is caused by SB1 or SB3 and both of them control the running direction.NC SB2 generates the stop command.  <table><tr><th>Sin</th><th>FWD</th><th>REV</th><th>Direction</th></tr><tr><td rowspan="2">ON</td><td rowspan="2">OFF→ ON</td><td>ON</td><td>Forward</td></tr><tr><td>OFF</td><td>Reverse</td></tr><tr><td rowspan="2">ON</td><td>ON</td><td rowspan="2">OFF→ ON</td><td>Forward</td></tr><tr><td>OFF</td><td>Reverse</td></tr><tr><td>ON→ OFF</td><td></td><td></td><td>Decelerat e to stop</td></tr></table> **Note**: for the 2-wire running mode, when FWD/REV terminal is valid, the inverter stop because of the stopping command from other sources, even the control terminal FWD/REV keeps valid; the inverter won't work when the stopping command is canceled. Only when FWD/REV is relaunched, the inverter can start again. For example, the valid STOP/RST stop when PLC signal cycles stop, fixed-length stop and terminal control (see P07.04).		
P06 Group Output terminals				
P06.01	Y1 output	0:Invalid 1:In operation	0	○
P06.02	HDO output		0	○

P06.03	Relay RO1 output	2:Forward rotation 3:Reverse rotation	1	○
P06.04	Relay RO2 output	4: Jogging 5:The inverter fault 8:Frequency arrival 9:Zero speed running 12:Ready for operation	5	○
P06.14	AO1 output	0:Running frequency	0	○
P06.15	AO2 output	1:Setting frequency 10:Analog AI1 input value 11:Analog AI2 input value 12:Analog AI3 input value 13:High speed pulse HDI input value	0	○
P07 Group Human-Machine Interface				
P08 Group Enhanced function				
P08.00	ACC time 2	Refer to P00.11 and P00.12 for detailed definition. TETA MA610 series define four groups of ACC/DEC time which can be selected by P5 group. The first group of ACC/DEC time is the factory default one. Setting range:0.0~3600.0s	Depend on model	○
P08.01	DEC time 2		Depend on model	○
P08.06	Jogging frequency	This parameter is used to define the reference frequency during jogging. Setting range: 0.00Hz ~P00.03 (the Max. frequency)	5.00Hz	○
P08.07	Jogging ACC time	The jogging ACC time means the time needed if the inverter runs from 0Hz to the Max. Frequency. The jogging DEC time means the time needed if the inverter goes from the Max. Frequency (P0.03) to 0H	Depend on model	○
P08.08	Jogging DEC time		Depend on model	○
P08.39	Cooling fan running mode	Set the operation mode of the cooling fan. 0: Normal mode, after the rectifier receives operation command or the detected temperature of module is above 45℃ or the module current is above 20% of the rated current, the fan rotates. 1:The fan keeps on running after power on	0	○
P08.44	UP/DOWN terminals control	0x00~0x221 LED ones: frequency control selection 0:UP/DOWN terminals setting valid 1:UP/DOWN terminals setting valid LED tens: frequency control selection 0:Only valid when P00.06=0 or P00.07=0 1:All frequency means are valid 2:When the multi-step are priority, it is invalid to the multi-step LED hundreds: action selection when stop	0x000	○

		0:Setting valid 1: Valid in the running, clear after stop 2: Valid in the running, clear after receiving the stop commands		
P08.45	UP terminals frequency increasing integral ratio	0.01~50.00Hz/s	0.50 Hz/s	○
P08.46	DOWN terminals	0.01~50.00 Hz/s	0.50 Hz/s	○
P09 Group PID control				
P10 Group Simple PLC and multi-step speed control				
P10.00	Simple PLC	0: Stop after running once. The inverter has to be commanded again after finishing a cycle. 1: Run at the final value after running once. After finish a signal, the inverter will keep the running frequency and direction of the last run. 2: Cycle running. The inverter will keep on running until receiving a stop command and then, the system will stop.	0	○
P10.01	Simple PLC memory	0: Power loss without memory 1:Power loss memory； PLC record the running step and frequency when power loss.	0	○
P10.02	Multi-step speed 0	100.0% of the frequency setting corresponds to the Max. frequency P00.03. When selecting simple PLC running, set P10.02~P10.33 to define the running frequency and direction of all steps. **Note:** The symbol of multi-step determines the running direction of simple PLC. The negative value means reverse rotation.  Multi-step speeds are in the range of $-f_{max}$~f_{max} and it can be set continuously. TETA MA610 series inverters can set 16 steps	0.0%	○
P10.03	The running time of step 0		0.0s	○
P10.04	Multi-step speed 1		0.0%	○
P10.05	The running time of step 1		0.0s	○
P10.06	Multi-step speed 2		0.0%	○
P10.07	The running time of step 2		0.0s	○
P10.08	Multi-step speed 3		0.0%	○
P10.09	The running time of step 3		0.0s	○
P10.10	Multi-step speed 4		0.0%	○

<table>
<tr><td>P10.11</td><td>The running time of step 4</td><td rowspan="31">speed, selected by the combination of multi-step terminals 1~4, corresponding to the speed 0 to speed 15.
 

When S1=S2=S3=S4=OFF, the frequency input manner is selected via code P00.06 or P00.07. When all S1=S2=S3=S4 terminals aren't off, it runs at multi-step which takes precedence of keypad, analog value, high-speed pulse, PLC, communication frequency input. Select at most
16 steps speed via the combination code of S1, S2, S3, and S4.
The start-up and stopping of multi-step running is determined by function code P00.06, the relationship between S1,S2,S3,S4 terminals and multi-step speed is as following:
<table>
<tr><td>S1</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td></tr>
<tr><td>S2</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td></tr>
<tr><td>S3</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td></tr>
<tr><td>S4</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td></tr>
<tr><td>Step</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr>
<tr><td>S1</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td></tr>
<tr><td>S2</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td></tr>
<tr><td>S3</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td></tr>
<tr><td>S4</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td></tr>
<tr><td>Step</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td></tr>
</table>
Setting range of P10.(2n,1<n<17): -100.0~100.0% Setting range of
P10.(2n+1,1<n<17):0.0~6553.5s(min)</td><td>0.0s</td><td>○</td></tr>
<tr><td>P10.12</td><td>Multi-step speed 5</td><td>0.0%</td><td>○</td></tr>
<tr><td>P10.13</td><td>The running time of step 5</td><td>0.0s</td><td>○</td></tr>
<tr><td>P10.14</td><td>Multi-step speed 6</td><td>0.0%</td><td>○</td></tr>
<tr><td>P10.15</td><td>The running time of step 6</td><td>0.0s</td><td>○</td></tr>
<tr><td>P10.16</td><td>Multi-step speed 7</td><td>0.0%</td><td>○</td></tr>
<tr><td>P10.17</td><td>The running time of step 7</td><td>0.0s</td><td>○</td></tr>
<tr><td>P10.18</td><td>Multi-step speed 8</td><td>0.0%</td><td>○</td></tr>
<tr><td>P10.19</td><td>The running time of step 8</td><td>0.0s</td><td>○</td></tr>
<tr><td>P10.20</td><td>Multi-step speed 9</td><td>0.0%</td><td>○</td></tr>
<tr><td>P10.21</td><td>The running time of step 9</td><td>0.0s</td><td>○</td></tr>
<tr><td>P10.22</td><td>Multi-step speed 10</td><td>0.0%</td><td>○</td></tr>
<tr><td>P10.23</td><td>The running time of step 10</td><td>0.0s</td><td>○</td></tr>
<tr><td>P10.24</td><td>Multi-step speed 11</td><td>0.0%</td><td>○</td></tr>
<tr><td>P10.25</td><td>The running time of step 11</td><td>0.0s</td><td>○</td></tr>
<tr><td>P10.26</td><td>Multi-step speed 12</td><td>0.0%</td><td>○</td></tr>
<tr><td>P10.27</td><td>The running time of step 12</td><td>0.0s</td><td>○</td></tr>
<tr><td>P10.28</td><td>Multi-step speed 13</td><td>0.0%</td><td>○</td></tr>
<tr><td>P10.29</td><td>The running time step13</td><td>0.0s</td><td>○</td></tr>
<tr><td>P10.30</td><td>Multi-step speed 14</td><td>0.0%</td><td>○</td></tr>
<tr><td>P10.31</td><td>The running time step14</td><td>0.0s</td><td>○</td></tr>
</table>

P10.32	Multi-step speed 15		0.0%	○
P10.33	The running time step15		0.0s	○
P10.36	PLC restart	0: Restart from the first step; stop during running (cause by the stop command, fault or power loss), run from the first step after restart. 1: Continue to run from the stop frequency; stop during running(cause by stop command and fault), the inverter will record the running time automatically, enter into the step after restart and keep the remaining running at the setting frequency.	0	◎
P11 Group Protective parameters				
P11.00	Phase loss protection	0x00~0x11 LED ones: 0: Input phase loss protection disable 1: Input phase loss protection enable LED tens: 0: Input phase loss protection disable 1: Input phase loss protection enable LED hundreds: 0: Input phase loss hardware protection disable 1: Input phase loss hardware protection enable	111	○
P11.03	Overvoltage stall protection	1: Enable 0: Disable	1	○
P11.04	Protection voltage at overvoltage stall	110~150%(standard bus voltage) (380V)	130%	○
		110~150%(standard bus voltage) (220V)	120%	
P11.05	Current limit action selection	The actual increasing ratio is less than the ratio of output frequency because of the big load during ACC running. It is necessary to take measures to avoid over current fault and the inverter trips.	01	◎
P11.06	Automatic current limit	During the running of the inverter, this function will detect the output current and compare it with the limit defined in P11.06. If it exceeds the level, the inverter will run at stable frequency in ACC running, or the inverter will derate to run during the constant running. If it exceeds the level continuously, the output frequency will keep on decreasing to the lower limit. If the output current is detected to be lower than the limit level, the inverter will accelerate to run.	G: 160.0%	◎
	Overload pre-	The output current of the inverter or the motor is above		

P11.08	alarm of the Motor/ inverter	P11.09 and the lasting time is beyond P11.10, overload pre-alarm will be output.Setting range of P11.08:	0x000	○
P11.09	Overload pre-alarm test level	Enable and define the overload pre-alarm of the inverter or the motor.Setting range: 0x000~0x131 LED ones: 0:Overload pre-alarm of the motor, comply with the rated current of the motor 1:Overload pre-alarm of the inverter, comply with the rated current of the inverter LED tens: 0:The inverter continues to work after underload pre-alarm 1:The inverter continues to work after underload	G: 150%	○
P11.10	Overload pre-alarm detection time		P: 120%	
			1.0s	○
P13 Group SM control				
P14 Group Serial communication				
P14.00	Local communication address	The setting range:1~247 When the master is writing the frame, the communication address of the slave is set to 0; the broadcast address is the communication address. All slaves on the MODBUS fieldbus can receive the frame, but the salve doesn't answer. The communication address of the drive is unique in the communication net. This is the fundamental for the point to point communication between the upper monitor and the drive. **Note:** The address of the slave cannot set to 0.	1	○
P14.01	Communication baud ratio	Set the digital transmission speed between the upper monitor and the inverter. 0:1200BPS 1:2400BPS 2:4800BPS 3:9600BPS 4:19200BPS 5:38400BPS 6:57600BPS **Note:** The baud rate between the upper monitor and the inverter must be the same. Otherwise, the communication is not applied. The bigger the baud rate, the quicker the communication speed.	4	○
P14.02	Digital bit checkout	The data format between the upper monitor and the inverter must be the same. Otherwise, the communication is not applied. 0: No check (N,8,1) for RTU 1: Even check (E,8,1) for RTU	1	○

		2: Odd check (O,8,1) for RTU 3:No check (N,8,2) for RTU 4: Even check (E,8,2) for RTU 5: Odd check(O,8,2) for RTU 6: No check (N,7,1) for ASCII 7: Even check (E,7,1) for ASCII 8: Odd check (O,7,1) for ASCII 9:No check (N,7,2) for ASCII 10: Even check (E,7,2) for ASCII 11: Odd check(O,7,2) for ASCII 12: No check (N,8,1) for ASCII 13: Even check (E,8,1) for ASCII 14: Odd check (O,8,1) for ASCII 15:No check (N,8,2) for ASCII 16: Even check (E,8,2) for ASCII 17: Odd check(O,8,2) for ASCII		
P17 Group Monitoring function				

Fault instruction and solution

Fault code	Fault type	Possible cause	What to do
OUt1	IGBT Ph-U fault	The acceleration is too fast IGBT module fault Misaction caused by interference The connection of the driving wires is not good, Grounding is not properly	Increase Acc time Change the power unit Check the driving wires Inspect external equipment and eliminate interference
OUt2	IGBT Ph-V fault		
OUt3	IGBT Ph-W fault		
OC1	Over-current when acceleration	The acceleration or deceleration is too fast The voltage of the grid is too low The power of the inverter is too low The load transients or is abnormal The grounding is short circuited or the output is phase loss There is strong external interference The overvoltage stall protection is not open	Increase the ACC time Check the input power Select the inverter with a larger power Check if the load is short circuited (the grounding short circuited or the wire short circuited) or the rotation is not smooth Check the output configuration. Check if there is strong interference Check the setting of relative function codes
OC2	Over-current when deceleration		
OC3	Over-current when constant speed running		
OV1	Over-voltage when acceleration	The input voltage is abnormal There is large energy feedback No braking components Braking energy is not open	Check the input power Check if the DEC time of the load is too short or the inverter starts during the rotation of the motor or it needs to add the dynamic bracking components Install the braking components Check the setting of relative function codes
OV2	Over-voltage when deceleration		
OV3	Over-voltage when constant speed running		
UV	DC bus Under voltage	The voltage of the power supply is too low The overvoltage stall protection is not open	Check the input power of the supply line Check the setting of relative function codes
OL1	Motor overload	The voltage of the power supply is too low The motor setting rated current is incorrect The motor stall or load transients is too strong	Check the power of the supply line Reset the rated current of the motor Check the load and adjust the torque lift

OL2	Inverter overload	The acceleration is too fast Reset the rotating motor The voltage of the power supply is too low The load is too heavy The motor power is too big	Increase the ACC time Avoid the restarting after stopping Check the power of the supply line Select an inverter with bigger power Select a proper motor
SPI	Input phase loss	Phase loss or fluctuation of input R,S,T	Check input power Check installation distribution
SPO	Output phase loss	U,V,W phase loss input(or serious asymmetrical three phase of the load)	Check the output distribution Check the motor and cable
OH1	Rectify overheat	Air duct jam or fan damage Ambient temperature is too high The time of overload running is too long	Clean the air duct or the fan Reduce the ambient temperature
OH2	IGBT overheat		
EF	External fault	SI external fault input terminals action	Check the external device input
CE	Communication error	The baud rate setting is incorrect Fault occurs to the communication wiring. The communication address is wrong There is strong interference to the communication	Set proper baud rate Check the communication connection distribution Set proper communication address Chang or replace the connection distribution or improve the anti-interference capability
ItE	Current detection fault	The connection of the control board is not good Hoare components is broken The modifying circuit is	Check the connector and repatch Change the hoare Change the main control panel
tE	Autotuning fault	The motor capacity does not comply with the inverter capability The rated parameter of the motor does not set correctly. The offset between the parameters autotunting and the standard parameter is huge Autotune overtime	Change the inverter mode Set the rated parameter according to the motor name plate Empty the motor load and reindentify Check the motor connection and set the parameter. Check if the upper limit frequency is above 2/3 of the rated frequency.

EEP	EEPROM fault	Error of controlling the write and read of the parameters Damage to EEPROM	Press STOP/RST to reset Change the main control panel
PIDE	PID feedback fault	PID feedback offline PID feedback source disappear	Check the PID feedback signal Check the PID feedback source
bCE	Braking unit fault	Braking circuit fault or damage to the braking pipes The external braking resistor is not sufficient	Check the braking unit and change new braking pipe Increase the braking resistor
END	Time reach of factory setting	The actual running time of the inverter is above the internal setting running time	Ask for the supplier and adjust the setting running time
PCE	Keypad communication fault	The connection of the keypad wires is not good or broken The keypad wire is too long and affected by strong interference There is circuit fault on the	Check the keypad wires and ensure whether there is mistake Check the environment and avoid the interference source Change the hardware and ask for service
UPE	Parameter upload error	The keypad is not in good connection or offline The keypad cable is too long and there is strong interference Part of the communication circuits of the keypad or	Check the keypad cable Check the environment and eliminate the interference source Change hardware and ask for maintenance service
DNE	Parameters downloading fault	The connection of the keypad wires is not good or broken The keypad wire is too long and affected by strong interference	Check the keypad wires and ensure whether there is mistake Change the hardware and ask for service Repack-up the data in the keypad
ETH1	Grounding shortcut fault 1	The output of the inverter is short circuited with the ground There is fault in the current detection circuit	Check if the connection of the motor is normal or not Change the hoare Change the main control panel
ETH2	Grounding shortcut fault 2		
LL	Electronic under load fault	The inverter will report the under load pre-alarm according to the set value	Check the load and the under load pre-alarm point

TETA ELECTRIC CO., LTD.

- Tel: +983132226282
- Fax: +983132226282
- Address: NO.2, 2TH FLOOR,
  ASEMAN BUILDING,
  HAGHSHENAS ALLEY, FERDOSI
  ST, ESFAHAN, IRAN.