START SHAPHON®

Microstep®

北京欣斯达特 步进电机驱动器

我们致力于每一步更完美

Microstep
EA202D
Microstep
TZ-2H504A
Microstep
MZ-2H504A
Microstep
Step Driver
Microstep
TD-2H611A

北京欣斯达特数字科技有限公司

Beijing Flourishing Start Digital Technology Co., Ltd

CONTENTS

Drive Model Naming Rules ---------- 2

Drive list ---------- 2

Drive Operation ---------- 3

Drive Connection Diagram ---------- 3

EA202D & MU-2H202D Drive Profile ---------- 3

MX-2H304D Drive Profile ---------- 4

MX-2H306D Drive Profile ---------- 4

TX-2H504D Drive Profile ---------- 5

TX-3H504D Drive Profile ---------- 5

MZ-2H504A Drive Profile ---------- 6

MZ-2H506A Drive Profile ---------- 6

TZ-2H704A Drive Profile ---------- 7

TZ-3H504A Drive Profile ---------- 7

TZ-3H506A Drive Profile ---------- 8

TD-2H611A Drive Profile ---------- 8

TD-3H511A Drive Profile ---------- 9

TD-3H522A Drive Profile ---------- 9

Drive Main Function Setting & Operation ---------- 10

Control Signal Interface ---------- 11

2-phase Motors Interface ---------- 12

3-phase Motor Interface ---------- 13

DIP Switch Setting ---------- 13

Driver Output Current Setting ---------- 13

Drive Mounting Dimensions ---------- 14

【Drive Model Naming】

Example: MX-2H 3 04 D /dk

Special series: example, dk for carving machine, GM series without;

Power Supply type: D for dc power supply, A for 50/60Hz AC power supply (All AC- powered driver can use DC power supply);

Maximum or typical power supply voltage divided by 10: example for Maximum DC40V power supply. AC supply for virtual value, detail reference to specification instructions;

Maximum output current: 2-phase drive mark Peak current, 3-phase drive mark value current (RMS), Sample Peak current 3.0A;

Drive type: 2H for two phase hybrid, 3H for three-phase;

Drive Series code: MU and EA for micro-drives, MX and TX for min-drive, MZ TZ for medium-drive, TD for large-drives;

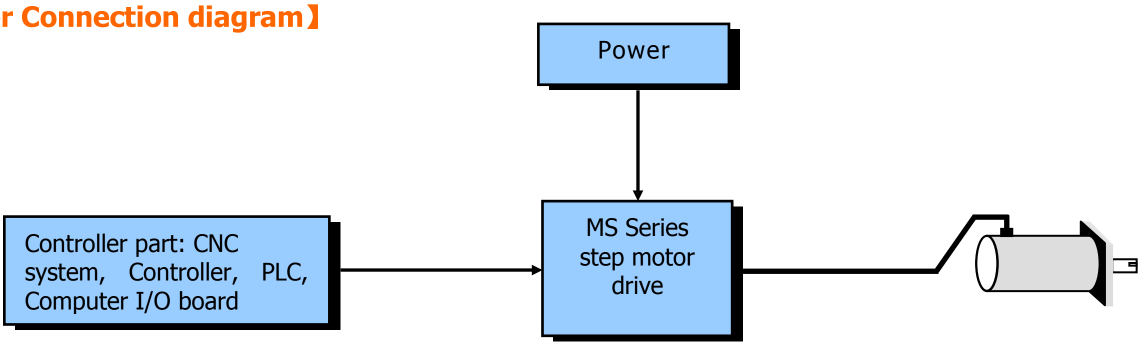
【Drive list】

Model	Phase	**Segment Step**	**Output Current**	**Supply Power & TYPICAL VALUE**	**Dimensions (mm) Weight(kg)**	**Size**
EA202D	2 phase	2/4/8/16	0.4-1.7A (Max) 4 ranks, accuracy 0.4A	POWER: DC24V POWER OVER 50W	100×60×19 0.17 kg	Micro
MU-2H202D		2/5/10/20/40	1.7A customization, non-adjust			
MX-2H304D	2 phase	22 ranks Max micostep 200 Max step 40000	0.2A-3.0A (Max) 16 ranks, accuracy 0.2A	DC(24-40)V, Typical value DC24、32V POWER OVER 100W	123×76×31 0.27 kg	Min
MX-2H306D				DC(40-60)V, Typical value DC50V POWER OVER 150W	123×76×38 0.35 kg	Min Thicken
TX-2H504D		28 ranks Max step 60000	0.4A-5.0A (Max) 16 ranks, accuracy 0.4A	DC(24-40)V, Typical value DC24/ DC 32V POWER OVER 150W	123×76×31 0.27 kg	Min
TX-3H504D	3 phase	28 ranks Max step 60000	0.3A-5.2A(effective value) 16 ranks, accuracy 0.3A	DC(24-36)V, Typical value DC24 / DC 32V POWER OVER 150W		
MZ-2H504A	2 phase	22 ranks Max step 40000	0.4A-5.0A (Max) 16 ranks, accuracy 0.4A	AC(24-45)V, Typical value AC40V DC(40-60)V, Typical value DC50V POWER OVER 200W	157×99×56 0.7kg	Medium
MZ-2H506A				AC(40-60)V, Typical value AC50V DC(60-80)V, Typical value DC70V POWER OVER 250W		
TZ-2H704A		28 ranks Max step 60000	0.5A-7.5A (Max) 16 ranks, accuracy 0.5A	AC(24-45)V, Typical value AC40V DC(40-60)V, Typical value DC50V POWER OVER 250W		
TZ-3H504A	3 phase	28 ranks Max step 60000	0.3A-5.2A (effective value) 16 ranks, accuracy 0.3A	AC(24-45)V, Typical valuAC40V DC(40-60)V, Typical value DC50V POWER OVER 200W		
TZ-3H506A				AC(40-60)V, Typical value AC50V DC(60-80)V, Typical value DC70V POWER OVER 250W		
TD-2H611A	2 phase	28 ranks Max step 60000	0.4A-6.0A (Max) 16 ranks, accuracy 0.4A	AC(70-140)V, Typical value AC80V & AC110V POWER OVER 500W	177×122×75 1.1kg	large
TD-3H511A	3 phase	28 ranks Max step 60000	0.3A-5.2A (effective value) 16 ranks, accuracy 0.3A	AC(70-140)V, Typical value AC80V & AC110V POWER OVER 500W		
TD-3H522A				AC(180-240)V, Typical value AC220V POWER OVER 600W		

【Drive Operation】

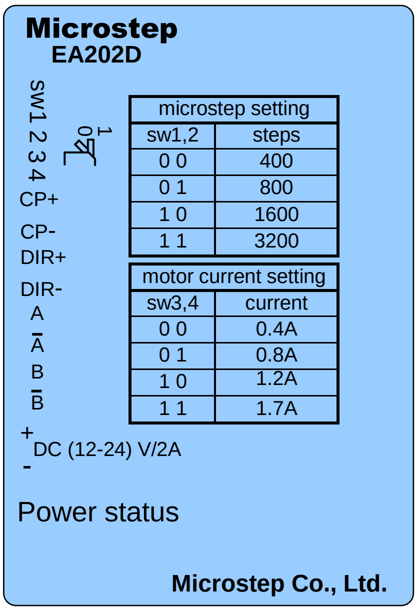
Input power	DC power supply, voltage error -15% - +15%, ripple ≤ 5%; AC power supply, voltage error -30% - +10%, frequency of 50/60Hz
Working condition	Operating temperature: -10℃～45℃; Humidity: 10～85% non-condensing; Non-corrosive, explosive, gas or liquid conductive; no metal dust.
Installation	Drive should be installed in a well ventilated and protective electrical control cabinet. Please keep the air channel for the cooling fan drive. If the heat dissipated by drive shell, drive should be fixed in the bigger and thick metal plate or cabinet, contact surface should be smooth or coated with heat conductive silicon grease. Fixing cooling fan beside drive is also a better heat dissipation method.
Connection	Control line should be used to shielded cable and separated with the power line and electrical lines. NOTE: Strictly prohibited tinning on the ending of control line and connection terminals! Otherwise it would cause heat damage to the terminal, generally use lead sheeting or direct access to the drive. PE terminal is ground protection side. In the case of non-isolated powered, drives and motors must be ground protection (Recommended powered by isolation transformer)

【 Driver Connection diagram】


Power
Controller part: CNC system, Controller, PLC, Computer I/O board
MS Series step motor drive

【EA202D and MU-2H202D Drive profile】

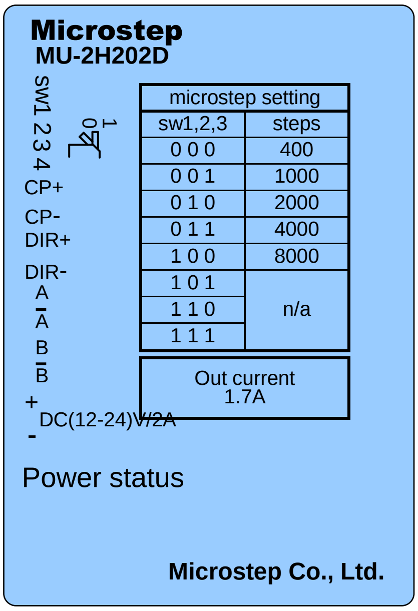
EA202D and MU-2H202D step drives are micro-drives; the size and installation are same. The main type used to drive 42 type or small 57 type 2-phase stepper motor. Both of them power supply are DC24, output Max phase current (peak) are 1.7A. The difference is as follows: 1. The number of segments is different (see below); 2. EA202D could set four gear phase current by DIP switch, while the MU-2H202D can only output a fixed current which the user could not adjust, user could customize the current before the instructions, and otherwise the factory default value is 1.7A.


Microstep
EA202D
SW1 2 3 4
1
0
CP+
CP-
DIR+
DIR-
A
Ā
B
B̄
+
DC (12-24) V/2A
-
Power status
Microstep Co., Ltd.

microstep setting	
sw1,2	steps
0 0	400
0 1	800
1 0	1600
1 1	3200

motor current setting	
sw3,4	current
0 0	0.4A
0 1	0.8A
1 0	1.2A
1 1	1.7A

EA202D panel drawing

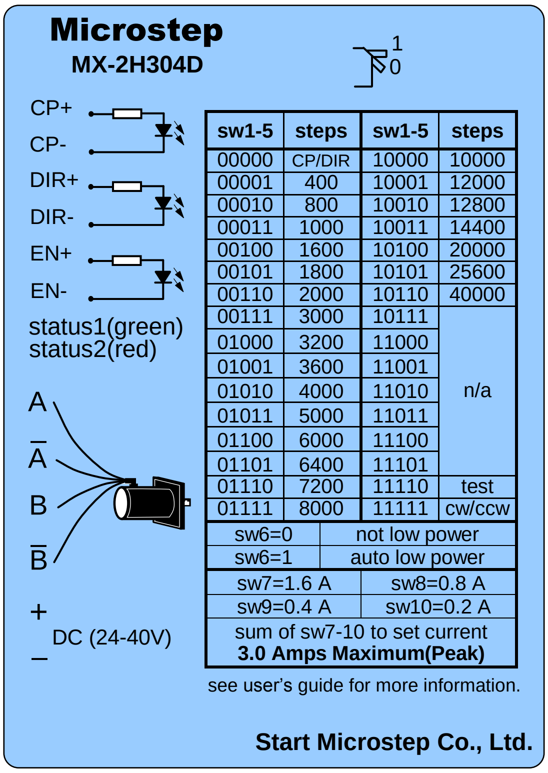

Microstep
MU-2H202D
SW1 2 3 4
1
0
CP+
CP-
DIR+
DIR-
A
Ā
B
B̄
+
DC(12-24)V/2A
-
Power status
Microstep Co., Ltd.

microstep setting	
sw1,2,3	steps
0 0 0	400
0 0 1	1000
0 1 0	2000
0 1 1	4000
1 0 0	8000
1 0 1	n/a
1 1 0	
1 1 1	

Out current
1.7A

MU-2H202D panel drawing

【MX-2H304D Drive profile】


Microstep
MX-2H304D
1
0
CP+
CP-
DIR+
DIR-
EN+
EN-
status1(green)
status2(red)
A
Ā
B
B̄
+
DC (24-40V)
–
see user's guide for more information.
Start Microstep Co., Ltd.

sw1-5	steps	sw1-5	steps
00000	CP/DIR	10000	10000
00001	400	10001	12000
00010	800	10010	12800
00011	1000	10011	14400
00100	1600	10100	20000
00101	1800	10101	25600
00110	2000	10110	40000
00111	3000	10111	n/a
01000	3200	11000	
01001	3600	11001	
01010	4000	11010	
01011	5000	11011	
01100	6000	11100	
01101	6400	11101	
01110	7200	11110	test
01111	8000	11111	cw/ccw

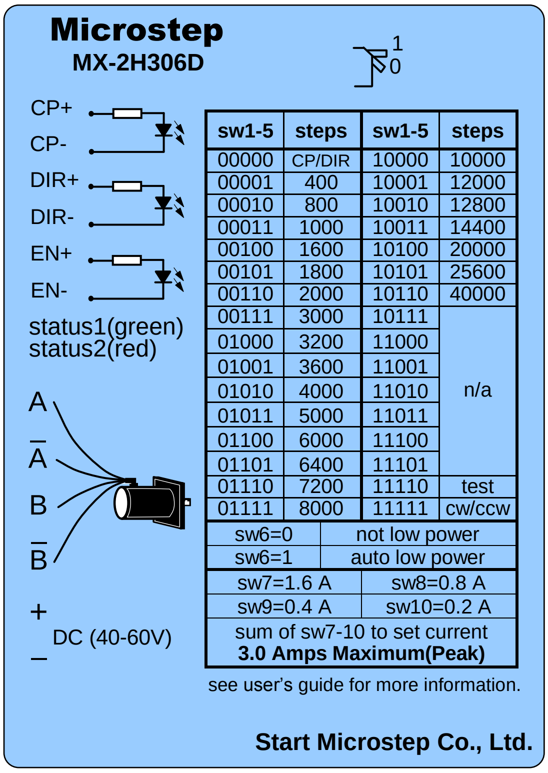
sw6=0	not low power
sw6=1	auto low power
sw7=1.6 A	sw8=0.8 A
sw9=0.4 A	sw10=0.2 A

sum of sw7-10 to set current
3.0 Amps Maximum(Peak)

MX-2H304D panel drawing

MX-2H304D step drives are mainly used to drive 57 type 2-phase hybrid stepper motor which current is below 3A. It is up to 22 segments and Max 40000 steps. Step could be set by 1 to 5 bit of DIP switch. Signal and doubt pulse mode. Self-test function, Phase memory function, auto half current function. Output max current is 3.0A. Current could be set bye 7 to 10 bit of the DIP switch (it could set 16 speeds current, setting resolution is 0.3A). MX-2H304D step drives is 24V to 49V DC power supply. Typical value is DC 24V or 32V. Recommend using switch power supply, power is over 100W. Relation setting and operation is as shown below.

【MX-2H306D Drive profile】


Microstep
MX-2H306D
1
0
CP+
CP-
DIR+
DIR-
EN+
EN-
status1(green)
status2(red)
A
Ā
B
B̄
+
DC (40-60V)
–
see user's guide for more information.
Start Microstep Co., Ltd.

sw1-5	steps	sw1-5	steps
00000	CP/DIR	10000	10000
00001	400	10001	12000
00010	800	10010	12800
00011	1000	10011	14400
00100	1600	10100	20000
00101	1800	10101	25600
00110	2000	10110	40000
00111	3000	10111	n/a
01000	3200	11000	
01001	3600	11001	
01010	4000	11010	
01011	5000	11011	
01100	6000	11100	
01101	6400	11101	
01110	7200	11110	test
01111	8000	11111	cw/ccw

sw6=0	not low power
sw6=1	auto low power
sw7=1.6 A	sw8=0.8 A
sw9=0.4 A	sw10=0.2 A

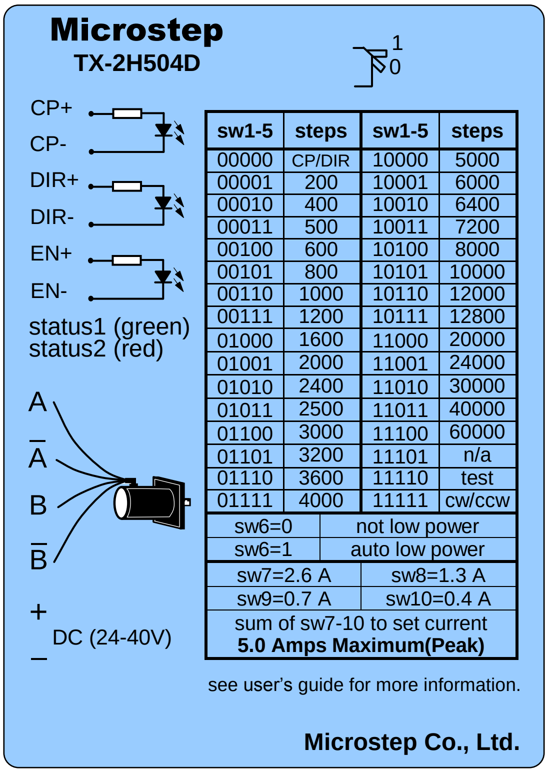
sum of sw7-10 to set current
3.0 Amps Maximum(Peak)

MX-2H306D panel drawing

MX-2H306D step drives are mainly used to drive high voltage 57 type 2-phase hybrid stepper motor which current is below 3A. It is up to 22 segments and Max 40000 steps. Step could be set by 1 to 5 bit of DIP switch. Signal and doubt pulse mode. Self-test function, Phase memory function, auto half current function. Output max current is 3.0A. Current could be set bye 7 to 10 bit of the DIP switch (it could set 16 speeds current, setting resolution is 0.3A). MX-2H306D step drives is 40V to 60V DC power supply. Typical value is DC 40V or 50V. Recommend using switch power supply, power is over 150W. Relation setting and operation is as shown below.

【TX-2H504D Drive profile】

TX-2H504D step drives are mainly used to drive 57 type or low voltage low speed 86 type 2-phase hybrid stepper motor which current is below 5A. It is up to 28 segments and Max 60000 steps. Step could be set by 1 to 5 bit of DIP switch. Signal and doubt pulse mode. Self-test function, Phase memory function, auto half current function. Output max current is 5.0A. Current could be set bye 7 to 10 bit of the DIP switch (it could set 16 speeds current, setting resolution is 0.3A). TX-2H504D step drives is 24V to 40V DC power supply. Typical value is DC 24V or 32V. Recommend using switch power supply, power is over 150W. Relation setting and operation is as shown below.



Microstep

TX-2H504D

sw1-5	steps	sw1-5	steps
00000	CP/DIR	10000	5000
00001	200	10001	6000
00010	400	10010	6400
00011	500	10011	7200
00100	600	10100	8000
00101	800	10101	10000
00110	1000	10110	12000
00111	1200	10111	12800
01000	1600	11000	20000
01001	2000	11001	24000
01010	2400	11010	30000
01011	2500	11011	40000
01100	3000	11100	60000
01101	3200	11101	n/a
01110	3600	11110	test
01111	4000	11111	cw/ccw

sw6=0 not low power

sw6=1 auto low power

sw7=2.6 A	sw8=1.3 A
sw9=0.7 A	sw10=0.4 A

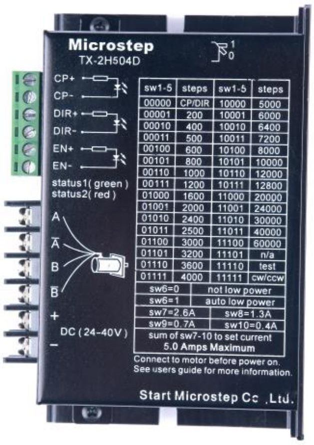
sum of sw7-10 to set current

5.0 Amps Maximum(Peak)

see user's guide for more information.

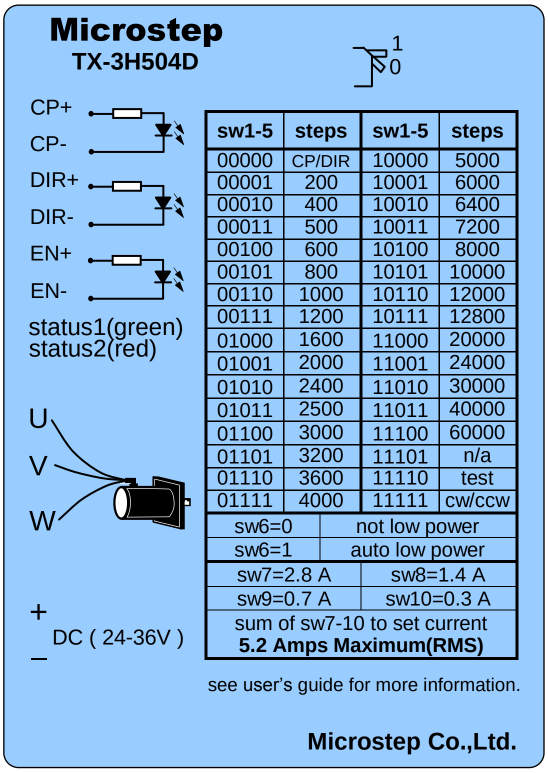
Microstep Co., Ltd.

TX-2H504D panel drawing



【TX-3H504D Drive profile】

TX-3H504D step drives are mainly used to drive 57 type or low voltage low speed 86 type 3-phase hybrid stepper motor. It is up to 28 segments and Max 60000 steps. Step could be set by 1 to 5 bit of DIP switch. Signal and doubt pulse mode. Self-test function, Phase memory function, auto half current function. Output max current is 5.2A (effective value). Current could be set bye 7 to 10 bit of the DIP switch (it could set 16 speeds current, setting resolution is 0.3A). TX-3H504D step drives is 24V to 36V DC power supply. Typical value is DC 24V or 32V. Recommend using switch power supply, power is over 150W. Relation setting and operation is as shown below.



Microstep

TX-3H504D

sw1-5	steps	sw1-5	steps
00000	CP/DIR	10000	5000
00001	200	10001	6000
00010	400	10010	6400
00011	500	10011	7200
00100	600	10100	8000
00101	800	10101	10000
00110	1000	10110	12000
00111	1200	10111	12800
01000	1600	11000	20000
01001	2000	11001	24000
01010	2400	11010	30000
01011	2500	11011	40000
01100	3000	11100	60000
01101	3200	11101	n/a
01110	3600	11110	test
01111	4000	11111	cw/ccw

sw6=0 not low power

sw6=1 auto low power

sw7=2.8 A	sw8=1.4 A
sw9=0.7 A	sw10=0.3 A

sum of sw7-10 to set current

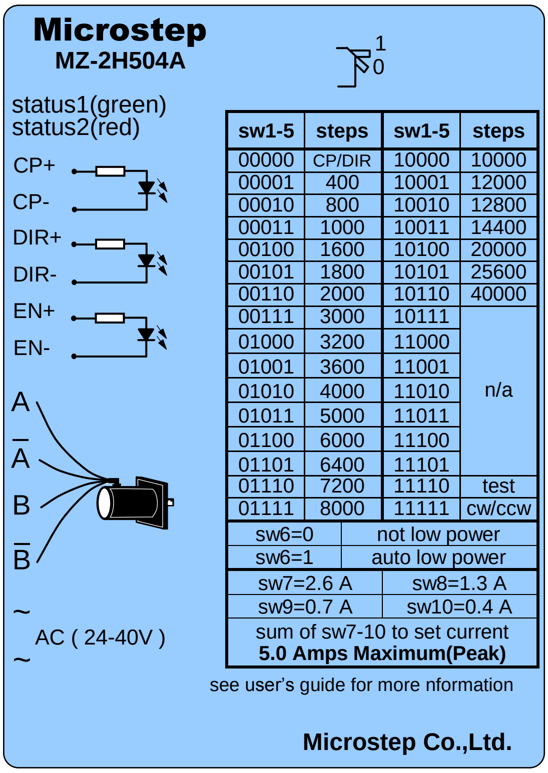
5.2 Amps Maximum(RMS)

see user's guide for more information.

Microstep Co.,Ltd.

TX-3H504D panel drawing

【MZ-2H504A Drive profile】



Microstep
MZ-2H504A

status1(green)
status2(red)

sw1-5	steps	sw1-5	steps
00000	CP/DIR	10000	10000
00001	400	10001	12000
00010	800	10010	12800
00011	1000	10011	14400
00100	1600	10100	20000
00101	1800	10101	25600
00110	2000	10110	40000
00111	3000	10111	n/a
01000	3200	11000	
01001	3600	11001	
01010	4000	11010	
01011	5000	11011	
01100	6000	11100	
01101	6400	11101	
01110	7200	11110	test
01111	8000	11111	cw/ccw

sw6=0	not low power
sw6=1	auto low power
sw7=2.6 A	sw8=1.3 A
sw9=0.7 A	sw10=0.4 A

sum of sw7-10 to set current
5.0 Amps Maximum(Peak)

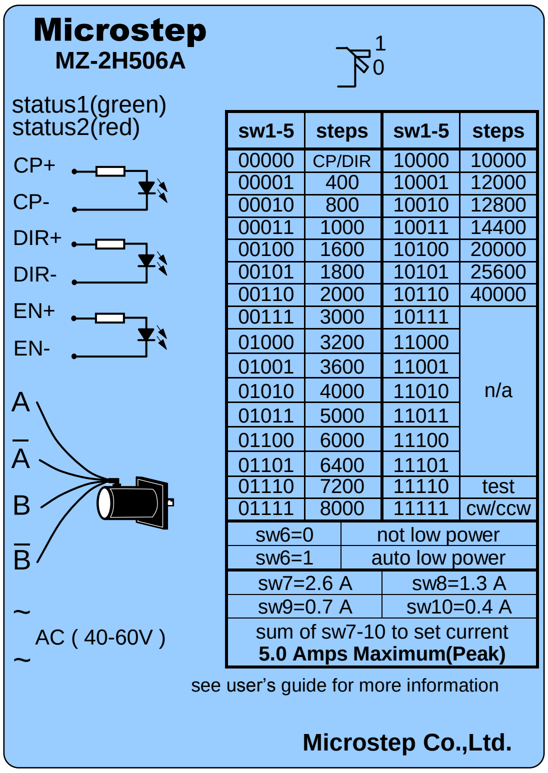
see user's guide for more nformation

Microstep Co.,Ltd.

MZ-2H504A panel drawing

MZ-2H504A step drives are mainly used to drive 86 type 2-phase hybrid stepper motor which current is below 5A. It is up to 22 segments and Max 40000 steps. Step could be set by 1 to 5 bit of DIP switch. Signal and doubt pulse mode. Self-test function, Phase memory function, auto half current function. Output max current is 5.0A (Peak). Current could be set bye 7 to 10 bit of the DIP switch (it could set 16 speeds current, setting resolution is 0.4A). MZ-2H504A step drives can drive by DC or AC power. AC input is 24V to 45V. Typical value is AC 40V. DC power is also available, positive and negative can access. DC input is 40V to 60V. Typical value is DC 50V. Supply power is over 200W. Relation setting and operation is as shown below.

【MZ-2H506A Drive profile】



Microstep
MZ-2H506A

status1(green)
status2(red)

sw1-5	steps	sw1-5	steps
00000	CP/DIR	10000	10000
00001	400	10001	12000
00010	800	10010	12800
00011	1000	10011	14400
00100	1600	10100	20000
00101	1800	10101	25600
00110	2000	10110	40000
00111	3000	10111	n/a
01000	3200	11000	
01001	3600	11001	
01010	4000	11010	
01011	5000	11011	
01100	6000	11100	
01101	6400	11101	
01110	7200	11110	test
01111	8000	11111	cw/ccw

sw6=0	not low power
sw6=1	auto low power
sw7=2.6 A	sw8=1.3 A
sw9=0.7 A	sw10=0.4 A

sum of sw7-10 to set current
5.0 Amps Maximum(Peak)

see user's guide for more information

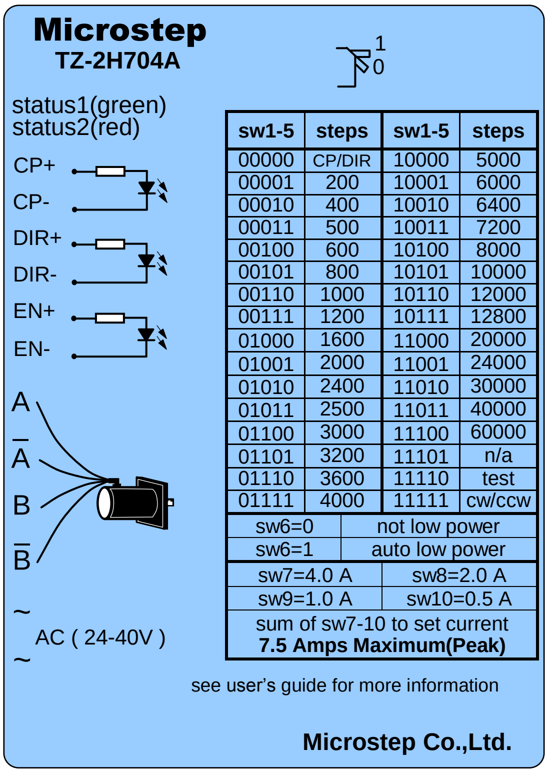
Microstep Co.,Ltd.

MZ-2H506A panel drawing

MZ-2H506A step drives are mainly used to drive 86 type 2-phase hybrid stepper motor which current is below 5A. It is up to 22 segments and Max 40000 steps. Step could be set by 1 to 5 bit of DIP switch. Signal and doubt pulse mode. Self-test function, Phase memory function, auto half current function. Output max current is 5.0A (Peak). Current could be set bye 7 to 10 bit of the DIP switch (it could set 16 speeds current, setting resolution is 0.4A). MZ-2H506A step drives can drive by DC or AC power. AC input is 40V to 60V. Typical value is AC 50V. DC power is also available, positive and negative can access. DC input is 60V to 80V. Typical value is DC 70V. Supply power is over 250W. Relation setting and operation is as shown below.

【TZ-2H704A Drive profile】

TZ-2H704A step drives are mainly used to drive 86 type 2-phase hybrid stepper motor which current is below 7.5A. It is up to 28 segments and Max 60000 steps. Step could be set by 1 to 5 bit of DIP switch. Signal and doubt pulse mode. Self-test function, Phase memory function, auto half current function. Output max current is 7.5A (Peak). Current could be set bye 7 to 10 bit of the DIP switch (it could set 16 speeds current, setting resolution is 0.5A). TZ-2H704A step drives can drive by DC or AC power. AC input is 24V to 45V. Typical value is AC 40V. DC power is also available, positive and negative can access. DC input is 40V to 60V. Typical value is DC 50V. Supply power is over 250W. Relation setting and operation is as shown below.



sw1-5	steps	sw1-5	steps
00000	CP/DIR	10000	5000
00001	200	10001	6000
00010	400	10010	6400
00011	500	10011	7200
00100	600	10100	8000
00101	800	10101	10000
00110	1000	10110	12000
00111	1200	10111	12800
01000	1600	11000	20000
01001	2000	11001	24000
01010	2400	11010	30000
01011	2500	11011	40000
01100	3000	11100	60000
01101	3200	11101	n/a
01110	3600	11110	test
01111	4000	11111	cw/ccw

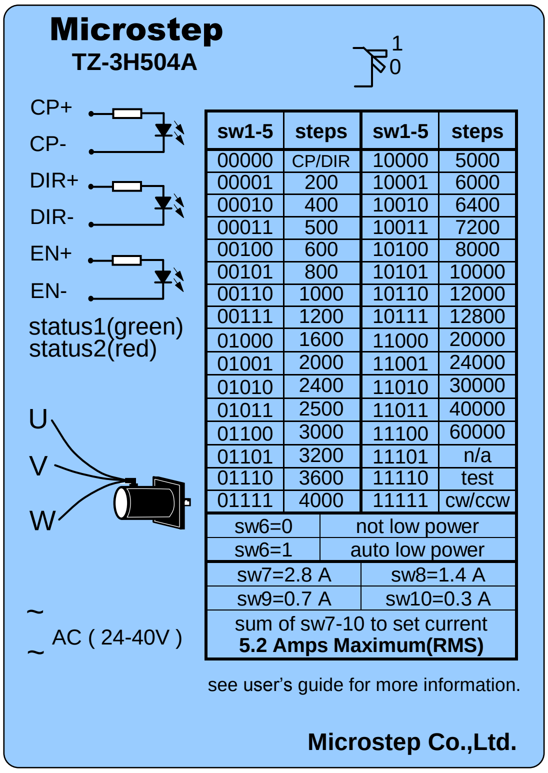
sw6=0	not low power
sw6=1	auto low power
sw7=4.0 A	sw8=2.0 A
sw9=1.0 A	sw10=0.5 A

sum of sw7-10 to set current
7.5 Amps Maximum(Peak)

TZ-2H704A panel drawing

【TZ-3H504A Drive profile】

TZ-3H504A step drives are mainly used to drive 86 type 3-phase hybrid stepper motor. It is up to 28 segments and Max 60000 steps. Step could be set by 1 to 5 bit of DIP switch. Signal and doubt pulse mode. Self-test function, Phase memory function, auto half current function. Output max current is 5.2A (effective value). Current could be set bye 7 to 10 bit of the DIP switch (it could set 16 speeds current, setting resolution is 0.3A). TZ-3H504A step drives can drive by DC or AC power. AC input is 24V to 45V. Typical value is AC 40V. DC power is also available, positive and negative can access. DC input is 40V to 60V. Typical value is DC 50V. Supply power is over 200W. Relation setting and operation is as shown below.



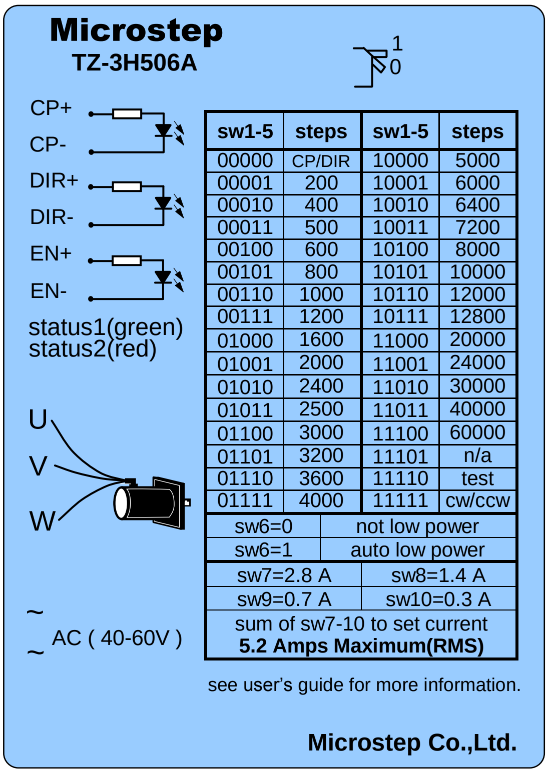
sw1-5	steps	sw1-5	steps
00000	CP/DIR	10000	5000
00001	200	10001	6000
00010	400	10010	6400
00011	500	10011	7200
00100	600	10100	8000
00101	800	10101	10000
00110	1000	10110	12000
00111	1200	10111	12800
01000	1600	11000	20000
01001	2000	11001	24000
01010	2400	11010	30000
01011	2500	11011	40000
01100	3000	11100	60000
01101	3200	11101	n/a
01110	3600	11110	test
01111	4000	11111	cw/ccw

sw6=0	not low power
sw6=1	auto low power
sw7=2.8 A	sw8=1.4 A
sw9=0.7 A	sw10=0.3 A

sum of sw7-10 to set current
5.2 Amps Maximum(RMS)

TZ-3H504A panel drawing

【TZ-3H506A Drive profile】



Microstep
TZ-3H506A

1
0

CP+
CP-
DIR+
DIR-
EN+
EN-
status1(green)
status2(red)

U
V
W

~
AC (40-60V)
~

sw1-5	steps	sw1-5	steps
00000	CP/DIR	10000	5000
00001	200	10001	6000
00010	400	10010	6400
00011	500	10011	7200
00100	600	10100	8000
00101	800	10101	10000
00110	1000	10110	12000
00111	1200	10111	12800
01000	1600	11000	20000
01001	2000	11001	24000
01010	2400	11010	30000
01011	2500	11011	40000
01100	3000	11100	60000
01101	3200	11101	n/a
01110	3600	11110	test
01111	4000	11111	cw/ccw

sw6=0	not low power
sw6=1	auto low power

sw7=2.8 A	sw8=1.4 A
sw9=0.7 A	sw10=0.3 A

sum of sw7-10 to set current
5.2 Amps Maximum(RMS)

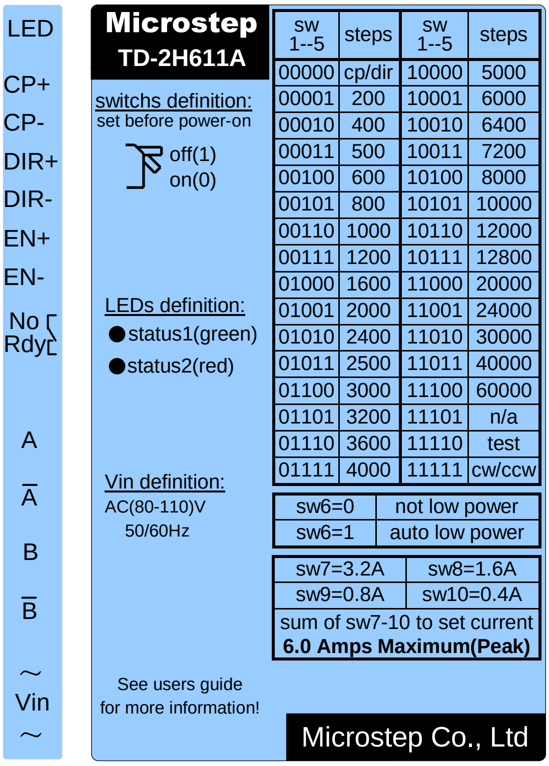
see user's guide for more information.

Microstep Co.,Ltd.

TZ-3H506A panel drawing

TZ-3H506A step drives are mainly used to drive 86 type 3-phase hybrid stepper motor. It is up to 28 segments and Max 60000 steps. Step could be set by 1 to 5 bit of DIP switch. Signal and doubt pulse mode. Self-test function, Phase memory function, auto half current function. Output max current is 5.2A (effective value). Current could be set bye 7 to 10 bit of the DIP switch (it could set 16 speeds current, setting resolution is 0.3A). TZ-3H506A step drives can drive by DC or AC power. AC input is 40V to 60V. Typical value is AC 50V. DC power is also available, positive and negative can access. DC input is 60V to 80V. Typical value is DC 70V. Supply power is over 250W. Relation setting and operation is as shown below.

【TD-2H611A Drive profile】



LED
CP+
CP-
DIR+
DIR-
EN+
EN-
No
Rdy
A
$\overline{A}$
B
$\overline{B}$
~
Vin
~

Microstep
TD-2H611A

switchs definition:
set before power-on
off(1)
on(0)

LEDs definition:
● status1(green)
● status2(red)

Vin definition:
AC(80-110)V
50/60Hz

sw 1--5	steps	sw 1--5	steps
00000	cp/dir	10000	5000
00001	200	10001	6000
00010	400	10010	6400
00011	500	10011	7200
00100	600	10100	8000
00101	800	10101	10000
00110	1000	10110	12000
00111	1200	10111	12800
01000	1600	11000	20000
01001	2000	11001	24000
01010	2400	11010	30000
01011	2500	11011	40000
01100	3000	11100	60000
01101	3200	11101	n/a
01110	3600	11110	test
01111	4000	11111	cw/ccw

sw6=0	not low power
sw6=1	auto low power

sw7=3.2A	sw8=1.6A
sw9=0.8A	sw10=0.4A

sum of sw7-10 to set current
6.0 Amps Maximum(Peak)

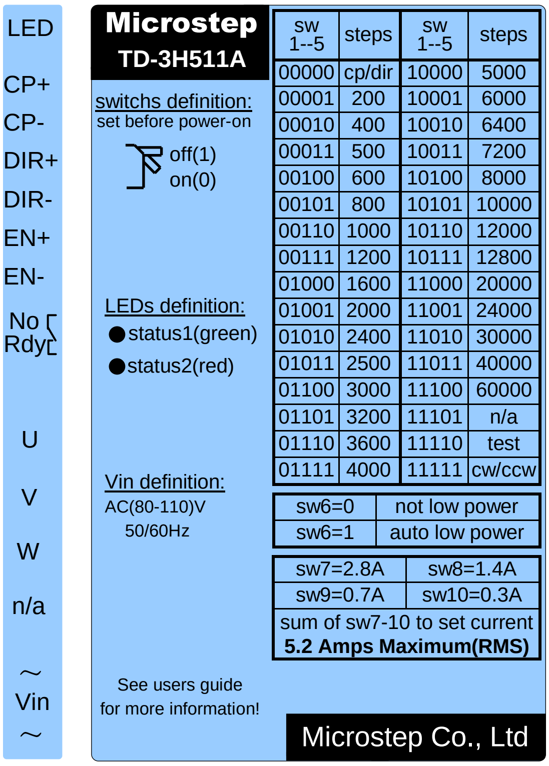
See users guide
for more information!

Microstep Co., Ltd

TD-2H611A panel drawing

TD-2H611A step drives are mainly used to drive 110 type 2-phase hybrid stepper motor which current is below 6A. It is up to 28 segments and Max 60000 steps. Step could be set by 1 to 5 bit of DIP switch. Signal and doubt pulse mode. Self-test function, Phase memory function, auto half current function. Output max current is 6.0A (Peak). Current could be set bye 7 to 10 bit of the DIP switch (it could set 16 speeds current, setting resolution is 0.4A). TD-2H611A step drives can drive by AC power. AC input is 70V to 140V. Typical value is AC 80V and AC 110V. Supply power is over 250W. Relation setting and operation is as shown below.

【TD-3H511A Drive profile】


LED
CP+
CP-
DIR+
DIR-
EN+
EN-
No
Rdy
U
V
W
n/a
~
Vin
~
Microstep
TD-3H511A
switchs definition:
set before power-on
off(1)
on(0)
LEDs definition:
● status1(green)
● status2(red)
Vin definition:
AC(80-110)V
50/60Hz
See users guide
for more information!
Microstep Co., Ltd

sw 1--5	steps	sw 1--5	steps
00000	cp/dir	10000	5000
00001	200	10001	6000
00010	400	10010	6400
00011	500	10011	7200
00100	600	10100	8000
00101	800	10101	10000
00110	1000	10110	12000
00111	1200	10111	12800
01000	1600	11000	20000
01001	2000	11001	24000
01010	2400	11010	30000
01011	2500	11011	40000
01100	3000	11100	60000
01101	3200	11101	n/a
01110	3600	11110	test
01111	4000	11111	cw/ccw

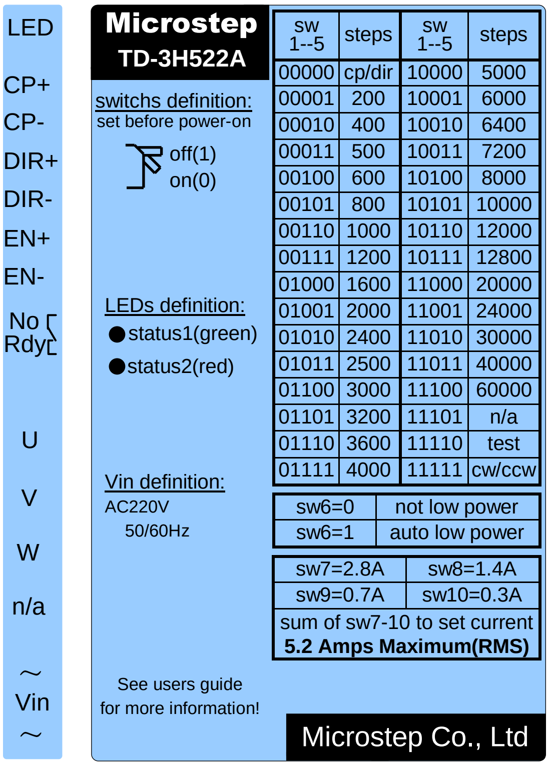
sw6=0	not low power
sw6=1	auto low power

sw7=2.8A	sw8=1.4A
sw9=0.7A	sw10=0.3A
sum of sw7-10 to set current **5.2 Amps Maximum(RMS)**	

TD-3H511A panel drawing

TD-3H511A step drives are mainly used to drive 110 type 3-phase hybrid stepper motor. It is up to 28 segments and Max 60000 steps. Step could be set by 1 to 5 bit of DIP switch. Signal and doubt pulse mode. Self-test function, Phase memory function, auto half current function. Output max current is 5.2A (effective value). Current could be set bye 7 to 10 bit of the DIP switch (it could set 16 speeds current, setting resolution is 0.3A). TD-3H511A step drives can drive by AC. AC input is 70V to 140V. Typical value is AC 80V and AC110V. Supply power is over 500W. Relation setting and operation is as shown below.

【TD-3H522A Drive profile】


LED
CP+
CP-
DIR+
DIR-
EN+
EN-
No
Rdy
U
V
W
n/a
~
Vin
~
Microstep
TD-3H522A
switchs definition:
set before power-on
off(1)
on(0)
LEDs definition:
● status1(green)
● status2(red)
Vin definition:
AC220V
50/60Hz
See users guide
for more information!
Microstep Co., Ltd

sw 1--5	steps	sw 1--5	steps
00000	cp/dir	10000	5000
00001	200	10001	6000
00010	400	10010	6400
00011	500	10011	7200
00100	600	10100	8000
00101	800	10101	10000
00110	1000	10110	12000
00111	1200	10111	12800
01000	1600	11000	20000
01001	2000	11001	24000
01010	2400	11010	30000
01011	2500	11011	40000
01100	3000	11100	60000
01101	3200	11101	n/a
01110	3600	11110	test
01111	4000	11111	cw/ccw

sw6=0	not low power
sw6=1	auto low power

sw7=2.8A	sw8=1.4A
sw9=0.7A	sw10=0.3A
sum of sw7-10 to set current **5.2 Amps Maximum(RMS)**	

TD-3H522A panel drawing

TD-3H522A step drives are mainly used to drive 110 type 3-phase hybrid stepper motor. It is up to 28 segments and Max 60000 steps. Step could be set by 1 to 5 bit of DIP switch. Signal and doubt pulse mode. Self-test function, Phase memory function, auto half current function. Output max current is 5.2A (effective value). Current could be set bye 7 to 10 bit of the DIP switch (it could set 16 speeds current, setting resolution is 0.3A). TD-3H522A step drives can drive by AC. AC input is 180V to 2400V. Typical value is AC 200V and AC220V. Supply power is over 600W. Relation setting and operation is as shown below.

【Drive Main Function Setting & Operation】

Segment Step	EA202D 和 MU-2H202D step drives could be set by 1, 2 bit of DIP switch. EA202D could set 4 segments and MU-2H202D set 5 segments. More detail operation please reference the plant drawing, N/A is invalid condition.
	M series step drives could be set by 1, 2, 3, 4, 5 bit of DIP switch. M series step drives could be set 22 segments (step) and max 40000 steps. Drive should be set before switch on otherwise setting is invalid. More detail operation please reference the plant drawing, N/A is invalid condition.
	T series step drives could be set by 1, 2, 3, 4, 5 bit of DIP switch. M series step drives could be set 28 segments (step) and max 60000 steps. Drive should be set before connect to the power otherwise setting is invalid. More detail operation please reference the plant drawing, N/A is invalid condition.
Signal/doubt pulse setting	EA202D and MU-2H202D step drives only have signal pulse mode. No doubt pulse mode, without setting.
	M and T series step drives have signal pulse mode and doubt pulse mode. Setting 1-5 bit DIP switch as 00000, switch on the driver. After 2 to 5 second the green light twinkling, switch off and then setting the steps and Rpm. Doubt pulse setting: Setting 1-5 bit DIP switch as 11111. Switch on the power. After 2 to 5 second the green light twinkling, switch off and then setting the steps and Rpm. Notes: Once signal/doubt pulse setting as previous, only when the pulse is change otherwise unnecessary second setting whether drives is switched on or off.
Self-test function	All the step drives have self-test function except EA202D and MU-2H202D. Self-test function: Setting 1-5 bit DIP switch as 11110, switch on the driver. After 2 to 5 second the step drive began in a lower frequency drive motor. This function is used to detect the drives properly without pulse signal setting.
Auto half current function	All models have auto half current function. Drive will automatically enter the half current state after the pulse stop 2 to 5 seconds. The current of the motor is only half of the normally working in order to reduce power consumption and protect the motor. You can also choose without this function (EA202D and MU-2H202D type drive excluded). For the M and T-type drives, the sixth bits DIP switch setting this function: 0 - no such function, 1 - have this function.
Output current setting	EA202D step drive can set 4-speed output current available by setting the DIP switches 3, 4 bit. Data could be read directly from the table. MU-2H202D step drive can not set the output current. Factory-configured by the user, the default value is 1.7A.
	M and T series have 16-speed output current available by setting the DIP switches 7, 8, 9, 10 bit. Drive output sine-wave current to the motor. Current is peak value for 2-phase motor and effective value for 3-phase motor. Total output current is equal to the sum of current when the 7, 8, 9, 10bits switch point 1.
Phase memory function	The drive power-off at a certain phase position, and phase position of next powering up is different, then the motor will chatter look. In order to eliminate chattering of motor, Drive should memory the power off phase position. This function is very important in a certain industries. M and T series have this function, Memory time is infinite. EA202D and MU-2H202D step drive have none.
Signal interface	CP + and CP- are as a step pulse signal positive and negative, DIR + and DIR- are direction level signal positive and negative terminal, EN + and EN- are To enable level signal positive and negative terminal, CW +, and CW- are forward pulse signal positive and negative terminal, CCW + and CCW-is backward pulse signal positive and negative terminal.
Electrical Interface	A, A-, B, B- for connecting 2-phase hybrid motor. Reverse One side of the two phase lines, can reverse the motor; U, V, W for connecting 3-phase hybrid motor. Reverse any two lines, which can make the motor reverse.
Power Interface	Different drives have different power requirements, More details reference relations description in the 【drive list】 & 【Introduction】. Note: All AC-powered drive can be able to driving by DC power.
Indicator	EA202D and MU-2H202D drives only have the power indicator. Other models drive has green and red indicator, respectively indicating the operational status of the drive: Green light, red light off for the normal working condition; green light flash, red light off for setting the single and double pulse; green flash, red light is illegal state; green light, red light flashing for the over current protection state; green light, red double flash for the over-voltage protection; the green light, red light flashes three times for over-temperature protected.
Installation	Considering the heat elimination, drive installation should keep cooling channels

【Driver control signal interface】

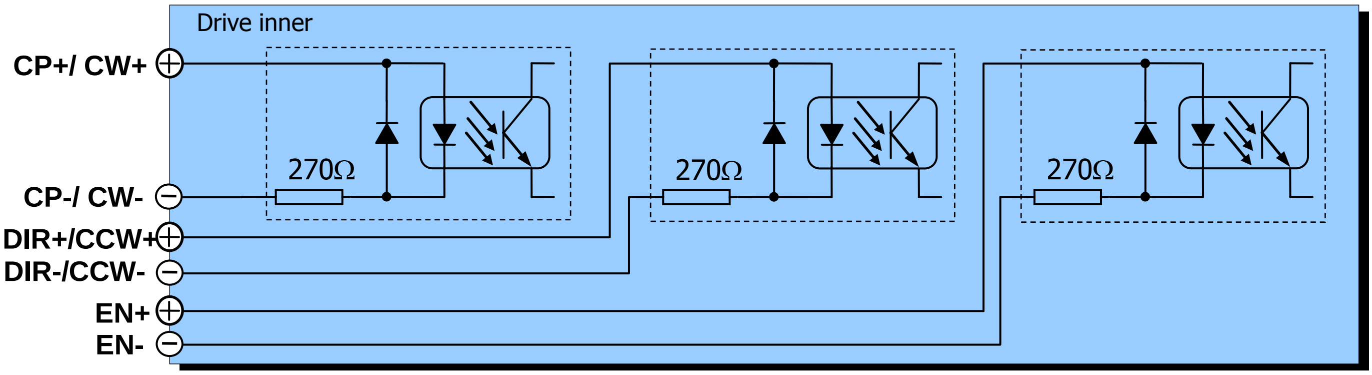
Drive is retransmitted weak signal of the computer controller system into strong signal which could be accepted by stepper motor. Control system output three type of driving signal.

1. Step Pulse signal CP: This is the most important signal, because the principle of stepper drive control system is converts the pulse signal of the control system into angular displacement of the stepper motor. Or, Drive receive pulse signal CP, then motor rotate a certain step angle, CP frequency is positive proportional to stepper motor speed. Amount of CP pulse determines the rotation angle of the stepper motor. Thus, control system regulates motor speed and position by CP pulse signal.

2. Direction level signal DIR: This signal defines the motor rotation direction. For example, Motor clockwise rotation in high level signal and anticlockwise rotation in low level signal. This reversing method is called signal pulse mode. In addition, there is a double pulse mode. Drive receive two line pulse signal (marked as CW and CCW). Motor rotates forward in CW pulse signal; motor rotates backward in CCW pulse signal. User setting signal and double pulse by DIP switch.

3. Enable signal EN: No Connection EN signal default effective status, then Drive work. Connect EN signal circuit, drive stop working. Torque free condition (equivalent to FREE signal of SH series drive), this signal is optional signal.

Our driver inner adopt optocoupler isolating input-signal in order to keep the normal communication and avoid mutual interference between the control system and drive. Three-way signal have same inner interface circuit. Common connection is as follows: ① Common-anode mode :Connect CP +, DIR + and EN + as common-anode with +5V external system; Connect pulse signal with CP-; Direction level signal with DIR-; Connect enable signal with EN-; ② Common-cathode mode: Connect CP -, DIR - and EN - as common-cathode with GND external system; Connect pulse signal with CP+; Direction level signal with DIR+; Connect enable signal with EN+; ③ Differential mode: Connect directly.



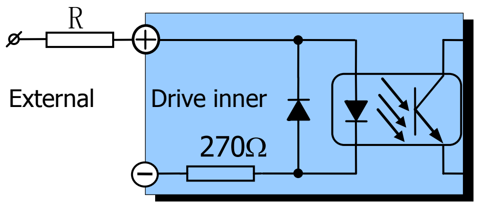
Drive input signal inner interface diagram

If the drive input signal is voltage signal, voltage range: 3.6V ≤ high level ≤ 5.5V;-5.5V ≤ low level≤ 0.3V, the most commonly is TTL level.

If the drive input signal is current signal, current range: 7mA ≤ high current ≤ 18mA;-18mA ≤ low current ≤ 0.2mA.

Either voltage or current signals, convert into optocoupler input current, in order to transport signal (reference above diagram),

If the voltage signal amplitude exceed standard numerical, user should add limiting resistance on external CP and DIR terminal, to ensure 7-18mA current to the drive’s inner optocoupler, reference below diagram.



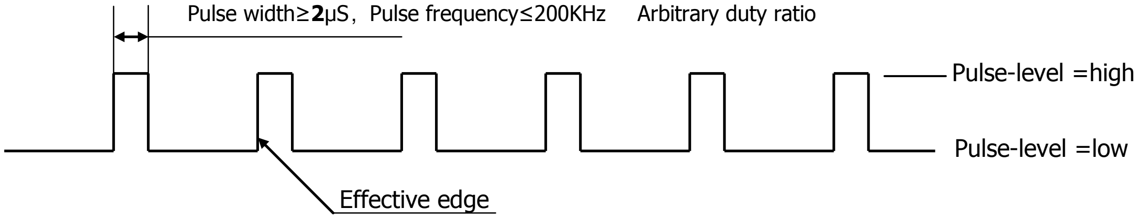
Signal Amplitude	Limiting Resistance (R)
5V	NON
12V	1.0K
24V	2.0K

Pulse signal control stepper motor running. Stepper motor rotates a certain angle when the effective edge of the stepper motor pulse signal is coming. Effective edge is mean: the moment of pulse signal current from small to large, or the moment of pulse-level from low to high, or the moment of inner drive optocoupler from stop to open.

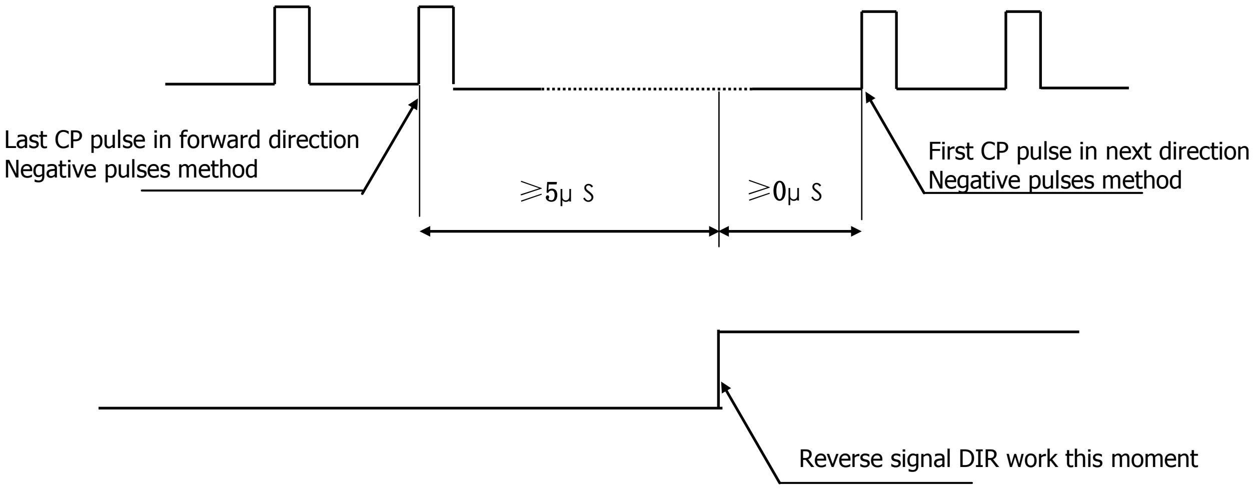
Pulse frequency requires less than 200 KHz;

Pulse width requirement of not less than 2μS.

Pulse drive current requirements for the 7-18mA


Pulse width≥2μS，Pulse frequency≤200KHz
Arbitrary duty ratio
Pulse-level =high
Pulse-level =low
Effective edge

Be sure the motor stopped, and then convert its rotational direction. The DIR signal could change over 5μS after ending of the last effective edge in forward direction and does not delay next pulse edge.


Last CP pulse in forward direction
Negative pulses method
≥5μ S
≥0μ S
First CP pulse in next direction
Negative pulses method
Reverse signal DIR work this moment

If driver adopt double pulse CW / CCW mode, the first pulse of next direction (such as CCW) could be effective 5μs delay the last pulse(CW) effective edge of forward direction.

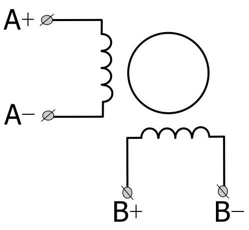
【2-phase motor Interface】

2-phase drive could be connected with 2-phase or 4-phase hybrid motor. Different motor winding have different connection methods, as follows:

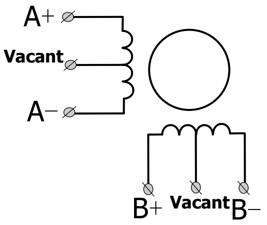
For the two-phase four wire motor, the drive can be connected directly (see below Part I);

For the four-phase six-wire motor, the middle tap of the two lines are vacant, the other four wires are connected with drive (see Figure II);

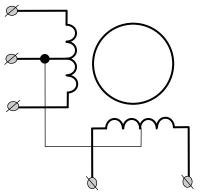
For the four-phase five wire motor, the windings are not independent, the motor and drive can not be connected (see Figure III); Eight four-phase eight wire motor, usually connected each two winding in parallel, and then connect with the drive (see below Part IV).



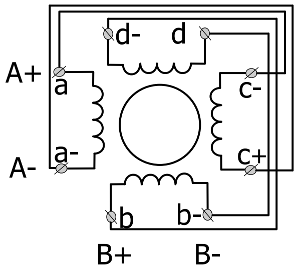
☞ Motor connect with drive directly ☑



☞ Motor can connect with drive directly, middle tap of the two lines are vacant ☑



☞This motor could not connect with drive because windings are not independent ☒



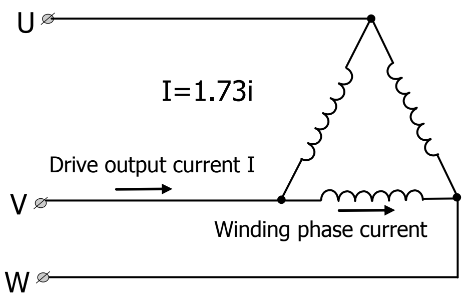
☞Motor can connect with drive in parallel ☑

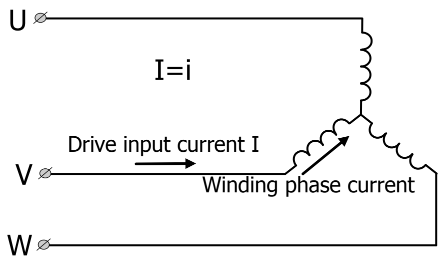
【3-phase motor Interface】

Drive and 3-phase hybrid motor adopt three-wire connection. Drive output three phase sine wave current to the motor, the current is effective value nominal. Two types of motor winding connection: the triangle and star (see below):

Triangle Connection: Common used, high-speed and good performance, but requires a large drive current (1.73 times of the motor winding current).

Star connection: Drive output current is equal to motor winding current





NOTE: Our company motors adopt triangle connection in the internal, only three lines leading out (excluding ground). Motor nominal current is not winding phase current, but the line current (i.e., drive output current). User set the drive output current to motor nominal current. If drive equip with motor of other manufacturers, user need to understand meaning of the nominal current. If the winding phase current is nominal value (e.g., 2.8A), the drive current be set phase current of 1.73 times (e.g., 4.8A).

【DIP switch settings】

M and T series drives have a 10-bit DIP switch for setting the step (segment), single / double pulse mode, self-test operation, automatic half current setting, the output current setting and so on. DIP switch 2 state is defined by 0 and 1, namely: ON = 0, OFF = 1. Detail setting please refers the corresponding description and the panel of the drive models. DIP switch must be settings before power.

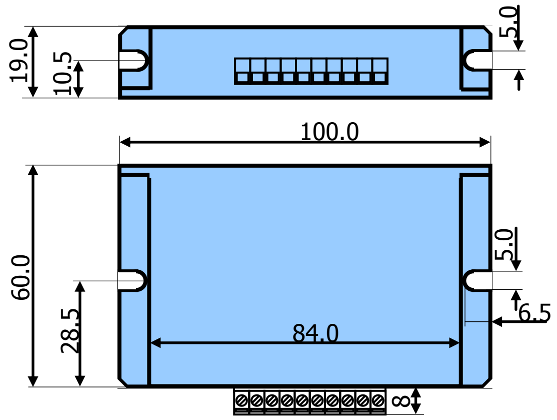
【Driver output current setting】

M and T series drives have 16 speed output current optional, setting by the 4 bit DIP switches (sw7-10). Drive output sine wave current to motor. Considering the user habit, 2-phase motor nominal value is peak current; 3-phase motor nominal value is effective value current. Each bit of 4 bit DIP switches represents a certain current value (see table below) in enable condition (= 1) and"0" in non-enabled state (= 0). Adding four bit together represents drive output current.

General Settings is (For example, MZ-2H504A, 3.6A): starting from 7 bit, seventh represent 2.6A, as 3.6A> 2.6A, so seventh set to 1. Remain 3.6A-2.6A=1.0A is not set. Eighth represent 1.3A, as 1.0A<1.3A, so eighth non-enabled, set to 0. And so on, the last bit should be set to 1011, output current is 2.6+0+0.7+0.4=3.7A, in this case the error is 0.1A.

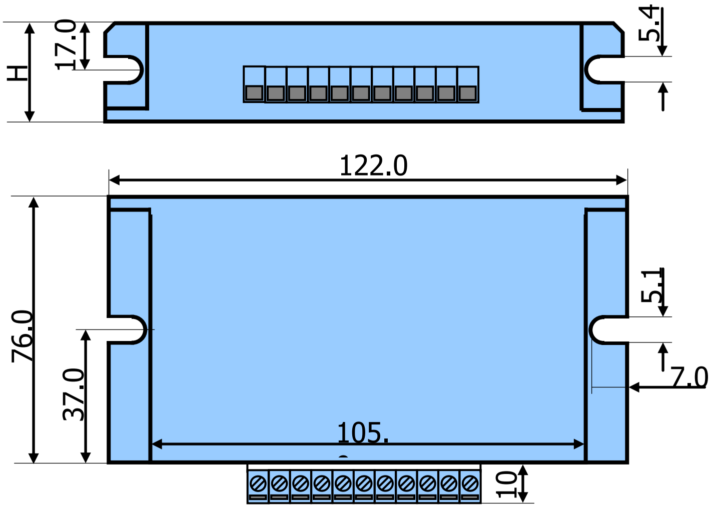
Switch	Current in Enable condition （=1）(Example: Max Current is 5.0A)
7	2.6A
8	1.3A
9	0.7A
10	0.4A

【Drive Mounting dimensions】


19.0
10.5
5.0
100.0
60.0
28.5
5.0
6.5
84.0
8

This structure applies follow mode:

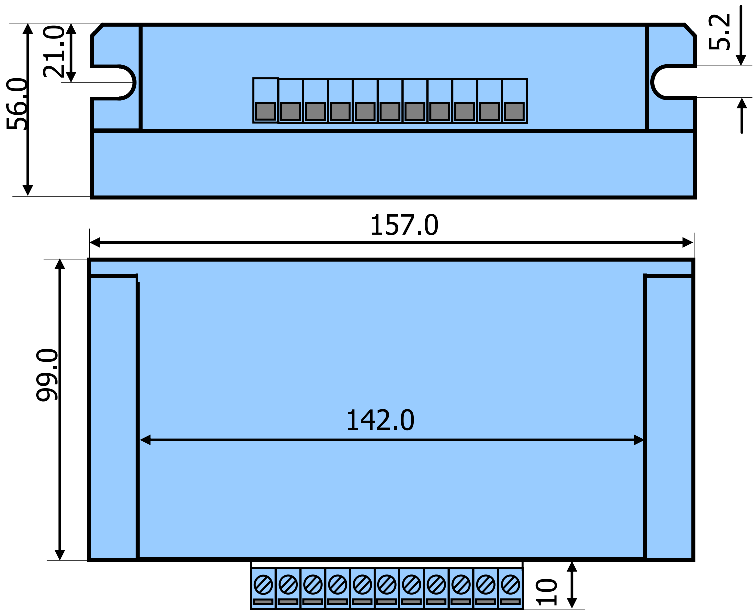
EA202D
MU-2H202D
Shell is heat conduction structure. Suggest vertical installation. Coated thermal grease on the contact surface if it is uneven.


H
17.0
5.4
122.0
76.0
37.0
5.1
7.0
105.
10

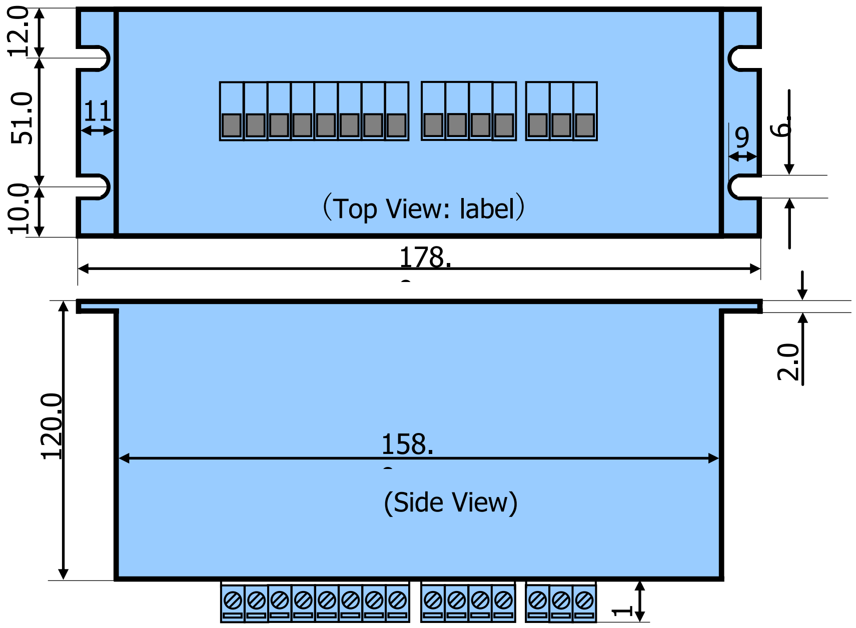
This structure applies MX and TX series:
MX-2H304D
TX-2H504D
TX-3H504D
H=31

MX-2H306D
H=38

Shell is heat conduction structure. Suggest vertical installation. Coated thermal grease on the contact surface if it is uneven.


56.0
21.0
5.2
157.0
99.0
142.0
10

This structure applies MZ and TZ series:
MZ-2H504A
MZ-2H506A
TZ-2H704A
TZ-3H504A
TZ-3H506A
With Self-cooling fan,
Vertical installation

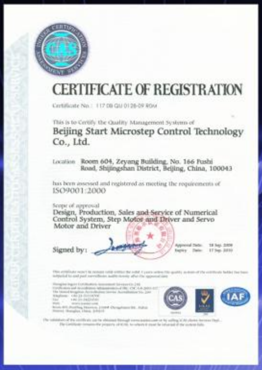

12.0
51.0
10.0
11
（Top View: label）
9
6.
178.
2.0
120.0
158.
(Side View)
1

This structure applies
MD and TD series:
MD-2H611A
TD-2H611A
TD-3H511A
TD-3H522A
With Self-cooling fan

本公司已通过
ISO9001:2000
国际质量管理体系认证

CE认证

认证号：117 08 QU 0128-09 ROM(Rev.1)



CERTIFICATE OF REGISTRATION

Certificate No.: 117 08 QU 0128-09 ROM

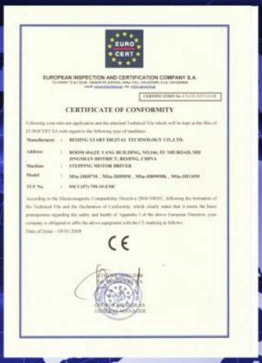
This is to Certify the Quality Management Systems of
Beijing Start Microstep Control Technology Co., Ltd.

Location Room 604, Zeyang Building, No. 166 Fushi Road, Shijingshan District, Beijing, China, 100043

has been assessed and registered as meeting the requirements of
ISO9001:2000

Scope of approval
Design, Production, Sales and Service of Numerical Control System, Step Motor and Driver and Servo Motor and Driver

Signed by:



EUROPEAN INSPECTION AND CERTIFICATION COMPANY S.A.

CERTIFICATE OF CONFORMITY

Manufacturer : BEIJING START DIGITAL TECHNOLOGY CO.,LTD.
Address : ROOM 604,ZE YANG BUILDING, NO.166, FU SHI ROAD, SHI JINGSHAN DISTRICT, BEIJING, CHINA
Machine : STEPPING MOTOR DRIVER

北京欣斯达特数字科技有限公司

Beijing Flourishing Start Digital Technology Co., Ltd

通讯地址：北京石景山区阜石路166号泽洋大厦604室
邮　　编：100043
销　　售：010-88909150
售后服务：010-88799875
传　　真：010-88909271
网　　址：www.startsh.com
电子邮箱：stat@public.bta.net.cn