

Autonics

Motor Driver (2-Phase intelligent stepping motor driver)

MD2U-ID20

M A N U A L



Thank you very much for selecting Autonics products.
For your safety, please read the following before using.

Caution for your safety

- *Please keep these instructions and review them before using this unit.
- *Please observe the cautions that follow;
- Warning** Serious injury may result if instructions are not followed.
- Caution** Product may be damaged, or injury may result if instructions are not followed.
- *The following is an explanation of the symbols used in the operation manual.
- Caution:**Injury or danger may occur under special conditions.

Warning

- In case of using this unit with machinery(Nuclear power control, medical equipment, vehicle, train, airplane, combustion apparatus, entertainment or safety device etc), it is required to install fail-safe device. (or contact us for information on type required.)**
It may cause serious human injury or a fire and damage to product.
- Installation, connection, operation, control, maintenance should be carried out by person who has been qualified.**
It may cause a fire, electric shock or human injury.
- Please use DC power with reinforced insulating the primary and secondary part for the DC power product.**
It may give an electric shock.
- Please install this unit after considering counterplan against power failure.**
It may cause human injury or damage to product by releasing holding torque of motor.
- Do not use this unit outdoors or place where there are flammable, corrosive gas, water and too much vibration etc.**
It may cause a fire or give an electric shock.
- Do not put finger or any object into this product.**
It may cause a fire or give an electric shock.
- Do not disassemble and modify this unit, when it is required, please contact us.**
It may cause a fire or give an electric shock, damage to product.
- Please use the adjuster with insulated screw driver.**
It may give an electric shock.

Caution

- Do not move, install, connect or inspect during the operation.**
It may give an electric shock.
- Power input voltage must be used within rated specification and power line should be over than AWG NO. 18(0.75mm²).**
It may cause a fire or give an electric shock.
- Please check the connection before supplying the power.**
It may cause a fire or give an electric shock, damage to product.
- When connecting the unit with power, please install current breaker.**
It may cause a fire.
- Please turn off the power when power is failed.**
It may cause human injury or damage to product due to sudden movement when recovering power failure.
- Please supply power after checking control input signal.**
It may cause a burn due to high temperature in surface.
- The emergency stop is needed during the operation.**
It may cause human injury or damage to product.
- Please apply power after checking control input signal.**
It may cause human injury or damage to product by sudden movement.
- Do not turn on the HOLD OFF signal input while it is maintaining vertical position.**
It may cause human injury or damage to product by releasing holding torque of motor.
- Please install a safety device when it is required to remain the vertical position after turning off the power.**
It may cause human injury or damage to product by releasing holding torque of motor.
- Please check if HOLD OFF signal input is ON when it is required to set the output manually.**
It may cause human injury by sudden movement.
- Please stop this unit when mechanical problem occurred.**
It may cause a fire or human injury.
- Do not touch the terminal when measuring insulation resistance and testing insulation dielectric strength.**
It may give an electric shock.
- Please observe rated specification.**
It may cause human injury, electric shock or damage to product.
- In cleaning the unit, do not use water or an oil-based detergent.**
It may cause a fire or give an electric shock.
- Please separate as industrial waste when disusing this unit.**
- Please use the designated 2-phase stepping motor in output part.**
It may cause a fire or damage to product.

*The above specification is changeable at anytime without notice.

Features

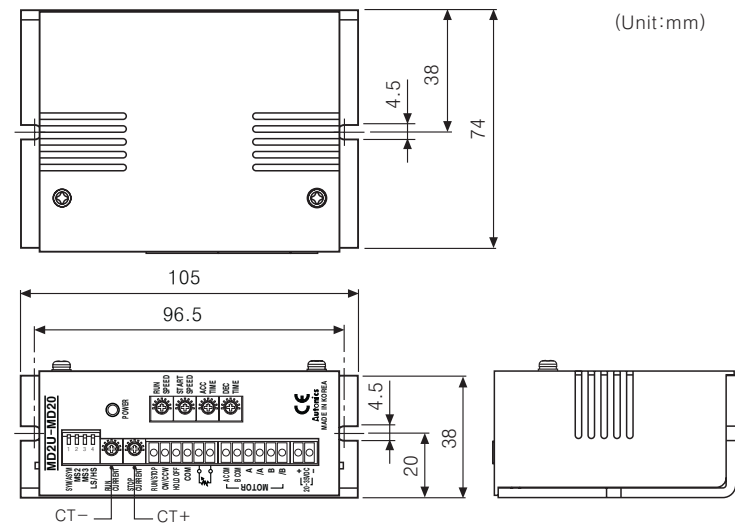
- Unipolar constant current drive type.
- Complete to realize the features of variable speed AC motor as stepping motor
- Able to change constant RUN speed using external voltage and adjuster
- Able to adjust ACC and DEC time
- Available brake function adjusting STOP current
- Available synchronous operation connecting a drive with 2 motors in parallel
- Realization of high torque in low-speed without gear
- Various applications with compact 2-phase stepping motor
- Simple operation with switch and adjuster
- Low vibration by microstep operation
- Power supply 20~35VDC

Specifications

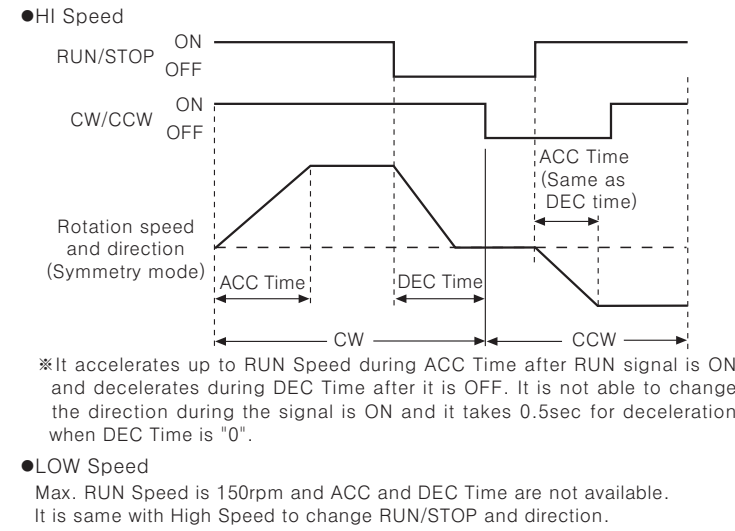
Model	MD2U-ID20
Power supply	20~35VDC
Allowable voltage range	90 to 120% of rating voltage
RUN current (1)	3A[Max.]
RUN current (2)	0.5~2A/Phase
Maximum speed	1500rpm
Dielectric strength	1000VDC 60Hz for 1 minute (Between electrification and non-electrification parts)
Insulation voltage	Min. 200MΩ (Based on 500VDC of electrification and non-electrification parts)
Impulse noise	1μs of pulse width, 1ns of pulse time, ±500VDC 60Hz of pulse height between power lines
Vibration	1.5mm amplitude at frequency of 10~55Hz in each of X, Y, Z directions for 2 hours
Shock	300m/s ² (Approx. 30G) in X, Y, Z directions for 3 times
Ambient temperature	0 ~ 50°C (at non-freezing status)
Ambient humidity	35 ~ 85%RH (at non-dew status)
Storage temperature	-20 ~ 60°C (at non-freezing status)
Unit weight	Approx. 200g

- *Reset the power when changing Dip S/W.
- *(1) Ambient temperature is 25[°C] and ambient humidity is 55[%RH].
- (2) The max. value of RUN current is based on RMS value in accordance with frequency of running motor, peak power can be changed by load fluctuation.

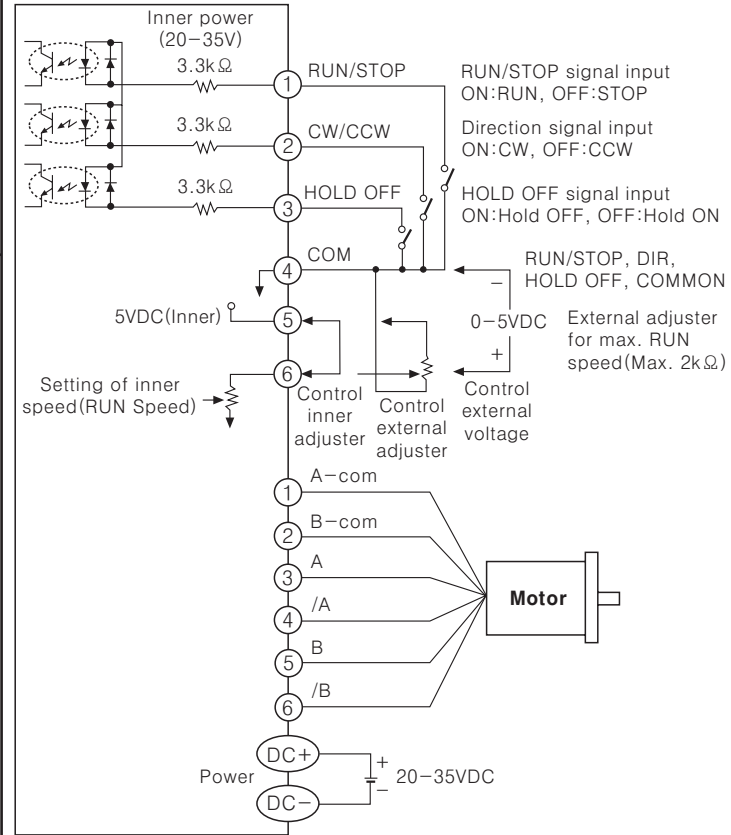
Dimensions



Time charts



Input • Output diagram

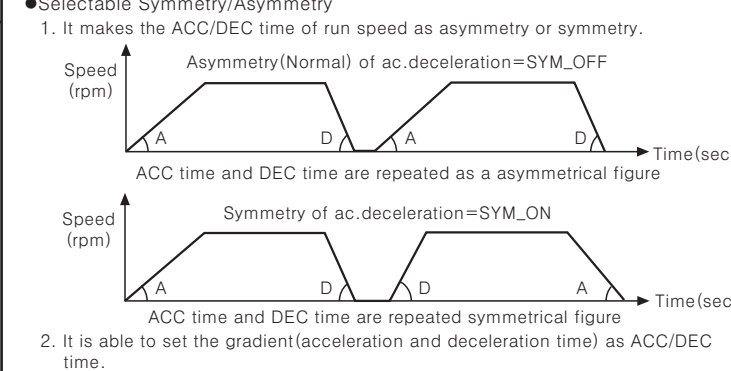


*Set inner speed up to the maximum value when using control of external adjuster and voltage.

Functions

S/W No.	1	2	3	4	Max. speed (rpm)	Speed mode
Name	SYM/ASYM (Normal)	MS2	MS3	Hi/Low speed		
S/W	ON: Symmetry	ON	ON	ON	1500	High speed
	OFF: Asymmetry (Normal)	ON	OFF	ON	1500	
	ON: Symmetry	OFF	ON	ON	1200	Low speed
	OFF: Asymmetry (Normal)	OFF	OFF	ON	600	
Not applied	D (Note1)	D	OFF		150	

- * (Note1) D=Don't care
- MS2/MS3
 - Set min. rotation angle of stepping motor.
 - The features of run and vibration are able to change depending on MS2, MS3.
 - Lower the maximum speed to run a motor smoothly.
- Hi/Low speed
 - RUN mode switch : Ac • deceleration control is not available in LS mode which all sections are start-stop region.
 - LS mode : It is able to run up to 1500rpm of max. constant speed of drive.
 - HS mode : It is able to run up to 1500rpm of max. constant speed of drive.
- Selectable Symmetry/Asymmetry
 - It makes the ACC/DEC time of run speed as asymmetry or symmetry.



- Setting of RUN current
 - RUN current is phase current provided to 2-phase stepping motor.
 - RUN current is set by variable resistance ratio within 0~100%.
 - It should be used within the rated current of motor, or it may cause overheating, step-out and torque can be lowered.
 - Setting range of RUN current 0.5~2.0A(Default value 1.4A)
 - Measure the voltage of CT- and CT+ in front of RUN current adjuster during the operation (Under 2kpps) to set the RUN current. (Using DC voltmeter)
Ex) Measuring voltage(0.7V) × 2=1.4A(Motor excitation current)

- Setting of STOP current
 - STOP current is phase current provided to 2-phase of stepping motor to be stopped.
 - STOP current is set by variable resistance ratio within 0~100%.
 - STOP current is changed because inner coil impedance according to motor.
 - It is operated when HOLD OFF signal is [L] and auto Current Down function is not available when it is [H], because current provided to each phase is cut off.
 - Setting range of STOP current : 20~70% of RUN current (Default value approx. 0.6A)
 - Selectable RUN speed
 - It sets max. RUN speed.
 - Max. speed is changed depending on speed mode and MS2/MS3.
 - Set max. RUN speed depending on motor and RUN current, because it can be stepped out as different max. slewing pulse rate range.
 - Selectable START speed
 - It sets desired START speed.
 - Max. SV of START speed is same with SV of RUN speed.
 - START speed is set within the START-STOP region selecting 0~50%.
 - Selectable ACC time
 - It sets the arrival time of max. constant RUN speed resolution.
 - It operates as AT_1, if ACC Time is under 33.3%, AT_2 when it is over 50%.
 - AT_1 is a sec. when RUN speed=100%, START speed=0%.
 - AT_2 is 2 sec. when RUN speed=100%, START speed=0%.
 - Selectable DEC time
 - It sets the arrival time of STOP point resolution.
 - It operates as DT_1, if ACC Time is under 33.3%, AT_2 when it is under 66.6% and DC_3 when it is the above.
 - DT_1 is 0.5 sec when RUN speed=100%, START speed=0%, regardless of resolution.
 - DT_2 is a sec when RUN speed=100%, START speed=0%.
 - DT_3 is 2 sec when RUN speed=100%, START speed=0%.
- *ACC Time and DEC Time are declined in proportion to the SV of START speed.

Failure diagnosis and management

- If motor does not rotate
Check the connection of controller and driver.
- If motor rotates as a reverse direction
It is CW rotation when CW/CCW input is [ON] and CCW rotation for [OFF].
- If motor does not work properly.
 - Check the connection of driver and motor.
 - Check output current depending on current adjusting S/W and current needed to operate motor is correct.

Caution for using

- Caution for signal input
 - It can not be change the direction during the operation.
 - In case, the signal input supply is higher than rated supply in the specification, please connect the additional resistance to external part.
 - Caution for setting the RUN and STOP current
A RUN current must be set under a rated current of the motor because motor emits heat too much when a RUN current is set over a rated current of the motor.
 - Caution for wiring
 - Use Twist pair(Over 0.2mm²) for the signal wire should be shorter than 2m.
 - Please use an electric wire is thicker than the motor lead when lengthening the motor wire connection.
 - Please leave a space over 10cm between a signal wire connection and power wire.
 - Caution for installation
 - Please mount on metal surface closely to raise radiation efficiency.
 - Please product at well-ventilated place dew to increasing heat.
 - Installation environment
 - It shall be used indoor
 - Altitude max. 2000m
 - Pollution degree 2
 - Installation category II
- *It may cause malfunction if above instructions are not followed.

Major products

- PROXIMITY SENSOR ■ PHOTOELECTRIC SENSOR ■ AREA SENSOR
- FIBER OPTIC SENSOR ■ DOOR/DOOR SIDE SENSOR ■ PRESSURE SENSOR
- ROTARY ENCODER
- COUNTER ■ TIMER
- TEMPERATURE CONTROLLER
- TEMPERATURE/HUMIDITY TRANSDUCER
- POWER CONTROLLER
- PANEL METER
- TACHO/LINE SPEED/PULSE METER
- DISPLAY UNIT ■ SENSOR CONTROLLER
- SWITCHING POWER SUPPLY
- GRAPHIC PANEL
- 5-PHASE STEPPING MOTOR & DRIVER & CONTROLLER
- LASER MARKING SYSTEM(CO₂, Nd:YAG)

Autonics Corporation
http://www.autonics.com

Global Partner for IA

■HEADQUARTERS: 41-5, Yongdang-ri, Ungsang-eup, Yangsan-si, Gyeongsang, 626-847, Korea

■OVERSEAS SALES: Bldg. 402 3rd Fl., Bucheon Techno Park, 193, Yakdae-dong, Wonmi-gu, Bucheon-si, Gyeonggi-do, 420-734, Korea
TEL:82-32-610-2730 / FAX:82-32-329-0728
E-mail : sales@autonics.com

EP-KE-14-0006