Autonics

Slim Digital Thyristor Power Controllers
DPUS Series

INSTRUCTION MANUAL

CE

Thank you for choosing our Autonics product.
Please read the following safety considerations before use.

▣ Safety Considerations

※Please observe all safety considerations for safe and proper product operation to avoid hazards.

※Safety considerations are categorized as follows.
⚠ **Warning** Failure to follow these instructions may result in serious injury or death.
⚠ **Caution** Failure to follow these instructions may result in personal injury or product damage.

※The symbols used on the product and instruction manual represent the following.
⚠ symbol represents caution due to special circumstances in which hazards may occur.

⚠ Warning

1. **Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss. (e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.)**
   Failure to follow this instruction may result in personal injury, fire, or economic loss.
2. **If it may cause serious hazard by malfunction or error of this unit, install proper protection circuit outside to prevent accidents.**
   Install a no fuse breaker (NFB) or a magnet connector (MC) outside separately before installing this unit. The class 1 grounding should be connected to prevent electric shock before supplying the power.
3. **Supply the rated power properly to prevent damage to the unit or malfunction.**
   Do not supply the power before completing wire it to prevent electric shock or malfunction.
4. **This unit is not explosion-proof. Do not this unit where there is flammable or explosive gas.**
5. **Do not disassemble or modify the unit. Please contact us if necessary.**
   Failure to follow this instruction may result in electric shock or fire.
6. **Do not connect, repair, or inspect the unit while connected to a power source.**
   Failure to follow this instruction may result in electric shock or fire.

⚠ Caution

1. **Do not use the unit outdoors.**
   Failure to follow this instruction may result in shortening the life cycle of the unit, or electric shock.
2. **Do not use water or oil-based detergent when cleaning the unit. Use dry cloth to clean the unit.**
   Failure to follow this instruction may result in electric shock or fire.
3. **Do not use the unit where humidity, direct sunlight, radiant heat, vibration, or impact may be present.**
   Failure to follow this instruction may result in fire or product damage.
4. **Do not inflow dust or wire dregs to inside of the unit.**
   Failure to follow this instruction may result in fire or product damage.
5. **Do not touch the heatsink due to high temperature during operation.**
   Failure to follow this instruction may result in burn.

▣ Ordering Information

DPUS | 2 | – | 025 | N

Option	**N**	Non-fuse
	F	Fuse
Rated current capacity	**025**	25A
Power supply	**2**	220VAC
	3	380VAC
	4	440VAC
Item	**DPUS**	Digital Thyristor Power Controller (Slim)

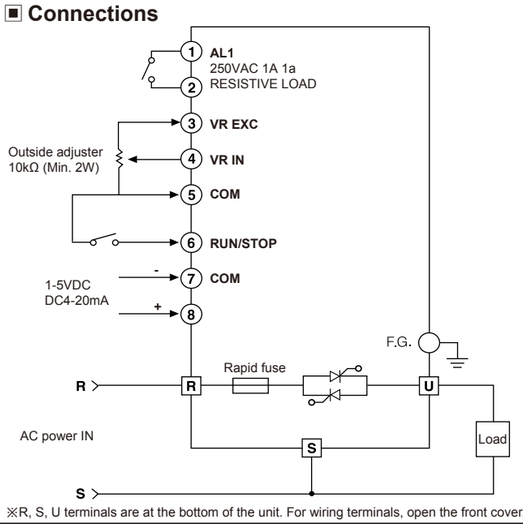
※**The above specifications are subject to change and some models may be discontinued without notice.**

▣ Specifications

Series	DPUS2-025□	DPUS3-025□	DPUS4-025□
Number of phases	1-phase		
Power supply	220VAC～	380VAC～	440VAC～
Allowable voltage range	90 to 110% of rated voltage		
Rated frequency	50/60Hz (auto recognition), allowable frequency range: ±2Hz (performance guarantee: ±1Hz)		
Rated current	25A		
Power consumption	Max. 5W		
Min. load current	3A		
Output range	• Phase control: 0 to 98% • Variable cycle control: 0 to 100%		
Output accuracy	Within ±10% F.S. of rated voltage		
Control method	Phase control, variable cycle control		
Load	Resistance load		
Indicator	Indicates LED status		
Setting method	Setting by front DIP switches and a rotary switch		
Control input	• Auto: DC4-20mA/1-5VDC⎓ • Manual: inside adjuster 10kΩ, outside adjuster 10kΩ (min. 2W)		
DIP switch input	Phase control/variable cycle control, voltage/current input, AUTO/MANUAL, ramp operation, over current alarm/current limit, load recognition mode, inside/outside adjuster		
Rotary switch input	Output setting: 10 to 100% over current and load disconnection alarm setting		
Dielectric strength	2,000VAC 50/60Hz for 1 min (between input terminal and power terminal)		
Vibration	0.75mm amplitude at frequency of 5 to 55Hz (for 1 min) in each X, Y, Z direction for 2 hours		
Insulation resistance	Over 200MΩ (at 500VDC megger)		
Noise immunity	±2kV the square wave noise (pulse width 1μs) by the noise simulator		
Environment – Ambient temp.	-10 to 50℃, storage: -20 to 80℃		
Environment – Ambient humi.	30 to 85%RH, storage: 30 to 85%RH		
Approval	CE		
Weight※1	Approx. 980g (approx. 880g)		

※1: The weight includes packaging. The weight in parenthesis is for unit only.
※Environment resistance is rated at no freezing or condensation.

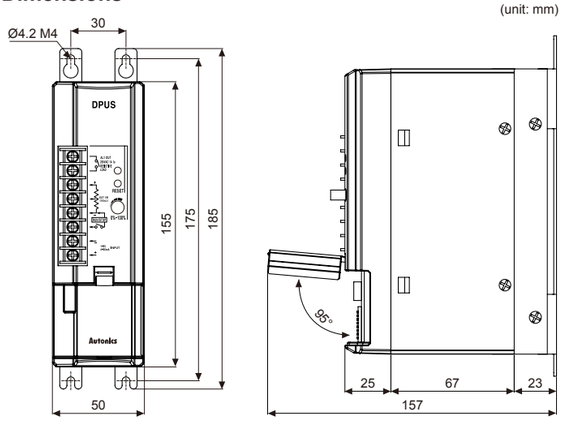
▣ Connections



※R, S, U terminals are at the bottom of the unit. For wiring terminals, open the front cover.

▣ Dimensions

(unit: mm)



▣ Functions

1. Ramp operation [DIP switch 4 ON]
When controlling the load which has inrush current (platinum, molybdenum, tungsten, infrared lamp, etc) in power ON, or when control input changes rapidly, it prevents the load to increase output gradually within the set time. Regardless of control method setting, Ramp operation increases/decreases input value.
The time for output to reach 0 to 100% (current limit output value) is fixed at 10 sec.

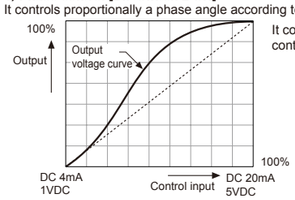
2. AUTO/MANUAL selection [DIP switch 3 ON/OFF]
1) AUTO: Mode for controlling the output by analog input.
2) MANUAL: Mode for controlling the output by adjusting inside or outside adjuster as control input adjuster.

Selection	Type		Input impedance	DIP switch
AUTO input (DIP switch 3 OFF)	Current	DC4-20mA	100Ω	DIP switch 1 ON
	Voltage	1-5VDC	13kΩ	DIP switch 1 OFF
MANUAL input (DIP switch 3 ON)	Inside adjuster	10kΩ	—	DIP switch 8 ON
	Outside adjuster	10kΩ	—	DIP switch 8 OFF

※For setting by the inside adjuster, do not use the outside adjuster.

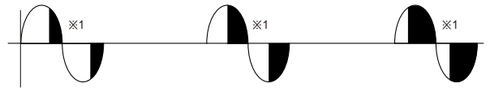
3. RUN/STOP [5-6 terminals]
It switches RUN/STOP by terminal input. RUN mode operates as the set value by control input.
STOP mode is standby status.

4. Control method
1) Phase control [DIP switch 2 ON]
It controls proportionally a phase angle according to control input with half cycle.



It controls phase angle proportional to control input (DC4-20mA or 1-5VDC) level.

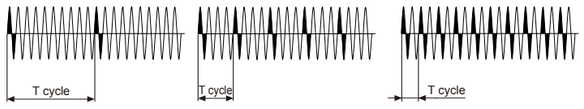
· 25% of control input signal · 50% of control input signal · 75% of control input signal



※1: Black parts of output waves are output value as applied to the load.

2) Variable cycle control [DIP switch 2 OFF]
It optimizes the number of AC voltage cycles supplied to the load by control input proportionally and controls the subject fast and correctly.

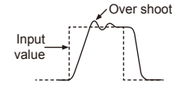
· 10% of control input signal · 25% of control input signal · 50% of control input signal



▣ Alarm

Type	Status indicator	Operation	Clear alarm
Overcurrent	Flashes red LED by 0.5 sec	Output stop (SCR OFF)	RESET switch or Power resupply
Heatsink overheat	Flashes red LED by 0.3 sec		
Thyristor error	Flashes green/red LED interval		
Current limit	Flashes orange LED by 0.5 sec	Current limit output	Automatically clear at alarm clear conditions
Load disconnection	Flashes green LED by 0.5 sec	Operation maintain	

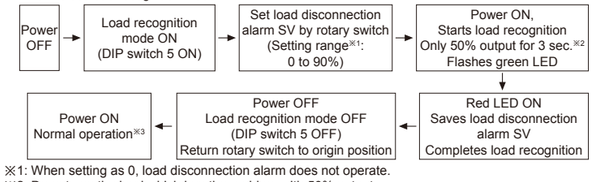
1. Current alarm
Current alarm is available only in phase control mode. Set alarm current value by the rotary switch.
1) Overcurrent alarm (DIP switch 6 OFF): When current reaches to the set current limit value, the set alarm occurs and output stops (flashes red LED by 0.5 sec).
To clear this alarm, re-supply the power or press the RESET key.
2) Current limit (DIP switch 6 ON): Current limit function limits output to prevent not to flow over the rated current (flashes orange LED by 0.5 sec).
※When operating current limit, it may cause over shoot temporarily.



2. Heatsink overheat alarm
When the temperature of a heatsink is over 90℃, heatsink overheat alarm occurs (flashes red LED by 0.3 sec). To clear this alarm, re-supply the power or press the RESET key.

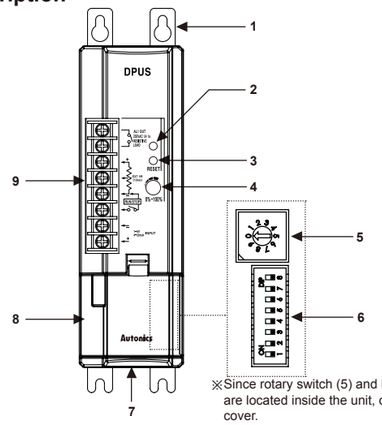
3. Thyristor error alarm
If current flows over 3A even though output is 0%, element error alarm occurs. When element error alarm occurs, output stops (flashes green/red LED interval). To clear this alarm, re-supply the power or press the RESET key.

4. Load disconnection alarm [Power OFF after DIP switch 5 ON]
Load disconnection alarm is available after measuring load resistance value by load recognition mode (DIP switch 5 ON).
When load resistance value is over than disconnection alarm SV, alarm occurs (load disconnection alarm occurs regardless of output value) and control operation is maintained (flashes green LED by 0.5 sec).
For output voltage is below 15V or output is 10%, load disconnection alarm does not operate.
When load resistance value is lower than the load disconnection alarm SV, this alarm cleared automatically.
- How to set load recognition mode



※1: When setting as 0, load disconnection alarm does not operate.
※2: Do not use the load which has the problem with 50% output.
※3: When output is lower than the load disconnection alarm SV set by the rotary switch, load disconnection alarm occurs.

▣ Unit Description



※Since rotary switch (5) and DIP switch (6) are located inside the unit, open the front cover.

1. Bracket
Using for mounting this unit on the panel.
2. Status indicator
When Power ON, it turns ON in Orange→Red→Orange→Turn OFF→Green.
You can check the status indicator for alarm.
3. RESET button
Using for clear alarm. Press the RESET button and power is resupplied.
4. Inside adjuster (10kΩ)
5. Rotary switch
Set current limit output (10 to 100%). Factory default: 0

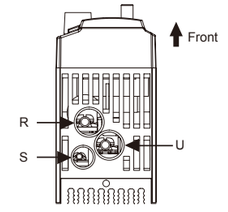
Position	1	2	3	4	5	6	7	8	9	0
SV	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

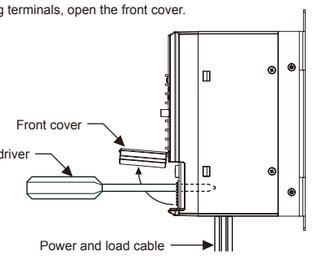
6. DIP switch

Position	1	2	3	4	5	6	7	8
ON	Current input (DC4-20mA)	Phase control	MANUAL	Ramp operation ON	Load recognition mode ON	Current limit	—	Inside adjuster
OFF	Voltage input (1-5VDC)	Variable cycle control	AUTO	Ramp operation OFF	Load recognition mode OFF	Overcurrent alarm	—	Outside adjuster

Factory default: All DIP switches OFF

7. Power input and load connection part
Placed at the bottom of the unit. For wiring terminals, open the front cover.





8. Front cover
Open the front cover, there are the rotary switch, DIP switch, power input part.
9. Terminal block

▣ Cautions during Use

1. In order to prevent electric shock, this unit should be grounded. Otherwise, mount the unit on the solid metal conductor which is grounded.
2. Install the unit vertically at the well ventilated place.
3. Install the unit at the access restriction area.
   ※Access restriction area: a electric expert with delegated authority or a well trained electric expert only accessible area.
4. Be sure that if using this unit over the rated current, it may cause damage to the unit directly.
5. Select the proper cable for connecting power and load to flow the rated current enough by the cable standard.
6. In order to open the front cover, the power supply should be cut off.
   Before replacing, wiring it, be sure that turn OFF the power of input and load parts and check the safety.
7. This product may be used in the following environments.
   ① Indoors
   ② Max. altitude: 2,000m
   ③ Pollution degree 2
   ④ Overvoltage category II

※**Failure to follow these instructions may result in product damage.**

▣ Major Products

■ Photoelectric Sensors
■ Fiber Optic Sensors
■ Door Sensors
■ Door Side Sensors
■ Area Sensors
■ Proximity Sensors
■ Pressure Sensors
■ Rotary Encoders
■ Connectors/Sockets
■ Switching Mode Power Supplies
■ Control Switches/Lamps/Buzzers
■ I/O Terminal Blocks & Cables
■ Stepper Motors/Drivers/Motion Controllers
■ Graphic/Logic Panels
■ Field Network Devices
■ Laser Marking System (Fiber, Co₂, Nd: YAG)
■ Laser Welding/Cutting System
■ Temperature Controllers
■ Temperature/Humidity Transducers
■ SSRs/Power Controllers
■ Counters
■ Timers
■ Panel Meters
■ Tachometers/Pulse (Rate) Meters
■ Display Units
■ Sensor Controllers
■ Recorders
■ Indicators
■ Converters
■ Controllers
■ Thyristor Power Controllers
■ Pressure Transmitters
■ Temperature Transmitters

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