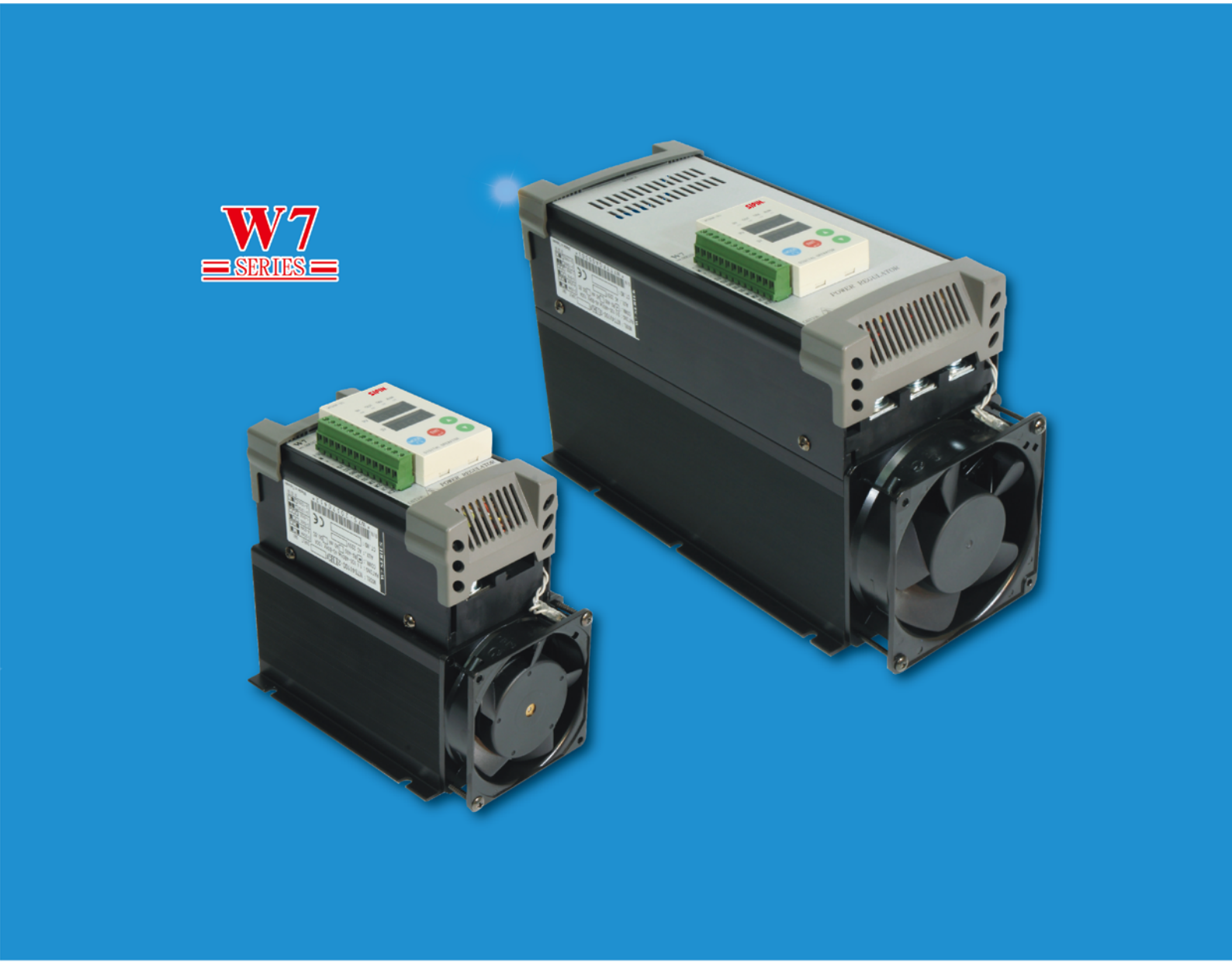
CE

Digital Thyristor Power Regulator

One single device satisfies your need of thermal load control



Professional、Durable

Smart Solutions by **SIPIN**

Product Features

- Downward-opened panel designed, Convenient for fuse replacement.
- Top and bottom designation with good looking covers, convenient to open and pug-in for wiring.
- European style terminals is used control wire is connected to the Re-wiring shall not be needed in case of replacement.
- Contains high-speed fuse to prevent damage to major components, external wiring, and reduces installation space when anomaly occurs.
- Immediately stops the output after a 0.5Hz power failure, and then buffer the output. (This prevents power surge from causing Fuse to blow abnormally)
- Activating circuit is independent from the main PCB circuit to prevent the damage occurred in case of main circuit malfunction.
- Automatic self-detecting function enables the availability for 45~65Hz frequency, Manual selecting or switching shall be not needed.
- The operation box that displays real-time information can be transmitted for convenient operation; a substitution of voltage meter, current meter, or power meter display.
- Effective RMS control is used for voltage, current, and power system.
- Insulated RS-485(MODBUS RTU) is used for communication purposes, capable of connecting up to 250 units.
- Capable of connecting multiple units which allows for an even distribution of power.
- When the controller is operating normally, information displayed on the Operation Box can be planned as: By input Percentage, Output Percentage, Buffered Rise Time, Buffered Drop Time, Maximum Output Limit, Voltage Output, Current Output, Power Output, Fin Temperature, Power Source Frequency, External Analog Input Percentage, Value of Digital Input, Operation Time, etc.
- Using Single Chip Control, input resolution 10-bit, output resolution 0.1%, and a variety of parameters for user settings to accommodate their requirements.
- Provides and additional port for RS-485 communication, and analog output (4~20Ma) or a second set of multi-function contacts (electronic contacts) according to user requirements.
- Signals such as 4-20mA, 1-5VDC, 2-10VDC, 0-20mA, 0-5VDC, 0-10VDC, isolated contact, Operation Box Input, COM Command (actual value or percentage)...etc., available for any kind of control signal.
- Two sets of Analog Signal Inputs can be planned for multiple functions:
  Anomaly Reset, Basic Output, Manual Setting, Maximum Output Limit, Manual/Auto Switch-over, Phase / Zero Distribution Switch-over, Phase / Zero Sampling Switch-over, Voltage Limit, Current Limit, etc.
- Nine Control Modes: Phase Angle Control Proportion Output, Zero Average Distribution, Zero Sampling Control, Phase Start→Zero equal sharing operation, Phase start→Zero sampling operation, Phase constant voltage, Phase constant current, Phase current limit, Phase constant power, suitable for all occasions, one single machine to meet your needs to control the heating load.
- Equipped with anomaly detection including, Fuse break, over-current, over-temperature, Temperature Sensor Anomaly, Current Detection, Low-current Detection, Load Decline Detection, load wire breakage, phase unbalance, voltage feedback anomaly, EEPROM Anomaly...etc., provides instant protection against anomalies, together with 4 sets of anomaly records.
- The multi-function Dry Contact can be planned as: anomaly dry contact (normally open), anomaly dry contact (normally closed), operation contact, or a current detection contact.

Product Appearance

IN : Input Indicator
OUT : Output Indicator
TRX : COM Indicator
ALM : Anomaly Indicator

MODE Mode Key and Exit Key
ENT Input Key
Up Key
Down Key

Mains Power Cover
The energized parts of main power are hidden by shield covers to prevent shocking of the power source and enhance the safety and outside appearance.

Digital Operation Box
For setting user-defined parameters and displaying the current status.

Control Signal Terminal Block
Terminal band of control signals (Temperature controller, control signal ...etc.) contains the connectors for output alarm signal.

Load Side Protection Cover
The energized parts of load are hidden by shield covers to prevent shocking of the power source and enhance the safety and outside appearance.

Heat Dissipation Fin
Increases heat dissipation area of the SCR Module.

Heat Dissipation Fan
Effective ventilation fans are always running to cool down the facility which assures the Power regulator works in proper condition.

Installation Precautions and Surrounding Conditions

※ Power Regulator generates internal heat during operation. Install the unit vertically with sufficient space reserved on both sides, otherwise heat dissipation may be hindered and the internal temperature of the Power Regulator may rise continuously.

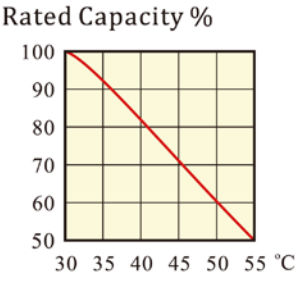
※ The Control Box shall be provided with vents or a ventilation fan for an air convection base on the principle that hot air rises from bottom to top.

※ DO NOT install the device in a hot position or where the ventilation is poor, otherwise use it at 70% of the rated capacity.

※ Avoid installing the device at a location with heavy steam, acid, alkali or corrosive vapor.

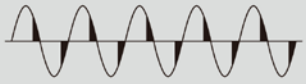
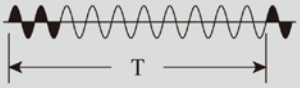
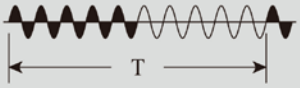
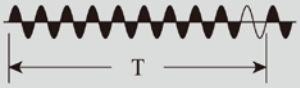
※ Humidity in the surrounding: Rh＜90% (without condensation).

※ Temperature in the surrounding: -10℃~45℃



※ The above data are for conditions where the heat dissipation fin is installed for maintaining heat convection and without corrosion or oil stains on the fin.

Control Method and Applicable Loads

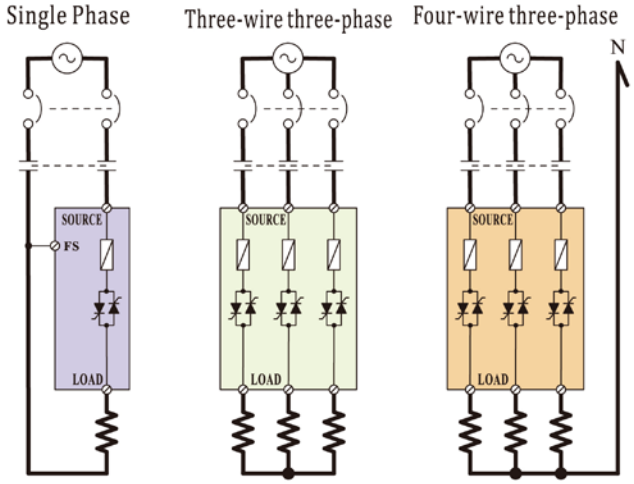
Output / Control mode	Output wave		
	20% Output	50% Output	90% Output
Phase angle control			
Zero crossing control (Cycle sampling)	 1 cycle ON and 4 cycle OFF	 1 cycle ON and 1 cycle OFF	 9 cycle ON and 1 cycle OFF
Zero crossing control (Time sampling)			

※ Phase Angle Control：Continuous Phase Angle Control, steady output, no fluctuation in the current meter, but harmonic waves occur.
Applicable Loading：Load with constant impedance, load with variable impedance, reactant load, IR Lamp.

※ Zero Cycle Sampling：Distributive Zero Control (variable cycle), minimum resolution 1Hz - number of harmonic waves is lower than Phase Angle Control - current meter fluctuates during output.
Applicable Loading：Load with constant impedance.

※ Zero Time Sampling：Time Sampling Zero Control, (constant period) minimum resolution 1Hz - control in low harmonic wave - output is in a full continuous wave.
Applicable Loading：Load with constant impedance.
Remarks : Zero cycles sampling low harmonic control, THID harmonic wave lower then 5%, which meets the US power company IEEE-519 specifications.
(Taiwan Power Company follows the regulations of the American Electric Power Company)

Wiring and Planning Precautions



NFB → Allows cutting off the power source, preventing electrocution of maintenance or repair personnel.

MC → Connected with the over-temp temperature sensor contact, for cutting off the power source of the Power Regulator. Prevents severe incidents caused by burnt SCR modules in the Power Regulator.
(Contact for the anomaly signal of Power Regulator: never use this to disconnect the Magnetic Contactor.)

Power Regulator → Allows to adjust the output power according to the control signals to maintain the desired temperature.
(This product is equipped with a high-speed fuse, no external fuse is required.)

※ Planning of the standard mains circuit: Main power → NFB → MC → Power Regulator →Load

※ Make sure all the screws are tightened for the wiring, otherwise poor contact may result in a temperature rise.

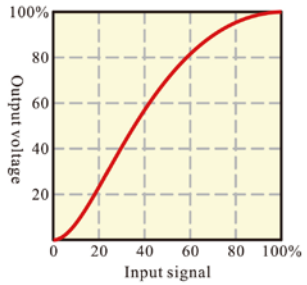
※ On completion of wiring, make sure all the cover plates are installed before engaging the power source, otherwise electrocution may occur, or a short-circuit may occur due to a conductive object falling in.

Table of Product ID

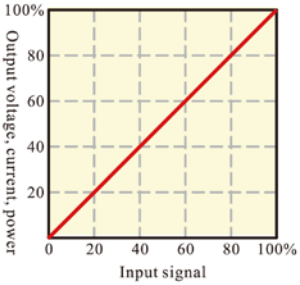
Product Series	W7	W7 Series	
Specification Type	S	Single phase	
	T	3 phase (3Ph 3W, 3Ph 4W)	
	D	3 phase inside delta(Phase voltage, phase current control)	
Mains Voltage	1V	40~120VAC	
	4V	180~480VAC	45~65Hz
	6V	460~690VAC	
Rated Current	030	30A	
	045	45A	
	060	60A	
	080	80A	
	100	100A	
	125	125A	
	150	150A	
	180	180A	
	230	230A	
	270	270A	
	300	300A	
	380	380A	
	450	450A	
	580	580A	
	750	750A	
Serial Number	–		
Auxiliary Power	1	1 § 110VAC	
	2	1 § 220VAC	
Add-on Card (DX terminal output)	0	No card	
	1	RS485 COM	(MODBUS RTU 2W)
	2	Analog output	(0-20mA or 4-20mA) ※Vmax：5VCD
	3	Electronic Contact	(24VDC 70mA)
Digital Operation Box	K	With Digital Operation Box	
	N	W/O Digital Operation Box	
Product Type	P	Standard	(Proportion control)
	D	V,A indication	(Proportion control. Single phase Voltage and single phase current RMS value display.)
	T	V,A indication	(Proportion control. single phase Voltage and 3 phase current RMS value display.)
	V	Voltage Feedback	(Voltage Feedback control)
	F	Full Function	(Voltage/ Current/ Power Feedback Control, Error Detection and Protection)
	C	Customized	
Special Function	S	Special (for low harmonic wave control transformer only)	Subject to customized design if required.

Control mode / Model code	Phase control (proportional)	Zero crossing cycle sampling (Variable cycle)	Zero crossing time sampling (Constant cycle)	Phase start→ Zero crossing cycle sampling	Phase start→ Zero crossing time sampling	Constant Voltage RMS	Limit Current RMS	Constant Current RMS	Constant Power RMS
P、D、T(standard,V,A)	◎	◎	◎	◎	◎				
V (Voltage feedback model)	◎	◎	◎	◎	◎	◎			
F (Full function model)	◎	◎	◎	◎	◎	◎	◎	◎	◎

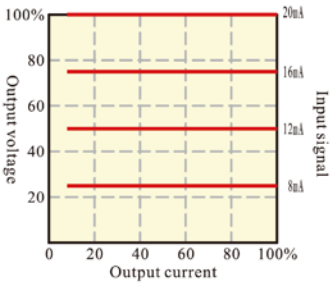
Proportion control



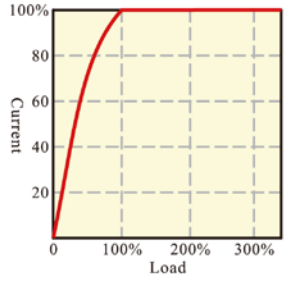
Feedback control



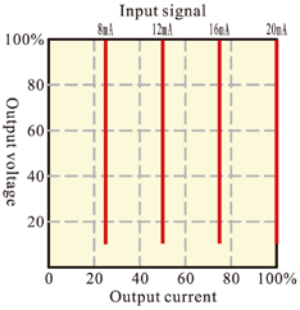
Constant voltage



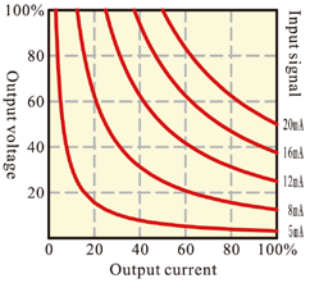
Limit current



Constant current



Constant power



Terminals

Single Phase (W7S)

Terminal Code	Description	Remarks
FS	FUSE blowout test	Direct wire from power supply to load must connected back to FS Terminal.
M	+5VDC	For this PCB only. No use elsewhere.
+	Control Signal Positive Input	See setting of SW1 Control PCB
–	Base level of analog signal	
S1	External analog signal 1, positive input	External VR:2~10KΩ Voltage signal: 0~5VDC ※ Please use isolation wire layout on signal wires.
S2	External analog signal 2, positive input	
GND	External analog signal Baseline Level	
DX+	Add-on Card Terminal	See Table-1
DX-		
M1	Multi-function Dry Contact output	Contact Capacity: 250VAC 2A 24VDC 2A
M2		
AC1	AUX Power Supply	See Specifications Tab for voltage of AUX Power Supply.
AC2		

Three Phase(W7T、W7D)

Terminal Code	Description	Remarks
•	Empty pin	No connection
M	+5VDC	For this PCB only. No use elsewhere.
+	Control Signal Positive Input	See setting of SW1 Control PCB
–	Base level of analog signal	
S1	External analog signal 1, positive input	External VR:2~10KΩ Voltage signal: 0~5VDC ※ Please use isolation wire layout on signal wires.
S2	External analog signal 2, positive input	
GND	External analog signal Baseline Level	
DX+	Add-on Card Terminal	See Table-1
DX-		
M1	Multi-function Dry Contact output	Contact Capacity: 250VAC 2A 24VDC 2A
M2		
AC1	AUX Power Supply	See Specifications Tab for voltage of AUX Power Supply.
AC2		

Table-1 Add-on Card Terminal Functions

Add-on Card / Terminal Code	0 : None	1 : COM	2 : Analog output	3 : Electronic Contact
DX+	Empty pin	RS-485 Com MODBUS RTU	Analog output +	Electronic Contact output Capacity: 24VDC 0.1A
DX-			Analog output base	
Description	No add-on card: empty pin, no connection.	Com Card, connect 220Ω resistor 1/2W for multiple unit communication	Analog Output Card: Isolated 0~20mA or 4~20mA output.	Electronic Contact Card: Isolated Electronic Contact output.

Input Signal Selection

SW1 can be seen when cover plate is opened.

4~20mA
Input Impedance 249Ω
S1 : ON
S2 : OFF
S3 : OFF

1~5VDC
Input Impedance 200KΩ
S1 : OFF
S2 : OFF
S3 : OFF

2~10VDC
Input Impedance 20KΩ
S1 : OFF
S2 : ON
S3 : OFF

0~20mA
Input Impedance 249Ω
S1 : ON
S2 : OFF
S3 : ON

0~5VDC
Input Impedance 200KΩ
S1 : OFF
S2 : OFF
S3 : ON

0~10VDC
Input Impedance 20KΩ
S1 : OFF
S2 : ON
S3 : ON

High-speed Fuse corresponding to Power Regulator

Rated Current	30A	45A	60A	80A	100A
Fuse	40ET	63ET	80ET 660GH-80	660GH-100	660GHX125
Brand	EATON (Bussmann)	EATON (Bussmann)	EATON (Bussmann) HINODE	HINODE	HINODE

Rated Current	125A	150A	180A	230A	270A
Fuse	80ET＊2 660GH-80＊2	660GH-100＊2	660GHX125＊2	250FM	315FM
Brand	EATON (Bussmann) HINODE	HINODE	HINODE	EATON (Bussmann)	EATON (Bussmann)

Rated Current	300A	380A	450A	580A	750A
Fuse	315FM	660GH-400	250FM＊2	315FM＊2	660GH-400＊2
Brand	EATON (Bussmann)	HINODE	EATON (Bussmann)	EATON (Bussmann)	HINODE

Accessories

Add-on Card

Add-on Card No.	Description	Remarks
WTCM10	RS-485 Com Card	Com Card, connect 220Ω 1/2W resistor for multiple unit communication.
WTCM20	Analog output Card (0-20 or 4-20mA)	Connect to 1 unit only. (Vmax: 5VDC)
WTCM30	Electronic contact card	Contact Capacity: 24VDC 70mA

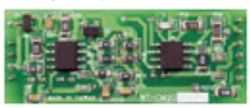
Operation Box and Connection Wires

Product No.	Description	Remarks
KP-WTDOP-01	W7 Digital Operation Box	
PMF-DOP01-200	2m length	Length can be customized according to demand, up to 10 meters
PMF-DOP01-500	5m length	
PMF-DOP01-1000	10m length	

Add-on Card

WTCM10

WTCM20



WTCM30

Operation Box

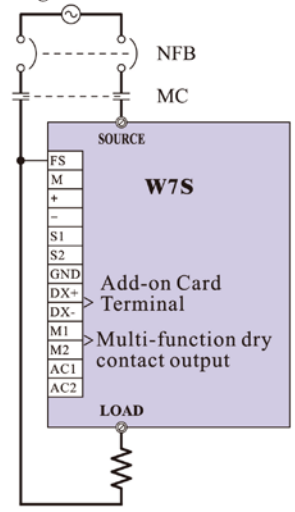
KP-WTDOP-01

Connection Wire

PMF-DOP01-XXXX

Single Phase Wiring Example

Single Phase

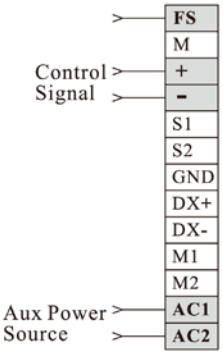


Main Circuit Diagram

※Installed on Source side if MC is used

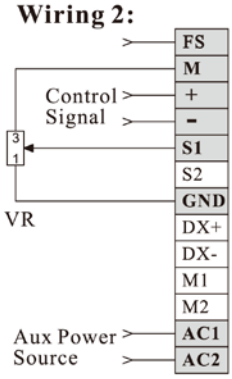
※Use 220Ω 1/2W termination resistor for multiple unit communication

Wiring 1:



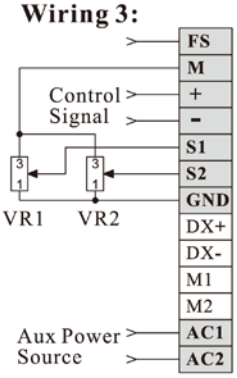
AIF 00	+ Control Signal Input

Wiring 2:



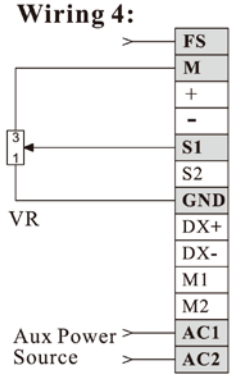
AIF 01	+ Control Signal Input S1 Max. output limit setting
AIF 12	+ Control Signal Input S1 Voltage limit setting
AIF 13	+ Control Signal Input S1 Current limit setting

Wiring 3:



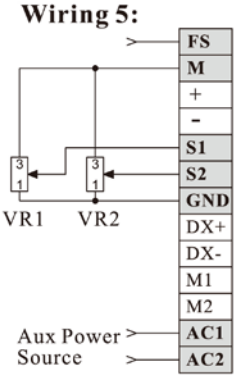
AIF 02	+ Control Signal Input S1 Max. output limit setting S2 Basic Output Setting
AIF 14	+ Control Signal Input S1 Voltage limit setting S2 Current limit setting

Wiring 4:



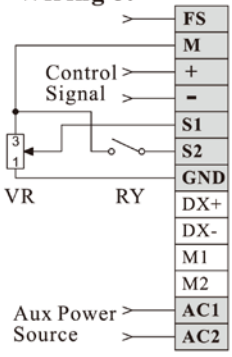
AIF 03	S1 Manual Setting

Wiring 5:



AIF 04	S1 Manual Setting S2 Basic Output Setting

Wiring 6:

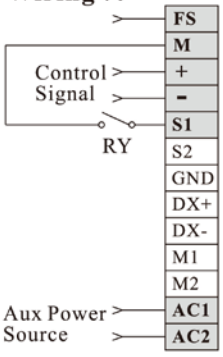


AIF 05	+ Control Signal Input S1 Manual Setting (ineffective in Auto) S2 Open: Auto; Close: Manual
AIF 06	+ Control Signal Input S1 Manual Setting (output limited in Auto) S2 Open: Auto; Close: Manual
AIF 07	+ Control Signal Input S1 Max. output limit setting ※Note2 S2 Open: Note 1 ; Close: Zero Cycle Sampling
AIF 08	+ Control Signal Input S1 Max. output limit setting ※Note2 S2 Open: Note 1; Close: Zero Time Sampling
AIF 09	+ Control Signal Input S1 Max. output limit setting ※Note2 S2 Open: Stop; Close: Operation

Note 1: Output according to CT. MD Control Mode when Contact is Open.

Note 2: Max. output limit setting, connect M and S1 when VR is not in use.

Wiring 7:



AIF 10	+ Control Signal Input S1 Open: Auto Close: Digital Input Setting ※Note3

※ Note 3: Digital Input Setting

CtrD =0~4 setting is percentage

CtrD =5~8 setting is actual value

3-phase Wiring Example

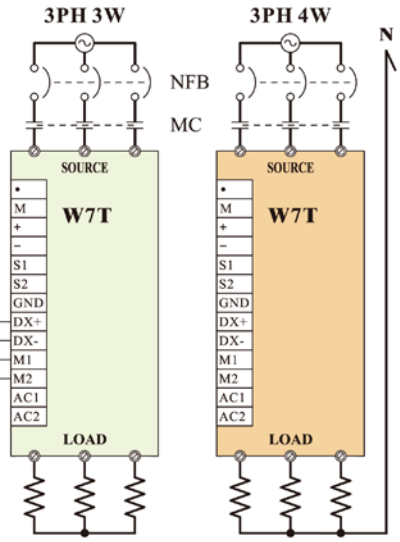
Main Circuit Diagram

※Installed on Source side if MC is used

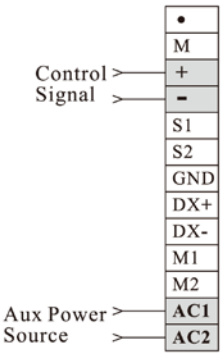
※Use 220Ω 1/2W termination resistor for multiple unit communication

Add-on Card Terminal

Multi-function dry contact output

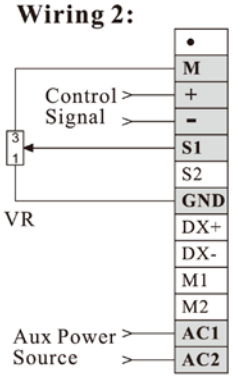


Wiring 1:



AIF	+ Control Signal Input
00	

Wiring 2:

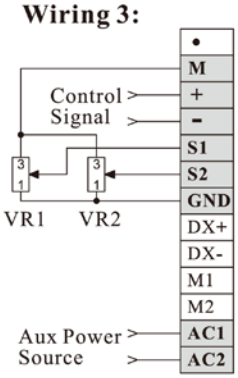


AIF	+ Control Signal Input
01	S1 Max. output limit setting

AIF	+ Control Signal Input
12	S1 Voltage limit setting

AIF	+ Control Signal Input
13	S1 Current limit setting

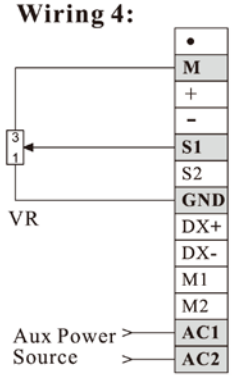
Wiring 3:



AIF	+ Control Signal Input
02	S1 Max. output limit setting
	S2 Basic Output Setting

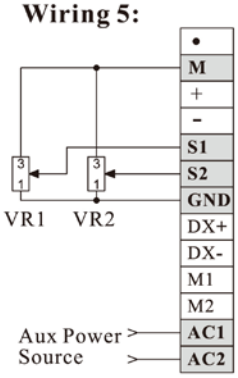
AIF	+ Control Signal Input
14	S1 Voltage limit setting
	S2 Current limit setting

Wiring 4:



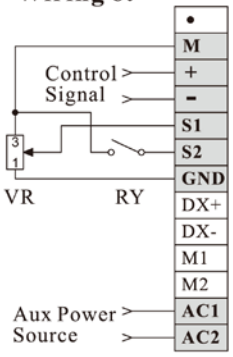
AIF	S1 Manual Setting
03	

Wiring 5:



AIF	S1 Manual Setting
04	S2 Basic Output Setting

Wiring 6:



AIF	+ Control Signal Input
05	S1 Manual Setting (ineffective in Auto)
	S2 Open: Auto; Close: Manual

AIF	+ Control Signal Input
06	S1 Manual Setting (output limited in Auto)
	S2 Open: Auto; Close: Manual

AIF	+ Control Signal Input
07	S1 Max. output limit setting ※Note2
	S2 Open: Note 1 ; Close: Zero Cycle Sampling

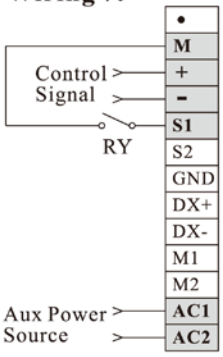
AIF	+ Control Signal Input
08	S1 Max. output limit setting ※Note2
	S2 Open: Note 1; Close: Zero Time Sampling

AIF	+ Control Signal Input
09	S1 Max. output limit setting ※Note2
	S2 Open: Stop; Close: Operation

Note 1: Output according to CT. MD Control Mode when Contact is Open.

Note 2: Max. output limit setting, connect M and S1 when VR is not in use.

Wiring 7:



AIF	+ Control Signal Input
10	S1 Open: Auto
	Close: Digital Input Setting ※Note3

※ Note 3: Digital Input Setting

CtrD =0~4 setting is percentage

CtrD =5~8 setting is actual value

Product Dimensions and Weight

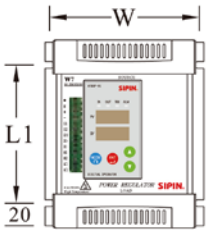
W7S Single Phase Controller

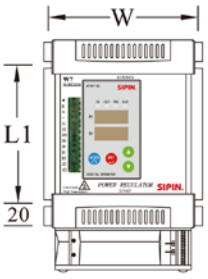
Normal rated current	Figure (Page10)	Outline dimensions (mm)			Net weights (Kg)	Packed dimensions (mm)			Packed weights (Kg)	Fixed-hole dimensions (mm)				Main power source screw	Torque (kgf.cm)	Way of cooling
		L	W	H		L	W	H		L1	L2	L3	W			
30A	A	162	98	135	1.32	225	127	166	1.56	122	O	O	90	M6	50~60	Self-Cooled
45A	A	200	98	135	1.51	262	127	166	1.77	122	O	O	90	M6	60~70	Self-Cooled
60,80A	B	162	112	185	1.77	225	140	220	2.10	122	O	O	104	M6	70~90	Self-Cooled
100A	C	189	112	185	2.03	250	140	220	2.36	122	O	O	104	M6	70~90	Fan Cooled
125,150,180A	C	275	112	185	2.99	336	140	220	3.36	122	86	O	104	M8	160~200	Fan Cooled
230,270A	C	287	112	190	3.45	345	140	220	3.85	122	86	O	104	M10	250~280	Fan Cooled
300,380A	D	390	140	250	6.07	450	168	277	6.69	122	86	94	132	M10	280~320	Fan Cooled
450A	D	390	140	250	6.75	450	168	277	7.37	122	86	94	132	M10*2	320~360	Fan Cooled
580A	D	460	140	250	8.62	590	260	390	10.64	122	86	94	132	M10*2	320~360	Fan Cooled
750A	D	560	140	250	10.56	690	260	390	13.09	122	86	239	132	M10*2	320~360	Fan Cooled

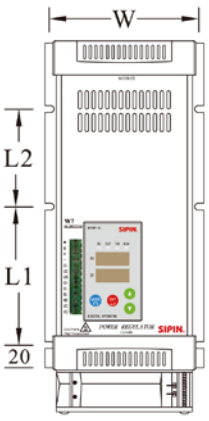
W7T、W7D Three Phase Controller

Normal rated current	Figure (Page10)	Outline dimensions (mm)			Net weights (Kg)	Packed dimensions (mm)			Packed weights (Kg)	Fixed-hole dimensions (mm)				Main power source screw	Torque (kgf.cm)	Way of cooling
		Length	Width	Height		Length	Width	Height		L1	L2	L3	W			
30A	E	200	140	150	2.63	262	168	182	2.98	122	O	O	132	M6	50~60	Air-cooling
45A	F	200	140	210	3.11	262	168	245	3.49	122	O	O	132	M6	60~70	Air-cooling
60,80,100A	G	242	140	210	3.59	302	168	245	3.97	122	O	O	132	M6	70~90	Fan-cooling
125,150A	G	326	140	210	5.13	388	168	245	5.62	122	86	O	132	M8	180~200	Fan-cooling
180A	G	382	140	210	5.95	443	168	245	6.46	122	86	94	132	M8	200~220	Fan-cooling
230,270A	H	322	215	270	15.44	445	320	400	17.39	230	O	O	203	M10	250~280	Fan-cooling
300,380A	H	402	215	270	20.48	530	320	400	22.81	230	80	O	203	M10	280~320	Fan-cooling
450A	I	390	380	250	18.77	515	500	390	21.83	122	86	94	372	M10*2	320~360	Fan-cooling
580A	I	460	380	250	24.30	590	500	390	28.01	122	86	94	372	M10*2	320~360	Fan-cooling
750A	I	560	380	250	29.00	690	500	390	32.60	122	86	239	372	M10*2	320~360	Fan-cooling

Fixed dimensions







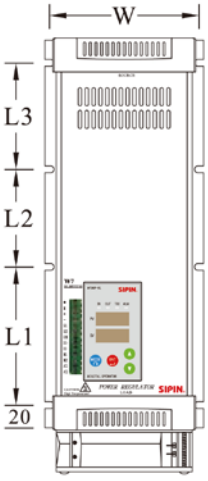


Figure A

Figure B

Figure C

Figure D

Figure E

Figure F

Figure G

Figure H

Figure I

SIPIN TECHNOLOGY CO., LTD.

No.39, Alley 296, Lane 988, Sec.1 Sinan Rd., Wujih Dist., Taichung City 41462, Taiwan (R.O.C.)

• Tel:+886-4-23350458(6 lines) • Fax:+886-4-23357625

For Worldwide Sales and Service, visit our website:www.scr.com.tw • Email:sales@scr.com.tw

• website:http://www.scr.com.tw

2020-01-1000