#### MODEL **H5S** DIGITAL TIME SWITCH

# INSTRUCTION MANUAL

OMRON

Thank you for purchasing this OMRON product. Please read this instruction MANUAL and thoroughly familiarize yourself with the functions and characteristics of the product before use. Please retain this MANUAL for future reference.



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#### Safety Precautions

#### Key to Warning Symbols



Indicates information that, if not followed, could result in relatively serious or minor injury, property damage, or faulty operation.

#### Graphic symbol

$\bigwedge$	<ul> <li>Warning against electric shock Notification of possible electric shock under certain conditions.</li> </ul>
$\bigcirc$	<ul> <li>General warning Notification of general, unspecified prohibition items.</li> </ul>
	<ul> <li>Prohibition against disassembly Notification of disassembly of products, when doing so can cause possible electric shock.</li> </ul>
	<ul> <li>General warning Notification of general, unspecified actions that users must perform.</li> </ul>
	<ul> <li>Warning against rupture Notification of possible rupture under certain conditions.</li> </ul>

#### Precautionary Information

## 

Minor injury by electrocution may occasionally occur. Do not touch any of the terminals while power is being supplied. Be sure to mount the terminal cover after wiring. When mounting a surface-mounting model on exposure, always install the Y92A-72H terminal cover (separately purchased).	
Minor injury due to explosion may occasionally occur. Do not use product where subject to flammable or explosive gas.	$\bigcirc$
Minor electric shock, fire or malfunction may occasionally occur. Never attempt to disassemble, modify, or repair the product or touch any of the internal parts.	(
Fire may occasionally occur. Tighten the terminal screws to the rated torque (from 0.98 to 1.17N·m).	0
Unexpected operation may occasionally occur. Before changing times or other settings while power is being supplied, either turn OFF the power on the load side or set the output ON/OFF switch to OFF and confirm the safety of the system.	0
Minor electric shock, fire, or malfunction may occasionally occur. Do not allow metal fragments or lead wire scraps to fall inside the Time Switch.	0
If the output relay is used beyond its life expectancy, its contacts may become fused or there may be a risk of fire. Use the output relay within its rated load and electrical life expectancy. The life expectancy of the output relay varies considerably according to its usage.	$\triangle$
Serious injury may occasionally occur due to fire or explosion of a battery, or leakage from a battery. Never attempt to short the positive and negative terminals, recharge, discosomble, deferm but and used in a provide a constraint of the battery to fire.	

### **Precautions for Safe Use**

Please comply strictly with the following instructions which are intended to ensure safe operation of the controller.

(1)Install the Time Switch only by qualified electrical workers.

- (2)Store the Time Switch within the specified ratings. If the Time Switch has been stored at temperatures -10°C or lower, let it stand for 3 hours or longer at room temperature before turning ON the power supply.
- (3)Mounting the Time Switch side-by-side may reduce the life expectancies of internal components.
- (4)Use the Time Switch within the specified ratings for operating temperature and humidity.
- (5)Do not operate the Time Switch in any of the following locations.
  - Locations subject to sudden or extreme changes in temperature.
  - Locations where high humidity may result in condensation.
- (6)The Time Switch is not waterproof or oil resistant. Do not use it in locations subject to water or oil.
- (7)Do not use the Time Switch in locations subject to excessive dust, corrosive gas, or direct sunlight.
- (8)Install the Time Switch well away from any sources of excessive static electricity, such as pipes transporting molding materials, powders, or liquids.
- (9)Maintain voltage fluctuations in the power supply within the specified range.
- (10)Internal elements may be destroyed if a voltage outside the rated voltage is applied.
- (11)Be sure to wire the terminals correctly.
- (12)Separate the Time Switch, the devices that generate input signals, input signal wires from any potential sources of noise, such as high-voltage lines.
- (13)Do not connect more than two crimp terminals to each Time Switch terminal.
- (14)Up to two wires of the same size and type can be inserted into a single terminals.
- (15)Use the specified wires for wiring.

Applicable wire: AWG 22 to AWG 14 (equal to a cross-sectional area of 0.326 to 2.081 mm<sup>2</sup>)

Solid wire or twisted wire

Copper

(16)Install a switch or circuit breaker that allows the operator to immediately turn OFF the power, and label it to clearly indicates its function.

- (17)Take adequate protective measures (such as a breaker, or fuse) for the power supply of the Time Switch.
- (18)When using heaters, be sure to use a thermal switch for the load circuit.
- (19)Always maintain the load current within specifications.
- (20)Use a switch, relay, or other contacts so that the rated power supply voltage will be reached within 0.1 s. If the power supply voltage is not reached quickly enough, the Time Switch may malfunction or outputs may be unstable.
- (21)Use a switch, relay, or other contact to turn the power supply OFF instantaneously. Outputs may malfunction and memory errors may occur if the power supply voltage is decreased gradually.
- (22)The Time Switch utilizes a transformerless power supply. Do not touch the input terminal while power is being supplied; touching live terminals may result in electric shock.
- (23)Use the Time Switch within the specified ratings for vibrations or shock.
- (24)Use a commercial power supply when using AC input type as a power supply voltage input.

Although some inverters specify their output frequency to 50/60 Hz as output specification, smoke or burnout may occur from a rise in internal temperature. Do not use inverter output as the power supply.

- (25)Do not leave the Time Switch for long periods at a high temperature with output current in the ON state. Doing so may result in the premature deterioration of internal components (e.g., electrolytic capacitors).
- (26)Do not use organic solvents (such as paint thinner or benzine), strong alkaline, or strong acids because they will damage the external finish.

(27)None of the Time Switch components are user-replaceable, including the battery.

(28)Use a tool such as long nose pliers to form a gate to pull wires out of the optional large terminal cover, Y92A-72H. Processing by hand may result in injury due to gate vestige.

### **Precautions for Correct Use**

- (1)When the power is turned ON, an inrush current will flow for a short time (AC: Approx. 2.5 A (0.3ms), DC: Approx. 1.1 A (3ms)). Depending on the power supply capacity, operation may not start. Be sure to use a power supply with a sufficient capacity and a breaker.
- (2)Inrush current generated by turning ON or OFF the power supply may deteriorate contacts on the power supply circuit. Turn ON or OFF to a device with the rated current of more than 10A.

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#### $\bigstar$ How would you like to use the Time Switch?

## The H5S Time Switch offers **<u>simple operation</u>** to set various time controls.



% Refer to the main part to know the other functions or those details.

The H5S Time Switch has other convenient functions.



## Operation

### 1. Operating Functions Weekly Yearly 2 chnls 2 chnls

The H5S, Digital Time Switch, has mainly three types. The main functions of these types are as shown in the following table.

Operating functions are different depending on models. Please check the model and number, and read this manual thoroughly.

		Pages	Weekly 2 chnls	Yearly 2 chnls	Yearly 4 chnls	
			H5S-WB2(D) H5S-WFB2(D)	H5S-YB2(D)-X H5S-YFB2(D)-X	H5S-YB4(D)-X H5S-YFB4(D)-X	
Weekly operation	Timer operation	4-1,4-2	0	0		
	Pulse-output operation	4-3	0	0		
	Cyclic operation	4-4	0	0		
Yearly	Timer operation	4-7	×	○(※)		
operation	Pulse-output operation	4-8	×	○(※)		
Setting holidays		5-1	○(Specifying a day)	○(Specifying a date)		
Day override operation		5-4	○(Specifying a day)	)(Specifying a day)		
Program check function		5-2	0			
Checking the setting		5-3	0			
Override and automatic return operation		5-8	0			
Summer time (DST) adjustment		5-5,6-6-6	O(Manual only)	$\bigcirc$ (Manual /	automatic)	
Operation on recovery from power failure		6-3	Automatic / Manual selectable A		Automatic only	
Time adjustment input function		6-2	0		×	
Total time/count display		6-1	0		×	
Bank switching		6-4	0 ×		<	
Season switching		6-5	×	× 0		
Operation during power OFF		7	0			

% Yearly programs are added to weekly programs.

## 2. Nomenclature

#### <Front panel>



#### <Display>



## 2. Nomenclature

#### Yearly 2 chnls

#### <Front panel>



#### <Display>



## 2. Nomenclature



#### <Front panel>



#### <Display>



## 3. Time Adjustment Weekly 2 chils

[Example] The current time (day/hour/minute) is set to Saturday 17:28.

 Set the Mode Switch to RUN.



② Press TIME ADJ for 2 s or more. The O symbol flashes.



FRI SAT

FRI

SUN MON TUE WED THU

SUN MON THE WED THU

PW

- ③ Press SAT. (The bar ( — ) mark at the Saturday position will turn ON.) Set the time with [h]and [m]. ※1
- ④ Press WRITE to confirm the setting, and the Time Switch will start timing from 0 second.
- \*1 Holding down these Keys rapidly advances the value. Pressing S decrements the value of the Key that was last pressed.

≪Note≫

- On first power-up or after a reset (p= Section 8), the time adjustment display appears on the screen. Adjust the time by following the steps (3) and (4).
- If <u>TIME ADJ</u> is pressed again before confirming the time adjustment setting,

the setting is cancelled. www.ValinOnline.com | Phone 844-385-3099 | Email: CustomerService@valin.





C

## 3. Time Adjustment

[Example] The current time is set to 17:28 on August 15, 2006.

Yearly

2 chnls

Yearl

4 chnls



4. Basic Operations

## 4-1. Ordinary Timer Operation Weekly Yearly Yearly 4 chnls

[Example] The Time Switch turns ON circuit 1 or circuit 2 at 8:30 and turns it OFF at 17:15 from Monday through Friday.



Set the Mode Switch to P1 or P2. ※1
 →See Section 4-5 for 4 channel type.

	TIMER	٨		П
RUN	PULSE	V	山 1	<u>□</u> 2

- ② Press the DAY Keys to turn on the bars (-) at the positions of Monday through Friday. Set the ON time with h and m. \*\*2
- $\ensuremath{\textcircled{}}$  3 Press  $\ensuremath{\fbox{}}$  WRITE). Set the OFF time with h and m.\*2

The color indicates flashing

PW

SUN MON THE WED THU FRI SAT

PW

SUN MON THE WED THU FRI SAT

SAT

Number of remaining steps

1

- 4 Press  $\fbox{WRITE}$  to confirm the settings.
- \*1 If one or more programs have already been set, the display starts showing the set programs. To add another program, press WRITE prepeatedly until "--:--" is displayed.

≪Note≫

- $\bullet$  If multiple settings are required, repeat the steps 2 through 4.
- Both the ON and OFF times must be set.
- All the set weekly programs can be checked by pressing WRITE in program setting mode.
- When the Mode Switch is set to P1 or P2 (to PRGM for 4 channel type), the Time Switch stop automatic operation. To forcibly turn ON or OFF the output, use the OUT ON/OFF switches.
- The set data will be cleared if the OUTPUT setting switch is moved between the TIMER and PULSE positions after the data has been set.

### 4-2. Multiple-day operation Weekly Yearly Yearly 4 chnis

[Example1] The Time Switch turns circuit 1 or circuit 2 <u>ON continuously</u> between 8:30 on Monday and 17:15 on Friday.



- ④ Press WRITE to confirm the settings.
- 1 If one or more programs have already been set, the display starts showing the set programs. To add another program, press WRITE prepatedy until "----" is displayed.
- \*2 Holding down these Keys rapidly advances the value. Pressing Solution decrements the value of the Key that was last pressed.



- To add another programs nave aiready been set, the display starts showing the set programs To add another program, press (WRITE) repeatedly until "--:-" is displayed.
- \*2 Holding down these Keys rapidly advances the value. Pressing Solution down the value of the Key that was last pressed.

### 4-3. Pulse-output Operation Weekly Yearly Yearly 4 chnis

[Example] The Time Switch turns ON circuit 1 or circuit 2 for 30 seconds at 8:25 am from Monday through Saturday.



- ④ Press WRITE to confirm the settings.
- 1 If one or more programs have already been set, the display starts showing the set programs. To add another program, press WRITE repeatedly until "----" is displayed.
- ※2 Holding down these Keys rapidly advances the value. Pressing decrements the value of the Key that was last pressed.

#### ≪Note≫

- If multiple settings are required, repeat the steps (2) through (4).
- Both the ON time and pulse width must be set.
- All the set weekly programs can be checked by pressing  $\fbox{WRITE}$  in program setting mode.
- When the Mode Switch is set to P1 or P2 (to PRGM for 4 channel type), the Time Switch stops automatic operation. To forcibly turn ON or OFF the output, use the OUT ON/OFF switches.
- The set data will be cleared if the OUTPUT setting switch is moved between the TIMER and PULSE positions after the data has been set.

4-4. Cyclic Operation Weekly Yearly Yearly 4 chnis

[Example] The Time Switch turns circuit 1 or circuit 2 ON for 5 minutes and OFF for 1 hour 55 minutes repeatedly from 8:00 to 19:00 on Sunday.





- O Press WRITE to confirm the settings.
- 1 If one or more programs have already been set, the display starts showing the set programs. To add another program, press WRITE repeatedly until "--:--" is displayed.
- \*2 Holding down these Keys rapidly advances the value. Pressing resolution of the Value of the Key that was last pressed.

≪Note≫

- If multiple settings are required, repeat the steps 2 through 7.
- All the start/stop times, ON/OFF time periods must be set.
- All the set weekly programs can be checked by pressing  $\fbox{WRITE}$  in program setting mode.
- When the Mode Switch is set to P1 or P2 (to PRGM for 4 channel type), the Time Switch stops automatic operation. To forcibly turn ON or OFF the output, use the OUT ON/OFF switches.
- Set Cyclic operation so as not to overlap other operations in individual circuits.
- The set data will be cleared if the OUTPUT setting switch is moved between the TIMER and PULSE positions after the data has been set.

## 4-5. Programming for 4 channel type

#### The following shows how to program (select an output) for 4 channel type.

PRGM RUN

Set the Mode Switch to PBGM



PW MON

TUF WED THU FBI

SUN

The color indicates flashing.

The rest of the procedure is the same as for 2 channel types.

\*The circuit number cannot be changed during the course of setting.

#### 4-6. About Yearly Program Yearly Yearlv 4 chnls

Yearly programs in addition to ordinary weekly programs can be set for 2 and 4 channel yearly types.



% If a weekly program and a yearly program overlap in operation time, the output of the H5S is continuously produced without being interrupted.

## 4-7. Yearly Timer Operation

[Example 1] The Time Switch turns ON a circuit at 18:00 and turns it OFF at 22:15 on March 25 every year.

Set the program in the following order.



March 25 (Start date) March 25 (End date) 18:00 (ON time) 22:15 (OFF time)

 Set the Mode Switch to P1 or P2. ※1 →See Section 4-5 for 4 channel type.



- Press YEAR for 1s or more. (The display moves to yearly program setting mode.)
- ③ Specify the start date using Y, M and D. ※2 Year can be set from the current year to the next two years as shown in the following example. If the year is set to "--", the operation performs every year. <Example>If the current year is 2006, the displayed year changes as follows.





Yearly 2 chnis

4 chnls



using (Y), (M)

 ④ Press WRITE).
 Specify the end date using Y, M and D. №2
 If the starting year has been set to "--", the ending year cannot be set.



- (5) Press WRITE. Set the ON time with h and m.\*2
- 6 Press WRITE. Set the OFF time with h and m.\*2



- O Press  $\fbox{WRITE}$  to confirm the settings.
- 1 If one or more programs have already been set, the display starts showing the set programs. To add another program, press [WRITE] repeatedly until "----" is displayed.
- \*2 Holding down these Keys rapidly advances the value. Pressing resolution of the Key that was last pressed.

#### ≪Note≫

- If multiple settings are required, repeat the steps (3) through (7).
- Yearly programs are added to weekly programs. ( FS Section 4-6)
- All the start/end dates and ON/OFF times must be set. The maximum number of yearly timer operations that can be set is 4 for each output channel.
- It is possible to set the Time Switch to operate for only one day (i.e., the start date is the same date as the end date).
- If one or more yearly programs have been set, the "[YEAR] " indicator light will turn on in run mode whether the yearly program is performed or not.
- When the year is specified, do not set the start date and end date in reverse sequence.
- The set data will be cleared if the OUTPUT setting switch is moved between the TIMER and PULSE positions after the data has been set.

[Example 2] The Time Switch turns a circuit ON continuously between 18:00 on March 25, 2006 and 12:00 on April 9, 2006.



To set multiple-day operation in yearly program setting mode, two yearly programs are required to be set as shown in the following example.

Program(1)



\*Output performance when no weekly programs are set on March 25 and April 9.



### 4-8. Yearly Pulse-output Operation Yearly 4 chails

[Example] The Time Switch turns ON a circuit to operate for 2 minutes at 18:00 between March 25 and April 9.

Set the program in the following order.

Day period Time period

March 25 (Start date) April 9 (End date) 18:00 (ON time) 2 minutes (Pulse width)

 ① Set the Mode Switch to P1 or P2. ※1 →See Section 4-5 for 4 channel type.





- ② Press YEAR for 1 s or more. (The display moves to yearly program setting mode.)
- ③ Specify the start date using Y, M and D.※2 Year can be set from the current year to the next two years as shown in the following example. If the year is set to "--", the operation performs every year. <Example> If the current year is 2006, the displayed year changes as follows.

--⇒06⇒07⇒08⇒--⇒06⇒







④ Press WRITE . Specify the end date using Y, M and D.\*\*2 If the starting year has been set to "--", the ending year cannot be set.



Set the ON time with h and m.\*2

5 Press WRITE.

⑥ Press (WRITE). Set the pulse width with (PLS). The displayed pulse width changes by pressing this Key in the following order. 1s→2s→····→59s→1m→···59m→60m→1s



- ⑦ Press WRITE to confirm the settings.
- 1 If one or more programs have already been set, the display starts showing the set programs. To add another program, press (WRITE) repeatedly until "----" is displayed.
- \*2 Holding down these Keys rapidly advances the value. Pressing S decrements the value of the Key that was last pressed.

#### ≪Note≫

- If multiple settings are required, repeat the steps (3) through (7).
- Yearly programs are added to weekly programs. (FF Section 4-6)
- All the start/end dates, ON time, and pulse width must be set. The maximum number of yearly pulse-output operations that can be set is 4 for each output channel.
- It is possible to set the Time Switch to operate for only one day (i.e., the start date is the same date as the end date).
- If one or more yearly programs have been set, the" [YEAR] " indicator light will turn on in run mode whether the yearly program is performed or not.
- When the year is specified, do not set the start date and end date in reverse sequence.
- The set data will be cleared if the OUTPUT setting switch is moved between the TIMER and PULSE positions after the data has been set.
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#### 4-9. Clearing the Settings Veekly 2 chnis

#### [Example 1] Clearing a part of the settings.

- Set the Mode Switch to P1 or P2 and select a setting to be cleared. See Section 4-5 for 4 channel type.
- ② Give a short press on CLEAR . ("EL-" appears on the main display and "SEEP" on the sub-display.) %If CLEAR is held down for 3 s or more, the display moves to the mode for clearing all the settings of the circuit.
- 3 Press WRITE to clear the setting.



## ≪Note≫ • If CLEAR is pressed while "*Lc*" is flashing, clearing operation is cancelled. · Each operation clears the following combination of settings.

Timer operation (weekly)	Both the ON/OFF times
Pulse-output operation (weekly)	Both the ON time and pulse width
Cyclic operation (weekly)	Both the start/stop times and ON/OFF time periods
Timer operation (yearly)	Both the start/end dates and ON/OFF times
Pulse-output operation (yearly)	Both the start/end dates, ON time and pulse width
Holiday operation (weekly)	All the holiday settings
Holiday operation (yearly)	Both the start/end dates
Day override operation (weekly)	All the day override operation settings

#### [Example 2] Clearing all the settings of each circuit.

- Set the Mode Switch to the position of the circuit whose settings are to be cleared.
   See Section 4-5 for 4 channel type.
- ② Hold down CLEAR for 3 s or more. ("LL" appears on the main display and "RLL" on the sub-display.)



③ Press WRITE to clear all the settings of the circuit.

≪Note≫

- If CLEAR is pressed while "Lr" is flashing, clearing operation is cancelled.
- The current time, set data of initial setting mode, holiday settings, or day override settings cannot be cleared in the same manner.
- · Yearly programs are also cleared with the yearly types.

## 5. Convenient Functions

### 5-1. Setting (Temporary) Holidays (Weekly)

Temporary holidays (non-operating days) can be set with ease. As the setting is automatically cleared after passing the days set as holidays, temporary holidays are easily set without changing the other settings including the output switches.

[Example] Friday and Saturday in the current week are set as holidays (non-operating days). The Time Switch operates according to the previous settings from the following week on.

 Press <u>HOLIDAY</u> for 2 s or more in run mode. (The display moves to holiday setting mode.)



② Turn off the bars (—) at the positions of the days set as holidays. Bar ON: Operating day ⇔ Bar OFF: Holiday



③ Press WRITE) to confirm the setting. After "ਮdਸਪ" is displayed for approximately 1 s, the display returns to RUN mode.

#### ≪Note≫

- Any day in the 7-day period starting from the current day can be set as a holiday. The setting is automatically cleared after passing the days set as holidays.
- All ON operations are cancelled on the holiday.
- The set holidays are valid for all the output channels.
- · Holiday setting mode can be entered from run mode only.
- If the current day setting is changed, all holiday settings are cleared.
- The display automatically returns to run mode if no Key input is entered within 30 seconds or if (HOLIDAY) is pressed for 2 s or more.

A display in run mode On a day set as a holiday, the "[HOLIDAY]" indicator is lit.



 Clearing holiday settings
 Give a short press on (CLEAR) in holiday setting mode.
 Press WRITE to clear the holiday settings.

\*If CLEAR is pressed while "[Lr" is flashing,

clearing operation is cancelled.



## 5-1. Setting (Temporary) Holidays (Yearly) 2 chris

Temporary(%) holidays (non-operating days) can be set simply by specifying dates.

As the setting is automatically cleared after passing the days set as holidays, temporary holidays are easily set without changing the other settings including the output switches.

\*Annual holidays can be set.

[Example] The days between April 29 and May 7 in 2006 are set as holidays (non-operating days). The Time Switch operates according to the previous settings from the following year on.

- Press HOLIDAY for 2 s or more in run mode. %1 (The display moves to holiday setting mode.)
- 2 Specify the start date of holidays using

   Year is displayed in the following order by pressing (Y). (Year can be set from the current year to the next two years.)
   <Example> If the current year is 2006, the displayed year changes as follows. 06⇒07⇒08⇒--⇒06⇒

The Color indicates flashing.





If the year is set to --, the holiday setting is executed every year.

③ Press (WRITE). In the same manner, specify the end date of holidays using (Y), (M) and (D).※2 If the starting year has been set to "--", the ending year cannot be set.



- (4) Press  $\fbox{WRITE}$  to confirm the settings.
- $\bigcirc$  Press HOLIDAY for 2 s or more to return to run mode.
- \*\*1 If one or more programs have already been set, the display starts showing the set programs. To add another program, press (WRITE) repeatedly until "----" is displayed.
- \*2 Holding down these Keys rapidly advances the value.

Pressing (♥) decrements the value of the Key that was last pressed. www.ValinOnline.com | Phone 844-385-3099 | Email: CustomerService@valin.

#### ≪Note≫

- Any date between the current date and December 31 in the year after the following year can be specified as a holiday.
- The setting is automatically cleared after passing the dates set as holidays (unless the year is set to --).
- If multiple settings are required, repeat the steps (2) through (4).
- Both the start and end dates of holidays must be set. The maximum number of holidays that can be set is 16.
- Holiday setting mode can be entered from run mode only.
- If the current date setting is changed, all holiday settings will be cleared.
- When the year is specified, do not set the start date and end date in reverse sequence.
- If no Key input is entered within 30 s or if <u>HOLIDAY</u> is pressed again for 2 s or more, the display automatically returns to run mode.

A display in run mode On a day set as a holiday, the "HOLIDAY" indicator is lit.



Clearing the holiday settings

<Clearing a part of holiday settings>

- ①When the holiday to be cleared is displayed, give a short press on CLEAR.
- ②Press WRITE) to clear the holiday setting.
- %If CLEAR is pressed while "LL-" is flashing, clearing operation is cancelled.

<Clearing all holiday settings>

①When any of the holiday settings is displayed, press CLEAR for 3 s or more.

- ②Press WRITE to clear all the holiday settings.
- If CLEAR is pressed while "LL-" is flashing,

clearing operation is cancelled.





### 5-2. Program Check Function Weekly Yearly 4 chnis

The set days and times when output turns ON and OFF over the course of one week can be displayed in the sequence the Time Switch is to operate.

 Press (TEST) for 2 s or more in run mode. ("ŁE5Ł" flashes and the day and time of the next change in output state is displayed.)



② Press WRITE). The display shows the time of the next change in output state. Each time WRITE is pressed, the display shows the days and times for one week.







≪Note≫

- Output is not turned ON or OFF according to displays in program check mode but according to settings and the current time.
- Program check mode can be entered from run mode only.
- Holiday settings (**[** Section 5-1), day override operation settings (**[** Section 5-4: weekly type only), and yearly settings (**[** Section 4-6: yearly types only) are also displayed.
- Settings for one week from the current day on can be checked with this function.
- After one-week schedule set for the circuit 1 is displayed, the display starts to show one-week schedule set for the circuit 2.
- If no Key input is entered within 30 s or if <u>TEST</u> is pressed again for 2 s or more, the display automatically returns to run mode.
# 5-3. Checking the Settings Weekly Yearly Yearly 4 chnis

The set times for one day can be checked.

- Press one of the DAY keys for 2 s or more in run mode to check settings for the day. ("CHEC" flashes and the time of the next On time is displayed.)
- ② Press WRITE. The display shows the time of the next change in output state.
- ③ If <u>WRITE</u> is pressed with the last setting of the day displayed, "*End*" is displayed for 2 s before the Time Switch automatically returns to run mode.

#### ≪Note≫

- This mode can be entered from run mode only.
- Output is not turned ON or OFF according to displays but according to settings and the current time.
- Holiday settings (F Section 5-1), day override operation settings (F Section 5-4: weekly type only), and yearly settings (F Section 4-6: yearly types only) are also displayed.
- If no Key input is entered within 30 s or if one of the DAY keys is pressed again for 2 s or more, the display automatically returns to run mode.







# 5-4. Day Override Operation Weekly

Operation for one day can be temporarily (for only one week) executed on another day.

[Example] The operations set for Sunday is executed this Saturday. The Time Switch performs the ordinary operation (according to the previous settings) from next Saturday on.

- Press COPY for 2 s or more in run mode. (The display moves to day override operation setting mode.)
- ② Turn on the bar (—) at the position of the day which the operations set for are to be executed on another day. (The [COPY] indicator will flash.)

③ Press WRITE to select the day on which the operations are to be executed.

④ Turn on the bar (—) at the position of the day. More than one day can be selected.

5 Press WRITE to confirm the setting.









The Color indicates flashing.

#### ≪Note≫

- Any day in the 7-day period starting from the current day can be set as a day on which another day's operations are to be executed. The setting is automatically cleared after passing the day.
- Day override operation setting mode can be entered from run mode only.
- The display returns to run mode if no Key input is entered within 30 seconds or if COPY is pressed for 2 s or more.

 Display in run mode
 The COPY indicator is displayed on a day on which another day's operations are to be executed.
 (It is Saturday in this example.) SUN MON TUE WED THU FRI SAT

Clearing day override operation settings
 Give a short press on <u>CLEAR</u> in day override operation setting mode.
 Press <u>WRITE</u> to clear the setting.
 If <u>CLEAR</u> is pressed again, clearing operation is cancelled.



### 5-5. Summer Time (DST) Adjustment (Manual) Weekly Yearly Yearly 4 chnis

Each time (+1h) is pressed for 2 s or more, the current time switches between the current time and the current time+1 hour.



≪Note≫

- The +1h indicator is turned on during summer time.
- Manual summer time adjustment is possible in run mode only.
- If summer time adjustment () Section 6-6-6) is set to automatic for the yearly types, manual adjustment is disabled.
- The settings are not changed by summer time adjustment.

### 5-6. Switching between 12-hour and 24-hour display Weekly Yearly Yearly 4 chnis

Each time h is pressed for 2 s or more, the current time switches between 12-hour (am/pm) and 24-hour display.



#### ≪Note≫

- Switching is possible only in run mode.
- The factory setting is 24-hour display.

# 5-7. Display Switching Weekly

Each time  $(\underline{m})$  is pressed for 2 s or more, the displayed content switches as shown below.



\*Displays only when the input selection is set to "LaLL". (

# 5-7. Display Switching

Each time  $(\underline{m})$  is pressed for 2 s or more, the displayed content switches as shown below.



\*Displays only when the input selection is set to "LaLL". ( F Section 6-6-2)

# 5-7. Display Switching

Yearly 4 chnls

Yearlv

2 chnls

Each time  $\boxed{\mathbf{m}}$  is pressed for 2 s or more, the displayed content switches as shown below.



### 5-8. Override and Automatic Return Operation Weekly Yearly Yearly 4 chnis

This function forcibly turns ON/OFF an output without changing the state of automatic operations.



# [Using override and automatic return operation for pulse-output operation]

Override and automatic return operation for pulse-output operation is as shown below. The operation procedure is the same as for timer operation.



6. Advanced Operations

# 6-1. Total Time/Count Display Weekly Yearly

This function displays the total elapsed time and total count of external inputs.

If the upper limit of the total time or the total count is set, it is also possible to display the alarm indicator.



Total time display (Displayed when the total elapsed time is 30,000 hours.)

<Resetting the total time and count>

- ① Press CLEAR for 3 s or more while the total time or count is displayed.
- ② Press WRITE to reset the total time and total count.

The resetting is cancelled by pressing CLEAR again while "Lr" is flashing.



Total count display (Displayed when the total input count is 500,000.)

The Color indicates flashing.



#### ≪Note≫

- Before using this function, input assignment is required. (FS Section 6-6-2)
- How to display total time or count. (For Section 5-7)
- How to set the alarm value for the total time or count. (FF Section 6-6-3, 6-6-4)
- The alarm indicator, [ALM], will be displayed if either total time or count reaches its preset alarm value.
- The total time display is shown in 0.1 hour unit.
- When the total time/count exceeds 99999.9 h or 999999, the time/count returns to 0.
- The totalizing function cannot be used when power is OFF.
- Refer to "Section 3. Wiring" in the Installation for wiring.

### 6-2. Time Adjustment Input Function Weekly Yearly

Time can be set to 00 min 00 s at the same time as external input is applied. When group-mounting two or more Time Switches, their times can be synchronized.

#### ≪Note≫

- Before using this function, input assignment is required.
   (ISS Section 6-6-2)
- This function cannot be used when power is OFF.
- Refer to "Section 3. Wiring" in the Installation for wiring.



### 6-3. Manual Operation on Recovery from Power Failure Weekly Yearly

After power is restored to the H5S, it is possible to set the Time Switch to stop turning ON output until external input is applied.

Power supply	≪Note≫ • This function is useful to
External	prevent output from automatically turning ON after recovery from power failure
Output	Before using this function, input assignment is required.
Indicator ON OFF Flashing ON (In the upper left corner of the screen)	<ul> <li>(F* Section 6-6-2)</li> <li>Refer to "Section 3. Wiring" in the Installation for wiring.</li> </ul>

# 6-4. Bank Switching Weekly 2 challs

Two groups (banks) of programs can be registered with the Time Switch. Banks can be switched <u>by external input</u>.



Switching banks in run mode

Banks are switched as shown in the following table depending on external input state. External input

	Open-circuited	Short-circuited
Bank	А	В



When a flush-mounting model is used

Programming a bank

Press TIME ADJ in program setting mode to switch banks

Different programs can be set for each bank.

≪Note≫ • Before using this function, input assignment is required. (FF Section 6-6-2) • Refer to "Section 3. Wiring" in the Installation for wiring.

# 6-5. Season Switching Yearly 4 chails

Weekly programs in response to seasons can be automatically switched throughout the year.

Mar. Apr. May Jun. Jul. Aug.Sept. Oct. Nov. Dec. Jan. Feb.

Spring Summer Autumn Winter				
Seasons (※)	Spring	Summer	Autumn	Winter
Setting	17:30 ON	19:00 ON	18:00 ON	17:00 ON
	21:00 OFF	22:00 OFF	21:00 OFF	21:00 OFF

※ Up to 4 seasons are set for the 4 channel type and up to 2 seasons are set for the 2 channel type.

Switching seasons

A group of programs is <u>automatically</u> switched to another according to the seasons set in initial setting mode. (FF Section 6-6-9)

Programming a season

Press TIME ADJ in program setting mode to switch seasons. Different programs can be set for each season.

≪Note≫

- Before using this function, other settings are required in initial setting mode. (
- This function switches weekly programs, but not yearly programs.

# 6-6. Initial Setting Mode Weekly Yearly Yearly 4 chnls



### 6-6-1. F1: Next Operation Display Weekly Yearly Yearly 4 chnis

The output channels which the next operation (the next ON or OFF time) set for is displayed on the sub-display can be selected. This function is useful when operations in a particular channel is to be monitored.



#### ≪Note≫

• The programs changing output state within 24 hours are displayed as the next operations.

- Press TIME ADJ for 3 s or more to leave initial setting mode.
- If TIME ADJ is pressed again before confirming the setting, the setting is cancelled.
- How to display a next operation. (FS Section 5-7)

# 6-6-2. F2: Input Selection Weekly Yearly 2 chails

The functions of external input can be selected between input for setting manual operation after power failure recovery, totalizing input, time adjustment input, and bank switch input.

# ◆Parameters ▶ □ Input disabled ▶ □ Input for setting manual operation after power failure recovery (F Section 6-3) ▶ □ Totalizing input (F Section 6-1) > Section 6-2) > Bank switch input (F Section 6-4) ※ Bank switch input is available for the weekly 2 channel type only. ※ The inverted character indicates the default.

Setting

The setting is made in F2 (input selection) of initial setting mode.

 Press <u>TIME ADJ</u> for 3 s or more in program setting mode to enter initial setting mode. Give a short press on <u>TIME ADJ</u> and move to the F2 display.



② Select one of the inputs using h or m. (The symbol on the sub-display will flash.)

PW	F	2	AUM
		Łŏł	2

③ Press WRITE to confirm the setting. (The symbol on the sub-display will change from flashing to lighting.)

#### ≪Note≫

- To leave initial setting mode, press TIME ADJ for 3 s or more.
- If (TIME ADJ) is pressed again before confirming the setting, the setting is cancelled.
- If the input setting is changed from or to bank switch input, all the set programs will be cleared when [WRITE] is pressed.

# 6-6-3. F3: Total Time Alarm Weekly Yearly

### The alarm value can be set for the total time. (FF Section 6-1)

#### Setting range

- 0.0 to 99990.0 h
  - ※ Time is set in 10 hour unit.
  - % The default is 0.0h (The alarm indicator output is off).

#### Setting

The setting is made in F3 (total time alarm) of initial setting mode.

 Press TIME ADJ for 3 s or more in program setting mode to enter initial setting mode. Give short presses on TIME ADJ and move to the F3 display.



- ② Alarm value setting display appears automatically in 2 s after entering F3. Press h or m to set an alarm value. (Pressing ≥ decrements the value of the Key that was last pressed.)
  - h : increments in 1,000 hour unit.
  - $\overline{m}$  : increments in 10 hour unit.



 Press (WRITE) to confirm the setting. (After a one second pause, the screen returns to the initial display of F3.)

#### ≪Note≫

- F3 is displayed only when " Łożt " is selected in F2 (input selection).
- Alarm (ALM indicator) will be displayed when either the total time (F3) or the total count (F4) reaches the set alarm value.
- If an alarm value for the total time is set to 0, the alarm indicator does not appear.
- To leave initial setting mode, press TIME ADJ for 3 s or more.
- If TIME ADJ is pressed again before confirming the setting, the setting is cancelled.

# 6-6-4. F4: Total Count Alarm Weekly Yearly a chails

### The alarm value can be set for the total count. (FF Section 6-1)

#### Setting range

- 0 to 999900 (6 digits)
  - \* Count is set in the hundreds.
  - % The default is 0 (The alarm indicator output is off).

#### Setting

The setting is made in F4 (total count alarm) of initial setting mode.

 Press <u>TIME ADJ</u> for 3 s or more in program setting mode to enter initial setting mode. Give short presses on <u>TIME ADJ</u> and move to the F4 display.



- ② Alarm value setting display appears automatically in 2 s after entering F4. Press h or m to set an alarm value. (Pressing ≥ decrements the value of the Key that was last pressed.)
  - h : increments in the ten thousands.
  - m : increments in the hundreds.



③ Press WRITE to confirm the setting. (After a one second pause, the screen returns to the initial display of F4.)

≪Note≫

- F4 is displayed only when " Łożt" is selected in F2 (input selection).
- Alarm (ALM indicator) will be displayed when either total time (F3) or total count (F4) reaches the set alarm value.
- If an alarm value for the total count is set to 0, the alarm indicator does not appear.
- To leave initial setting mode, press TIME ADJ for 3 s or more.
- If TIME ADJ is pressed again before confirming the setting, the setting is cancelled.

### 6-6-5. F5: Date Format Selection Yearly 4 chails

### The displayed date format is selectable between "month. day" and "day. month".

### Parameters

nn.dd : "month. day"

dd.nn : "day. month"

\* The inverted character indicates the default.

### Setting

The setting is made in F5 (date format selection) of initial setting mode.

 Press TIME ADJ for 3 s or more in program setting mode to enter initial setting mode. Give short presses on TIME ADJ and move to the F5 display.



② Change the setting using h or m. (The symbol on the sub-display will flash.)



③ Press WRITE to confirm the setting. (The symbol on the sub-display will change from flashing to lighting.)

≪Note≫

- The date format set in this function corresponds to all the displays showing a month and a day such as for "time adjustment", "setting programs" and "setting holidays".
- To leave initial setting mode, press TIME ADJ for 3 s or more.
- If TIME ADJ is pressed again before confirming the setting, the setting is cancelled.

### 6-6-6. F6: Summer Time (DST) Adjustment

### Manual and automatic summer time adjustment is selectable.

# Parameters Anual adjustment Automatic adjustment (Select summer time schedule in F7.)

\* The inverted character indicates the default.

Setting

The setting is made in F6 (summer time adjustment) of initial setting mode.

 Press TIME ADJ for 3 s or more in program setting mode to enter initial setting mode. Give short presses on TIME ADJ and move to the F6 display.

② Change the setting using hor m. The symbol on the sub-display will flash.



The color indicates flashing.

388

PW (+1h)

③ Press WRITE to confirm the setting. (The symbol on the sub-display will change from flashing to lighting.)

≪Note≫

- If summer time adjustment is set to "RUL" (automatic adjustment), (+1h) will be ignored.
- To leave initial setting mode, press TIME ADJ for 3 s or more to leave the initial setting mode.
- If  $\fbox{TIME ADJ}$  is pressed again before confirming the setting, the setting is cancelled.

### 6-6-7. F7: Summer Time Schedule Selection

The time and date when the Time Switch automatically switches to and from summer time can be selected with reference to the following regions. Parameters

Regions		Summer time start date and time	Summer time end date and time
US	(North America)	At 2:00 of the first Sunday in April	At 2:00 of the last Sunday in October
EU	(Europe)	At 2:00 of the last Sunday in March	At 3:00 of the last Sunday in October
RUSE	(Australia)	At 2:00 of the last Sunday in October	At 3:00 of the last Sunday in March

\* The inverted character indicates the default.

#### Setting

The setting is made in F7 (summer time schedule) of initial setting mode.

 Press <u>TIME ADJ</u> for 3 s or more in program setting mode to enter initial setting mode. Give short presses on <u>TIME ADJ</u> and move to the F7 display.



② Select one of the regions using h or m. (The symbol on the sub-display will flash.)



 Press (WRITE) to confirm the setting. (The symbol on the sub-display will change from flashing to lighting.)

#### ≪Note≫

- F7 is displayed only when summer time adjustment (F6) is set to "Rue a".
- To leave initial setting mode, press TIME ADJ for 3 s or more.
- If TIME ADJ is pressed again before confirming the setting, the setting is cancelled.

# 6-6-8. F8: Season Switching Yearly 4 chails

### Programs can be automatically switched according to the set seasons.

- Parameters
  - FF : No switching

Automatic switching (Specify the period in F9.)

\* The inverted character indicates the default.

#### Setting

The setting is made in F8 (season switching) of initial setting mode.

 Press(<u>TIME ADJ</u>) for 3 s or more in program setting mode to enter initial setting mode. Give short presses on (<u>TIME ADJ</u>) and move to the F8 display.



② Change the setting using h or m. (The symbol on the sub-display will flash.) E 5 8

Press WRITE to confirm the setting.
 (The symbol on the sub-display will change from flashing to lighting.)

"C" and "D" are not displayed in the 2 channel type.

≪Note≫

- When this function is set to ON, the number of programmable steps is changed. (Refer to "Section 4. Ratings and characteristics" in the Installation.)
- If the setting is changed between ON and OFF, all the set weekly programs will be cleared.
- This function switches weekly programs but not yearly programs.
- To leave initial setting mode, press TIME ADJ for 3 s or more.

### 6-6-9. F9: Period of Season

### The date on which the Time Switch automatically switches programs can be set.

### Setting

The setting is made in F9 (period of season) of initial setting mode.

- Press <u>TIME ADJ</u> for 3 s or more in program setting mode to enter initial setting mode. Give short presses on <u>TIME ADJ</u> and move to the F9 display.
- $\label{eq:select} \fbox{2} \ensuremath{\mathbb{C}} \ensu$
- ③ Press WRITE to confirm the setting and specify the start date with M and D.\*
- ④ Press WRITE Key and specify the end date with M and D.\*
- (5) Press(WRITE) to confirm the setting. (After (WRITE) is pressed, another season can be set.)

™ F9

Yearly

2 chnls

SE Sh

Yearl

4 chnis

"C" and "D" are not displayed in the 2 channel type.







※ Holding down these Keys rapidly advances the value. Pressing S decrements the value of the Key that was last pressed.

#### ≪Note≫

- The default is as follows.
  - A : 1. 1 to 12.31 (Jan/01 to Dec/ 31)

B to D : --.-- to --.-- (not specified) %"C" and "D" are not displayed in the 2 channel type.

- If the set periods are overlapped, the priority is increased in the following order. A→B→C→D

   <Example>Setting : A(January 1 to December 31), B(April 1 to September 30)
  - Performance : A(January 1 to March 31), B(April 1 to September 30), A(October 1 to December 31)
- The year cannot be specified.
- On a leap-year day, February 29, the Time Switch performs the same operation as that of February 28.
- If period setting is not required, set the parameter to ----.
- If TIME ADJ is pressed again before confirming the setting, the setting is cancelled.

• To leave initial setting mode, press TIME ADJ) for 3 s or more. www.ValinOnline.com | Phone 844-385-3099 | Email: CustomerService@valin.

### 7. Operation while the Power Supply is OFF Weekly Yearly A chails

The display can be activated even when the power is OFF. The current time can be displayed and settings can be made.

- While power is OFF, output as well as the output indicator and the power indicator are turned OFF.
- If no key input is entered within 2 min or more, the display is automatically turned off. <u>To activate the display, press any Key for 1 s or more</u>. \*Except for slide switches and DIP switches.
- •A next operation is not displayed during the power off.
- Override and automatic return operation is not available.



# 8. Resetting

Weekly Yearly Yearly 2 chnis 2 chnis 4 chnis

All the set data including the current time can be reset (initialized).

 Resetting is possible in any mode from run mode to setting mode.



<Diagram with the front cover open>

### 9. Time Accuracy

### <Standard model> ···· Models <u>without</u> "-X" in final letter of model number

Time accuracy is adjusted to  $\pm$ 15 s/month at an ambient temperature of 25°C before delivery. Nevertheless, as time accuracy is influenced by ambient temperature whether it is high or low, inaccuracy may occur. For example, if the product is used at ambient temperatures of over 50°C or under 0°C, there may be an inaccuracy of more than 60 s/month.

<Temperature compensation model>  $\cdots$  Models with "-X" in final letter of model number .

The Time Switch carries the circuits to manage time accuracy against temperature change. This model provides highly accurate time measurement in a broad temperature range as shown below.

 $\pm 15$  s/month  $\cdots$  at ambient temperatures of –10 to 45  $^\circ C$   $\pm 20$  s/month  $\cdots$  at ambient temperatures of 45 to 55  $^\circ C$ 

### 10. Displayed Symbols Weekly Yearly 2 chnis

The following symbols are displayed by operations in run mode and program setting mode.

Displayed symbols	Name	Meaning	Section
наяч	HDAY (Holiday)	Holiday setting mode	5-1
EESE	TEST (Test)	Program check function	5-2
[Lr	CLR (Clear)	Clearing the settings	4-9
SEEP	STEP (Step)	Clearing a part of settings	4-9
<i>ALL</i>	ALL (All)	Clearing all the settings	4-9
Сару	COPY (Copy)	Day override operation	5-4
EHEE	CHEC (Check)	Checking the settings	5-3
Най-	HOUR (Hour)	Total time display	6-1
Ent	CNT (Count)	Total count display	6-1

### Self-check function

When an error occurs, the following error codes are displayed.

Error code	Meaning	Output	Countermeasures
E	CPU error	OFF	Press (RESET).
53	Memory error	OFF	Press RESET .

### Troubleshooting

If there is a problem with the Time Switch, check the following items.

Problems	Check items	Section
The Time Switch does not operate when the power is turned ON.	Is the power actually ON? Check that the PW indicator is turned on.	<operation>2</operation>
The Time Switch does not operate	Is the Time Switch wired correctly? Check the wiring.	<installation>2,3</installation>
according to the	Is the OUT ON/OFF switch set to AUTO?	<operation>2</operation>
settings.	Is the Time Switch set correctly?	<operation>4</operation>
	Isn't the Time Switch set for holiday operation?	<operation>5-1</operation>
	Isn't the Time Switch set for override and automatic return operation?	<operation>5-8</operation>
	Isn't the Time Switch set for day override operation? (Weekly type only)	<operation>5-4</operation>
	Isn't the Time Switch set for yearly operation? (Yearly types only)	<operation>4-6</operation>
	Are banks (weekly type only) or seasons	<operation>6-4</operation>
	(yearly types only) set correctly?	<operation>6-5</operation>
Output does not turned ON when the OUT ON/OFF switch is set to ON.	Is the power actually ON? Check that the I indicator is turned on.	<operation>2</operation>
The time is fast or	The time accuracy is influenced by the ambient temperature.	<operation>9</operation>
	Is the Time Switch installed in a location subject to excessive noise? Timing performance may be adverserly affected if the Time Switch is installed in a location subject to excessive noise. Separate the Time Switch from any sources of noise.	-
The display does not appear.	If no Key input is entered within 2 minutes with the power OFF, the display is turned off.	<operation>7</operation>
The display is incorrect.	The Time Switch may be affected by noise or surge. Separate the Time Switch from any sources of noise.	_
There is a black spot on the LCD display's surface.	Black spot may appear due to static electricity. The spot disappears after a while.	-

# Installation

### 1. Dimensions and Mounting Dimensions

H5S-BB (Flush-mounting Model)

(Unit: mm)



### ■ H5S-□FB□ (Surface-mounting model)



### ■ H5S-□FB□ (Surface-mounting model)





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# 3. Wiring

Read the following information before performing wiring.

#### <Output>

- The Time Switch output is no-voltage contact output. A power supply must be provided to drive the load. Perform wiring according to the information on the next page.
- Output contact rating is different between 2 channel and 4 channel types. ( **F** Installation 4, 5)
- When driving an inductive load (e.g., coil), a surge voltage is generated when the contacts (i.e., Time Switch output) are switched, and in some cases this may damage other devices connected to the Time Switch or the same line. Absorb the surge with a capacitor (C) and resistor (R) as shown in the following diagram.



As a rough guide, the capacitor (C) and resistor (R) should have the following specifications:

C: 0.5 to 1 µF for a switching current of 1 A

- R: 0.5 to 1  $\Omega$  for a switching voltage of 1 V
  - Use a capacitor with a dielectric strength appropriate for the power supply voltage. Use an AC-type capacitor with AC circuits.

There may be cases where, due to inconsistencies in the nature and characteristics of the load, delays in restoring the load may cause problems. Be sure to confirm that correct operation is possible under the actual operating conditions.

#### <Input>%2 channel type only

 Use a contact input such as a switch or relay. (Use a high-reliability contact capable of making and breaking 0.1 mA at 5 V)

#### <Wiring>

- Applicable tightening torque : 0.98 to 1.17 N·m
   Do not connect more than two crimp terminals to each Time Switch terminal.
- •Up to two wires of the same size and type can be inserted into a single terminals.
- When using solid wires, strip them as shown in the right hand diagram.
- Applicable wire for wiring is as follows: 600V vinyl-insulated wire with a gage of AWG 22 to AWG 14 (equal to a cross-sectional area of 0.326 to 2.081 mm<sup>2</sup>)

Solid wire or twisted wire www.Vabp@nline.com | Phone 844-385-3099 | Email: CustomerService@valin.



Wiring when using Flush-mounting Model



Full scale diagram

### Separate Power Supplies for Time Switch and Load



#### Common Power Supply for Time Switch and Load



Recommended fuse : T2A, 250 VAC, time delay, low breaking capacity

### 4. Ratings and Characteristics

		Weekly 2 chnls	Yearly 2 chnls	Yearly 4 chnls	
		H5S-WB2(D)	H5S-YB2(D)-X	H5S-YB4(D)-X	
		H5S-WFB2(D)	H5S-YFB2(D)-X	H5S-YFB4(D)-X	
Su	pply voltage	100 to 240 VAC 50/60 Hz : Models without "D" in model number			
		24 VDC	: Models with "D" in mode	l number	
Op	erating voltage range	85	to 110% of rated voltage (a	AC)	
		85	to 120% of rated voltage (I	DC)	
Po	wer consumption (*1)	Approx. 2.9 VA (AC)	Approx. 3.2 VA (AC)	Approx. 3.5 VA (AC)	
		Approx. 0.8 W (DC)	Approx. 0.9 W (DC)	Approx. 1.0 W (DC)	
8	Number of circuits	SPST-NO X 2 circ	uits (independent)	SPST-NO X 4 circuit (independent)	
đ	Circuit	Separa	ted from power circuit (no-	voltage)	
8	Resistive (cosφ=1)	15 A, 250	VAC (*2)	3A, 250VAC	
put	lnductive	10 A, 250 VA	AC (cos = 0.7)	2A, 250VAC (cos	
Am	bient operating temperature	-10 to 5	5 °C (with no icing or conde	ensation)	
Am	bient operating humidity	25 to 8	5% (with no icing or conde	nsation)	
Storage temperature		-25 to 6	5 °C (with no icing or conde	ensation)	
Total error (*3)		±0.01% ±0.05s max.			
Cyclic error (*4)		±15s per month (at 25°C) ±15s per month (at -10 to 45 °C)			
Me	emory protection	5 years min. (at 25°C)			
We	eight	Approx. 200 g			
	Cycle length	1 week	1 year (with the built-in	calendar to year 2099)	
lo	Minimum cycle length		1 min		
Pe l	Pulse width	1 to 59 s (ii	n seconds) or 1 to 60 min (	in minutes)	
a	Weekly programs (*5)	40 steps/chnl	48 steps/chnl (*6)	48 steps/chnl (*6)	
<u></u>			24 steps/chnl (*7)	12 steps/chnl (*7)	
ŝ	Yearly program capacity	_	16 steps (4 times)/chnl	16 steps (4 times)/chnl	
	Yearly holiday setting capacity	-	16 times	16 times	
Ins	tallation environment	Over-voltage Categ	ory II, pollution degree 2 (	as per IEC61010-1)	
Altitude		2,000 m max.			
Vibra	Mechanical durability	10 to 55 Hz, 0.75 mm double amplitude			
ĺô	Malfunction durability	10 to 5	55 Hz, 0.25 mm double am	plitude	
l S	Mechanical durability		300m/s <sup>2</sup>		
Ŗ	Malfunction durability		100m/s <sup>2</sup>		
Ap	provals	cURus UL 508 / CSA C 22.2 No.14			
		EN60730-2-7			
1		VDE0106/part100			

\*1 At 264 VAC, 60Hz for AC-type or 28.8 VDC for DC-type

- \*2 A current of 15 A can be passed through each output. The current as sum of 2 outputs varies depending on the ambient air temperature. The right hand diagram shows the derating curve.
- \*3 The total error including the repeat accuracy, setting error. variation due to voltage change, and variation due to temperature change is ±0.01%±0.05 s max.
- \*4 Refer to "9. Time accuracy" in the Operation.
- \*5 Number of steps used for each weekly operation is as shown below.
  - Timer operation: 2 steps
    - Pulse-output operation : 1 step
  - Cyclic operation: 4 steps
- \*6 Program capacity when no season is set: FF Section 6-5 in the Operation

\*7 Program capacity when seasons are set : FF Section 6-5 in the Operation



# 5. Output (Built-in Relay) Life Expectancy

<2 channel type>

Mechanical life expectancy at 20°C 100,000 operations min.

- Electrical life expectancy at 20°C
  - 50,000 operations min. for a resistive load of 15 A at 250 VAC
  - 50,000 operations min. for a resistive load of 10 A at 30 VDC
  - 50,000 operations min. for an inductive load ( $\cos\phi = 0.7$ ) of 10 A at 250 VAC
  - 50,000 operations min. for a motor load of 1 HP at 250 VAC
  - 50,000 operations min. for a lamp load of 100 W at 100 VAC
  - 10,000 operations min. for a lamp load of 300 W at 100 VAC

#### <4 channel type>

Mechanical life expectancy at 20°C 100,000 operations min.
 Electrical life expectancy at 20°C

- 50,000 operations min. for a resistive load of 3 A at 250 VAC
- 50,000 operations min. for a resistive load of 3 A at 30 VDC

# 6. EN/IEC Standards

The insulation system between the power supply circuit and output terminals provides basic insulation.

Therefore connect the output terminals only to circuits without accessible conductive parts. If a connection to Safety Extra Low-Voltage (SELV) circuits is desired, supplementary insulation must be provided.

Use crimp type cable lug terminals with insulating sleeves for wiring.

Be sure to mount a surface-mounting model (H5S-DFBD) in a enclosure.

The derating curve shows the load current as a sum of both outputs [A] vs. the ambient air temperature [°C] of 2 channel types.



If wires with a temperature rating of 105 °C or higher are used, see the derating curve in the Section 4, "Ratings and characteristics".

#### Control system

Types of automatic operation

Protective class Rated impulse withstand voltage :Electronic :Weekly models - Type 1BSTU Yearly models - Type 2BSTU :Class 0 :2500V AC

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# 7. Accessories and Repair Parts

Protective cover

Y92A-72C



DIN track mounting adapter

Y92F-90



Only for H5S- FB model (Surface-mounting model)

Large terminal cover

Y92A-72H (in pairs)



\*Only for H5S- FB model (Surface-mounting model)

### 8. Record of Settings

### Use the following chart to record important settings.

	Output No.	Bank:
	ON Time	OFF Time
e.q.	SUN NOVTEWED (HD (FR) SAT	SUN (OD/CED/ED/FD/ERDSAT
Ŭ	10:30	19:00
	SUN MON TUE WED THU FRI SAT	SUN MON TUE WED THU FRI SAT
	:	:
	SUN MON TUE WED THU FRI SAT	SUN MON TUE WED THU FRI SAT
		:
	SUN MON TUE WED THU FRI SAT	SUN MON TUE WED THU FRI SAT
		:
	SUN MON TUE WED THU FRI SAT	SUN MON TUE WED THU FRI SAT
	:	:
	SUN MON TUE WED THU FRI SAT	SUN MON TUE WED THU FRI SAT
		:
	SUN MON TUE WED THU FRI SAT	SUN MON TUE WED THU FRI SAT
	•••	:
	SUN MON TUE WED THU FRI SAT	SUN MON TUE WED THU FRI SAT
	:	:
	SUN MON TUE WED THU FRI SAT	SUN MON TUE WED THU FRI SAT
	SUN MON TUE WED THU FRI SAT	SUN MON TUE WED THU FRI SAT
		:
	SUN MON TUE WED THU FRI SAT	SUN MON TUE WED THU FRI SAT
	:	:
	SUN MON TUE WED THU FRI SAT	SUN MON TUE WED THU FRI SAT
		:
	SUN MON TUE WED THU FRI SAT	SUN MON TUE WED THU FRI SAT

Weekly timer operation

#### Weekly pulse-output operation

	Output No.	Bank:
	ON Time	Pulse width
e.g.	SIN (COCOCOCOCOCOCOCOCOCOCOCOCOCOCOCOCOCOCO	20.0
	8:30	30 5
	SUN MON TUE WED THU FRI SAT	
	SUN MON TUE WED THU FRI SAT	
	:	
	SUN MON TUE WED THU FRI SAT	
	SUN MON TUE WED THU FRI SAT	
	SUN MON TUE WED THU FRI SAT	
	SUN MON TUE WED THU FRI SAT	
	•••	
	SUN MON TUE WED THU FRI SAT	
	:	
	SUN MON TUE WED THU FRI SAT	
	SUN MON TUE WED THU FRI SAT	
	SUN MON TUE WED THU FRI SAT	
	:	
	SUN MON TUE WED THU FRI SAT	
	SUN MON TUE WED THU FRI SAT	;

#### Weekly Cyclic operation

		Output No.		вапк.
	Start Time	Stop Time	ON width	OFF width
e.g.	SUN CONCERENT REAT	SIN COLORD THREAT	5 min	25 min
	10:30	19:00		23 1111.
	SUN MON TUE WED THU FRI SAT	SUN MON TUE WED THU FRI SAT		
	:	:		
	SUN MON TUE WED THU FRI SAT	SUN MON TUE WED THU FRI SAT		
	:	:		
	SUN MON TUE WED THU FRI SAT	SUN MON TUE WED THU FRI SAT		
	:	:		
	SUN MON TUE WED THU FRI SAT	SUN MON TUE WED THU FRI SAT		

#### Yearly holiday settings

	Start date	End date
e.g.	12/28/2006	1/ 4/2007
	/ /	/ /
	/ /	/ /
	/ /	/ /
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	/ /	/ /

#### Period of season settings

	Start date	End date
Α	/	/
В	/	/
С	/	/
D	/	/

Yearly	timer	operatio	n
--------	-------	----------	---

Output No.

	Start date	End date	ON Time	OFF Time
e.g.	7/20/	8/31/	8:00	19:00
	/ /	/ /	:	:
	/ /	/ /		:
	/ /	/ /	:	:
	/ /	/ /	:	:

Yearly pulse-output operation

Output No.

	Start date	End date	ON Time	Pulse width
e.g.	12/24/	12/24/	21:00	3 min.
	/ /	/ /		
	/ /	/ /	:	
	/ /	/ /	:	
	/ /	/ /	:	

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Phone: 33-1-56 63 70 00	Fax: 82-2-2163-0599
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