

Sensor controller

HPAN series

INSTRUCTION MANUAL

Thank you for purchasing HANYOUNG product.

Please check whether the product is the exactly same as you ordered.
Before using the product, please read this instruction manual carefully.
Please keep this manual where you can view at any time

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Safety information

Before using the product, please read the safety information thoroughly and use it properly. Alerts declared in the manual are classified to Danger, Warning and Caution by their criticality

DANGER	DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury
WARNING	WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury
CAUTION	CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury

⚠ Danger

Do not touch or contact the input/output terminals because they may cause electric shock.

⚠ Warning

- If there is a possibility of an accident caused by errors or malfunctions of this product, install external protection circuit to prevent the accident.
- This product does not contain an electric switch or fuse, so the user needs to install a separate electric switch or fuse externally. (Fuse rating : 250 V 0.5 A)
- To prevent deflection or malfunction of this product, supply proper power voltage in accordance with the rating.
- To prevent electric shock or malfunction of this product, do not supply the power until the wiring is completed.
- Since this product is not designed to explosion-protective structure, do not use it at the places which have flammable or explosive gas.
- Do not disassemble, modify, revise or repair this product. This may cause malfunction, electric shock or fire.
- Attach or detach this product while the power is off. Otherwise, it may cause malfunction or electric shock.
- If you use the product with methods other than specified by the manufacturer, there may be bodily injuries or property damages.
- Due to the danger of electric shock, use this product installed onto a panel while an electric current is applied.

⚠ Caution

- The contents of this manual may be changed without prior notice.
- Please check whether the product you purchased is the exactly same as you ordered.
- Please check whether the product has no damage or abnormality during delivery.
- Do not use the product at the places which have corrosive (especially noxious gas or ammonia) or flammable gas.
- Do not use this product at any place with direct vibration or impact.
- Do not use this product at any place with liquid, oil, medical substances, dust, salt or iron contents. (Pollution level 1 or 2)
- Do not polish this product by substances such as alcohol or benzene.
- Do not use this product at any place with excessive induction trouble, static electricity or magnetic noise.
- Do not use this product at any place with possible thermal accumulation due to direct sunlight or heat radiation.
- Install this product at place under 2,000m in altitude.
- When the product gets wet, the inspection is essential because there is danger of an electric leakage or fire.
- If there is an excessive noise from power supply, it is recommended to use insulating transformer and noise filter. The noise filter must be attached to the panel grounded and wiring between the filler output side and power supply terminal should be as short as possible.
- If gauge cables are arranged too closely, the effect on noise may occur.
- Do not connect anything to the unused terminals.
- After checking polarity of terminal, connect wires to the right position.
- When this product is connected to a panel, use a circuit breaker or switch approved by IEC947-1 or IEC947-3.
- Install the circuit breaker or switch at near place for convenient use.
- Write down on a label that the operation of circuit breaker or switch disconnects the power since the device is installed.
- For the continuous and safe use of this product, the periodic maintenance is recommended.
- Some parts of this product have limited life span, and others are changed by their usage.
- When power is on, the preparation period of contact output is required. In case of using signals of external interlock circuit, use a delay Relay.

Suffix code

Model	Code	Information
HPAN-	<input type="checkbox"/>	SENSOR CONTROLLER
Function	C7	General controller
	C7W	2 Channel controller
	CT7	High function controller

Specification

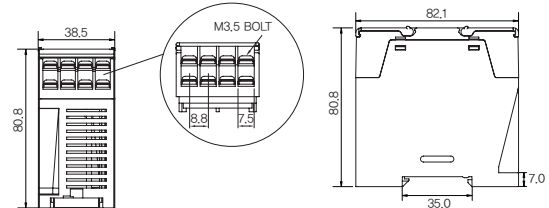
Model	HPAN-C7	HPAN-CT7	HPAN-C7W
Function	Common	High function (timer)	Connecting 2 internal sensors
Power supply voltage	100 ~ 240 V a.c. (50/60 Hz) ±10 %		
Power consumption	Approx. 5 VA		
Power for sensor	12 V d.c. (±10 %), 200 mA Max.		
Input	[H]level 4 ~ 30 V d.c., [L] level 0 ~ 2 V d.c. Pull up/ Pull down resistance connection (4.7kΩ) by NPN/PNP switch setting Inversion function of NORM INV input signal		
Control output	Contact	OUT	OUT1, OUT2
	None contact	NO contact : 250 V a.c. 3A resistance load, NC contact 250 V a.c. 2A resistance load, Rated load lifetime : above 100 thousand times.	O.C. OUT
Output response speed	Relay contact : approximately 10 ms NPN open collector : less than 5 μs		
Operation mode	IN,ES AND function operation	IN,ES AND function operation/ AND trigger function operation	-
Timer function	-	3 types of timer set up mode (ON DELAY, OFF DELAY, ONE SHORT DELAY) time set up function (min-max)	-
Ambient Temp./Humidity	-10 ~ 55 °C, 35 ~ 85 % R.H. (Freezing, dew not allowed)		
Noise immunity	Square wave noise due to noise simulator (1 us pulse per 16 ns) ±2kV (insert into power input terminal)		
Dielectric strength	1 minute within 1500 V a.c., 60 Hz		
Insulation resistance	10 MΩ (500 V d.c. mega between the power and the output)		
Vibration resistance	10 ~ 55 Hz double amplitude 0.75 mm, X · Y · Z 2 hour for each direction (when power turned OFF)		
Shock resistance	100 % (approximately 10G), X · Y · Z 2 hour for each direction (when power turned OFF)		
Weight	approximately 160 g		

※ (ES : IN1/IN2)

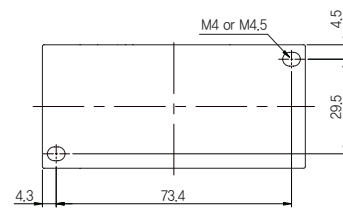
Dimension

[Unit : mm]

■ Dimension

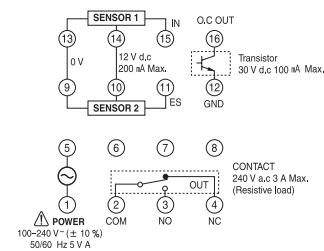


■ Panel cutout

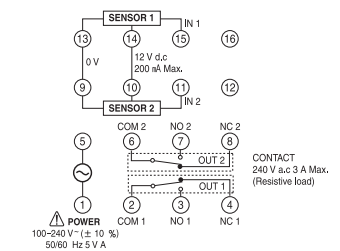


Connection diagram

■ HPAN-C7/CT7



■ HPAN-C7W

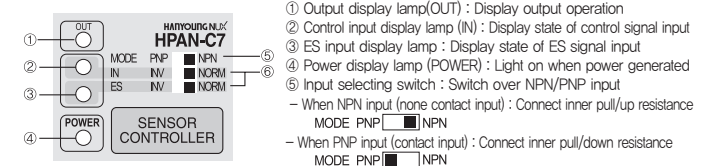


- IN/IN 1/IN 2 : Connect control input
- ES : Connect ES input (ES : IN1/IN2)
- O.C. OUT : NPN open collector output (None contact output)
- OUT/OUT1/OUT2 : Relay output (Contact output)

※ The connection diagrams in the dotted lines are diagrams of the internal circuits.

Name and Function of Each Parts

■ HPAN-C7



※ Refer to input logic of input connection.

※ Control input (IN) and ES input are applied at the same time (HPAN-CT/CT7)

⑥ Input signal conversion switch: switch over INV/NORM input signal

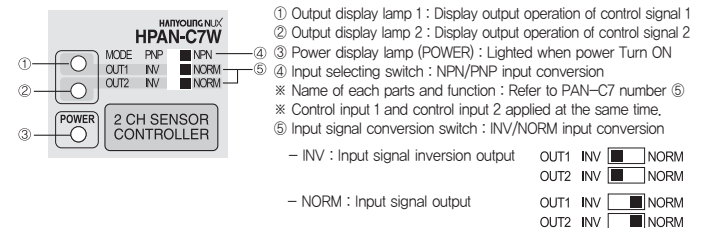
- INV : Input signal inversion output
- NORM : Input signal output

※ When conversion switch of control input (IN) and ES input are same, control input and ES input display lamp will be lighted oppositely.

Ex) control input and ES signal input : LOW

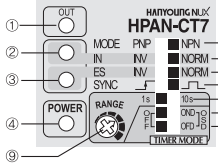


■ HPAN-C7W



- INV : Input signal inversion output
- NORM : Input signal output

HPAN-CT7



- ① Output display lamp : Display output operation
- ② Control input display lamp : Display state of control signal input
- ③ ES input display lamp : Display state of ES input
- ④ Power display lamp : Lighted when power Turn ON
- ⑤ Input selecting switch : NPN/PNP input conversion
- ⑥ Name of each parts and function : Refer to PAN-C7 number
- ⑦ Input signal conversion switch : INV/NORM input signal conversion
- * Name of each parts and function : Refer to PAN-C7 number ⑥.

- ⑦ AND trigger function conversion switch : AND function operation / AND trigger function conversion switch
- : AND function mode selection (Instant output) SYNC
 - : AND function mode selection (Maintain output) SYNC

* For operation state, refer to operation mode.
 * Set to AND logic operation ES signal mode only when using one control input.

⑧ Timer time selecting switch : Select max selection time

- Time range with 1s selection : Approximately 1s 10s
- Time range with 10s selection : Approximately 1s 10s

⑨ Timer set up volume : Adjusting in time range due to time set up

* Timer set up range refer to number ⑧

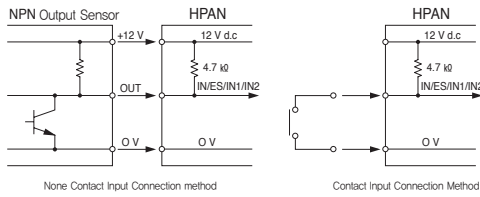
⑩ Timer set up mode switch : 3 types of operation mode depending on setting

- * ON DELAY, OFF DELAY, ONE SHORT DELAY mode
- * Refer to setting and operation state

Input Connection

NPN Input (none contact input)

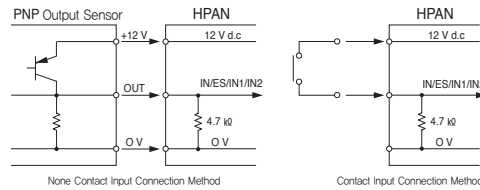
Inner circuit when input selecting switch NPN is set



* Please set input conversion switch to NPN. Otherwise, device might not work properly.

PNP Input (contact input)

Inner circuit when input selecting switch PNP is set



* Please set input conversion switch to PNP. Otherwise, device might not work properly.

Selection of Input logic

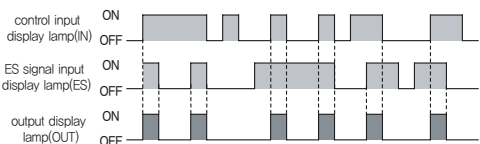
Input method	NPN set up		PNP set up	
	Input voltage	O.C	Input voltage	O.C
H	0 V - 2 V d.c	0 V - 2 V d.c	5 V - 30 V d.c	5 V - 30 V d.c
L	5 V - 30 V d.c	OPEN	0 V - 2 V d.c	OPEN

* In order to receive open collector input, input logic (NPN/PNP) conversion switch is built in which can pull up/pull down 47 K ohm resistance within inside.

* When handling input signal conversion switch (INV/NORM input signal conversion), input logic can be inverted (refer to name of each parts and function)

AND function / AND trigger function mode (C7/CT7)

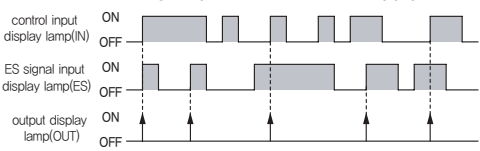
AND logic ES mode (AND operation)



• Output display lamp is lighted when control input display lamp (IN) and ES input display lamp (ES) are ON at the same time

- Operation mode stays even control input is selected with PNP. (*Refer to name of each parts and function)
- Do not connect anything to ES terminal when using only 1 control input or when ES input is unnecessary.
- When using PAN-C7, set CLOCK AND ES conversion switch to (*Refer to name of each parts and function)
- ES signal input display lamp and Control input display lamp can be operated oppositely (*Refer to name of each parts and function)

CLOCK AND logic operation ES mode (apply CT7)



• Instantaneous output become ON when control input display lamp (IN) and ES input display lamp (ES) are ON at the same time.

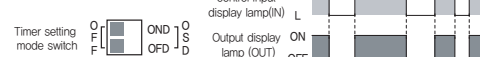
- When using CLOCK AND logic operation ES signal mode, output has very short signal (approximately 5 μs). So by adjusting timer setting, set signal to off delay or one short delay. (*refer to name of each parts and function)
- Operation mode stays same even control input is selected with PNP.
- Do not connect anything to ES terminal when using only 1 control input or when ES lamp is unnecessary.
- When using PAN-C7, set CLOCK AND logic ES conversion switch to (*Refer to name of each parts and function)
- ES signal input display lamp and Control input display lamp can be operated oppositely

Timer Setting Mode (CT7)

* Set up time (T) : Refer to name of each parts and function (Number 8 and 9)

* Set up time (T) : Setting from 40 ms to 10s possible

NORMAL Mode



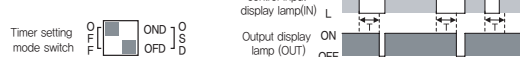
• Output occurs depending on received control input (Timer set up does not effect anything)

ON DELAY Mode



- Output occurs after delaying set up time (T). Standardizing H(high) of control input
- Control input yields nothing if it is shorter than set up time (T)

OFF DELAY Mode



- Output occurs after delaying set up time (T). Standardizing L(Low) of control input
- Within set up time (T), if control input is H (high), output is delayed with standardizing L (Low) of second input.

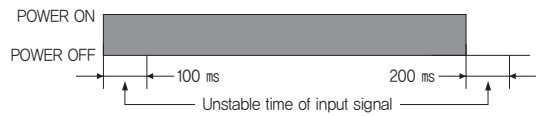
ONE SHORT DELAY Mode



- Output occurs for amount of set up time (T) with standardizing H (high) of control input.
- Output occurs even though control input is shorter than set up time (T)

Matters that Require Attention when operating

Power

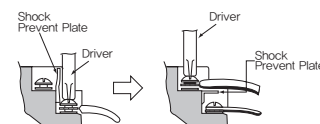


- After inputting/opening power, for 200 ms, it is considered as rising/falling time of inside/outside power so it does not operate during unstable time in order to prevent malfunction which can be caused by unstable output operation of outside attached signal.

- ① When power turn ON, wait for 100 ms before inserting signal
- ② When power turn OFF, wait for 200 ms before turn ON power

Connection

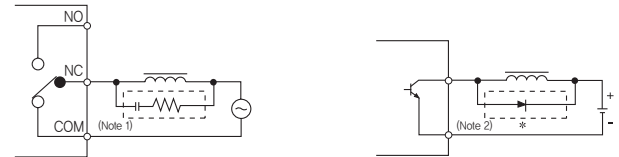
When Connecting Terminal



- Terminal plate is made of upper part and lower part. (It is easier to connect with lower part than upper part)
- Built in Shock prevent plate between upper and lower part of terminal plate made device to more safe to use

When Connecting load output

- Attaching surge observer at both side(end) of inductive load (motor, solenoid and etc), (just like picture 1) will inhibit noise occurrence
- When using Relay for DC as a load, just like picture 2, please attach diode at both side(end) of relay coil

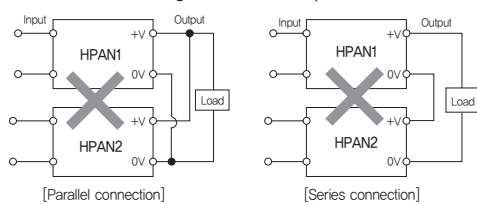


[Picture 1] Relay Output

[Picture 2] NPN open Collector Output (Except HPAN-C7W)

- * (Note 1) Surge observer (Resistance 2.2 Ω, Condenser 0.1 μF, Voltage : 630 V a.c)
- (Note 2) Max reversed voltage should be at least three times bigger than load voltage. Current capacity is 1 A

When connecting with series or parallel



- In any cases, controller has to be either series or parallel. It cannot be used at the same time.

Input

- Please make length of wire as short as possible from input instrument to main instrument.
- Wire power line separately from Input signal line and power line
- If input signal line gets long, please use shield line to wire.
- Output specification of input instrument and input selection switch have to be same.
- Ex) When using NPN output sensor, set input selection switch as NPN (connect inside pullup resistance)

Output

- Wire power line separately from NPN open collector output line/power line
- When output generated within NPN open collector, it is high speed response(5us) so using micro switch or limit switch within input signal can make chattering to occur

Installing

- Because of inner circuit, heat occurs within CASE so please install it where ventilation is great
- When installing two or more devices, locating them with minimum 10 mm gap can decrease heat occurrence

Volt installing method

- ① By using M4 volt, fix holes at the end of each side of bottom part
- ② Tightening torque : Please make it less than 8 kg · cm

DIN rail (width 35 mm) installing method

- ① Put upper part of device in to DIN rail
- ② Pushing bottom part of device will complete installing
- ③ When disassembling device from DIN rail, pull bottom side of stripper hole by driver. It will make easier to disassemble

