e-Front runners

FC SERIES ELECTRONIC INTEGRATOR

DATA SHEET PKH

This electronic integrator receives analog or pulse signals and performs 6-digit LED's integration display. The instrument offers high reliability since it has no moving parts.

FEATURES

1. The indicator uses large 6-digit LED's which are easy to read.
2. The instrument accepts either analog or pulse signal input.
3. A number of optional functions such as BCD transmission and pulse transmission are available, so the integration can be readily used for remote transmission or connected with a computer.

SPECIFICATIONS

Input signal: Analog input;
1 to 5V DC (input resistance 1MΩ min.)
4 to 20mA DC
(input resistance 250Ω)
Pulse input;
No-voltage NO contact or transistor open collector connection
Output current, 2mA max.
Voltage when ON, 0.6V or less
Voltage when OFF, 4.5V or more
Ton, Toff≧66.7 msec.

Accuracy: Analog input;
Rated value±0.5%±1 digit
Rated value means the theoretical value to be obtained when 100% input is continuously applied and integrated.
Pulse input; ±1 digit

Indication method:
Decimal 6-digit LED's (No indication for zero "0" in higher digits)

Size of numerals:
Approx. 7.5mm high

Integration cutoff:
No cutoff or 10% cutoff, selectable
(Cutoff function works via cutoff switch inside instrument.)
Cut point accuracy;
$^{+0}_{-0.5}$% of input value full scale
Hysteresis; 1% max.

Integration constants:
Analog input
1-hour integration vale with 100% input
Standard integration constants are;
50, 100, 200, 250, 300, 400
500, 600, 750, 800, 900, 1000
1200, 1500, 1600, 1800, 2000, 3000
4000, 6000, 8000
(An optical integer from 20 to 9999 can be used as a constant when so specified.)
Pulse input
Input pulses integrated on 1 : 1 base

Reset method: Zero resetting possible with reset push-button switch inside instrument. For model with function for BCD transmission of integrated value, resetting is possible via signal from outside.

Power supply: 24V (20 to 30V) DC (or 100V ±10% AC, 50/60Hz is available on request)

Power consumption:
Approx. 6W at 24V DC, approx. 8VA at 100V AC

Power indicator lamp:
LED (rectangular type, green)

Ambient temperature:
0 to 50°C (-30 to +70°C for storage)

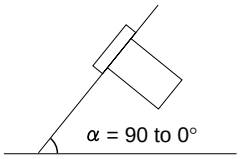
Ambient humidity:
90%RH or less

Outline dimensions (HxWxD):
144 x 72 x 400mm(case) + terminal section

Mass (weight): Approx. 4.5kg

Finish color: Munsell 7Y 7.3/1.4; frame color of N1.5 is available on request

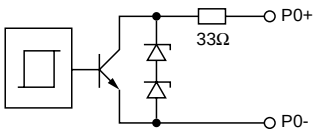
Mounting method:
Panel flash-mount type



Optional Functions

Protection against power interruption:
When power is interrupted (including when power switch is OFF), functions such as integration, indication, pulse transmission and BCD transmission are stopped. When power is restored, integration resumes from the value held when the power interruption occurred. This is because a battery serves as a memory backup for retaining the memory contents (integrated value). The battery is effective for about 170 hours or about 7 days (power interruption time).

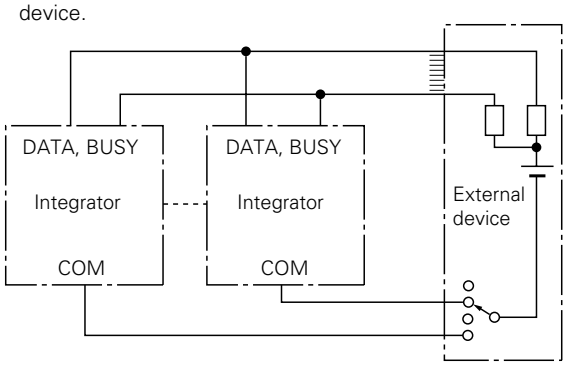
Pulse transmission (provided only with analog input):
Pulses corresponding to the integration constant x 1, x 2, x 5 or x 10 are transmitted outside. Integration constant x 1/2, x 1/5, or x 1/10 is also available.
Contact make time; 80 to 200 msec
Kinds of pulses
No-contact pulse (semiconductor contact output)
Output contact, NPN transistor open collector



Contact capacity; 33V DC, 50mA max.
5V DC, 1mA min.
Withstand voltage, 500V AC for 1 minute between PO- and ground
33V DC between PO+ and PO-

Relay contact (not possible when power failure protection provided)
Output contact; NO contact
Contact capacity; 100V AC, 0.3A/24V DC, 02A (resistive load)
Withstand voltage; 1000V AC for 1 minute between contacts and ground

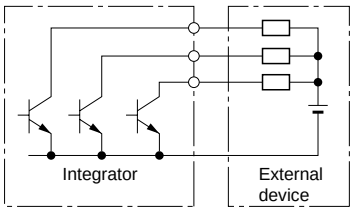
Parallel connection for BCD transmission (negative logic):
The BCD outputs of multiple integrators can be connected in parallel and changed over and measured via an external device.



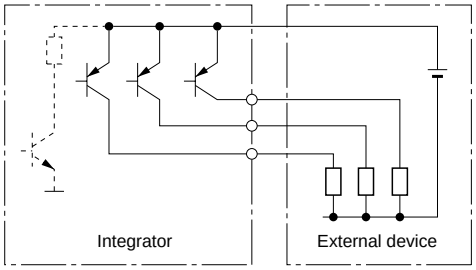
(Caution is necessary at the external device when using RESET/ENABLE, please consult with Fuji.)

Integrated value transmission:
Integrated value is transmitted outside in BCD code. A signal which can be read out is simultaneously transmitted. When ENABLE signal of "L" level from outside is input, the value in the output register is held and there is no change in the output. When the internal data are undergoing change, a BUSY signal is transmitted (does not affect the ENABLE signal).
Kinds of signals
- o DATA; BCD 6 digits, parallel output
- o BUSY; Conversion in progress, H or L level selectable; at high impedance when integrator power interrupted (transistor OFF)
- o ENABLE; Signal from outside; output value remains unchanged when at L level
- o COM; 0V
- o RESET; Reset signal from outside; counter is reset when at L level

Kinds of DATA outputs (one kind should be specified)
- o Transistor output negative logic
  (output is "L" level when internal data "H")



- o Transistor output positive logic
  (output is "H" level when internal data "H")



Output rating (DATA, BUSY)

o Negative logic (NPN transistor emitter (–) common, collector output)

"L" equals 1.1V/Imax. or less, input current (Imax.) equal to 30mA

"H" equals applied voltage +5 to 33V, leakage current 20μA or less (at 33V)

o Positive logic (PNP transistor emitter (+) common, collector output)

"L" equals transistor OFF, leakage current 20μA or less (at 33V)

"H" equals applied voltage +1.5V, output current (Imax.) equal to 30mA

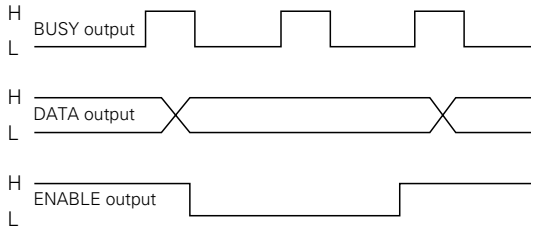
Input rating (ENABLE, RESET)

o "L" level equals 1.1V max. , output current 0.5mA max., or no-voltage contact ON

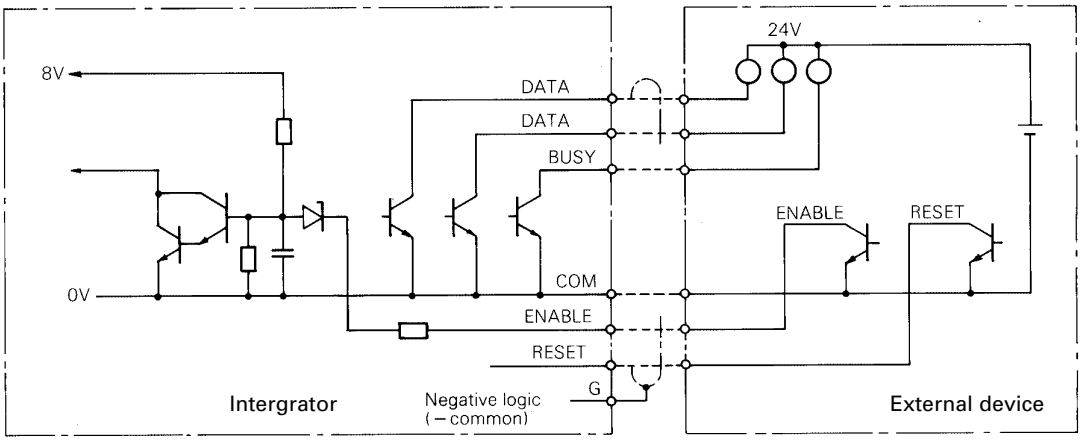
"H" level equal to 5V min., 33V max., or no-voltage contact OFF

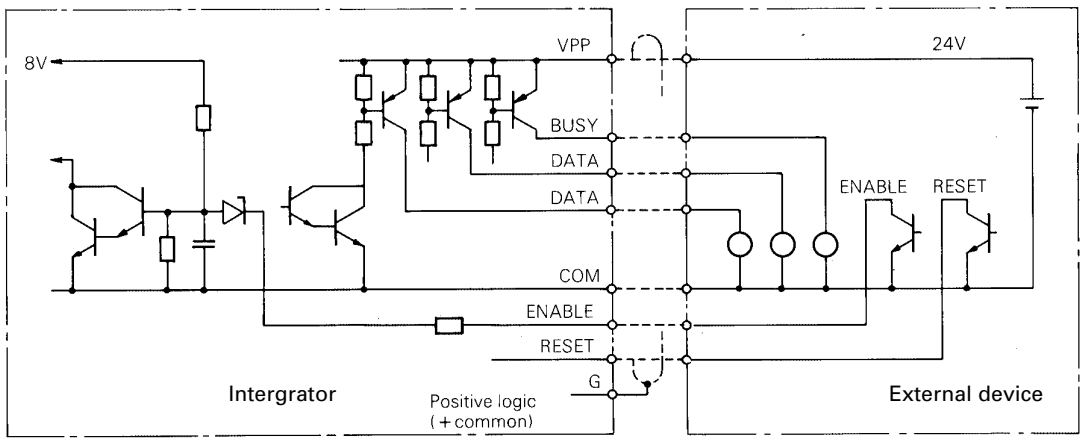
Cable length; 500m max.

Outline of timing (see interface timing on next page for details)



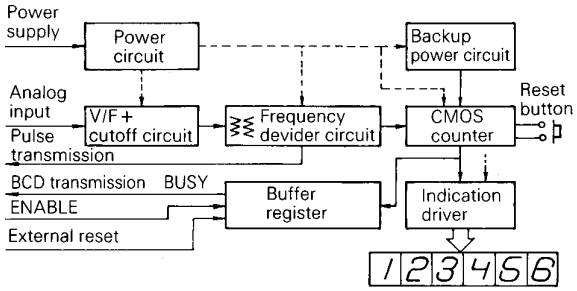
Example of interface



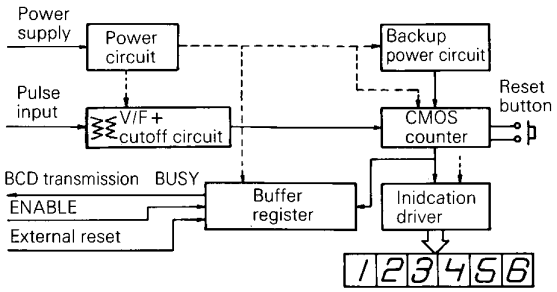


FUNDAMENTAL PRINCIPLE DIAGRAM

With analog input

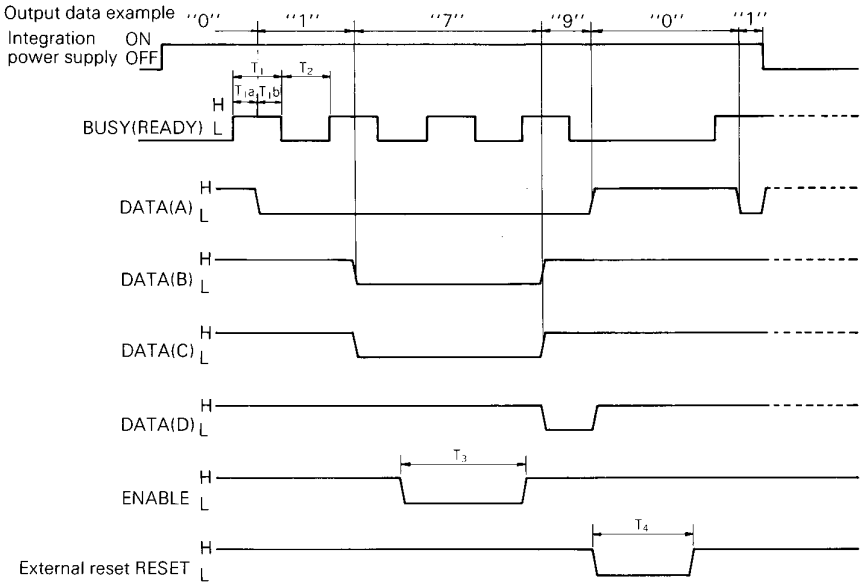


With pulse input

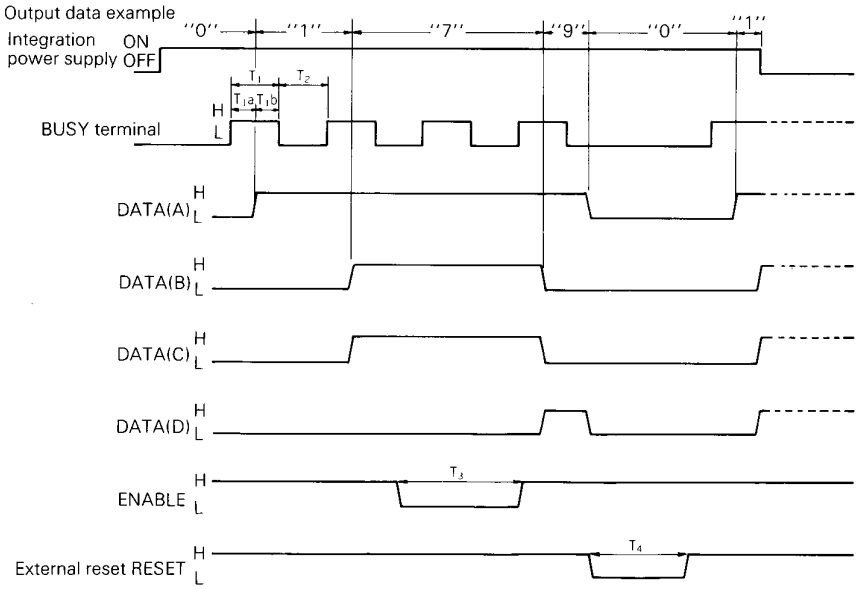


Interface timing

Negative logic interface timing



Positive logic interface timing



T_1, T_2 = 150ms
T_1a, T_1b = $T_1/2$
--- = high impedance

T_3 : no limiting
T_4 : 20ms minimum

CODE SYMBOLS

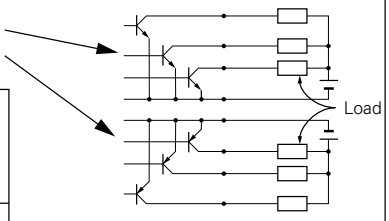
1	2	3	4	5	6	7	8	9	10	11	12	13
P	K	H					2	-				

Description	
Input signal	
A	Analog input, 1 to 5V DC
B	Analog input, 4 to 20mA DC
P	Pulse input, counter works at ON
Q	Pulse input, counter works at OFF
Accuracy	
1	General-use type ±0.5%
Integration constant (1-hour integrated value with 100% input) Specify Y with pulse input	
A ~ Z	See table below
Power supply	
1	24V DC
3	100V AC, 50/60Hz
Protection against power interruption	
1	Battery backup provided
0	None
Pulse transmission (Specify Y with pulse input)	
A ~ Z	See table below
Integrated value transmission	
A	BCD transmission (negative logic)
B	BCD transmission (positive logic)
Y	None
Optional function (1)	
A	BCD transmission (negative logic) Parallel connection
Y	None
Optional function (2)	
Y	None

Code	Integral	Code	Integral	Code	Integral
V	50	J	750	U	2000
W	100	K	800	H	3000
A	200	L	900	P	4000
B	250	M	1000	Q	6000
C	300	N	1200	D	8000
E	400	R	1500	Z	Other than above, but within 20 to 9999
F	500	S	1600		
G	600	T	1800	Y	with pulse input

Multiple \ Contact	*Relay contact	No contact
x1	A	J
x2	B	K
x5	C	L
x10	D	M
x1/2	N	U
x1/5	P	V
x1/10	Q	W
None	Y	

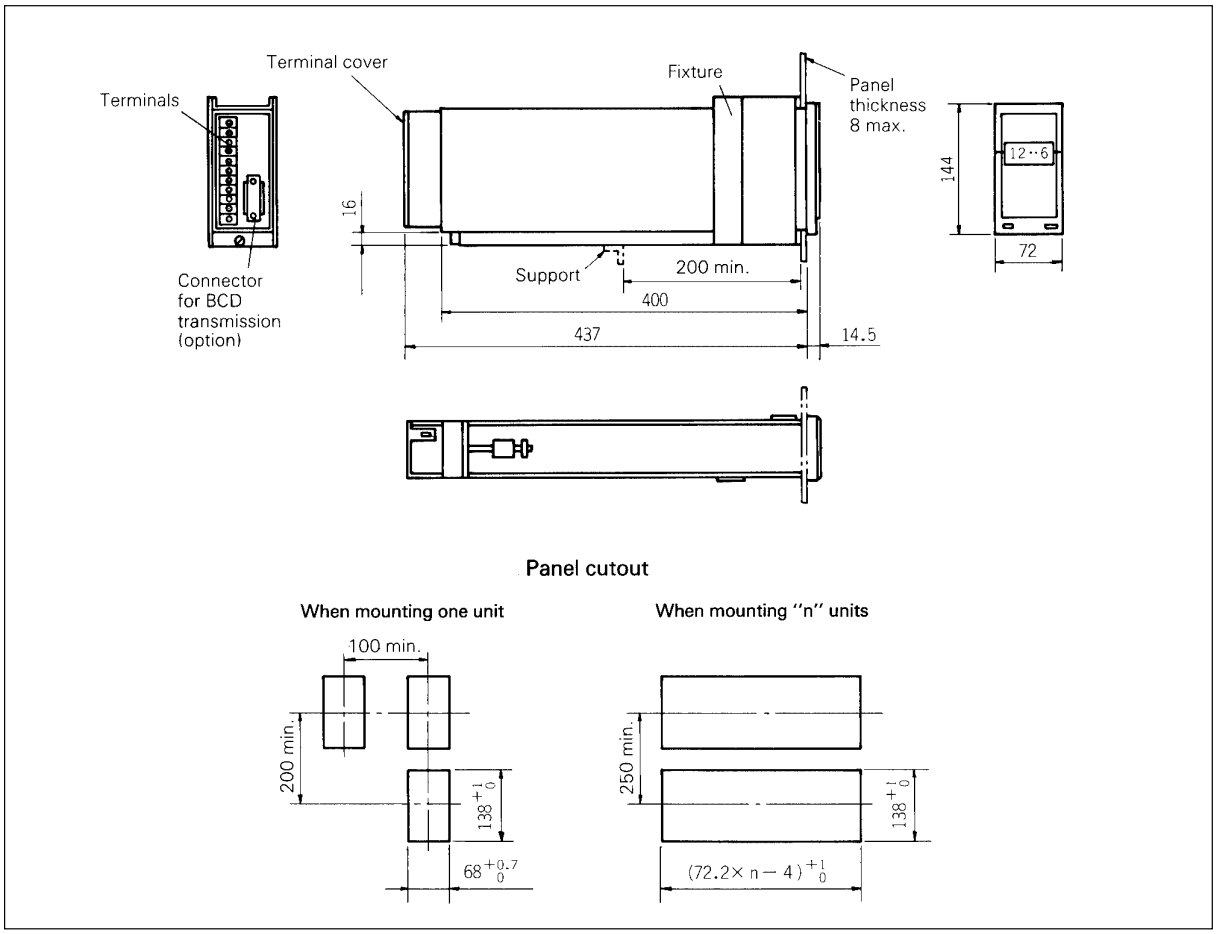
*When battery back-up is provided, relay contact output cannot be equipped.



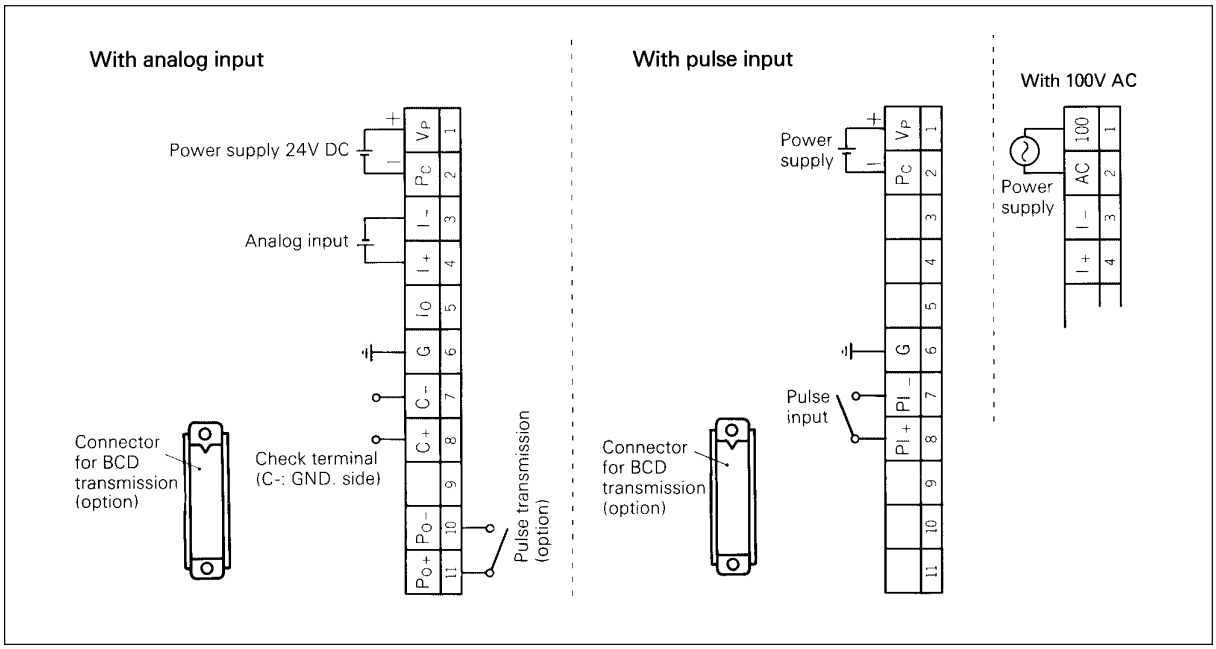
Manufacturable range for pulse transmission

Constant \ Multiple	x 1/10	x 1/5	x 1/2	x 1	x 2	x 5	x 10
50 or less	x	x					
100	x	x					
200	x						
250							
~			Manufacturing range				
2000							
3000							x
4000							x
6000						x	x
8000						x	x
below 10000						x	x

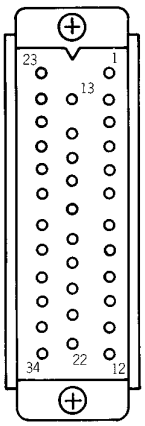
OUTLINE DIAGRAM (Unit : mm)



CONNECTION DIAGRAM



BCD output connector (option)



Terminal No.	Signal name	Terminal No.	Signal name	Terminal No.	Signal name
1	A_1	13	A_3	23	A_5
2	B_1	14	B_3	24	B_5
3	C_1	15	C_3	25	C_5
4	D_1	16	D_3	26	D_5
5	A_2	17	A_4	27	A_6
6	B_2	18	B_4	28	B_6
7	C_2	19	C_4	29	C_6
8	D_2	20	D_4	30	D_6
9		21	COM	31	
10	BUSY	22	COM	32	G (shield)
11	RESET			33	VPP
12	ENABLE			34	VPP

Connector used: MC-34SBMG (Supplier: Honda Communication Industries Co., Ltd., Japan)

Note:

A( ) = 2^0
B( ) = 2^1
C( ) = 2^2
D( ) = 2^3

Digit

Digit	6	5	4	3	2	1

MSD LSD

SCOPE OF DELIVERY

Integrator and mounting fixtures
Output connector when BCD transmission provided

⚠ Caution on Safety

*Before using this product, be sure to read its instruction manual in advance.

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