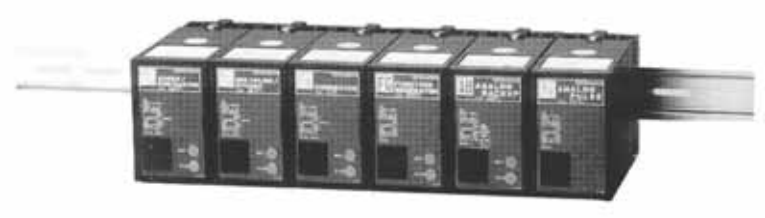


■ Common standard specifications

● High quality/high reliability

Highly reliable electronic parts are adopted.
Aging test of each part as well as burn-in aging test of the product under a high temperature are implemented.

● PCB treatment

In order to reinforce insulation resistance stability of PCB surfaces and prevent the surfaces from insulation deterioration, B side of the PCB was cleaned and coated with high humidity resistant varnish after parts installation.

● Output limiter circuit

Even if an excessive input is applied, the product confines the output to about 1.5 times of rating and protects the output side equipments.

■ Type code designation

C (1) P (2) — (3) (4) (5)

(1) Product (kind of conversion)

Mark	Product (kind of conversion)
ADT	Adding/subtracting
MLT	Multiplying/dividing
LT	Temperature/pressure correction
FGT	Function generating
AMT	Analog backup
VFT	Voltage pulse

(2) Dielectric strength voltage

Mark	Dielectric strength voltage (50/60Hz)
1	AC1,500V for 1 min. between input and output

(3) (4) (5)

(3) input specification (4) output specification (5) auxiliary supply
Refer to individual specifications.

■ Standard specification

Item	Specification	
Tolerance	% against output span	
Effect of temperature	23±10℃ tolerance %	
Characteristics	In conformity with JIS C 1111-1989 in tolerance	
Output ripple	≦1%p-p against output span	
External adjustment of output	±5% adjustable	
Auxiliary supply	Indicated in each specifications	
Overvoltage	Input	2 times (10 sec.), 1.2 times (continuity) of rated voltage
	Auxiliary supply	1.5 times (10 sec.), 1.2 times (continuity) of rated voltage
Over current	10 times (5 sec.), 1, 2 times (continuity) of rated current	
Insulation resistance	Between input terminal, output terminal, auxiliary supply terminal outer case (earth) ≧50MΩ at DC500V	
Material of outer case	Fire-retardant ABS resin	
Appearance color	Outer case	Black (N 1.5)
	Rating plate	Dark blue (5PB 2/6)
Operating temperature/ humidity range	0-+55℃, 5-90℃RH (No Condensation)	
Storage temperature range	-40-+70℃	

ADDING/SUBTRACTING TRANSDUSER

CADTP1 - ☐☐☐

CADTP1-C7H1
(80×50×133mm/500g)

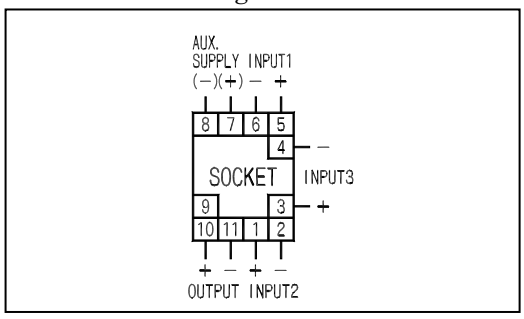
■ Use

A transducer does adding and subtracting of 3 inputs. By a programming unit (CCM-1), it is possible to change a parameter or output a simulated output for a loop test.

■ Features

1. Constant voltage/current output.
2. Withstand voltage between electric circuit and outer case AC2, 000V (50/60Hz), AC1, 500V (50/60Hz) for 1 minute between input/output and auxiliary supply, or AC1, 500V (50/60Hz) for 1 minute between input and output.
3. Plus/minus input/output is not manufacturable.
4. Impulse withstands voltage 5kV, 1.2/50μs (between electric circuit and outer case), and positive/ negative polarity 3 times each is guaranteed.

■ Connection diagram



■ Specification

Input (input resistance)	Output (load resistance)	Auxiliary supply	Common specification
A8 : DC1-5V (approx.1MΩ) C7 : DC4-20mA (approx.100Ω) 00 : other than those above	1 : DC0-100mV (≧200Ω) 2 : DC0-1V (≧200Ω) 3 : DC0-5V (≧1kΩ) 4 : DC 0-10V (≧2kΩ) 5 : DC1-5V (≧1kΩ) A : DC0-1mA (≧12kΩ) B : DC0-5mA (≧2.4kΩ) C : DC0-10mA (≦1.2kΩ) D : DC0-16mA (≦750Ω) E : DC1-5mA (≦3kΩ) F : DC4-20mA (≦750Ω) H : DC4-20mA (≦800Ω) DC1-5V (≧250kΩ) SW switching 0 : other than those above	1 : AC100V(+10%, -15%),50/60Hz 2 : AC110V(+10%, -15%),50/60Hz 3 : AC200V(+10%, -15%) 50/60Hz 4 : AC220V(+10%, -15%), 50/60Hz 5 : DC24V(+10%, -15%) 0 : other than those above	Tolerance (when gain is ≦1) : ±0.25% Consumption VA: AC power source:2.5VA DC power source:3.0W Weight: AC power source:500g DC power source:400g

●Open of current output: even if the current output terminal is used in a state of regular open, there is no problem. Also, a voltage of approx. 25V occurs on the output terminal.

● Operational expression

Input: X_1-X_3 (0-100%)

Output: X_0 (0-100%)

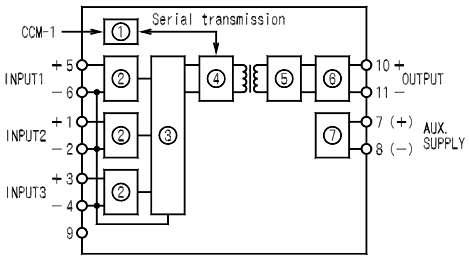
Operational expression:

$$X_0 = K_0 \{K_1 (X_1 + A_1) + K_2 (X_2 + A_2) + K_3 (X_3 + A_3)\} + A_0$$

Gain: K_0-K_3 (±29.999)

Bias: A_0-A_3 (±299.99%)

■ Block diagram



①Modular jack
②Input circuit
③Analog multi-flexor
④CPU operational circuit
⑤Pulse width demodulation circuit
⑥Output circuit
⑦Insulated power source circuit

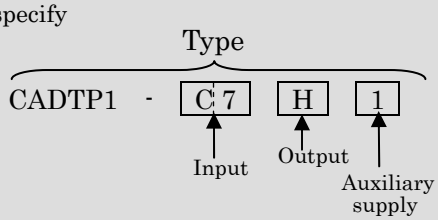
● Factory preset

Products are shipped in the following setting.
(Can be changed by specification)

PARAMETER	
NO.	DATA
A_1	0.0%
A_2	0.0%
A_3	0.0%
A_0	0.0%
K_1	0.5
K_2	0.3
K_3	0.2
K_0	1.0

■ Purchase specifications

●Item to specify



MULTIPLYING/DIVIDING TRANSDUSER

CMLTP1 - [ ] [ ] [ ]

CMLTP1-C7H1

(80×50×133mm/500g)

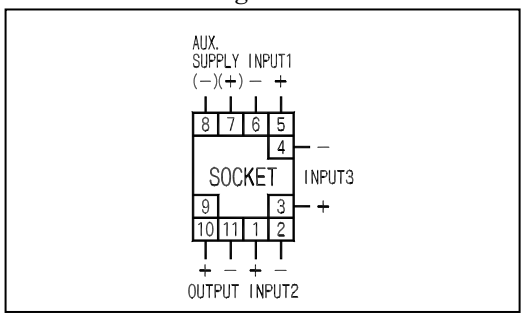
■ Use

A transducer does multiplying and dividing of 3 inputs. By a programming unit (CCM-1), it is possible to change a parameter or output a simulated output for a loop test.

■ Features

1. Constant voltage/current output.
2. Withstand voltage between electric circuit and outer case AC2, 000V (50/60Hz), AC1, 500V (50/60Hz) for 1 minute between input/output and auxiliary supply, or AC1, 500V (50/60Hz) for 1 minute between input and output. 3. Plus/minus input/output is not manufacturable.
4. Impulse withstands voltage 5kV, 1.2/50μs (between electric circuit and outer case), and positive/ negative polarity 3 times each is guaranteed.

■ Connection diagram



■ Specification

Input (input resistance)	Output (load resistance)	Auxiliary supply	Common specification
A8 : DC1-5V (approx.1MΩ) C7 : DC4-20mA (approx.100Ω) 00 : other than those above	1 : DC0-100mV (≧200Ω) 2 : DC0-1V (≧200Ω) 3 : DC0-5V (≧1kΩ) 4 : DC 0-10V (≧2kΩ) 5 : DC1-5V (≧1kΩ) A : DC0-1mA (≧12kΩ) B : DC0-5mA (≧2.4kΩ) C : DC0-10mA (≦1.2kΩ) D : DC0-16mA (≦750Ω) E : DC1-5mA (≦3kΩ) F : DC4-20mA (≦750Ω) H : DC4-20mA (≦800Ω) DC1-5V (≧250kΩ) SW switching 0 : other than those above	1 : AC100V(+10%, -15%),50/60Hz 2 : AC110V(+10%, -15%),50/60Hz 3 : AC200V(+10%, -15%) 50/60Hz 4 : AC220V(+10%, -15%), 50/60Hz 5 : DC24V(+10%, -15%) 0 : other than those above	Tolerance (when gain is ≦1) : ±0.25% (only when each input is more than or equal to 5%) Consumption VA: AC power source:2.5VA DC power source:3.0W Weight: AC power source:500g DC power source:400g

●Open of current output: even if the current output terminal is used in a state of regular open, there is no problem. Also, a voltage of approx. 25V occurs on the output terminal.

● Operational expression

Input: X_1-X_3 (0-100%)

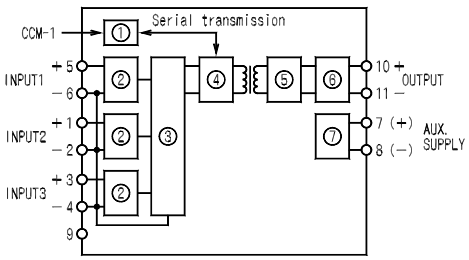
Output: X_0 (0-100%)

Operational expression : $X_0 = K_0 \dfrac{(K_1X_1+A_1)(K_2X_2+A_2)}{(K_3X_3+A_3)} + A_0$

Gain: K_0-K_3 (±29.999)

Bias: A_0-A_3 (±299.99%)

■ Block diagram



①Modular jack
②Input circuit
③Analog multi-flexor
④CPU operational circuit
⑤Pulse width demodulation circuit
⑥Output circuit
⑦Insulated power source circuit

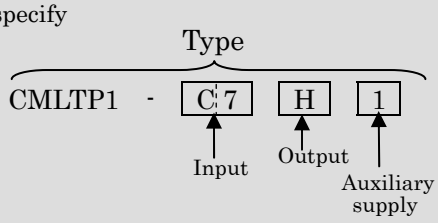
● Factory preset

Products are shipped in the following setting. (Can be changed by specification)

PARAMETER	
NO.	DATA
A_1	0.0%
A_2	0.0%
A_3	0.0%
A_0	0.0%
K_1	1.0
K_2	1.0
K_3	1.0
K_0	1.0

■ Purchase specifications

●Item to specify



TEMPERATURE/PRESSURE CORRECTING TRANSDUSER

CLTP1 - [ ] [ ] [ ]

CLTP1-C7H1
(80×50×133mm/500g)

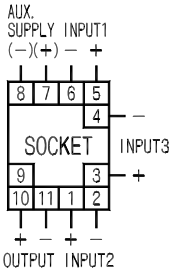
■ Use

A transducer that takes in temperature, pressure and differential pressure, then processes them for measurement of flow rate. By a programming unit (CCM-1), it is possible to change a parameter or output a simulated output for a loop test.

■ Features

1. Constant voltage/current output.
2. Withstand voltage between electric circuit and outer case AC2, 000V (50/60Hz), AC1, 500V (50/60Hz) for 1 minute between input/output and auxiliary supply, or AC1, 500V (50/60Hz) for 1 minute between input and output.
3. Plus/minus input/output is not manufacturable.
4. Impulse withstands voltage 5kV, 1.2/50μs (between electric circuit and outer case), and positive/ negative polarity 3 times each is guaranteed.

■ Connection diagram



■ Specification

Input (input resistance)	Output (load resistance)	Auxiliary supply	Common specification
A8 : DC1-5V (approx.1MΩ) C7 : DC4-20mA (approx.100Ω) 00 : other than those above	1 : DC0-100mV (≧200Ω) 2 : DC0-1V (≧200Ω) 3 : DC0-5V (≧1kΩ) 4 : DC 0-10V (≧2kΩ) 5 : DC1-5V (≧1kΩ) A : DC0-1mA (≧12kΩ) B : DC0-5mA (≧2.4kΩ) C : DC0-10mA (≦1.2kΩ) D : DC0-16mA (≦750Ω) E : DC1-5mA (≦3kΩ) F : DC4-20mA (≦750Ω) H : DC4-20mA (≦800Ω) DC1-5V (≧250kΩ) SW switching 0 : other than those above	1 : AC100V(+10%, -15%),50/60Hz 2 : AC110V(+10%, -15%),50/60Hz 3 : AC200V(+10%, -15%) 50/60Hz 4 : AC220V(+10%, -15%), 50/60Hz 5 : DC24V(+10%, -15%) 0 : other than those above	Tolerance (when gain is ≦1) : ±0.25% (only when each input is more than or equal to 5%) Consumption VA: AC power source:2.5VA DC power source:3.0W Weight: AC power source:500g DC power source:400g

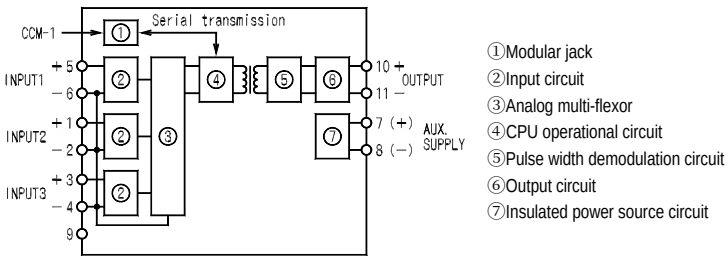
●Open of current output: even if the current output terminal is used in a state of regular open, there is no problem. Also, a voltage of approx. 25V occurs on the output terminal.

● Operational expression

$$X_0 = K_1 X_1 \sqrt{\frac{K_2X_2+A_2}{K_3X_3+A_3}} \quad \text{or} \quad K_1 \sqrt{X_1} \sqrt{\frac{K_2X_2+A_2}{K_3X_3+A_3}}$$

X_0: output signal
X_1: differential pressure input signal
X_2: pressure input signal
X_3: temperature signal
Gain: K_1-K_3 (±29.999)
Bias: A_2, A_3 (±299.99%)

■ Block diagram



● Factory preset

Products are shipped in the following setting.
(Can be changed by specification)
Without square root extracting function.

PARAMETER	
NO.	DATA
A_2	0.0%
A_3	0.0%
K_1	1.0
K_2	1.0
K_3	1.0

■ Purchase specifications

●Item to specify

Type

CLTP1 - C7 H 1

Input / Output / Auxiliary supply

Please specify as [with square root extracting function] in the case of $\sqrt{X_1}$.

FUNCTION GENERATING TRANSDUSER

CFGTP1 - ☐☐☐

■ Use

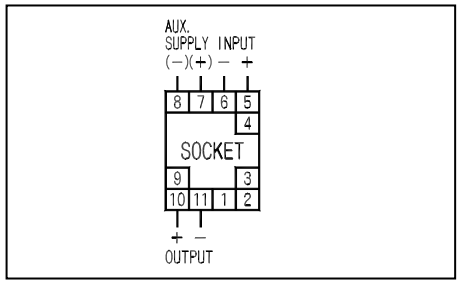
A transducer which does broken line operation of a DC input. Up to15 broken lines (kinked point X and Y 16 each) can be changed by a programming unit (CCM-1).

CFGTP1-C7H1
(80×50×133mm/500g)

■ Features

1. Constant voltage/current output.
2. Withstand voltage between electric circuit and outer case AC2, 000V (50/60Hz), AC1, 500V (50/60Hz) for 1 minute between input/output and auxiliary supply, or AC1, 500V (50/60Hz) for 1 minute between input and output.
3. Plus/minus input/output is not manufacturable.
4. Impulse withstands voltage 5kV, 1.2/50μs (between electric circuit and outer case), and positive/ negative polarity 3 times each is guaranteed.

■ Connection diagram



■ Specification

Input (input resistance)	Output (load resistance)	Auxiliary supply	Common specification
A8 : DC1-5V (approx.1MΩ) C7 : DC4-20mA (approx.100Ω) 00 : other than those above	1 : DC0-100mV (≧200Ω) 2 : DC0-1V (≧200Ω) 3 : DC0-5V (≧1kΩ) 4 : DC 0-10V (≧2kΩ) 5 : DC1-5V (≧1kΩ) A : DC0-1mA (≧12kΩ) B : DC0-5mA (≧2.4kΩ) C : DC0-10mA (≦1.2kΩ) D : DC0-16mA (≦750Ω) E : DC1-5mA (≦3kΩ) F : DC4-20mA (≦750Ω) H : DC4-20mA (≦800Ω) DC1-5V (≧250kΩ) SW switching 0 : other than those above	1 : AC100V(+10%, -15%),50/60Hz 2 : AC110V(+10%, -15%),50/60Hz 3 : AC200V(+10%, -15%) 50/60Hz 4 : AC220V(+10%, -15%), 50/60Hz 5 : DC24V(+10%, -15%) 0 : other than those above	Tolerance (when gain is ≦1) : ±0.25% Consumption VA: AC power source:2.5VA DC power source:3.0W Weight: AC power source:500g DC power source:400g

●Open of current output: even if the current output terminal is used in a state of regular open, there is no problem. Also, a voltage of approx. 25V occurs on the output terminal.

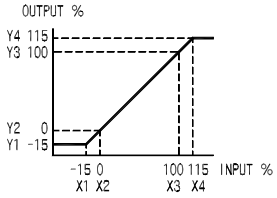
● UR-1 precise resistance unit (Selling separately)

Use UR-1 combined with a transducer of voltage input. When changing the transducer in a hot line state at the time of current input, if measures against open are necessary, connect UR-1 to socket and convert it into a voltage signal before using it.
(UR-1, resistance specified)

X-axis: X_1-X_{16}
(-15-+115%)

Y-axis: Y_1-Y_{16}
(-15-+115%)

● Input/Output graph

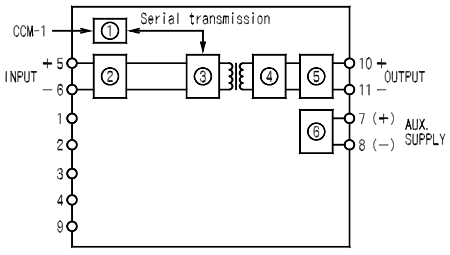


● Factory preset

Products are shipped in the following setting.
(Can be changed by specification)

PARAMETER			
X/DATA		Y/DATA	
1	-1.00%	1	-1.00%
2	0.00%	2	0.00%
3	100.00%	3	100.00%
4	110.00%	4	110.00%

■ Block diagram



①Modular jack
②Input circuit
③CPU operational circuit
④Pulse width demodulation circuit
⑤Output circuit
⑥Insulated power source circuit

■ Purchase specifications

●Item to specify

Type

CFGTP1 - C☐7 H 1

Input / Output / Auxiliary supply

In the case of specifying the kinked point, only specify the number of necessary point by order of X1＜X2＜.....＜X15＜X16.

ANALOG BACKUP TRANSDUSER

CAMTP1 - [ ] [ ] [ ]

■ Use

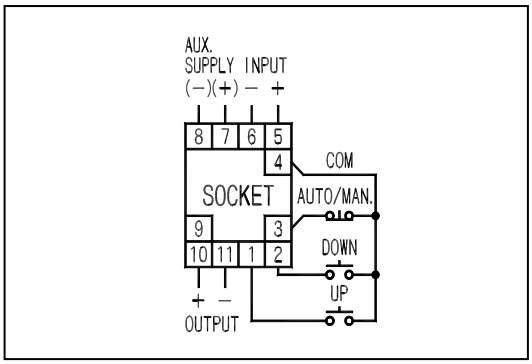
A transducer which provides output with a backup when a computer or a PID controller was down. Follow-up movement of input/output (SPEED) and output backup function (HOLD) at the time of supporting power failure are settable by a programming unit (type CCM-1) .

CAMTP1-C7H1
(80×50×133mm/500g)

■ Features

1. Constant voltage/current output. A product with a selection switch for DC4-20mA/DC1-5V is manufacturable.
2. Withstand voltage between electric circuit and outer case AC2, 000V (50/60Hz), AC1, 500V (50/60Hz) for 1 minute between input/output and auxiliary supply.
3. With or without the output hold at the time of auxiliary supply failure, and the response time of output follow-up can be set or changed by the programming unit CCM-1. Also, a simulated output for a loop test is available.
4. With setting value of the programming unit CCM-1 stored in a nonvolatile memory, there is no need to set the CCM-1 again even if the electric power of main device failed.
5. Manual UP/DOWN operation of the external control input is possible.

■ Connection diagram



■ Specification

Input (input resistance)	Output (load resistance)	Auxiliary supply	Common specification
A1 : DC0-10mV (approx.1MΩ) A2 : DC0-50mV (approx.1MΩ) A3 : DC0-60mV (approx.1MΩ) A4 : DC0-100mV (approx.1MΩ) A5 : DC0-1V (approx.1MΩ) A6 : DC0-5V (approx.1MΩ) A7 : DC0-10V (approx.1MΩ) A8 : DC1-5V (approx.1MΩ) C1 : DC0-10μA*1 (100mV) C2 : DC0-100μA (100mV) C3 : DC0-1mA (approx.100Ω) C4 : DC0-5mA (approx.100Ω) C5 : DC0-10mA (approx.100Ω) C6 : DC0-16mA (approx.100Ω) C7 : DC4-20mA (approx.100Ω) 00 : other than those above	1 : DC0-100mV (≧200Ω) 2 : DC0-1V (≧200Ω) 3 : DC0-5V (≧1kΩ) 4 : DC 0-10V (≧2kΩ) 5 : DC1-5V (≧1kΩ) A : DC0-1mA (≧12kΩ) B : DC0-5mA (≧2.4kΩ) C : DC0-10mA (≦1.2kΩ) D : DC0-16mA (≦750Ω) E : DC1-5mA (≦3kΩ) F : DC4-20mA (≦750Ω) H : DC4-20mA (≦800Ω) DC1-5V (≧250kΩ) SW switching 0 : other than those above	1 : AC100V(+10%, -15%),50/60Hz 2 : AC110V(+10%, -15%),50/60Hz 3 : AC200V(+10%, -15%) 50/60Hz 4 : AC220V(+10%, -15%), 50/60Hz 5 : DC24V(+10%, -15%) 0 : other than those above	Tolerance:±0.25% *2 (% against output span) Consumption VA: AC power source:2.5VA DC power source:3.0W Weight: AC power source:500g DC power source:400g

●Open of current output: even if the current output terminal is used in a state of regular open, there is no problem. Also, a voltage of approx. 25V occurs on the output terminal.
*1. Circuit voltage ≦15V for an input of 10μA.
*2. Tolerance becomes ±0.5% when input voltage is less than 50mV; input current is less than 100μA.

● UR-1 precise resistance unit (Selling separately)

Use UR-1 combined with a transducer of voltage input. When changing the transducer in a hot line state at the time of current input, if measures against open are necessary, connect UR-1 to socket and convert it into a voltage signal before using it.

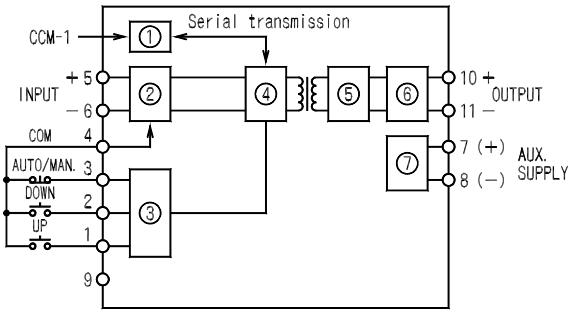
(UR-1, resistance specified)

Control input	UP (a contact), DOWN (a contact), AUTO/MAN. (b contact)		
Control input Contact switching Voltage Current	DC24V, 7mA		
Input/output follow-up response	0-30S±1S/F.S (can be set at will by 1S step with CCM-1) Standard Factory preset: SPEED is set to 10S.		
UP/DOWN follow-up response	20S±1S (fixed)/F.S *		
HOLD function	0	Begins the reset when the electric power recovers	HOLD = 0 or 1 can be set at will by CCM-1. HOLD = 0 at the time of the standard output.
	1	At the time of a power failure, it starts from the state before the failure.	
AUTO/MAN. signal	Output does follow-up response to input at the time of AUTO mode. Output does follow-up response to UP/DOWN signal at the time of MAN. mode.		

*Output rises to 125% when UP continues short-circuiting from the outside.

Output drops to 0% When DOWN continues short-circuiting,.

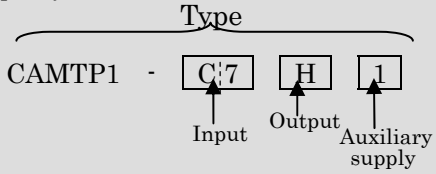
■ Block diagram



①Modular jack
②Input circuit
③Digital input circuit
④CPU operational circuit
⑤Pulse width demodulation circuit
⑥Output circuit
⑦Insulated power source circuit

■ Purchase specifications

●Item to specify



VOLTAGE PULSE TRANSDUSER

CVFTP1 - ☐☐☐

CVFTP1-C711
(80×50×133mm/500g)

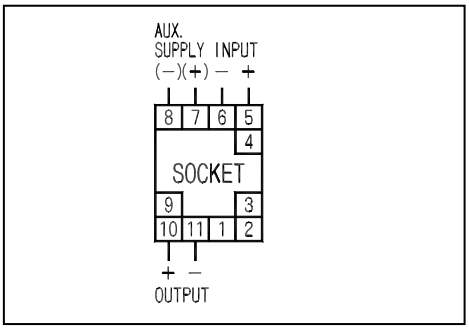
■ Use

A transducer which converts a DC input signal into a unit pulse. Please use the device by combining it with either one of open collector, voltage pulse, relay contact and photo-MOS relay output according to application. Also, the device has the function to cut the output pulse at the time of a low input as standard equipment. Setting of the frequency of output pulse, pulse width, output cut value at the time of a low input are possible by using a programming unit (type CCM-1).

■ Features

1. Constant voltage/current output.
2. Withstand voltage between electric circuit and outer case
   AC2, 000V (50/60Hz), AC1, 500V (50/60Hz) for 1 minute between input/output and auxiliary supply, or AC1, 500V (50/60Hz) for 1 minute between input and output.
3. Plus/minus input/output is not manufacturable.
4. Impulse withstands voltage 5kV, 1.2/50μs between electric circuit and outer case is guaranteed.

■ Connection diagram



■ Specification

Input (input resistance)	Output (load resistance)	Auxiliary supply	Common specification
1 : DC0-10mV (approx.1MΩ) 2 : DC0-50mV (approx.1MΩ) 3 : DC0-60mV (approx.1MΩ) 4 : DC0-100mV (approx.1MΩ) 5 : DC0-1V (approx.1MΩ) 6 : DC0-5V (approx.1MΩ) 7 : DC0-10V (approx.1MΩ) 8 : DC1-5V (approx.1MΩ) C1 : DC0-10μA*1 (100mV) C2 : DC0-100μA (100mV) C3 : DC0-1mA (approx.100Ω) C4 : DC0-5mA (approx.100Ω) C5 : DC0-10mA (approx.100Ω) C6 : DC0-16mA (approx.100Ω) C7 : DC4-20mA (approx.100Ω) 00 : other than those above	1 : voltage pulse 10Vp (≧2kΩ) 2 : open collector DC48V, 100mA MAX. 3 : no-voltage 1a contact DC30V, 200mA 5,000,000 times (resistance load) AC125V, 200mA 2,000,000 times (COSφ=1) 4 : Photo MOS relay AC/DC125V, 70mA MAX. (resistance load)	1 : AC100V(+10%, -15%),50/60Hz 2 : AC110V(+10%, -15%),50/60Hz 3 : AC200V(+10%, -15%) 50/60Hz 4 : AC220V(+10%, -15%), 50/60Hz 5 : DC24V(+10%, -15%) 0 : other than those above	Tolerance:±0.25% *2 (% against output span) Consumption VA: AC power source:2.5VA DC power source:3.0W Weight: AC power source:500g DC power source:400g

*1. Circuit voltage: ≦15V for an input of 10μA. *2. Tolerance becomes ±0.5% when input voltage is less than 50mV; input current is less than 100μA.

Output range

Mark	Output signal (allowable load)	Range of output frequency
1	Voltage pulse 10Vp (load≧2kΩ)	10p/h-36,000p/h (0.002778Hz-10Hz) 3:≦3,600P/h (1Hz)
2	Open collector DC48V, 100mA MAX.	
3	No-voltage 1a contact	
4	Photo-MOS relay AC/DC125V, 70mA MAX.	

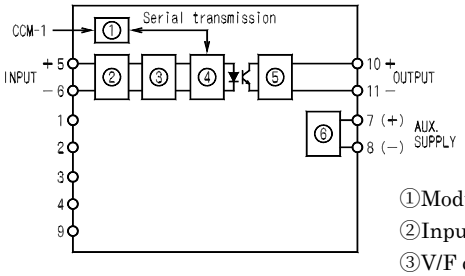
● Factory preset

Products are shipped in the following setting.
(Can be changed by specification)

PARAMETER	
No.	DATA
P	3,600p/h
C	1.0%
T	100ms

Mark	Name	Setting range
P	Number of the output pulse	10P/h-36, 000P/h However, 1a contact: MAX.3, 600P/h
C	Low input cut value	0.0-20.0%
T(1)	Output pulse width	50-300ms

■ Block diagram



①Modular jack
②Input circuit
③V/F circuit
④CPU operational circuit
⑤Output circuit
⑥Insulated power source circuit

■ Purchase specifications

●Item to specify

Type

CVFTP1 - C 7 1 1

Input Output Auxiliary supply

PROGRAMMING UNIT

CCM-1

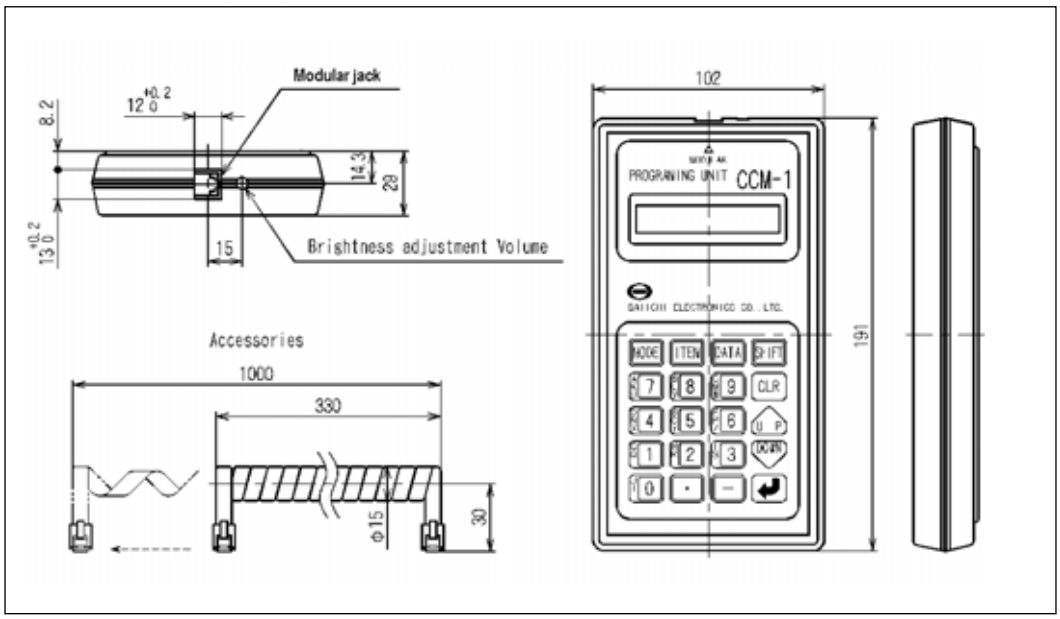
■ Use

The programming unit is a setter for changing the setting values of the soft spec type transducers (C series). Besides the data setting function, the programming unit can output any value for a loop test.

■ Specification

Power: supplied by soft spec type transducers.
Connection: modular jack
Weight: 300g

■ Dimensions (mm)



■ Purchase specifications

●Item to specify

Type

CCM-1