

■ 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.

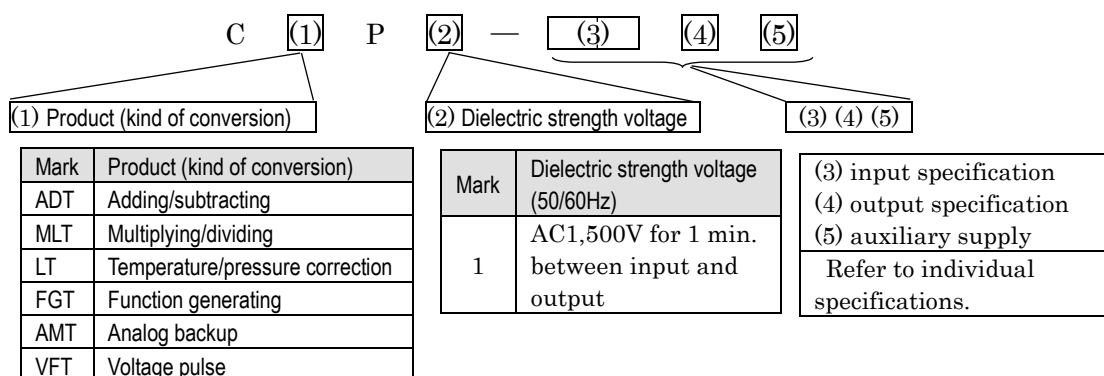
● PCB treatment

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



■ 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 TRANSDUCER

CADTP1 - □ □ □

■ 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.

■ 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%)

● Factory preset

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

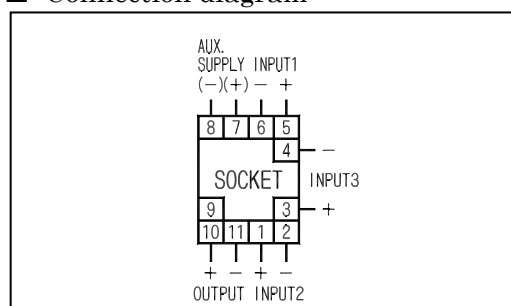
PARAMETER	
NO.	DATA
A_1	0.0%
A_2	0.0%
A_3	0.0%
A_0	0.0%
K_1	0.5
K_2	0.3
K_3	0.2
K_0	1.0

CADTP1-C7H1

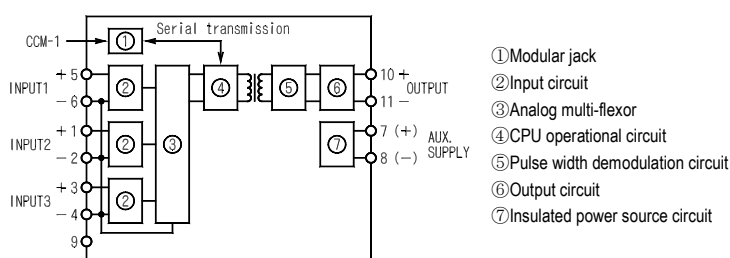
(80×50×133mm/500g)



■ Connection diagram

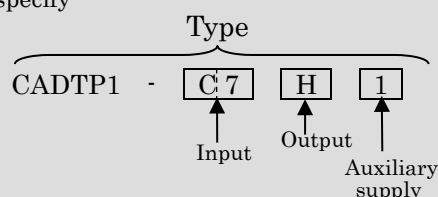


■ Block diagram



■ Purchase specifications

●Item to specify



MULTIPLYING/DIVIDING TRANSDUCER

CMLTP1 - □ □ □

■ 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.

■ Specification

Input (input resistance)	Output (load resistance)	Auxiliary supply	Common specification
A8 : DC1-5V (approx.1M Ω) C7 : DC4-20mA (approx.100 Ω) 00 : other than those above	1 : DC0-100mV (≥200 Ω) 2 : DC0-1V (≥200 Ω) 3 : DC0-5V (≥1k Ω) 4 : DC 0-10V (≥2k Ω) 5 : DC1-5V (≥1k Ω) A : DC0-1mA (≥12k Ω) B : DC0-5mA (≥2.4k Ω) C : DC0-10mA (≤1.2k Ω) D : DC0-16mA (≤750 Ω) E : DC1-5mA (≤3k Ω) F : DC4-20mA (≤750 Ω) H : DC4-20mA (≤800 Ω) DC1-5V (≥250k Ω) 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: $X_0 = K_0 \frac{(K_1 X_1 + A_1)(K_2 X_2 + A_2)}{(K_3 X_3 + A_3)} + A_0$

Gain: K_0-K_3 (±29.999%)

Bias: A_0-A_3 (±299.99%)

● Factory preset

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

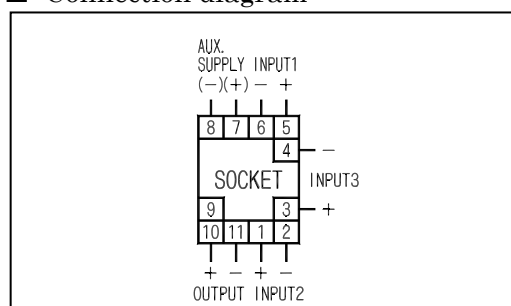
PARAMETER	
NO.	DATA
A ₁	0.0%
A ₂	0.0%
A ₃	0.0%
A ₀	0.0%
K ₁	1.0
K ₂	1.0
K ₃	1.0
K ₀	1.0

CMLTP1-C7H1

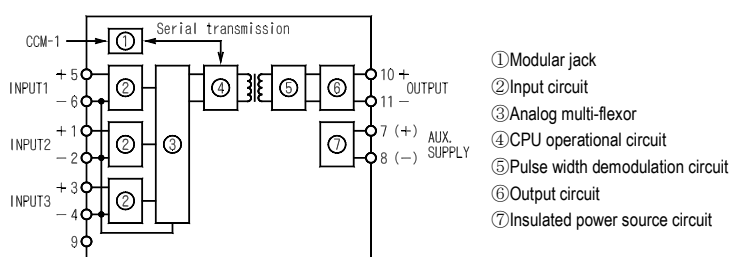
(80×50×133mm/500g)



■ Connection diagram

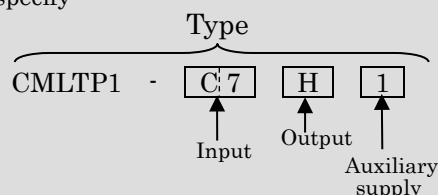


■ Block diagram



■ Purchase specifications

●Item to specify



TEMPERATURE/PRESSURE CORRECTING TRANSDUCER

CLTP1 - □ □ □

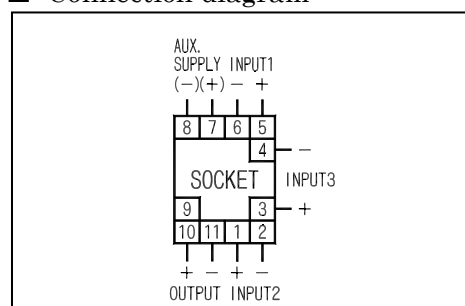
■ Use

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.

CLTP1-C7H1
(80×50×133mm/500g)



■ Connection diagram



■ 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.

■ 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

$$X_0 = K_1 X_1 \sqrt{\frac{K_2 X_2 + A}{2}} \quad \text{or} \quad K_1 \sqrt{X_1} \sqrt{\frac{K_2 X_2 + A_2}{K_3 X_3 + A_3}}$$

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)

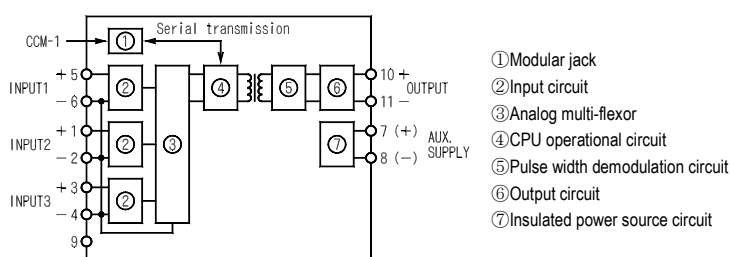
Bias: A_2 , A_3 (±299.99%)

● Factory preset

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

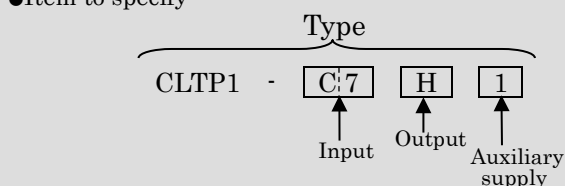
PARAMETER	
NO.	DATA
A_2	0.0%
A_3	0.0%
K_1	1.0
K_2	1.0
K_3	1.0

■ Block diagram



■ Purchase specifications

●Item to specify



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

FUNCTION GENERATING TRANSDUCER

CFGTP1 - □ □ □

■ Use

A transducer which does broken line operation of a DC input. Up to 15 broken lines (kinked point X and Y 16 each) can be changed by a programming unit (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), and positive/ negative polarity 3 times each is guaranteed.

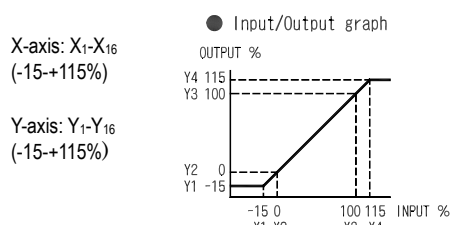
■ Specification

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)

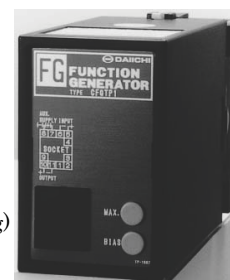


● Factory preset

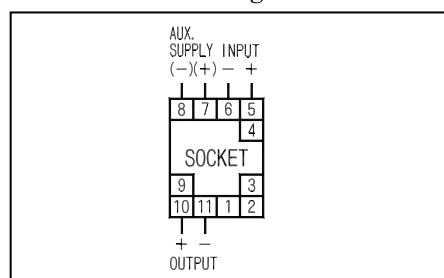
Products are shipped in the following setting.
(Can be changed by specification)

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%

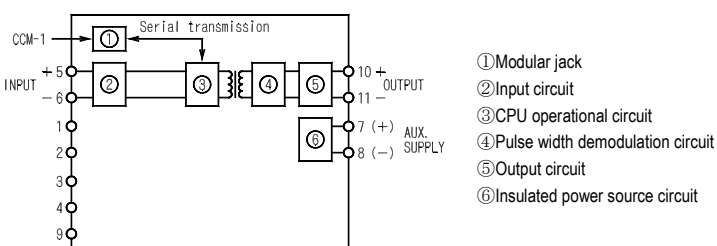
CFGTP1-C7H1
(80×50×133mm/500g)



■ Connection diagram

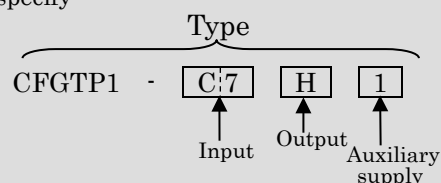


■ Block diagram



■ Purchase specifications

●Item to specify



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) .

■ 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

■ Specification

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

●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. 30V occurs on the output terminal.

*1. Circuit voltage ≤15V for an input of 10μA.

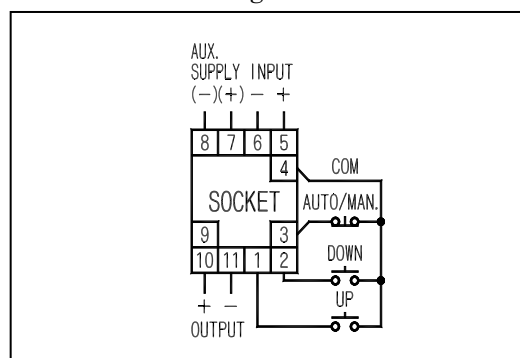
*2. Tolerance becomes ±0.5% when input voltage is less than 50mV; input current is less than 100μA.

CAMTP1-C7H1

(80×50×133mm/500g)



■ Connection diagram



● 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.

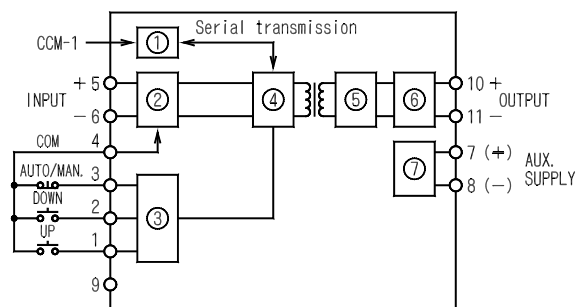
(UR-1, resistance specified)

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
	1	At the time of a power failure, it starts from the state before the failure.
		HOLD = 0 or 1 can be set at will by CCM-1. HOLD = 0 at the time of the standard output.
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	
Type	
CAMTP1 -	C7 H 1
	Input Output Auxiliary supply

VOLTAGE PULSE TRANSDUCER

CVFTP1 - □ □ □

■ 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.

■ 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 : DC0-10 μA*1 (100mV) C2 : DC0-100 μA (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

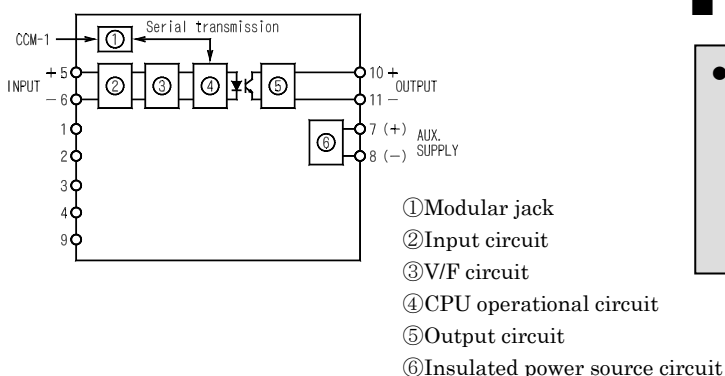
Mark	Output signal (allowable load)	Range of output frequency
1	Voltage pulse 10Vp (load ≥ 2 kΩ)	10p/h-36,000p/h (0.002778Hz-10Hz) 3 : ≤3,600p/h (1Hz)
2	Open collector DC48V, 100mA MAX.	
3	No-voltage 1a contact	
4	Photo-MOS relay AC/DC125V, 70mA MAX.	

● Factory preset

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

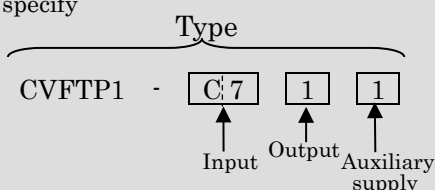
PARAMETER	Mark	Name	Setting range
No.			
P	P	Number of the output pulse	10P/h-36,000P/h However, 1a contact: MAX.3,600P/h
C		Low input cut value	0.0-20.0%
T	T(1)	Output pulse width	50-300ms

■ Block diagram



■ Purchase specifications

● Item to specify



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

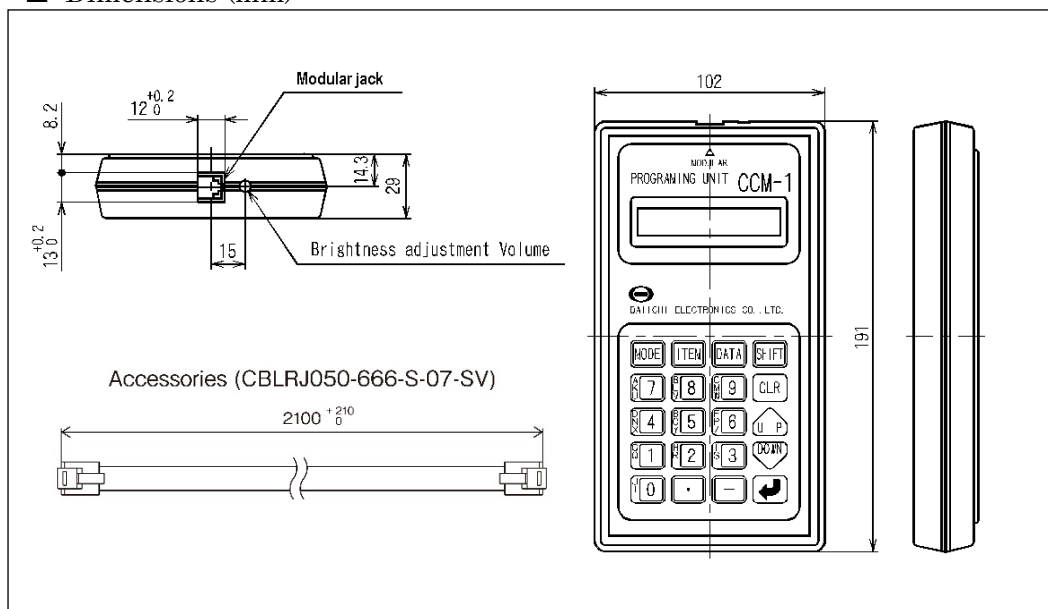
Power: supplied by soft spec type transducers.

Connection: modular jack

Weight: 300g



■ Dimensions (mm)



■ Purchase specifications

●Item to specify

Type

CCM-1