Up/Down Counter

DIN size W72×H72, W144×H72mm 8Digit Up/Down counter

▣Features

- ●Counting speed : 1cps, 30cps, 2kcps, 5kcps
- ●Display digit : 8digit(0~99999999)
- ●Ease to select 20 kinds of input operation modes and
  18 kinds of output operation modes by internal DIP switch.
- ●Available to set a decimal point
- ●Wide range of input power supply:
  100−240VAC 50/60Hz, 12−24VDC(Option)
- ●Micro computer built−in

> ⚠ **Please read "Caution for your safety" in operation manual before using.**

▣Specifications

Model	Single preset	F8A	L8A
	Indication type	F8B	L8B
Digit		8(99999999)	8(99999999)
Digit size		W4×H8mm	W6.3×H10mm
Power supply		100−240VAC 50/60Hz, 12−24VDC(Option)	
Allowable voltage range		90 ~ 110% of rated voltage	
Power consumption		• Preset : Approx. 5.4VA(240VAC 60Hz), Approx. 3W(24VDC) • Indication type :Approx. 4.7VA(240VAC 60Hz), Approx. 2.6W(24VDC)	• Preset : Approx. 6.1VA(240VAC 60Hz), Approx. 3.1W(24VDC) • Indication type : Approx. 5.4VA(240VAC 60Hz), Approx. 2.6W(24VDC)
Max.counting speed		Selectable **1cps/30cps/2kcps/5kcps** by internal DIP switch	
Min. signal width	RESET input	Approx. 20ms	
Input type	CP1, CP2 Input	**[Voltage input]** Input impedance : 5.4kΩ, "H" level voltage : 5−30VDC, "L" level voltage : 0−2VDC **[No-Voltage input]** Impedance at short−circuit : Max. 1kΩ, Residual voltage at short−circuit : Max. 2VDC, Impedance at open−circuit : Max. 100kΩ	
	RESET input		
Control output	Con− tact	Type	Single preset : SPDT(1c)	
		Capacity	250VAC 3A resistive load	
	Solid− state	Type	Single presetType : 1 NPN open collector	
		Capacity	30VDC Max. 100mA Max.	
Memory retention		10 years(when using non−volatile memory semiconductor)	
External sensor power		12VDC±10% 50mA Max.	
Ambient temperature		−10 ~ +55℃(at non−freezing status)	
Storage temperature		−25 ~ +65℃(at non−freezing status)	
Ambient humidity		35 ~ 85%RH	
Insulation resistance		100MΩ(at 500VDC)	
Dielectric strength		2000VAC 50/60Hz for 1 minute	
Noise strength	AC power	±2kV the square wave noise(pulse width:1μs) by the noise simulator	
	DC power	±500V the square wave noise(pulse width:1μs) by the noise simulator	
Vibration	Mechanical	0.75mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 1 hour	
	Malfunction	0.5mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 10 minutes	
Shock	Mechanical	300m/s² (Approx. 30G) in X, Y, Z directions 3 times	
	Malfunction	100m/s² (Approx. 10G) in X, Y, Z directions 3 times	
Relay life cycle	Mechanical	Min. 10,000,000 times	
	Electrical	Min. 100,000 times(250VAC 3A at resistive load)	
Weight	AC power	F8A : Approx. 287g, F8B : Approx. 253g	L8A : Approx. 500g, L8B : Approx. 446g
	DC power	F8A : Approx. 283g, F8B : Approx. 253g	L8A : Approx. 498g, L8B : Approx.444g

(A) Counter

(B) Timer

(C) Temp. controller

(D) Power controller

(E) Panel meter

(F) Tacho/ Speed/ Pulse meter

(G) Display unit

(H) Sensor controller

(I) Proximity sensor
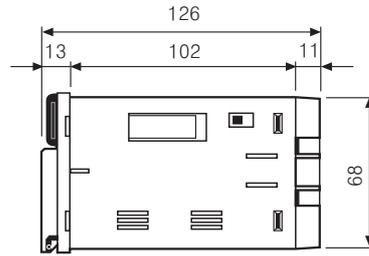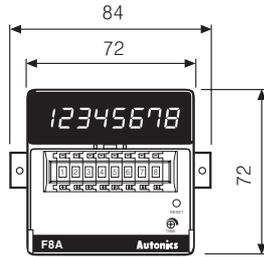
(J) Photo electric sensor

(K) Pressure sensor

(L) Rotary encoder

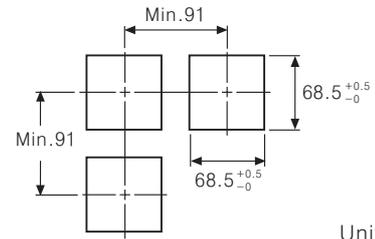(M) 5-Phase stepping motor & Driver & Controller

F/L Series

▣ Dimensions

● F Series

● Panel cut-out

Min.91
Min.91
68.5$_{-0}^{+0.5}$
68.5$_{-0}^{+0.5}$

Unit:mm

● L Series

● Panel cut-out

Min.170
Min.76
67.5$_{-0}^{+0.5}$
138$_{-0}^{+0.5}$

Unit:mm

▣ Connections

● F8A

12VDC
CP1 CP2 50mA 0V RESET
SOLID STATE OUT
30VDC Max.
100mA Max.

8	9	10	11	12	13	14
15						17
16						18
1	2	3	4	5	6	7

NO NC COM

CONTACT OUT :
250VAC 3A
RESISTIVE LOAD

SOURCE

● F8B

12VDC
CP1 CP2 50mA 0V RESET

8	9	10	11	12	13	14
15						17
16						18
1	2	3	4	5	6	7

SOURCE

● L8A

12VDC
CP1 CP2 50mA 0V RESET

CONTACT OUT :
250VAC 3A
RESISTIVE LOAD

13	14	15	16	17	18	19	20	21	22	23	24
1	2	3	4	5	6	7	8	9	10	11	12

COM NC NO

SOLID STATE OUT
30VDC Max.
100mA Max.

SOURCE

● L8B

12VDC
CP1 CP2 50mA 0V RESET

13	14	15	16	17	18	19	20	21	22	23	24
1	2	3	4	5	6	7	8	9	10	11	12

SOURCE

Autonics

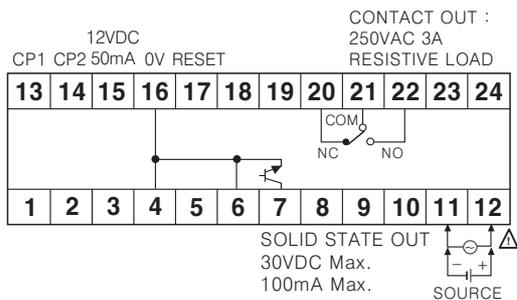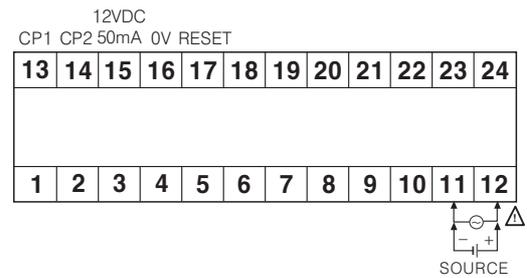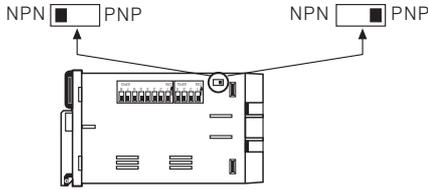## ▣ Input logic selection

● **F Series**
Input logic is changeable by input logic selection switch located at the one-side of case.

• No voltage input (NPN)   • Voltage input (PNP)

NPN ■ PNP   NPN ■ PNP

● **L Series**
Input logic is changeable by input logic selection switch located at the terminal block.

• No voltageinput (NPN)

F ■ S

• Voltage input (PNP)

F ■ S
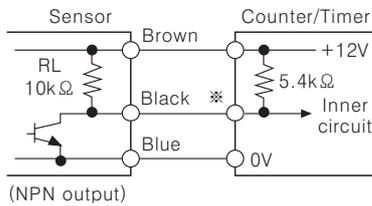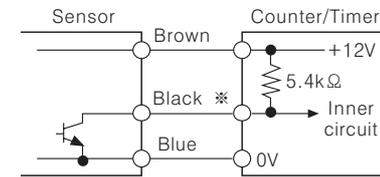
※ Please be sure to turn OFF the power before changing input logic.

▣ Input connections

◎ Input logic : No-voltage input (NPN)

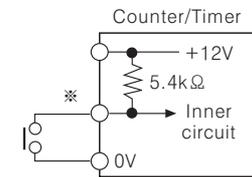● Solid-state input (Standard input sensor : NPN output type sensor)

Sensor — Brown — Counter/Timer +12V
RL 10kΩ — Black ※ — 5.4kΩ — Inner circuit
Blue — 0V
(NPN output)
※ CP1, CP2 (INHIBIT), RESET input

Sensor — Brown — Counter/Timer +12V
Black ※ — 5.4kΩ — Inner circuit
Blue — 0V
(NPN open collector output)

● Contact input

Counter/Timer +12V
※ — 5.4kΩ — Inner circuit
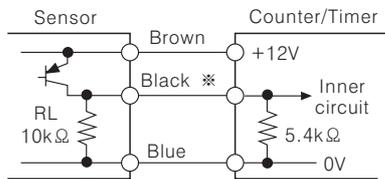0V
Counting speed : 1 or 30cps setting

◎ Input logic : voltage input (PNP)

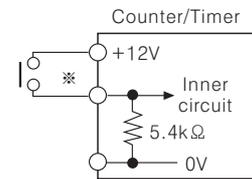● Solid-state input (Standard input sensor : PNP output type sensor)

Sensor — Brown — Counter/Timer +12V
Black ※ — Inner circuit
RL 10kΩ — Blue — 5.4kΩ — 0V
(PNP output)
※ CP1, CP2 (INHIBIT), RESET input

Sensor — Brown — Counter/Timer +12V
Black ※ — Inner circuit
Blue — 5.4kΩ — 0V
(PNP open collector output)
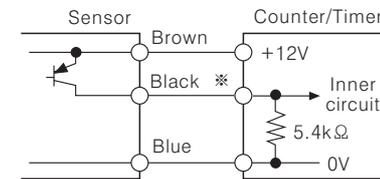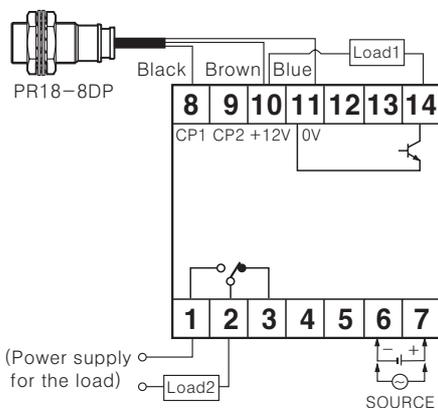
● Contact input

Counter/Timer +12V
※ — Inner circuit
5.4kΩ — 0V
Counting speed : 1 or 30cps setting

▣ Input & output connections

◎ In case of operating the load by power supply of the sensor

PR18-8DP
Black | Brown | Blue | Load1

| 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| CP1 | CP2 | +12V | 0V | | | |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

(Power supply for the load) — Load2 — SOURCE − +

● Please select proper capacity of load, because total value of load capacity and current consumption should not be exceed current capacity (Max. 50mA).

◎ In case of operating the load by external power supply

(−) Ratesvoltage
(+) circuit
※ Load1

| 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| CP1 | CP2 | +12V | 0V | | | |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

(Power supply for the load) — Load2 — SOURCE − +
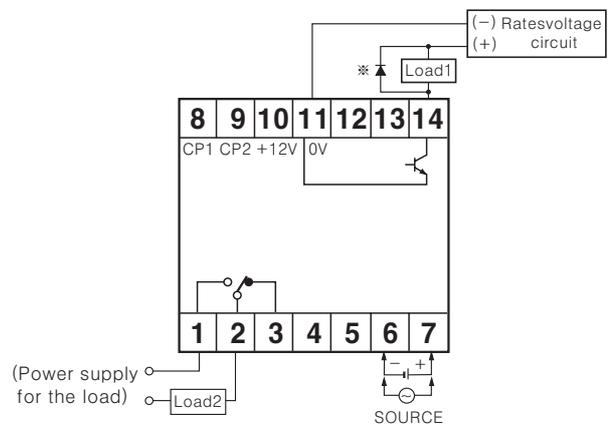
● The capacity of the load must not be exceed Max. 30VDC, Max. 100mA of the switching capacity of the transister.
● Please do not supply the reverse polarity voltage.
※ In case of using the inductive load (Relay, etc.), please connector the surge absorber (Diode) at both terminals of the load, in case of using the inductive load.
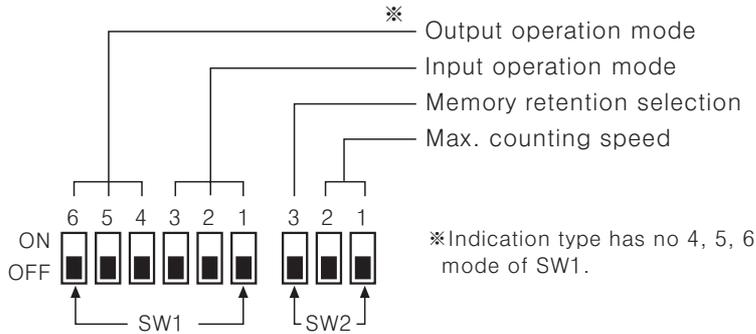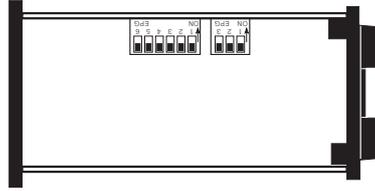
F/L Series

▣ Selection by DIP switches

●W72×H72 DIP switch position
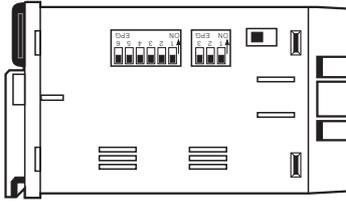
●W144×H72 DIP switch position

●Selecting memory retention

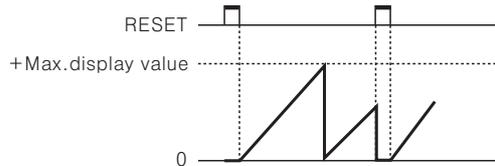| SW2	Function
ON ▨3 OFF	Non memory
ON ▨3 OFF	Memory

※ ── Output operation mode
── Input operation mode
── Memory retention selection
── Max. counting speed

ON
OFF
6 5 4 3 2 1 ─ 3 2 1
└── SW1 ──┘ └ SW2 ┘

※Indication type has no 4, 5, 6 mode of SW1.

●Selecting max. counting speed

SW2	Max. counting speed
ON ▨1 ▨2 OFF	1cps
ON ▨1 ▨2 OFF	30cps
ON ▨1 ▨2 OFF	2kcps
ON ▨1 ▨2 OFF	5kcps

▣ Counting function(Indication type-F8B, L8B)

●**Up mode**

RESET
+Max.display value
0

●**Down mode**

RESET
+Max.display value
0
−Max.display value

● **Up / Down-A, B, C input mode**

RESET
+Max.display value
0
−Max.display value

●**Up / Down-D, E, F mode**
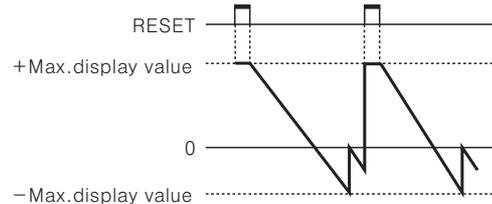
RESET
+Max.display value
0
−Max.display value
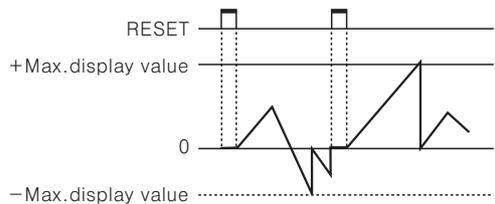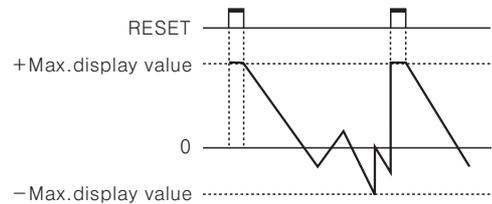
▣ Decimal point setting

Dispaly the decimal point.
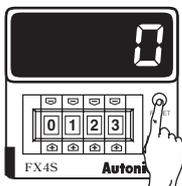
RUN mode → → → Return to RUN mode

※It returns to decimal point setting status if pressing RESET button for over 3sec. in RUN mode.
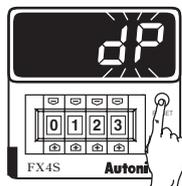
※When "dp" is flickering, one touch the Reset button.
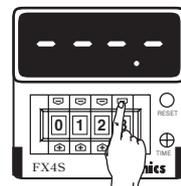
※If pressing one of digital switchbuttons(⊕, ⊖) in decimal point setting mode, decimal point will be moved to Up(+) direction.

※It returns to RUN mode if pressing RESET button for over 3sec. in decimal point setting status.

●Changing the decimal point

(Factory default)
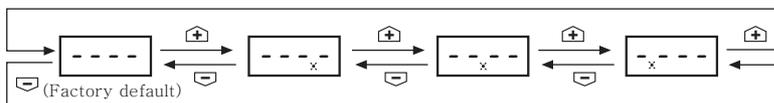
※It returns to RUN mode if no RESET button or digital switch is applied for 60sec. in decimal point settingstetus.
※The decimal point setting is existed in indication type.

▣ Input operation mode(Counter)

Input mode(SW1)			No-voltage input type(NPN)	Voltage input type(PNP)
Up mode	Up/Down−A Command input	ON [2 3] OFF	cp1 / cp2 / Counting value: 0 1 2 3 2 1 2 3	cp1 / cp2 / Counting value: 0 1 2 3 2 1 2 3
	Up/Down−B Individual input	ON [2] OFF	cp1 / cp2 / Counting value: 0 1 2 3 2 1 1 2 3	cp1 / cp2 / Counting value: 0 1 2 3 2 1 1 2 3
	Up/Down−C Phase difference input	ON [2] OFF	cp1 / cp2 / Counting value: 0 1 2 3 2 1 2 3	cp1 / cp2 / Counting value: 0 1 2 3 2 1 2 3
	Up Up input	ON [2 3] OFF	cp1 / cp2 / Counting value: 0 1 2 3 (No counting) 4 5	cp1 / cp2 / Counting value: 0 1 2 3 (No counting) 4 5
			cp1 (No counting) / cp2 / Counting value: 0 1 2 3 4 5	cp1 (No counting) / cp2 / Counting value: 0 1 2 3 4 5
Down mode	Up/Down−D Command input	ON [2 3] OFF	cp1 / cp2 / Counting value: n n−1 n−2 n−3 n−2 n−1 n−2 n−3 0	cp1 / cp2 / Counting value: n n−1 n−2 n−3 n−2 n−1 n−2 n−3 0
	Up/Down−E Individual input	ON [2] [3] OFF	cp1 / cp2 / Counting value: n n−1 n−2 n−3 n−2 n−1 n−1 n−2 n−3 0	cp1 / cp2 / Counting value: n n−1 n−2 n−3 n−2 n−1 n−1 n−2 n−3 0
	Up/Down−F Phase difference input	ON [3] OFF	cp1 / cp2 / Counting value: n n−1 n−2 n−3 n−2 n−1 n−2 n−3 0	cp1 / cp2 / Counting value: n n−1 n−2 n−3 n−2 n−1 n−2 n−3 0
	Down Down input	ON [2 3] OFF	cp1 / cp2 / Counting value: n n−1 n−2 (No counting) n−3 n−4 n−5 0	cp1 / cp2 / Counting value: n n−1 n−2 (No counting) n−3 n−4 n−5 0
			cp1 (No counting) / cp2 / Counting value: n n−1 n−2 n−3 n−4 n−5 0	cp1 (No counting) / cp2 / Counting value: n n−1 n−2 n−3 n−4 n−5 0

※ Ⓐ : Over Min. signal width, Ⓑ : Over 1/2 of Min. signal width.
　Counting miss by one(±1) is occured if the signal width of Ⓐ or Ⓑ is less than min. signal width.

F/L Series

▣ Output operation mode

■ ← One−shot output**(0.05 ~ 5sec)**   □ ← Self−holding output

Output mode (SW1)	Up mode	Down mode	Operation after count up
F (4 5 6: ON, ON, ON)			The display value continues until reset signal is applied and the output will be held. • Self−holding output is held until reset signal is applied.
N (4 5 6: ON OFF OFF)			The display value and self−holding output are held until reset signal is applied.
C (4 5 6: OFF ON OFF)			The display value returns to reset start status when display value is reached to preset value.
R (4 5 6: ON ON OFF)			The display value is held until output is OFF then returns to reset start status.
K (4 5 6: ON OFF ON)			The display value continues until reset signal is applied.
P (4 5 6: OFF ON OFF)			The display value is held during one−shot output time, counting process is returned to reset start status when output is ON.
Q (4 5 6: OFF ON ON)			The display value continues during one−shot output time.
S (4 5 6: ON ON ON)	**Up**	**Down**	• Up, UP/Down−A, B, C input mode −Output is ON when (Display value) ≥ (Preset value) • Down, UP/Down−D, E, F input mode −Output is ON when (Display value) ≤ (Zero)

Each diagram shows RESET, Setting, 0, and Output traces.

Up/Down Counter

■Proper usage

◎Reset function
● Reset
In case of changing the input mode after supplying the power, please take a external reset or manual reset. **If reset is not executed, the counter will be working as previous mode.**
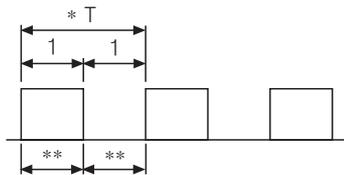● Reset signal width
It is reset perfectly when the reset signal is applied during max. 20ms regardless of the contact input & solid−state input.
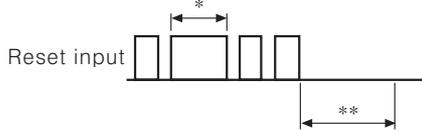
Reset input

*In case of a contact reset, it is reset perfectly if the ON time of reset signal is applied during max. 20ms even though a chattering is occurred.
**It can be input the signal of CP1 & CP2 after max. 50ms from closing time of reset signal.

◎Min.signal width of CP1, CP2 input

*Please make duty ratio(ON/OFF) 1:1.
** Min. signal width ┌ 1cps : Max. 500ms
                     │ 30cps : Max. 16.7ms
                     │ 2kcps : Max. 0.25ms
                     └ 5kcps : Max. 0.1ms

◎Max. counting speed
This is respond speed per 1 sec. when the duty ratio (ON/OFF) of input signal is 1:1. If duty ratio is not 1:1, the respond speed will be getting slow against input signal and also the width between ON and OFF should be over min. signal width and also one of ON width and OFF width is under min. signal width, this product may not response.
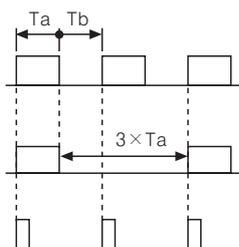
Width of Ta(ON) and Tb(OFF) must be larger than Min. signal width.

Max.counting speed is 1/2 value of catalog spec. when duty rate is 1:3.

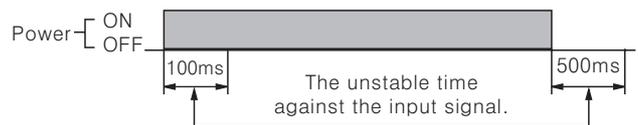It can not respond because Max. signal width(1a) is little.

◎Error display

Error signal	Error description	Returning method
Err0	Zero set state	Change the se value to non zero state

※When Error is displayed, the output continues OFF state.
※There is no Error function in the indication type.

FX4S Autonics
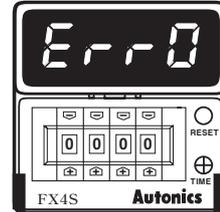
◎Power
The inner circuit voltage starts to rise up for the first 100ms after power on, the input may not work at this time. And also the inner circuit voltage drops down for the last 500ms after power off, the input may not work at this time.

Power ON/OFF — 100ms — The unstable time against the input signal. — 500ms

(A) Counter
(B) Timer
(C) Temp. controller
(D) Power controller
(E) Panel meter
(F) Tacho/Speed/Pulse meter
(G) Display unit
(H) Sensor controller
(I) Proximity sensor
(J) Photo electric sensor
(K) Pressure sensor
(L) Rotary encoder
(M) 5-Phase stepping motor & Driver & Controller