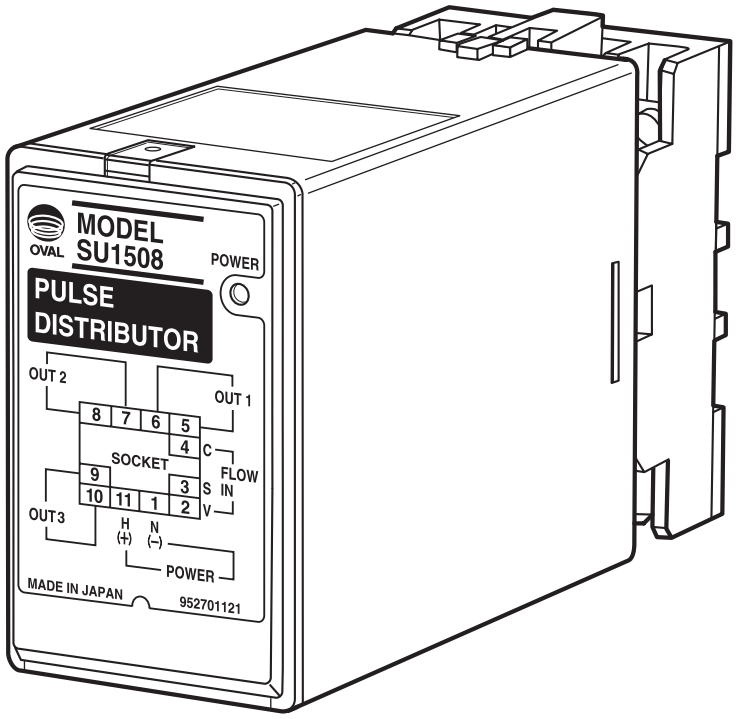
OVAL INSTRUCTIONS

Ins. No. E-944-9-E

PULSE DISTRIBUTOR

MODEL : SU1508



Every OVAL product is fabricated and shipped from our factory under stringent quality control program. In order to maintain its design performance throughout the life of this distributor, this manual offers the operator the necessary installation, operation and maintenance information.
Be well familiar with these instructions before you place the distributor in service and keep this manual for your quick reference. It is recommended that you also familiarize yourself with the instruction manuals of a pulse generator (flowmeter) and receiving instrument.

CONTENTS

The indications **NOTE**, **CAUTION**, and **WARNING** shown throughout this manual are to draw your attention to specific items:

➡ NOTE

Notes are separated from the general text to bring user's attention to important information.

⚠ **CAUTION**

Caution statements call attention to user about hazards or unsafe practices that could result in minor personal injury or property damage.

⚠ **WARNING**

Warning statements call attention to user about hazards or unsafe practices that could result in serious personal injury or death.

1. GENERAL

The pulse divider functions as a pulse divider and a frequency divider in a unit. It accepts a signal sent from a sensor and produces three outputs in a single shot after 1/1 duty wave shaping. It also functions as a frequency divider that produces three outputs with different division ratio.

2. FEATURES

1. Accepts signals, produces outputs, and provides power isolation.
2. Accommodates large capacity power supply for sensor.
3. Pulse reduction from 1/1 to 1/10000 is available.
4. Division ratio is selectable as desired for three outputs individually.
5. Discretionary power supply for users is available in the range of 85 to 264VAC (20 to 30V for DC).
6. Pulse limiter for upper width is provided.
7. Open collector, voltage pulse, and relay contact pulse input are available.
8. Plug-in configuration and DIN rail mount are available.

3. INSTALLATION

Installation Location

Select an installation location where

1. Mechanical vibration, shock and corrosive gases least exist.
2. Air is dry and temperature at room temperature and stable.

➡NOTE: Although the manufacturer guarantees stated performance at ambient temperatures from -10 to + 50℃, it is recommended that the instrument be placed in service in a room temperature environment.

Units in mm

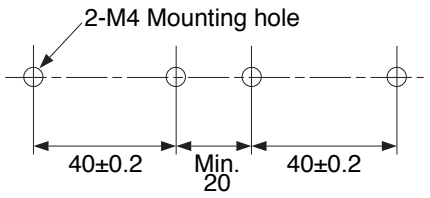


Fig. 3.1 Mounting Centers

3. Potential sources of inductive interference, such as electromagnetic contactors, are located sufficiently away.
4. A lightening arrestor is provided if incoming signals are subject to potential influence of lightening.
5. A sufficient working space is secured behind the instrument to facilitate wiring and maintenance (see Fig. 3.1).

Units in mm

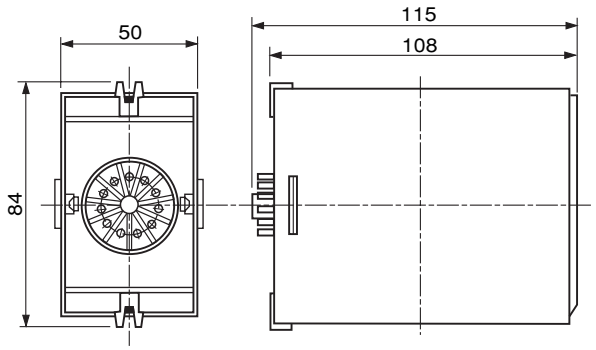


Fig. 3.2 Outline Dimensions, Distributor Body

Units in mm

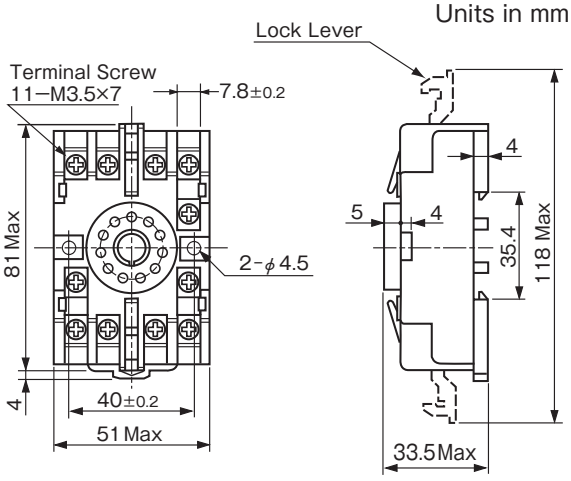


Fig. 3.3 Outline Dimensions, Surface Connection Socket Assembly (11PFA)

4. WIRING

1. Separate field wiring from other power lines or power circuits to minimize the possibility of inductive interference.
2. Terminal arrangement is shown in Fig. 4.1.
3. M3.5 screws are used for terminals. Ensure good electrical connections.
4. Upon completion of wiring connections, install the distributor body into the socket. Then engage the locking levers on the socket assembly with the distributor body.
5. For incoming signal cables from the flowmeter or other signal sources, cables recommended for the instrument of interest must be used. Transmission length also depends on the specification of that instrument.

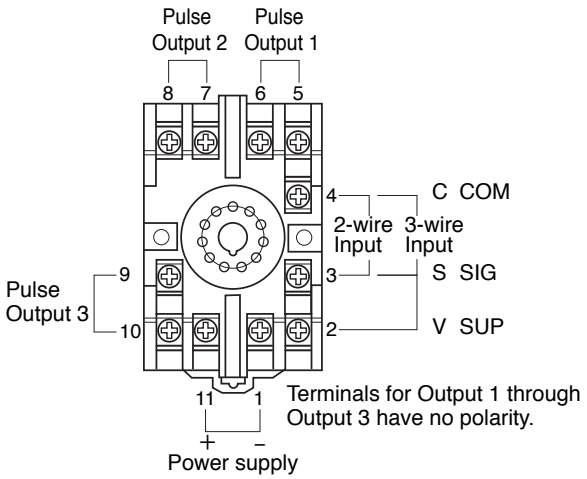
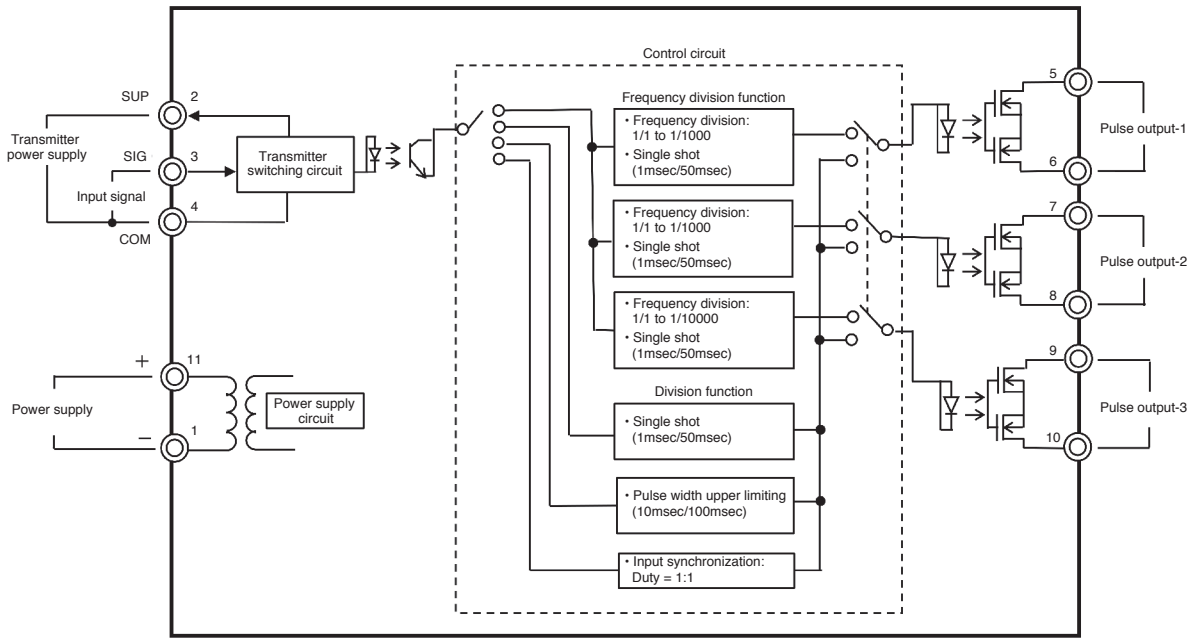


Fig. 4.1 Terminal Identification

⚠ CAUTION

Make electrical connections upon confirmation of compatibility of flowmeter (pulse generator) and receiving instrument by their model No., serial No., etc.

5. OVERALL BLOCK DIAGRAM



※ : Select the pulse input format corresponding to the connected transmitter. The setting of the transmitter switching circuit is defined by the product code.

Fig. 5.1

● Description of Individual Circuits (by block)

- Transmitter switching circuit……Selects the acceptable signal type of pulse generator and shapes the waveform (settable by pulse generator setting jumper).
- Power supply circuit……Supplies power of required voltages to individual circuits.
- Control circuit……Converts the signal to the pulse outputs set for three outputs individually (settable by PLD setting jumper).

6. PREPARATION AND OPERATION

1. Ensure that the pulse distributor and related equipment are correctly installed and wired with no place left unfinished.

> ⚠ **WARNING**
>
> **Make sure to see that the power terminals are connected to a power source of the rated voltage. Applying a power of incorrect voltage could ruin your instrument.**

2. Supply power to this instrument and make sure to see that the power indicator (green LED) comes on.
3. Initiate operation by allowing the fluid to flow.

7. QUICK TROUBLESHOOTING

● If the trouble is suspected to be internal of the distributor, seek our service.

Problem	Check	Possible Causes
Power indicator lamp (LED) fails to come on.	1. Inspect the power supply board. Is power source type (AC/DC) in conformity with the power supply board? 2. Make sure of power source voltage. Is an 85 to 246VDC (50/60Hz) power or 20 to 30VDC power Impressed across terminals 11 (+) and 1 (−)?	1. Power supply board is improper. 2. Line voltage is improper. 3. A fault In the internal power board.
No pulse output.	1. Input signal line correctly wired? 2. Input signal coming in? 3. Pulse generator valid on the pulse generator select board ? 4. Output signal line correctly wired ?	1. Input wiring is incorrect. 2. Pulse generator is at fault. 3. Input circuit setting is improper. 4. Power supply board or pulse generator select board or distributor board in the internal assembly is at fault.

8. INDIVIDUAL JUMPER SETTING

● **Input Setting :** Establishes input pulse mode.

Short-circuits the jumper corresponding to the number marked ● in the following table in accordance with the pulse generator model indicated by a number shown in the Product Code.

➡ NOTE: Refer to 10. PRODUCT CODE CONFIGURATION (P.9).

⑨ Pulse Input (CODE ⑧)	Pulse Generator Model	Jumper Setting																
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16 *1	17
E (1) ※2	8V 2-wire current pulse				●				●		●					●	2-3	
K (2)	Contact-closure pulse			●				●		●			●				2-3	●
B (3)	Voltage pulse			●				●					●				1-2	
D (4)	24V 2-wire current pulse		●				●					●			●		2-3	
C (5)	12V 2-wire current pulse			●				●				●		●			2-3	
G (6)	Open collector pulse			●				●		●			●				2-3	
J (8)	32V 3-wire open collector pulse	●				●				●			●				2-3	
H (B)	24V 3-wire open collector pulse		●				●			●			●				2-3	

※ Shown in parentheses are old product codes.

➡ NOTES: *1. For jumper 16, the following applies.
"1-2" refers to a short circuit at 1-2 side.
"2-3" refers to a short circuit at 2-3 side.
*2. 3kΩ is mounted on PLD board R179.

● **Output Setting** : Establishes output pulse mode.

Short-circuits the jumper corresponding to the number marked ● in the following table in accordance with the pulse generator model indicated by a number shown in the Product Code.

➡ NOTE: Refer to 10. PRODUCT CODE CONFIGURATION (P.9).

⑪⑫ Pulse Input 1 (CODE ⑨)	Output Setting	J23-										J31		J20	J21	J22	J24	J25	J26	J28	J29	J30
		1	2	3	4	5	6	7	8	9	10	0	1									
S1 (1)	1ms			●										OPEN								
S5 (2)	50ms				●			●	●													
LA (3)	Input synchronization Pulse width upper limiter 10ms				●		●						●									
LX (4)	Input synchronization Pulse width upper limiter 100ms					●			●	●			●									
SD (5)	Input synchronization Duty 1 : 1 output			●								●										
B1, B5 (7)	Pulse frequency division	●												See next page.								

※ Shown in parentheses are old product codes.

● **Frequency Division Output Pulse Setting**

Short-circuits the jumper corresponding to the number marked ● in the following table in accordance with the pulse generator model indicated by a number shown in the Product Code.

➡ NOTE: Refer to 10. PRODUCT CODE CONFIGURATION (P.9).

1. Output 1 Setting

⑪⑫⑬ Pulse Input 1 (CODE ⑩)	Output 1	J24-		J20-				J28
		0	1	2	3	6	7	
B1X (1)	Frequency division 1/1 pulse width 1ms			●				●
B11 (2)	Frequency division 1/10 pulse width 1ms	●		●				●
B12 (3)	Frequency division 1/100 pulse width 1ms		●	●				●
B13 (4)	Frequency division 1/1000 pulse width 1ms	●	●	●				●
B5X (5)	Frequency division 1/1 pulse width 50ms				●	●	●	●
B51 (6)	Frequency division 1/10 pulse width 50ms	●			●	●	●	●
B52 (7)	Frequency division 1/100 pulse width 50ms		●		●	●	●	●
B53 (8)	Frequency division 1/1000 pulse width 50ms	●	●		●	●	●	●

※ Shown in parentheses are old product codes.

2. Output 2 Setting

⑭⑮⑯ Pulse Input 1 (CODE ⑪)	Output 2	J25-		J21-				J29
		0	1	2	3	6	7	
B1X (1)	Frequency division 1/1 pulse width 1ms			●				●
B11 (2)	Frequency division 1/10 pulse width 1ms	●		●				●
B12 (3)	Frequency division 1/100 pulse width 1ms		●	●				●
B13 (4)	Frequency division 1/1000 pulse width 1ms	●	●	●				●
B5X (5)	Frequency division 1/1 pulse width 50ms				●	●	●	●
B51 (6)	Frequency division 1/10 pulse width 50ms	●			●	●	●	●
B52 (7)	Frequency division 1/100 pulse width 50ms		●		●	●	●	●
B53 (8)	Frequency division 1/1000 pulse width 50ms	●	●		●	●	●	●

※ Shown in parentheses are old product codes.

3. Output 3 Setting

⑰⑱⑲ Pulse Input 1 (CODE ⑫)	Output 3	J26-			J22-				J30
		0	1	2	2	3	6	7	
B1X (1)	Frequency division 1/1 pulse width 1ms				●				●
B11 (2)	Frequency division 1/10 pulse width 1ms	●			●				●
B12 (3)	Frequency division 1/100 pulse width 1ms		●		●				●
B13 (4)	Frequency division 1/1000 pulse width 1ms	●	●		●				●
B5X (5)	Frequency division 1/1 pulse width 50ms					●	●	●	●
B51 (6)	Frequency division 1/10 pulse width 50ms	●				●	●	●	●
B52 (7)	Frequency division 1/100 pulse width 50ms		●			●	●	●	●
B53 (8)	Frequency division 1/1000 pulse width 50ms	●	●			●	●	●	●
B14 (A)	Frequency division 1/10000 pulse width 1ms			●	●				●
B54 (B)	Frequency division 1/10000 pulse width 50ms			●		●	●	●	●

※ Shown in parentheses are old product codes.

9. Enclosure Removal

Unlatch the lock lever of socket assembly, separate the distributor body and remove the enclosure (see Fig. 9.1).

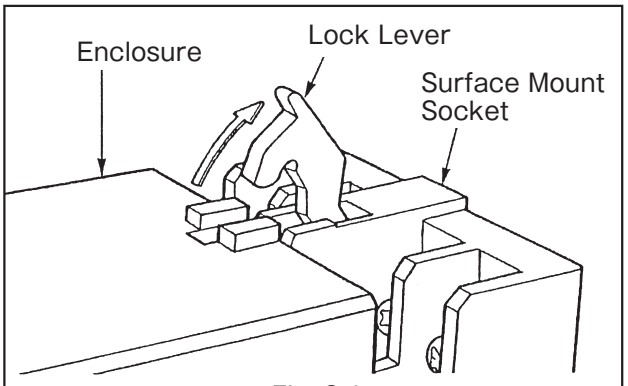


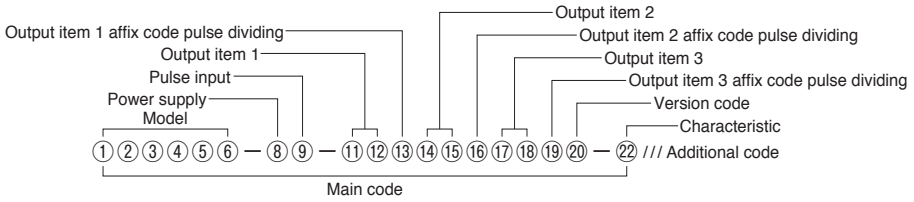
Fig. 9.1

10. GENERAL SPECIFICATIONS

<table>
<tr><td colspan="2">Item</td><td colspan="4">Description</td></tr>
<tr><td colspan="2" rowspan="10">Input Signal</td><td>Incoming Pulse</td><td>Companion Pulse Generator</td><td colspan="2">Power to Pulse Generator</td></tr>
<tr><td>8VDC 2-wire current pulse</td><td>Opto OD01, 02</td><td>8.5VDC</td><td rowspan="9">Current carrying capacity 40mA approx. with short-circuit protection circuit (Note)</td></tr>
<tr><td>Contact-closure pulse</td><td>PG20</td><td>13.5VDC</td></tr>
<tr><td>2-wire, 12VDC 3-wire voltage pulse</td><td>PG30,NPG60A(F)</td><td>13.5VDC</td></tr>
<tr><td>24VDC 2-wire current pulse (4/20mADC)</td><td>PA14, 15, 25, NPG60A(E)</td><td>24.0VDC</td></tr>
<tr><td>12VDC 2-wire current pulse</td><td>PG30S</td><td>13.5VDC</td></tr>
<tr><td>Open collector pulse</td><td>FLOWPET-5G, NPG60A(E3)</td><td>13.5VDC</td></tr>
<tr><td>32VDC 3-wire open collector pulse</td><td>PA11</td><td>32.0VDC</td></tr>
<tr><td>24VDC 3-wire open collector pulse</td><td>Mass Flow Monitor (only at 100VAC) ※</td><td>24.0VDC</td></tr>
<tr><td>Response pulse</td><td colspan="3">5kHz max. (50Hz max. in case of PG20) with output 500Hz max.</td></tr>
<tr><td rowspan="5">Output Signal</td><td>Signal</td><td colspan="4">Static relay, three outputs</td></tr>
<tr><td>Capacity</td><td colspan="4">Max. applied voltage 230VAC/340VDC Allowable current 0.2A
“ON” resistance: 16Ω max. “OFF” leak current: 1μA max.</td></tr>
<tr><td>Output pulse width</td><td colspan="4">1. Single shot 1ms, 50ms (Three outputs can be set individually.)
2. Duty 1:1 (Response 500Hz max. 100ms single shot for 4Hz or less)
3. Input synchronization (Pulse width upper limiter 10 ms, 100ms)</td></tr>
<tr><td>Output frequency</td><td colspan="4">Max. output frequency: 500Hz</td></tr>
<tr><td>Frequency division</td><td colspan="4">OUT1 : 1/1, 1/10, 1/100, 1/1000
OUT2 : 1/1, 1/10, 1/100, 1/1000
OUT3 : 1/1, 1/10, 1/100, 1/1000, 1/10000 } Individually chosen for each output.</td></tr>
<tr><td colspan="2">Power Supply</td><td colspan="4">85 to 132VAC, 133 to 264VAC 50/60Hz or 20 to 30VDC</td></tr>
<tr><td colspan="2">Power Consumption</td><td colspan="4">100VAC 15VA/200VAC 25VA (Max.10W)</td></tr>
<tr><td colspan="2">Ambient Temperature</td><td colspan="4">−10 to +50℃</td></tr>
<tr><td colspan="2">Insulation Resistance</td><td colspan="4">Between Power Terminal in a lump and output terminal: 10MΩ min. (500VDC)</td></tr>
<tr><td colspan="2">Withstand Voltage</td><td colspan="4">Between Power Terminal in a lump and output terminal: 1500VAC × 1min. (In case of AC terminal)
Between Power Terminal in a lump and output terminal: 1000VAC × 1min. (In case of DC terminal)</td></tr>
<tr><td colspan="2">Mounting</td><td colspan="4">Plug-in type (Mounted on wall or DIN rail)</td></tr>
<tr><td colspan="2">Enclosure</td><td colspan="4">Resin molding, black</td></tr>
<tr><td colspan="2">Weight</td><td colspan="4">0.5kg approx., including socket</td></tr>
<tr><td colspan="2">Accessory Furnished</td><td colspan="4">Front panel mount socket: 1 pc. Ferrite core only in case of DC terminal</td></tr>
</table>

➡ NOTE ※: Current capacity up to 100mA is available only with specifications of 100VAC and pulse generator's power-supply voltage of 24VDC.

11. PRODUCT CODE CONFIGURATION



● Main code

①	②	③	④	⑤	⑥	**Model**
S	U	1	5	0	8	Pulse distributor

⑦	**—**

⑧	**Power supply**
D	20 to 30VDC
J	85 to 264VAC 50Hz/60Hz

⑨	**Pulse input**
B	Voltage pulse 12VDC 2 wires/3 wires
C	Current pulse 12VDC for PG30S Exclusive Use
D	Current pulse 24VDC (4/20mA) for ULTRA OVAL, PA25, PA14, etc.
E	Current pulse 8VDC for ME Meters (Opto OD01 and OD02) Exclusive Use
G	Open collector pulse 12VDC 2 wires/3 wires
H	Open collector pulse 24VDC 3 wires
J	Open collector pulse 32VDC 3 wires
K	Contact pulse 12VDC 2 wires/3 wires
Z	Special

⑩	**—**

⑪	⑫	**Output item 1**	
Pulse output 1			
S	1	Division function pulse width 1ms	Pulse Division Function Pulse Outputs 1 through 3 yield identical results. The specification is established using Pulse Output 1, and subsequent output codes are denoted as "N."
S	5	Division function pulse width 50ms	
S	9	Division function pulse width is special	
S	D	Division function duty 1:1	
L	A	Division function pulse width upper limit cut 10ms	
L	X	Division function pulse width upper limit cut 100ms	
L	9	Division function pulse width upper limit cut Special	
B	1	After dividing: pulse width is 1ms	Pulse Dividing Capability For Pulse Outputs 1 through 3, individual divide values and pulse widths can be configured.
B	5	After dividing: pulse width is 50ms	
B	9	After dividing: pulse width is special	
Z	Z	Special	

⑬	**Output item 1 Supplementary Code for Pulse Dividing**	
N	Division function no division	(except for Pulse Output 2 "B1, B5, B9")
X	Frequency 1/1	(When Pulse output 1 is "B1, B5, B9")
1	Frequency 1/10	(When Pulse output 1 is "B1, B5, B9")
2	Frequency 1/100	(When Pulse output 1 is "B1, B5, B9")
3	Frequency 1/1000	(When Pulse output 1 is "B1, B5, B9")
Z	Special	(When Pulse output 1 is "B1, B5, B9")

⑭	⑮	**Output item 2**	
Pulse output 2			
N	N	Division function same as Output 1	(except for Pulse Output 2 "B1, B5, B9")
B	1	After dividing: pulse width is 1ms	(When Pulse output 1 is "B1, B5, B9")
B	5	After dividing: pulse width is 50ms	(When Pulse output 1 is "B1, B5, B9")
B	9	After dividing: pulse width is special	(When Pulse output 1 is "B1, B5, B9")
Z	Z	Special	(When Pulse output 1 is "B1, B5, B9")

⑯	**Output item 2 Supplementary Code for Pulse Dividing**	
N	Division function same as Output 1	(except for Pulse Output 2 "B1, B5, B9")
X	Frequency 1/1	(When Pulse output 2 is "B1, B5, B9")
1	Frequency 1/10	(When Pulse output 2 is "B1, B5, B9")
2	Frequency 1/100	(When Pulse output 2 is "B1, B5, B9")
3	Frequency 1/1000	(When Pulse output 2 is "B1, B5, B9")
Z	Special	(When Pulse output 2 is "B1, B5, B9")

⑰	⑱	**Output item 3**	
Pulse output 3			
N	N	Division function same as Output 1	(except for Pulse Output 2 "B1, B5, B9")
B	1	After dividing: pulse width is 1ms	(When Pulse output 2 is "B1, B5, B9")
B	5	After dividing: pulse width is 50ms	(When Pulse output 2 is "B1, B5, B9")
B	9	After dividing: pulse width is special	(When Pulse output 2 is "B1, B5, B9")
Z	Z	Special	(When Pulse output 2 is "B1, B5, B9")

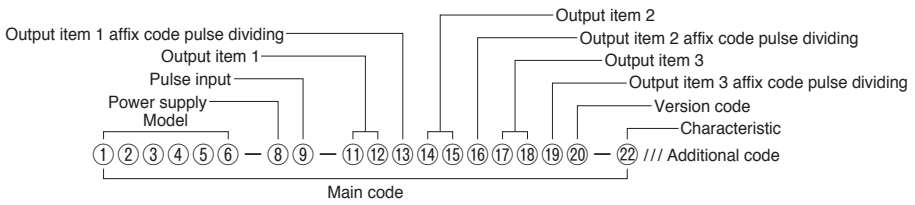
⑲	**Output item 3 Supplementary Code for Pulse Dividing**	
N	Division function same as Output 1	(except for Pulse Output 2 "B1, B5, B9")
X	Frequency 1/1	(When Pulse output 3 is "B1, B5, B9")
1	Frequency 1/10	(When Pulse output 3 is "B1, B5, B9")
2	Frequency 1/100	(When Pulse output 3 is "B1, B5, B9")
3	Frequency 1/1000	(When Pulse output 3 is "B1, B5, B9")
4	Frequency 1/10000	(When Pulse output 3 is "B1, B5, B9")
Z	Special	(When Pulse output 3 is "B1, B5, B9")

⑳	**Version code**
A	Version code: A

㉑	**—**

㉒	**Characteristic**
0	Standard
Z	Special

※1: When operating at 85 to 132VAC with a 24V output power supply, the power supply's current capacity for the transmitter becomes 100mA. Otherwise, it is limited to a maximum of 40mA.



● Additional code

Document			
D	S	J	SPEC. & DWG (Approval Drawing) (Japanese)
D	S	E	SPEC. & DWG (Approval Drawing) (English)
D	R	0	Re-submission of SPEC. & DWG
D	C	J	Final DWG (Japanese)
D	C	E	Final DWG (English)
D	W	J	Wiring diagram (Japanese)
D	W	E	Wiring diagram (English)
S	D	J	Inspection report of electronics (Japanese)
S	D	E	Inspection report of electronics (English)
D	T	J	Inspection procedure (Japanese)
D	T	E	Inspection procedure (English)
C	B	J	Traceability certificate: B set Only Japanese
Witness Test			
V	1	1	Appearance, dimensions, quantity check
V	1	4	Appearance, dimensions, quantity check/performance

〈CONFIGURATION OF OLD PRODUCT CODE〉

The new product code has been implemented since April 2017.
Therefore, the configuration of old product code will not be updated after April 2017.
Contact OVAL if you wish to order with the old product code for reasons such as type approval.

Item	Model							Supplementary Code							Description
	①	②	③	④	⑤	⑥	–	⑦	⑧	⑨	⑩	⑪	⑫	⑬	
Type	S	U	1	5	0	8	–								Pulse Distributor
Power Supply								6							20 to 30VDC
								7							85 to 264VAC 50Hz/60Hz ※
								9							Other than above
Input Signal									1						8VDC 2-wire current pulse
									2						2-wire, 12VDC 3-wire contact-closure pulse
									3						2-wire, 12VDC 3-wire voltage pulse
									4						24VDC 2-wire current pulse (4/20mADC)
									5						12VDC 2-wire current pulse
									6						2-wire, 12VDC 3-wire open collector pulse
									8						32VDC 3-wire open collector pulse
									B						24VDC 3-wire open collector pulse
									9						Other than above
Output Signal										1					1ms
										2					50ms
										3					Input synchronization Pulse width upper limiter 10ms
										4					Input synchronization Pulse width upper limiter 100ms
										5					Input synchronization Duty 1:1 output (Response 500Hz max.)
										7					Pulse frequency division
										9					Other than above
Output 1											0				It chooses except output pulse width's code "7"
											1				Frequency division 1/1 pulse width 1ms
											2				Frequency division 1/10 pulse width 1ms
											3				Frequency division 1/100 pulse width 1ms
											4				Frequency division 1/1000 pulse width 1ms
											5				Frequency division 1/1 pulse width 50ms
											6				Frequency division 1/10 pulse width 50ms
											7				Frequency division 1/100 pulse width 50ms
											8				Frequency division 1/1000 pulse width 50ms
											9				Other than above
Output 2												0			Output signal width's code is other than “7”
												1			Frequency division 1/1 pulse width 1ms
												2			Frequency division 1/10 pulse width 1ms
												3			Frequency division 1/100 pulse width 1ms
												4			Frequency division 1/1000 pulse width 1ms
												5			Frequency division 1/1 pulse width 50ms
												6			Frequency division 1/10 pulse width 50ms
												7			Frequency division 1/100 pulse width 50ms
												8			Frequency division 1/1000 pulse width 50ms
												9			Other than above
Output 3													0		Output signal width's code is other than “7”
													1		Frequency division 1/1 pulse width 1ms
													2		Frequency division 1/10 pulse width 1ms
													3		Frequency division 1/100 pulse width 1ms
													4		Frequency division 1/1000 pulse width 1ms
													5		Frequency division 1/1 pulse width 50ms
													6		Frequency division 1/10 pulse width 50ms
													7		Frequency division 1/100 pulse width 50ms
													8		Frequency division 1/1000 pulse width 50ms
													A		Frequency division 1/10000 pulse width 1ms
													B		Frequency division 1/10000 pulse width 50ms
													9		Other than above
Version Code														A	

➡ NOTE ※: The current capacity of pulse generator's power supply is 100mA when power supply is 85 to 132VAC and power to pulse generator is 24V. In other cases, the current capacity is 40mA.
To use this device as a pulse distributer, select a supplementary code for output signal from "1 to 5", and select "0" for supplementary codes ⑩, ⑪, and ⑫.
To use this device as a pulse divider or frequency divider, select "7" for output signal, then choose pulse width and frequency division for supplementary codes ⑩, ⑪, and ⑫.

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All specifications are subject to change without notice for improvement.

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