Serial Type Optical Data Transmission Device Long Distance Type

BWF SERIES

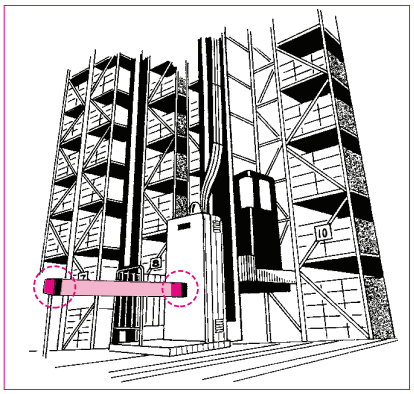
High performance in compact and light weight of handy size, 44 x 84 x 130.3mm!
Long distance, 100m and 200m!
400m type is also available in the same size!

- Actual transmission distance is 2 times or more than rated value and data transmission with high reliability is realized.
- Many kinds of interface are lined up, RS-232C, RS-422, current-loop and RS-422/RS-485 multi-drop, etc.
- Level lowering warning output are provided due to prevent some troubles such as dislocation of optical axis or dirty lens surface.
- It can be easy to check optical axis adjustment with optical checker or checking terminal.

Applications

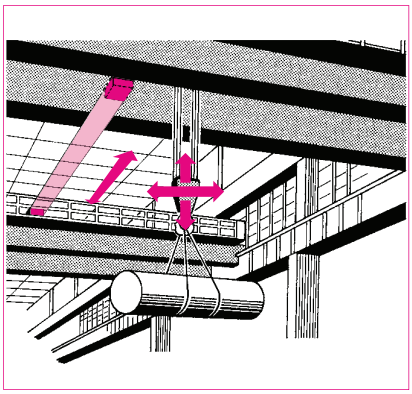
Control of stacker crane for Automated Storage Systems

Instruction of address, main power ON/OFF, traveling and upturn/downturn etc.



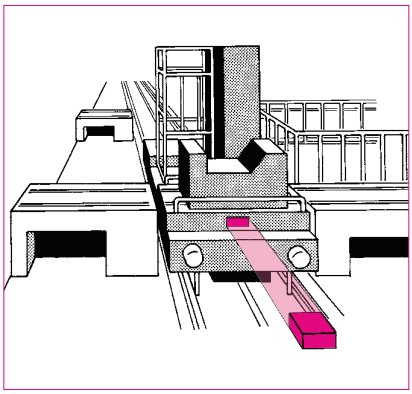
Control of OVERHEAD TRAVELING crane

Instruction of advance, reverse, sideways traveling, hoisting up, winding dow etc.



Control of track type A. G. V.

Instruction of address, main power ON/OFF, traveling and etc.



Type/Models

Type	Interface	Model No.	Transmission distance	Power source
Serial type	RS-232C/RS-422	BWF-11A/BWF-11B	100m	10 to 30VDC
		BWF-21A/BWF-21B	200m	
		BWF-31A/BWF-31B	100m	85 to 110VAC
		BWF-41A/BWF-41B	200m	
	Current loop/RS-232C	BWF-12A/BWF-12B	100m	10 to 30VDC
		BWF-22A/BWF-22B	200m	
		BWF-32A/BWF-32B	100m	85 to 110VAC
		BWF-42A/BWF-42B	200m	
	RS-422/RS-485 Multi-drop	BWF-13A/BWF-13B	100m	10 to 30VDC
		BWF-23A/BWF-23B	200m	
	RS-232C/RS-422 Multi-channel type	BWF-110	100m	18 to 30VDC
		BWF-210	200m	

Note) Make sure to use Type A and Type B in pair because transmission system is full-duplex two-way transmission. BWF-110/210 have provided 6kinds of frequency.

★BWF with CE mark and low temperature types are lined-up.

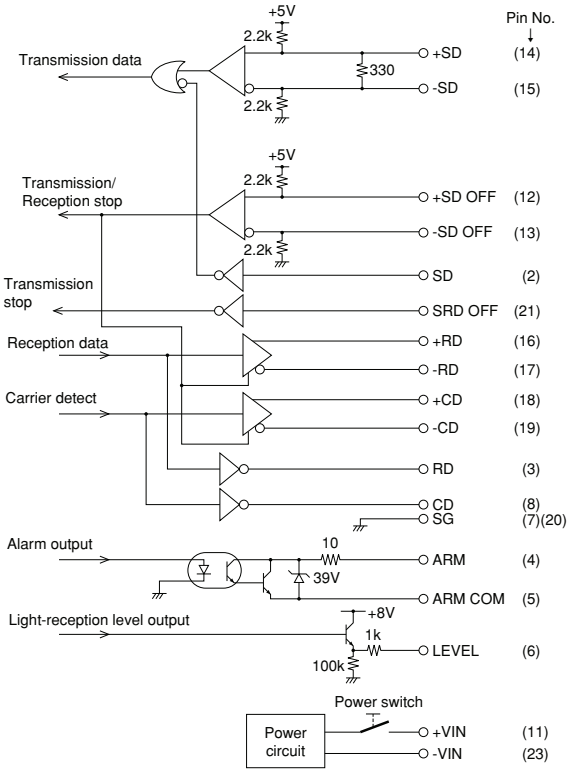
BWF-11/21/31/41

RS-232C/RS-422 type

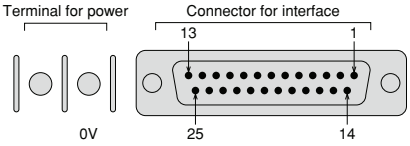
■ Specifications

Type	Serial type			
Model No.	**BWF-11A/11B**	**BWF-21A/21B**	**BWF-31A/31B**	**BWF-41A/41B**
Transmission distance	100m	200m	100m	200m
Directional angle	±2°	±1°	±2°	±1°
Transmission method	Full duplex two-way transmission			
Transmission speed	DC to 19.2kbps			
Input/Output interface	RS-232C/RS-422			
Modulation method	FSK modulation			
Modulation frequency	Type A (transmission 5.5MHz, reception 6.0MHz), Type B (transmission 6.0MHz, reception 5.5MHz)			
Power source	12 to 24VDC (10 to 30VDC)		100VAC 50/60Hz (80 to 110VAC)	
Current consumption	150mA or less (at 12VDC), 80mA or less (at 24VDC)		40mA	
Warning output	Photo-coupler (35V, 50mA), ON when light-reception level margin is 1.5 times or more and OFF when light-reception level margin is 1.5 times or less			
Light-reception level Output	0 to 5V (in proportion to light reception amount)			
Indication lamps	Power source, carrier detect, data input, data output, light-reception level margin (Red LED) POW (Power lamp): Light-up when power source ON CD(Carrier detect lamp): Light-up when light-reception, light-reception margin level 1 SD (Data input lamp): Light-up when transmission data input RD (Data output lamp): Light-up when reception data output L1 (Light-reception level lamp): Light-up when margin 1.5 times L2 ((Light-reception level lamp): Light-up when margin 2 times L3 (Light-reception level lamp): Light-up when margin 2.5 times			
Connection	Connector (25pins D-sub connector), but M3 screw terminal at power source			
Ambient illuminance	20,000lux or less (Both sun light and incandescent lamp)			
Ambient temperature/humidity	-10 to +50℃, 85%RH or less (not icing, not condensing)			
Protective structure	IP60 (IEC Standard), available up to IP64 by user's option			
Case material	ABS resin			
Weight	Approx. 500g			

■ Input/Output circuit



■ Connection



Terminal for power (M3 screw terminal)

Make sure to connect +V to terminal at left side for DC power. DC power provides on connector for interface too. Connect either one.

Connector for interface (25 pins D-sub connector)

Interface	Pin No.	Symbols	Functions
RS-232C	2	SD	Transmission data
	3	RD	Reception data
	8	CD	Reception carrior detect
	21	SD OFF	Transmission stop
RS-422	14	+SD	Transmission data (+)
	15	-SD	Transmission data (-)
	16	+RD	Reception data (+)
	17	-RD	Reception data (-)
	18	+CD	Reception carrior detect (+)
	19	-CD	Reception carrior detect (-)
	12	+SRD OFF	Transmission/Reception stop (+)
	13	-SRD OFF	Transmission/Reception stop (-)
Level	6	LEVEL	Light-reception level output
——	7・20	SG (0V)	GND for signal
Alarm	4	ARM	Alarm output
	5	ARM COM (0V)	
Power source	11	+VIN	Power source (10 to 30VDC)
	23	-VIN (0V)	

Note) Don't connect 0V for power source to ground for signal (SG).

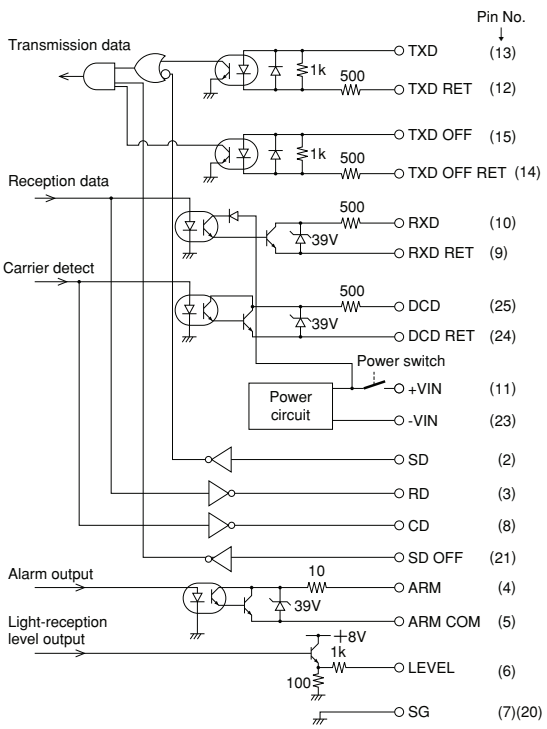
BWF-12/22/32/42

Current loop/RS-232C type

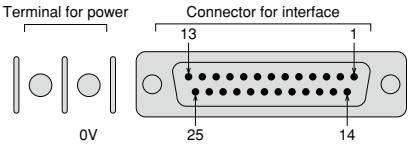
■ Specifications

Type	Serial type			
Model No.	**BWF-12A/12B**	**BWF-22A/22B**	**BWF-32A/32B**	**BWF-42A/42B**
Transmission distance	100m	200m	100m	200m
Directional angle	±2°	±1°	±2°	±1°
Transmission method	Full duplex two-way transmission			
Transmission speed	DC to 9,600bps (But 19.2kbps for RS-232C)			
Input/Output interface	Current loop/RS-232C			
Modulation method	FSK modulation			
Modulation frequency	Type A (transmission 5.5MHz, reception 6.0MHz), Type B (transmission 6.0MHz, reception 5.5MHz)			
Power source	12 to 24VDC (10 to 30VDC)		100VAC 50/60Hz (80 to 110VAC)	
Current consumption	150mA or less (at 12VDC), 80mA or less (at 24VDC)		40mA	
Warning output	Photo-coupler (35V, 50mA), ON when light-reception level margin is 1.5 times or more and OFF when light-reception level margin is 1.5 times or less			
Light-reception level Output	0 to 5V (in proportion to light reception amount)			
Indication lamps	Power source, carrier detect, data input, data output, light-reception level margin (Red LED) POW (Power lamp): Light-up when power source ON CD(Carrier detect lamp): Light-up when light-reception, light-reception margin level 1 SD (Data input lamp): Light-up when transmission data input RD (Data output lamp): Light-up when reception data output L1 (Light-reception level lamp): Light-up when margin 1.5 times L2 ((Light-reception level lamp): Light-up when margin 2 times L3 (Light-reception level lamp): Light-up when margin 2.5 times			
Connection	Connector (25pins D-sub connector), but M3 screw terminal at power source			
Ambient illuminance	20,000lux or less (Both sun light and incandescent lamp)			
Ambient temperature/humidity	-10 to +50℃, 85%RH or less (not icing, not condensing)			
Protective structure	IP60 (IEC Standard), available up to IP64 by user's option			
Case material	ABS resin			
Weight	Approx. 500g			

■ Input/Output circuit



■ Connection



Terminal for power (M3 screw terminal)

Make sure to connect +V to terminal at left side for DC power. DC power provides on connector for interface too. Connect either one.

Connector for interface (25 pins D-sub connector)

Interface	Pin No.	Symbols	Functions
Current loop	13	TXD	Transmission input data
	12	TXD RET	
	10	RXD	Reception inputdata
	9	RXD RET	
	25	DCD	Carrier output
	24	DCD RET	
	15	TXD OFF	Transmission stop
	14	TXD OFF RET	
RS-232C	2	SD	Transmission data
	3	RD	Reception data
	8	CD	Reception carrior detect
	21	SD OFF	Transmission stop
Level	6	LEVEL	Light-reception level output
——	7・20	SG (0V)	GND for signal
Alarm	4	ARM	Alarm output
	5	ARM COM (0V)	
Power source	11	+VIN	Power source (10 to 30VDC)
	23	-VIN (0V)	

Note) Don't connect 0V for power source to ground for signal (SG).

BWF-13/23

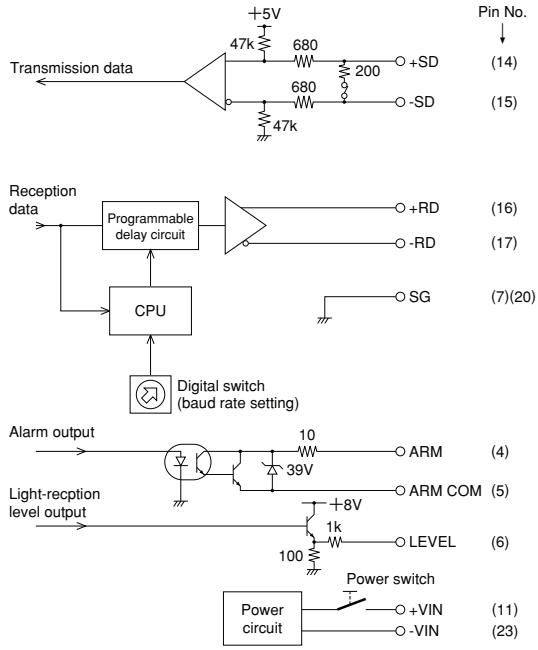
RS-422/RS-485 Multi-drop type

Max. 31 pcs can be connected to PC or PLC.

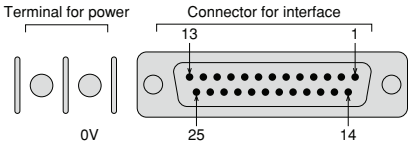
■ Specifications

Type	Serial type	
Model No.	**BWF-13A/13B**	**BWF-23A/23B**
Transmission distance	100m	200m
Directional angle	±2°	±1°
Transmission method	Full duplex two-way transmission	
Transmission speed	DC to 19.2kbps	
Input/Output interface	RS-422/RS-485 Multi-drop	
Modulation method	FSK modulation	
Modulation frequency	Type A (transmission 5.5MHz, reception 6.0MHz), Type B (transmission 6.0MHz, reception 5.5MHz)	
Power source	12 to 24VDC (10 to 30VDC)	
Current consumption	150mA or less (at 12VDC), 80mA or less (at 24VDC)	
Warning output	Photo-coupler (35V, 50mA), ON when light-reception level margin is 1.5 times or more and OFF when light-reception level margin is 1.5 times or less	
Light-reception level Output	0 to 5V (in proportion to light reception amount)	
Indication lamps	Power source, carrier detect, data input, data output, light-reception level margin (Red LED) POW (Power lamp): Light-up when power source ON CD(Carrier detect lamp): Light-up when light-reception, light-reception margin level 1 SD (Data input lamp): Light-up when transmission data input RD (Data output lamp): Light-up when reception data output L1 (Light-reception level lamp): Light-up when margin 1.5 times L2 ((Light-reception level lamp): Light-up when margin 2 times L3 (Light-reception level lamp): Light-up when margin 2.5 times	
Connection	Connector (25pins D-sub connector), but M3 screw terminal at power source	
Ambient illuminance	20,000lux or less (Both sun light and incandescent lamp)	
Ambient temperature/humidity	-10 to +50℃, 85%RH or less (not icing, not condensing)	
Protective structure	IP60 (IEC Standard), available up to IP64 by user's option	
Case material	ABS resin	
Weight	Approx. 500g	

■ Input/Output circuit



■ Connection



Terminal for power (M3 screw terminal)

Make sure to connect +V terminal at left side for DC power. DC power provides on connector for interface too. Connect either one.

Connector for interface (25 pins D-sub connector)

Interface	Pin No.	Symbols	Functions
RS-422/ RS-485 Multi-drop	14	+SD	Transmission data (+)
	15	-SD	Transmission data (-)
	16	+RD	Reception data (+)
	17	-RD	Reception data (-)
	18	+CD	Reception carrior detect (+)
	19	-CD	Reception carrior detect (-)
	12	+SRD OFF	Transmission/Reception stop (+)
	13	-SRD OFF	Transmission/Reception stop (-)
Level	6	LEVEL	Light-reception level output
——	7・20	SG (0V)	GND for signal
Alarm	4	ARM	Alarm output
	5	ARM COM (0V)	
Power source	11	+VIN	Power source (10 to 30VDC)
	23	-VIN (0V)	

Note) In case of RS-485, connect between +SD and +RD, -SD and +RD.
Note) Don't connect 0V for power source to ground for signal (SG).

BWF-110/210

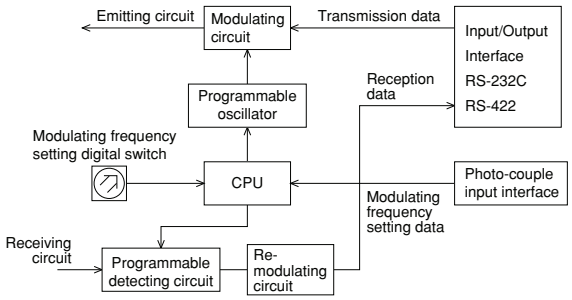
Multi-channel type

■ Specifications

Type	Serial type	
Model No.	**BWF-110**	**BWF-210**
Transmission distance	100m	200m
Directional angle	±2°	±1°
Transmission method	Full duplex two-way transmission	
Transmission speed	DC to 64kbps (But 19.2kbps for RS-232C)	
Input/Output interface	RS-232C/RS-422	
Modulation method	FSK modulation	
Power source	24VDC (Fluctuation range 18 to 30VDC)	
Current consumption	240mA or less (at 18VDC), 130mA or less (at 30VDC)	
Warning output	Photo-coupler (35V, 50mA), ON when light-reception level margin is 1.5 times or more and OFF when light-reception level margin is 1.5 timeas or less	
Light-reception level Output	0 to 5V (in proportion to light reception amount)	
Indication lamps	POW (Power lamp): Light-up when power source ON CD(Carrier detect lamp): Light-up when light-reception, light-reception margin level 1 SD (Data input lamp): Light-up when transmission data input RD (Data output lamp): Light-up when reception data output L1 (Light-reception level lamp): Light-up when margin 1.5 times L2 ((Light-reception level lamp): Light-up when margin 2 times L3 (Light-reception level lamp): Light-up when margin 2.5 times D0 (Lamp for modulating frequency setting value): Lowest bit D1 (Lamp for modulating frequency setting value) D2 (Lamp for modulating frequency setting value): Highest bit	
Connection	Connector (25pins D-sub connector), but M3 screw terminal at power source	
Ambient illuminance	20,000lux or less (Both sun light and incandescent lamp)	
Ambient temperature/humidity	-10 to +50℃, 85%RH or less (not icing, not condensing)	
Protective structure	IP60 (IEC Standard), available up to IP64 by user's option	
Case material	ABS resin	
Weight	Approx. 500g	

■ How to set receiving modulated frequency

Circuit structure



Modulating frequency

Type	A	B	C	D	E	F
Switch No.	0	1	2	3	4	5
Transmission	5.5MHz	6.0MHz	6.5MHz	7.0MHz	7.5MHz	8.0MHz
Reception	6.0MHz	5.5MHz	7.0MHz	6.5MHz	8.0MHz	7.5MHz
	A pair		A pair		A pair	

How to set (how to change)

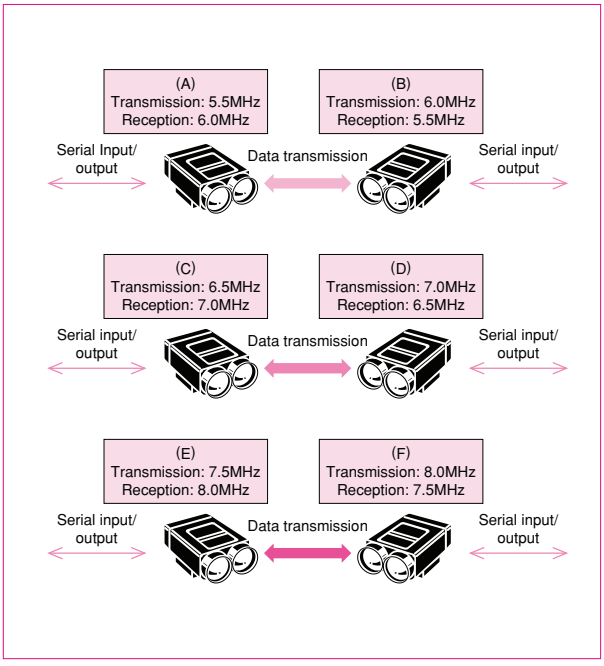
(1)It can be changed with inner digital switch (Rotary switch) or external input.

(2)In case of external input, it can set with 3 bits binary data.(Photo-coupler input, 18 to 26VDC, 5 to 10mA)

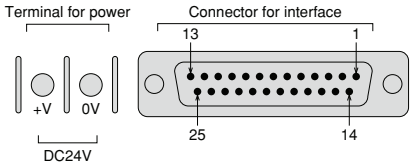
(3)Unused switch No. should be 0.

(4)Transmission/reception consists of each pair (A/B, C/D, E/F).

Modulating frequency can be set to A to F



■ Connection



Terminal for power (M3 screw terminal)

Make sure to connect +V terminal at left side for DC power.

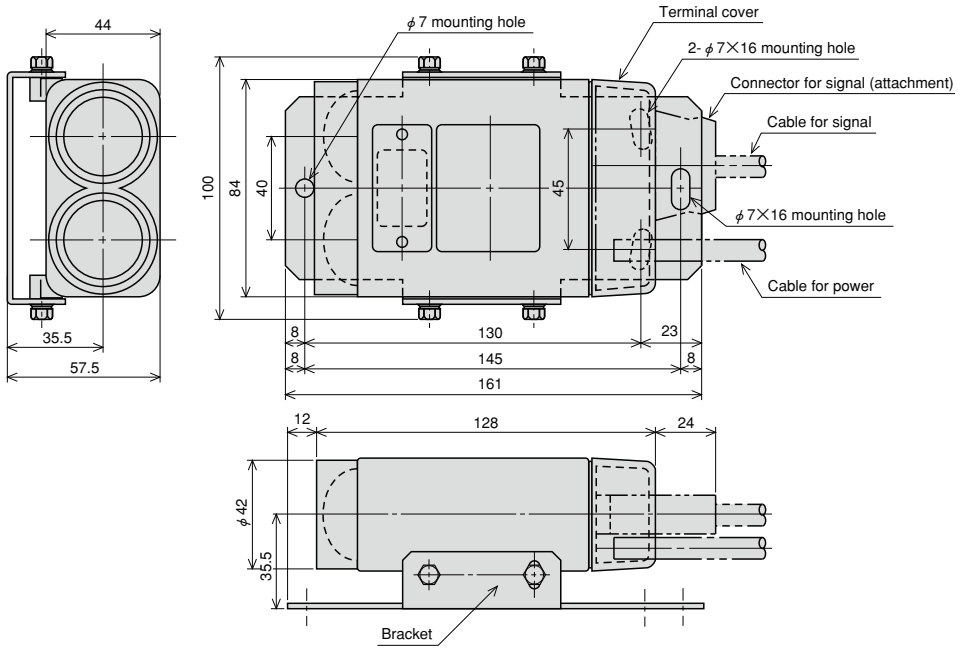
Connector for interface (25 pins D-sub connector)

Pin No.	Symbols	Functions
1	———	———
2	SD	Transmission data (RS-232C)
3	RD	Reception data (RS-232C)
4	ARM	Alarm output
5	ARM COM	Alarm output COM
6	LEVEL	Light-reception level output
7	SG	GND for signal (common)
8	CD	Reception carrior detect (RS-232C)
9	+COM	COM for frequency changeover
10	DO	For frequency changeover
11	+VIN	Power source (24VDC)
12	+SRD OFF	Transmission/Reception stop + (RS-422)
13	-SRD OFF	Transmission/Reception stop - (RS-422)

Pin No.	Symbols	Functions
14	+SD	Transmission data +(RS-422)
15	-SD	Transmission data -(RS-422)
16	+RD	Reception data +(RS-422)
17	-RD	Reception data -(RS-422)
18	+CD	Reception carrior detect +(RS-422)
19	-CD	Reception carrior detect -(RS-422)
20	SG	GND for signal (common)
21	SD OFF	Transmission stop (RS-232C)
22	———	———
23	-VIN	Power source (0V)
24	D1	For frequency changeover
25	D2	For frequency changeover

Note) Use either terminal or connector side for power source.
Note) Don't connect 0V for power source to ground for signal (SG).

■ External dimensions



Note) Adjusting angle, 4° for both up/down & right/left.