

Wireless charging system

0

600W type

RCS600 for 12V · 24V · 48V battery

Manual



Standard head



Long distance head

Thank you very much for purchasing the Wireless charging system RCS600 of B&PLUS.
Please read the instruction manual before use and please use the products correctly.

Request for use

- This product, which is one of those high frequency utilization equipment of Radio Law. In the case of using in Japan, please apply for a permission application for high frequency utilization equipment permission to Ministry of Internal Affairs and Communications. In the case of using the product out side Japan, please take appropriate action after confirming by yourself the standards and regulations to which the customer's system should conform. If you have any questions about the application, please contact our sales department.
- For the control communication device that is installed in the product, there is no need for (diploma) radio station authorization of the Minister as it corresponds to " a weak radio station (weak radio equipment)" to. However, please be careful when operating it as it may affect electronic devices (sensor devices) and medical devices (pacemakers, etc.).

Disclaimer

- In principle, repairs will be charged in the event of failure or damage caused by fire, earthquake, acts by a third party, other accidents, intentional or negligent use by the customer, misuse, or use under abnormal conditions.
- The Company is not liable for any incidental damages (loss of business profit, etc.) resulting from the use or inability to use this machine.
- If this unit is used for purposes other than battery charging, we cannot guarantee it.

※ Specifications subject to change without notice.



If there is a point of notice about the contents of this document, hope you'll give me your contact us, thank you.

For safety precautions

Please read, please use it correctly and full attention to safety this "Safety Precautions" before use. Incorrect handling may cause not only malfunction or failure, leading to an accident or injury. Also in order to prevent damage or injury, please look after.





■ About Warnings

You are viewing mark with the following notes on safety in this manual.






 Caution	It indicates that if ignoring this display, and operate the product in an improper manner, serious injury or possible death can occur.
 Attention	If you ignore the display, and operate the product in an improper manner, it indicates that there is a possibility that people bear the damage, the potential and property damage may occur.

■ About designation

The symbol shown in the instruction manual and product, have the following meanings.

	Shows the attention "Please be careful".
 	It shows that please without doing the "forbidden".
	It indicates mandatory "Please always run".

Caution

	Do not do the resolution and remodeling Failure to do so may result in fire, electric shock or malfunction. In addition, there is a risk that can lead to serious injury. When I perform the resolution and remodeling, a guarantee may not be received.
	Do not use it as trouble and an abnormal state Smoke, or in the case of such an abnormal state when abnormal noise or offensive smell is, please stop using it immediately. The Malfunction or electric shock , the cause of the fire.
	The equipment inside, do not insert foreign objects and water It may cause fire, smoke, electric shock, or malfunction due to malfunction or short circuit.
	This product is compatible with <u>12 VDC</u> or <u>24 VDC</u> or <u>48 VDC</u> lead battery and lithium ion battery. Because voltage current setting may be required depending on the type of battery and conditions of use, be sure to contact our sales representative when purchasing.
	In accordance with the instructions, please do the wiring and mounting Please ensure proper procedure to street work. The malfunction or cause of the fire.

Attention



Please do not take any action in the hot-line state

If you want to support the installation, maintenance, and failure, after confirming that the main circuit breaker (power board) is always out, please work. When working with hot-state, there is a potential for electric shock.



Please use the power supply as set forth in the specification always

If it is used in power outside of the specifications such as a power in excess of the rated voltage, there is a risk of overheating, fire or malfunction.



To contact a specialized dealer or installation of equipment (installation), the wiring

Improper by doing installation work on your own, you will malfunction or an electrical shock, the cause of the fire.



Keep the specified temperature range

Use the product so that its temperature does not exceed the specified temperature range. Using outside the specification range may cause equipment failure due to heat generation.



If you want to dispose of this product, you will be disposed of as industrial waste

Please dispose of in accordance with waste disposal regulations specified.



Please be sure to use the specified parts and accessories

The malfunction or accident, the cause of the fire.



Do not put your hands or metal objects between the coils during operation

There and heat generated by induction heating, the potential to catch fire.



Do not install in a place that may be exposed to high temperature

When installed in a place such as hot air heater or direct sunlight directly, it could cause a malfunction or fire.



Do not block the cooling fan

Heat build up inside and cause malfunction or fire.



Do not touch the high temperature part

Work for a while or immediately after operation, please do not touch the (power supply unit, charging unit, head part) hot spots. Doing so could result in burns.



Please be careful about the influence due to the installation environment

Please be careful about the influence on the material degradation due to the installation environment and the intrusion of foreign material. Especially when using it outdoors, please install it with less influence from ultraviolet rays.



Do not use a deteriorated battery

Charging a deteriorated battery may cause the battery to overheat, resulting in an accident or fire. Replace the battery regularly according to the battery manufacturer's recommended replacement time.



Do not use head cables other than those specified by us.

If you use a cable other than the specified one, the cable may generate heat, resulting in an accident, malfunction, or fire. Be sure to use the specified cable.



Do not disconnect the battery while charging

If the battery is disconnected during charging, it may cause an accident, malfunction or fire. Be sure to check that the battery is not charged before disconnecting the battery.

⚠ Attention



Do not use under conditions with excessive vibration or impact

Using it beyond the conditions may cause an accident, malfunction or fire. Be sure to use it within the specifications.



Do not use in a state where it is filled with dust containing oil and moisture and accumulated.

Accumulation inside the device may cause a malfunction or fire. Clean it regularly or put it in a case to protect it.

About the description in the manual

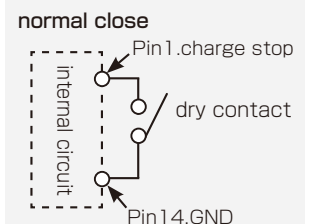
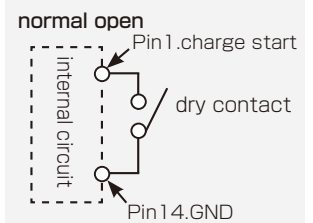
- The charging unit of this product have two specifications, normal open type and normal close type.

	normal open	normal close
12V type	RCS600-CA12	RCS600B-CA12
24V type	RCS600-CA24	RCS600B-CA24
48V type	RCS600-CA48	RCS600B-CA48

Please see P.17 for details.

normal open type: external connection pin (Pin) is arranged as shown on the right. When the dry contact is ON, charging starts, and when it is OFF, charging stops. To start charging, it is necessary to turn it on on the ON connector, separate wiring, or on the control side.

normal close type: the external connection pin (Pin) is arranged as shown on the right. When the dry contact is OFF, charging starts, and when it is ON, charging stops.



- This manual is for 600W wireless power supply system for 12V or 24V or 48V battery.

The following label is displayed in the explanation of the specific specifications.

Please do not confuse the description, and make sure to check the corresponding part.

normal open normal close



Shown in the explanation for 12V type



mark is posted as a representative.



Shown in the explanation for 24V type



mark is posted as a representative.



Shown in the explanation for 48V type



mark is posted as a representative

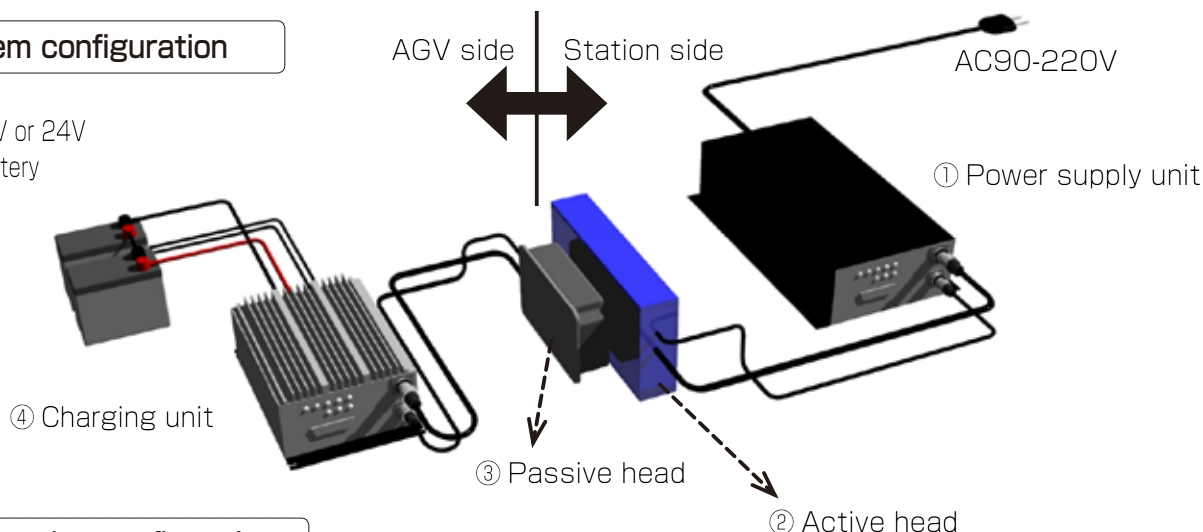
1. Product summary	
– System configuration	6
– Basic Product Configuration	6
– Product information	6
2. Basic operation	
– Various functions and protection	7
3. The name and specification of each part	
– Power Supply unit	8
– Active Head (Standard · Long Distance)	9
– Charging unit	10
– Passive Head (Standard · Long Distance)	11
4. Notes at the time of installation (at the time of attachment)	
– Power supply unit and Charging unit	12
– Heads	12
5. Maintenance	14
6. About each unit and LED output display	
– Power supply unit display	15
– Charging unit display	16
7. Connection diagram	
– Standard Specification Head	18
– Long distance Specification Head	19
8. Operation method	
– How to switch on a power supply	20
– How to turn off the power	20
– About basic charging	21
– About charge control	22
– Other	24
9. About included product and optional products	25
– Additional bundle purchase type	25
– Options	26
10. Identifying and troubleshooting abnormalities	
– LED indications for power supply and charging unit in case of abnormality	28
– Troubleshooting	29
11. Consultation on how to use and repair	30

1. Product summary




This product is a revolutionary wireless charging system that generates high-frequency waves from an AC power source and transmits power to the charging control circuit in a non-contact manner. It is a revolutionary wireless recharging system that also has a signal communication function.

System configuration

Various 12V or 24V
or 48V Battery






Basic product configuration

	Type code (12V)	Type code (24V)	Type code (48V)	Discription
① Power supply unit	RCS600-AC (Common specification)			<ul style="list-style-type: none"> Convert AC power to high frequency. Receives the input signal and supplies high frequency to the active head. Output various signals received by the active head to the external control device.
② Active Head	RCS600-AH (Standard type)			<ul style="list-style-type: none"> By electromagnetic coupling method, power is transmitted to the passive head without contact. Receives various signals from the passive head, and transmitted to the power supply unit.
	RCS600-AH-L (Long distance type)			
③ Passive Head	RCS600-CH (Standard type)			<ul style="list-style-type: none"> The receiving power from the active head, and supplies power to the charging unit. Various signals output from the charging unit are transmitted to the active head wirelessly.
	RCS600-CH-L (Long distance type)			
④ Charging unit	RCS600-CA12 ^{*1} RCS600B-CA12 ^{*2} 	RCS600-CA24 ^{*1} RCS600B-CA24 ^{*2} 	RCS600-CA48 ^{*1} RCS600B-CA48 ^{*2} 	<ul style="list-style-type: none"> Charges the battery. Monitors the battery voltage and outputs the results to the receiving head and external control equipment connected to the unit.

*1 normal open type *2 normal close type

The type code ending in "-NOP" is a model that does not come with a thermistor. The type code of the charging unit (normal open, normal close) is generally described after this in this manual. "RCS600 (B) -CA__"

Product informaiton

	12V type 	24V type 	48V type 
Charging method (See page 22 for the details)	CC · CV charge control Charge voltage : Max.15V Charge current : Max.34A	CC · CV or CP · CV charge control Charge voltage : Max.35V Charge current : Max.25A	CC · CV or CP · CV charge control Charge voltage : Max.60V Charge current : Max.12A
Compatible battery	12VDC lead battery, 12VDC lithium ion battery	24VDC lead battery, 24VDC lithium ion battery	48VDC lead battery, 48VDC lithium ion battery
Default setting (See page 21)	Charge voltage : 14.4V Charge current : 34A Recharge voltage : 12V	Charge voltage : 28.8V Charge current : 20A Recharge voltage : 24V	Charge voltage : 57.6V Charge current : 10A Recharge voltage : 48V

2. Basic operation

Various functions and protection

○ Non-contact power transmission & signal transmission system

Since power transmission and signal transmission are done in a non-contact manner by electromagnetic coupling method, there is no problem even if glass or plastic exists in the transmission space.

○ Oscillation power control function

If you have a transmission area within the specified range within the active head / passive head, active head will make the oscillation behavior by controlling so that the internal voltage is constant value. If not in the transmission area is passive head, and it is the specifications that make the intermittent oscillation. If the passive head is in the transmission area, the Ready LED of the power supply unit will light and the Ready signal will be output to the outside.

○ Head overheat protection function

When the internal heat generation of the head exceeds a certain temperature during oscillation of the head, the protection function is activated and the operation shifts to the intermittent oscillation operation.

○ Charging function

The battery is charged by CC / CV charging or CP / CV charging, and it can be almost fully charged. When the charging voltage exceeds a certain level, it is judged to be fully charged and charging is completed. (See page 22)

○ Battery voltage abnormality

Stops charging when battery voltage is detected outside a certain value. (See page 28)

○ Over current protection

When charging current reaches a certain level or more it stops. (See page 28)

○ Over voltage protection

When charging voltage reaches a certain level or more it stops. (See page 28)

○ Battery overheating protection

When the battery reaches a certain temperature or below, charging stops. (See page 28)

○ Recharge function

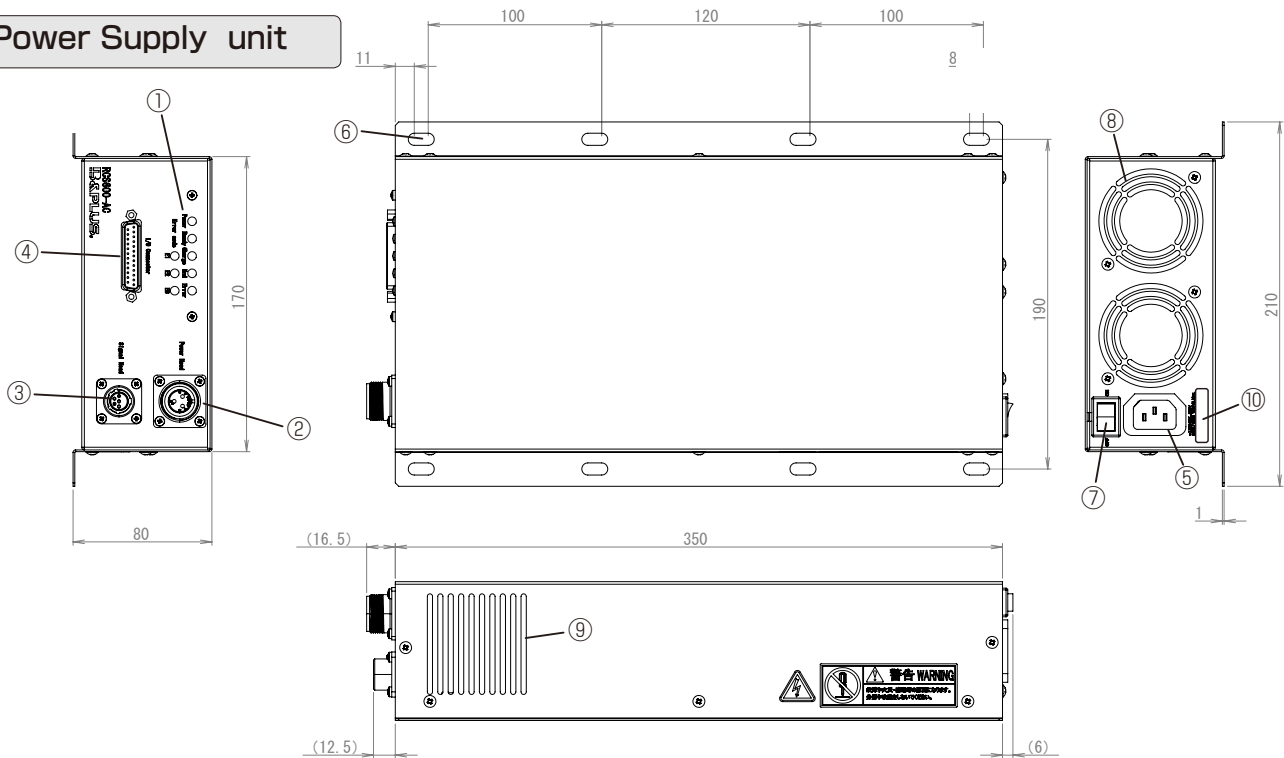
If the battery is discharged with the heads facing each other after reaching the set constant voltage and the charge is complete, the battery will start charging again when the re-charge voltage falls below the set re-charge voltage. (See page 21)

○ Other functions

- Output frequency · · · The frequency to oscillate for non-contact power supply is $85\text{kHz} \pm 1\text{kHz}$.
- Power supply operation · · · When the main power is turned on, the device goes into a standby state, and when the passive head is located within the rated gap in the active head, power supply starts automatically. In addition, during power supply, the operation adapts to the constant current and constant voltage power supply control performed by the charge control device on the power receiving side.
When the passive head goes out of the power transmission range, it automatically stops supplying power and goes into a standby state.
- An abnormality is detected, charging is stopped, and an LED is displayed on the surface of the power supply unit.
The cause of the error display is shown in the power supply unit and charging unit error determination LED display.
- End of charging · · · Charging ends when the charging current is $1.0\text{A} \pm 0.5\text{A}$ or less.

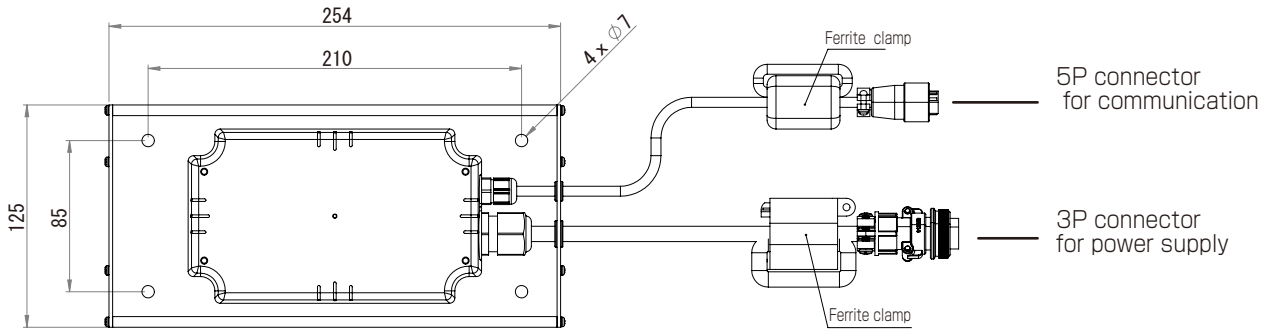
3.The name and specification of each part

Power Supply unit

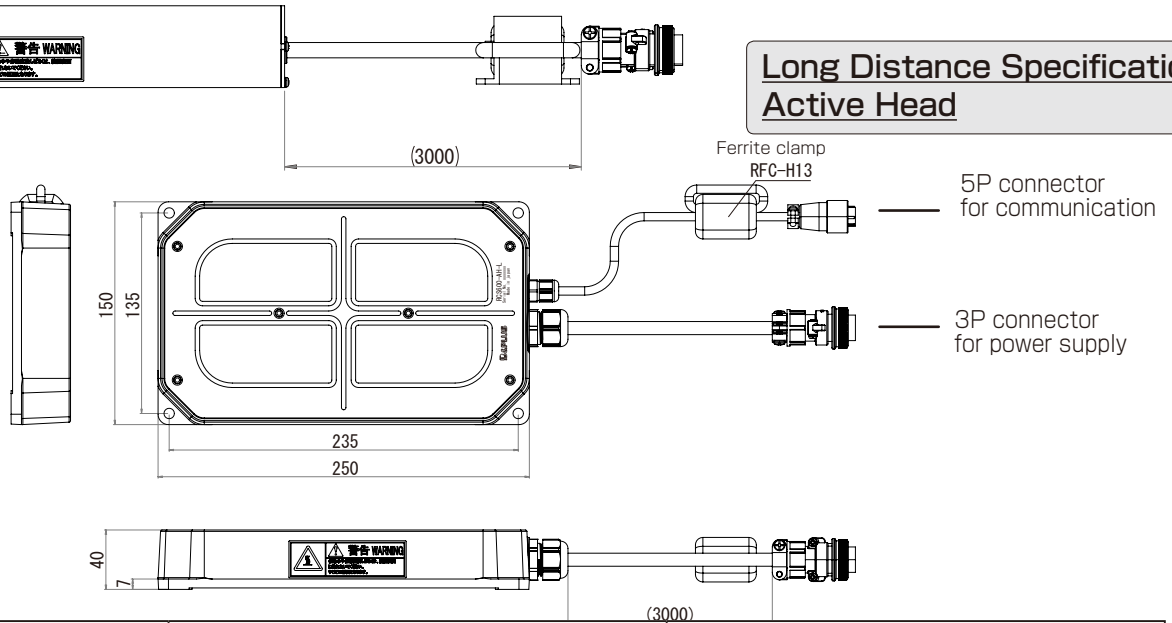


Type code	RCS600-AC	
Applicable active head	RCS600-AH, RCS600-AH-L	
Rated input voltage	AC100V / AC200V	
Supply voltage	AC 90V ...AC 220V Single phase 50/60 Hz	
Current consumption	9A (at 100V), 4.5A (at 200V)	
① LED display	Power, Ready, Charge, End, Error, E1 ~ E3 (See page 15)	
External output	Power, Ready, Charge, End, Error, E1 ~ E3	
Operating temperature	0...50℃	
Storage temperature	-10...50℃	
Operating humidity	35 ... 90% RH or less However, no condensation	
Isolation	≥ 50M Ohm	
Dielectric strength	AC1500V, 1 minute	
Shock rating	10 G, in the X, Y, and Z directions 11 ms	
Vibration rating	19.6 m / sec ² (10 to 55 Hz), 20 times in X and Y directions	
Protection class	IP20 (Indoor installation type)	
Weight	3.3kg	
Conne- ction	② For power supply	Round 3-pin
	③ For communication	Round 5-pin
	④ I/O connector(external I/O signal)	D-sub25-pin (See page 15)
	⑤ Power	3P inlet/ This path has an overcurrent protection circuit with a fuse. The ground resistance should be 100 Ω or less.
Cooling method	Forced air cooling	
Protection circuit	Overheat protection	
Material	Case	SECC
⑥ Mounting part	7mm x 15mm (M6 bolt: 4 mounting locations, 4 auxiliary locations) for enclosure fixing	
⑦ Power supply switch	Main power on/off	
⑧ Exhaust port	Since this product uses a forced air cooling system with a built-in fan, take care to ensure that the air intake and exhaust ports are not blocked, and that the installation environment of the unit does not hinder convection so that heat does not accumulate	
⑨ Inlet		
⑩ Serial number label	SERIAL NO description	
Accessories	Power cable with ferrite clamp E04SR401938 (gray) 1PC. Filters for air intake 8pcs., tapes 8pcs.	

Standard Specification Active Head

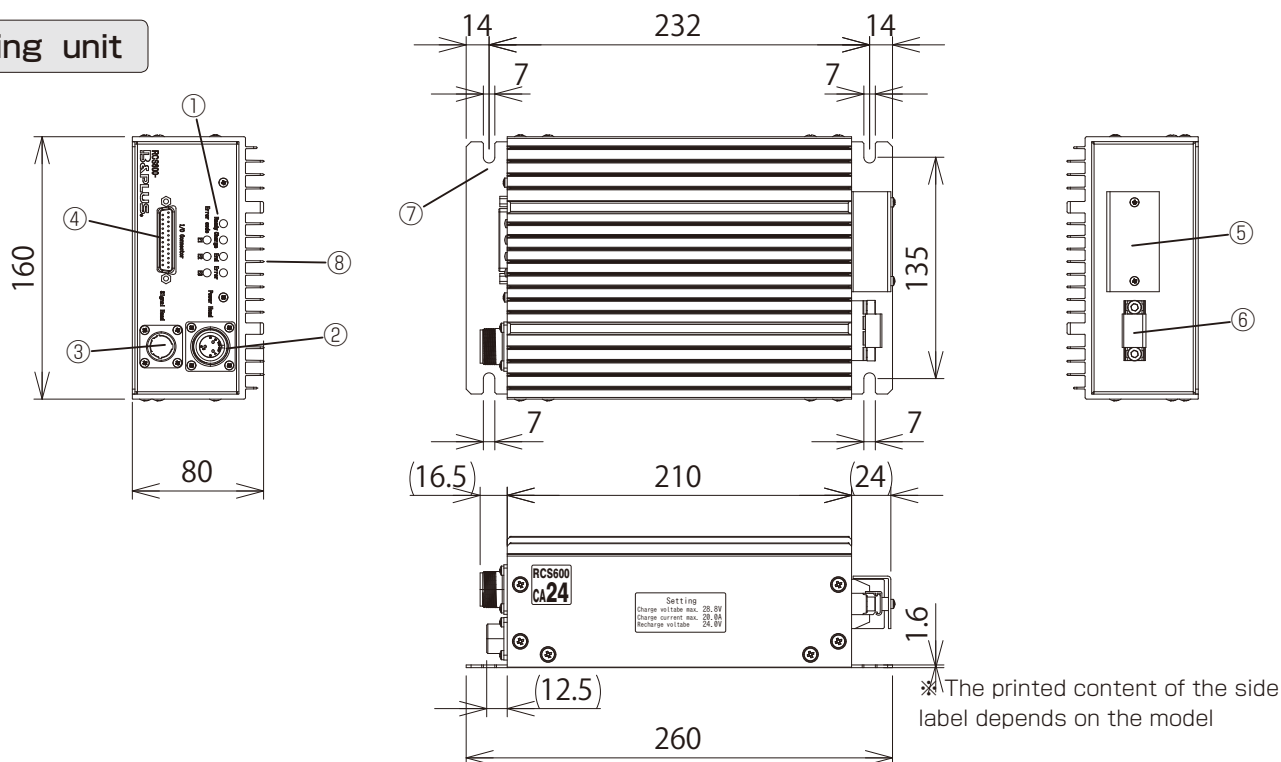


Long Distance Specification Active Head



		Standard Specification Active Head	Long Distance Specification Active Head
Type code		RCS600-AH(3.0m),RCS600-AH-005(0.5m)	RCS600-AH-L(3.0m), RCS600-AH-L-005(0.5m)
Applicable unit		RCS600-AC	
Rated gap	Distance	0 ~ 20mm	20 ~ 40mm * Be sure to follow the specified distance.Using outside the specifications may damage the equipment.
	Center offset	± 10 mm in the X axis direction and ± 15 mm in the Y axis direction (For details, see P. 13)	± 10mm in X axis direction. ± 20mm in Y axis direction. However, the total displacement of the XY axes can be up to 20mm. (See page 13 for details)
Operating temperature		0...50°C	
Storage temperature		-10...50°C	
Operating humidity		35 ... 90% RH or less However, no condensation	
Isolation		≥ 50M Ohm	
Dielectric strength		2000 VAC / 1min	
Shock rating		10 G, in the X, Y, and Z directions 11ms	
Vibration rating		19.6 m / sec ² (10 to 55 Hz), 20 times in X and Y directions	
Protection class		IP65 (Indoor installation type)	IP6X (Indoor installation type)
Weight(including cable connector part)		3.0kg(Cable length3.0m)/2.5kg(Cable length0.5m)	3.3kg(Cable length3m)/2.8kg(Cable length0.5m)
Connection	Supply	Connected to the Charging unit at the (male) 3-pin round	Connected to the Charging unit at the (male) 3-pin round
	Communication	Connected to the Charging unit at the (male) 5-pin round	Connected to the Charging unit at the (male) 5-pin round
Material	Case	PPS, aluminum	
	Output cable	φ 8.6 2.5mm ² x 3 PUR	
	Communication cable	φ 5.6 0.3mm ² x 4 PUR	
Mounting part		For enclosure fixing φ 7 × 4 places	
Accessories		positioning label,2 ferrite clamp RFC -H13(white) 1PC., ferrite clamp E04SR401938 1PC.	positioning label,ferrite clamp RFC-H13 (white) 1PC., ferrite clamp E04SR401938 for power cable (gray)1PC.
Max. cable length when using optional cable		5.5m	5.5m * Extending the cable of a long-distance head may cause premature switching of CC ⇒ CV.
Remarks		See page 26-27 for cable variations.	

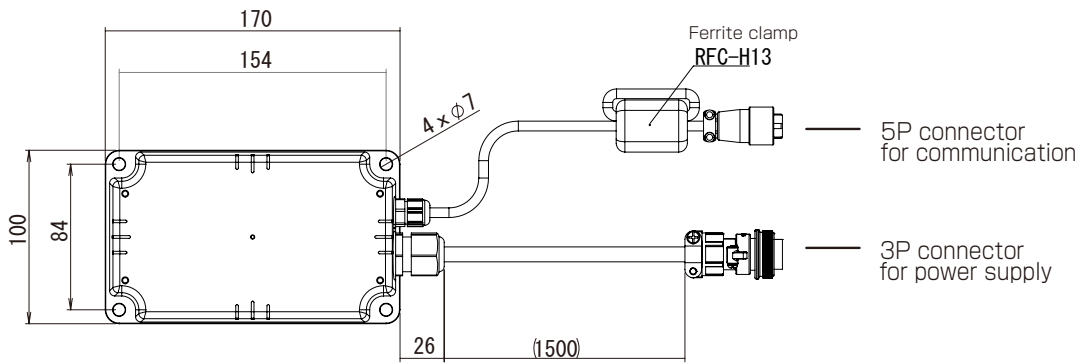
Charging unit



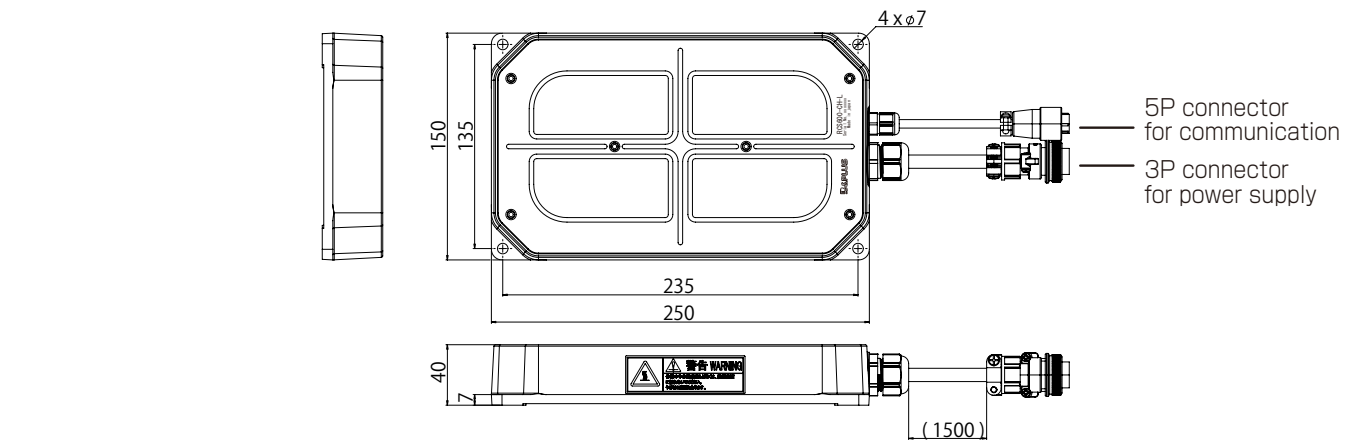
Type code	normal open normal close	RCS600-CA12 RCS600B-CA12	RCS600 CA12	RCS600-CA24 RCS600B-CA24	RCS600 CA24	RCS600-CA48 RCS600B-CA48	RCS600 CA48	
Applicable passive head	RCS600-CH, RCS600-CH-L							
Applicable battery	Lithium ion battery, Lead battery							
Output voltage	Max.15V		Max.35V		Max.60V			
Output current	Max.34A		Max.25A		Max.12A			
External input	normal open :Charge start signal (activation signal) normal close: Charge stop signal							
External output	Ready, Charge, End, Error, E1 ~ E3							
① LED display	Ready, Charge, End, Error, E1 ~ E3							
Operating temperature	0...50°C							
Storage temperature	-10...50°C							
Operating humidity	35 ... 90% RH or less However, no condensation							
Isolation	≥ 50M Ohm							
Dielectric strength	AC1500V/1min							
Shock rating	10 G, in the X, Y, and Z directions 11 ms							
Vibration rating	19.6 m / sec ² (10 to 55 Hz), 20 times in X and Y directions							
protection class	IP40 (Indoor installation type)							
Weight	2.8kg		2.7kg		2.7kg			
Conne- tion	② For power supply	Round 3-pin						
	③ For communication	Round 5-pin						
	④ I/O connector (external I/O signal)	D-sub 25-pin						
	⑤ Battery (terminal screw M5)	Terminal block (M5) to connect the AGV battery. For details on charging method, see p. 21. (Values are factory default settings.)						
⑥ Thermistor (terminal screw M4)	Thermistor connection terminal block (M4) for AGV battery temperature detection. Install the thermistor supplied as an ac- cessory. *Operation with a resistor is not compensated. When extending the cable, use a cable of 0.25 mm ² or more. When the battery temperature is other than -10 to 60° C, an abnormal battery temperature is output and charging is stopped.							
Cooling method	Natural air cooling							
Protection circuit	Battery	Battery high / low temperature protection						
		Over voltage protection						
		Over current protection						
Material	Case	Aluminum						
⑦ Mounting part	For enclosure fixing 7mm wide M6 bolt x 4 places							
⑧ Fin for heat dissipation	Since this product uses a natural air cooling system, in order to obtain a higher cooling effect, install the unit so that it does not interfere with convection, and be careful not to let heat build up.							
Accessories	Thermistor(Not included in the -NOP type) Dsub 25P-Connector for start signal ON (included only to normal open type)							

*normal open and normal close have different colors on the front and rear panels. (normal open: gray normal close: black)

Standard Specification Passive Head



Long Distance Specification Passive head



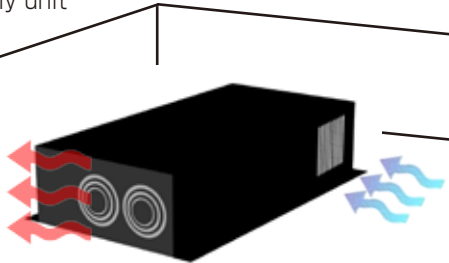
		Standard Specification Passive Head	Long Distance Specification Active Head
Type code		RCS600-CH(1.5m),RCS600-CH-01(1.0m),RCS600-CH-005(0.5m)	RCS600-CH-L(1.5m), RCS600-CH-L-01(1.0m) RCS600-CH-L-005(0.5m)
Applicable unit		RCS600(B)-CA24 or RCS600(B)-CA12	or RCS600(B)-CA48
Rated gap	Distance	0 ~ 20mm	20 ~ 40mm * Be sure to follow the specified distance.Using outside the specifications may damage the equipment.
	Center offset	± 10 mm in the X axis direction and ± 15 mm in the Y axis direction (For details, see P. 13)	± 10mm in X axis direction. ± 20mm in Y axis direction. However, the total displacement of the XY axes can be up to 20mm. (See page 13 for details)
Operating temperature		0...50°C	
Storage temperature		-10...50°C	
Operating humidity		35 ... 90% RH or less However, no condensation	
Isolation		≥ 50M Ohm	
Dielectric strength		2000 VAC / 1 min	
Shock rating		10 G, in the X, Y, and Z directions 11 ms	
Vibration rating		19.6 m / sec ² (10 to 55 Hz), 20 times in X and Y directions	
Protection class		IP65 (Indoor installation type)	IP6X (Indoor installation type)
Weight(including cable connector part)		2.0kg(Cable length1.5m)/1.8kg(Cable length0.5m)	3.1kg(Cable length1.5m)/2.9kg(Cable length0.5m)
Connection	Supply	Connected to the Charging unit at the (female) 3-pin round	Connected to the Charging unit at the (female) 3-pin round
	communication	Connected to the Charging unit at the (female) 5-pin round	Connected to the Charging unit at the (female) 5-pin round
Material	Case	PPS, aluminum	
	Output cable	φ 8.6 2.5mm ² x 3 PUR	
	Communication cable	φ 5.6 0.3mm ² x 4 PUR	
Mounting part		For enclosure fixing φ 7 × 4 places	
Accessories		Central positioning label, ferrite clamp RFC-H13(white) 1PC.	Central positioning label, ferrite clamp E04SR401938 for charging cable (gray) 1PC.
Max. cable length when using optional cable		5.0m	5.0m * Extending the cable of a long-distance head may cause premature switching of CC ⇒ CV.
Remarks		See page 26-27 for cable variations.	

4. Notes at the time of installation

(at the time of attachment)

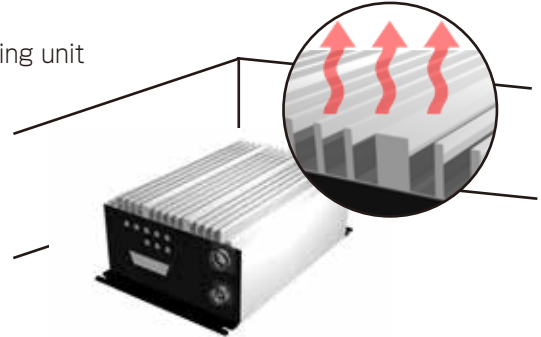
Power supply unit and Charging unit

Power supply unit



Since this product uses a forced air cooling system with a built-in fan, take care to ensure that the air intake and exhaust ports are not blocked, and that the installation environment of the unit does not hinder convection so that heat does not accumulate.

Charging unit



Since this product is a natural air cooling system, in order to obtain a higher cooling effect, please install the unit so that the installation environment does not interfere with convection and do not allow heat to build up.

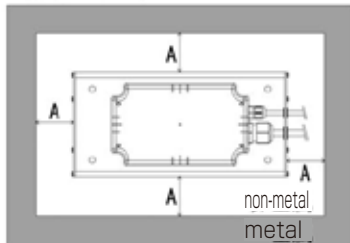
Heads

○ Influence of surrounding metal

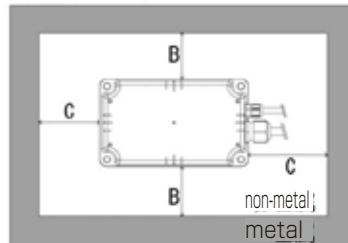
To avoid influence of surrounding metal, keep minimum spacing.

Also, please remove metal chips and cutting pieces on the transmission surface of the head part. Metal pieces may generate heat, which may result in damage to equipment or accidents. Therefore, install it so that the metal does not face each other for a long time within the range outside the specifications.

■ Active Head / RCS600-AH



■ Passive Head / RCS600-CH

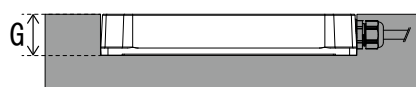
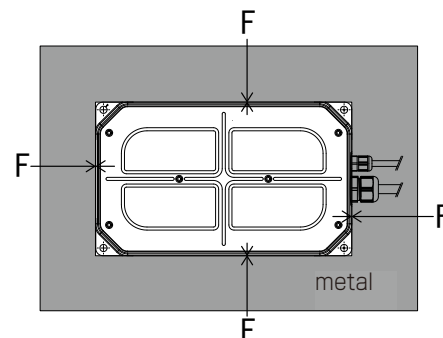


	(mm)				
	A	B	C	D	E
Active Head RCS600-AH	45	/	/	46	/
Passive Head RCS600-CH	/	57.5	87	/	45



■ Long Distance Specification Active Head / RCS600-AH-L

■ Long Distance Specification Passive Head / RCS600-CH-L

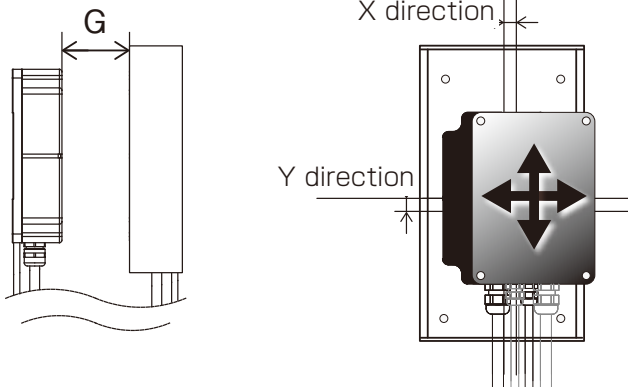


	(mm)	
	F	G
Active Head RCS600-AH-L	0	40
Passive Head RCS600-CH-L		

○ For the transmission distance and center off-set between the heads

Set the allowable misalignment of the passive head and the active head within the following ranges.

If the product is used outside the range, you may or equipment degradation of transmission efficiency may be damaged. Also, it is not possible to combine a standard head and a long distance head.



■ Standard Specification Head

Direction	Distance
G	0 ~ 20mm
X	± 10mm
Y	± 15mm

■ Long Distance Specification Head

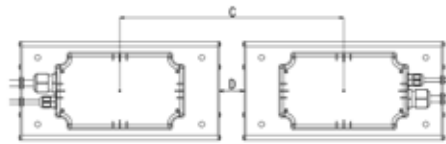
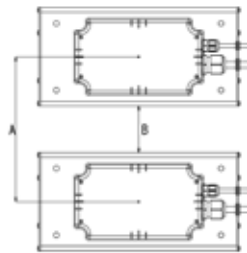
Direction	Distance
G	20 ~ 40mm
X	± 10mm
Y	± 20mm

* The total axis misalignment of XY for long distance specifications is up to 20mm.

· Mutual Interference between the heads

If you are installing in parallel head, to avoid the effects of mutual interference, please attach the head with an interval greater than or equal to the value shown in the table below always.

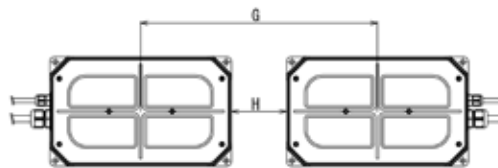
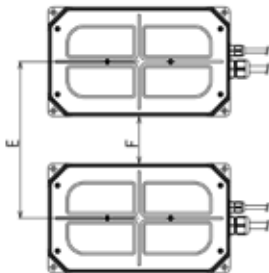
■ Standard Specification Head



Type code	A	B	C	D
RCS600-AH	170	45	300	46
RCS600-CH				

(mm)

■ Long Distance Specification Head



Type code	E	F	G	H
RCS600-AH-L	190	40	290	40
RCS600-CH-L				

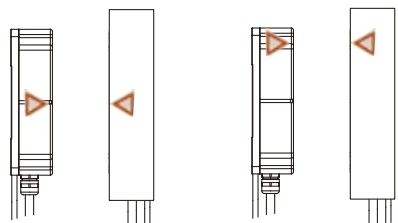
(mm)

○ Positioning label

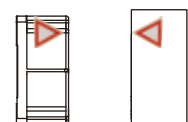
Positioning label is included for head positioning.

An example of pasting is shown, so please use it if necessary.

【Side view】

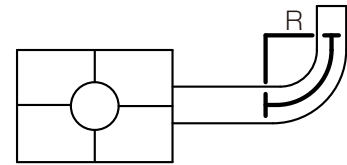


【Top view】



R bending of the head and the cable line
Please make the following is greater than
or equal to the number of R(mm) bending of the cable line.

- Active Cable and Passive Cable : R50
- Signal Cable line : R30



○ Installation of ferrite clamp
For details, see P.18 ~ P.20

5. Maintenance

<Maintenance>

The cooling fan and power switch may require maintenance depending on the operating environment and frequency of use. If you notice any abnormality when using the product, please contact us. Also, to reduce dust/mist, attach the filter included with the power supply unit to the air inlet of the power supply unit. The filter should be inspected periodically, and if any clogging, deterioration, or contamination is observed, the filter should be replaced immediately. If the filter becomes dirty, not enough air can be taken in, which may cause malfunction or fire. For replacement filters, see P.25 in the section "9. Included and Optional Accessories".

◆ Filter (Type : RCS-FILTER01)

This is a filter for the RCS600-AC. Please use it by attaching it to the air intake section. A separate instruction manual is available. (No.T320403)



Reference example

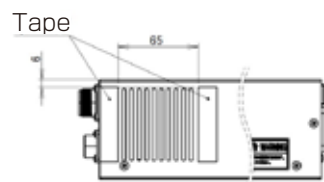
Both sides need to be attached



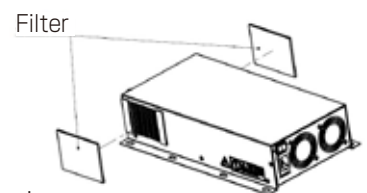
Filter
8pcs. included
24pcs. for optional purchases



Tape
8pcs. included
8pcs. for optional purchases



Tape



Filter

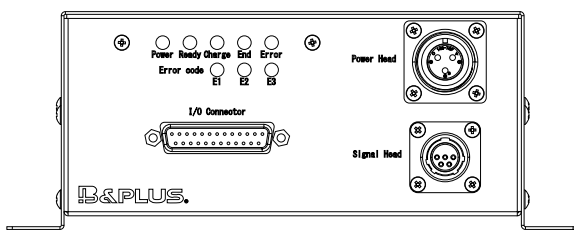
installation image

■ Daily inspection		
Inspection point	Inspection details	Inspection method
Inspection of each device · Power connector · Each terminal block of the Charging unit · Connectors between devices · LED lighting · others	Whether there are any damaged parts Whether the screws have fallen off Whether the wiring is connected correctly Whether there is any abnormal noise Whether there is odor Whether the connector is properly connected Whether an abnormality has occurred	Please check by sight, sound and smell.
Presence or absence of metal foreign matter besides the active head or passive head	Whether there is any metallic foreign matter between and around the head	Please check by sight.
Error indication LED lighting	Whether Error, E1 to E3 are not lit	Please check by sight.
Power supply cooling fan operation	Whether it is operating without noise	Please check by sight and sound.

■ Periodic inspection		
Inspection point	Inspection details	Inspection method
All units (once/year)	Check for looseness and missing screws, bolts, nuts, etc. Whether dust has accumulated on each device	Check visually and retighten.
Battery inspection (at least 1-2 times/year)	Whether the battery has deteriorated	Check according to the battery manufacturer's instruction manual or specifications.
Check the cooling status of the power supply unit (1-2 times or more/year)	Whether the slits of the inlet or exhaust port are clogged with dust, etc.. Whether foreign matter is attached Whether the cooling fan is working without abnormal noise	Please check visually, sound, and airflow, and if necessary, clean or replace (consult with our person in charge).
Check if the charging unit output setting is the specified value (twice/year)	Check the charging voltage/current settings	Measure with a voltmeter and ammeter at the charging unit output terminals.
Check the usage conditions (at least 1-2 times/year)	Whether the transmission distance between heads fluctuates greatly (is it within the transmission distance range?) Check whether the cooling function has deteriorated due to accumulation of dust, etc. around the equipment.	Please check visually, with a distance meter, etc. If there is a problem, please adjust and clean

6.LED/IO connector for each units

Power supply unit (RCS600-AC)

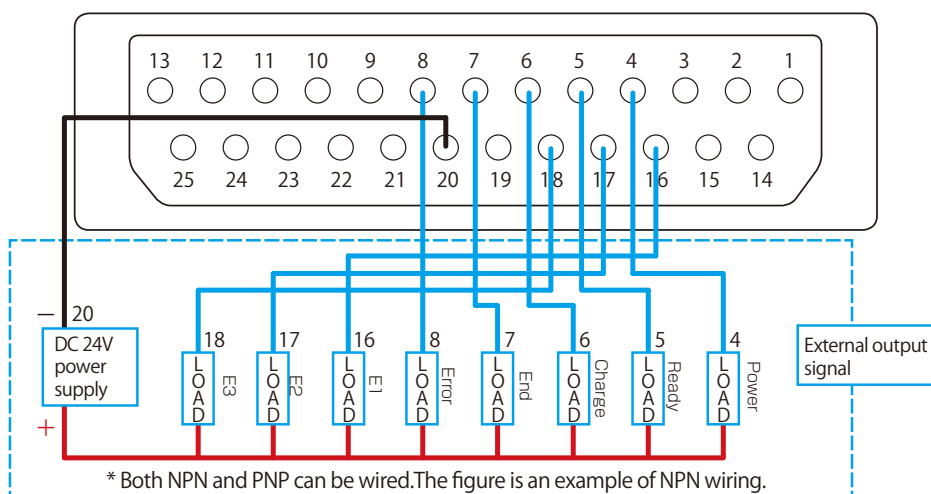


LED output display

Name	Function	Display	Output
Power	Display main power supply	Lit green	Present
Ready	Displayed in the stopped charging state (charging standby state)	Lit blue	Present
Charge	Displaying during constant current or voltage charge operation	Lit orange	Present
End	Display the end of charging	Lit green	Present
Error	Indicates abnormality	Lit red	Present
Error code	Display abnormal contents by combination E1 ~ E3.	Lit red	Present

For details on how to identify and deal with abnormalities, please refer to "Identifying and Troubleshooting Abnormalities" on page 28.

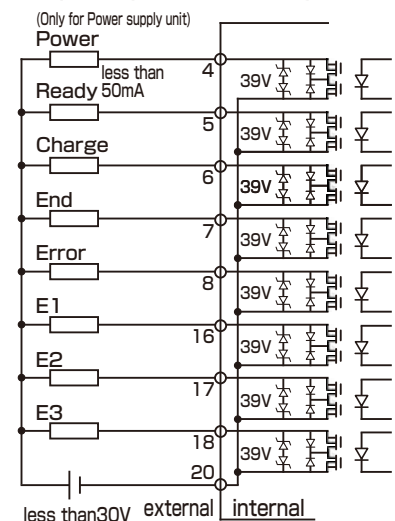
I/O connector



* Both NPN and PNP can be wired. The figure is an example of NPN wiring.

Fitting surface of connector (cable wiring side)

Output signal circuit diagram



Protective cap : DB-25S-DC1 Hirose Electric
Mounting screw: M2.6 (mm screw)

○ Connector specification
If necessary, the followings are recommended.

Connector: D-sub 25 pin (male)
Soldering type : HDBB-25P (05) Hirose Electric
Case made by HDB-CTH Hirose Electric
Terminal block type : SUBCON 25M-SH made by Phoenix Contact







I/O connector function

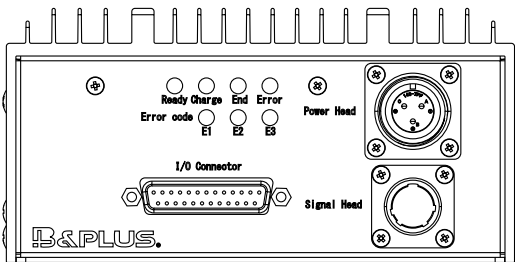
Name	Function	Pin No.	Remark
Power	ON with power supply	4,20	Output
Ready	ON when charging is stopped (charging standby state)	5,20	Output
Charge	ON during constant current or constant voltage charge operation	6,20	Output
End	ON at the end of charging	7,20	Output
Error	ON when abnormal	8,20	Output
E1 E2 E3	The abnormality are indicated by LED lighting combinations of E1 to E3	16,20 17,20 18,20	Output

The operation status of the power supply unit is output to the outside at the same time as the LED display. As for the operation of the output signal, the output turns ON when the LED lights up. Each output is an open collector output circuit with a rated voltage of 24V and a maximum current of 50mA. Built-in output surge absorption protection circuit (maximum 39V).

* Do not wire in combinations other than those listed in "I/O connector functions" above. Wiring to pins other than those listed above may result in malfunction.

Charging unit (RCS600(B)-CA __)

	Type code	
	Normal open	Normal close
12V type	RCS600-CA12 	RCS600B-CA12 
24V type	RCS600-CA24 	RCS600B-CA24 
48V type	RCS600-CA48 	RCS600B-CA48 

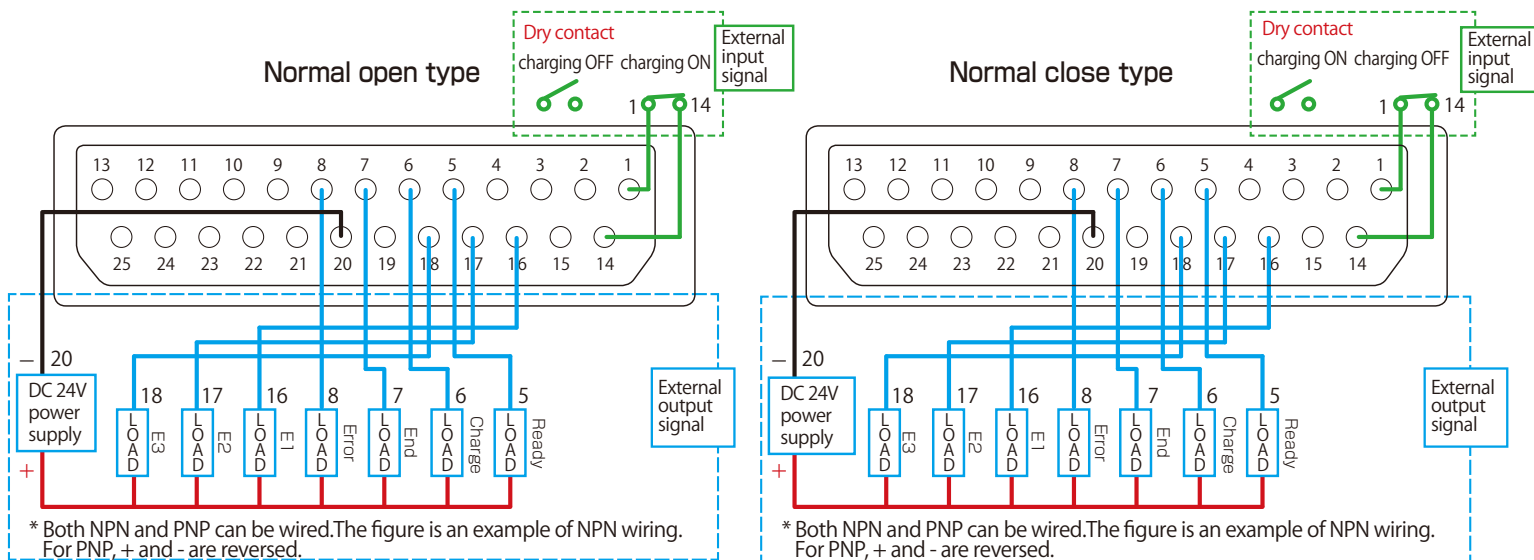


LED output

Name	Function	Display method	Output
Ready	Displayed in the stopped charging state (charging standby state)	Lit Blue	Present
Charge	Displaying during constant current or voltage charge operation	Lit Orange	Present
End	Display the end of charging	Lit Green	Present
Error	Indicates abnormality	Lit in Red	Present
Error code	Display abnormal contents by combination E1 ~ E3.	Lit in Red	Present

For details on how to identify and deal with abnormalities, please refer to "Identifying and Troubleshooting Abnormalities" on page 28.

I/O connector



* Both NPN and PNP can be wired. The figure is an example of NPN wiring. For PNP, + and - are reversed.

* Both NPN and PNP can be wired. The figure is an example of NPN wiring. For PNP, + and - are reversed.

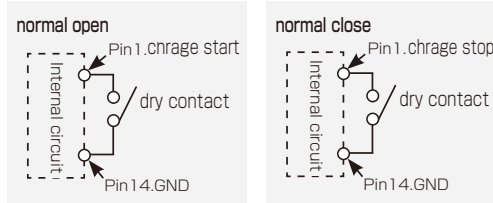
Fitting surface of connector (cable wiring side)

Fitting surface of connector (cable wiring side)

normal open type: When you connect Pin 1 and Pin 14, charging will start. Since the charging unit does not operate (charge) unless Pin 1 and Pin 14 are connected, use the attached Dsub25P start signal ON connector, or turn it ON separately by wiring or on the control side.

normal close type: Since Pin 1 and Pin 14 are connected in advance, charging will start when the power is turned on and the heads are properly facing each other.

■ Wiring of start signal of charging unit



I / O connector function

Name	Function	Pin No.	Remark
Charge start signal(activation signal)	dry contact ON: start charging dry contact OFF: stop charging	1,14	Input
Charge stop signal	dry contact ON: stop charging dry contact OFF: start charging		
Ready	Displayed in the stopped charging state (charging standby state)	5,20	Output
Charge	ON during constant current or constant voltage charge operation	6,20	Output
End	Turn on when charging ends	7,20	Output
Error	ON when abnormal	8,20	Output
E1	The abnormality are indicated by LED lighting combinations of E1 to E3	16,20	Output
E2		17,20	
E3		18,20	

※ The followings are recommended for the Dsub 25 pin plug side if it is prepared by the customer.
HDBB-25P (05) Hirose Electric Machine
Case : HDB-CTH Hirose Electric Case
Terminal block type : SUBCON 25M-SH made by Phoenix Contact

The operation status of the charging unit is output to the outside simultaneously with the LED indicates
The operation of the output signal turns ON when the LED is lit.

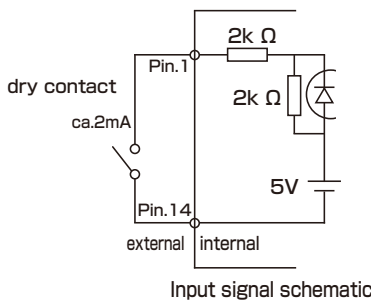
In the output circuit, rated voltage 24 V rated current 50 mA, only surge protection (39 V) is installed.

Parameter setting of charging current · charging voltage · timer is done by connecting dedicated connector to PC and launching dedicated software

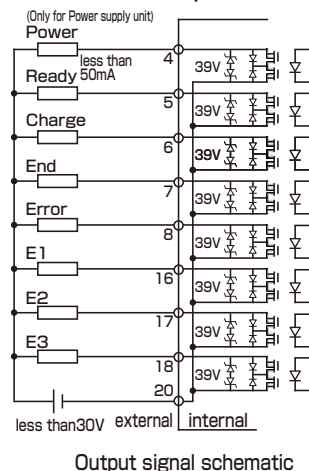
Input circuit specifications

Items	Specification	
Type code	RCS600-CA_	RCS600B-CA_
Contact	Dry contact (Normal open type)	Dry contact (Normal close type)
Pin.1	Start charging	Stop charging
Rated voltage	5V	5V
Rated current	About 2mA	About 2mA

Input

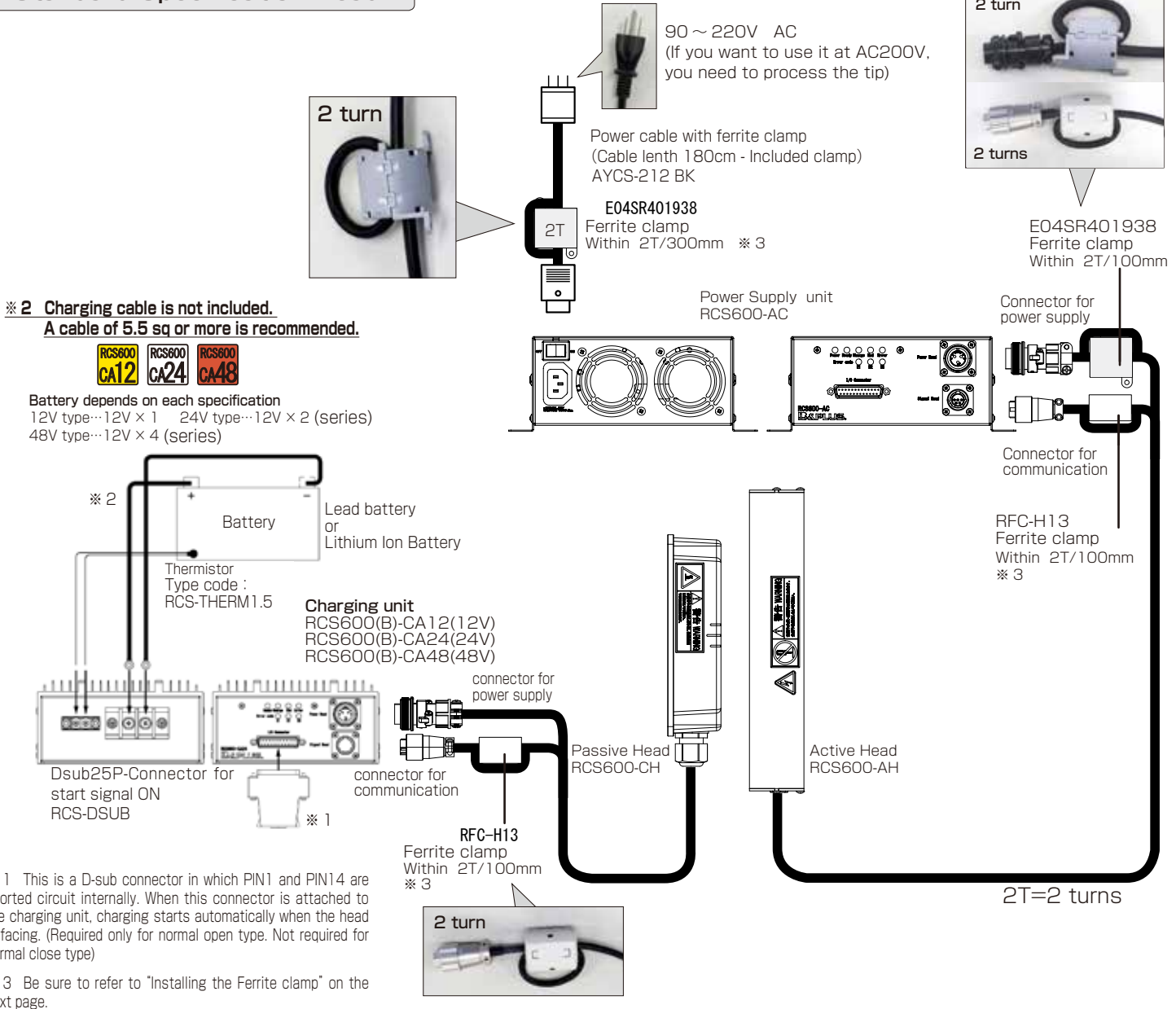


Output



7. Connection diagram

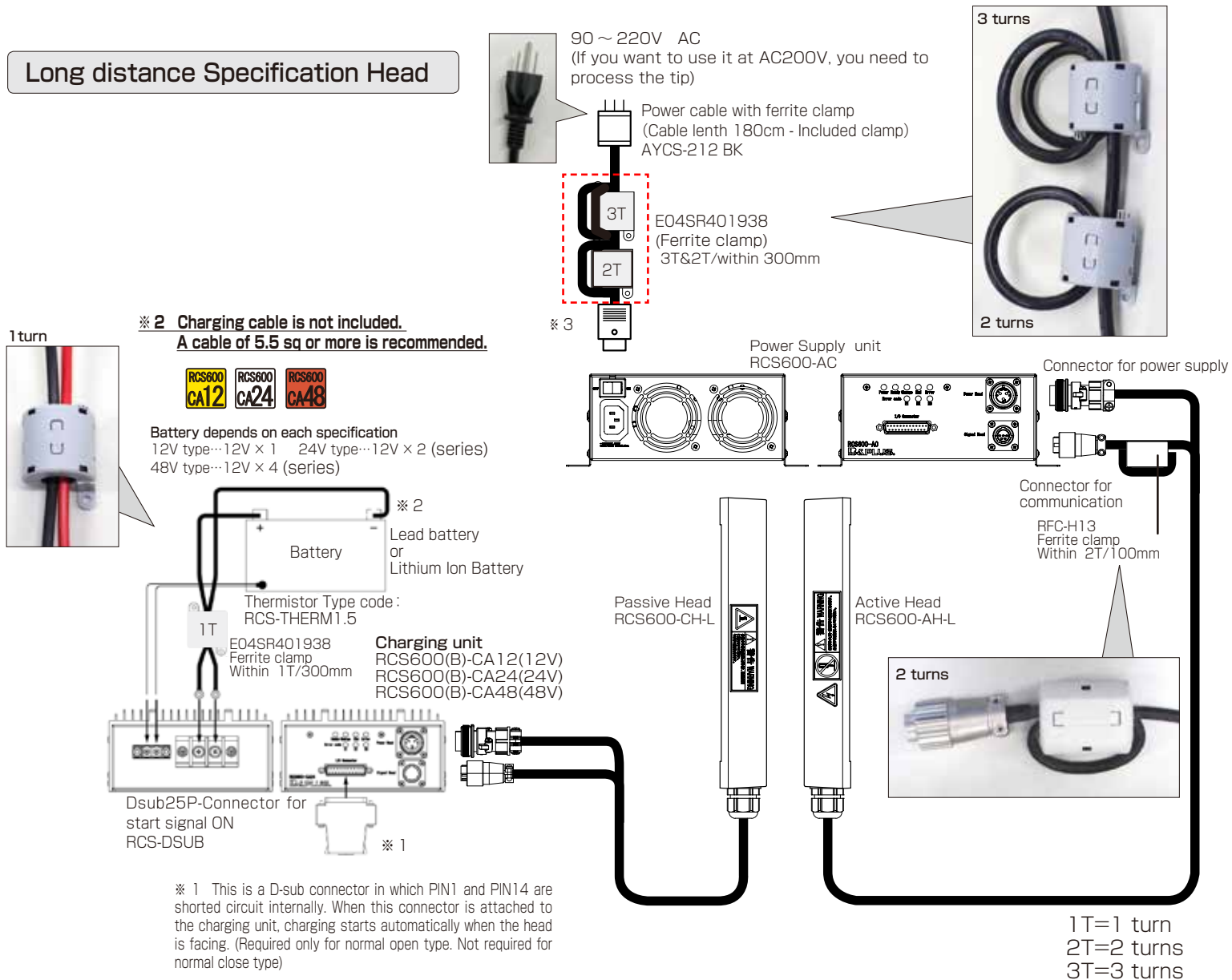
Standard Specification Head



Common to standard specification heads and long distance specification heads

- Turn on the power after completing the wiring.
- Battery and charging cable are not included in this product. Please prepare and process by customer.
- Make sure that the ends of the charging cable do not touch each other.
- Please be sure to attach the thermistor to the attached parts. It is recommended to paste on the upper part of battery. Please do not touch it the terminal
- Connect each cable with the specified length. There is a possibility that an error may occur due to output reduction or the like.
- The "turn", which counts the number of turns of the ferrite clamp of each cable, indicates the number of times that the cable passes through the inside of the ferrite clamp.
For example, if it is wrapped around the ferrite clamp once, it will take 2 turns, and if it passes through the cable without wrapping it once, it will take 1 turn.

Long distance Specification Head



※ About installing the Ferrite Clamp

In order to fulfill the criteria of Article 65, paragraph 1, product 3 of the Radio Equipment Regulations, and Ministry of Internal Affairs and Communications Notification 207, and malfunction prevention please attach the enclosed ferrite clamp to the following positions with specified turns each.

Case for standard specification head

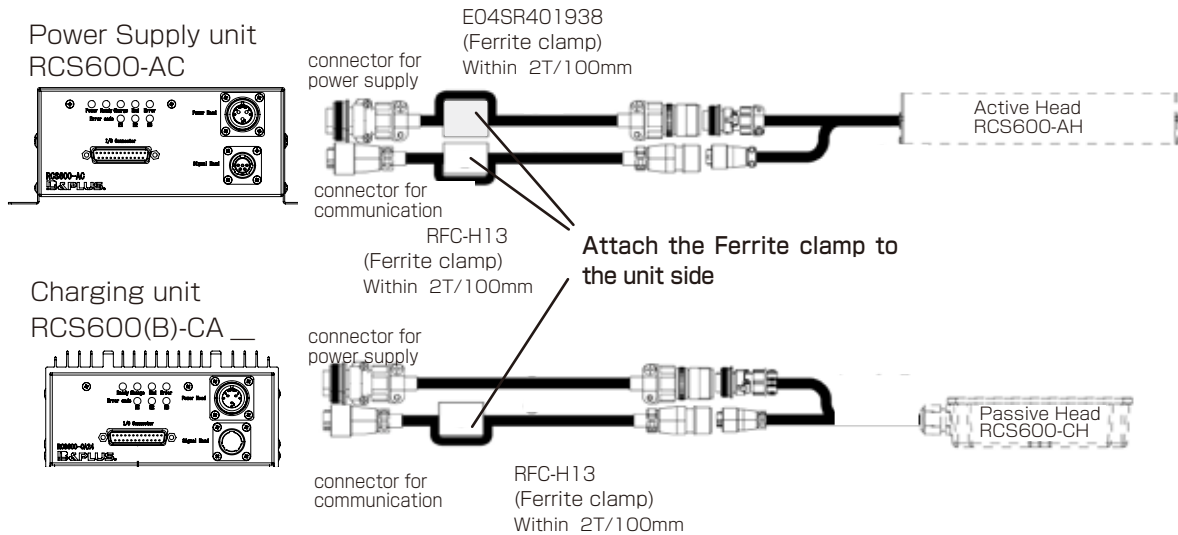
- 1 piece to the communication cable of the passive head within 100 mm from the charging unit. (2 turns)
- 1 piece each to the power supply cable and communication cable of the active head within 100 mm from the power supply unit. (2 turns)
- 1 piece to the power supply cable within 300 mm from the power supply unit. (2 turns)(It is already installed at the time of shipment)

Case for long distance specification heads (see figure above)

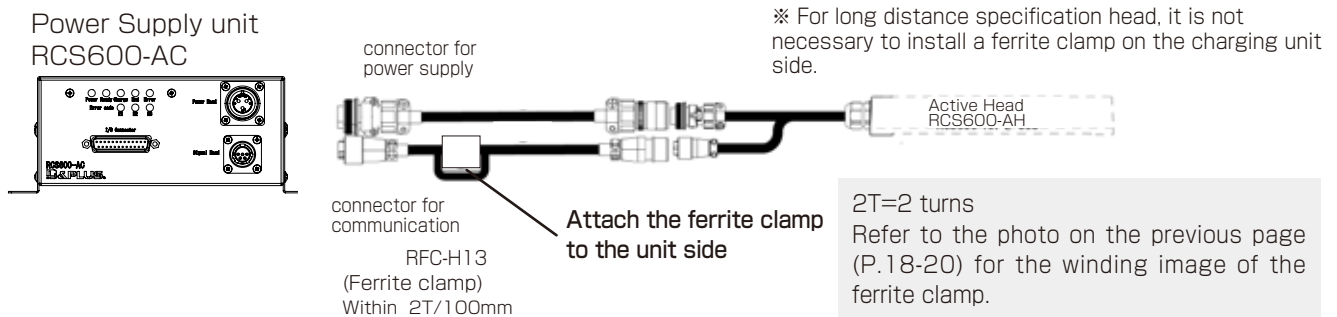
- 1 piece from the charging unit to the battery within 100 mm (1 turn)
- 1 piece to the communication cable of the active head within 100 mm from the power supply unit (2 turns)
- For the power cable, attach 1 piece of additional ferrite clamp included with the active head within 300 mm in addition to the one already installed at the time of shipment. (Refer to the figure above ※ 3)

※ When using each extension cables, install them on the unit side regardless of the head specifications. Please refer to the next page.

Ferrite clamp installation image when using various extension cables with the standard head



Ferrite clamp installation image when using various extension cables with long distance head



8. Operation methods

How to switch on a power

- Turn on the power switch on the back of the power supply unit. (Pressing the switch to the ON side will turn it "on" .)
- When active and passive heads are out of transmission range :
When the power is turned on, LED of the power supply unit (Power) is lit, it will be intermittent oscillation state.
 - When active and passive heads are within transmission range:
When the power is turned on, LED of the power supply unit (Power) is lit, and immediately the LED (Ready) turns on. (However, for normal open type, charging will not start if the charge start signal is OFF.)
Then (Ready) turns off, (Charge) lights and becomes charging state.



Attention

When active head and passive heads are within the range, when the power can be transmitted charging immediately.

How to turn off the power

- Turn off the power switch on the back of the power supply unit. (Pressing the switch in the opposite direction to the ON side will turn it off.)
- When active and passive heads are within transmission range : When the power is turned off, the LED (Power) of the power supply unit turns off after several tens of seconds and the operation is stopped.
 - When active and passive heads are within transmission range : Charging will stop as soon as the power is turned off. The LED of the power supply unit and the LED of the charging unit will all turn off after a few seconds, and the operation will be stopped. (Depending on the state of the LED that is lit, the time until it is completely turned off changes from a few seconds to a few tens of seconds.)

About basic charging

The non-contact power supply operation flow of the unit is described as below.

- ① When the power supply unit is turned on, the system enters standby mode (intermittent oscillation). Rise time is about 5 seconds.
- ② When the passive head (power receiving side) is in the rated gap of the active head (power transmitting side), communication between the active head and passive head.
The machine will start communicating and start transmitting power in about 2 seconds. (Power transmission and communication are performed without contact.)
- ③ When the battery voltage reaches the specified voltage and the charge current drops to 1.0A (± 0.5A), the charging is completed.
In addition, if the passive head is out of the rated gap of the active head, it automatically stops charging and enters the standby state.
- ④ When the battery voltage drops, recharging starts. (The voltage value varies depending on the setting.)
- ⑤ If the charging location is in a high-temperature environment and the rated gap between the passive head and the active head is large, continuous charging over a long period of time may cause the overheat protection function of the head to activate and stop continuous charging. In this case, lower the operating ambient temperature or reduce the rated gap between the passive head and the active head to enable continuous operation.
- ⑥ When using two batteries in series, please fully charge each battery so that they have the same voltage before connecting them in series. If you operate with a voltage difference, the battery may be damaged.



12V type CC / CV * charge control

Maximum output mode timer

When the current exceeds the constant current control 25A, the set current exceeding 25A is valid for 10 minutes from the start of charging, but after 10 minutes, the set current automatically becomes 25A.

However, when "charging ends" or "outside the rated gap", the set current that exceeds the constant current control 25A is restored. Constant current control When the current is set to 25A or less, there is no limit to the duration of constant current control.



24V type CC / CV * or CP / CV * charge control method

<Recharge ON timer function>

If the battery is not fully charged within the time specified by the CV timer (factory default setting of 60 minutes), charging will start when the time set by the recharge ON timer. If the battery is fully charged within the time specified by the CV timer, the recharge ON timer will not start and the charging operation will start when the battery voltage drops to the recharge voltage. With the parameter setting software, you can enable or disable the recharge ON timer function.

(RCS-DATA-CBL is required to make changes. See page 26)

<What is a CV timer>

It is a charge stop timer after CV charging starts. When the mode shifts to CV mode and the specified time has passed, the charging operation ends even during charging and the End lamp lights up.

<Charging parameter setting>

When charging the battery charging voltage to 30V or more, change the values of "CV voltage", "Battery voltage abnormality setting", and "Output overvoltage setting". When setting the battery charging current to 20A or more, change the values of "CC current" and "output overcurrent setting".



48V type CC / CV * or CP / CV * charge control method

See 24V type for Recharge ON timer function.

Charging parameter setting: When setting the battery charging current to 10A or more, change the values of "output overcurrent setting".

* CC/CV : Constant current/ constant voltage

CP/CV : Constant power/ constant voltage

Standard setting value (factory setting value) and settable range

The setting ranges and standard setting values for current, voltage, and recharge voltage are as follows. Regarding the change of the setting value, we ask for your request at the time of ordering the product, and set the value before shipping from the factory. You can change it even after purchase. Please contact us if you need it.
* For each setting, there is an error of ± 0.5V in voltage and ± 0.5A in current.

12V type	Standard	Settable range
Charging voltage	14.4V	12 ± 0.5V ~ 15 ± 0.5V
Charging current	34A	10 ± 0.5A ~ 34 ± 0.5A
Recharge voltage	12V	8.5 ± 0.5V ~ 14 ± 0.5V

24V type	Standard	Settable range
Charging voltage	28.8V	24 ± 0.5V ~ 35 ± 0.5V
Charging current	20A	10 ± 0.5A ~ 25 ± 0.5A
Recharge voltage	24V	16.5 ± 0.5V ~ 34 ± 0.5V

48V type	Standard	Settable range
Charging voltage	57.6V	48 ± 0.5V ~ 60 ± 0.5V
Charging current	10A	5 ± 0.5A ~ 12 ± 0.5A
Recharge voltage	48V	32.5 ± 0.5V ~ 59 ± 0.5V

Charge control

About charge control

This unit uses a constant current / constant voltage (CC / CV) charge control method and a constant power / constant voltage (CP / CV) charge control method.

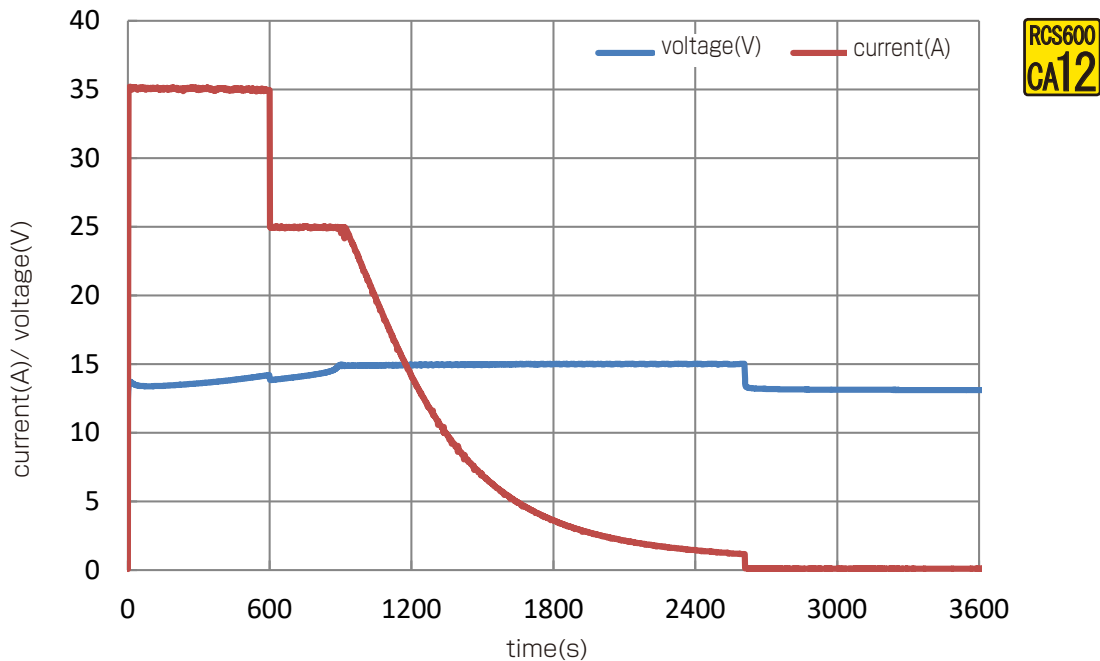
As shown in each graph, an internal check is performed immediately after the start of charging.

Constant current / constant voltage (CC / CV) charge control method type · · · When the battery is in a discharged state (when the charge amount is low), constant current control (CC) is performed, but when the charge amount increases and the battery voltage reaches the set charge voltage value, it shifts to constant voltage charge control (CV). , Squeeze the charging current so that it does not exceed the set voltage value. When the charging current drops to 1.0A (± 0.5A), it is considered to be fully charged and charging ends automatically.

Constant power / constant voltage (CP / CV) charge control method type · · · When the battery is in a discharged state (when the amount of charge is low), constant power control (CP) is performed, and the values of the charging voltage and charging current are changed so that the battery is charged with the maximum power. However, since the set value is the upper limit, if the charging current value is low, the operation is similar to constant current control (CC). When the battery voltage reaches the charge voltage set value, constant voltage charge control (CV) and charge end operation are performed as in the (CC / CV) charge control method type.

[Using RCS600(B)-CA12]

**Battery[CYCLON-G G-16EP] 50% (8Ah) Charging characteristics after discharge
(CC Current 34A CV Voltage 15V)**

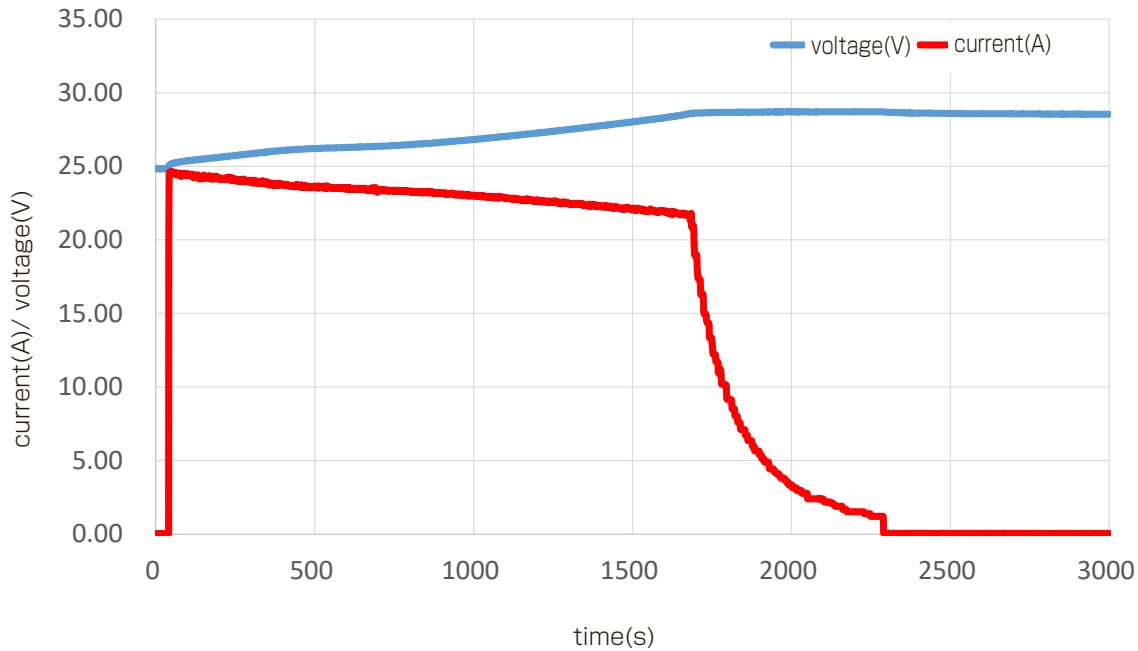


[Using RCS600(B)-CA24]

**Battery [SCIB SIP24-23] 50% (11Ah) Charge Characteristics After Discharge
(Constant power (600W) Max.25A CV Voltage 28.6V)**

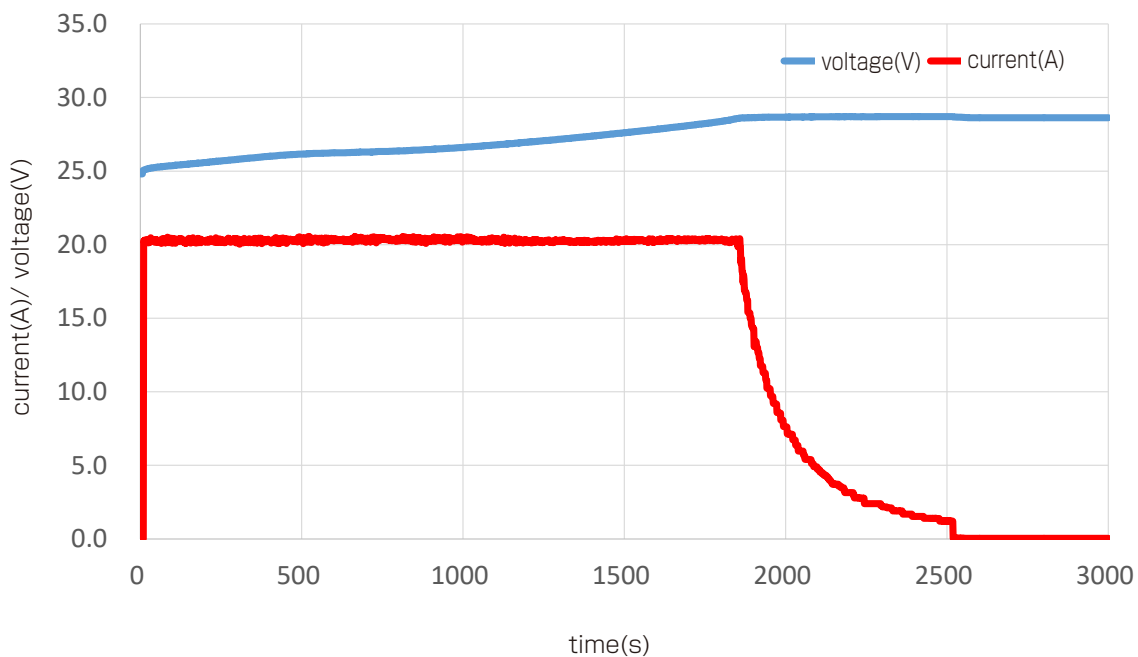
※ When the charging current setting value is high, the characteristic graph shows that the current decreases as the voltage increases.

CA24 SCIB SIP24-23 50% Max.25.0A CV Voltage 28.6V



**Battery [SCIB SIP24-23] 50% (11Ah) Charge Characteristics After Discharge
(Constant power (600W) Max.20A CV Voltage 28.6V)**

※ *When the Charge current setting value is around 20A, there is an upper limit capacity for the current value in response to the voltage increase, so charging is performed at the upper limit of the set current value, and it behaves like CC-CV charging.

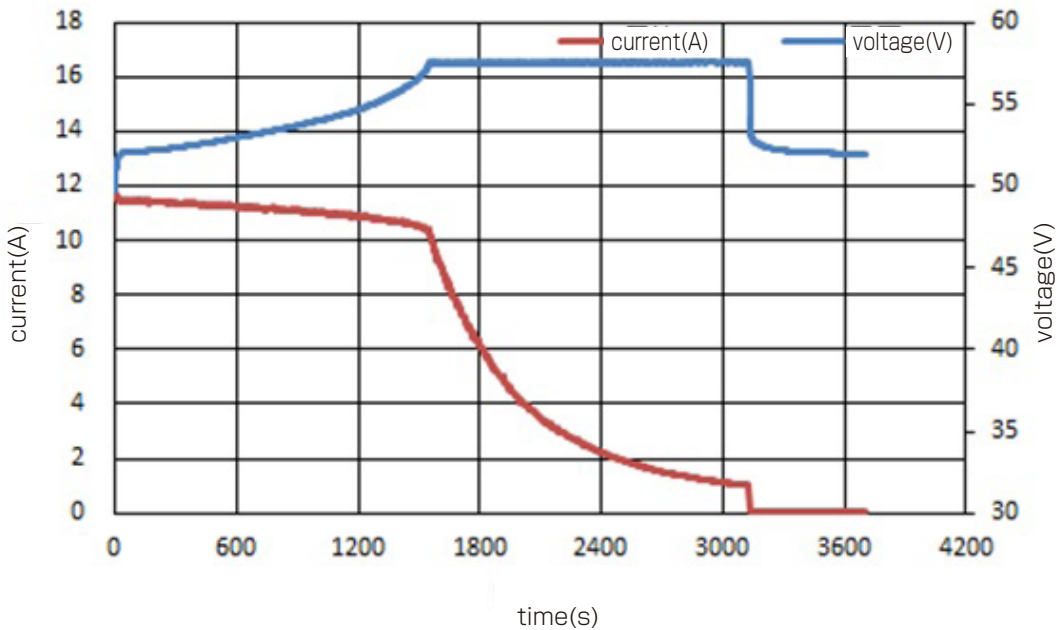


[Using RCS600(B)-CA48]

Battery [CYCLON-G G-16EP(four 12V batteries connected in series) 50% (8A h)

Charge characteristics after discharge

(Constant power(600W) Max.12A CV Voltage 57.6V)

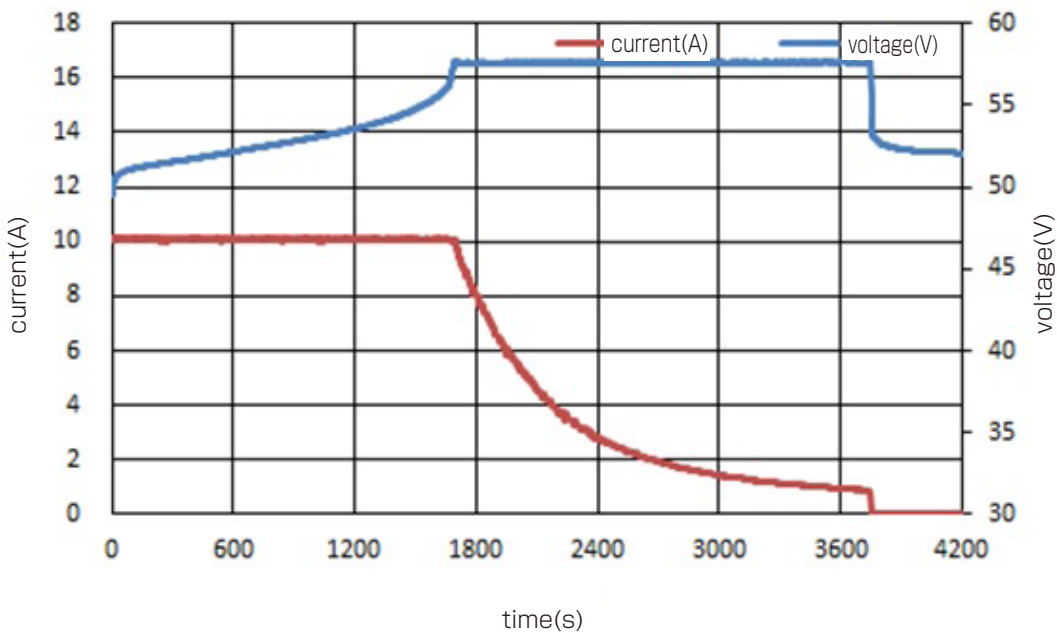


Battery [CYCLON-G G-16EP(four 12V batteries connected in series)

50% (8A h) Charge characteristics after discharge

(Constant power(600W) Max.10A CV voltage 57.6V)

*When the set current is low, the upper limit current is maintained even if the charging voltage rises, resulting in a charging curve similar to CC-CV charging.



Other

<Communication function>

Communication machine is equipped with the passive head and active head of the unit. Performs wireless communication with the communication unit, we are charging control and state control of the battery.

9.About included product and optional products

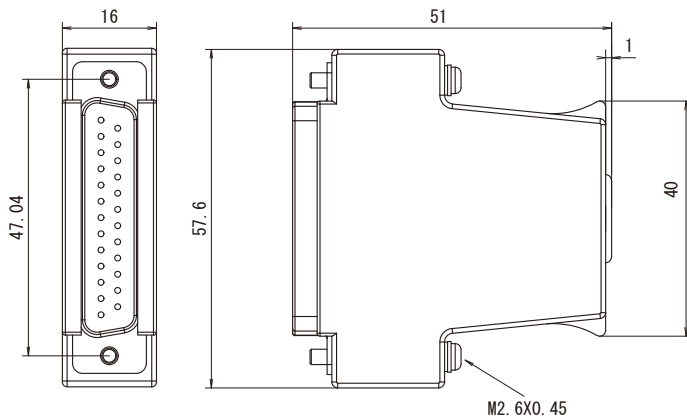
Included product additional purchase model

◆ Additional Dsub25P-Connector for start signal ON (Type code: RCS-DSUB)

*included only for normal open type. not included for normal close type as it is not required.

This is a D-sub connector in which PIN1 and PIN14 are shorted circuit internally.

When this connector is attached to the charging unit, charging starts automatically when the heads are facing.



【Specifications】

Connector pin: 25 pin male (By Hirose)
Material: Body-Mild steel + Nickel plating
Mounting : Fixing with two M2.6 screws
※ Refer to page 17 for the connector pin numbers. PIN1 and PIN14 are internally shortened in advance.



For the normal open type, a dustproof cover is attached. (Type code : DB-25S-DC1)

◆ Filter (Type code:RCS-FILTER01)

The filter for RCS600-AC.

(each 8pcs. of filters and tapes are included.)

For optional purchase, 24pcs. of filters and 8pcs. of tapes)

Attach the unit to the air inlet section. (See P.14)

A separate instruction manual is available.

(Document No.: T320403)



Reference example

Both sides need to be attached

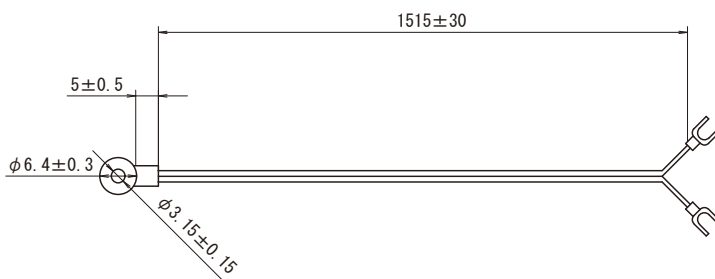


◆ Thermistor for additional purchase

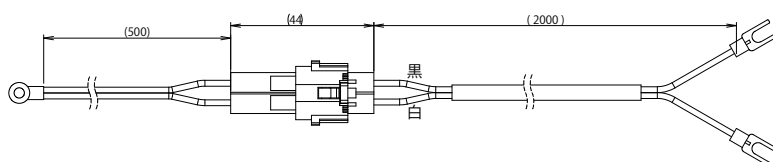
Type code : RCS-THERM1.5 (Cable1.5m), RCS-THERM2.5(Cable2.5m)

It is recommended to paste the thermistor on the top of the battery used.

At that time, be sure not to touch the terminals.



Type code : RCS-THERM-C (Cable 2m/with connector)



【Specifications】

Connection terminal : Yterminal F1. 25 – 3.5

Material : Cable HVFF0.3sq

Mounting : Fixing with two M3-4 screws

【Specifications】

Connection terminal : Yterminal F1. 25 – 3.5

Material : Extension cable FR-PCVV 0.3sq

Thermistor side connector : FRS-106B(By HERO Electric)

Charging unit side connector : FRS-107B(By HERO Electric)

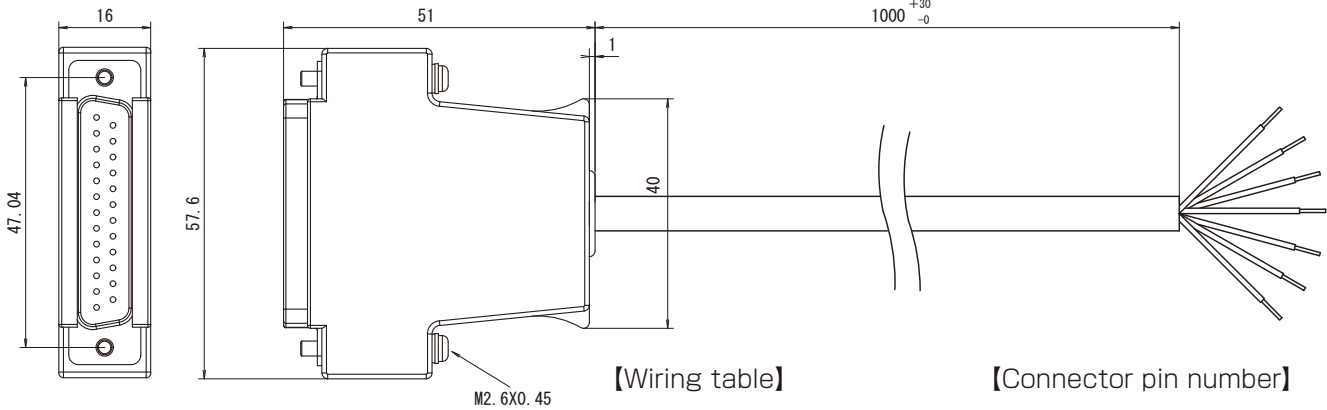
Mounting method : Fixing with two M3-4 screws

◆ Ferrite clamp for additional purchase
Refer to pages 18-20.



Option

◆ Dsub25P connector cable for I/O signal (Type code : RCS-DSUB-CBL)
This is the included product (Type code: RCS-DSUB) with a cable.
It can be purchased as an option.



【Specifications】

Connector pin: 25 pin male (By Hirose)
Cable: 12x0.2sq
Mounting method: Fixing with two M2.6 screws

【Wiring table】

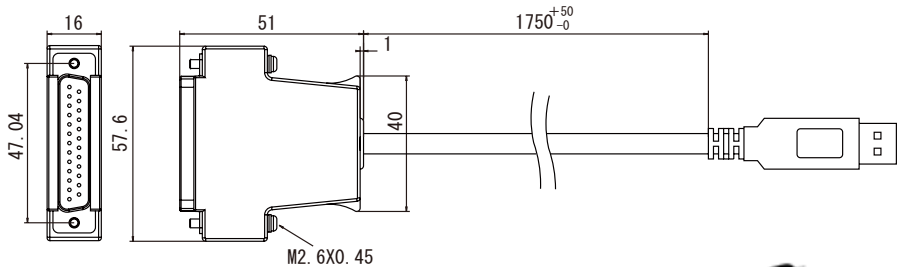
- 1 : Brown
- 4 : Red
- 5 : Orange
- 6 : Yellow
- 7 : Green
- 8 : Purple
- 14 : Blue
- 16 : Gray
- 17 : White
- 18 : Black
- 20 : Pale Blue

【Connector pin number】

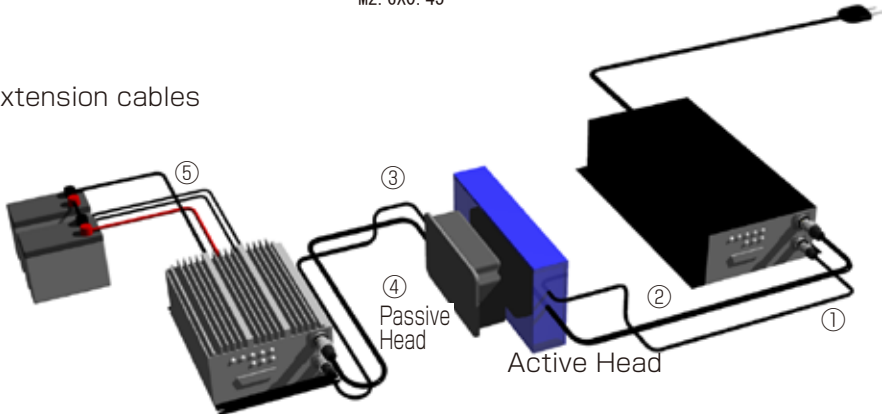
- Disconnected : 2, 3, 9, 10, 11, 12, 13, 15, 19, 21, 22, 23, 24, 25

◆ Output setting / Writing cable set for 600W (Type code: RCS-DATA-CBL)

This cable is used to connect to the charging unit and to set the charging voltage, charging current and recharge voltage. By downloading the dedicated application software from our website, you can connect the charging unit to a PC and set various parameters. For more details, please contact our sales.



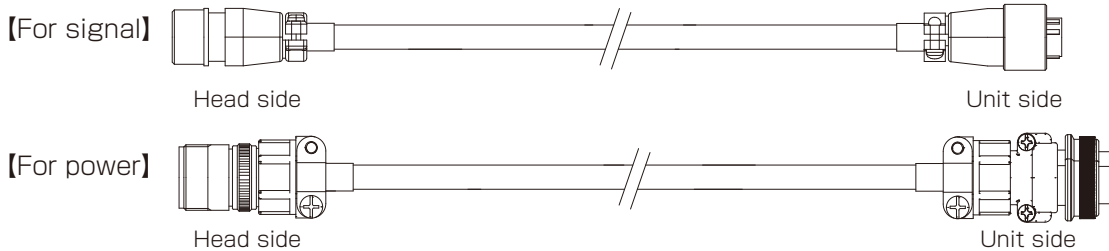
◆ Various extension cables



Product	Applicable	Cable type	Length	Type code	p.26	
Extension cable for active head	Signal	Robot cable	1.5 m	RCS600AH-SIR015	①	The maximum length of the cable should not exceed 5.5m when using the optional cable. Extending the cable of a long-distance head may cause premature switching of CC ⇒ CV.
			2.5 m	RCS600AH-SIR025	①	
	Power	Standard cable	1.5m	RCS600AH-PWN-015	②	
			2.5m	RCS600AH-PWN-025	②	
		Robot cable	1.5m	RCS600AH-PWR-015	②	
			2.5m	RCS600AH-PWR-025	②	
Extension cable for passive head	Signal	Robot cable	1.5m	RCS600CH-SIR-015	③	The maximum length of the cable should not exceed 5.0m when using the optional cable. Extending the cable of a long-distance head may cause premature switching of CC ⇒ CV.
			2.5m	RCS600CH-SIR-025	③	
			3.5m	RCS600CH-SIR-035	③	
	Power	Standard cable	1.5m	RCS600CH-PWN-015	④	
			2.5m	RCS600CH-PWN-025	④	
			3.5m	RCS600CH-PWN-035	④	
		Robot cable	1.5m	RCS600CH-PWR-015	④	
			2.5m	RCS600CH-PWR-025	④	
			3.5m	RCS600CH-PWR-035	④	

When purchasing only the extension cable as an option, the ferrite clamp is not included. Please use the ferrite clamp that comes with the head.

It is a connector on both ends, a 3-pole connector for power and a 5-pole connector for signals.



◆ Battery connection cable

Product	Unit	Battery side size	Length	Type code	See the chart on P.26
Charging cable for battery connection	Charging unit	For M6 terminal	1m	RCS-CBL-M6-01	⑤
			2m	RCS-CBL-M6-02	⑤
		For M8 terminal	1m	RCS-CBL-M8-01	⑤
			2m	RCS-CBL-M8-02	⑤



Battery connection cable

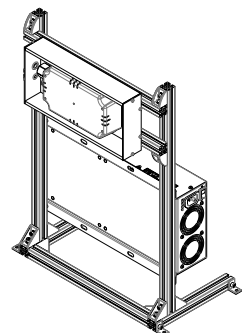
◆ Power cable (Model: AYCS-212 BK)

This is an AC power cable that connects to the RCS600-AC. (Refer to P.18-20 connection diagram)

◆ Aluminum frame stand (model: RCS-STAND01)

Bracket (stand) for mounting RCS600-AC and RCS600-AH.

An instruction manual is available separately. (Document number: T320401)



Installation image diagram

10. Identifying and troubleshooting abnormalities

If you have any trouble using this product, please click here. When an error occurs in this product, it is possible to guess the cause of the error from the LED display on the side of the power supply unit and charging unit. If you are unable to solve the problem, please contact our sales representative.

LED display for determining abnormalities in the power supply unit and charging unit

Target unit	Name	Detected content and cause	LED				Possible factors	Return condition	
			E1	E2	E3	Error			
Poewr	Charge								
○		Power supply unit low temperature / heating	Low temperature detection inside the power supply unit (about -10 °C ± 5 °C) Overheat detection inside the power supply unit (85 ± 5 °C)	○	○	○	○	Ambient temperature Low temperature or high temperature. FAN failure. Clogged air vents.	Automatic return when target detection temperature rises above 0 ± 5 °C or falls below 70 ± 5 °C
○	○	Charging unit low temperature / heating	Low temperature detection inside the charging unit (about -10 °C ± 5 °C) Overheat detection inside the charging unit (85 ± 5 °C)	○	○		○	Ambient temperature Low temperature or high temperature. Use under conditions where the surrounding environment is closed.	Automatic return when target detection temperature rises above 0 ± 5 °C or falls below 70 ± 5 °C
○	○	Abnormality in battery voltage ※1	12V: Detect battery voltage 8 ± 0.5 to 16 ± 0.5 V or less 24V: Detect battery voltage 16 ± 0.5 to 31 ± 0.5 V or less 48V: Detect battery voltage 32 ± 0.5 to 61 ± 0.5 V or less	○			○	Use of different types of batteries, such as rated voltage difference.	Reset battery voltage abnormality
○	○	Output over current	12V: Over current to battery detected (35.5 ± 0.5A) 24V: Over current to battery detected (21.5 ± 0.5A) 48V: Over current to battery detected (13.0 ± 0.5A)				○	Inconsistency of setting data. Malfunction.	Remove the over current condition and reset
○	○	Battery temperature error	Low temperature detection of battery (about -10 °C ± 5 °C) Battery overheat detection (approx. 60 ± 5 °C)				○	Ambient temperature is too low / too hot. Inadequate current setting for battery specifications. Battery deterioration etc.	Reset battery temperature within 0 ± 5 to 50 ± 5 °C
○	○	Output over voltage	12V: Detect over voltage to battery (16.5 ± 0.5V) 24V: Detect over voltage to battery (33 ± 0.5V) 48V: Detect over voltage to battery (63 ± 0.5V)				○	Inconsistency of setting data. Malfunction.. External voltage application.	Remove the over voltage condition and reset
○	○	Charge count error	When charging and stopping are repeated four times during the 30 seconds after charging starts.				○	Overcurrent detection on the power feed side, high recharge voltage setting value, improper distance/axis misalignment, etc.	Keep within the rated gap and review the reset/recharge voltage setting values.
○	○	Communication error A Gap abnormality ※2	Temperature abnormality of the head, deviated from the rating gap	-	-	-	-	It deviates from the rated gap / misalignment, and starts feeding.	Reset within the rated gap
○	○	Communication error B overheating of active head	Overheating of active head Detection of (85 ± 5 °C or higher)	-	-	-	-	Ambient high temperature. Operation for a long time. Heat radiation failure due to ambient environment.	Automatic restoration with falling of object detection temperature or reset
○	○	Communication error C overheating of passive head	Overheating of passive head Detection of (85 ± 5 °C or higher)					Ambient high temperature. Operation for a long time. Heat radiation failure due to ambient environment.	Automatic restoration with falling of object detection temperature or reset
○	○	Communication error D signal connector disconnection	Detects connector disconnection and disconnection					Connector is disconnected or broken.	Connect the connector part, or Repair a broken wire

[caution] * 1 The battery voltage error is detected only at the start of charging, and the output overvoltage is detected during charging.

* 2 The LED indications for communication errors A to D differ depending on the unit and type. Please refer to the following.

Power supply unit: Communication error Any of the following behaviors ① to ④ for A to D

A Gap error: Only the Power LED lights up. Or one of the following behaviors ① to ④

B, C Head overheat error: Only Power LED turns on.

D Signal connector disconnection abnormal: Only Power LED lights up.

① Ready lights up or blinks.

② Ready, Charge, and End LEDs light up repeatedly in sequence.

③ Ready, Charge, and End LEDs light repeatedly in that order, and then the Error LED lights.

④ Ready → Charge LED turns on repeatedly in this order.

Charging unit: Communication error Any of the following behaviors (1) to (4) for A to D

① Ready lights up or blinks.

② Ready, Charge, and End LEDs light up repeatedly in sequence.

③ Ready, Charge, and End LEDs light repeatedly in that order, and then the Error LED lights.

④ Ready → Charge LED turns on repeatedly in this order.

Reset means any of the following operations.

Turn off the power supply unit, and then turn it on after one minute.

Set the distance between the heads to 200mm or more and turn them on again after 1 minute.

Turn off the charge start signal, hold it for 2 seconds or more, and then turn it on again. (normal open typ)

In the case of normal close type, turn off the charge stop signal, hold it for 2 seconds or more, and then turn it off again.

A summary of the phenomenon is shown below for your reference.

Trouble Shooting

Phenomenon	LED				Possible factors	Possible factors and remedies, etc.
	E1	E2	E3	Error		
The device does not operate when the power switch is pressed.					Main power (power side) outlet is disconnected.	Please take measures in various places.
					The breaker on the main power supply side is tripped.	Please take measures in various places.
					The power cord of the high-frequency power supply is disconnected.	Please take measures in various places.
					The cord is broken.	Please take measures in various places.
Not charging (Error occurs)	○			○	Use different types of batteries, such as those with different voltage ratings.	Check the situation described on the left, and take measures such as measuring and replacing the battery voltage.
	○			○	The battery voltage may be out of the setting range.	Check the battery charging voltage and current settings. (The set values vary depending on the battery used, so make sure they match the battery used.)
Charging starts, but is completed in a short time and charging does not continue.					If more than one battery is connected, one of the batteries may have failed or be at the end of its life.	Check the voltage of each battery one by one.
					It is possible that the battery itself is faulty or has reached the end of its life.	Make sure the battery is ready for use. Replace the battery. Please replace the battery and try to check the charge again.
Charging takes longer than expected. It takes longer than expected.					If the charging cable is several meters long, the charging voltage may be lower than the set voltage due to voltage effect, and the battery may not be fully charged or it may take longer to fully charge.	Review the cable length and cable conductor diameter.
Only power LED is lit					The fuse may be blown or the internal circuit may be broken.	Please contact to our sales.
The charging operation starts, but after the Charge/End LED lights repeatedly, Error lights up.				○	Since the distance is not within the specification, the power cannot be fully supplied and the charging current may have dropped to complete the charging. Basically, Charge/end is repeated. Also, when the distance axis is off When the distance axis deviates just before, it may become Ready/Charge/End.	Please check communication distance/center offset. Remove abnormalities and reset.
				○	If the voltage drops immediately after charging and the charging process is repeated, the battery may be deteriorated.	Check the battery condition with a battery tester. If the battery is badly deteriorated If the battery is badly deteriorated, replace the battery.
				○	The CV voltage and recharge voltage may be close. After charging is complete, the battery voltage will drop. If the recharge voltage setting is too high, the battery will immediately reach the recharge voltage and recharge.	Reduce recharge voltage.
Ready/Charge/End LED lights repeatedly, but no error occurs.				○	When the communication state is unstable, the interference to signal communication increases as the charging current increases after charging starts.	Check that the ferrite clamp of the communication cable is securely attached.
Turn on the power switch. The LED lights up. but the battery cannot be charged.					An error has been detected or there is an abnormality in the CPU operation.	Check the lit LED, and refer to the error detection on page 28.
						Check to make sure that no wires are connected to other terminals than those permitted. Check that the connectors of each device are properly connected.
Immediately after charging starts, a temperature error occurs in one of the devices and it does not operate.	○	○		○	It may be out of the operating temperature range.	Check the ambient temperature of the device. (Low and high temperature)
	○	○	○	○		Check the required space distance on page 12 and whether the equipment has accumulated any dust, oil, or other contaminants, and consult with our sales.

Phenomenon	Possible factors and remedies, etc.
When using the write cable (RCS RCS-DATA-CBL), the software seems to be communicating, but the screen shows The message "CONNECTING..." remains on the screen, but it does not become OK after a while.	Please close the open software and plug/unplug the USB connector side. After that, start up the software again.
Other < Abnormalities in the battery >	When using two batteries in series, fully charge each battery to the same voltage before installing the equipment. When using two batteries in series, fully charge each one to the same voltage before installing the equipment. If there is a voltage difference, the charging unit may fail. If you operate the product with a voltage difference, it may cause an error in the charging unit. If there is a voltage difference between the charging unit and the power supply unit, it may cause an error in the charging unit. If there is a voltage difference between the charging unit and the power supply unit, the two units will be synchronized, and the error will occur in both units.

One of the reasons why some abnormalities may occur even though the product is operated within the specifications is that the customer's operating environment such as below may be the cause of the problem.

- the battery is not charged enough (in time) for the power consumption.
- Power supply voltage
- Environmental noise
- Surrounding metal

Check the LED lighting status and the condition in which the abnormality occurs (transmission distance, ambient temperature, etc.), and consult with our sales representative.

11. Consultation on how to use and repair

B&PLUS K.K.	Wireless Power Supply by B & PLUS K.K.
〒 355-0311	
2452-5 Koya Ogawa-machi Hiki-gun Saitama JAPAN	
TEL	0493-71-5160
FAX	0493-81-4771
HP	https://www.b-plus-kk.jp/
E-MAIL	sales@b-plus-kk.jp

Wireless Power Supply by
B & PLUS K.K.

Mail : sales@b-plus-kk.com

Web : <http://www.b-plus-kk.com>

* Info may change the mention contents such as specifications without a notice.
Thank you for understanding

* Please refer to instruction manual or the user's guide. It can be download by HP.