RE-C   Controller Specifications for
Ring Pump series RP-Q-B / RP-Q-C / RP-TX / RP-HX Bi-polar Stepper Motors
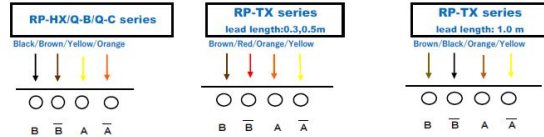
Product Name	**Low voltage bi-polar stepper motor controller**
Model Number	**RE-C600 : controller unit**
Applicable Pumps	**Ring Pump RP-Q-B series, RP-Q-C series**
	Ring Pump RP-TX series
	Ring Pump RP-HX series
Drive Voltage	**RP-Q-B / RP-Q-C Series: VM=3.0 V**
	RP-TX / RP-HX Series : VM=2.6 V
Imput Voltage	**RE-C600 : DC5V, 1.0 A (AC-DC adaptor of AC100-240V 50/60Hz is included as accessory)**
Control Method	**Voltage drive method for bi-polar coil**
Excitation Method	**1/4 microstep drive method**
Motor Speed	**1 - 2,000 pps (4 - 8,000 Hz) Digital frequency division**
Functions	**Various controls using PC software**
	SINGL-MODE
	Program-Mode

Connection Terminals: RE-C600 (Size: 100 x 100 x 34 mm)

USB Connection Terminal (USB A-microB: Included as accessory)
Pump Connection Terminals-1
Pump Connection Terminals-2
DC-IN Connection Terminal (AC Adaptor: Included as accessory)
Start Switch
Start- LED (BLUE)
Pause-Switch
Pause-LED (GREEN)
Power-LED (RED)

Pump wiring to motor connection terminal

RP-HX/Q-B/Q-C series	RP-TX series lead length:0.3,0.5m	RP-TX series lead length: 1.0 m
Black/Brown/Yellow/Orange	Brown/Red/Orange/Yellow	Brown/Black/Orange/Yellow
B B̄ A Ā	B B̄ A Ā	B B̄ A Ā

Accessories Included: RE-C600 :	● **Type A-micro B USB Cable**
	● **USB Memory Stick (PC Softwre)**
	● **AC-DC Adapter**

Motor Speed (PPS) and Motor Rotation for Each Series

RP-Q-B Series (1/150.95 gear ratio motor specification)

Motor Speed PPS	1	5	10	50	100	200	300	400	500	800	1000	1200	1250
Motor Rotation rpm	0.02	0.10	0.20	0.99	1.99	3.98	5.96	7.96	9.94	15.92	19.87	23.84	24.83

7.96

RP-Q-C Series (1/51.45 gear ratio motor specification)

Motor Speed PPS	1	5	10	50	100	200	300	400	500	800	1000	1100	
Motor Rotation rpm	0.06	0.29	0.58	2.92	5.83	11.66	17.49	23.32	29.15	46.64	58.31	64.14	

RP-TX Series (1/135.8 gear ratio motor specification)

Motor Speed PPS	1	5	10	50	100	200	300	400	500	800	1000	1200	1500
Motor Rotation rpm	0.02	0.11	0.22	1.10	2.21	4.42	6.63	8.84	11.05	17.67	22.09	26.51	33.14

RP-HX Series (1/50 gear ratio motor specification)

Motor Speed PPS	1	5	10	50	100	200	300	400	500	800	1000		
Motor Rotation rpm	0.06	0.30	0.60	3.00	6.00	12.00	18.00	24.00	30.00	48.00	60.00		

Special Notes:

a) Discharge Rate: Please input "Discharge Rate per Rotation (µL/rev)".
(Refer to data incuded with the pumps)

b) Control the motors within the range to prevent motor stepping-out (or motor
stopping or vibrating).

SINGLE

<Single Settings>
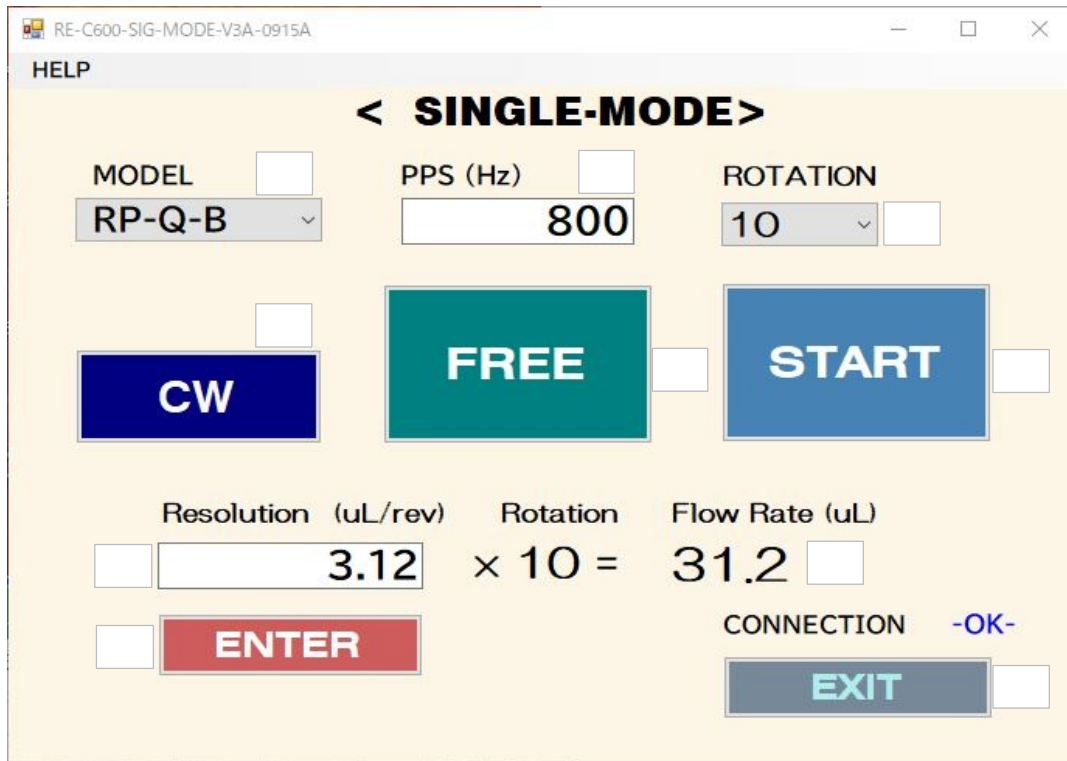
①	Pump Selection	Click the "∀" (drop down) and select the pump.
		RP-Q-B RP-Q-C
		RP-TX RP-HX
		Operating Voltage: VM value is selected automatically.
		RP-Q-B/RP-Q-C VM = 3.0V (fixed)
		RP-TX/RP-HX VM = 2.6V (fixed)
②	DIRECTION	rotating direction. (Clockwise CW or Counter-Clockwise CCW)
	Pump Speed	PPS 1500
	FREE	Click FREE to supply media (solution) for pump
		Click STOP.

<PROGRAM Settings>

Input Resolution "μL/rev"	Input the value from "Discharge Volume per Rotation (μL/rev)" that comes attached with the pump.
ENTER	Click ENTER to fix the "Resolution" settings.
ROTATION	
Flow Rate uL	uL/rev ROTATION Floe Rate uL
START	START button while connected to the PC (computer) with USB.
	* Auto Stop
EXIT	Disconnect from PC (computer).

PROGRAM

<Initial Settings>

	Pump Selection	Click the "∀" (drop down) and select the pump.
		RP-Q-B RP-Q-C
		RP-TX RP-HX
	VOLTAGE	Operating Voltage: VM value is selected automatically.
		RP-Q-B/RP-Q-C VM = 3.0V (fixed)
		RP-TX/RP-HX VM = 2.6V (fixed)
	Fast Forward Operation - 1	Click the "∀"(drop down) and rotating direction. (Clockwise CW or Counter-Clockwise CCW)
	Fast Forward Operation - 2	START/STOP the optimal high speed pump operation to supply the media (solution).
		* Click START to supply media (solution) for each pump on each channel. Once the media (solution) flows to the tip of the discharge tube, click STOP.

<PROGRAM Settings>

	Input Resolution "µL/rev"	Input the value from "Discharge Volume per Rotation (µL/rev)" that comes attached with the pump.
	Specify Flow Rate "µL/min"	Input desired flow rate (µL/min).
	ENTER	Click ENTER to fix the "Resolution" and "Flow Rate" settings.
		The optimal "PPS" and "RPM" values will be automaticaly displayed.
	Select DIRECTION	Select between Clockwise (CW) or Counter-Clockwise (CCW)
	Operation Time	Set operation (ON) time
		* Setting range between 00h 00m 01s to 99h 59m 59s
	Stop Time	Set stop (OFF) time
		* Setting range between 00h 00m 01s to 99h 59m 59s
		(3)
	POS-CLEAR	Select between POS 1 to POS 5 ( ) and click POS-CLEAR to clear setting for that POS. (To reset settings)
	RESET	RESET all settings in POS 1 to POS 5.
	Specify POS	Click the "∀" (drop down) and select POS.
		Allows up to 5 different program condition settings in POS 1 to POS 5.
		Program is reflected on the POS by repeating to .
		(Flow Rate, ENTER, DIRECTION, Operation Time, Stop Time)
	REPEAT	Input number of repeat operation for specified program table (POS 1 to POS 5).
		Initial setting is "1". Can input value between 1 to 99.
	WAIT TIME (h:m)	If needed, specify the wait time before the START time for each channel. (Input h:m)

<WRITE Settings>

	WRITE	Click WRITE to input the PROGRAM settings to controller's ROM (memory) (During WRITE, it will be in WAIT mode)

<Operation Settings>

    "Controller Switch - START"

                        Use the controller's switch to START / STOP / PAUSE without the PC.

    "PC-START"

        START   START / STOP button while connected to the PC (computer) with USB.

                              * Each click will change between START   STOP.

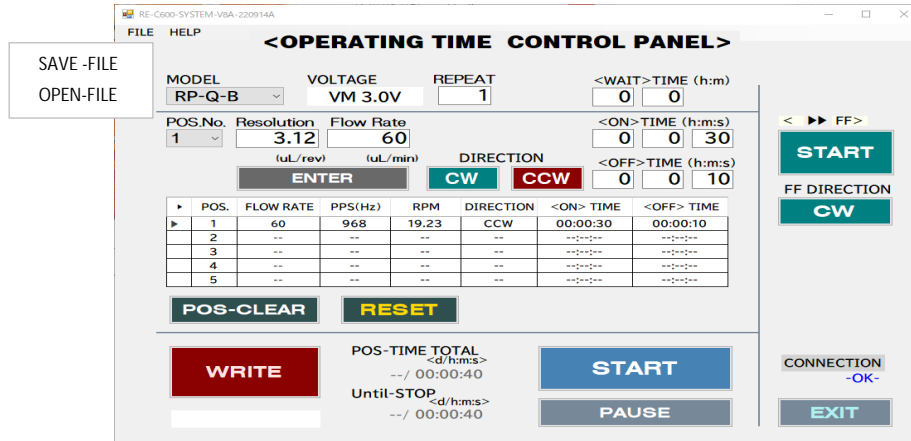   PAUSE   PAUSE button while connected to the PC (computer) with USB.

                              * Each click will change between PAUSE   RESTART   PAUSE.

        EXIT   Disconnect from PC (computer).

                        NB. When controlling from PC side, "START" and "Pause" of main unit SW
                              must be set to <OFF> position to prevent possible unstable operation.

SAVE-FILE / OPEN FILE

SAVE-FILE   Click on SAVE-FILE to save the PROGRAM setting (Type in file name)

OPEN-FILE   Click on OPEN-FILE to open saved PROGRAM setting.

                  * Once the PROGRAM setting is opened, click WRITE to save it in the computer ROM.

                  * Click all the CH that needs to operate (letters turn from grey to black), and click CH-SET
                    to save it in the computer ROM (memory).