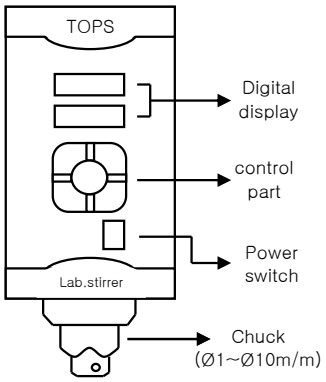
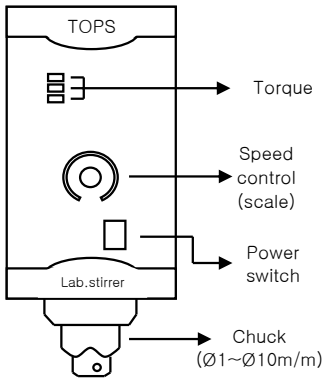
2. Functional Description

Digital Type



Scale Type

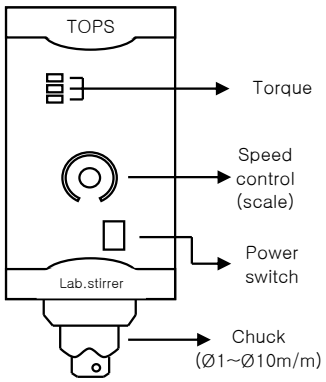


3. Technical Specifications

MODEL	Electronic overhead stirrer (BL1000 series)							
	BL1020	BL1020D	BL1010	BL1010D	BL1006	BL1006D	BL1003	BL1003D
Stirring capacity (H2O)	40ℓ		80ℓ		100ℓ		120ℓ	
Viscosity (Max.)	20,000mpas (low,med)		50,000mpas (medium)		70,000mpas (med,high)		150,000mpas (high)	
Motor (out put)	Brushless DC motor 100W							
Torque (Max.)	4.8kg . cm (47Ncm)		9.7kg . cm (95Ncm)		16kg . cm (156Ncm)		32kg . cm (318Ncm)	
Speed range	80 ~ 2,000rpm		50 ~ 1,000rpm		35 ~ 600rpm		25 ~ 300rpm	
Speed controller	Feed-back control							
Speed display	Scale	Digital	Scale	Digital	Scale	Digital	Scale	Digital
Stirring motion	–	1.Right 2.left 3.Auto reverse	–	1.Right 2.left 3.Auto reverse	–	1.Right 2.left 3.Auto reverse	–	1.Right 2.left 3.Auto reverse
Timer	–	99hr 59min	–	99hr 59min	–	99hr 59min	–	99hr 59min
Chuck range	Ø1 ~ 10mm							
Dimensions (WxDxH)	78 x 190 x 170							
Weight	3.2kg							
Electrical supply	AC220V 50/60Hz							

4. Operation of Scale Type

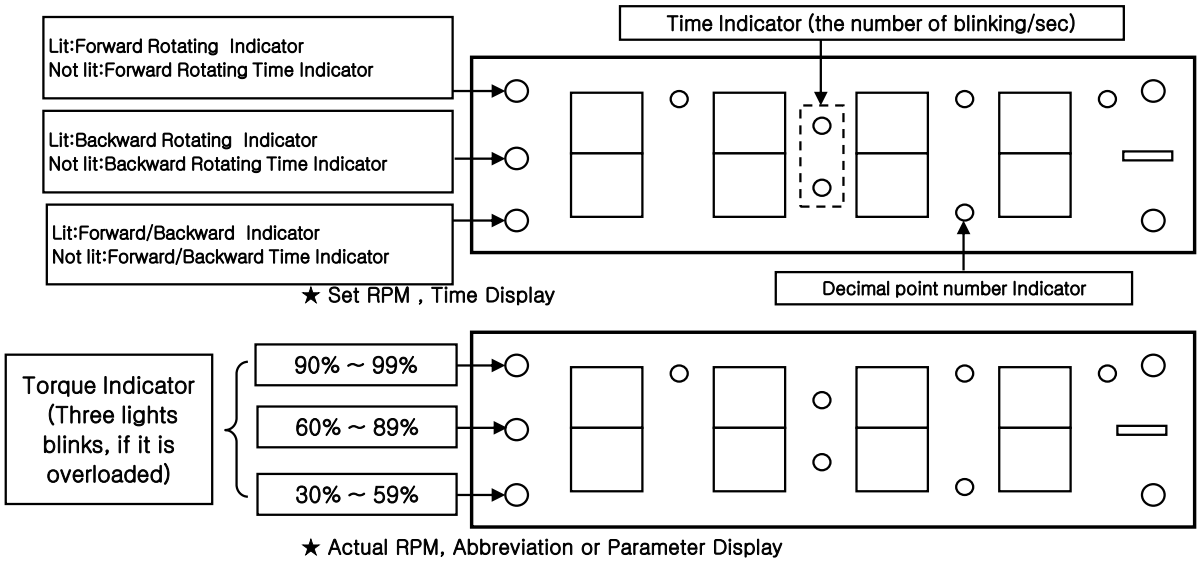
Scale



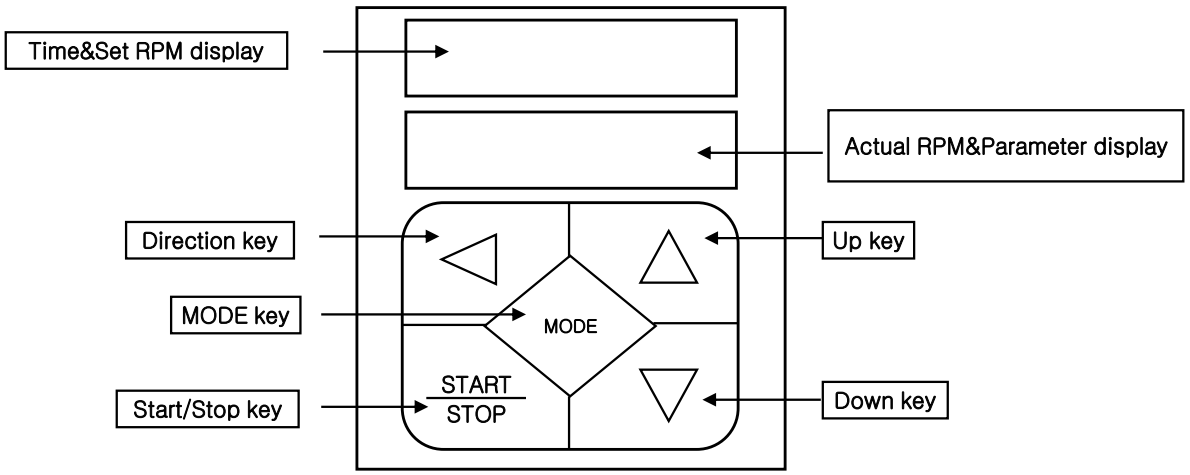
1. Install the equipment.
2. Connect the impeller lod to chcuk firmly.
3. Insert a plug into the outlet
4. Turn on the switch.
5. Set speed by turning volume. (Scale)
6. After experiment, without exception, set the volume in Min. and pull the plug out the wall.

Torch blinking means the motor is loaded too much.
The Motor pauses automatically after blinking for 10 sec.
After solving problems, run your experiment further.

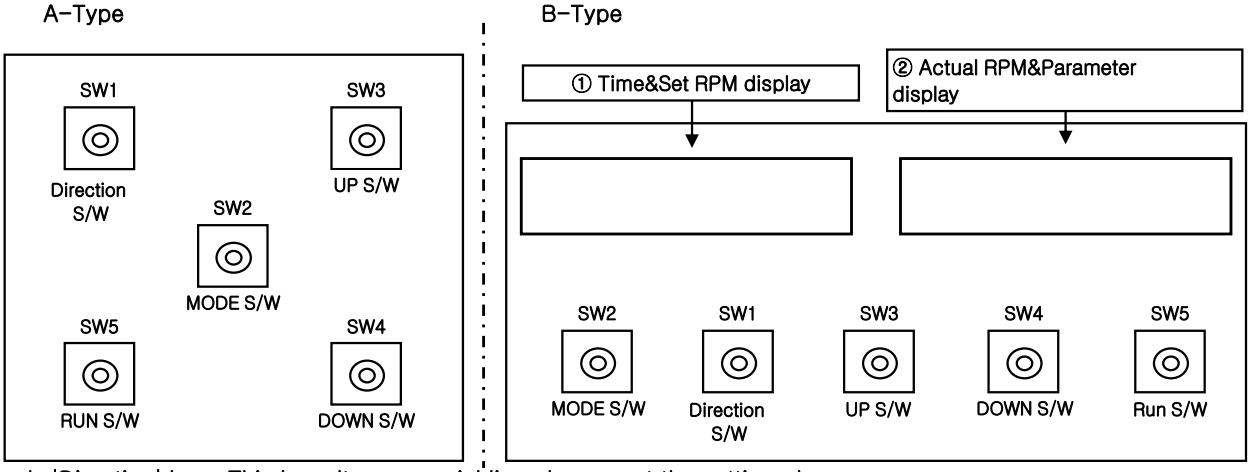
5. FND Display



6. Display in details



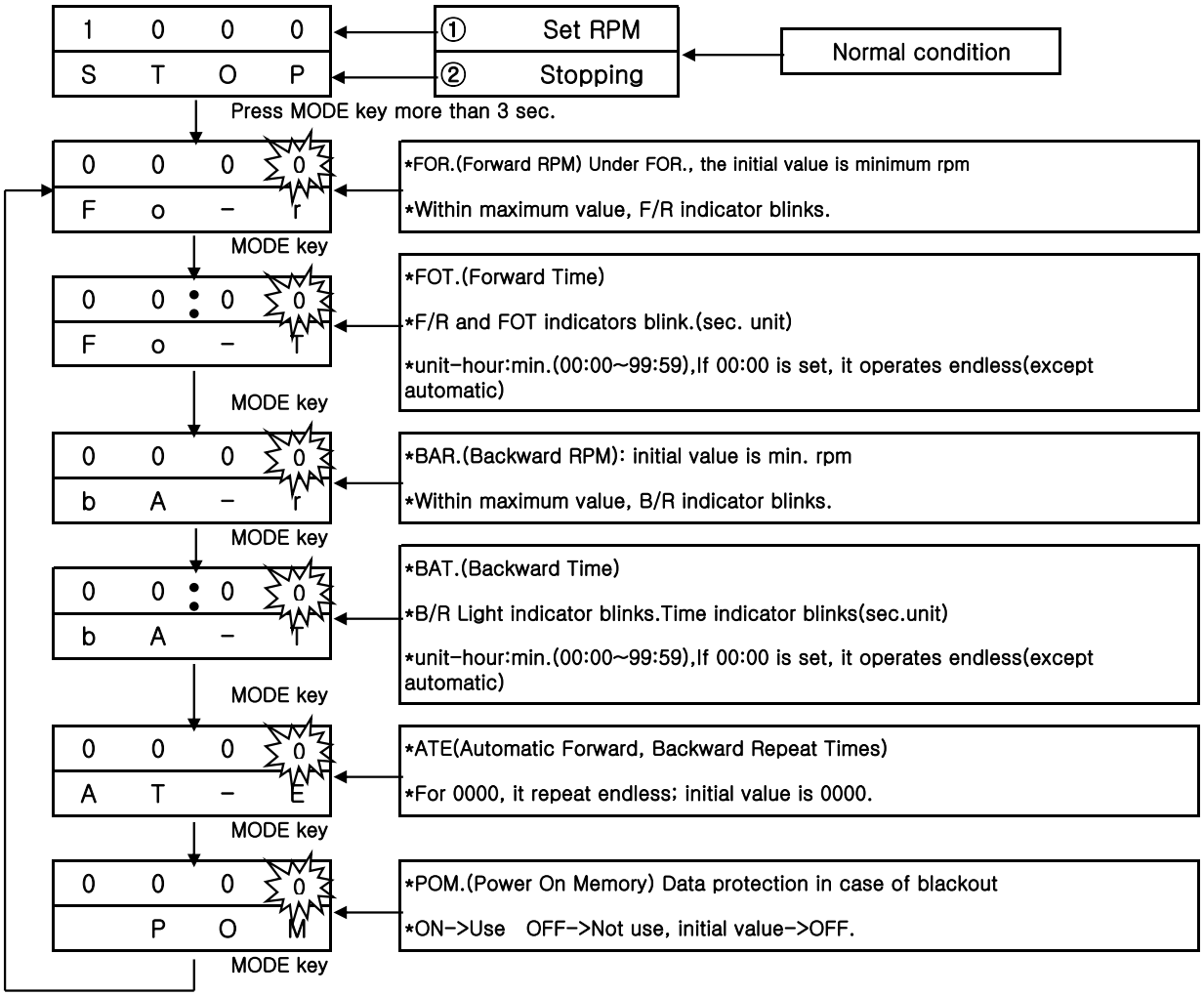
7. Function of each S/W TYPE(It could be changed by A-Type or B-Type as per each product)



1. 'Direction' key : This key alters numerial line changes at the setting phage.
   Under nomal motor phase, the 'Direction' key alters the display from remaining time to set RPM in turns.(vise versa)
2. 'Mode' key : This key can be applicable to every mode.
   Under normal phase, at stop mode, this key allows to change the mode from forward, backward, automaic operation systematically.
3. 'UP' key : Set mode can be increased.
4. 'Down' key : Set mode can be decreased.
5. Start/Stop key : This key can operate or stop the motor.

8. Description of each parameter

* Turn on power, then last set RPM will be displayed on forward rotation.



* Direction key 4, Up key 5 and Down key 6 can alter the mode.
* To return to nomarl phase, press MODE Key more than 3 sec.(memory fuction)

9. Operation

1. Forward Rotating Mode(F/R Mode)

1)To execute F/R mode, press Mode S/W, F/R and Operating S/W orderly.
2)By pressing UP/DOWN S/W, you can modulate rpm under operation(to maximum rpm).
3)Under operation, it is possible to see remaining time by pressing direction S/W.
4)If set time is 00:00, there is no time limitation for consecutive operation.
5)Under a pause phase, you can see operating timeby pressing direction S/W right.(a min unit)

2. Backward Rotating Mode(B/R Mode)

1)In order to execute B/R mode, after pressing mode S/W, chose B/R, then press Operating S/W.
2)By pressing UP/DOWN S/W, you can modulate rpm under operation(to maximum rpm).
3)Under operation, it is possible to see remaining time by pressing direction S/W.
4)If set time is 00:00, there is no time limitation for consecutive operation.
5)Under a pause phase, you can see operating time direction S/W right.(a min unit)

3. Automaic Operating Mode

1)To execute this mode, press mode S/W, automatic operating, operating S/W in order.
2)If FOT, BAT is not set, Error-1 occurs.
3)Under automatic operation, you cannot modulate rpm.
4)Under operation, it is possible to see remaining timeand repeating times(F/B rotating) by pressing direction S/W.
5)If set time is 00:00, there is no time limitation for consecutive operation.
6)Under a pause phase, you can see operating time and repeating times by pressing direction S/W.(min/times)

10. Description of Operation

*Turn on power, then last set RPM will be dispalyed on forward rotation.

In forward rotating operation

Ex) FOR 900 , FOT 00:01 setting
BAR 500 , BAT 00:05 setting

Normal Action(Forward rotation)

Display	F/R Indicator is lit.
Time executed	The number of blinking/sec (display)
Press Direction key; remainning time -> set RPM (in truns)	
Motor --> Forward rotationg with 900RPM(1 min.later, the motor stops).	

In backward rotating operation

Ex) FOR 900 , FOT 00:01 setting
BAR 500 , BAT 00:05 setting

Normal Action(Backward rotation)

Display	B/R Indicator is lit.
Time executed	The number of blinking/sec(display)
Press Direction key; remainning time -> set RPM (in truns)	
Motor --> Backward rotationg with 500RPM(5 min.later, the motor stops).	

In automatic rotating operation -1

Ex) FOR 900 , FOT 00:01 setting
BAR 500 , BAT 00:05 setting
ATE 0000 setting

Normal Action

Display	A/R indicator is lit.(For F/R, F/R Indicator is lit. For B/R, B/R Indicator is lit.)
Press 'Direction' key; remainning time -> set RPM (in truns)	
Motor --> F/R for 1 min. with 900RPM; 5 sec later, 1 min of B/R 900rpm; 5 sec.later F/R again.. Unlimited repeat	

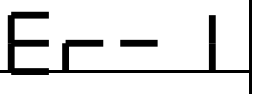
In automatic rotating operation -2

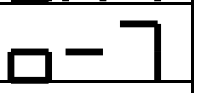
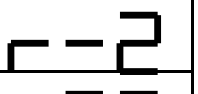
Ex) FOR 900 , FOT 00:01 setting
BAR 500 , BAT 00:05 setting
ATE 0005 setting

Normal Action

Display	A/R Indicator is lit(For F/R, F/R Indicator is lit. For B/R, B/R Indicator is lit.)
Time 작동시	F/B Rotating time blinks(when motor executed)
Press 'Direction' key; remainning time -> set RPM (in truns)	
Motor --> F/R for 1 min. with 900RPM; 5 sec later, 1 min of B/R 900rpm; 5 sec.later F/R again.5 times of F/R puls B/R, it pauses.	

11. Display of each parameter

RAT(Ratio)	
RPM(MAX.RPM)	
FOR(Forward Operating RPM)	
BAR(Backward Rotating RPM)	
ATE(Automatic Total Times)	
POW(Motor Power)	
M-R(Max.RPM of motor)	
Error-1	
ON	

PAU (Pause)	
SAT(Soft start time)	
FOT(Forward Operating Time)	
BAT(Backward RotatingTime)	
Power failure compensation	
STOP	
PERCENT(%)	
Error-2	
OFF	

12. Miscellaneous [Key explanation in details and other opererating sets]

1. Desciption of each S/W

1) S/W1 : Direction S/W

Condition	Operation mode	Description of operation	Remark
Operation	Forward rotating	Display of remaining time==>Display of setting RPM (Repeat)	
	Backward rotating	Display of remaining time==>Display of setting RPM (Repeat)	
	Automatic Mode	Remaining Time for Forward(Backward) Rotating==>Repeated Remaining Time for Forward(Backward) Rotating==>Remaining Time for Forward(Backward) Rotating (Repeat)	
Stop	Forward rotating	Forward rotating==>Forward rotating Set rpm indicator (repeat)	It indicates operating time and F(B)/R repeating times before pausing.
	Backward rotating	Forward rotating==>Forward rotating Set rpm indicator (repeat)	
	Automatic Mode	F/R==>B/R rpm==>B/R Time ==>F/B Repeat Times==>B/R rpm Indicator (repeat)	

2) S/W2 : MODE S/W

① When S/W2 is presed under a pause mode: backward => automatic => forward rotating will be displayed in truns.

3) S/W3,S/W4 : UP/DOWN S/W

①There is no fuction undder pause mode.
②Under F/B rotating(but automatic), this key allows to increase/decrease set rpm.
③Rpm modulation limit is from min.rpm to max.rpm.
④Even if rpm was modulated under operation, a stop mode alters it to previously set rpm.

4) S/W5 : Operating/Stop S/W

① When the motor executes, this key stops it.(vise versa)
②Under automactic mode, if F/B rotating time is not set, it causes Error-1. (see Error)
③In case of every error, it does not allow operation.

13. Explanation for error message and solution

1. Error-1: Set-time Error

1) It occurs when F/B rotating time(under automaic operation) is not set.
2) To solve the problme, set operation time.

2. Error-2 : MOTOR Over-current Error (PROGRAM Sensing)

1) It occurs when motor executes more than 91% over its capacity, consecutively 10 seconds.
2) The output is different from motor to motor(or from RPM to RPM).
3) To sovle the problem, turn off the motor first, then turn on again.

3. Error-3 : Reach out of Minimum RPM

1) It occurs when minimum RPM cannot be achieved within 10 sec. of operation.
2)Stirer=100RPM(Output RPM=100/gear rates)
3) To solve the problem, turn the motor off/on again.

4. Error-4 : If motor stops during the operation, Error-4 will be displayed.

1) Sense works only under rotating process.
2) Sense delay time: before set RPM- withine 10 sec. after set time- 0.2s.
Set RPM is less than 500(Motor)- after 5sec.after Set RPM executed.
3) If rotating is not occurs from beginning of operation, it can categorize in Error-3.
4)To solve the problem, turn the motor off/on again.

5. Error-5 : Motor sensor error

1) Motor sense output problem
2) To solve the problem, turn the motor off/on again.

6. Error-6 : MOTOR Over-current Error (HARDWARE Sensing)

1)FET(MOTOR output device) Error or MOTOR Interior Problems
2) Soon after sensing problems, error occurs.
3) To solve the problem, turn the motor off/on again.
4) For consecutive errors, check motor or PCB.

14. Miscellaneous

1. If there is no input for more than 60 sec. at MODE or PARAMETER lebel ,then the display will return to the standard phase.
2.Under normal operation, RPM changes are available by pressing Up/Down Key(Maximum RPM Setting).
--> This function is not available under automaitc operation. Set-time is not chaged.
3. Under automaitc operation, by pressing 'Direction' Key, the display will be turn AUTT time to Set RPM.
4.For PARAMETER setting, press MODE Key more than 3 sec.
5. At the beginning of setting, by pressing MODE Key, the display will be chage for the follwing turns;
Forward Rotating-> Backward Rotating-> Automating Operation.
6. When over-loaded, 3EA of torch(more than 90%) will blink at the same time, After 5 sec. it pauses.
--> Within 5 sec(less than 90%), it execute normaly.; In order to reset, turn off/on the motor.
7.Numerical valvue chagnes; for upward, 0->1->2->3…8->9->0->1. for downward, reverse turns.