

# EC30D SERIES CONTROL UNITS

## Instruction Manual for the Control Units for Vibratory Drives

Variable Frequency type

### Model

**EC30-1DF**

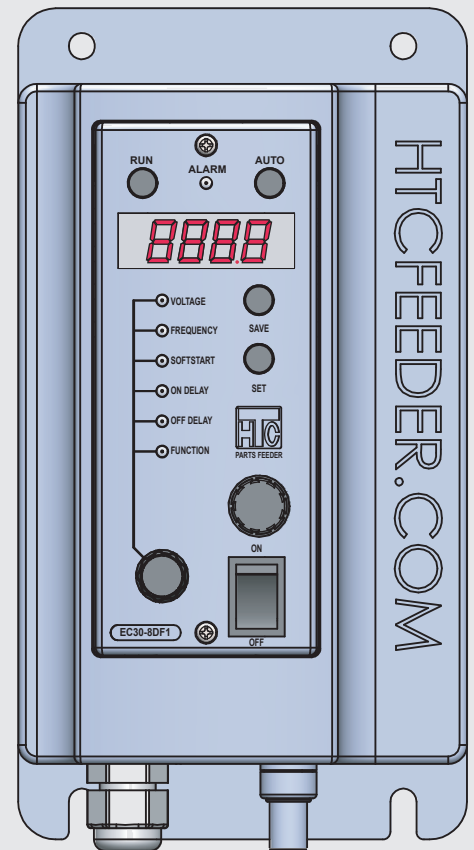
**EC30-3DF**

**EC30-5DF**

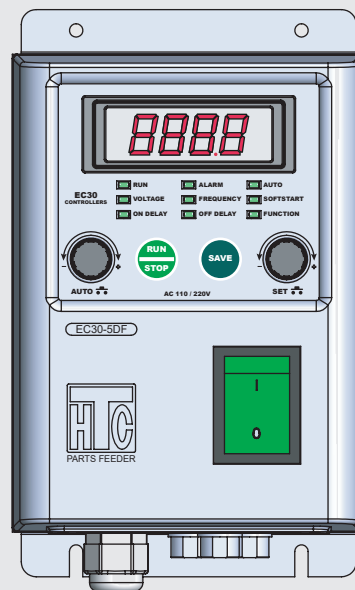
**EC30-8DF**

**EC30-10DF**

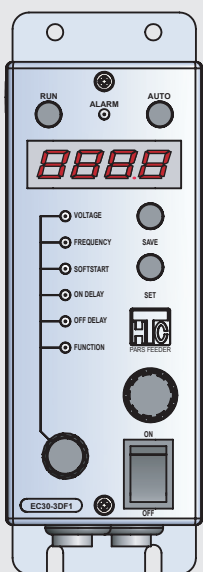
**EC30-10DF**



**EC30-5DF**



**EC30-3DF**



HTC2020



Before use the “Control Units”, please read this “Instruction Manual” including “Safety Instruction” thoroughly to use it right way. Please keep it on file for further reference.

# INSTRUCTION MANUAL

**\*\* Read the Instruction Manual to the last before use and operate the machine correctly.\*\***

## Introduction

Thank you for your purchase of HTC EC30 series frequency variable digital controller. In order to correctly and safely operate this controller, be sure to read through this instruction manual before using this device. This instruction manual with guarantee certificate shall be delivered to end users without fail. In addition, users shall keep this manual at the safe place where readily available whenever needed even after reading.

### 1. Before usage

In order for you to use this device correctly and safely and to make the most of its function, notes below and on the next page shall be observed.

- ▶ On receiving this device, please check if there is any failure due to the transportation. If you find any inconvenience such as a failure, do not hesitate to contact the nearest sales office.
- ▶ This controller is only for **HTC** electromagnetic parts feeder. Usage in other than this application or usage exceeding the specification range is prohibited. It may cause failures.
- ▶ The "parts feeder" described in this instruction manual is the generic names for the bowl feeder, the linear feeder and so on.

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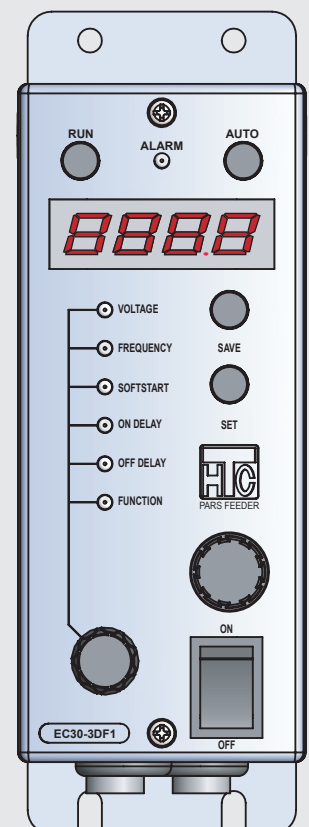
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## EC30-3DF












Warrenty  
(one year)

# INSTRUCTION MANUAL






## 2. Notes on Safety

As to the safety, users must have a great responsibility of their own. Be sure to begin any operation after reading through this operation manual. In addition, in order to use this controller with safe, be sure to obey the warning and caution labels of this device as well as to observe the following notes.

 <b>Danger</b>	If this indication is ignored and the control unit handled incorrectly, there may Be a very high possibility of death or serious injury.
 <b>Warning</b>	This description shows that not observing this remark and mishandling the device will cause the death or serious injury of human body.
 <b>Caution</b>	If this indication is ignored and the control unit handled incorrectly, there may Be a possibility of death or serious injury.
 <b>Danger</b>	
	Never start the work before the charge lamp (LED 3) goes out. Before starting inspection, wait for more than five minutes after the power is turned off. Otherwise, electric shock may result.
	Please never drive with the panel opened (an emergency case is excluded). Moreover, please turn off the power supply when you open the panel. It gets an electric shock, short-circuited, and is likely to ignite.
	Please never do the wiring work without cutting off the primary side power supply or the main breaker. It gets an electric shock, short-circuited, and is likely to ignite.
	These controllers are only for the <b>HTC parts feeders</b> (electromagnetic type vibration) they are not possible to use it for other usages such as a piezo-electric type parts feeders and the single phase motors. It gets short-circuited and is likely to ignite.
	Do not install and operate the control unit if it is damaged or if any of its part is missing. Personal injury may result.
 <b>Warning</b>	
	Be sure to connect the grounding conductor. Wiring work must be done by a qualified expert. Otherwise electric shock may result.
	Please never use it in the place with a gas or a liquid that explodes and ignites. It causes a fire.
	Please a person other than the repair engineer never performs disassembling, repairing nor remodeling this device. It may ignite, do abnormal motion to make him/her injured.

# INSTRUCTION MANUAL

## 3 Continue

	Do not sue the control unit in places where flammable, explosive or combustible gas or liquid exists. Such gas or liquid can cause fire.
	It must not be used in a place where it exposes to water, oil or chemicals, or outdoors, or in a place of high temperature and humidity. There is a fear of an electric shock, a fire or a failure.
	Temperature of heat dissipation fins and ambient of the controller box may become high (50~70°C) please note that there is a fear of the burn. Moreover, please install a space for heat radiation in the surrounding
	Before replacing fuse, be sure to turn off the power. Otherwise, electric shock may result.
	Do not damage, forcibly pull or bend the wiring. If a heavy object is placed on or held between the wiring damage, fire or electric shock can result.
	While the control unit is being energized, do not touch the output terminal of the control unit even when it is stopped, because electric shock may result.
	Be sure to connect the grounding conductor. Wiring work must be done by a qualified expert. Otherwise electric shock may result.
	Do not connect the output terminal (OUT1, OUT2) to the AC power source because fire or failure results.
	Do not turn ON and OFF the power frequently because failure of the control unit results.
	Use the control unit with the designated voltage only. Otherwise, fire or failure can result.
	Do not touch the radiation fins whose temperature become high. Provide a radiation space round the control unit to prevent possible burn.
	Do not conduct tests using a megger (to measure the insulation resistance) because the failure of the control unit results.
	Do not install the controller in a place subjected to vibration or shock because the failure of the control unit results.
	Do not allow foreign objects such as paper, small chips of wood or oil into the controller nor allow combustibles such as waste thread and dust to attach to the cooling fins because fire or accident may result.
	Noise generates from the control unit or the wiring or equipment connected to the controller. Check for malfunction of equipment or sensors in the vicinity. Personal injury may result.



## WARNING



### Welding Area

Please disconnect/turn off the main power source. otherwise the controller will be damaged risk



Before welding to the bowl, be sure to securely connect the ground clamp of the welder to the bowl. Has to disconnect/turn off the main power source. Otherwise, the ground wire connecting the main body and the control unit may be burned and electric shock or leakage may result.

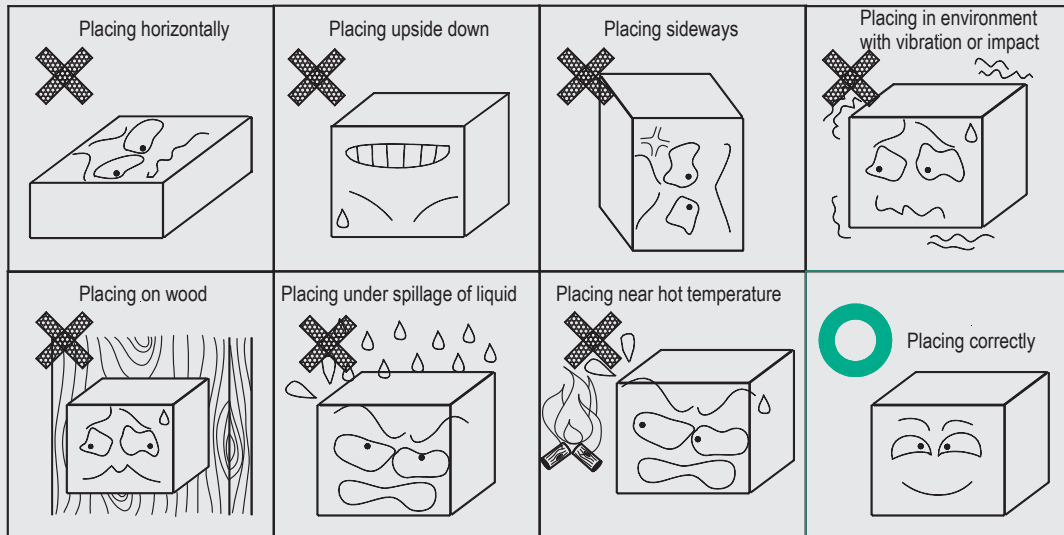


# INSTALLATION

## Installation

### (1) Installation place

- ① Please install it on a firm material such as metals (nonflammable material) having no vibration.
- ② Please have a space in surroundings without fail so as not to ruin heat radiation and install it vertically.
- ③ Oils and fats and chemicals, etc. may hurt the resin, painting, and the cable of BOX. These liquid and mist must not splash directly on the controller.

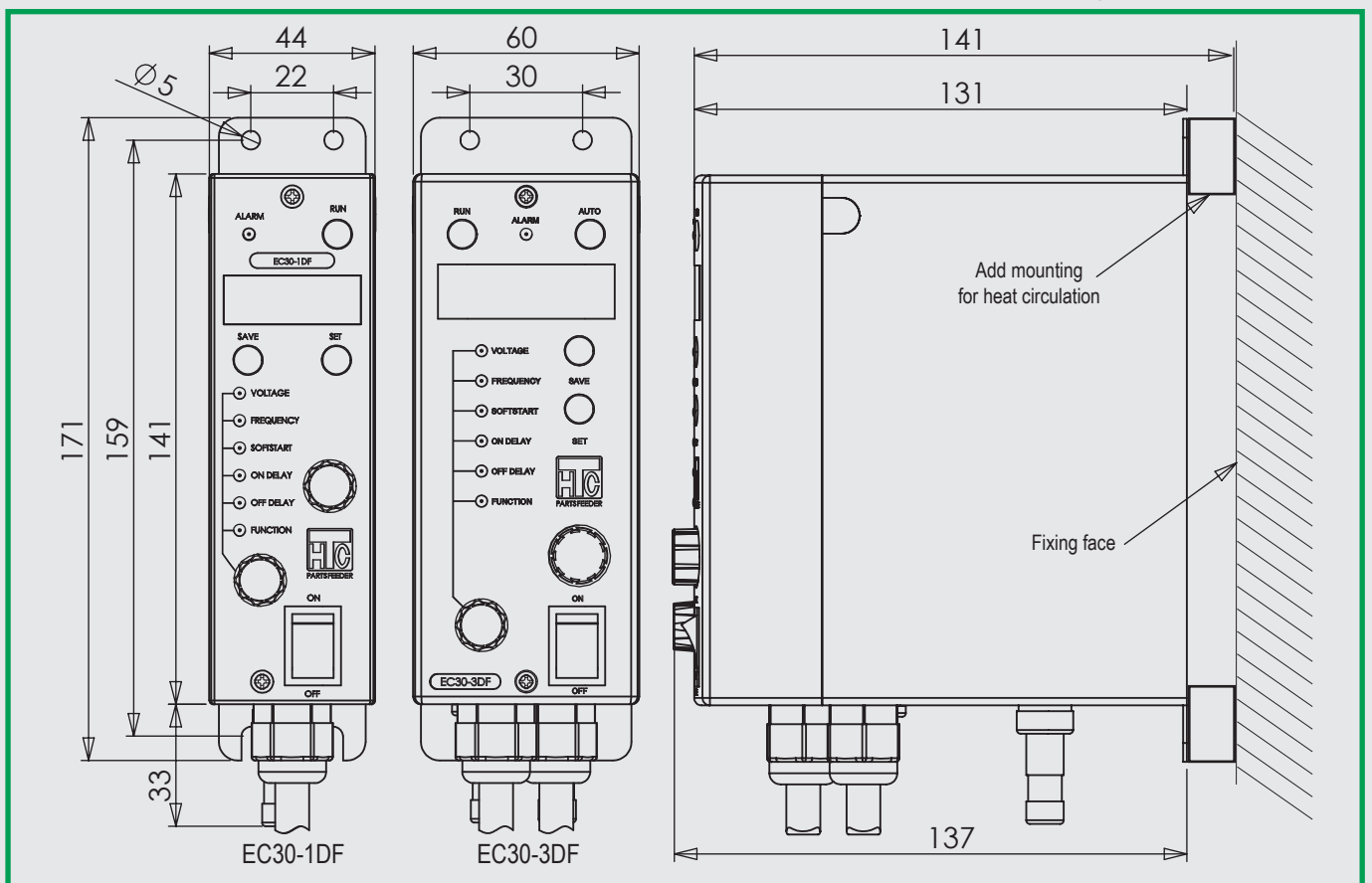


### (2) Installation hole and surrounding space

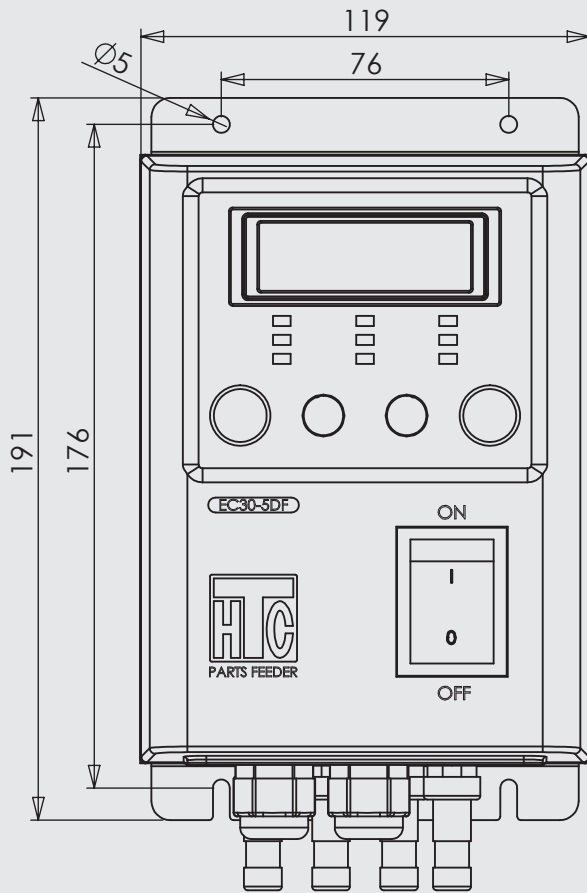
Please refer to the figure below for the size concerning controller's installation. Moreover, it is necessary to leave a space shown in the figure below in the surroundings of the controller for heat radiation (Unit: mm)

[Installation dimension]

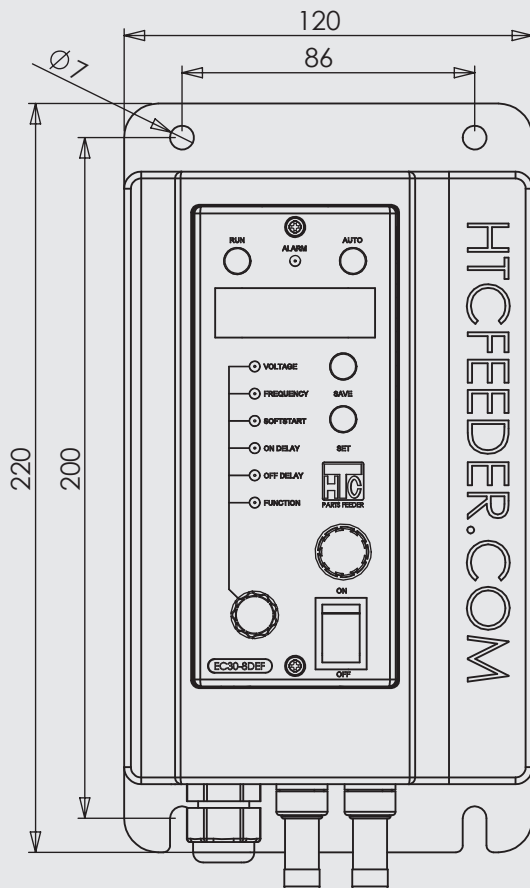
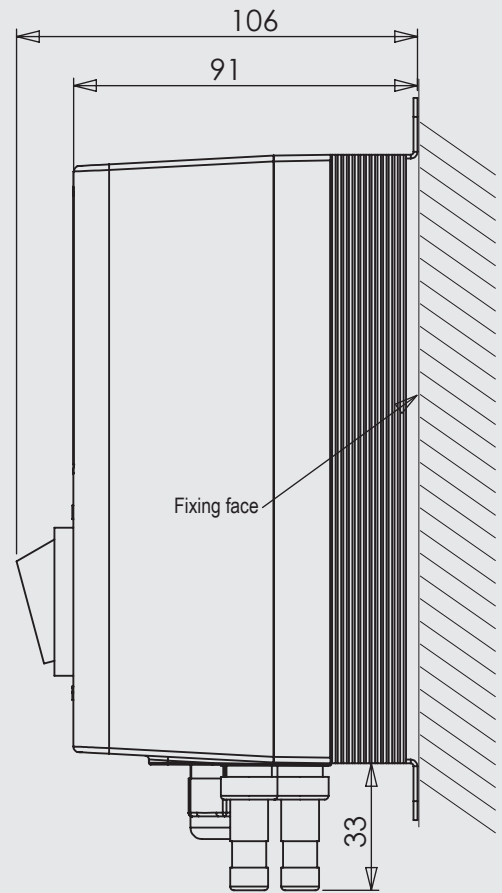
[Space to the surroundings]



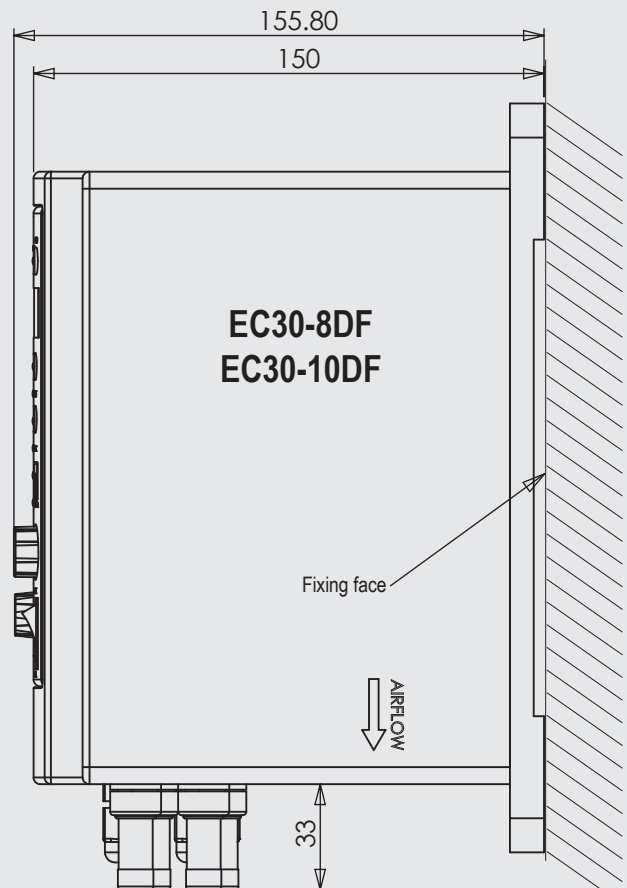
# INSTALLATION



EC30-5DF

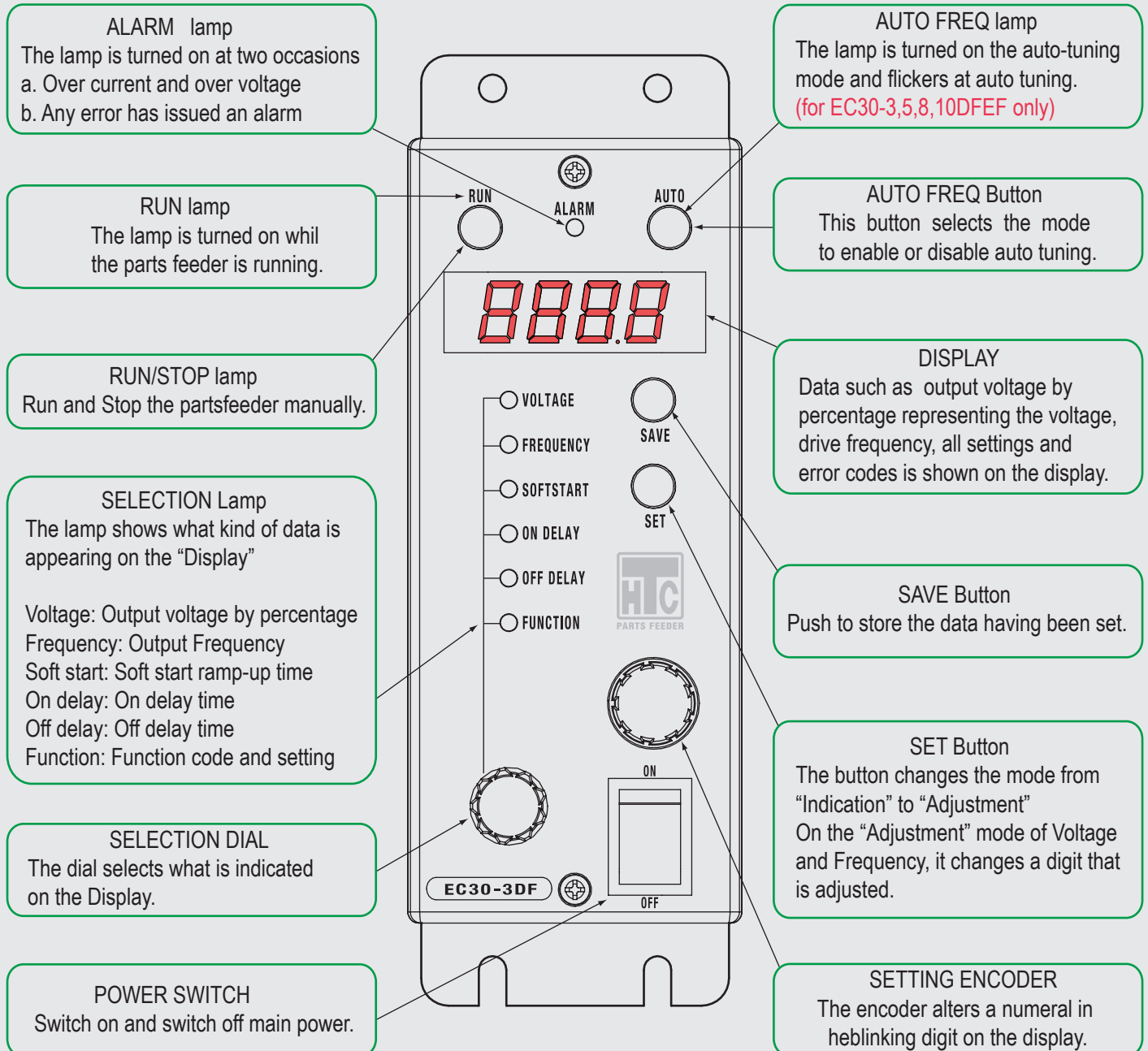


EC30-8DF  
EC30-10DF



# FUNCTIONS OF PANEL

● Turning on ○ Turning off

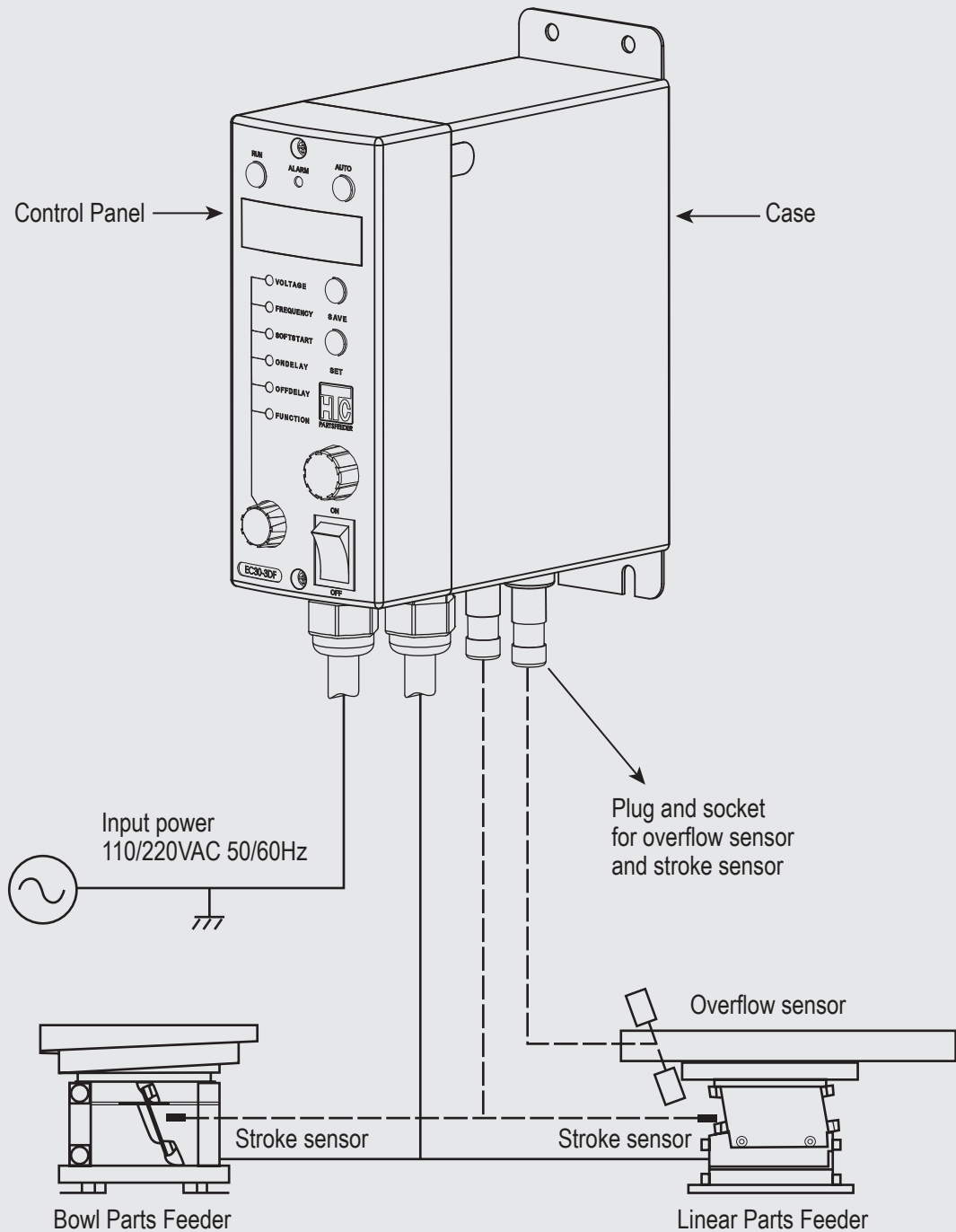


**Warning:** Turn off the input power supply before removing the front cover!

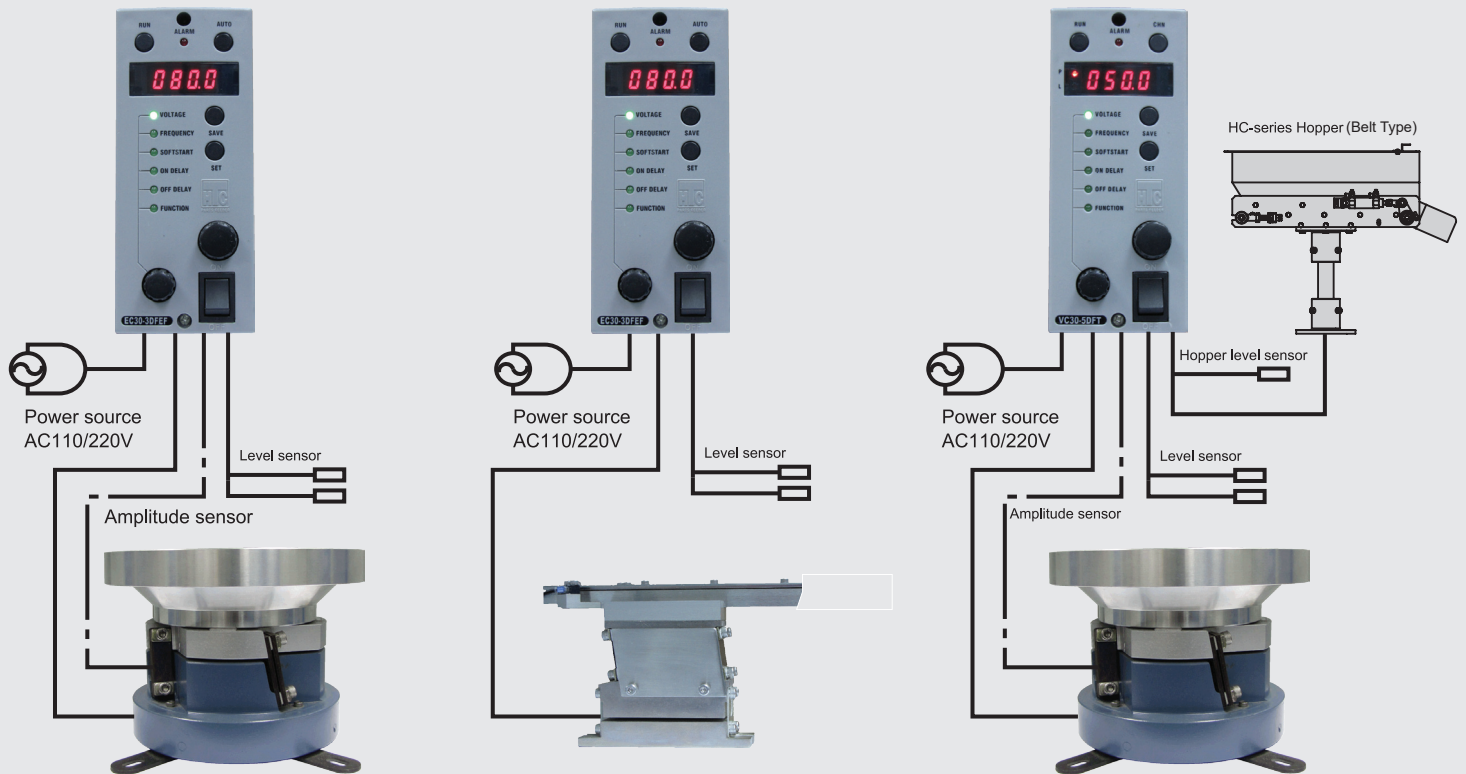
# I/P O/P CONNECTION

## Wiring Connections

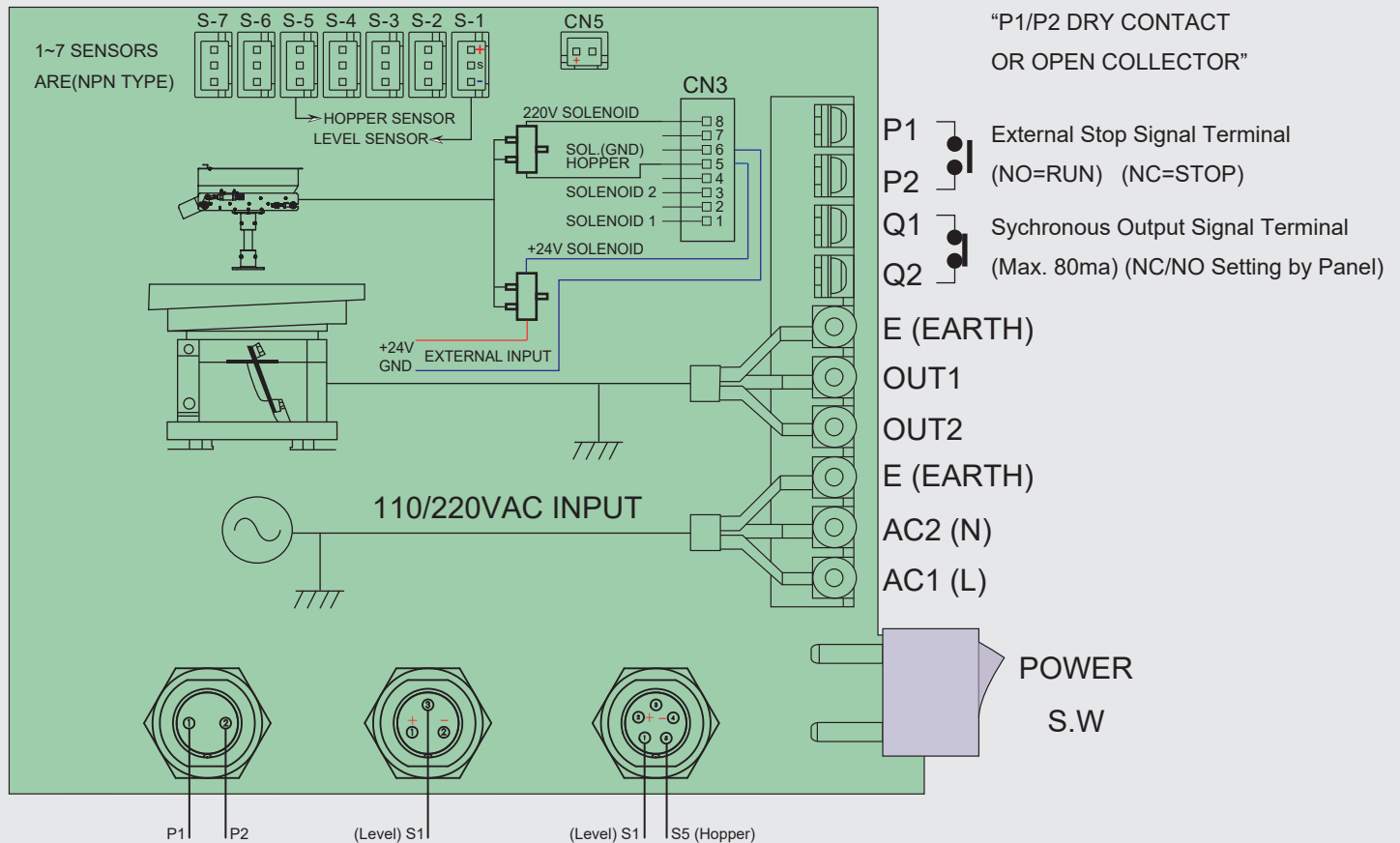
Wire the Control Unit and Bowl Parts Feeder or Linear Parts Feeder



# WIRING CONNECTION



## MAIN BOARD CONNECTION



### NOTE:

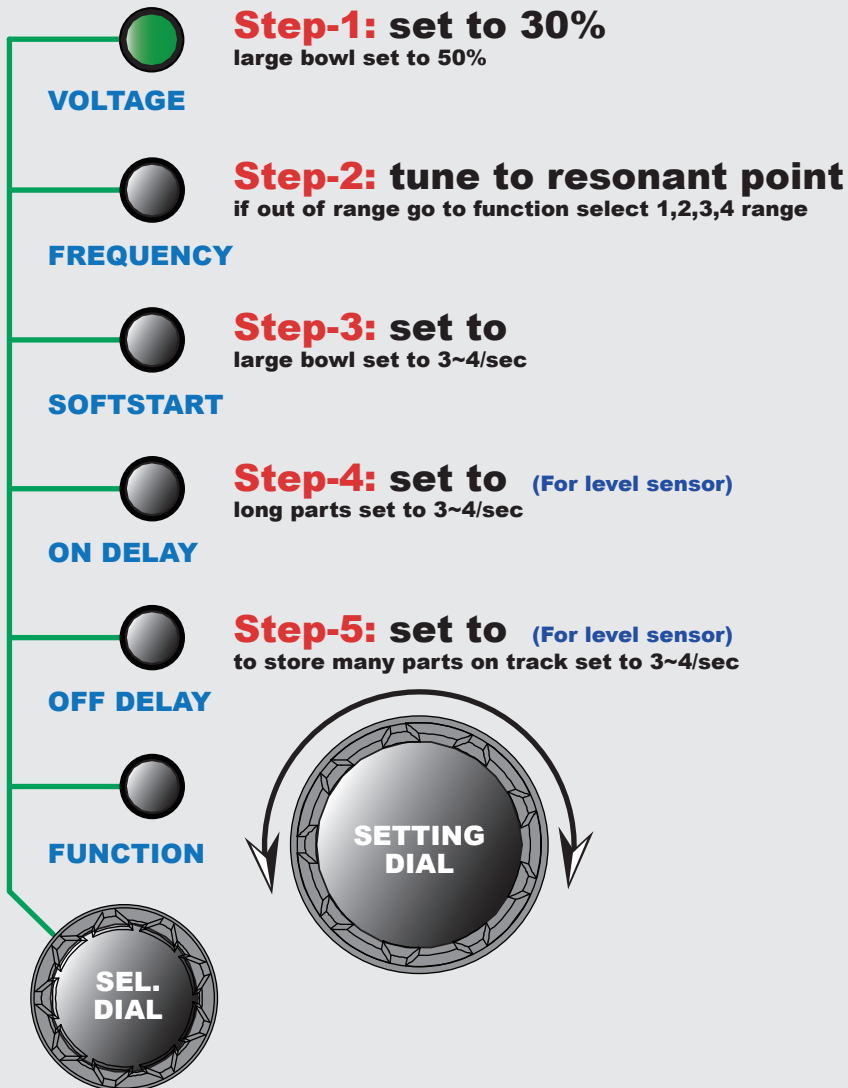
(ALL HTC CONTROLLER CAN BE APPLIED PNP TYPE SENSOR, SEPECIFY ON ORDER)

# SETTING ILLUSTRATION



Datas under RUN mode to be set

the values can be changed accordingly



## Frequency range

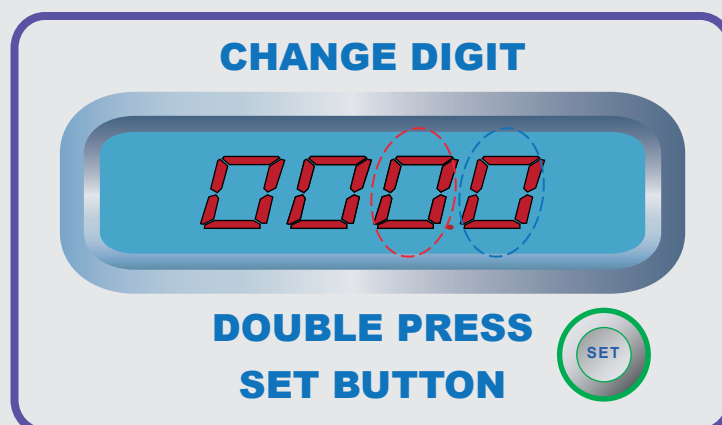
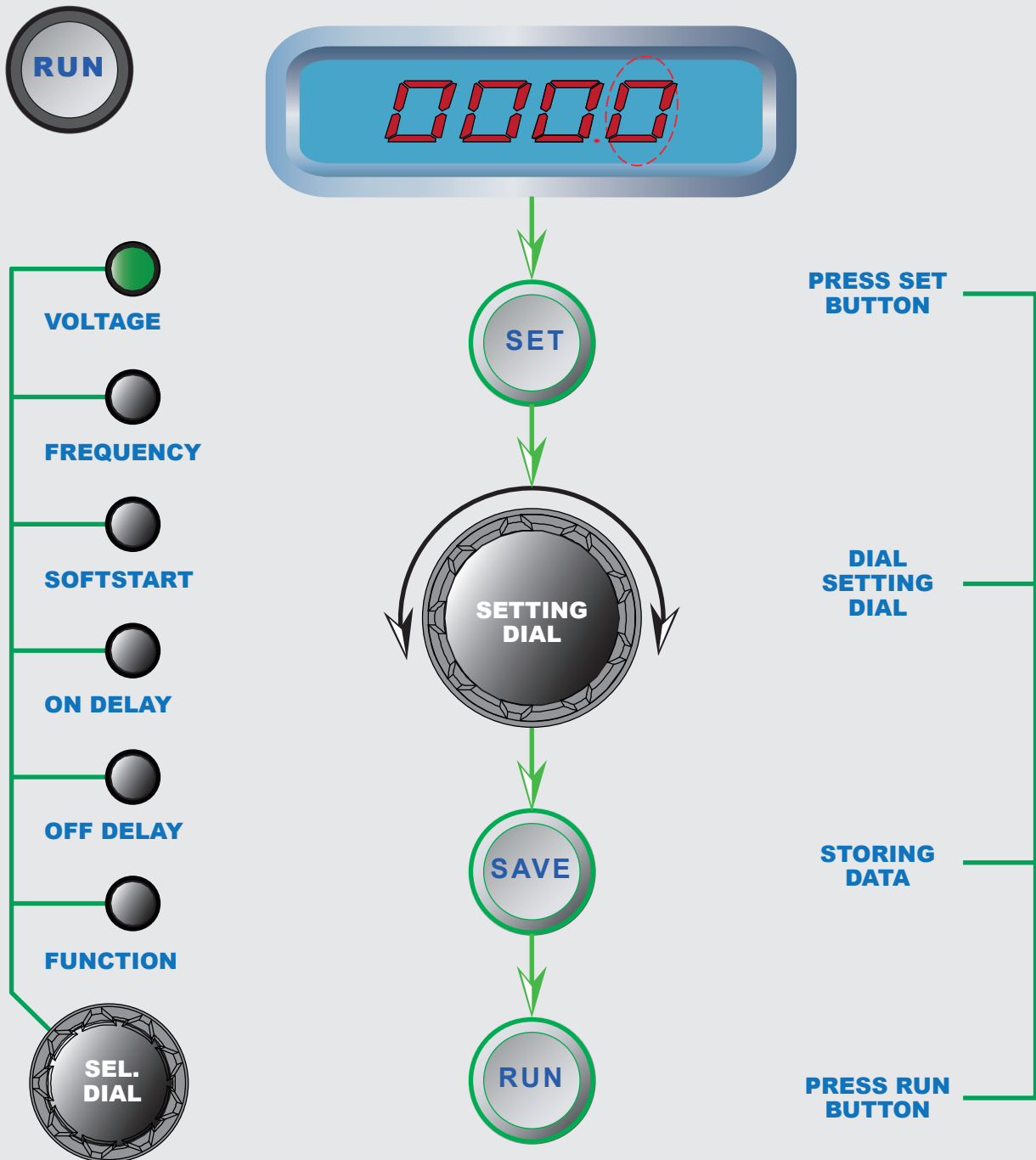
F r E 1 (45~90Hz)  
F r E 2 (90~180Hz) default  
F r E 3 (180~360Hz)  
F r E 4 (65~120Hz)

Press **SAVE** button to store the datas have been set

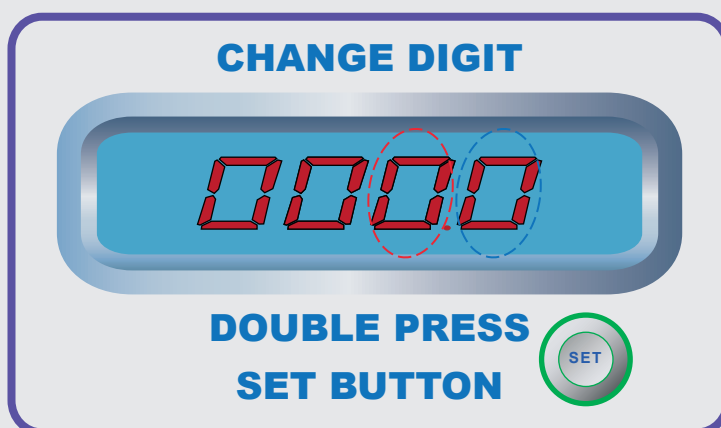
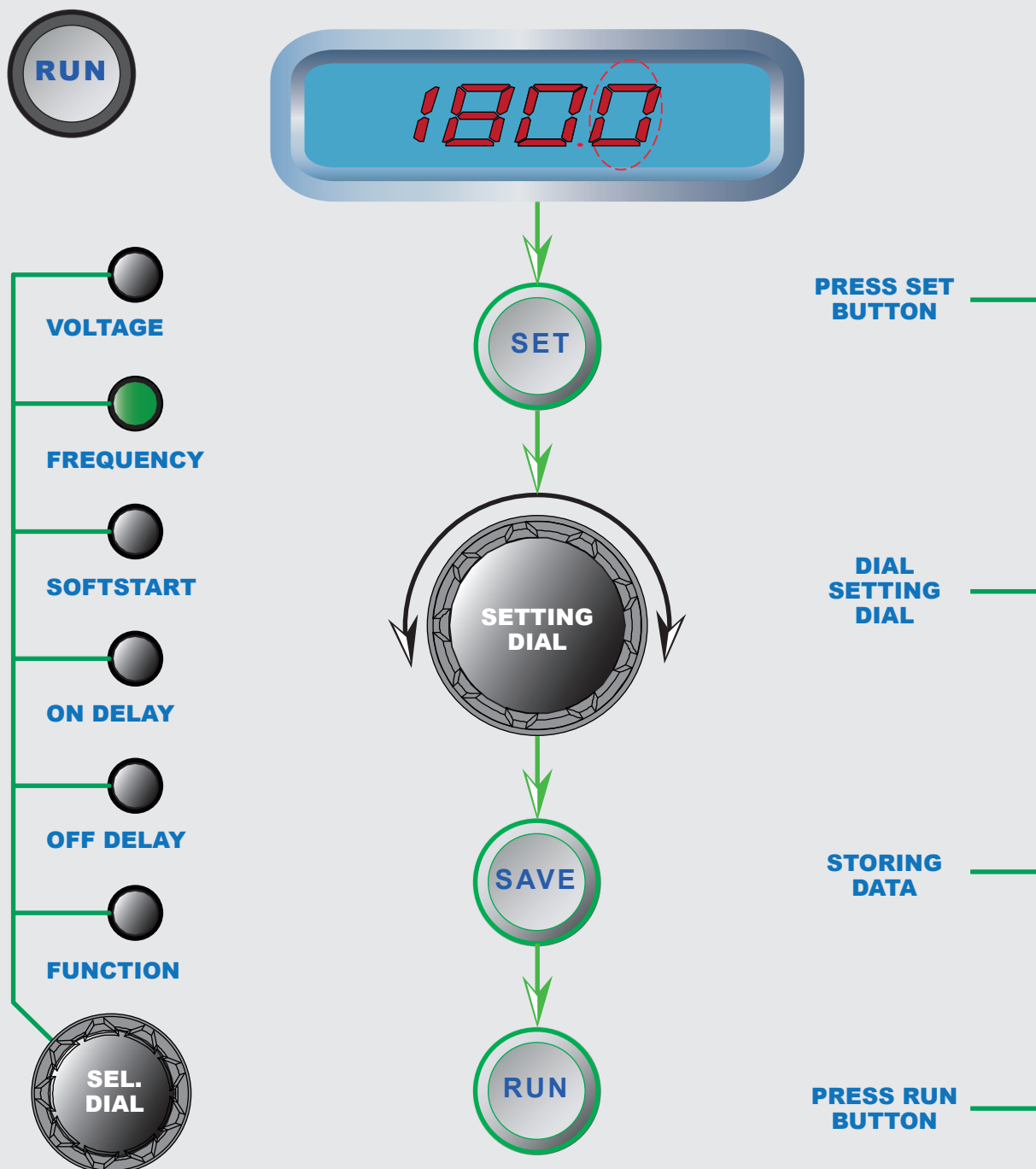
Run by power on



# VOLTAGE SETTING



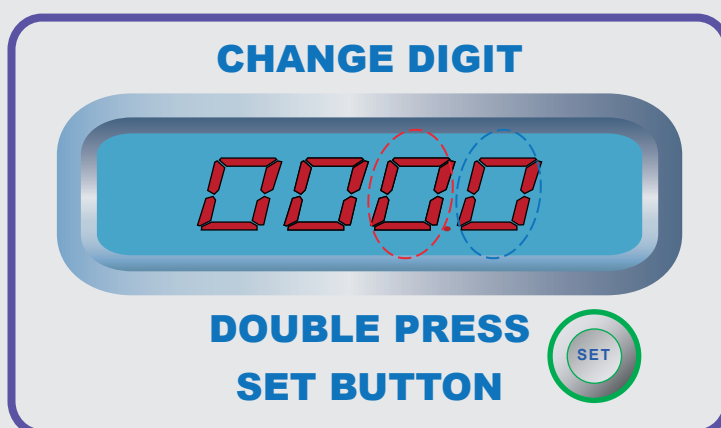
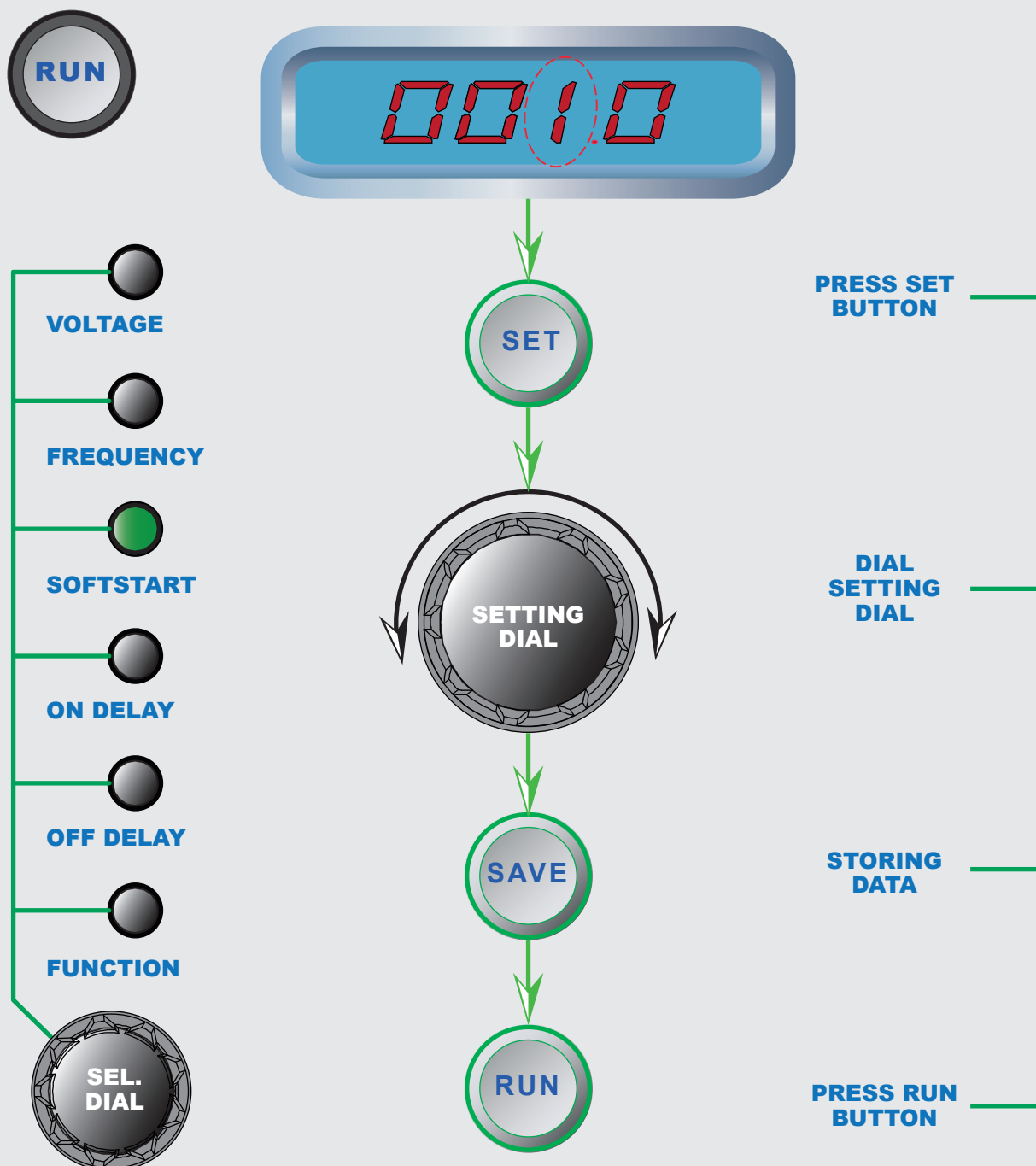
# FREQUENCY SETTING





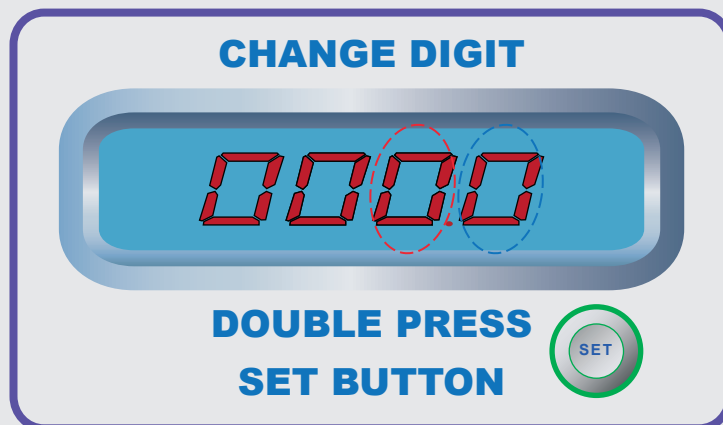
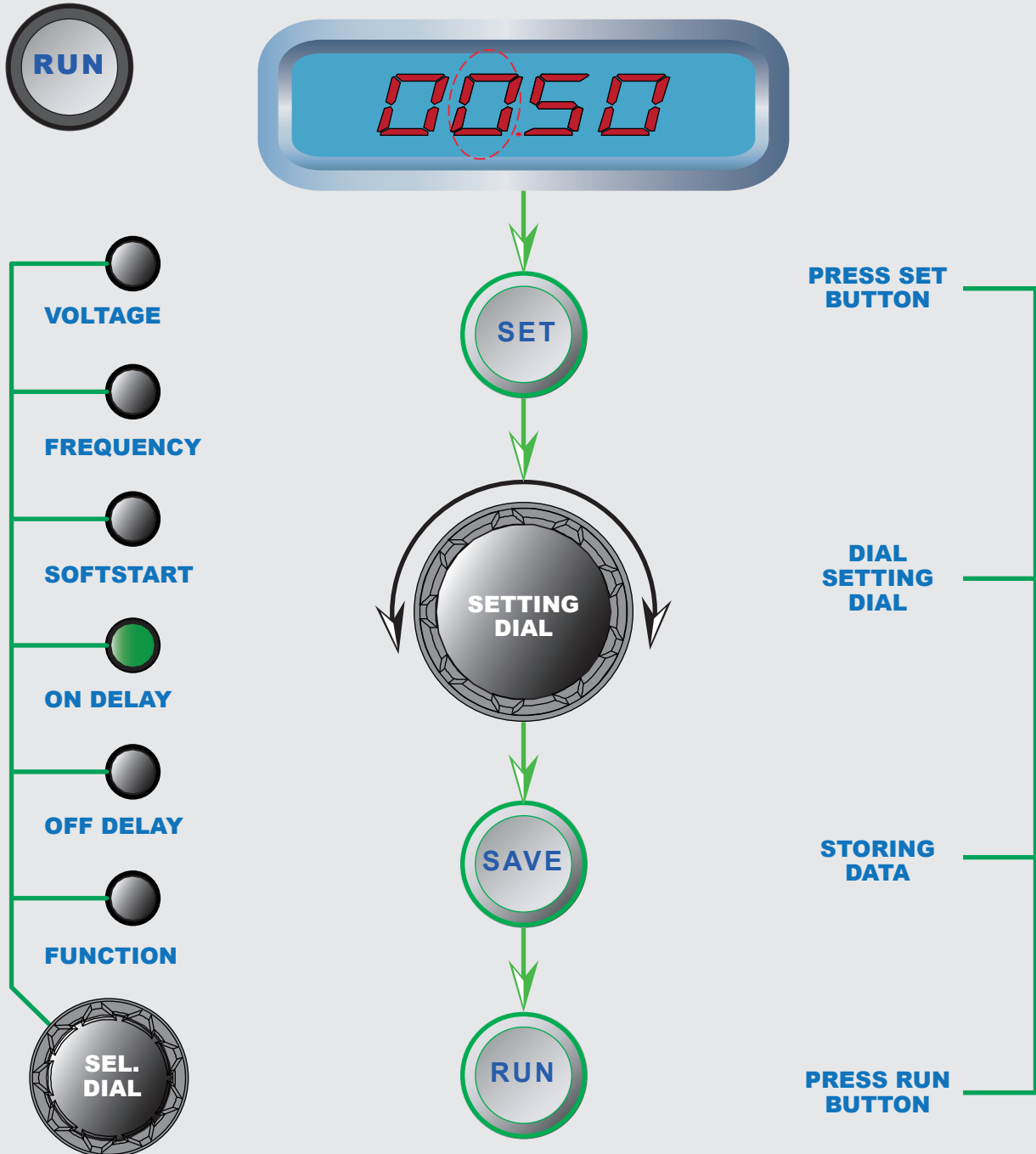
# SOFT START SETTING

SMALL BOWL 0.5~2.0/S LARGE BOWL 3.0~4.0/S



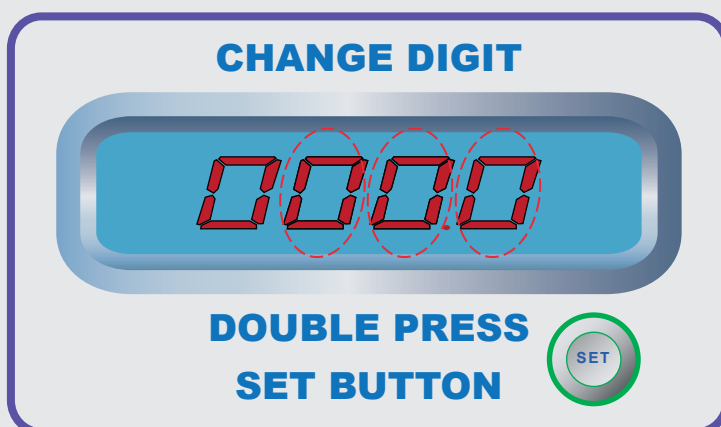
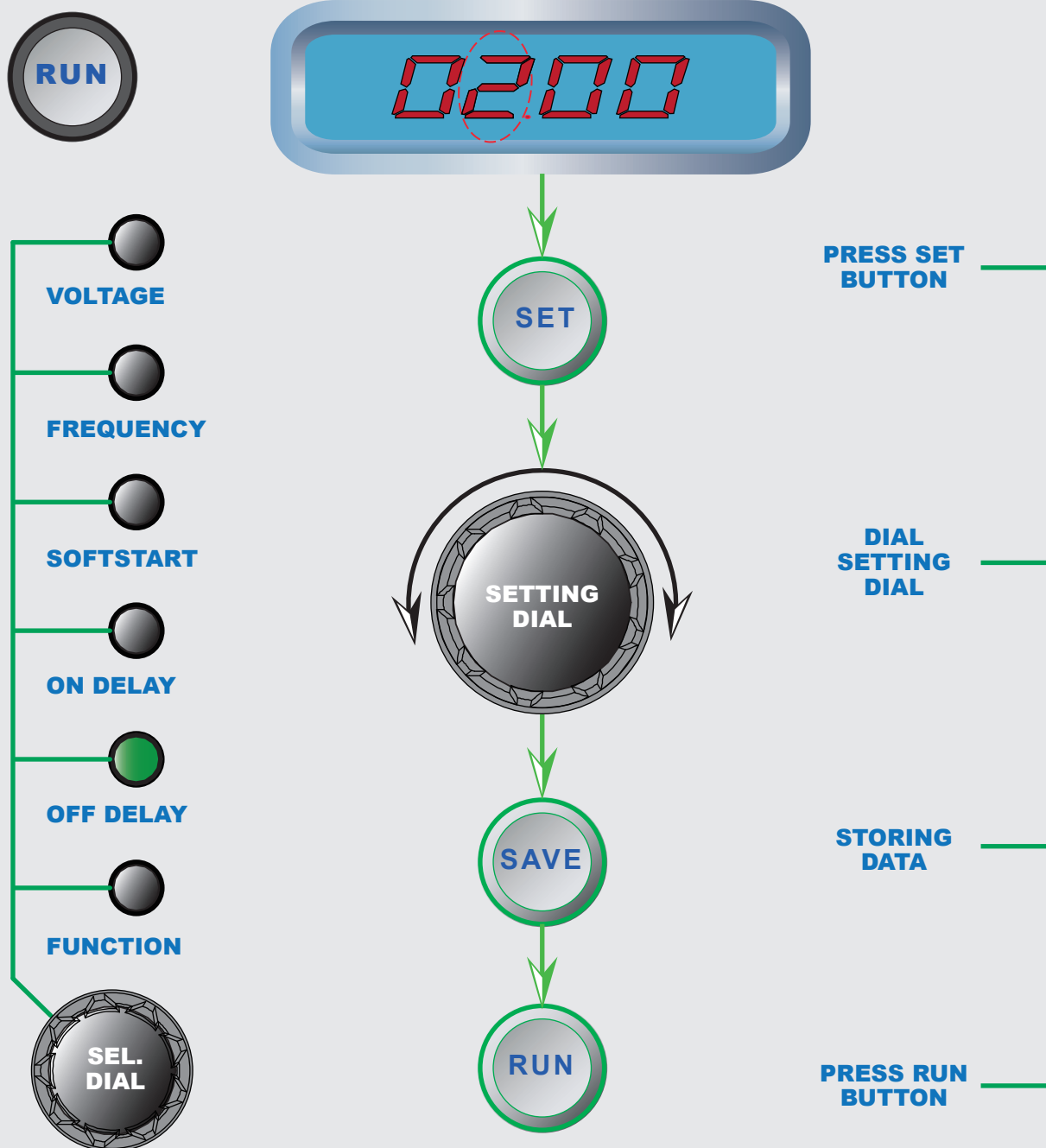
# ON DELAY SETTING

## LEVEL SENSOR & SOLENOID

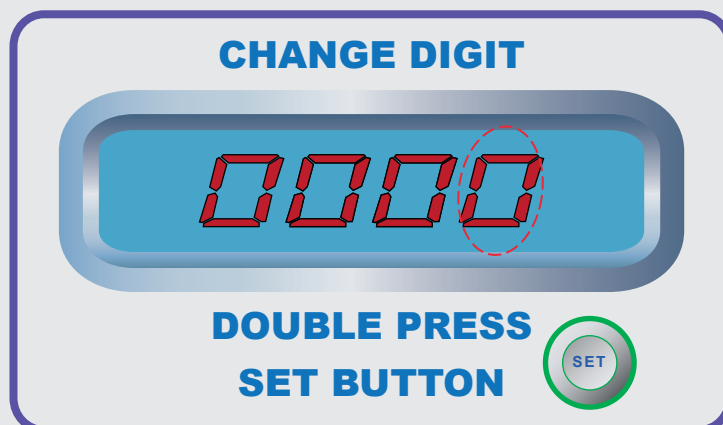
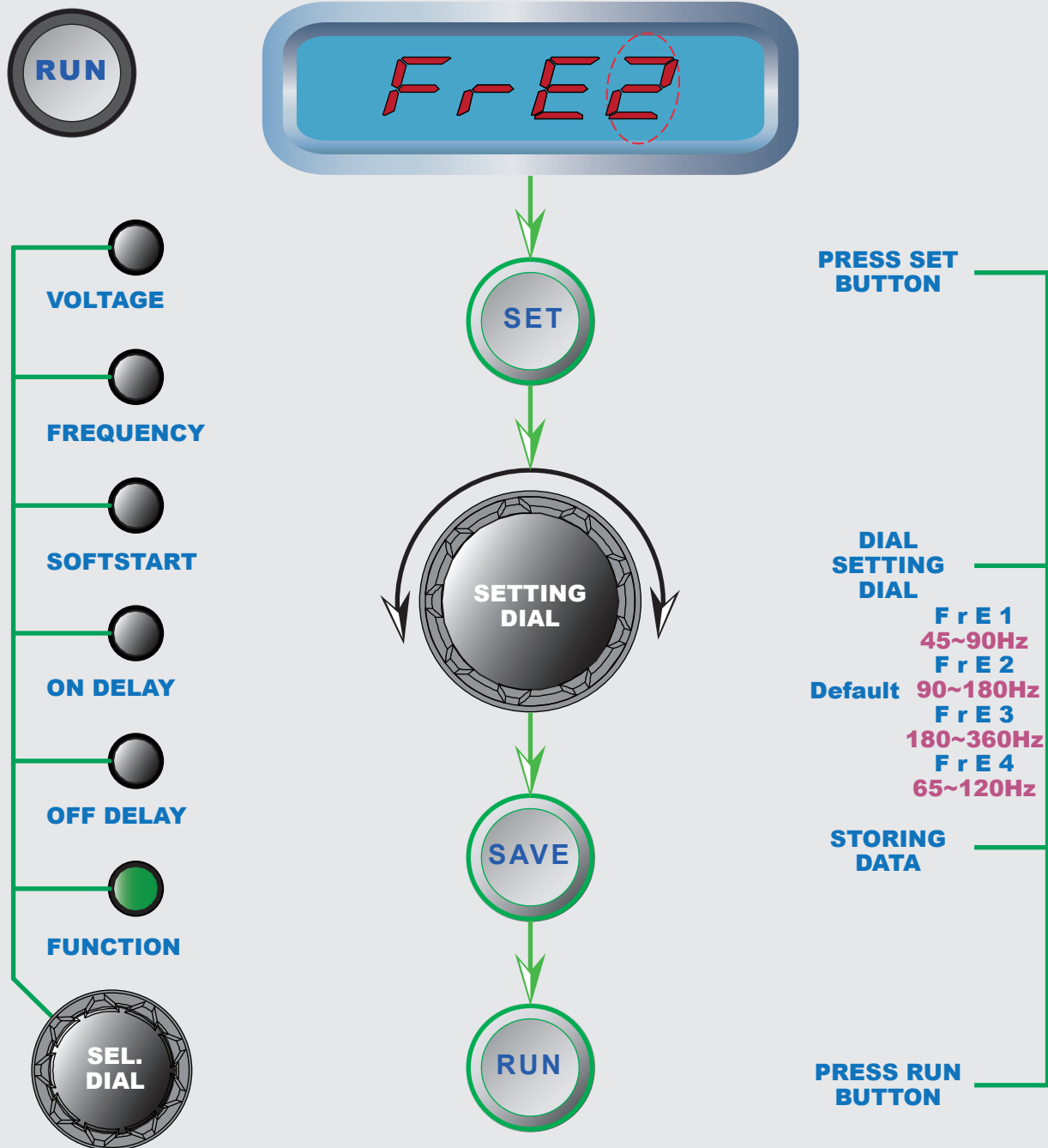


# OFF DELAY SETTING

## LEVEL SENSOR & SOLENOID

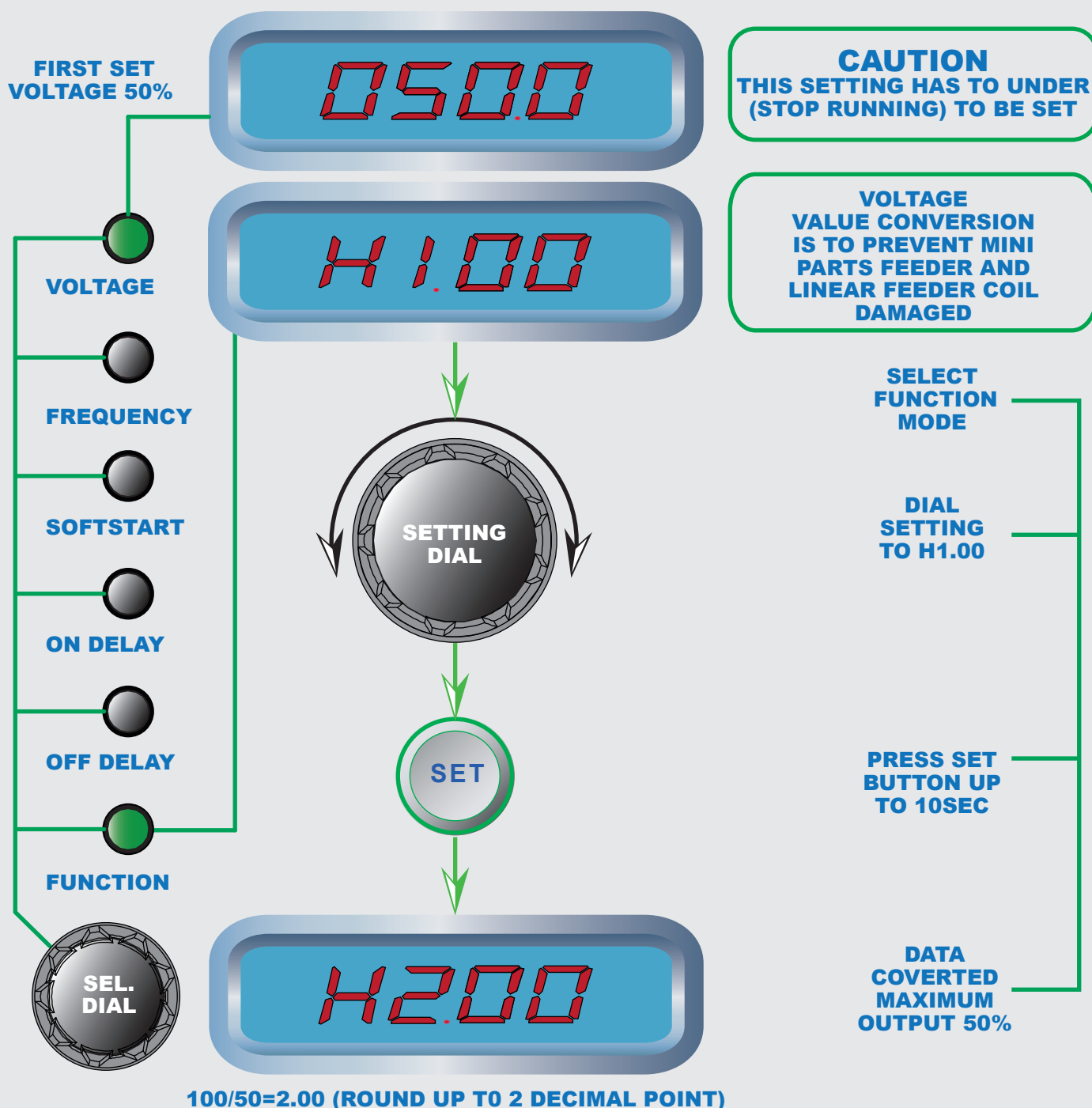


# FREQUENCY SELECTION

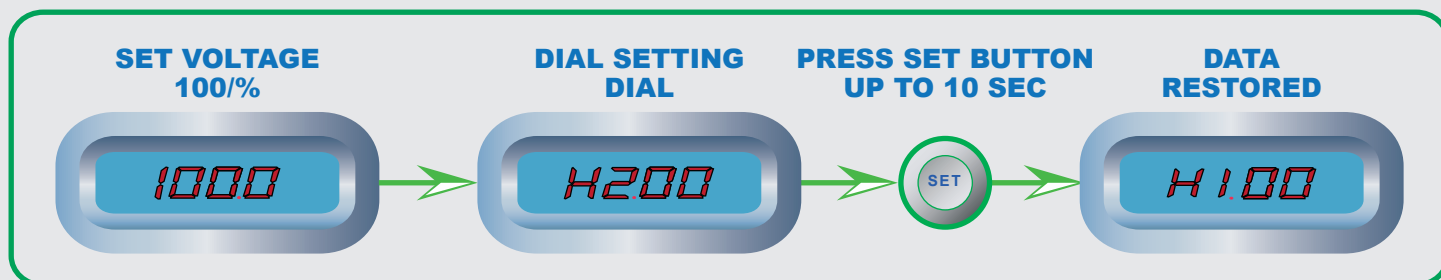


# VOLTAGE VALUE CONVERSION

## MAXIMUM VOLTAGE OUTPUT SETTING



## RESTORE VOLTAGE 100% OUTPUT (STOP THE CONTROLLER BEFORE SETTING)



# SUPPLEMENTAL FUNCTION

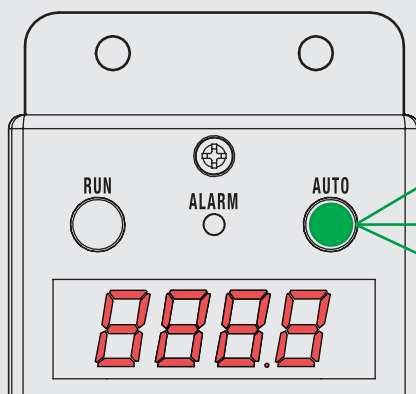
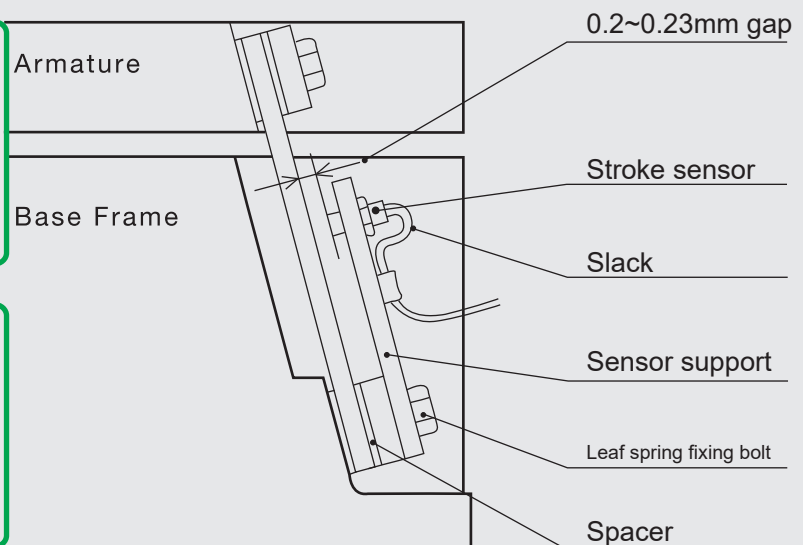
## CONSTANT SPEED CONTROL

Apply a stroke sensor on parts feeder for constant speed control

- The stroke sensor must be mounted on in front of a leaf spring. The sensor must be off the leaf spring by 0.2mm and it is called the “air gap”. The width of the gap changes by the vibration of the drive unit and the change is detected with the proximity sensor. The sensor support is screwed together with the leaf spring fixing bolt on the base frame side or bottom, never on the bowl side or top. The bolt should be longer than usual by the thickness of the support.
- Put some slack in the cable on the sensor to prevent secondary-excited vibration. Fix the cable without contact with any obstacle to break it.
- Recommended stroke sensor is “EH-110 Proximity sensor by Keyence.

**Note:** (under RUN mode to be set)  
When the stroke sensor applied there maybe a irregular resonance occur. adjust (G03.0) setting until noise is normal.

**Note:**  
The Feeder is constant speed controlled even without enable the AUTO tuning Lamp.



### AUTO FREQ lamp

The lamp is turned on the auto-tuning mode and flickers at auto tuning.

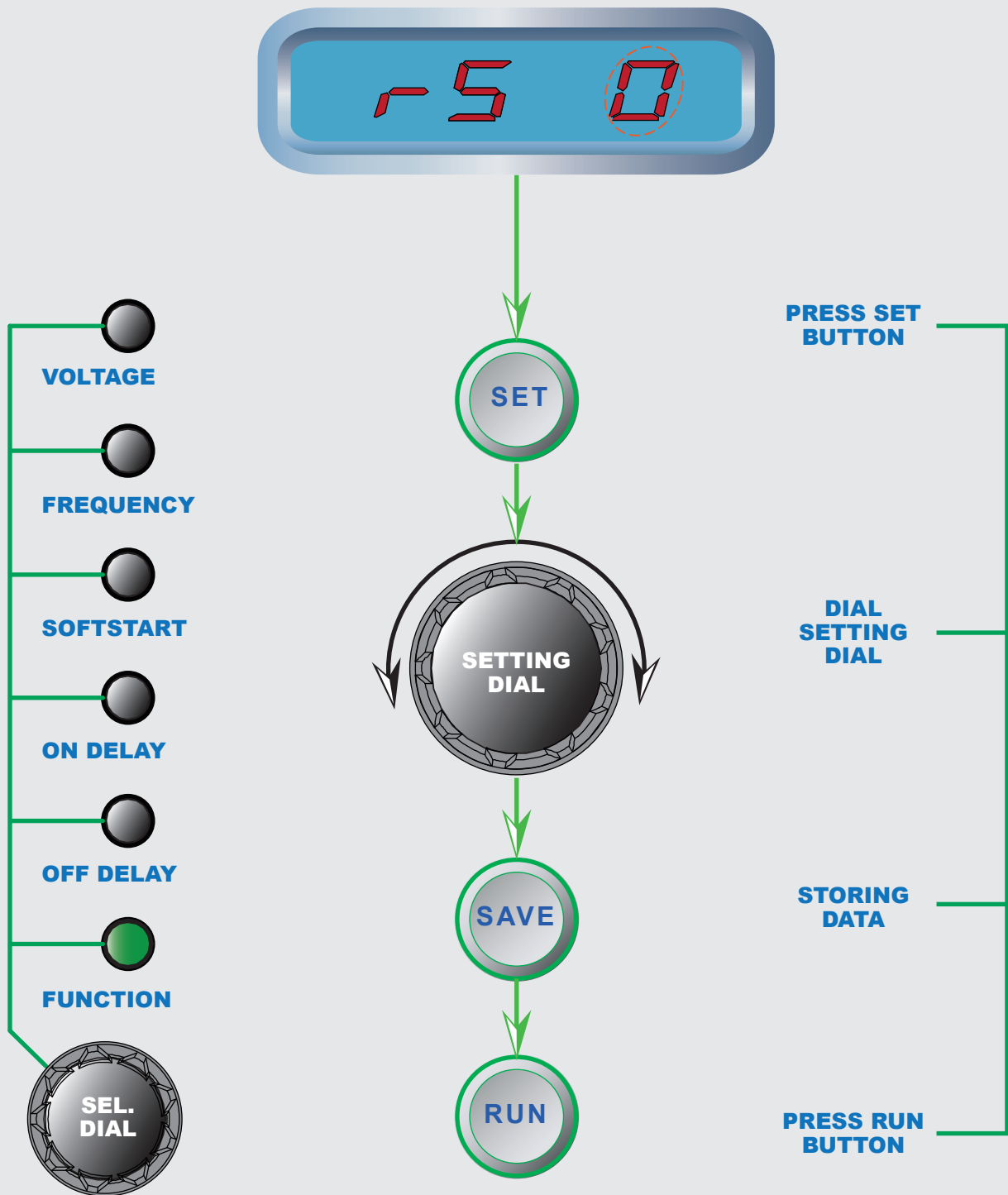
Press AUTO FREQ Button (up to 10sec)

This button selects the mode to enable or disable auto tuning.

### Note

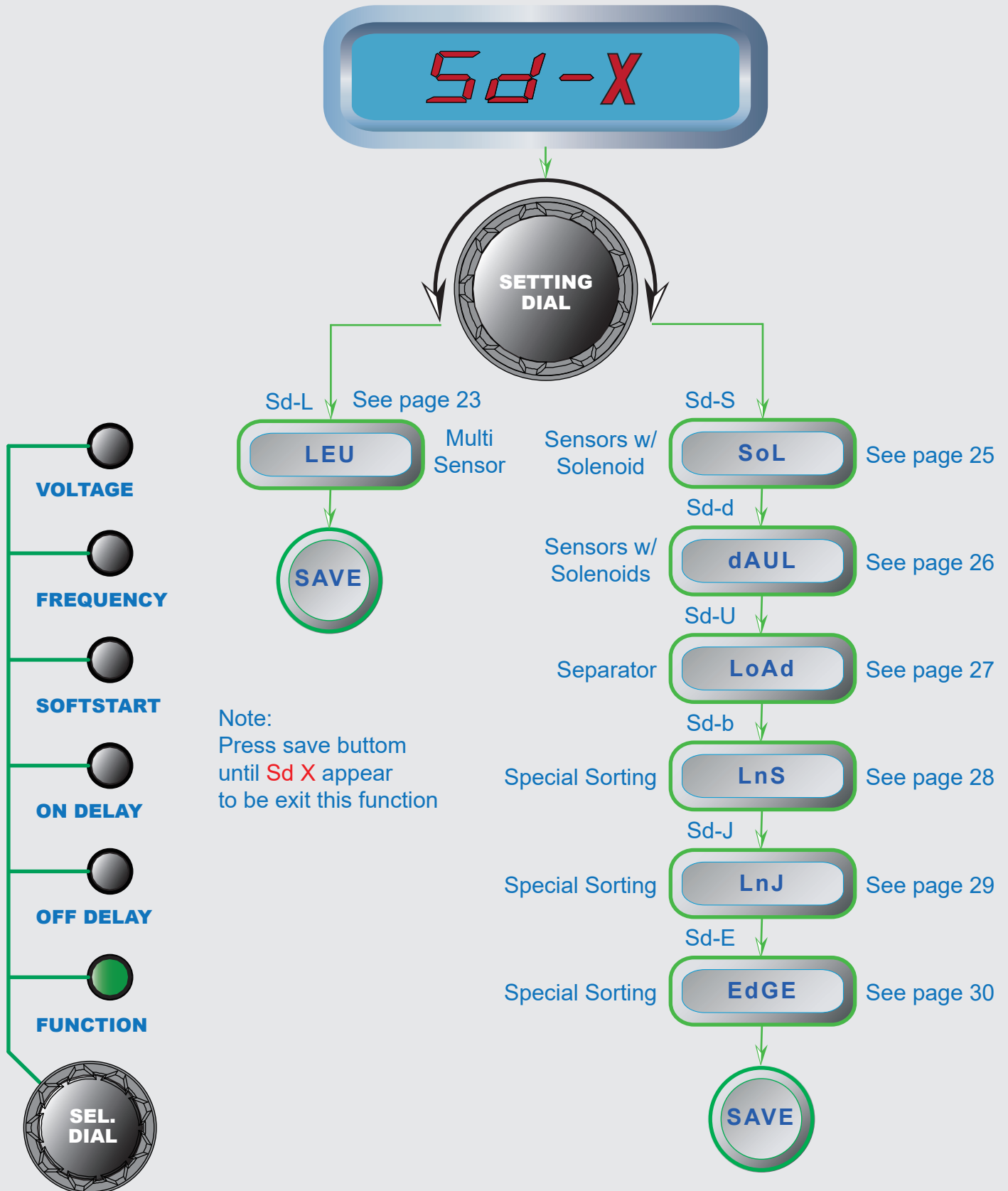
Without a Strike Sensor Installed  
The Auto Lamp can not be enable

# POWER ON SETTING



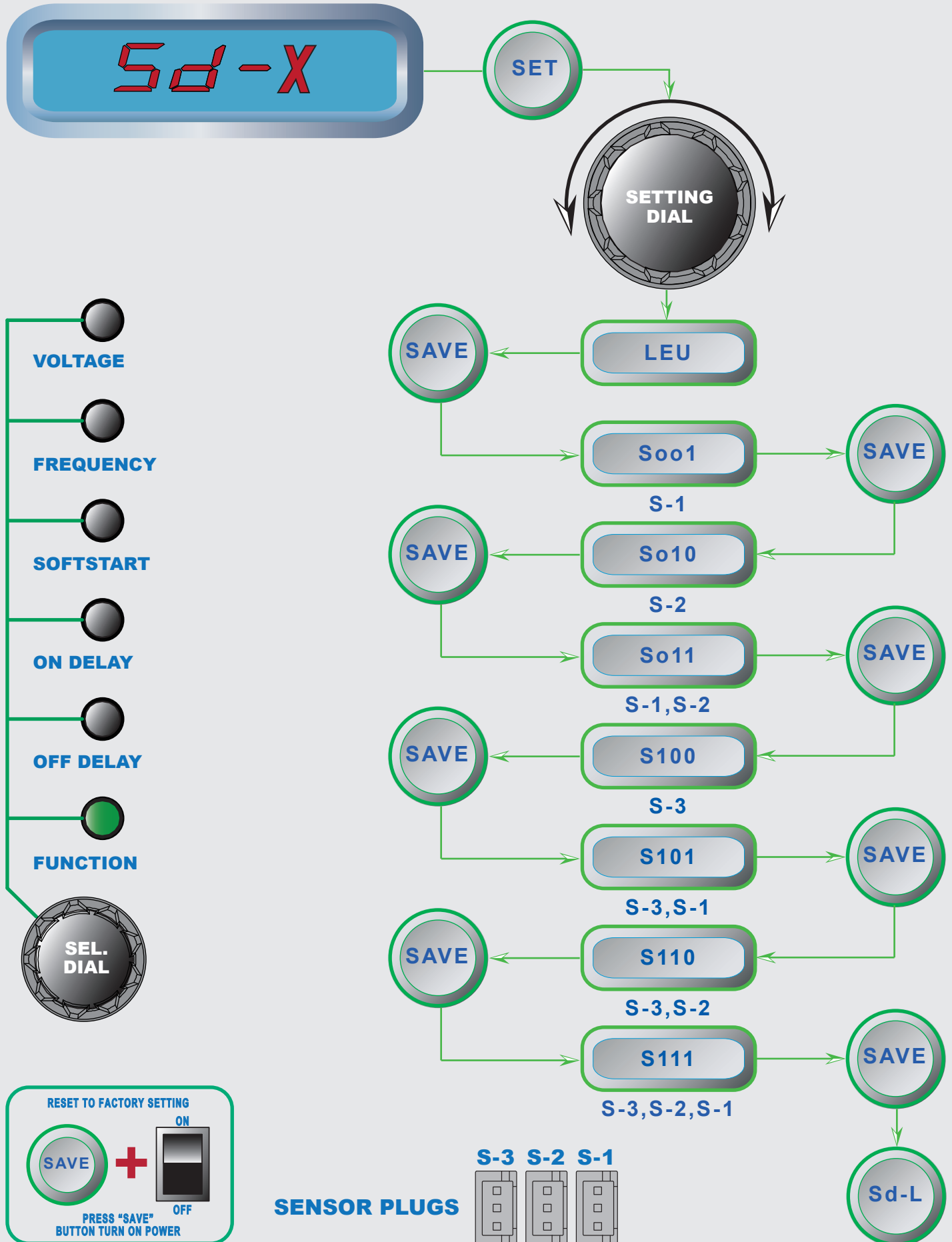
r 5 1= Power on    r 5 0= Press run button

# SENSORS & SOLENOIDS FUNCTION

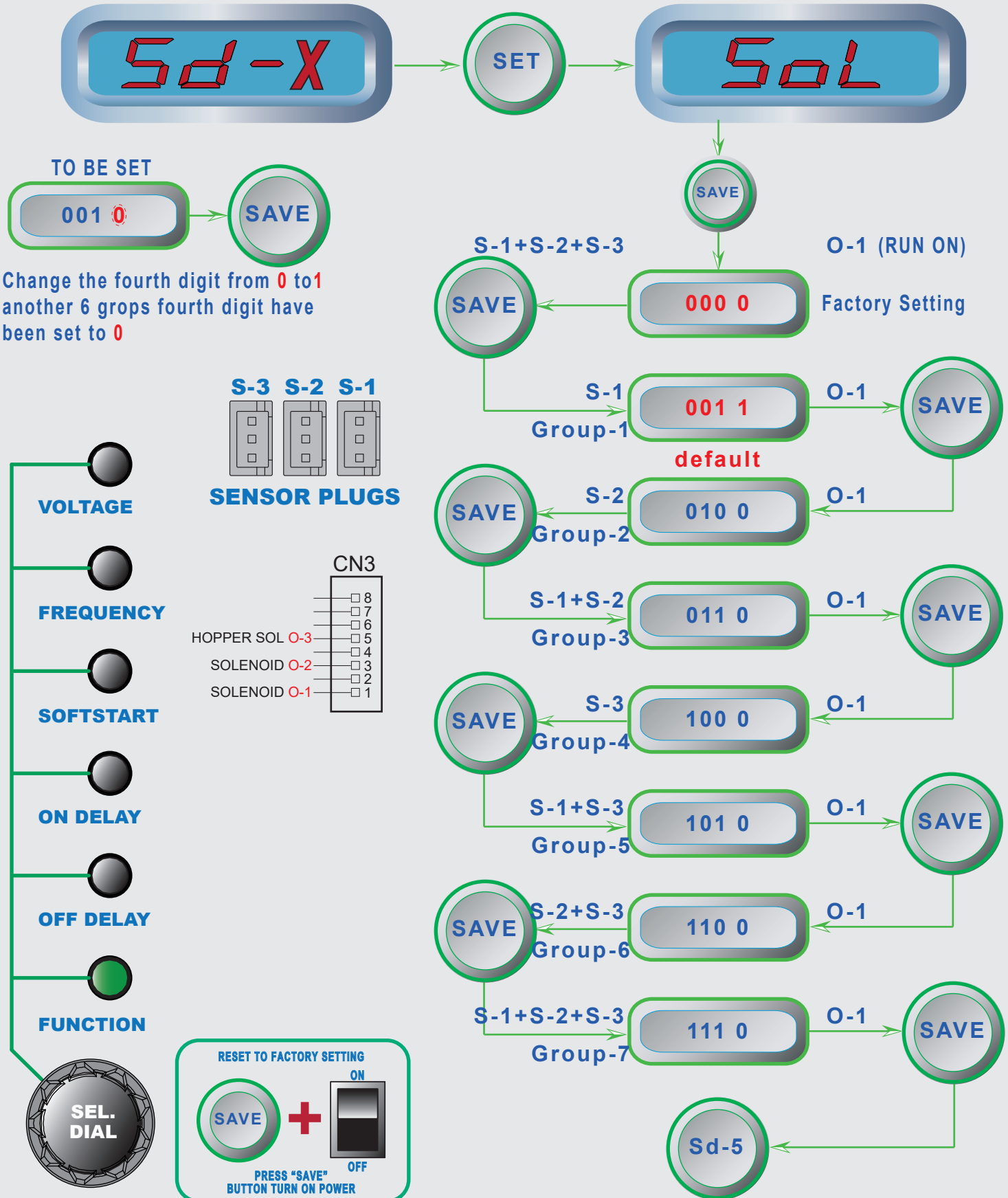




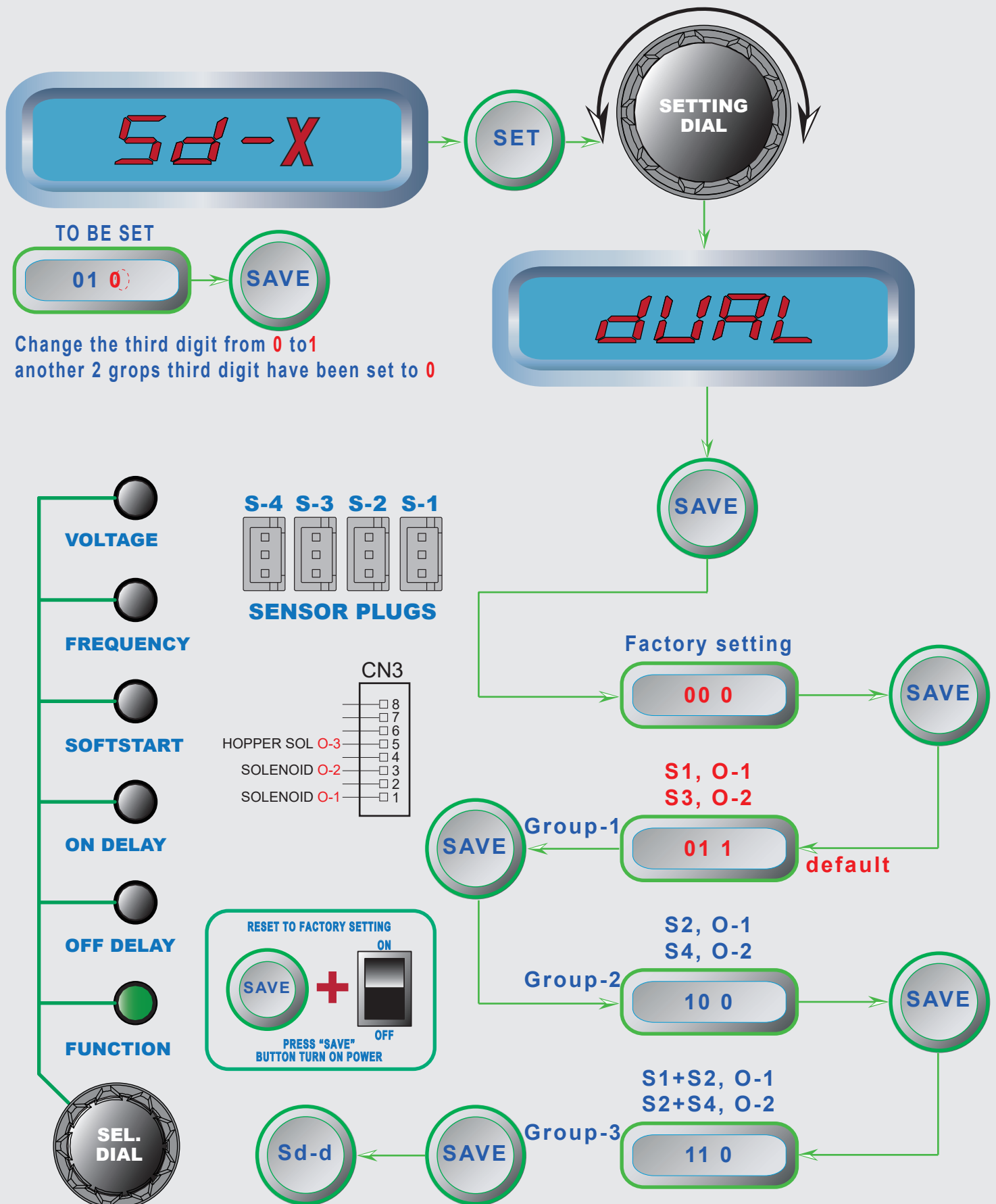
# MULTI SENSORS SELECTION



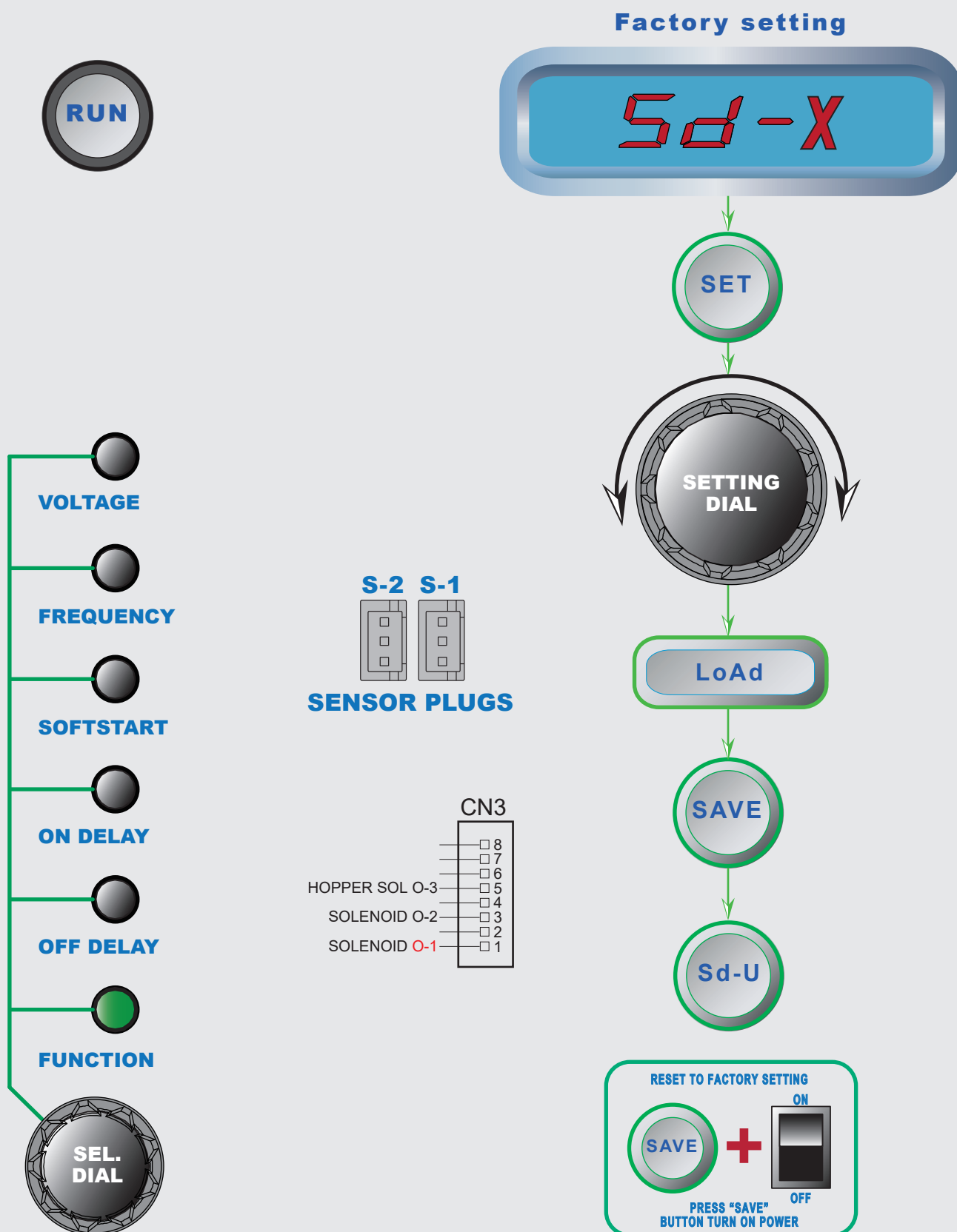
# SENSORS WITH SOLENOIDS FUNCTION SELECTION



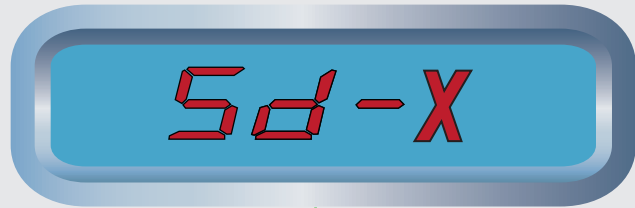
# DUAL TRACKS SENSORS PLUS SOLENOIDS



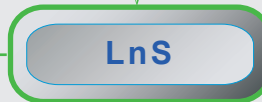
# LOADING SEPARATOR



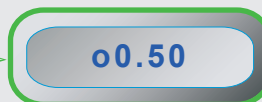
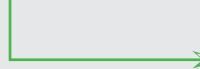
# L&S SPECIAL SORTING



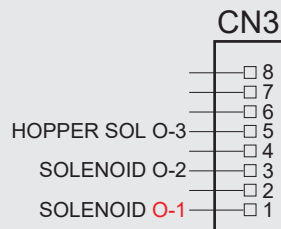
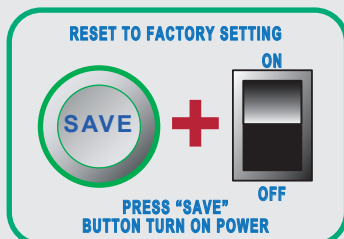
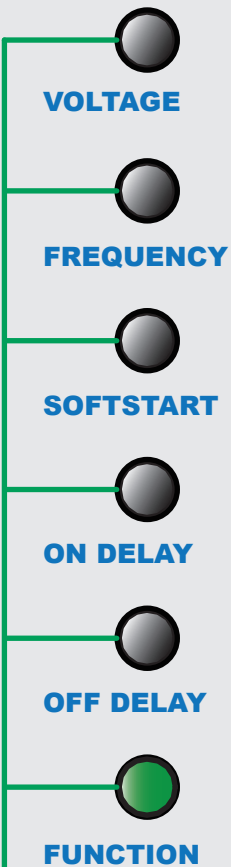
S-2 O-1



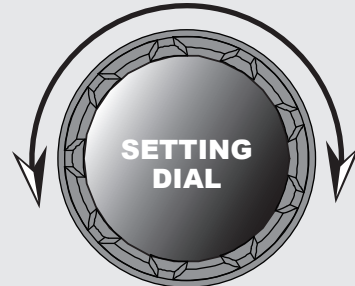
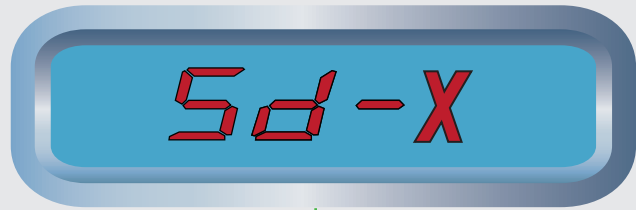
On delay



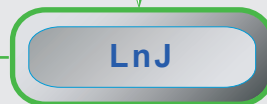
Off delay



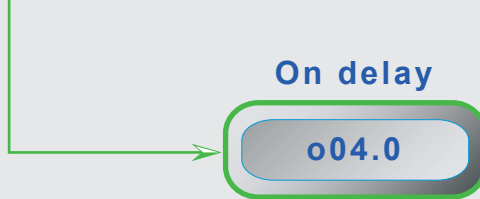
# L&J SPECIAL SORTING



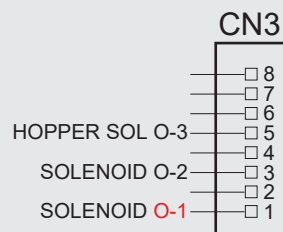
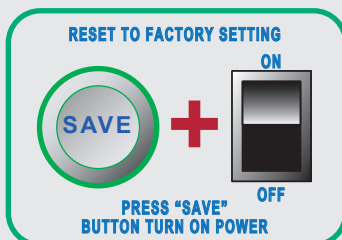
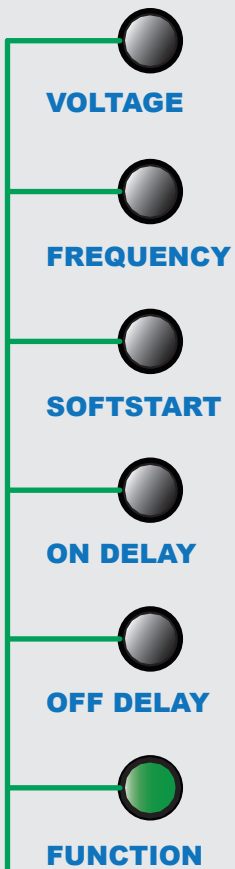
S-2 O-1



On delay

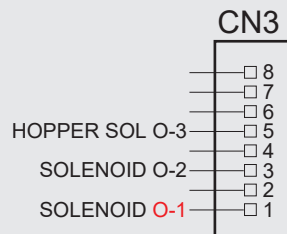
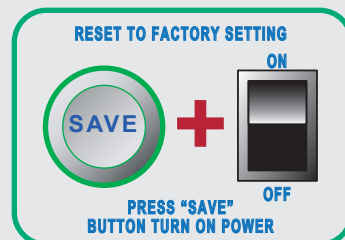
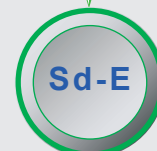
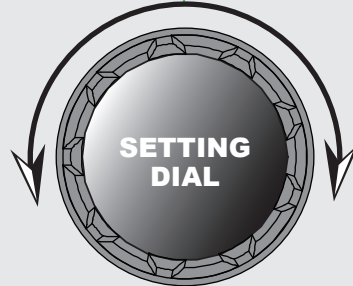


Off delay

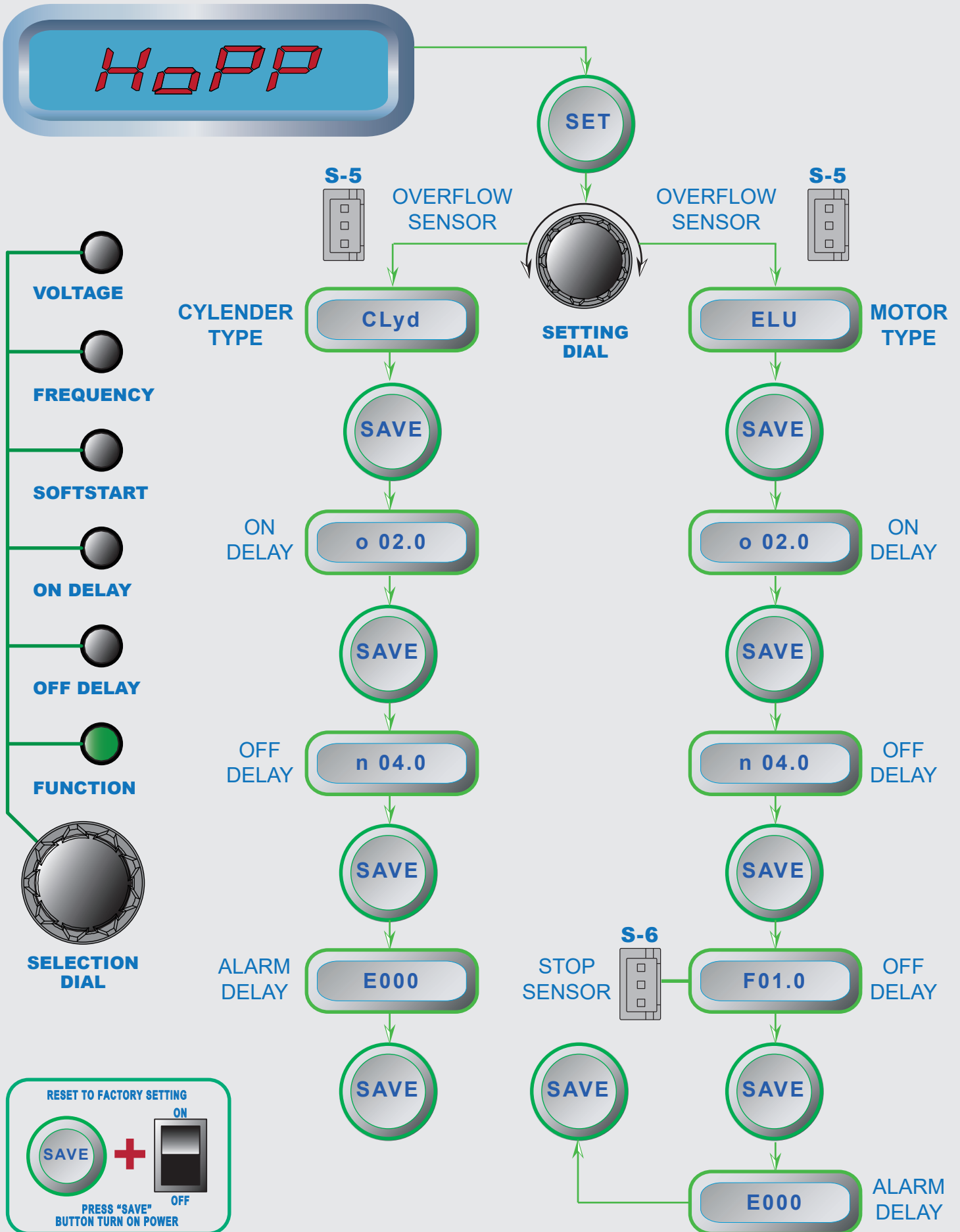


# EDGE SORTING

Factory setting

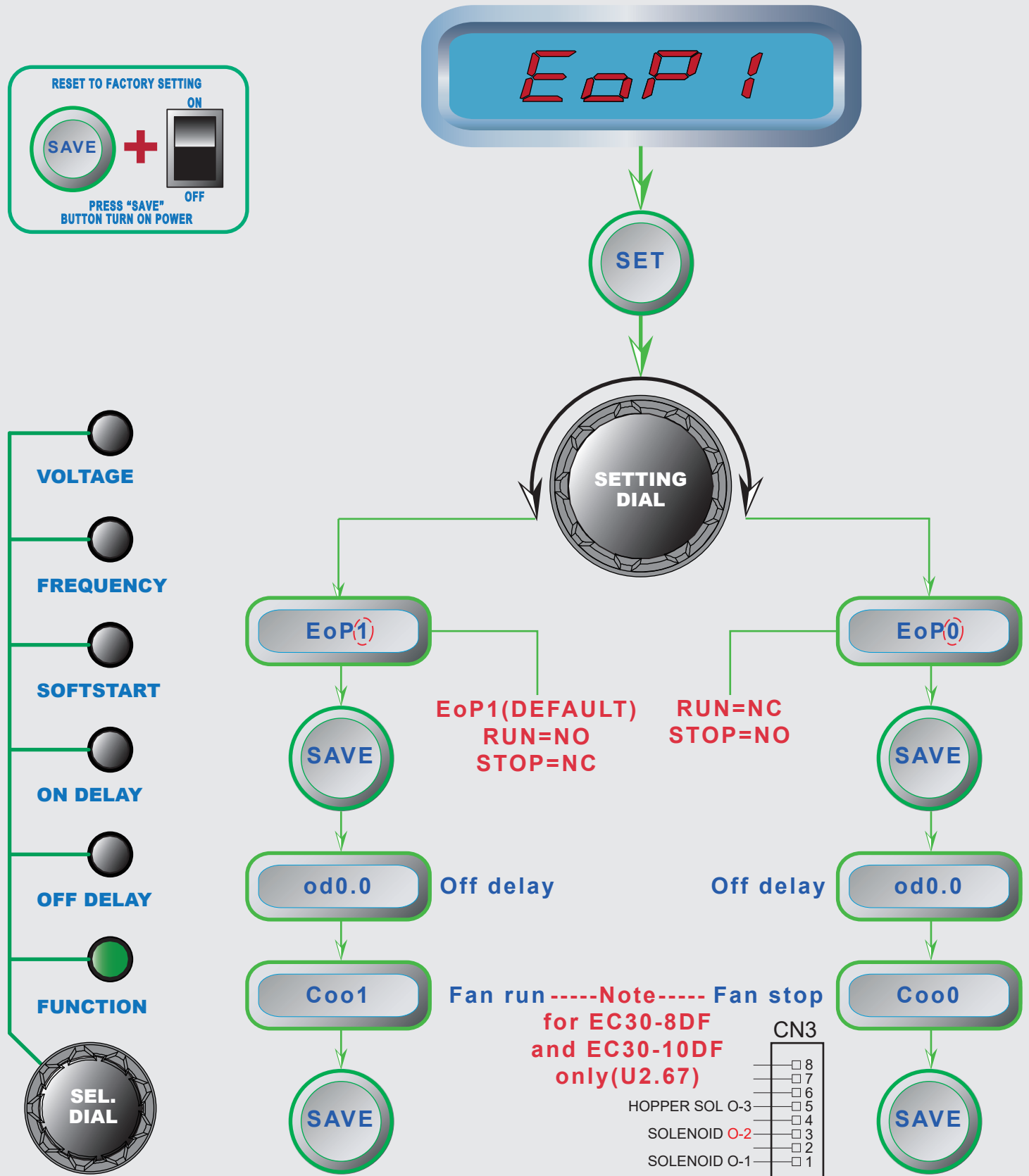


# HOPPER SETTING

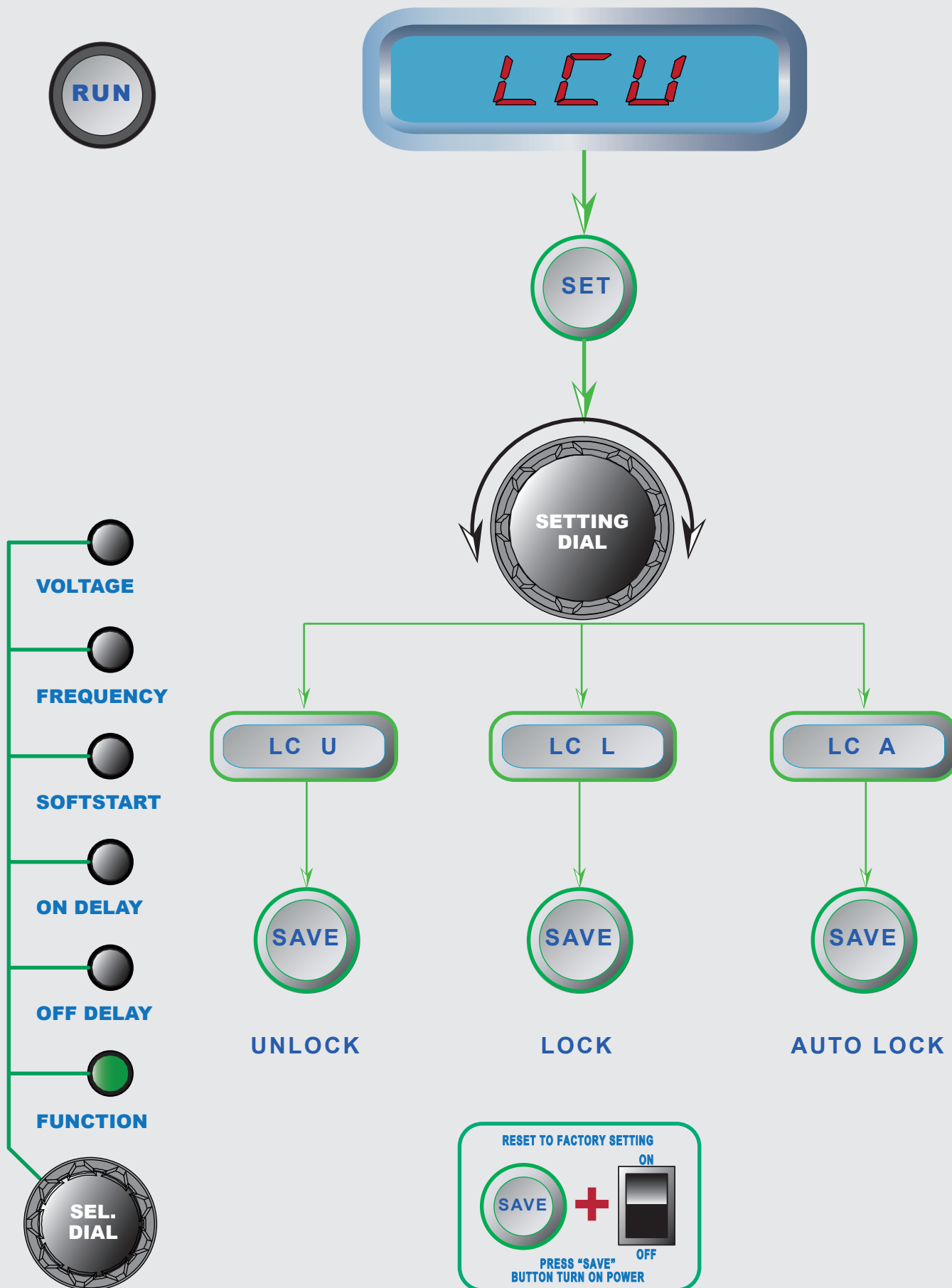




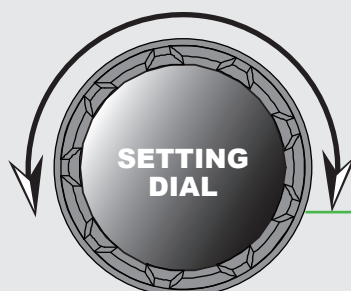
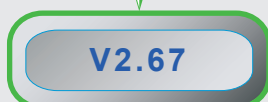
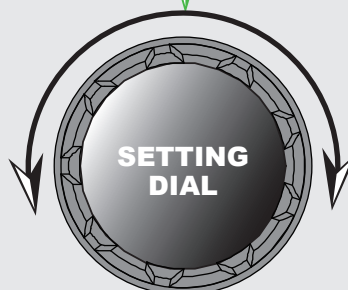
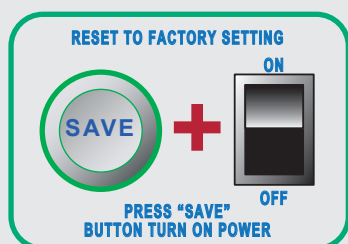
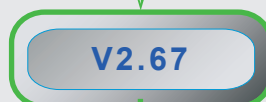
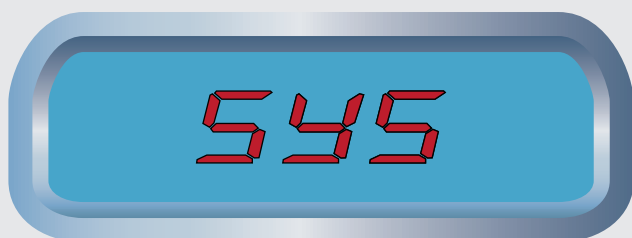
# Q1.Q2 SYNCHRONOUS SETTING



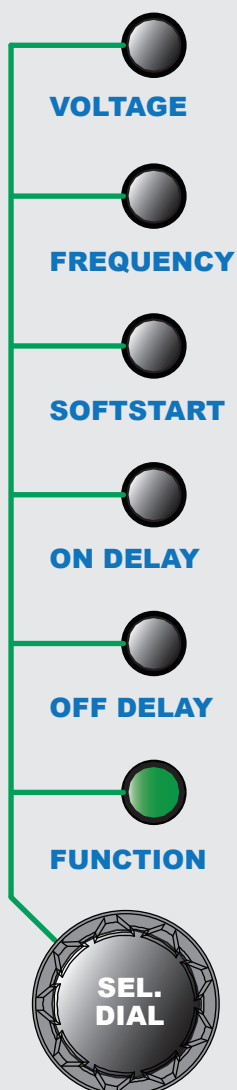
# LOCK/UNLOCK SELECTION



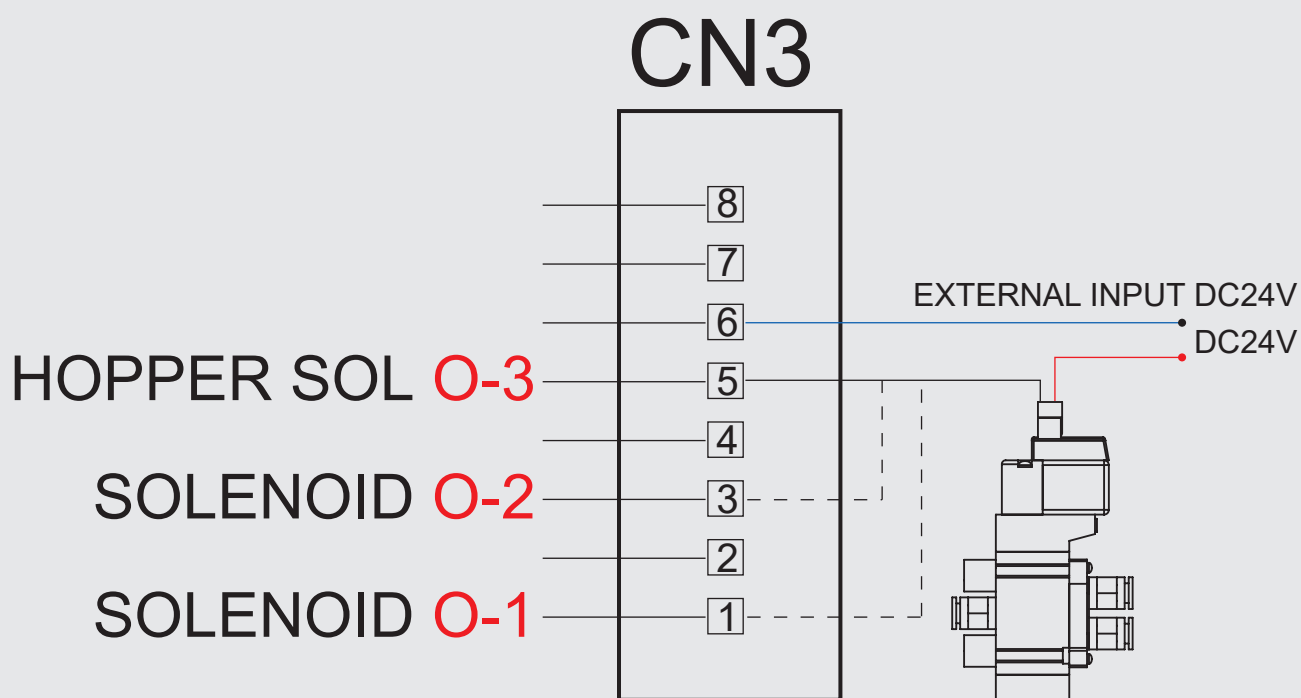
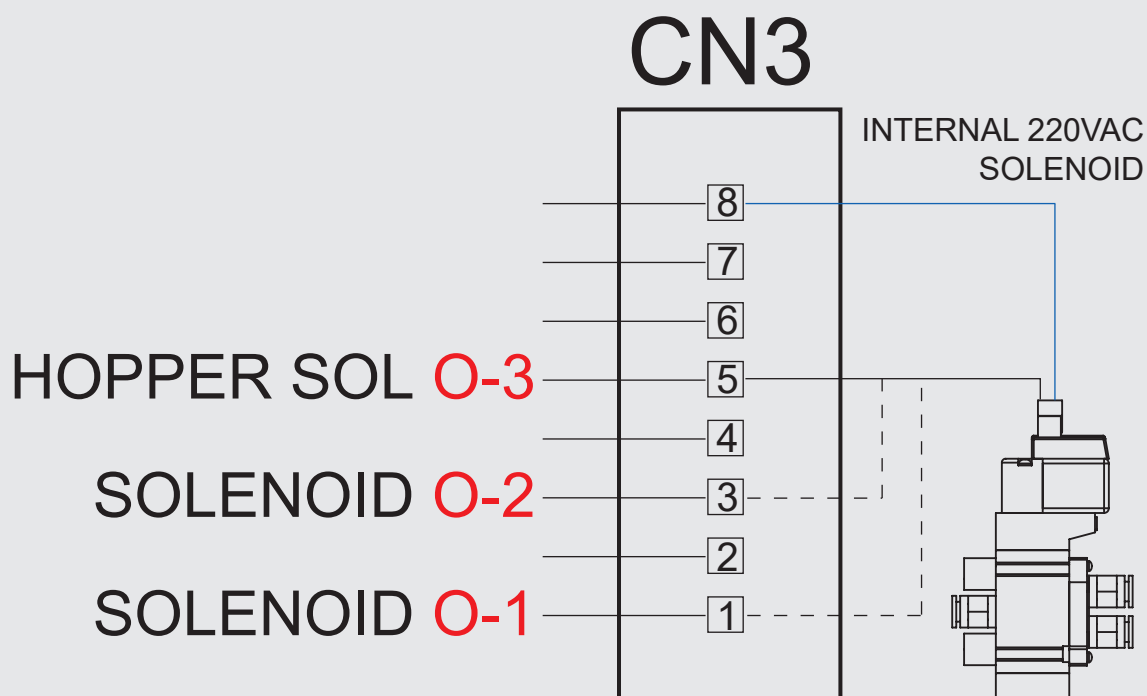
# PROGRAM VERSION AND SAVE DEFAULT



SAVE  
Default

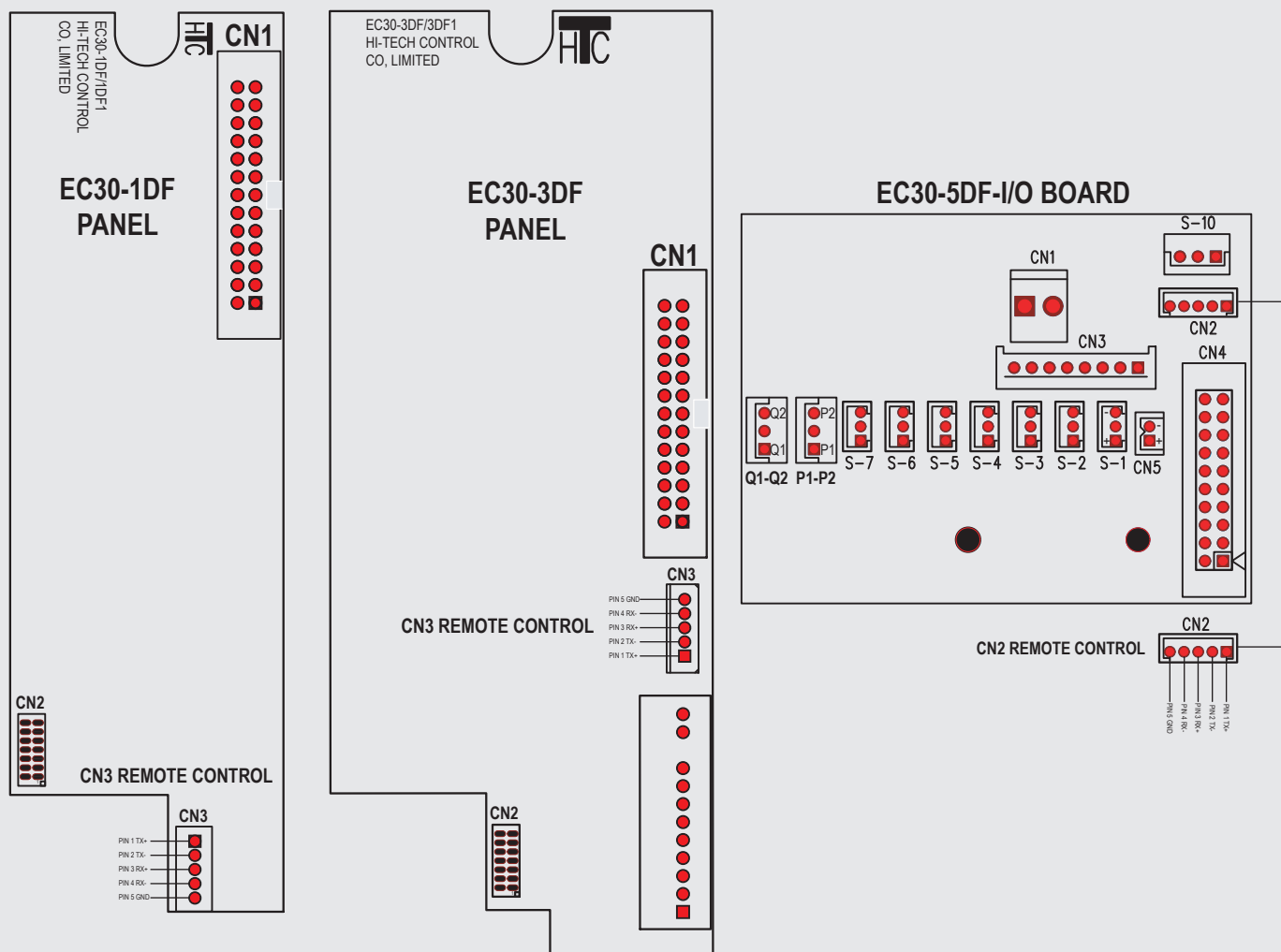
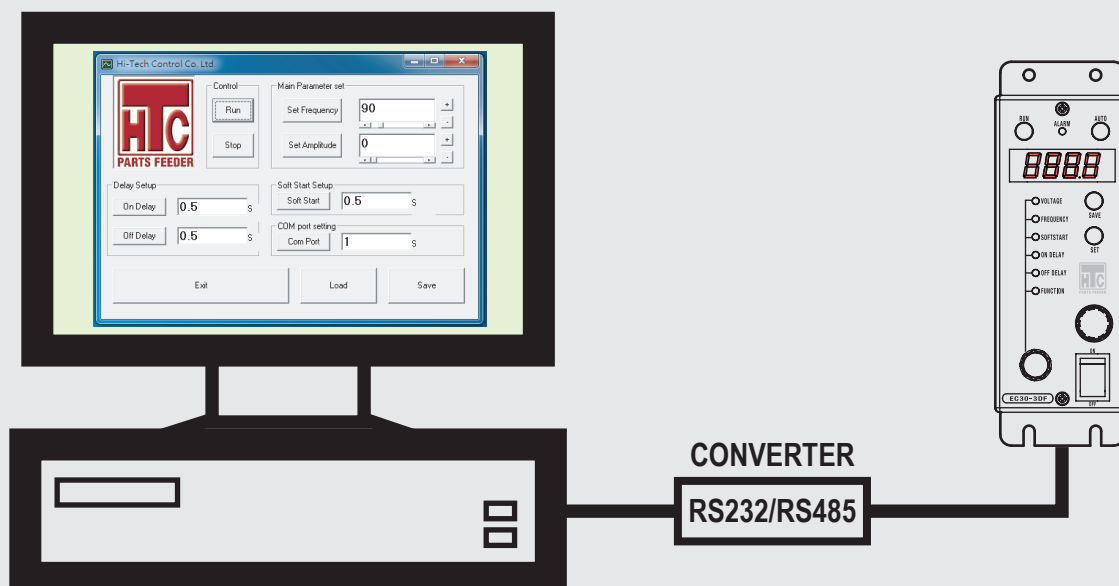


## 220VAC/24VDC SOLENOID WIRING

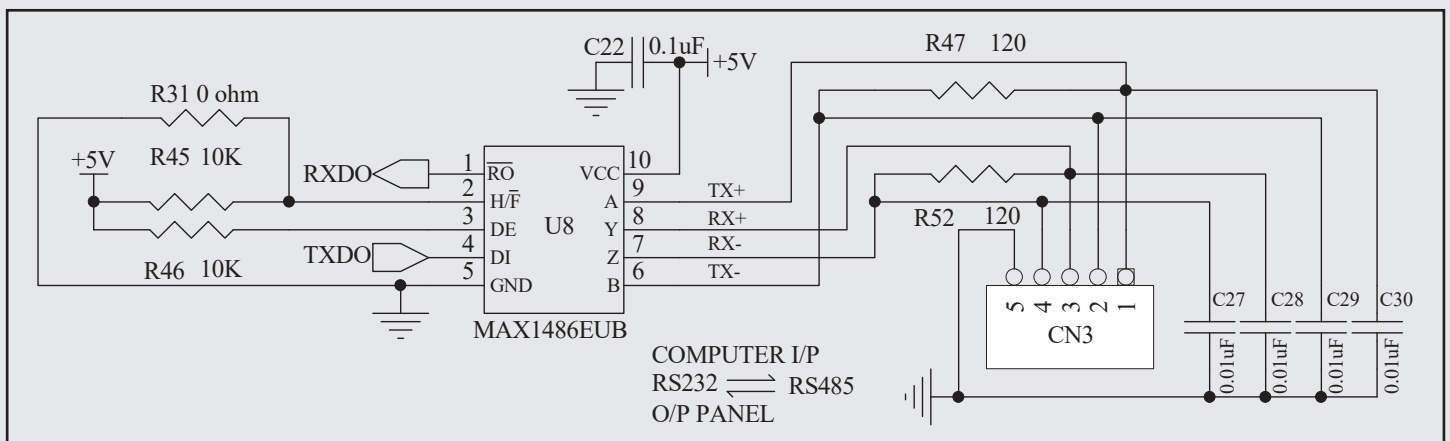
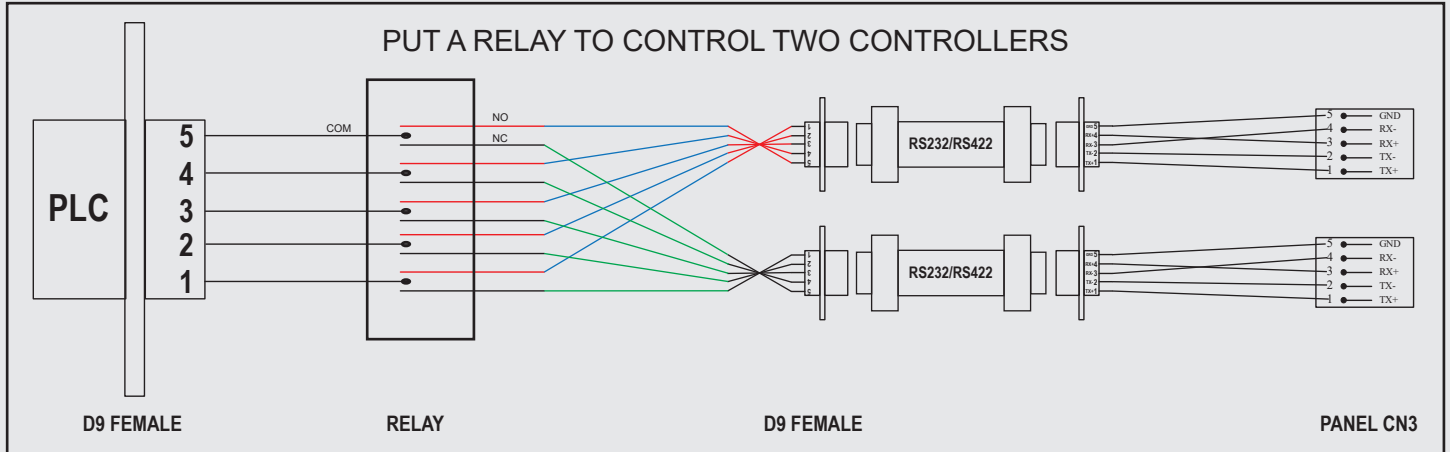
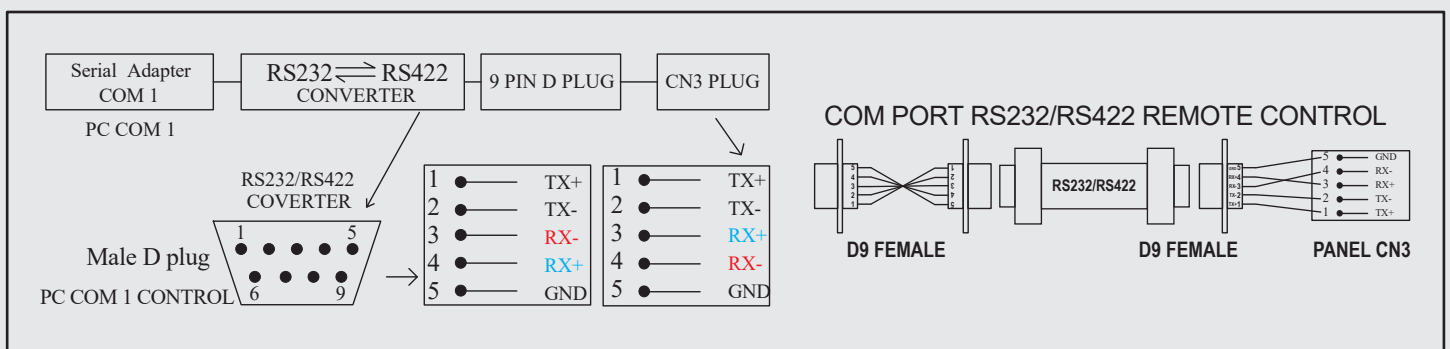
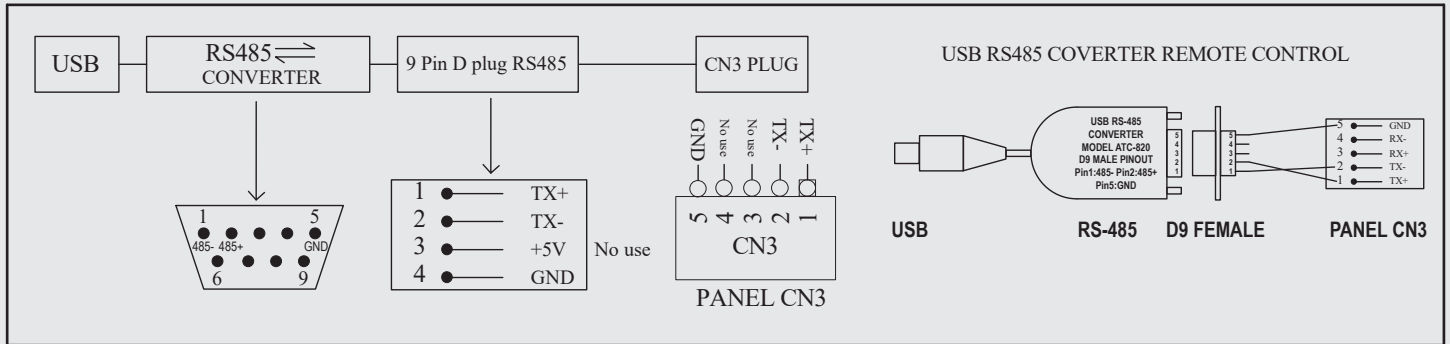


**NOTE:**  
(ALL HTC CONTROLLER CAN BE APPLIED 220VAV OR DC24V SOLENOID) SEPECIFY ON ORDER)

# REMOTE CONTROL



# REMOTE CONTROL



# REMOTE CONTROL

## REMOTE OPERATION

### RS232

This section describes the remote operation of the control unit.

The control unit can be remotely controlled through RS232C communication.

#### 1. Commands

The following is a list of all commands and a brief description of each.

#### 1. Control commands –

SF<Freq>	Sets vibration Frequency where frequency is 4 digit number which equals frequency in Hz X 10 Example : 120Hz = SF1200 Range : 50Hz to 300Hz
SA<amp>	Sets vibration amplitude ratio where amplitude is 4 digit number which equals in percent X 10. Example: 90% = SA900 Range : 0 to 100%
ON	Start vibration
OF	Stop vibration
SC<number>	Set counter value in counter mode
SO<time>	Sets on delay where time is 2 digit number which equals time in second X 10. Example: 3 second = SO30 Range: 0 to 4 second
SX<time>	Sets off delay where time is 2 digit number which equals time in second X 10. Example: 3 second = SX30 Range: 0 to 4 second
SS<time>	Sets Soft start where time is 2 digit number which equals time in second X 10. Example: 3 second = SS30 Range: 0 to 4 second
SV	Save all data in internal memory
RF	Read Vibration Frequency in Hz Example: 89.1, which represents 89.1Hz
RA	Read Amplitude in percent Example: 85.1, which represents 85.1%

#### 2. Command/Response Formats

The data and commands must conform to format. The command length should never be set more than 128 characters in a burst, must wait for response to commands from the chamber. Multiple commands could be accepted by chamber.

##### Command Format –

- All commands are 1 to 3 upper case alpha characters.
- Upper case alpha characters are used. Lower case characters, spaces and punctuation (except “,”) are ignored.
- “lf” to terminate command. A carriage return (cr) may optionally precede the linefeed and is ignored.

##### Number Format –

The number format permitted is generalized with the following rules:

- A decimal point can optionally occur as part of the number.
- The number is terminated with any non-numeric character.
- The number can have trailing characters of any type before ending “,” or “lf”.
- Leading non-numeric, non-upper case alpha characters are ignored.
- The number must not have any spaces imbedded.

##### Response format –

The control unit will return fixed point numbers. The format is:

XXX.X cr lf

# REMOTE CONTROL

## RS485

This section describes the remote operation of the EC30 series vibration controller. The vibration controller can be remotely controlled through RS485 communication.

### **1. Commands**

The following is a list of all commands and a brief description of each.

#### RS485 settings

Baud rate: 19200

Data bits: 8bit

Parity: N

Stop bit: 1

#### RS485 command set

- Set Voltage:

"SAxxxx/cr", where xxxx is voltage percentage x 10, /cr is Carriage Return (#13)

- Set Frequency:

"SFxxxx/cr", where xxxx is Frequency (Hz) x 10, /cr is Carriage Return

- Run:

"ON/cr", where /cr is Carriage Return

- STOP:

"OF/cr", where /cr is Carriage Return

- Set On Delay:

"SOxxx/cr", where xxx is delay time (second) x 100, /cr is Carriage Return

- Set Off Delay:













"SXxxx/cr", where xxx is delay time (second) x 100, /cr is Carriage Return

Save:

"SA/cr", where /cr is Carriage Return



# TROUBLE SHOOTING

First checking item		Remedy
<ul style="list-style-type: none"> <li>Does the resonant frequency of the parts feeder much the driving frequency range of the Control Unit?</li> </ul>		<ul style="list-style-type: none"> <li>Review the Function setting.</li> <li>Readjust the resonant frequency of the drive unit with leaf spring.</li> </ul>
<ul style="list-style-type: none"> <li>Is the setting of the drive frequency range correct?</li> </ul>		<ul style="list-style-type: none"> <li>Review the function setting.</li> </ul>
<ul style="list-style-type: none"> <li>Is the weight of a bowl or chute too heavy for the drive unit?</li> </ul>		<ul style="list-style-type: none"> <li>Reduce the weight with a decrease of thickness of a bowl or chute.</li> <li>Adjust the air gap.</li> </ul>
<ul style="list-style-type: none"> <li>Is there any fault wiring confusing polarities, the stroke sensor and the control unit?</li> <li>Is the air gap out of the standard width?</li> </ul>		<ul style="list-style-type: none"> <li>Review the wiring plug connector.</li> <li>Narrow the air gap of the core and armature of the drive unit.</li> </ul>
Trouble	Checking Item	Turning on  Turning off 
A. Feeder does not run 	<ul style="list-style-type: none"> <li>1. Fault wiring of power source</li> <li>2. Low voltage, supply rated voltage</li> <li>3. Fuse F1 melts down</li> </ul>	Check the power Check the fuse
B. Feeder does not run 	<ul style="list-style-type: none"> <li>1. Stopped by the external operation signal</li> <li>2. Overflow signal is working</li> </ul>	Check external control Auto
C. Feeder does not run 	<ul style="list-style-type: none"> <li>1. Fault wiring to the feeder/Cable breaks</li> <li>2. Fault setting of Voltage</li> </ul>	Check the cable and adjust voltage
D. Feeder does not run 	<ul style="list-style-type: none"> <li>1. The stroke sensor is not working, removed or broken lead</li> <li>2. Stopped by over current protection</li> </ul>	Replace stroke sensor and adjust voltage
E. Feeder does not run 	<ul style="list-style-type: none"> <li>2.1. fault wiring to feeder/any short circuit see manual of feeder</li> <li>2.2. Drive frequency range is out of the frequency of the drive unit</li> <li>2.3. The air gap of the drive unit is too wide</li> </ul>	Check the cable and drive coil  Fine tune frequency Re-adjust air gap
F. Stroke does not build up 	<ul style="list-style-type: none"> <li>1. Stopped by over input voltage protection</li> <li>1. Fault setting of Voltage on the panel</li> <li>2. Too wide air gap of the drive unit</li> <li>3. Fault function setting for the stroke sensor</li> <li>4. Feeder provides a bowl out of the specification</li> </ul>	Lower the power source  Re-adjust air gap  Replace the stroke sensor
G. Stroke fluctuates 	<ul style="list-style-type: none"> <li>1. Fault wiring the shield cable and plug connector</li> <li>2. Loose fitting of the bowl</li> </ul>	Fine tune the frequency Press SAVE Button after setting
H. Memory store no setting	<ul style="list-style-type: none"> <li>1. You did not store the data before off the power</li> </ul>	
<b>Error Coder</b>		
<b>Over Load</b> 	<b>Over Voltage</b> 	<b>Over Heat</b> 
1) Feeder out of the range of the controller 2) Check feeder's Coil (Burnt?) and the air gap (too wide)	1) The I/P voltage is out of the range of the controller (max 260VAC) 2) To slow down the input voltage under 260VAC	1) Refer Page 5. Keep on a good air circulation place 2) Put an fan for air circulation

# TABLE OF FUNCTION




Function Code	Name of Function	Applicable Range	Factory Default	Remarks
<b>F-E2</b>	Drive frequency	1: 45 to 90Hz (half wave) 2: 90 to 180Hz (full wave) 3: 180 to 360Hz (hi frequency) 4: 65 to 120Hz (middle frequency)	2	See page 15
<b>H100</b>	Voltage conversion ratio	Setting maximum voltage ratio	0	See page 16
<b>G030</b>	Stroke gain control	Gain range 00.0 to 25.5. Inconstant mode adjust the gain when the stroke is hunting	3	See page 17
<b>r 5 0</b>	Run/Stop by the panel mode	0: Running/Stopping Run/Stop button on panel. 1: Power supply runs the feeder ignoring Run/Stop button	0	See page 18
<b>Sd-L</b>	<b>LEU</b> P.20 <b>SoL</b> P.21	<b>dUAL</b> P.22 <b>LoRd</b> P.23 <b>LnS</b> P.24 <b>LnJ</b> P.25 <b>Ed6E</b> P.26		
<b>HoPP</b>	Hopper	CLyd - Cylinder Type ELU - Elevator Motor Type	CLyd	See page 27
<b>EoP I</b>	Q1- Q2 setting	od0.0 On delay 0~9.9sec Coo0 Fan ON/OFF Coo0=off Coo1=on	1	See page 28
<b>LC U</b>	Panel buttons lock	U: Unlock L: Lock A: Auto Lock	U	See page 29
<b>SYS</b>	Program version and default	U X.XX Program version Load: Loading default Save: Update default	V2.67	See page 30

Note:

**G030** for Model: EC30-3,5,8,10 DFEF feed back control only.

**EoP I** Fan ON/OFF for EC30-8,10DF,DFEF only.

## How to initialize the settings

1. Turn power off	2. Pressing "SAVE" button turn power on.	3. Initializing	Initialized and release "SAVE" button
POWER ON  OFF	SAVE  OFF	 "000.0" means program has been initialized.	The data selected by setting dial appears on the display.

# SPECIFICATION

Models		EC30-1DF	EC30-3DF	EC30-5DF	EC30-8DF	EC30-10DF	EC30-3,5,8,10DFEF
Power Source		AC110/220 ± 10% 50/60Hz (Auto Detect) MAX. 260V					
Output Current		1A	3A	5A	8A	10A	FEEDBACK CONTROL
Output Voltage		0~210V (Input power 220V) 0~98V (Input power 110V)					
Frequency		1, (45~90Hz)		2, (90~180Hz)	3, (180~360Hz)	4, (65~120Hz)	
Control Mode		Sine Wave P M W Control					
Operation Mode	Auto-tuning mode	The output drive frequency chases the resonant frequency of the drive unit automatically and the control unit controls the stroke constant.					
	Constant stroke mode	The control unit controls the stroke constant at the preset drive frequency.					
Additional Function	Run/Stop operation	An external signal runs or stops the parts feeder.					
	Output signal	The control unit outputs a synchronous signal with running and stopping of the parts feeder.					
	Soft start	Ram-up time 0.2~4.0 seconds					
	On and Off delay	Delay time 0.2 to 4.0 seconds					
	+12V source sensor	With a 3 cored socket plug					
	Remote control	EC30 series controllers can be remoted control by RS232/RS485					
Applicable condition	Ambient temperature	0~40°					
	Ambient moisture	10~90% (No condensation is allowed)					
	Workable location	Indoor					
	Noise resistance	1000V or more					
	Colour of case	Gray					
	Outline dimensions	44W x 171H x 140D	60W x 171H x 140D	119W x 191H x 110D	119W x 191H x 110D	120W x 220H x 155D	Accordingly
	Mass	1.0kg	1.2kg	1.2kg	1.5kg	4.5kg	
	Applicable Fuse	2.0A	4.0A	6.0A	9.0A	11A	* 260VAC (Fast blow)*
Note: EC30-3,5,8,10DFEF with an Auto-tuning mode and constant stroke mode							

This Instruction Manual will be revised for improvement without noticed

## Accessories

Label	Denomination	Type	Manufacturer	HTC-Mat-code
I/P	Power cable gland	Nylon	KSS	GN0016
	Grommet	Rubber	HTC	RB0016
O/P	Power cable gland	Nylon	KSS	GN0016
	Grommet	Rubber	HTC	RB0016
S1	Plug connector(3/5p) Level Sensor	Metal	Standard	MT12P3/5
S2	Plug connector(4p) Hopper/Q1,Q2	Metal	Standard	MT12P4
S3	Plug connector(2p) P1.P2/stroke sensor	Metal	Standard	MT12P2

# WARRANTY

## Warranty

### HTC PARTS FEEDER CONTROL UNITS WARRANTY

Part No	EC30-1DF	EC30-3DF	EC30-5DF	EC30-8DF	EC30-10DF	EC30-3,5,8,10DFEF
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Warranty period : One(1) year from the date of shipment as calculated  
based on the eight (8) -hours operation per date.

Seller will be repair the above products free of charge in accordance with the follow conditions of this warranty.  
Notify the failure occurring during the period of this warranty to the address shown below.

#### [Condition of warranty]

1. Seller will repair or replace free of charge within the period of this warranty the above products returned intact to factory. Transportation charges prepaid, which seller, upon inspection, shall determine to be defective in design, material and workmanship, provided that above products shall have been used in accordance with the instruction manual, precautionary notes on labels, etc, attached to the products.
2. The following conditions shall not be applied to this warranty even in case such conditions are occurred.
  1. Any failure or damage due to fire, earthquake, damage by flood and thunder, lighting, abnormal voltage, power (voltage, frequency). etc. which are not designated.
  2. Any failure or damage caused by incorrect handling or operation of the products.
  3. Any failure or damage caused by handling contrary to the using conditions, using methods and cautions, stated in the instruction manual.
  4. Any failure or damage resulting from modification carried out without the understanding of seller.
  5. Any changes in appearance such as the damage of the enclosure or housing and peeling of paint.
  6. Any portions agreed on by the prior consultation between the buyer and seller regarding special conditions.
  7. Other equipment provided (such as sensors and solenoid valve)
3. This warranty shall be effective only in Hong Kong and China.



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This Instruction Manual will be revised for improvement without noticed