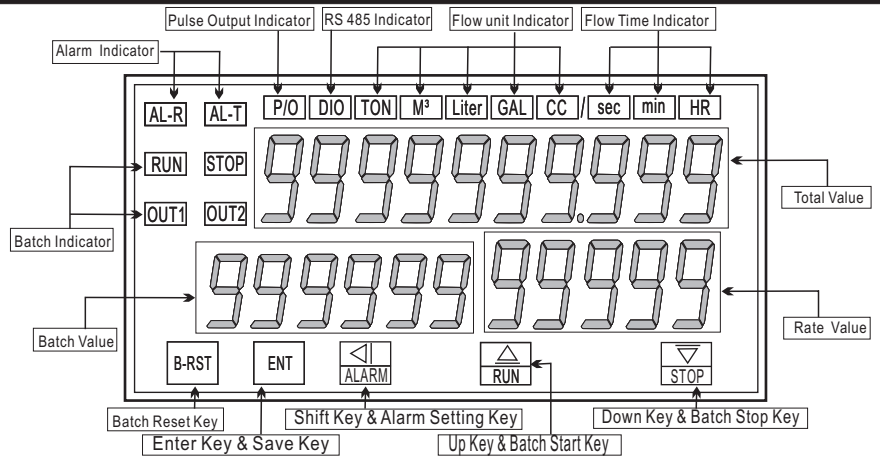
GRT-B

ANALOG / PULSE INPUT
RATE / TOTALIZER / BATCH FLOW METER

MANUAL

* Please understand key indicators & functions at the first operation.

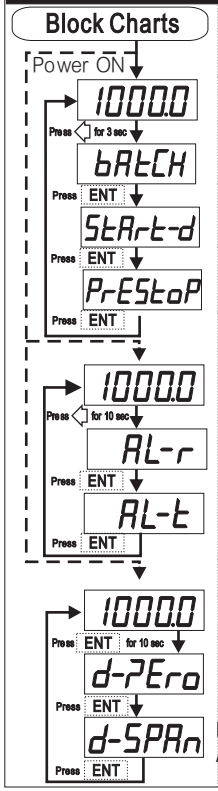
FRONT PANEL & KEY FUNCTIONS



Key Name	Symbol	Descriptions
Batch Reset Key	B-RST	1. Press this key for 3 sec can enable the reset function for batch value.
Enter Key & Save Key	ENT	1. In the measuring status, press this key can enter to parameter pages. 2. In the parameter setting, press this key can save the value & go to next parameter. 3.In the measuring status, press this key for 10 sec can enter to display value adjustment of "ZERO" & "SPAN"
Shift Key & Alarm Setting Key	AL	1. In the measuring status, press this key for 3 sec can enter to batch alarm setting page (The selecting digit will be flashed) 2. In the measuring status, press this key for 10 sec can enter to alarm setting page (The selecting digit will be flashed) 3. In the parameter setting , press this key can move the cursor left.
Up Key & Batch Start Key	△	1. In the measuring status, press this key can start the batch counting. 2. In the parameter setting, press this key can increase the digits.
Down Key & Batch Stop Key	▽	1. In the measuring status, press this key can stop the batch counting. 2. In the parameter setting , press this key can decrease the digits.

**1. The following block charts are parameters codes, parameter codes & parameters will alternate flashing if the parameters can be modified.
2. To modify the parameters, please press ◁△▽and press **ENT** to save the parameters after the modification.
3. Please don't forget the new pass code after modification.
4. In any pages, press△ &▽, or don't press any keys for 2 minutes that will back to measuring status.

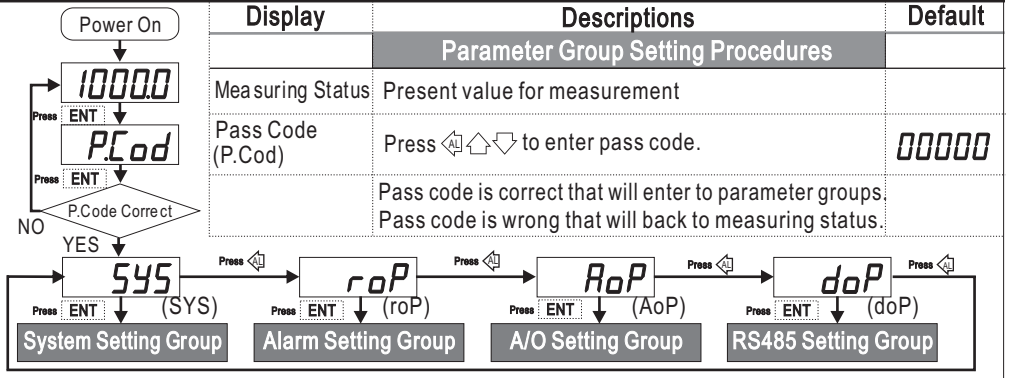
GENERAL MODE OPERATING PROCEDURES



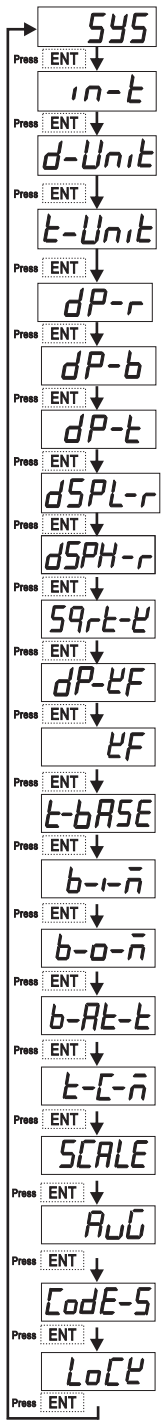
Display	Descriptions	Default
	Batch Alarm Setpoint	
Measuring Status	Present value for measurement	
Batch Setpoint (bAtCH)	Press◁△▽to modify batch setting.(0~999999)	000100
Batch Alarm Run Delay Setting (Start-d)	Press◁△▽to modify batch alarm delay time (0~99)	00001
Batch Alarm Preset Setting (Prestop)	Press◁△▽to modify batch alarm preset value (0~9999)	00001
	Alarm Setpoint	
Measuring Status	Present value for measurement	
Alarm Rate Setpoint (AL-R)	Press◁△▽to modify rate alarm setting.(0~99999)	000100
Alarm Total Setpoint (AL-T)	Press◁△▽to modify total alarm setting.(0~9999999999)	0 10000
	Display: "ZERO" & "SPAN" Adjustment	
Measuring Status	Present value for measurement	
Rate Display Zero Adjusting Setting	Press◁ to select adjusting speed rate, press△ ▽ to modify the zero value. PS: To use this function to adjust the real zero value.	000000
Rate Display Span Adjusting Setting	Press◁ to select adjusting speed rate, press△ ▽ to modify the span value. PS: To use this function to adjust the real span value.	000000

Remark: 1. There are 4 parameter groups of "System Setting Group(SYS)", "Alarm Setting Group(roP)", "Analog Output Setting Group (AoP)" & "RS485 Setting Group(doP)" for modification.
2. Press◁ to select each group page, and press **ENT** to enter each group or parameter page for modification or saving the parameters.
3. Some of optional functions of parameter pages still exist, but the functions are disable.

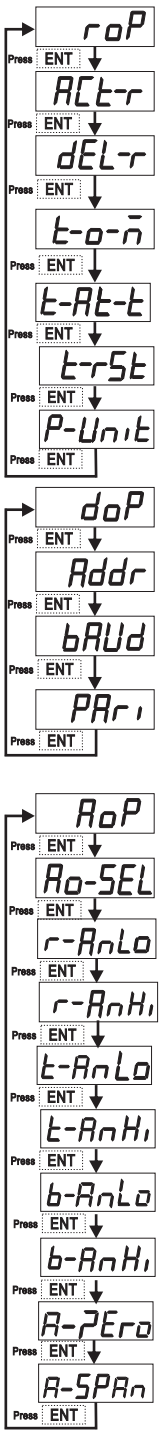
PROGRAMMING MODE OPERATING PROCEDURES



Display	Descriptions	Default
	Parameter Group Setting Procedures	
Measuring Status	Present value for measurement	
Pass Code (P.Cod)	Press◁△▽to enter pass code.	00000
	Pass code is correct that will enter to parameter groups Pass code is wrong that will back to measuring status.	

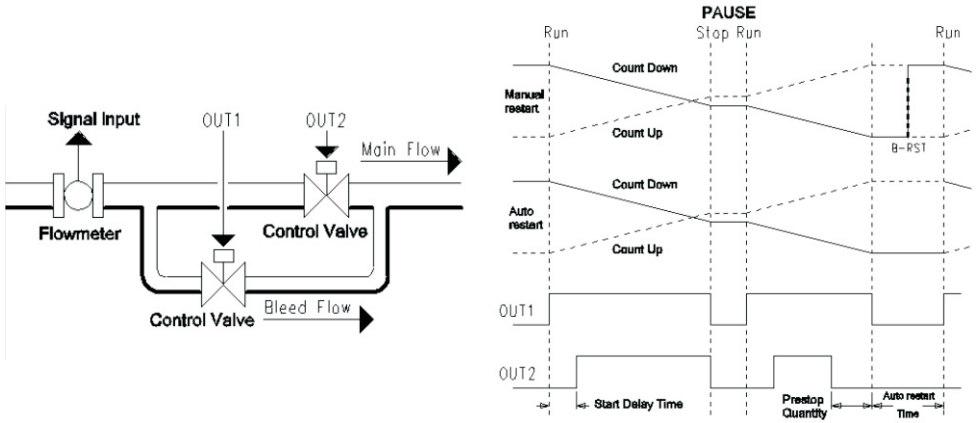


Display	Descriptions	Default
	System Setting Group Procedures	
Input Signal Setting (in-t)	Press ⌂⌄ to modify the input signal setting. (AN/ PULSE/ MAG-P)	An
Flow Unit Setting (d-Unit)	Press ⌂⌄ to modify the flow unit setting. (TON/ m^3/ Liter/ GAL/ CC)	ton
Time Parameter Setting (t-Unit)	Press ⌂⌄ to modify time parameter (Sec/ Min/ Hour/ Day)	min
Rate Decimal Point Setting (dP-r)	Press ⌂⌄ to select rate decimal point (0, 1, 2, 3, 4). EX: if the value shows "0.00" that means the decimal point is 2 digits.	00000
Batch Decimal Point Setting (dP-b)	Press ⌂⌄ to select batch decimal point (0, 1, 2, 3, 4). EX: if the value shows "0.00" that means the decimal point is 2 digits.	00000
Total Decimal Point Setting (dP-t)	Press ⌂⌄ to select total decimal point (0, 1, 2, 3, 4). EX: if the value shows "0.00" that means the decimal point is 2 digits.	00000
Display Low Scale Setting (dSPL)	Press◁⌂⌄ to modify display low scale for the input signal zero value.	00000
Display Hi Scale Setting (dSPH)	Press◁⌂⌄ to modify display high scale for the input signal span value.	0 1000
Analog Root Square Setting (Sqrt-k)	Press ⌂⌄ to select analog root square setting (0.5, 1.5, 2.5)	0.5
K Factor Decimal Point Setting (dP-KF)	Press ⌂⌄ to select K factor decimal point (0, 1, 2, 3, 4). EX: if the value shows "0.00" that means the decimal point is 2 digits.	00000
K Factor Setting (KF)	Press◁⌂⌄ to modify K factor (0 ~ 99999)	00 1.00
Sampling Time Base (tbASE)	Press◁⌂⌄ to modify sampling time base (0.1~999.9 sec).	000 1.0
Batch Count Mode Setting (b-i-M)	Press ⌂⌄ to modify batch count mode (Up, Down).	UP
Alarm Batch Mode Setting (b-o-M)	Press ⌂⌄ to modify alarm batch mode setting. (N: Manual reset; A: Auto reset)	n
Alarm Batch Reset Restart Setting (b-At-t)	Press◁⌂⌄to modify the alarm batch reset restart setting. (0.1~99.9 sec)	0000.1
Total Count Mode Setting (t-C-M)	Press ⌂⌄ to modify total count mode (SYN, NSYN). (SYN: synchronizing; NSYN: non-synchronizing)	n-SYn
Scale Coefficient Adjustment (SCALE)	Press◁⌂⌄to modify scale coefficient 1 (0.0001 ~9.9999).	1.0000
Display Average Setting (AvG)	Press◁⌂⌄ to modify display average (1~99). PS: Please use this function for stable display value when input signal is unstable.	00005
Pass Code Setting (CodE-S)	Press◁⌂⌄ to modify pass code (0~19999). PS: Please don't forget the new pass code after modification.	00000
Key Lock Setting (LoCK)	Press ⌂⌄ to lock the keys, using key lock function (0~2)	00000



Display	Descriptions	Default
Alarm Setting	**Alarm Setting Group Procedures**	
Alarm Rate Action Setting (ACt-t)	Press ⌂⌄ to modify alarm value that is ≧(Hi) or <(Lo) for alarm action.	Hi
Alarm Rate Run Delay Setting (dEL-r)	Press◁⌂⌄to modify the value, when the display value reach the alarm value that need to wait for this time (0~99 sec) for alarm action.	00000
Alarm Total Mode Setting (t-o-M)	Press ⌂⌄ to modify alarm total mode setting. (N: Manual reset; A: Auto reset)	n
Alarm Total Reset Restart Setting (t-At-t)	Press◁⌂⌄to modify the alarm total reset restart setting. (0.1~99.9 sec)	0000.1
Total Value Reset Setting (t-rSt)	Press ⌂⌄ to modify total value reset. (No, Yes)	no
Pulse Output Unit Setting (P-Unit)	Press ⌂⌄ to modify pulse output unit setting. (0.001; 0.01; 0.1; 1)	1
Display	**Descriptions**	**Default**
RS485 Setting	**RS485 Setting Group Procedures**	
Address Setting (Addr)	Press◁⌂⌄ to modify address (0~255).	00000
Baud Rate Setting (bAUd)	Press ⌂⌄to select baud rate (19200/9600/4800).	19200
Parity Setting (PAri)	Press ⌂⌄ to select parity (n.8.2/n.8.1/even/odd).	n.8.2
Display	**Descriptions**	**Default**
A/O Setting Page	**A/O Setting Group Procedures**	
A/O Selection Setting (Ao- sEL)	Press⌂⌄to select analoug output (Rate, Total, Batch)	rAtE
Rate A/O Low Scale Setting (r-AnLo)	Press◁⌂⌄ to adjust rate A/O low scale to correspond to the display value (programmable).	00000
Rate A/O Hi Scale Setting (r-AnHi)	Press◁⌂⌄ to adjust rate A/O hi scale to correspond to the display value (programmable).	0 1000
Total A/O Low Scale Setting (r-AnLo)	Press◁⌂⌄ to adjust total A/O low scale to correspond to the display value (programmable).	00000
Total A/O Hi Scale Setting (r-AnHi)	Press◁⌂⌄ to adjust total A/O hi scale to correspond to the display value (programmable).	0 1000
Batch A/O Low Scale Setting (r-AnLo)	Press◁⌂⌄ to adjust batch A/O low scale to correspond to the display value (programmable).	000000
Batch A/O Hi Scale Setting (r-AnHi)	Press◁⌂⌄ to adjust batch A/O hi scale to correspond to the display value (programmable).	00 1000
A/O Zero Adjustment (AZEro)	Press◁ to select adjusting speed rate, press⌂ ⌄ to modify the A/O zero. PS: To use this function to adjust the real A/O zero.	00000
A/O Span Adjustment (ASPAn)	Press◁ to select adjusting speed rate, press ⌂ ⌄ to modify the A/O span. PS: To use this function to adjust the real A/O span.	00000

Batch operations



Modbus RTU Mode Protocol Address Table

Data format
16Bit : 8000~7FFF (-32768~32767) 32Bit : 80000000~7FFFFFFF (-2147483648~2147483647)
64Bit : 0000000000000000~FFFFFFFFFFFFFFFF (0~2^{64}-1)

Modbus	HEX	Name	Description	ACT
0000	0000	IN_T	Input Type，Input Range 0000~0002(0~2) 0:AN，1:PULSE，2:MAG-P	R/W
0001	0001	D_UNIT	Display Flow Unit，Input Range 0000~0004(0~4)0:TON，1:M3，2: LITER，3:GAL，4:CC	R/W
0002	0002	T_UNIT	Time base Unit，Input Range 0000~0003(0~3)，0:SEC，1:MIN，2:HR，3:DAY	R/W
0003	0003	DP_R	Rate Decimal Point，Input Range 0000~0004(0~4)	R/W
0004	0004	DP_B	Batch Decimal Point，Input Range 0000~0004(0~4)	R/W
0005	0005	DP_T	Totalizer Decimal Point，Input Range 0000~0004(0~4)	R/W
0006	0006	DP_KF	Pulse input K-Factor Decimal Point，Input Range 0000~0004(0~4)	R/W
0007	0007	T_BASE	Time base，Input Range 0001~03E7(0.1~99.9 seconds)	R/W
0008	0008	DSPL_R	Rate Display Low，Input Range 0001~03E7(0~999)	R/W
0009	0009	SQRT_K	Analog input Square Root Constant-K，Input Range 0000~0002(0~2)，0:0.5，1:1.5，2:2.5	R/W
0010	000A	B_I_M	Batch Controll er Counting Mode，Input Range 0000~0001(0~1)，0:UP，1:DOWN	R/W
0011	000B	B_O_M	Batch Controll er Output Mode，Input Range 0000~0001(0~1)，0:Manual，1:Auto	R/W
0012	000C	B_AT_T	Batch Controll er Auto-Restart Time，Input Range 0001~03E7(0.1~99.9 seconds)	R/W
0013	000D	T_C_M	Totalizer Counting Mode，Input Range 0000~0001(0~1)，0:SYN，1:N-SYN	R/W
0014	000E	AVG	Average，Input Range 0001~0063(1~99)	R/W
0015	000F	LOCK	Panel Lock，Input Range 0000~0002(0~2)，0:All，1:External Operating，2: Batch Operating	R/W
0016	0010	ACT_R	Rate Active Direction，Input Range 0000~0001(0~1)，0:HI，1:LO	R/W
0017	0011	T_O_M	Totalizer Alarm output Mode，Input Range 0000~0001(0~1)，0:Manual，1:Auto	R/W
0018	0012	T_AT_T	Totalizer Alarm Auto-Restart Time，Input Range 0001~03E7(0.1~99.9 seconds)	R/W
0019	0013	T_RST	Totalizer Manual Reset，Input Range 0000~0001(0~1)，0:NO，1:YES	R/W
0020	0014	P_UNIT	Totalizer Pulse Unit，Input Range 0000~0003(0~3)，0:0.001，1:0.01，2:0.1，3:1)	R/W
0021	0015	ADDR	Communication Address，Input Range 0000~00FF(0~255)	R/W
0022	0016	BAUD	Baud Rate，Input Range 0000~0004(0~4)，0:38400，1:19200，2: 9600，3:4800，4:2400	R/W
0023	0017	PARI	Parity Check，Input Range 0000~0003(0~3)，0:N82，1:N81，2: EVEN，3:ODD	R/W
0024	0018	AO_SEL	Analog Output Select，Input Range 0000~0002(0~2)，0:RATE，1:TOTAL，2:BATCH	R/W
0025	0019	START_D	OUT2 Start Delay Time，Input Range 0000~0063(0~99 seconds)	R/W
0026	001A	PRESTOP	OUT 2 Prestop Counting，Input Range 0000~270F(0~9999)	R/W
0027	001B	DEL_R	Rate Alarm Delay Time，Input Range FF9D~0063(-99~99)	R/W

Modbus	HEX	Name	Description	ACT
0028	001C	A_ZERO	Analog Output Zero Adjust，Input Range E890~1770(-6000~6000)	R/W
0029	001D	A_SPAN	Analog Output Span Adjust，Input Range E890~1770(-6000~6000)	R/W
0030	001E	KF	K-Factor ，Input Range 00000000~0001869F(0~99999) high word	R/W
0031	001F		K-Factor ，Input Range 00000000~0001869F(0~99999) low word	R/W
0032	0020	DSPH_R	Analog input Rate Display High，Input Range 00000000~0001869F(0~99999) high word	R/W
0033	0021		Analog input Rate Display High，Input Range 00000000~0001869F(0~99999) low word	R/W
0034	0022	SCALE	Totalizer Scale ，Input Range 00000001~0001869F(0.0001~9.9999) high word	R/W
0035	0023		Totalizer Scale ，Input Range 00000001~0001869F(0.0001~9.9999) low word	R/W
0036	0024	CODE_S	Code Setting，Input Range 00000000~0001869F(0~99999) high word	R/W
0037	0025		Code Setting，Input Range 00000000~0001869F(0~99999) Low word	R/W
0038	0026	R_ANLO	RATE ANLO，Input Range 00000000~0001869F(0~99999) high word	R/W
0039	0027		RATE ANLO，Input Range 00000000~0001869F(0~99999) Low word	R/W
0040	0028	R_ANHI	RATE ANHI，Input Range 00000000~0001869F(0~99999) high word	R/W
0041	0029		RATE ANHI，Input Range 00000000~0001869F(0~99999) Low word	R/W
0042	002A	B_ANLO	Batch ANLO，Input Range 00000000~000F423F(0~99999) high word	R/W
0043	002B		Batch ANLO，Input Range 00000000~000F423F(0~99999) Low word	R/W
0044	002C	B_ANHI	Batch ANHI，Input Range 00000000~000F423F(0~99999)high word	R/W
0045	002D		Batch ANHI，Input Range 00000000~000F423F(0~99999)low word	R/W
0046	002E	BATCH	Batch，Input Range 00000001~000F423F(1~99999) high word	R/W
0047	002F		Batch，Input Range 00000001~000F423F(1~99999) low word	R/W
0048	0030	AL_R	Rate Alarm，Input Range 00000000~0001869F(0~99999) high word	R/W
0040	0031		Rate Alarm，Input Range 00000000~0001869F(0~99999) low word	R/W
0050	0032	INLO	Low Analog Input Adjusted Value，Input Range 00000000~00FFFFFF(0~16777215) high word	R/W
0051	0033		Low Analog Input Adjusted Value，Input Range 00000000~00FFFFFF(0~16777215) low word	R/W
0052	0034	INHI	High Analog Input Adjusted Value，Input Range 00000000~00FFFFFF(0~16777215) high word	R/W
0053	0035		High Analog Input Adjusted Value，Input Range 00000000~00FFFFFF(0~16777215) low word	R/W
0054	0036	T_ANLO	Total ANLO，Input Range 0000000000000000~00000002540BE3EF(0~9999999999) highest word	R/W
0055	0037		Total ANLO，Input Range 0000000000000000~00000002540BE3EF(0~9999999999)	R/W
0056	0038		Total ANLO，Input Range 0000000000000000~00000002540BE3EF(0~9999999999)	R/W
0057	0039		Total ANLO，Input Range 0000000000000000~00000002540BE3EF(0~9999999999) lowest word	R/W
0058	003A	T_ANHI	Total ANHI，Input Range 0000000000000000~00000002540BE3EF(0~9999999999) highest word	R/W
0059	003B		Total ANHI，Input Range 0000000000000000~00000002540BE3EF(0~9999999999)	R/W
0060	003C		Total ANHI，Input Range 0000000000000000~00000002540BE3EF(0~9999999999)	R/W
0061	003D		Total ANHI，Input Range 0000000000000000~00000002540BE3EF(0~9999999999) lowest word	R/W
0062	003E	AL_T	Totalizer Alarm，Input Range 0000000000000000~00000002540BE3EF(0~9999999999) highest word	R/W
0063	003F		Totalizer Alarm，Input Range 0000000000000000~00000002540BE3EF(0~9999999999)	R/W
0064	0040		Totalizer Alarm，Input Range 0000000000000000~00000002540BE3EF(0~9999999999)	R/W
0065	0041		Totalizer Alarm，Input Range 0000000000000000~00000002540BE3EF(0~9999999999) lowest word	R/W
0066	0042	DISPLAY_RATE	Rate Display Range 00000000~0001869F(0~99999) high word	R
0067	0043		Rate Display Range 00000000~0001869F(0~99999) low word	R
0068	0044	DISPLAY_BATCH	Batch Display Range 00000000~000F423F(0~999999) high word	R
0069	0045		Batch Display Range 00000000~000F423F(0~999999) low word	R
0070	0046	DISPLAY_TOTAL	Totalizer Display Range 0000000000000000~00000002540BE3EF(0~9999999999) highest word	R
0071	0047		Totalizer Display Range 0000000000000000~00000002540BE3EF(0~9999999999)	R
0072	0048		Totalizer Display Range 0000000000000000~00000002540BE3EF(0~9999999999)	R
0073	0049	DISPLAY_TOTAL	Totalizer Display Range 0000000000000000~00000002540BE3EF(0~9999999999) lowest word	R
0074	004A	STATUS	Alarm output status，Display Range 0000~001F(0~31)，Bit0:AL_T，Bit1:OUT2，Bit2: OUT1，Bit3:AL_R，Bit4:RUN=1 / STOP=0	R
0075	004B	PARI	Write = 0x01 (Function 06)，Reset batch count (If B_O_M = 0)	W

Error Code of Self-Diagnosis

iaFL	Input signal is over 120% of input range.
daFL	Input signal is under display range (-19999)
E-00	EEPROM reading/writing suffers the interference (about 1 million times).

TERMINAL DESCRIPTIONS :

1.B_RST terminal :
If B_O_M = N (Manual reset), once terminal B_RST & COM is short, batch controller reset.

2.RUN terminal :
a. If batch controller is pulse, once terminal RUN & COM is short, batch controller continue run.
b. If B_O_M = N (Manual reset), batch controller already reset, once terminal RUN & COM is short, batch controller will be reset.

3.STOP terminal :
When batch controller is action, once terminal STOP & COM short, controller will be pulse.

4.SQRT terminal :
When terminal SQRT & COM short, analog input rootextractor action.

Note : VR is ON/OFF detect adjust for magnetic pick-up signal.