BEM SERIES TEMPERATURE CONTROL INSTRUMENT

Thank you for buying BEM series digital temperature control instruments

This description describes the function and performance of the product as well as the application method to give full play to the effect of the product. Please pay attention to the following items when using this product:

The person who uses this product must have sufficient electrical system knowledge.

This product should be read and understood in order to ensure the correct use of the product before using this product.

Be sure to consider the applicability of this product to the systems, machines and equipment used. Please pay attention to and observe the prohibition of this product when using.

The examples provided in other technical data such as the manual are only for the user's reference, and do not guarantee a certain action.

When the product is used in combination with other products, please confirm whether it is in conformity with the relevant specifications and principles.

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A2

NOTICE

① The controller does not touch the AC power terminal, so as not to be subjected to electric shock.
② Before sending power, please confirm that the power supply voltage is consistent with the controller specification, otherwise the power supply may cause the controller to be damaged
③ Do not dismantle, refit and repair the product or contact any internal components
④ If the output relay exceeds the expected service life, the contact melting may occur sometimes and burning
⑤ Tighten the terminal screws with the torque of 0. 74-0. 90N.m, and the loosened screws may lead to fire
⑥ The instrument to prevent damage or failure, selecting proper fuse power line and input / guaranteeOutput line to prevent current shock
⑦ The fire, explosion, or instrument damage, forbidden in flammable and explosive gas, steam emissionUse of places
⑧ This product is strictly inspected before leaving the factory, such as the warranty of the company due to the quality problems.In the year, the products sold by the responsible authority themselves are not responsible for any other joint liability. Because Damage caused by improper disassembly or improper use is not within the scope of warranty.

MATTERS NEEDING ATTENTION

① Allow the heat to be distributed, do not fill the space around the product, do not plug the ventilation hole of the product
② Do not install the controller on high wave interference, corrosive gas, high temperature, high humidity, and iceAnd the spattering of dew, liquid, or oil and gas
③ There should be enough distance between the controller and the equipment that can produce high frequency and surge.
④ Please confirm the wiring to the terminal for the correct use
⑤ Use the product under the rated load and power supply
⑥ Do not use paint thinner or similar chemicals to clean products, use standard grade alcohol
⑦ Read the information provided in the directory and instructions and ensure that the output unit is connected before the connection is controlled.I have understood the information
⑧ If the front mask has been stripped or broken, the temperature controller must not be used

A3 ELECTRICAL SPECIFICATIONS

Rated voltage	180V-240VAC, 50Hz
Power consumption	≤5VA
Work environment	Ambient temperature: 0℃-50℃ Relative humidity: 35%-85% RH (no condensation)
Storage temperature	-25℃-65℃ (Avoid freezing or dew)
Resolving power	1℃, 0.1℃ (Adjustable)
Connection mode	Terminal
Measurement accuracy	±0.5%FS
Memory protection	Nonvolatile memory
Installation environment	Installation type II, pollution grade 2
Relay output	Relay contacts AC220V/DC30V,5A
Logic level output	ON: DC12V;OFF: DC0.5Vbelow; Maximum flow: 30mA,load resistance≥1K

A4 Product Selection

Please refer to the following code to confirm whether the delivered product is in accordance with the model you selected.

BEM – □□□□□□ – □□□□
① ② ③ ④ ⑤ ⑥ ⑦

① Positive Size
A: 48*48 B: 48*96 D: 72*72 E: 96*96

② Input Signal

Name	K	J	E	S	N	T	B	R	RE3	RE5	PT 100	CU 50	PT. 100	CU. 50	0–5V 0–20mA	1–5V 4–20mA
Code	K	J	E	S	n	T	b	r	r3	r5	Pt	Cu	Pt.	Cu.	5.	5-

③ Power Type
L: linear power supply
S: switching power supply

④ Master Output
1: relay 2: logic level output (solid-state output)
3:PID4-20mA output (custom)
4: thyristor phase shift trigger / zero crossing trigger (custom)
5: 30A relay (custom) 6: send 4-20mA output (custom)

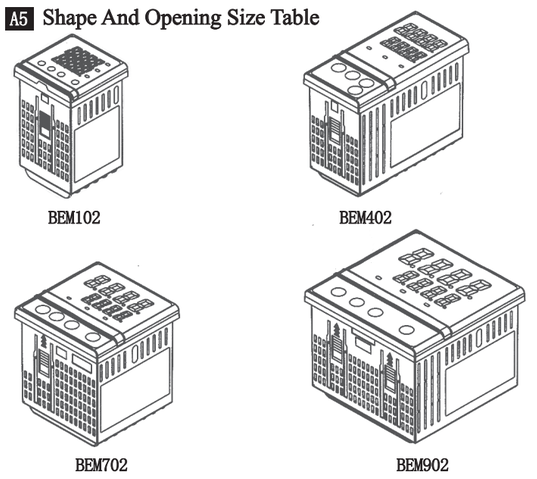
⑤ Alarm Output 1

The value of AL1T/AL2T	Significance
0	No alarm, the AL1, AL2 menu will not appear in the case of tacit sense
1	Upper limit absolute alarm
2	Upper limit deviation alarm (first alarm default value)
3	Lower limit absolute value alarm (second default value of alarm)
4	Lower limit deviation alarm
5	Out of band (out of interval) alarm
6	Intra band (interval) alarm
P–1	Upper absolute value alarm with power holding function
P–2	Upper limit deviation alarm with electric holding function
P–3	Lower absolute value alarm for electric holding function
P–4	Lower deviation alarm for electric holding function

⑥ The alarm output 2 is the same as the alarm output 1

⑦ Function Code
Customizing the serial number of the product, this item is meaningless when the product is selected

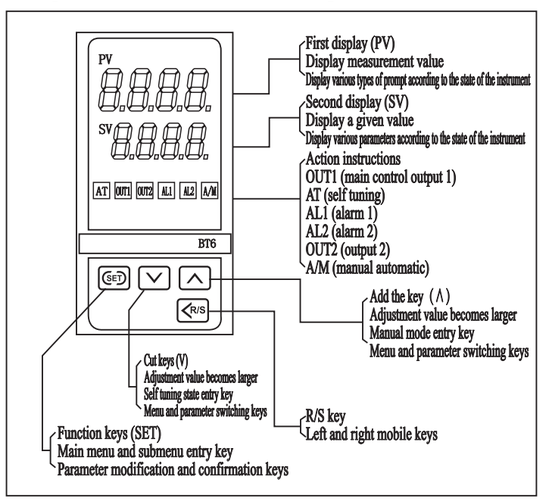
A5 Shape And Opening Size Table



Company: mm

Model	Panel size	Shell size Long x wide x high	Aperture size
BEM102	48×48	45×45×83	46×46
BEM402	48×96	45×90×83	45×91
BEM702	72×72	66×66×83	67×67
BEM902	96×96	90×90×83	91×91

B1 Operation Panel Function Description



B2 The main menu displays instructions (press and hold the SET key for 3 seconds to enter the main menu interface)

1. user parameters
In the normal state of measurement and control, click the set key to enter the user parameter setting.press again, then enter the next user parameter setting until all the parameters are set.

Code	Code	Parameter meaning	Explain	Set range	Default value	Display condition
Su	SV	Temperature setting	Temperature setting value	SLL–SLH	100℃	Manual function closure,when the manual function is opened,display the power of control percentage
St	ST	Set the instrument running time	When the timing function is able to be able to be able (ET=1,2,3), this parameter exists.see the details of the timing section.parameter setting the display of the decimal point, said.	0–9999s/m	60	Ton = 1 && ET != 0

2. Engineer parameters
When you hold the set key for 3 seconds, you can get into the shape of the engineer's parameters, if you want to quit,Then press set key for 1 seconds, if you want to set the next parameter, then press the set key once.The parameters of the engineer are described in the following table

Code	Code	Parameter meaning	Explain	Set range	Default value	Display condition
AL1	AL1	First alarm	There are 12 modes of alarm, which are determined by AL1T.	-1999–9999	30	AL1!=0
AL2	AL2	Second alarm	There are 12 modes of alarm, which are determined by AL2T.	-1999–9999	50	AL2!=0
SC	SC	Display value correction	The =Pb value of the display value + internal measurement value;	–50–50	0	1
P	P	Proportional band	If it is 0, a bit control, and the, D menu is not displayed at this point, but the HY menu will be displayed.	0–9999	30	1
oH	OH	Lower switching difference of bit control	When the master control is a two bit control (P=0) master control switching difference, PV < SV–OHL absorption	0–200	2	P = 0
oHH	OHH	Shift difference at the upper side of the position control	When the master control is a two bit control (P=0) master control switching difference, PV > SV+OHH closes	0–200	0	P = 0
I	I	Integral time constant	If it is zero, the integral control function is cancelled	0–9999	240	P != 0
d	D	Differential time constant	If set to zero, cancel the differential action	0–9999	60	P != 0
T	T	Control cycle	The action cycle of the main control	0–100	20	P != 0
Pc	Pc	Proportional band (refrigeration side)	The 1–200% of the proportional band	Heating/ cooling PID action	50	Dir = H–C
Tc	Tc	Proportional cycle cooling side	1–100sec (not set to 0)	Heating/ cooling PID action	20	Dir = H–C
db	db	Not feeling	Temperature input, set (heating side) ratio band and (refrigeration side) proportion band between control action do not feel band, set negative number to overlap	-1999–9999	0	Dir = H–C
Ar	AR	Integral limit	Use of integral limiting	0–100%	80	P != 0
Atu	ATU	Self tuning switch	OFF: shut down; ON: open the long press SW key for 3 seconds to enter quickly	OFF/ON	OFF	P != 0
CtH	CTH	Current detector input 1	0–9999A when the value is input to 100, the calibration point signal is 100A.	0–100	100	CTon = 1
ACt	ACT	Heater broken line alarm	0–9999A when the detection CT end is less than ACT, the AL2 alarm output	Alarm value reference current detecto input value	0	CTon = 1
LCK	Lck	Parameter lock	0: not locking; 1: lock the user parameters; 2: lock all the parameters	0–2	0	1

B3 Factory Parameters

Hold down the setting button and shift key until Code(CodE) is displayed. Enter 010 in this state, then press the set button to enter the following menu. After setting it, press the set key again and return to the Code(CodE) state. The parameters of this layer are only suitable for use by the instrument engineer or manufacturer, and the ordinary users do not use it.

Code	Code	Parameter meaning	Explain	Set range	Default value	Display condition
AL1t	AL1T	Selection of the first alarm mode	See the alarm form	0–5,P1–P5	2	1
AL2t	AL2T	Selection of the second alarm mode	The alarm mode shows that there is no AL2 function when the function of current alarm is opened.	0–5,P1–P5	2	1
AH1	AH1	Switch difference of first alarm relay	Switch difference of alarm relay	0–200	1	1
AH2	AH2	Switch difference of second alarm relay	Switch difference of alarm relay	0–200	1	1
AH	AH	Overtemperature off deviation	Turn off the output when PV>SP+AH	0–––999	30	
FP	FP	Proportional band lead	To reduce or eliminate the overshoot of the first heating by moving the proportion down FP degrees.	0–100	5	1
SLL	SLL	Minimum set value setting	The minimum set value that the user can set	Full range	0	1
SLH	SLH	Maximum set value setting	The maximum set value that the user can set	Full range	1370	1
PL	PL	Minimum power limit	The minimum output power to limit the output of the instrument	0–30%	0%	1
PH	PH	Maximum power limit	OUT=0 measure the maximum output power of the instrument after the temperature enters the proportional band Maximum output power of OUT=1,2 instrument	30–100%	100%	1
dLY	DLY	Minimum time interval of main control action during refrigeration	Prevent compressor start and stop frequently, lead to compressor damage or overload protection circuit action	0 – 200s	60s	1
PSL	PSL	The display value of linear input zero position	Only when the input is a linear signal (voltage, current, etc.) it is used to this parameter	-1999–9999	0	1
PSH	PSH	The display value of linear input full degree	Only when the input is a linear signal (voltage, current, etc.) it is used to this parameter	-1999–9999	1370	1
dP	dP	The position of the decimal point at linear input	The decimal point is invalid only for the linear input (5V, 5V) to the thermocouple and the thermal resistance signal	0–3	0	1
dF	DF	Filter coefficient	The larger the SL6 shows, the filtering effect is good and the display is stable.	0–––250	200	
tSL	TSL	Adjust the transfer output zero position	When the measured value is less than TSL, the output output enters this state according to this value, and the output output is only related to the TSL.	0–9999	00	1
tSH	TSH	Adjust the output fullness of the output	When the measured value is more than TSL, the output output enters this state according to this value, and the output output is only related to the TSL.	0–9999	400	1
Addr	Addr	Postal address	Instrument communication address	1–250	1	Con=1
bPS	bps	Baud rate	Setting up the communication rate, the baud rate	300–38400	9600	Con=1
Et	ET	Timing function permit	0: No time 1: Master control output timing when ALT reaches the time temperature. After the time of time, the control output is closed; and the operation is waiting; the 4 decimal points of the SP digital tube flicker in half a second, indicating the end of the timing and closing the output. Need; and press BL to open AL2 after 2: Single time time when ALT reaches the time temperature,start time, after the end of the time, do not close the control output, only play the role of reminding, according to the BL set to open AL2: AL2 stops the time after 3. The time of the time.When ALT reaches the time temperature, it starts time. After the end of the time, the control output is not closed, only the reminding function is played, and the AL2 is opened according to the BL setting. After the end of the AL2 time, the ALT is time and circulate after it reaches the temperature. 4.Timing startup, after the delay ST time, the master control begins to output.	0,1,2,3,4	0	Ton = 1
tIE	TIE	Timed time unit	0: seconds 1: points	0,1	1	Ton = 1
ALt	ALT	The lower deviation temperature triggered by a timing timer	When the temperature reaches the SP –ALT value at ET=1,2,3, the meter starts to countdown. If the value of ALT is larger, the meter can start to countdown as soon as it is on the power.	0–9999℃	1℃	Ton = 1
bL	BL	After the timing is completed, the time of the second alarm relay suck in	0: after the completion of the timer, the second alarm relay is not sucking. 250: after the completion of the timer, the second alarm relay often suck together; 1–249: after the completion of the timer, the timing time of the timing alarm relay is (seconds).	0–250s	5s	Ton = 1

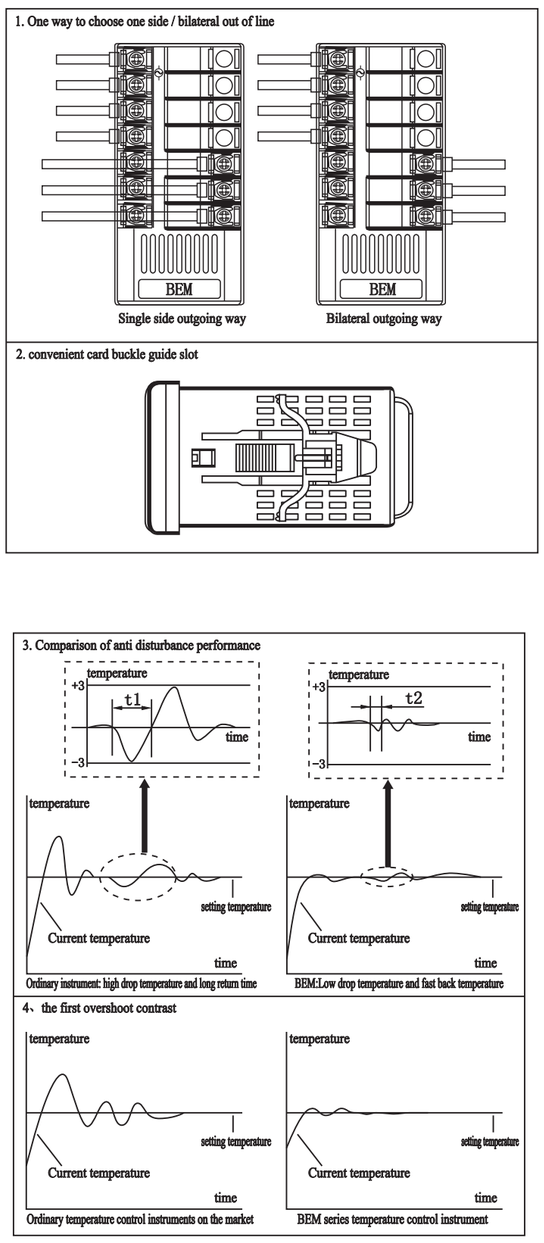
Time Description: when the timing function is opened, the timing state can be viewed by shifting and reducing the keys.The SV position shows the timing state. When the timing is not started, the setting time is displayed, and the unit is timed.The decimal point display. Is the time course, display the countdown, unit of time, theThe decimal point flashes in half a second, and the end of the timing shows 0000. In a non - menu state, long pressBit and key, reset the timing state (whether it is at the time or the end of the time), when the time reference is taken.When the number is modified, the timing state is also reset. When the timing is 2, the time is finished,Start heating.

B4 Setting parameter description

Hold down the setting and shift keys until the Cod(CodE)is displayed and lost in this state modify the Cod(CodE)=020 state by adding and subtraction keys. The parameters of this layer are only suitable for the manufacturer to be out of the house before adjusting, please do not use it after leaving the factory.

Display character	Code	Significance	Other instructions	Range	Default value
Sn	SN	Selection sensor Input signal	Different input models need to match different the input resistance. RE3 represents Wre3–25, RE5 represents 5–26. 5V. represents 0–––5V input 5V represents 1 – 5V input	K,J,E,S,N,T.B,R, RE3, RE5,PT、Cu、PT. , Cu. , 5V. , 5V	K
unit	Unit	Unit selection	℃: Centigrade; ℉: Fahrenheit degree	℃, ℉	℃
out	OUT	Output mode choice	RLY: switch class (relay, 12V pulse voltage output, thyristor zero output); 1–5: (1–5V, 4–20mA contro signal output) The corresponding output of MPO: (SCR phase–shift output) needs the support of the corresponding output module	RLY, 1–5, MPO	RLY
dir	Dir	Control direction	HOT: heating control, that is, reverse control; COL: refrigeration control, that is, forward control; H–C: heating and cooling together HOT, COL mode output control is OUT1 H–C mode OUT1 for heating control output OUT2 is the output of refrigeration control	HOT, COL, H–C Description: the COL and H–C control modes correspond only to the RLY mode	HOT
tt	Tt	Temperature tracking	Make the display temperature close to the set value within the range of the set value of ± Tt	0–10	1
Hnd	Hnd	manual control is it allowed	0: manual control prohibition 1: manual control permit When the manual control is allowed, the shift key can be used to enter the manual control state, and the output power percentage of the instrument can be controlled by adding and subtraction keys in the manual control state.	0,1	0
FAC	FAC	Overtemperature display limit	0– shutoff functionOther values, beyond the set value. The portion of the excess is displayed proportionately Display value = SV+ (PV–SV) /FAC	0–100	0

B5 Other information



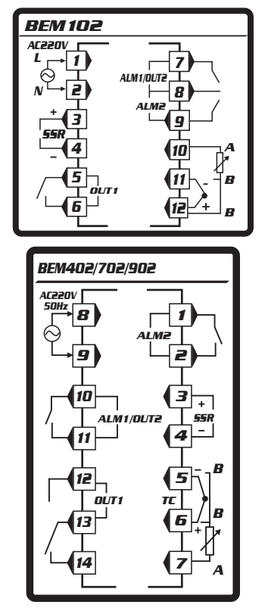
C1 Error Display Function

When the instrument does not work properly, the instrument will display the message prompt after the diagnosis.

Message	Explain	Elimination method
HHHH	Input broken line, polarity connection or beyond the input range	Please check whether the input signal is wrong
LLLL	Input broken line, polarity connection or beyond the input range	Please check whether the input signal is wrong

C2 Example Diagram of Wiring:

The following wiring diagram is only used for connection instructions, and the actual wiring is based on the wiring diagram of the instrument shell.



C3 Judgment and maintenance of simple instrument problem:

1.The instrument can be electrified only after the correctunmistakable connection. The PV window displays the measured value, and the SV window displays the control value.
2. There is no display on the instrument and no output action.
① First of all, please check the instrument power connection is wrong?
② Do you check the consistency of the instrument power and the input power?
③ Is it abnormal to measure the input power by an instrument?
3. The PV window displays "HHH" or "LLL" after the instrument is on power.
① The display "HHH" or "LLL" indicates the exception of the input part of the instrument signal.
② First of all, please check the instrument signal input wiring is wrong?
③ Do you check the consistency of sensor specifications and instrument input specifications?
④ Does the sensor check whether the sensor is damaged or whether the sensor is damaged (open circuit or short circuit)?
4.The instrument does not output after electricity, but the corresponding indicator light is displayed normally.
① First check the output wiring of the instrument is wrong?
② Do you check the output of the instrument to match the external load?
③ Is there a damage (open circuit or short circuit) for the inspection of the external load of the instrument?
5. The display or control of the instrument is abnormal.
① First check the wiring of the instrument is wrong?
② Is it reasonable to check the parameters of the instrument?