DIGITAL BURNER CONTROLLER

TBC2800 SERIES

FEATURES

- Compatible to UV, Double rod (separated flame rod and ignition rod) and 1 rod (integrated flame rod and ignition rod) flame detection which can be set manually
- Integrate 6 kinds of timing choices which can be set manually according to the application requirements
- 24 hours continuous operation (except UV application), Lifecycle ≥ 250K times (Note 1)
- IP54 protection, field or cabinet installation
- Multifunctional LED lights and buttons indicate the Flame strength, fault & operation sequence and parameters
- Remote or on-site reset
- Adjustable flame on-off threshold
- Comply with EN298

SPECIFICATIONS

W x D x H:	122.5 x 82 x 131.2mm
Mains input：	220/230VAC –15/+10%，50／60Hz
Power consumption：	9 VA
Cable length of flame rod:	75m(max)
Cable length of UV：	75m（max)
Flame threshold setting：	1~10μA
Cover material：	PC/ABS
Protection class：	IP54
Ambient temperature：	-20℃～+60℃
Ambient humidity：	〈 95%, non condensing
Lifecycle：	250,000 cycles comply with EN298
Drive gas valve：	1A(max)；power factor：1
Drive ignition transformer：	2A(max)；PF：0.2
Maximum output for terminal：	2A，242Vac
UV sensor：	C7027A/C7035A/C7044A

APPLICATION

TBC2800 series is the high-performance burner controller which is designed for commercial and industrial application and suitable for gas firing.

TBC2800 series can be used for pulse firing and modulating firing mode.

TBC2800 series applies to multiple burners application, such as steel, machinery manufacturing, non-ferrous metals, glass, ceramic, petrochemical and other industries.

INSTALLATION

TBC2800 can be installed with DIN rail or two M4 screws. While installing with M4 screw, it is necessary to put the sealing gasket beforehand so as to ensure IP 54 protection.

TBC2800 reserves 7 x M16 holes for cable wiring.

⚠️ **WARNING**

Improper operation will cause personal injury or equipment damage! Disconnect the power connection before installation!

Must consider the electric shock protection! Make sure the end-users can not access the parts not proper insulated
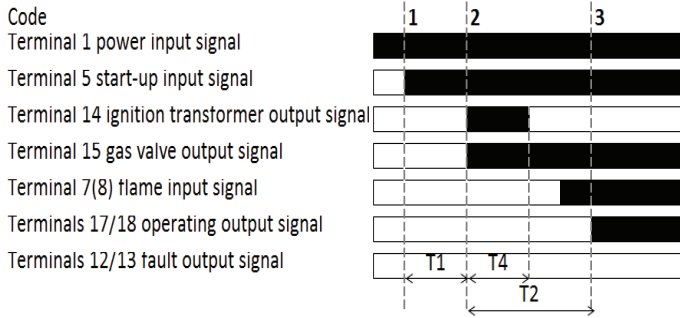
⚠️ **CAUTION**

- Read these instructions carefully. Failure to follow them could damage the product or cause a hazardous condition.
- Check the ratings given in the instructions and marked on the product to make sure the product is suitable for the application.
- Installer must be a trained, experienced, flame safeguard service technician.
- After installation is completed, the operation parameters should be set by the authorized person according to the application requirements and this product handbook.
- Keep the flame detector cable and ignition cable as far as possible.
- C7027A/C7035A/C7044A is not the self-checking UV sensor, so TBC2800 should be restarted once every 24 hours.

Note1: If one rod flame detection is applied, TBC2800 lifecycle will be 100,000 times.
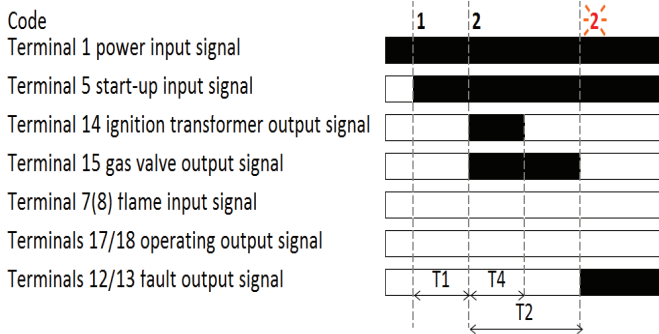
Program sequence

Define working sequence, timing, failure control program.

1.Normal start up

| Code		1	2	3
Terminal 1 power input signal				
Terminal 5 start-up input signal				
Terminal 14 ignition transformer output signal				
Terminal 15 gas valve output signal				
Terminal 7(8) flame input signal				
Terminals 17/18 operating output signal				
Terminals 12/13 fault output signal		T1	T4	
			T2	

As receiving the start-up signal, TBC2800 implements the flame simulation during T1(waiting time). If it doesn't detect the flame signal, T2(safety time on start-up) elapses along with driving the gas valve and ignition transformer. After T2 pasts and the flame signal is received, the operation signal contact between terminals 17 and 18 closes. The LED display indicates the current program status **3** .

2. No flame signal during start-up

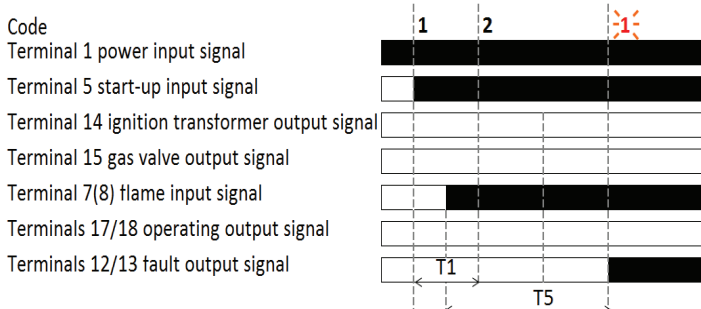| Code		1	2	-2-
Terminal 1 power input signal				
Terminal 5 start-up input signal				
Terminal 14 ignition transformer output signal				
Terminal 15 gas valve output signal				
Terminal 7(8) flame input signal				
Terminals 17/18 operating output signal				
Terminals 12/13 fault output signal		T1	T4	
			T2	

If no flame signal is detected during T2, the fault lock-out occurs, i.e. the valve closes, the fault signal contact between terminals 12 and 13 closes. During the entire safety time on start-up T2, the gas valve is open. The LED display blinks and indicates **2** .

3.Flame simulation
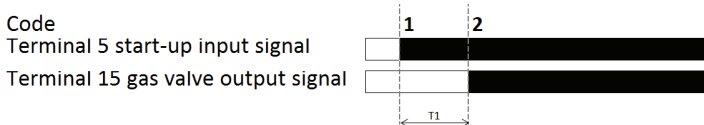
Code		1	2
Terminal 5 start-up input signal			
Terminal 15 gas valve output signal			
		T1	

As receiving the start-up signal, TBC2800 implements the flame simulation during T1 (waiting time).

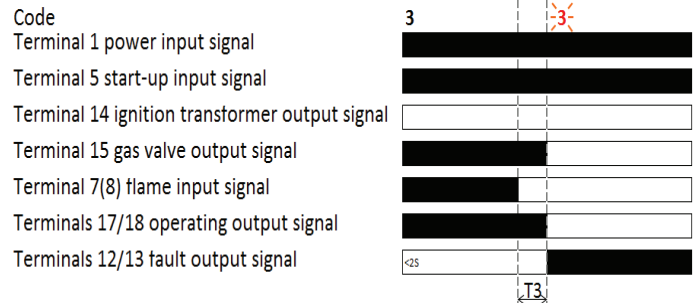| Code		1	2	-1-
Terminal 1 power input signal				
Terminal 5 start-up input signal				
Terminal 14 ignition transformer output signal				
Terminal 15 gas valve output signal				
Terminal 7(8) flame input signal				
Terminals 17/18 operating output signal				
Terminals 12/13 fault output signal		T1		
			T5	

If the flame is detected during T1, TBC2800 starts the flame simulation delay time T5. If the flame disappears during T5, the burner will start up. Otherwise the fault lock-out occurs. The LED display blinks and indicates **1.**

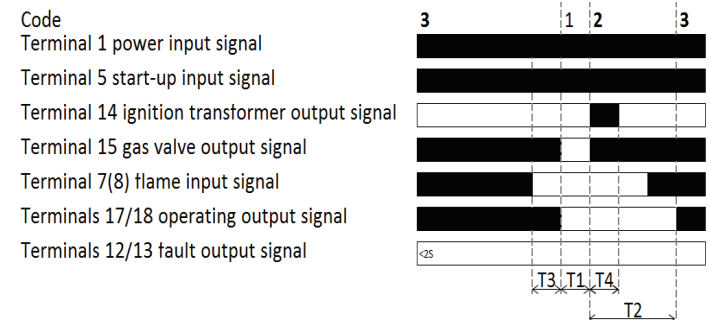### 4. Lock-out immediately or restart once after flame fail

They can be set according to the application requirements.

The immediate lock-out is default.

1). **Lock-out immediately after fault**

Code		3	-3-
Terminal 1 power input signal			
Terminal 5 start-up input signal			
Terminal 14 ignition transformer output signal			
Terminal 15 gas valve output signal			
Terminal 7(8) flame input signal			
Terminals 17/18 operating output signal			
Terminals 12/13 fault output signal	<2S		
		T3	

TBC2800 will perform the fault lock-out after flame failure during operation T3. At the same time, the gas valve is closed. The fault signal contact between terminals 12 and 13 closes. The LED display blinks and indicates **3.**

Code		3	1	2	3
Terminal 1 power input signal					
Terminal 5 start-up input signal					
Terminal 14 ignition transformer output signal					
Terminal 15 gas valve output signal					
Terminal 7(8) flame input signal					
Terminals 17/18 operating output signal					
Terminals 12/13 fault output signal	<2S				
			T3 T1 T4		
			T2		

2).**Restart once after fault**

TBC2800 will perform one time restart after flame failure during operation T3. The gas valve is closed and the operating signal contact is open. Now TBC2800 attempts to restart once. If it fails, the fault lock-out occurs. The LED display blinks and indicates **2** . If the flame signal is detected within the safety time T2 on restart, The LED display indicates the current program status **3** .

5. Switch-off in succession occurs during a start-up too often

If switch-off occurs more than three times in succession during a start-up, an inadmissible quantity of non-combusted gas can reach the combustion chamber during T2 via open gas valves. A fault lock-out occurs. The LED display blinks **4**.

6. Time between two start-ups is too short

If time between two start-ups is too short, a fault lock-out occurs. The LED display blinks and indicates 7.

7. Remote reset is too persistent

If the application of a remote reset signal to TBC2800 is continuous(> T7), the fault lock-out occurs. The LED display blinks and indicates 6. TBC2800 keeps on operating and LED blinks until the remote reset signal disappears.

8. Remote resets is too often

If the remote reset is too often, the fault lock-out occurs. The LED display blinks and indicates 5 .The fault can only be cleaned by manual reset.

9. Fault lock-out information summary

Table 1: Fault lock-out information

| Code (blinking)	Fault lock	Result	Unlock
1	Flame simulation failure	Stop	Remote reset / reset button
2	Start-up flame failure	Stop	Remote reset / reset button
3	Operation flame fail-	Stop	Remote reset / reset
4	Too frequent start-up	Stop	Remote reset / reset button
5	Too frequent remote reset	Stop	Reset button
6	Persistent remote reset	Continue to work	Remote reset cancel
7	Too short time interval between startups	Fail to start up	T6 past
8	Internal temporary error	Stop	Remote reset / reset button
9	Internal storage error	Stop	Contact service

10. Time definition

Table 2: Time definition

Time	Description	Range	Reference Fault lock
T1	Waiting time		
T2	Safety time on start-up	3,5,10S	
T3	Safety time during operation	1,2s	
T4	Ignition time	2,3,6 S Correspond with T2	
T5	Flame simulation delay	Max 25S	
T6	Interval between two start signal	10,12,15S Correspond with T2	Time between two start-ups is too short
T7	Last time of Remote Reset	10s	Permanent remote reset

*Note: If T3=2s, follow EN746-2.

11. Running state information summary

1> Sleep, code: " - "   2> Stand by, code: "0"
3> Flame simulation(T1) ,code: " 1 "
4> Ignition process(T2) code: " 2 "
5> Working process, code: " 3 "
6> Fault lock code: refer to Table 1 Fault lock information
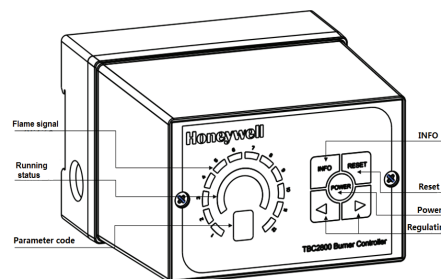
12.Button operation

1. Press the INFO button for 2s, then the parameter code will be displayed. Choose the code by pressing < or > button, the LED lights will indicate the current parameter value.

2 . Press < and > button at the same time for 2s, one dot will light in the right corner. The setting value will blink, then parameters can be checked or adjusted.

3 . Check or adjust the setting value by pressing < or > button.

4 . After checking or setting, press < and > button for 2s for saving and quit.

5. Press INFO for 2s for quit, TBC2800 will restart automatically and the setting parameter will come into effect.

NOTE：

・The parameters can only be set in standby state; If TBC2800 is in running state or fault lock-out, parameters can only be checked.

・During the parameters setting, if there has no button-pressing in 30s, TBC2800 will exit setting automatically, return to the original state and close all values in this unfinished setting.

・Please refer to Table 3 for parameter and the related value.

Description	Param	Range	Default	Adjustable
Flame on-off threshold	F	1~10	1	Yes
Flame detection	P	1-Flame rod 2-UV	1	Yes
Timing	C	1,2,3,4,5,6	2	Yes
Burner restart	H	1-Fault lock 2-Restart once	1	Yes
Fault record	E	1~9	-	No
Software version	U	-	-	No

13.LED

1. **LED bars**
   A. Indicate the flame intensity data;
   B. Indicate the parameter value when in setting process;
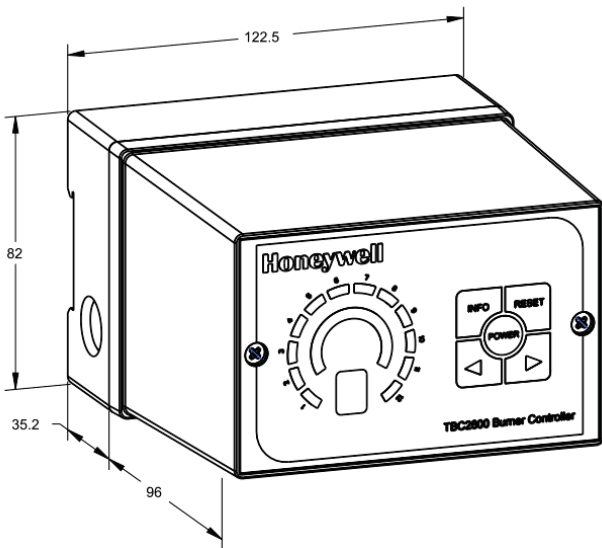
2. **LED Loop**
   A. Light is off in startup or parameter setting.
   B. Light is green in the normal status.
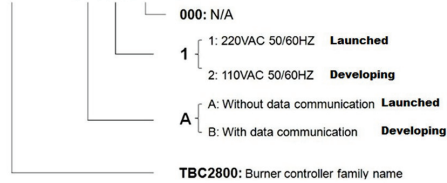   C. Light is red in the fault status.

3. **"8" digital tube**
   A. Indicate the operation code (light);
   B. Indicate the parameter code;

Dimension（mm）

Installation

DIN rail

Mounting plate

Product Code

TBC2800 A 1 000

000: N/A

1
- 1: 220VAC 50/60HZ **Launched**
- 2: 110VAC 50/60HZ **Developing**

A
- A: Without data communication **Launched**
- B: With data communication **Developing**

TBC2800: Burner controller family name

Timing

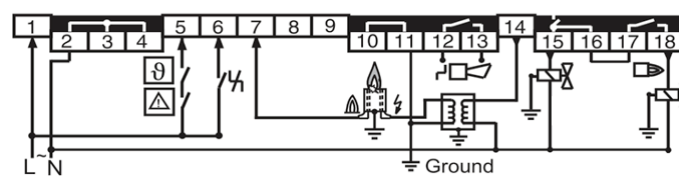| Code	T2（sec）	T3（sec）
1	3	1
2	5	1
3	10	1
4	3	2
5	5	2
6	10	2

Wiring diagram

Double Rod Flame Detection
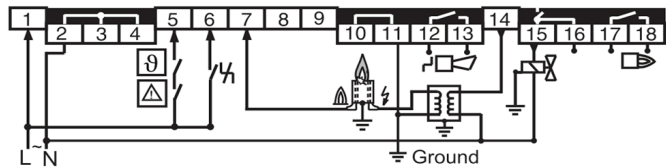
One Rod Flame Detection (special ignition transformer)
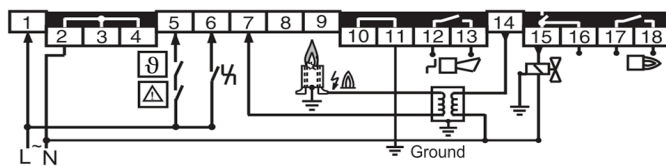
UV Flame Detection
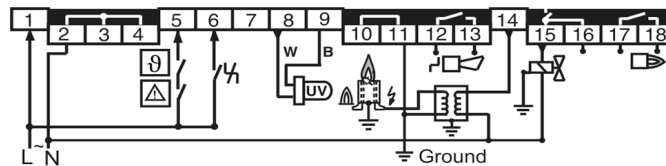
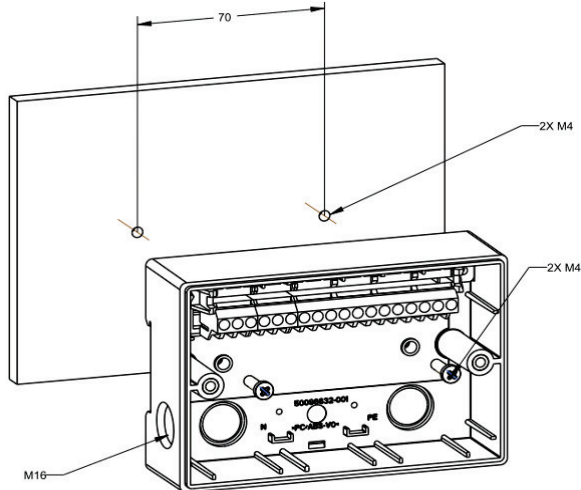### Pilot and Main firing control (Double Rod for example)

- ϑ **Start-up signal**
- **Gas valve**
- **Ignition transformer**
- **High voltage**
- **Flame signal**
- **Operation signal**
- **Fault signal**
- **Reset signal**
- **Safety interlocks**
- **UV sensor**（W：white cable；B：blue cable）