Intelligent Hybrid Geyser

NORIS Intelligent Geyser is a sophisticated microprocessor-based system. Noris Intelligent geyser is a dual fuel (natural gas and electricity) water heater differing from traditional geyser in that it has electronic thermostat and ignition system instead of mechanical thermostat and pilot based ignition system. It operates on gas supply if it is present with sufficient pressure. It automatically switches to electric heater mode in the absence of gas for five minutes.

Features:

- **Intelligent operation:**
  Pilot less, Hassle free operation. User defines 'Start' and 'End' of Heating Times. The customers define priority of GAS and ELECTRICITY. Its Intelligent System decides GAS or ELECTRICITY depending on priority and Availability, Intelligently and Automatically.

- **Two Programmable Heating t Time-Settings:**
  NORIS has two-time settings (zones) for convenience. At programmed time, the intelligent geyser automatically turns itself 'ON' and then it will turn 'OFF' at the programmed time. There are two such ON-OFF time settings called time zones. Its intelligent heating control, superior insulation, and automatic scheduling helps **SAVE** electricity/gas while ensuring hot water**.**

- **Bluetooth controlled:**
  Program 'ON/OFF' Times and Priority of GAS or ELECTRICITY via mobile phone.

- **Gas detection and ignition:**
  It detects GAS automatically and ignites burner at Preset Time when GAS priority is set.

- **Saves Gas/Electricity:**
  It employs most efficient use of energy by unique, use of sophisticated technology couple with superior Insulation. It pays its own cost by saving of energy.

- **Dual Option**
  Gas & Electric intelligent auto switching

The Intelligent geyser lights automatically at pre-programmed time and accurately maintains the water temperature.
The efficiency is improved by replacing the pilot with electronic igniter circuit.

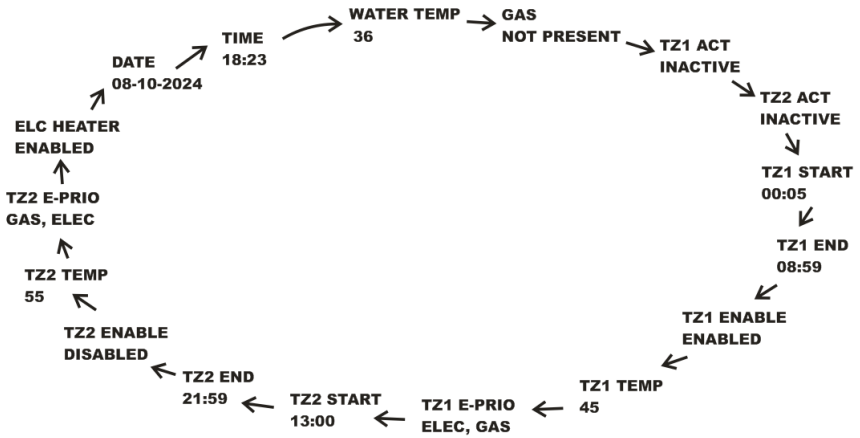
Operation:

The user has option of setting two independent time zones of time according to his need of hot water. Both time zones have independent temperature set points. The duration of time zones can also be set independently. Overlapping of zone 2 over zone 1 is not allowed. Both time zones can be enabled or disabled independently. The geyser has a built-in RTC which maintains the local time.
When time zones are programmed, the burner is immediately lit if current time lies into the zone or RTC alarm is set to the nearest zone start time. When the alarm is up and the water is colder 5 ^{0}C from the set temperature, the burner is lit. When the water temperature reaches the set OFF point, the burner/electric element is turned off. The burner/electric element is turned ON again only if the water gets 5 ^{o}C colder and time zone is activated.
When the time zone is De-activated, temperature is measured but the burner/electric element is not turned ON.
If there is no gas supply at the start of time zone, the geyser waits for five minutes. It turns on the electric heater automatically if enabled. During gas operation, the flame is continuously detected as a safety measure.
Note: The time format is 24 Hours.

Graphic User Interface:

Normally displays the status of geyser. The display remains ON for one minute after power on. Then it turns off to save energy. User can activate display again by short press of PROG button. It again remains active for one minute. Each short press of PROG button extends display activation for one minute. The first line reads ‘STAT’ and a battery or power plug icon. Remaining battery is displayed by this if the AC adapter is not plugged in.

The status information is displayed only one item for three seconds only. All items cycle one-by-one. The second line displays the name of status item. The third line displays its status/value.

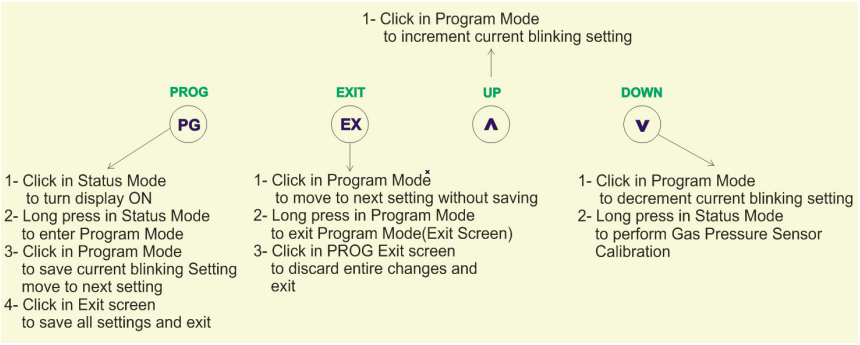


The information displayed includes:

1- Current water temperature in degrees centigrade.
2- Gas Supply Status, (Present/Not present)
3- Time zone 1 Activation Status (Active/Inactive)
4- Time zone 2 Activation Status (Active/Inactive)
5- Time zone 1 Start time (HH:MM in 24 Hour format)
6- Time zone 1 End time (HH:MM in 24 Hour format)
7- Time zone 1 Enable Status (Enabled/Disabled)
8- Temperature Set Point for Time Zone 1 in degrees centigrade
9- Time zone 2 Start time (HH:MM in 24 Hour format)

10- Time zone 2 End time (HH:MM in 24 Hour format)
11- Time zone 2 Enable Status (Enabled/Disabled)
12- Temperature Set Point for Time Zone 2 in degrees centigrade
13- Electric Heater Status (Enabled/Disabled)
14- Current Date (DD-MM-YYYY)
15- Current Time (HH:MM)

The four buttons are labeled as PROGRAM, EXIT, UP and DOWN. These buttons have different actions on long press and short click.



1- **PROGRAM:** Long press starts the programming mode. Hours of time zone 1 start time start blinking. The user can change this value by pressing UP or DOWN buttons. The value cycles among the valid values. The user clicks PROGRAM to set this value and go to minutes or clicks EXIT to leave the value and go to minutes.

   All settings are changed in the similar fashion. When the display is OFF, short press activates display.
2- **EXIT:** This button skips a setting by short click in program mode. The long press quits program mode and resumes normal operation.
3- **UP:** It increases the blinking value in program mode.
4- **DOWN:** It decreases the blinking value in program mode. The long press in status mode activates the Tare (calibration)

function. It calibrates the Natural Gas pressure sensor for zero pressure.

Settings/Programming:

The Intelligent geyser is programmed through front panel display and four push-buttons. A long press (3 seconds) of PROG button changes the mode from ‘STAT’ to ‘PROG’ in first line. All settable items display one at a time. The value to be set blinks rapidly. The user can change its value by pressing UP or DOWN buttons. Once the value displays according to desire, the user can save it by short press of PROG button or discard it by pressing EXIT button. The date and time are only set after pressing PROG after setting minutes. All parameters saved in the memory are saved while exiting the programming mode. Press EXIT button for 3 seconds. A message is displayed,

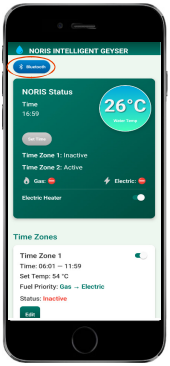
Now, press PROG to save all parameters or discard all parameters which were skipped by short press of EXIT.

The following items are programmable through buttons.

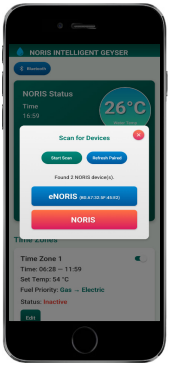
1- Time zone 1 Start time (HH:MM in 24 Hour format)
2- Time zone 1 End time (HH:MM in 24 Hour format)
3- Time zone 1 Enable Status (Enabled/Disabled)
4- Temperature Set Point for Zone 1 in degrees centigrade
5- Time zone 2 Start time (HH:MM in 24 Hour format)
6- Time zone 2 End time (HH:MM in 24 Hour format)
7- Time zone 2 Enable Status (Enabled/Disabled)
8- Temperature Set Point for Zone 2 in degrees centigrade
9- Electric Heater Status (Enabled/Disabled)
10- Current Date (DD-MM-YYYY)
11- Current Time (HH:MM)

NOTE: During date setting, year is set first to estimate leap year.

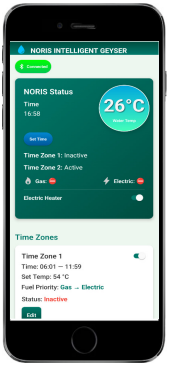
Settings/Programming via mobile app:



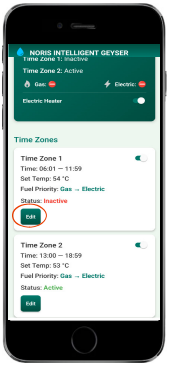
Open Noris app and click on Bluetooth icon



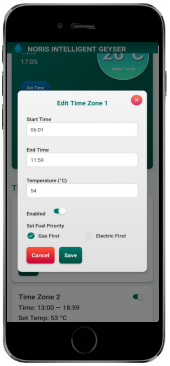
Connect to Noris and pair



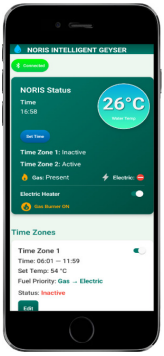
After connection Bluetooth icon shows connected.



Time zone setting change click on edit



Change time, priority and electric heater enable/disable



When the programmed time zone become active, the indicators “Gas Present” and “Burner on” appear.

Natural Gas Pressure Calibration:

This function has been performed in factory. Due to aging or some other catastrophic event the air pressure offset value stored may lost. In this case the geyser may not detect correct gas pressure and malfunction. Perform calibration in this case.

Follow the steps given below to perform calibration once before installation.

1- Turn off the gas supply valve or remove the gas supply hose.
2- Long press DOWN button.
3- The NORIS starts ignition try for almost 13 seconds.
4- It displays gas pressure (near zero) briefly and exits.

TEST PROCEDURES:

Safety Tests:

i- Check if the geyser lit the burner when no time zone is active.
ii- Check the gas leakage while the burner is off.
iii- Check if the geyser opens gas solenoid valve and not turn on the igniter?
iv- Check if there is any notable delay in solenoid valve opening and igniter sparking.
v- Check if the geyser turns on despite the water is already hot (within OFF set point – 5 ^{o}C range).