



Boiler Ignition Sequences

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Excell 80SP

Sequence of Operation

Start (heating mode)

Selector switch on (c/h mode) Fan runs at low speed.

Live 240v at No1 of terminal link (if link removed) feed to programmer.

If room thermostat fitted live at No2 via programmer.

Feed from No2 to the room thermostat.

Live 240v at No3 via room thermostat energises the PCB and pump.

* Operation of the pump. (L & N from terminal M2 6 and 7 of P.C.B) Flow switch operates due to pumped water pressure.

240v from boiler flow switch to terminal M4 No16.

Fan runs at full speed, feed from white and blue wires M3 Nos 8 &14

Air pressure switch operates due to fan pressure through the fan venturi.

240v from P.D. switch to P.C.B. terminal M3 No11.

Live 240v to gas valve solenoid.

Start (domestic hot water mode)

Selector switch on (any position)

Opening a draw off tap operates the manifold diaphragm.

Movement of the diaphragm in turn pushes the fulcrum arm.

240v from the dhw flow switch to terminal M5 No26 energises the P.C.B.

* Continues as heating mode above, from operation of pump onwards.

Excell 80E & 96E

Sequence of Operation

Start (heating mode)

Selector switch on (c/h mode)

24v dc at No1 of terminal link (if link removed) feed to programmer.

Returned live at N2 via programmer if room thermostat is fitted.

Feed from No2 to the room thermostat.

24v returned to No3 via room thermostat energises the PCB and pump.

* Operation of pump. (L & N from terminal M27 and 8 of P.C.B)

Flow switch operates due to pumped water pressure. 24v from boiler flow switch to terminal M5 No20.

Fan runs at full speed, feed from white and blue wires M1 No3 & 4.

Air pressure switch operates due to fan pressure through the fan venturi.

24v from P.D. switch to P.C.B. terminal M5 No23.

Live 240v to gas valve solenoid from terminal M1 No2

Electronic ignition goes through ignition attempt.

Burner ignites and is checked by the electronic circuitry.

Burner fires at low rate for approx. 2 minutes, then full gas.

Start (domestic hot water mode)

Selector switch on (any position)

Opening a draw off tap operates the manifold diaphragm.

Movement of the diaphragm in turn pushes the fulcrum arm.

D/H/W flow switch sends 24v to terminal M5 No19 energising the P.C.B.

* Continues as heating mode above, from operation of pump onwards.

Maxin 24e & 28e

Sequence of Operation

Start (heating mode)

Selector switch on (c/h mode).

Live 240v at No5 of terminal link (if link removed) feed to programmer.

Live 240v at No4 via link or programmer.

Red/ Black wire feeds No1 on 2nd terminal, feed to room thermostat.

Live 240v at No2 via room thermostat energises PCB and pump.

* Pump Operates. (L & N from terminal M1 Nos 22 & 23.

Flow switch operates owing to pumped water pressure.

240v from boiler flow switch white wire to terminal M3 No10.

Fan runs at full speed, feed from white and blue wires M4 Nos 28 & 24.

Air pressure switch operates due to fan pressure through the fan venturi.

240v from P.D. switch brown wire to P.C.B. terminal M4 No25.

Live 240v to gas valve solenoid, via high limit stat.

Start (domestic hot water mode)

Selector switch on (any position)

Opening a draw off tap operates the manifold diaphragm.

Movement of the diaphragm in turn operates the diverter valve.

240v from the d/h/w flow switch to terminal M3 No7 energises the P.C.B.

* Continues as heating mode above, from operation of pump onwards.

Linea 24/28 & Plus AG

Sequence of Operation

Start (heating mode)

Selector switch on (c/h mode)

Live 240v at terminal TA (2nd TA down on terminal block) if link removed then feed to programmer.

Returned live at = via programmer.

Feed from = to the room thermostat if fitted.

Live 240v at TA via link or room thermostat energises the PCB and pump.

* Operation of pump. (L & N from terminal M15 of P.C.B.)

Flow switch operates owing to pumped water pressure.

24v d.c. from boiler flow switch white wire to terminal M5

Fan runs at full speed, feed from Brown and blue wires M12.

Air pressure switch operates due to fan pressure through the fan venturi.

24v dc from the P.D.switch black wire to P.C.B. terminal M3

Live 240v to gas valve solenoid and ignition.

Start (domestic hot water mode)

Selector switch on any position.

Opening a draw of tap activates the d/h/w flow sensor.

12 v d.c. from the d/h/w flow sensor to terminal M5 energises the P.C.B. and pump.

* Continues as heating mode above, from operation of pump onwards.

Mynute 10e, 14e, 20e

Sequence of Operation

Start

Selector switch on and external controls calling for heat/hot water.

Providing system has sufficient water pressure (purple wires J3 240V). Pump J4 and fan J6 blue and brown wires will run (240V).

Fan running proves the air pressure switch (red, grey and white wires J6 240V). This allows ignition sequence to begin via I.C.B.

Live 240V to gas valve from J3 blue and brown wires (240V).

Ignition spark lasts for five seconds establishing ignition. If ignition is not sensed then the appliance will go to lockout.

Once ignition is sensed then the electronic circuitry allows full gas rate to pass through to the burner.

When the appliance reaches the desired temperature the burner will shut down and the boiler will perform a three-minute anti-cycle delay. This can be overridden by placing a jumper on JP1.

Depending on the temperature of the appliance when it shuts down a 30 second pump over-run is operated to dissipate any residual heat within the appliance.

Option

Sequence of Operation

Start (heating mode)

Selector switch on heating/hot water mode.

Providing system has sufficient water pressure. Pump M5 and fan M6 blue and brown wires will run (240V).

Fan running proves (switches) the air pressure switch.

24vdc from the air pressure switch red wire to terminal M6 energises PCB.

Live 240V to gas valve solenoid terminal M1 blue and brown wires and ignition.

Ignition spark lasts for 10 seconds establishing ignition.

Once successful ignition has been achieved (from cold) the appliance will operate at 75% of maximum for fifteen-minute period, there after the appliance operates on maximum output until the desired temperature setting is reached. Once the desired temperature is reached, the burner will modulate.

The appliance will now monitor the setting of the heating potentiometer against the temperature of the primary thermistor, and increases or decreases current to the modulating coil (green & yellow wires M4), this in turn adjusts the burner pressure.

When the temperature of the primary thermistor exceeds the setting of the heating potentiometer, ignition will be terminated and the appliance will anti-cycle for three minutes. (Timer delay).

After the three minute timer delay when the appliance ignites (as above). It will then operate at minimum output for two minutes, output is then increased to 75% of maximum for fifteen-minute period, there after the appliance operates on maximum output or begins to modulate until the desired temperature setting is reached.

Note: If a jumper tag has been inserted at CM1 on the PCB, the operation at minimum is reduced from two minutes to 30 seconds, the 15-minute operation at 75% output is cancelled and the three-minute anti-cycle is also cancelled.

Start (domestic hot water mode)

Selector switch on hot water or hot water/heating.

Opening domestic hot water tap that will activate the domestic hot water flow switch.

24vdc from the domestic hot water flow switch terminal M4 energises the PCB, which allows the fan to run. Feed from M6 brown and blue wires.

Fan running proves (switches) the air pressure switch.

24vdc from the air pressure switch red wire to terminal M6 energises PCB.

Live 240V to gas valve solenoid terminal M1 blue and brown wires and ignition.

Ignition spark lasts for 10 seconds establishing ignition.

The appliance will now monitor the setting of the hot water potentiometer against the temperature of the secondary thermistor, and increases or decreases current to the modulating coil (green & yellow wires M4), this in turn adjusts the burner pressure.

When the temperature of the secondary thermistor exceeds the setting of the hot water potentiometer, ignition will be terminated until the temperature drops.

Flowmatic RS 20/80

Sequence of Operation

Start (heating mode)

Switch on constant position (c/h mode) Pump runs at low speed

Live 240v at No 1 of terminal, if link removed feed to programmer or thermostat.

Returned live at No 3 via programmer or room thermostat.

Live 240v at No 3 via room thermostat energises the PCB and pump.

* Operation of pump. (L & N from terminal M1 Nos 4 and 5 of P.C.B.)

Flow switch operates owing to pumped water pressure.

240v from boiler flow switch white wire to terminal M6 No 43.

Fan runs at full speed, feed from white and blue wires M7 Nos 44 & 45.

Air pressure switch operates due to fan pressure through the fan venturi.

240v from the P.D.switch to P.C.B. brown wire on terminal M7 No 49.

Live 240v to gas valve solenoid from M2 No7 via safety stat.

Start (domestic hot water mode)

Switched on any position (summer / timed / constant).

Opening a draw of tap operates the manifold diaphragm.

Movement of the diaphragm in turn pushes the diverter valve onto the 3 micro switches.

240v from two d/h/w micro switches to terminal M5 Nos 33,35 & 12.5vdc to No39.

* Continues as heating mode above, from operation of pump onwards.

Note: Each d/h/w micro switch has a different part in overriding the c/h mode.

One switch supplies live to bring on the pump.

One switch allows voltage to by-pass the timer, room stat and c/h thermostat.

And the third one diverts the feed to the mod coil from the heating stat to the d/h/w stat.

Flowmatic RSE 24/96

Sequence of Operation

Start (heating mode)

Switch on constant position (c/h mode)

Live 240v at No 1 of terminal, if link removed feed to programmer or thermostat.

Returned live at No 3 via programmer or room thermostat.

Live 240v at No 3 via room thermostat energises the PCB and pump.

* Operation of pump. (L & N from terminal M1 Nos 4 and 5 of P.C.B.)

Flow switch operates owing to pumped water pressure.

240v from boiler flow switch white wire to terminal M6 No 43.

Fan runs at full speed, feed from white and blue wires M7 Nos 44 & 45.

Air pressure switch operates due to fan pressure through the fan venturi.

240v from the P.D.switch to P.C.B. brown wire on terminal M7 No 49.

Live 240v to gas valve solenoid from M2 No7.

Start (domestic hot water mode)

Switched on any position (summer / timed / constant).

Opening a draw of tap operates the manifold diaphragm.

Movement of the diaphragm in turn pushes the diverter valve onto the 3 micro switches.

240v from two d/h/w micro switches to terminal M5 Nos 33,35 & 12.5vdc to No39.

* Continues as heating mode above, from operation of pump onwards.

Note: Each d/h/w micro switch has a different part in overriding the c/h mode.

One switch supplies live to bring on the pump.

One switch allows voltage to by-pass the timer, room stat and c/h thermostat.

And the third one diverts the feed to the ignition from the heating stat to the d/h/w stat.

Mynute RSE 12/48 without Ineco

Sequence of Operation

Start

Link out terminals 2-3 to by-pass any external controls.

Power out on 2 and back on 3.

Pump runs

240v through main stat p1-1 (white wire)

240v through safety stat (yellow dot) and high limit stat

240v in on white wire to terminal 8.

240v out on blue/black, terminal 9.

240v through PD switch n/closed and common to red/black

Pump has operated flow switch and now power to fan on white wire.

Fan makes PD switch via flue venturi, brown terminal 6.

Boiler sparks and lights.

Fan overruns when boiler is over 80c via fan overrun stat and

N/closed and common of flow switch. Two black wires.

Mynute RSE 12/48 with Ineco/Huba

Sequence of Operation

Start

Link out terminals 2-3 to by-pass any external controls.

Power out on 2 and back on 3.

Pump runs.

240v through main stat p1-1 (white wire)

240v through safety stat (yellow dot) and hi-limit stat.

240v into terminal 1 (white wire)

118v on C (blue/black) to common (red/black)

Through operation of flow switch 240v out on E to fan.

Fan runs.

PD switch makes power 118v on brown A to ignition box.

Boiler sparks and lights.

Boiler will fan overrun via fan overrun stat (black wires) through

N/closed and common of flow switch to fan if boiler is over 80c.

Mynute RS 12/48

Sequence of Operation

Start

Link out terminals 2-3 on pcb to by pass any external controls.

Power out on 2 and back on 3.

Pump runs.

240v on terminal 12 (white/red)

240v through safety stat (yellow dot)

240v on terminal 9 (white/black) and (blue/black) to PD

240v on terminal 7 (red/black)

Flow switch makes through operation of pump.

Fan runs.

PD switch makes.

Boiler fires.

Fan runs at slow speed via terminal 11 through resistor to n/closed

To common on flow switch to fan.

Mynute SE 14/48, 20/70, 28/96 with Ineco/Huba

Sequence of Operation

Start

Link out 1 and 3 on terminal strip to by-pass any external controls.

Power out on 1 and back on 3.

Pump runs.

240v through P1-1 on main stat.(white wire)

240v through safety stat. (yellow dot. White wire.)

240v through hi-limit stat to 1 on ignition box.

118v out on C (blue/black)

118v back on B (red/black)

240v out on E (red/white)

Flow switch makes and 240v to fan.

Fan runs.

PD switch makes, 118v in on A (brown)

Boiler sparks and lights.

Fan overruns at over 80c via fan overrun stat and n/closed and common of flowswitch.

Mynute SE 14/48, 20/70, 28/96 with Brama Box

Sequence of Operation

Start

Link out 1-3 on terminal strip to by-pass any external controls.

Power out on 1 and back on 3.

Pump runs.

240v through P1-1 on main stat.(white/wire)

240v through safety stat.(yellow dot)

240v through hi-limit.(white wire)

118v out on blue/black. J3

118v back on red/black. J3

240v out on white/red. J3

240v through flow switch to fan.

Fan runs.

Pd switch makes 118v on brown J3.

Boiler sparks and lights.

Fan overruns at over 80c via fan overrun stat and n/closed and common of flowswitch.

Mynute SE 10, 14, 20 with pump overrun

Sequence of Operation

Start

Isolate boiler from mains

Disconnect external controls and link 1 & 3

Power out on 1 and back on 3

Pump runs

240v through main thermostat P1 – 1 (white wire)

240v through safety thermostat (with yellow dot) to terminal 10 (white wire) on the ignition control box adjacent to the gas valve

240v out terminal 7 (blue/black wire) to the normally closed on the PD switch, powers the common (red/black) on the PD switch to the normally open on the flow switch

Pump has operated the flow switch and now power is supplied to the fan on the white wire

Fan makes PD switch via the flue venturi, terminal 9 (brown wire) on the Ignition box.

240v out on orange wire terminal 8 to high limit stat and in on terminal 6 orange wire

Boiler sparks and lights

Pump overruns when the boiler is off and the boiler is over 80c via the pump overrun stat (two black wires) and the normally open on the boiler stat.

Mynute SE 10, 14, 20 with fan overrun

Sequence of Operation

Start

Isolate boiler from mains

Disconnect external controls and link 1 & 3

Power out on 1 and back on 3

Pump runs

240v through main thermostat P1 – 1 (white wire)

240v through safety thermostat (with yellow dot) to terminal 10 (white wire) on the ignition control box adjacent to the gas valve

240v out terminal 7 (blue/black wire) to the normally closed on the PD switch, powers the common (red/black) on the PD switch to the normally open on the flow switch

Pump has operated the flow switch and now power is supplied to the fan on the white wire

Fan makes PD switch via the flue venturi, terminal 9 (brown wire) on the Ignition box.

240v out on orange wire terminal 8 to high limit thermostat and in on terminal 6 orange wire.

Boiler sparks and lights

Fan overruns when the boiler is off and the boiler is over 80c via fan overrun thermostat (two black wires) and the normally closed and common of the flowswitch.

Compact

Sequence of Operation

Start (heating mode)

Selector switch on heating/hot water mode.

Providing system has sufficient water pressure. Pump CN2 and fan CN4 blue and brown wires will run (240V).

Fan running proves (switches) the air pressure switch.

24vdc from the air pressure switch red wire to terminal CN8 5 – 6 energises PCB.

Live 240V to gas valve solenoid terminal CN5 blue and brown wires and ignition.

Ignition spark lasts for 10 seconds establishing ignition.

Once successful ignition has been achieved (from cold) the appliance will operate at 75% of maximum for fifteen-minute period, there after the appliance operates on maximum output until the desired temperature setting is reached. Once the desired temperature is reached, the burner will modulate.

The appliance will now monitor the setting of the heating potentiometer against the temperature of the primary thermistor, and increases or decreases current to the modulating coil CN9 3 – 4 this in turn adjusts the burner pressure.

When the temperature of the primary thermistor exceeds the setting of the heating potentiometer, ignition will be terminated and the appliance will anti-cycle for three minutes. (Timer delay).

After the three minute timer delay when the appliance ignites (as above). It will then operate at minimum output for two minutes, output is then increased to 75% of maximum for fifteen-minute period, there after the appliance operates on maximum output or begins to modulate until the desired temperature setting is reached.

Note: If a jumper tag has been inserted at JP2 on the PCB, the operation at minimum is reduced from two minutes to 30 seconds, the 15-minute operation at 75% output is cancelled and the three-minute anti-cycle is also cancelled.

Start (domestic hot water mode)

Selector switch on hot water or hot water/heating.

Opening domestic hot water tap that will activate the domestic hot water flow switch.

24vdc from the domestic hot water flow switch terminal CN9 7 - 8 energises the PCB, which allows the fan to run. Feed from CN2 brown and blue wires 240V.

Fan running proves (switches) the air pressure switch.

24vdc from the air pressure switch red wire to terminal CN8 5 – 6 energises PCB.

Live 240V to gas valve solenoid terminal CN5 blue and brown wires and ignition.

Ignition spark lasts for 10 seconds establishing ignition.

The appliance will now monitor the setting of the hot water potentiometer against the temperature of the secondary thermistor, and increases or decreases current to the modulating coil CN9 3 - 4, this in turn adjusts the burner pressure.

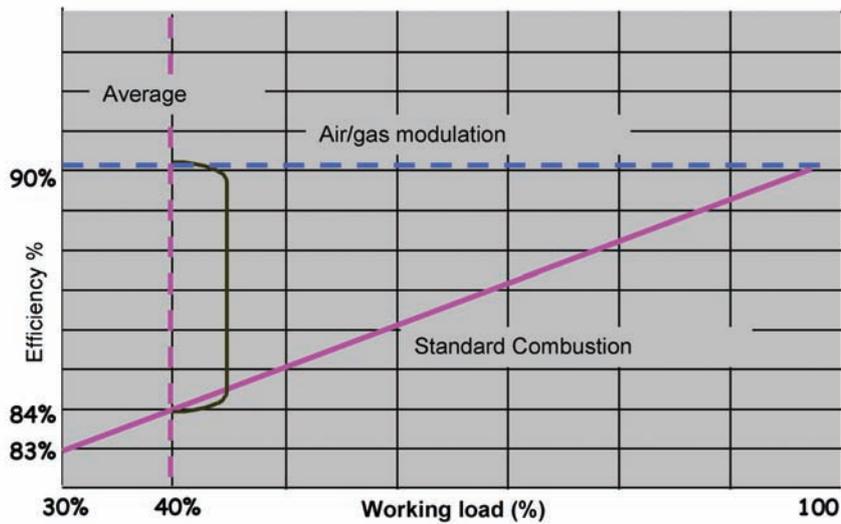
When the temperature of the secondary thermistor exceeds the setting of the hot water potentiometer, ignition will be terminated until the temperature drops.

Linea 7 Series

Sequence of Operation

The Linea 7-Series combination boilers are based on the successful Linea Plus AG. The main advantage of these new products apart from the outputs and flow rates is the air gas modulation. The air gas modulation system enables the appliance to maximise efficiency by maintaining the air/gas ratio irrespective of output.

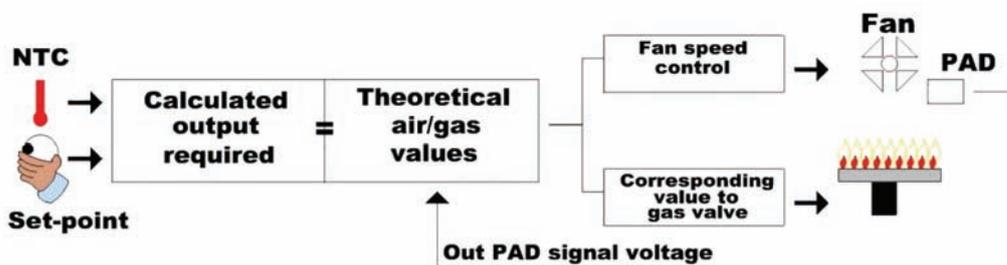
The air/gas modulation system ensures that appliance efficiency is optimised across the output range. With a traditional standard combustion boiler, the efficiency will drop when the boiler is not working at its maximum output (see the efficiency graph below). The average working output of a boiler is normally between 30% and 50% of the maximum output.



Air/Gas Modulation System

The air/gas system is comprised of a, modulating fan, differential analogue pressure switch (PAD) and a modulating gas valve.

The principle of the air/gas system is relatively simple, the fan is controlled electronically in order to achieve the theoretical signal voltage from the PAD, the actual value from the PAD will determine if either an increase or decrease in fan speed is required. Simultaneously, the corresponding current – relative to the signal voltage output from the PAD – is relayed to the gas valve modulating coil.



Start (heating mode)

Selector switch on (c/h mode)

Live 240v at terminal TA (2nd TA down on terminal block) if link removed then feed to programmer.

Returned live at = via programmer.

Feed from = to the room thermostat if fitted.

Live 240v at TA via link or room thermostat energises the PCB and pump.

* Operation of pump. (L & N from terminal M15 of P.C.B.)

Pressure switch operates due to water pressure in system.

24v d.c. from boiler pressure switch white wire to terminal M5

Fan runs at predetermined speed (theoretical) from microprocessor, feed from brown and blue wires M12.

Air pressure switch (PAD) converts the real air pressure into a d.c. voltage (0.7 – 5.0) and feeds it into the microprocessor.

Live 240v feed from brown and blue wires M14 to gas valve and ignition begins with dc voltage to modulator coil.

Start (domestic hot water mode)

Selector switch on any position.

Opening a draw of tap activates the d/h/w flow sensor.

12v d.c. from the d/h/w flow sensor to terminal M5 energises the P.C.B. and pump.

* Continues as heating mode above, from operation of pump onwards.

Once the burner has lighted and the soft light/transition phase has finished, it is the NTC temperature together with the NTC set point that the microprocessor uses to determine the fan speed & the power to the modulator coil. The air pressure switch (PAD) confirms the real air value with the microprocessor, which ensures that the microprocessor is operating the boiler correctly.

Linea HE

Sequence of Operation

For the Linea HE to operate in heating or hot water a request for heat must occur.

Central Heating

The boiler must receive an external request via the room thermostat and time clock to say heat is required.

Hot Water

The boiler must receive a request from the domestic hot water flow switch calling for hot water.

Ignition Attempt

When a request for the boiler to operate is received it activates the pump and sets the diverter valve to the required position.

Before beginning an ignition attempt it checks electronically that the fan is not running.

Providing this check is OK the fan is then activated to run for 2 seconds at a pre-purge speed to clear the combustion chamber and confirm that the airway is clear.

The fan then drops to an ignition speed for approximately 3 seconds.

After 1.2 seconds of the ignition speed, the gas valve and spark electrode are energised for 1.5 seconds.

During this phase a flame must be present for at least 0.25 seconds, if this happens the fan will run for another 2 seconds in a stabilisation phase before modulating to achieve its desired setting.

If no flame is sensed then the fan will continue to operate at the ignition speed for 10 seconds before another ignition attempt is made. The maximum number of ignition attempts is 5 before the boiler locks out on failure to ignite and will show a fault on the display.

When the Linea HE is operating in heating mode the flow and return thermistors constantly feed information back to the software and in hot water mode it is the return and hot water thermistors that feed information back to the software.

During a heating request, the thermistor will shut the burner down when it reaches 5° passed its set-point and relight once the anti cycling has finished and providing the temperature is 5° below its set-point.

During a hot water request, the thermistor will shut the burner down when it reaches 5° passed its set-point and relight once the temperature is 4° above its set-point, providing TSC is not active.

Compact HE

Sequence of Operation

Start (heating mode)

Selector switch on heating/hot water mode.

Circuit made through black/black on CN1.

24vdc through white/black of water pressure switch then black/white of condense pressure switch. Pump CN2 and fan CN4 run and motorised valve moves to heating position, 240vac on CN3 brown/blue. No pressure or condense problem will allow only pump to run.

Providing system has sufficient water pressure. Pump CN2 and fan CN4 blue and brown wires will run (240V).

240vac across brown/blue on CN3 Motorised valve.

Fan running proves (switches) the air pressure switch.

24vdc from the air pressure switch grey wire to terminal CN8 5 – 6 energises PCB.

Live 240v to gas valve solenoid terminal CN5 blue and brown wires and ignition.

Ignition spark lasts for 8 seconds establishing ignition.

Once successful ignition has been achieved (from cold) the appliance will operate at 75% of maximum for fifteen-minute period, there after the appliance operates on maximum output until the desired temperature setting is reached. Once the desired temperature is reached, the burner will modulate.

The appliance will now monitor the setting of the heating potentiometer against the temperature of the primary thermistor, and increases or decreases current to the modulating coil CN9 3 – 4 this in turn adjusts the burner pressure.

When the temperature of the primary thermistor exceeds the setting of the heating potentiometer, ignition will be terminated and the appliance will anti-cycle for three minutes. (Timer delay).

After the three minute timer delay when the appliance ignites (as above). It will then operate at minimum output for two minutes, output is then increased to 75% of maximum for fifteen-minute period, there after the appliance operates on maximum output or begins to modulate until the desired temperature setting is reached.

Note: If a jumper tag has been inserted at JP2 on the PCB, the operation at minimum is reduced from two minutes to 30 seconds, the 15-minute operation at 75% output is cancelled and the three-minute anti-cycle is also cancelled.

Start (domestic hot water mode)

Selector switch on hot water or hot water/heating.

Opening domestic hot water tap that will activate the domestic hot water flow switch.

24vdc through white/black of water pressure switch then black/white of condense pressure switch. Pump CN2 and fan CN4 run and motorised valve moves to hot water position,(if heating demand is on) 240v on CN3 black. No pressure or condense problem will allow only pump to run.

240vac across black/blue on CN3 motorised valve.

Fan running proves (switches) the air pressure switch.

24vdc from the air pressure switch grey wire to terminal CN8 5 – 6 energises PCB.

Live 240V to gas valve solenoid terminal CN5 blue and brown wires and ignition.

Ignition spark lasts for 8 seconds establishing ignition.

The appliance will now monitor the setting of the hot water potentiometer against the temperature of the secondary thermistor, and increases or decreases current to the modulating coil CN9 3 - 4, this in turn adjusts the burner pressure.

When the temperature of the secondary thermistor exceeds the setting of the hot water potentiometer, ignition will be terminated until the temperature drops

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