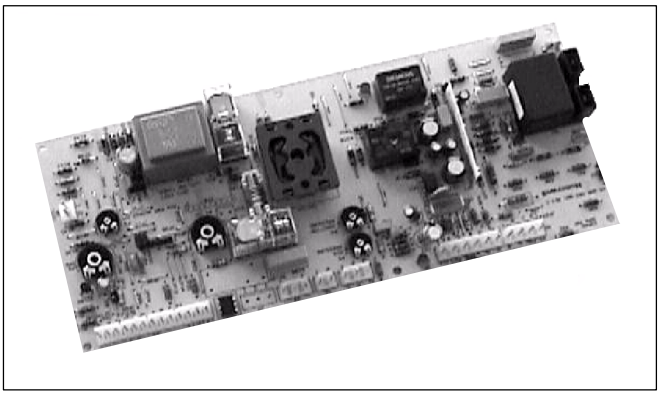
Honeywell

S4562DM 1022

COMBI BOARD

PRODUCT HANDBOOK



APPLICATION

S4562DM 1022 combi board is a combination of an automatic ignition control and a logic control with gas pressure modulation.

S4562DM 1022 combi board must be used with a VK4105G modulating gas control to provide an optimised safety sub-system for programmed safe light up and flame supervision of the main burner of the appliance.

S4562DM 1022 combi board can be used in appliances according European standards for household electrical requirements EN 60335.

For glossary of terms, abbrevations and symbols see document EN2R-9039

Contents

DESCRIPTION

S4562DM 1022 combi board is a combination of a double modulating logic control with electronic ignition, gas pressure modulation, integrated power supply for the direct modulating operator, pump control, transformer, fuses, wiring centre at the PCB and status indicator lamps.

The S4562DM 1022 combi board can be used both in fan assisted appliances and atmospheric appliances.
In case of an atmospheric application the air proving switch input should be shorted with an external wire.
In case of a fan assisted application the air proving switch **and** fan should be connected to the board.

When the S4562DM 1022 combi board is energized by the central heating thermostat, the igniter part is controlled depending on the central heating temperature setting.

If the flow sensor detects a flow rate, the igniter part is controlled depending on the DHW temperature sensor input and flow rate (feed forward) input, independent of the CH temperature setting and CH temperature sensor input.

The logic control will give priority to the DHW mode.

S4562DM 1022 combi board provides automatic ignition for DBI application with non volatile lock out, on board reset and fixed waiting times.

The modulating control gives excellent performance and a high reliability standard.

S4562DM 1022 combi board has an adjustable start up pressure and an adjustable electrical minimum pressure.

The performance of the ignition control part is optimized and dedicated to the VK4105G gas controls.

The mains switch provides full-disconnection and is suitable to provide an OFF position for the appliance. This switch does not provide all-pole disconnection from the supply.

FEATURES

Logic control

- Potmeters for temperature control.
- Off/reset position on the main switch.
- Frost protection.
- Sensor break protection/detection.
- Pump overrun timer.
- Double modulating control.
- Pump control.
- On board transformer, fuses and wiring centre.
- PI control for CH mode
- PID + FF (feed forward) control for DHW mode

Ignition control

- Hybrid technology for high reliability.
- Flame supervision.
- Built in 25 Hz ignition.
- Alarm LED.
- Accurate safety timer.
- Full operating sequence after flame loss.
- Non volatile lock out according to EN 298.
- EMC filter.
- Protective impedance flame rod.
- Under voltage protection.
- Permanent alarm indication
- Adjustable start up pressure at no flame
- Adjustable electrical minimum pressure.
- Built in driver for gas modulation.

DIMENSIONAL DRAWING AND CONNECTION

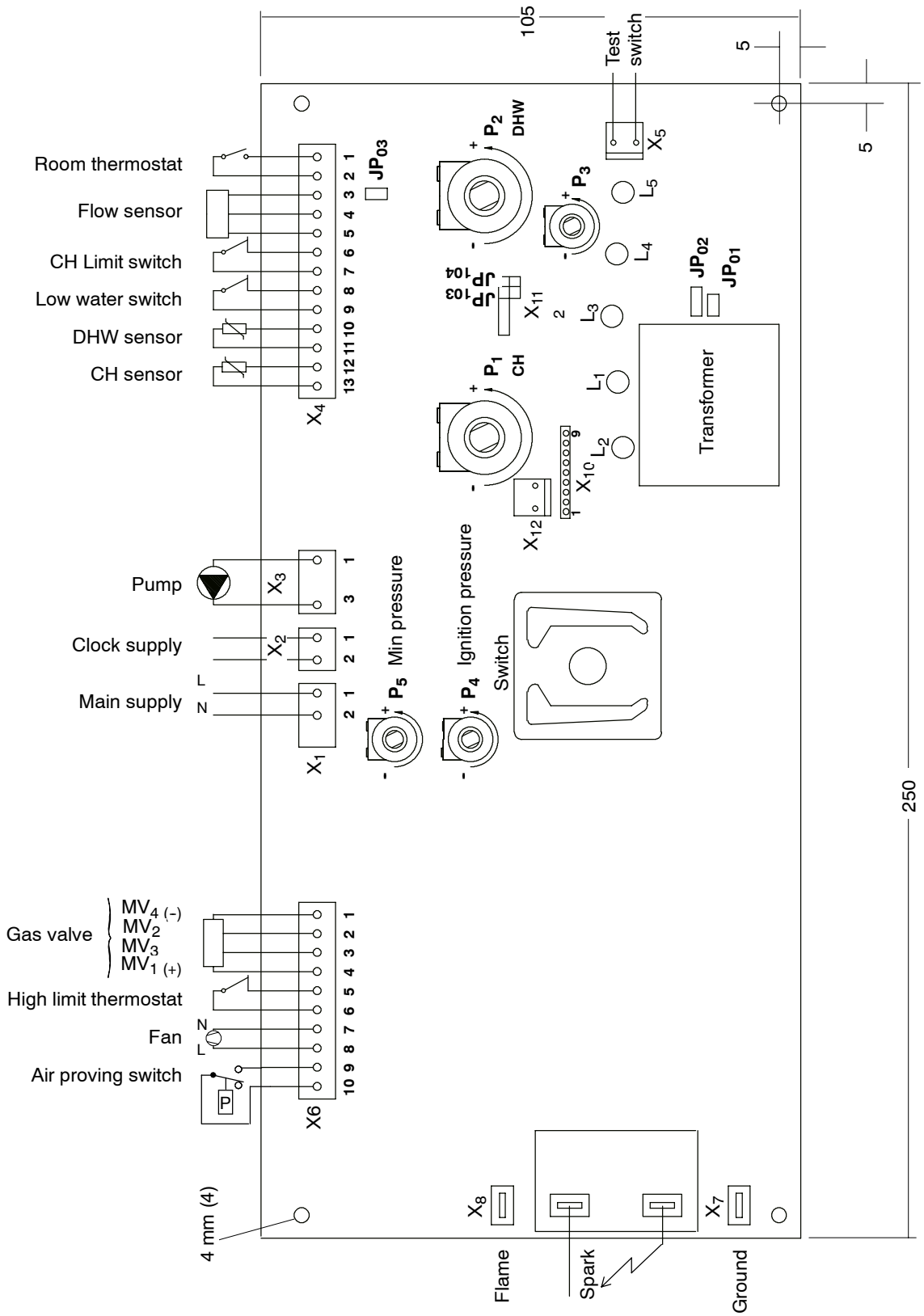


Fig. 1. Dimensional drawing and connections

SPECIFICATIONS

Model
S4562DM 1022
Electronic interface system with direct burner ignition and double modulation control with identification mark of Ferroli on PCB.

Dimensions
See fig 1. page 4, approximately 250x105x35 mm

Supply voltage
230 Vac (+10%,-15%), 50 Hz ± 2 Hz

Power consumption PCB
6 VA

Electrical rating

Mains input
Supply voltage: 230 Vac (+10 %/-15 %), 50 Hz, 2 A max
Fusing: 2 A slow (switch off capacity is 1500 A)

Pump output
Output voltage: 230 Vac (+10 %/-15 %), 50 Hz, 1 A max, cos $\varphi > 0.6$

Gas control
Output voltage: 230 V rectified (+10 %/-15 %), 100 Hz with
pulse width modulation suitable for VK4105G gas control.

High limit control
Output voltage: 230 Vac (+10 %/-15 %), 50 Hz, 1 A max, cos $\varphi > 0.6$

Fan output (optional)
Output voltage: 230 Vac (+10 %/-15 %), 50 Hz, 1 A max, cos $\varphi > 0.6$

Air pressure switch (optional)
Output voltage: 230 Vac (+10 %/-15 %) 50 Hz, 1 A max, cos $\varphi > 0.6$

Flow sensor
Output voltage: 12 Vdc ± 4 Vdc
Current rating: 7 mAdc ± 3 mAdc

Room thermostat
Output voltage: 18 Vac ± 3 Vac
Current rating: 5 mA ± 20 %

Clock supply
Output voltage: 230 Vac (+10 %/-15 %), 50 Hz
Power rating: 100 VA

CH limit switch:
Output voltage: 22 Vdc ± 4 Vdc
Current rating: 20 mAdc ± 5 mAdc

Low water switch
Output voltage: 22 Vdc ± 4 Vdc
Current rating: 4 mAdc ± 2 mAdc

OTC (X_{10})
Output voltage: 12 Vdc ± 4 Vdc
Current rating: 3 mAdc - 5 mAdc

Electrical connection (see table 1. page 5 and fig. 1. page 4)
Molex connector 3069 series (Molex order number 09-91-XX00) with crimp terminals out of the 2478 series. Accomodates polarising key type 2560-1

Table 1.

Connection		Status	Range	Type
	Item			
Mains supply	X1.1 X1.2	Input	230 Vac	4 pins Molex
Room thermostat	X4.1 X4.2	Input	18 Vac	4 pins Molex
Pump	X3.1 X3.3	Output	230 Vac	3 pins Elkay connector
CH sensor	X4.12 X4.13	Input	T7335	Molex
Flow sensor	X4.3 X4.4 X4.5	Input	12 Vdc	Molex
DHW sensor	X4.10 X4.11	Input	T7335	Molex
Test switch	X5.1 X5.2	Input	12 Vdc	Molex
Low water switch	X4.8 X4.9	Input	22 Vdc	Molex
CH limit switch	X4.6 X4.7	Input	22 Vdc	Molex
Clock	X2.1 X2.2	Output	230 Vac	Molex
Gas valve	X6.1 .to X6.4	Output	230 V rectified	10 pins Molex
Air pressure switch	X6.9 X6.10	Input	230 Vac	10 pins Molex
Fan	X6.7 X6.8	Output	230 Vac	10 pins Molex
High limit control	X6.5 X6.6	Input	230 Vac	10 pins Molex
Ground connection	X7	Input		6.3 mm spade terminal
Flame sensing	X8	Input	230 Vac with high source impedance	6.3 mm spade terminal
Ignition	On TR1	Output	> 12 kV at 12 pF load	2.8 mm spade terminals

Timing
Self check time (T_c): 2.3 s
Safety time (T_s): 10 s

Flame sensing

Min flame current: 0.9 μA
Response time on: > 0.2 s
Response time off (T_{FR}): ⩽ 1 s at I_{flame} = 2 μA
Maximum length of flame sensing cable: 1 m

Ignition

Spark voltage: > 12 kV at 40 pF load
Spark frequency: 25 Hz
Spark energy: 3 μAs.
Maximum spark gap: 3.5 mm
Maximum length of ignition cable: 0.5 m

Ignition

Under voltage disabling limit: 173 Vac ± 10 Vac
No flame current: < 0.45 μA
Flame present: < 0.9 μA
Sparking frequency at 230 V line voltage:
$0.7f_{spark,spec} \leqslant f_{spark} \leqslant 1.4f_{spark,spec}$
Spark energy: > 0.6 * specified spark energy
Flame response time at flame off $T_{FR,off}$:
⩽ 1 s at I_{flame} = 2 μA
Flame response time at flame present $T_{FR,on}$: < 0.2 s

Pressure adjustment

Ignition pressure adjustment: 2.5 ... 14 mbar
Electrical minimum pressure adjustment: 2.5 ... 10 mbar

Environmental conditions

Free air operating temperature range inside the housing:
0 ... 60 °C
Ambient operating humidity: 90% at 40 °C (non condensing)
Storage temperature: -20 ... + 60 °C

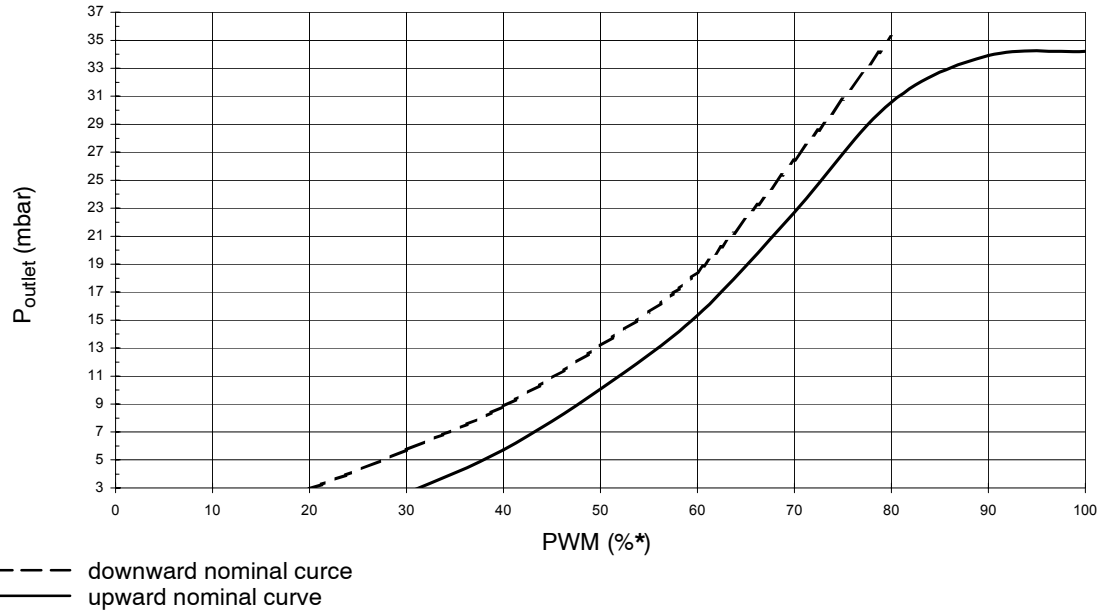


Fig. 2. Nominal graph modulating performance at 37 mbar inlet pressure, 2.8 mm outlet restriction

SYSTEM OPERATION

Logic control

If the line voltage is connected to the control the **"Power on indication"** is on (L_5).
If the flow sensor is activated the **"DHW indication"** is on (L_1).
If the boiler is operating in CH mode the **"RT indication"** is on (L_2).
If the low water switch becomes active (open) LED L_5 is flashing (1 Hz).
If the control is in the anti fast cycling, timer LED L2 is flashing (1 Hz).

DHW mode

When DHW mode is detected as a result of detecting flow rate, the pump is off and the pulse width output is controlled, depending on the DHW temperature sensor input signal and flow rate input signal in the range of 0 ... 100%.
The igniter part is on/off controlled with ac voltage.
The logic control has a P temperature control.
The setpoint temperature is set with potmeter P_2.
After heat demand the logic control goes in the anti cycling timer mode.

CH mode

When the room thermostat is energized (CH position), the operation is identical to DHW mode, but according to CH settings. The pump is on.
For better temperature control the boiler starts with a lower setpoint.
The setpoint will increase during this time to the set point (CH slope).
The setpoint can be adjusted by potmeter P_1
The logic control has a PI temperature control.
If the boiler reaches the switch off temperature the igniter part is de-energized and the logic control goes in the anti cycling timer mode (shunt JP_{01} is not placed).
With potmeter P_3 on the printed circuit board it is possible to adjust the maximum gas burner pressure between the mechanical maximum and minimum of the modulating gas control in CH mode.
After heat demand the pump stays on for a certain time (pump overrun time) and the logic control goes in the anti fast cycling time.

Summer/winter mode

With potmeter P_1 it is possible to select summer or winter mode.
With the potmeter at the minimum temperature setting the logic control is at summer mode.
The logic control starts with the winter mode after a temperature setting of 40 °C.

Outside Temperature Control (OTC) function (optional)

Together with a OTC board it is possible to get an outside temperature compensation at the CH temperature setting. Therefore connector X10 is placed.

Main switch

With the main switch it is possible to disconnect the mains voltage in Line and Neutral. With the same switch it is possible to reset the igniter part during a lock out condition.

Ignition control

General

The combi board provides closed loop sparking
The output pressure of the modulating gas valve is controlled by a PWM signal generated by the logic control.

Program run atmosheric application (see fig. 3.)

When the logic control generates a call for heat, a self check period (T_c) elapses before built in igniter and gas valve are switched on.
The ignition spark ignites the gas and the resulting flame is detected by the flame rod.
Ignition is switched off after a predetermined extended ignition time and flame establishment.
If flame is not established within the safety time (T_s), the S4562DM 1022 locks-out.
If the flame is lost during normal run, the S4562DM 1022 repeats the start sequence.
In the running mode, the gas pressure is controlled by the logic board, from 100% down to a minimum pressure dependent on the setting of the electrical minimum potmeter P_5

Program run fan assisted application (see fig. 4.)

When the logic control generates a call for heat, a self check period (T_c) elapses when the air flow proving switch (APS) is in the no air position.
After the self check period (T_c) the fan starts running.
When sufficient air flow is proven by the APS, the built in igniter and the gas valves are switched on and the "burner on" indication is present.
The gas pressure is controlled at a low value dependent on the setting of the ignition gas pressure adjustment potmeter P_4
The ignition spark ignites the gas and the resulting flame is detected by the flame rod. Sparking then stops after the extended spark time.
If flame is not established within the safety time (T_s), the S4562DM 1022 locks out and the lock-out indication is present.
If the flame is lost during normal run, the S4562DM 1022 repeats the start sequence.
If no air flow is proven by the APS, the ignition control stays in waiting mode.
If the high limit thermostat opens during run, the gas valves close and the start sequence is repeated.
The S4562DM 1022 will lock out since no flame will be detected.
In the running mode, the gas pressure is controlled by the logic board, from 100% down to a minimum pressure dependent on the setting of the electrical minimum potmeter P_5

NOTE: If an automatic return high limit thermostat is used, it should have a return time that is substantially longer than the safety time, otherwise the combi board will not lock out.

Reset from lock-out

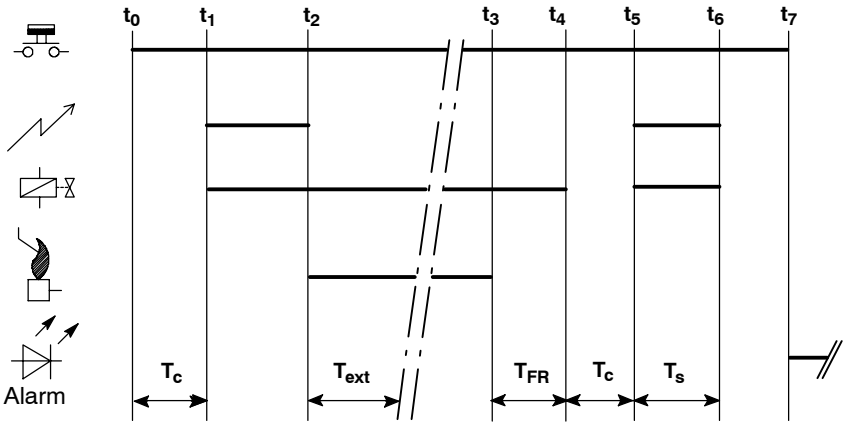
The combi board can be reset from the lock out state by turning the main switch.

NOTE: If during normal run the main switch is activated, the gas valves close and the S4562DM 1022 starts a new sequence after releasing the reset button.

NOTE: When first starting, the combi board can be in the lock out condition; reset the combi board. If a first reset is not successful, wait at least 15 seconds before attempting another try.

NOTE: After a reset an extended waiting time can occur.

TIMING DIAGRAM

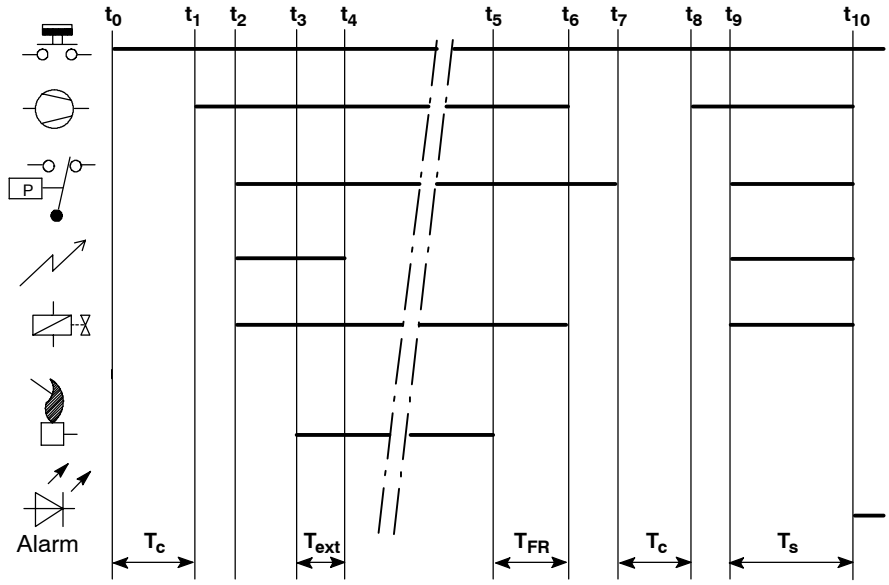


Legend

See EN2R-9039 for clarification of symbols

- t_0 - Heat demand
- t_1 - Ignition trial
- t_2 - Flame establishing
- t_3 - Flame failure
- t_4 - Flame failure response
- t_5 - Ignition trial
- t_6 - Lock-out
- t_7 - End heat demand: still alarm signal

Fig. 3. Timing diagram ignition part atmospheric application



Legend

See EN2R-9039 for clarification of symbols

- t_0 - Heat demand
- t_1 - Fan starts running
- t_2 - Air flow is proven, ignition trial
- t_3 - Flame established
- t_4 - Ignition stops
- t_5 - Flame failure
- t_6 - Flame failure response
- t_7 - Air flow stopped, new start
- t_8 - Fan starts running
- t_9 - Air flow is proven, ignition trial
- t_{10} - End of safety time:lock out

Fig. 4. Timing diagram ignition part fan assisted application

CONTROL SPECIFICATION

NOTE: All temperatures are based on the nominal sensor characteristic.

Sensor temperature ranges

R_{25} = 10000Ω

DHW mode

NOTE: With jumper JP_{03} it is possible to change the temperature setting.

Jumper JP_{03} is placed

DHW setpoint range: 42 ... 62 °C (± 2.5 °C)
Fixed switch off temperature: 87 °C (± 2.5 °C)
Fixed switch on temperature: 75 °C (± 2.5 °C)

DHW setpoint is adjustable by potmeter P_2

Jumper JP_{03} is not placed

DHW setpoint range: 42 ... 54 °C (± 2.5 °C)
Fixed switch off temperature: 87 °C (± 2.5 °C)
Fixed switch on temperature: 75 °C (± 2.5 °C)

DHW setpoint is adjustable by potmeter P_2

Temperature control parameters DHW mode

Algorithme control:

$PWM = P + I + D$
$dT_1 = T_{setpoint} - T_{actual}$
$dT_2 = T_{actual} - T_{previous}$
$I = Sum\ (dT_1)/Ki$
$D = dT_2 * Kd$
$P = dT_1 * Kp$

	Natural gas	LP gas
K_p	5	5
K_i	8	8
K_D	5	8

CH mode

CH setpoint range:

Maximum switch off point: setpoint + 7 °C (± 1 °C)
Maximum switch on point: setpoint − 7 °C (± 1 °C)
Maximum setpoint: 85 °C (± 1 °C)
Minimum switch off point: setpoint + 7 °C (± 1 °C)
Minimum switch on point: setpoint − 7 °C (± 1 °C)
Minimum setpoint: 34 °C (± 2.5 °C)

CH setpoint is adjustable by potmeter P_1

Temperature control parameters CH mode

Algorithme control:

$PWM = P + I + D$
$dT_1 = T_{setpoint} - T_{actual}$
$dT_2 = T_{actual} - T_{previous}$
$I = Sum\ (dT_1)/Ki \rightarrow Ki = 12$
$D = dT_2 * Kd \rightarrow Kd = 0$
$P = dT_1 * Kp \rightarrow Kp = 9$

Burner pressure setting

Maximum PWM setting range: 5 ... 95%
Maximum PWM setting can be done by turning potmeter P_3

Anti cycling timer

The anti cycling timer starts after the boiler reaches the CH switch off temperature **or** after a CH heat demand is finished **or** when a DHW demand is finished.

If the timer is running, it is directly disabled if the test switch is activated or if there is a request for DHW.

With jumper JP_{01} it is possible to disable this function.

Test switch

Function of test switch:
disable DHW mode
start on CH mode
pulse width modulation =100% (no modulation)

Maximum output PWM is adjustable by potmeter P_3

Sensor break protection

The logic control shall de energize the igniter part when the sensor is in high resistance state.
High resistance state is activated at sensor resistance higher than:
DHW mode: > 150 kΩ
CH mode: > 150 kΩ

There is a debounce time of 10 s before the igniter part switches off.

Sensor short protection

The logic control shall de energize the igniter part when the sensor in low resistance state.
Low resistance state is activated at sensor resistance lower than:
DHW mode: < 50 E
CH mode: < 50 E

There is a debounce time of 10 s before the igniter part switches off.

CH slope function (see fig 5.)

In CH mode the logic control has a slope control function. The pulse width output is controlled according a slow increase of the CH setpoint temperature. Due to the fact that the logic control has a PI control, the logic control can start at a burner pressure between the mechanical minimum and maximum setting.

Definition soft start time:
CH slope time = (max temp setting − start temp)/T_{slope}

T_{slope} = 10 °C /minute

Room thermostat

Current: 5 mA (± 25%) at 18 Vac

Flow sensor

On point: 17 Hz (± 1 Hz)
Off point: 14 Hz (± 1 Hz)

CH limit thermostat

When the limit thermostat opens, the igniter is de energized and the pump starts.

Low water switch

When the low water switch opens, the igniter and pump are de energized.
Debounce time: 10 seconds
LED (L_3) is flashing at a frequency of 1 Hz

Pump control

During DHW mode the pump is off and during CH mode the pump is on.
After CH heat demand there is a pump overrun time of 360 seconds (± 25%).
The DHW heat demand will end the pump overrun.
When there is no heat demand during 24 hours, the pump is activated for 10 seconds.

Frost protection

When the control detects a CH sensor temperature below the frost temperature the logic control reacts as if there is a normal CH request.
Frost on: < 6 °C (± 2.5 °C)
Frost off: > 16 °C (± 2.5 °C)

Timing

Anti cycling time: 140 s (± 1 s)
Self check time (T_c): 2.3 s ± 30%
Safety time (T_s): 10 s. (+ 0%, −20%)
Extended spark time (T_{ext}): = 0
Pump overrun time: 360 s (± 1 s)
Flame failure respons time: < 1 s at I_{flame} = 2 μA

Indications

Lock out: LED L_1 (see fig. 4.)
Burner on: green LED L_2

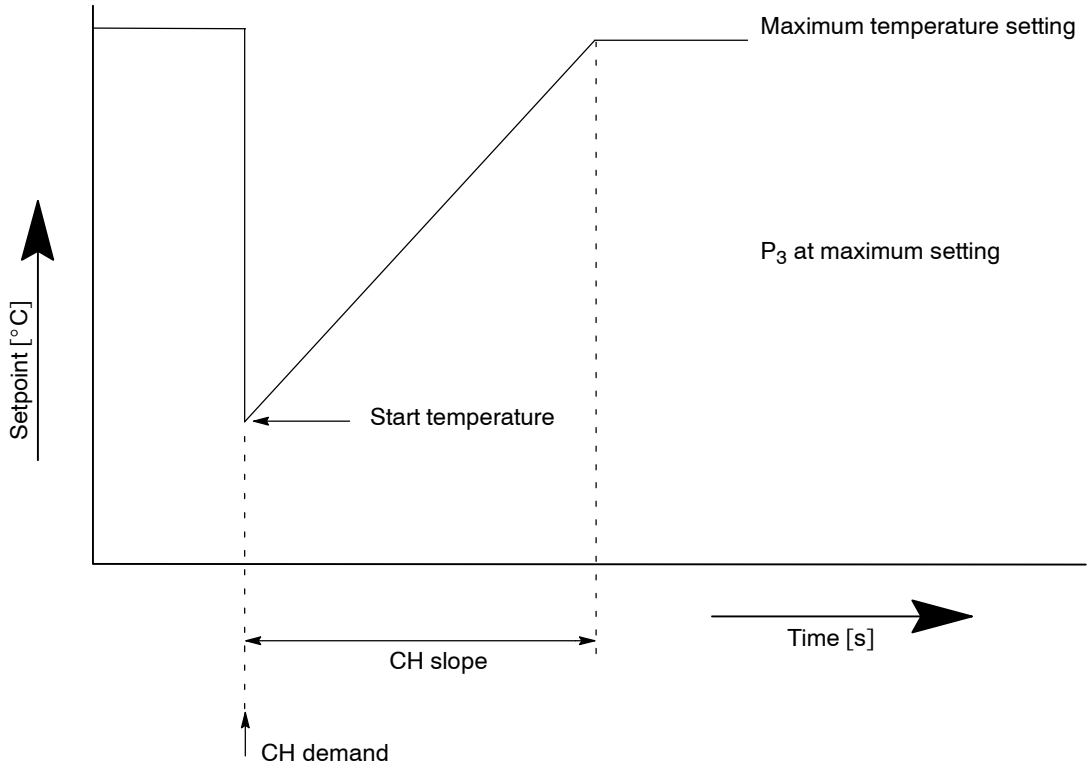


Fig. 5. Graph CH slope.

INSTALLATION, ADJUSTMENT AND CHECKOUT

IMPORTANT

Take care that installer is a trained experienced service person.

Before installing or replacing any control check that type number is correct for the application.

Ensure combustion chamber is free of gas before start up.

Conduct a thorough check out when installation is completed.

At the first start the combi board can be in lock out; reset the ignition control, see system operation on page 7

⚠ WARNING

Disconnect power supply to prevent electrical shock and/or equipment damage.

Turn off gas supply before starting installation.

After installation wait at least one hour before connecting the mains supply, because the device can become wet due to condensation.
Do not connect wet device to mains

Mounting

S4562DM 1022 combi board will be delivered as a bare board, suitable for a clean environment according to EN 60730-1

S4562DM 1022 combi board can be mounted in any direction.

S4562DM 1022 combi board has 6 mounting holes with Ø 4 mm.

S4562DM 1022 combi board is intended for the Ferroli Domina boiler.

The sensor and flame sensing connection are safely accessible.

Protection against electrical shock must be provided by the appliance in which the control is installed.

The printed circuit board should be mounted in an enclosure that provide the correct creepage and clearance distances.

Reset switch, burner on and alarm indicator light must have safe separation to accessible parts.

⚠ CAUTION

Do not connect the combi board to the mains when it is not connected to the gas control.

General

The S4562DM 1022 combi board incorporates an EMC filter. Disconnect the combi board from the mains before performing a dielectric strength test.

The adjustable gas outlet pressure during ignition and during modulation depends on a non fail safe circuit. As a result the gas technical safety of the appliance should not rely on the proper functioning of the adjustable gas outlet pressure.

Wiring

IMPORTANT

Wiring must be in accordance with local regulations.

The appliance manufacturer's instructions should always be followed. If such instructions are not provided see fig.1. page 4

- Use cable which can withstand 105 °C ambient.
- Use cable which is proven against moisture.
- Wiring between combi board and spark probe must be suitable for the temperatures encountered.
- Wiring between combi board and spark probe must have a minimum isolation resistance to earth of 500MΩ under all working conditions.
- Wiring between combi board and flame sensing probe must be one piece without means for interrupting.

⚠ CAUTION

The ignition cable and its connections shall have a protection against electrical shock hazard.

Fuses

The combi board is internally fused with a 2 A slow fuse.

NOTE: The ignition control has integrated fuse tracks that may not be replaced by any means.

Spark gap

Maximum allowable spark gap is 3.5 mm

Adjustments

⚠ WARNING

Adjustments must be made by qualified persons only.

If the appliance manufacturer supplies checkout and/or service and maintenance instructions carefully follow them. If these instructions are not provided then use the procedure outlined below.

IMPORTANT

Both an adjustment of gas outlet pressure during ignition and an electrical minimum gas outlet pressure adjustment is available.

Setting of electrical minimum rate

- Place a short on connector X_5
- Set potmeter P_3 to minimum.
- Make sure appliance is running.
- Check gas input to the appliance using a clocking gas meter or alternatively a pressure gauge connected to the outlet pressure tap.
- Turn mechanical minimum adjustment screw on the gas valve counter-clockwise to increase the minimum gas flow to the desired value. See dimensional drawing in Product Handbook EN2R-9025.
- If minimum gas pressure cannot be reached with mechanical minimum, increase minimum gas pressure with potmeter P_5 to the desired value.
- Set potmeter P_3 at maximum.
- Remove the short on connector X_5

Adjustment of gas outlet pressure during ignition.

- Disconnect flame detection or connect it to earth.
- Start up boiler.
- Set the gas outlet pressure during the safety time with potmeter P_4.
- Reset the appliance if necessary and check/re-adjust until the desired gas outlet pressure is set.
- Allow 15 seconds recovery time between two start attempts.
- Check if gas outlet pressure is correct.
- Connect the flame detection.

NOTE: For the best accuracy keep following sequence:

❶ Make minimum rate setting.
❷ Set the gas outlet pressure during ignition.

Checkout

Checking flame current

- The minimum value should be in accordance with specified value.
- To check the flame current connect a dc micro-Ampèremeter between the flame sensing wire and the flame sensing rod.
- Meter connections polluted with e.g. alkaline substances lying close to earth can cause flame current simulation. Make sure no false flame current can flow from meter connections to earth.
- If flame current is insufficient check that flame sensing rod is fully enveloped by the flame and that the burner and ignition control are reliable grounded.

⚠ CAUTION

In case of an atmospheric application the air proving switch input should be externally shorted.
The S4562DM 1022 acts as an atmospheric version.

In case of an fan assisted application the air proving switch **and** fan should be connected to the board.
The S4562DM 1022 acts as a fan assisted version.

Final checkout of the installation

Set appliance in operation after any adjustment and observe several complete cycles to ensure that all components function correctly.

Serviceability

The unit is field replaceable

⚠ WARNING

Honeywell is not responsible for damage and/or injury due to miswiring.

TOLERANCES AND PRODUCT LIFE

Product life

The combi board will withstand at least 250000 cycles at rated loads.

The combi board will withstand at least 6000 lock out operations with rated loads.

In order to ensure long term operation, mount the combi board at a position in the appliance where ambient temperature and heat radiation is low.

High temperature will affect the product life.

EMC GUIDELINES

The electronic ignition is a source of mains interference and radio frequency interference (RFI).

In order to minimise RFI twist the ignition wires, do not lead them close to mains wires and position them close to earth metal.

QUALITY ASSURANCE STATEMENT

Products are manufactured under an ISO 9001 (1994) based and certified Quality System.

The quality system is described in the Honeywell Combustion Controls Center Quality Assurance Programme and its related operational procedures and instructions.

The quality system is approved by Gastec against certificate number 9.302/2.

The quality organisation is responsible for defining, maintaining, improving and verification of the quality systems in the field of design, production process and field quality service.

Assembly processes are guided by work instructions. Patrol inspections form part of the assembly processes.

Assembly inspection is performed by employees of the quality control department, using their own authorised equipment.

All inspections (incoming and assembly) are performed by trained personel and according inspection procedures.

STANDARDS AND APPROVALS

Standards

The combi board meets the european standards:

- EN 60730-1: Automatic electrical controls for household and simular use.
- EN 55014: Emission requirement for household appliances and portable tools.
- EN 55104: Immunity requirements for household appliances, tools and similar apparatus.

The ignition control meets the european standard:

- EN 298: Automatic gas burner control systems.

Regarding electrical safety, the combi board can be used in appliances according to european standard for household electrical requirements EN 60335 series.

Approvals

The combi board conforms with the following EC - Directives:

- Gas Appliance Directive (90/396/EEC)
- Low Voltage Directive (73/23/EEC)
- Electro Magnetic Compatability Directive (89/336/EEC)

ORDERING INFORMATION

Identification of device

The identification of the device is by Honeywell Ordering Specification (O.S.) number and date code.

Packing

The combi boards shall be packed in a carton box according to the Honeywell standards.

When ordering specify:

- Model number of combi board.
- Order numbers of replacement parts and accessories required.

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