



**SIMPLY BETTER**



# **ProCon Streamline Gas Condensing Boiler.**

## **Installation and Operating Manual.**

The modulating gas condensing boiler can operate on either Natural Gas or LPG, Conversion kit required.

Kit Name	Product Code
Natural Gas	96.38200-7202
LPG	96.38200-7201

### **Installation Regulations and Requirements**

The installation of GK boilers must be in accordance with the relevant requirements of Gas Safety (Installation & Use) Regulations 1994, Health & Safety at Work Act, Building Regulations, IEE Regulations, Construction (Design & Management) Regulations 1994, Local Authority Bye-Laws, National, Fire Regulations and Insurance Company requirements.

The following Codes of Practice are also applicable:-

BS 5440-1: 2000 Installation of flues and ventilation for gas appliances of rated input not exceeding 70 kW net (1st, 2nd and 3rd family gases).

Part 1: Specification for the installation of flues.

BS 5440-2: 2000 Installation of flues and ventilation for gas appliances of rated input not exceeding 70 kW net (1st, 2nd and 3rd family gases).

Part 2: Specification for installation and maintenance of ventilation for gas appliances.

BS 5449: 1990 Specification for forced circulation hot water central heating systems for domestic premises.

BS 6644: 2005 Specification for gas fired hot water boilers of rated inputs between 70kW (net) and 1.8MW(net) (2nd and 3rd family gases).

BS 6798: 1987 Specification for installation of gas fired hot water boilers of rated input not exceeding 60 kW.

BS 6880: 1988 Code of Practice for low temperature hot water heating systems of output greater than 45kW. Parts 1, 2 & 3.

BS 6891: 1988 Specification for installation of low pressure gas pipework of up to 28mm (R1) in domestic premises (2nd family gases)

BS 7593: 1992 Code of Practice for treatment of water in domestic hot water central heating systems.

BS 7671: 1992 Requirements for electrical installations. IEE Wiring Regulations. Sixteenth edition.

CISBE Guide reference sections B7, B11 and B13.

CP342 Part 2: 1974 Code of Practice for centralized hot water supply.

IGE/UP/2 Gas installation pipework, boosters and compressors on industrial and commercial premises.

IGE/UP/4 Commissioning of gas fired plant on industrial and commercial premises

IGE/UP/10 Installation of gas appliances in industrial and commercial premises. Part 1: Flued appliances.

And any addition prevailing regulation and or code of practice not detailed above.

### **Appliance Warranties**

All MHG appliances enjoy a full 24 month warranty as detailed in our terms and conditions.

The guarantee period shall begin on the day of commissioning, or at latest 3 months after delivery has been made.

The customer shall only be able to claim against MHG under guarantee if the commissioning of the object of delivery has been carried out by MHG staff or the authorised supplier, if the customer has followed MHG's instructions relating to the treatment and maintenance of the object of delivery, and if no replacement parts of outside origin have been fitted.

Parts subject to wear such as ignition electrodes, seals etc. are strictly excluded from the guarantee."

In addition to the above warranties, the gas condensing boilers Primary Heat Exchangers carry a 60 month guarantee against manufacturing or material defect.

**Technical Data****Gas Condensing Boiler**

Description	Unit	
Product Number		CE-0063AR3527
Category		II2ELL3P
Weight	Kg	64
Dimensions	mm	1070 x 870 x 450
Primary Water Content	L	1.4
Heating Flow & Return	mm	22
DHW Inlet & Outlet	mm	15
Gas Supply Inlet	mm	15
Flue Gas/Combustion Air	mm	80/125
Nominal Input	kW	7.2 – 27.3
Nominal Output 80/60°C	kW	7.0 – 26.2
Nominal Output 50/30°C	kW	7.7 – 26.8
Nominal Efficiency 80/60°C	%	97.2 – 96.0
Nominal Efficiency 50/30°C	%	98.2 – 106.9
Nominal Efficiency 40/30°C	%	101.0 – 108.5
Maximum Flow Temperature	°C	90
Nominal Mass Flow Rate @20 ΔT	L/h	1160
Maximum Operating Pressure	bar	3
Maximum Inlet Gas pressure	mbar	50
Minimum Inlet Gas Pressure	mbar (N/L)	18/35
Nominal Power Input	V / Htz	230/50
Installation Categories		B23, B33, C13X, C33X, C43X, C53X, C63X, C83X
Residual Flue Gas Pressure	Pa	90
Flue Gas Temperature @ 80/60°C	°C	94

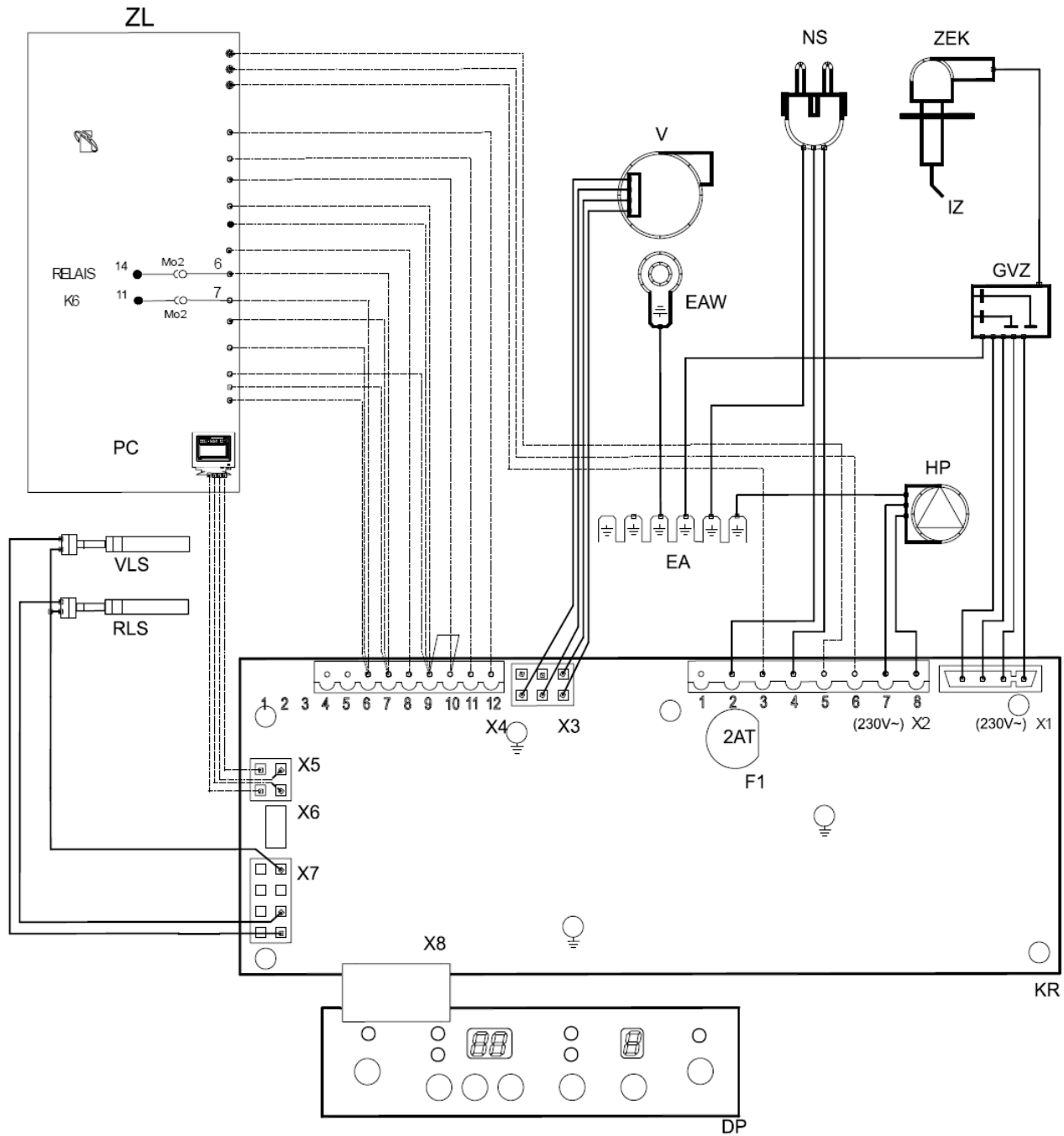
### **Pressure (Safety) Relief Valve**

In accordance with the prevailing British Standard 5440/6644, the installer shall install as suitably sized Pressure (Safety) Relief Valve.

The location of this valve is important with respect to the applied pressure of the units circulation pump, it is therefore recommended to locate the Pressure (Safety) Relief Valve on the return pipe immediately adjacent to the heat generator; furthermore, there must not be any means of isolation between the unit and the Pressure (Safety) Relief Valve.

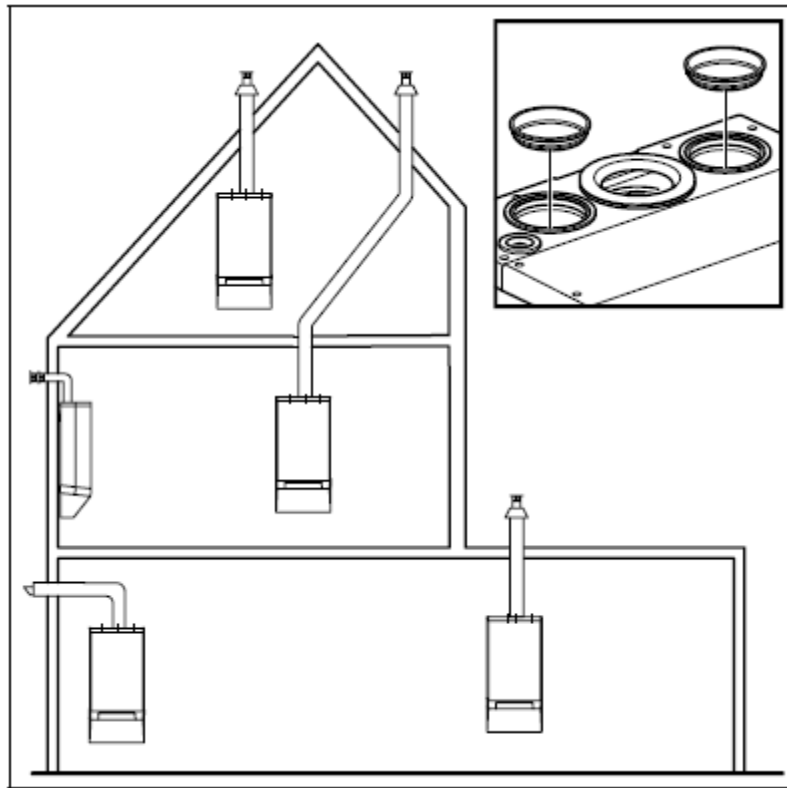
To assist with the correct positioning of the pressure relief valve hydraulic connector kits are available as an optional extra.

# Internal Wiring Diagram Gas Condensing Boiler

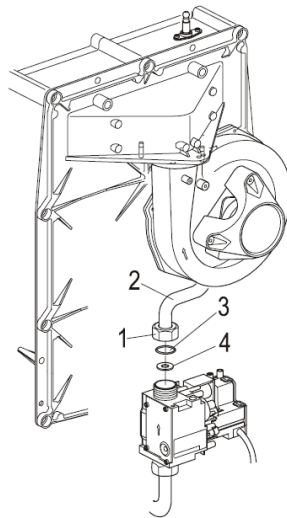


## Fluing Installation Options

To Follow



## Fuel Gas Conversion Procedure



### Conversion of the gas setting ring

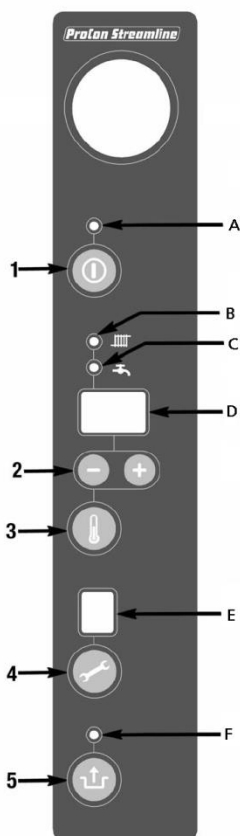
1. Switch off the electrical supply to the appliance.
2. Close the gas tap.
3. Remove the front cover of the appliance.
4. Disconnect the coupling (1) above the gas valve and turn the gas mixing pipe (2) backwards.
5. Replace the O-ring (3) and the gas setting ring (4) by the rings of the conversion set.
6. Reassemble in reverse order.
7. Open the gas tap.
8. Check the gas connections for tightness/ leaks.
9. Switch on the electrical supply to the appliance.
10. Change the parameters d and F to the values given in the table below.
11. Now check the setting of the gas/air ratio. (See below)
12. Attach a sticker of the set gas type over the existing sticker on the gas mixing pipe (2).
13. Apply a sticker of the set gas type at the appliance plate.
14. Re-fix the front cover of the appliance



## **Boiler Controls**

Please note that the orientation of the panel may differ depending upon the version and country of operation.

All settings are made via the boilers control panel.



#	Description / Function
1	Power Mode Selector
2	Parameter Adjustment Selectors
3	Temperature Set Point Selector
4	Commissioning Mode Selector
5	Boiler Reset / Setting Store Selector
A	Power Indicator LED
B	Heating Mode Output Set Point Indicator LED
C	HWS Mode Output Set Point Indicator LED
D	Boiler Flow Set Point Temperature
E	Operating Mode Indication Display
F	Reset Required Indicator

## **Controller Adjustment**

The control panel can be used to set or review the operation parameters of the boilers. A number of the buttons have dual/multiple functions dependant to the sequence of operation or function mode the unit is in.

### **1 / A** Power Mode Selector/Indicator.

Pressing the button once will change to operating mode of the boiler.

If the LED is Red and the display is indicating -- the boiler is OFF and will not respond to an enabling signal.

If the LED is Green and the display is blank the boiler is ON and will respond to an enabling signal.

### **2 / 3 / B / C / D** Boiler Flow Temperature Adjustment for Heating and HWS Operation.

Pressing button 3 will illuminate the heating mode LED B and display the respective target flow temperature on the display D. This can be adjusted via the + & – buttons 2. The setting can be stored by pressing the Reset Button 5.

Pressing button 3 twice will illuminate the HWS mode LED C and display the respective target flow temperature on the display D. This can be adjusted via the + & – buttons 2. The setting can be stored by pressing the Reset Button 5.

### **4 / E / 2** Commissioning Mode Selection

The commissioning mode can be activated by pressing the following buttons in the required sequence.

<b>Required Function</b>	<b>Buttons</b>	<b>Display</b>
Low Fire	Service Button 4 & Minus Temperature Button 2	L
Hire Fire Heating Mode	Service Button 4 & Plus Temperature Button 2	h
Highest Firing Mode	Service Button 4 & Plus Temperature Button 2 Twice	H
Exit Commissioning Mode	Minus Temperature Button 2 & Plus Temperature Button 2	Normal Control

These operating mode must be used when commissioning the appliance and following any service interventions.

### **5 / F Reset / Storage Button**

If the unit fails to operate correctly and the unit Locks-Out the F LED will be illuminated, a fault code will be displayed on E and the Reset button must be pressed for up to 5 Seconds to reset the boiler. Prior to resetting the boiler the fault code displayed on E should be noted.

### **Second Level Access and Alteration**

A second level of operational parameters can be accessed and altered if required to suit the installation.

The second level is accessed as follows.

Switch Off the boiler by pressing button 1 so that the display E indicates –.

Press Service 4 and Reset 5 buttons simultaneously until the display E indicates – and the display D indicates 0.

Press the + button to change the Display D to 15. Press the Service 4 button to accept the password.

Access to the second level is now available.

Pressing the Service 4 buttons provides access to the different functions. The + & – buttons are used to alter the function. The Reset 5 button is used to store the altered functions.

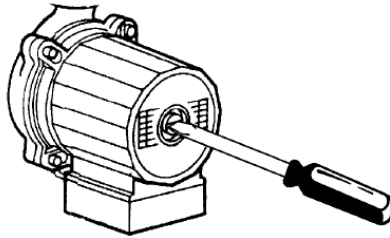
Function	Setting	Required Setting	Description
0	Access Code	15	Second Level Access Code
1	System Type	3	
2	CH Pump Continuous	0	0 = Pump Overrun Only 1 = Pump Continuous 2 = CH Pump Continuously Active with External MIT Switch
3	Set CH Power %	70	CH Output
4	Set Max Power	80	HWS Output
5	Weather Comp Curve Min Flow Temp.	25	Max Outside Air Temp For Min CH Flow Temp
6	Weather Comp Curve Outside Air Max Flow Temp.	-1	Min Outside Air Temp For Max CH Flow Temp
7	Weather Comp Curve Outside Air Max Temp.	25	Max Outside Air Temp for CH Operation
8	CH Pump Over-run Time	1	0 – 15 Minutes
9	CH Pump Over-run Time HWS Mode	1	0 – 15 Minutes
A	Rest Position of 3 way valve or 2 Port Valve Present	0	0 = Confirmed During CH Operation 1 = Confirmed During HWS Operation
C	Step Modulation	0	0 = Step Modulation Off During CH Operation 1 = Step Modulation On During CH Operation
d	Minimum Output	30	25%–40% Nat Gas 40% LPG
E	Min Flow Temp Requested by Open-Therm Controller	40	Requested Flow Temp Below Which the Boiler Will Not Operate
F	Ignition Speed % of Max	70	40 – 99%
H	Max Fan Speed	45	40 = 4000rpm 50 = 5000rpm

## Commissioning The Appliance

### Pre-Commissioning Checks

Prior to undertaking the commissioning of the unit please ensure that the system water has been cleansed and treated with a suitable inhibitor as detailed in Filling the system and system water quality.

Prior to applying power to the appliance its circulation pumps should be bled and checked to ensure free rotation of the armature.



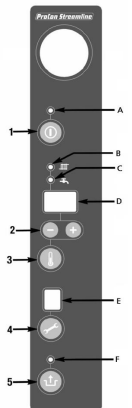
### Combustion System Commissioning.

A flue gas analyser must be used to ensure that the correct combustion settings are achieved.

The appliance must be placed in the commissioning mode to check and set the combustion at Maximum and Minimum outputs.

This achieved as follows.

Locate the flue gas sampling point on the flue adapter mounted directly above the boiler.



The commissioning mode can be activated by pressing the following buttons in the required sequence.

Required Function	Buttons	Display
Low Fire	Service Button 4 & Minus Temperature Button 2	L
Hire Fire Heating Mode	Service Button 4 & Plus Temperature Button 2	h
Highest Firing Mode	Service Button 4 & Plus Temperature Button 2 Twice	H
Exit Commissioning Mode	Minus Temperature Button 2 & Plus Temperature Button 2	Normal Control

Insert your flue gas analyser in the sampling point and note the readings for the low and high outputs.

The High fire setting should always be set prior to adjusting the Low fire.

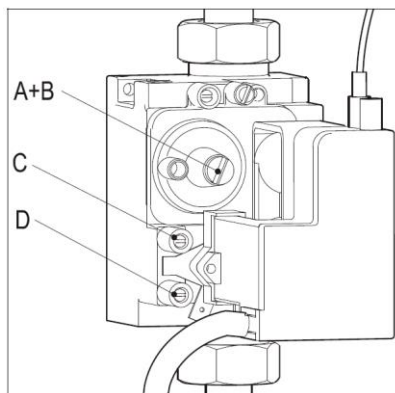
Adjust the unit to operate at High fire and adjust the gas valve B to obtain the correct CO<sub>2</sub>%.

Adjust the unit to operate at Low fire and adjust the gas valve B to obtain the correct CO<sub>2</sub>%.

Following the successful adjustment of both High and Low fire setting the boiler should be allowed to pass through one ignition cycle prior to the settings being rechecked.

Gas Valve Adjustments.

A = Dust Cap, B = High & Low Fire Adjustment, C = Off-Set pressure point, D = Inlet pressure point.



Required combustion settings.

Setting	Natural Gas (H) (G20)	LPG (P) (G31)
Low Fire CO <sub>2</sub> %	8.9	9.9
High Fire CO <sub>2</sub> %	9.1	10.3
Minimum Inlet Dynamic Gas Pressure Mbar	18	29
Outlet Restrictor Diameter mm	7.05	5.35
Minimum Fan Speed (Parameter d)	25	40
Minimum Ignition Speed (Parameter F)	70	50

### **Routine Inspection and Servicing.**

As with all appliances, we would highly recommended that a competent heating engineer services the ThermiPro unit, at least every 12 months. This is assuming a normal daily usage of 8 – 10 hours.

If however the unit is to be operated 24 hours a day, 7 days, we would recommend services every 6 months.

If the Installer/Commissioning Engineer is unable to undertake the Routine Service Inspection, as detailed in the following section for the boiler and the respective section of the installed burner manual, please contact the MHG Technical Department, who will be able to arrange the Routine Service Inspection to be undertaken.

### **Routine Service Inspection**

Before commencing any service/maintenance work, the following tasks must be undertaken.

- a) Ask the end user about any problems with the operation of the boiler unit and note their comments.
- b) Check the water pressure of the installation.
- c) Remove the boiler casing and visually inspect all pipe and water joints for signs of leakage.
- d) Inspect the appliance for signs of water leakage or ingress.
- e) Run the unit in Commissioning Mode HIGH FIRE; with the use of a flue gas analyzer record the CO<sub>2</sub> level.
- f) Run the unit in Commissioning Mode LOW FIRE; with the use of a flue gas analyzer record the CO<sub>2</sub> level.
- g) Listen to the sound of the combustion fan.
- h) Undertake a System Water Analysis to check the concentration level of the Water Treatment, and note the level onto the Service Report.
- i) Check the flue route including the terminal position for conformity with prevailing regulations, and trim back any foliage that may be around the terminal.
- j) Check the plant room/compartment ventilation system for conformity with prevailing regulations.
- k) Check the Pressure (Safety) Relief Valve size, rating and orientation, for conformity with prevailing regulations.

The results of the Inspections undertaken above must be acted upon, and all discrepancies should be recorded on the Service Report and brought to the Client / End User's attention.

Undertake any maintenance, and if necessary any preventative maintenance, that's required.

## **Routine Cleaning & Maintenance**

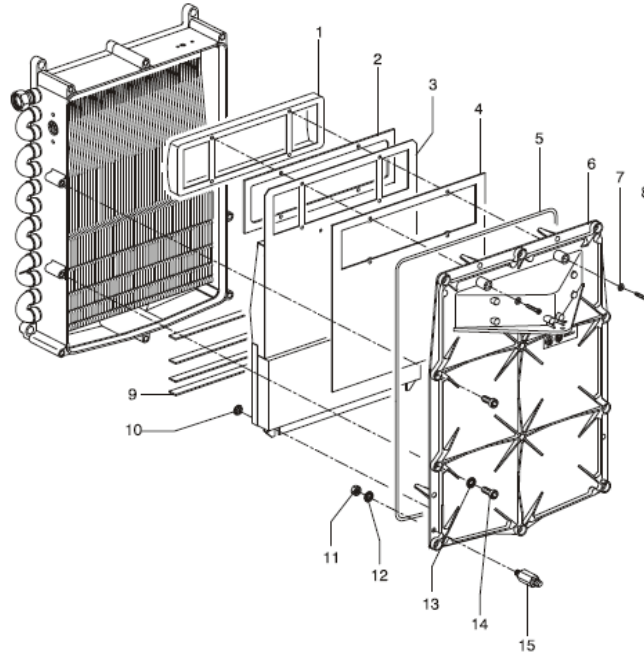
As part of the Routine Service Inspection, certain areas of the boiler need to be checked and cleaned as necessary.

- a) Turn the boiler OFF at the ON/OFF switch and electrically isolate the boiler by removing the plug or fuse from the boiler supply.
- b) Turn off the fuel supply at the boiler isolation tap, fitted by the installer, adjacent to the appliance.
- c) Remove the electrical connections from the boiler.
- d) Remove the burner plate from the boiler.
- e) Inspect the burner and clean with compressed air as required. Do not brush the burner. Ensure that the compressed air does not damage the burner surface.
- f) Brush the heat exchanger with a suitable soft bristled brush.
- g) Adjust the ignition electrode as indicated in the image below.
- h) Flush the heat exchanger with water.
- i) Open the condensate trap and clean.
- j) Refit the condensate trap and refill with water via the heat exchanger.
- k) Refit the burner plate assembly.
- l) Ensure that all electrical connections are correctly and securely connected.
- m) Inspect all water joints. Any joints found to be leaking MUST be replaced. It is also advisable when replacing water joints to also change any adjacent joints at the same time.
- n) Inspect all fuel joints with a suitable leak detection method. Any joints found to be leaking MUST be replaced. It is also advisable when replacing joints to also change any adjacent joints at the same time.
- o) With the use of a suitable Flue Gas Analyser, check and adjust the combustion settings.
- p) Inspect the general condition of the flue system, including the termination, repair as necessary or advise on any remedial action as required.
- q) Following the satisfactory completion of the above service procedure complete the required paperwork and leave the boiler as found if possible.

## **Burner Plate Removal.**

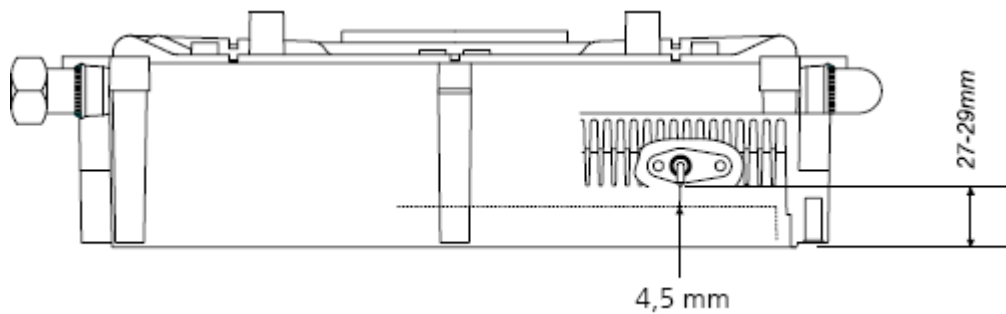






### Ignition Electrode Adjustment.

With the burner assembly removed set the ignition electrode to 27-29mm from the edge of the casing. This will ensure that the gap will be 4.5 mm when the burner assembly is refitted.



### **Fault Codes.**

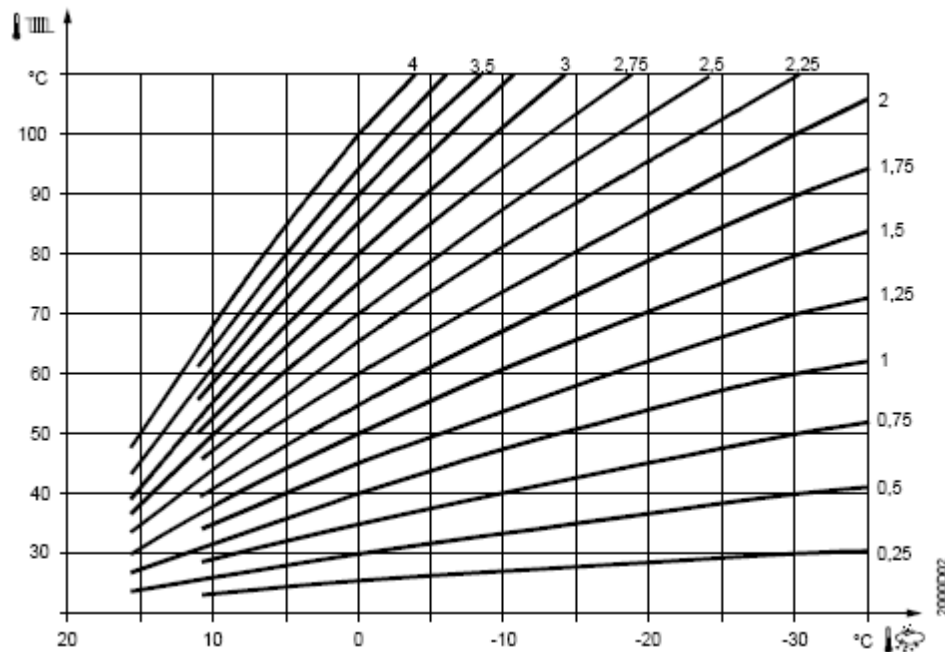
If the boiler encounters an operation fault a code will be displayed on the boiler s control panel.

Please note the fault code prior to resetting boiler.

Pressing the Reset button for 5 seconds resets the unit.

Fault Code Display D	Fault Code Display E	Description	Cause / Remedy
1		Flow Sensor S1 Fault	Check sensor and wiring
2		Return Sensor S2 Fault	Check sensor and wiring
3		Not Used	Not Used
	0	General Sensor Fault After Self Check	Check wiring, replace sensors
	1	Temperature Too High	Air in system, Strainer blocked, Pump failure.
	2	S1 or S2 Requires Replacing	Check wiring, replace sensors
	4	No Flame Signal After 4 Ignition Attempts	Gas supply Off, Gas pressure too low, Gas Valve Faulty, Gas valve out of adjustment, ignition electrode /cable fault, Condensate drain blocked.
	5	Flame Out 4 Restarts	Gas pressure too low, Gas valve out of adjustment, ignition electrode /cable fault, Condensate drain blocked.
	6	Flame Detected When Fan Off	Ignition electrode /cable fault, Controller fault.
	7	Computer Connected to Controller	Reset Unit
	8	Fan Speed Incorrect	Fan fault, Fan wiring fault,
	F or h	Internal Controller Fault	Reset Unit, Earthing fault

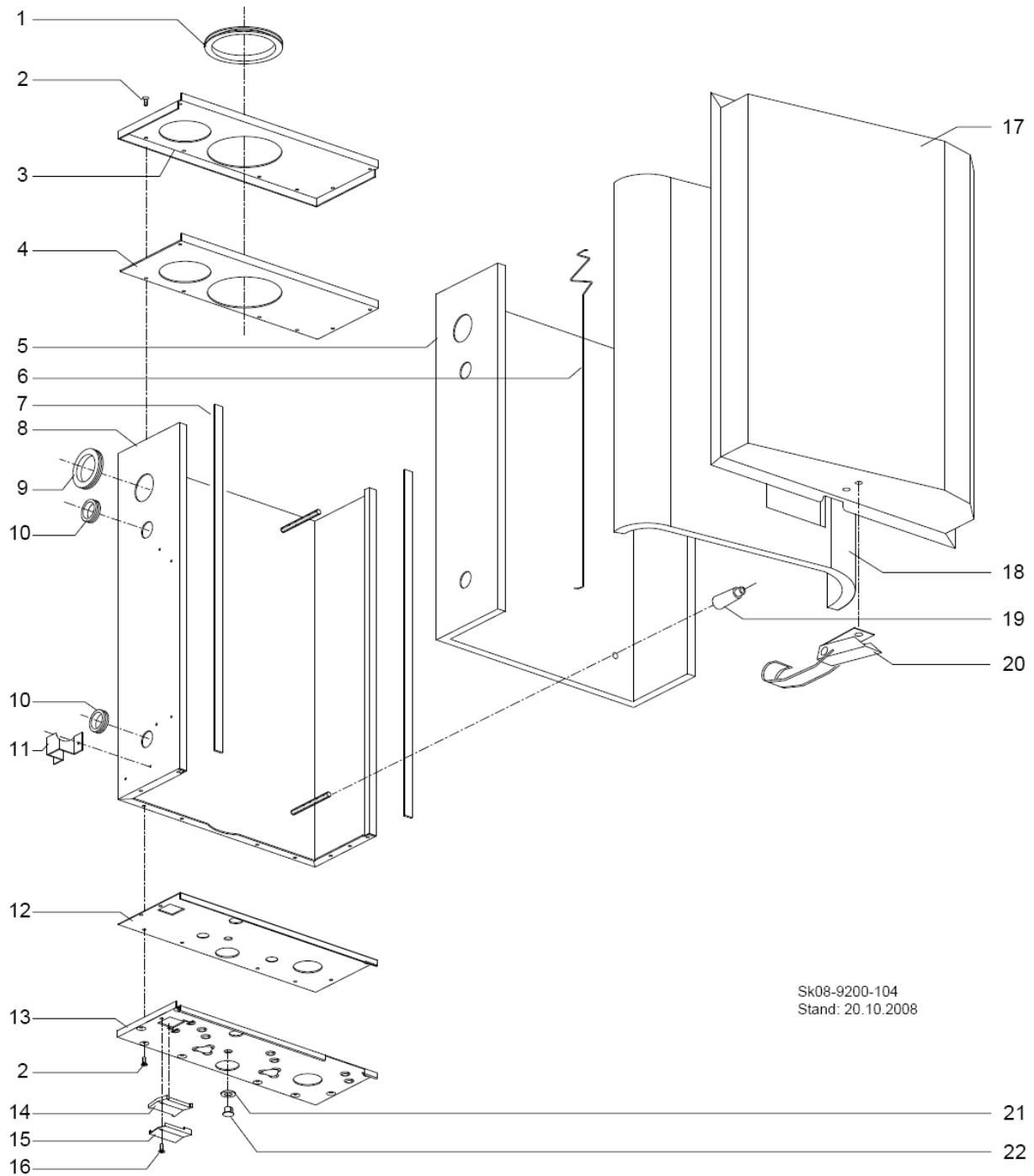
## 15.0 Weather Compensation Slope



Outside Air Temperature Sensor Resistance Curve (NTC 12k Ω)

NTC 12 kOhm					
T [°C]	R [Ohm]	T [°C]	R [Ohm]	T [°C]	R [Ohm]
-15	76020	25	12000	65	2752
-10	58880	30	9805	70	2337
-5	45950	35	8055	75	1994
0	36130	40	6653	80	1707
5	28600	45	5522	85	1467
10	22800	50	4609	90	1266
15	18300	55	3863	95	1096
20	14770	60	3253	100	952

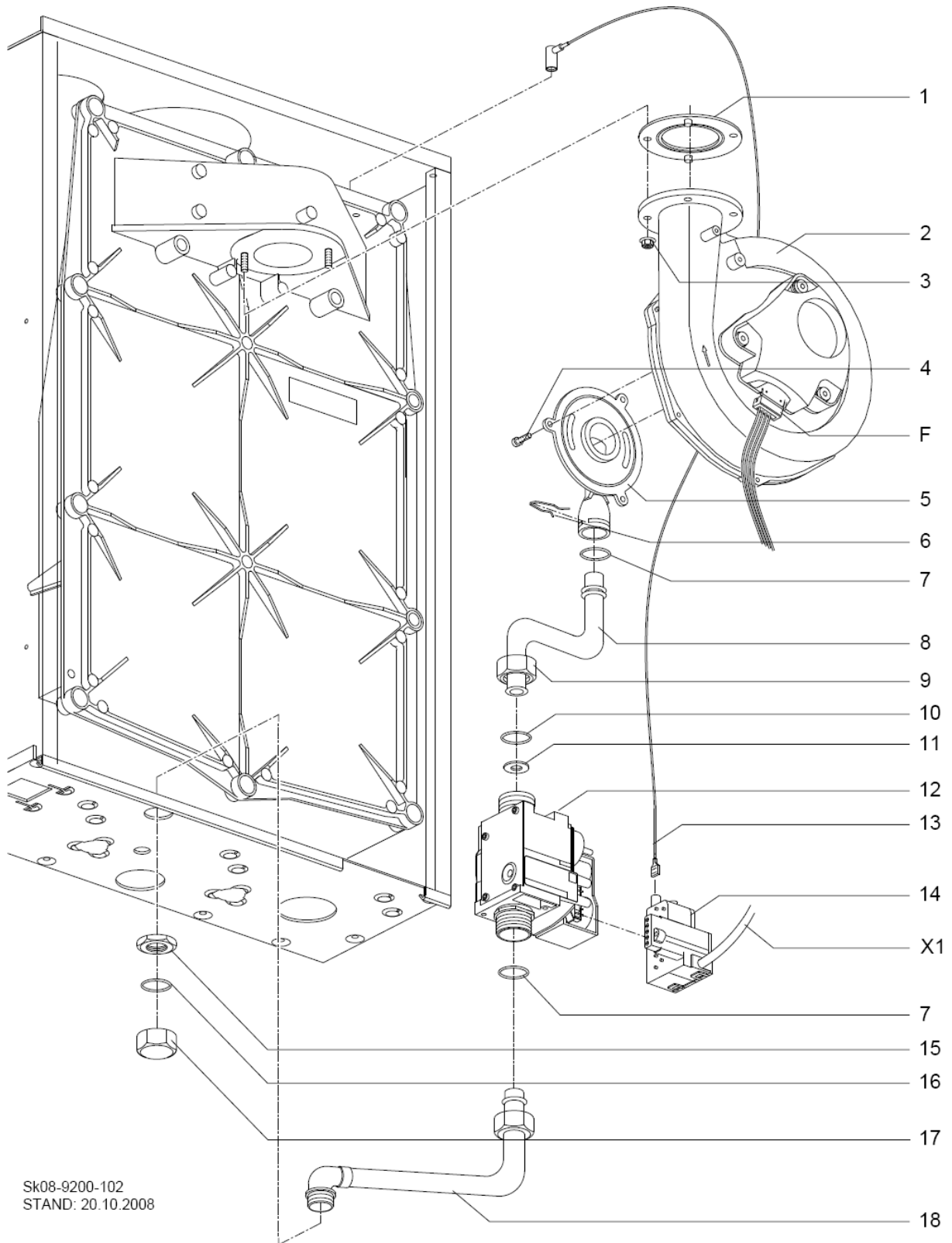
## 17.0 Exploded Spares Diagram





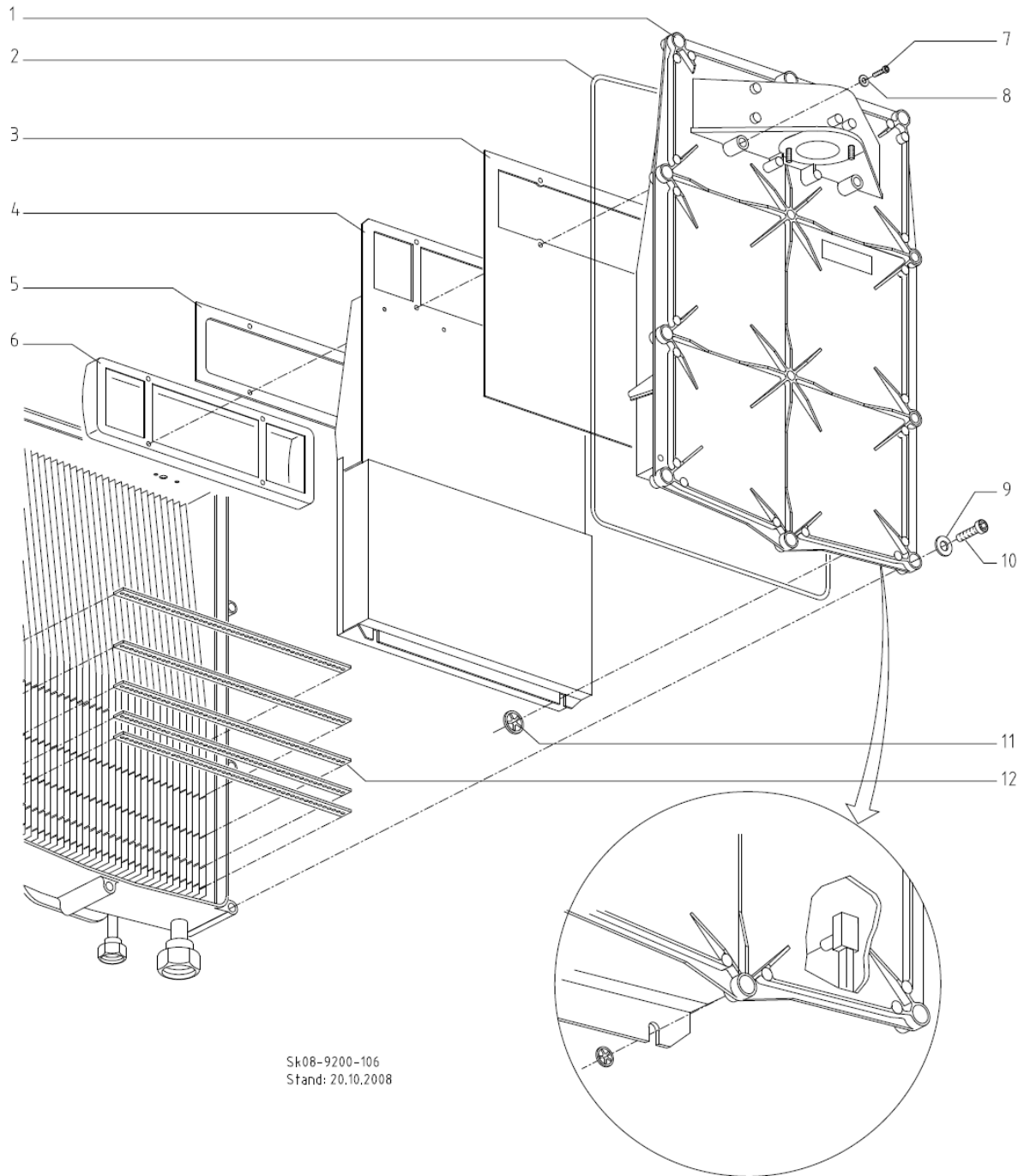




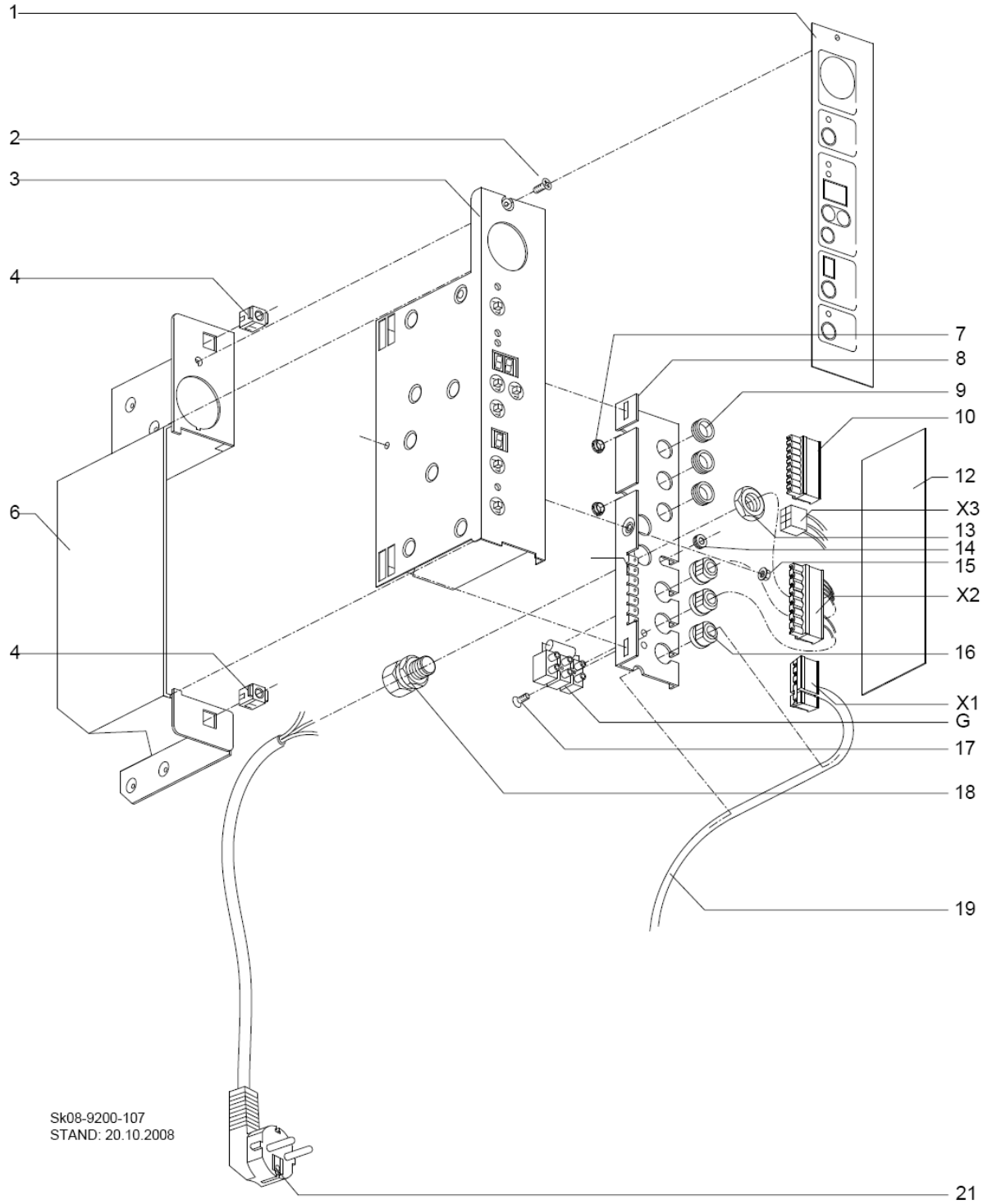


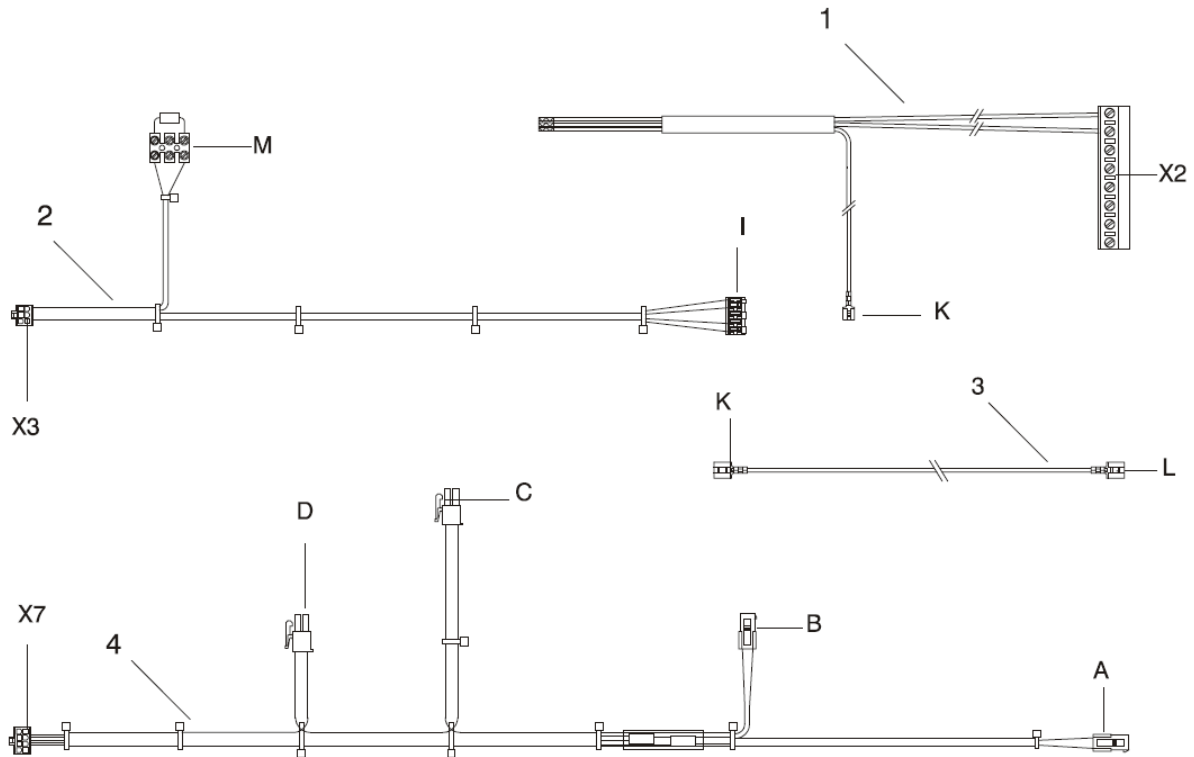






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## **18.0 Parts List**

Please quote the respective bubble number when requesting replacement components.

## Notes

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