broag

remeha Gas 3c Technical information

Atmospheric gas boiler

92 - 372 kW

CE

remeha
CLEAN HEAT

CONTENTS

PREFACE

These technical instructions contain useful and important information for the proper operation and maintenance of the remeha Gas 3c central heating boiler.
Furthermore, important instructions are given to prevent accidents and serious damage before commissioning and during operation of the boiler, to ensure safe and trouble free boiler operation. Read these instructions carefully before putting the boiler into operation, familiarize yourself with its operation and control and strictly observe the instructions given.

If you have any questions, or if you need more information about specific subjects relating to this boiler, please do not hesitate to contact us.
The data published in these technical instructions is based on the latest information and is subject to revisions. We reserve the right to modify the construction and/or design of our products at any moment, without being obliged to adjust earlier supplies accordingly.

1. BOILER DESCRIPTION

The remeha Gas 3c boiler is a cast iron sectional boiler with atmospheric burners.
Suitable for all qualities of natural gas, cat. I 2 H (20 mbar).
The boiler meets the requirements of the CE regulations at the following directives:

- Gas appliance directive no. 90/396/EEC
- Efficiency directive no. 90/42/EEC
- Electrical low voltage directive no. 73/23/EEC
- Machinery directive no. 89/392/EEC
- E.M.C. directive no. 89/336/EEC.

Classification type for evacuation of the combustion products: B11 BS.
For further advice or information contact Broag Ltd.

The remeha Gas 3c is supplied with electronic ignition and insulated casings.
Water connections Ø 70 mm int.

2. CONSTRUCTION

2.1 General

- Boiler block of cast iron sections are joined together with conical nipples.
- Gas train and water connections can be fitted on either side of the boiler.
  The gas train should as standard always be fitted on the same side as the instrumental panel, thermostat pocket and the flow*.
- Instrument panel is fitted in the front casing.
- Cleaning of the cast iron block from top of the boiler.

2.2 Burners

The burners are stainless steel, atmospheric burners. They guarantee a low noise level.

2.3 Boiler floor

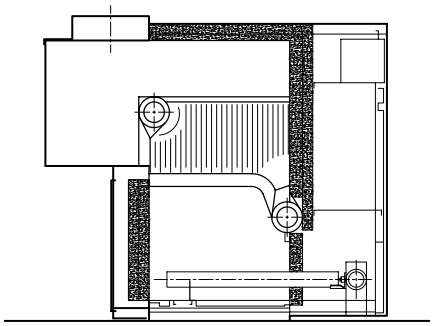
The remeha Gas 3c boiler is supplied as standard with reflecting floor plates with ventilation underneath.

2.4 Assembling

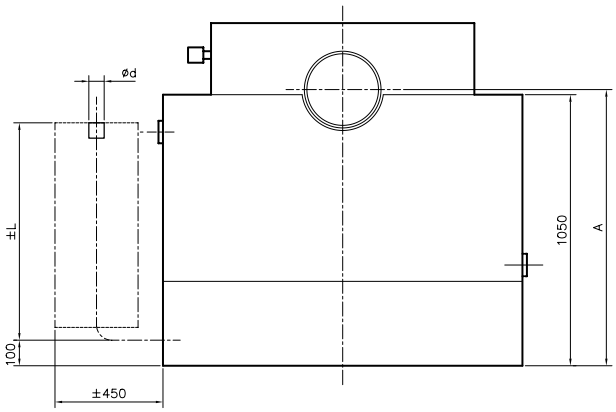
The boiler must be assembled on site.

** On request extension cables can be delivered, so that the gas train can be fitted on the opposite side to the instrument panel, thermostat pocket and the flow.*

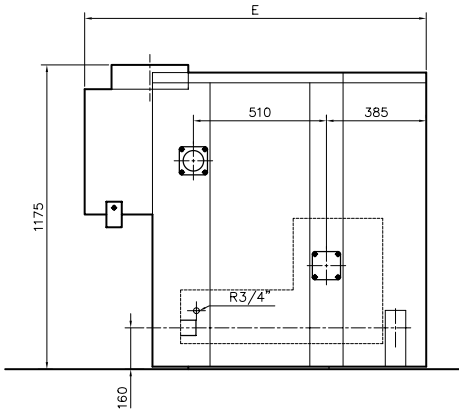
3. TECHNICAL INFORMATION AND DIMENSIONS



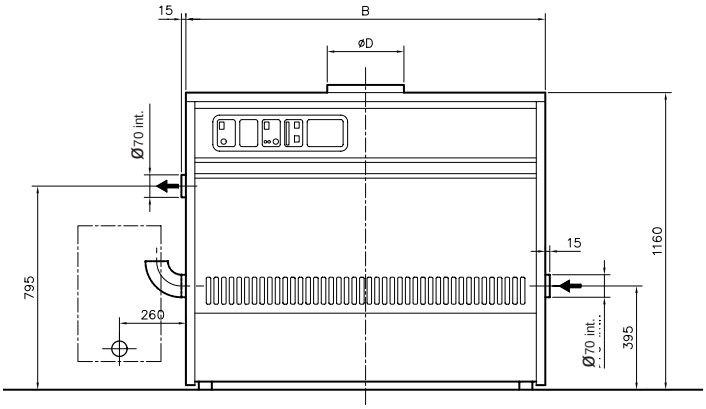
Cross section



Top view



Left hand side view



Front view

Fig. 01 View figures

Number of sections	Output	Input Hs	Dimensions						Water resistance		Water contents	Boiler weight
			A	B	Ø D	Ø d	E	±L	Δt = 10°C	Δt = 20°C		
	kW	kW	mm	mm	mm	"	mm	mm	mbar	mbar	l	kg
5	92	114	1015	675	200	1"	1220	670	16	4	51	385
6	115	142	1015	775	200	1"	1220	670	24	6	58	440
7	138	170	1040	875	200	1"	1220	670	36	9	65	495
8	162	200	1040	975	250	1"	1220	670	48	12	71	550
9	186	228	1040	1075	250	$1^1/_4$"	1220	700	60	15	78	605
10	210	258	1040	1175	250	$1^1/_4$"	1220	700	76	19	85	665
11	234	286	1065	1275	300	$1^1/_4$"	1320	700	96	24	91	720
12	256	315	1065	1375	300	$1^1/_4$"	1320	700	116	29	98	775
13	280	343	1065	1475	300	2"	1320	960	136	34	105	830
14	301	369	1065	1575	300	2"	1320	960	160	40	111	890
15	325	399	1090	1675	350	2"	1320	960	186	46	118	945
16	348	426	1090	1775	350	2"	1320	960	208	52	125	1000
17	372	454	1090	1875	350	2"	1320	960	236	59	131	1055

4. APPLICATION

4.1 L.P.H.W. system

4.1.1 Water temperature
Maximum water temperature is 110°C (high limit thermostat).
Highest boiler water temperature is 95°C (control thermostat).
Minimum return water temperature is 20°C at a flow rate related at a Δt of 20°C (flow/return temperature).

4.1.2 Water pressure
Boiler sections pressure test at 12 bar.
Maximum pressure test for the boiler block is 6 bar.
Minimum working pressure boiler is 0.8 bar.
Maximum working pressure is 6 bar.

4.1.3 Water flow
The minimum water flow through the boiler is:

$$\frac{\text{Output boiler in kW}}{93} = \ldots \text{ m}^3/\text{h}$$

This minimum flow must be maintained for 5 minutes after the burner stops firing to avoid high temperature shutdown due to residuel heat gain.
Due to the design and manufacture of the boiler no specific minimum water flow requirement exists other than for high-temperature protection.

4.1.4 Water treatment
Water treatment under normal circumstances is not necessary (see our water quality recommendations).

4.1.5 Noise level
The noise level measured around the boiler depending on boiler room construction is about 50-55 dBA.
(Noise level taken at 1 meter from the boiler)

4.2 Chimneys
The average flue gas temperature is so low that the chimney must be in accordance with the guidelines of British Gas and BS 6644.

4.3 Installation standards
The following instructions must be adhered to when the remeha Gas 3c is installed:
Gas safety (installation and use) Regulations 1984 (as amended).
All gas appliances must, by law, be installed by competent persons (e.g. Corgi) in accordance with the above regulations. Failure to install appliances correctly could lead to prosecution.
It is in your own interest and that of safety to ensure that the law is complied with.
In addition to the above regulations, this appliance must be installed in compliance with the current I.E.E. Regulations for electrical installation, local building regulations, the Building Standards (Scotland), Consolidation Regulations and bye laws of the local water undertaking and Health and Safety Document No. 635 'The Electricity at Work Regulations 1989'. It should also be in accordance with the relevant recommendations in the current editions of the following British Standards and Codes of Practice, viz.
BS 5540 Pt 1 and 2, BS 5449, BS 5546, BS 6798, BS 6891 and BG.DM2.

Important:
The remeha Gas 3c is certified appliance and must not be modified or installed in any way contrary to these 'Installation and Servicing Instructions'.
Manufacturers instructions must NOT be taken in any way as overriding statutory obligations.

5. TYPICAL BOILER INSTALLATIONS

One boiler in boiler room

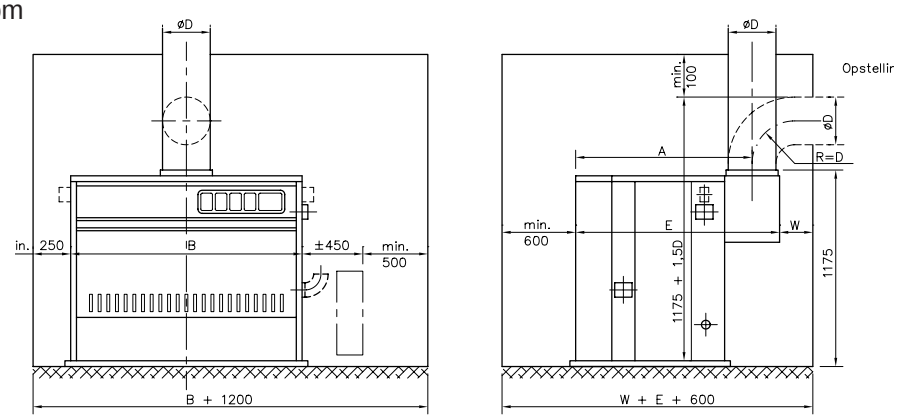


Fig. 02 Installation 1

Two boilers in boiler room

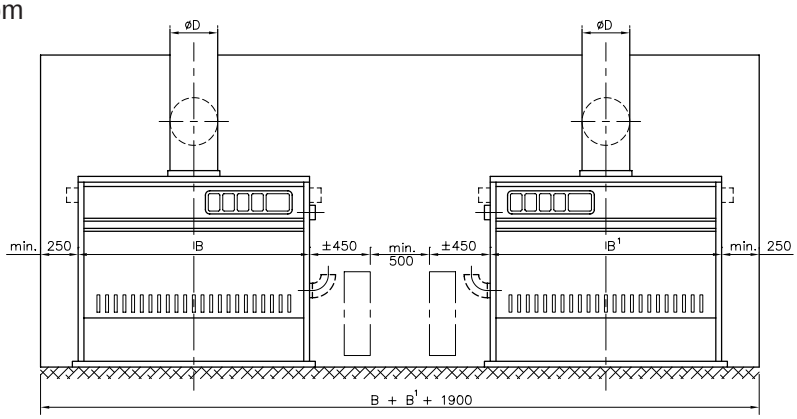


Fig. 03 Installation 2

Two boilers in boiler room
back to back

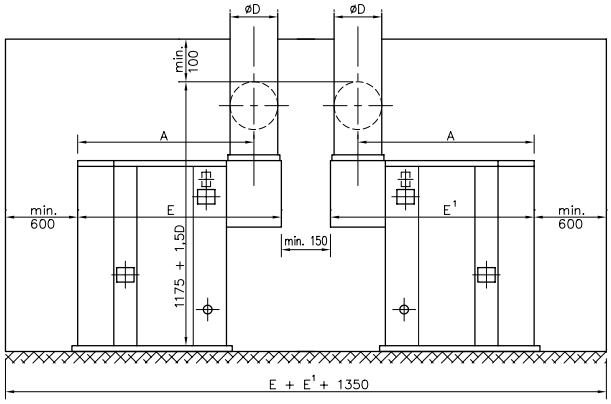


Fig. 04 Installation 3

		Number of sections												
		5	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**
Dimensions (mm)	**A**	1015	1015	1040	1040	1040	1040	1065	1065	1065	1065	1090	1090	1090
	B	675	775	875	975	1075	1175	1275	1375	1475	1575	1675	1775	1875
	Ø D	200	200	200	250	250	250	300	300	300	300	350	350	350
	E	1220	1220	1220	1220	1220	1220	1320	1320	1320	1320	1320	1320	1320

6. REGULATION AND SAFETY EQUIPMENT

6.1 General

The remeha Gas 3c is supplied with electronic control and safety equipment with flame detection.

6.2 Instrument panel

The remeha Gas 3c is supplied with an instrument panel that is fitted in the front of the boiler, either left or right. The instrument panel can be delivered in three models:

- simple instrument panel On/Off;
- simple instrument panel High/Low;
- complete instrument panel High/Low.

All connections are pre-wired and fitted with plugs. The capillaries from the control panel should be fitted in the pocket of the boiler, wich is fitted in the top front of the end section.

The instrument panel, pocket and the flow should always be fitted at one side of the boiler either left or right and standard on the same side as the gas train.***

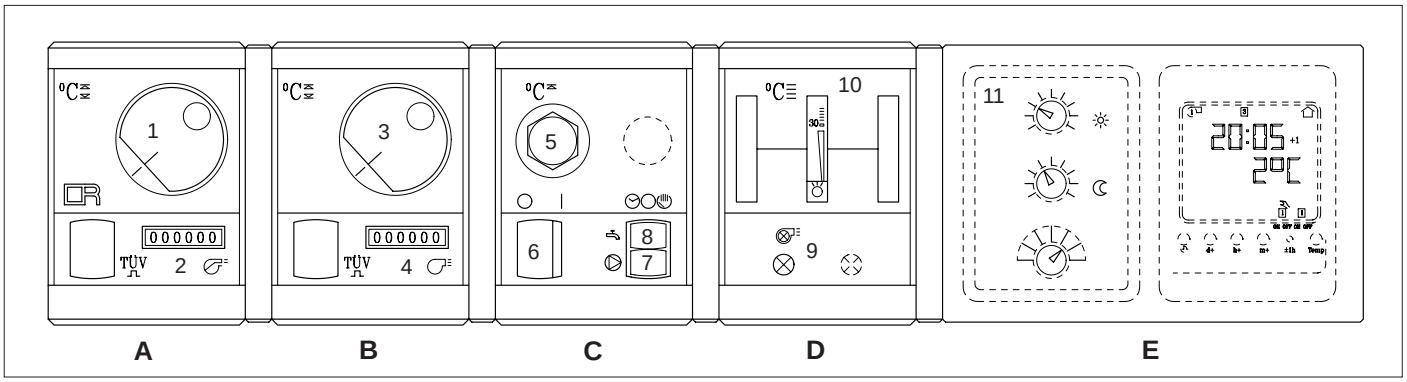


Fig. 05 Layout of the complete instrument panel

The modules contain:

Module A

1. Control thermostat
   Setting between 35°-95°C
2. Hour run meter total running hours*

Module B

3. High-Low thermostat
   Setting between 35°-95°C**
4. Hour run meter full load*

Module C

5. High-limit thermostat 110°C (locking)
6. Operating switch (On/Off with optical display)*
7. Switch for circulating pump*
   Manual/Off/Automatic
8. Switch for domestic hot water storage pump*
   Manual/Off/Automatic

Module D

9. Warning light*
10. Analogue thermometer water temperature

Module E

11. Option for ***rematic***® weather compensating boiler control*

* *Absent in simple instrument panels*
** *Absent in simple instrument panel On/Off*
*** *On request extension cables can be delivered, so that the gas train can be fitted on the opposite side to the instrument panel, thermostat pocket and the flow.*

6.3 Standard electronic gas train On/Off or High/Low

6.3.1 Schematic construction

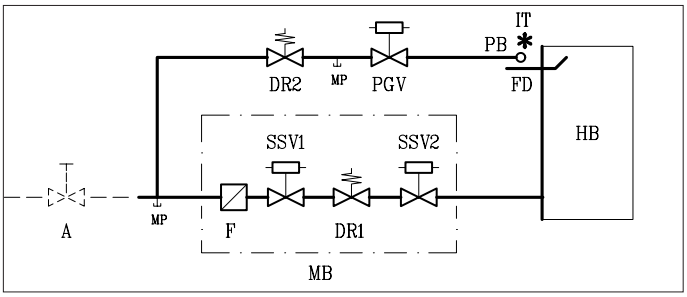


Fig. 06 5-12 sections

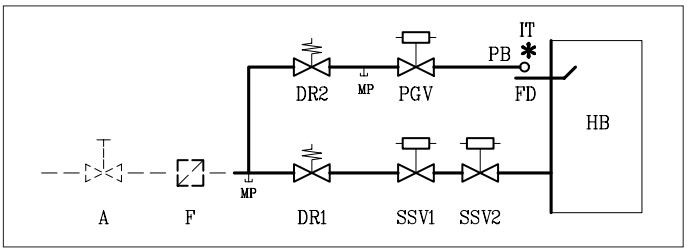


Fig. 07 13-17 sections

Legend

A	*Gas cock*
PB	*Pilot burner*
DR	*Gas governor*
F	*Gas filter*
HB	*Main gas burners*
MB	*Gas multibloc*
IT	*Ignition transformer*
PGV	*Pilot gas valve*
MP	*Measuring point*
SSV	*Safety shut-off valve*
FD	*Flame detector*
- - - -	*Not supplied*

6.3.2 Specification

1 Gas multibloc (5-12 sections)
2 Safety shut-off valves (13-17 sections)
1 Gas governor (13-17 sections)
1 Pilot gas valve
1 Pilot gas governor
1 Ignition transformer 5 kV
1 Pilot burner with flame detector
1 Down draught thermostat set at 70˚C

6.3.3 Control panel on gas train

1 Main switch
1 Control box Satronic
1 Fuse, brusk
1 Signal lamp

6.4 Functions

6.4.1 Flame protection

Flame protection by means of ionisation flame detection.

6.4.2 Down draught thermostat

The boiler is fitted with a down draught thermostat Honeywell (typ L6068A).
If there is down draught the thermostat will switch off the boiler. Fixed setpoint is 70°C.

6.4.3 Thermostats

Control thermostat On/Off Landis & Gyr 35°-95°C.
Control thermostat High/Low Landis & Gyr 35°-95°C (High/Low version only).
High-limit thermostat locks out at 110°C.

7. ASSEMBLY AND INSTALLATION GUIDELINES

7.1 General

The boiler is suitable for operating at a maximum working pressure of 6 bar and a minimum pressure of 0.8 bar. Boiler can be installated in open or closed systems.

7.2 Boiler assembly

Broag provides special tools on loan, for the boiler assembly with detailed building instructions. However, building supervision and/or actual boiler erection services can be provided by Broag or an approved boiler erection engineer.

7.3 Water connections

The boiler water connections can be fitted on either side of the boiler.
The water connection is flanged on the boiler with a pipe connection for welding Ø 70 mm to the installation.
The top blind-flange has an integral cast 1" tapping to accept a safety valve. The end sections have a $^{3}/_{4}$" tapping to accept drain/off cocks (Tapping BSP).

7.4 Pocket for instrument panel

The pocket should be fitted in the top front end section of the boiler and at that side of the boiler where the gas train is fitted. Other end section tapping 1" should be sealed.

7.5 Water pressure

Each section is hydraulically tested to at least 12 bar.
Maximum test pressure for the assembled boiler block is 6 bar.
Operating pressure between 0.8 bar and 6 bar.

8. GAS SUPPLY

8.1 General
The gas train can be fitted on the left or right hand side of the boiler but as standard is always fitted on the same side of the boiler instrument panel (fitted in the front casing).*
The local Gas authority should be consulted to ensure that an adequate pressure and supply is available at the boilers maximum output. To minimise risk of sediment or foreign particles entering the control valves, an approved filter may be fitted into the pipe work downstream.
The gas supply should be conform to the British Gas safety regulations.

8.2 Gas pressure
Maximum gas pressure at inlet 100 mbar.
Burner pressure:
- full load : 11.8 mbar (100%)
- part load (High/Low version only): 4.2 mbar (60%)
- injector size: 4.4 mm Ø.

9. ELECTRICAL SUPPLY

9.1 General
The electrical installation must conform to the IEE regulations and also to local authority requirements.

9.2 Control panel
A control panel is fitted on the gas train.

9.3 Electrical connections
The boiler is pre-wired. Only the main supply should be wired to this control panel.

9.4 Electrical data
Main supply: 240V - 50Hz (L/N).
Running current: 120 W.
Installed fuse: 6 Amp.

9.5 Wiring diagram for the instrument panel

9.5.1 Simple instrument panel

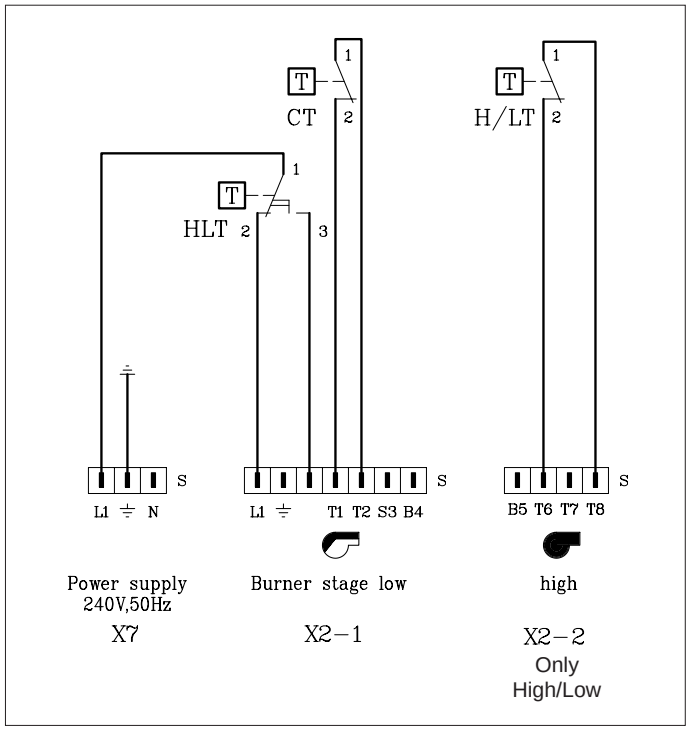
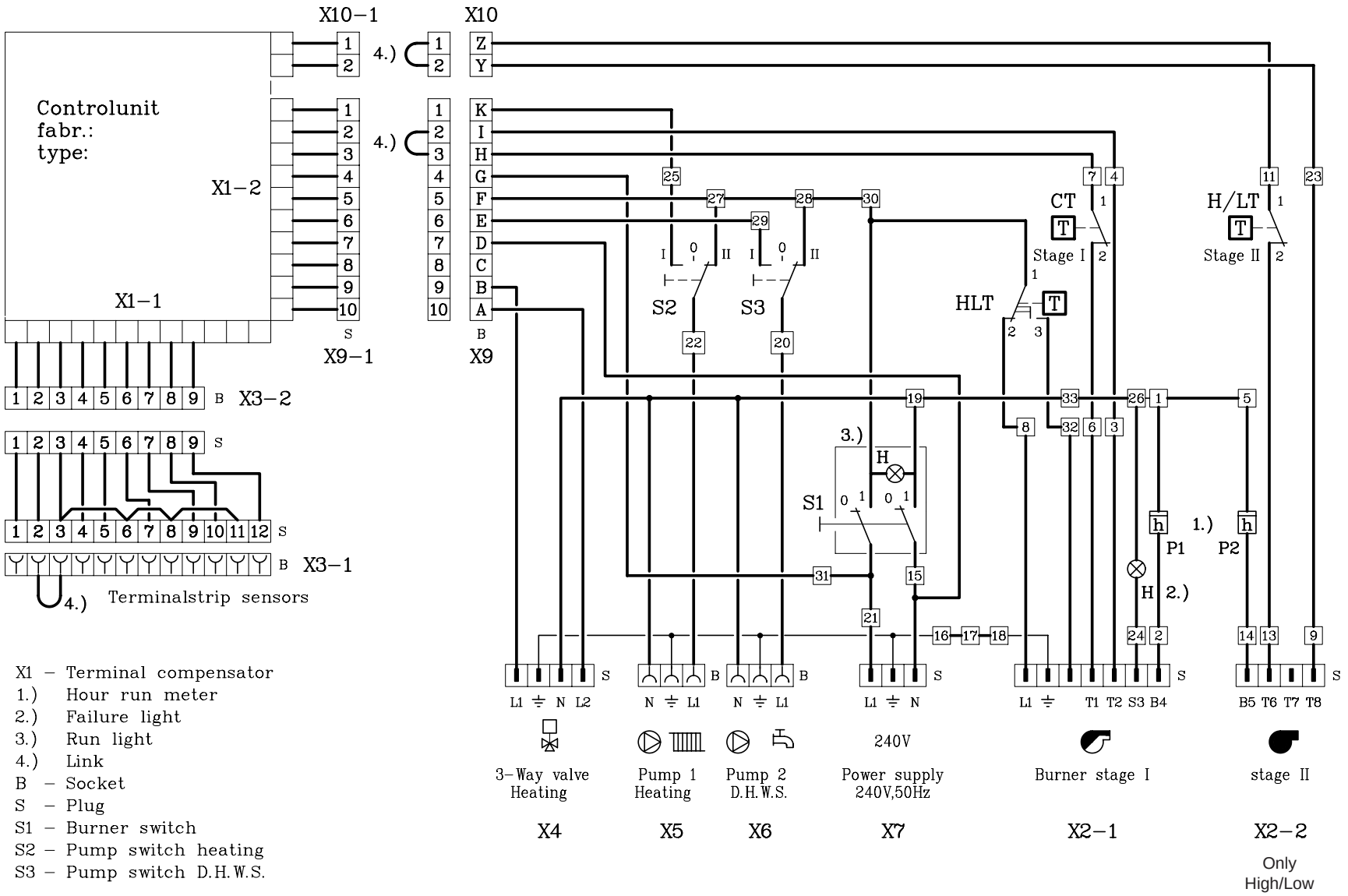


Fig. 08 Wiring diagram for the simple instrument panel

Legend
CT Control thermostat
HLT High limit thermostat
H/LT High/Low thermostat
S Plug
Connector

* *On request extension cables can be delivered, so that the gas train can be fitted on the opposite side to the instrument panel, thermostat pocket and the flow.*



X1 – Terminal compensator
1.) Hour run meter
2.) Failure light
3.) Run light
4.) Link
B – Socket
S – Plug
S1 – Burner switch
S2 – Pump switch heating
S3 – Pump switch D.H.W.S.

Fig. 09 Wiring diagram for the complete instrument panel

9.6 Wiring diagram boiler

9.6.1 Complete wiring diagram for On/Off boiler with simple instrument panel

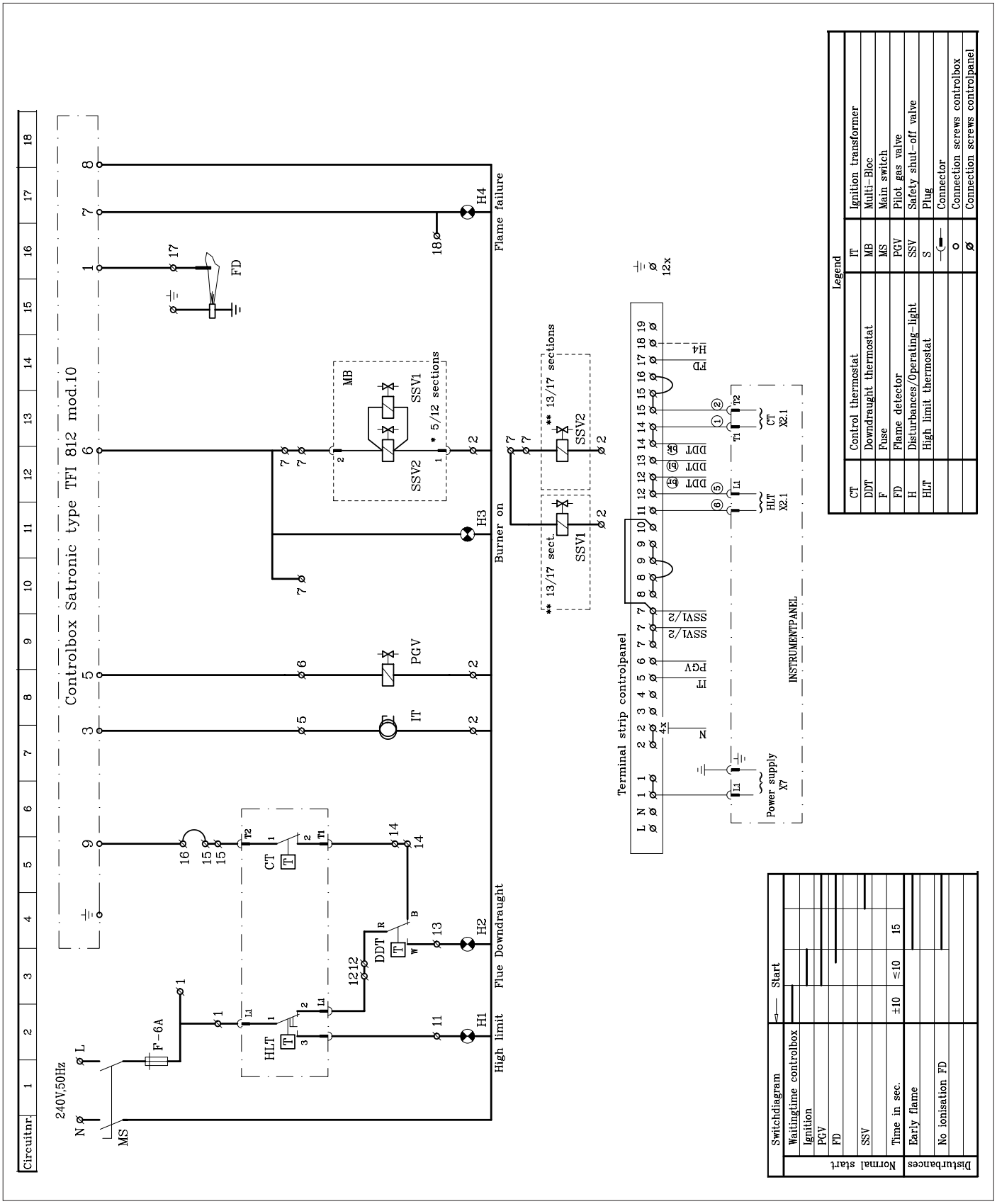


Fig. 10 Wiring diagram for the boiler with simple instrument panel

9.6.2 Complete wiring diagram for On/Off boiler with complete instrument panel (High/Low thermostat will not be used)

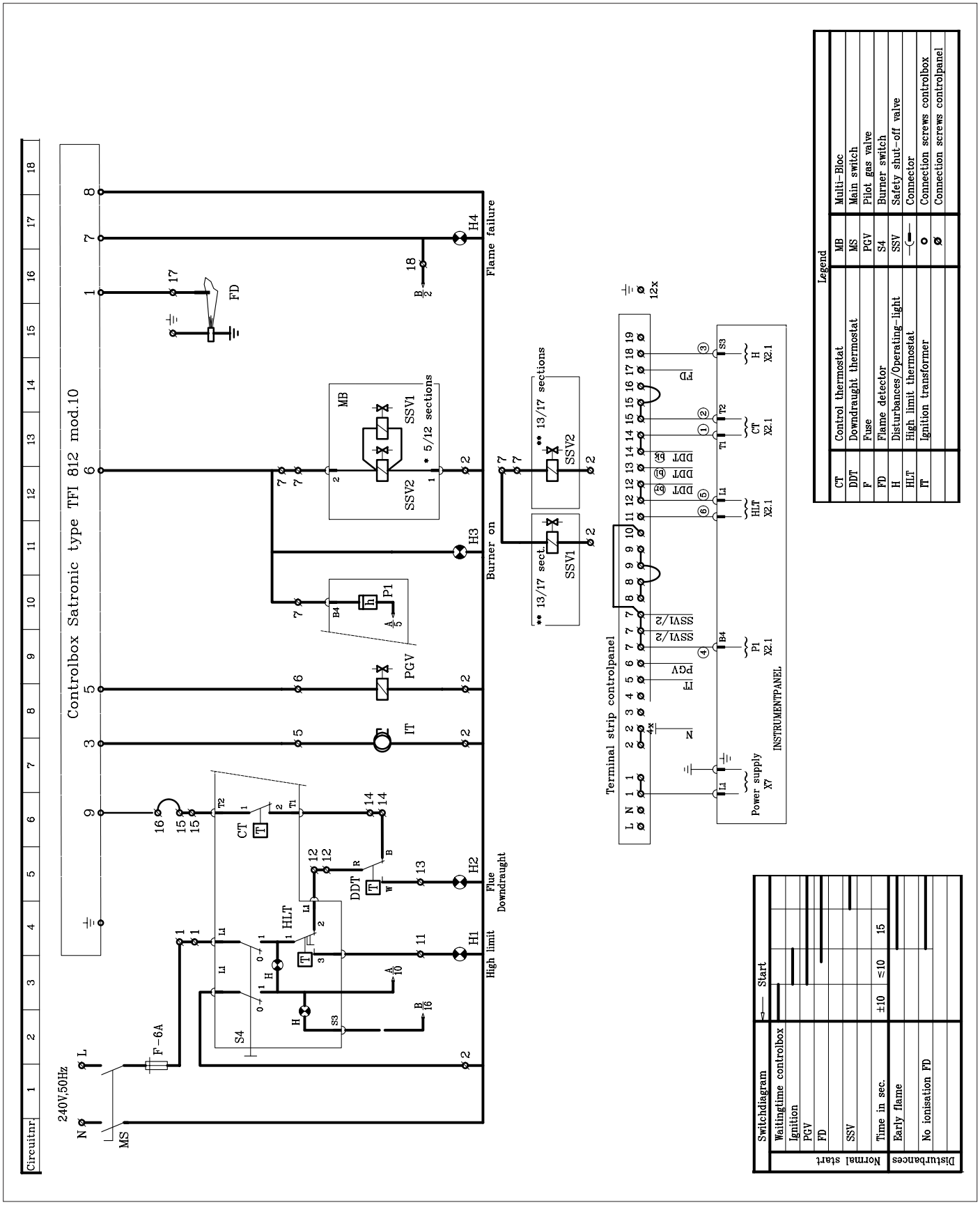


Fig. 11 Wiring diagram for the boiler with complete instrument panel

9.6.3 Complete wiring diagram for High/Low boiler with simple instrument panel

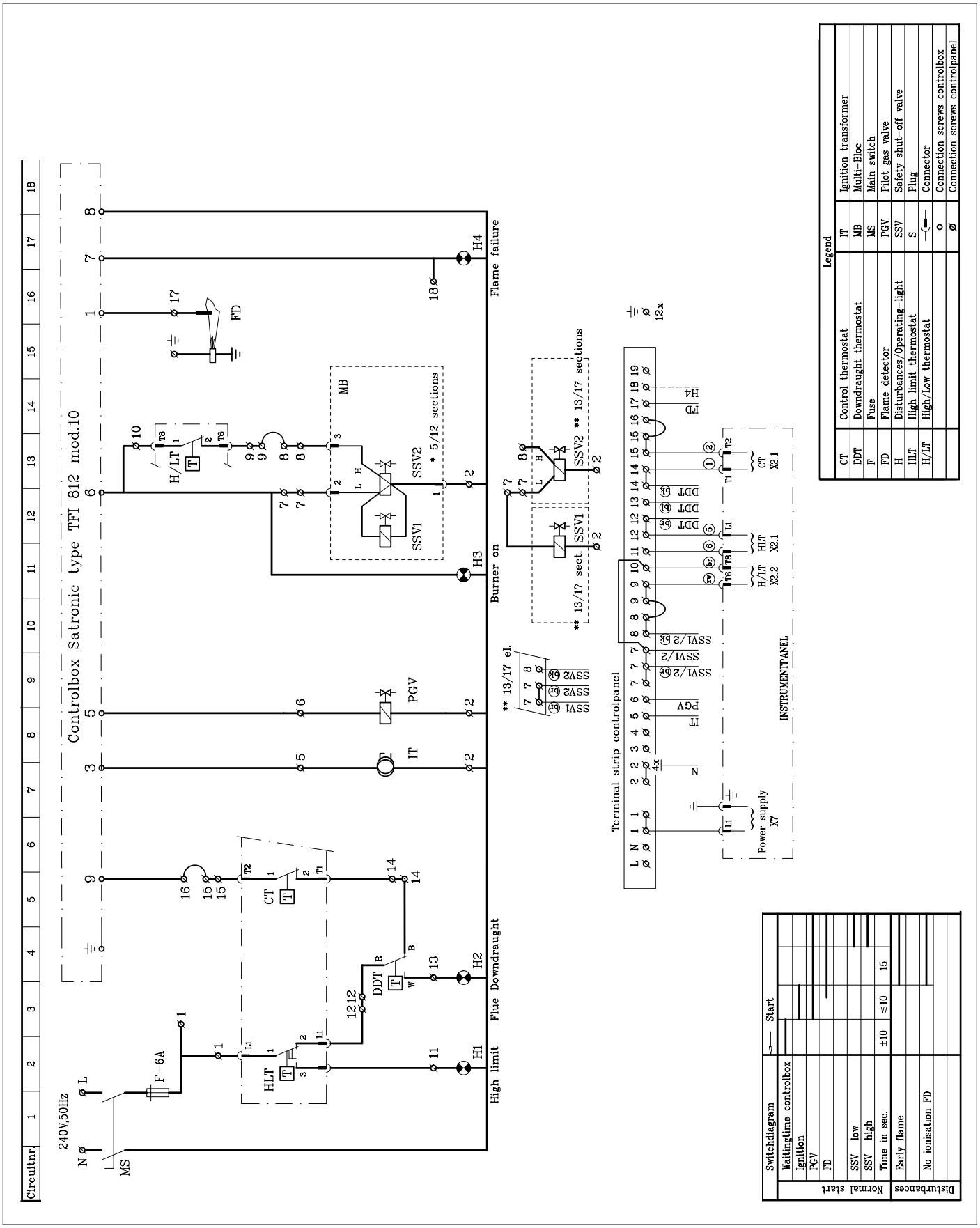


Fig. 10 Wiring diagram for the boiler with simple instrument panel

9.6.4 Complete wiring diagram for High/Low boiler with complete instrument panel

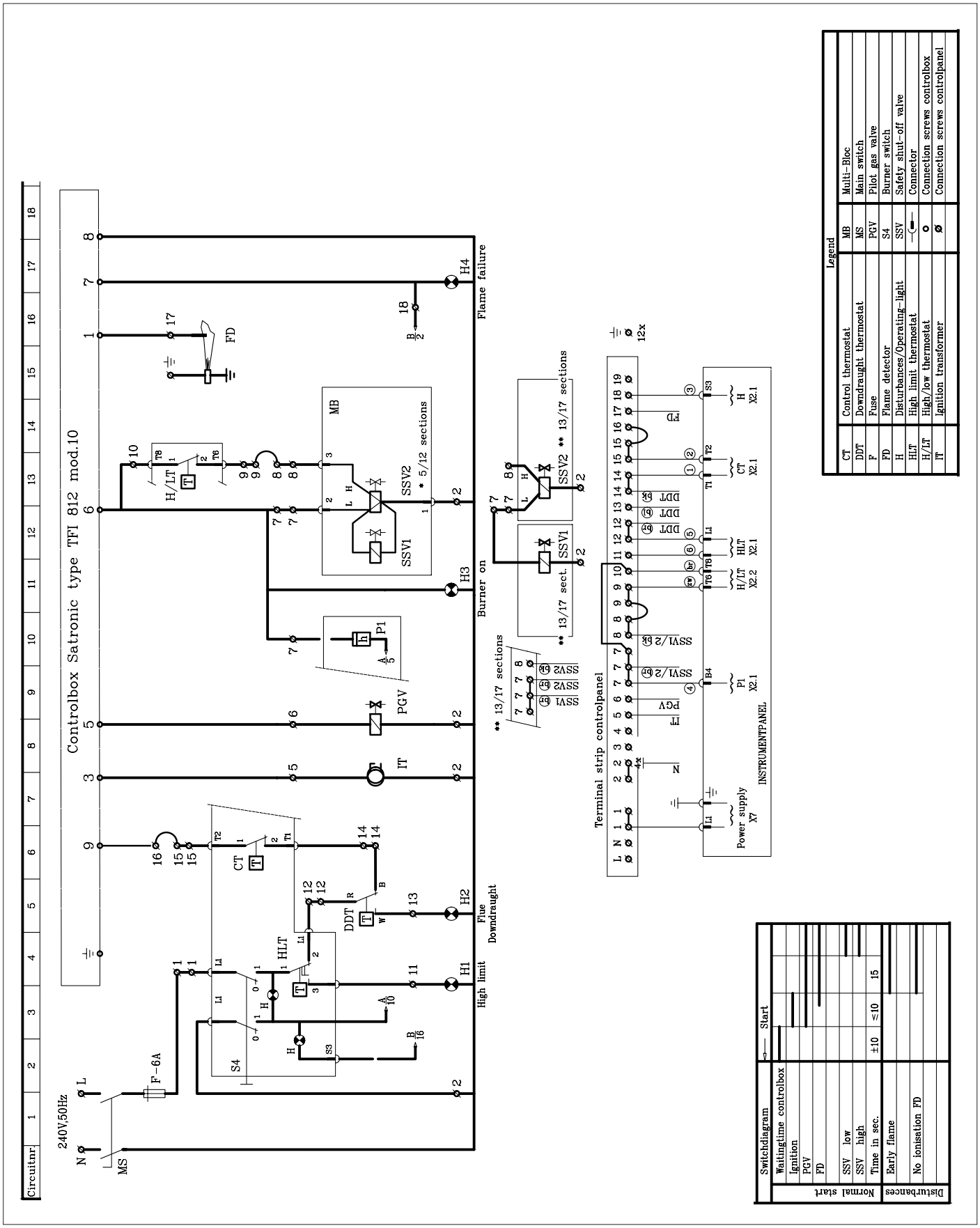


Fig. 11 Wiring diagram for the boiler with complete instrument panel

10. COMMISSIONING

10.1 Technical information

Control box: Satronic TFI 812 B mod. 10.
Main supply: 240V - 50 Hz.
Minimum ionisation current: 5 μA.
Reaction time flame protection: 1 sec.
Safety time: < 10 sec.
Maximum ambient temperature: 60°C.
Injector size pilot burner: Ø 0.8 mm.
Injector size main burner: Ø 4.4 mm.
Burner pressure full load: 11.8 mbar (100%).
Burner pressure part load: (High/Low version only):
4.2 mbar (60%).

Warning:
Control box operates on a neutral/phase supply.

10.2 Commissioning the boiler

1. Check gas connections.
2. Check electrical supply (L/N and earth).
3. Check water connections and if the installation is filled.
4. Switch on circulation pump and check rotation direction.
5. Open main gas cock (release air in gas pipe work).
6. Switch on electrical supply.
7. Set the control thermostats at about 85°C.
8. After a waiting time of about 12 seconds you will get ignition. At a minimum ionisation current of 5 μAmp the ignition stops. 15 sec. later the safety gas valve will open, the boiler is on.
9. Leave the boiler on for a couple of minutes to get rid of air in the gas pipe.
10. Set the correct burner pressure.
11. Check the thermostats for correct operation.
12. Check the flame protection, start the boiler with disconnected ionisation probe.

10.3 Switching off the boiler

1. Switch off the electrical supply.
2. Turn off the gas cock.

11. MAINTENANCE

11.1 General

It is essential for a good combustion, to clean the boiler, the gas train and boiler room once a year.

11.2 Maintening the boiler

1. Clean the internal flue ways of the boiler with a steel cleaning brush (available from Broag).
   Remove top casing and top of the flue hood.
2. Clean the burners internally and externally.
3. Clean boiler room and the floor underneath the boiler.
4. Clean the boiler casings.
5. Clean the gas train, ignition, pilot burner, thermostats and wiring.
6. Check start program, ignition time and safety times.
7. Check flame protection, and thermostats.
8. Check the boiler input at 100% and 60% load (High/Low version only).
9. Make a combustion efficiency calculation.
10. Check the boiler and installation for water leakage.
11. Check gas train and gas pipe for gas leakage.

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since 1988

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