VARMAX TWIN SERIES BOILERS

Gas condensing boiler with modulating burner

INSTALLATION, COMMISSIONING AND SERVICING INSTRUCTIONS

Models: 550 kW, 640 kW, 780 kW and 900 kW

NATURAL GAS
PROPANE GAS

IMPORTANT NOTE
THESE INSTRUCTIONS MUST BE READ AND UNDERSTOOD BEFORE INSTALLING, COMMISSIONING, OPERATING OR SERVICING EQUIPMENT
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1. WARNINGS AND RECOMMENDATIONS

PLEASE READ THIS MANUAL CAREFULLY BEFORE INSTALLING, MAINTAINING AND USING THE BOILER. IT CONTAINS IMPORTANT SAFETY INFORMATION.

1.1. VARMAX TWIN supply limits

The VARMAX TWIN boiler you have received is composed of:
- 2 VARMAX type generators with the same power to be connected to each other
- 1 450 mm common exhaust flue between the generators
- 4 Teflon plates (to help position the generators)
- 2 LPB bus cable trays with holding screws
- 1 LPB bus cable
- 2 OCI 345 communication modules with holding screws
- 1 QAZ 36 flow sensor

This manual describes the specific features of the assembly. Everything which relates to one of the 2 generators (internal accessibility, settings, maintenance, spare parts, etc.) is described in the particular generator's manual. The following data must therefore be used:
- For the VARMAX TWIN 550, see the information for the VARMAX 275,
- For the VARMAX TWIN 640, see the information for the VARMAX 320,
- For the VARMAX TWIN 780, see the information for the VARMAX 390,
- For the VARMAX TWIN 900, see the information for the VARMAX 450.

1.2. Transport and storage

The generators:
- must be arranged horizontally in a place where the temperature is between 0 °C and +50 °C and whose relative humidity is between 5% and 95%.
- must not be stacked,
- must be protected from humidity.

1.3. Symbols used in this document

INFORMATION: This symbol draws attention to comments.

IMPORTANT: Failure to comply with these instructions may cause damage to the installation or to other objects.
**1.4. Qualification of personnel for installation, adjustment, use and maintenance**

The operations to install, adjust and maintain the boiler must be carried out by qualified and approved professionals in accordance with current local and national regulations. These operations may require intervention under voltage, with the casing doors (located on the front of the generators) open. The basic usage operations must be carried out with the casing doors closed.

**1.5. Safety instructions**

- Always remove the power supply to the boiler and shut off the overall gas supply to it before carrying out any work on it.
- Check that there are no gas leaks on the installation after any intervention on the boiler (maintenance or repair).

<table>
<thead>
<tr>
<th><img src="image" alt="WARNING:" /></th>
<th>If you smell gas:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Do not use any naked flames, smoke or activate any contacts or electric switches.</td>
</tr>
<tr>
<td></td>
<td>• Switch off the gas supply.</td>
</tr>
<tr>
<td></td>
<td>• Ventilate the premises.</td>
</tr>
<tr>
<td></td>
<td>• Look for the leak and correct it.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><img src="image" alt="WARNING:" /></th>
<th>If any smoke is released:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Switch off the generators.</td>
</tr>
<tr>
<td></td>
<td>• Ventilate the premises.</td>
</tr>
<tr>
<td></td>
<td>• Look for the leak and correct it.</td>
</tr>
</tbody>
</table>

| ![WARNING:](image) | This boiler's earth continuity is provided by link cables (green/yellow) and specific holding screws. During any disassembly operations, make sure that the cables in question are reconnected; you MUST also reuse the original holding screws. |

**1.6. Water characteristics**

Refer to the VARMAX generator's installation, use and maintenance manual.
2. APPROVALS

2.1. Compliance with European Directives

- Low voltage (2006/95/CE)
  This appliance is not intended for use by persons (including children) whose physical, sensory or mental abilities are reduced, or persons without experience or knowledge, unless they have been able to benefit, through someone responsible for their safety, from supervision or prior instruction concerning the use of the appliance. Children must be supervised to ensure they do not play with the appliance.

- Electromagnetic compatibility (2004/108/CEE)
- Efficiency (92/42/CEE)
- Gas appliances (2009/142/CE)
- WEEE (2012/19/UE)
  Waste Electrical and Electronic Equipment.

2.2. Regulatory installation conditions

The appliance must be installed and maintained by a qualified professional, in accordance with the regulations and current regulatory practices in the country where the boiler is installed.

2.3. Environmental compatibility

This appliance contains electrical and electronic elements which must not be thrown away with household waste. Local legislation must be complied with.

2.4. Gas category

This boiler has been adjusted in the factory to work with group H (type G20) natural gas with a supply pressure of 20 mbar.

INFORMATION: Any work on a sealed component will lead to loss of the guarantee.

<table>
<thead>
<tr>
<th>Category</th>
<th>GB, IE</th>
</tr>
</thead>
<tbody>
<tr>
<td>VARMAX TWIN 550 and 640</td>
<td>(\text{I}_{2H3P})</td>
</tr>
<tr>
<td>VARMAX TWIN 780 and 900</td>
<td>(\text{I}_{2H})</td>
</tr>
</tbody>
</table>
### 2.5. Gas supply pressures

<table>
<thead>
<tr>
<th>INFORMATION:</th>
<th>The pressures provided below must be taken at the input to the gas valve (20 mbar).</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Natural gas H G20</strong></td>
<td><strong>G31 Propane gas</strong> (for VARMAX TWIN 550 and 640)</td>
</tr>
<tr>
<td>Nominal pressure (mbar)</td>
<td>20</td>
</tr>
<tr>
<td>Minimum pressure (mbar)</td>
<td>17</td>
</tr>
<tr>
<td>Maximum pressure (mbar)</td>
<td>25</td>
</tr>
</tbody>
</table>
3. TECHNICAL SPECIFICATIONS

3.1. Dimensions

The dimension of 450 mm between the 2 generators must be respected to assemble the exhaust flue (it is not a minimum or maximum dimension).
3.2. Doorway

Refer to the VARMAX generator's installation, use and maintenance manual.

3.3. Combustion at 15°C and 1013 mbar

<table>
<thead>
<tr>
<th>MODELS</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>550</td>
<td>640</td>
<td>780</td>
<td>900</td>
</tr>
<tr>
<td>Nominal power Pn (80/60°C)</td>
<td>kW</td>
<td>536</td>
<td>624</td>
<td>762</td>
</tr>
<tr>
<td>Nominal power when condensing Pn (50/30°C)</td>
<td>kW</td>
<td>580</td>
<td>676</td>
<td>830</td>
</tr>
<tr>
<td>Rated heat input Qn</td>
<td>kW</td>
<td>550</td>
<td>640</td>
<td>780</td>
</tr>
<tr>
<td>Min heat input Qmin</td>
<td>kW</td>
<td>66</td>
<td>66</td>
<td>87</td>
</tr>
<tr>
<td>Gas flow rate at Pn (15 °C) *</td>
<td>m³/h</td>
<td>58.2</td>
<td>67.72</td>
<td>82.6</td>
</tr>
<tr>
<td>CO₂ value range</td>
<td>%</td>
<td>at Qmin: 8.3 % &lt; CO₂ &lt; 8.7 % at Qmax: 8.8 % &lt; CO₂ &lt; 9.2 %</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhaust mass flow rate at Qn / Qmin (80/60°C) *</td>
<td>g/s</td>
<td>240.1 / 31</td>
<td>257.7 / 30.9</td>
<td>352 / 43</td>
</tr>
<tr>
<td>Exhaust mass flow rate at Qn / Qmin (50/30°C) *</td>
<td>g/s</td>
<td>225.9 / 26</td>
<td>239.5 / 26.6</td>
<td>327 / 41</td>
</tr>
<tr>
<td>Exhaust temperature at Qn / Qmin (80/60°C) *</td>
<td>°C</td>
<td>61 / 54.7</td>
<td>60.8 / 55.1</td>
<td>60.3 / 54.5</td>
</tr>
<tr>
<td>Exhaust temperature at Qn / Qmin (50/30°C) *</td>
<td>°C</td>
<td>35.4 / 30.7</td>
<td>37.1 / 31</td>
<td>36 / 29.3</td>
</tr>
<tr>
<td>Firebox pressure at nominal Qcal (B23)</td>
<td>Pa</td>
<td>132</td>
<td>162</td>
<td>152</td>
</tr>
<tr>
<td>Exhaust outlet interior diameter</td>
<td>mm</td>
<td>250</td>
<td>250</td>
<td>300</td>
</tr>
<tr>
<td>Maximum allowable nozzle pressure (B23P) at Qn / Qmin (80/60°C)*</td>
<td>Pa</td>
<td>127 / 3</td>
<td>151 / 3</td>
<td>177 / 3</td>
</tr>
<tr>
<td>Maximum allowable nozzle pressure (B23P) at Qn / Qmin (50/30°C)*</td>
<td>Pa</td>
<td>104 / 3</td>
<td>123 / 3</td>
<td>149 / 3</td>
</tr>
<tr>
<td>Combustion air flow rate at Qn * (15°C)</td>
<td>m³/h</td>
<td>704.8</td>
<td>820.2</td>
<td>999.6</td>
</tr>
<tr>
<td>NOx class</td>
<td></td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoke removal and air inlet type classifications</td>
<td></td>
<td>B23, B23P</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* values corresponding to a G20 setting.
### 3.3.1. **G31 Propane Gas (for relevant models and destination countries)**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>MODELS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>550</td>
</tr>
<tr>
<td>Nominal power $P_n$ (80/60°C)</td>
<td>kW</td>
</tr>
<tr>
<td>Nominal power when condensing $P$ (50/30°C)</td>
<td>kW</td>
</tr>
<tr>
<td>Nominal heat input $Q_n$</td>
<td>kW</td>
</tr>
<tr>
<td>Minimum heat input $Q_{min}$</td>
<td>kW</td>
</tr>
<tr>
<td>Gas flow rate at $P_n$</td>
<td>$m^3/h$</td>
</tr>
<tr>
<td>$CO_2$ value ranges</td>
<td>%</td>
</tr>
<tr>
<td>at $Q_{min}$: $9.8 % &lt; CO_2 &lt; 10.2 %$</td>
<td></td>
</tr>
<tr>
<td>at $Q_{max}$: $10.4 % &lt; CO_2 &lt; 10.8 %$</td>
<td></td>
</tr>
<tr>
<td>Flue-gas mass flow rate at $Q_n / Q_{min}$ (80/60°C)</td>
<td>g/s</td>
</tr>
<tr>
<td>Flue-gas mass flow rate at $Q_n / Q_{min}$ (50/30°C)</td>
<td>g/s</td>
</tr>
<tr>
<td>Flue-gas temperature at $Q_n / Q_{min}$ (80/60°C)</td>
<td>°C</td>
</tr>
<tr>
<td>Flue-gas temperature at $Q_n / Q_{min}$ (50/30°C)</td>
<td>°C</td>
</tr>
<tr>
<td>Appliance pressure at nominal $Q_{cal}$ (B23)</td>
<td>Pa</td>
</tr>
<tr>
<td>Inside diameter of flue-gas output</td>
<td>mm</td>
</tr>
<tr>
<td>Maximum allowable nozzle pressure (B23P) at $Q_n / Q_{min}$ (80/60°C)</td>
<td>Pa</td>
</tr>
<tr>
<td>Maximum allowable nozzle pressure (B23P) at $Q_n / Q_{min}$ (50/30°C)</td>
<td>Pa</td>
</tr>
<tr>
<td>Combustion air flow rate at $Q_n$</td>
<td>$m^3/h$</td>
</tr>
<tr>
<td>NOx class</td>
<td>6</td>
</tr>
<tr>
<td>Flue-gas removal and air inlet type classifications</td>
<td>B23, B23P</td>
</tr>
</tbody>
</table>
### 3.4. Operating conditions

<table>
<thead>
<tr>
<th>Parameter</th>
<th>MODELS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max flow temperature setting °C</td>
<td>85</td>
</tr>
<tr>
<td>Max flow temperature °C</td>
<td>88</td>
</tr>
<tr>
<td>Maximum safe temperature °C</td>
<td>110</td>
</tr>
<tr>
<td>Max service pressure hPa (bar)</td>
<td>6000 (6)</td>
</tr>
<tr>
<td>Min cold pressure hPa (bar)</td>
<td>1000 (1)</td>
</tr>
<tr>
<td>Hydraulic pressure loss at ΔT 20 per generator daPa</td>
<td></td>
</tr>
<tr>
<td>Main exchanger Condenser</td>
<td>820</td>
</tr>
<tr>
<td>2 or 3 tapping version</td>
<td>1185</td>
</tr>
<tr>
<td>4 tapping version</td>
<td>770</td>
</tr>
<tr>
<td></td>
<td>970</td>
</tr>
<tr>
<td>Nominal water flow rate (P/20) VARMAX TWIN m³/h</td>
<td>23</td>
</tr>
<tr>
<td>Nominal water flow rate (P/20) per generator m³/h</td>
<td>11.5</td>
</tr>
<tr>
<td>Maximum water flow rate (P/10) per generator m³/h</td>
<td>23.0</td>
</tr>
<tr>
<td>Total water content (2 generators) L</td>
<td>478</td>
</tr>
<tr>
<td>Total weight without water (2 generators) kg</td>
<td>1050</td>
</tr>
<tr>
<td>Installation premises temperature (min / max) °C</td>
<td>5 / 45</td>
</tr>
<tr>
<td>Installation premises relative humidity</td>
<td>between 5% and 95%</td>
</tr>
<tr>
<td>Protection level</td>
<td>IP20</td>
</tr>
<tr>
<td>Maximum installation altitude m</td>
<td>2000</td>
</tr>
</tbody>
</table>

### 3.5. Electrical connection

<table>
<thead>
<tr>
<th>Parameter</th>
<th>MODELS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical supply V</td>
<td>230 V AC (+10% -15%), 50Hz</td>
</tr>
<tr>
<td>Electrical power consumed at Qn (excluding accessory) VARMAX TWIN W</td>
<td>476</td>
</tr>
<tr>
<td>Electrical power consumed in standby mode VARMAX TWIN W</td>
<td>704</td>
</tr>
<tr>
<td>Maximum length of sensor cables m</td>
<td>10</td>
</tr>
<tr>
<td>Power terminal output per generator V A</td>
<td>230V AC (+10%, -15%) 5 mA at 1A</td>
</tr>
</tbody>
</table>
4. INSTALLATION

4.1. Positioning the air filters and the filtering layers

**IMPORTANT:** The air filters provided with the generators MUST be installed.

The air filters must be installed before the gas lines are connected. Refer to the VARMAX generator's installation, usage and maintenance manual, paragraph "4-1 Positioning the air filter and the layer").

4.2. Installing the boiler

The VARMAX TWIN boilers must not be installed on an flammable surface (wooden floor, plastic floor covering, etc.).

**Recommended distances relative to walls and ceiling:**
Sufficient clearances must be provided to permit easy maintenance operations on the boilers.
The minimum values (in mm) are indicated in figure 2 and in the table below.

<table>
<thead>
<tr>
<th>MODELS</th>
<th>A*</th>
<th>B*</th>
<th>C</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>550</td>
<td>450</td>
<td>600</td>
<td>263</td>
<td></td>
</tr>
<tr>
<td>640</td>
<td>450</td>
<td>600</td>
<td>263</td>
<td></td>
</tr>
<tr>
<td>780</td>
<td>450</td>
<td>700</td>
<td>427</td>
<td></td>
</tr>
<tr>
<td>900</td>
<td>450</td>
<td>700</td>
<td>427</td>
<td></td>
</tr>
</tbody>
</table>

The greyed out zone above the boiler must remain free of any obstacles to enable the burner to be inspected and cleaned.

These values cannot be substituted for the specific regulatory requirements.

*figure 2 - Peripheral clearance*
• The 2 VARMAX generators must be positioned horizontally using a spirit level to enable effective gas release for the exchanger body (use the base as the reference surface).
• The space between the 2 VARMAX generators must be $450 \pm 10$ mm.
• A 2 cm free space must also be left above the side panels to allow for their disassembly and reassembly.
• The 2 generators must be in the same alignment and on the same horizontal level.

To adjust the flush level, screw or unscrew the 4 adjustable feet, using a 17 mm wrench.
4 Teflon plates are provided to facilitate the introduction of the 2 generators in relation to each other:

- Put one plate under each of the 4 feet of the generator to be moved,

![Teflon plates (x4)](image)

- Position the generator,
- Remove the Teflon plates.

### 4.3. Installing the LPB bus cable trays

Position the 2 trays for the LPB bus cable on the rear of the 2 generators and secure them using the 4 self-tapping screws provided.

![4 self-tapping screws provided](image)

The roof of each generator must be drilled (Ø 4 bit); to do so, use the trays as scale.
4.4. Opening / closing the casing doors

Refer to the VARMAX generator's installation, use and maintenance manual.

4.5. Removing the control panels (MMI)

Refer to the VARMAX generator's installation, use and maintenance manual.

4.6. Installing / removing the casing doors

Refer to the VARMAX generator's installation, use and maintenance manual.

4.7. Installing / removing the side panels

Refer to the VARMAX generator's installation, use and maintenance manual.

4.8. Installing / removing the upper panels

Refer to the VARMAX generator's installation, use and maintenance manual.

4.9. Step

Refer to the VARMAX generator's installation, use and maintenance manual.

4.10. Changing the gas type (G20 to G31)

WARNING: Changing the type of gas used must be performed on the two VARMAX generators.

WARNING: The use of Propane gas is forbidden on the 780 and 900 VARMAX TWIN models.

Refer to the VARMAX generator's installation, use and maintenance manual.
4.11. Exhaust connection

**IMPORTANT:** There is a specific connection for the exhausts to the VARMAX TWIN boilers. Do not refer to the VARMAX generator's installation, use and maintenance manual.

The size of the chimney pipes must be determined taking account of combustion gas pressure on boiler output equal to 0 Pa (see table § 3.3). You must comply with the regulatory texts and rules of the art that apply in the country where the boiler will be installed, i.e.:

**One exhaust temperature sensor per generator guarantees the protection of the combustion product evacuation ducts.**

The VARMAX TWIN boilers are approved to be connected to:
- a B23 chimney (all models)
- a B23P chimney (all models)

**INFORMATION:** The duct lengths provided below are in linear metres (ml). The total length of all the ducts is rounded to a straight-line length (the curves have a straight-line equivalent).

4.11.2. Installing the exhaust flue

The flue provided may be installed either to the right or the left of the VARMAX TWIN boiler.

Example with exhaust outlet to the left:

**figure 6 - Flue orientation**

**INFORMATION:** When assembling the flue, we recommend fitting the assembly on the ground then installing it on the 2 generators. At least 3 people are required to handle and secure the assembly.
### IMPORTANT:
The 2 collars delivered with the smoke works kit may be used to support the assembly either on the ceiling or on the ground (their position is "greyed out" on each T at 135° - figure 7).

### IMPORTANT:
During final connection to the generator exhaust outlet nozzles, make sure that there are not too many mechanical demands on the 2 offset increases (item 1) as this may create seal losses for the exhaust.
4.11.3. Connection to a B23 chimney

**B23 type connection:**
Air from the installation premises, gas evacuation through the roof via a natural draft pipe.

**IMPORTANT:** Check that the boiler installation premises have high and low ventilation, that it conforms to current regulations and that it is not obstructed.

The size of the chimney pipes must be determined taking account of combustion gas pressure on boiler output equal to 0 Pa (see table § 3.3).

The exhaust extraction ducts must be made in a material resistant to the condensate that can form when the boiler is operating. These materials must also be able to withstand exhaust temperatures up to 120°C. Horizontal pipes must be avoided to limit condensation build-up.

Check that the combustion gas is evacuated via a sealed connection.

**WARNING:**

- Check:
  1. That the flue is not under pressure, with both generators operating.
  2. If one of the generators is operating at minimum power, that the other generator does not discharge into it.

Dimensioning recommendations based on a POUJOULAT type (Condensor type) supply:

**figure 8 - Sizing recommendations**
Exhaust duct height in linear metres (ml)
(in 50/30°C operating regime)

<table>
<thead>
<tr>
<th>ø connection ø duct</th>
<th>250 mm</th>
<th>300 mm</th>
<th>350 mm</th>
<th>400 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>G20</td>
<td>G31</td>
<td>G20</td>
<td>G31</td>
</tr>
<tr>
<td>MODELS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>550</td>
<td>15 to 50</td>
<td>16 to 50</td>
<td>3 to 50</td>
<td>3 to 50</td>
</tr>
<tr>
<td>640</td>
<td>16 to 50</td>
<td>--</td>
<td>3 to 50</td>
<td>5 to 50</td>
</tr>
<tr>
<td>780</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>900</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

**WARNING:** The values below are provided for information purposes. They must be checked by calculation.

**WARNING:** The VARMAX TWIN flue must not be made to support the exhaust duct's weight.

4.11.4. Connection to a B23P chimney

**B23P type connection:**
Air from the installation premises, gas evacuation through the roof via a pressurised duct.

**IMPORTANT:** Check that the boiler installation premises have high and low ventilation, that it conforms to current regulations and that it is not obstructed.

**WARNING:** For B23P type connection, it is VITAL to use ducts with CONDENSOR (Poujoulat) type CSTB notice (pressurised ducts).

**WARNING:** The combustion product extraction duct must be dimensioned by using the parameters set out in the table in chapter 3.3. Depending on the actual configuration of the duct, a calculation is required to check that the pressures at the boiler outlet do not exceed the maximum allowable values (200 Pa). Values corresponding to the 50/30°C regime are to be used for this calculation.

Dimensioning recommendations based on a POUJOULAT (Condensor type) supply: See the figure on the previous page.
Exhaust duct height in linear metres (ml)
(in 50/30°C operating regime)

<table>
<thead>
<tr>
<th>Ø connection Ø duct Gas type</th>
<th>250 mm 250 mm</th>
<th>300 mm 300 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø connection Ø duct Gas type</td>
<td>G20 G31 G20 G31</td>
<td>-- -- -- --</td>
</tr>
<tr>
<td>550</td>
<td>1 to 100 1 to 100 -- --</td>
<td></td>
</tr>
<tr>
<td>640</td>
<td>1 to 100 1 to 100 -- --</td>
<td></td>
</tr>
<tr>
<td>780</td>
<td>-- -- 1 to 100 --</td>
<td></td>
</tr>
<tr>
<td>900</td>
<td>-- -- 1 to 100 --</td>
<td></td>
</tr>
</tbody>
</table>

**WARNING:**
The values below are provided for information purposes. They must be checked by calculation.

**WARNING:**
The VARMAX TWIN flue must not be made to support the exhaust duct's weight.

### 4.12. Hydraulic connection

A water circulation pump integrated into each generator and a smart regulation logic enable optimum operation up to Pinst/30 (Pinst = Instant output power expressed as Th/h - 1Th/h = 1.163 kW). Below this rate of Pinst/30, the generators will continue to operate, but will gradually reduce their power (shutdown below Pinst/46).

In the main exchanger, as in the condenser on each generator, you must ensure that the rates recommended in paragraph 3.4 are not exceeded (i.e. Output power in nominal Th/h generator / 10).

**Therefore, a differential pressure valve must be integrated into the circuit according to the diagram.**

Sizing the pipes connecting the boiler to the installation must be done carefully, to minimise the pressure losses and so avoid oversized circulating pumps.

In some cases the diameter of the connection pipes will be greater than the diameter of the boiler tappings. The diameter increase can then be made advantageously after the union connectors, the stop valves, and/or the hydraulic balancing valves.

Tichelmann assembly encourages a natural balance of the flow rate between the 2 generators.

The VARMAX TWIN boilers are equipped with the following elements:

- A drainage valve on each generator's main exchanger,
- A drainage valve on each generator's condenser.
In accordance with the diagram, it is imperative to fit the boiler and its installation with the following components:
• powered isolating valve (with an end of run contact*) on the flow tapping on each generator’s main exchanger,
• balancing / isolating valve on each generator’s return tapping,
• anti-return flap,
• filters,
• mud cup,
• expansion vessel,
• effective drain mechanism,
• safety valve set at 6 bars, on each generator, sized according to each generator's heat output (see location figure 1 page 8).
• disconnector on the boiler's filling circuit in relation to the supply network.

(*) The end of run contact only allows the generator to start up when full opening is reached.

The VARMAX TWIN are delivered either in 2/3 tapping connection version or in 4 tapping connection version. A 2/3 tapping version cannot be converted into a 4 tapping version and vice versa.

4.12.1. Hydraulic connection using 2 tappings

![Diagram of hydraulic connection using 2 tappings]

*figure 9 - Hydraulic connection using 2 tappings*
4.12.2. **Hydraulic connection using 3 tappings**

![Diagram of 3 tapping hydraulic connection](image1)

*figure 10 - Hydraulic connection using 3 tappings*

4.12.3. **Hydraulic connection using 4 tappings**

![Diagram of 4 tapping hydraulic connection](image2)

*figure 11 - Hydraulic connection using 4 tappings*
4.13. Gas connection

**IMPORTANT:**
- The gas must be connected on the 2 VARMAX generators
- The use of Propane is prohibited on the VARMAX TWIN 780 and 900 boilers.

Refer to the VARMAX generator's installation, use and maintenance manual.

4.14. Electrical connection

**WARNING:**
Ensure that the general electrical power supply has been cut off before starting any repair work.

**WARNING:**
You must respect the live (L) - neutral (N) polarity during electrical connection.

**IMPORTANT:**
The VARMAX generators must be connected to the earth and the national standards concerning low voltage electric installations in the country must be respected.
Provide a two pole circuit breaker upstream of EACH VARMAX GENERATOR (distance between contacts: 3.5 mm minimum).
Fitting the electrical installation with a 30 mA differential protective device is strongly advised.

Please refer to the installation and usage manual for the NAVISTEM B3000 boiler controller for information about the electrical connections to the control panel (electricity supply characteristics, cable section and connection to terminal blocks).

Refer to the VARMAX generator's installation, usage and maintenance manual for all information about accessing the generators' control panel and the cable runs.

4.14.1. Connecting the OCI345 communication modules

4.14.1.1. Installing the communication modules

The modules are installed on the NAVISTEM B3000 boiler controllers, located in the control panel for the 2 VARMAX generators.
On each VARMAX generator:
- Access the control panel and remove its protective cover.
- Secure the module to the boiler controller with the 2 screws supplied.

**figure 12 - OCI345 attachment**

- Connect the communication layer from the OCI345 module to the boiler controller's X11 connector (see previous figure).

**IMPORTANT:** Proceed carefully during connection.

### 4.14.1.2. Electrical connection

- Connect the VARMAX generators via the LPB bus (the LPB bus connects to the OCI345 communication module's DB and MB terminal blocks).

**figure 13 - LPB bus connection**

**WARNING:** The "LPB bus" cable must be run from generator 1's control panel to generator 2's control panel via the 2 generators' "low current" trays and via the "LPB bus cable run" trays (see § 4.3). Hold the cable using the cable clamps.
4.14.2. Connecting the QAZ36 flow sensor

4.14.2.1. Installing the sensor

The sensor must be placed in a pocket as close as possible to the 2 generators' common hydraulic output.

4.14.2.2. Electrical connection

- Connect the QAZ36 flow sensor to terminal block BX2 on generator 1's NAVISTEM B3000 boiler controller (see chapter 8).

![Warning: The sensor cable must be run to generator 1's control panel via the "low current" tray. Hold the cable using the cable clamps.]

![Diagram of flow sensor connection]

figure 14 - Flow sensor connection

4.14.3. Connection to the boiler controller's terminal blocks

Refer to the NAVISTEM B3000 boiler controller's manual.

5. START-UP (COMMISSIONING)

Refer to the VARMAX generator's installation, use and maintenance manual.

6. CHECKS AFTER COMMISSIONING

Refer to the VARMAX generator's installation, use and maintenance manual.

7. MAINTENANCE OPERATIONS

Refer to the VARMAX generator's installation, use and maintenance manual.
VARMAX TWIN - Installation, commissioning and servicing

8. HYDRAULIC DIAGRAMS AND CONFIGURATIONS

Management of secondary systems by external regulation

Management of secondary systems by ATLANTIC

Symbol | Function
--- | ---
| | Isolation valve open
| | 2-channel powered valve
| | Filter
| | Safety unit
| | Mud cup
| | External sensor
| | Balancing valve
| | 3-channel powered valve
| | Anti-return flap
| | Pump
| | Bleed valve
| | Temperature sensor

VX200
1 direct network

VX220
1 network regulated by 3-channel valve and 1 circuit with constant temperature and throughput

VX210
1 network regulated by V3V with accumulated DHW

VX202
3 or 4 networks regulated by 3-channel valve, without DHW

VX212
3 or 4 networks regulated by 3-channel valve, with semi-instantaneous DHW
1 direct network, no communication with the secondary

A. MAIN AND VARIANT HYDRAULIC DIAGRAMS

**Figure 15 - VX200 diagram**

**Figure 16 - VX201 diagram (variant)**
B. REGULATION ACCESSORIES REQUIRED

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Appliance reference</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>OCI 345</td>
<td>supplied</td>
</tr>
<tr>
<td>1</td>
<td>LPB BUS</td>
<td>supplied</td>
</tr>
<tr>
<td>1</td>
<td>QAZ 36</td>
<td>supplied</td>
</tr>
<tr>
<td>1</td>
<td>QAC 34</td>
<td>059260</td>
</tr>
</tbody>
</table>

C. CUSTOMER’S ELECTRICAL CONNECTION

Generator No. 1:

**INFORMATION:** If the isolation valve is not equipped with an automatic reset valve, connect the Q1.1 isolating valve’s closure contact to Y2.

![Diagram VX200: Circulation pump on direct circuit Q2](image)

Diagram VX200: Insulating valve Q1.1 Alarm relay

Mains supply 230 VAC 50 Hz

![Diagram VX200](image)

Generator No. 2:

**INFORMATION:** If the isolation valve is not equipped with an automatic reset valve, connect the Q1.2 isolating valve’s closure contact to Y2.

![Diagram VX200](image)
D. SPECIFIC START-UP PROCEDURE

☞ Make the accessories’ electrical connections.
☞ Start up the generator on its own.
☞ Make the following settings:

**On generator No. 1**

- **Set the date and time: Time and date menu**
  - Set the time: Hour / minute (1) HH.MM
  - Set the date: Day / month (2) DD.MM
  - Set the year: Year (3) YYYY

- **Configure the isolating valve and its end of run: Configuration menu**
  - Valve command: Relay output QX3 (5892)
  - End of run: Input H5 (5977)

- **Configuration menu**
  - Start up heating circuit 1: Heating circuit 1 (5710) Start
VARMAX TWIN - Installation, commissioning and servicing

Diagrams: VX200 / VX201

<table>
<thead>
<tr>
<th>Line No.</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**VX200 diagram only:**

Configure pump Q2

Relay output QX2 (5891) Pump CC1 Q2

**All diagrams:**

Configure TWIN B10 output sensor

BX2 sensor input (5931) Common flow sensor B10

• **Configure as generator No. 1: LPB network menu**

| Appliance number | Appliance address (6600) | 1 |
| Segment number   | Segment address (6601)   | 0 |
| Adjust the bus supply | Bus supply function (6604) | Automatic |
| Adjust the clock rate | Clock operation (6640) | Master |
| Return the messages from generator 2 | Display system messages (6610) | Yes |
| Activate relay K10 if generator 2 is at fault | Syst messages alarm relay (6611) | Yes |

• **Adjust the heating circuit Heating circuit 1 menu**

| Adjust the comfort setting | Comfort setting temperature (710) | - - - |
| Adjust the curve slope | Heating curve slope (720) | - - - |

• **Switch the heating regime to permanent comfort**

**On generator No. 2**

• **Configure the isolating valve and its end of run: Configuration menu**

| Valve command | Relay output QX3 (5892) | K37 exhaust flap |
| End of run    | Input H5 (5977)         | Exhaust flap info return |

• **Configure as generator No. 2: LPB network menu**

| Appliance number | Appliance address (6600) | 2 |
| Segment number   | Segment address (6601)   | 0 |
| Adjust the bus supply | Bus supply function (6604) | Automatic |
| Adjust the clock rate | Clock operation (6640) | Slave without adjustment |

• Make sure that the communication cable is fully connected between the 2 generators (\(\Delta\) respect the polarity).

• Switch off and back on again generator 2. If the communication has been correctly established, the clock is updated correctly.
E. ELECTRICAL AND HYDRAULIC VALIDATION

On generator No. 1

<table>
<thead>
<tr>
<th>Line No.</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Gener 1 status (8100) Released / not released</td>
</tr>
<tr>
<td></td>
<td>Gener 2 status (8101) Released / not released</td>
</tr>
</tbody>
</table>

Flow diagnostic menu

Validate the presence of all the generators

Inputs/outputs test menu

Check the outputs

Alarm relay

Pump Q2 (VX200 diagram)

Isolating valve Q1.1

Reset the outputs

Check the sensor values

External sensor B9

TWIN B10 output sensor

Configuration menu

Check the hydraulic diagram

On generator No. 2

Inputs/outputs test menu

Check the outputs

Alarm relay

Isolating valve Q1.2

Reset the outputs

Configuration menu

Check the hydraulic diagram
F. CONFIGURATION OPTIMISATION

On generator No. 1

Heating circuit optimisation:

<table>
<thead>
<tr>
<th>Line No.</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>• Heating circuit 1 menu</td>
<td></td>
</tr>
<tr>
<td>Adjust the reduced setting</td>
<td>Reduced setting temperature (712) - - -</td>
</tr>
<tr>
<td>• Heating circuit 1 timer programme menu</td>
<td></td>
</tr>
<tr>
<td>Preselection</td>
<td>Preselection (500) - - -</td>
</tr>
<tr>
<td>Adjust the timer programming</td>
<td>On / off phases (501...506) - - -</td>
</tr>
<tr>
<td>• Heating circuit 1 holiday menu</td>
<td></td>
</tr>
<tr>
<td>Preselection</td>
<td>Preselection (641) - - -</td>
</tr>
<tr>
<td>Adjust the timer programming</td>
<td>On / off phases (642--643) - - -</td>
</tr>
</tbody>
</table>

• Switch the heating regime to automatic Auto

VARMAX TWIN optimisation:
The Varmax Twin may be optimised as necessary using the parameters in the Flow menu. Refer to the NAVISTEM B3000 boiler's controller manual for more details.

Maintenance optimisation
A maintenance message may be generated that does not set the generator to fault. This maintenance message may be displayed after the following 3 counters have expired:

• Time since last maintenance (or commissioning): set parameter 7044 to 12 months (Maintenance / Special regime menu)
• Burner's operating hours (parameter 7040 - menu Maintenance / Special regime menu)
• Number of starts (parameter 7042 - menu Maintenance / Special regime menu)

These last 2 parameters are dependent on the boiler's hydraulic installation. We recommend using at least parameter 7044 for annual maintenance.
A. HYDRAULIC DIAGRAM

B. REGULATION ACCESSORIES REQUIRED

<table>
<thead>
<tr>
<th></th>
<th>Quantity</th>
<th>Appliance reference</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication kit</td>
<td>2</td>
<td>OCI 345</td>
<td>supplied</td>
</tr>
<tr>
<td>Communication cable</td>
<td>1</td>
<td>LPB BUS</td>
<td>supplied</td>
</tr>
<tr>
<td>Output sensor kit</td>
<td>1</td>
<td>QAZ 36</td>
<td>supplied</td>
</tr>
</tbody>
</table>
C. CUSTOMER'S ELECTRICAL CONNECTION

**Generator No. 1:**

**INFORMATION:** If the isolation valve is not equipped with an automatic reset valve, connect the Q1.1 isolating valve's closure contact to Y2.

**Diagram: VX211**

**Generator No. 2:**

**INFORMATION:** If the isolation valve is not equipped with an automatic reset valve, connect the Q1.2 isolating valve's closure contact to Y2.
D. SPECIFIC START-UP PROCEDURE

☞ Make the accessories’ electrical connections.
☞ Start up the generator on its own.
☞ Make the following settings:

**On generator No. 1**

- **Time and date menu**
  
<table>
<thead>
<tr>
<th>Line No.</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
  
  | Hour / minute (1) | HH.MM |
  | Day / month (2)   | DD.MM |
  | Year (3)          | YYYY  |

- **Configure the isolating valve and its end of run: Configuration menu**
  
  | Valve command                | Relay output QX3 (5892) |
  | End of run                   | K37 exhaust flap |
  | Input H5 (5977)              | Exhaust flap info return |

- **Configuration menu**
  
  | Configure the TWIN B10 output sensor | BX2 sensor input (5931) |
  |                                      | Common flow sensor B10 |

Diagram: VX211
**For a request via 0...10V input**

Configure the H1 input

<table>
<thead>
<tr>
<th>Line No.</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1 input function (5950)</td>
<td>10V consumption circ. request</td>
</tr>
<tr>
<td>H1 voltage 1 value (5953)</td>
<td>0.0</td>
</tr>
<tr>
<td>H1 function value (5954)</td>
<td>0</td>
</tr>
<tr>
<td>H1 voltage 2 value (5955)</td>
<td>10.0</td>
</tr>
<tr>
<td>H1 function 2 value (5956)</td>
<td>1000 (for equivalence 10 V = 100 °C)</td>
</tr>
</tbody>
</table>

**For a request via LPB**

Check that the secondary regulatory is defined on an LPB segment other than 0 (reserved for the generators)

**In all cases (LPB network menu)**

Configure as generator No. 1

| Appliance address (6600)                      | 1                                          |
| Segment address (6601)                       | 0                                          |
| Bus supply function (6604)                   | Automatic                                  |
| Clock operation (6640)                       | Master                                     |

Return the messages from generator 2

| Display system messages (6610)               | Yes                                        |

Activate relay K10 if generator 2 is at fault

| Syst messages alarm relay (6611)             | Yes                                        |

**On generator No. 2**

- **Configure the isolating valve and its end of run: Configuration menu**
  
  Valve command
  End of run

<table>
<thead>
<tr>
<th>Relay output QX3 (5892)</th>
<th>K37 exhaust flap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input H5 (5977)</td>
<td>Exhaust flap info return</td>
</tr>
</tbody>
</table>

- **LPB network menu**

  Configure as generator No. 2

  | Appliance address (6600) | 2                                      |
  | Segment address (6601)  | 0                                      |
  | Bus supply function (6604) | Automatic                |
  | Clock operation (6640)  | Slave without adjustment              |

- Make sure that the communication cable is fully connected between the 2 generators (⚠️ respect the polarity).

- Switch off and back on again generator 2. If the communication has been correctly established, the clock is updated correctly.
E. ELECTRICAL AND HYDRAULIC VALIDATION

On generator No. 1

- **Flow diagnostic menu**
  
  Validate the presence of all the generators

  | Line No. | Value
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Gener 1 status (8100)</td>
<td>Released / not released</td>
</tr>
<tr>
<td>Gener 2 status (8101)</td>
<td>Released / not released</td>
</tr>
</tbody>
</table>

- **For a request via 0...10V input**

<table>
<thead>
<tr>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>To be validated with the voltage sent by the boiler room's PLC</td>
</tr>
</tbody>
</table>

- **Inputs/outputs test menu**

  Voltage in H1

<table>
<thead>
<tr>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1 voltage signal (7840)</td>
</tr>
</tbody>
</table>

- **For a request via LPB**

  If the boiler room's regulator is configured as slave clock, it must retrieve the date and time.

<table>
<thead>
<tr>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>To be validated with the voltage sent by the boiler room's PLC</td>
</tr>
</tbody>
</table>

- **Inputs/outputs test menu**

  Check the outputs

<table>
<thead>
<tr>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relay test (7700)</td>
</tr>
<tr>
<td>Relay output QX1</td>
</tr>
<tr>
<td>Relay test (7700)</td>
</tr>
<tr>
<td>Relay output QX3</td>
</tr>
<tr>
<td>Relay test (7700)</td>
</tr>
<tr>
<td>No test</td>
</tr>
</tbody>
</table>

  Check the sensor values

<table>
<thead>
<tr>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>External T° B9 (7730) in °C</td>
</tr>
<tr>
<td>BX2 sensor T° (7821) in °C</td>
</tr>
</tbody>
</table>

- **Configuration menu**

  Check the hydraulic diagram

<table>
<thead>
<tr>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generator 1 inspection No. (6212) 14</td>
</tr>
<tr>
<td>Generator 2 inspection No. (6213) 0</td>
</tr>
<tr>
<td>DHW information (6215) 0</td>
</tr>
<tr>
<td>Information about heating circuits 3, 2 and 1 (6217) 0</td>
</tr>
</tbody>
</table>
On generator No. 2

- **Inputs/outputs test** menu
  
  Check the outputs
  
<table>
<thead>
<tr>
<th>Line No.</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarm relay</td>
<td>Relay test (7700)</td>
</tr>
<tr>
<td>Isolating valve Q1.2</td>
<td>Relay test (7700)</td>
</tr>
<tr>
<td>Reset the outputs</td>
<td>Relay test (7700)</td>
</tr>
</tbody>
</table>

- **Configuration** menu
  
  Check the hydraulic diagram
  
<table>
<thead>
<tr>
<th>Line No.</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generator 1 inspection No. (6212)</td>
<td>14</td>
</tr>
<tr>
<td>Generator 2 inspection No. (6213)</td>
<td>0</td>
</tr>
<tr>
<td>DHW information (6215)</td>
<td>0</td>
</tr>
<tr>
<td>Information about heating circuits 3, 2 and 1 (6217)</td>
<td>0</td>
</tr>
</tbody>
</table>

**F. CONFIGURATION OPTIMISATION**

**VARMAX TWIN optimisation:**

The Varmax Twin may be optimised as necessary using the parameters in the *Flow* menu. Refer to the NAVISTEM B3000 boiler's controller manual for more details.

**Maintenance optimisation**

A maintenance message may be generated that does not set the generator to fault. This maintenance message may be displayed after the following 3 counters have expired:

- Time since last maintenance (or commissioning): set parameter 7044 to 12 months 
  *(Maintenance / Special regime menu)*
- Burner's operating hours (parameter 7040 - menu *Maintenance / Special regime* menu)
- Number of starts (parameter 7042 - menu *Maintenance / Special regime* menu)

These last 2 parameters are dependent on the boiler's hydraulic installation. We recommend using at least parameter 7044 for annual maintenance.
1 network regulated by three-channel valve, DHW production, or 1 direct circuit with constant temperature and flow rate

A. HYDRAULIC DIAGRAM

**figure 18 - VX210 diagram**

**figure 19 - VX220 diagram**
B. REGULATION ACCESSORIES REQUIRED

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Appliance reference</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>AVS 75</td>
<td>059751</td>
</tr>
<tr>
<td>2</td>
<td>OCI 345</td>
<td>supplied</td>
</tr>
<tr>
<td>1</td>
<td>LPB BUS</td>
<td>supplied</td>
</tr>
<tr>
<td>1</td>
<td>QAZ 36</td>
<td>supplied</td>
</tr>
<tr>
<td>1</td>
<td>QAZ 36 059261</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>QAC 34 059260</td>
<td></td>
</tr>
</tbody>
</table>

C. CUSTOMER’S ELECTRICAL CONNECTION

**Generator No. 1:**

**INFORMATION:** If the isolation valve is not equipped with an automatic reset valve, connect the Q1.1 isolating valve’s closure contact to Y2.

Diagram VX210: DHW circulation pump Q3
Diagram VX220: Direct circulation pump Q15

Insulating valve Q1.1
Alarm relay

Mains supply 230 VAC 50 Hz

LPB bus

→ If an external management system (e.g. PLC) or a command pump (boiler, heating and/or DHW circuit) is connected, refer to § 9.4 (Varmax) for the specific configuration.
**Generator No. 2:**

**INFORMATION:**
If the isolation valve is not equipped with an automatic reset valve, connect the Q1.2 isolating valve’s closure contact to Y2.
D. SPECIFIC START-UP PROCEDURE

Make the accessories’ electrical connections.

IMPORTANT: Configure the switches on the AVS75 extension module.

Start up the generator on its own.

Make the following settings:

On generator No. 1

<table>
<thead>
<tr>
<th>Line No.</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hour / minute</td>
<td>HH.MM</td>
</tr>
<tr>
<td>Day / month</td>
<td>DD.MM</td>
</tr>
<tr>
<td>Year</td>
<td>YYYY</td>
</tr>
</tbody>
</table>

**Time and date menu**

- Set the time
- Set the date
- Set the year

**Configure the isolating valve and its end of run: Configuration menu**

- Valve command
- End of run

**Configuration menu**

- Configure the DHW pump *(VX210 diagram)*
- Configure the Q15 pump *(VX220 diagram)*
- Configure the TWIN B10 output sensor
- Configure the H1 input *(VX220 diagram)*
- Configure the extension module

**Configure as generator No. 1: LPB network menu**

- Appliance number
- Segment number
- Adjust the bus supply
- Adjust the clock rate
- Return the messages from generator 2
- Activate relay K10 if generator 2 is at fault

- Appliance address
- Segment address
- Bus supply function
- Clock operation
- Display system messages
- Syst messages alarm relay

- 1
- 0
- Automatic
- Master
- Yes
- Yes
• **Heating circuit 1 menu**
  - Adjust the comfort setting
  - Adjust the curve slope

• **Domestic hot water menu**
  - Adjust the comfort setting

• Switch the heating regime to permanent comfort

**VX210 diagram only:**

• **Domestic hot water menu**
  - Adjust the comfort setting

**VX220 diagram only:**

• **Consumption circuit 1 menu**
  - Set the output setting to be taken into account if the consumption circuit is requested

**On generator No. 2**

• Configure the isolating valve and its end of run: **Configuration menu**
  - Valve command
  - End of run
  - K37 exhaust flap
  - Exhaust flap info return

• Configure as generator No. 2: **LPB network menu**
  - Appliance number
  - Segment number
  - Adjust the bus supply
  - Adjust the clock rate

• Make sure that the communication cable is fully connected between the 2 generators (respect the polarity).

• Switch off and back on again generator 2. If the communication has been correctly established, the clock is updated correctly.
E. ELECTRICAL AND HYDRAULIC VALIDATION

On generator No. 1

• **Flow diagnostic** menu
  Validate the presence of all the generators
  
<table>
<thead>
<tr>
<th>Line No.</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gener 1 status (8100)</td>
<td>Released / not released</td>
</tr>
<tr>
<td>Gener 2 status (8101)</td>
<td>Released / not released</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

• **Inputs/outputs test** menu
  Check the outputs

<table>
<thead>
<tr>
<th></th>
<th>Line No.</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarm relay</td>
<td>Relay test (7700)</td>
<td>Relay output QX1</td>
</tr>
<tr>
<td>DHW pump Q3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(VX210 diagram)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant circuit pump Q15</td>
<td>Relay test (7700)</td>
<td>Relay output QX2</td>
</tr>
<tr>
<td>(VX220 diagram)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heating circuit 3-channel valve opening</td>
<td>Relay test (7700)</td>
<td>Relay output QX21 module 1</td>
</tr>
<tr>
<td>Heating circuit 3-channel valve closure</td>
<td>Relay test (7700)</td>
<td>Relay output QX22 module 1</td>
</tr>
<tr>
<td>Heating circuit pump</td>
<td>Relay test (7700)</td>
<td>Relay output QX23 module 1</td>
</tr>
<tr>
<td>Reset the outputs</td>
<td>Relay test (7700)</td>
<td>No test</td>
</tr>
</tbody>
</table>

  Check the sensor values

<table>
<thead>
<tr>
<th></th>
<th>Line No.</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>External sensor B9</td>
<td>External T° B9 (7730)</td>
<td>in °C</td>
</tr>
<tr>
<td>DHW sensor B3</td>
<td>DHW temperature B3/B38 (7750)</td>
<td>in °C</td>
</tr>
<tr>
<td>B1 flow sensor</td>
<td>Temperature sensor BX21 module 1 (7830)</td>
<td>in °C</td>
</tr>
</tbody>
</table>

• **Configuration** menu
  Check the hydraulic diagram

<table>
<thead>
<tr>
<th></th>
<th>Line No.</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generator 1 inspection No. (6212)</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Generator 2 inspection No. (6213)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>DHW information (6215)</td>
<td>4 (VX210 diagram)</td>
<td>0 (VX220 diagram)</td>
</tr>
<tr>
<td>Information about heating circuits 3, 2 and 1 (6217)</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>
On generator No. 2

- **Inputs/outputs test** menu
  
  Check the outputs
  
  - Alarm relay
  
  - Isolating valve Q1.2
  
  - Reset the outputs

- **Configuration** menu
  
  Check the hydraulic diagram

<table>
<thead>
<tr>
<th>Line No.</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generator 1 inspection No. (6212)</td>
<td>14</td>
</tr>
<tr>
<td>Generator 2 inspection No. (6213)</td>
<td>0</td>
</tr>
<tr>
<td>DHW information (6215)</td>
<td>0</td>
</tr>
<tr>
<td>Information about heating circuits 3, 2 and 1 (6217)</td>
<td>0</td>
</tr>
</tbody>
</table>

F. CONFIGURATION OPTIMISATION

**Heating circuit optimisation:**

- **Heating circuit 1** menu
  
  Adjust the reduced setting
  
  Reduced setting temperature (712) - - -

- **Heating circuit 1 timer programme** menu
  
  Preselection
  
  Preselection (500) - - -

  Adjust the timer programming
  
  On / off phases (501...506) - - -

- **Heating circuit 1 holiday** menu
  
  Preselection
  
  Preselection (641) - - -

  Adjust the timer programming
  
  On / off phases (642–643) - - -

- Switch the heating regime to automatic
  
  Auto

**DHW optimisation:**

- **Domestic hot water** menu
  
  Adjust the comfort setting
  
  Reduced setting (1612) - - -
Adjust the DHW release mode

• **Timer programme 4/DHW menu**
  - Preselection
  - Adjust the timer programming

• **DHW tank menu**
  - Adjust the over value

**VX210 diagram only:**

• **Domestic hot water menu**
  - Configure an Anti-Legionnaires’ Disease function
  - Anti-Legionnaires’ Disease function (1640)
  - Periodic Anti-Legionnaires’ Disease function (1641)
  - Day week Anti-Legionnaires’ Disease function (1642)
  - Anti-Legionnaires’ Disease setting temperature (1645)
  - Anti-Legionnaires’ Disease function duration (1646)

**VARMAX TWIN optimisation:**

The Varmax Twin may be optimised as necessary using the parameters in the *Flow* menu. Refer to the NAVISTEM B3000 boiler's controller manual for more details.

**Maintenance optimisation**

A maintenance message may be generated that does not set the generator to fault. This maintenance message may be displayed after the following 3 counters have expired:

• Time since last maintenance (or commissioning): set parameter 7044 to 12 months (*Maintenance / Special regime* menu)
• Burner's operating hours (parameter 7040 - menu *Maintenance / Special regime* menu)
• Number of starts (parameter 7042 - menu *Maintenance / Special regime* menu)

These last 2 parameters are dependent on the boiler's hydraulic installation. We recommend using at least parameter 7044 for annual maintenance.
A. MAIN AND VARIANT HYDRAULIC DIAGRAMS

3 or 4 networks regulated by three-channel valve, with or without DHW production

Diagram
VX202
VX212

figure 20 - VX202 diagram

figure 21 - VX212 diagram (variant)
B. REGULATION ACCESSORIES REQUIRED

<table>
<thead>
<tr>
<th>Extension module kit (delivered with a network sensor QAD 36)</th>
<th>3 (4)</th>
<th>AVS 75</th>
<th>059751</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication kit</td>
<td>2</td>
<td>OCI 345</td>
<td>supplied</td>
</tr>
<tr>
<td>Communication cable</td>
<td>1</td>
<td>LPB BUS</td>
<td>supplied</td>
</tr>
<tr>
<td>Output sensor kit</td>
<td>1</td>
<td>QAZ 36</td>
<td>supplied</td>
</tr>
<tr>
<td>Output sensor kit</td>
<td>1</td>
<td>QAC 34</td>
<td>059260</td>
</tr>
<tr>
<td>DHW sensor kit <em>(VX212 diagram)</em></td>
<td>1</td>
<td>QAZ 36</td>
<td>059261</td>
</tr>
</tbody>
</table>

C. CUSTOMER’S ELECTRICAL CONNECTION

**Generator No. 1:**

**INFORMATION:** If the isolation valve is not equipped with an automatic reset valve, connect the Q1.1 isolating valve’s closure contact to Y2.

![Diagram VX202 / VX212](image_url)

- If an external management system (e.g. PLC) or a command pump (boiler, heating and/or DHW circuit) is connected, refer to § 9.4 (Varmax) for the specific configuration.
**Generator No. 2:**

**INFORMATION:** If the isolation valve is not equipped with an automatic reset valve, connect the Q1.2 isolating valve's closure contact to Y2.
D. SPECIFIC START-UP PROCEDURE

☞ Make the accessories’ electrical connections.

⚠️ IMPORTANT: Configure the switches on the AVS75 extension modules.

☞ Start up the generator on its own.
☞ Carry out the adjustments below.
On generator No. 1

**Time and date menu**
- Set the time
  - Hour / minute (1) HH.MM
- Set the date
  - Day / month (2) DD.MM
- Set the year
  - Year (3) YYYY

**Configure the isolating valve and its end of run: Configuration menu**
- Valve command
  - Relay output QX3 (5892) K37 exhaust flap
- End of run
  - Input H5 (5977) Exhaust flap info return

**Configuration menu**
- Start up heating circuit 1
  - Heating circuit 2 (5710) Start
- Start up heating circuit 2
  - Heating circuit 2 (5715) Start
- Start up heating circuit 3
  - Heating circuit 3 (5721) Start

**VX212 diagram only:**
- Define a low heel
  - H1 input function (5950) Consumption circuit 1 request.
- Position a shunt on H1 OR reverse the contact direction
  - Contact type (5951) Normally-closed contact (NC)
- For the DHW to be effective, an activator must be defined, even if it is not connected
  - Relay output QX2 (5891) DHW pump/valve Q3

**Configure pump Q1**
- Relay output QX3 (5892) Boiler pump Q1

**Configure TWIN B10 output sensor**
- BX2 sensor input (5931) Common flow sensor B10

**Configure the extension modules**
- Extension module 1 function 1 (6020) Heating circuit 1
- Extension module 2 function 1 (6021) Heating circuit 2
- Extension module 3 function 1 (6022) Heating circuit 3

**Configure as generator No. 1: LPB network menu**
- Appliance number
  - Appliance address (6600) 1
- Segment number
  - Segment address (6601) 0
- Adjust the bus supply
  - Bus supply function (6604) Automatic
- Adjust the clock rate
  - Clock operation (6640) Master
- Return the messages from generator 2
  - Display system messages (6610) Yes
- Activate relay K10 if generator 2 is at fault
  - Syst messages alarm relay (6611) Yes
VARMAX TWIN - Installation, commissioning and servicing

**Diagrams: VX202 / VX212**

- **Heating circuit 1 / 2 / 3 menu**
  - Adjust the comfort setting
  - Adjust the curve slope

- **Domestic hot water menu**
  - Adjust the comfort setting
  - Adjust the DHW release mode

- **VX212 diagram only:**
  - **Consumption circuit 1 menu**
    - Set the output setting to be taken into account if the consumption circuit is requested
      - Cons request output setting (1859) 60 °C (depends on the Rubis setting)
  - **Domestic hot water menu**
    - Adjust the comfort setting
    - Adjust the DHW release mode

- **On generator No. 2**
  - **Configure the isolating valve and its end of run: Configuration menu**
    - Valve command
    - End of run
      - Relay output QX3 (5892)
      - Input H5 (5977)
  - **Configuration menu**
    - If 4th heating circuit present: Start up
      - Heating circuit 1
      - Configure the extension module
        - Extension module 1 function 1 (6020)
  - **Configure as generator No. 2: LPB network menu**
    - Appliance number
    - Segment number
    - Adjust the bus supply
    - Adjust the clock rate
      - Appliance address (6600) 2
      - Segment address (6601) 0
      - Bus supply function (6604) Automatic
      - Clock operation (6640) Slave without adjustment
If 4th heating circuit present:

- Adjust the heating circuit *Heating circuit 1* menu
  
  Adjust the comfort setting  
  Comfort setting temperature (710) - - -

- Adjust the curve slope  
  Heating curve slope (720) - - -

- Switch the heating regime to permanent comfort

- Make sure that the communication cable is fully connected between the 2 generators (⚠️ respect the polarity).

- Switch off and back on again generator 2. If the communication has been correctly established, the clock is updated correctly.

### E. ELECTRICAL AND HYDRAULIC VALIDATION

**On generator No. 1**

- **Flow diagnostic** menu
  
  Validate the presence of all the generators

<table>
<thead>
<tr>
<th>Line No.</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gener 1 status (8100)</td>
<td>Released / not released</td>
</tr>
<tr>
<td>Gener 2 status (8101)</td>
<td>Released / not released</td>
</tr>
</tbody>
</table>

- **Inputs/outputs test** menu
  
  Check the outputs

<table>
<thead>
<tr>
<th>Line No.</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarm relay</td>
<td>Relay test (7700) Relay output QX1</td>
</tr>
<tr>
<td>Isolating valve Q1.1</td>
<td>Relay test (7700) Relay output QX3</td>
</tr>
<tr>
<td>All the extension module relays</td>
<td>Relay test (7700) Relay output QX2... module ...</td>
</tr>
<tr>
<td>Reset the outputs</td>
<td>Relay test (7700) No test</td>
</tr>
</tbody>
</table>

  Check the sensor values

<table>
<thead>
<tr>
<th>Line No.</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>External sensor B9</td>
<td>External T° B9 (7730) in °C</td>
</tr>
<tr>
<td>DHW sensor B3 *(<em>VX212 diagram</em>)</td>
<td>DHW temperature B3/B38 (7750) in °C</td>
</tr>
<tr>
<td>TWIN B10 output sensor</td>
<td>BX2 sensor T° (7821) in °C</td>
</tr>
<tr>
<td>B1 flow sensor</td>
<td>Temperature sensor BX21 module 1 (7830) in °C</td>
</tr>
</tbody>
</table>
**On generator No. 2**

**Inputs/outputs test** menu
- Check the outputs
  - Alarm relay
  - Isolating valve Q1.2
  - Reset the outputs
- Check the sensor values (if 4th heating circuit present)
  - B1.2 flow sensor

**Configuration** menu
- Check the hydraulic diagram
- Information about heating circuits 3, 2 and 1 (6217) 30303
- Status of contact H1 (7841) Closed if the shunt is in place

**VARMAX TWIN - Installation, commissioning and servicing**

---

**Line No.** | **Value**
--- | ---
B12 flow sensor | Temperature sensor BX21 module 2 (7832) in °C
B14 flow sensor | Temperature sensor BX21 module 3 (7834) in °C

**VX212 diagram only:**
- Check the status of contact H1
- Generator 1 inspection No. (6212) 14
- Generator 2 inspection No. (6213) 0
- DHW information (6215) 0 (VX202 diagram)
- 4 (VX212 diagram)
- Information about heating circuits 3, 2 and 1 (6217) 30303

---

**F. CONFIGURATION OPTIMISATION**

**On generators 1 and 2**

**Heating circuit optimisation**

**Heating circuit 1 / 2 / 3** menu
- Adjust the reduced setting
  - Reduced setting temperature (712/1012/1312) - - -
DHW optimisation:

- **DHW tank** menu
  - Adjust the over value: Output setting temperature over value (5020) — 16 °C

**VARMAX TWIN optimisation:**
The Varmax Twin may be optimised as necessary using the parameters in the *Flow* menu. Refer to the NAVISTEM B3000 boiler's controller manual for more details.

**Maintenance optimisation**
A maintenance message may be generated that does not set the generator to fault. This maintenance message may be displayed after the following 3 counters have expired:

- Time since last maintenance (or commissioning): set parameter 7044 to 12 months (*Maintenance / Special regime* menu)
- Burner's operating hours (parameter 7040 - menu *Maintenance / Special regime* menu)
- Number of starts (parameter 7042 - menu *Maintenance / Special regime* menu)

These last 2 parameters are dependent on the boiler's hydraulic installation. We recommend using at least parameter 7044 for annual maintenance.
## 9. SPARE PARTS LIST

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESIGNATION</th>
<th>REF. FOR MODELS</th>
</tr>
</thead>
<tbody>
<tr>
<td>001</td>
<td>Offset increase with seal and grease</td>
<td>76479 76480</td>
</tr>
<tr>
<td>002</td>
<td>250 mm long straight element with seal and grease</td>
<td>76481 76482</td>
</tr>
<tr>
<td>003</td>
<td>90° curved element with seal and grease</td>
<td>76483 76484</td>
</tr>
<tr>
<td>004</td>
<td>260-400 mm long adjustable element with seal and grease</td>
<td>76485 76486</td>
</tr>
<tr>
<td>005</td>
<td>135° T with seal and grease</td>
<td>76487 76488</td>
</tr>
<tr>
<td>006</td>
<td>Measuring element with seal and grease</td>
<td>76489 76490</td>
</tr>
<tr>
<td>007</td>
<td>550 - 900 mm long adjustable element with seal and grease</td>
<td>76491 76492</td>
</tr>
<tr>
<td>008</td>
<td>Side drain buffer with seal and grease</td>
<td>76493 76494</td>
</tr>
<tr>
<td>009</td>
<td>Siphon</td>
<td>76477</td>
</tr>
<tr>
<td>010</td>
<td>Set of 5 seals with grease</td>
<td>76495 76496</td>
</tr>
<tr>
<td>011</td>
<td>30 ml tube of silicon grease</td>
<td>76478</td>
</tr>
<tr>
<td>012</td>
<td>Suspension collar for flue support</td>
<td>76497 76498</td>
</tr>
<tr>
<td>--</td>
<td>OCI 345 communication module</td>
<td>76168</td>
</tr>
<tr>
<td>--</td>
<td>LPB bus cable</td>
<td>76452</td>
</tr>
<tr>
<td>--</td>
<td>QAZ 36 sensor</td>
<td>62864</td>
</tr>
<tr>
<td>--</td>
<td>Set of 2 LPB bus cable trays with screws</td>
<td>76453</td>
</tr>
<tr>
<td>--</td>
<td>Set of 4 Teflon plates</td>
<td>76454</td>
</tr>
</tbody>
</table>
Hamworthy Heating Accredited Agents

North West England (Sales & Service)
Gillies Modular Services
210-218 New Chester Road, Birkenhead, Merseyside L41 9BG
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HEVAC Limited
Naas Road, Dublin 12, Ireland
tel: 00 353 141 91919  fax: 00 353 145 84806

Northern Ireland (Sales & Service)
HVAC Supplies Limited
Unit A6, Dargan Court, Dargan Crescent, Belfast BT3 9JP
tel: 02890 747737  fax: 02890 741233

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McDowall Modular Services
14-46 Lomond Street, Glasgow, Scotland G22 6JD
tel: 0141 336 8795  fax: 0141 336 8954

North East England (Service)
Allison Heating Products
12 Sunnyside Lane, Cleadon Village, Sunderland SR6 7XB
tel: 0191 536 8833  fax: 0191 536 9933

Hamworthy Heating Customer Service Centre

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Technical Enquiries
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Servicing
tel: 01202 662555

Spares
tel: 0845 450 2866

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Fleets Corner, Poole,
Dorset BH17 0HH.

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Fax: 01202 662522
Email: aftersales@hamworthy-heating.com
Website: www.hamworthy-heating.com

Hamworthy reserves the right to make changes and improvements which may necessitate alteration to the specification without prior notice.