Features

- Continuous, simultaneous, real-time monitoring of respiratory and anesthetic gases.
- IntelliVue G1 is fully integrated with the Philips IntelliVue MP20/30/40/50 families of anesthesia patient monitors.
- IntelliVue G5 is fully integrated with the Philips IntelliVue MP40/50/60/70/80/90 families of anesthesia patient monitors.¹
- Measurement of oxygen (optional for IntelliVue G1; standard for IntelliVue G5), carbon dioxide, nitrous oxide, halothane, isoflurane, enflurane, sevoflurane, desflurane.
- Manual anesthetic agent selection (IntelliVue G1).
- Automatic Agent Identification (IntelliVue G5) of up to two anesthetic agents.
- Inspiration and expiration values for all gases.
- Airway Respiration Rate (awRR), derived from CO₂ waveform.
- Minimum alveolar concentration values (MAC).
- Long-term stability offering easy and infrequent calibration.
- Individual alarm limits for each parameter.
- Quick access to the most commonly performed functions.

¹ In the USA & Canada, IntelliVue G5 is also integrated with MP 20/30.
Description

The M1013A IntelliVue G1 and the M1019A IntelliVue G5 provide a non-dispersive infrared measurement of respiratory and anesthetic gases and a paramagnetic measurement of oxygen (Fast O2).

The IntelliVue G1 is designed to work with the Philips IntelliVue MP20/30/40/50 Anesthesia option #H30 and the IntelliVue G5 with the MP40/50/60/70/80/901 Anesthesia option #H30 through a digital interface (RS232).

Both gas analyzers are intended for measuring the airway gases of ventilated patients during the induction of, maintenance of, and emergence from anesthesia.

The gas analyzers produce display waves for O2, CO2, N2O, and anesthetic agents, together with numerics for inspired and end-tidal values for O2, CO2, N2O, anesthetic agents, MAC values and airway respiration rate.

With the IntelliVue G1 an anesthetic agent must be selected manually for measurement.

The IntelliVue G5 automatically identifies two out of five anesthetic agents at a time.

An automatic zero calibration is performed by the IntelliVue G1 and IntelliVue G5 as required to maintain measurement accuracy.

Specifications

Physical

Size (H x W x D)
85 x 300 x 232 mm, (3.35 x 11.81 x 9.13 inches).

Weight
< 4 kg (8.8 lb.) net.

Safety

Complies with:
• IEC/EN 60601-1
• UL 60601-1
• CSA C22.2 No. 601.1-M90
• IEC/EN 60601-1-1
• IEC/EN 60601-1-2

Caution:
U.S. Federal Law restricts this device to sale by or on the order of a physician.

Environmental

Operating Temperature
10 to 40 ºC (50 to 104 ºF).

Storage
-20 to 65 ºC (-4 to 149 ºF).

Operating Humidity
5 to 90 % RH max at @ 40 ºC (104 ºF).

Storage Humidity
5 to 95 % RH max. at @ 65 ºC (149 ºF).

Operating Altitude
–305 to 2900 m, (–1,000 to 9,515 ft.).

Storage Altitude
–305 to 5000 m, (–1,000 to 16,404 ft.).

Sample Flow Rate
200 ml/minute (± 20 ml/min.).

Warmup Time
1-2 minutes to measure CO2, typically less than 6 minutes for full accuracy specifications.

Interface

RS-232-C (RJ45)

Calibration Interval
Annual Gas calibration test. Calibration is stable and normally only requires checking.

Units

mmHg, kPa, vol% for all gases,
(except for CO2, no vol%).

Power Requirements

• Input: 100 to 240 V ±10 % ac.
• Frequency: 50/60 Hz.
• Power consumption: 45 VA max.

1 In the USA and Canada, IntelliVue G5 is also integrated with MP20/30.
**Monitored Gases / Parameters**

- **O₂**
- **CO₂**
- **Airway Respiration Rate (awRR)**
- **N₂O**
- The anesthetic agents Halothane, Enflurane, Isoflurane, Sevoflurane and Desflurane. IntelliVue G1 can measure one of these manually selected agents at a time. IntelliVue G5 can automatically detect two of these agents at a time.
- **Minimum alveolar concentration (MAC) values**

**Oxygen Measurement**

*Range*

5 to 100 vol%.

*Accuracy*

± 3 vol%.

*Resolution*

1 vol%.

*Rise-time*

< 500 msec typical.

**Carbon Dioxide Measurement**

*Range*

0 to 76 mmHg.

*Accuracy*

± 0.5 vol% or 12 % relative, which ever is greater.

*Resolution*

1 mmHg.

*Rise-time*

350 msec typical

1. Accuracy specifications refer to BTPS for mmHg [kPa] and STPD for vol% at 40-60 % relative humidity. They refer to M1658A tubing and M1657B watertrap.

2. With 2.6m M1658A tubing and M1657B watertrap (10-90 % step response) at 25°C and 40% relative humidity.

**Nitrous Oxide Measurement**

*Range*

0 to 100 vol%.

*Accuracy*

2.0 % + 8 % relative.

*Resolution*

1 vol%.

*Rise-time*

500 msec typical

**Anesthetic Agent Measurement**

The IntelliVue G1 and IntelliVue G5 identify any of the following anesthetic agents.

For IntelliVue G1 the agent must be selected manually. IntelliVue G5 automatically identifies up to two of the following agents:

<table>
<thead>
<tr>
<th>Agent</th>
<th>Range (vol%)</th>
<th>Accuracy</th>
<th>Resolution (vol%)</th>
<th>Rise time typical (msec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Halothane</td>
<td>0 - 8.5</td>
<td>0.15 vol% + 15.0 % relative</td>
<td>0.05</td>
<td>&lt; 500</td>
</tr>
<tr>
<td>Enflurane</td>
<td>0 - 10.0</td>
<td>0.15 vol% + 15.0 % relative</td>
<td>0.05</td>
<td>&lt; 500</td>
</tr>
<tr>
<td>Isoflurane</td>
<td>0 - 8.5</td>
<td>0.15 vol% + 15.0 % relative</td>
<td>0.05</td>
<td>&lt; 500</td>
</tr>
<tr>
<td>Sevoflurane</td>
<td>0 - 10.0</td>
<td>0.15 vol% + 15.0 % relative</td>
<td>0.05</td>
<td>&lt; 500</td>
</tr>
<tr>
<td>Desflurane</td>
<td>0 - 20.0</td>
<td>0.15 vol% + 15.0 % relative</td>
<td>0.05</td>
<td>&lt; 500</td>
</tr>
</tbody>
</table>
Sample Delay Time
All measurements are subject to a delay of 5 seconds due to the length of the sampling path.

Total System Response Time
The Total System Response Time is the sum of Sample Delay Time and Rise Time.

Zero Calibration
The IntelliVue G1 and G5 request the first zero calibration not later than 5 minutes after power-on. In a steady state, a normal zero is performed not more than every 2 hours. The normal zero calibration lasts less than 21 seconds. The O₂ zero calibration is performed once as part of the startup and typically once every 4 months of continuous operation / standby state. An O₂ zero calibration can last up to 60 seconds.

Alarms

Limit Alarms
Limit alarms are provided for the numeric values displayed by the IntelliVue G1 and IntelliVue G5 (see table 2 below).

Table 2: Alarm Limits

<table>
<thead>
<tr>
<th>Gas</th>
<th>High Limit Range</th>
<th>Low Limit Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>etCO₂</td>
<td>20 - 76 mmHg</td>
<td>10 - 75 mmHg</td>
</tr>
<tr>
<td>imCO₂</td>
<td>0 - 20 mmHg</td>
<td>none</td>
</tr>
<tr>
<td>inN₂O</td>
<td>0 - 82 vol%</td>
<td>none</td>
</tr>
<tr>
<td>inO₂ (Optional)</td>
<td>19 - 100 vol%</td>
<td>18 - 99 vol%</td>
</tr>
<tr>
<td>in/et HAL/ISO/ENF</td>
<td>0.1 - 7.5 vol%</td>
<td>0.0 - 7.4 vol%</td>
</tr>
<tr>
<td>in/et SEV</td>
<td>0.1 - 9.0 vol%</td>
<td>0.0 - 8.9 vol%</td>
</tr>
<tr>
<td>in/et DES</td>
<td>0.2 - 20.0 vol%</td>
<td>0.0 - 19.8 vol%</td>
</tr>
<tr>
<td>awRR</td>
<td>10 - 60 rpm (Adult, Pediatric)</td>
<td>0 - 55 rpm</td>
</tr>
</tbody>
</table>

Alarm Delay
< 19 seconds if no automatic zero calibration occurs within that time.

Apnea Alarm

Adjustable Delay Range
10 - 40 seconds

Alarm Criterion
No detected breath within the adjusted delay time.

Apnea Alarm Delay
Within 2 seconds after this criterion is met, if no automatic zero calibration occurs.

INOP Alarms
Unique INOP messages and with or without an INOP tone are triggered on the host monitor if certain conditions occur.

The exact messages depend on the host monitor used and are described in the monitor’s accompanying documentation.

1With 2.6 m M1658A tubing and M1657B watertrap (10-90 % step response) at 25 °C and 40 % relative humidity.
Options

The following options are available for the IntelliVue G1

- #A01 - without O₂ measurement
- #A02 - with paramagnetic O₂ measurement

One of the following K-options must be ordered:

- #K11 - IntelliVue Interface Cable (1.5 m)
- #K12 - IntelliVue Interface Cable (3.0 m)

IntelliVue G5

One of the following K-options must be ordered:

- #K11 - IntelliVue Interface Cable (1.5 m)
- #K12 - IntelliVue Interface Cable (3.0 m)

Accessories

To ensure the specified performance of and to prevent possible damage to the M1013A IntelliVue G1 and the M1019A IntelliVue G5, only the following accessories may be used:

- M1658A Gas Sample Tube, 2.6 m
- M1657B Watertrap.
- 13902A Elbow Airway Adapter, 15 mm (right angle).
- M1612A Straight Airway Adapter.
- M1655A/B Gas Exhaust Return Line.
- M1656A/B Gas Exhaust Return Filter.

For service purposes, the following accessories may be used:

- M1662A Calibration Gas
- M1659A Calibration Bag.

Note: These accessories are not included with the IntelliVue G1 or the IntelliVue G5.

Documentation

The User’s Guide and Service and Installation Guide for this module are included in the documentation package shipped with the Philips IntelliVue Systems.

1. May not be available in all countries.