



**Pursuant to section 12 of
the Weights and Measures Act 1985
Certificate No 2680 Revision 4**

issued by:
The National Measurement Office

In accordance with the provisions of section 12 of the Weights and Measures Act 1985, the Secretary of State for Business, Innovation & Skills has issued this UK national type-approval certificate to:

**T + J Installations
Units A & B, Riverside Industrial Estate
Atherstone Street
Fazeley, Tamworth.
B78 3RW
United Kingdom**

and hereby certifies as suitable for use for trade the following pattern of a spirit-measuring instrument for use in dispensing intoxicating liquor in fixed quantities of 25 ml. The instrument uses bottle fed reservoirs to deliver liquor under pressure to multi-outlet delivery guns. Correct measure for each brand is achieved by means of precise control of both pressure and delivery time. A dispense is initiated by the momentary depression of a switch at the bar dispense point.

The necessary data (principal characteristics, alterations, securing, functioning etc) for identification purposes and conditions (when applicable) are set out in the descriptive annex to this certificate.

Note: This certificate relates to the suitability of the equipment for use for trade only in respect of its metrological characteristics. It does not constitute or imply any guarantee as to the safety of the equipment in use for trade or otherwise.

This revision replaces previous versions of the certificate.

Issue Date: 22 September 2014
Valid Until: 10 March 2023
Reference No: T1115/0004

Signatory: G Stones
for Chief Executive



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CERTIFICATION NO 2680

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CERTIFICATION NO 2680

Descriptive Annex

1 INTRODUCTION

This type of liquid measuring instrument is for use in dispensing intoxicating liquor (spirits) in fixed quantities of 25 ml. The instrument is supplied from reservoirs fed by a quantity of inverted bottles. Each reservoir feeds a constant pressure pump, which is driven by a constant pressure air source. The pumps transfer the air pressure to the 'liquor line'. Each liquor line couples to a multi-outlet delivery gun.

Each delivery gun has multiple liquor feeds and has a membrane keypad for selection of the requested liquor. Pressing the selected key couples to computer controlled equipment that opens the selected delivery port for a controlled period, thereby delivering the measure.

Connection to external computer systems via isolated and data protected communications ports, enables the dispensing data to be coupled to management data and stock control systems. A general system schematic is shown in Figure 1.

2 CONSTRUCTION

2.1 Mechanical

The equipment consists of the following components:

- air compressor;
- pressure sense switch;
- pressure regulator;
- air accumulator tank;
- constant pressure pumps;
- liquor reserves fitted with product sense switches;
- beverage tubing suitable for liquor;
- a spirits dispense gun (the Berg Laser™ dispenser);
- an electronic control unit (ECU).

2.1.1 Air Compressor – PN 8006355

The air required by the system is supplied with an industry standard air compressor.

2.1.2 Pressure Sense Switch – PN 8000212 (Figure 2)

Between the air compressor and the pressure regulator is a pressure sense switch wired to the orange insulated conductor of the pressure/level sense cable.

2.1.3 Pressure Regulator – PN 8009379 (Figure 3)

This is an industry standard gas pressure regulator.

2.1.4 Air Accumulator Tank – PN 8006539

This is a 2.5 US gallon (approximately 9.5 litres) stainless steel tank.

2.1.5 Constant Pressure Pump – PN 8009570 (Figure 4)

The pump units are two chamber diaphragm pumps powered by compressed air providing a constant pressure on the liquid in the lines. They are fitted with non-return valves to ensure the liquid is sent to the spirit dispense gun and not back to the reserve.

2.1.6 Liquor Reserve with Product Sense Switch – PN 8000200 (Figure 5)

The reserves are plastic units designed to securely hold inverted bottles. For each regulated product, there is a 2-wire product sense switch installed through the bottom of the reserve that is nearest the pump for that product.

2.1.7 Berg Laser™ Dispenser – PN 8009416 (Figure 6)

The Berg Laser dispenser consists of a stainless steel enclosure containing a separate solenoid valve for each brand of liquor. The dispenser is completed with a length of flexible stainless steel conduit enclosing the tubes that carry the liquor to the point of dispense. The dispenser pictured is the Berg Laser™ 1200, capable of controlling 12 separate products.

2.1.8 Electronic Control Unit (ECU) – PN 8009699 (Figure 7)

The pictured Infinity ECU is a powder coated aluminium enclosure containing the CPU used to control the dispensing operation.

2.2 Electrical

Mains power (230 V, 50 Hz) is supplied to the Infinity ECU which then supplies power to the dispenser.

2.3 Electronics

The CPU controls solid state switches that are used to power the liquor solenoid valves for the precise time needed for an accurate measure.

2.4 Legends

2.4.1 The capacity legend, 25 ml, is durably marked on the front face of the gun. See Figure 6.

2.4.2 The number of the certificate of approval and the supplier, preceded by the words "Cert No," is durably marked on each dispenser assembly (on the side of the part mounted on the underside of the bar) by means of a label. Label content is shown in Figure 8. The bar gun is also labelled with the manufacturers name:- Berg Laser™, - Berg Company.

2.4.3 The manufacturers name is also found on a label on the ECU.

2.5 Sealing and Stamping

2.5.1 The pressure cut out switch is located in a clear box so the gauge is visible. It is secured with 4 screws and there are two locations for wire and lead seals (Figure 2).

2.5.2 The air pressure regulator is secured in one of two ways. The first method uses a standard box with a clear cover is located over the regulator adjustment knob. The box is drilled to accept wire for sealing purposes. An optional alternative method employs a Norgren pre-set regulator. This is covered by a plastic collar which has pre-drilled lugs secured with nylon ties. This shall be sealed with wire and lead seal (Figure 3).

2.5.3 An alternative single clear fronted cabinet, housing the pressure sense switch and regulator are sealed at the top right hand corner and bottom left hand corner (see Figures 9, 10 and 11).

3 OPERATION

3.1 Dispense Sequence

With the system fully charged with liquid the bar gun switch for the required spirit is depressed. A valve in the Laser dispenser opens and the air pressure drives the liquid through the tube into the glass. When the required amount of liquid has dispensed the valve closes.

3.2 Interlocks

3.2.1 Pressure Sense Switch

Should the pressure drop, further dispensing is prevented until the pressure is restored.

3.2.2 Product Sense Switches

For each regulated product, there is a 2-wire product sense switch installed through the bottom of the reserve that is nearest the pump for that product. When 'low level' is detected in the reserve, further dispensing is prevented until the reserve has been replenished. Operation is such that the interlock operates well before the liquor line is run low. Thus, even the last delivery before cut-off will be full measure.

3.3 System set-up

The accuracy of dispense period is achieved on set-up. A portable PC with proprietary software is coupled to the ECU unit. Test dispenses are poured and measured by test measure or by weight. The results are fed back into the computer and after a few iterations, the correct dispense is attained. The PCs used for set-up are used by the installer and are removed from site after use. No subsequent adjustment is possible other than recalling the installers.

3.4 Software Security

The multiple levels of software security are:

- an embedded serial number;
- user settable network security code;
- user settable, function specific, security levels
- dispense times only settable with installer's special equipment.

3.4.1 Embedded Serial Number

Prevents using a rogue copy of the software to change data at an installation.

3.4.2 Network Security Code

Restricts access to the ECU to only the properly serialized copy of the software.

3.4.3 Management Settable, Function Specific, Security Levels

This tool is used to restrict access to any function by anyone not specifically authorised to perform that function. For example, functions such as network setup (access to the network security code), brand operations (where portion sizes are set), and calibration, as well as any other function, can be separable and/or collectively restricted.

3.4.4 As noted in 3.3 above, system set-up is performed with special equipment which is removed from site and is only available to the installers

4 AUTHORISED ALTERNATIVES

4.1 35 ml Measure

As described in the certificate, but opting to dispense 35 ml portions instead of 25 ml portions. In this case the legends shall be changed accordingly.

4.2 Pressure Source

As described in the certificate, but having the pressure required by the system optionally supplied by utilising the premises air supply or CO₂, in which case the air compressor may be omitted. For CO₂, there would be a primary CO₂ regulator after the source and before the pressure sense switch.

4.3 Berg Laser™ Dispensers

The following system configurations may optionally be installed as alternatives or in combination with the 12-Brand gun described in this descriptive annex. These are:

- Berg Laser™ 600
- Berg Laser™ 1600
- Berg Laser™ 1200 Remote
- Berg Laser™ 1600 Remote
- Berg Laser™ 2400 Remote
- Berg Laser™ 3200 Remote

The 600 and 1600 are identical to the 1200 but controlling 6 and 16 separate products instead of 12.

4.4 Clear fronted cabinet

Having a single clear fronted cabinet to house both the pressure sense switch and pressure regulator.

4.5 Electronic Control Unit (ECU) – PN 8004550 (Figure 12)

Having an alternative ECU as shown in Figure 12. The alternative ECU has an aluminium enclosure containing the CPU used to control the dispensing operation.

4.6 Alternative manufacturer label, see figure 13.

5 RECOMMENDED TESTS

In addition to those tests specified in Regulations the following tests may be performed to check for conformity to the pattern.

5.1 Accuracy

The equipment is calibrated on-site following installation. On completion of these activities, accuracy tests should be performed and correct delivery should be verified at each bar position. Note the approximate tube length from the reservoir pump to each dispenser. These lengths shall not be adjusted after calibration / sealing.

5.2 Interlocks

Verify the operation of the interlocks described in 3.2.

5.3 Labels and Markings

Verify that the dispensing measure label is present on each dispenser gun within the installation. Verify that the supplier and certificate label is present on one of the dispenser assemblies (under bar unit).

5.4 Sealing

On completion of tests, verify that the sealing described in 2.5 is in place.

6**CERTIFICATE HISTORY**

Certificate Number	Date	Description
2680	01 May 2012	Certificate first issued.
2680 Amendment 1	02 August 2006	Extended Expiry date
2680 Revision 1	11 March 2013	Section 5 deleted with subsequent sections renumbered. Renewal of certificate for a further period of 10 years.
2680 Revision 2	18 July 2013	Addition of section 2.5.3 Addition of section 4.4 Addition of Figures 9, 10 and 11. Section 5.4 typing error, changed from 2.3 to 2.5.
2680 Revision 3	10 January 2014	Addition of section 4.5 Addition of Figure 12
2680 Revision 4	22 September 2014	Change of applicant address details Addition of section 4.6 Addition of Figure 13

Berg Laser
March 26, 2003

Basic system schematic with limit switches

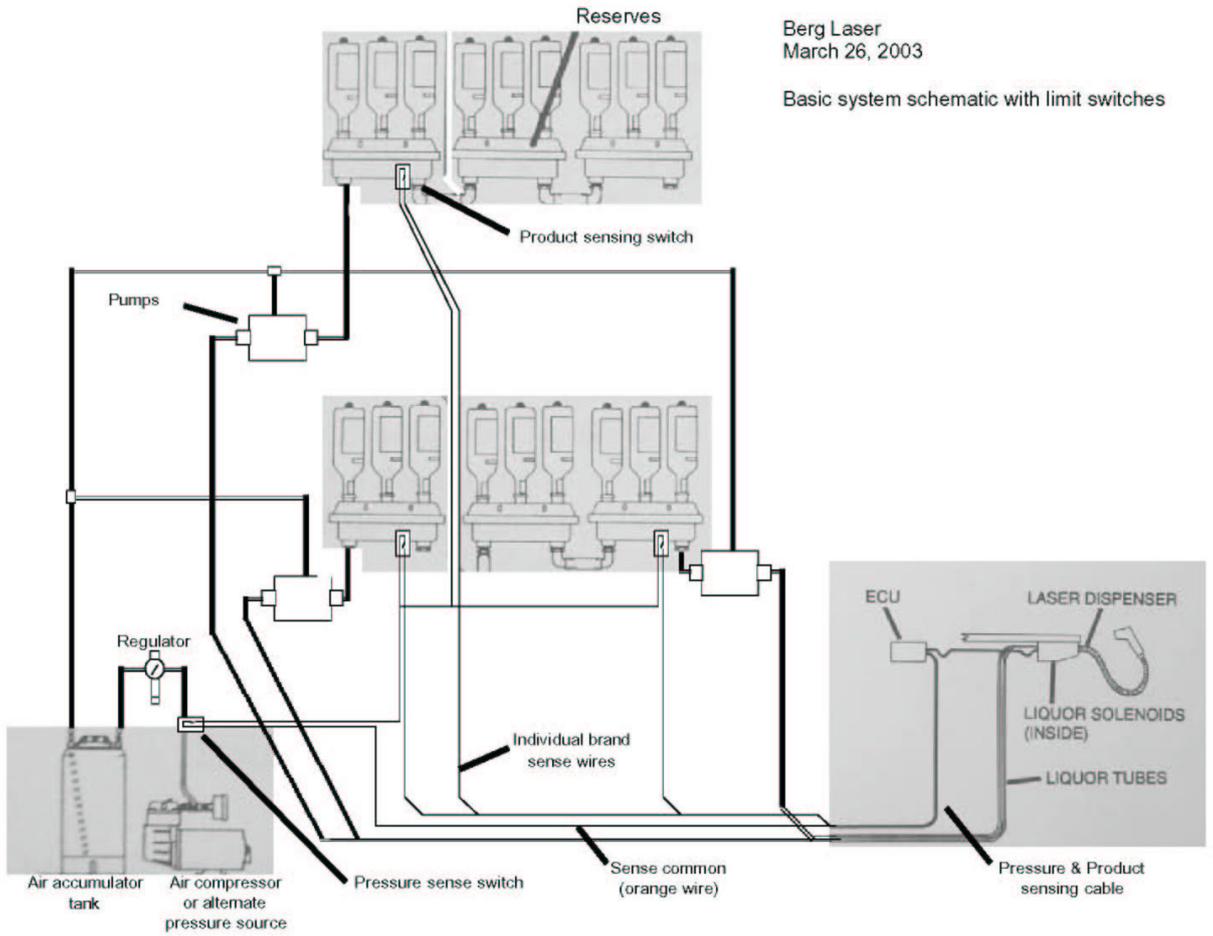


Figure 1 Basic System Schematic



Figure 2 Pressure Sense Switch with Security Seal



Figure 3 Pressure Regulator in clear case and optional pre-set regulator with wire seal

note: arrows indicate positions where case and cover are drilled to accept wire for sealing purposes



Figure 4 Constant Pressure Pump

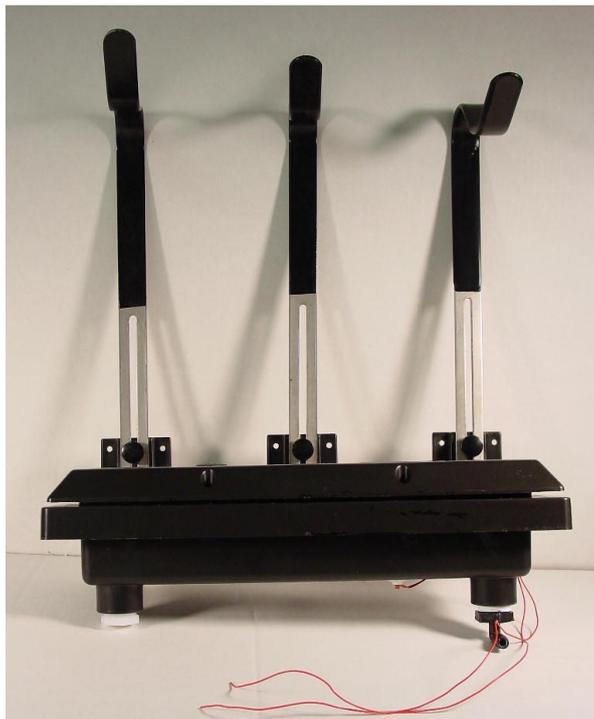


Figure 5 Liquor Reserve with Product Sense Switch



Figure 6 Berg Laser™ Dispenser with inset showing dispensed amount legend



Figure 7 Infinity Electronic Control Unit (ECU)

Woodward Enterprises Ltd
 90 Waverley Avenue
 Twickenham
 TW2 6DN
 020 8898 2532

UK Cert. No. 2680

Figure 8 Label



Figure 9 Pressure sense switch and regulator housed in a single clear case



Figure 10 Position of security seal at top right corner

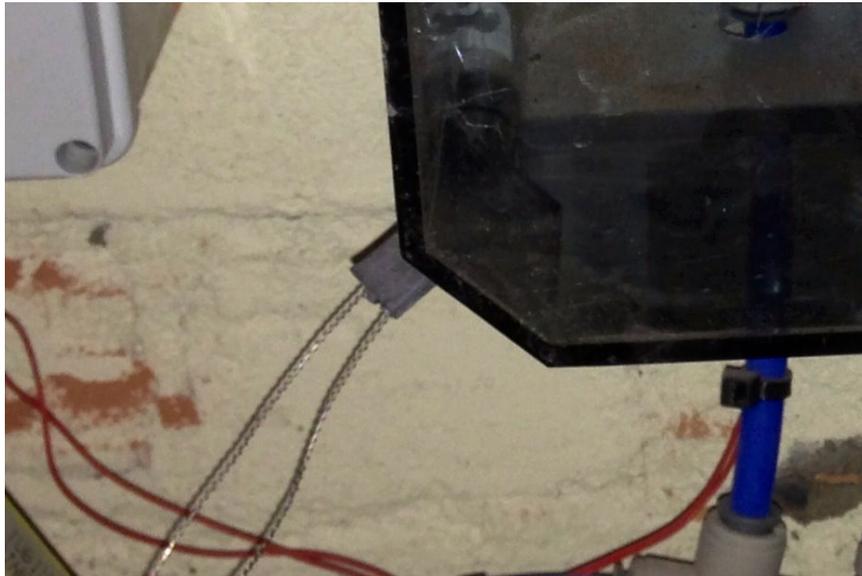


Figure 11 Position of security seal at bottom left corner



Figure 12 Authorised alternative - Electronic Control Unit (ECU)

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Figure 13 Alternative label