

**Carbonator/Filler – FT102X**  
**Filler/Capper (Counter Pressure Filling Station) – FT104X**



- Applications**
- ▶ Soft drinks
  - ▶ Beer
  - ▶ Milk
  - ▶ Juices and cordials
  - ▶ Water
  - ▶ Health and nutritional products

**Features / benefits**

- ▶ Easily reproducible test batches
- ▶ Very flexible and accurate
- ▶ No CO<sub>2</sub> loss during filling due to double stage cooling
- ▶ Easy to use: many functions automated
- ▶ Cost saving: for small test batches no production line is required
- ▶ Additional filling/capping head (FT104X) can be added at a later date
- ▶ Fill and cap different container styles to individual parameters on the same product run with the FT104X
- ▶ 32 preset programs
- ▶ Accurate control of filling and carbonating variables
- ▶ Option of filling and crown seal capping and/or screw top capping at a single station
- ▶ 30l process vessel, positioned at a convenient height
- ▶ Batch & continuous processing
- ▶ Throughputs up to 60l/h achievable (2l bottles) on FT102X
- ▶ Higher throughputs possible with add-on filling/capping system (FT104X)
- ▶ Wide range of cans or bottles can be used from 0.15l to in excess of 2l
- ▶ Evaluation service for customer cans and bottles
- ▶ CO<sub>2</sub> content of 12g/l can be realised
- ▶ Enhanced colour touch screen control with help facility as standard
- ▶ In-bottle pressure measurement enables accurate and reproducible depressurisation
- ▶ Improved cleaning programs with heater and spray ball
- ▶ Carbonates at any temperature between 4°C and ambient
- ▶ Premix and postmix capability
- ▶ Adds protective gases (N<sub>2</sub> connection now standard)
- ▶ Many parameters can be automated
- ▶ Fills non-carbonated drinks
- ▶ CO<sub>2</sub> or NO<sub>2</sub> flushing
- ▶ Carbonates foaming products

## Description

### Preparing Carbonated Beverages in the Laboratory

The Armfield FT102X miniature-scale carbonator provides the ability to establish precise and repeatable parameters when carbonating in the laboratory, this can dramatically improve the speed with which new products are developed.

The FT102X is a totally new design including a large number of improvements and enhancements. In particular, special attention has been given to the ease of use, enhanced flexibility, reliability and improved Clean In Place (CIP).

Both premix and postmix operations are available from the standard machine, and an option is available to add the syrup for postmix automatically. Other options enable for deaeration of the product and evacuation of the bottles, continuous processing capability, and filling and capping (screw and/or crown) at a single station without removing the bottle.

The FT102X Carbonator/Filler is easy to install, set up and use. Colour touch screen control is used with a new graphical interface, enabling different carbonating and filling scenarios to be set and stored. The improved semi-automated cleaning programme takes the user step by step through the cleaning process and enables the unit to be made ready for another product or formulation.

The FT102X is ideally suited as a general purpose filling and carbonation installation for small laboratory applications. Used in conjunction with one of Armfield's FT74 UHT/HTST units, a complete drinks line can be created in the laboratory; consisting of heat treatment, carbonation, filling and capping.

## Description of Operation

The FT102X is a combined carbonator and filler, designed primarily to enable R&D staff to prepare small quantities of beverages with reproducible characteristics and replicating the production product.

The carbonation takes place using a recirculation pump to circulate the product from a 30l vessel through a heat exchanger system and a sinter tube where the CO<sub>2</sub> is introduced. The pressure in the carbonation vessel is controlled automatically by the plc. The vessel has two compartments, an outer compartment from which the product to be carbonated is drawn, and an inner compartment which contains the most recently carbonated product. When the inner compartment is full the contents overflow into the outer compartment.

The product is first chilled down to below the required carbonation temperature using a plate heat exchanger and then an in-line heater under PID control heats the product to an accurately controlled temperature. The plate heat exchanger requires a chilled water supply. This can either be the customers own supply or the Armfield FT63 re-circulating process chiller (which can also be used with other products in the laboratory such as an Armfield FT74XA).

The plate heat exchanger is able to be dismantled fully for cleaning.

After carbonation, the product is passed to the filling head through a long tubular heat exchanger which further cools the product to prevent CO<sub>2</sub> release. The filling process takes place under PLC control. It consists of raising the bottle to the filling head, syrup dosing (option), evacuating the bottle (option), flushing the bottle with CO<sub>2</sub> (or N<sub>2</sub> if not carbonating), pressurising the bottle (CO<sub>2</sub> or N<sub>2</sub>), counter-pressure filling the bottle, re-pressurising the vessel, allowing time for the contents to level-out, de-pressurising (or snifting) and clearing the overflow.

Most functions of the FT102X are under PLC control and the operator interface is a touch screen control panel. It is possible to save and recall up to 32 sets of operating parameters to suit different products and containers. Each set of parameters can be allocated a descriptive name.

## Filling and Capping Containers

A wide range of cans, PET and glass bottles can be handled.

The standard options can handle most containers from 0.15 to 2 litres, and larger containers (including 5l kegs) can usually be accommodated by simple modifications. However, we understand that all containers are different and we will be pleased to evaluate your containers in advance, particularly if screw capping is required.



### FT104X Filler/Capper - (Counter Pressure Filling Station)

The FT104X is a counter pressure filling station, which can be used as an add-on filling station for the FT102X.

- ▶ Simple enabling mod to FT102X enables FT104X to be added, either at time of order or at a later date. (Order code FT102X-46)
- ▶ FT104X adds an extra filling position to the one on FT102X, enabling a faster throughput
- ▶ One standard filling head included. Additional filling heads are available for cans or wider opening bottles.
- ▶ FT102X can still be used stand alone
- ▶ FT104X has its own control screen, making it easy to use and preventing any operator confusion regarding which head is being used.
- ▶ Simple connection to FT102X
- ▶ FT104X uses standard FT102X accessories, i.e. filling head adaptors, PET bottle carrier, filling tubes, centring rings etc.
- ▶ As the FT104X is independent from the FT102X filling system it is possible to use different filling parameters, different containers and/or different capping mechanisms if required
- ▶ FT104X can also be used as a stand alone counter pressure filler for filling from pressurised vessels



## Optional Features

### FT102X-2 Capper Enabling System

Incorporated into the filling station, this option enables the user to fit either the crown seal capper or the screw cap sealer into the capping head. It includes a pneumatic drive, which is used to move out the filling head and position the selected capper over the bottle. The two capping heads are interchangeable once installed, and can easily be fitted by the user.

### FT102X-3 Crown seal capper mechanism (Requires FT102X-2)

The standard FT102X-3 works with the majority of bottles and crown caps. For other bottles we can normally produce a special capper head, order code **FT102X-3-SPL**. Armfield can test your bottles free of charge for suitability. (includes 1 set of calipers) .

### FT102X-4 Screw cap sealer mechanism (Requires FT102X-2)

For use with splined plastic screw caps. Includes a motor drive with a variable torque setting to enable for a wide range of bottles and screw caps to be used. The motor limit current (hence the torque setting) is set electronically from the control panel. Different inserts can be fitted to the capping head to accommodate different types or sizes of cap. The standard insert fits many typical 28mm caps. Armfield can test your caps and bottles free of charge for suitability. For other bottles using splined caps we can normally produce a special insert tailored to the cap, order code **FT102X-4-SPL**.

*Note: For successful operation the FT102X-17 PET bottle holder must be used. For glass bottles a special holder (FT102X-17-SPL) can usually be provided.*

### FT102X-5 Centering Ring

The FT102X-5 is used to position the bottle centrally on the platform. Two of these acetal centering rings are included with each FT102X. These can be machined to suit the customer bottle size (if provided). Additional centering rings can be supplied for use with more bottle types. Order code **FT102X-5-ZZ** where ZZ is the hole size in mm.

### FT102X-6 Filling head for cans (diameter between 60-70 mm)

The standard FT102X-6 works with most cans, but some cans with unusual lips may need special attention. Armfield can test your cans free of charge for suitability.

### FT102X-10 Vacuum system

Used for both deaerating the product (prior to carbonating) and for evacuating the bottles prior to filling. It includes the vacuum pump, the addition of a deaeration surface in the chamber and all the valves and controls for both processes.

The evacuation parameters are integrated seamlessly with the other filling functions on the operator interface panel and are saved as part of the normal filling data.

### FT102X-14 Syrup feed system

Comprising a feed vessel for syrup, peristaltic metering pump plus the various valves and facilities for automated syrup dosing. The syrup dosing parameters are integrated seamlessly with the other filling functions on the operator interface panel and are saved as part of the normal filling data.



Detail of Filling Head with optional Screw Capper Fitted

### FT102X-17 PET bottle neck support

Used to prevent crushing of containers during filling. The standard FT102X-17 works with most PET bottles with a 28mm nominal neck width. Armfield can test your bottles free of charge for suitability. For other bottles or different sizes we can produce a special support tailored to the bottle, order code **FT102X-17-SPL**.

### FT102X-19 Filling Head for larger bottle openings

The standard filling head provided with the FT102X is suitable for bottles with an opening up to 25mm. The FT102X-19 enables bottles with a larger opening from 25 mm to 43 mm (O/D) to be filled.

### FT102X-22 Hot Filling Connection

For filling directly from other process systems (This option is included in option FT102X-14).

### FT102X-35 Filling tube

A replacement filling tube, which can be used to fill to a different headspace.

### FT102X-44 Continuous Operation Facility

This option comprises a buffer tank and pump to enable product to be taken from a continuous process (such as an Armfield UHT system) and matched to the FT102X Carbonator/Filler. The buffer tank is filled from the feeding system and the pump transfers the contents to the FT102X carbonation vessel as required. An additional plate heat exchanger stage is incorporated into the FT102X to cool down the incoming product.

### FT102X-46 Enabling system for FT104X

It is possible to use additional filling heads on an FT102X system in order to increase throughput, by adding an FT104X filling system. The FT102X-46 (ordered with the FT102X) enable an FT104X additional filling head to be added to the system at any time without modification to the FT102X.

*Notes: The FT102X-2, -4, -10, -14, and -22 options must be specified at initial purchase and cannot be added later. The FT102X-44 and -46 options require pipework changes, but can be installed on site (at extra cost).*

## Requirements

## Scale



- ▶ Electricity supply: Single phase (see ordering codes)
- ▶ Water supply: Supply of chilled water at approx 3°C to 5°C below the carbonation temperature, @ 10l/min.  
The Armfield FT63 is ideal for use with the FT102X
- ▶ Mains water @ 2 bar (min)
- ▶ CO<sub>2</sub> (and/or N<sub>2</sub>) supply with manual regulator, 6 bar
- ▶ Compressed air supply with manual regulator, 6 bar



Detail of enhanced colour touch screen control with help facility as standard

## Technical specifications

Gas pressure	0-4 bar
Gas content	0 - >12 g/l
Vessel capacity	130 litre (certified in accordance with the Pressure Equipment Directive) (27 litre product capacity)
Contact surfaces	316L Stainless Steel or food grade platinum cured silicone hose
Gases	CO <sub>2</sub> , N <sub>2</sub> or any safe, non-flammable alternatives or mixture.
	During cleaning compressed air is used

## Overall dimensions

Model	FT102X	FT104X	FT63
Length	0.80m	0.75m	0.76m
Width	0.80m	0.75m	0.57m
Height	1.75m	1.75m	0.89m

## Packed and crated shipping specifications

Volume	2.1m <sup>3</sup>	2.1m <sup>3</sup>	0.7m <sup>3</sup>
Gross weight	372kg	350kg	160kg

## FT104X Optional Accessories

see FT102X descriptions for more details

- ▶ FT104X-2 Capper Enabling System
- ▶ FT104X-3\* Crown Seal Capper (requires FT104X-2)
- ▶ FT104X-4 Screw Cap Sealer Mechanism (requires FT104X-2)
- ▶ FT104X-6\* Filling Head for Cans
- ▶ FT104X-10 Vacuum System for Bottles (requires FT102X-10)
- ▶ FT104X-14 Syrup Dosing System
- ▶ FT104X-17\* PET bottle neck Support
- ▶ FT104X-19\* Filling Head for Bottles, 25mm to 43mm
- ▶ FT104X-35\* Filling Tube for different head space

\* Note, these items are identical and interchangeable with the FT102X equivalents.

## Ancillary Equipment

The Armfield range of UHT processing systems may be used to pasteurise the product prior to carbonation and filling. Units may be linked directly to the Carbonator/Filler.

Available options include the FT74-30-MKIII (indirect heating using a plate heat exchanger), the FT74-20-MKIII (indirect heating using a tubular heat exchanger) and the FT174X (direct heating by injection of steam).

## Armfield FT102X / FT104X

FT102X and FT104X side by side.

This system is also compatible with the FT104X Counter Pressure Filling Station, which gives even more options including an extra filling station for faster throughput.

[www.explorearmfield.com/en/products/view/ft102x](http://www.explorearmfield.com/en/products/view/ft102x)



## Ordering codes

- ▶ FT102X-A: 220-240V, 1ph, 10A, 50Hz
- ▶ FT102X-G: 220-240V, 1ph, 10A, 60Hz
- ▶ FT104X-A: 220-240V, 1ph, 10A, 50Hz
- ▶ FT104X-G: 220-240V, 1ph, 10A, 60Hz
- ▶ FT63(SS)-A: 220-240V, 1ph, 10A, 50Hz
- ▶ FT63(SS)-G: 220-240V, 1ph, 10A, 60Hz

## Knowledge base

- > 28 years' expertise in research & development technology
- > 50 years' providing engaging engineering teaching equipment

Benefit from our experience, just call or email to discuss your laboratory needs, latest project or application.

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